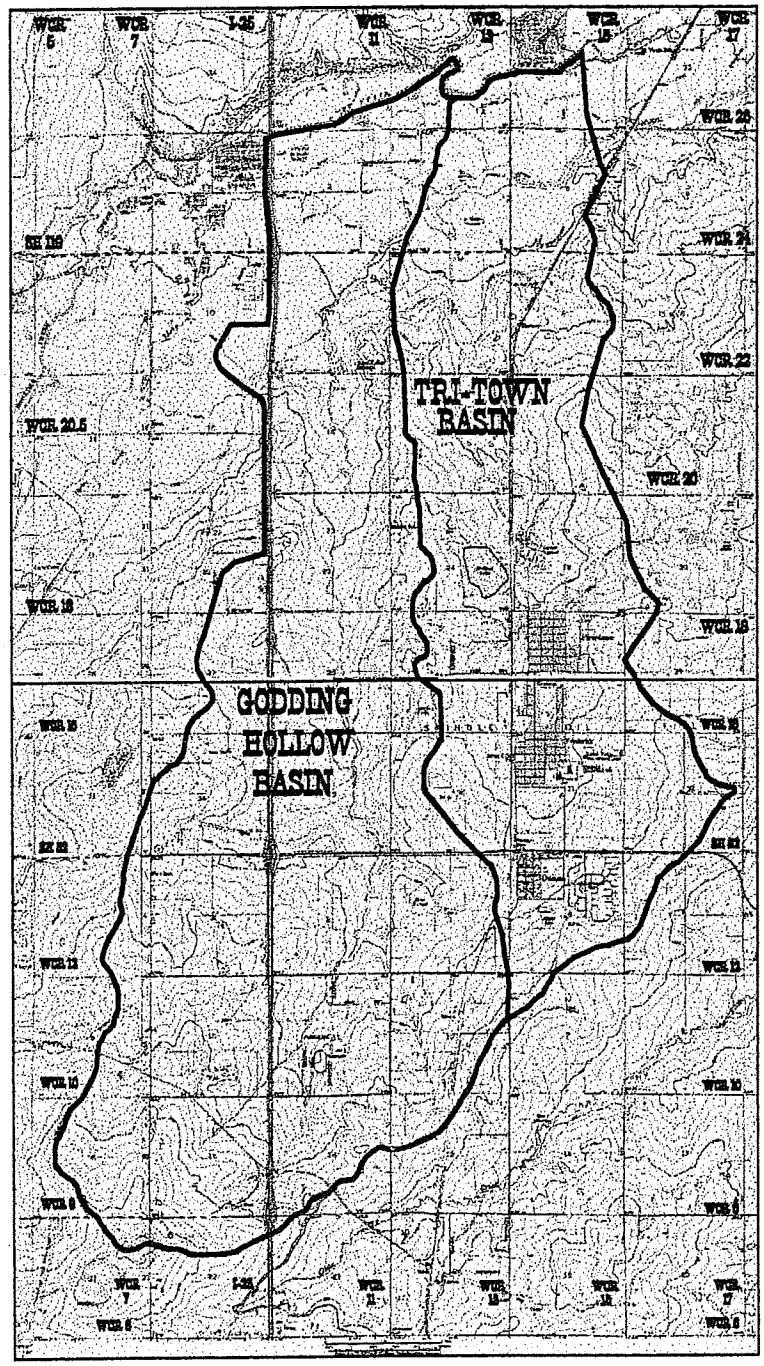
SOUTH WELD I-25 CORRIDOR MASTER DRAINAGE PLAN



WELD COUNTY

DACONO

DACONO SANITATION DISTRICT

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SOUTH WELD I-25 CORRIDOR MASTER DRAINAGE PLAN

Attached is the South Weld I-25 Corridor Master Drainage Plan.

To acquire the two-volume Technical Addendum, please call the Weld County Public Works Department at (970)356-4000, Ext. 3750.

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I-25 CORRIDOR MASTER DRAINAGE PLAN
GODDING HOLLOW AND TRI-TOWN BASINS
SOUTH WELD COUNTY, COLORADO

PREPARED FOR:

Weld County
Dacono Sanitation District
St. Vrain Sanitation District
Tri-Area Sanitation District
City of Dacono
Town of Firestone
Town of Frederick
Town of Erie

PREPARED BY:

Anderson Consulting Engineers, Inc.
2900 South College Avenue, Suite 3B
Fort Collins, CO 80525

February 17, 2000

I-25 CORRIDOR MASTER DRAINAGE PLAN
GODDING HOLLOW AND TRI-TOWN BASINS
SOUTH WELD COUNTY, COLORADO

PREPARED FOR:

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September 8, 1999

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I. INTRODUCTION

Southwest Weld County is presently experiencing rapid growth and development within the boundaries of the Godding Hollow and Tri-Town Basins. These basins have a long history of flooding problems with the most severe problems recently focused within the communities of Dacono, Firestone and Frederick. In addition, potential flooding and overtopping of Interstate Highway 25 poses a threat to public health and safety. As future development occurs within the basins, these existing flooding problems will likely be exacerbated; consequently, the construction of adequate storm drainage facilities that mitigate both existing and future flooding problems becomes increasingly important.

In support of the need to provide these facilities, Weld County contracted with Anderson Consulting Engineers, Inc. to develop master drainage plans for the Godding Hollow and Tri-Town Basins. This report summarizes the results of the master planning efforts for both of these basins.

1.1 Project Goals and Objectives

The goal of this project was to develop a Master Drainage Plan (MDP) that can be utilized as a tool for making decisions related to stormwater management within the boundaries of the two basins. Completion of the master drainage plan for the Godding Hollow and Tri-Town Basins involved the development of a planning document that would:

(a) identify long-term capital improvements and rehabilitation measures for the existing drainage system;

(b) be a tool for implementation of future improvements associated with new developments within the basin boundaries;

(c) provide a basis for prioritizing and scheduling required improvements (implementation plan);

(d) provide the flexibility to implement improvements that afford flood protection while being cost effective;

(e) address water quality issues;

(f) identify uniform criteria for the planning and design of major drainageway facilities and on-site detention requirements; and

(g) provide a recommendation related to a financing and funding mechanism.

Sensitivity to these objectives was an important consideration during the preparation of the master drainage plan; however, the primary focus of the planning efforts was the reduction of both existing flooding and the potential for future flooding problems within the Godding Hollow and Tri-Town Basins.

1.2 Scope of Work

The scope of work followed during the development of the master drainage plan included the tasks described below.

1. Scoping and Coordination Meetings. This task included a scoping meeting to discuss project goals and objectives, schedule, deliverables, modeling criteria and level of detail, and planning concepts and evaluation procedures. Coordination meetings were also conducted to discuss project status, overall direction of the project and promote the exchange of information. Workshops were held with members of the I-25 Corridor MDP Task Force which included representatives from the five governing bodies (Towns of Erie, Frederick, and Firestone, The City of Dacono, and Weld County), the Tri-Area Sanitation District, Colorado Water Conservation Board, several irrigation companies, and various other entities. During the coordination meetings, the scope of the project was often slightly modified to reflect information and results generated during the completion of the planning effort.

2. Data Collection and Field Investigation. A detailed review of all available reports, mapping and data pertinent to the planning efforts was conducted. This information included but was not limited to: (a) existing drainage criteria and policies; (b) existing and ongoing drainage studies; (c) zoning data; (d) pertinent soils, rainfall and runoff data; (e) inventories of existing facilities; (f) available mapping and utility data bases; and (g) agreements with various entities including ditch companies and Weld County. In conjunction with the collection and review of available data, a field reconnaissance was conducted to further define and verify locations of existing drainage or flooding problems and formulate plans for conceptual improvements at these locations. Survey requirements were identified along with all existing facilities earmarked for evaluation during the hydraulic evaluation.

3. Mapping and Surveying. All available mapping sources were investigated. These sources included USGS quadrangle maps and mapping generated from existing and ongoing drainage studies. To facilitate the master planning efforts, aerial

photography was utilized from a 1998 aerial flight. Survey requirements included the collection of data necessary to define existing structures (bridges, channels, culverts, outlet structures, etc.) with respect to geometric configuration, invert and overtopping elevations, etc.

4. Inventory of Existing Facilities. All information related to the major storm drainage facilities within the major drainageway of each basin was compiled. Existing detention facilities, culverts, bridges, road crossings, drainage channels, irrigation ditches, and major storm sewers were inventoried and evaluated. The capacity of each structure was determined and the feasibility of integrating existing facilities into the master drainage plan investigated.

5. Hydrologic Analysis and Modeling. A detailed hydrologic model was developed and utilized to simulate the stormwater runoff for three scenarios: (a) existing or "as is" condition; (b) future development conditions with existing facilities; and (c) future development conditions with on-site detention and proposed improvements.

6. Hydraulic Analysis and Modeling. A detailed hydraulic analysis was completed to evaluate the structures identified during the inventory of existing facilities. All proposed improvements were also evaluated during the hydraulic analysis and modeling efforts.

7. Drainageway Planning and Alternative Development. Storm drainage improvements were identified to mitigate the existing and potential future flood hazard problems. Alternative stormwater management plans were conceptually developed and internally reviewed and refined with input from the staff of the Weld County Public Works Department and the I-25 MDP Task Force.

8. Basin Drainage Criteria. Criteria for the planning and design of drainage facilities were developed in conjunction with the I-25 MDP Task Force. The criteria specifically focused on the planning and design of major drainageway facilities/road crossings and on-site detention requirements.

9. Funding/Financing Alternatives. An investigation of various funding and financing alternatives was completed. The results of the investigation along with a recommendation were presented to the governing bodies and interested parties.

10. Reporting and Technical Documentation. The results of the master planning effort are summarized in this report. All recommended improvements are identified along with preliminary design drawings and detailed cost estimates. An implementation plan for the construction of the proposed improvements is presented. Documentation in the form of technical appendices and a project notebook is provided to allow replication of the steps taken to: (a) generate the design flows, (b) estimate the capacity of the existing and future facilities, (c) develop and evaluate the alternative plans, and (d) generate the cost estimates.

1.3 Acknowledgments

The preparation of this report along with the supporting documentation involved the dedicated efforts of many members of the I-25 MDP Task Force, Weld County government, and members of the communities impacted by the implementation of a master drainage plan. These individuals are identified below.

Mr. Dale Hall, Weld County Commissioner
Ms. Barbra Kirkmeyer, Weld County Commissioner
Mr. Frank Hempen, Jr., Weld County Public Works Director
Mr. Drew Scheltinga, Weld County Public Works Engineer
Mr. Larry Lang, Colorado Water Conservation Board
Ms. Linda Stepien, Mayor, City of Dacono
Ms. Helen Gray, Economic Development Coordinator, City of Dacono
Mr. Vic Smith, Mayor, Town of Erie
Ms. Wendi Palmer, Public Works Construction Engineer, Town of Erie
Mr. Rick Patterson, Mayor, Town of Firestone
Mr. Edward Tagliente, Mayor, Town of Frederick
Mr. Don Silar, The Sear-Brown Group, representing the Tri-Area Sanitation District

The assistance and cooperation of these individuals are acknowledged and greatly appreciated.

In addition to those individuals listed above, members and representatives of the Dacono Sanitation District, Saint Vrain Sanitation District, Last Chance Ditch, Rural Ditch, Godding Ditch, and the Colorado Department of Transportation provided invaluable information and details related to the existing facilities, historic flooding, and on going/proposed basin development. The information provided by these individuals is also gratefully acknowledged.

1.4 Mapping and Surveying

Digital USGS quadrangle mapping was utilized during the master planning efforts. These maps were combined to form a single, contiguous topographic base map that encompassed the drainage boundaries of both basins. The following USGS quadrangle maps were obtained:

(a) Erie, Colorado, 1967, Photo revised 1979;
(b) Frederick, Colorado, 1950, Photo revised 1994; and
(c) Gowanda, Colorado, 1949, Photo revised 1979.

All the quadrangles utilized the NAD29 Vertical Datum and incorporated a contour interval of 10 feet.

In addition to the USGS mapping, digital aerial photographic images (1998) were obtained from Weld County and utilized to illustrate the location of all proposed improvements.

The survey data necessary to complete the project was provided by TST, Inc. of Fort Collins, Colorado.

1.5 Previous Studies

Previous studies related to stormwater management within the Godding Hollow and Tri-Town Basins were collected and reviewed during the completion of this project. No reports for the Godding Hollow Basin were identified through the research effort; however, several reports for the Tri-Town Basin were identified.

Reports documenting stormwater drainage conditions and improvements in the Tri-Town Basin included:

(a) Preliminary Engineering Report Drainage Study Firestone-Frederick Area (Nelson, Haley, Patterson and Quirk, Inc., September 1975);

(b) Master Drainage Study For the Tri-Area Basin, Including the Towns of Frederick, Firestone and Unincorporated Evanston (Rocky Mountain Consultants, Inc., September 1984);

(c) Report of Investigation for the Tri-Area Drainageway Improvements, Town of Firestone (TST, Inc., November 18, 1991); and

(d) Conceptual Design Report For South Side Drainage Improvements, Town of Frederick, Colorado (Rocky Mountain Consultants, Inc., April 1996).

Several other drainage studies associated with development within the basins were also collected and reviewed. The information gathered from these reports, including the available design drawings and specifications, were evaluated and utilized during the completion of this master planning effort.

With respect to flood studies within the basins, the Federal Emergency Management Agency (FEMA) has produced approximate flood information and mapping along the Saint Vrain River and Godding Hollow. Furthermore, FEMA has documented flooding in the Tri-Town Basin in the following documents:

(a) Flood Insurance Study, Town of Frederick, Colorado, Weld County, January 1979, Revised July 13, 1983;

(b) Flood Insurance Study, Town of Firestone, Colorado, Weld County, June 1979;

(c) Flood Insurance Study, Town of Dacono, Colorado, Weld County, July, 1979; and

(d) Flood Insurance Study, Weld County, Colorado Unincorporated Areas and Town of Eaton, Colorado; Revised September 27, 1991.

A special study of the major drainageway in the Tri-Town Basin was conducted by Gingery Associates, Inc. in October 1977. This study involved a hydrologic and hydraulic analysis of the drainageway which resulted in the delineation of the 100-year floodplain in the vicinity of Firestone, Frederick and Dacono.

II. BASIN CHARACTERISTICS

2.1 Location and Description

The Godding Hollow and Tri-Town Basins are located in the southwest corner of Weld County approximately 15 miles north of the Denver metropolitan area. The adjoining basin limits can be defined by the Saint Vrain River on the north, Weld County Road 15 (WCR 15) on the east, Weld County Road 8 on the south and Weld County Road 7 on the west. The drainage basin boundaries are delineated on the vicinity map in Figure 2.1.

The total drainage area encompassed within the Godding Hollow Basin is estimated to be 12,419 acres of which approximately 11 percent is developed. Primary land use within the basin is agricultural and comprises about 10,980 acres. Of the area that is developed, the land use consists of low to medium density residential housing developments, a motorized race track, and light to medium industrial development. Existing development is scattered throughout the basin predominantly concentrated along the I-25 corridor. Five jurisdictional entities control growth and development within the Godding Hollow Basin. These entities include Weld County (9,420 acres or 76%), Town of Firestone (510 acres or 4%), Town of Frederick (1,806 acres or 15%), City of Dacono (509 acres or 4%), and Town of Erie (174 acres or 1%).

The total drainage area encompassed within the Tri-Town Basin is estimated to be 7,945 acres, of which approximately 25 percent is developed. Primary land use within the basin is agricultural and comprises about 5,920 acres. Of the area that is developed, the land use consists of low, medium, and high density residential housing developments, parks and golf courses, and light industrial/commercial development. Existing development is predominantly limited to the area between WCR 18 on the north, WCR 15 on the east, WCR 12 on the south and WCR 13 on the west. Within the Tri-Town Basin, four jurisdictional entities control growth and development. These entities include Weld County (3,900 acres or 49%), Town of Firestone (2,016 acres or 25%), Town of Frederick (1,439 acres or 18%), and City of Dacono (590 acres or 8%). The existing corporate limits are delineated in Appendix A.

2.2 Drainage Features

Within the Godding Hollow Basin, the Godding Hollow channel is the most predominant drainage feature, traversing the central portion of the basin in a northerly direction. Several minor tributaries exist within the watershed to collect and convey stormwater runoff into Godding Hollow. Numerous county roads, state highways and irrigation canals cross Godding Hollow and

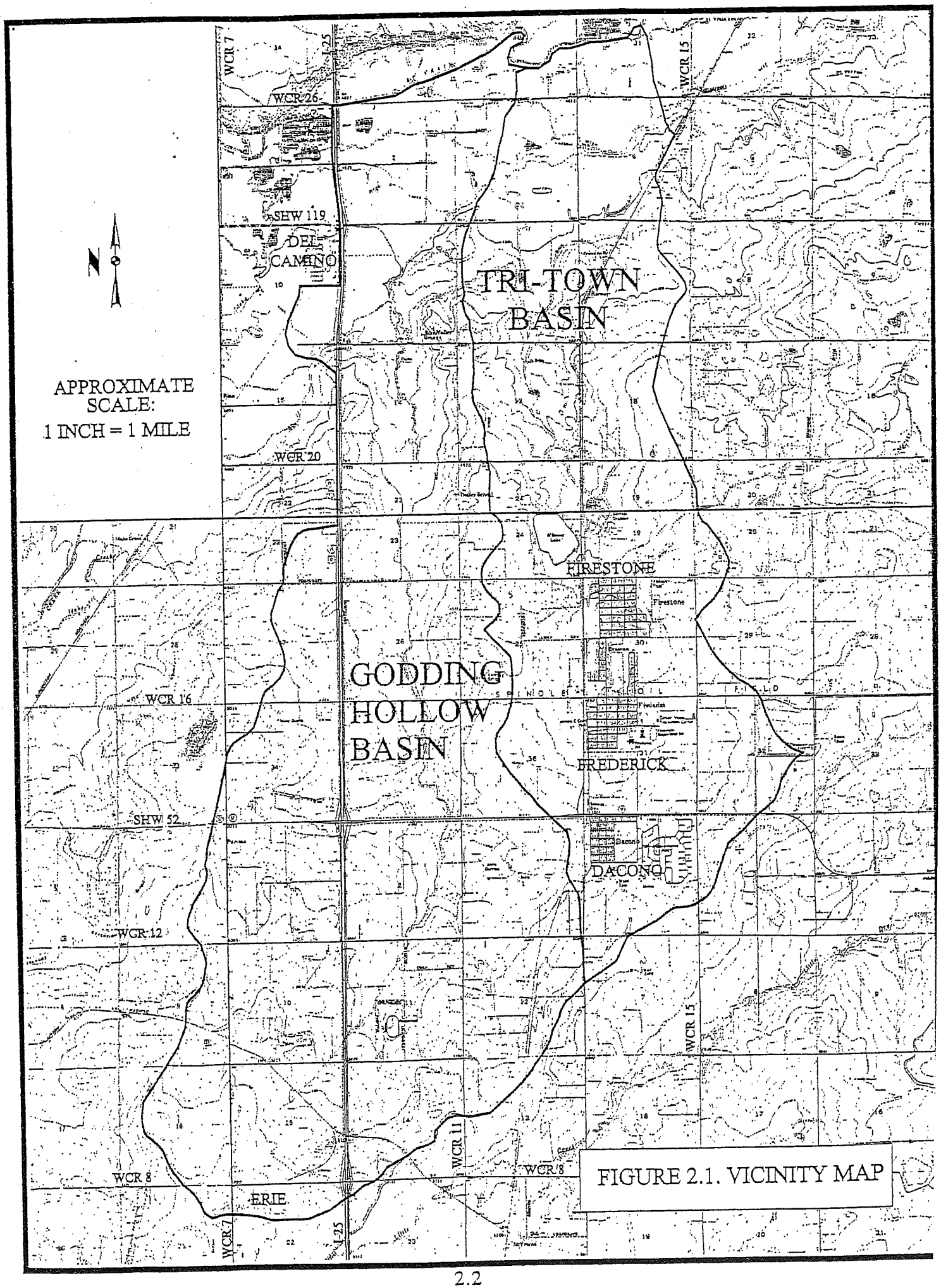


FIGURE 2.1. VICINITY MAP

its tributaries; these crossings also tend to constrict the channel and create potential for detention, flooding of adjacent property and overtopping of roadways during major storm events. Within this basin, several detention ponds/storage areas exist which may provide for a reduction in stormwater runoff.

Within the Tri-Town Basin, the Tri-Town Drainageway (also known as Biederman Draw or the McCormick Seep Ditch in its northern most reach) is the most predominant drainage feature, traversing the central portion of the basin in a northerly direction. Similar to the Godding Hollow Basin, several minor tributaries exist within the watershed to collect and convey stormwater runoff into the drainageway. Numerous county roads, state highways and irrigation canals cross the drainageway and its tributaries; these crossings tend to constrict the channel and create potential for detention, flooding of adjacent property and overtopping of roadways during major storm events. In the upper portion of the basin, there is no significant existing detention storage on either the major drainageway or its tributaries.

The Saint Vrain River, which defines the northern boundary of both basins, represents the second notable drainage feature in each basin. The river receives all the stormwater runoff that is generated within the watersheds. The 100-year floodplain associated with the Saint Vrain River encompasses less than 5 percent (950 acres) of the total drainage area within both basins.

Four irrigation ditches, the Last Chance Ditch, the Rural Ditch, the Godding Ditch, and the Coalridge Ditch (also known as the Severance Ditch or the Boulder Ditch), also traverse the Godding Hollow and Tri-Town Basins. These ditches convey irrigation flows within the basin but offer limited value as drainage features that will convey stormwater runoff out of the basin. Due to the limited capacity of the ditch systems coupled with the magnitude of the stormwater flows, these irrigation ditches do not represent a drainage boundary within the basin.

The drainage features along with the limits of the 100-year floodplain associated with the Saint Vrain River, Godding Hollow and Tri-Town Drainageway are presented on the existing drainage facilities map provided on Sheet 1.

2.3 Description of the Major Drainageways

2.3.1 Godding Hollow Drainageway

The Godding Hollow Basin consists of a predominantly rural watershed with a well-defined major drainage channel. The major drainageway originates near the intersection of WCR 7 and WCR 8. From this location, the Godding Hollow Drainageway conveys stormwater runoff under a 42-foot wide timber railroad bridge located approximately one-half mile southwest of the WCR

10/I-25 intersection. At WCR 10, runoff passes under the road in a single reinforced box culvert (2'Hx3.5' W). Runoff is then directed to three reinforced box culverts (two 6'Hx11'W) and one 6'Hx14'W) which are utilized to convey the flows beneath both lanes of I-25 while a 60-foot wide timber bridge is utilized at the east frontage road. From the I-25 frontage road, the channel continues northeast combining with three minor tributaries north of the Colorado National Speedway complex. At this location, the major drainageway conveys stormwater northward to the crossings of Coalridge Ditch and State Highway 52 where runoff is detained by the canal and road embankments which incorporate crossing structures consisting of two reinforced box culverts (7'Hx7'W and 8'H x 8'W). North of State Highway 52, a major unnamed tributary draining approximately 2,170 acres west of I-25 converges with the main channel of Godding Hollow. The main channel continues north for approximately three miles before passing under the Godding Ditch flume. The steel flume spans 60 feet of the Godding Hollow floodplain. Approximately one-half mile north of the Godding Ditch, the Godding Hollow channel confluences with the Rural Ditch. The Rural Ditch continues northeast for approximately one-quarter mile at which point turns north in a wasteway to the Saint Vrain River. During large flood events, Godding Hollow Basin runoff will break out of the Rural Ditch, combine with out of bank Tri-Town Basin runoff and proceed over land to the Saint Vrain River. In summary, the major drainageway crosses one railroad, ten major county and/or state roads, four canals, and numerous other minor roads and utilities.

Minor erosion of the Godding Hollow channel is evident at several locations and is typically associated with livestock watering and access. Erosion is also visible at several road crossings and where farming practices have over-steepened the channel banks. In general, active erosion of the channel bed and banks is not prevalent throughout the basin. The Godding Hollow channel and floodplain are not heavily encroached with vegetation. The vegetation species vary from rangeland grasses and shrubs to willows and large deciduous trees occasionally intermingled with dense stands of wetland grasses and shrubs.

Sheet 1 presents an illustration of the major drainageway and major crossing structures within the basin along with the location of the major tributaries to Godding Hollow. A detailed description of the existing detention facilities/reservoirs, conveyance facilities and major road crossings, is provided in Chapter 3.

2.3.2 Tri-Town Drainageway

The Tri-Town Basin consists of a predominantly rural watershed with approximately 1.5 square miles of urban development in the upper portion of the watershed. A well defined major

drainage channel exists through portions of the basin. Several reaches of the major drainage path have been altered by man-made activities. These activities include levee construction, channelization, urban development (buildings and streets), and modifications resulting from farming and ranching operations. In general, stormwater runoff generated within the basin flows into the Tri-Town Drainageway and is conveyed in a northerly direction toward the Saint Vrain River.

The major drainageway for the Tri-Town Basin originates in the vicinity of the City of Dacono. Stormwater runoff generated south of Dacono is combined with runoff from the urbanized area and through the residential streets, ultimately concentrating east of the Birch Street/8th Street intersection. At this location, stormwater runoff is conveyed across 8th Street and State Highway 52 via a cluster of corrugated metal pipes (CMPs), typically less than 4 feet in diameter. A channel/drainage swale conveys stormwater northward across an open field to a man-made channel/berm which directs the runoff in a channel located west of the Towns of Frederick and Firestone. The channel can be typically described as trapezoidal in configuration, bottom widths vary from four feet to six feet, maximum channel depth ranges from six to twelve feet with 1H:1V sideslopes. This channel conveys runoff west along the south side of the Town of Frederick and beneath Main Street in a 6'H x 8'W reinforced concrete box (RCB) culvert. The outlet of the Main Street culvert directs the flow contained in the channel north toward WCR 16 where the major drainageway conveys the runoff via a 6'H x 10'W RCB. The channel continues north for approximately one mile along the west side of the Town of Firestone. Near Firestone, the main channel alignment makes three sharp bends, crossing over the Coalridge Ditch siphon and cutting through the abandoned railroad embankment prior to crossing WCR 13 through a 50-foot wide steel and concrete bridge. Immediately after crossing WCR 13, the channel crosses under WCR 18 through a 17.5-foot steel and timber bridge. Just prior to crossing WCR 20, stormwater runoff conveyed in the major drainageway converges with flow released from the Weld County Tri-Area Sanitation District sewage treatment outfall. From this location, the main channel continues northward approximately one mile where it crosses a lateral from the Godding Ditch before it traverses the Greggerson Dairy to WCR 24 in a series of open ditches and closed conduits. The major drainageway is then carried by the Biederman Ditch north and east to its confluence with the Last Chance Ditch, approximately three-quarters of a mile north of WCR 24. During large flood events, Tri-Town Basin runoff will overflow the Biederman Ditch and combine with out of bank Godding Hollow Basin runoff and proceed over land to the Saint Vrain River. In summary, the major drainageway crosses one abandoned railroad embankment, seven county and/or state roads, two canals, and numerous other minor roads and utilities.

Minor erosion of the major drainageway is evident at several locations; this erosion is frequently associated with livestock watering and access. Erosion is also visible at several road

crossings and at locations where farming practices and channel maintenance have over-steepened the channel banks. In general, erosion of the channel bed and banks is actively occurring throughout the basin. Furthermore, the major drainageway and floodplain are not generally encroached with heavy, dense vegetation. The vegetation species vary from rangeland grasses and shrubs to willows and large deciduous trees occasionally intermingled with dense stands of wetland grasses and shrubs.

Sheet 1 presents an illustration of the major drainageway and major crossing structures within the basin along with the location of the major tributaries to the Tri-Town Drainageway. A detailed description of the existing detention facilities/reservoirs, conveyance facilities and road crossings, is provided in Chapter 3.

III. INVENTORY OF EXISTING FACILITIES

Within the Godding Hollow Basin, the existing storm drainage facilities are largely associated with the limited development that has occurred within the basin. Small, local detention ponds, storm sewers, and conveyance channels comprise the network of drainage facilities that provide flood control during the minor and major storm events. Minimal land development has occurred adjacent to the major drainageway. Consequently, the structures along the major drainageway of Godding Hollow that were investigated as part of this master planning effort include road/railroad/canal crossings and detention storage provided by road/railroad embankments.

Within the Tri-Town Basin, the existing storm drainage facilities are largely associated with the development in the vicinity of Frederick and Firestone. Similar to the Godding Hollow Basin, small local detention ponds, storm sewers, and conveyance channels comprise the network of drainage facilities that provide flood control during the minor storm events. Although land development has occurred adjacent to the major drainageway in the upper portion of the basin, in general, limited improvements have been made along the main channel. The majority of the structures investigated in the Tri-Town Basin included road/railroad/canal crossings and any significant detention storage.

As part of this master planning effort, an inventory of the existing facilities associated with the major drainageway of each basin was conducted. The inventory and evaluation of each facility involved: (a) field reconnaissance to document location, condition and additional data requirements; (b) review of available design and as-built drawings; (c) collection of site-specific survey data; and (d) evaluation of the hydraulic capacity. Tables 3.1 and 3.2 summarize the results of the inventory and evaluation of the existing facilities. Sheet 1 presents the size and location of the inventoried existing drainage facilities. Specific information related to these facilities is provided in the following paragraphs. More detailed data and photographic documentation associated with each facility are provided in the project notebook submitted in conjunction with this report.

3.1 Detention Facilities

Along the major drainageways, few detention facilities exist that provide effective reduction of peak discharges during minor and major storm events. The effective detention

Table 3.1 Inventory of Existing Drainage Facilities for the Godding Hollow Basin.

Facility Name and/or Type	Location [UDSWMM ID]	Condition	Maximum Storage Volume (acre-ft)	Maximum Discharge Capacity[1] (cfs)
MAIN CHANNEL				
WCR 26 RCB	Between WCR 11 and WCR 13 [202]	fair	N/A	210
Last Chance Ditch Flume	Between WCR 11 and WCR 13 [202]	poor	N/A	370
WCR 24 Arch CMP	Between I-25 and WCR 11 [203]	fair	N/A	240
WCR 22 Arch CMP	Between I-25 and WCR 11 [204]	fair	N/A	300
Godding Ditch Bridge/Flume	S. of WCR 22 [204]	fair	N/A	3,000
WCR 20 Arch CMP	Between I-25 and WCR 11 [205]	fair	N/A	210
WCR 18 Arch CMP	Between I-25 and WCR 11 [206]	fair	N/A	190
WCR 16 Arch CMP	Between I-25 and WCR 11 [207]	fair, vegetation, encroachment	N/A	160
SHW 52 Pond and RCB Outlet	Between I-25 and WCR 11 [308]	good	58	1,000
Coalridge Ditch Pond and RCB Outlet	0.2 miles S. of SHW 52 [309]	good, some sediment blockage	32	790
WCR 12 CMP	Between I-25 and WCR 11 [210]	fair, vegetation, encroachment	N/A	60
I-25 E. Frontage Road Timber Bridge	N. of WCR 10 E. side of I-25 [213]	good	N/A	2,050
I-25 Triple Barrel RCB	N. of WCR 10 on I-25 [213]	good	N/A	2,460
West WCR 10 Arch CMP	Between I-25 and WCR 7 [216]	poor, vegetation, scour	N/A	40
UPRR Timber Bridge	S. WCR 10, between WCR 7 and I-25 [217]	good	N/A	1,450
OTHER TRIBUTARY STRUCTURES				
I-25/WCR 18 Pond with Two RCP Outlets	Between WCR 16/18 at I-25 [341]	fair	170	140
I-25/SHW 52 Pond RCP/CMP Outlet	0.15 miles N. of SHW 52 at I-25 [321]	fair, undersized outlet	82	90
East WCR 10 CMP	WCR 10, S. of Speedway [236]	fair	N/A	70
I-25 Double Barrel RCB	N. of WCR 8 on I-25 [237]	fair, 1 foot of deposition	N/A	430
UPRR Spur Pond and CMP Outlet	N. of WCR 8 and W. of I-25 [237]	fair	26	530

[1]Maximum discharge capacity prior to overtopping, assuming no obstructions

Table 3.2 Inventory of Existing Drainage Facilities for the Tri-Town Basin.

Facility Name and/or Type	Location [UDSWMM ID]	Condition	Maximum Storage Volume (acre-ft)	Maximum Discharge Capacity[1] (cfs)
MAIN CHANNEL				
WCR 24 Arch CMP	Between WCR 11 and WCR 13 [252]	poor	N/A	60
WCR 22 Arch CMP	Between WCR 11 and WCR 13 [253]	good	N/A	80
WCR 20 Arch CMP	Between WCR 11 and WCR 13 [254]	good	N/A	40
Milavec Lake Arch CMP	Access Road to Milavec Lake from WCR 13 [N/A]	good	N/A	190
WCR 18 Bridge	West of WCR 13 [255]	good	N/A	750
WCR 13 Bridge	South of WCR 18 [256]	good	N/A	1,500
WCR 16 RCB	East of WCR 13 [760]	good	N/A	710
Main St. RCB	Corner of 8th and Main St. in SW Frederick [761]	good	N/A	520
SHW 52, 4 CMP's	East of WCR 13 [262]	good	N/A	N/A[2]
OTHER TRIBUTARY STRUCTURES				
WCR 13 CMP	Between WCR 20 and WCR 18, Sewage Plant Outfall [275]	good	N/A	30
UPRR Embankment Ponds	Between WCR 22 and WCR 24 [372]	fair	67	190

[1] Maximum discharge capacity prior to overtopping, assuming no obstructions
[2] Assumed to be ineffective due to potential debris loading

facilities that do exist along the major drainageways are not related to land development and can be characterized as detention storage created by roadway embankments. Several additional detention facilities, not located on the major drainageway, also exist and are effective in reducing the peak discharge. These off-channel detention areas are also typically related to storage created by existing embankments. Minor detention facilities also exist within the Godding Hollow and Tri-Town Basins. These minor facilities provide for a reduction in peak flows locally, but offer a limited significant reduction of peak flows along the major drainageway. Consequently, they were not specifically inventoried during the master planning effort. These minor facilities were included in the hydrologic analysis, however, to define existing conditions as discussed in Chapter 4.

3.1.1 Godding Hollow Basin

The existing detention facilities identified within the Godding Hollow Basin which were effective in reducing the peak discharge in the major drainageway are described in the following paragraphs and are presented on Sheet 1.

State Highway 52/Coalridge Ditch Detention Pond. This detention pond is located in the upper portion of the Godding Hollow Basin immediately south of State Highway 52. The roadway embankment associated with State Highway 52 is elevated approximately 14.5 feet above the invert of the 8'H x 8'W RCB which releases runoff from the detention area. The canal embankment associated with the Coalridge Canal is located within the backwater created by the State Highway 52 Detention Pond. This embankment is elevated approximately 14.1 feet above the invert of the 7'H x 7'W RCB which releases runoff from the detention area upstream of the canal. The two detention areas form one pond during large events with water from the canal pond flowing directly into the pond formed by the State Highway 52 embankment. The volume provided behind the roadway embankment prior to overtopping is 58 acre-feet with a corresponding release through the existing box culvert of 1,000 cfs. The additional volume provided by the canal embankment prior to overtopping is 32 acre-feet with a release rate of approximately 790 cfs. The 100-year existing conditions discharge is estimated to be 4,010 cfs which corresponds to a combined storage volume of 144 acre-feet and overtopping depths of approximately 1.9 feet for both State Highway 52 and the Coalridge Ditch embankments.

I-25/State Highway 52 Pond. This detention facility is an existing pond located on the major west tributary to the main Godding Hollow flow path, approximately 800 feet north of the intersection of I-25 and State Highway 52. The roadway embankment associated with I-25 and its frontage roads is elevated approximately 8 feet above the invert of the existing 36-inch siphon

which drains the detention area. The volume provided behind the roadway embankment prior to overtopping is 82 acre-feet with a maximum release rate of 90 cfs from the existing siphon. The 100-year existing conditions discharge is estimated to be 1,230 cfs which corresponds to a storage volume of 107 acre-feet and an overtopping depth of approximately 0.6 feet.

I-25/WCR 18 Pond. This detention pond is an existing storage area located on a minor tributary to Godding Hollow approximately 1,000 feet south of Weld County Road 18 and immediately west of I-25. The roadway embankment associated with I-25 and its frontage roads is elevated approximately 10 feet above the invert of the existing 36-inch culvert which drains the detention area. An additional 24-inch culvert, located approximately 3 feet above the 36-inch culvert, also drains the detention area. The volume provided behind the roadway embankment prior to overtopping is 170 acre-feet with a maximum release of 140 cfs through both culverts. The 100-year existing condition discharge is estimated to be 100 cfs which corresponds to a storage volume of 74 acre-feet. During the 100-year existing condition event, the frontage road is overtopped by as much as 3 feet, but I-25 does not overtop.

UPRR Spur Pond. This detention facility is an existing pond located on a tributary to the main Godding Hollow channel, approximately 1,800 feet north of WCR 8 and approximately 800 feet west of I-25. The railroad spur embankment is elevated approximately 14.4 feet above the invert of the existing 6.5-foot CMP which drains the detention area. The volume provided behind the railroad spur embankment prior to overtopping is 26 acre-feet with a maximum release rate of 530 cfs. The 100-year existing condition discharge is estimated to be less than 800 cfs. This facility was not incorporated into the existing condition modeling effort due to the temporary nature of the railroad spur.

3.1.2 Tri-Town Basin

No existing detention facilities were located on the major drainageway in the Tri-Town Basin. However, ponding behind one existing embankment is effective in reducing the 100-year peak discharge to the downstream subbasins. This detention area consists of two ponds closely located to each other and adjacent to the railroad embankment between Weld County Road 22 and Weld County Road 24 as shown on Sheet 1. At the two ponding locations, the combined volume behind the railroad embankment is estimated to be 61 acre-feet with a combined release rate of approximately 190 cfs prior to overtopping of the embankment. During the 100-year existing condition event, the maximum storage volume behind the embankment is 41 acre-feet with a release rate of approximately 120 cfs.

3.2 Major Road Crossings

3.2.1 Godding Hollow Basin

There are eleven major road crossings, one railroad crossing, and three canal crossings on the major drainageway of Godding Hollow. The crossings consist of three timber/steel bridges, four reinforced concrete box culverts (RCB), six arched corrugated metal pipes (CMP), one circular CMP, and one concrete flume. The capacity of each crossing was calculated using the U.S. Army Corps of Engineers' HEC-2 Water Surface Profile program and/or the Federal Highway Administration's HY-8 Culvert Analysis program. Table 3.1 summarizes the location, condition, and hydraulic capacity of each crossing structure. A brief description of each road crossing is provided in the following paragraphs.

WCR 26 Culvert. The crossing at Weld County Road 26 consists of a 3'H x 8.5'W reinforced concrete box culvert. At this location, roadway overtopping occurs at a depth of approximately 4.2 feet from the invert of the culvert. The capacity of the culvert prior to overtopping is 210 cfs. The 100-year existing condition discharge in Godding Hollow at Weld County Road 26 is 7,000 cfs.

Last Chance Ditch Flume. Low flows generated within the Godding Hollow Basin cross over the Last Chance Ditch in a concrete flume. Large flow events will be out of bank prior to reaching this location and will spill into and out of the Last Chance Ditch east and west of this crossing. The capacity of the existing flume crossing is estimated to be 370 cfs.

WCR 24 Culvert. The crossing at Weld County Road 24 is a 6'H x 8'W arch corrugated metal pipe culvert. At this location, roadway overtopping occurs at a depth of approximately 6.4 feet from the invert of the culvert. The capacity of the culvert prior to overtopping is 240 cfs. The 100-year existing condition discharge in Godding Hollow at Weld County Road 24 is 4,490 cfs.

WCR 22 Culvert. The crossing at Weld County Road 22 is also a 6'H x 8'W arch corrugated metal pipe culvert. At this location, roadway overtopping occurs at a depth of approximately 7.7 feet from the invert of the culvert. The capacity of the culvert prior to overtopping is 300 cfs. The 100-year existing condition discharge in Godding Hollow at Weld County Road 22 is 4,510 cfs.

Godding Ditch Bridge/Flume. At this location the Godding Ditch is conveyed over Godding Hollow in a steel flume. This bridge incorporates an opening which is approximately 60 feet wide and 10 feet in height. The depth of flow at which the canal embankment overtopping occurs is approximately 11.3 feet. The capacity of the bridge prior to overtopping the canal

embankment is estimated to be 3,000 cfs. The 100-year existing condition discharge in Godding Hollow at Godding Ditch is 4,510 cfs.

WCR 20 Culvert. The crossing at Weld County Road 20 is a 6'H x 8'W arch corrugated metal pipe culvert. At this location, roadway overtopping occurs at a depth of approximately 5.4 feet from the invert of the culvert. The capacity of the culvert prior to overtopping is 210 cfs. The 100-year existing condition discharge in Godding Hollow at Weld County Road 20 is 4,580 cfs.

WCR 18 Culvert. The crossing at Weld County Road 18 is also a 6'H x 8'W arch corrugated metal pipe culvert. At this location, roadway overtopping occurs at a depth of approximately 7.5 feet from the invert of the culvert. The capacity of the culvert prior to overtopping is 190 cfs. The 100-year existing condition discharge in Godding Hollow at Weld County Road 18 is 4,730 cfs.

WCR 16 Culvert. The crossing at Weld County Road 16 is a 6'H x 8'W arch corrugated metal pipe culvert. At this location, roadway overtopping occurs at a depth of approximately 5.1 feet from the invert of the culvert. The capacity of the culvert prior to overtopping is 160 cfs. The 100-year existing condition discharge in Godding Hollow at Weld County Road 16 is 4,740 cfs.

State Highway 52 (WCR 14) Culvert. The crossing at State Highway 52 (WCR 14) is a 8'H x 8'W reinforced concrete box culvert. At this location, roadway overtopping occurs at a depth of approximately 14.5 feet from the invert of the culvert. The capacity of the culvert prior to overtopping is 1,000 cfs. The 100-year existing condition discharge in Godding Hollow at State Highway 52 is 4,000 cfs.

Coalridge Ditch Culvert. At this location, Godding Hollow passes under the Coalridge Ditch. The crossing at Coalridge Ditch is a 7'H x 7'W reinforced concrete box culvert. At this location, canal embankment overtopping occurs at a depth of approximately 14.1 feet from the invert of the culvert. The capacity of the culvert prior to overtopping is 790 cfs. The 100-year existing condition discharge in Godding Hollow at the Coalridge Canal is 3,670 cfs.

WCR 12 Culvert. The crossing at Weld County Road 12 is a 36-inch diameter corrugated metal pipe culvert. At this location, roadway overtopping occurs at a depth of approximately 5.9 feet from the invert of the culvert. The capacity of the culvert prior to overtopping is 60 cfs. The 100-year existing condition discharge in Godding Hollow at Weld County Road 12 is 2,620 cfs.

I-25 East Frontage Road Bridge. This timber bridge incorporates an opening which is approximately 60 feet wide and 5.5 feet in height. The capacity of the bridge prior to overtopping the roadway is 2,050 cfs. The 100-year existing condition discharge in Godding Hollow at the I-25 East Frontage Road is 920 cfs.

I-25 Culvert. The crossing at Interstate 25 is a triple barrel (two 6'H x 11'W, one 6'H x 14'W) reinforced concrete box culvert. At this location, roadway overtopping occurs at a depth of approximately 9.0 feet from the invert of the culvert. The capacity of the culvert prior to overtopping is 2,460 cfs. The 100-year existing condition discharge in Godding Hollow at Interstate 25 is 920 cfs, therefore Interstate 25 is not overtopped during the existing condition 100-year discharge.

WCR 10 Culvert. The crossing at Weld County Road 10 is a 2'H x 3.5'W arch corrugated metal pipe culvert. At this location, roadway overtopping occurs at a depth of approximately 3.5 feet from the invert of the culvert. The capacity of the culvert prior to overtopping is 40 cfs. The 100-year existing condition discharge in Godding Hollow at Weld County Road 10 is 540 cfs.

Union Pacific Railroad Bridge. This timber bridge incorporates an opening which is approximately 42 feet wide and 2.5 feet in height. The capacity of the bridge prior to overtopping the railroad is 1,450 cfs. The 100-year existing condition discharge in Godding Hollow at Union Pacific Railroad is 370 cfs.

Tributary Crossing of Interstate 25. A major tributary crosses Interstate 25 immediately north of the intersection of Interstate 25 and the State Highway 52. The crossing structure consists of a 36-inch siphon. The capacity of the culvert prior to overtopping is estimated to be 90 cfs. The 100-year existing condition discharge at this location is estimated to be 1,230 cfs. The depth of flow associated with overtopping the roadway is approximately 0.6 feet.

Tributary Crossing of East WCR 10. A major tributary crosses WCR 10 east of Interstate 25 and south of the Colorado National Speedway. The crossing structure consists of a 48-inch CMP. The capacity of the culvert prior to overtopping is estimated to be 70 cfs. The 100-year existing condition discharge at this location is estimated to be 1,190 cfs.

Tributary Crossing of Interstate 25. A major tributary crosses Interstate 25 immediately north of Weld County Road 8. The crossing structure consists of two 3'H x 10'W reinforced concrete box culvert. The capacity of the crossing prior to overtopping is estimated to be 430 cfs. The 100-year existing condition discharge at this location is estimated to be 870 cfs.

Within the Godding Hollow Basin, several additional road crossings of tributaries to Godding Hollow also exist. These tributaries convey significant storm flows that may require crossing structures capable of passing the 100-year existing condition discharge. This master planning effort did not inventory or specifically identify these road crossings. It is noted, however, that several of these crossing structures provided inadequate capacity to convey runoff generated during relatively minor storm events and were experiencing sedimentation problems. As land development occurs within the basin, these structures should be more closely inventoried and evaluated.

3.2.2 Tri-Town Basin

There are nine major road crossings of the major drainageway in the Tri-Town Basin. The crossings consist of two timber/steel/concrete bridges, two reinforced concrete box culverts (RCBs), four arched corrugated metal pipes (CMPs), and one circular CMP cluster. Table 3.2 summarizes the location, condition, and hydraulic capacity of each crossing structure. A brief description of each road crossing is provided in the following paragraphs.

WCR 24 Culvert. The crossing at Weld County Road 24 is a 3'H x 5'W arch corrugated metal pipe culvert. At this location, roadway overtopping occurs at a depth of approximately 3.5 feet from the invert of the culvert. The capacity of the culvert prior to overtopping is 60 cfs. The 100-year existing condition discharge in Tri-Town Drainageway at Weld County Road 24 is 3,820 cfs.

WCR 22 Culvert. The crossing at Weld County Road 22 is also a 3'H x 5'W arch corrugated metal pipe culvert. At this location, roadway overtopping occurs at a depth of approximately 4.5 feet from the invert of the culvert. The capacity of the culvert prior to overtopping is 80 cfs. The 100-year existing condition discharge in Tri-Town Drainageway at Weld County Road 22 is 3,840 cfs.

WCR 20 Culvert. The crossing at Weld County Road 20 is a 2.5'H x 3.5'W arch corrugated metal pipe culvert. At this location, roadway overtopping occurs at a depth of approximately 2.9 feet from the invert of the culvert. The capacity of the culvert prior to overtopping is 40 cfs. The 100-year existing condition discharge in Tri-Town Drainageway at Weld County Road 20 is 3,840 cfs.

Milavec Lake Access Culvert. This road crossing provides access from WCR 13 to Milavec Lake. The crossing at Milavec Lake is a 4'H x 6'W arch corrugated metal pipe culvert. At this location, roadway overtopping occurs at a depth of approximately 8.0 feet from the invert of the culvert. The capacity of the culvert prior to overtopping is 190 cfs. The 100-year existing condition discharge in Tri-Town Drainageway at Milavec Lake Access Road is 3,450 cfs.

WCR 18 Bridge. This steel and timber bridge incorporates an opening which is approximately 17.5 feet wide and 6 feet in height. The depth of flow at which roadway overtopping occurs is approximately 7.0 feet. The capacity of the bridge prior to overtopping the roadway was calculated to be 750 cfs. The 100-year existing condition discharge in Tri-Area Drainageway at WCR 18 is 3,450 cfs.

WCR 13 Bridge. This steel and concrete bridge incorporates an opening which is approximately 50 feet wide and 6 feet in height. The depth of flow at which roadway overtopping occurs is approximately 8.8 feet. The capacity of the bridge prior to overtopping the roadway was

calculated to be 1,500 cfs. The 100-year existing condition discharge in Tri-Area Drainageway at WCR 13 is 2,590 cfs.

WCR 16 Culvert. The crossing at WCR 16 is a 6'H x 10'W reinforced concrete box culvert. At this location, overtopping of the right bank and associated flooding of adjacent property and WCR 16, occurs 50 feet upstream at a depth of approximately 10.3 feet above the invert of the culvert. The capacity of the culvert prior to overtopping is 710 cfs. The 100-year existing condition discharge in Tri-Area Drainageway at WCR 16 is 1,940 cfs.

Main Street Frederick Culvert. The crossing at Main Street is a 6'H x 8'W reinforced concrete box culvert. At this location, overtopping of the right bank occurs at the upstream face of the culvert, at a depth of approximately 8.6 feet above the invert. The capacity of the culvert prior to overtopping is 520 cfs. The 100-year existing condition discharge in Tri-Area Drainageway at Main Street is 1,940 cfs.

State Highway 52/Eighth Street Culverts. This crossing of State Highway 52 and Eighth Street in Dacono is comprised of a cluster of corrugated metal pipes. Two CMPs with diameters of 3.5 feet and 4.0 feet convey flow under Eighth Street. One 3.5-foot CMP and two arched CMPs (2.5'H x 4'W) convey flow under State Highway 52. At this location, roadway overtopping occurs at a depth of approximately 6.0 feet from the invert of the most upstream culvert. Due to the potential debris loading, all of these pipes were assumed to be ineffective during large events. The 100-year existing condition discharge in Tri-Area Drainageway at State Highway 52 is 1,520 cfs.

3.3 Open Channels

3.3.1 Godding Hollow Basin

At WCR 24½, the Godding Hollow major drainageway confluences with the Rural Ditch. Stormwater runoff within the Godding Hollow channel combines with the water conveyed in the Rural Ditch and continues northeast for approximately 1,800 feet before emptying into the Rural Ditch Wasteway at the end of the Rural Ditch. This reach of the Rural Ditch is incapable of conveying stormwater runoff from even minor storm events within the Godding Hollow Basin. Similarly, the other irrigation ditches, namely the Coalridge Ditch, Godding Ditch, and the Last Chance Ditch, offer limited value as drainage features that will capture and convey stormwater out of the basin. Furthermore, the major drainageway of the Godding Hollow Basin is typically incapable of conveying stormwater runoff generated from any event in excess of the 2-year existing condition storm event.

3.3.2 Tri-Town Basin

In general, the Tri-Town Drainageway can be described as a relatively small channel with a capacity to convey not more than the peak flows generated during the 2-year to 10-year existing condition storm event. Along the south and west sides of Frederick and the west side of Firestone, the drainageway's flood carrying capacity has been enlarged through excavation and placement of levees and berms. Given the magnitude of the 100-year peak discharges at this location, the improved channel is not capable of conveying the 100-year flood event.

IV. HYDROLOGIC ANALYSES AND MODELING

4.1 Formulation of Hydrologic Model

The primary objective of the hydrologic analyses and modeling efforts was the development of peak discharge and hydrograph data at various locations throughout the Godding Hollow and Tri-Town Basins. This information combined with the capacity of the existing drainage facilities provided insight to existing and future flooding problems and promoted the development of stormwater management plans for the basins. The hydrologic analyses for the Godding Hollow and Tri-Town Basins were conducted for the 2-, 5-, 10-, 25-, 50-, and 100-year return periods. Three scenarios were simulated by the model: (a) existing condition with existing facilities; (b) future development condition with existing facilities; and (c) future development conditions with on-site detention and proposed improvements.

4.1.1 Model Description

The modeling approach chosen to simulate the runoff generated within and routed through the Godding Hollow and Tri-Town Basins involved the application of two computer models, the Colorado Urban Hydrograph Procedure (CUHP) and the Urban Drainage Stormwater Management Model (UDSWM2-PC). The CUHP model is a hydrologic simulation program developed in 1978 for the Urban Drainage and Flood Control District; it is used to generate storm hydrographs for a number of basin subcatchments. The program requires input of the design storm as a 3-hour hyetograph (5 minute increments) distribution from which a total precipitation depth is computed. The methodology used in developing the design storm is outlined in the Urban Storm Drainage Criteria Manual (USDCM, 1978). Storm hydrographs were generated by the CUHP model for the 2-, 5-, 10-, 25-, 50-, and 100-year return periods; these hydrographs were written to an input file to be used by the UDSWM2-PC model.

The UDSWM2-PC model is essentially the runoff block of the Environmental Protection Agency's Stormwater Management Model (SWMM). This model simulates the quantity of runoff from an urban drainage basin and the routing of flow through the basin. The hydrologic analyses and modeling for the Godding Hollow and Tri-Town Basins utilized this model to develop flood hydrographs at various locations throughout the basin. Storm flow hydrographs generated by the CUHP model are entered into the UDSWM2-PC model and routed through the drainage network to depict the actual network of detention ponds and open channels that exist within the basin.

4.1.2 Network Development

The network incorporated into the UDSWM2-PC runoff block is a model of the basin's drainage network, representing each of the drainage subbasins and facilities along the major drainageway. The first step in forming the network is to conceptualize and develop a schematic linking the drainage subbasins to the drainage facilities within the major drainageway. Identification of each drainage facility is based on the information compiled from the field reconnaissance and surveying efforts. Facilities incorporated into the modeling network are referred to by UDSWM2-PC as: conveyance elements (conduits and open channels), subcatchments(or subbasins), storage units (detention ponds), flow dividers (diversions), and manholes (nodes or design points). The subbasin delineation was accomplished through the use of mapping and survey data generated during the project. Drainage network schematics were developed for the Godding Hollow and Tri-Town Basins for the three scenarios previously discussed: (a) existing condition with existing facilities; (b) future development condition with existing facilities; and (c) future development conditions with on-site detention and proposed improvements. The network schematic diagrams are provided in the project notebook that accompanies this report.

In general, the numbering scheme integrated into the modeling network was developed to allow easy identification of each type of facility. The numbering convention is presented below.

1 - 99	Subbasin hydrograph inputs (from CUHP)
100 - 199	Conveyance elements (i.e., storm sewers and open channels)
200 - 299	Nodes (design points and diversions)
300 - 399	Existing and future regional detention facilities
400 - 499	Simulated detention facilities (approved and future development)
700 - 799	Nodes (combination design points)

4.2 Rainfall Design Storms

The rainfall design storms used in the hydrologic analysis of the Godding Hollow and Tri-Town Basins were based on information presented in the Precipitation Frequency Atlas of the Western United States, NOAA Atlas 2, Volume III, Colorado (1973). The one-hour rainfall values obtained for the Tri-Town area from the NOAA Atlas were used to develop a three-hour design storm. The three-hour storms developed for each return period are presented in the project notebook which accompanies this document. Further documentation and details regarding the development of the design storms can also be found in the Urban Storm Drainage Criteria Manual.

4.3 Hydrologic Modeling Parameters

The hydrologic modeling of the Godding Hollow and Tri-Town Basins involved the determination of several hydrologic parameters associated with each subbasin. These parameters are summarized in the following paragraphs. Table 4.1 presents hydrologic modeling parameters developed for the existing condition analyses.

4.3.1 Subbasin Delineation and Basin Characteristics

The Godding Hollow and Tri-Town Basins were subdivided into smaller subbasins ranging in size from approximately 14 acres to nearly 950 acres. The delineation of subbasins was based on several considerations including the location of drainage facilities, road crossings, and potential flooding problems. The location of major drainage facilities and the desire to obtain peak discharge data at several design points resulted in the wide range of drainage areas noted above.

The subbasin delineation for the Godding Hollow and Tri-Town Basins is presented on Sheet 2. The U.S.G.S. topographic mapping with a 10-foot contour interval, was used to determine the subbasin characteristics and significant hydrologic parameters. These data included subbasin area, length (distance from the downstream design point along the flow path to the high point of the basin), distance to the basin centroid, and basin slope.

4.3.2 Land Use

The majority of the existing land use in the Godding Hollow and Tri-Town Basins is agricultural. The Godding Hollow Basin is primarily undeveloped agricultural land with the exception of lands along the I-25 corridor. Within a half mile of I-25, there are numerous commercial and light industrial developments. In the upper Tri-Town Basin, the urbanized areas of Dacono, Frederick, and Firestone consist primarily of medium density residential housing. The remaining area of the Tri-Town Basin consists of agricultural lands with pockets of very low to medium density residential.

For existing conditions, the imperviousness of each subbasin was estimated from aerial photography provided by Weld County and verified during field investigations. This photography displays only existing developments through the fall of 1998. Information regarding developments approved for construction as of March 1, 1999 was obtained from the local jurisdictions of Erie,

Table 4.1 Hydrologic Parameters for Existing Conditions.

Subbasin No.	Basin Area (acres)	Basin Length (ft)	Distance to Basin Centroid (ft)	Average Basin Slope (ft/ft)	Percent Imperv.	Depression Storage (inches)		Infiltration Rates (in/hr)		Horton's Decay Rate
						Pervious	Imperv.	Initial	Final	
GODDING HOLLOW BASIN										
GHSB1	779.3	6000	1800	0.004	10.6	0.4	0.1	3.0	0.5	0.0018
GHSB2	284.2	7000	3800	0.003	17.9	0.4	0.1	3.1	0.5	0.0018
GHSB3	687.9	9700	3800	0.007	19.0	0.4	0.1	3.8	0.6	0.0018
GHSB4	772.4	8700	3300	0.008	18.4	0.4	0.1	4.3	0.6	0.0018
GHSB5	836.8	9100	3300	0.007	13.2	0.4	0.1	4.0	0.6	0.0018
GHSB6	886.5	9300	3000	0.007	20.7	0.4	0.1	4.2	0.6	0.0018
GHSB7	946.2	10400	3000	0.007	10.2	0.4	0.1	3.8	0.6	0.0018
GHSB8	265.5	6500	1800	0.010	10.1	0.4	0.1	3.5	0.5	0.0018
GHSB9	185.4	5900	1400	0.011	10.0	0.4	0.1	3.3	0.5	0.0018
GHSB10	142.5	3400	800	0.018	56.5	0.4	0.1	3.5	0.5	0.0018
GHSB11	117.3	3500	900	0.012	29.7	0.4	0.1	3.0	0.5	0.0018
GHSB12	65.1	3400	1400	0.013	10.0	0.4	0.1	3.0	0.5	0.0018
GHSB13	193.2	4400	1800	0.019	10.0	0.4	0.1	3.0	0.5	0.0018
GHSB14	154.1	4300	1900	0.019	10.0	0.4	0.1	3.0	0.5	0.0018
GHSB15	61.3	1950	700	0.013	11.7	0.4	0.1	3.0	0.5	0.0018
GHSB16	131.1	3400	1600	0.015	10.0	0.4	0.1	3.0	0.5	0.0018
GHSB17	223.1	4100	1500	0.026	10.5	0.4	0.1	3.1	0.5	0.0018
GHSB20	154.4	4100	1800	0.012	10.0	0.4	0.1	3.0	0.5	0.0018
GHSB21	372.0	6400	3000	0.009	11.0	0.4	0.1	3.8	0.6	0.0018
GHSB22	321.0	5600	2700	0.015	14.8	0.4	0.1	3.3	0.5	0.0018
GHSB23	418.5	6000	3000	0.012	10.5	0.4	0.1	3.1	0.5	0.0018
GHSB24	376.9	5700	2300	0.015	11.4	0.4	0.1	3.0	0.5	0.0018
GHSB25	83.2	3000	800	0.014	12.4	0.4	0.1	3.3	0.5	0.0018
GHSB26	38.6	3300	1100	0.017	11.6	0.4	0.1	3.3	0.5	0.0018
GHSB27	407.7	7500	2800	0.019	11.7	0.4	0.1	3.2	0.5	0.0018
GHSB30	437.5	8000	4300	0.014	12.4	0.4	0.1	3.0	0.5	0.0018
GHSB31	215.4	6600	1600	0.013	10.0	0.4	0.1	3.3	0.5	0.0018
GHSB32	599.3	9300	4000	0.015	18.4	0.4	0.1	3.3	0.5	0.0018
GHSB33	210.9	5900	2400	0.008	10.4	0.4	0.1	3.1	0.5	0.0018
GHSB34	208.7	7500	3900	0.019	14.1	0.4	0.1	3.2	0.5	0.0018
GHSB35	95.7	4200	1600	0.014	55.2	0.4	0.1	3.0	0.5	0.0018
GHSB36	348.6	6800	1900	0.014	10.0	0.4	0.1	3.1	0.5	0.0018
GHSB37	541.0	7100	2500	0.026	19.7	0.4	0.1	3.3	0.5	0.0018
GHSB40	225.6	5000	2300	0.012	14.6	0.4	0.1	3.5	0.5	0.0018
GHSB41	342.8	5900	2300	0.011	10.3	0.4	0.1	3.7	0.5	0.0018
GHSB42	122.5	2500	1400	0.008	54.4	0.4	0.1	4.2	0.6	0.0018
GHSB43	156.5	5000	2600	0.004	10.0	0.4	0.1	3.2	0.5	0.0018

Table 4.1 Hydrologic Parameters for Existing Conditions (Continued).

Subbasin No.	Basin Area (acres)	Basin Length (ft)	Distance to Basin Centroid (ft)	Average Basin Slope (ft/ft)	Percent Imperv.	Depression Storage (inches)		Infiltration Rates (in/hr)		Horton's Decay Rate
						Pervious	Imperv.	Initial	Final	
TRI-TOWN BASIN										
TTSB51	560.0	7600	4200	0.005	21.3	0.4	0.1	3.8	0.6	0.0018
TTSB52	610.6	8000	2800	0.008	19.3	0.4	0.1	4.4	0.6	0.0018
TTSB53	640.4	8400	3400	0.009	15.0	0.4	0.1	4.4	0.6	0.0018
TTSB54	346.9	8900	2400	0.008	10.5	0.4	0.1	4.3	0.6	0.0018
TTSB55	173.9	4600	2300	0.014	25.0	0.4	0.1	4.4	0.6	0.0018
TTSB56	27.3	1500	700	0.003	30.8	0.4	0.1	4.5	0.6	0.0018
TTSB57	14.2	1000	600	0.004	27.5	0.4	0.1	4.5	0.6	0.0018
TTSB58	17.3	900	400	0.004	23.2	0.4	0.1	4.5	0.6	0.0018
TTSB59	19.4	1500	700	0.005	21.1	0.4	0.1	4.5	0.6	0.0018
TTSB60	53.7	3100	1300	0.006	48.1	0.4	0.1	3.4	0.5	0.0018
TTSB61	250.8	6000	1600	0.011	10.0	0.4	0.1	3.4	0.5	0.0018
TTSB62	108.1	3500	1100	0.014	50.0	0.4	0.1	3.0	0.5	0.0018
TTSB63	288.0	4850	2200	0.015	10.2	0.4	0.1	3.1	0.5	0.0018
TTSB70	683.9	8500	4200	0.007	21.7	0.4	0.1	3.9	0.6	0.0018
TTSB71	114.3	3200	1700	0.016	10.3	0.4	0.1	4.6	0.7	0.0016
TTSB72	392.8	4800	2400	0.015	25.9	0.4	0.1	4.5	0.6	0.0018
TTSB73	115.3	3800	1900	0.016	10.0	0.4	0.1	4.5	0.6	0.0018
TTSB74	324.3	5600	2500	0.011	15.3	0.4	0.1	4.5	0.6	0.0018
TTSB75	722.3	8200	4200	0.015	11.1	0.4	0.1	4.2	0.6	0.0018
TTSB76	49.2	2600	900	0.012	50.0	0.4	0.1	4.5	0.6	0.0018
TTSB77	37.2	2400	800	0.020	17.4	0.4	0.1	4.5	0.6	0.0018
TTSB78	36.4	2400	1100	0.011	50.0	0.4	0.1	4.5	0.6	0.0018
TTSB79	40.1	2800	1100	0.021	23.2	0.4	0.1	4.5	0.6	0.0018
TTSB80	42.1	2400	1000	0.007	42.8	0.4	0.1	4.5	0.6	0.0018
TTSB81	110.0	3300	1400	0.018	29.4	0.4	0.1	4.5	0.6	0.0018
TTSB82	88.7	3500	1400	0.012	10.8	0.4	0.1	4.5	0.6	0.0018
TTSB83	48.4	2900	900	0.013	33.8	0.4	0.1	4.5	0.6	0.0018
TTSB84	69.1	3200	1600	0.018	18.4	0.4	0.1	4.5	0.6	0.0018
TTSB85	16.1	1000	400	0.006	31.4	0.4	0.1	4.7	0.6	0.0018
TTSB86	57.4	4000	1700	0.018	22.5	0.4	0.1	4.5	0.6	0.0018
TTSB87	74.1	3900	1600	0.005	51.8	0.4	0.1	4.0	0.6	0.0018
TTSB88	24.9	2800	1300	0.016	32.8	0.4	0.1	4.2	0.6	0.0018
TTSB89	211.4	5000	1800	0.012	15.3	0.4	0.1	3.7	0.5	0.0018
TTSB90	441.2	5200	2300	0.016	23.6	0.4	0.1	4.4	0.6	0.0018
TTSB91	225.6	5400	2700	0.012	58.3	0.4	0.1	3.3	0.5	0.0018
TTSB92	117.0	4000	1500	0.011	10.8	0.4	0.1	3.8	0.6	0.0018
TTSB93	45.8	3500	2400	0.011	50.7	0.4	0.1	3.0	0.5	0.0018
TTSB94	38.7	3100	1200	0.011	17.6	0.4	0.1	3.1	0.5	0.0018
TTSB95	374.3	4900	2400	0.010	10.0	0.4	0.1	3.3	0.5	0.0018
TTSB96	269.3	4500	1800	0.013	29.7	0.4	0.1	4.5	0.6	0.0018

Dacono, Frederick, and Firestone. Existing conditions with respect to this master planning effort was determined to be the land use assuming the existence of those developments approved for construction as of March 1, 1999. For future development conditions, land use and zoning maps were also provided by the local jurisdictions. The land use information is provided on Sheet 3.

4.3.3 Soils, Infiltration, and Depression Storage

Soils information for Godding Hollow and Tri-Town Basins was obtained from the Soil Survey of Weld County, Southern Part, Colorado (1980), published by the Soil Conservation Service. The soil types specified from the soil survey were classified into the four hydrologic soil groups. These four groups basically classify the soils according to infiltration rates, from A representing well drained soils to D representing poorly drained soils. The soil types represented within Godding Hollow and Tri-Town Basins can be generally classified in the B to C hydrologic soil groups. Soils mapping pertinent to the Godding Hollow and Tri-Town Basins is provided on Sheet 4.

The Urban Drainage and Flood Control District (UDFCD) analyzed in-depth rainfall/runoff data for each of the hydrologic soil groups and established recommended values for infiltration rates and decay coefficients for use with CUHP (USDCM, Vol. 1, 1978). The values recommended for each of the soil groups are reproduced in Table 4.2. For subbasins containing more than one soil group classification, the coverage of each soil group was measured and an area-weighted average determined.

Table 4.2. Hydrologic Soil Groups Recommended Values (USDCM, Vol. 1, 1978).

SCS Hydrologic Soil Group	Infiltration (in/hr)		Horton's Decay Coefficient
	Initial	Final	
A	5.0	1.0	0.0007
B	4.5	0.6	0.0018
C	3.0	0.5	0.0018
D	3.0	0.5	0.0018

Surface depression storage losses and water intercepted by trees, bushes, and other vegetation play an important role in the hydrologic cycle and the determination of rainfall available for runoff. The CUHP method requires estimation of these losses for both impervious and pervious areas to facilitate the calculation of the effective rainfall for each storm event. Values for surface depression storage and interception losses were selected in accordance with the values presented in the USDCM (Volume 1, 1978). Infiltration, depression storage, and decay coefficient values incorporated into the hydrologic model are presented in Table 4.1.

4.4 Hydraulic Modeling Parameters

Several hydraulic modeling parameters are required by the UDSWM2-PC model to simulate the routing of storm flows through the storm sewers and open channels. The parameters required by the model to simulate the routing of stormwater through storm sewers are listed below:

1. Pipe diameter
2. Pipe length
3. Invert slope
4. Manning's *n*
5. Maximum headwater depth

For the modeling of open channels, the hydraulic parameters required by the UDSWM2-PC model are as follows:

1. Bottom width of channel or channel cross section
2. Length of channel
3. Invert slope
4. Channel sideslopes (XH: 1V)
5. Manning's *n*
6. Maximum flow depth

Where appropriate, data for each of the parameters were recorded during the field reconnaissance and surveying efforts.

4.5 Special Modeling Functions Utilized

In addition to the basic channel routing functions incorporated into the UDSWM2-PC model, special modeling functions are often required in the hydrologic model to simulate the more intricate drainage systems. The UDSWM2-PC model incorporates the capability to simulate detention storage facilities, flow diversions and exports from a basin. For the modeling efforts associated with the Godding Hollow and Tri-Town Basins, the capability to simulate detention storage facilities was utilized extensively.

The detention facilities simulated by the UDSWM2-PC model were generally limited to those facilities that were effective in reducing the peak associated with the 100-year storm event for existing conditions. As previously discussed in Chapter 3, the detention facilities evaluated in conjunction with this master plan include five existing detention ponds located in the Godding Hollow and Tri-Town Basins. At these locations, stage-storage-discharge relationships were developed for each detention pond or system of ponds. The UDSWM2-PC model utilized these relationships to determine the volume of stormwater detained in each pond and the corresponding discharge that was released from the pond.

Several other detention facilities also exist within the Godding Hollow and Tri-Town Basins; however, the effectiveness of some of these ponds in providing reduction of peak discharges is limited to frequent storm events. Consequently, the smaller detention ponds were excluded from the UDSWM2-PC master plan model.

4.6 Summary of Existing Conditions

4.6.1 Definition of Existing Conditions

The definition of existing condition includes all development that presently exists or was approved for construction prior to March 1, 1999. All basin development after this date is considered under the future conditions analysis. Results of the hydrologic analyses and modeling identified locations at which major problems exist; these locations include areas of potential flooding as well as locations where the storm drainage criteria, as defined in the next section, are violated.

4.6.2 Storm Drainage Criteria

During this master planning effort, a meeting was conducted on March 16, 1999 to discuss the storm drainage criteria associated with each jurisdiction. Given the number of jurisdictional entities and the disparity in the drainage criteria, this meeting was scheduled to specifically address the storm drainage criteria that pertain to the development and evaluation of the master drainage plans. The discussion focused on the criteria that pertain to: (a) major road crossings; and (b) detention ponds. The meeting resulted in the recommendations below with respect to storm drainage criteria that would guide the development and evaluation of the master drainage plans.

Major Road Crossings:	No overtopping of the roadway during major storm events.
Detention Ponds:	For Godding Hollow Basin, limit the release from on-site detention facilities (associated with future development) to the 100-year existing condition peak discharge during the 100-year storm event and the 10-year existing condition peak discharge during the 10-year storm event. For the Tri-Town Basin, limit the release from on-site detention facilities (associated with future development) to the 2-year existing condition peak discharge during the 100-year storm event for that portion of the basin south of Weld County Road 18. North of Weld County Road 18, limit the release from on-site detention facilities (associated with future development) to the 100-year existing condition peak discharge during the 100-year storm event and the 10-year existing condition peak discharge during the 10-year storm event.

These drainage criteria were utilized to identify potential problems along the major drainageway. In general, violations related to the criteria were specifically noted where road crossings exceeded maximum allowable overtopping depths or detention facilities overtopped the pond embankments during the storm events.

4.6.3 Modeling Results

Based on the existing condition analyses of the Godding Hollow and Tri-Town Basins, several facilities or structures lack the capacity to safely convey the 100-year design storm and create potential flooding problems within the basin. The results of the hydrologic modeling for

each subbasin as well as specific locations along the major drainageway are presented in Table 4.3 and Table 4.4. A graphical representation of the discharge profile along the major drainageway is also provided in Figures 4.1 and 4.2 for the Godding Hollow and Tri-Town Basins, respectively. Flood hydrographs at selected locations throughout the basin are presented in Appendix B.

4.6.4 Godding Hollow Basin: Summary of Existing Drainage Problems

During the 100-year flood event, storm water runoff typically exceeds the capacity of the natural channel. The limits of flooding were identified in a floodplain analysis of Godding Hollow shown on the currently effective Federal Emergency Management Agency (FEMA) flood insurance rate maps. The regulatory floodplain information is also provided on Sheet 1 in this report. Flooding along Godding Hollow has been exacerbated where road crossings exist. It is also recognized that potential flooding problems will likely occur along several of the major tributaries to Godding Hollow, especially at the road crossings where undersized culvert and sediment accumulation limits the capacity of the crossing structures to convey stormwater runoff. A brief summary of the major problem areas noted during this master planning effort is presented in the following paragraphs. This summary is limited, however, to those locations along the major drainageway of Godding Hollow.

WCR 26 Culvert. The 100-year peak discharge in Godding Hollow at Weld County Road 26 is estimated to be 7,000 cfs. This flow greatly exceeds the capacity of the existing crossing structure, which is estimated to be 210 cfs. The stormwater runoff captured by the channel will flow both east and west along Weld County Road 26 before overtopping the road. In addition, the capacity of the Godding Hollow channel is greatly exceeded by the magnitude of the 100-year peak discharge. These circumstances result in an extensive floodplain in the vicinity of the Weld County Road 26 crossing. An improved crossing structure could significantly reduce the localized flooding problems at this location.

Last Chance Ditch Flume. Low flows conveyed within Godding Hollow cross over the Last Chance Ditch in a concrete flume. During major storm events, the capacity of the existing flume is exceeded, and flooding will occur both upstream and downstream of this crossing. Stormwater flows will be captured by the Last Chance Ditch and will spill at various downstream locations. Installation of a siphon structure for the Last Chance Ditch along with channel improvements will reduce the flooding at this location.

Godding Hollow/Rural Ditch Channel/Wasteway. At WCR 24½ the Godding Hollow low flow channel confluences with the Rural Ditch. The Godding Hollow channel continues northeast

Table 4.3 Subbasin Peak Discharges for Existing Conditions.

Subbasin No.	Drainage Area (acres)	Peak Discharge (cfs)					
		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
GODDING HOLLOW BASIN							
GHSB1	779.3	40	166	288	519	736	926
GHSB2	284.2	17	48	78	136	189	239
GHSB3	687.9	49	110	198	368	520	666
GHSB4	772.4	59	128	237	455	646	826
GHSB5	836.8	38	99	202	406	587	760
GHSB6	886.5	83	174	309	574	806	1,022
GHSB7	946.2	31	95	207	425	622	812
GHSB8	265.5	12	49	90	167	237	300
GHSB9	185.4	9	39	71	129	183	232
GHSB10	142.5	132	220	302	402	515	619
GHSB11	117.3	39	87	129	202	264	318
GHSB12	65.1	2	11	20	36	51	70
GHSB13	193.2	11	50	87	155	218	274
GHSB14	154.1	9	38	66	118	165	207
GHSB15	61.3	2	9	16	29	41	55
GHSB16	131.1	8	35	61	108	154	193
GHSB17	223.1	17	69	120	213	298	374
GHSB20	154.4	8	36	63	113	157	199
GHSB21	372.0	15	44	94	188	273	350
GHSB22	321.0	25	78	133	234	327	408
GHSB23	418.5	20	81	141	256	363	457
GHSB24	376.9	23	90	154	274	385	482
GHSB25	83.2	6	23	41	75	110	148
GHSB26	38.6	2	8	14	26	38	52
GHSB27	407.7	22	83	146	263	369	465
GHSB30	437.5	21	75	128	230	325	410
GHSB31	215.4	11	44	79	144	204	257
GHSB32	599.3	50	136	222	384	533	670
GHSB33	210.9	9	37	65	118	166	211
GHSB34	208.7	12	38	64	114	161	201
GHSB35	95.7	72	122	168	241	296	343
GHSB36	348.6	18	75	132	239	338	424
GHSB37	541.0	72	187	305	518	706	871
GHSB40	225.6	17	53	91	162	227	285
GHSB41	342.8	16	61	115	214	305	387
GHSB42	122.5	97	157	217	317	396	470
GHSB43	156.5	5	23	41	75	106	134

Table 4.3 Subbasin Peak Discharges for Existing Conditions (Continued).

Subbasin No.	Drainage Area (acres)	Peak Discharge (cfs)					
		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
TRI-TOWN BASIN							
TTSB51	560.0	47	100	173	314	441	561
TTSB52	610.6	54	113	206	393	558	707
TTSB53	640.4	36	83	165	332	480	618
TTSB54	346.9	12	33	74	157	230	298
TTSB55	173.9	29	57	96	169	232	290
TTSB56	27.3	9	16	26	43	57	70
TTSB57	14.2	3	7	11	19	25	31
TTSB58	17.3	3	7	12	21	29	36
TTSB59	19.4	3	7	12	22	31	39
TTSB60	53.7	27	47	65	94	120	143
TTSB61	250.8	13	51	93	171	243	307
TTSB62	108.1	80	139	198	283	355	418
TTSB63	288.0	16	66	116	209	295	372
TTSB70	683.9	62	130	224	408	573	725
TTSB71	114.3	5	11	29	72	109	144
TTSB72	392.8	76	144	241	424	583	727
TTSB73	115.3	5	15	35	74	107	138
TTSB74	324.3	23	53	105	209	299	380
TTSB75	722.3	28	77	167	350	513	665
TTSB76	49.2	26	42	59	87	113	136
TTSB77	37.2	2	5	9	17	25	32
TTSB78	36.4	19	31	44	64	83	100
TTSB79	40.1	3	5	9	17	25	32
TTSB80	42.1	19	31	45	69	91	110
TTSB81	110.0	31	58	94	157	213	263
TTSB82	88.7	2	5	12	26	39	51
TTSB83	48.4	15	27	42	69	92	113
TTSB84	69.1	3	7	13	26	38	49
TTSB85	16.1	5	9	14	23	32	39
TTSB86	57.4	5	10	18	33	46	60
TTSB87	74.1	36	58	81	119	152	183
TTSB88	24.9	7	13	21	33	45	55
TTSB89	211.4	19	53	94	167	232	291
TTSB90	441.2	74	146	252	450	620	776
TTSB91	225.6	163	269	363	503	630	741
TTSB92	117.0	6	19	41	79	113	145
TTSB93	45.8	23	39	54	78	98	116
TTSB94	38.7	2	7	11	19	27	35
TTSB95	374.3	18	76	137	250	354	445
TTSB96	269.3	70	129	208	353	475	584

Table 4.4 Major Drainageway Peak Discharges for Existing Conditions.

Location	UDSWMM Element	Drainage Area (acres)	Peak Discharge (cfs)					
			2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
GODDING HOLLOW BASIN								
WCR 26	202	18,320	562	1,189	1,891	3,523	5,128	7,000
Tri-Town Basin Inflow	751	18,040	575	1,212	1,907	3,539	5,119	6,997
WCR 24	203	11,350	292	664	996	1,988	3,209	4,492
Basin 43 Inflow	703	10,660	283	679	991	1,998	3,242	4,540
WCR 22	204	10,500	282	678	984	1,990	3,227	4,514
WCR 20	205	9,730	286	689	975	2,009	3,272	4,583
WCR 18	206	8,890	298	699	957	2,044	3,361	4,727
WCR 16	207	7,310	253	621	855	1,978	3,336	4,735
West Tributary Inflow	707	6,370	238	588	821	1,886	3,164	4,439
SHW 52	308	4,200	218	545	749	1,704	2,919	4,007
Basins 30 and 33 Inflow	708	4,200	221	590	891	2,232	3,207	4,170
Coalridge Ditch Detention (outflow)	309	3,550	201	523	781	1,964	2,824	3,672
Coalridge Ditch Detention (inflow)	208	3,550	202	603	1,070	2,002	2,851	3,698
Basins 31 and 32 Inflow	709	3,280	215	610	1,057	1,959	2,784	3,612
Confluence with Basins 31 and 32	209	2,470	162	464	806	1,492	2,110	2,747
WCR 12	210	2,280	182	456	776	1,430	2,016	2,618
Basin 34 Inflow	711	2,140	144	426	731	1,363	1,949	2,531
Confluence with Basin 34	211	1,930	134	392	673	1,252	1,794	2,330
CO National Speedway	712	1,810	130	383	652	1,213	1,738	2,247
Upstream of CO National Speedway	212	830	33	150	272	521	758	985
I-25	213	760	35	144	257	491	714	920
WCR 10	216	350	23	87	157	292	422	536
UPRR	217	220	17	69	120	213	298	374
TRI-TOWN BASIN								
Confluence with Godding Hollow	751	6,690	296	700	1,223	2,247	3,096	3,957
WCR 24	252	6,130	294	696	1,195	2,177	2,989	3,819
WCR 22	253	5,520	338	796	1,261	2,212	3,023	3,844
WCR 20	254	4,440	336	769	1,295	2,251	3,050	3,842
Basin 75 Inflow	754	4,090	341	767	1,272	2,158	2,912	3,659
WCR 18	255	3,370	334	729	1,178	2,075	2,765	3,445
WCR 13 (downstream)	755	3,200	318	699	1,126	1,964	2,615	3,268
WCR 13 (upstream)	256	2,550	272	577	911	1,545	2,060	2,593
M°Clure Street (Firestone)	258	2,350	255	543	857	1,449	1,957	2,492
WCR 16	760	1,730	188	409	651	1,111	1,517	1,937
Main Street (Frederick)	761	1,730	193	416	659	1,176	1,644	2,108
SHW 52	262	820	226	424	602	930	1,240	1,519
Second Street (Dacono)	263	290	16	66	116	209	295	372

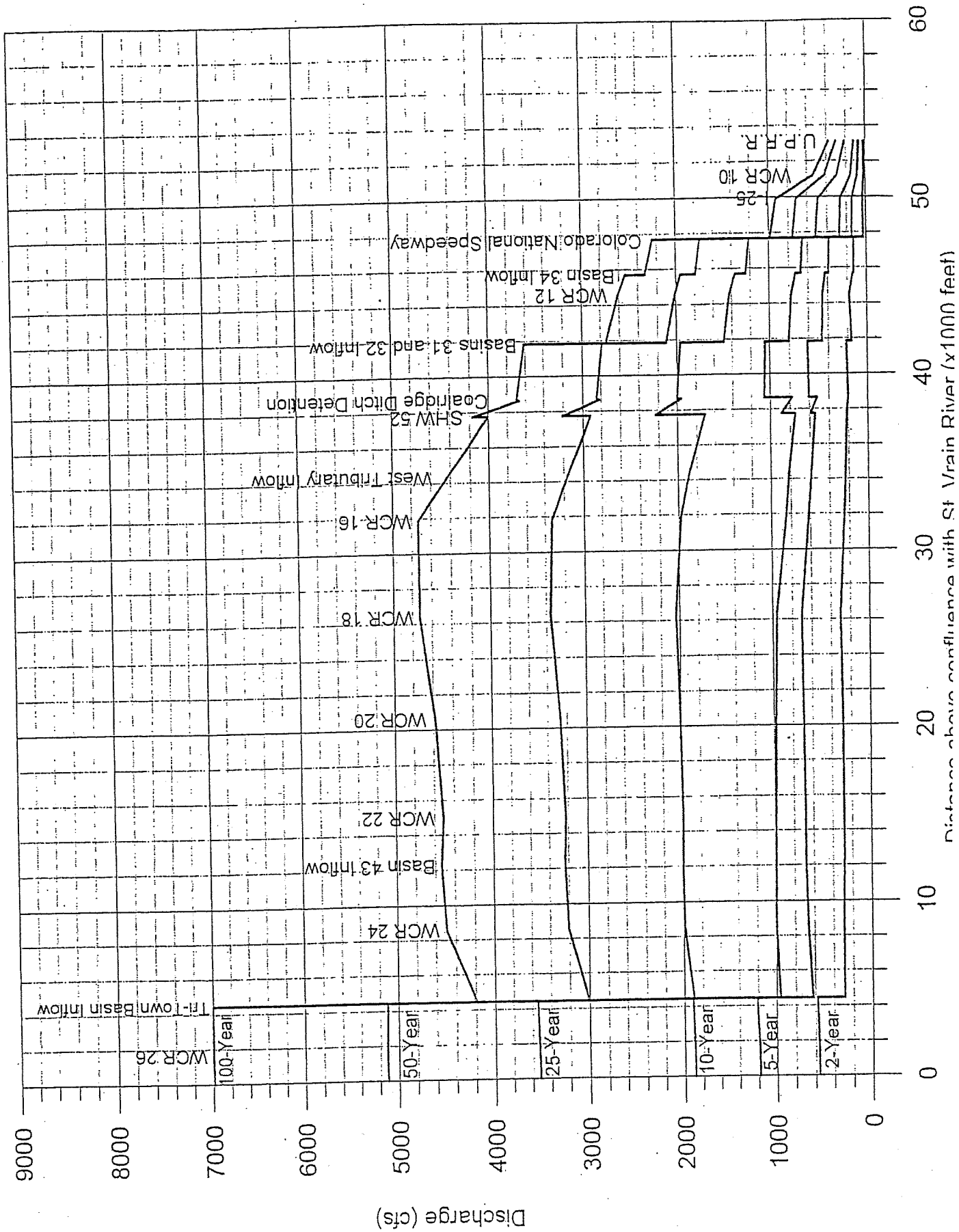


Figure 4.1 Discharge Profiles for Godding Hollow Basin: Existing Conditions.

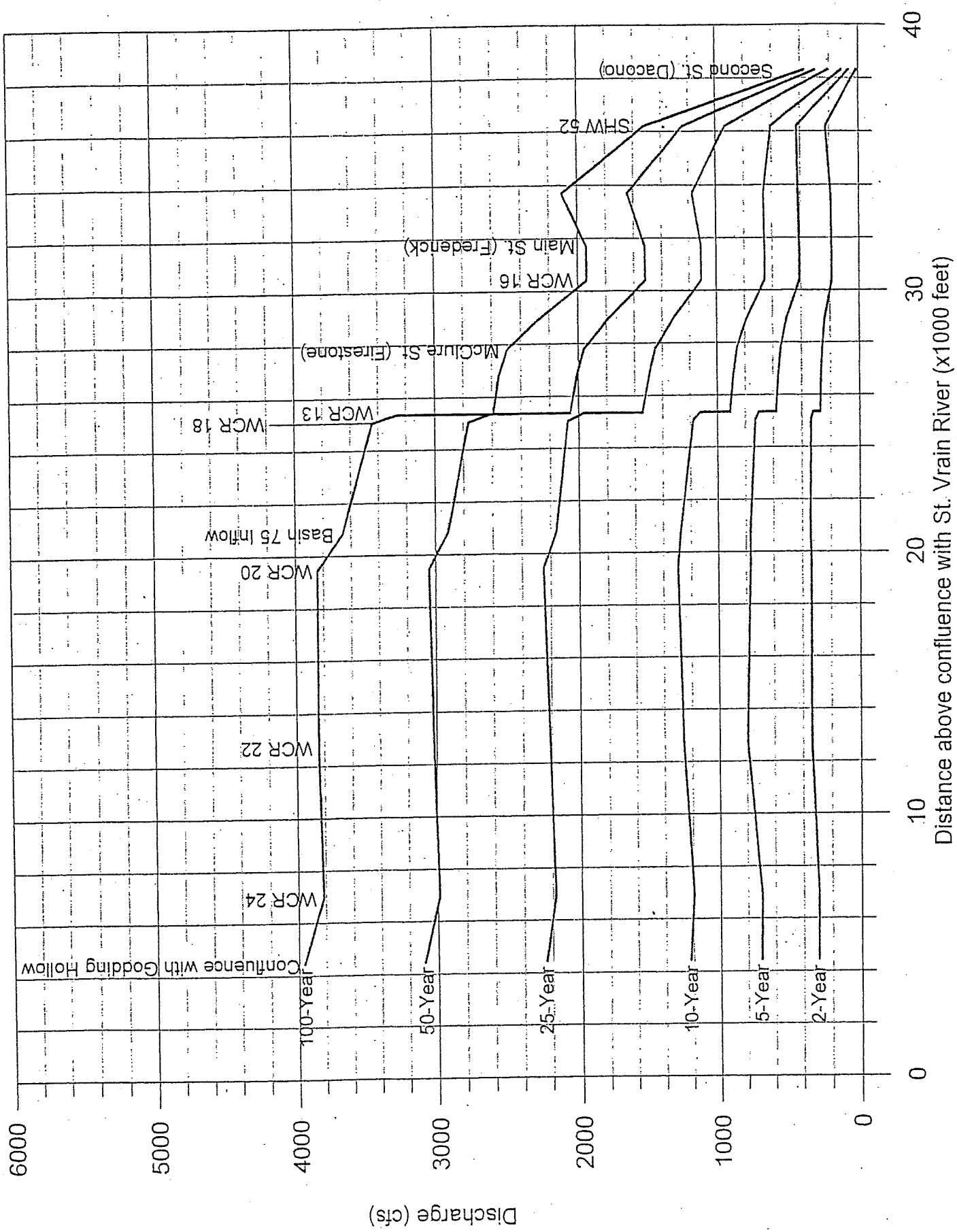


Figure 4.2 Discharge Profiles for Tri-Town Basin: Existing Conditions.

in the Rural Ditch for approximately 1,800 feet before emptying into the Rural Ditch wasteway at the end of the Rural Ditch. Large flow events will spill out of the Rural Ditch and flow north to WCR 24¾. Channel improvements may limit the localized flooding problems in this area and may isolate the stormwater runoff from the Rural Ditch.

WCR 24 Culvert. This culvert crossing lacks the capacity to convey the 100-year peak discharge of 4,490 cfs at this location. The capacity of the existing structure was estimated to be 240 cfs prior to overtopping the roadway. Large flow events will overtop WCR 24 west of this crossing. An improved crossing structure could reduce the localized flooding problems at this location.

WCR 22 Culvert. The 100-year existing conditions discharge in Godding Hollow at Weld County Road 22 is 4,510 cfs. This compares to a culvert capacity, prior to overtopping the roadway, of 300 cfs. The road will overtop along both sides of the culvert. An improved crossing structure could significantly reduce the localized flooding problems at this location.

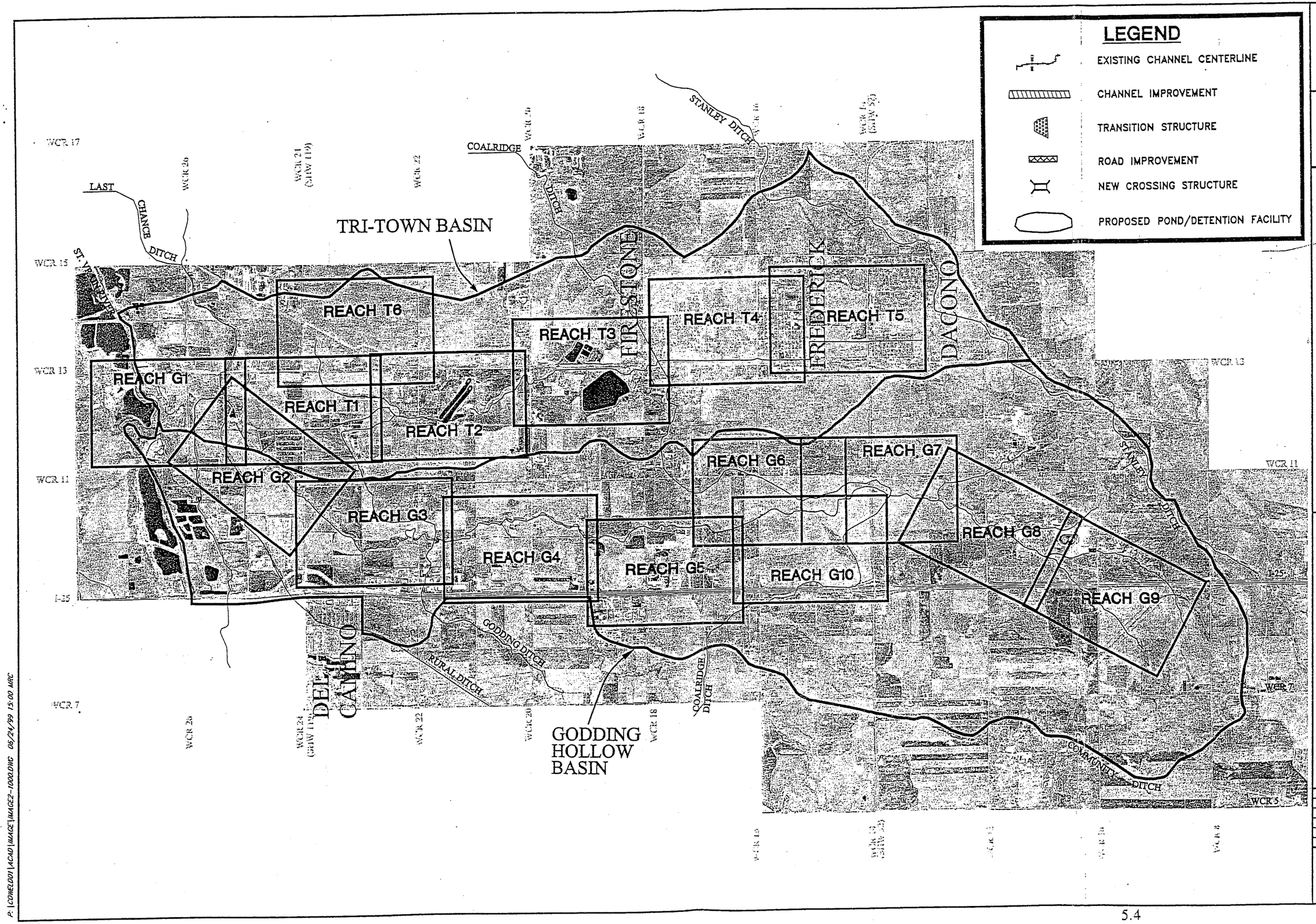
Godding Ditch Bridge/Flume. At this location, the Godding Ditch is conveyed over Godding Hollow in a steel flume. The capacity of the bridge prior to overtopping the canal embankment is estimated to be 3,000 cfs. The 100-year existing condition discharge in Godding Hollow at the Godding Ditch is 4,510 cfs. Large flows will flow into and out of the ditch. An improved crossing structure could reduce the localized flooding problems at this location and prevent overtopping of the canal embankment.

WCR 20 Culvert. The capacity of the culvert prior to overtopping is 210 cfs. The 100-year existing condition discharge in Godding Hollow at Weld County Road 20 is 4,580 cfs. Flows will spread out east and west along the road before overtopping. An improved crossing structure could reduce the localized flooding problems at this location.

WCR 18 Culvert. The capacity of the culvert prior to overtopping is 190 cfs. The 100-year existing condition discharge in Godding Hollow at Weld County Road 18 is 4,730 cfs. Flows will spread out east and west along the road before overtopping. An improved crossing structure could reduce the localized flooding problems at this location.

WCR 16 Culvert. The capacity of the culvert prior to overtopping is 160 cfs. The 100-year existing condition discharge in Godding Hollow at Weld County Road 16 is 4,740 cfs. Flows will spread out east and west along the road before overtopping. An improved crossing structure could reduce the localized flooding problems at this location.

State Highway 52 (WCR 14) Culvert. The capacity of the culvert prior to overtopping is 1,000 cfs. The 100-year existing condition discharge in Godding Hollow at State Highway 52 is 4,010 cfs. Some of the flows will be detained behind the large highway embankment before overtopping occurs to the west of the culvert. Additional detention along with an improved



WELD COUNTY
I-25 CORRIDOR MASTER DRAINAGE PLAN
GODDING HOLLOW AND TRI-TOWN BASIN
REACH LOCATIONS

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ACADFILE: COWELD01\WAGE2-1500	

FIGURE 5.1

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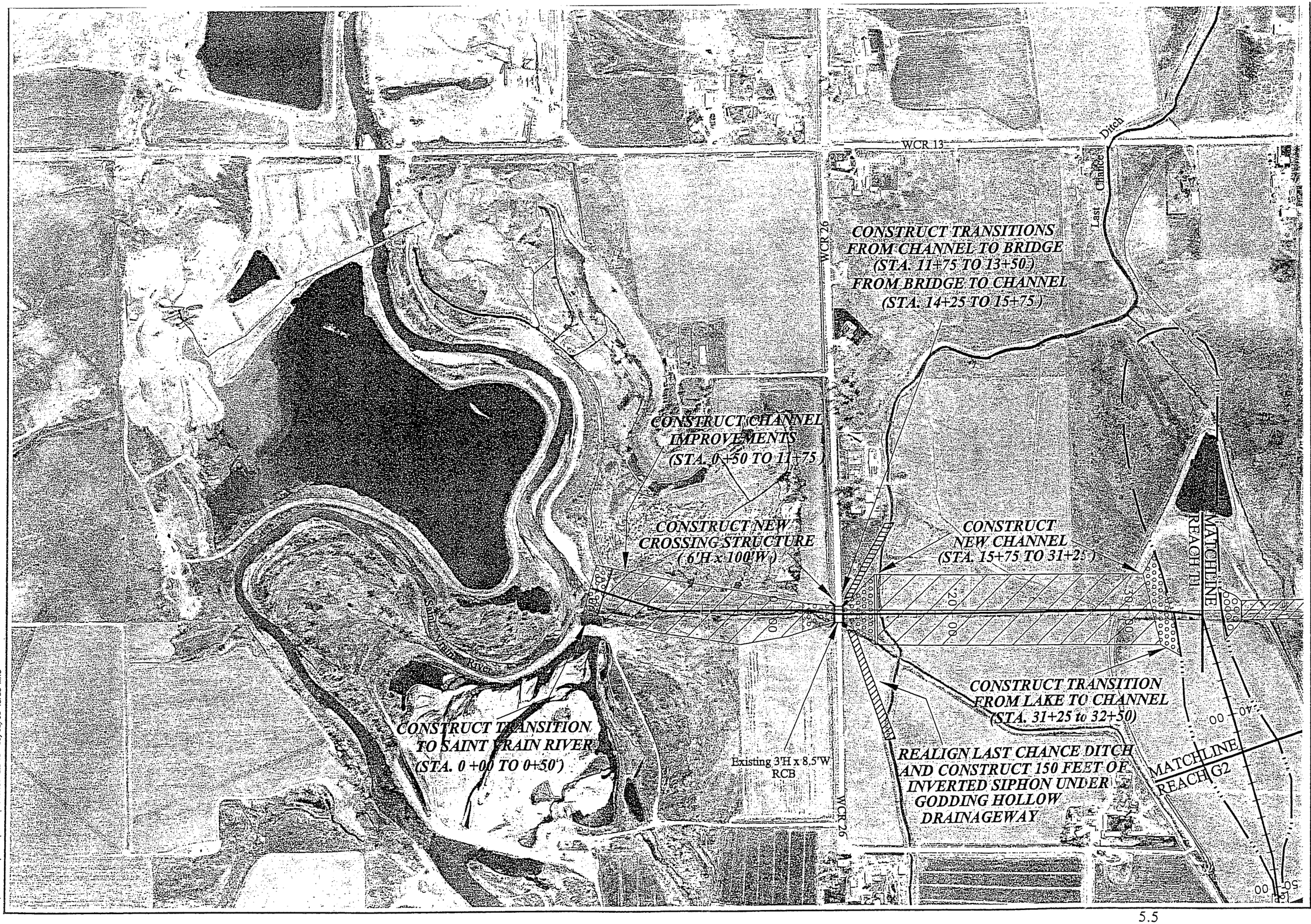

SCALE
1" = 500'

WELD COUNTY
I-25 CORRIDOR MASTER DRAINAGE PLAN
GODDING HOLLOW BASIN
REACH G1

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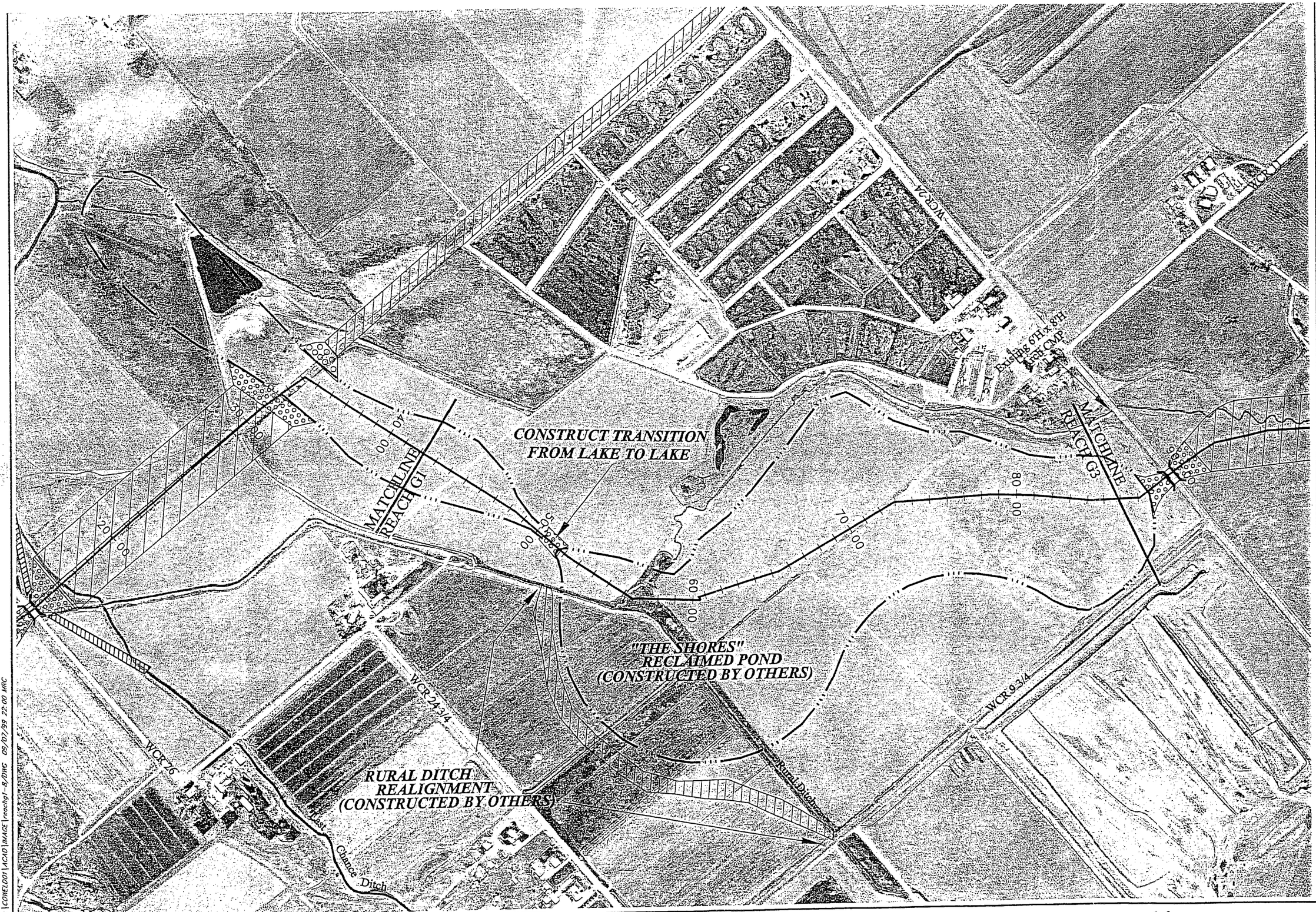
ACADFILE COWELD01\ACAD\REACHG1-8	

FIGURE 5.2

P:\COWELD01\ACAD\IMAGE\REACHG1-8.DWG 09/08/99 15:55 MRC



SCALE
1" = 500'

WELD COUNTY
I-25 CORRIDOR MASTER DRAINAGE PLAN
GODDING HOLLOW BASIN
REACH G2

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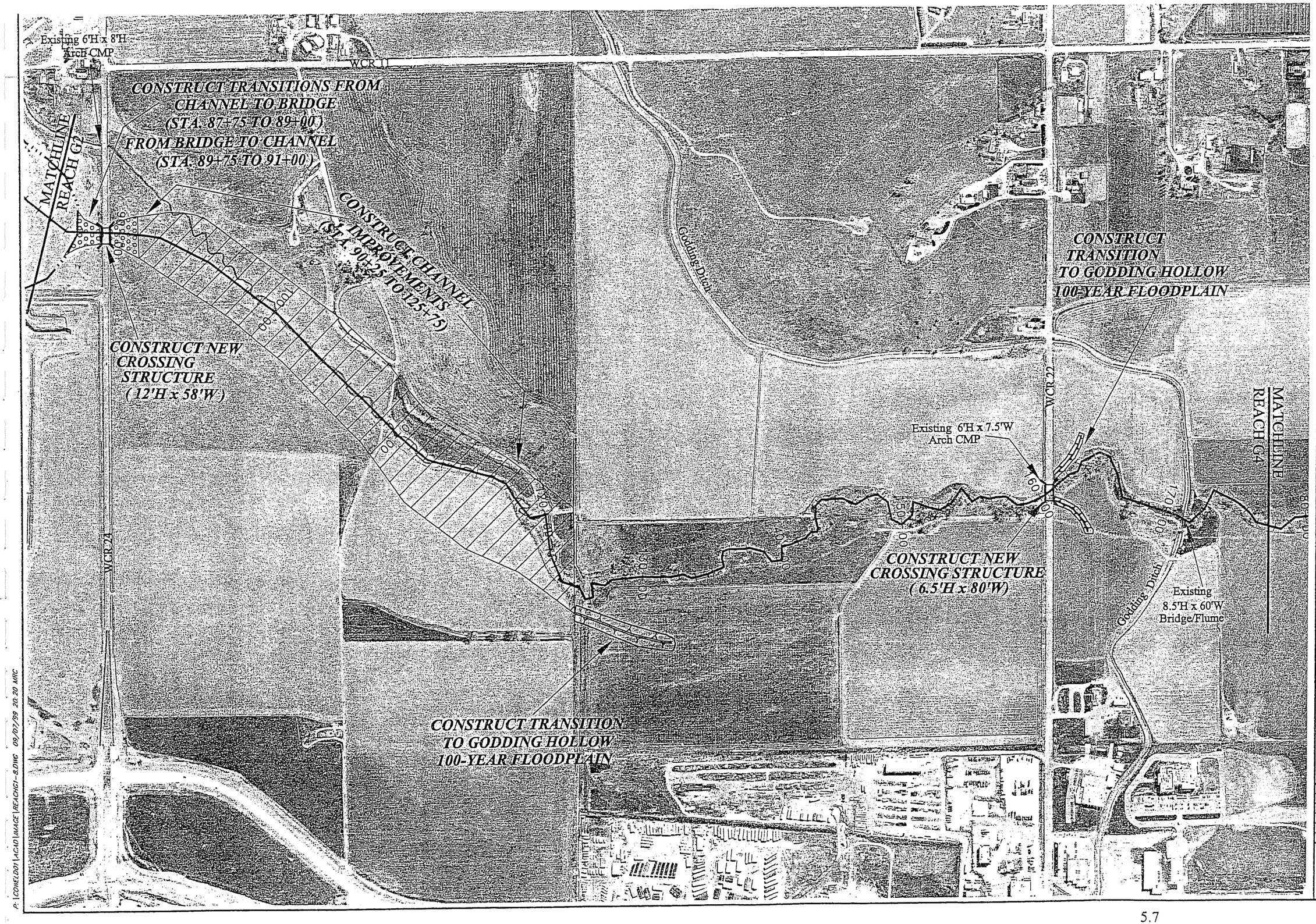
FIGURE
5.3

P:\COWELD01\ACAD\IMAGE\reachg1-8.DWG 09/07/99 22:00 MRC



SCALE
1" = 500'

WELD COUNTY
I-25 CORRIDOR MASTER DRAINAGE PLAN
GODDING HOLLOW BASIN
REACH G3

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ACADFILE: COWELD01\ACAD\REACHG1-8	

FIGURE
5.4

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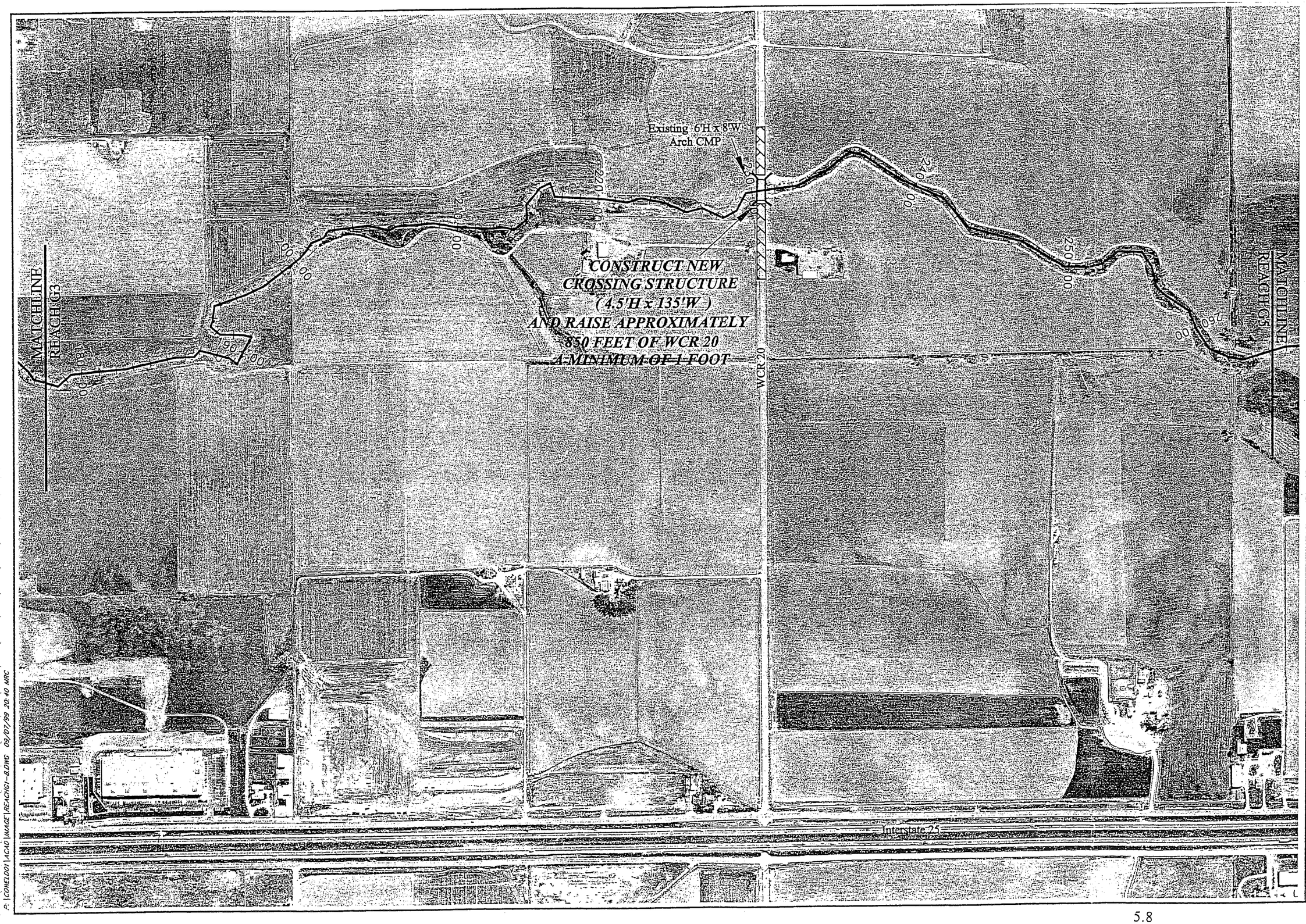

SCALE
1" = 500'

WELD COUNTY
I-25 CORRIDOR MASTER DRAINAGE PLAN
GODDING HOLLOW BASIN
REACH G4

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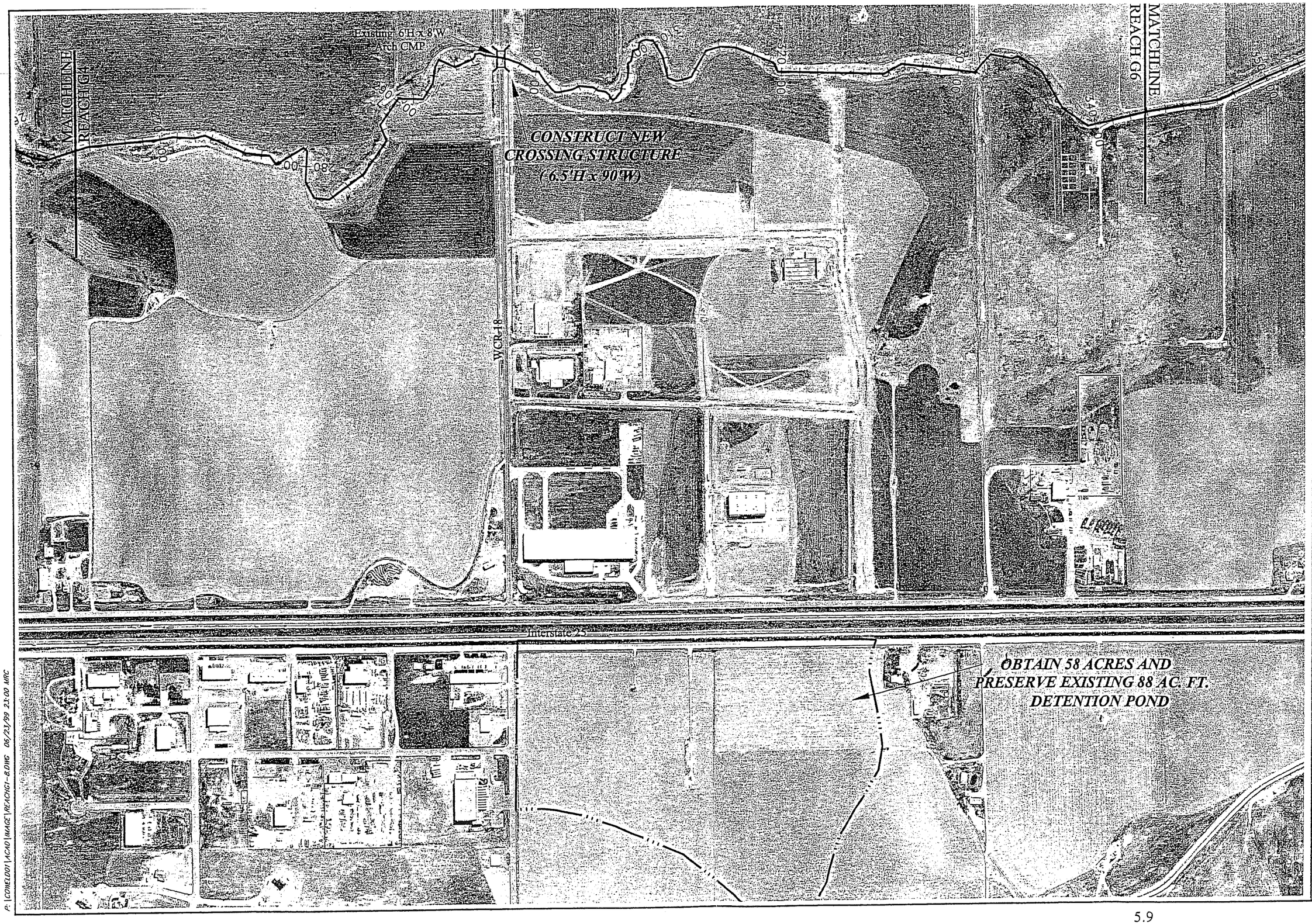
ACADFILE: COWELD01\ACAD\REACHG1-6	

FIGURE
5.5

P:\COWELD01\ACAD\IMAGE\REACHG1-8.DWG 09/07/99 20:40 MRC



SCALE
1" = 500'

WELD COUNTY
I-25 CORRIDOR MASTER DRAINAGE PLAN
GODDING HOLLOW BASIN
REACH G5

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Revisions:	6/22/99
ACADFILE: COWELD01\ACAD\REACHG1-8	

FIGURE
5.6

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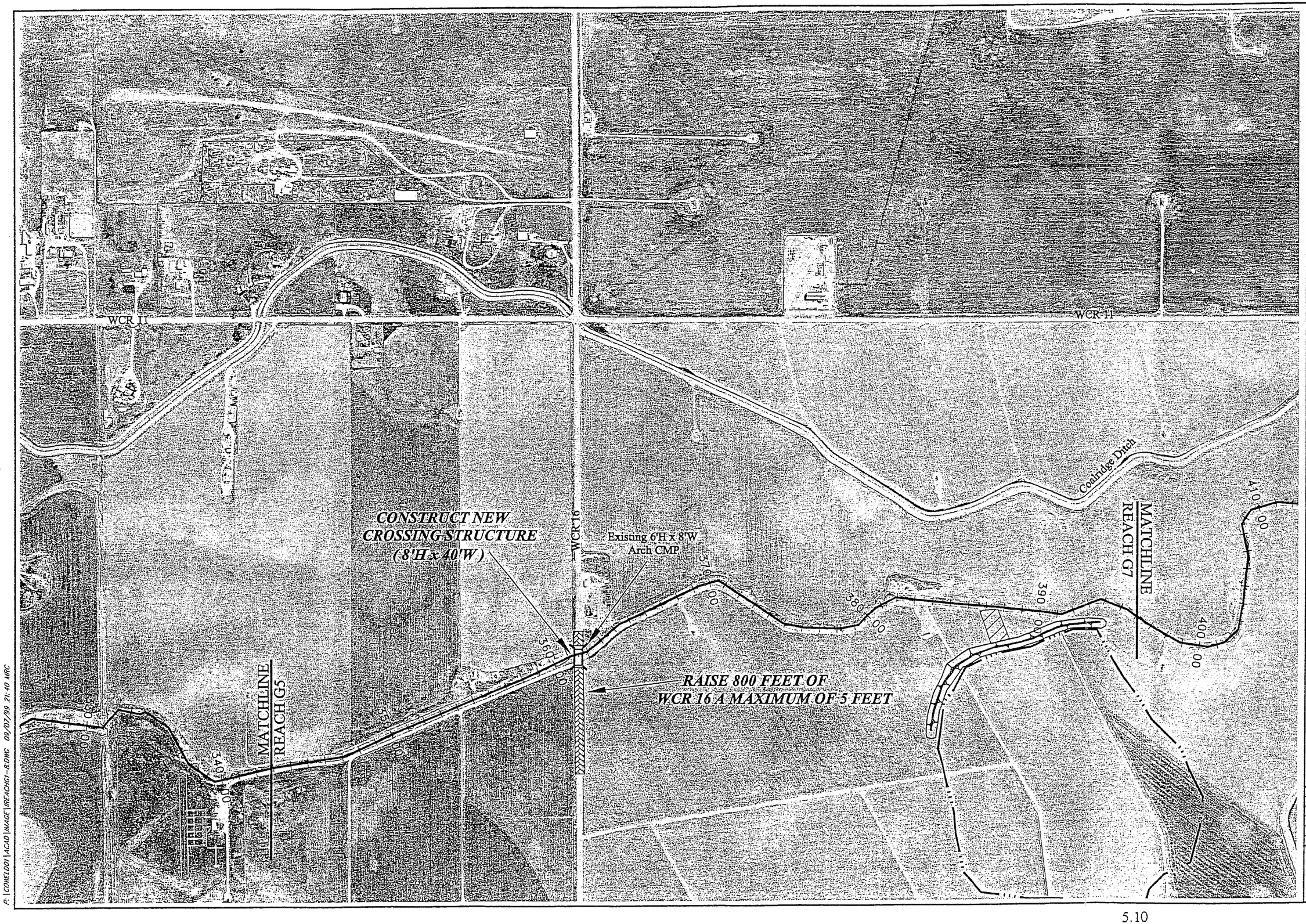

SCALE
1" = 500'

WELD COUNTY
I-25 CORRIDOR MASTER DRAINAGE PLAN
GODDING HOLLOW BASIN
REACH G6

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Revisions:	9/7/99
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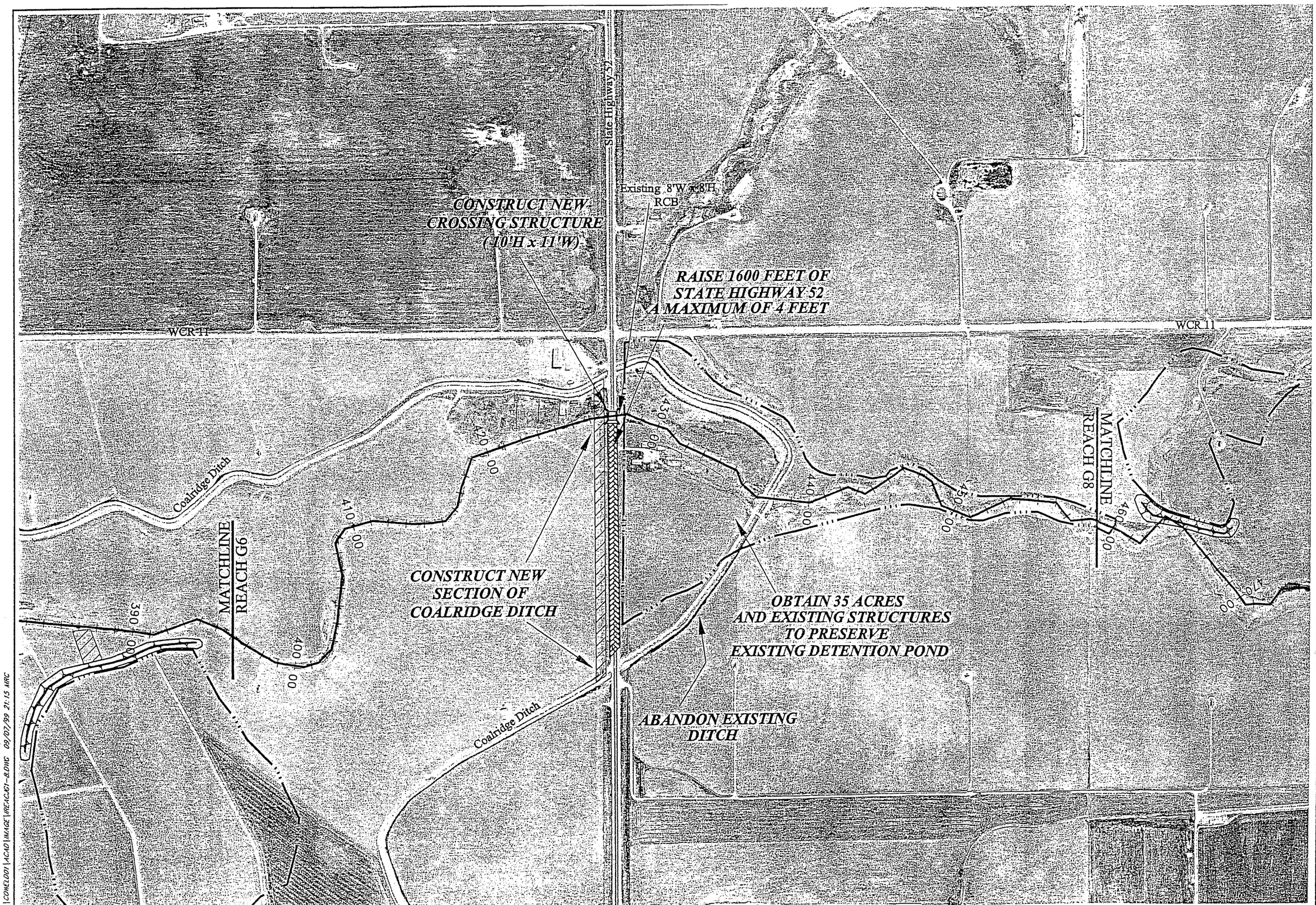
FIGURE
5.7

P:\COWELD01\ACAD\IMAGE\REACHG1-8.DWG 09/07/99 21:40 MRC



N

SCALE
1" = 500'

WELD COUNTY
I-25 CORRIDOR MASTER DRAINAGE PLAN
GODDING HOLLOW BASIN
REACH G7

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ACADFILE: COWELD01\ACAD\REACH01-8	

FIGURE
5.8

P:\COWELD01\ACAD\IMAGE\REACH01-8.DWG 09/07/99 21:15 MRC

SCALE
1" = 500'

WELD COUNTY
I-25 CORRIDOR MASTER DRAINAGE PLAN
GODDING HOLLOW BASIN
REACH G8

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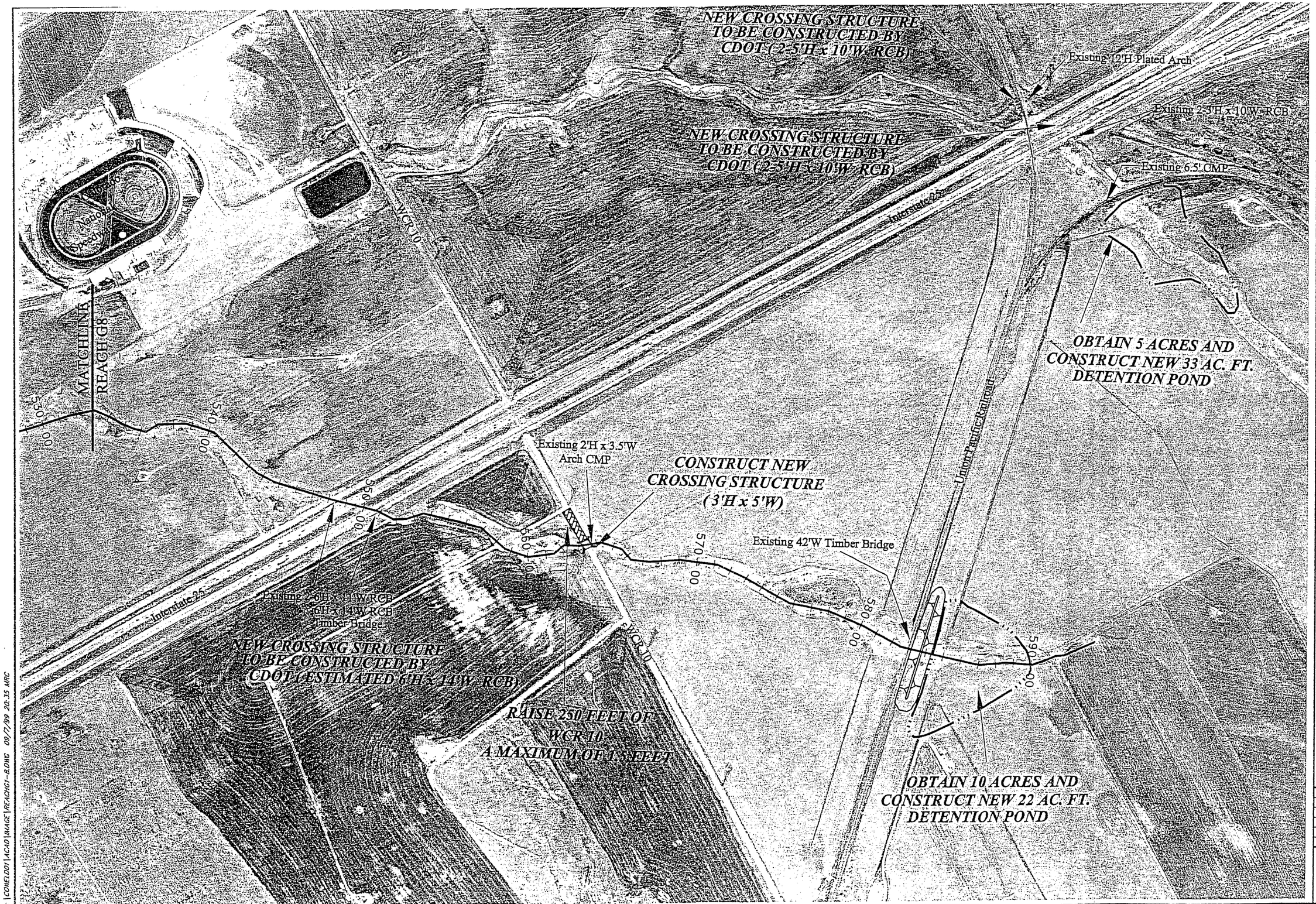
ACADFILE: COWELD01\ACAD\REACHG1-8	

FIGURE 5.9

P:\COWELD01\ACAD\IMAGE\REACHG1-8.DWG 09/07/99 20:50 MRC



SCALE
1" = 500'

WELD COUNTY
I-25 CORRIDOR MASTER DRAINAGE PLAN
GODDING HOLLOW BASIN
REACH G9

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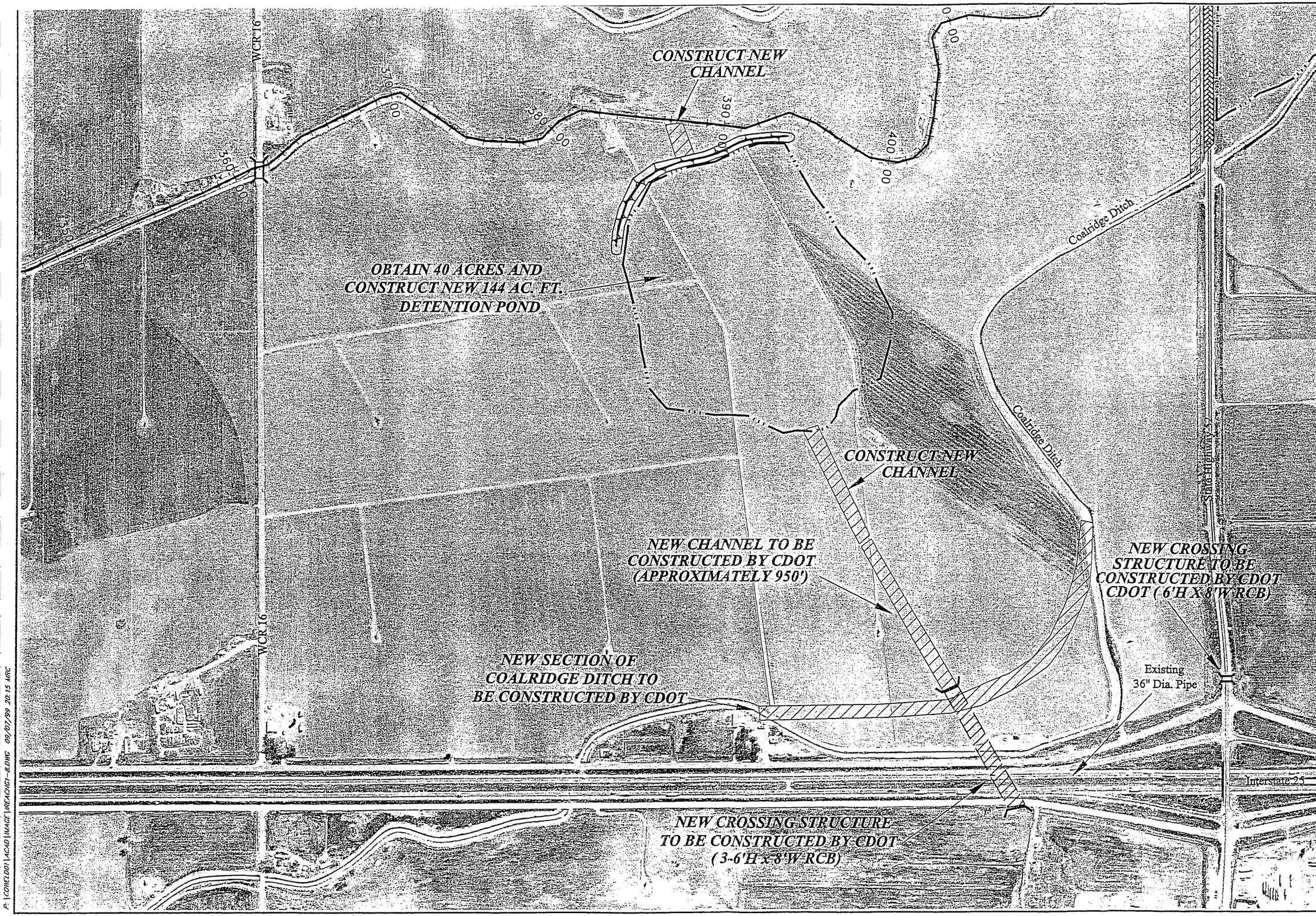
FIGURE
5.10

P:\COWELD01\ACAD\IMAGE\REACHG1-8.DWG 09/7/99 20:35 MRC



SCALE
1" = 500'

WELD COUNTY
I-25 CORRIDOR MASTER DRAINAGE PLAN
GODDING HOLLOW BASIN
REACH G10

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ACADFILE:	COWELD01\ACAD\REACH01-8

FIGURE 5.11

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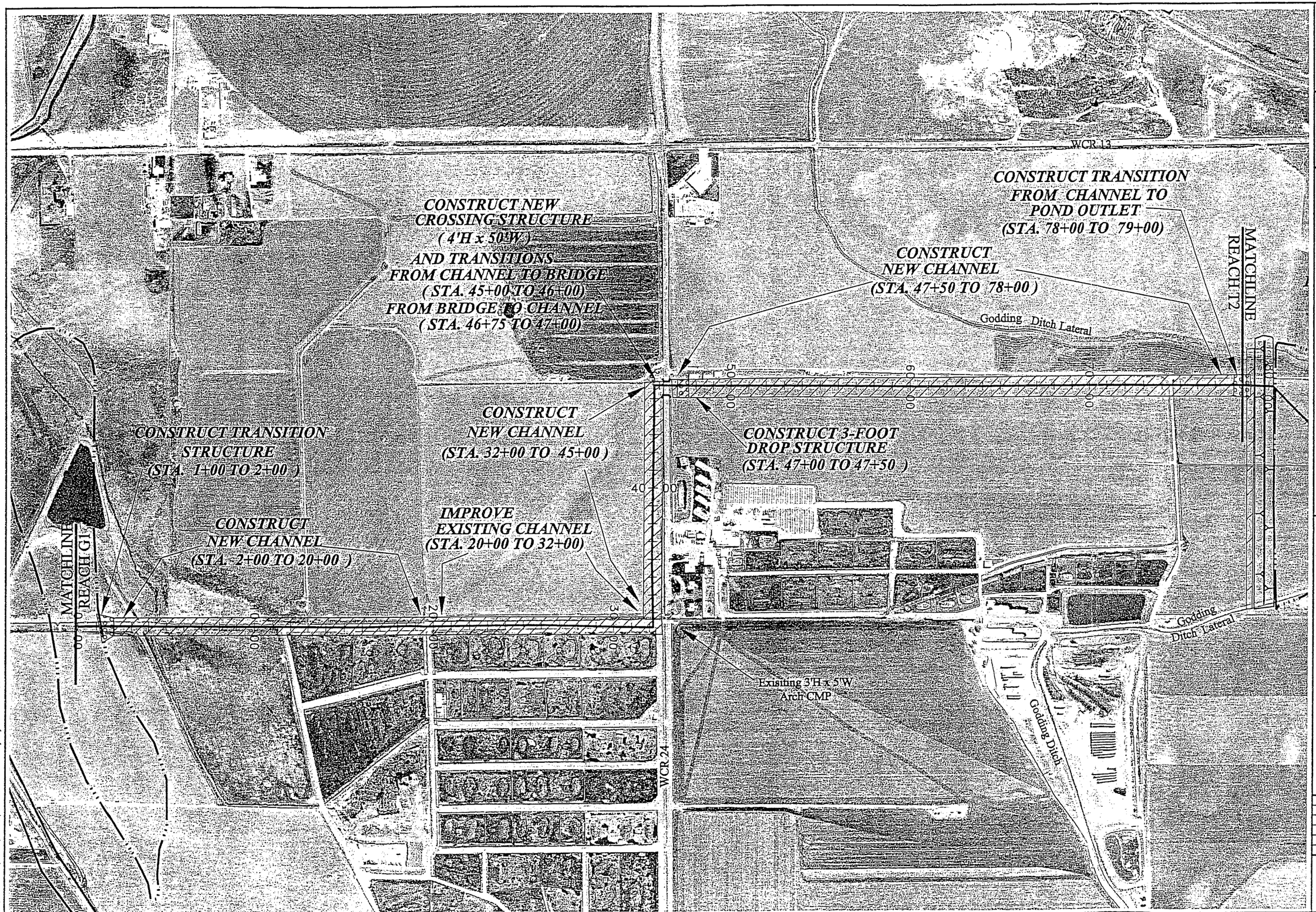

SCALE
1" = 500'

WELD COUNTY
I-25 CORRIDOR MASTER DRAINAGE PLAN
TRI-TOWN BASIN
REACH T1

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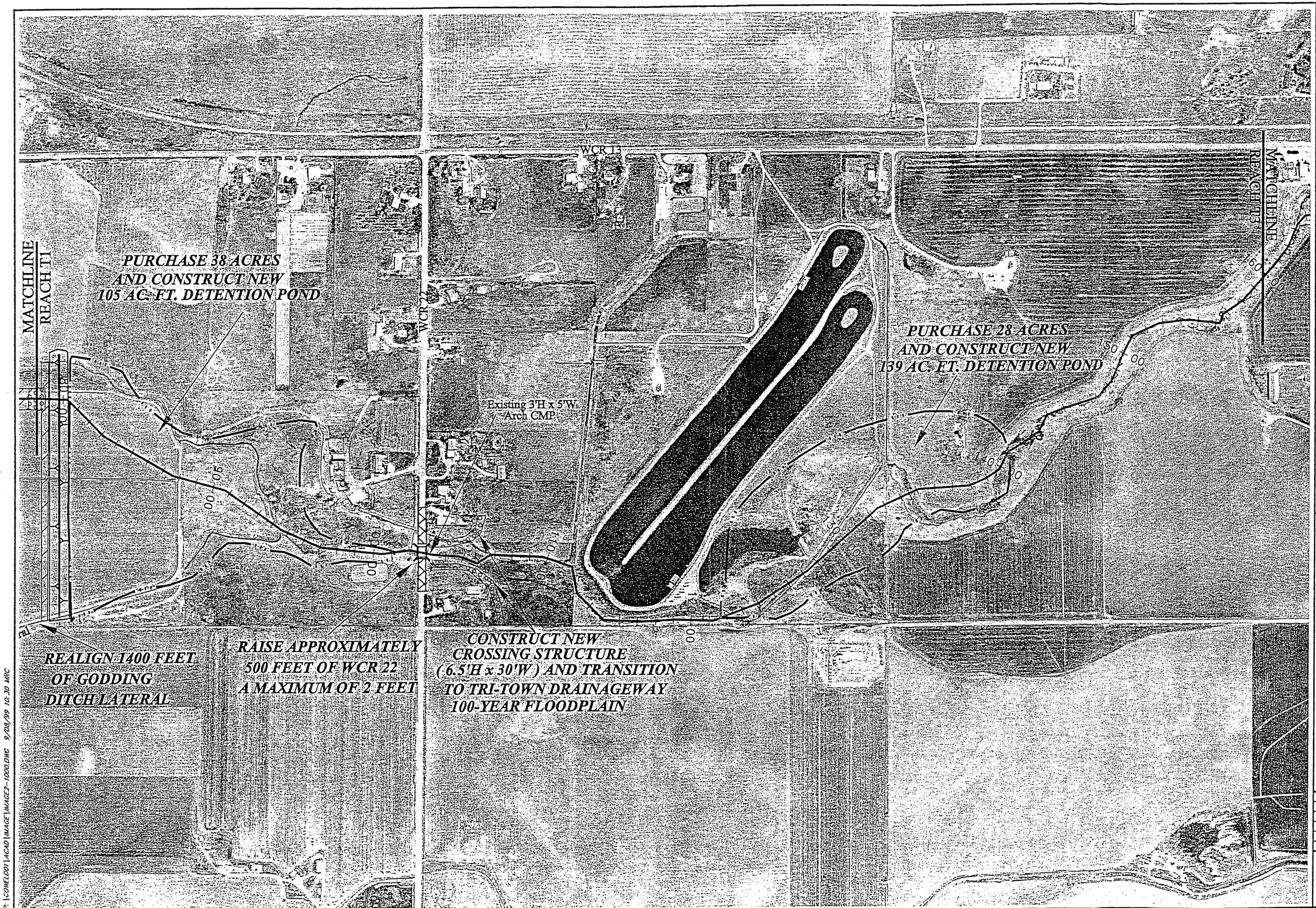
Revisions:	9/08/99
ACADFILE: COWELD01\ACAD\REACHT1-5	

FIGURE 5.12

P:\COWELD01\ACAD\IMAGE\REACHT1-5.DWG 9/08/99 11:00 MRC



N

SCALE
1" = 500'

WELD COUNTY
I-25 CORRIDOR MASTER DRAINAGE PLAN
TRI-TOWN BASIN
REACH T2

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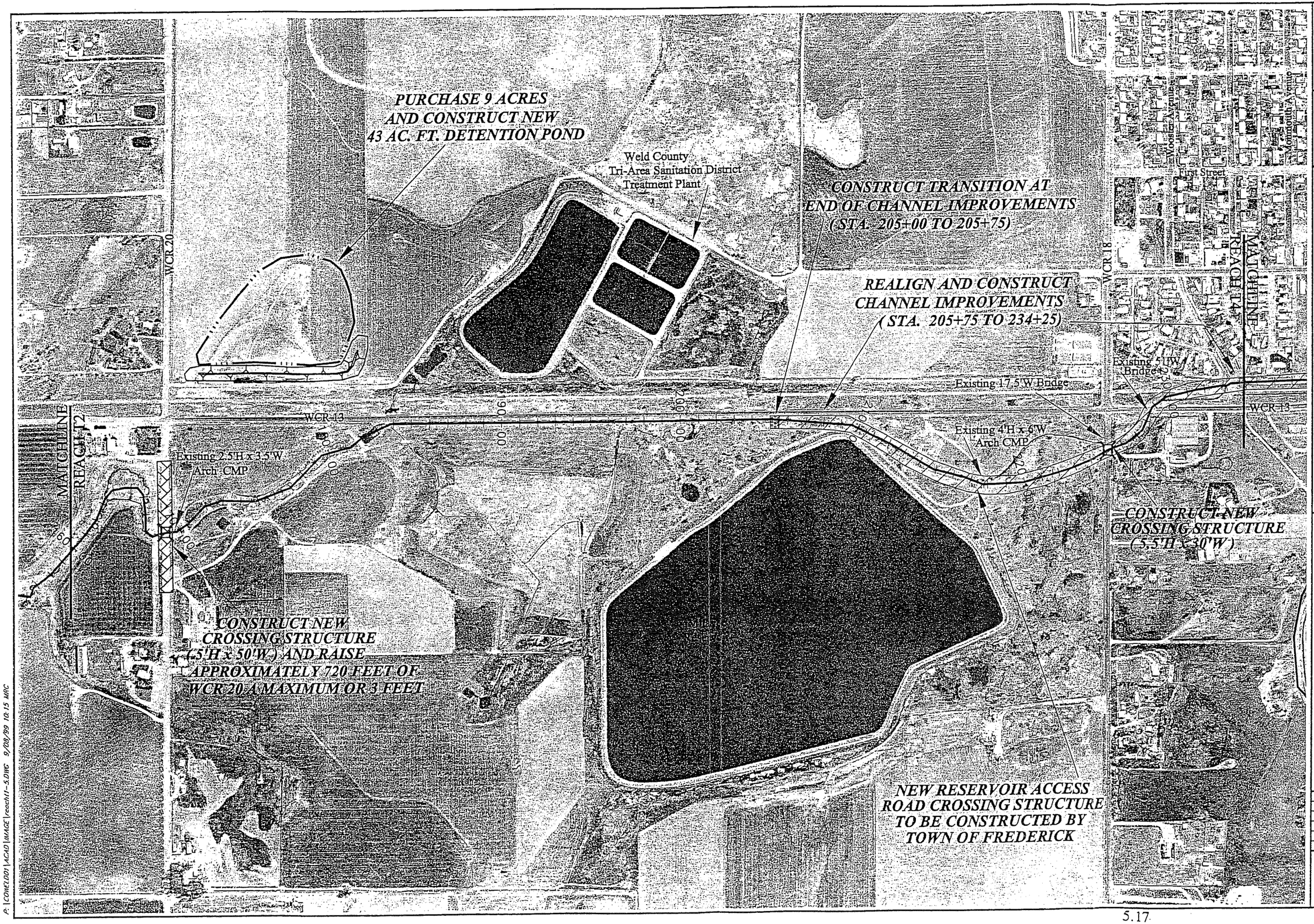
ACADFILE:	COWELD01\ACAD\REACHT1-5

FIGURE
5.13

P:\COWELD01\ACAD\IMAGE\IMAGE2-1000.DWG 9/08/99 10:30 MRC



SCALE
1" = 500'

WELD COUNTY
I-25 CORRIDOR MASTER DRAINAGE PLAN
TRI-TOWN BASIN
REACH T3

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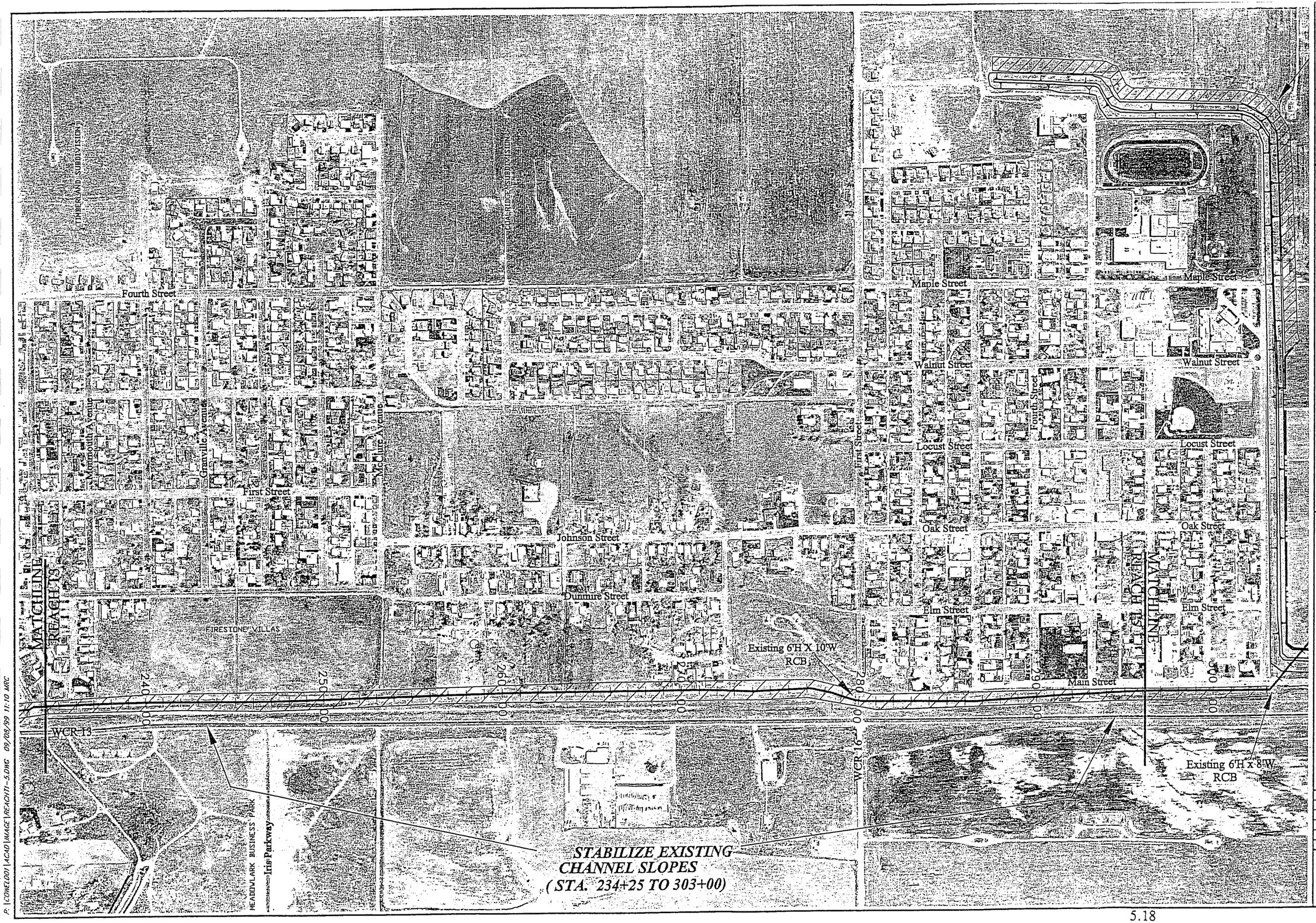
Drawn:	MRC
Revisions:	9/8/99
ACADFILE:	COWELD01\ACAD\REACHT1-5

FIGURE
5.14

P:\COWELD01\ACAD\IMAGE\reacht1-5.DWG 9/08/99 10:15 MRC



SCALE
1" = 500'

WELD COUNTY
I-25 CORRIDOR MASTER DRAINAGE PLAN
TRI-TOWN BASIN
REACH T4

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Project No.	COWELD02
Date:	5/14/99
Design:	BLV/CJP
Drawn:	MRC
Revisions:	9/08/99
ACADFILE:	COWELD01\ACAD\REACHT1-5

FIGURE
5.15

P:\COWELD01\ACAD\IMAGE\REACHT1-5.DWG 09/08/99 11:10 MRC

SCALE
1" = 500'

WELD COUNTY
I-25 CORRIDOR MASTER DRAINAGE PLAN
TRI-TOWN BASIN
REACH T5

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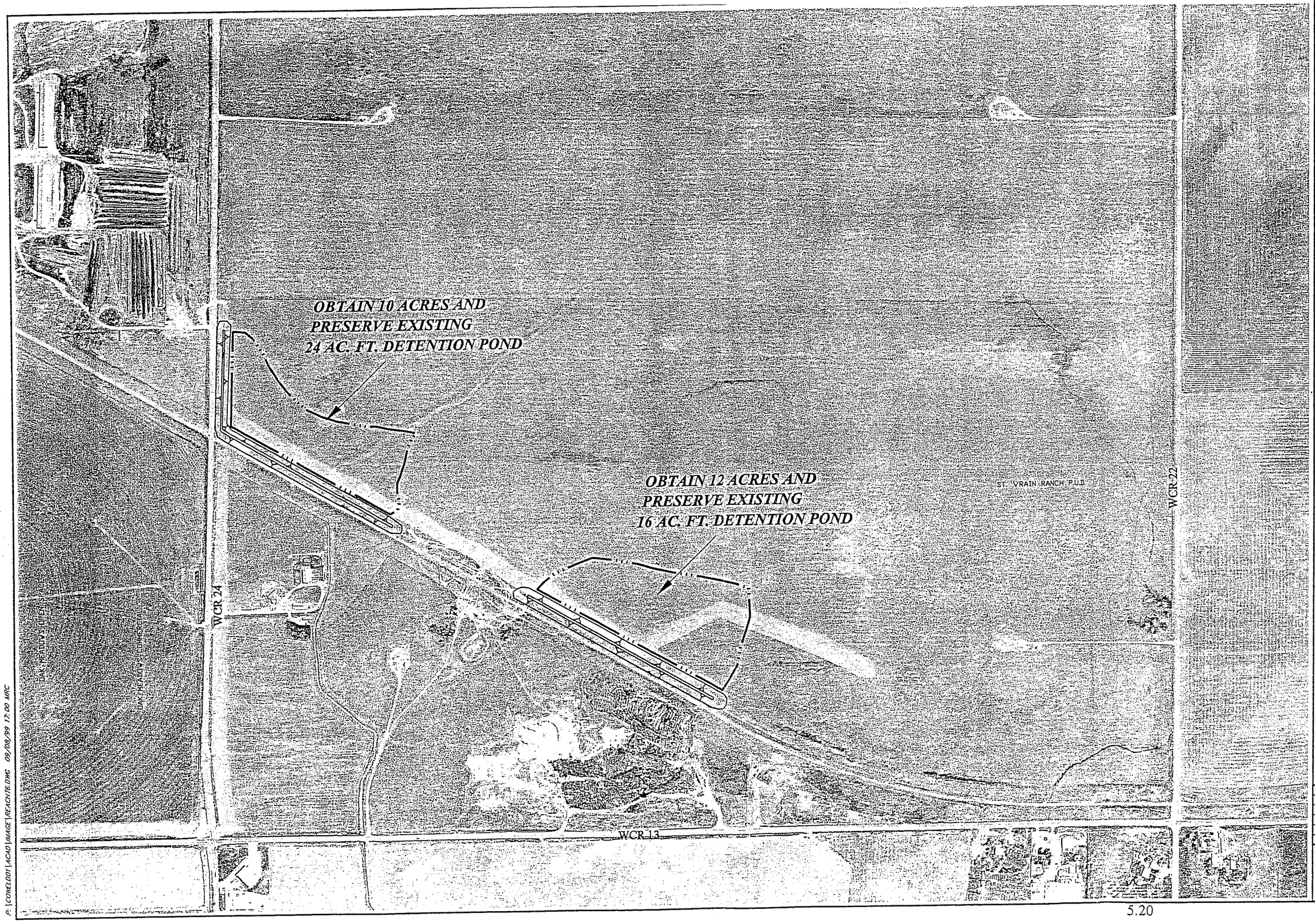
Drawn:	MRC
Revisions:	9/08/99
ACADFILE: COWELD01\ACAD\REACHT1-5	

FIGURE
5.16

P:\COWELD01\ACAD\IMAGE\REACHT1-5.DWG 09/08/99 11:25 MRC



SCALE
1" = 500'

WELD COUNTY
I-25 CORRIDOR MASTER DRAINAGE PLAN
TRI-TOWN BASIN
REACH T6

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Drawn:	MRC
Revisions:	9/08/99
ACADFILE:	COWELD01\ACAD\REACH11-5

FIGURE
5.17

P:\COWELD01\ACAD\IMAGE\REACH16.DWG 09/08/99 12:00 MRC

5.2.1 Godding Hollow Basin Reach G1: Saint Vrain River to "The Shores" Lakes Outlet

The proposed improvements to Reach G1 are presented below and presented in Figure 5.2.

1. Channel Improvements. Construct approximately 3,000 feet of channel improvements from the confluence of the Saint Vrain River to the outlet from "The Shores" Lake. The channel improvements should include a low flow channel along with an overbank area to convey flood flows. In addition, the channel incorporates a grass lining, bottom width of 20 feet (low flow channel), maximum top width of 400 feet, sideslopes of 4H:1V, and design depth of approximately 4 feet. In conjunction with construction of the channel, a transition structure into the Saint Vrain River and from the lake is required.

2. WCR 26 Crossing. Replace the existing 3'H x 8.5'W RCB crossing of WCR 26 with a bridge structure with a minimum opening of 6'H x 100'W. Transitions from the channel improvements to the bridge crossing are required along with placement of stabilization measures to control the potential erosion in the vicinity of the crossing.

3. Realign Last Chance Ditch. Construction of the channel and bridge crossing will require realignment of the Last Chance Ditch to a location adjacent to WCR 26. An inverted siphon (approximately 150 feet) is required to convey flows beneath the major drainageway. In conjunction with the realignment of the ditch, a side-channel weir should be included in the improvements to divert potential stormwater captured by the ditch into the major drainageway.

5.2.2 Godding Hollow Basin Reach G2: Outlet of "The Shores" Lakes to WCR 24

The proposed improvements to Reach G2 focus on the transition structure between the two lakes. The transition structure includes the placement of stabilization measures to ensure the conveyance of stormwater runoff in an erosionally stable manner. Based on a review of proposed development plans, it has been assumed that a portion of the Rural Ditch will be realigned during the construction of the lakes. This realignment will be completed in conjunction with development of the property. Figure 5.3 presents the improvements in Reach G2.

5.2.3 Godding Hollow Basin Reach G3: WCR 24 to Godding Ditch

Improvements in Reach G3 focused on the alleviation of flooding problems at three locations: (a) WCR 24; (b) the channel reach upstream of WCR 24; and (c) WCR 22. The specific improvements to Reach G3 are presented below and also in Figure 5.4.

1. WCR 24 Crossing. Replace the existing 6'H x 8'W arch CMP crossing of WCR 24 with a bridge structure with a minimum opening of 12'H x 58'W. Transitions from the existing channel to the bridge crossing are required along with placement of stabilization measures to control the potential erosion in the vicinity of the crossing.

2. Channel Improvements. In conjunction with the improvements to the crossing at WCR 24, construct approximately 3,000 feet of channel improvements upstream from WCR 24. The channel improvements should incorporate a compound channel configuration, i.e., a low flow channel along with an overbank area to convey flood flows. In addition, the channel incorporates a grass lining, bottom width of 20 feet (low flow channel), maximum top width of 400 feet, sideslopes of 4H:1V, and design depth of 4 feet. At the upstream end of the channel improvements, a berm is required to capture the stormwater runoff and direct the flows into the proposed improvements.

3. WCR 22 Crossing. Replace the existing 6'H x 7.5'W arch CMP crossing of WCR 22 with a bridge structure with a minimum opening of 6.5'H x 80'W. Transitions from the existing channel to the bridge crossing are required along with placement of stabilization measures to control the potential erosion in the vicinity of the crossing.

5.2.4 Godding Hollow Basin Reach G4: WCR 20

The proposed improvements to Reach G4 focus on the replacement of the existing 6'H x 8'W arch CMP crossing of WCR 20 with a bridge structure with a minimum opening of 4.5'H x 135'W. Transitions from the existing channel to the bridge crossing are required along with placement of stabilization measures to control the potential erosion in the vicinity of the crossing. In conjunction with the replacement of the existing structure, approximately 850 feet of the roadway should be raised to a maximum height of 1 foot. Figure 5.5 presents the improvements for Reach G4.

5.2.5 Godding Hollow Basin Reach G5: WCR 18

The proposed improvements to Reach G5 focus on the replacement of the existing 6'H x 8'W arch CMP crossing of WCR 18 with a bridge structure with a minimum opening of 6.5'H x 90'W. Transitions from the existing channel to the bridge crossing are required along with placement of stabilization measures to control the potential erosion in the vicinity of the crossing.

An existing detention pond is also located within this reach. The existing pond is located west of I-25 and south of WCR 18. This existing pond tends to reduce the peak flows within the major drainageway; consequently, preserving the storage volume is necessary. At this location, it is recommended that property be obtained and a new detention pond be constructed capable of storing not less than 88 acre-feet.

Figure 5.6 presents the improvements associated with Reach G5.

5.2.6 Godding Hollow Basin Reach G6: WCR 16

The proposed improvements to Reach G6 focus on the replacement of the existing 6'H x 8'W arch CMP crossing of WCR 16 with a bridge structure with a minimum opening of 8'H x 40'W. Transitions from the existing channel to the bridge crossing are required along with placement of stabilization measures to control the potential erosion in the vicinity of the crossing. In conjunction with the replacement of the existing structure, approximately 800 feet of the roadway should be raised to a maximum height of 5 feet. Figure 5.7 presents the improvements associated with Reach G6.

5.2.7 Godding Hollow Basin Reach G7: State Highway 52/Coalridge Ditch

Improvements in Reach G7 focused on the alleviation of flooding problems in the vicinity of State Highway 52. The specific improvements to Reach G7 are presented below and also in Figure 5.8.

1. State Highway 52 Crossing. Replace the existing 8'H x 8'W RCB crossing of State Highway 52 with a bridge structure with a minimum opening of 10'H x 11'W. Transitions from the existing channel to the bridge crossing are required along with placement of stabilization measures to control the potential erosion in the vicinity of the crossing. In conjunction with the bridge replacement, raise 1,600 feet of roadway a maximum of 4 feet.

2. Realign Coalridge Ditch. Construction of the channel and bridge crossing will require realignment of the Coalridge Ditch to a location immediately north of State Highway 52. In conjunction with the realignment of the ditch, a side-channel weir should be included in the improvements to divert potential stormwater captured by the ditch into the major drainageway.

3. Regional Detention Pond. The existing detention ponds formed behind State Highway 52 and the Coalridge Ditch should be preserved to reduce the downstream flood peaks. This will require obtaining approximately 35 acres of land along with the existing structures located immediately west of the major drainageway and south of State Highway 52.

5.2.8 Godding Hollow Basin Reach G8: WCR 12

Improvements in Reach G8 focused on the alleviation of flooding problems at WCR 12 and the construction of a regional detention facility on a tributary to the major drainageway. The specific improvements to Reach G8 are presented below and also in Figure 5.9.

1. WCR 12 Crossing. Replace the existing 3' CMP crossing of WCR 12 with a bridge structure with a minimum opening of 5.5'H x 35'W. Transitions from the existing channel to the bridge crossing are required along with placement of stabilization measures to control the potential erosion in the vicinity of the crossing. In conjunction with replacement of the crossing structure, approximately 300 feet of roadway should be raised a maximum of 2 feet.

2. Regional Detention Pond. To reduce the peak flows from a tributary to the major drainageway, a regional detention pond is proposed north and west of the intersection of WCR 11 and WCR 12. The proposed pond will incorporate a storage volume of 76 acre-feet and will require obtaining 17 acres of land and the construction of an outlet structure from the pond and a transition into the major drainageway.

5.2.9 Godding Hollow Basin Reach G9: I-25/WCR 10

Improvements in Reach G9 focused on the alleviation of potential flooding problems at WCR 10 along with the construction of regional detention facilities on both the major drainageway and a tributary to the major drainageway. The specific improvements to Reach G9 are presented below and also in Figure 5.10.

1. WCR 10 Crossing. Replace the existing 2'H x 3.5'W arch CMP crossing of WCR 10 with a structure with a minimum opening of 3'H x 5'W. Transitions from the existing channel to the bridge crossing are required along with placement of stabilization measures to control the potential erosion in the vicinity of the crossing. In conjunction with replacement of the crossing structure, approximately 250 feet of roadway should be raised a maximum of 1.5 feet.

2. Regional Detention Ponds. To reduce the peak flows within the major drainageway, two regional detention ponds are proposed south of WCR 10 and west of I-25. Both ponds are located behind an existing railroad embankment. For the pond located along the major drainageway, 22 acre-feet of storage is required which will necessitate the acquisition of approximately 10 acres along with the construction of an improved outlet structure. The pond located on the tributary to the major drainageway will require 33 acre-feet of storage. At this location, it is necessary to obtain approximately 5 acres of land along with the construction of an improved outlet.

This reach also includes the crossing of I-25 and the East Frontage Road. Conversations with representatives of CDOT have indicated that these structures will be replaced with two 8'H x 8'W RCBs. It should be noted that the existing structures adequately convey the peak flows generated during the 100-year storm event. The proposed structures also convey these flows.

5.2.10 Godding Hollow Basin Reach G10: West Tributary at I-25

The improvements in this reach focus on the alleviation of flooding at I-25 and a tributary to the major drainageway located north of State Highway 52. Based on conversations with representatives of CDOT, the existing 36-inch structure is being replaced with three 6'H x 8'W RCBs. In addition, a conveyance channel is being constructed to convey stormwater runoff from the I-25 crossing to the major drainageway. However, it is understood that the existing detention pond at this location (approximately 80 acre-feet) is being reduced significantly. To limit the peak flows in the major drainageway and mitigate the reduction of the existing detention pond, a regional detention facility is proposed immediately east of I-25 along the tributary channel. The regional pond will store 144 acre-feet which will require acquisition of 40 acres of land along with the construction of an outlet structure. The improvements to Reach G10 are presented in Figure 5.11.

5.2.11 Tri-Town Basin Reach T1: WCR 24

The improvements in the Tri-Town Basin begin in Reach T1 and are focused on: (a) the transition of flows from the major drainageway into the improvements associated with the Godding Hollow Basin; (b) channel improvements upstream and downstream of WCR 24; and (c) installation of a crossing structure beneath WCR 24. The specific improvements to Reach T1 are presented below and also in Figure 5.12.

1. Transition to Godding Hollow Drainageway. In the vicinity of the northern lake associated with The Shores Development, the major drainageway for the Tri-Town Basin will transition from an improved channel into the lake. Stabilization measures will be required at this location.

2. Channel Improvements. This improvement consists of the construction associated with a conveyance channel from the transition into the lake to a proposed regional pond located downstream of WCR 22. Approximately 7,600 feet of channel improvements will be required. The channel improvements should include a compound channel configuration, i.e., a low flow channel along with an overbank area to convey flood flows. In addition, the channel incorporates a grass lining, bottom width of 20 feet (low flow channel), maximum top width of 90 feet, sideslopes of 4H:1V, and design depth that varies from 4 to 6 feet. At the upstream end of the channel improvements, a transition structure is required to stabilize the outflow from the proposed regional pond.

3. WCR 24 Crossing Structure. In conjunction with the conveyance channel, a crossing of WCR 24 will be required. This crossing will consist of a structure with a minimum opening that is 4'H x 50'W. A drop structure is also required in the vicinity of this crossing to ensure that stormwater runoff will be conveyed beneath WCR 24.

5.2.12 Tri-Town Basin Reach T2: WCR 22

The improvements in Reach T2 are focused on: (a) construction of two regional detention ponds; and (b) replacement of an existing crossing of WCR 22. The specific improvements to Reach T2 are presented below and also in Figure 5.13.

1. Regional Detention Ponds. To reduce the peak flows within the major drainageway, two regional detention ponds are proposed north and south of WCR 22. For the pond located north of WCR 22, 105 acre-feet of storage is required which will necessitate the acquisition of approximately 38 acres along with the

construction of an improved outlet structure. Construction of this pond will also require the relocation of an existing irrigation lateral.

The pond located south of WCR 22 will require the acquisition of 28 acres of land which will provide 139 acre-feet of detention storage. An outlet structure will also be required.

2. WCR 22 Crossing. Replace the existing 3'H x 5'W arch CMP crossing of WCR 22 with a structure with a minimum opening of 6.5'H x 30'W. Transitions from the existing channel to the bridge crossing are required along with placement of stabilization measures to control the potential erosion in the vicinity of the crossing. In conjunction with replacement of the crossing structure, approximately 500 feet of roadway should be raised a maximum of 2 feet.

5.2.13 Tri-Town Basin Reach T3: WCR 20/WCR 18

The improvements in Reach T3 are focused on: (a) replacement of existing crossings at WCR 20 and WCR 18; (b) construction of channel improvements near Milavec Reservoir; and (c) construction of a regional detention pond. The specific improvements to Reach T3 are presented below and also in Figure 5.14.

1. WCR 20 Crossing. Replace the existing 2.5'H x 3.5'W arch CMP crossing of WCR 20 with a structure that incorporates a minimum opening that is 5'H x 50'W. Transitions from the existing channel to the bridge crossing are required along with placement of stabilization measures to control the potential erosion in the vicinity of the crossing. In conjunction with replacement of the crossing structure, approximately 720 feet of roadway should be raised a maximum of 3 feet.

2. Channel Improvements. This improvement consists of the construction associated with a conveyance channel along the east side of Milavec Reservoir and extending through the crossings of WCR 18 and WCR 13. Approximately 2,800 feet of channel improvements will be required. The channel improvements should include a compound channel configuration, i.e., a low flow channel along with an overbank area to convey flood flows. In addition, the channel incorporates a grass lining, bottom width of 20 feet (low flow channel), maximum top width of 90 feet, sideslopes of 4H:1V, and design depth of 4 feet. It should be noted that the Town of Frederick is proposing to replace an existing access road crossing to Milavec Reservoir which will cross the channel improvements.

3. WCR 18 Crossing. Replace the existing 17.5-foot bridge structure at WCR 18 with a structure that incorporates a minimum opening that is 5.5'H x 30'W. Transitions from the existing channel to the bridge crossing are required along with

placement of stabilization measures to control the potential erosion in the vicinity of the crossing.

4. Regional Detention Pond. To reduce the peak flows within the major drainageway, a regional detention pond is proposed to be located east of WCR 13 and south of WCR 20. At this location, approximately 43 acre-feet of storage is required which will necessitate the acquisition of approximately 9 acres of land along with the construction of an improved outlet structure.

5.2.14 Tri-Town Basin Reach T4: Firestone/Frederick

The improvements in Reach T4 involve the stabilization of the existing conveyance channel located east of WCR 13. Stabilization efforts should include the channel reach from Firestone in the vicinity of Wooster Avenue to the southern limits of Frederick, a distance of approximately 6,600 feet. In this reach, channel sideslopes should be regraded to a more stable slope (3H:1V) and vegetated. These improvements are presented in Figure 5.15.

5.2.15 Tri-Town Basin Reach T5: Frederick/Dacono

The improvements in Reach T5 are focused on: (a) construction of a regional detention pond; (b) construction of channel improvements along the major drainageway between Frederick and Dacono; and (c) installation of crossing structures beneath State Highway 52. The specific improvements to Reach T5 are presented below and also in Figure 5.16.

1. Regional Detention Pond. To reduce the peak flows within the major drainageway, a regional detention pond is proposed to be located immediately south of Frederick. At this location, approximately 136 acre-feet of storage is required which will necessitate the acquisition of approximately 35 acres of land along with the construction of an improved outlet structure. In addition, improvements to an existing berm and swale which will convey stormwater into the regional pond are required.

2. Channel Improvements. This improvement consists of the construction of channel improvements from the regional pond to State Highway 52. Approximately 2,400 feet of channel improvements will be required. The channel improvements should include a compound channel configuration, i.e., a low flow channel along with an overbank area to convey flood flows. In addition, the channel incorporates a grass lining, bottom width of 20 feet (low flow channel), maximum top width of 100 feet, sideslopes of 4H:1V, and design depth of 4 feet.

3. State Highway 52 Crossing. This improvement involves the placement of three structures to convey stormwater runoff from Dacono across State Highway 52. These structures include two 4'H x 10'W RCBs, one 48-inch RCP and one 4'H x 8'W RCB.

5.2.16 Tri-Town Basin Reach T6: Railroad Embankment Regional Ponds

The improvements in this reach involve the preservation of two existing detention ponds. These ponds are located east of the railroad embankment and south of WCR 24. For the northern pond, 24 acre-feet of storage is required which will necessitate the acquisition of approximately 10 acres. The southern pond will require the acquisition of 12 acres of land which will preserve 16 acre-feet of detention storage. These improvements are presented in Figure 5.17.

5.2.17 Additional Considerations

As indicated previously, road crossings of several tributaries to the Godding Hollow and Tri-Town Drainageways also exist. Several of these crossings lack the capacity to convey the peak discharge from the 100-year storm event for existing conditions. In addition, several of the crossings were noted to be experiencing potential sediment and debris problems that would tend to reduce the conveyance capacity. As land development occurs within the basin, these crossing structures will require improvements to meet the existing drainage criteria. Improvements to these structures should consider the peak discharges conveyed through or over these crossings during the 100-year storm event. In addition, the capacity and stability of downstream conveyance facilities should be considered.

5.3 Drainage Criteria

It is understood that land development within both basins will be dictated by the guidelines and recommendations provided in this master planning document. The following information is presented to guide development within the Godding Hollow and Tri-Town Basins.

- Land development in the Godding Hollow Basin will be required to limit the stormwater runoff to the magnitude of the existing condition, 10-year and 100-year flood events.

- Land development in the Tri-Town Basin will be required to limit the stormwater runoff for the area located north of WCR 18 to the magnitude of the existing condition, 10-year and 100-year flood event. For that portion of the Tri-Town Basin located south of WCR 18, stormwater runoff should be limited to the magnitude of the existing condition, 2-year flood event.

- Releases from land development in each subbasin will be conveyed in a safe and stable manner to the major drainageway. This statement implies that stormwater runoff will be conveyed in an appropriate outfall facility such as a channel, storm sewer, etc.

- All existing railroad/roadway detention ponds previously discussed must remain intact or be replaced.

5.4 Cost Estimates

Estimates of the costs were developed for the proposed improvements and provided the basis for the opinion of costs generated for the comprehensive plans for each basin. Data used to develop unit costs were obtained from bid tabulations, quotations from various suppliers and manufacturers, and information supplied by local contractors and city utility departments. The unit pricing data compiled and used to generate the cost estimates is provided in Appendix C. The cost estimates for the comprehensive plans included the following categories: (a) general drainage infrastructure; and (b) engineering, permitting, legal, fiscal and administrative costs.

General drainage infrastructure costs are defined as the costs associated with the labor and materials for the drainage improvements as well as the drainage ROW/easements or land acquisition for the construction and maintenance of the drainage improvements. A contingency of 35% was included in the estimate of construction costs to include those real and intangible items not directly accounted for in the unit pricing data and the costs associated with mobilization, utility relocation, bonds, and insurance for the contractor.

The final cost category was estimated to be approximately 20% of total construction costs. This category is intended to include professional engineering and construction services, labor required to obtain the necessary permits, and legal requirements. Administrative costs relate to the implementation of the construction plan by the various governmental agencies.

The cost estimates for the comprehensive plans are presented in Tables 5.1 and 5.2.

Table 5.1 Cost Estimate for Godding Hollow Basin.

Reach-Item	Description	Proposed Improvements/ General Drainage Infrastructure	Property Acquisition	Engineering, Permitting, Legal & Admin.	Total Cost
G1-1	Channel Improvements	$2,651,000	$317,000	$530,000	$3,498,000
G1-2	Replacement of WCR 26 Crossing	$810,000		$162,000	$972,000
G1-3	Last Chance Ditch Realignment and Siphon	$86,000	$11,000	$17,000	$114,000
				Reach G1 Subtotal	*$4,584,000*
G2-1	Lake to Lake Transition	$145,000	$4,000	$29,000	$178,000
				Reach G2 Subtotal	*$178,000*
G3-1	Channel Improvements	$3,718,000	$390,000	$744,000	$4,852,000
G3-2	Replacement of WCR 24 Crossing	$470,000		$94,000	$564,000
G3-3	Replacement of WCR 22 Crossing	$648,000		$130,000	$778,000
				Reach G3 Subtotal	*$6,194,000*
G4-1	Replacement of WCR 20 Crossing	$1,229,000		$246,000	$1,475,000
				Reach G4 Subtotal	*$1,475,000*
G5-1	Replacement of WCR 18 Crossing	$729,000		$146,000	$875,000
G5-2	I-25 and WCR 18 Detention Pond		$580,000	$20,000[1]	$600,000
				Reach G5 Subtotal	*$1,475,000*
G6-1	Replacement of WCR 16 Crossing	$712,000		$142,000	$854,000
				Reach G6 Subtotal	*$854,000*
G7-1	Replacement of State Highway 52 Crossing	$1,008,000		$202,000	$1,210,000
G7-2	State Highway 52 Detention Pond		$510,000	$20,000[1]	$530,000
G7-3	Coalridge Ditch Realignment	$106,000		$21,000	$127,000
				Reach G7 Subtotal	*$1,867,000*
G8-1	Replacement of WCR 12 Crossing	$400,000		$80,000	$480,000
G8-2	Detention Pond	$272,000	$170,000	$54,000	$496,000
				Reach G8 Subtotal	*$976,000*
G9-1	Replacement of WCR 10 Crossing	$134,000		$27,000	$161,000
G9-2	UPRR Detention Pond	$32,000	$100,000	$6,000	$138,000
G9-3	UPRR Spur Detention Pond	$220,000	$50,000	$44,000	$314,000
				Reach G9 Subtotal	*$613,000*
G10-1	West Tributary Detention Pond	$379,000	$400,000	$76,000	$855,000
G10-2	Channel Construction	$297,000	$70,000	$59,000	$426,000
				Reach G10 Subtotal	*$1,281,000*
				Godding Hollow Basin Total Cost	***$19,497,000***

[1] Only legal and administrative costs are estimated for this improvement.

Table 5.2 Cost Estimate for Tri-Town Basin.

Reach-Item	Description	Proposed Improvements/ General Drainage Infrastructure	Property Acquisition	Engineering, Permitting, Legal & Admin.	Total Cost
T1-1	Channel Improvements	$1,172,000	$216,000	$234,000	$1,622,000
T1-2	Replacement of WCR 24 Crossing	$405,000		$81,000	$486,000
				Reach T1 Subtotal	*$2,108,000*
T2-1	Regional Detention Pond (North)	$252,000	$380,000	$50,000	$682,000
T2-2	Replacement of WCR 22 Crossing	$469,000		$94,000	$563,000
T2-3	Regional Detention Pond (South)	$541,000	$280,000	$108,000	$929,000
				Reach T2 Subtotal	*$2,174,000*
T3-1	Replacement of WCR 20 Crossing	$706,000		$141,000	$847,000
T3-2	Regional Detention Pond	$264,000	$90,000	$53,000	$407,000
T3-3	Channel Improvements	$193,000	$51,000	$39,000	$283,000
T3-4	Replacement of WCR 18 Crossing	$243,000		$49,000	$292,000
				Reach T3 Subtotal	*$1,829,000*
T4-1	Channel Improvements	$344,000	$120,000	$69,000	$533,000
				Reach T4 Subtotal	*$533,000*
T5-1	Regional Detention Pond	$1,291,000	$350,000	$258,000	$1,899,000
T5-2	Channel/Berm Improvements	$368,000	$94,000	$74,000	$536,000
T5-3	Replacement of SHW 52 Crossing	$356,000		$71,000	$427,000
				Reach T5 Subtotal	*$2,862,000*
T6-1	Regional Detention Pond (North)	$0	$100,000	$10,000[1]	$110,000
T6-2	Regional Detention Pond (South)	$0	$120,000	$10,000[1]	$130,000
				Reach T6 Subtotal	*$240,000*
				Tri-Town Basin Total Cost	***$9,746,000***

[1] Only legal and administrative costs are estimated for this improvement.

5.5 Hydrologic Analysis

The future condition hydrologic model was modified to reflect the improvements identified for the comprehensive plans. Hydrologically, the plans reflect the reduction in peak discharges provided by the regional detention facilities. Discharge data pertaining to the implementation of the comprehensive plans are presented in tabular form in Tables 5.3 and 5.5. Figure 5.18 and 5.19 graphically displays the discharge profiles for each basin assuming implementation of the comprehensive plans. For comparison with both existing and future condition modeling results, flood hydrographs associated with implementation of the proposed improvements at selected locations along the major drainageway are presented in Appendix B.

Table 5.3 Subbasin Peak Discharges for Future Conditions with Regional Detention.

Subbasin No.	Drainage Area (acres)	Peak Discharge (cfs)					
		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
GODDING HOLLOW BASIN							
GHSB1	779.3	108	206	288	529	730	926
GHSB2	284.2	38	61	78	140	191	239
GHSB3	687.9	99	153	198	379	524	666
GHSB4	772.4	112	178	237	463	646	826
GHSB5	836.8	84	143	202	419	590	760
GHSB6	886.5	141	229	309	583	804	1022
GHSB7	946.2	88	149	207	441	627	812
GHSB8	265.5	43	69	90	169	235	300
GHSB9	185.4	35	56	71	131	182	232
GHSB10	142.5	152	230	298	432	531	616
GHSB11	117.3	59	98	128	203	264	318
GHSB12	65.1	8	14	20	39	55	70
GHSB13	193.2	46	70	87	157	220	274
GHSB14	154.1	34	53	66	119	165	207
GHSB15	61.3	9	13	16	30	43	55
GHSB16	131.1	31	48	61	111	154	192
GHSB17	223.1	32	45	56	72	86	100
GHSB20	154.4	31	49	63	114	158	199
GHSB21	372.0	46	72	94	192	270	350
GHSB22	321.0	67	105	133	237	325	408
GHSB23	418.5	50	98	141	261	360	457
GHSB24	376.9	56	109	154	278	382	482
GHSB25	83.2	14	28	41	82	116	146
GHSB26	38.6	7	11	14	29	40	52
GHSB27	407.7	38	93	146	264	366	464
GHSB30	437.5	67	102	128	236	322	410
GHSB31	215.4	39	62	79	145	202	257
GHSB32	599.3	58	141	222	385	530	669
GHSB33	210.9	13	39	65	119	166	211
GHSB34	208.7	35	52	64	116	158	201
GHSB35	95.7	86	133	167	237	291	338
GHSB36	348.6	62	102	132	241	335	424
GHSB37	541.0	115	180	229	334	435	531
GHSB40	225.6	45	71	91	164	225	285
GHSB41	342.8	48	84	115	218	303	387
GHSB42	122.5	119	172	216	318	396	467
GHSB43	156.5	22	33	41	76	105	134

Table 5.3 Subbasin Peak Discharges for Future Conditions with Regional Detention. (Continued).

Subbasin No.	Drainage Area (acres)	Peak Discharge (cfs)					
		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
TRI-TOWN BASIN							
TTSB51	560.0	85	133	173	323	443	561
TTSB52	610.6	93	151	206	398	554	707
TTSB53	640.4	69	116	165	341	480	618
TTSB54	346.9	22	45	74	161	230	298
TTSB55	173.9	26	44	63	103	138	172
TTSB56	27.3	6	10	15	24	32	39
TTSB57	14.2	11	18	25	40	52	64
TTSB58	17.3	3	5	8	13	18	22
TTSB59	19.4	2	4	6	10	14	18
TTSB60	53.7	25	44	60	88	113	134
TTSB61	250.8	2	3	5	8	11	13
TTSB62	108.1	56	99	133	192	246	292
TTSB63	288.0	7	12	16	23	29	34
TTSB70	683.9	74	144	228	373	503	631
TTSB71	114.3	11	19	29	72	109	144
TTSB72	392.8	27	42	56	85	108	130
TTSB73	115.3	17	27	35	74	107	138
TTSB74	324.3	48	80	111	205	282	358
TTSB75	722.3	56	92	130	191	225	258
TTSB76	49.2	26	42	60	88	113	136
TTSB77	37.2	1	1	2	3	3	4
TTSB78	36.4	20	32	45	66	85	103
TTSB79	40.1	5	8	11	17	22	27
TTSB80	42.1	16	26	37	58	77	93
TTSB81	110.0	12	20	28	45	58	72
TTSB82	88.7	4	6	8	12	16	19
TTSB83	48.4	16	25	35	54	70	86
TTSB84	69.1	0	0	0	1	1	1
TTSB85	16.1	3	4	6	9	12	15
TTSB86	57.4	6	10	15	25	33	41
TTSB87	74.1	33	53	73	108	139	166
TTSB88	24.9	5	8	10	16	21	25
TTSB89	211.4	16	26	35	51	65	78
TTSB90	441.2	20	33	47	78	102	126
TTSB91	225.6	145	234	304	423	535	634
TTSB92	117.0	4	6	10	16	21	26
TTSB93	45.8	10	18	24	36	47	57
TTSB94	38.7	4	6	8	11	13	16
TTSB95	374.3	4	6	8	12	15	18
TTSB96	269.3	17	24	31	44	55	65

Table 5.4 Major Drainageway Peak Discharges for Future Conditions with Regional Detention.

Location	UDSWMM Element	Drainage Area (acres)	Peak Discharge (cfs)					
			2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
GODDING HOLLOW BASIN								
WCR 26	202	18,320	1,290	2,063	2,686	3,455	4,088	4,739
Tri-Town Basin Inflow	751	18,040	1,285	2,054	2,667	3,425	4,049	4,696
WCR 24	203	11,350	1,061	1,675	2,144	2,787	3,338	3,918
Basin 43 Inflow	703	10,660	1,035	1,631	2,073	2,680	3,205	3,769
WCR 22	204	10,500	1,022	1,610	2,045	2,646	3,162	3,695
WCR 20	205	9,730	992	1,558	1,961	2,517	3,002	3,515
WCR 18	206	8,890	971	1,519	1,881	2,368	2,854	3,310
WCR 16	207	7,310	842	1,345	1,660	2,111	2,541	2,971
West Tributary Inflow	707	6,370	767	1,233	1,510	1,929	2,309	2,680
SHW 52	308	4,200	561	878	1,044	1,355	1,634	1,904
Basins 30 and 33 Inflow	708	4,200	571	898	1,162	1,772	2,320	2,853
Confluence with Basins 30 and 33	208	3,550	496	774	991	1,462	1,907	2,335
Basins 31 and 32 Inflow	709	3,280	464	722	919	1,354	1,757	2,143
Confluence with Basins 31 and 32	209	2,470	408	611	780	1,203	1,593	1,970
WCR 12	210	2,280	380	566	721	1,109	1,466	1,806
Basin 34 Inflow	711	2,140	362	545	697	1,075	1,427	1,770
Confluence with Basin 34	211	1,930	327	494	633	961	1,273	1,574
CO National Speedway	712	1,813	316	479	614	921	1,222	1,514
Upstream of CO National Speedway	212	830	135	204	257	413	559	710
I-25	213	760	128	191	240	374	506	641
WCR 10	216	350	53	75	94	140	185	231
UPRR	217	220	32	45	56	72	86	100
TRI-TOWN BASIN								
Confluence with Godding Hollow	751	6,690	315	507	677	855	1,112	1,377
WCR 24	252	6,130	274	443	577	677	790	937
Basin 52 Detention	352	5,520	251	403	507	590	642	693
WCR 22	253	5,520	260	419	584	814	991	1,167
Basin 53 Detention	353	5,400	208	334	461	572	625	679
WCR 20	254	4,440	216	371	525	892	1,170	1,435
Basin 75 Inflow	754	4,090	198	332	459	757	966	1,170
WCR 18	255	3,370	158	271	377	604	800	996
WCR 13 (downstream)	755	3,200	133	227	315	502	667	829
WCR 13 (upstream)	256	2,550	118	205	286	458	611	761
M°Clure Street	258	2,350	96	166	230	364	486	605
WCR 16	760	1,730	52	80	84	92	100	107
Basin 61 Detention	361	1,730	52	80	84	92	100	107
SHW 52	262	820	187	318	419	610	774	928
Second Street (Dacono)	263	290	7	12	16	23	29	34

Table 5.5 Unit Runoff Data.

Subbasin No.	UDSWMM Node ID	Drainage Area (acres)	100-Year Peak Discharge (cfs)	Unit Runoff (cfs/acre)
GODDING HOLLOW BASIN				
GHSB1	401	779.3	926	1.19
GHSB2	402	284.2	239	0.84
GHSB3	403	687.9	666	0.97
GHSB4	404	772.4	826	1.07
GHSB5	405	836.8	760	0.91
GHSB6	406	886.5	1022	1.15
GHSB7	407	946.2	812	0.86
GHSB8	408	265.5	300	1.13
GHSB9	409	185.4	232	1.25
GHSB10	410	142.5	616	4.32
GHSB11	411	117.3	318	2.71
GHSB12	412	65.1	70	1.08
GHSB13	413	193.2	274	1.42
GHSB14	414	154.1	207	1.34
GHSB15	415	61.3	55	0.90
GHSB16	416	131.1	192	1.46
GHSB17	417	223.1	373	1.67
GHSB20	420	154.4	199	1.29
GHSB21	421	372.0	350	0.94
GHSB22	422	321.0	408	1.27
GHSB23	423	418.5	457	1.09
GHSB24	424	376.9	482	1.28
GHSB25	425	83.2	146	1.75
GHSB26	426	38.6	52	1.35
GHSB27	427	407.7	464	1.14
GHSB30	430	437.5	410	0.94
GHSB31	431	215.4	257	1.19
GHSB32	432	599.3	669	1.12
GHSB33	433	210.9	211	1.00
GHSB34	434	208.7	201	0.96
GHSB35	435	95.7	338	3.53
GHSB36	436	348.6	424	1.22
GHSB37	437	541.0	871	1.61
GHSB40	440	225.6	285	1.26
GHSB41	441	342.8	387	1.13
GHSB42	442	122.5	467	3.81
GHSB43	443	156.5	134	0.86

Table 5.5 Unit Runoff Data (Continued).

Subbasin No.	UDSWMM Node ID	Drainage Area (acres)	100-Year Peak Discharge (cfs)	Unit Runoff (cfs/acre)
TRI-TOWN BASIN				
TTSB51	451	560.0	561	1.00
TTSB52	452	610.6	707	1.16
TTSB53	453	640.4	618	0.97
TTSB54	454	346.9	298	0.86
TTSB55	455	173.9	172	0.99
TTSB56	456	27.3	39	1.43
TTSB57	457	14.2	64	4.51
TTSB58	458	17.3	22	1.27
TTSB59	459	19.4	18	0.93
TTSB60	460	53.7	134	2.50
TTSB61	461	250.8	13	0.05
TTSB62	462	108.1	292	2.70
TTSB63	463	288.0	34	0.12
TTSB70	470	683.9	631	0.92
TTSB71	471	114.3	144	1.26
TTSB72	472	392.8	727	1.85
TTSB73	473	115.3	138	1.20
TTSB74	474	324.3	358	1.10
TTSB75	475	722.3	605	0.84
TTSB76	N/A	49.2	136	2.76
TTSB77	477	37.2	4	0.11
TTSB78	N/A	36.4	100	2.75
TTSB79	479	40.1	27	0.67
TTSB80	480	42.1	93	2.21
TTSB81	481	110.0	72	0.65
TTSB82	482	88.7	19	0.21
TTSB83	483	48.4	86	1.78
TTSB84	484	69.1	1	0.01
TTSB85	485	16.1	15	0.93
TTSB86	486	57.4	41	0.71
TTSB87	487	74.1	166	2.24
TTSB88	488	24.9	25	1.00
TTSB89	489	211.4	78	0.37
TTSB90	490	441.2	126	0.29
TTSB91	491	225.6	634	2.81
TTSB92	492	117.0	26	0.22
TTSB93	493	45.8	57	1.24
TTSB94	494	38.7	16	0.41
TTSB95	495	374.3	18	0.05
TTSB96	496	269.3	65	0.24

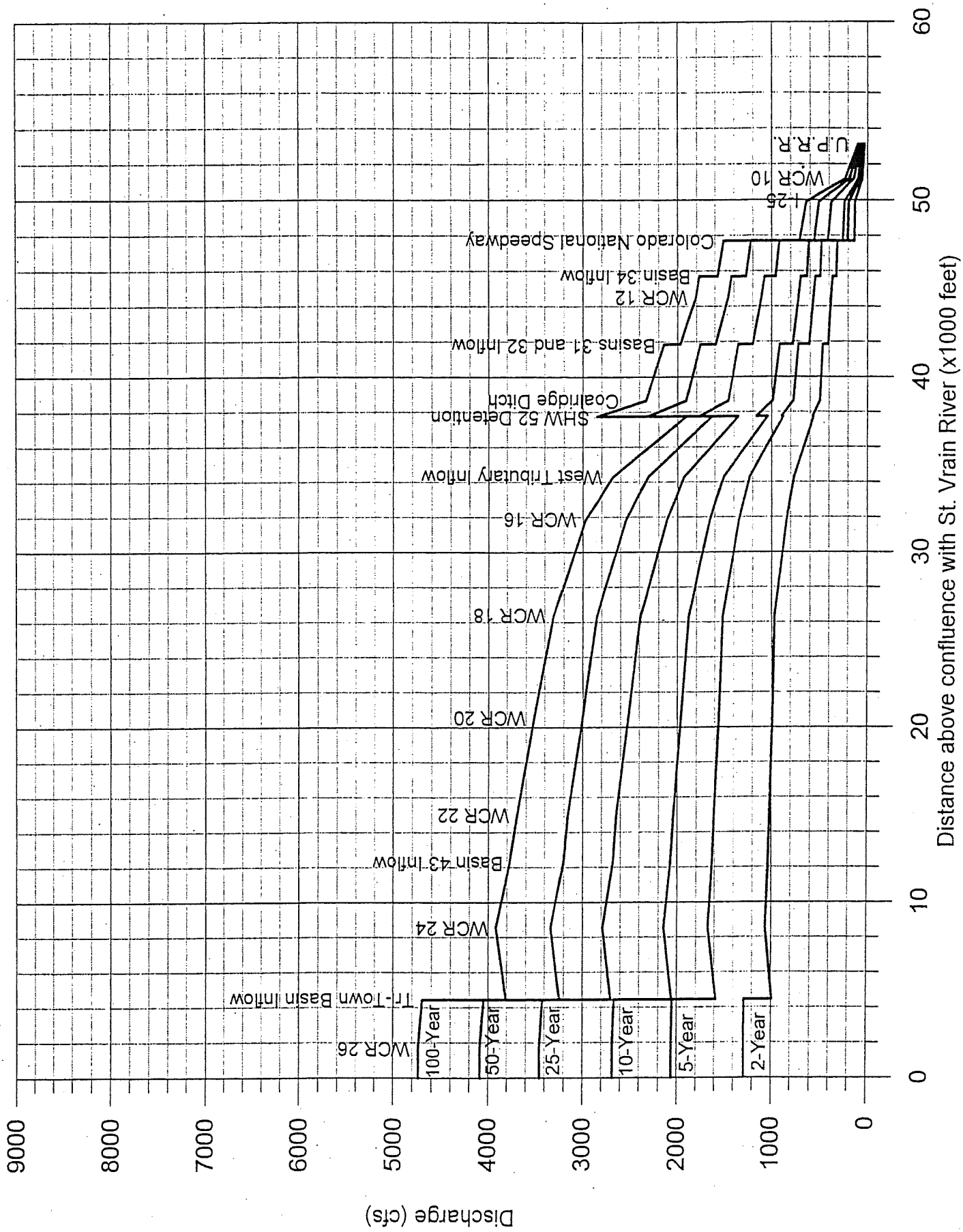

Figure 5.18 Discharge Profiles for Godding Hollow Basin: Future Conditions with Regional Detention.

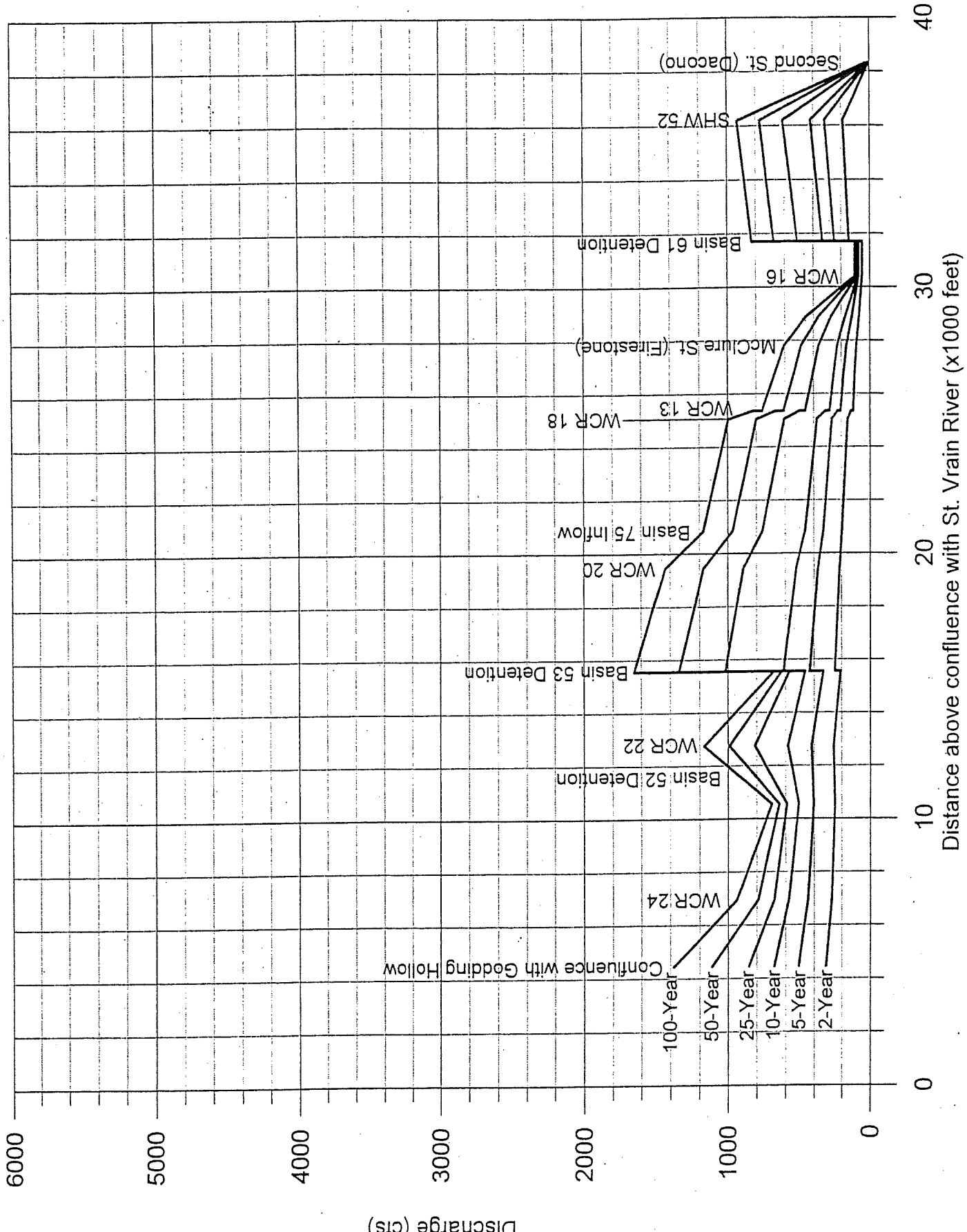

Figure 5.19 Discharge Profiles for Tri-Town Basin: Future Conditions with Regional Detention.

VI. IMPLEMENTATION PLAN

6.1 Plan Evaluation

To promote the construction of the drainage improvements as funding becomes available, implementation priorities were established and an implementation plan developed. The implementation and phasing of the drainage improvements are dependent on several factors. The factors described below were utilized to establish the priority of implementation for the improvements.

- Improvements that reduced the health and safety hazards to the public and vehicular traffic were considered the highest priority.
- Improvements to areas likely to incur the most flood damages were considered to be the next highest priority.
- Construction phasing of adjacent improvements was considered. For example, improving a culvert crossing may significantly reduce flood damage upstream of the crossing; however, the downstream channel must be improved in conjunction with the roadway crossing to prevent an increase in flood damages on the downstream property.

6.2 Recommended Plan

Results of the implementation planning efforts are presented in Tables 6.1 and 6.2. It is recommended that a proactive approach be taken to facilitate the administration of the implementation plan and the construction of the improvements. Identifying an organizational entity that will administer the implementation of the plans is a vital first step in the process. In addition, selection of a funding mechanism and identification of alternative funding sources is equally important.

Obstacles that hinder the implementation of the comprehensive plans are frequently encountered; in many instances these obstacles could have been addressed or considered much earlier in the planning process. Consequently, administration of the plan should provide immediate consideration of: (a) acquisition of property, easements and rights-of-way necessary to construct proposed improvements; and (b) identification of potential utility conflicts that will require resolution prior to construction of the improvements.

Table 6.1 Implementation Plan for Godding Hollow Basin.

Implementation Priority	Reach-Item	Description	Total Cost
Phase I (5-10 years)	G3-2	Replacement of WCR 24 Crossing	$564,000
	G3-3	Replacement of WCR 22 Crossing	$778,000
	G4-1	Replacement of WCR 20 Crossing	$1,475,000
	G5-1	Replacement of WCR 18 Crossing	$875,000
	G6-1	Replacement of WCR 16 Crossing	$854,000
	G7-1	Replacement of State Highway 52 Crossing	$1,210,000
	G7-2	State Highway 52 Detention Pond	$530,000
	G7-3	Coalridge Ditch Realignment	$127,000
	G8-1	Replacement of WCR 12 Crossing	$480,000
	G9-1	Replacement of WCR 10 Crossing	$161,000
		Subtotal Phase I	***$7,054,000***
Phase II (10-15 years)	G1-1	Channel Improvements	$3,498,000
	G1-2	Replacement of WCR 26 Crossing	$972,000
	G1-3	Last Chance Ditch Realignment and Siphon	$114,000
	G2-1	Lake to Lake Transition	$178,000
	G10-1	West Tributary Detention Pond	$855,000
	G10-2	Channel Construction	$426,000
		Subtotal Phase II	***$6,043,000***
Phase III (15-20 years)	G3-1	Channel Improvements	$4,852,000
	G5-2	I-25 and WCR 18 Detention Pond	$600,000
	G8-2	Detention Pond	$496,000
	G9-2	UPRR Detention Pond	$138,000
	G9-3	UPRR Spur Detention Pond	$314,000
		Subtotal Phase III	***$6,400,000***

Table 6.2 Implementation Plan for Tri-Town Basin.

Implementation Priority	Reach-Item	Description	Total Cost
Phase I (5-10 years)	T1-2	Replacement of WCR 24 Crossing	$486,000
	T2-2	Replacement of WCR 22 Crossing	$563,000
	T3-1	Replacement of WCR 20 Crossing	$847,000
	T3-4	Replacement of WCR 18 Crossing	$292,000
	T5-1	Regional Detention Pond	$1,899,000
	T5-2	Channel/Berm Improvements	$536,000
		Subtotal Phase I	***$4,623,000***
Phase II (10-15 years)	T1-1	Channel Improvements	$1,622,000
	T2-1	Regional Detention Pond (North)	$682,000
	T2-3	Regional Detention Pond (South)	$929,000
	T3-2	Regional Detention Pond	$407,000
	T3-3	Channel Improvements	$283,000
	T4-1	Channel Improvements	$533,000
	T5-3	Replacement of SHW 52 Crossing	$427,000
		Subtotal Phase II	***$4,883,000***
Phase III (15-20 years)	T6-1	Regional Detention Pond (North)	$110,000
	T6-2	Regional Detention Pond (South)	$130,000
		Subtotal Phase III	***$240,000***

(1) Only legal and administrative costs are estimated for this improvement.

VII. FUNDING AND FINANCING ALTERNATIVES

This chapter presents a summary of the alternatives available for funding/financing the proposed improvements identified in Chapter 6. The information provided in this document specifically focuses on the mechanisms or entities typically responsible for the administration of the stormwater improvement program and potential funding/financing alternatives.

7.1 Mechanism or Entity

To fund and implement the improvements identified in the master drainage plan, certain mechanisms will need to be utilized or an entity will need to be formed to administer, operate and manage the implementation of the improvements identified in the plan. The information below briefly describes the more common mechanisms used and entities which have been previously formed to complete these tasks.

7.1.1 Cooperation Via Intergovernmental Agreements

This mechanism will involve the integration of efforts by the various jurisdictions through intergovernmental agreements. The agreements may create a board or commission, consisting of representatives of each jurisdiction, for the purpose of coordinating the implementation of the drainage plan. Each jurisdiction will determine the nature of the funding/financing alternatives necessary and will be responsible for the collection of a portion of the funds required to implement the drainage plan. These alternatives may include monthly user fees, taxes, development fees, etc. Assessments/taxes levied by any jurisdiction will require support of the public through the voting process. Given the number of jurisdictions and the fact that each jurisdiction will be solely responsible for the selection of its funding/financing alternative, an equitable means of generating revenue to implement, administer and manage the improvements may be difficult to achieve. An alternative to this mechanism may be to have the responsibility assumed by an existing entity, such as the Tri-Area Sanitation District or one of the municipalities.

7.1.2 County Public Improvement District

A County Public Improvement District (CPID) may be created for the purpose of constructing, installing, acquiring, operating, or maintaining drainage improvements within the CPID. A CPID must be approved by a majority of the district's electors. It has perpetual existence and may sue and be sued. The Board of County Commissioners acts as the CPID Board. A CPID has the authority to levy and collect ad valorum taxes against all property within the district and the authority of eminent domain. A CPID may issue bonds upon approval by the district's electors.

7.1.3 Local Improvement District

A Local Improvement District (LID) may be formed to fund specific drainage improvements through assessments against those properties benefitted by the improvements or the levy of a sales tax. A LID is not generally intended to pay for operation and maintenance costs (unless a sales tax is levied in part for that purpose). Because a LID is typically formed to fund construction of specific improvements, the flexibility to modify or revise the master plan improvements may be difficult. Support for a sales tax levied within a LID must be obtained through the voting process. The County has the authority to issue special assessment bonds on behalf of a LID. A LID must be dissolved by the County upon completion of the improvements and repayment of the bonds (if any).

7.1.4 Drainage District

A drainage district may be created under Article 20, Title 37 of the Colorado Revised Statutes to provide for funding and management of drainage improvements for "lands not at present cultivatable or useful or fully so", (C.R.S. § 37-20-101). The district must be formed through the election process. The district would have its own elected board of directors and would have perpetual existence. It also could be used to fund operations and maintenance. Although a drainage district would be established to drain agricultural lands, municipalities may be included within the district upon petition of the majority of landowners in such municipality. A drainage district may make assessments according to the benefits received. Bonds may be issued upon approval by the district's electors.

In summary, a mechanism should be used or an entity formed to administer and implement the drainage improvements to ensure: (a) the longevity of the improvements; (b) adequate, stable

and equitable funding for the stormwater improvements program; and (c) the flexibility to modify or revise the stormwater improvements program, as necessary.

As part of the master planning effort, a workshop was conducted to discuss the organizational entities associated with implementation of the master drainage plan. The consensus of those jurisdictions represented at the workshop indicated that the concept of cooperation via intergovernmental agreements warranted further investigation.

7.2 Funding/Financing Methods

There are several financing and funding methods/sources available to the jurisdictions participating in this master planning effort. The *primary funding and financing methods* are presented and discussed below.

7.2.1 Monthly User Fees

Similar to fees associated with water and sanitary sewer facilities, this fee is essentially a service charge for the construction of capital improvements associated with stormwater management. The fee also incorporates the long-term operation and maintenance associated with the improvements. The difference between water and sanitary sewer charges and storm water services charges is the basis of measurement employed for setting rates. The typical basis of storm water fees is the runoff production potential of a particular property. Typically, a uniform fee is identified for all single family residences (based on size) while industrial, commercial and multi-family sites are considered on an individual basis. Revenue bonds can be utilized for facility construction, purchase of equipment, or other major capital outlays. The revenue bonds are backed by revenues generated from the monthly user fees.

7.2.2 System Development/Basin Drainage Fees or Payments

Pursuant to C.R.S. § 30-28-133, these fees or payments are used in conjunction with other funding methods (i.e., monthly user fees) to balance financial participation in the cost of service and facilities. These fees or payments provide a funding mechanism through which subdividers share in the cost of drainage facilities in the drainage basin in which the subdivision is located.

7.2.3 Special Assessments

Several methods of levying special assessments on benefitted properties have been used for stormwater and flood control improvements. Projects funded through special assessments must have a special benefit to the properties included in the assessment area and charges for each parcel must be consistent with the relative benefit to each property. Special assessment mechanisms are most often used for small local projects since they localize the cost of projects which serve a limited area and a limited constituency.

7.2.4 Mill Levy/Taxes

This method involves an assessment on all property owners based on the assessed value of the property. Taxes are primarily intended as revenue generators, and can be tied to specific stormwater improvements. Assessments/taxes levied by the various jurisdictions will require support of the public through the voting process.

7.3 Secondary Funding and Financing Sources

Secondary funding and financing sources should also be identified to supplement any or all of the sources described above. These sources may not provide a continuous revenue stream but offer funds on a periodic basis to construct specific capital improvements associated with stormwater management plans. As a minimum, these sources include monies available from Energy Impact Funds, loans/grants available through the Colorado Water Conservancy Board, Enhancement Funds available through the Colorado Department of Transportation, and Community Development Block Grants (CDBG).

In summary, the mechanism selected should include revenues generated from multiple sources to ensure the comprehensive stormwater management program is realized. The method or mix of methods will be directly related to the longevity, sufficiency, and equitability of the funding mechanism and the costs associated with implementation, operation and management of the capital improvements.

During a workshop related to funding and financing of stormwater improvements, comments were obtained and several issues were discussed. With respect to funding and financing sources, the following comments/issues were presented by those jurisdictions represented at the workshop.

- An increase in taxes or the mill levy is not the preferred option.
- Monthly user fees and basin impact fees merit additional investigation.
- Secondary funding sources should be pursued.

7.4 Conceptual Financing Plan

Given the information provided in the workshop along with the proposed drainage improvements, a conceptual financing plan was prepared to demonstrate the potential range of fees associated with implementation of the improvements. The approach and assumptions which were used to create the conceptual financing plan for each basin are presented below.

- The total number of existing dwelling units within each basin was estimated with information supplied by the various jurisdictions within each basin.

- The new dwelling units or future development within each basin was estimated annually with information provided by the various jurisdictions.

- The conceptual financing plans assume funding of the proposed improvements through revenue bonds. The principal and interest on the bonds will be paid through a Plant Investment Fee and monthly user fees. The Plant Investment Fee is assumed to be restricted to future development. The monthly fees are intended to be for all existing and future residents and will create income necessary to cover the remainder of the debt service and administrative costs.

- Two financing plans were developed for each basin. The first plan for each basin assumed that the Plant Investments Fee would account for approximately 50% of the principal amount of the required debt. The second plan increased the Plant Investment Fee to account for approximately 90% of the principal value of the indebtedness.

- Each revenue bond was assumed to be 20 years in duration, 6% interest rate, and fully amortized with constant principal and interest payments throughout the 20-year period of the bonds.

- The administrative costs associated with the entity responsible for implementation of the improvements were also included. These costs accounted for all legal, accounting and management expenses associated with the entity. The initial administrative costs were increased 5% annually to account for inflation.

The conceptual financing plans are presented on Tables 7.1 and 7.2 for the Godding Hollow Basin and Tables 7.3 and 7.4 for the Tri-Town Basin. It should be emphasized that these plans are conceptual in nature and provide an indication of the Plant Investment Fees and monthly fees required to implement the drainage improvements given the assumptions listed above. Various modifications to these plans can be made to reflect an increase or decrease in either Plant Investment Fees or monthly fees. In addition, secondary funding sources could also reduce these costs and should be actively pursued. Once an implementation plan is better defined and an entity established for administration of the plan, the financing plan can be revised to more accurately reflect the fee structure.

Given the assumptions utilized to generate the financing plans, the following information is provided for consideration:

Godding Hollow Basin:

- The plant investment fees range from a maximum of $2,000 (based on 50% of principal value) to $2,900 (based on 90% of principal value).
- The monthly fees for each equivalent residential unit decrease from $20 (based on a 50% plant investment fee) to $15 (based on a 90% plant investment fee).

Tri-Town Basin:

- The plant investment fees range from a maximum of $750 (based on 50% of principal value) to $1,400 (based on 90% of principal value).
- The monthly fees for each equivalent residential unit decrease from $10 (based on a 50% plant investment fee) to $6 (based on a 90% plant investment fee).

It should be noted that a significant amount of money is identified in the ending fund balance for all plans. This balance can be utilized to fund future projects and provide for ongoing operation and maintenance of stormwater facilities. Alternatively, the monthly fees could be reduced accordingly as the debt service associated with each bond issue is satisfied. For planning purposes pertinent information associated with the development of equivalent residential units is presented in Appendix D.

Table 7.1 Conceptual Financing Plan #1: Godding Hollow Basin

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Debt Service Revenues																		
New Units within Basin	100	200	280	280	300	300	300	300	300	300	300	250	250	200	200	200	200	200
Total Units within Basin	380	580	860	1140	1440	1740	2040	2340	2640	2940	3240	3490	3740	3940	4140	4340	4540	4740
Plant Investment Fees ($1500 thru 2006, then $2000)	$150,000	$300,000	$420,000	$420,000	$450,000	$450,000	$540,000	$600,000	$600,000	$600,000	$600,000	$500,000	$500,000	$400,000	$400,000	$400,000	$400,000	$400,000
Monthly Fees ($20 per month)	$91,200	$139,200	$206,400	$273,600	$345,600	$417,600	$489,600	$561,600	$633,600	$705,600	$777,600	$837,600	$897,600	$945,600	$993,600	$1,041,600	$1,089,600	$1,137,600
Tolal Revenue for Debt Service	$241,200	$439,200	$626,400	$693,600	$795,600	$867,600	$1,029,600	$1,161,600	$1,233,600	$1,305,600	$1,377,600	$1,337,600	$1,397,600	$1,345,600	$1,393,600	$1,441,600	$1,489,600	$1,537,600
Debt Service Requirements (Bond Issue #1) $7,054,000	0	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445
Debt Service Requirements (Bond Issue #2) $6,043,000							$519,527	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527
Debt Service Requirements (Bond Issue #3) $6,400,000															$550,219	$550,219	$550,219	$550,219
Authority Admin. Costs	$50,000	$52,500	$55,125	$57,881	$60,775	$63,814	$67,005	$70,355	$73,873	$77,566	$81,445	$85,517	$89,793	$94,282	$98,997	$103,946	$109,144	$114,601
Excess Annual Revenues	$241,200	-$219,745	$19,955	$87,155	$189,155	$261,155	-$96,372	$35,628	$107,628	$179,628	$251,628	$211,628	$271,628	$219,628	-$282,591	-$234,591	-$186,591	-$138,591
Ending Fund Balance	**$241,200**	**$21,455**	**$41,411**	**$128,566**	**$317,722**	**$578,877**	**$482,505**	**$518,134**	**$625,762**	**$805,390**	**$1,057,019**	**$1,268,647**	**$1,540,275**	**$1,759,904**	**$1,477,313**	**$1,242,722**	**$1,056,131**	**$917,540**

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Debt Service Revenues																	
New Units within Basin	200	200	200	200	200	200	200	200	100	100	100	100	100	0	0	0	0
Total Units within Basin	4940	5140	5340	5540	5740	5940	6140	6340	6440	6540	6640	6740	6840	6840	6840	6840	6840
Plant Investment Fees ($1500 thru 2006, then $2000)	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$200,000	$200,000	$200,000	$200,000	$200,000	$0	$0	$0	$0
Monthly Fees ($20 per month)	$1,185,600	$1,233,600	$1,281,600	$1,329,600	$1,377,600	$1,425,600	$1,473,600	$1,521,600	$1,545,600	$1,569,600	$1,593,600	$1,617,600	$1,641,600	$1,641,600	$1,641,600	$1,641,600	$1,641,600
Tolal Revenue for Debt Service	$1,585,600	$1,633,600	$1,681,600	$1,729,600	$1,777,600	$1,825,600	$1,873,600	$1,921,600	$1,745,600	$1,769,600	$1,793,600	$1,817,600	$1,841,600	$1,641,600	$1,641,600	$1,641,600	$1,641,600
Debt Service Requirements (Bond Issue #1) $7,054,000	$606,445	$606,445	$606,445														
Debt Service Requirements (Bond Issue #2) $6,043,000	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527									
Debt Service Requirements (Bond Issue #3) $6,400,000	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	
Authority Admin. Costs	$120,331	$126,348	$132,665	$139,298	$146,263	$153,576	$161,255	$169,318	$177,784	$186,673	$196,006	$205,807	$216,097	$226,902	$238,247	$250,159	$262,667
Excess Annual Revenues	-$90,591	-$42,591	$5,409	$659,854	$707,854	$755,854	$803,854	$851,854	$1,195,381	$1,219,381	$1,243,381	$1,267,381	$1,291,381	$1,091,381	$1,091,381	$1,091,381	$1,641,600
Ending Fund Balance	**$826,950**	**$784,359**	**$789,768**	**$1,449,622**	**$2,157,476**	**$2,913,330**	**$3,717,183**	**$4,569,037**	**$5,764,418**	**$6,983,799**	**$8,227,180**	**$9,494,561**	**$10,785,942**	**$11,877,323**	**$12,968,704**	**$14,060,085**	**$15,701,685**

Table 7.2 Conceptual Financing Plan #2: Godding Hollow Basin

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Debt Service Revenues																		
New Units within Basin	100	200	280	280	300	300	300	300	300	300	300	250	250	200	200	200	200	200
Total Units within Basin	380	580	860	1140	1440	1740	2040	2340	2640	2940	3240	3490	3740	3940	4140	4340	4540	4740
Plant Investment Fees ($2000 thru 2006, then $2900)	$200,000	$400,000	$560,000	$560,000	$600,000	$600,000	$600,000	$870,000	$870,000	$870,000	$870,000	$725,000	$725,000	$580,000	$580,000	$580,000	$580,000	$580,000
Monthly Fees ($15 per month)	$68,400	$104,400	$154,800	$205,200	$259,200	$313,200	$367,200	$421,200	$475,200	$529,200	$583,200	$628,200	$673,200	$709,200	$745,200	$781,200	$817,200	$853,200
Tolal Revenue for Debt Service	$268,400	$504,400	$714,800	$765,200	$859,200	$913,200	$967,200	$1,291,200	$1,345,200	$1,399,200	$1,453,200	$1,353,200	$1,398,200	$1,289,200	$1,325,200	$1,361,200	$1,397,200	$1,433,200
Debt Service Requirements (Bond Issue #1) $7,054,000	0	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445	$606,445
Debt Service Requirements (Bond Issue #2) $6,043,000							$519,527	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527
Debt Service Requirements (Bond Issue #3) $6,400,000															$550,219	$550,219	$550,219	$550,219
Authority Admin. Costs	$50,000	$52,500	$55,125	$57,881	$60,775	$63,814	$67,005	$70,355	$73,873	$77,566	$81,445	$85,517	$89,793	$94,282	$98,997	$103,946	$109,144	$114,601
Excess Annual Revenues	$218,400	-$102,045	$108,355	$158,755	$252,755	$306,755	-$158,772	$165,228	$219,228	$273,228	$327,228	$227,228	$272,228	$163,228	-$350,991	-$314,991	-$278,991	-$242,991
Ending Fund Balance	**$218,400**	**$116,355**	**$224,711**	**$383,466**	**$636,222**	**$942,977**	**$784,205**	**$949,434**	**$1,168,662**	**$1,441,890**	**$1,769,119**	**$1,996,347**	**$2,268,575**	**$2,431,804**	**$2,080,813**	**$1,765,822**	**$1,486,831**	**$1,243,840**

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Debt Service Revenues																	
New Units within Basin	200	200	200	200	200	200	200	200	100	100	100	100	100	0	0	0	0
Total Units within Basin	4940	5140	5340	5540	5740	5940	6140	6340	6440	6540	6640	6740	6840	6840	6840	6840	6840
Plant Investment Fees ($2000 thru 2006, then $2900)	$580,000	$580,000	$580,000	$580,000	$580,000	$580,000	$580,000	$580,000	$290,000	$290,000	$290,000	$290,000	$290,000	$0	$0	$0	$0
Monthly Fees ($15 per month)	$889,200	$925,200	$961,200	$997,200	$1,033,200	$1,069,200	$1,105,200	$1,141,200	$1,159,200	$1,177,200	$1,195,200	$1,213,200	$1,231,200	$1,231,200	$1,231,200	$1,231,200	$1,231,200
Tolal Revenue for Debt Service	$1,469,200	$1,505,200	$1,541,200	$1,577,200	$1,613,200	$1,649,200	$1,685,200	$1,721,200	$1,449,200	$1,467,200	$1,485,200	$1,503,200	$1,521,200	$1,231,200	$1,231,200	$1,231,200	$1,231,200
Debt Service Requirements (Bond Issue #1) $7,054,000	$606,445	$606,445	$606,445														
Debt Service Requirements (Bond Issue #2) $6,043,000	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527	$519,527									
Debt Service Requirements (Bond Issue #3) $6,400,000	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	$550,219	
Authority Admin. Costs	$120,331	$126,348	$132,665	$139,298	$146,263	$153,576	$161,255	$169,318	$177,784	$186,673	$196,006	$205,807	$216,097	$226,902	$238,247	$250,159	
Excess Annual Revenues	-$206,991	-$170,991	-$134,991	$507,454	$543,454	$579,454	$615,454	$651,454	$898,981	$916,981	$934,981	$952,981	$970,981	$680,981	$680,981	$680,981	$1,231,200
Ending Fund Balance	**$1,036,850**	**$865,859**	**$730,868**	**$1,238,322**	**$1,781,776**	**$2,361,230**	**$2,976,683**	**$3,628,137**	**$4,527,118**	**$5,444,099**	**$6,379,080**	**$7,332,061**	**$8,303,042**	**$8,984,023**	**$9,665,004**	**$10,345,985**	**$11,577,185**

Table 7.3 Conceptual Financing Plan #1: Tri-Town Basin

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Debt Service Revenues																		
New Units within Basin	200	200	300	350	350	400	400	400	400	400	400	300	300	250	250	200	200	200
Total Units within Basin	1800	2000	2300	2650	3000	3400	3800	4200	4600	5000	5400	5700	6000	6250	6500	6700	6900	7100
Plant Investment Fees ($750)	$150,000	$150,000	$225,000	$262,500	$262,500	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000	$225,000	$225,000	$187,500	$187,500	$150,000	$150,000	$150,000
Monthly Fees ($10 per month)	$216,000	$240,000	$276,000	$318,000	$360,000	$408,000	$456,000	$504,000	$552,000	$600,000	$648,000	$684,000	$720,000	$750,000	$780,000	$804,000	$828,000	$852,000
Tolal Revenue for Debt Service	$366,000	$390,000	$501,000	$580,500	$622,500	$708,000	$756,000	$804,000	$852,000	$900,000	$948,000	$909,000	$945,000	$937,500	$967,500	$954,000	$978,000	$1,002,000
Debt Service Requirements (Bond Issue #1) $4,623,000	0	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447
Debt Service Requirements (Bond Issue #2) $5,123,000							$440,433	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433
Authority Admin. Costs	$50,000	$52,500	$55,125	$57,881	$60,775	$63,814	$67,005	$70,355	$73,873	$77,566	$81,445	$85,517	$89,793	$94,282	$98,997	$103,946	$109,144	$114,601
Excess Annual Revenues	$316,000	-$59,947	$48,428	$125,171	$164,277	$246,739	-$148,885	-$104,235	-$59,753	-$15,447	$28,675	-$14,397	$17,327	$5,337	$30,623	$12,173	$30,976	$49,519
Ending Fund Balance	**$316,000**	**$256,053**	**$304,480**	**$429,652**	**$593,929**	**$840,668**	**$691,783**	**$587,547**	**$527,794**	**$512,347**	**$541,022**	**$526,624**	**$543,951**	**$549,288**	**$579,911**	**$592,084**	**$623,060**	**$672,579**

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Debt Service Revenues																	
New Units within Basin	200	200	200	200	200	200	200	200	100	100	100	100	100	0	0	0	0
Total Units within Basin	7300	7500	7700	7900	8100	8300	8500	8700	8800	8900	9000	9100	9200	9200	9200	9200	9200
Plant Investment Fees ($750)	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$75,000	$75,000	$75,000	$75,000	$75,000	$0	$0	$0	$0
Monthly Fees ($10 per month)	$876,000	$900,000	$924,000	$948,000	$972,000	$996,000	$1,020,000	$1,044,000	$1,056,000	$1,068,000	$1,080,000	$1,092,000	$1,104,000	$1,104,000	$1,104,000	$1,104,000	$1,104,000
Tolal Revenue for Debt Service	$1,026,000	$1,050,000	$1,074,000	$1,098,000	$1,122,000	$1,146,000	$1,170,000	$1,194,000	$1,131,000	$1,143,000	$1,155,000	$1,167,000	$1,179,000	$1,104,000	$1,104,000	$1,104,000	$1,104,000
Debt Service Requirements (Bond Issue #1) $4,623,000	$397,447	$397,447	$408,600														
Debt Service Requirements (Bond Issue #2) $5,123,000	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433									
Authority Admin. Costs	$120,331	$126,348	$132,665	$139,298	$146,263	$153,576	$161,255	$169,318	$177,784	$186,673	$196,006	$205,807	$216,097	$226,902	$238,247	$250,159	$262,667
Excess Annual Revenues	$67,789	$85,772	$92,302	$518,269	$535,304	$551,991	$568,312	$584,249	$953,216	$956,327	$958,994	$961,193	$962,903	$877,098	$865,753	$853,841	$841,333
Ending Fund Balance	**$740,367**	**$826,140**	**$918,441**	**$1,436,710**	**$1,972,014**	**$2,524,005**	**$3,092,316**	**$3,676,566**	**$4,629,782**	**$5,586,109**	**$6,545,103**	**$7,506,296**	**$8,469,199**	**$9,346,297**	**$10,212,050**	**$11,065,890**	**$11,907,223**

Table 7.4 Conceptual Financing Plan #2: Tri-Town Basin

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Debt Service Revenues																		
New Units within Basin	200	200	300	350	350	400	400	400	400	400	400	300	300	250	250	200	200	200
Total Units within Basin	1800	2000	2300	2650	3000	3400	3800	4200	4600	5000	5400	5700	6000	6250	6500	6700	6900	7100
Plant Investment Fees ($1,400)	$280,000	$280,000	$420,000	$490,000	$490,000	$560,000	$560,000	$560,000	$560,000	$560,000	$560,000	$420,000	$420,000	$350,000	$350,000	$280,000	$280,000	$280,000
Monthly Fees ($6 per month)	$129,600	$144,000	$165,600	$190,800	$216,000	$244,800	$273,600	$302,400	$331,200	$360,000	$388,800	$410,400	$432,000	$450,000	$468,000	$482,400	$496,800	$511,200
Total Revenue for Debt Service	$409,600	$424,000	$585,600	$680,800	$706,000	$804,800	$833,600	$862,400	$891,200	$920,000	$948,800	$830,400	$852,000	$800,000	$818,000	$762,400	$776,800	$791,200
Debt Service Requirements (Bond Issue #1) $4,623,000	0	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447	$397,447
Debt Service Requirements (Bond Issue #2) $5,123,000							$440,433	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433
Authority Admin. Costs	50,000	52,500	55,125	57,881	60,775	63,814	67,005	70,355	73,873	77,566	81,445	85,517	89,793	94,282	98,997	103,946	109,144	114,601
Excess Annual Revenues	$359,600	-$25,947	$133,028	$225,471	$247,777	$343,539	-$71,285	-$45,835	-$20,553	$4,553	$29,475	-$92,997	-$75,673	-$132,163	-$118,877	-$179,427	-$170,224	-$161,281
Ending Fund Balance	**$359,600**	**$333,653**	**$466,680**	**$692,152**	**$939,929**	**$1,283,468**	**$1,212,183**	**$1,166,347**	**$1,145,794**	**$1,150,347**	**$1,179,822**	**$1,086,824**	**$1,011,151**	**$878,988**	**$760,111**	**$580,684**	**$410,460**	**$249,179**

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Debt Service Revenues																	
New Units within Basin	200	200	200	200	200	200	200	200	100	100	100	100	100	0	0	0	0
Total Units within Basin	7300	7500	7700	7900	8100	8300	8500	8700	8800	8900	9000	9100	9200	9200	9200	9200	9200
Plant Investment Fees ($1,400)	$280,000	$280,000	$280,000	$280,000	$280,000	$280,000	$280,000	$280,000	$140,000	$140,000	$140,000	$140,000	$140,000	$0	$0	$0	$0
Monthly Fees ($6 per month)	$525,600	$540,000	$554,400	$568,800	$583,200	$597,600	$612,000	$626,400	$633,600	$640,800	$648,000	$655,200	$662,400	$662,400	$662,400	$662,400	$662,400
Total Revenue for Debt Service	$805,600	$820,000	$834,400	$848,800	$863,200	$877,600	$892,000	$906,400	$773,600	$780,800	$788,000	$795,200	$802,400	$662,400	$662,400	$662,400	$662,400
Debt Service Requirements (Bond Issue #1) $4,623,000	$397,447	$397,447	$397,447														
Debt Service Requirements (Bond Issue #2) $5,123,000	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433	$440,433									
Authority Admin. Costs	120,331	126,348	132,665	139,298	146,263	153,576	161,255	169,318	177,784	186,673	196,006	205,807	216,097	226,902	238,247	250,159	262,667
Excess Annual Revenues	-$152,611	-$144,228	-$136,145	$269,069	$276,504	$283,591	$290,312	$296,649	$595,816	$594,127	$591,994	$589,393	$586,303	$435,498	$424,153	$412,241	$399,733
Ending Fund Balance	**$96,567**	**-$47,660**	**-$183,806**	**$85,263**	**$361,767**	**$645,357**	**$935,669**	**$1,232,318**	**$1,828,135**	**$2,422,262**	**$3,014,255**	**$3,603,649**	**$4,189,951**	**$4,625,450**	**$5,049,602**	**$5,461,843**	**$5,861,576**

APPENDIX A

EXISTING CORPORATE LIMITS

I-25 Corridor

Master Drainage Plan

Responses to Draft

Report Coments

I-25 CORRIDOR MASTER DRAINAGE PLAN

RESPONSES TO DRAFT REPORT COMMENTS

The comments received following the open house are attached. A response has been prepared to address each comment. Please refer to the original comment to obtain the "Comment ID" indicated below.

Comment ID	Response
DL1	The master drainage plan identifies improvements that will reduce potential flooding within both the Godding Hollow and Tri-Town Basins. Included in the master drainage plan is a summary of the peak discharge data which will be necessary to evaluate the floodplain. Following the approval of the master drainage plan, a detailed floodplain study merits serious consideration. The floodplain study will provide the data necessary to better define the existing 100-year floodplain.
DL2	As indicated in the master drainage plan, one of several alternative entities may be selected which would be responsible for administration and implementation of the recommended improvements. It is likely that the same entity will be responsible for operation and maintenance of the improvements. Based on meetings and workshops conducted during the preparation of the master drainage plan, an existing entity (such as a sanitation district) may be the best choice to administer/implement the improvements identified in the master drainage plan.
DL3	Flow paths into and out of the proposed detention facilities would be better defined during final design of either on-site detention ponds or regional detention ponds.
FW1	During the scoping process for this study, it was noted that a potential threat to the public's health and safety during a large magnitude flood event exists today in both the Godding Hollow and Tri-Town Basins. As development and growth occur within the basin, the threat to the public will increase. This will happen even though the master plan identifies improvements that will mitigate a potential increase in the magnitude of the flood events; growth will create an increase in the population that will be at risk during a flood event. Benefits associated with the implementation of improvements will accrue to both existing and future residents in the basin. Whether the payment obligation for implementation of the improvements is assigned as impact fees or monthly user fees is yet to be determined. The master plan simply provides an example of a payment schedule that is based on both impact fees and monthly user fees.
FW2	The land use planning within the basins is dictated by each local jurisdiction. Given the detention requirements associated with the master plan, the peak discharge of the 100-year flood event will not be significantly increased and in some parts of the basin, will be reduced. Consequently, the stormwater runoff that is conveyed to the major drainageway is more dependent on the detention requirements than on the land use

planning.

FW3 Monthly fees that are based on percent impervious acreage, lot size and/or square footage within a building can be developed. The local jurisdictions will play an important role in the development of the monthly fees structure.

FW4 During the initial phases of this master planning effort, it was decided to design improvements to convey the peak discharge associated with the 100-year flood event. It is acknowledged that the costs of providing less flood protection should be weighed against the potential risks associated with the flooding. The master drainage plan is a flexible working document which can be refined in the future to reflect this additional effort.

KG1 The regional detention pond in reach T3 has been added to Table 5.2.

KG2 For reaches T3, T4, and T5, the report estimates improvement costs of $3,970,000 while the Tri-Area Sanitation District (District) estimates improvement costs of $3,366,285. Consequently, a 15% difference exists between those numbers estimated in the master plan and those costs estimated by the District. While unit costs may vary from item to item, the 15% difference in the total cost estimate is considered acceptable.

RB1 It is acknowledged that undetained releases from properties adjacent to the Godding Hollow major drainageway may result in no impact to the overall peak discharge in the drainageway. However, allowing future development to release stormwater flows un-detained will also increase the occurrence and magnitude of low frequency events (i.e., more water is observed more frequently in the downstream channel). Increasing the frequency of the peak flows in the channel can have adverse impacts on channel stability and may require downstream channel improvements. These issues merit serious consideration before releasing undetained runoff from the development.

FS1 The report has been changed to further clarify the path of the low flow channels for the Godding Hollow and Tri-Town Drainageways. Given the magnitude of the flood flows during large events in the Godding Hollow and Tri-Town Basins along with the existing topography, however, it is anticipated that flood flows will be out of bank north of WCR 24 where the runoff from the two basins will combine and flow northward to the banks of the Saint Vrain River.

FS2 During the master planning effort, it was determined that a single channel that combined the flows from both the basins would be more economical. The conceptual design presented in the master plan will safely convey the peak discharge associated with the 100-year event. It should be understood, however, that the master planning document is a flexible tool that should be refined, as necessary, during final design and implementation of the proposed improvements. Consequently, the outfall from both basins may be revised following a more detailed investigation of alternative improvements.

FS3 Several provisions are provided in the Master Drainage Plan for maintaining irrigation flows in the existing canal systems. As stated on page 5.2, spill structures are recommended at the major drainageways to safely release stormwater captured by the ditches back to the major channel. The preservation of existing water rights will be a priority during the implementation of proposed improvements. This includes potential relocation of existing ditches, headgates, turnout structures, etc.

FS4 Channel operation and maintenance responsibility (removal of weeds, erosion control) will be assigned to the entity selected to administer the implementation of the proposed improvements. The open channels proposed in the Master Drainage Plan are storm drainage channels which will not convey water for extended periods of time, therefore seepage issues are not anticipated to be problem. If channel seepage is an issue at a specific location, it should be addressed during the final design of the specific improvement.

WP1 This comment has been corrected in the text of the report.

WP2 This comment has been added in the text of the report.

WP3 This comment has been corrected in the text of the report.

WP4 The size of the structures are indicated in the text, on Sheet 1, and in a table similar to Table 3.1 located in the project notebook.

WP5 This comment has been added in the text of the report.

WP6 This comment has been added in the text of the report.

WP7 Yes, the decay coefficient of 0.0016 is correct. Subbasin TTSB71 contained a significant amount of SCS Hydrologic Soil Group A. The Horton's Decay Coefficient for subbasin TTSB71 was slightly lower then 0.0018 used for the other subbasins due to this soil type.

WP8 By comparing the results presented in Tables 4.6 and 5.3 of the report, the reduction in peak discharge as a result of the regional detention facilities in subbasins 17 and 37 can be determined. The pond in Subbasin 17 reduces peak discharges from the subbasin by 273 cfs (373 cfs - 100 cfs) and the pond in Subbasin 37 reduces peak discharges from the subbasin by 340 cfs (871 cfs - 631 cfs).

Pages 4.9 and 5.3 of the report state that on-site detention will be required of all future development to maintain the historic flows in the Godding Hollow Basin.

The cost shown for the regional detention ponds described on Page 5,25, Paragraph 5.2.9.2 of the report do include regrading the area to maximize the volume of the proposed facility.

The ponds described on Page 5.25, Paragraph 5.2.9.2 of the report are regional

detention facilities.

WP9 This comment has been corrected on the figure.

WP10 Given the costs associated with the proposed improvements to the Godding Hollow Basin, it is not certain that over-detention will be more costly than simply detaining to the 100-year historic levels. From the perspective of the developer, one should also consider the potential reduction in basin impact fees and weigh this against the cost to set aside additional land for detention. In addition, the developer must also consider that the outfall facilities from the property to the major drainageway may be less costly if 2-year or 10-year historic flows are released from the property. Referring to the financing tables in Chapter 7 of the master drainage plan, an example has been prepared to illustrate the comparison of the fees associated with a proposed development.

Scenario 1 (100-year Detention)	
Total Cost of Improvements:	Approximately $20 million
Plant Investment Fee:	$1,500/development unit
Number of Development Units	300
Total Plant Investment Fee	$450,000

Scenario 2 (Over-detention)	
Total Cost of Improvements:	Approximately $10 million
Plant Investment Fee:	$750/development unit
Number of Development Units	300
Total Plant Investment Fee	$225,000

Scenario 1 refers to the improvements required to convey the 100-year historic flows through the Godding Hollow Basin assuming: (a) $20 million in drainage improvements; (b) $1,500 in plant investment fees per development unit; and (c) 300 units within the development.. Scenario 2 illustrates the potential reduction in the improvements if implementation of 2-year or 10-year historic releases from on-site ponds are realized. Over-detention will ultimately reduce the total cost of drainage improvements and is assumed to reduce this total cost to$10 million; consequently, the plant investment fee is reduced accordingly to $750 per development unit. Assuming the same number of development units, the cost savings to the developer becomes $225,000. This cost savings must be weighed against the cost associated with additional detention. Furthermore, these costs must also consider that facilities must also convey stormwater safely from the property to the major drainageway. A reduction in the release rate would also reduce costs of the outfall facilities. Finally, one should also consider that over-detention may also reduce the monthly user fees for both existing and future residents.

During the initial phases of this master planning effort, it was decided to design improvements to convey the peak discharge associated with the 100-year flood event. It is acknowledged that the costs of providing less flood protection should be weighed against the potential risks associated with the flooding. The master drainage plan is a

flexible working document which can be refined in the future to reflect this additional effort.

Adding more regional detention facilities will likely reduce the peak discharge and ultimately the costs of downstream improvements. However, regional detention facilities are also costly and may offset the savings associated with the downstream improvements thereby increasing the overall costs within the basin.

It is acknowledged that it is difficult to capture all of the runoff from a development parcel. It is possible, however, to release undetained flows from a parcel while over-detaining that portion of the parcel that is directed to a detention pond. In so doing, the design criteria requiring the release of stormwater runoff from the parcel at historic levels will be satisfied.

TL1 To date, no decision has been made regarding the funding for the drainage improvements. Alternatives have been presented in Chapter 7 of the master drainage plan. Following approval of the master drainage plan, the local jurisdictions will be responsible for determining the funding for the improvements as well as the entity responsible for administration and implementation of the improvements.

TL2 Where appropriate, the cost estimates for the improvements included property acquisition and relocation of irrigation ditches and laterals (see Table 5.1 and 5.2).

TL3 The storm drainage channel alignments presented in the master drainage plan are based on the best available information and mapping. These alignments may be revised as the improvements proceed to final design and will ultimately integrate input from property owners.

TL4 See response FS3.

TL5 Improvements will be made according to an implementation plan ultimately selected by the local jurisdictions. While it is acknowledged that the maximum benefit of the master drainage plan will not be realized until all the components of the plan are in place, every effort will be made to insure that individual components are implemented in a safe and logical manner. Given the detention requirements in the basins, the potential flooding within the basins should not be higher than the flooding that presently exists.

I-25 CORRIDOR MASTER DRAINAGE PLAN

PUBLIC COMMENTS

DL1 Need to conduct a flood plain study to determine how improvements will impact proposed development

DL2 Need to determine what entity will be in charge of channel maintenance.

DL3 Need to verify flow paths into and out of proposed detention ponds

NAME (OPTIONAL) Diana Light - Gillens Inc.
(303) 426-1731

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I-25 CORRIDOR MASTER DRAINAGE PLAN

PUBLIC COMMENTS

Government officials have repeatedly told us that development will pay its own way. (Nickerson, Farmer & Miner Wed. Aug. 4.1999.

FW1 Current citizens should not have to subsidize wealthy landowners, speculators, and developers. The new industry and developments in the Godding Hollow Basin should pay the entire costs of the new drainage system in the Basin. This can be accomplished through impact fees. (Without their growth the new system would not be needed.)

FW2 If the Godding Hollow Basin is so prone to flooding, it would be wise to rethink the high density development planned.

FW3 Fees should be determined on a ratio of buildings, concrete, blacktop, to open land. The more open land a developer provides the less the fees should be.

FW4 System costs should be determined for 10 or 25 year floods, and compaired to systems designed for 100 year floods. Then, the best economic choice can be determined.

NAME (OPTIONAL) Fred Webb : Gretchen Webb : Emily Webb

THE SEAR-BROWN GROUP
FULL-SERVICE DESIGN PROFESSIONALS

209 SOUTH MELDRUM
FORT COLLINS, COLORADO 80521-2603

970-482-5922 FAX: 970-482-6368

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August 17, 1999

Mr. Frank B. Hempen, Jr., P.E.
Director of Public Works/County Engineer
Weld County Public Works Department
1111 "H" Street
P.O. Box 758
Greeley, CO, 80632-0758

Re: South Weld I-25 Corridor Master Drainage Plan

Dear Frank:

We have reviewed the draft publication titled "I-25 Master Drainage Plan Godding Hollow and Tri-Town Basins South Weld County, Colorado." Overall the report looks good. We have only the following two comments:

KG1 1) It appears that the Regional Detention pond located in Tri-Town Reach T3 was left off of Table 5.2.

KG2 2) In addition, the following Table shows a comparison between a portion of the construction estimates (reaches T3, T4 and T5 as shown on the attached Table 5.2) for proposed improvements within the Tri-Area Sanitation District Service area given in the master drainage plan report as compared to our estimates of the construction costs.

CONSTRUCTION ESTIMATE COMPARISON TABLE				
ITEM	QUANTITY	ANDERSON ESTIMATE	SEAR-BROWN ESTIMATE	DIFFERENCE
10'x4' Box Culvert/Forest	2	$120,000.00	$70,000.00	$50,000.00
48" RCP/Cherry	1	$48,000.00	$16,000.00	$32,000.00
4'x8' Box Culvert/Birch St	1	$96,000.00	$40,500.00	$55,500.00
5'x15'Box Culvert/WCR18	2	$180,000.00	$106,875.00	$73,125.00
Riprap	1167 c.y.	$85/c.y.	$60/c.y.	$29,175.00
Channel Earthwork	108,539 c.y.	$5/c.y.	$5/c.y.	$0.00
Channel Property Acquisition	24.5 acres	$10,000/acre	$5,000-$10,000/acre use $7,500/acre	$61,250.00
Detention Pond Property Acquisition	35 acres	$10,000/acre	$5,000-$10,000/acre use $7,500/acre	$87,500.00
Detention Pond Excavation	200,000 c.y.	$5/c.y.	$5/c.y.	$0.00
Spillway/Outlet costs	1 each	$106,400.00	$106,400.00	$0.00
TOTAL DIFFERENCE = $388,550.00				

NOTE: The Sear-Brown construction estimates were derived from bid tabs, vendor estimates and the Weld County tax assessors office.

A portion of the construction estimate by Anderson, including 35% contingencies and engineering etc. for proposed improvements within the Tri-Area Sanitation District service area was $3,970,000.00. Our estimate of the total construction cost using the same 35% contingency and 20% for engineering is $3,366,285.00.

If you have questions regarding this letter please call us.

Sincerely,

Kevin W. Gingery

Kevin W. Gingery, P.E.
Engineering Manager

cc: File 004-063b

Table 5.2 Cost Estimate for Tri-Town Basin.

Reach-Item	Description	Proposed Improvements/ General Drainage Infrastructure	Property Acquisition	Engineering, Permitting, Legal & Admin.	Total Cost
T1-1	Channel Improvements	$1,172,000	$216,000	$234,000	$1,622,000
T1-2	Replacement of WCR 24 Crossing	$405,000		$81,000	$486,000
				Reach T1 Subtotal	*$2,108,000*
T2-1	Regional Detention Pond (North)	$252,000	$380,000	$50,000	$682,000
T2-2	Replacement of WCR 22 Crossing	$469,000		$94,000	$563,000
T2-3	Regional Detention Pond (South)	$541,000	$280,000	$108,000	$929,000
				Reach T2 Subtotal	*$2,174,000*
T3-1	Replacement of WCR 20 Crossing	$706,000		$141,000	$847,000
T3-2	Channel Improvements	$193,000	$51,000	$39,000	$283,000
T3-3	Replacement of WCR 18 Crossing	$243,000		$49,000	$292,000
				Reach T3 Subtotal	*$1,422,000*
T4-1	Channel Improvements	$344,000	$120,000	$69,000	$533,000
				Reach T4 Subtotal	*$533,000*
T5-1	Regional Detention Pond	$1,291,000	$350,000	$258,000	$1,899,000
T5-2	Channel/Berm Improvements	$368,000	$94,000	$74,000	$536,000
T5-3	Replacement of SHW 52 Crossing	$356,000		$71,000	$427,000
				Reach T5 Subtotal	*$2,862,000*
T6-1	Regional Detention Pond (North)	$0	$100,000	$10,000[1]	$110,000
T6-2	Regional Detention Pond (South)	$0	$120,000	$10,000[1]	$130,000
				Reach T6 Subtotal	*$240,000*
				Tri-Town Basin Total Cost	*$9,339,000*

[1] Only legal and administrative costs are estimated for this improvement.

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SCHOSTAK
BROTHERS & COMPANY
EST. 1920

25800 Northwestern Highway
Suite 750
Southfield, MI 48075
(248) 262-1000
(248) 262-1814 FAX

August 13, 1999

Mr. Frank B. Hempen, Jr., P.E.
Director of Public Works/County Engineer
Weld County Public Works Department
1111 "H" Street
P.O. Box 758
Greeley, Colorado 80632-0758

REF: Comments on "Draft" I-25 Corridor Master Drainage Plan, Godding Hollow And Tri-Town Basins, South Weld County, Colorado

Dear Mr. Hempen:

Love & Associates, Inc. has reviewed a copy of the above-referenced document. On behalf of our client, Sun Communities, Inc., we would like to offer the following comments on this draft report. Sun Communities, Inc. owns approximately 296 acres of land located east of Interstate 25 (I-25) and south of Weld County Road 24. The Godding Hollow channel bisects this parcel of land. Sun Communities, Inc. is in the development review process for the proposed construction of residential home sites on the east side of the Godding Hollow channel. Commercial sites are intended to be developed by others between I-25 and the Godding Hollow channel.

We have been working on an ongoing basis with the Town of Firestone and their engineer, David B. Lindsay, P.E., of TST, Inc. since early spring of this year. We welcome the work being performed on this study and await the timely completion of the report.

Additionally, we have discussed with the Town of Firestone that it is Sun's desire to utilize the hydrologic models being developed for the master plan study to show that stormwaters from developed areas within the Sun Communities property can be discharged directly to the proposed Godding Hollow flood conveyance channel without adversely impacting downstream properties. Our logic is that since the Godding Hollow basin is long, wide and relatively flat, the storm peaks from our site will be conveyed downstream and be long gone before the flood peak from the upstream basin reaches our site.

SCHOSTAK BROTHERS & COMPANY
EST. 1920

Up to this point in time, the Town of Firestone and their engineer have been willing to consider this option. We would like the master plan report to recognize this fact and to
RB1 allow us an opportunity to prove this scenario can work for the benefit of all concerned parties.

Our flood consultant, David J. Love, P.E. of Love & Associates, Inc. has been trying to obtain a copy of the Godding Hollow hydrologic model since March of this year from the author of the draft report, Anderson & Company, Inc. To date, Anderson & Company, Inc. refuses to release the hydrologic model until the draft report is finalized. We respectfully request that the hydrologic model be released at the earliest possible date, so we may perform the required modifications to the model to determine the hydrologic impact of developing this site without incorporating on-site detention.

We would appreciate consideration for incorporating Sun's comments into the above-mentioned report.

Sincerely,

Schostak Brothers & Company

By _____
Raymond J. Behling
As agent for Sun Communities OLP

cc: Town of Firestone
David Lindsay, TST, Inc.
Gary Shiffman, Sun
Brian Fannon, Sun
C. Meehan, Sun
S. Duczynski, Schostak Bros.

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I-25 CORRIDOR MASTER DRAINAGE PLAN

PUBLIC COMMENTS

8/14/99

We live on the corner of Road 13 + WCR #26 — we have lived in Sec 1 - SW of Tri-Town since 1959.

FS1 Q. page 2.1 - Para 2.3.1 of the Master Drainage Plan it states that the Godding Hollow and Tri-Town Basin came together before continuing to the St Vrain River — This is not true and for the last forty years and prior to that the Tri-Town drainage which is conveyed by the Bieberman Ditch once it goes under road #24 - goes north then east to the East Channel ditch —

FS2 Combining all the water from Tri-Town along with the water from the Godding Hollow to one discharge point — can become a disaster! —

FS3 I see no provision in the plan to preserve water rights on the McCormick Deep Ditch — the Bieberman or the Cole Ditch — Also I see no provision to protect all headgates down stream on the Rural Ditch — Water rights must be addressed for water users in Sec 1, 2 and 6 —

FS4 Another great concern with having a large open channel is weed, erosion, sand, seepage — The north discharge to St Vrain is very close to gravel — which can cause a high water table for residents along Rd 26 + 13

NAME (OPTIONAL) [signature] Pres Rural Ditch
303-776-2161

P.S.
above comments are just a few of many concerns

From: <WPalmer777@aol.com>
To: NORTHDOMAIN.NORTHPOST(DSCHELTINGA)
Date: 8/24/99 12:09pm
Subject: I-25 drainage comments

Drew, attached are my technical comments. I am assuming that Frank received the political comments when he meet with Davis Stahl.

CC: CENTDOMAIN.SMTP("wpalmer@ci.erie.co.us")

Technical comments from Wendi Palmer, Town of Erie, For the I-25 Corridor Master Drainage plan

WP1 Page 1.2, paragraph 1.2.1, Dacono is referred to as a Town and Erie is referred to as a City. These should be reversed.

WP2 Page 2.3, paragraph 2.3.1, the 2'h x 3.5'w arch cmp crossing WCR10 west of I-25 was not mentioned.

WP3 Page 2.4, first line top of page, you are discussing 3 box culverts and in the first description (two 11 6'Hx11'W) the 11 after the 2 should be deleted.

WP4 Page 3.2, Table 3.1, it would be helpful if the size of the structures were also indicated. If you use landscape layout you should have plenty of room to add the description.

WP5 Page 3.4, this section describes the existing detention facilities. It would be helpful if the reader was referred to sheet 1 so the exact location of the facilities could be viewed. Also this table should identify the existing structure crossing under the UPRR Spur, and what the capacity of this structure is. You are proposing a detention pond upstream of the structure.

WP6 Page 3.8 paragraph 3.2.1, this section describes the existing structures, the existing structure crossing under the UPRR Spur, and the capacity of this structure is not described.

WP7 Page 4.5, Table 4.1, and page 4.21 Table 4.5, the Horton's Decay Rate for subbasin No. TTSB71 is 0.0016 and the rest are 0.0018. is this correct?

WP8 Page 5.25, paragraph 5.2.9.2, Regional Detention Ponds. It is not clear how much the detention facility has reduced the peak. Is the report recommending reducing the historic peak or just keeping the discharge to historic? The amount of storage is defined and the area needed for the pond. Does the cost include regrading the area to maximize the volume in the proposed area? If the volume is available it would be desirable to reduce the peak discharge in a regional facility.

WP9 Figure 5.10, the existing structures under the UPRR and the UPRR Spur are not labeled. All other structures are labeled.

WP10 Requiring developers to over detain a 100 year storm to a 2 year historic rate would be difficult to implement and we would be dependent upon development to improve the drainage in the basin over historic. Wouldn't be more practical to allow minor over topping of some of the roads during a 100 year event and size the structures accordingly. Also more regional facilities would do more to improve drainage than relying upon developers to provide onsite detention facilities to reduce the historic rate. Often during development it is difficult to capture all of the runoff and divert it to the detention pond. Especially offsite road improvements. Regional detention is easier to control and maintain.

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I-25 CORRIDOR MASTER DRAINAGE PLAN

PUBLIC COMMENTS

TL1 (1) Who is going to pay for this and how is it going to be funded?

TL2 (2) I did not see any ~~that~~ funds that were allocated to pay for property that had to be ~~the~~ purchased for right of way also did not see any funds to move Irrigation ditchs and laterals.

TL3 (3) What if a person did not want this drainage coming though there property

TL4 (4) How are you going to handle the irrigation ditchs and laterals? also there are ditchs ~~that~~ that handle drain water Rights like the (Coal ditch)

TL5 (5) ~~what~~ If your plan call for improvement to ~~that~~ be made up in the middle of ~~your~~ your plan at the start. That would ~~as~~ mean that more water would be directed down stream quicker. so there would more chance that people at the north ~~end~~ end of your plan may get flooded out quicker.

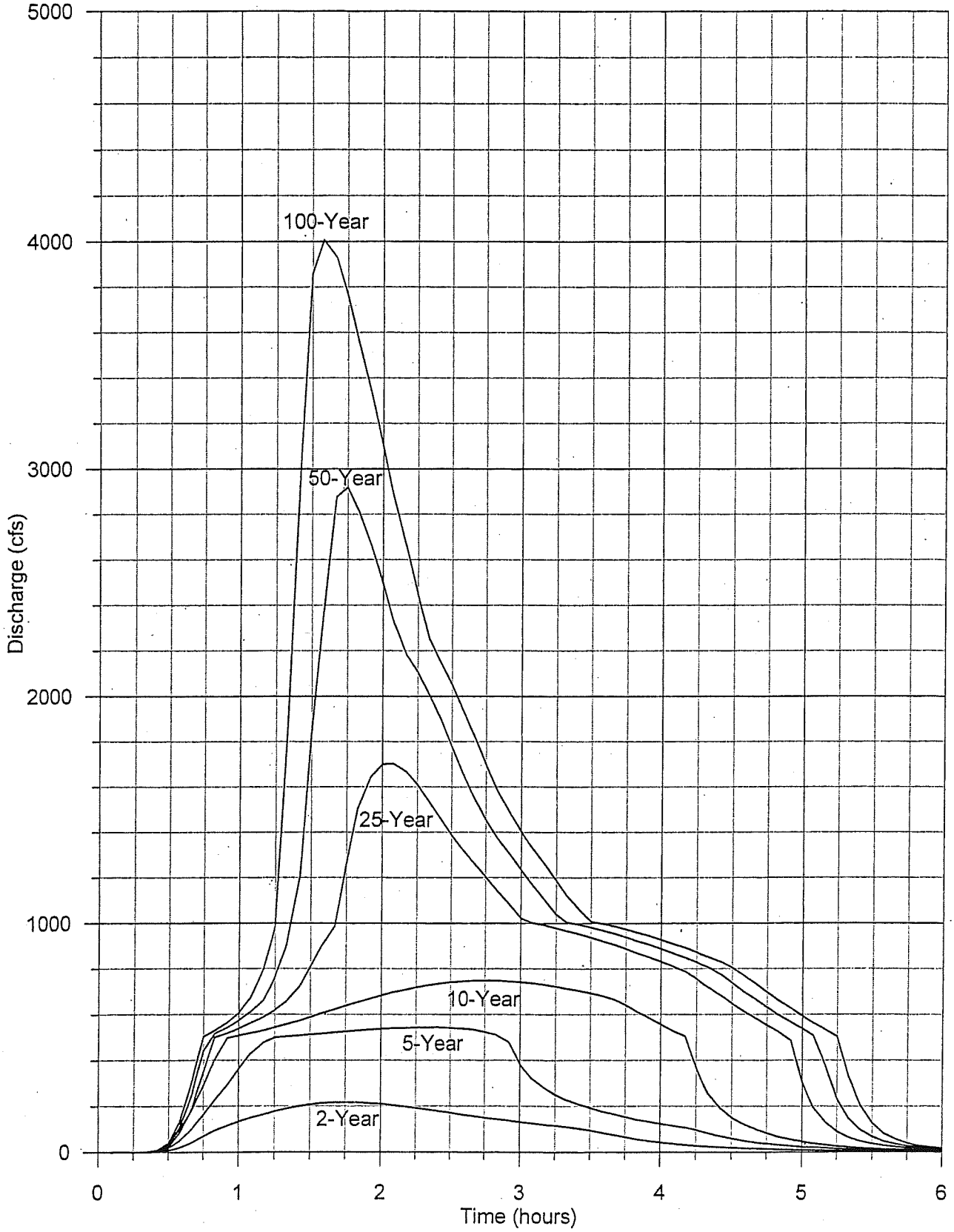
NAME (OPTIONAL) Ted Lohmann
6254 WCR 26
Longmont Colo 80504

APPENDIX B

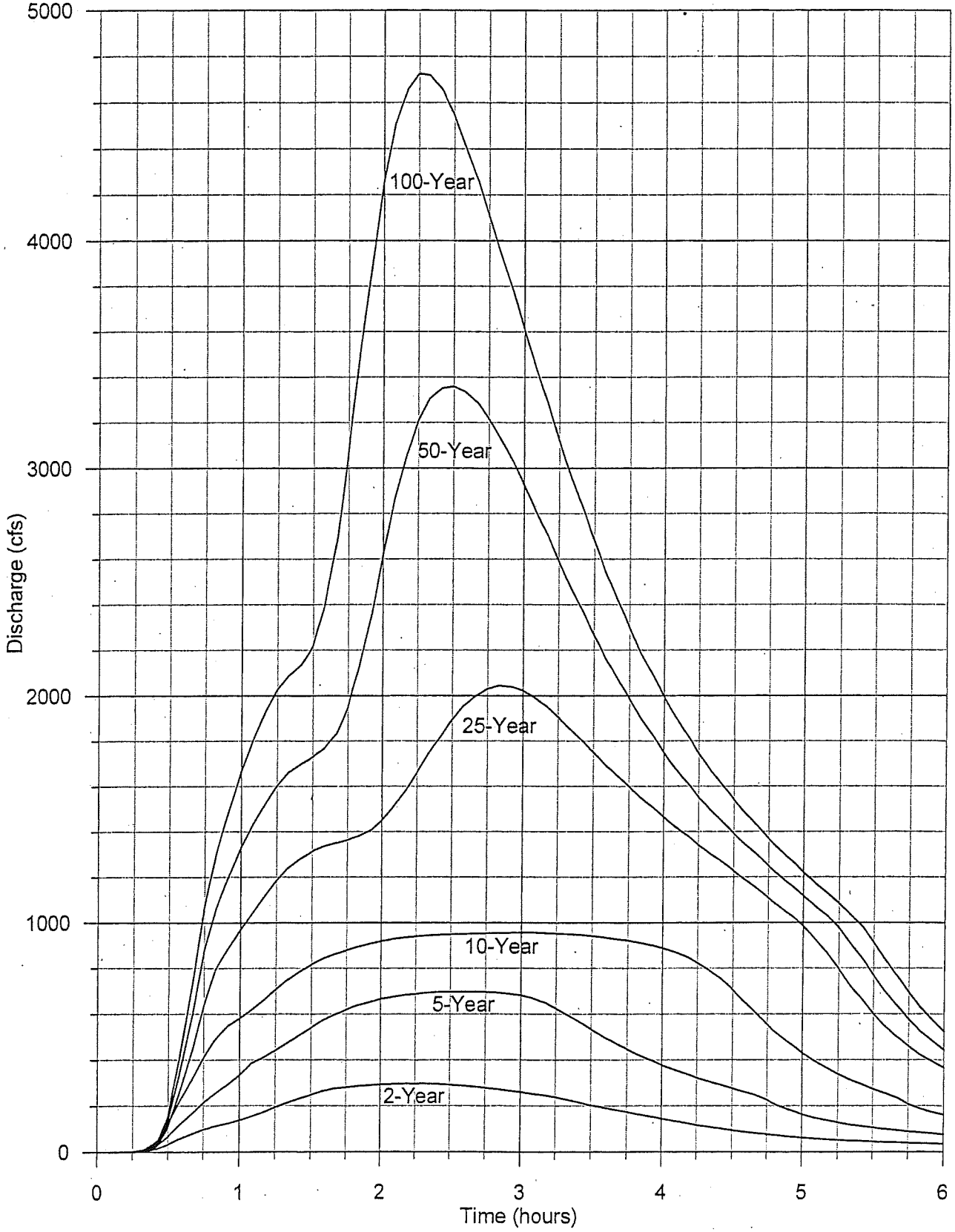
FLOOD HYDROGRAPHS

GODDING HOLLOW BASIN

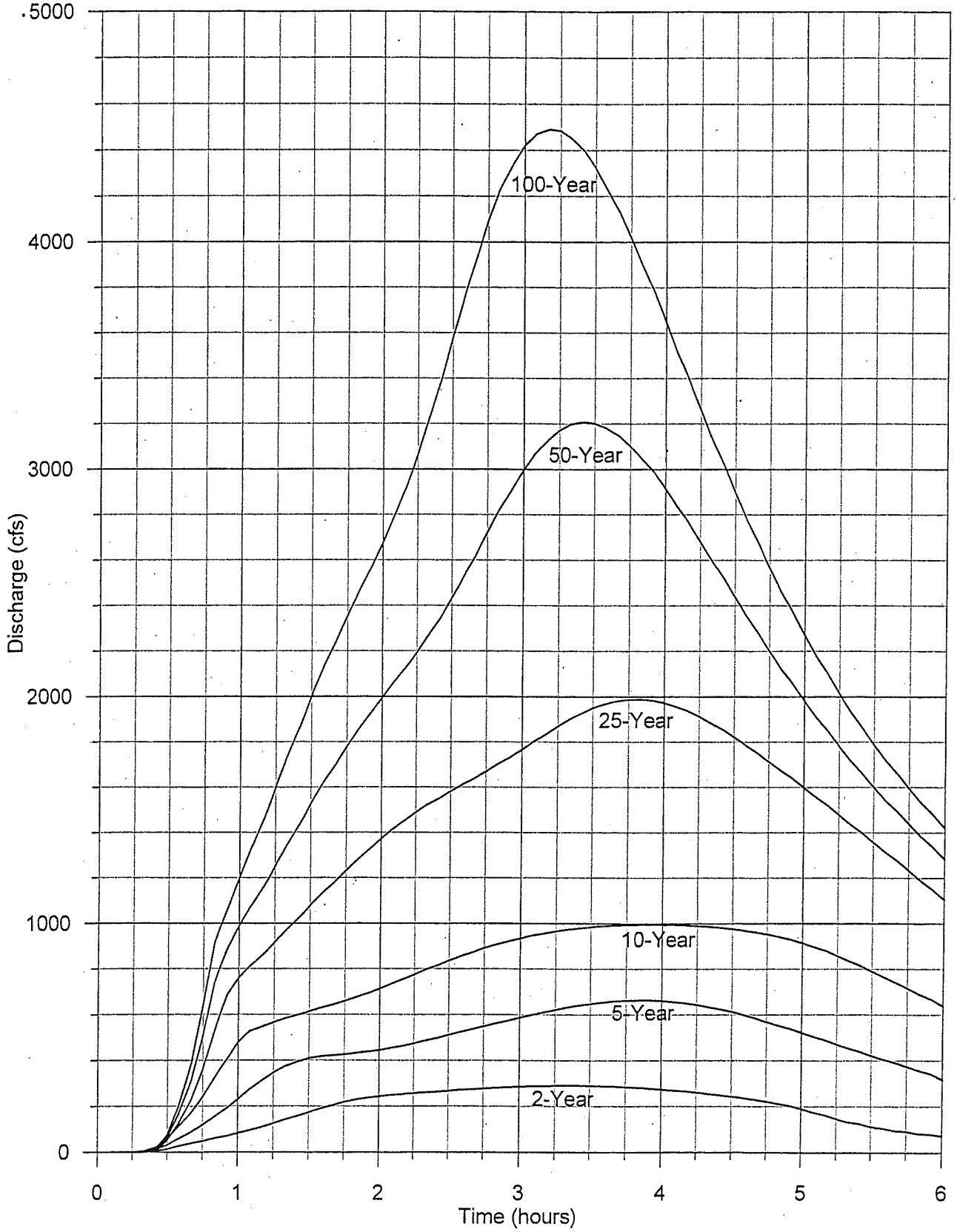
I-25 Master Drainage Plan
Appendix B
Flood Hydrographs
Godding Hollow Basin - Existing Conditions
State Highway 52 (UDSWMM Node 308)



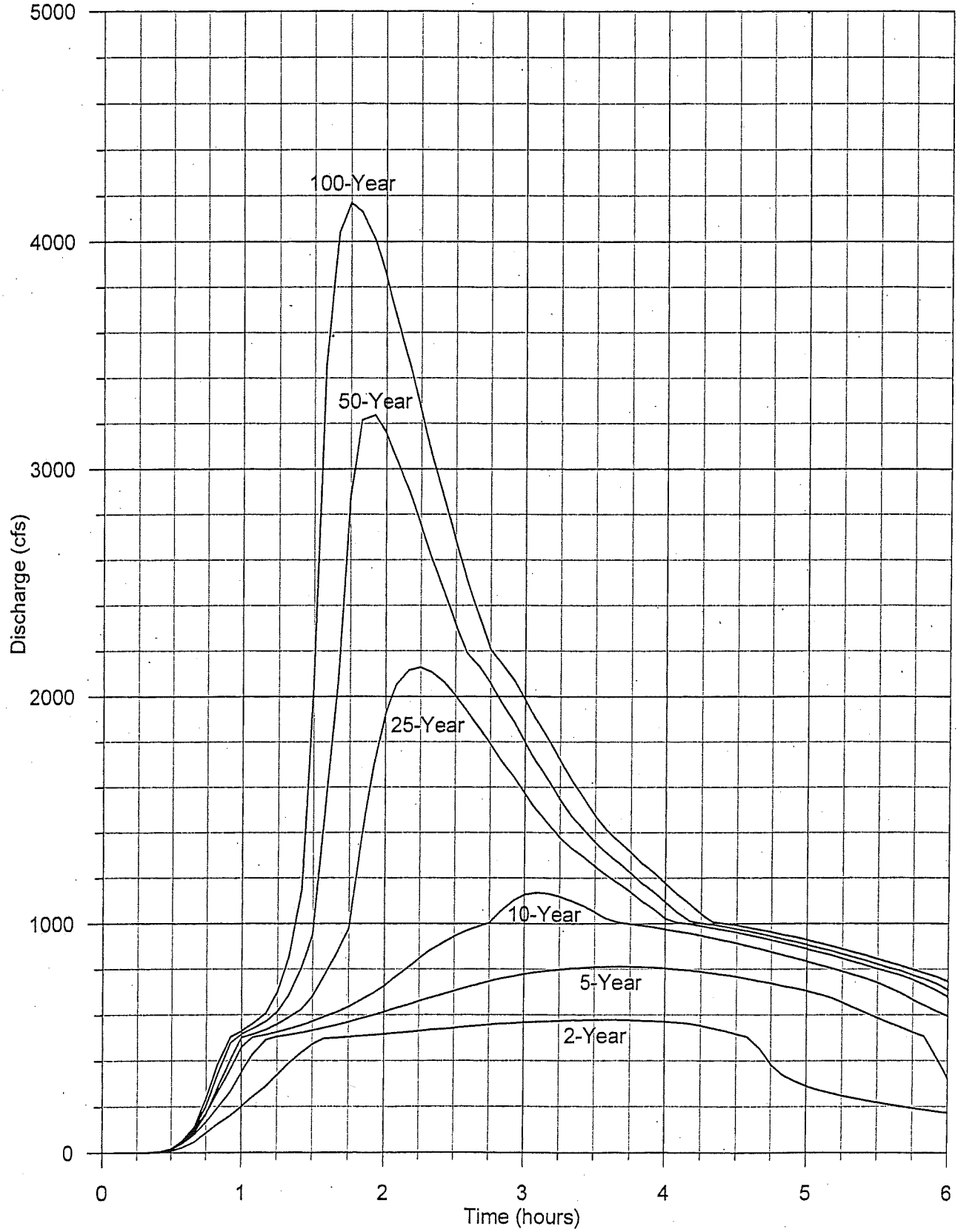
I-25 Master Drainage Plan
Appendix B
Flood Hydrographs
Godding Hollow Basin - Existing Conditions
Weld County Road 18 (UDSWMM Node 206)



I-25 Master Drainage Plan
Appendix B
Flood Hydrographs
Godding Hollow Basin - Existing Conditions
Weld County Road 24 (UDSWMM Node 203)



I-25 Master Drainage Plan
Appendix B
Flood Hydrographs
Godding Hollow Basin - Future Conditions
State Highway 52 (UDSWMM Node 308)



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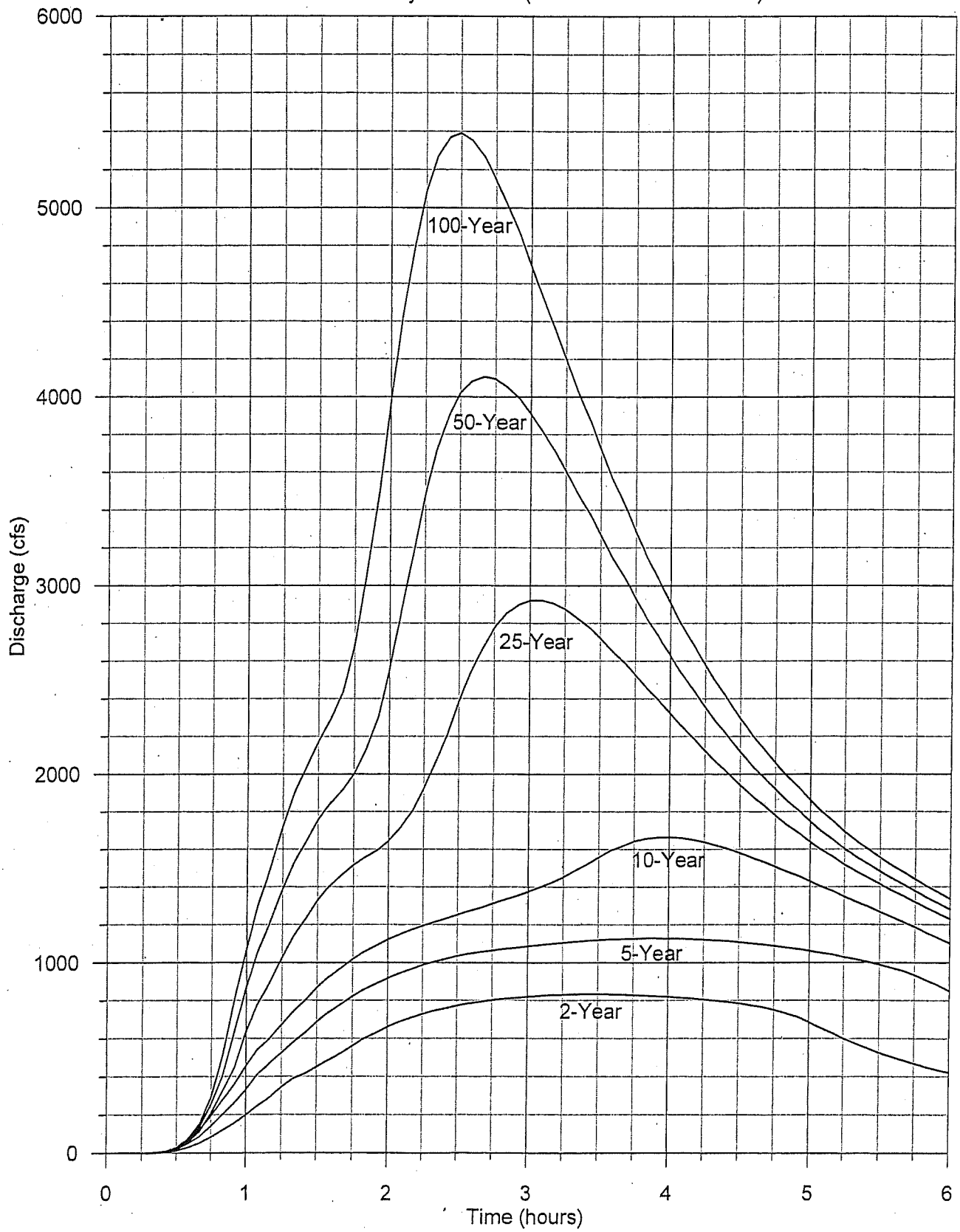

I-25 Master Drainage Plan
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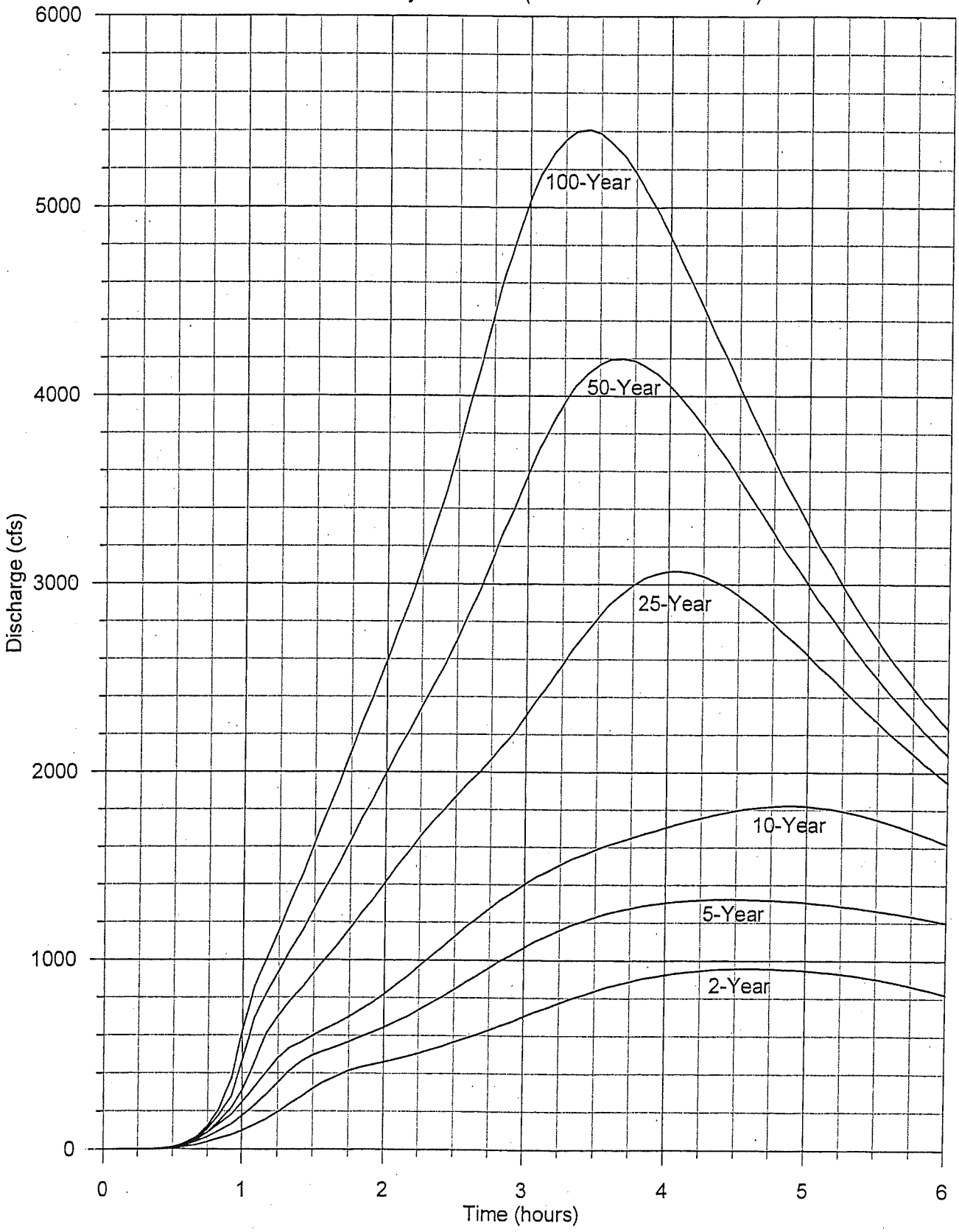
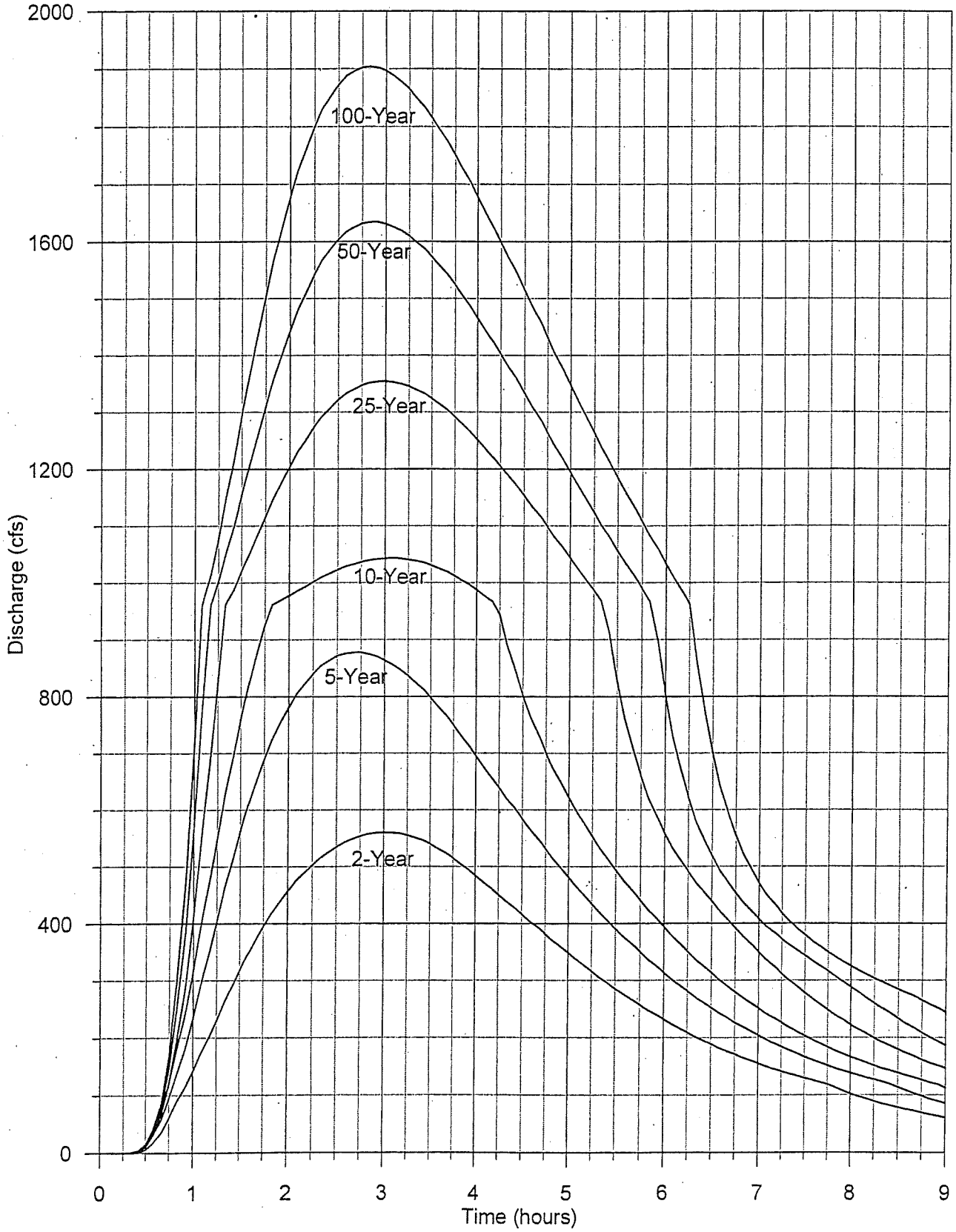


I-25 Master Drainage Plan
Appendix B
Flood Hydrographs
Godding Hollow Basin - Future Conditions with Regional Detention
State Highway 52 (UDSWMM Node 308)



I-25 Master Drainage Plan
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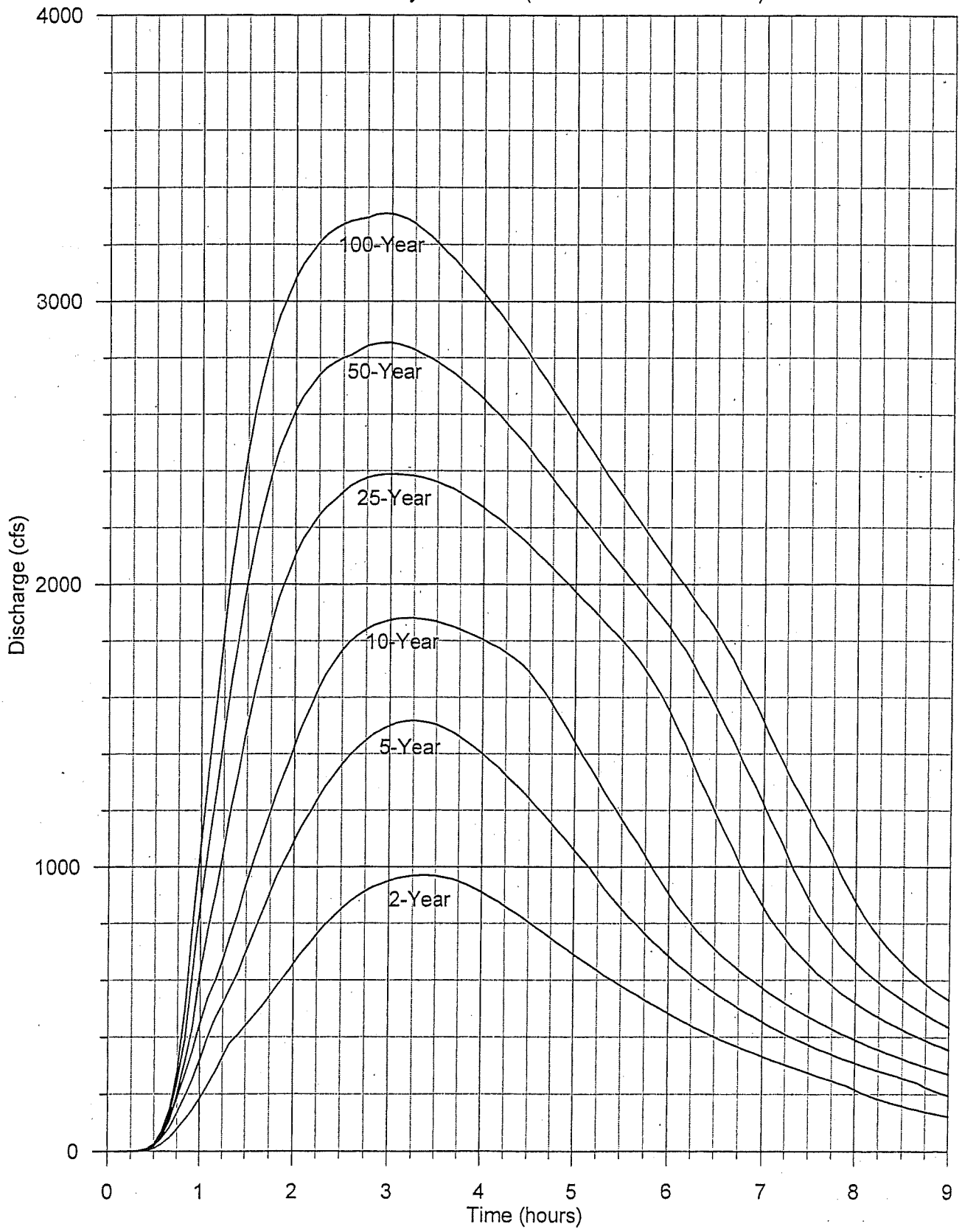
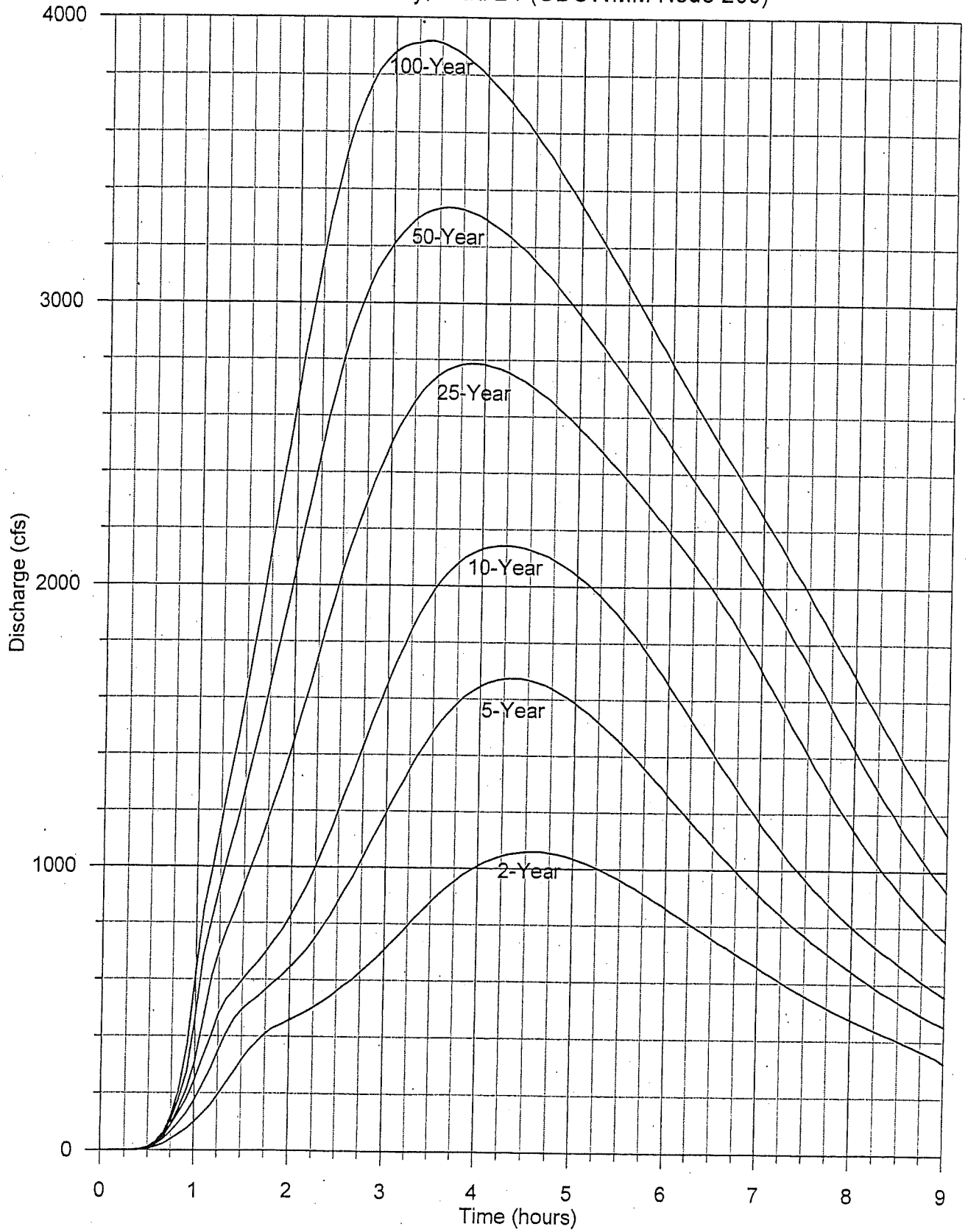
Godding Hollow Basin - Future Conditions with Regional Detention
Weld County Road 18 (UDSWMM Node 206)

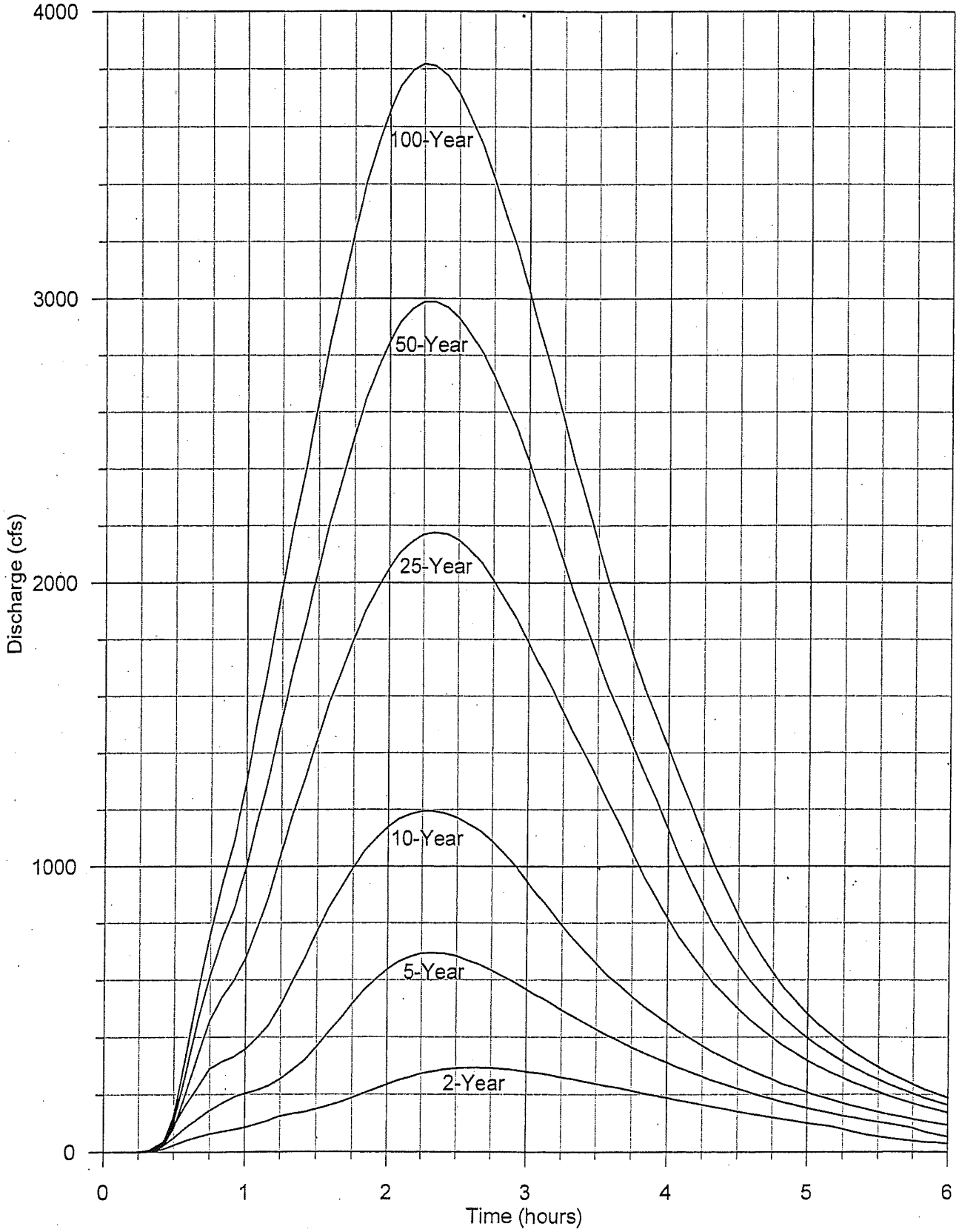


I-25 Master Drainage Plan
Appendix B
Flood Hydrographs
Godding Hollow Basin - Future Conditions with Regional Detention
Weld County Road 24 (UDSWMM Node 203)



TRI-TOWN BASIN

I-25 Master Drainage Plan
Appendix B
Flood Hydrographs
Tri-Town Basin - Existing Conditions
Weld County Road 24 (UDSWMM Node 252)



I-25 Master Drainage Plan
Appendix B
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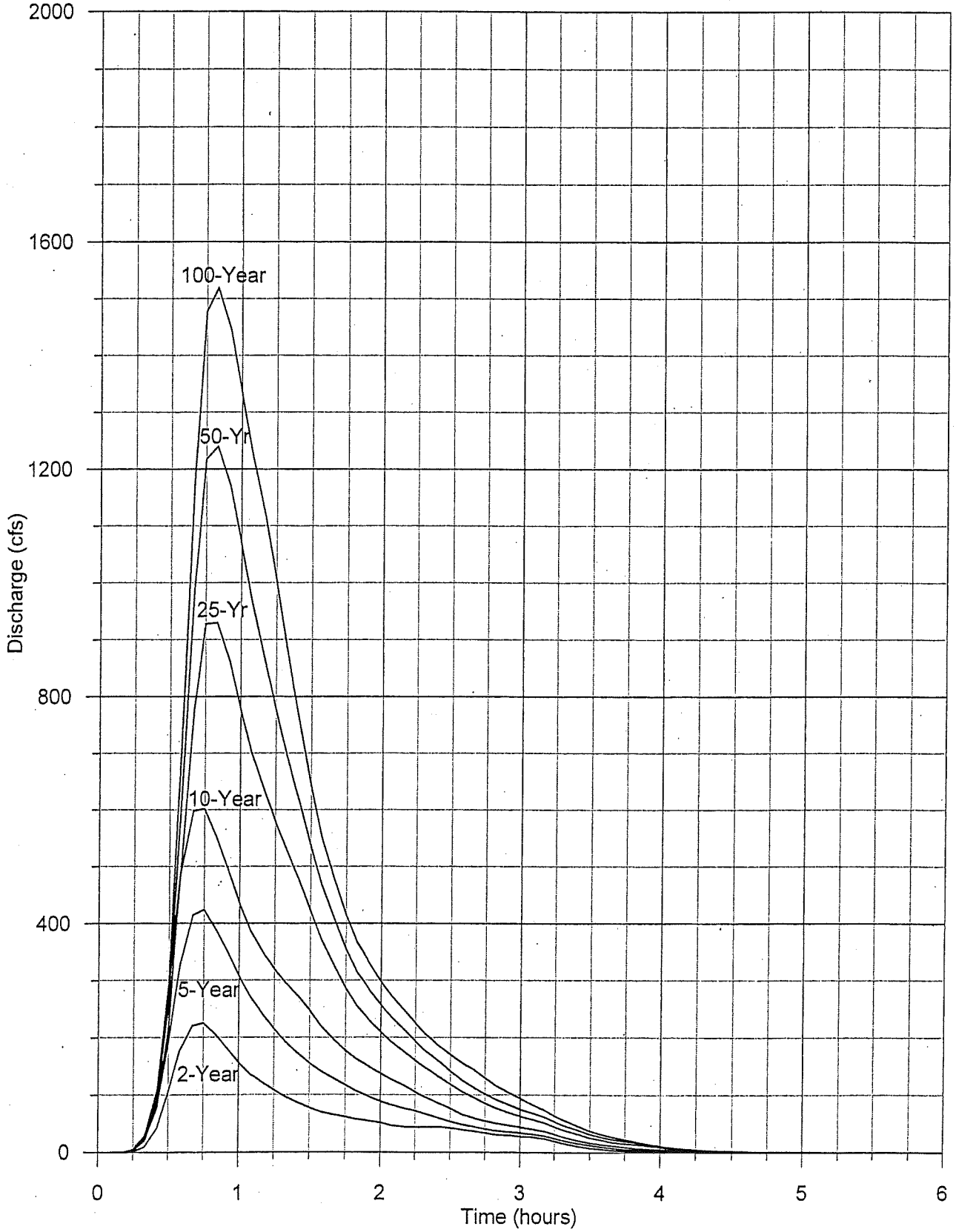
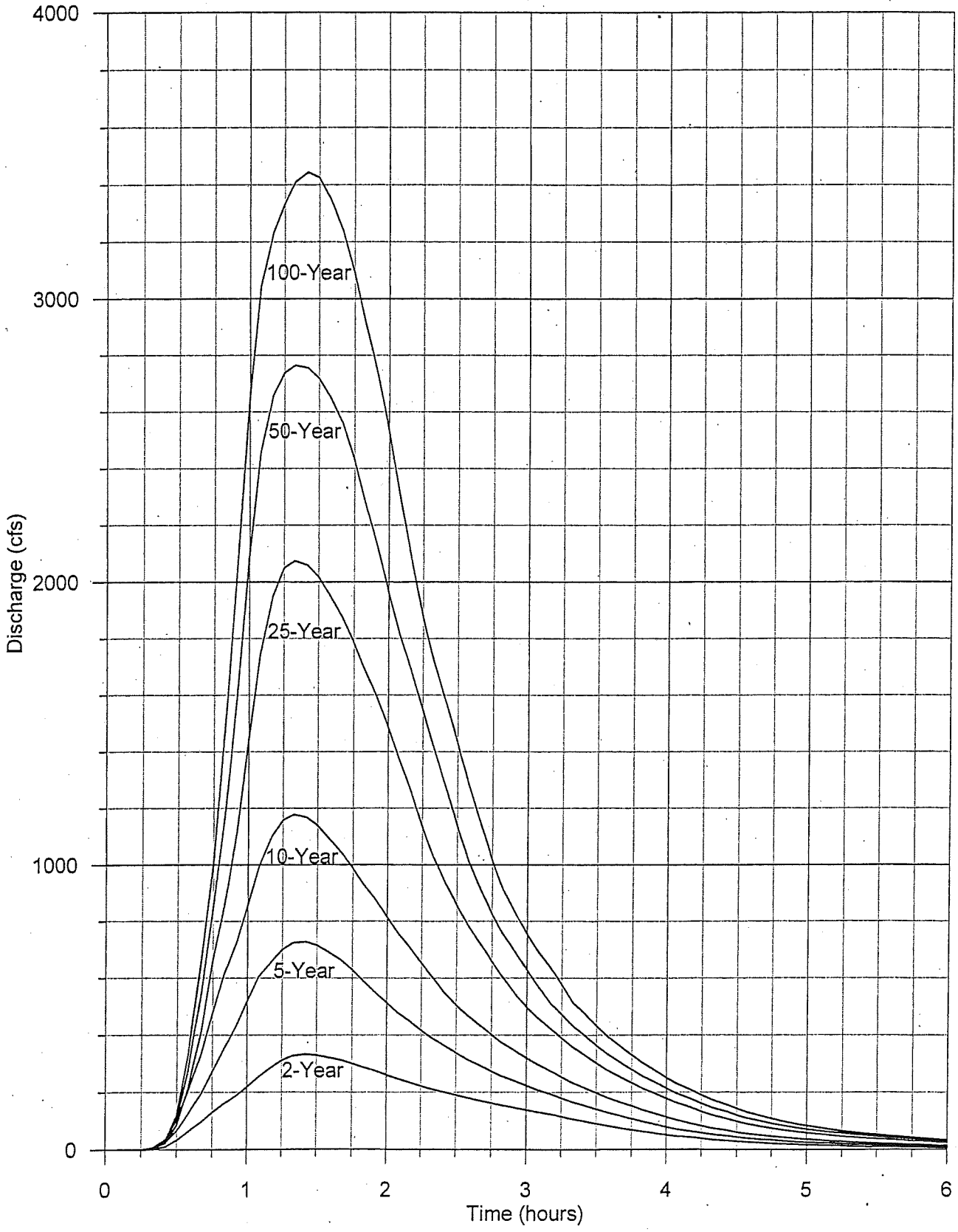
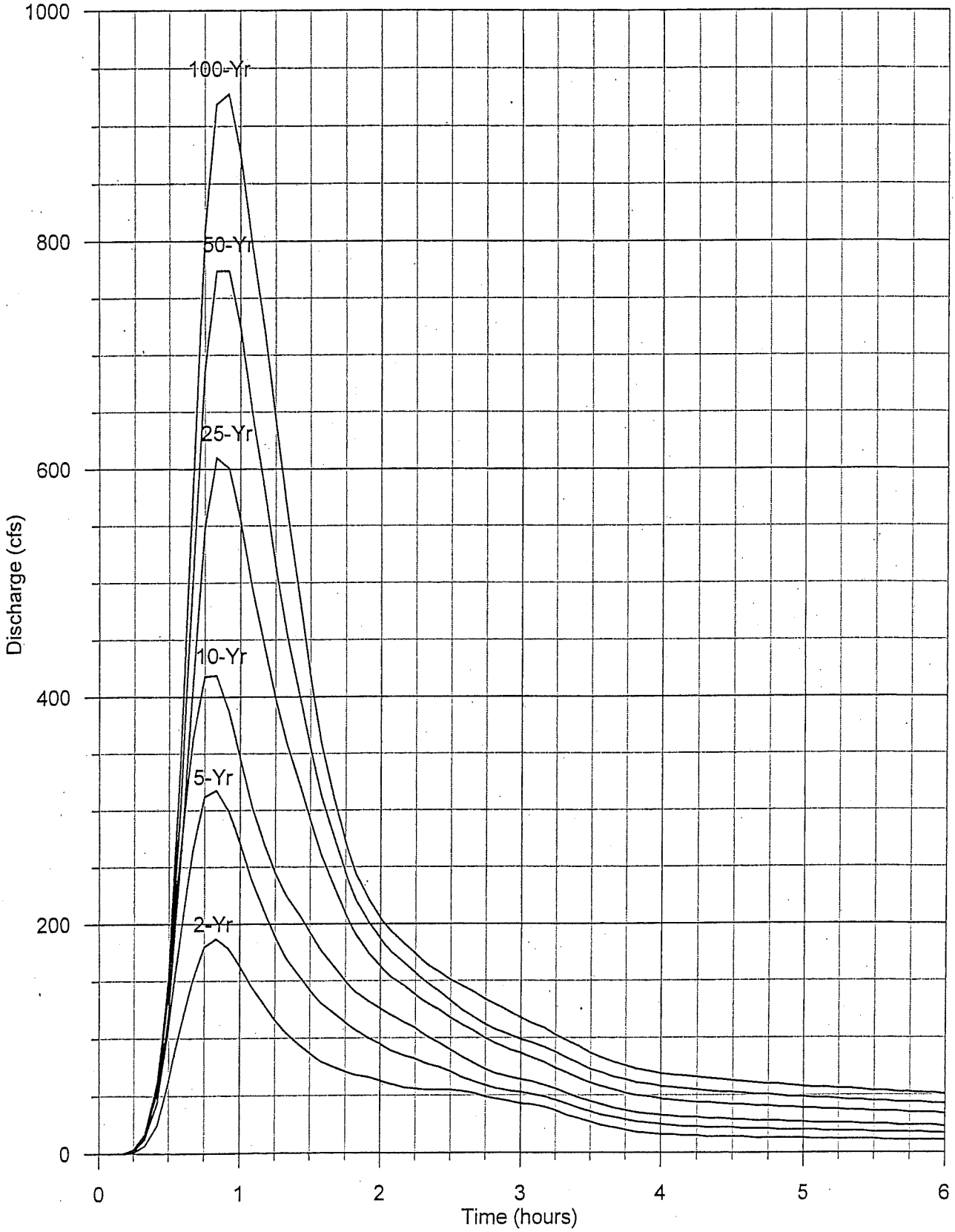
Tri-Town Basin - Existing Conditions
State Highway 52 (UDSWMM Node 262)



I-25 Master Drainage Plan
Appendix B
Flood Hydrographs
Tri-Town Basin - Existing Conditions
Weld County Road 18 (UDSWMM Node 255)



I-25 Master Drainage Plan
Appendix B
Flood Hydrographs
Tri-Town Basin - Future Conditions
State Highway 52 (UDSWMM Node 262)



I-25 Master Drainage Plan
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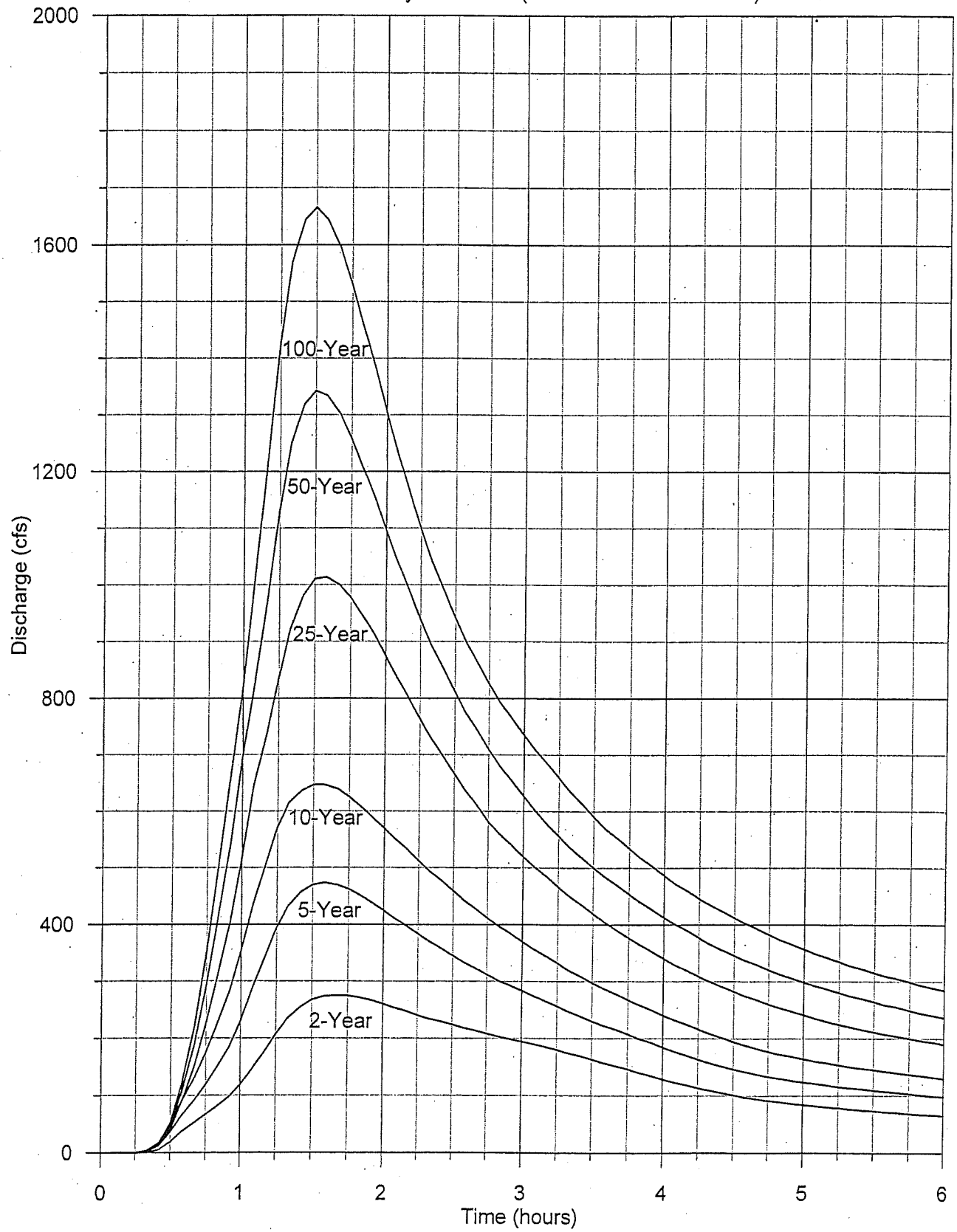
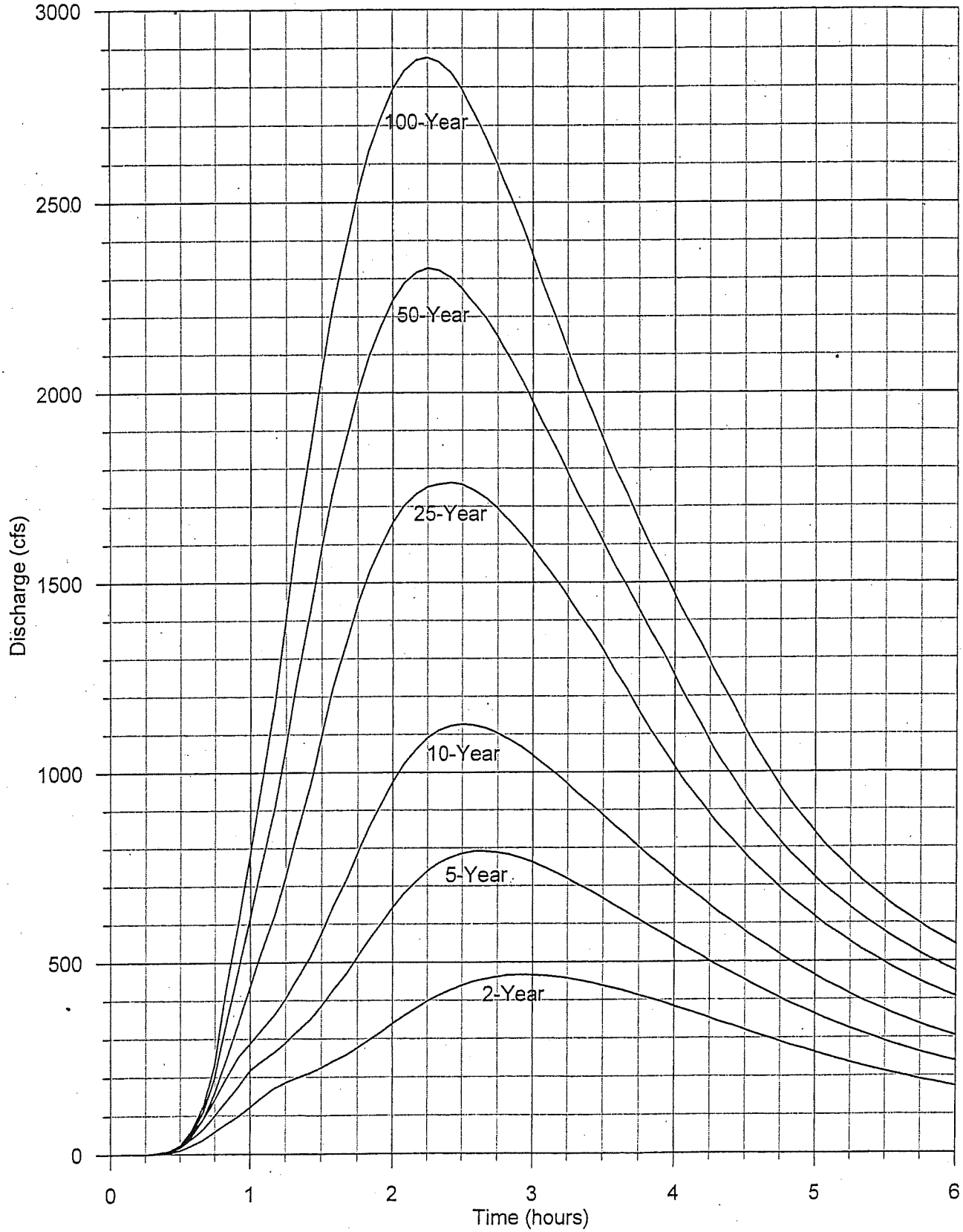
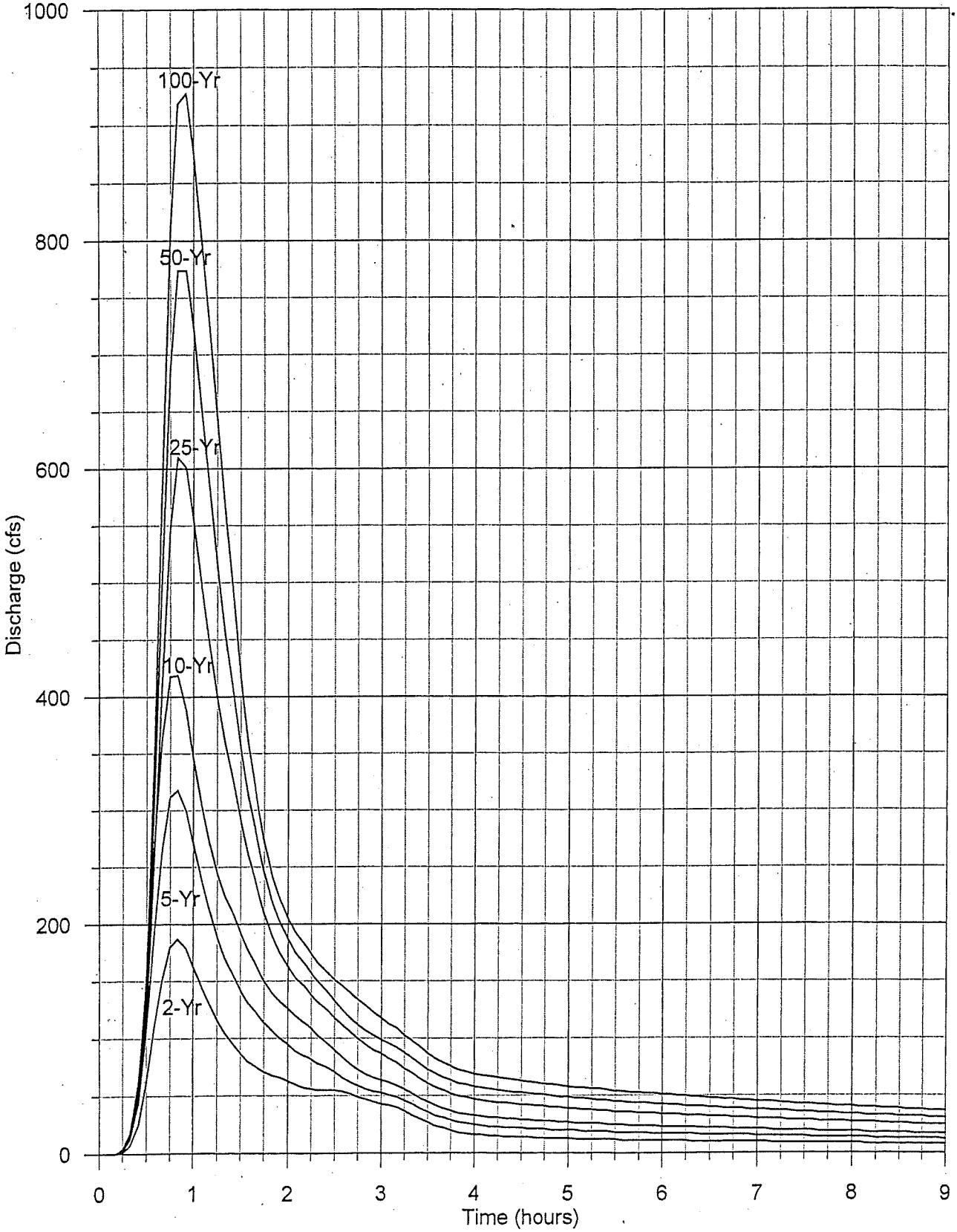
Flood Hydrographs
Tri-Town Basin - Future Conditions
Weld County Road 18 (UDSWMM Node 255)



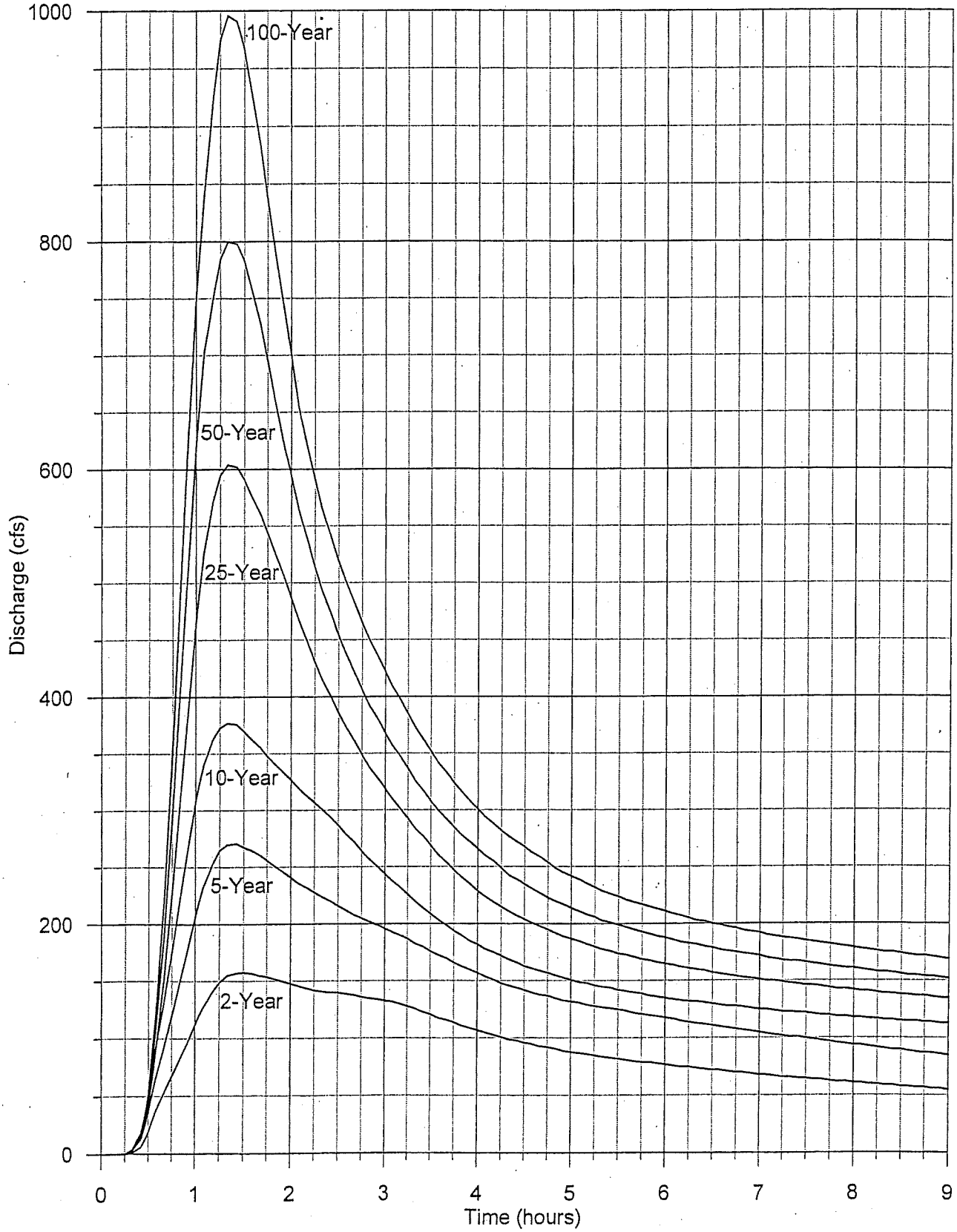
I-25 Master Drainage Plan
Appendix B
Flood Hydrographs
Tri-Town Basin - Future Conditions
Weld County Road 24 (UDSWMM Node 252)



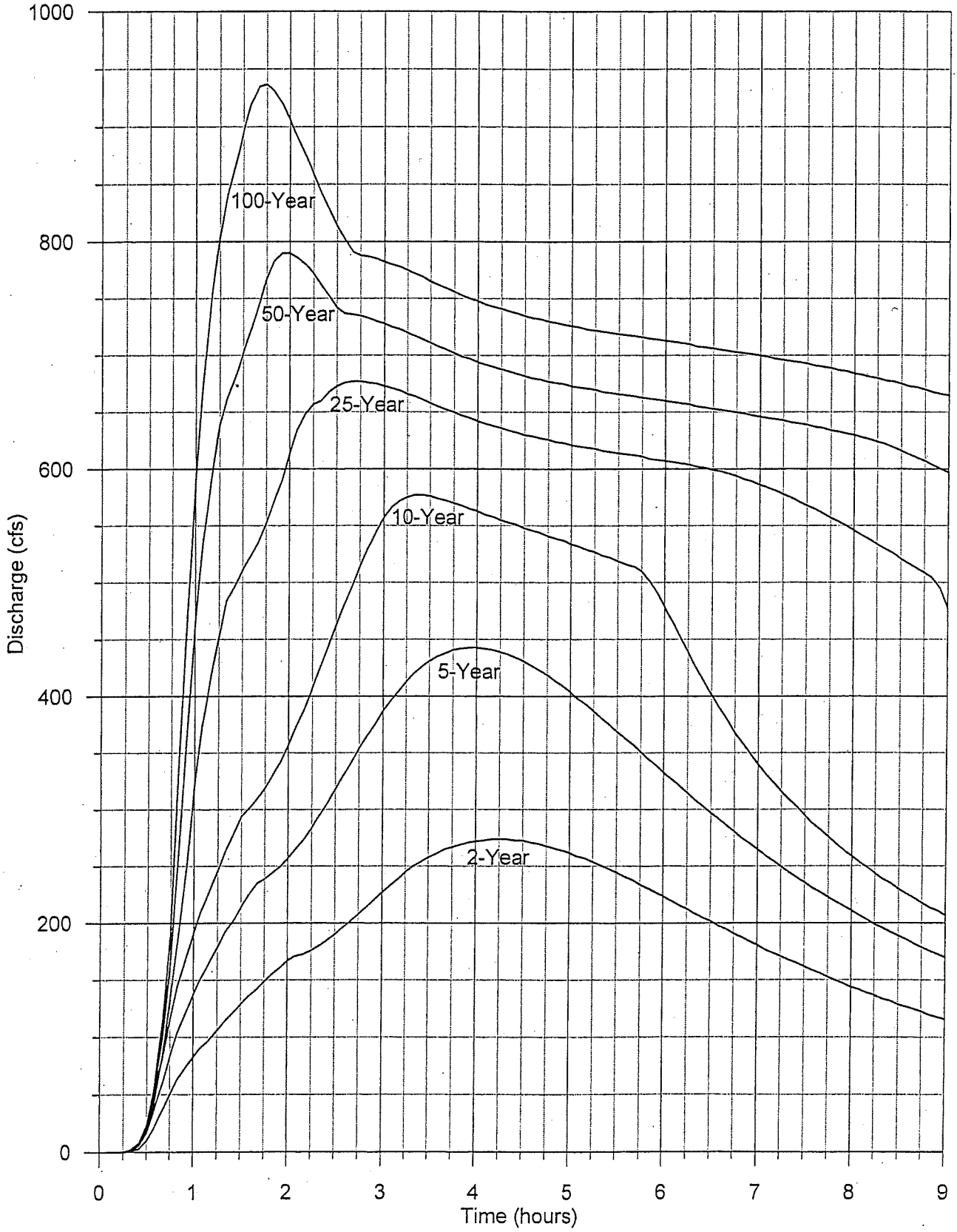
I-25 Master Drainage Plan
Appendix B
Flood Hydrographs
Tri-Town Basin - Future Conditions with Regional Detention
State Highway 52 (UDSWMM Node 262)



I-25 Master Drainage Plan
Appendix B
Flood Hydrographs
Tri-Town Basin - Future Conditions with Regional Detention
Weld County Road 18 (UDSWMM Node 255)



I-25 Master Drainage Plan
Appendix B
Flood Hydrographs
Tri-Town Basin - Future Conditions with Regional Detention
Weld County Road 24 (UDSWMM Node 252)



APPENDIX C

UNIT PRICING DATA

Unit Pricing Data

Property Acquisition

Residential

Unimproved	$10,000/AC
With Structures	$80,000/UNIT

Commercial/Industrial

Unimproved	$75,000/AC
Improved	$150,000/AC
With Structures	40/S.F.

Drainage Improvements

Excavation	5/C.Y.
Structural Concrete for culverts, head walls, wingwalls, drop structures, etc.	300/C.Y.
Street Demolition and Repair	30/S.Y.
Road Base Fill	8/C.Y.
Riprap	85/C.Y.
Bridges	80/S.F.

Reinforced Concrete Pipes

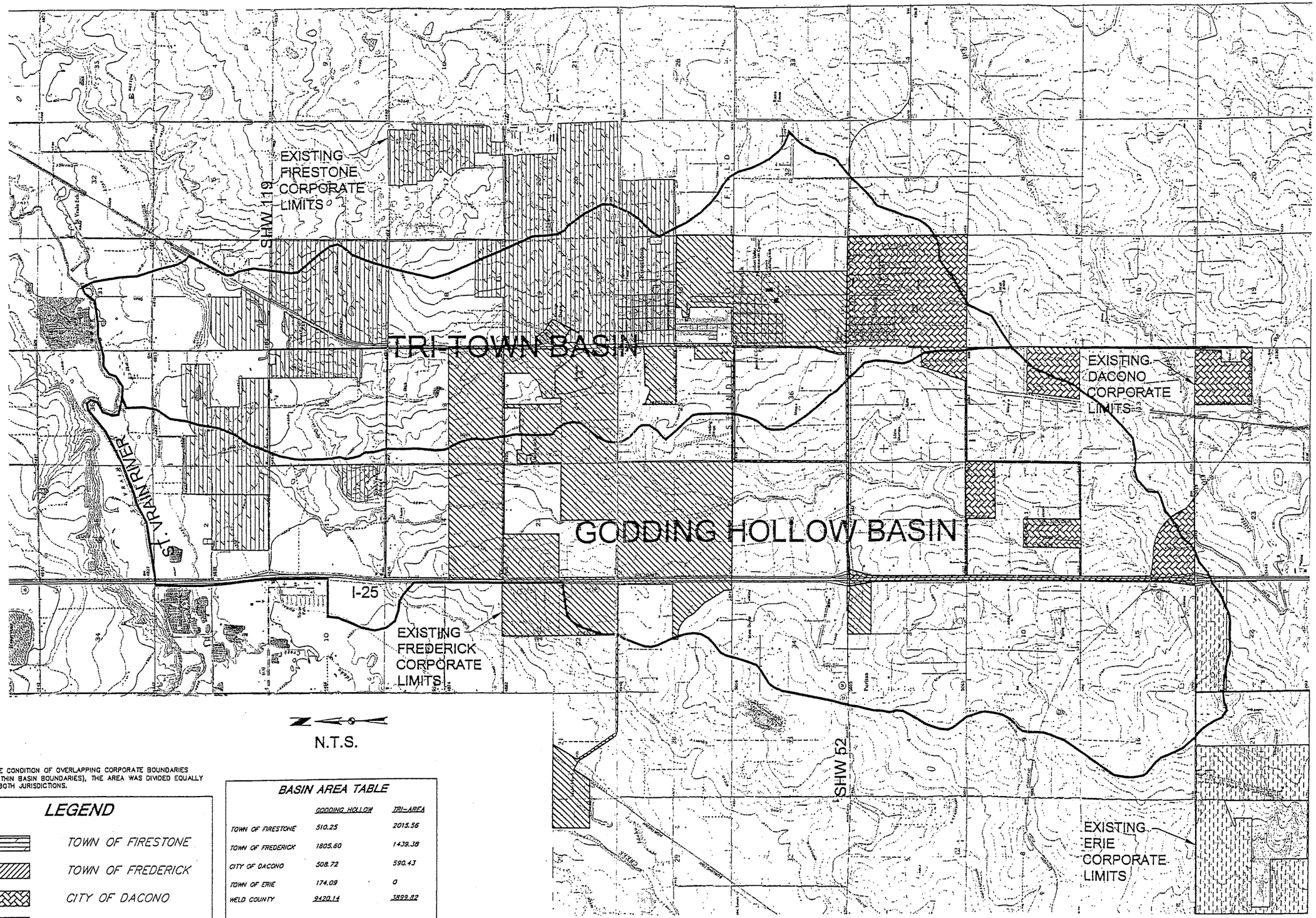
15-inch diameter RCP	26/L.F.
18-inch diameter RCP	29/L.F.
24-inch diameter RCP	36/L.F.
30-inch diameter RCP	44/L.F.
36-inch diameter RCP	52/L.F.
42-inch diameter RCP	60/L.F.
48-inch diameter RCP	72/L.F.
54-inch diameter RCP	93/L.F.
60-inch diameter RCP	112/L.F.
66-inch diameter RCP	120/L.F.

Precast Concrete Boxes

Precast 4'Hx6'W Concrete Box (ASTM C-850)	210/L.F.
Precast 4'Hx8'W Concrete Box (ASTM C-850)	280/L.F.
Precast 8'Hx10'W Concrete Box (ASTM C-850)	670/L.F.
Precast 8'Hx8'W Concrete Box (ASTM C-850)	600/L.F.
Precast Three-Sided 3'Hx12'W Concrete Box (ASTM C-850)	650/L.F.
Precast Three-Sided 4'Hx12'W Concrete Box (ASTM C-850)	700/L.F.
Precast Three-Sided 3'Hx20'W Concrete Box (ASTM C-850)	875/L.F.

Note: Unit costs listed above include materials, equipment, and labor.

C.Y. - Cubic Yard S.Y. - Square Yard AC - Acre
S.F. - Square Foot L.F. - Lineal Foot



NOTE:
WHERE THE CONDITION OF OVERLAPPING CORPORATE BOUNDARIES EXISTS (WITHIN BASIN BOUNDARIES), THE AREA WAS DIVIDED EQUALLY BETWEEN BOTH JURISDICTIONS.

LEGEND

- TOWN OF FIRESTONE
- TOWN OF FREDERICK
- CITY OF DACONO
- TOWN OF ERIE

BASIN AREA TABLE

	GODDING HOLLOW	TRI-AREA
TOWN OF FIRESTONE	510.25	2015.56
TOWN OF FREDERICK	1805.60	1439.38
CITY OF DACONO	508.72	590.43
TOWN OF ERIE	174.09	0
WELD COUNTY	9420.14	3899.82
TOTAL	12418.80 ac	7945.19 ac

I-25 CORRIDOR MASTER DRAINAGE PLAN

EXISTING CORPORATE LIMITS

SHEET A

WELD COUNTY, COLORADO
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DRAWN BY: TWK
DESIGNED BY: TWK
CHECKED BY: DBL

PROJECT NUMBER: 0651109
ACAD FILE: excorplts
DATE: 6/23/99
REVISION: 09/07/99

TST, INC
Consulting Engineers
748 Walters Way
Building D
Fort Collins, CO 80525
(970)224-5573
Fax (970)224-5183
Web Page: www.tstinc.com

established for administration of the plan, the financing plan can be revised to more accurately reflect the fee structure.

Given the assumptions utilized to generate the financing plans, the following information is provided for consideration:

Godding Hollow Basin:

- The plant investment fees range from a maximum of $2,000 (based on 50% of principal value) to $2,900 (based on 90% of principal value).
- The monthly fees for each equivalent residential unit decrease from $20 (based on a 50% plant investment fee) to $15 (based on a 90% plant investment fee).

Tri-Town Basin:

- The plant investment fees range from a maximum of $750 (based on 50% of principal value) to $1,400 (based on 90% of principal value).
- The monthly fees for each equivalent residential unit decrease from $10 (based on a 50% plant investment fee) to $6 (based on a 90% plant investment fee).

It should be noted that a significant amount of money is identified in the ending fund balance for all plans. This balance can be utilized to fund future projects and provide for ongoing operation and maintenance of stormwater facilities. Alternatively, the monthly fees could be reduced accordingly as the debt service associated with each bond issue is satisfied.

VIII. SUMMARY AND RECOMMENDATIONS

This document summarizes the results of a master planning effort related to stormwater management within the Godding Hollow and Tri-Town Basins. The focus of the planning effort was the identification of improvements that would reduce both existing flooding and the potential for future flooding problems. Drainage improvements within each basin are described in detail in Chapter 5 along with the cost estimate associated with each improvement. A plan for implementing the drainage improvements was developed and is presented in Chapter 6. Finally, pertinent information related to funding and financing the drainage improvements was compiled and is presented in Chapter 7.

Following the approval and adoption of the master drainage plan, it is recommended that the local jurisdictions responsible for this planning effort continue to diligently pursue implementation of the drainage improvements. Based on information obtained during the planning document, the following recommendations are also provided.

(1) An organizational entity that is responsible for the administration and implementation of the drainage improvements must be identified. It is recommended that a local sanitation district be earmarked to perform this function for the following reasons: (a) the sanitation district has statutory authority, (b) selection of a local sanitation district does not require formation of a new entity, and (c) the local sanitation districts are familiar with stormwater management planning and drainage improvements.

(2) A Technical Advisory Group (TAG) should be formed to work with the local sanitation district. As a minimum , the TAG should represent all local jurisdictional entities as well as irrigation districts. The TAG should provide guidance and direction related to: (a) development of funding/financing mechanisms including impact fees and monthly user fees, (b) identification of implementation priorities and oversight of the implementation plan, and (c) the pursuit of secondary funding sources.

(3) Coordination with entities and/or property owners that may be impacted by the implementation of the drainage improvements should be conducted as early as possible. Potential conflicts associated with property acquisition, easements, and rights-of-way may require resolution prior to construction of the proposed improvements.

Finally, it is important to remember that this planning effort culminated in the preparation of a comprehensive, flexible document that is intended to guide the decision-making process with respect to stormwater management within the basins. As the implementation of the drainage improvements progresses from this stage into preliminary and final design, revisions and

modifications to the improvements may be necessary. These revisions or modifications should not change the underlying goal of this document, that is the reduction in the damages associated with existing flooding as well as potential flooding associated with future development in the basins.

APPENDIX D

EQUIVALENT RESIDENTIAL UNIT INFORMATION

For the purpose of the Conceptual Financing Plan, it was necessary to attempt to predict the development absorption rate within each of the basins. In an effort to do this, all jurisdictions within the basins were contacted and the absorption rate utilized was intended to be a conservative summary of the growth potential within the basins. Additionally, the common denominator for this growth was assumed to be one single-family unit (equivalent residential unit - ERU). Therefore, the units described in the Conceptual Financial Plan are equal to one single-family equivalent (ERU). There was no attempt to differentiate between the potential different land uses such as single-family, multi-family, commercial, industrial, etc.

In the future, as development occurs within the basins, a relationship between ERU's and the other potential land uses can be developed. For example, within multi-family developments, a discount could be utilized whereby one multi-family unit may be equal 50-70% of a single-family unit. Additionally, within commercial and industrial developments, the relationship may be 3,000-4,000 square feet equals one single-family equivalent.

Since the predominant type of development within the basin was anticipated to be single-family residential, it was assumed that this would be the obvious common denominator for evaluating future growth. However, as the basin develops, all aspects of the Conceptual Financing Plan can be reevaluated and adjusted as required.

The plant investment fees, which are currently changed within communities along the Front Range of Colorado, range from $250 and $3,000 for an equivalent residential unit (ERU) as defined in this study. The characteristics of the actual development within the basin will be known better at the time the First Bond Issue is being established. It is recommended that the final relationship, and multipliers for all land use types be established prior to the creation of the First Bond Issue.

established for administration of the plan, the financing plan can be revised to more accurately reflect the fee structure.

Given the assumptions utilized to generate the financing plans, the following information is provided for consideration:

Godding Hollow Basin:

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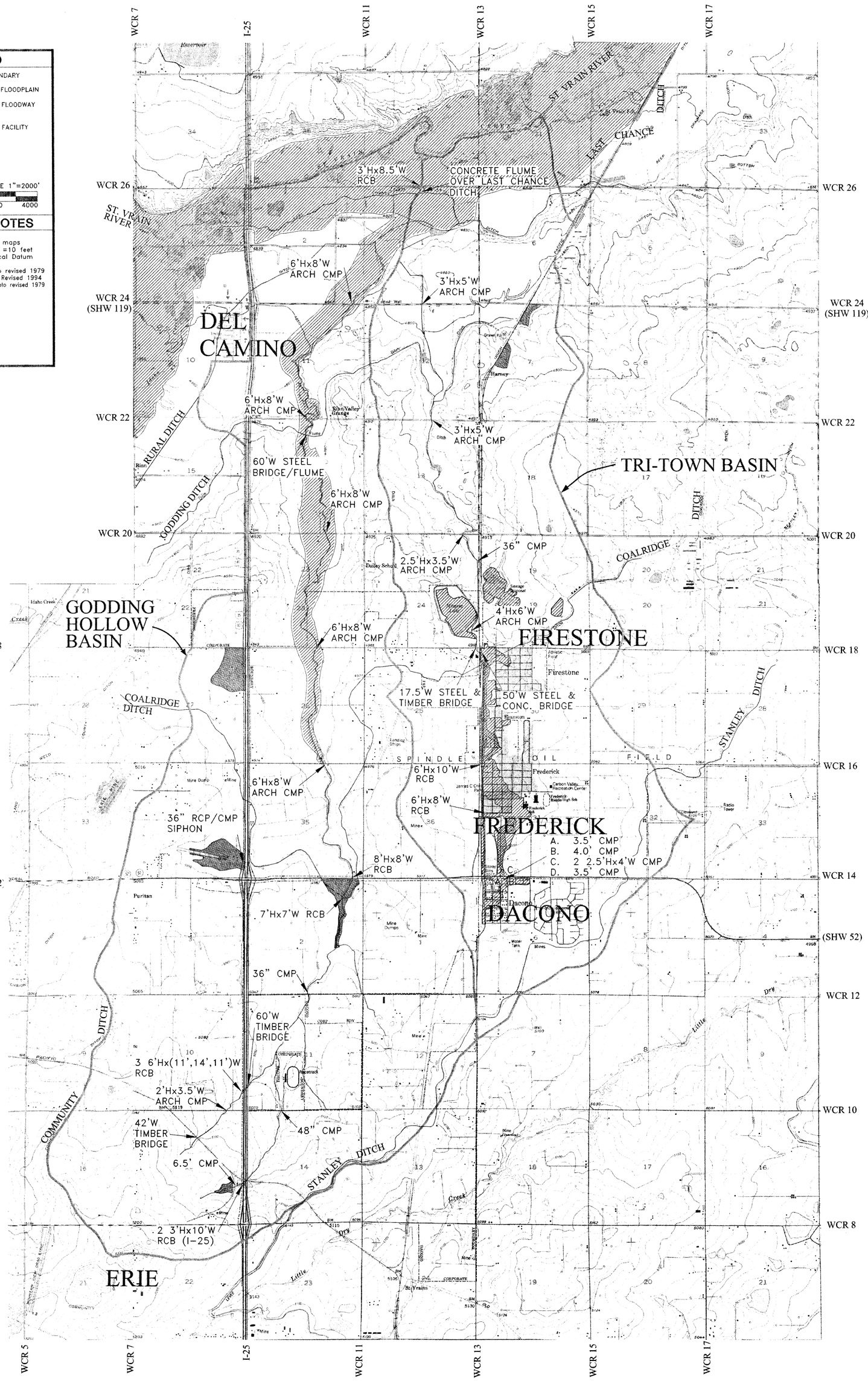
LEGEND

- BASIN BOUNDARY
- 100-YEAR FLOODPLAIN
- ONE-FOOT FLOODWAY
- DETENTION FACILITY

ORIGINAL SCALE 1"=2000'
0 2000 4000

GENERAL NOTES

1. USGS Quadrangle Base maps 7.5 minute series, C.I. =10 feet National Geodetic Vertical Datum of 1929.
   A. Erie, Co. 1967, Photo revised 1979
   B. Frederick, Co. 1950, Revised 1994
   C. Gowanda, Co. 1949, Photo revised 1979



TST, INC Consulting Engineers 748 Whalers Way Building D Fort Collins, CO 80525 (970)226-0557 Metro (303)595-9103 Fax (970)226-0204	PROJECT NUMBER: COWELD01 ACAD FILE: COWELD_EX_FLD DATE: 3/2/99 REVISED: 9/07/99	DRAWN BY: MRC DESIGNED BY: CJP CHECKED BY: BAA	Anderson Consulting Engineers, Inc *Civil • Water Resources • Environmental* 2900 S. College Avenue, Suite 3B, Fort Collins, CO 80525 Phone (970) 226-0120 · Fax (970) 226-0121

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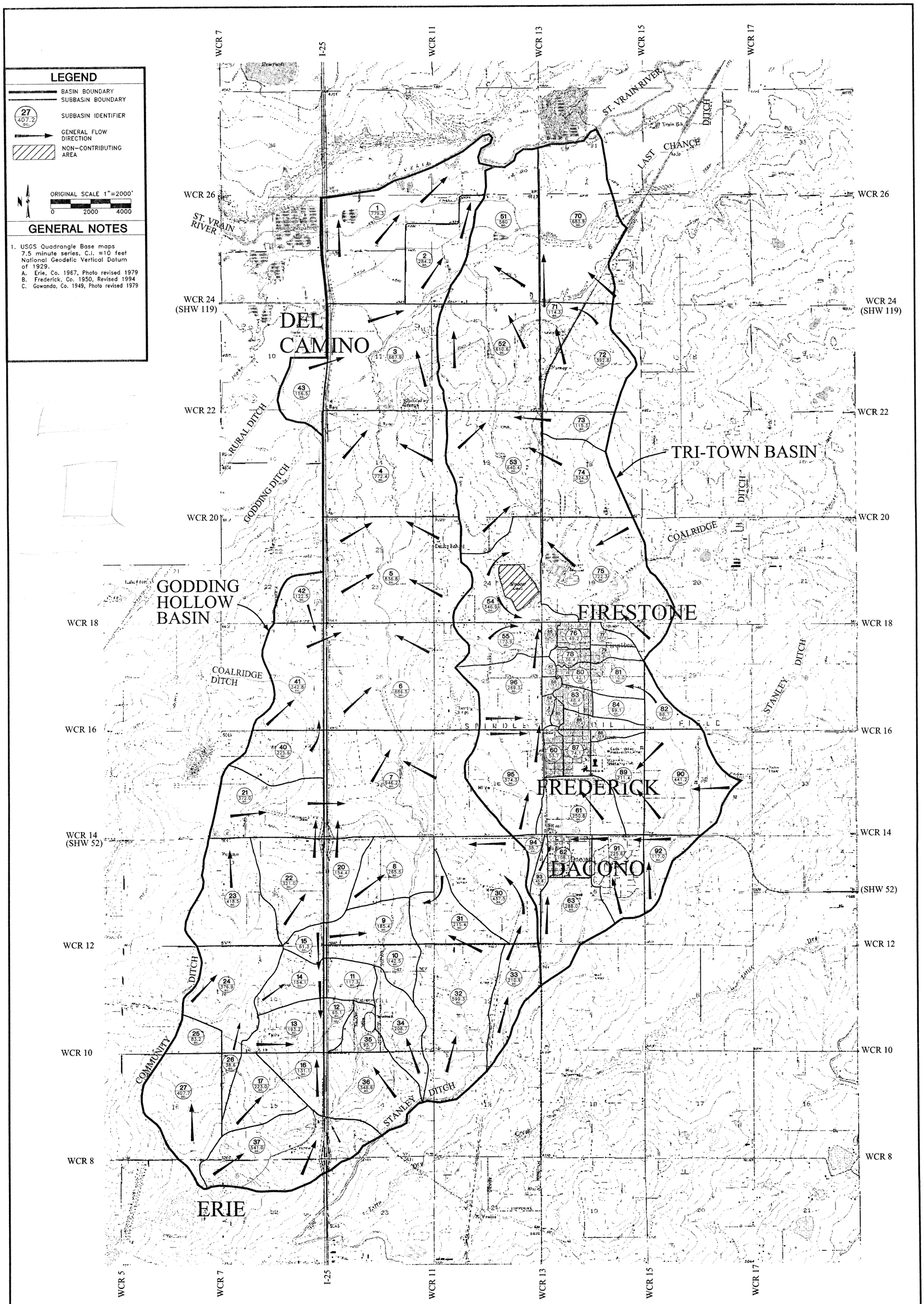
GREELEY, COLORADO 80632

I-25 CORRIDOR MASTER DRAINAGE PLAN

EXISTING DRAINAGE FACILITIES AND 100-YEAR FLOODPLAINS

SHEET 1/4 SHEETS



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PROJECT NUMBER: COWELD01	DRAWN BY: MRC
ACAD FILE: COWELD_SUB	DESIGNED BY: CJP
DATE: 3/2/99	CHECKED BY: BAA
REVISION: 9/07/99	

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I-25 CORRIDOR MASTER DRAINAGE PLAN

SUBBASIN MAP

SHEET 2/4 SHEETS

LEGEND

- PARKS/OPEN SPACE **
- RURAL DENSITY RESIDENTIAL
- LOW DENSITY RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- COMMERCIAL/INDUSTRIAL
- BASIN BOUNDARIES
- SUBBASIN BOUNDARIES

N

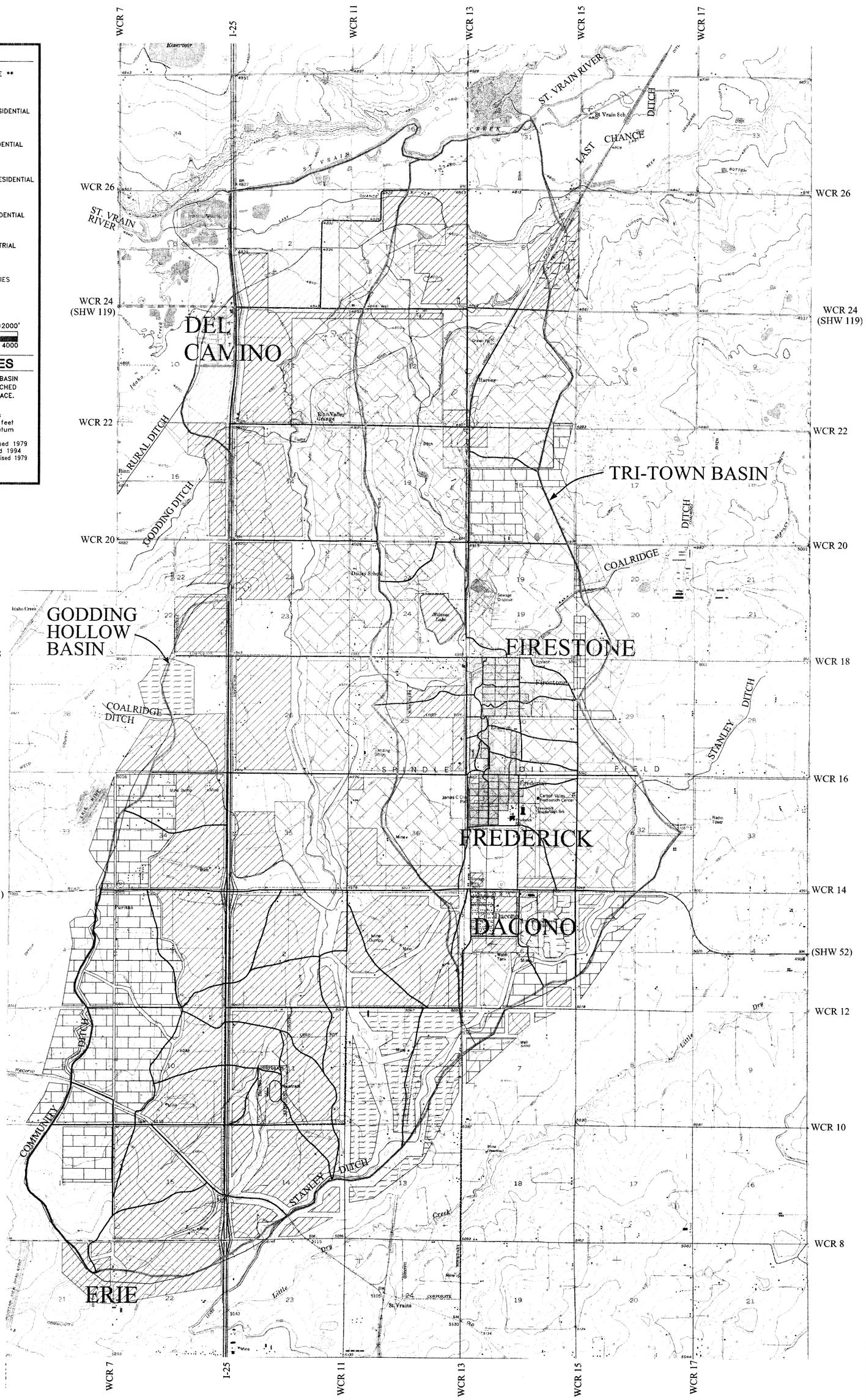
ORIGINAL SCALE 1"=2000'

0 1000 2000 4000

GENERAL NOTES

** ALL THE AREAS WITHIN THE BASIN BOUNDARIES THAT ARE NOT HATCHED ARE EITHER PARKS OR OPEN SPACE.

1. USGS Quadrangle Base maps 7.5 minute series, C.I. =10 feet National Geodetic Vertical Datum of 1929.
   A. Erie, Co. ,1967, Photo revised 1979
   B. Fredrick, Co. ,1950, Revised 1994
   C. Gowanda, Co. ,1949, Photo revised 1979



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P.O. BOX 758
GREELEY, COLORADO 80632

I-25 CORRIDOR MASTER DRAINAGE PLAN

DEVELOPED LAND USE MAP

SHEET 3 / 4 SHEETS

LEGEND

- HYDROLOGIC GROUP A
- HYDROLOGIC GROUP B
- HYDROLOGIC GROUP C
- HYDROLOGIC GROUP D
- BASIN BOUNDARYS
- SUBBASIN BOUNDARYS

N

ORIGINAL SCALE 1"=2000'

0 2000 4000

GENERAL NOTES

1. USGS Quadrangle Base maps 7.5 minute series, C.I. =10 feet National Geodetic Vertical Datum of 1929.
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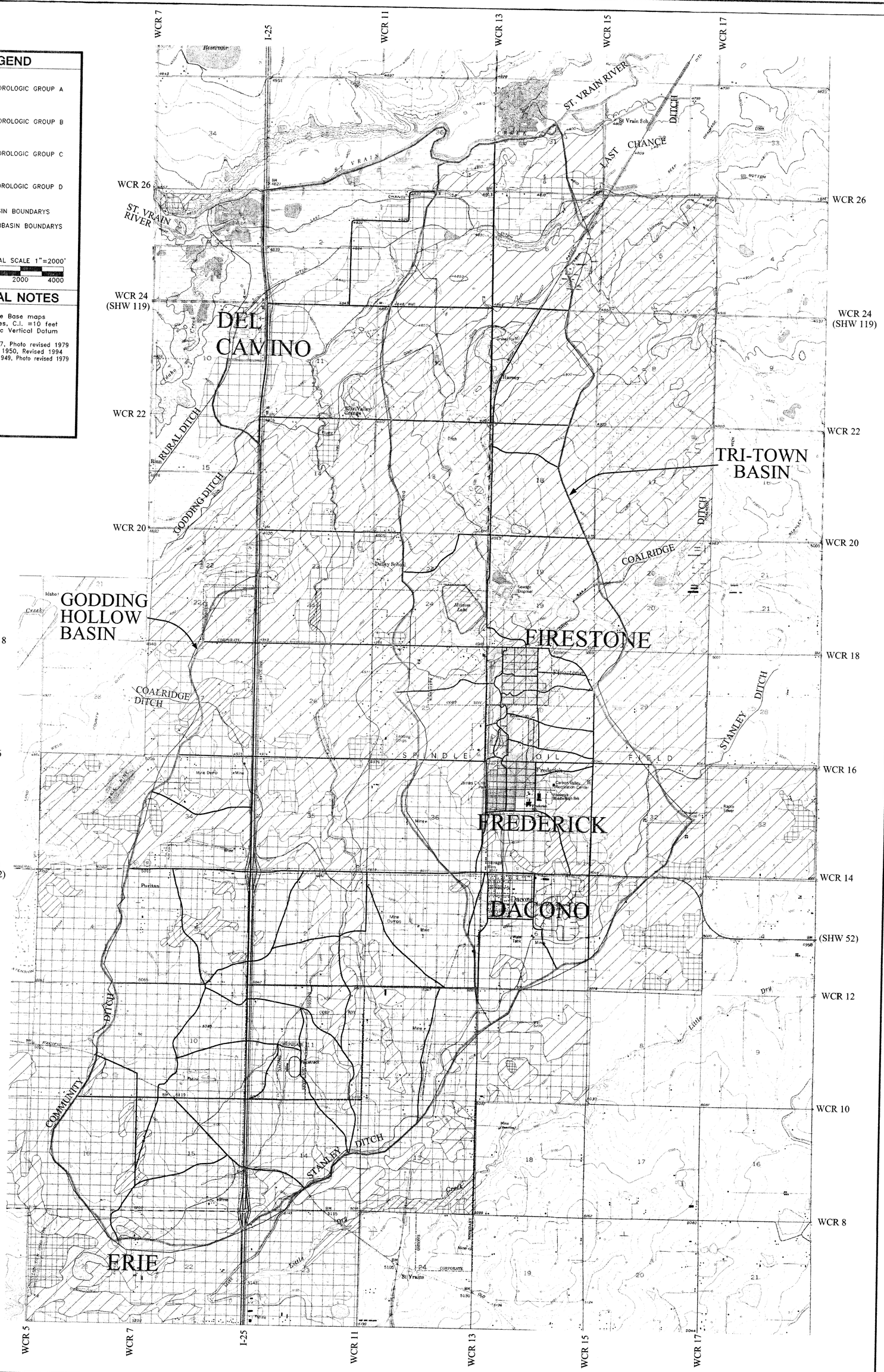

TST, INC Consulting Engineers 748 Whalers Way Building D Fort Collins, CO 80525 (970)226-0557 Metro (303)595-9103 Fax (970)226-0204	PROJECT NUMBER: COWELDO1 ACAD FILE: COWELD_SOIL DATE: 3/2/99 REVISED: 09/07/99	DRAWN BY: MRC DESIGNED BY: CJP CHECKED BY: BAA	Anderson Consulting Engineers, Inc *Civil • Water Resources • Environmental* 2900 S. College Avenue, Suite 3B, Fort Collins, CO 80525 Phone (970) 226-0120 / Fax (970) 226-0121

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GREELEY, COLORADO 80632

I-25 CORRIDOR MASTER DRAINAGE PLAN

SOIL MAP

SHEET 4/4 SHEETS

PROJECT NOTEBOOK
for
I-25 CORRIDOR MASTER DRAINAGE PLAN
SOUTH WELD COUNTY, COLORADO
VOLUME 1 OF 2, GODDING HOLLOW BASIN

PREPARED FOR:

Weld County
Public Works Department
933 North 11th Avenue
Greeley, CO 80632

PREPARED BY:

Anderson Consulting Engineers, Inc.
2900 S. College Avenue, Suite 3B
Fort Collins, CO 80525
(ACE Project No. COWELD01)

December 6, 1999

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I

DRAINAGE FACILITIES INVENTORY/ANALYSIS

I-A

INVENTORY SUMMARY

Project Notebook Table 1. Inventory of Existing Drainage Facilities - Godding Hollow Basin

Facility Name and/or Type	Location [UDSWMM ID]	Condition	Structure Dimensions	Maximum Storage Volume (acre-ft)	Maximum Discharge Capacity[1] (cfs)	Existing Condition Peak 2-Year Discharge (cfs)	Existing Condition Peak 10-Year Discharge (cfs)
MAIN CHANNEL							
WCR 26 RCB	Between WCR 11 and WCR 13 [202]	fair	span=8.5' rise=3'	N/A	210	560	1,890
Last Chance Ditch Flume	Between WCR 11 and WCR 13 [202]	poor	width=12' length=30'	N/A	370	560	1,890
WCR 24 Arch CMP	Between I-25 and WCR 11 [203]	fair	span=8' rise=6'	N/A	240	290	1,000
WCR 22 Arch CMP	Between I-25 and WCR 11 [204]	fair	span=7.5' rise=6'	N/A	300	280	980
Godding Ditch Bridge/Flume	S. of WCR 22 [204]	fair	width=60' length=8.5'	N/A	3,000	280	980
WCR 20 Arch CMP	Between I-25 and WCR 11 [205]	fair	span=8' rise=6'	N/A	210	290	980
WCR 18 Arch CMP	Between I-25 and WCR 11 [206]	fair	span=8' rise=6'	N/A	190	300	960
WCR 16 Arch CMP	Between I-25 and WCR 11 [207]	fair, vegetation, encroachment	span=8' rise=6'	N/A	160	250	860
SHW 52 Pond and RCB Outlet	Between I-25 and WCR 11 [308]	good	span=8' rise=6'	58	1,000	220	750
Coalridge Ditch Pond and RCB Outlet	0.2 miles S. of SHW 52 [309]	good, some sediment blockage	span=7' rise=7'	32	790	200	780
WCR 12 CMP	Between I-25 and WCR 11 [210]	fair, vegetation, encroachment	diam.=3'	N/A	60	180	780
I-25 E. Frontage Road Timber Bridge	N. of WCR 10 E. side of I-25 [213]	good	span=3@20' rise=5.5'	N/A	2,050	40	260
I-25 Triple Barrel RCB	N. of WCR 10 on I-25 [213]	good	span=2@11' 1@14' rise=6'	N/A	2,460	40	260
West WCR 10 Arch CMP	Between I-25 and WCR 11 [216]	poor, vegetation, scour	span=3.5' rise=2'	N/A	40	20	160
UPRR Timber Bridge	S. WCR 10, between WCR 7 and I-25 [217]	good	span=3@13' rise=2.5'	N/A	1,450	20	120
OTHER TRIBUTARY STRUCTURES							
I-25/WCR 18 Pond with Twin RCP Outlets	Between WCR 16/18 at I-25 [341]	fair	diam.=2' diam.=3'	170	140	40	80
I-25/SHW 52 Pond RCP/CMP Outlet	0.15 miles N. of SHW 52 at I-25 [321]	fair, undersized outlet	diam.=3'	82	90	5	60
East WCR 10 CMP	WCR 10, S. of Speedway [236]	fair	diam.=4'	N/A	70	80	370
I-25 Double Barrel RCB	N. of WCR 8 on I-25 [237]	fair, 1 foot of deposition	span=10' rise=3'	N/A	430	70	310

PRR Spur Pond and Outlet	N. of WCR 8 and W. of I-25 [237]	fair	no outlet	26	530	0	150

CMP

[1]Maximum discharge capacity prior to street overtopping, assuming no obstructions

I-B

INVENTORY OF STRUCTURES

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/20/99
Task: ACE Project No.: CO-WELD-01

Structure Identification GODDING HOLLOW
Name: Rural Wasteway (Irrigation lateral off of the Last Chance Ditch)
Number: Godding Hollow Basin
Location: WCR 26
Type: RCB

Geometry
Diameter: N/A
Width: 8.5'
Height: 3.2'
Length: 22' (perpendicular to road)
Skew: 30°
Headwall
U/S: Square edge
D/S:
Wingwalls
U/S: none
D/S: none

Setting
XSEC Location:
Erosion Protection
U/S: Grass vegetation
D/S: Concrete rubble
Channel Configuration
U/S: Straight
D/S: From 20' to 60' d/s of road, channel drops 10-15' over a concrete debris structure.

Condition
Structure Material: concrete, good condition
Scour/Deposition
U/S: 1.3' of scour u/s of lip
D/S: none
Channel Banks
U/S: grass covered @ 1.5:1 (6' high banks) (11' bottom width, 25' top width) → typical XS
D/S: concrete rubble protection @ 1:1 slopes
Vegetation
U/S: grass
D/S: none
Debris Potential: low
Freeboard/Spill Location: left bank

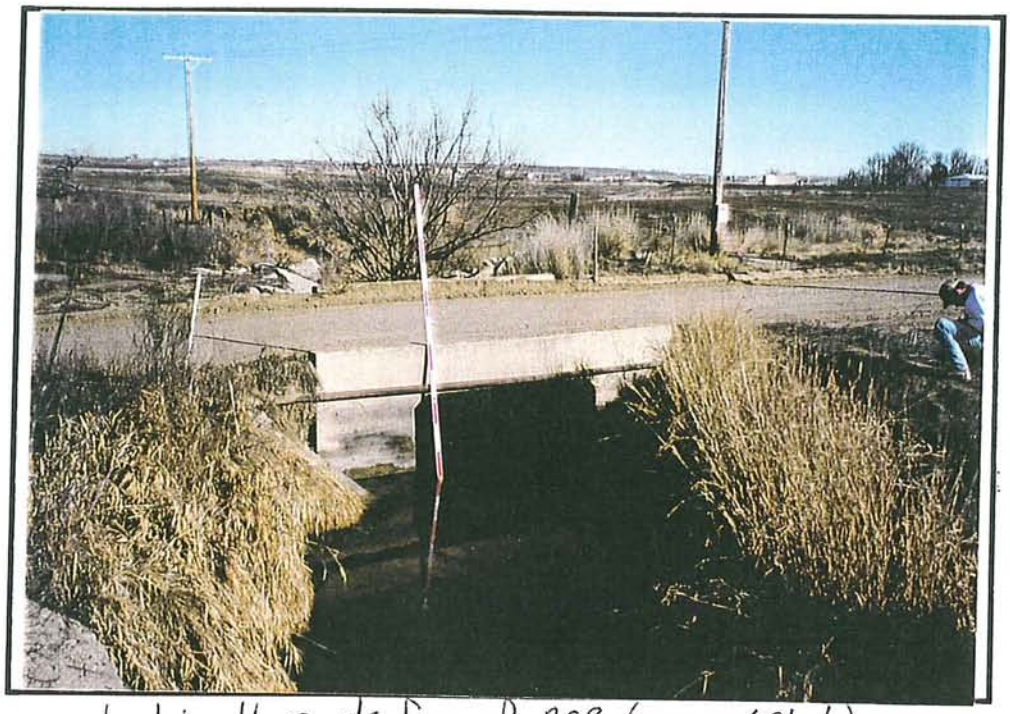
Comments: 1' thick concrete floor in structure
3" steel pipe running parallel to structure @ u/s face
flow control structure u/s of RCB (approx. 30')

Structure Type: RCB Location: WCR 26 Station: _____

Rural Waste way

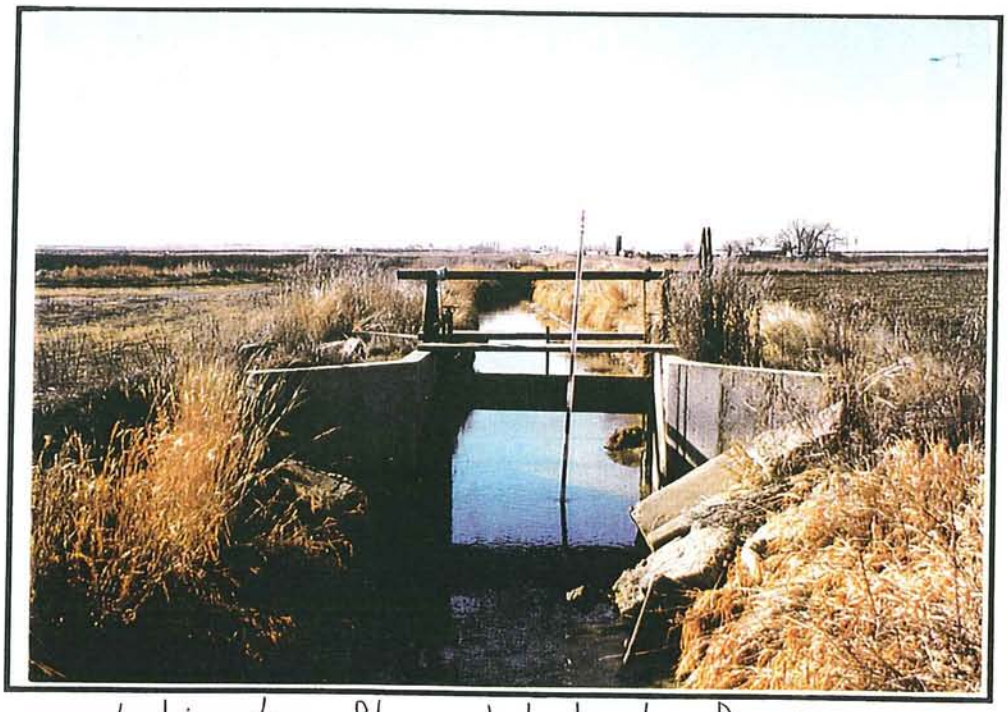
Godding Hollow

Photograph: Roll # 1 Photo # 1



Looking d/s @ u/s face of RCB (approx. 60' u/s)

Photograph: Roll # 1 Photo # 2

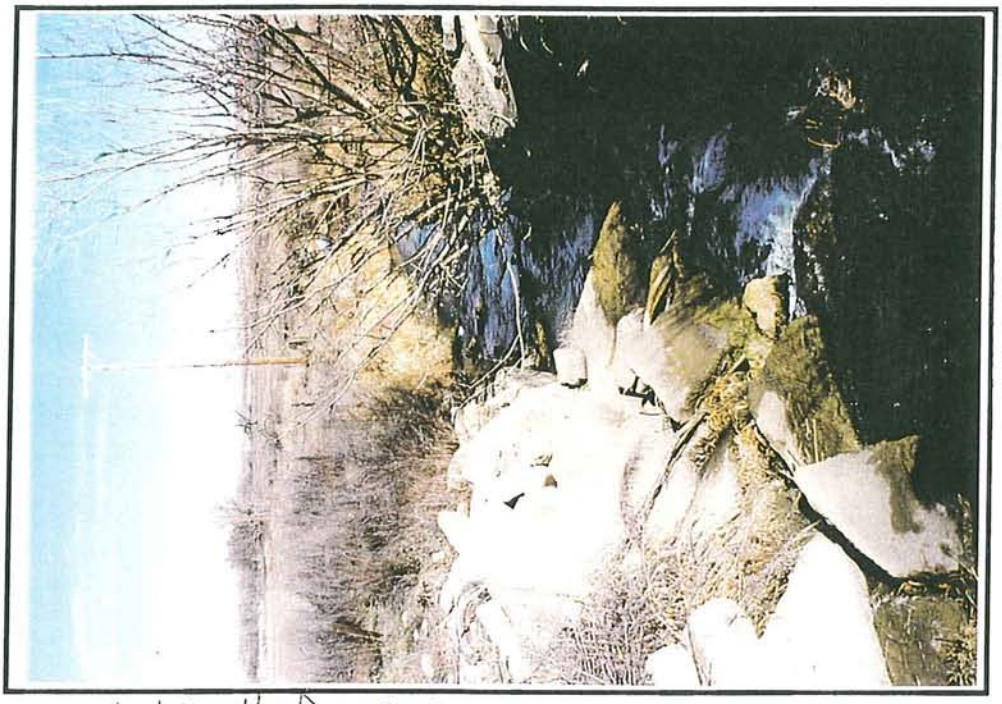


Looking u/s @ flow control structure from RCB

Structure Type: RCB Location: Rural Waterway WCR 26 Station:

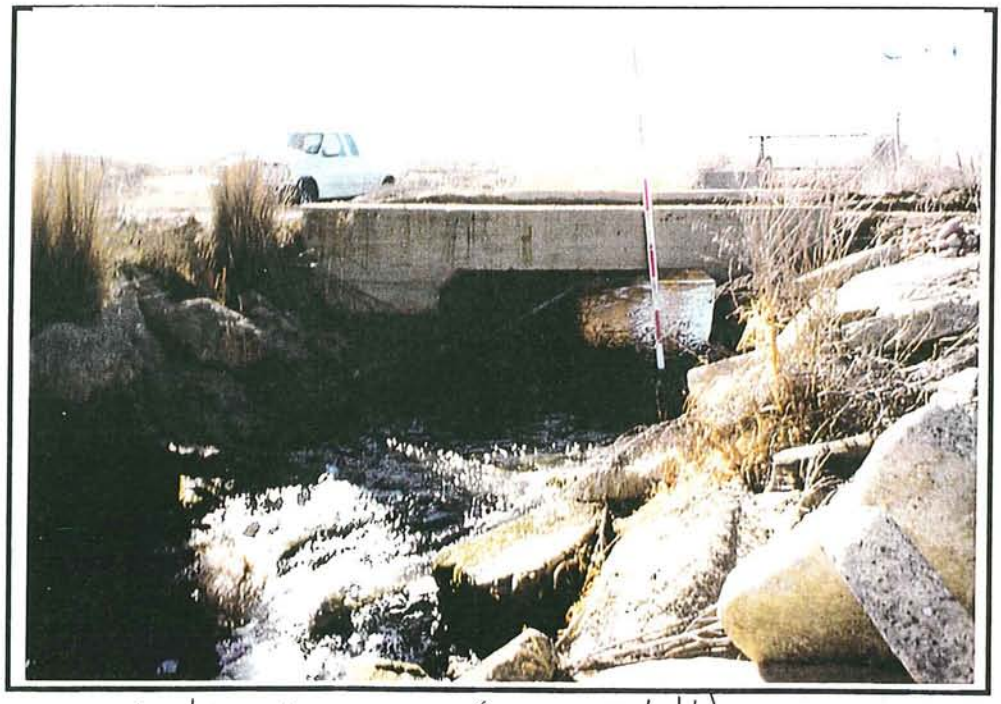
Godding Hollow

Photograph: Roll # 1 Photo # 3



Looking dls from RCB

Photograph: Roll # 1 Photo # 4



Looking uls @ RCB (approx. 20' dls)

STRUCTURE INVENTORY FORM

Project Name: WELD COUNTY I-25 MDP Date: 10/28/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: GODDING HOLLOW (RURAL WASTEWAY)
Number:
Location: AT CROSSING OF LAST CHANCE DITCH, APPROX. 300 ft U/S WCR 26
Type: CONCRETE FLUME OVER LAST CHANCE DITCH

Geometry

Diameter: N/A
Width: 12'
Height: 3.0'
Length: 30'
Skew: N/A
Headwall
U/S: N/A
D/S: N/A
Wingwalls
U/S: NONE
D/S: NONE

Setting

XSEC Location: N/A
Erosion Protection
U/S: NONE
D/S: CONCRETE DEBRIS ON CHANNEL BANKS, Poor Condition.
Channel Configuration
U/S: Straight, Rectangular Shape 6'=BW
D/S: Straight Bend to Left D/S, Rectangular Shape, 8'-20'±BW

Condition

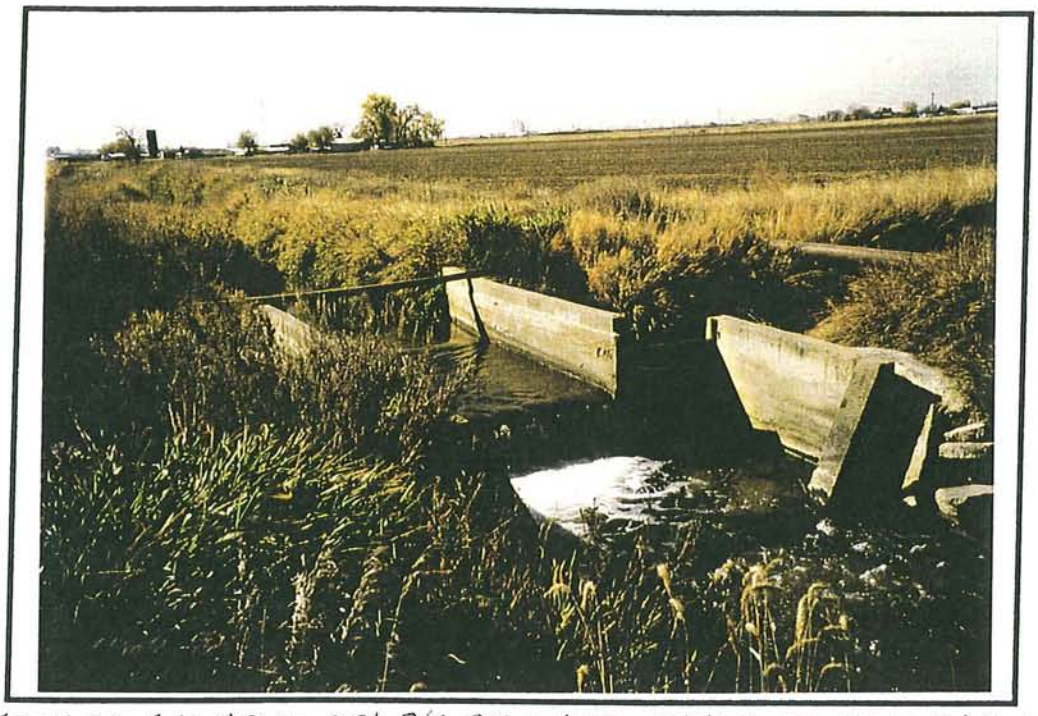
Structure Material: Concrete Good Condition (Apr. 22, 1958 inscribed top wall N.W. corner)
Scour/Deposition
U/S: Fine Silts & Sands on Channel bottom
D/S: Some fines more along banks
Channel Banks
U/S: 5-6' High @ ≈ 0.5:1 Side Slopes
D/S: 5-6' High @ ≈ 0.5:1 Side Slopes
Vegetation
U/S: Heavy Veg. on banks, Grasses
D/S: Banks Covered with 3-4' grasses
Debris Potential:
Freeboard/Spill Location: ≈3.5' Height of concrete flume Walls, banks U/S higher still

Comments: Waste Way ≈ 4' wide on left bank, Concrete Stilling box immediately D/S of Flume, Normal Water Mark ≈ 8-10" From Floor in Flume

GODDING HOLLOW (RURAL WATERWAY)

Structure Type: CONCRETE FLUME Location: OVER LAST CHANCE DITCH Station:

Photograph: Roll # 6 Photo # 1



FROM RB GH APROX. 30' D/S OF LAST CHANCE DITCH, LKS. U/S AT FLUME

Photograph: Roll # 6 Photo # 2

FROM LB GH AT U/S END OF FLUME, LKS D/S

GODDING HOLLOW (RURAL WASTEWAY)

Structure Type: CONCRETE FLUME Location: OVER LAST CHANCE DITCH Station: _____

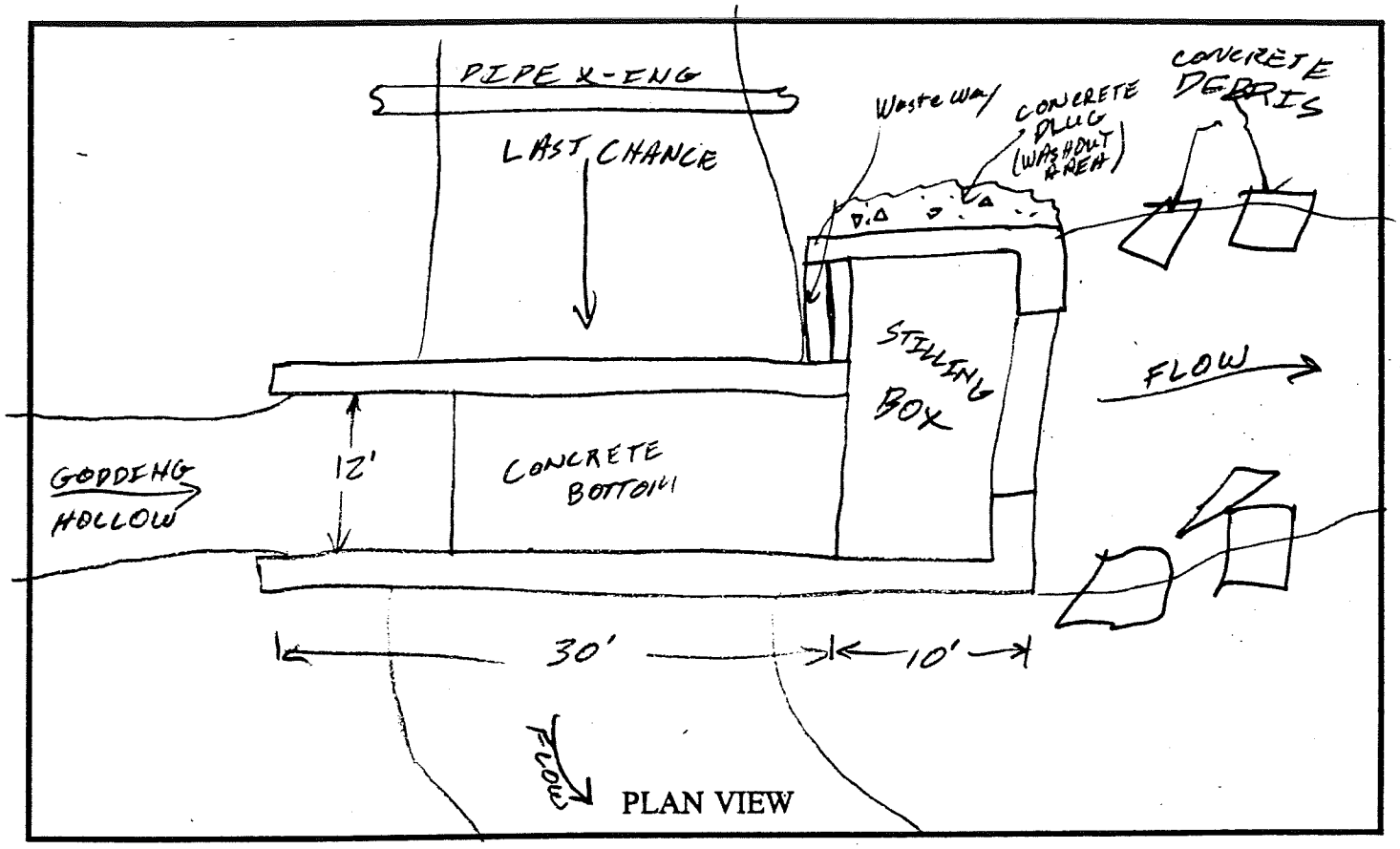
Photograph: Roll # 6 Photo # 3

FROM LB LAST CHANCE DITCH ≈ 20' U/S GH FLUME, LKG. D/S AT CONCRETE FLUME.

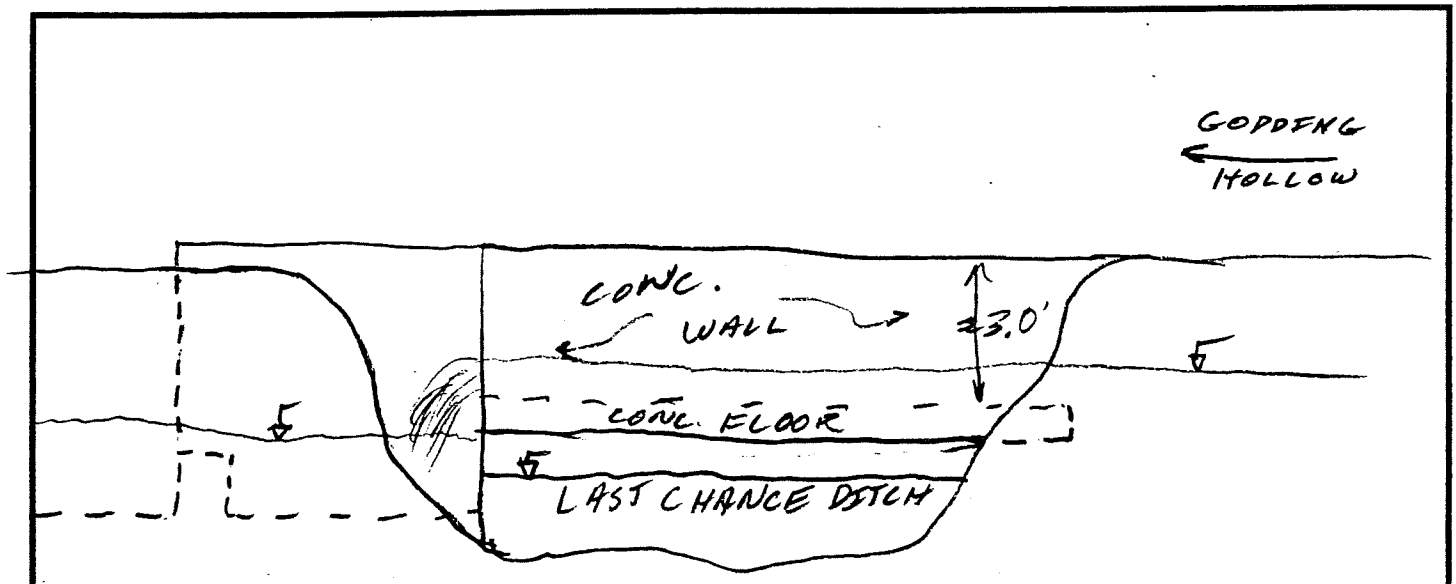
Photograph: Roll # 6 Photo # 4

FROM LB LAST CHANCE DITCH ≈ 30' D/S FLUME, LKG. U/S AT FLUME.

Structure Type: CONCRETE FLUME Location: GODDING HOLLOW (RURAL WASTEWAY) OVER LAST CHANCE DITCH Station: _____



PLAN VIEW



LOOKING DOWNSTREAM ALONG LAST CHANCE DITCH

ELEVATION or PROFILE

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/29/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Godding Hollow
Number:
Location: Approx. 1/2 mile east of WCR 9 3/4
Type: G. H. channel dumps into ditch (confluence area; no structure)

Geometry
Diameter:
Width:
Height:
Length:
Skew:
Headwall
U/S:
D/S:
Wingwalls
U/S:
D/S:

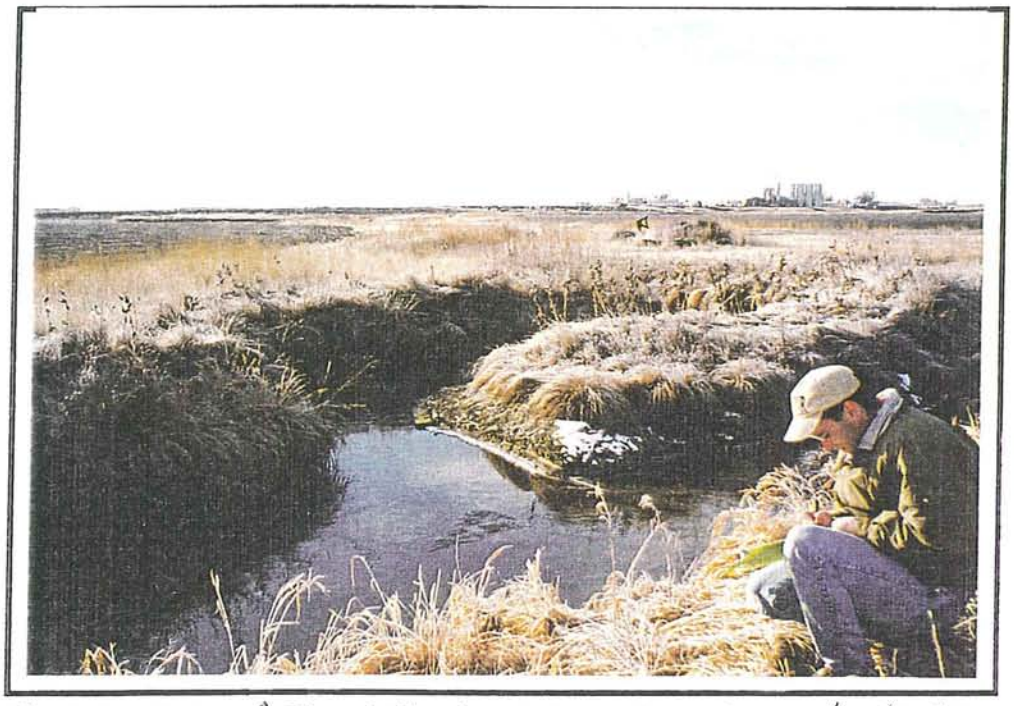
Setting
XSEC Location:
Erosion Protection
U/S:
D/S:
Channel Configuration
U/S: 3-5' wide channel, sinuous, incised, top width ~10'
D/S: ↳ 3-4' below existing ground

Condition
Structure Material:
Scour/Deposition
U/S: silty-clay
D/S:
Channel Banks
U/S: near vertical
D/S:
Vegetation
U/S: thick weeds along banks
D/S:
Debris Potential: low
Freeboard/Spill Location: ~4' & spill laterally along ditch

Comments: All flow from G. H. is dumped into the Rural Ditch and routed downstream (see sketch on back).

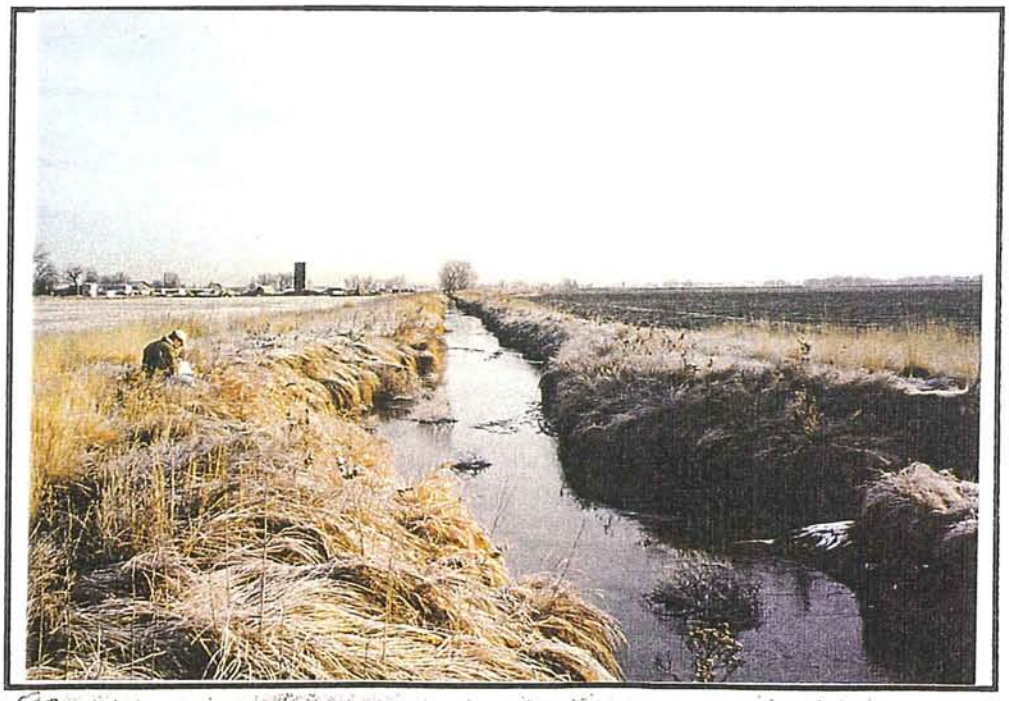
Structure Type: Channel Location: GODDING HOLLOW AT CONFLUENCE WITH RURAL DITCH Station: _____

Photograph: Roll # 3 Photo # 15



FROM LT. BNK. of Rural Ditch, LKG, South and U/S Along Godding Hollow.

Photograph: Roll # 3 Photo # 16



FROM LT. BANK OF RURAL DITCH
APPRX. 50 FEET U/S OF GODDING HOLLOW CONFLUENCE,
LKG. N.E. AND D/S ALONG RURAL DITCH

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/20/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Gadding Hollow Creek
Number:
Location: WCR 24
Type: Arch pipe (plated) corrugated

Geometry
Diameter: N/A
Width: 7.7'
Height: 5.7'
Length: 40'
Skew: 45° (high flow); none @ low flow
Headwall
U/S: sheet pile (top is 2' above pipe, 8' wide)
D/S: none
Wingwalls
U/S: sheet pile (45° angle, 9' long)
D/S: none

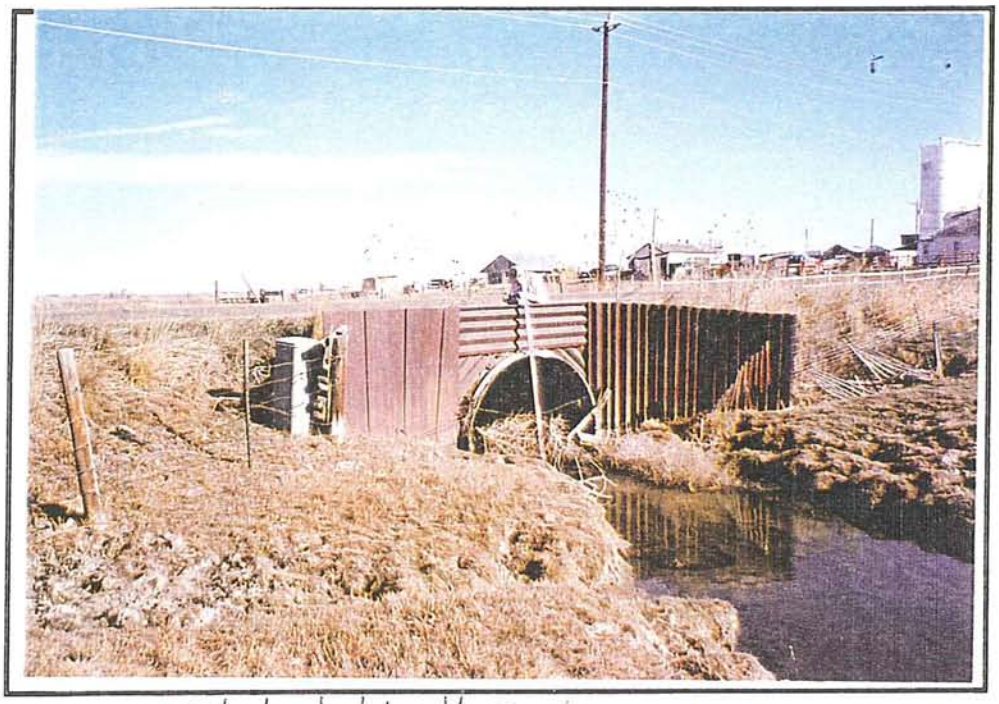
Setting
XSEC Location:
Erosion Protection
U/S: none
D/S: none
Channel Configuration
U/S: straight, slightly incised 3-4'
D/S: straight, slightly incised 3-4', high LB (leveed up 6')

Condition
Structure Material: corrugated metal, good
Scour/Deposition
U/S: heavily silty-clayey ~~deposition~~ in channel bottom
D/S: " " " " "
Channel Banks
U/S: flat, pasture grassland, cattle-trampled
D/S: grasses, high LB, gently sloping upward RB
Vegetation
U/S: overbanks - pasture land, barren, little grass
D/S: native grasses - LB; grasses - RB
Debris Potential: low
Freeboard/Spill Location: u/s - LB; overtop across WCR 24 on LB for approx 1000' - ~~1500~~'

Comments: channel very - none
buried telephone line @ u/s end across channel (runs b/t headwall and WCR 24)

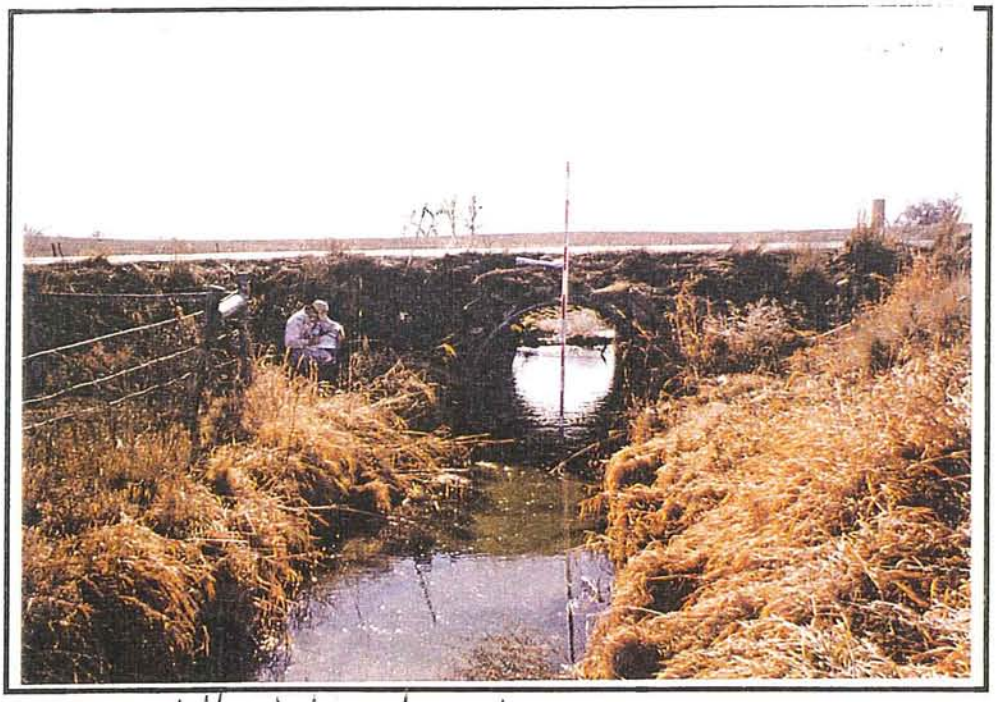
Structure Type: Plated arch CMP Location: NCR 24 Station:
Godding Hollow

Photograph: Roll # 1 Photo # 5



45' uls, looking dls @ pipe

Photograph: Roll # 1 Photo # 6



45' dls, looking uls @ pipe

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/20/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Godding Hollow
Number:
Location: WCR 22
Type: plated arch culvert

Geometry
Diameter:
Width: 7.5'
Height: 6'
Length: 90'
Skew: none
Headwall
U/S: none
D/S: none
Wingwalls
U/S: none
D/S: none

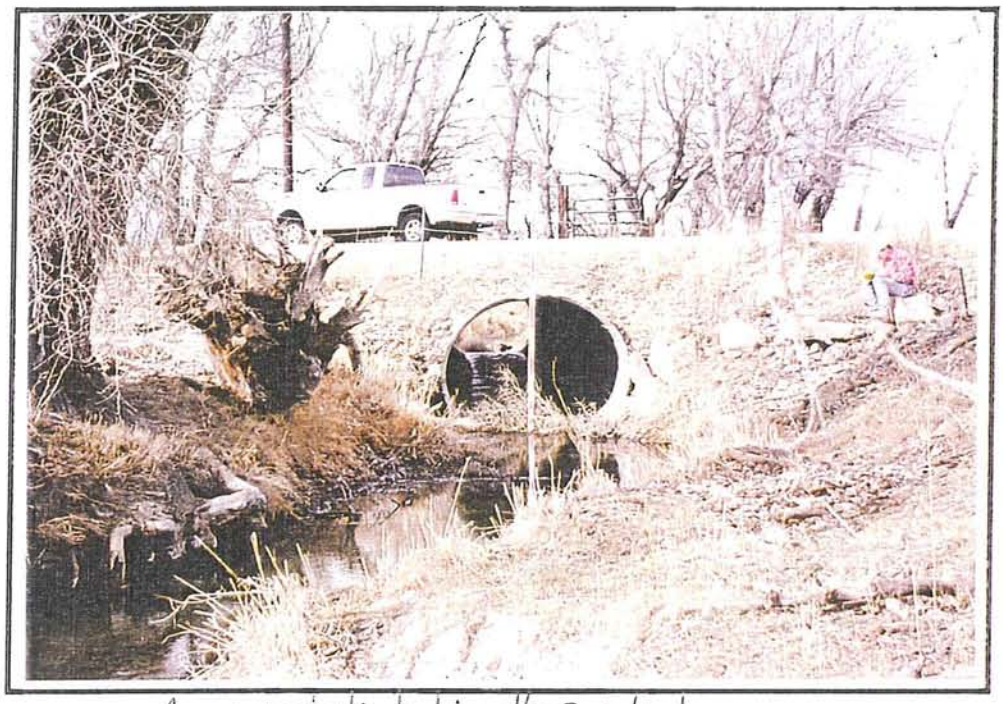
Setting
XSEC Location:
Erosion Protection
U/S: none
D/S: light red sandstone; $D_{50} \simeq 12''$ - scattered
Channel Configuration
U/S: incised silty-clayey bed channel w/ 5-6' banks
D/S: incised, more sand and gravel

Condition
Structure Material: corrugated metal, good
Scour/Deposition
U/S: none
D/S: 1' of undercutting @ invert
Channel Banks
U/S: 2:1, stable
D/S: 2.5:1, stable
Vegetation
U/S: grasses and weeds
D/S: more weeds, riprap immediately below culvert, trees along LB
Debris Potential: low-moderate (large cottonwood trees along creek)
Freeboard/Spill Location: RB ditch; overtops WCR22 along RB

Comments: channel more sinuous u/s (low flow)

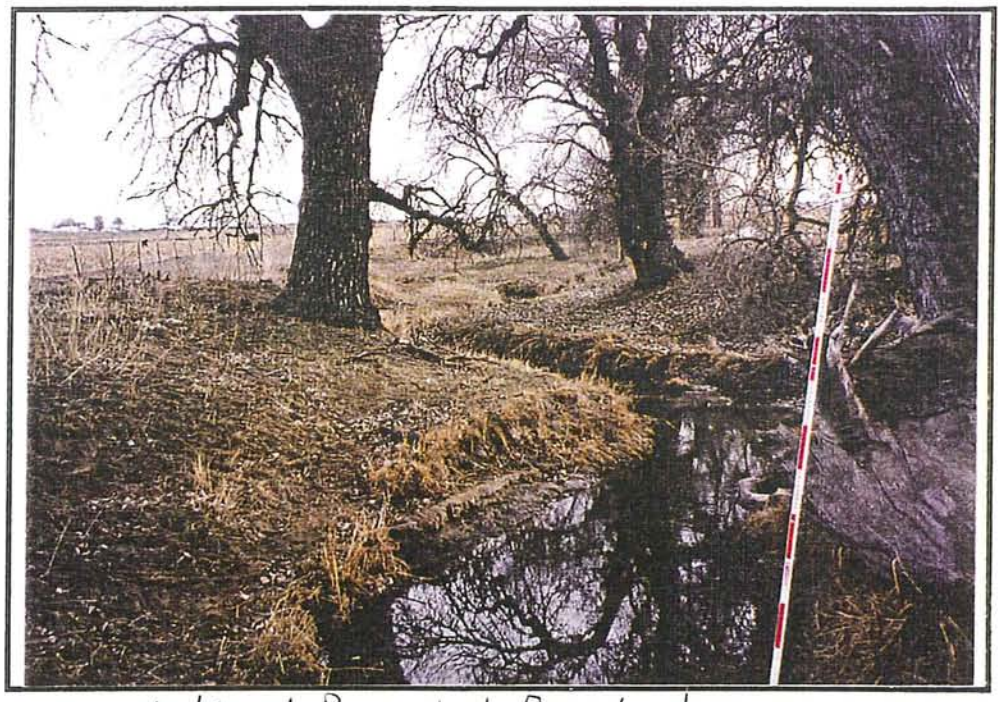
Structure Type: Plated arch pipe Location: WCR 22 Station: _____
Godding Hollow

Photograph: Roll # 1 Photo # 8



Approx. 100' u/s looking d/s @ culvert

Photograph: Roll # 1 Photo # 9

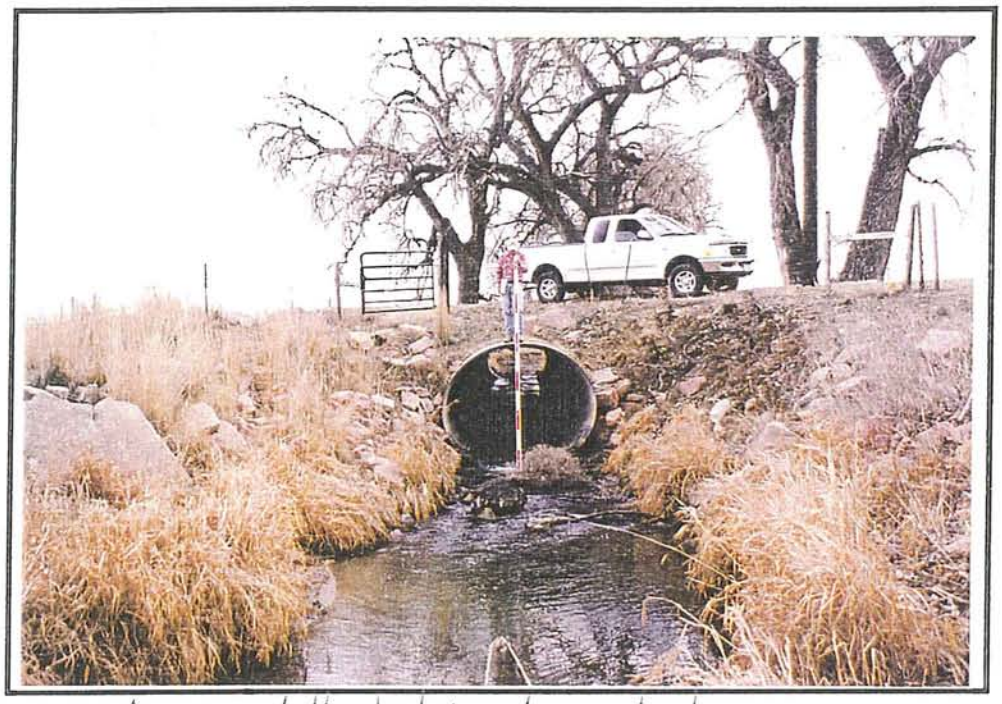


Looking u/s from culvert from u/s side

Structure Type: Plated arch pipe Location: WCR 22 Station: _____

Godding Hollow

Photograph: Roll # 1 Photo # 10



Approx. 100' dls looking uls @ culvert

Photograph: Roll # 1 Photo # 11

Standing on LB looking dls from culvert

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/20/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: Godding Hollow
Number:
Location: Godding Ditch south of WCR 22
Type: Flume crossing G.H. (carries flow over G.H.) - clear span crossing
• wasteway
• sand trap

Geometry

Diameter: N/A
Width: 60' (abutment to abutment)
Height: see notes on profile
Length: 85' U/S Face to D/S Face
Skew: none
Headwall
U/S: none
D/S: none
Wingwalls
U/S: RB -30° from ℄ of flume LB - 80° from ℄ of flume
D/S: RB- " " " " " LB - " " " " "

Setting

XSEC Location:
Erosion Protection
U/S: none
D/S: some concrete rubble on LB (drainage wasteway on LB)
Channel Configuration
U/S: slightly sinuous; incised 2-3', clays and silts, overbank relief
D/S: " " " " " "

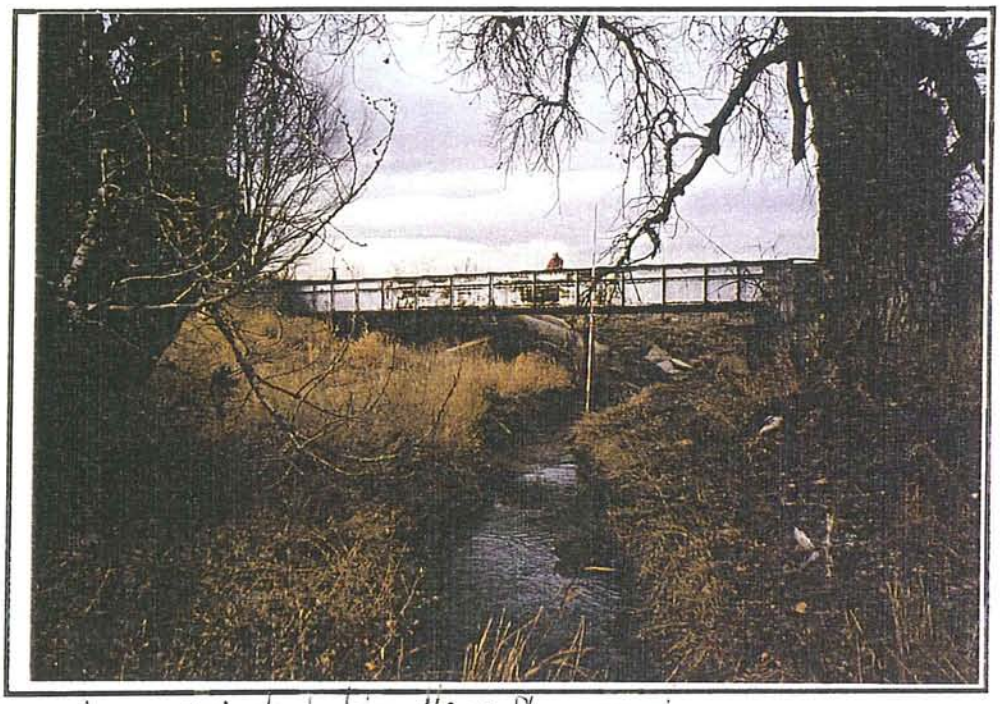
Condition

Structure Material: steel, old
Scour/Deposition
U/S: none
D/S: none
Channel Banks
U/S: ineffective/pending area in LOB; RB steeper (2:1)
D/S: more open (overbank relief); 3:1
Vegetation
U/S: mostly weeds; a couple of cottonwoods
D/S: grasses, scattered weeds
Debris Potential: low
Freeboard/Spill Location: @ crossing

Comments: minor culvert approx. 150' u/s; poor condition (squashed)
dist from overbank to low chord = 6.2'
ditch is perched above Godding Hollow

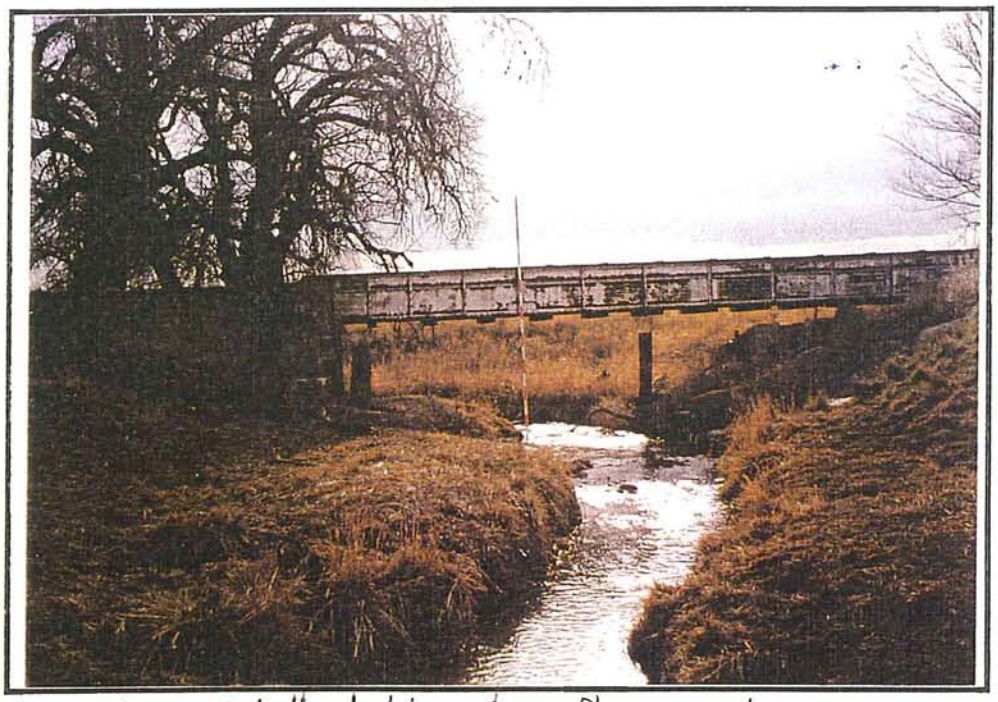
Structure Type: Flume / clear span crossing Location: Ditch south of Godding WCR22 Godding Hollow Station: _____

Photograph: Roll # 1 Photo # 12



Approx. 90' uls looking dls @ flume crossing

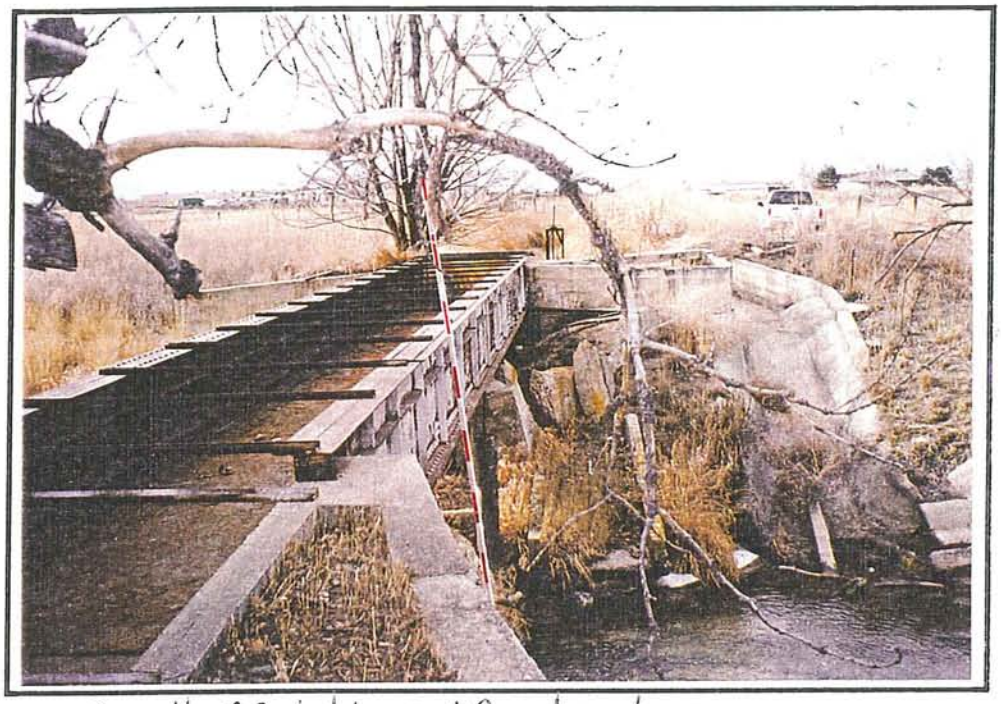
Photograph: Roll # 1 Photo # 13



Approx. 75' dls looking uls @ flume crossing

Structure Type: Flume / clear span crossing Location: Ditch south of Godding WCR22 Godding Hollow Station: _____

Photograph: Roll # 1 Photo # 14

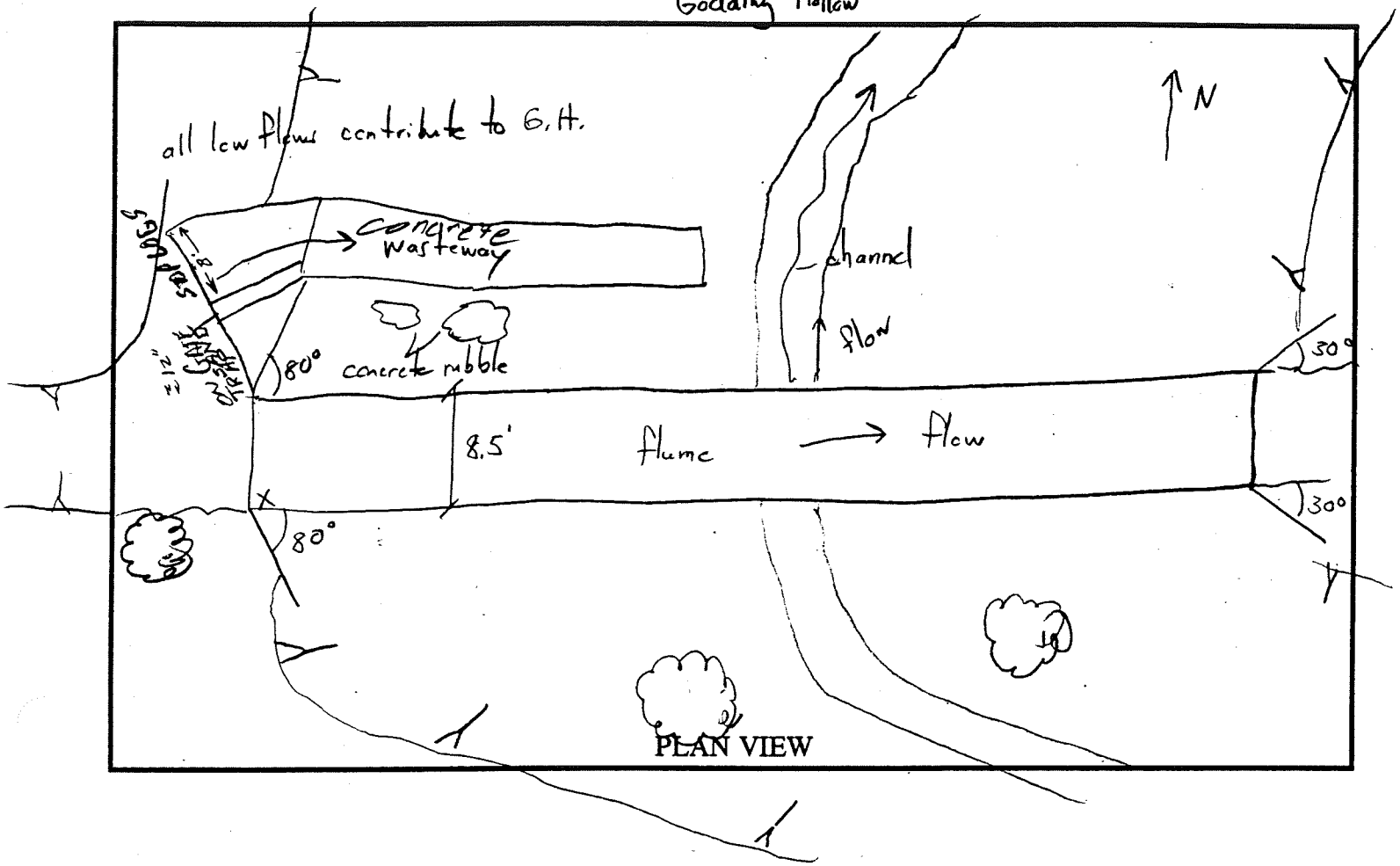


From d/s RB looking @ LB and waste way

Photograph: Roll # _____ Photo # _____

Structure Type: Flume/ clear span crossing Location: Ditch south of WCR22 Station: _____

Godding Hollow



PLAN VIEW

RB

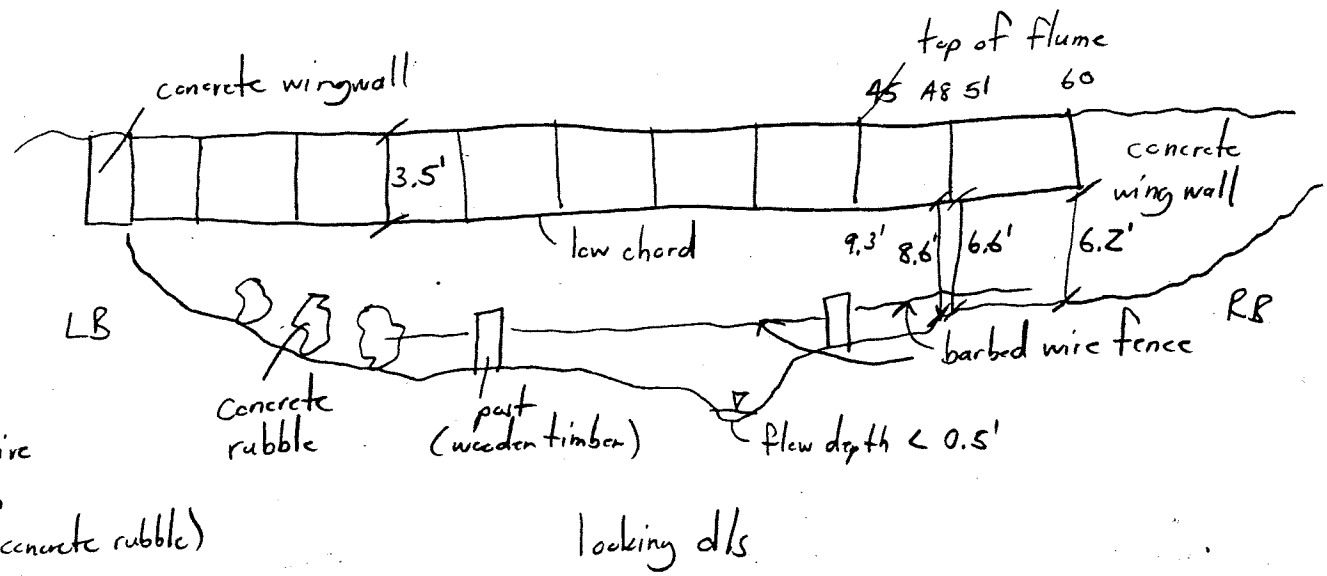
STA	Dist from ground to low chord (ft)
60	6.2
51	6.6
48	8.6
45	9.3
40	9.8
39	7.4
27	6.4

↓

rest of XS ineffective f' e to brouwage (concrete rubble)

8	5.0
0	2.5

LB



ELEVATION or PROFILE

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/20/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Godding Hollow
Number:
Location: WCR 20
Type: plated arch CMP

Geometry
Diameter: N/A
Width: 7.7'
Height: 5.7'
Length: 55'
Skew: none
Headwall
U/S: none
D/S: none
Wingwalls
U/S: none
D/S: none

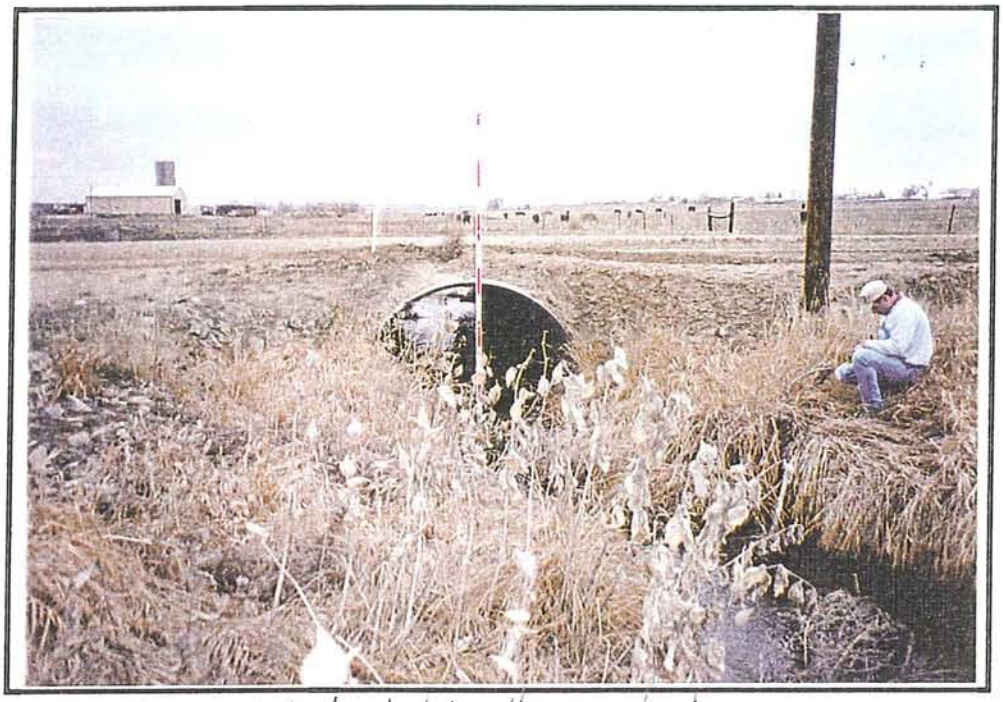
Setting
XSEC Location:
Erosion Protection
U/S: none
D/S: none
Channel Configuration
U/S: incised 2'; silty-clayey bed, some gravel, straight
D/S: incised 3'; meandering, 5' wide, 5-6' top width

Condition
Structure Material: corrugated metal, good
Scour/Deposition
U/S: none; 0.3' of deposition in culvert
D/S: none
Channel Banks
U/S: generally flat; banks are 3-4' high above bed, plowed fields of overbank
D/S: 2-3' above bed; flat pasture land
Vegetation
U/S: thick weeds; lone cottonwood approx. 100' u/s next to oil tank
D/S: none - burned off (generally pasture grasses)
Debris Potential: moderate (weeds)
Freeboard/Spill Location: overtop LB approx. 50' u/s of culvert & through roadside ditch culvert
Comments: on u/s side, roadside drainage comes into G.H. (culverts on both sides)

overtop 20 approx. 150' from G.H.

Structure Type: Plated Arch CMP Gadding Hollow Location: WCR20 Station: _____

Photograph: Roll # 1 Photo # 15



Approx. 40' u/s looking d/s @ culvert

Photograph: Roll # 1 Photo # 16

Approx. 50' d/s looking u/s @ culvert

Structure Type: Plated Arch CMP Location: WCR20 Station: _____
Godding Hollow

Photograph: Roll # 1 Photo # 17

From WCR20 looking ups @ channel ℄

Photograph: Roll # 1 Photo # 18

From WCR20 looking dns @ channel ℄

STRUCTURE INVENTORY FORM

Project Name: Weld County 1-25 MDP Date: 1/20/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: Godding Hollow
Number:
Location: WCR 18
Type: Plated arch CMP

Geometry

Diameter: N/A
Width: 7.8'
Height: 6'
Length: 60'
Skew: none
Headwall
U/S: none
D/S: none
Wingwalls
U/S: none
D/S: none

Setting

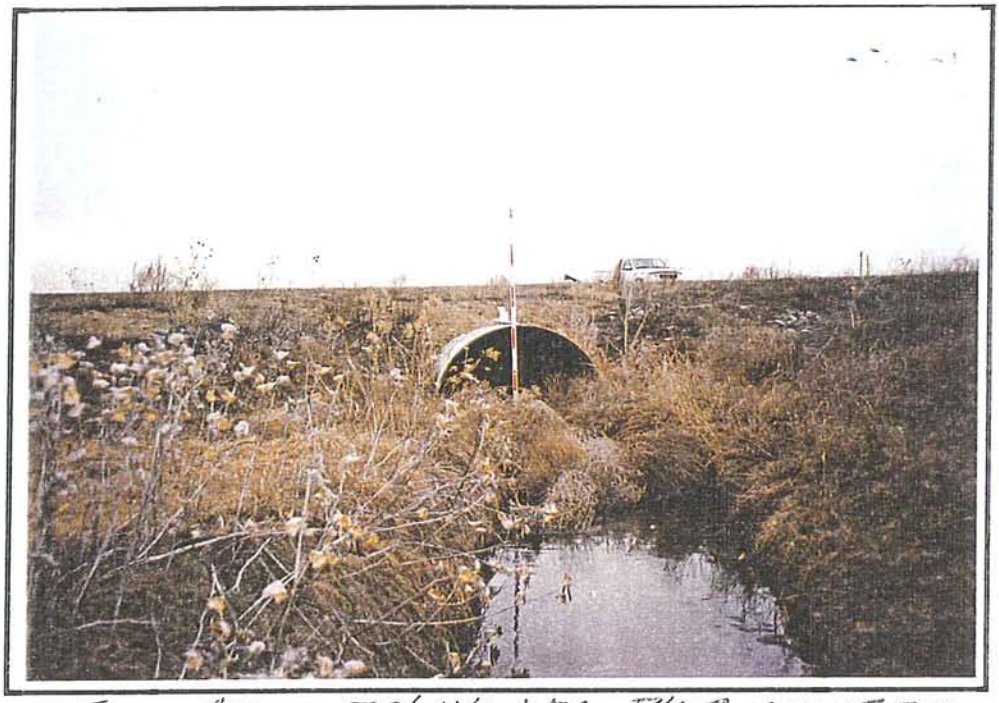
XSEC Location:
Erosion Protection
U/S: none
D/S: none
Channel Configuration
U/S: sandy-clayey bed, 5' wide channel, 2-3' banks, fairly straight, incised 2'
D/S: " " -gravelly bed, 3-4' " " 3-4' " , more sinuous, " "

Condition

Structure Material: corrugated metal, good
Scour/Deposition
U/S: none
D/S: 1' of scour d/s of invert
Channel Banks
U/S: generally flat (3-4:1); elevated fields on both sides
D/S: 3-4' vertical banks, flatter (3:1) overbanks, development encroaching along RB
Vegetation
U/S: thick grasses and weeds, several tumbleweeds @ u/s end of culvert
D/S: thick grasses and weeds
Debris Potential: moderate (weeds)
Freeboard/Spill Location: 2.5' from crown to top of road along CMP ℄
= O.T. LB to u/s road ditch, O.T. WCR 18 approx. 200-300' from culvert
Comments: telephone cable crossing along u/s face through channel
22' width of road pavement

Structure Type: Plated Arch CMP Location: GODDING HOLLOW WCR 18 Station: —

Photograph: Roll # 1 Photo # 19



From Approx. 50' U/S LEG. D/S @ CULVERT

Photograph: Roll # 1 Photo # 20

FROM 45' D/S LEG. U/S @ CULVERT

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MOP Date: 1/20/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: Godding Hollow
Number:
Location: WCR16
Type: Plated arch CMP

Geometry

Diameter: N/A
Width: 7.7'
Height: 5.7' (0.7' of silty-clay deposition) (assumed)
Length: 40'
Skew: none
Headwall
U/S: none
D/S: none
Wingwalls
U/S: none
D/S: none

Setting

XSEC Location:
Erosion Protection
U/S: none
D/S: none
Channel Configuration
U/S: slightly meandering, incised 1', silty-clay-y bed, 3' wide
D/S: " " , " " , " " , " "

Condition

Structure Material: corrugated metal, good
Scour/Deposition
U/S: 1' of deposition @ u/s invert
D/S: 2' of deposition @ d/s invert
Channel Banks
U/S: approx. 2:1, 20-30' top width, then flat overbanks
D/S: flatter LB, steeper (1:1) RB, approx. 20' wide
Vegetation
U/S: thick grasses and weeds
D/S: " " " "
Debris Potential: moderate (weeds) tumbleweeds
Freeboard/Spill Location: 2' of freeboard O.T. LB of channel across oil service road to u/s roadside ditch, OT WCR16 150' from culvert

Comments: opening approx. 50% blocked by RB

Structure Type: Plated Arch CMP Location: GOODING HOLLOW WKR 16 Station: _____

Photograph: Roll # 2 Photo # 21

From Left Bank Approx. 45' U/S LKG. D/S at Culvert

Photograph: Roll # 1 Photo # 22

From Left Bank Approx. 30' D/S LKG. U/S at Culvert

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/21/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: Godding Hollow
Number: Structure Not At A Major Road Crossing
Location: Approx. 1/3 mile south of WCR 16 (dirt road crossing for oil derrick)
Type: CMP

Geometry

Diameter: 6'
Width: —
Height: —
Length: 55'
Skew: none
Headwall
U/S: none
D/S: none
Wingwalls
U/S: none
D/S: none

Setting

XSEC Location:
Erosion Protection
U/S: large concrete rubble on RB, nothing on LB
D/S: none
Channel Configuration
U/S: silty-clayey bed, deeply incised (8-10'), slightly meandering
D/S: " " " " " " "

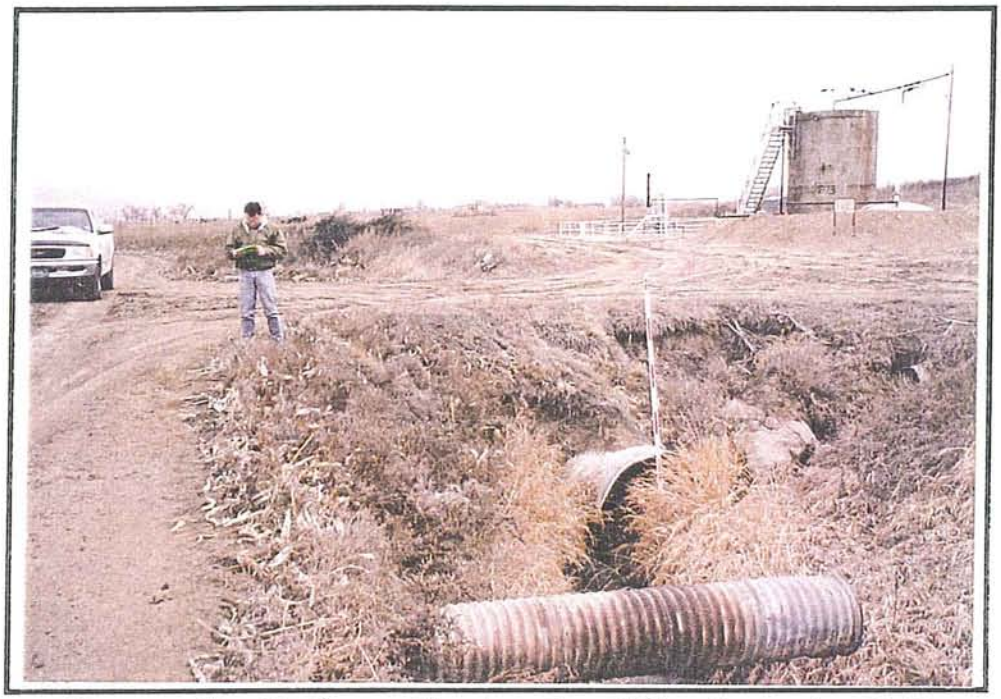
Condition

Structure Material: corrugated metal, good
Scour/Deposition
U/S: some deposition on u/s side (piping around culvert)
D/S: 3' of deposition in culvert (" " " causing some bank failure @ culvert)
Channel Banks
U/S: steep (1.5:1)
D/S: " (1:1)
Vegetation
U/S: thick weeds and grasses
D/S: " " " "
Debris Potential: moderate
Freeboard/Spill Location: 4-5'; spill across road

Comments: road crossing in middle of farm land

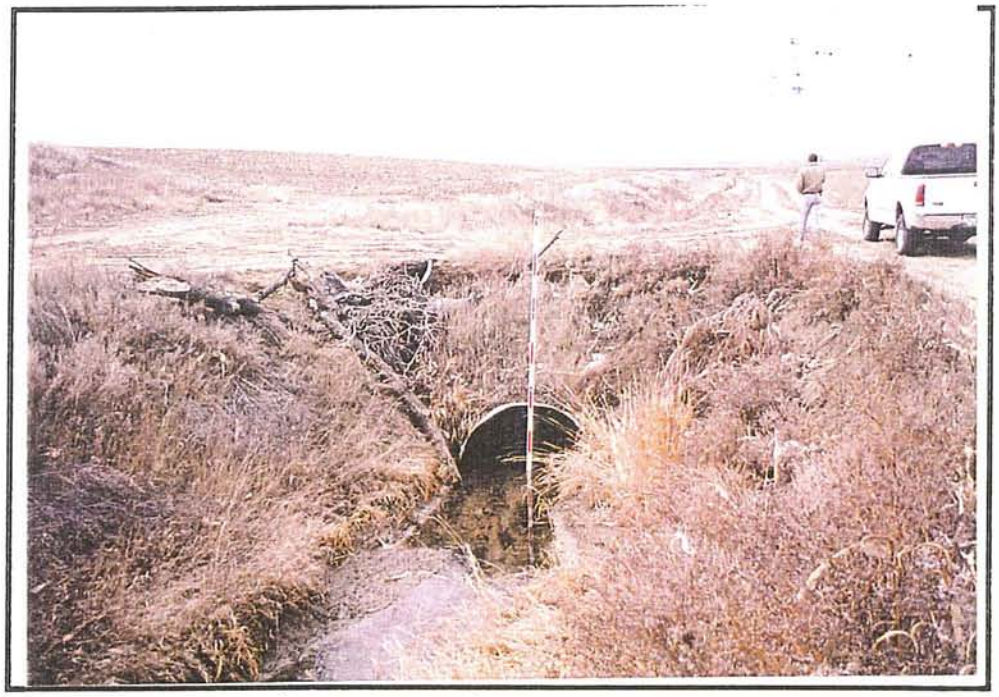
Structure Type: 6' Dia CMP Location: GODDING HOLLOW 1/3 mile S. WCR16 Station: _____

Photograph: Roll # 1 Photo # 23



FROM LB 50 ft U/S LKG D/S @ CULVERT

Photograph: Roll # 1 Photo # 24



From LB 50 ft D/S LKG. U/S @ CULVERT

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/21/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Gadding Hollow
Number:
Location: Approx. 1/3 mile north of Highway 52, Structure Not At A Major Road Crossing
Type: CMP

Geometry
Diameter: 6'
Width: N/A
Height: N/A
Length: 60'
Skew: none
Headwall
U/S: none
D/S: none
Wingwalls
U/S: none
D/S: none

Setting
XSEC Location:
Erosion Protection
U/S: Some concrete rubble on LB, nothing on RB
D/S: none
Channel Configuration
U/S: silty-clayey bed, deeply incised (8-10'), slightly sinuous thalweg
D/S: " " " " " (6-8'), " " " 3' channel)

Condition
Structure Material: corrugated metal, good
Scour/Deposition
U/S: none
D/S: 2.5' of dep. in culvert
Channel Banks
U/S: some bank failures u/s RB, erosion from field runoff on LB near headwall, steep (1:1)
D/S: banks are flatter (1.5:1), no notable failures
Vegetation
U/S: thick weeds, scattered grasses
D/S: " " " "
Debris Potential: moderate (weeds)
Freeboard/Spill Location: ~2'; near inlet and then over road on LB and back into Ch. D/S

Comments: - culvert coming in on LB near inlet causing erosion; maybe piping around culvert (culvert approx. 1' dia.)
- LB encroaches on culvert inlet
- runoff from farm fields collected in 6-12" CMPs and dumped into various points along channel

Structure Type: 6' CMP Location: GODDING HOLLOW Approx 1/3 mile North of HWY 52 Station: _____

Photograph: Roll # 1 Photo # 25

From LB 50 feet u/s, LRG D/S @ Culvert

Photograph: Roll # 2 Photo # 1

From LB 60' d/s, looking u/s @ culvert

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/21/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: Godding Hollow
Number:
Location: State Highway 52
Type: RCB

Geometry

Diameter: N/A
Width: 8'
Height: 8.1'
Length: ~~87'~~ (72' from TST survey data) (72' from ACE taping on 3/30/99)
Skew: 45° (low-flow channel) coming from RB to LB into culvert
Headwall
U/S: none (1:1 bevel on top 0.15' thick)
D/S: none (1:1 bevel on top)
Wingwalls
U/S: 45° concrete flare
D/S: 45° concrete flare

Setting

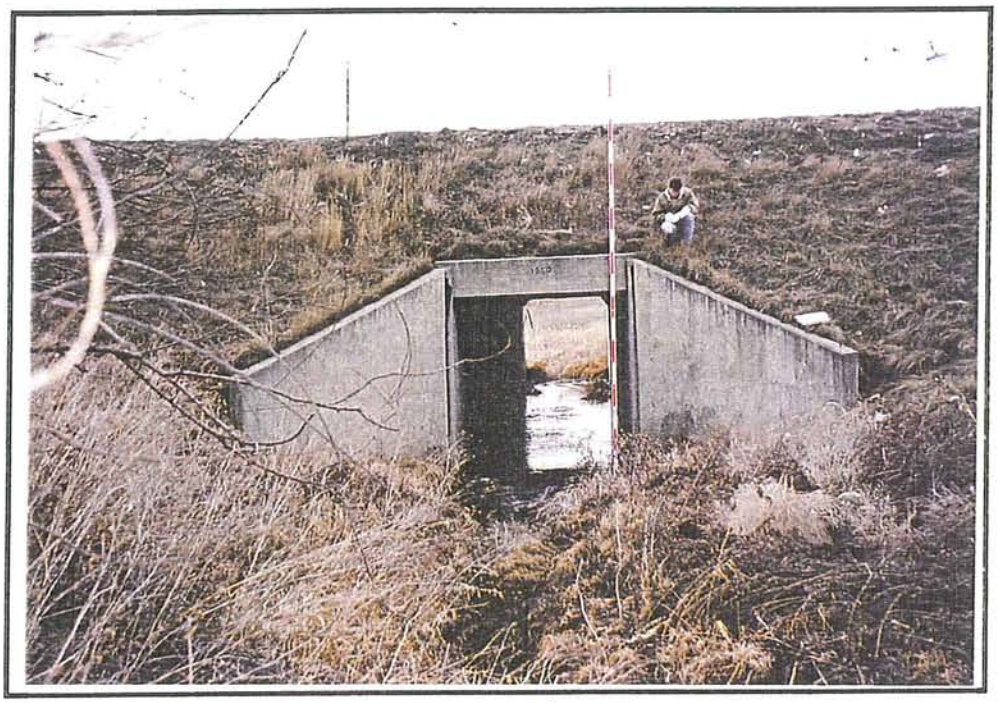
XSEC Location:
Erosion Protection
U/S: none
D/S: none
Channel Configuration
U/S: more sinuous, silty-clayey bed, 3-4' channel incised ~1'
D/S: silty-clayey bed, slightly sinuous, 2-3' channel, incised 2-3'

Condition

Structure Material: concrete, good (date of 1960) - some cracking
Scour/Deposition
U/S: slight deposition into culvert (~0.1-0.2')
D/S: slight scour hole dls at lip of concrete floor (floor ~2' thick) no undermining of floor hole ~2.5' down from floor
Channel Banks
U/S: very flat (4:1)
D/S: flatter (3:1) immediately dls of culvert for approx. 50', then more vertical (2:1)
Vegetation
U/S: thick weeds, cat-tails along RB, scattered brush along LB
D/S: thick grasses and weeds
Debris Potential: moderate (weeds)
Freeboard/Spill Location: 10', culvert crown well below road grade, spill location well west of culvert (approx. 1500' down LB
↳ from culvert crown to top of road
Comments:
normal high water mark 12-18" above floor in culvert
high water mark ~4' " " " "

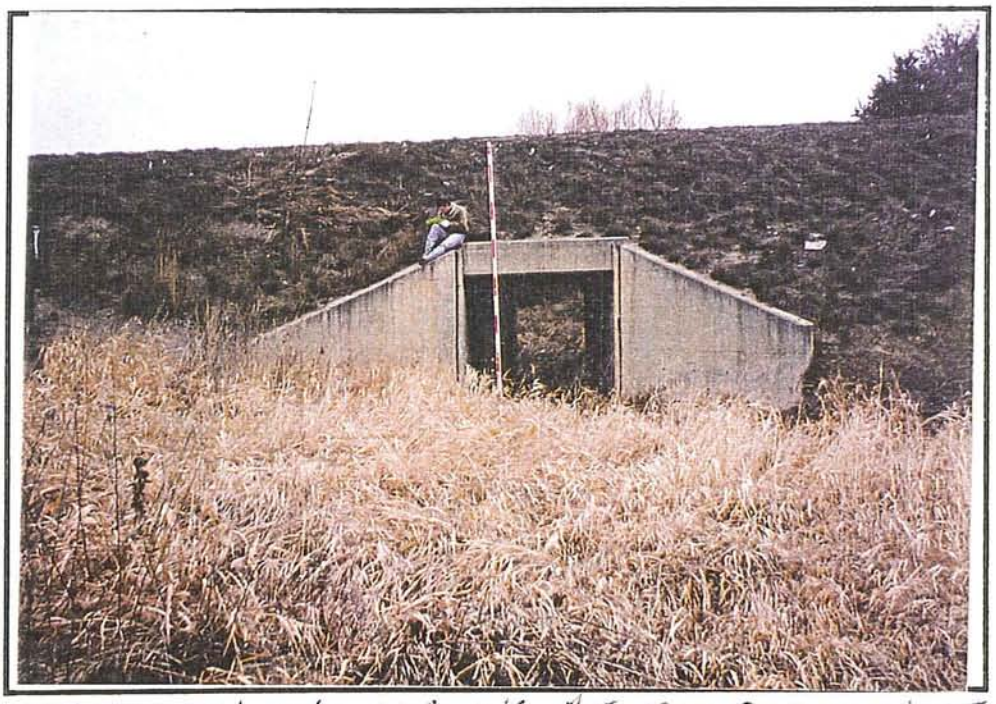
Structure Type: 1- 8'x8' RCB Location: GODDING HOLLOW State HWY 52 Station: _____

Photograph: Roll # 2 Photo # 2



FROM RB 70' D/S, LKG. U/S AT 1960 BOX CULVERT

Photograph: Roll # 2 Photo # 3



FROM LB 60' U/S, LKG. D/S AT 1960 BOX CULVERT

Structure Type: 8'x8' RCB Location: Godding Hollow SHWSZ Station:

Photograph: Roll # 5 Photo # 12A

Looking u/s of SHWSZ

Photograph: Roll # 5 Photo # 13A

Looking d/s of SHWSZ

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/21/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Godding Hollow
Number:
Location: 0.2 mile south of SH52 (RCB crosses under canal)
Type: RCB

Geometry
Diameter: N/A
Width: 7'
Height: 7'
Length: 90'
Skew: 60° (from parallel to headwall to channel alignment)
Headwall
U/S: none (45° bevel on top; 0.1' high)
D/S: none
Wingwalls
U/S: 15° from ℄ of RCB (27' from RCB outlet to edge, then 15' flare out (tie-back
D/S: 15° from ℄ of RCB (27' from RCB outlet to edge, then 15' flare out (tie-back

Setting
XSEC Location:
Erosion Protection
U/S: none (some riprap in channel, D_{50} ~ 6")
D/S: some riprap (D_{50} ~ 6") in channel, otherwise nothing
Channel Configuration
U/S: slightly sinuous, 2-3' channel, incised 2', silty-clayey bed
D/S: slightly sinuous, 3' channel, incised 2-3', silty-clayey bed

Condition
Structure Material: concrete, good
Scour/Deposition
U/S: 0.4' of dep. @ u/s face; inlet apron - 2' of dep.
D/S: 0.4' of dep. @ d/s face; outlet apron - 3-4' of dep.
Channel Banks
U/S: flat (3:1) beyond wingwalls 100' top width
D/S: flat (4:1) beyond the wingwalls, higher LB (2:1) d/s
Vegetation
U/S: thick weeds, cattails
D/S: thick weeds, cattails
Debris Potential: moderate (weeds)
Freeboard/Spill Location: 2-3', spills along LB 200-300' from culvert

Comments: normal high water mark ~24" @ u/s end
0.5' high, 45° corners in RCB running entire length of culvert

Structure Type: 1-7'x7' RCB & WASTEWAY

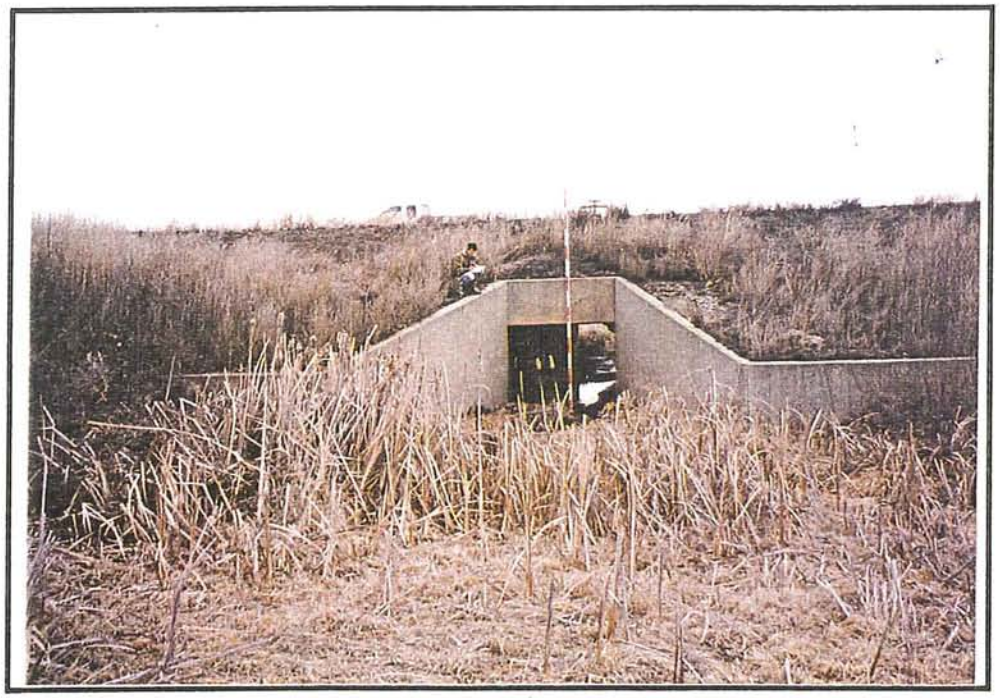
Location: GODDING HOLLOW NCWCB DITCH ¼ Mi. U/S S.H. 52

Station: _____

Photograph: Roll # 2 Photo # 4

FROM LB 110' D/S, LKG. U/S AT RCB CULVERT

Photograph: Roll # 2 Photo # 5



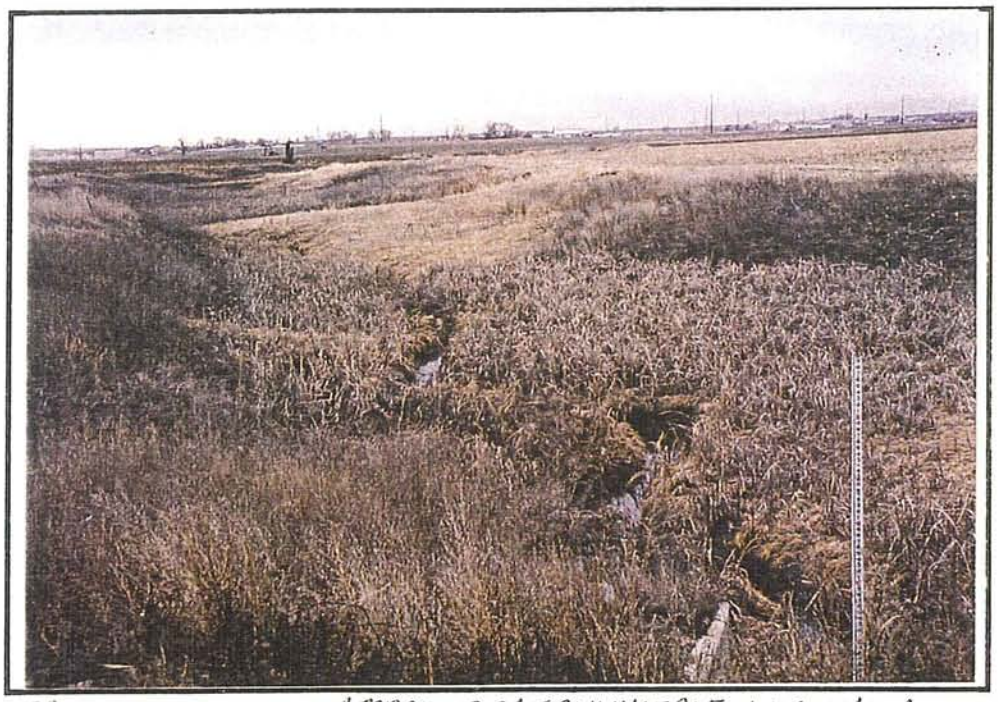
FROM LB 70' U/S, LKG. D/S AT RCB CULVERT

Structure Type: 1-7'x7' RCB Location: NCWCB DITCH GODDING HOLLOW Station: _____
& NCWCB DITCH WASTEWAY 1/4 MI. U/S S.H. 52

Photograph: Roll # 2 Photo # 6

FROM LB 200' U/S, LKG. D/S AT CULVERT & DITCH AT EDGE OF FIELD.

Photograph: Roll # 2 Photo # 7



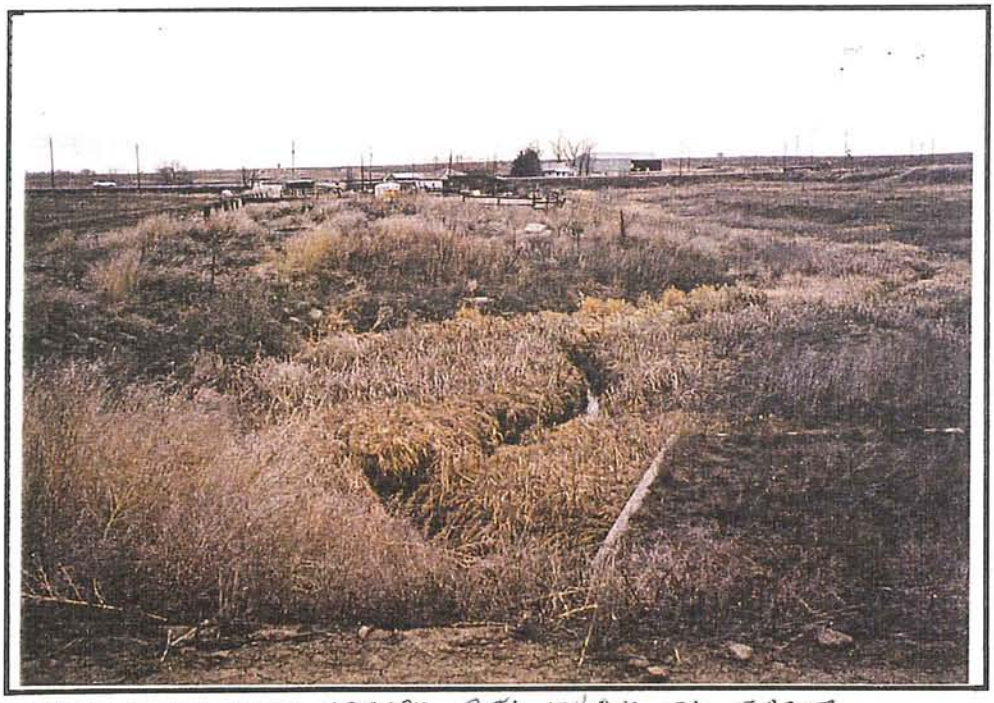
FROM ℄ CULVERT APPROX. 25' FROM U/S FACE, LKG. U/S AT CHANNEL AND BASIN.

Structure Type: 1-7'x7' RCB Location: GODDING HOLLOW NCWCB DITCH 1/4 MI. U/S S.R. 52 Station: _____

Photograph: Roll # 2 Photo # 8

FROM ℄ CULVERT APPROX. 25' FROM U/S FACE, LKG. D/S ACROSS CANAL AT DROP INLET (INTO RCB) WASTEWAY.

Photograph: Roll # 2 Photo # 9 & 10



FROM ℄ CULVERT APPROX. 25' FROM D/S FACE, LKG: D/S AT S.R. 52 and Channel.

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/21/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: Godding Hollow
Number:
Location: WCR 12
Type: CMP

Geometry

Diameter: 3'
Width: N/A
Height: N/A
Length: 40'
Skew: 80° (low flow channel comes from RB to LB) from ℄ of culvert to low flow channel
Headwall
U/S: none
D/S: none
Wingwalls
U/S: none
D/S: none

Setting

XSEC Location:
Erosion Protection
U/S: none
D/S: none
Channel Configuration
U/S: wide flat swale, silty-clayey bottom, more definition u/s
D/S: wide, flat swale, silty-clayey bottom, not really defined

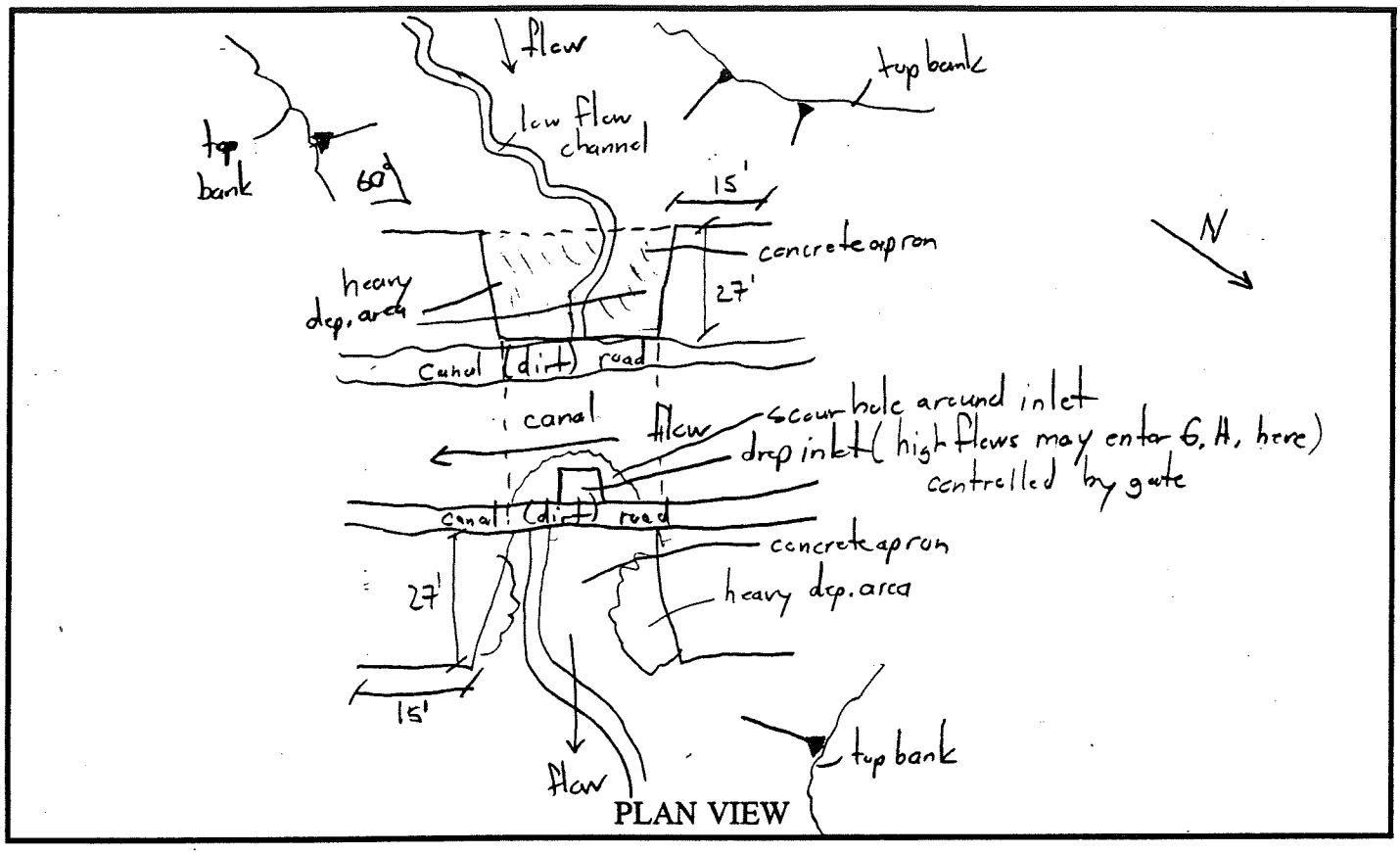
Condition

Structure Material: corrugated metal
Scour/Deposition
U/S: some dep in culvert (0.1-0.2')
D/S: some dep. in culvert (0.1-0.2')
Channel Banks
U/S: flat immediately u/s, then more defined banks (3:1) - car junkyard encroaches on floodplain
D/S: flat overbank areas (5:1)
Vegetation
U/S: thick w/ cattails
D/S: thick w/ cattails
Debris Potential: high (weeds & cattails)
Freeboard/Spill Location: 1.5', would spill @ culvert crossing

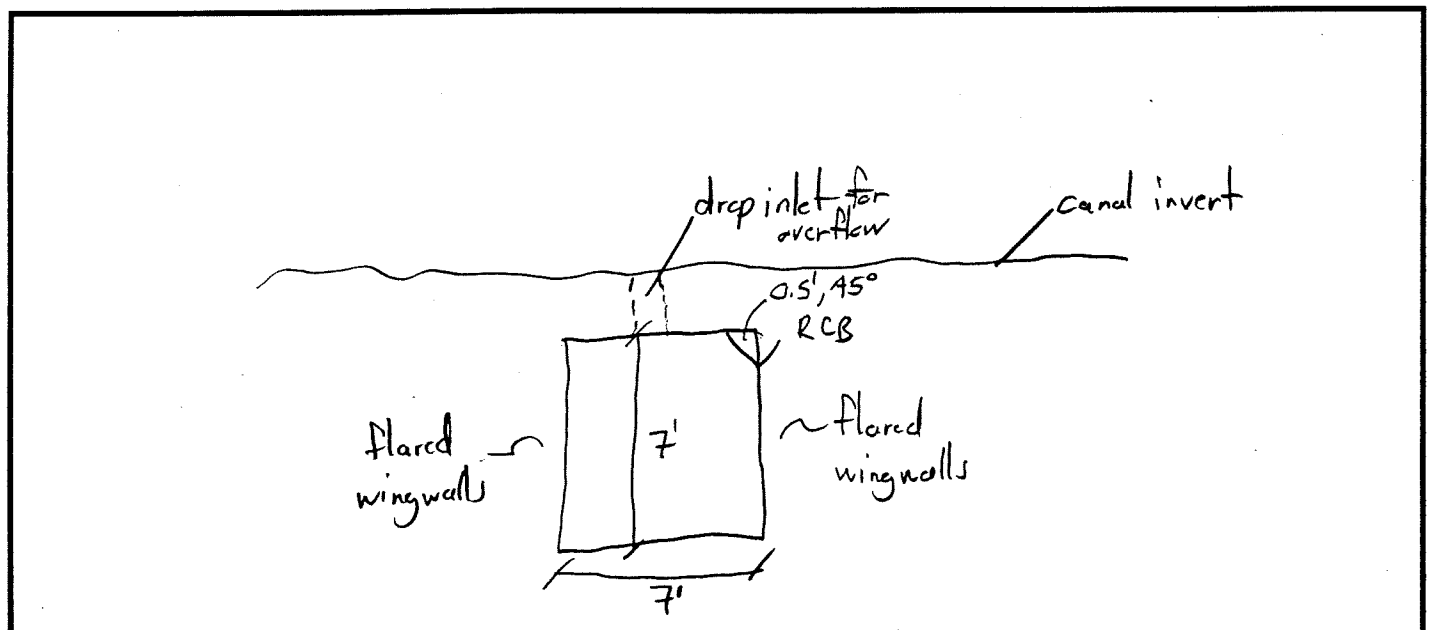
Comments: 10' chain link fence encroaching into floodplain along LB, then 1/4 mile u/s car junkyard encroaches floodplain

u/s side of culvert

Structure Type: RCB Location: 0.2 mile south of SH52 (RCB crosses under canal) Station:



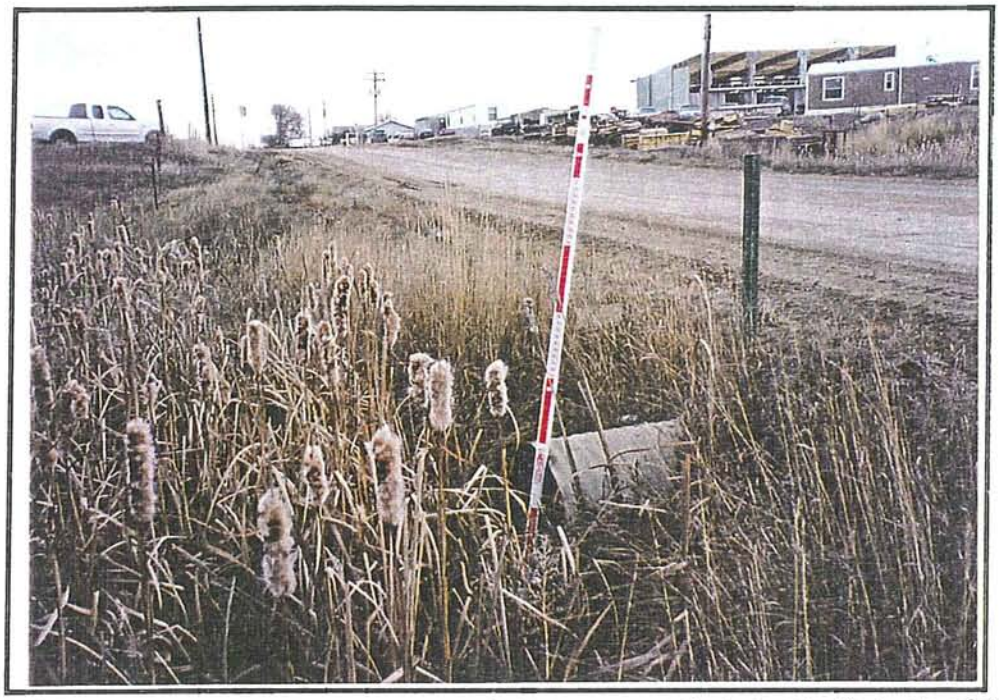
PLAN VIEW



ELEVATION or PROFILE

Structure Type: 3' CMP Location: GODDING HOLLOW WCR12 Station: _____

Photograph: Roll # 2 Photo # 11



FROM LB 5' D/S, LKG. AT CULVERT AND EAST APPROACH ROAD

Photograph: Roll # 2 Photo # 12

FROM LB of Thalweg 15' U/S, LKG. AT CULVER AND WEST APPROACH ROAD

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/21/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: Godding Hollow
Number:
Location: I-25 Frontage Rd. (east side of highway)
Type: Timber pile bridge (3 spans, 2 pile bents)

Geometry

Diameter: N/A
Width: 25'
Height: 5.5'
Length: 60' (3 20' spans)
Skew: 30° (bridge is aligned properly w/ channel, but road is skewed 30° d/s from ⊥ to channel
Headwall
U/S: none
D/S: none
Wingwalls
U/S: 45° wooden 2"x10"'s
D/S: " " " "

Setting

XSEC Location:
Erosion Protection
U/S: none
D/S: none
Channel Configuration
U/S: flat swale (no defined low flow channel)
D/S: " " b/t farm fields (higher LB several hundred feet d/s)
BW=20', 1:1 SS, 5' of flow before spilling, slope from USGS
- overbanks from USGS

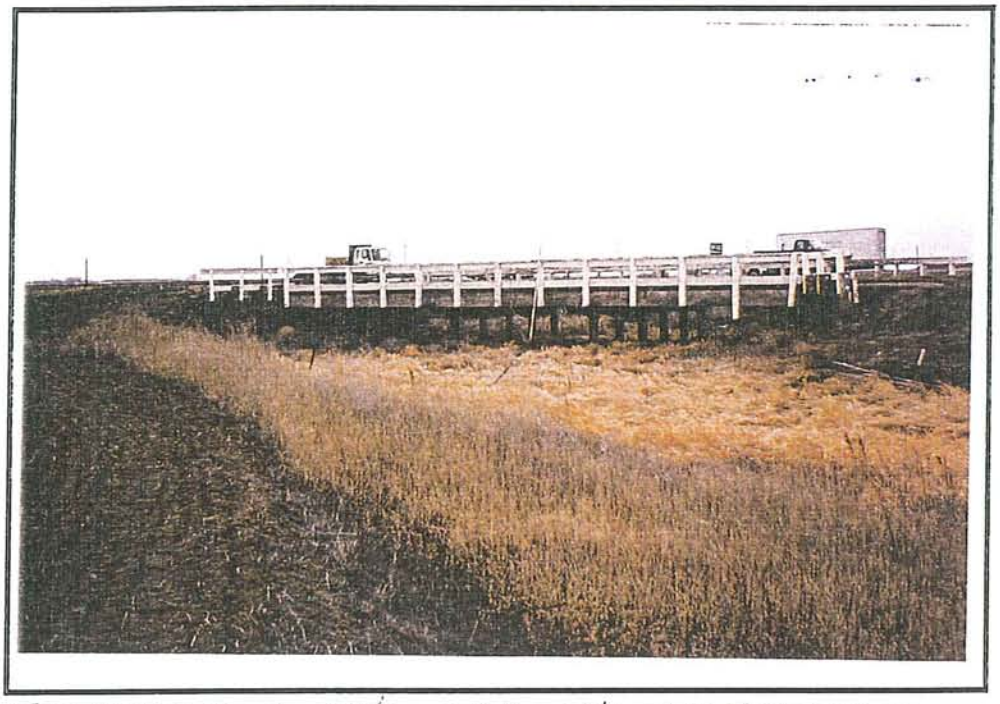
Condition

Structure Material: wood, good
Scour/Deposition
U/S: 1-2' of dep. b/t face and d/s face of northbound I-25
D/S: more dep. just d/s of face
Channel Banks
U/S: flat (approx. 35' b/t u/s face and d/s face of north bound I-25)
D/S: flat overbank areas
Vegetation
U/S: thick w/ cattails and weeds in channel
D/S: " " weeds
Debris Potential: high (cattails and weeds)
Freeboard/Spill Location: 3'; @ bridge deck

Comments: frontage road & northbound I-25 ~30' apart

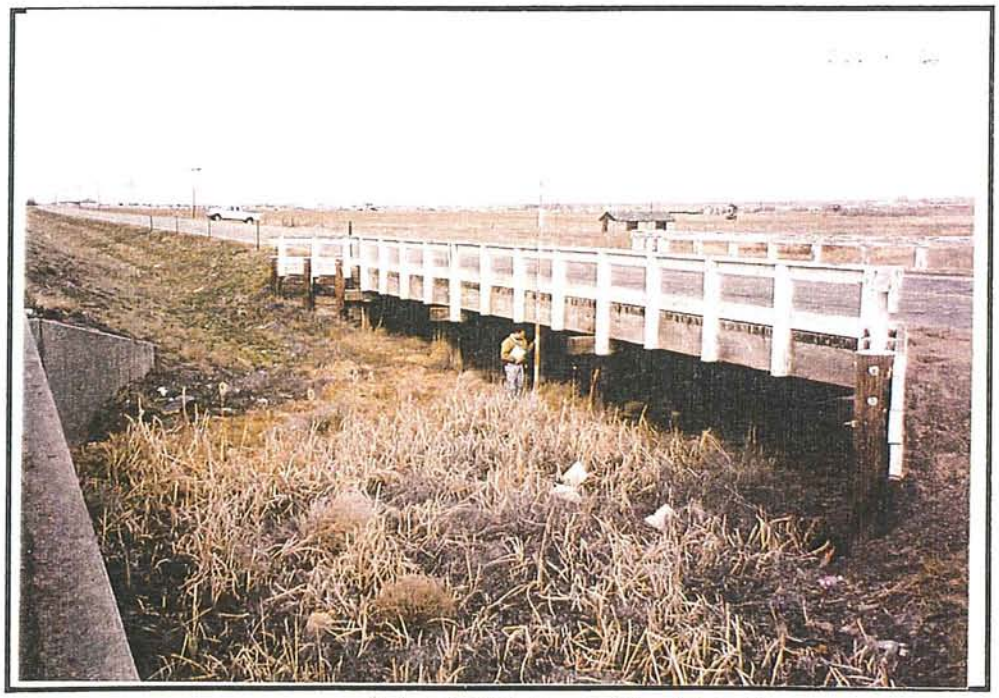
Structure Type: TIMBER PILE BRIDGE Location: GODDING HOLLOW I-25 FRONTAGE ROAD BRIDGE Station: _____

Photograph: Roll # 2 Photo # 13



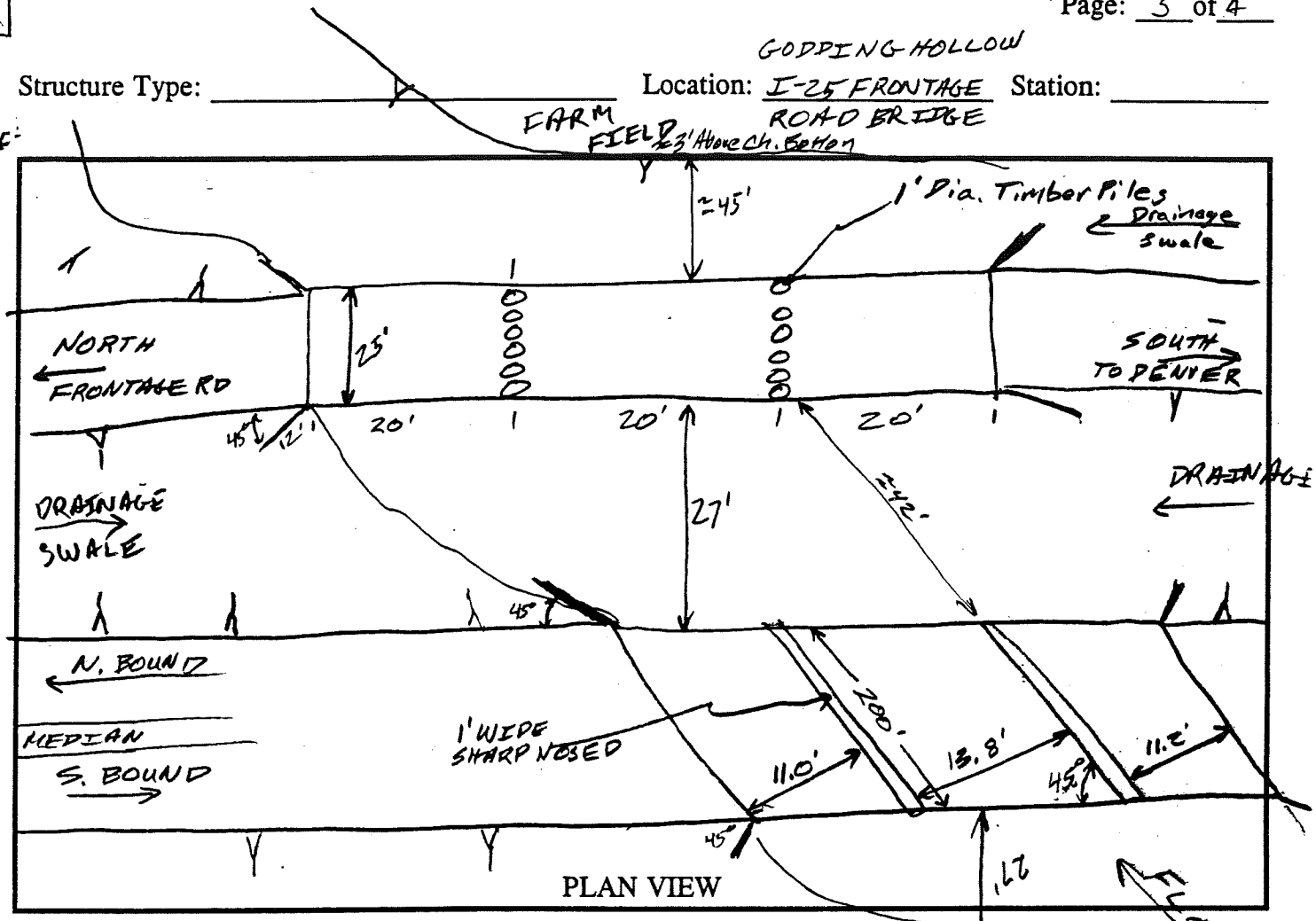
FROM RB 120' D/S, LKG. U/S AT BRIDGE

Photograph: Roll # 2 Photo # 14

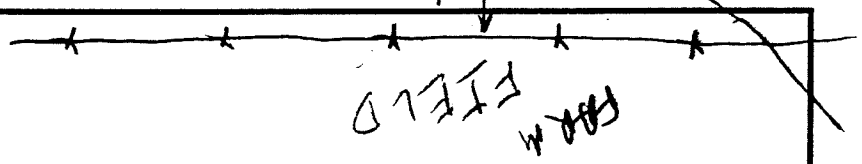


FROM R B ON S. ABUTMENT OF D/S FACE I-25 CULVERT, LKG. D/S AT FRONTAGE ROAD BRIDGE

Structure Type: _____ Location: GODDING HOLLOW I-25 FRONTAGE ROAD BRIDGE Station: _____



PLAN VIEW



ELEVATION or PROFILE

Structure Type: Timber pile bridge Location: Gedding Hollow I-25 Frontage Rd. bridge Station: _____

Photograph: Roll # 5 Photo # 11A

Looking D/E from Frontage Rd. Bridge

Photograph: Roll # _____ Photo # _____

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/21/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: Godding Hollow
Number:
Location: North & south bound I-25
Type: 3 RCB's

Geometry

Diameter: N/A
Width: 11', 13.8', 11.2' (LB to RB) 1' piers b/t boxes, sharp nosed, aligned 45° from road
Height: 6' (all 3)
Length: 200' (through RCB's)
Skew: 45° (RCB's aligned properly w/ flow, but roads skewed 45° d/s from ⊥ to channel)
Headwall
U/S: none (0.1' bevel @ 45° slant downward)
D/S: none
Wingwalls
U/S: 45° tapered (approx. 8' long)
D/S: " " " " "

Setting

XSEC Location:
Erosion Protection
U/S: none
D/S: "
Channel Configuration
U/S: flat swale; no defined low flow channel
D/S: none (~30' b/t bridge & RCB's)

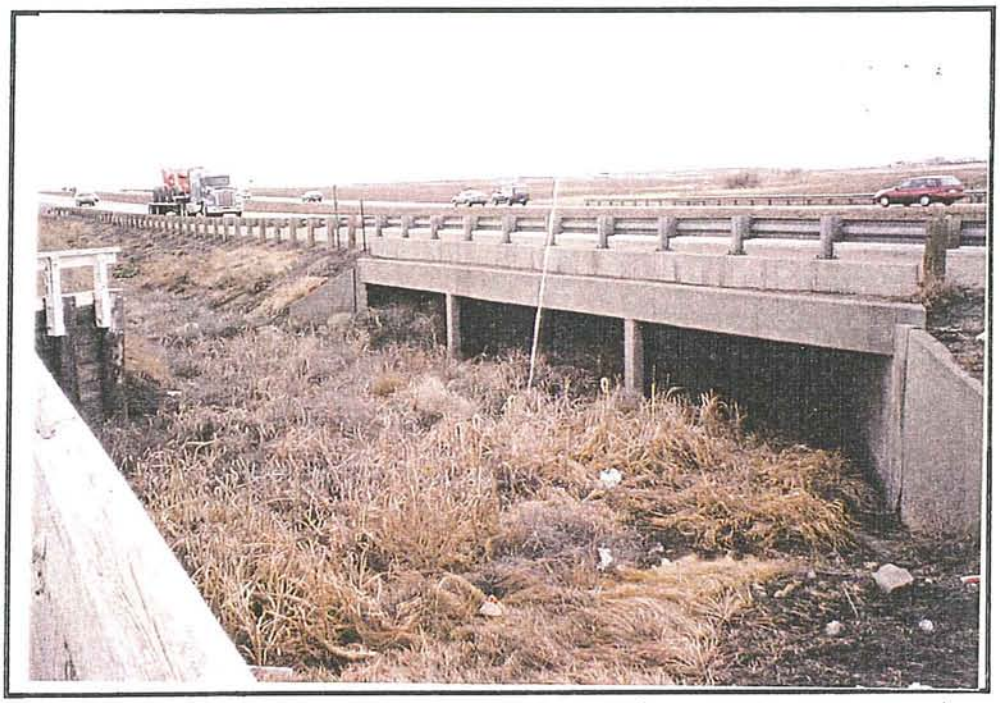
Condition

Structure Material: concrete, good
Scour/Deposition
U/S: 1-2' of dep. just u/s of face, then 0.1-0.2' through culverts
D/S: more dep. here b/c of bridge 30' d/s (0.2-0.3' in culverts)
Channel Banks
U/S: flat, b/t farmers fields
D/S: drainage swales coming in from N & S
Vegetation
U/S: channel thick w/ weeds & grasses; overbanks - grasses
D/S: " choked w/ weeds & cattails
Debris Potential: moderate (weeds thick w/ tumbleweeds @ d/s end b/t outlet & frontage rd. bridge
Freeboard/Spill Location: 3'; @ bridge
from Culvert Crown
Comments: normal high water mark ~1' in culvert

GODDING HOLLOW

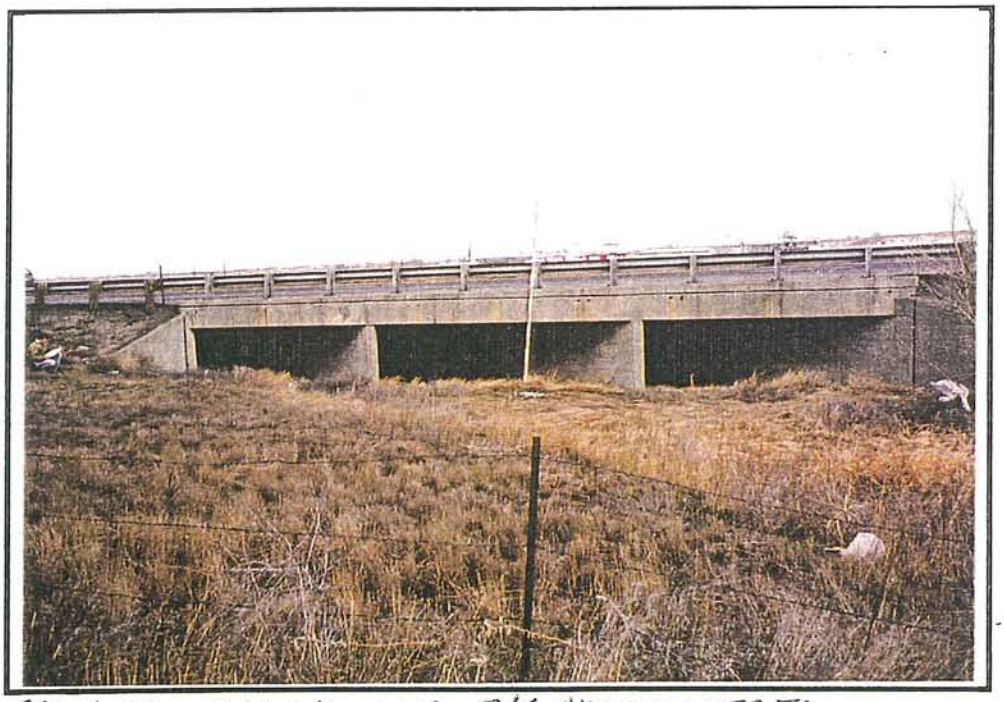
Structure Type: 3-10'x12' RCB Location: I-25 Station: _____

Photograph: Roll # 2 Photo # 15



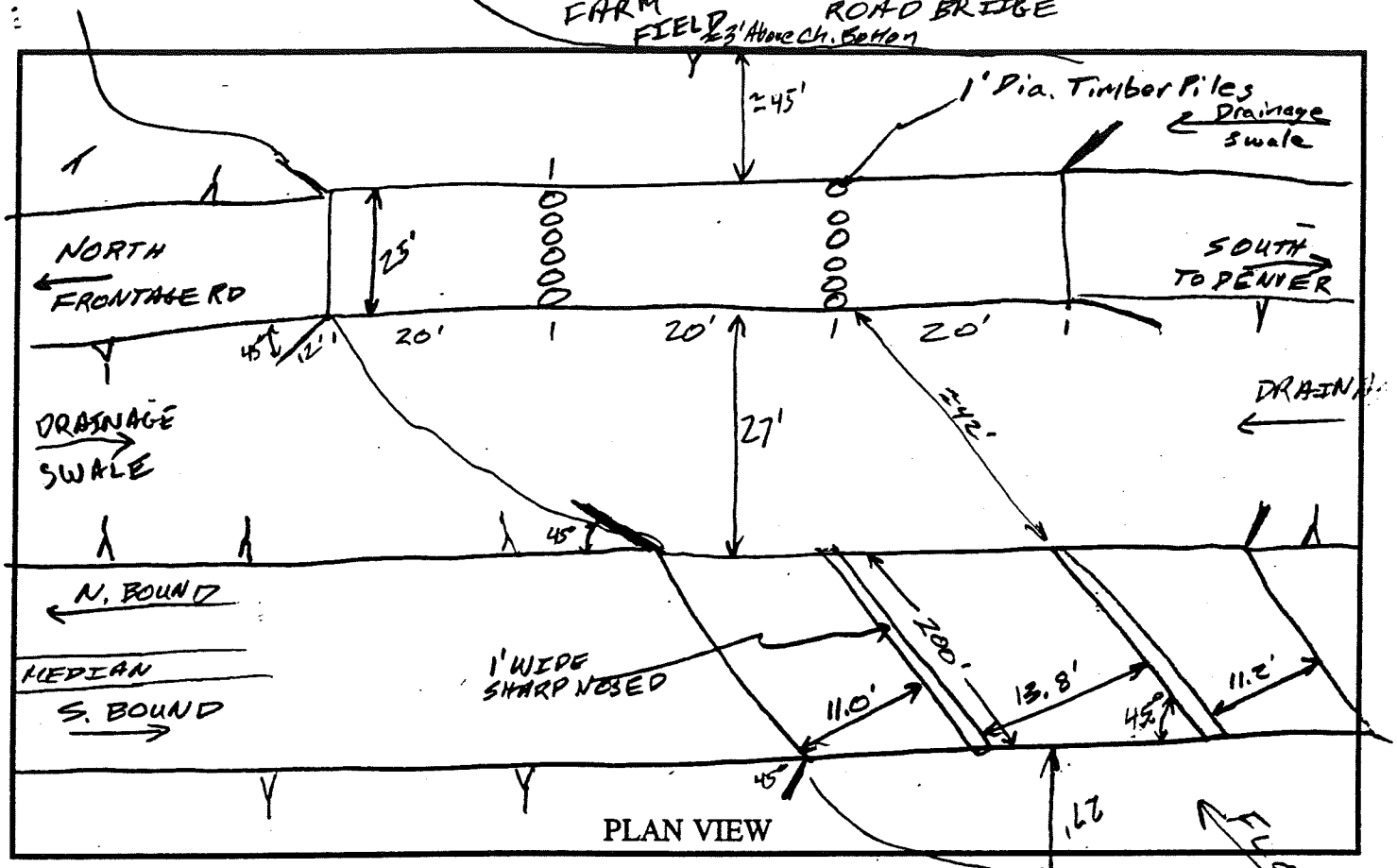
FROM LB ON FRONTAGE ROAD BRIDGE, LKG. U/S AT CULVERTS

Photograph: Roll # 2 Photo # 16

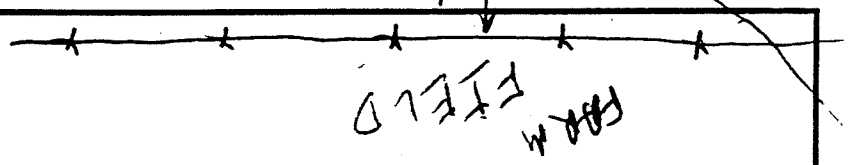


FROM LB 100' U/S, LKG. D/S AT CULVERTS.

Structure Type: _____ Location: GODDING HOLLOW I-25 FRONTAGE ROAD BRIDGE Station: _____



PLAN VIEW



ELEVATION or PROFILE

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/21/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Gadding Hollow
Number:
Location: WCR10 - West
Type: CMP Arch

Geometry
Diameter: N/A
Width: 3.5'
Height: 2.2'
Length: 45'
Skew: none (culvert aligned w/ low flow channel, road skewed 30° dls LB to RB)
Headwall
U/S: none
D/S: none
Wingwalls
U/S: none
D/S: none

Setting
XSEC Location:
Erosion Protection
U/S: none
D/S: some concrete rubble on RB, nothing on LB
Channel Configuration
U/S: V-notch (1-2'), slightly incised
D/S: " " " " "

Condition
Structure Material: corrugated metal, good
Scour/Deposition
U/S: none
D/S: 2.5' of scour below invert
Channel Banks
U/S: flat swale (20:1), overbanks farm fields
D/S: " " " " " "
Vegetation
U/S: thick grasses and cattails
D/S: " " " "
Debris Potential: high (u/s end choked w/ wood, weeds - ~50% blocked)
Freeboard/Spill Location: ; @ culvert

Comments:

Structure Type: CMP Arch Location: CODDING HOLLOW WCR 10 West Station: _____

Photograph: Roll # 2 Photo # 17

FROM LB 25' U/S, LKG. D/S @ CULVERT

Photograph: Roll # 2 Photo # 18

FROM LB 25' D/S, LKG. U/S @ CULVERT

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/21/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: Godding Hollow
Number:
Location: Union Pacific RR
Type: Wooden pile bridge

Geometry

Diameter: N/A
Width: 42'
Height: 2.5'
Length: 12'
Skew: none
Headwall
U/S: none
D/S: "
Wingwalls
U/S: none
D/S: "

Setting

XSEC Location:
Erosion Protection
U/S: none
D/S: "
Channel Configuration
U/S: wide, flat swale (no low flow channel defined)
D/S: " " " " " " "

Condition

Structure Material: wooden timbers, good
Scour/Deposition
U/S: none
D/S: "
Channel Banks
U/S: none (50:1; b/t farmers fields)
D/S: " " " " "
Vegetation
U/S: thick w/ weeds & cattails & a couple of small (3" dia) trees
D/S: " " " " " " " " " " "
Debris Potential: high (low low chord & lots of veg)
Freeboard/Spill Location: 2.5'; @ bridge
↳ lowchord to top rail
Comments: very low chord; not much clearance

Structure Type: BRIDGE Location: GOODING HOLLOW U.P.R.R. Station: _____

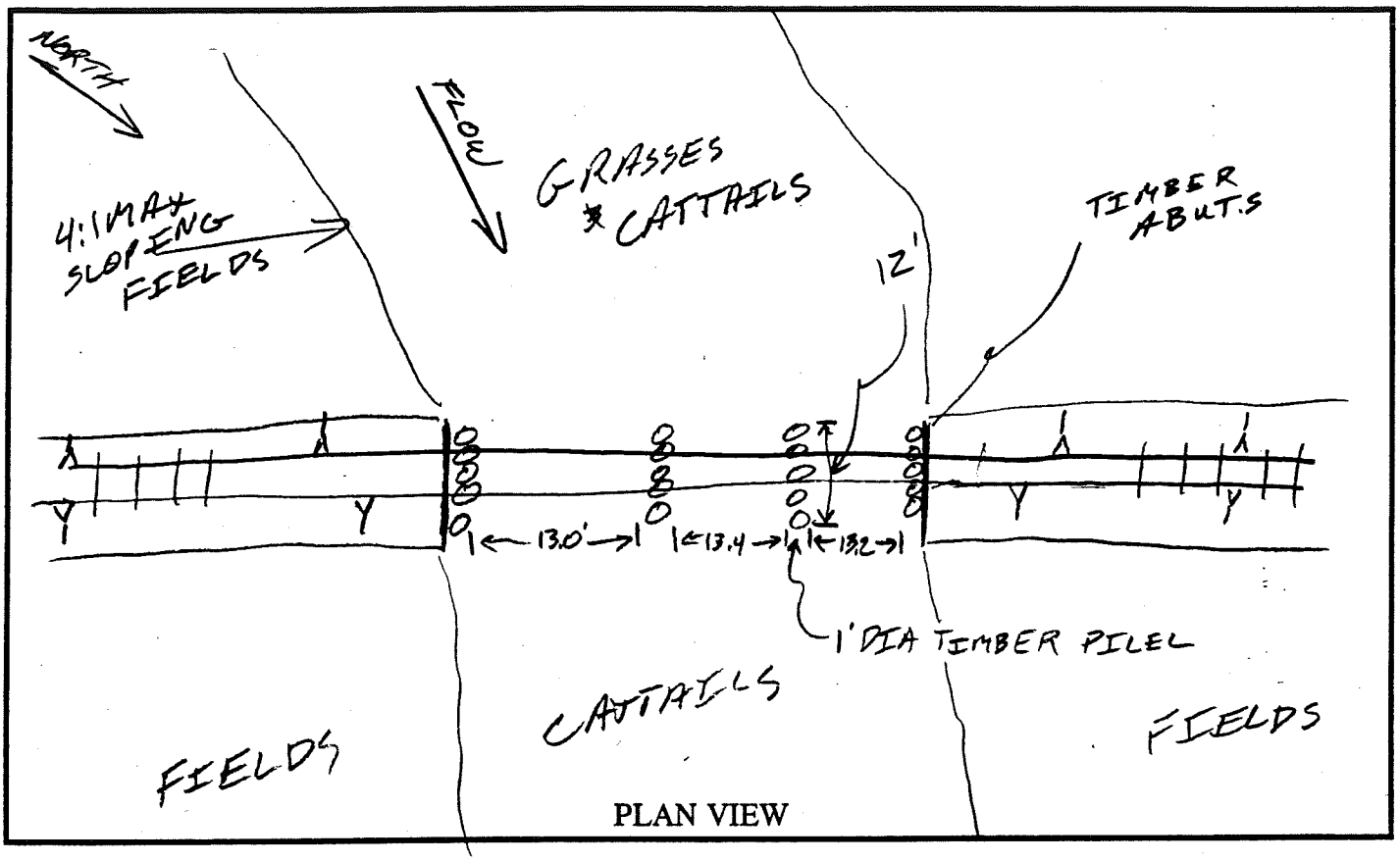
Photograph: Roll # 2 Photo # 19

FROM CHANNEL 100' U/S, LKG. D/S AT BRIDGE

Photograph: Roll # 2 Photo # 20

FROM CHANNEL 100' D/S, LKG. U/S AT BRIDGE

Structure Type: TIMBER BRIDGE Location: GODDING HOLLOW U.P.R.R. Station: _____



PLAN VIEW

ELEVATION or PROFILE

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/20/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Del Camino CDOT Godding Hollow
Number:
Location: I-25 Southbound
Type: RCB (new)

Geometry 45° bevel 0.4' high (top of RCB)
Diameter: —
Width: 12'
Height: 4.1'
Length: obtain off of plan set
Skew: none
Headwall
U/S: none
D/S:
Wingwalls
U/S: 45° angle
D/S:

Setting
XSEC Location:
Erosion Protection
U/S: none (culvert under construction)
D/S:
Channel Configuration
U/S: none (no observable channel)
D/S:

Condition
Structure Material: concrete, new
Scour/Deposition
U/S: N/A
D/S:
Channel Banks
U/S: N/A
D/S:
Vegetation
U/S: u/s basin covered in pasture grasses
D/S:
Debris Potential: low
Freeboard/Spill Location: N/A

Comments: Assume west end of culvert is u/s side
CDOT BM (ROW APW 70078 STA 1321+80) on west side
Elev. 4855.57)

Structure Type: RCB Location: Southbound I-25 Station: _____
Godding Hollow

Photograph: Roll # 1 Photo # 7

Looking dls from approx. 25' uls @ face

Photograph: Roll # _____ Photo # _____

STRUCTURE INVENTORY FORM

Project Name: WELD COUNTY I-25 MDP Date: 03/31/99
Task: ACE Project No.: COWELD01

Structure Identification

Name: GODDING HOLLOW TRIB., EXISTING DETENTION UNDER I-25
Number:
Location: WCR 16 3/4 & I-25 W. Frontage Rd. (≈ 1000' S. WCR 18)
Type: Concrete Pipes 1) HI 2) LO

	HI	LO
Geometry		
Diameter:	2'	3'
Width:	N/A	—
Height:	N/A	—
Length:	≈ 1.55'	≈ 2.05'
Skew:	—	—
Headwall		
U/S:	—	—
D/S:		—
Wingwalls		
U/S:	Flared End Section	Flared End Section
D/S:		" " "
Setting		
XSEC Location:	—	—
Erosion Protection		
U/S:	—	—
D/S:	—	—
Channel Configuration		
U/S:	Outlet Detention Pond	Outlet Det. Pond
D/S:	see below	see below.
Condition		
Structure Material:	Concrete in good Condition	
Scour/Deposition		
U/S:	NONE	2-3" sediment
D/S:	NONE	≈ 6" " "
Channel Banks		
U/S:	NONE	—
D/S:	100-YR Sheet Flows across Vacant Lot, unkept Grass & weeds Low Flows 3' Bot., 3:1, 3' deep, SLOPE FROM QUAD	
Vegetation		
U/S:	Cut Grass	weeds
D/S:	Weeds	weeds
Debris Potential:	Tumbleweeds	Tumbleweeds
Freeboard/Spill Location:	7' above U/S Invert OT over both lanes of I-25 @ culverts	10' above U/S Invert

Comments:

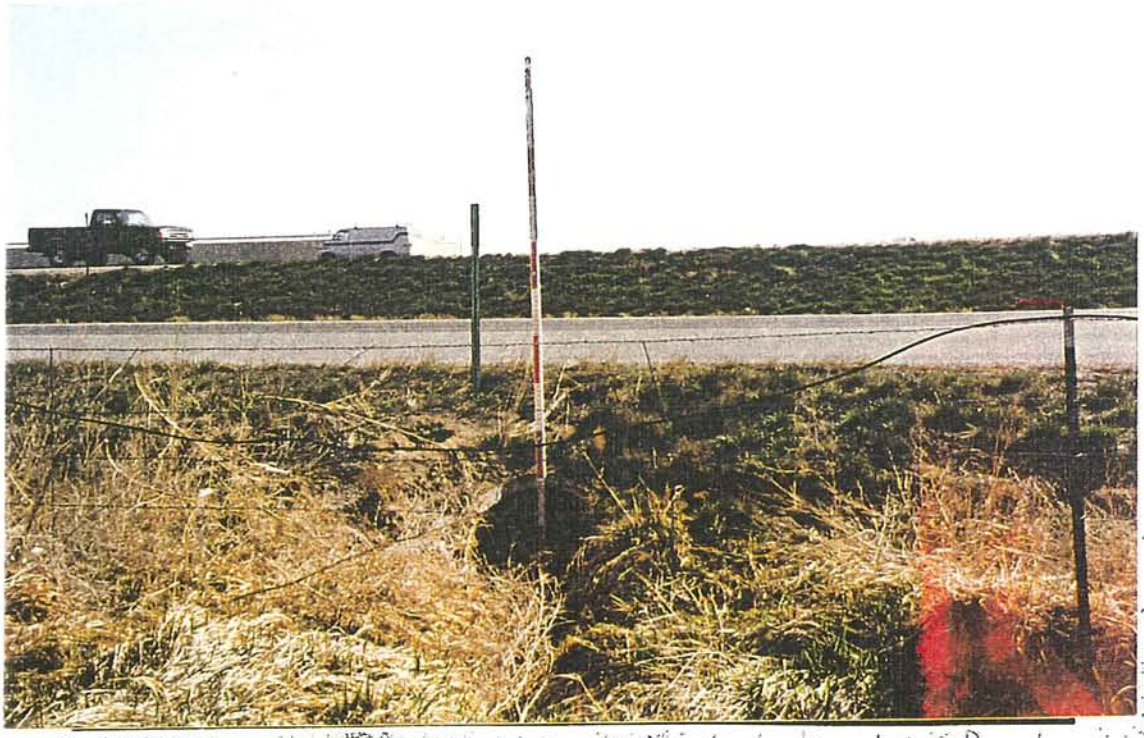
25' 25' 35' 35' 35' 25' 25'

Structure Type: RCP (high culvert) ~2' Location: GOODING HOLLOW TRIB, WCR18/SB I-25 Station: _____

Photograph: Roll # 5 Photo # 0A

u/s face of high culvert (embankment is SB I-25)

Photograph: Roll # 5 Photo # 1A



u/s face of low culvert (embankment is frontage road)

GOODING HOLLOW TRIB.

Structure Type: 3' RCP (low) Location: WCR16 3/4 I-25 Station:

Photograph: Roll # 5 Photo # 2A

D/S face of high culvert (embankment is frontage road)

Photograph: Roll # 5 Photo # 3A

D/S face of low culvert (embankment is frontage road)

Structure Type: Concrete Pipe Under I-25 Location: GOODING HOLLOW TRIB. UCR 16 3/4 I-25 Station: _____

Photograph: Roll # 5 Photo # 4A

Looking dk along element no. 141 toward main stem of G. H.

Photograph: Roll # _____ Photo # _____

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/26/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Godding Hollow (west trib.)
Number:
Location: I-25 e north of SH W52
Type: RCP / CMP (RCP @ inlet, CMP embedded in concrete @ outlet)

Geometry
Diameter: 3'
Width: —
Height: —
Length:
Skew: None
Headwall
U/S: none
D/S: See comments
Wingwalls
U/S: none
D/S: see comments

Setting
XSEC Location:
Erosion Protection
U/S: none
D/S: "
Channel Configuration
U/S: no defined channel
D/S: farm fields

Condition
Structure Material: concrete, good
Scour/Deposition
U/S: 0.3-0.4' of dep. in culvert
D/S: culvert 50% blocked w/ soil
Channel Banks
U/S: farmer's fields, flat
D/S: " " "
Vegetation
U/S: scattered grasses
D/S: none
Debris Potential: moderate (weeds)
Freeboard/Spill Location: 3'; @ culvert

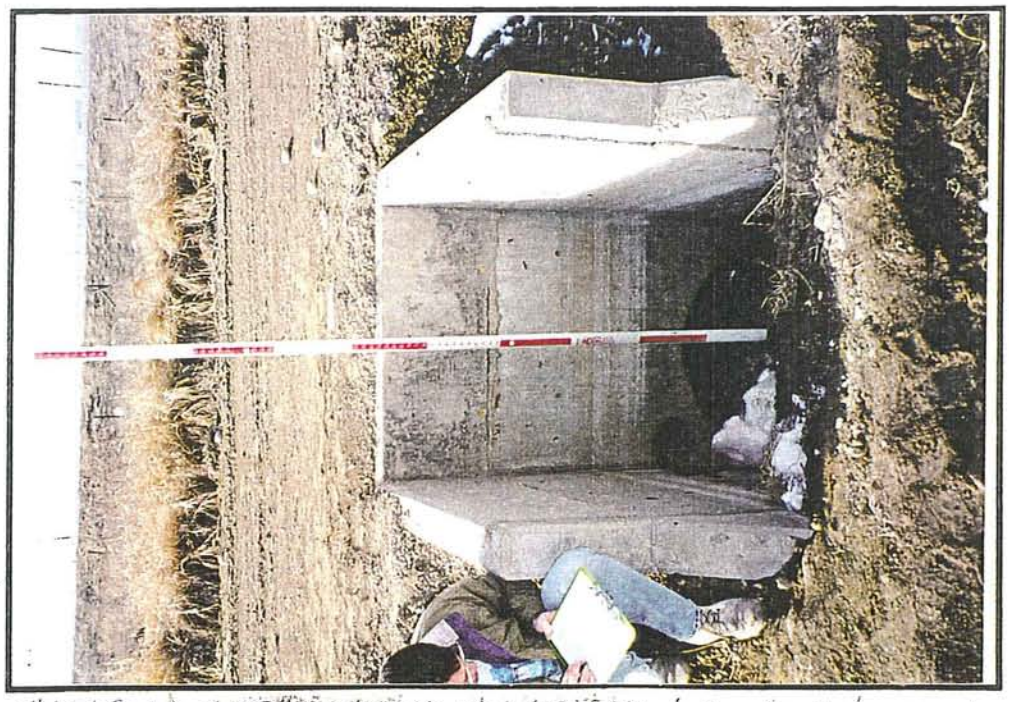
Comments: At outlet flow has to fill drop box before it can flow into farmer's field. (lip of box ~3' above culvert invert; then another 2' to grade). Culvert is siphoned under ditch.

Structure Type: 36" RCP/CMP SIPHON? Location: GODDING HOLLOW WEST TRIB N. of HWY 52 Station: _____

Photograph: Roll # 3 Photo # 6

From Plowed Field 60 feet D/S, LKG. U/S AT SIPHON OUTLET

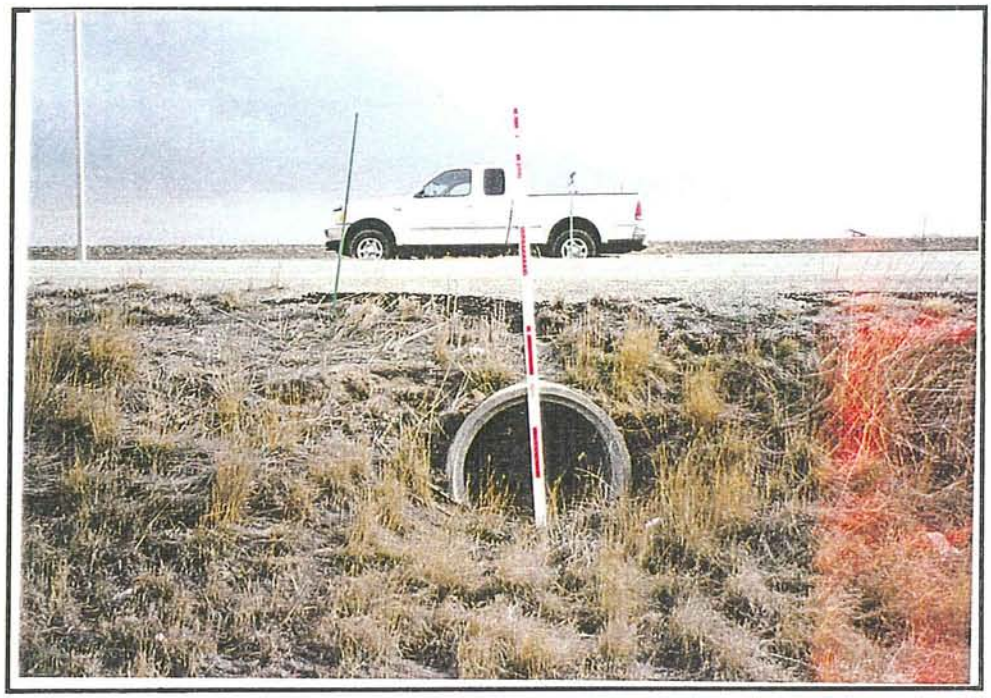
Photograph: Roll # 3 Photo # 7



From Field 10' D/S, LKG U/S AT 36 inch Pipe & Siphon Outlet Box.

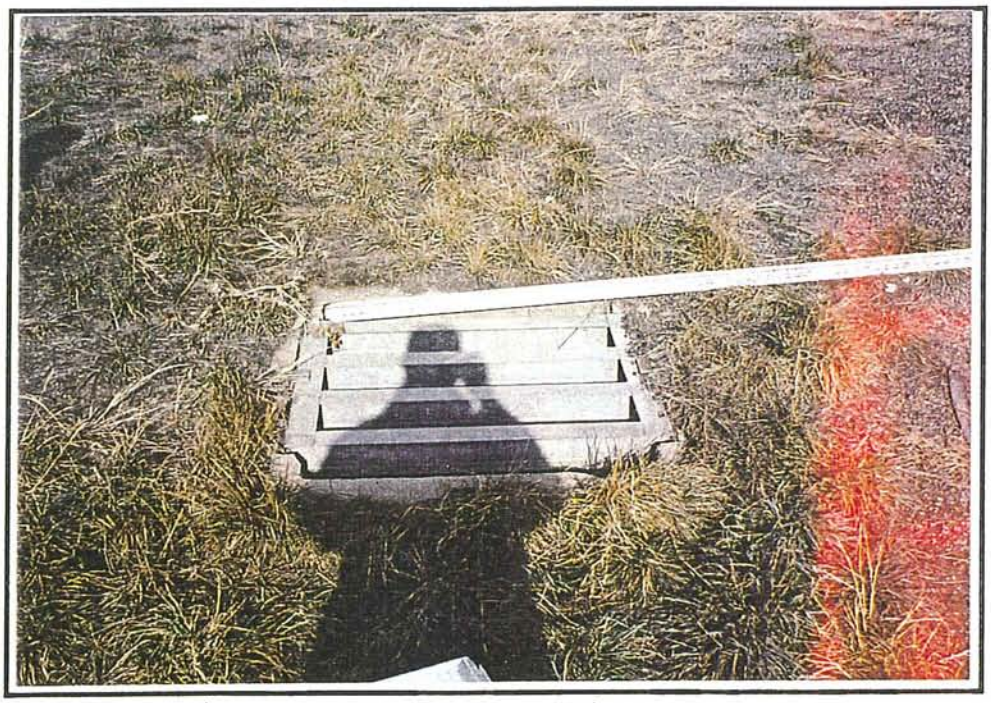
Structure Type: 36" RCP Location: GOODING WEST TRIBUTARY I-25 N. SH 52 Station: _____

Photograph: Roll # 3 Photo # 4



FROM 25' U/S in Dentention Area, LKG. D/S at Culvert under Frontage Road

Photograph: Roll # 3 Photo # 5



CDOT 3'x3' DROP INLET TYPICAL, BETWEEN FRONTAGE ROAD AND I-25

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 5/31/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: Godding Hollow West Tributary
Number:
Location: SHW52 / WCR 7 1/4
Type: CMP (2)

Geometry

Diameter: 36" (2)
Width: —
Height: —
Length: ~50'
Skew: —
Headwall
U/S: N/A
D/S: N/A
Wingwalls
U/S: N/A (pipe sticking out of fill)
D/S: N/A " " " " "

Setting

XSEC Location: N/A
Erosion Protection
U/S: none
D/S: "
Channel Configuration
U/S: roadside swale
D/S: " "

Condition

Structure Material: corrugated metal, good condition
Scour/Deposition
U/S: none (culverts perched ~1-2' above existing ground)
D/S: "
Channel Banks
U/S: N/A
D/S: "
Vegetation
U/S: grasses, weeds
D/S: grasses, weeds
Debris Potential: low
Freeboard/Spill Location: @ culverts; 2.5' of head from culvert crown to top of road

Comments: most 100 yr flows will overtop SHW52

Structure Type: 2 - 36" CMPs Location: GODDING HOLLOW W. TRIBUTARY SHW 52/UCR 7/4 Station: _____

Photograph: Roll # 5 Photo # 6

From Approx. 15' u/s, Lkg. D/s @ Culverts.

Photograph: Roll # 5 Photo # 7

From Approx. 33' D/s, Lkg. U/s @ Culverts.

Structure Type: 2- 36" CMPS Location: SHW 52/WCR 7¼ GODDING HOLLOW W. TRIBUTARY Station: _____

Photograph: Roll # 5 Photo # 8

From D/S side SHW 52, LKG. D/S AT FLOW PATH

Photograph: Roll # _____ Photo # _____

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MOP Date: 5/31/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Godding Hollow Trib.
Number:
Location: WCR 10 EAST (just south of racetrack)
Type: CMP arch

Geometry
Diameter: —
Width: 5'
Height: 3'
Length: 45' (all invert to drop inlet), 70' total (inlet to outlet)
Skew: —
Headwall
U/S: none
D/S: concrete rubble
Wingwalls
U/S: none
D/S: "

Setting
XSEC Location: —
Erosion Protection
U/S: none
D/S: concrete rubble
Channel Configuration
U/S: V-shaped incised channel
D/S: detention pond

Condition
Structure Material: corrugated metal, good condition
Scour/Deposition
U/S: none
D/S: "
Channel Banks
U/S: flat
D/S: N/A
Vegetation
U/S: grasses, weeds
D/S: N/A
Debris Potential: high
Freeboard/Spill Location: —

Comments: flows will overtop road and spill into detention pond.

Structure Type: 3'x5' Arch. CMP Location: GODDING HOLLOW TRIB, E. Trib. @ UCR 10 Station: _____

Photograph: Roll # 5 Photo # 8A

From Approx. 50 feet U/S, LKg. D/S at Culvert and Raceway Lake in Background

Photograph: Roll # 5 Photo # 9A

From Centerline UCR 10, LKg. U/S From Culvert.

Structure Type: 3' x 5' Arch CMP Location: GODDING HOLLOW TRIB, E. Trib. @ WCRID S. Raceway Station: _____

Photograph: Roll # 5 Photo # 10A

From Centerline WCRID, LKG, D/S HT Survey Rod 3.6 feet in Drop Inlet, Outlet from pond appears directly above rod.

Photograph: Roll # _____ Photo # _____

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/26/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Godding Hollow
Number:
Location: RR embankment east of I-25, East Trib.
Type: CMP

Geometry
Diameter: 12'
Width: N/A
Height: N/A
Length:
Skew: 90° (from LB to RB)
Headwall
U/S: none
D/S: "
Wingwalls
U/S: none
D/S: "

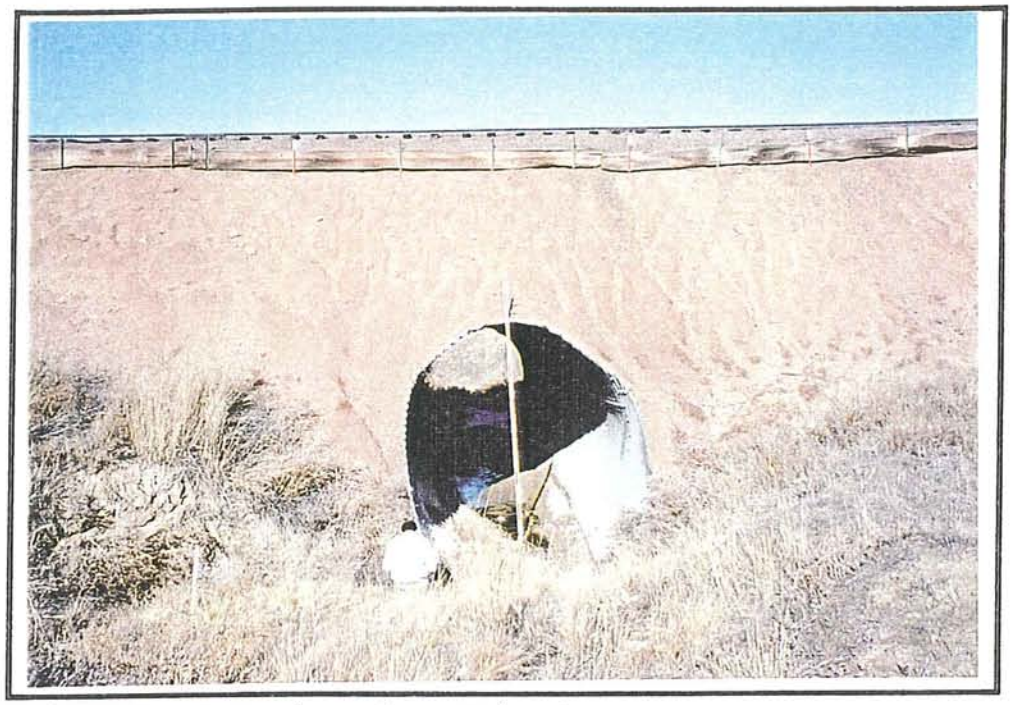
Setting
XSEC Location:
Erosion Protection
U/S: none
D/S: "
Channel Configuration
U/S: 2' incised channel ~2' wide
D/S: more deeply incised

Condition
Structure Material: Corrugated metal, good
Scour/Deposition
U/S: ~1' of sed. in culvert
D/S: " " " " "
Channel Banks
U/S: 3:1
D/S: 2:1 (V-shaped valley)
Vegetation
U/S: scattered grasses & weeds
D/S: " " " "
Debris Potential: moderate (weeds)
Freeboard/Spill Location: 8', @ culvert

Comments:

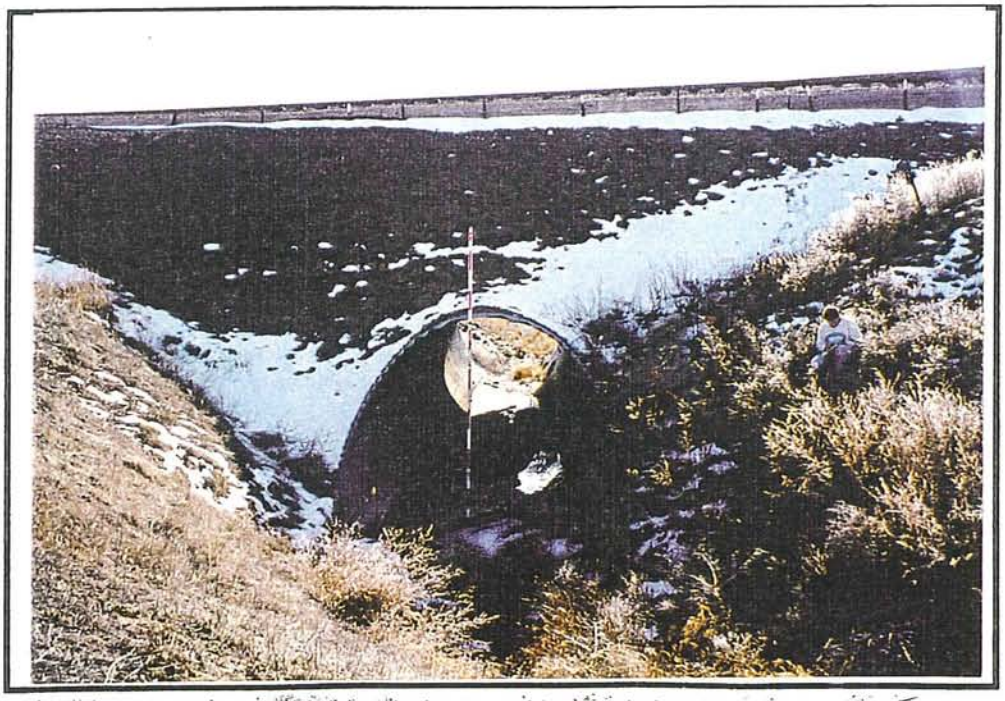
Structure Type: Plated Arch CMP Location: GODDINS HOLLOW TRIB. E. TRIB. UNDER SCRAPMETAL R.R. SPUR. Station:

Photograph: Roll # 3 Photo # 11



FROM RB 60' U/S, LKG. D/S AT CULVERT

Photograph: Roll # 3 Photo # 12



FROM LB 60' D/S, LKG. U/S AT CULVERT.

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/26/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Godding Hollow
Number:
Location: Frontage Rd. east of I-25, EAST TRIB.
Type: 2 4'x10' RCB's

Geometry
Diameter: N/A
Width: 10'
Height: 4'
Length:
Skew: none
Headwall
U/S: none
D/S: "
Wingwalls
U/S: none
D/S: 45° flare

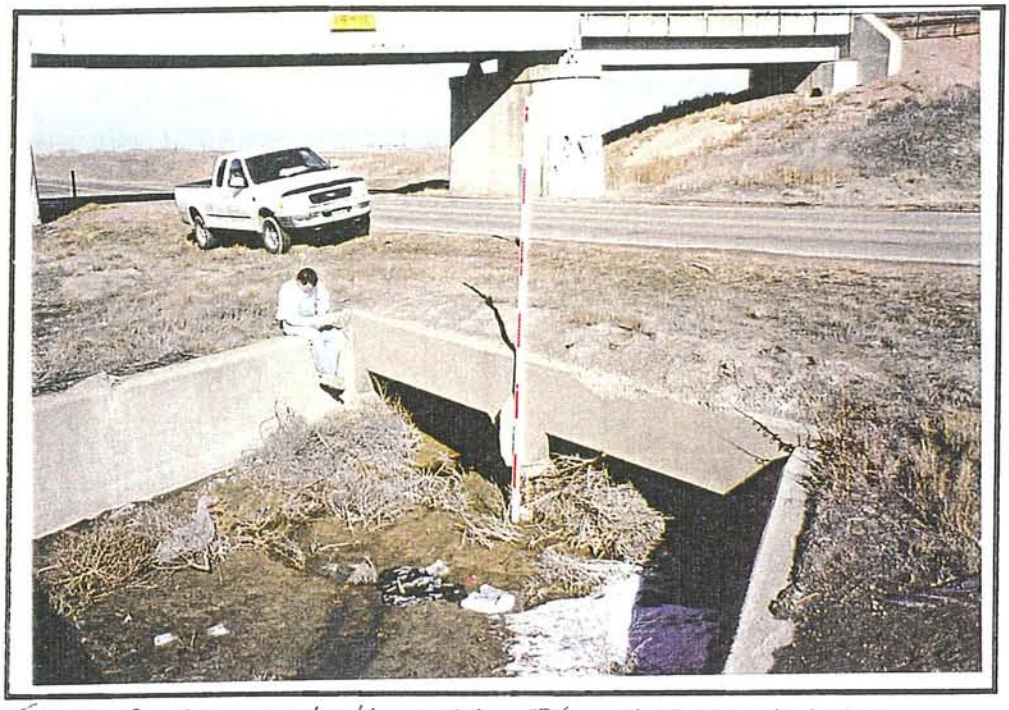
Setting
XSEC Location:
Erosion Protection
U/S: none
D/S: "
Channel Configuration
U/S: N/A
D/S: "

Condition
Structure Material: concrete, good
Scour/Deposition
U/S: ~2' of sed. in culverts
D/S: " " " " "
Channel Banks
U/S: N/A
D/S: 3:1
Vegetation
U/S: tumble weeds
D/S: weeds
Debris Potential: moderate
Freeboard/Spill Location: ~3', @ culverts

Comments: flows daylight to det. area where flow takes 90° bend to left through large CMP through RR embankment

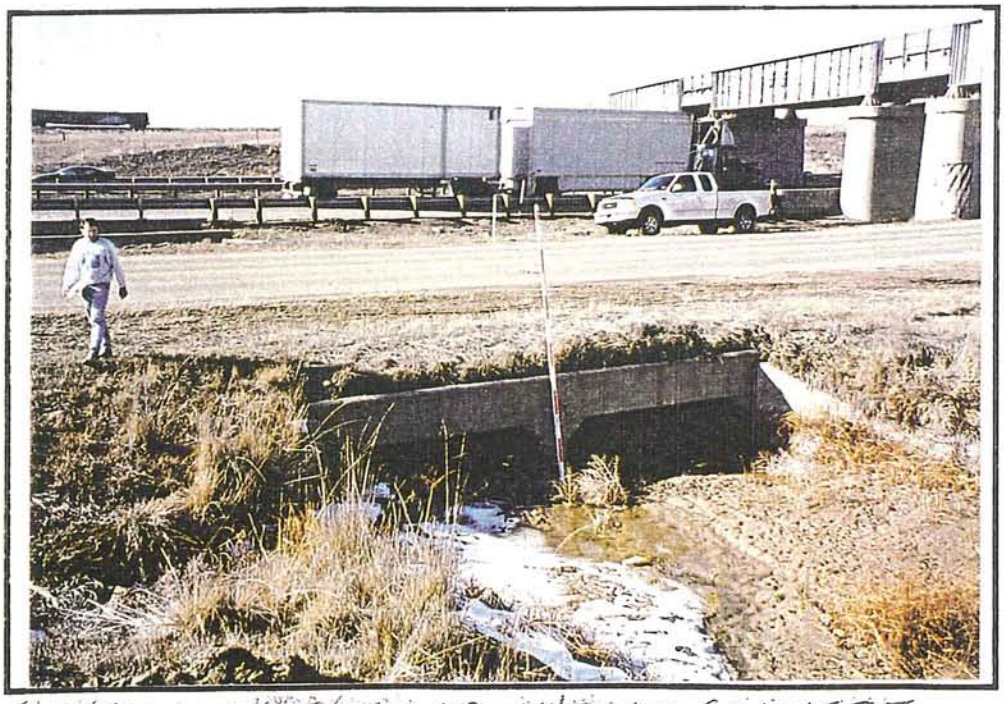
Structure Type: 2 - 4'x10' RCB Location: GODDING HOLLOW E. TRIB. I-25 EAST FRONTAGE ROAD N. OF METAL SCRAP YARD Station: _____

Photograph: Roll # 3 Photo # 9



FROM RT BK 25' U/S, LKG D/S AT CULVERT

Photograph: Roll # 3 Photo # 10

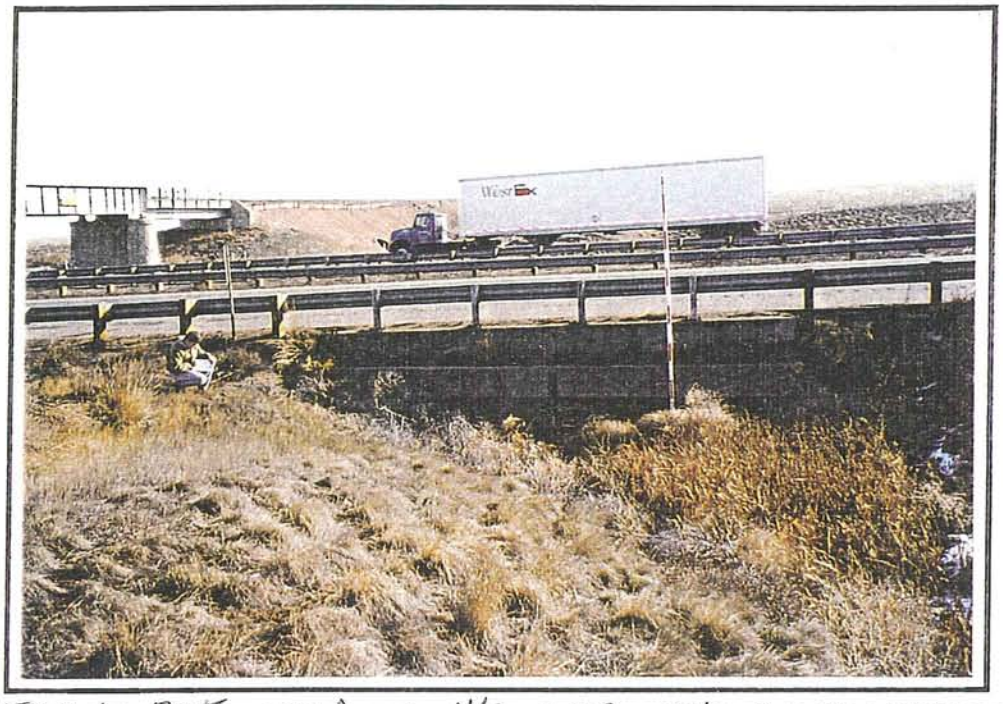


FROM RB 50' D/S, LKG U/S AT CULVERT

Structure Type: 2-4'x10' RCB Location: GODDING HOLLOW EAST TRIB. Station: _____

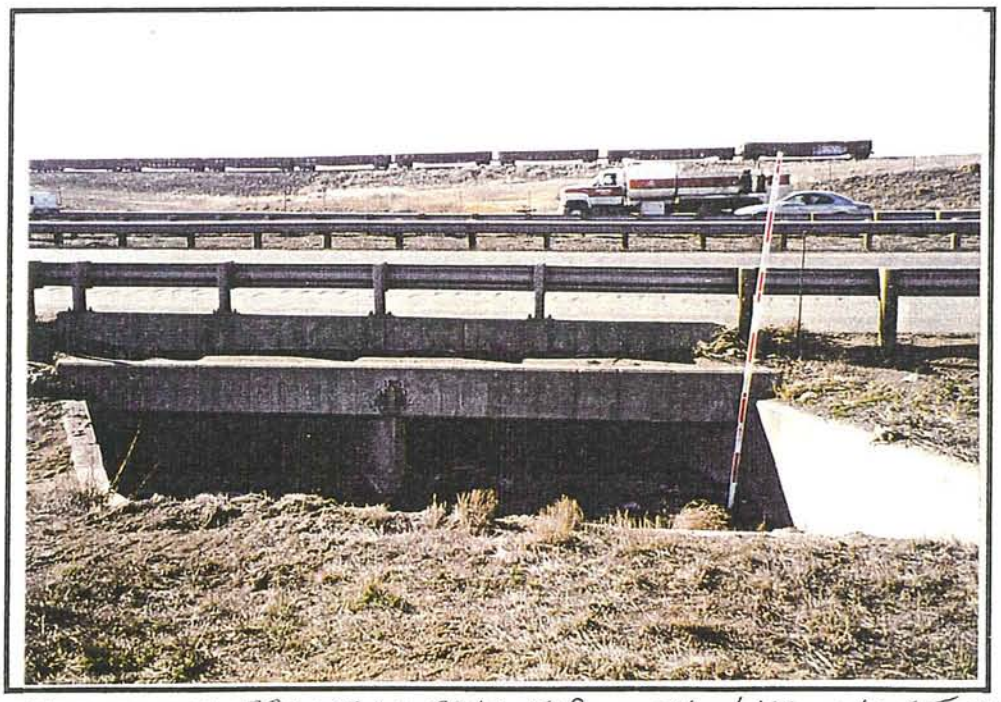
I-25 N. OF R.R. SPUR TO SCRAP METAL YARD

Photograph: Roll # 3 Photo # 3



FROM Lt. BNK. 50 feet U/S, LKG. D/S AT CULVERT

Photograph: Roll # 3 Photo # 8



FROM ON TOP FRONTAGE ROAD 50 feet D/S, LKG. U/S AT CULVERT

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/26/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Godding Hollow
Number: East Trib.
Location: RR embankment just west of I-25 & approx. 1/3 mile north of SH47
Type: CMP

Geometry
Diameter: 6.5'
Width: N/A
Height: N/A
Length: 70'
Skew: 30' from ℄ of RR embankment
Headwall
U/S: none
D/S: "
Wingwalls
U/S: none
D/S: "

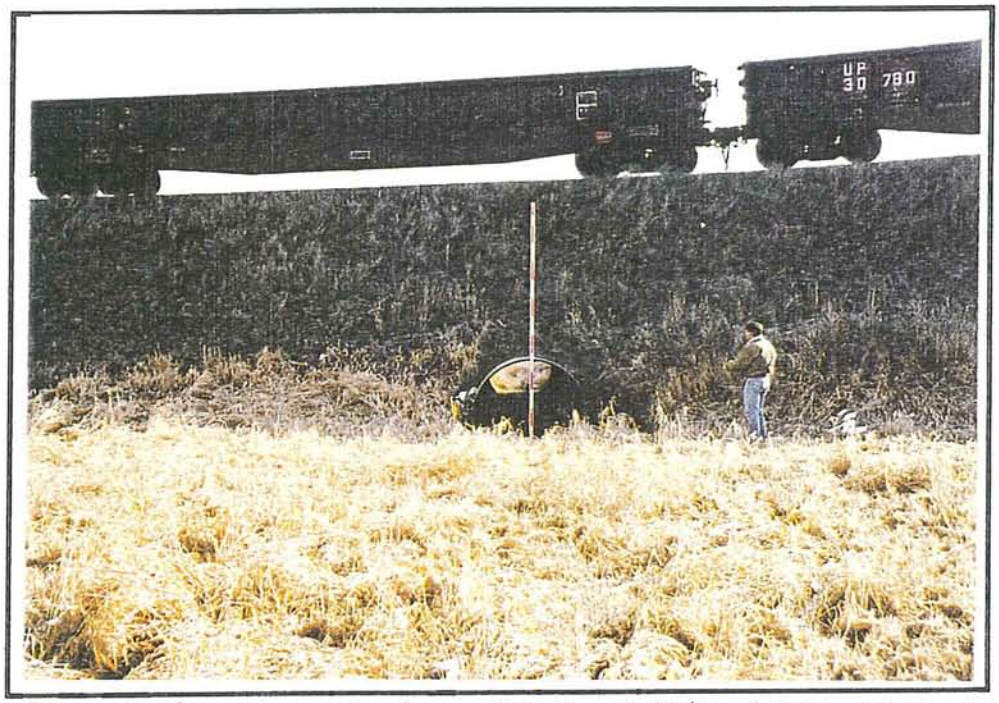
Setting
XSEC Location:
Erosion Protection
U/S: none
D/S: "
Channel Configuration
U/S: sinuous, channel incised 2-3' 1' wide, flow is from right to left
D/S: becomes wider (6-8') and more incised (3-4')

Condition
Structure Material: corrugated metal, good
Scour/Deposition
U/S: scour around inlet, piping around RR
D/S: more dep. in pipe (0.3-0.4')
Channel Banks
U/S: flat detention area, flat banks (20:1)
D/S: generally flat, " " " "
Vegetation
U/S: thick weeds and grasses
D/S: " " " "
Debris Potential: low
Freeboard/Spill Location: 8-10'; @ embankment

Comments:

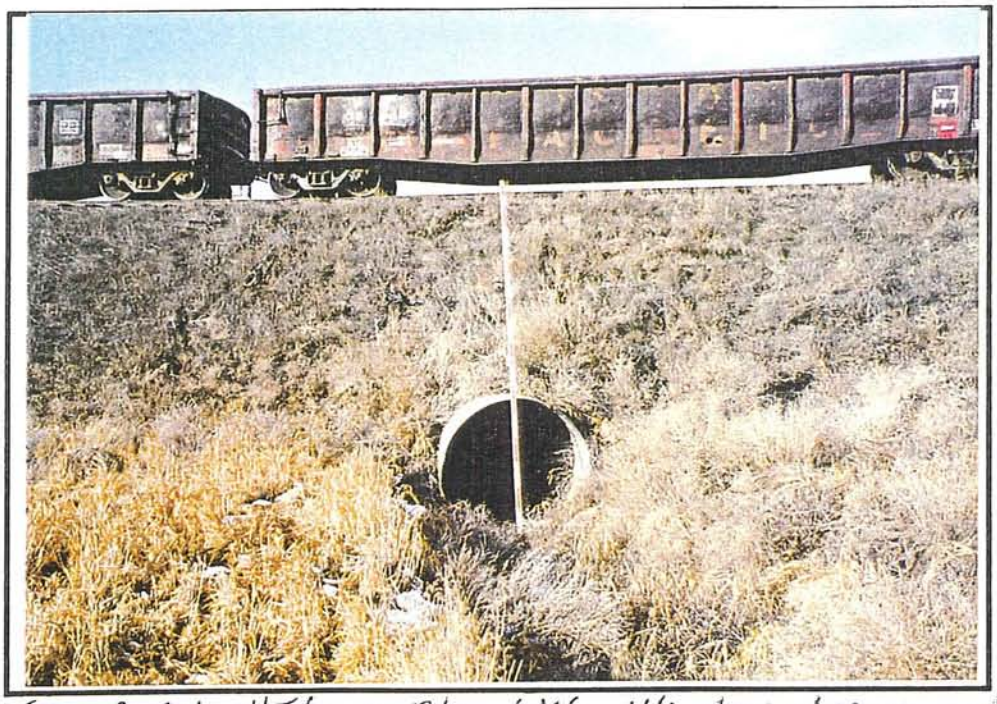
Structure Type: 6.5' CMP Location: GOPHING HOLLOW East Trib. Station: _____

Photograph: Roll # 3 Photo # 1



From Middle Channel Appr. 100 feet U/S, LKG. D/S At Culvert and Railroad embankment.

Photograph: Roll # 3 Photo # 2



From Rt. Bnk. 45 feet D/S, LKG. U/S At Culvert and Railroad Embankment.

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/26/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Godding Hollow
Number:
Location: Corner of WCR 11 & 12 (pipe under WCR 11, flow is east to west)
Type: 15" ADS

Geometry
Diameter: 15"
Width: N/A
Height: N/A
Length: 65'
Skew:
Headwall
U/S: none
D/S: "
Wingwalls
U/S: none
D/S: "

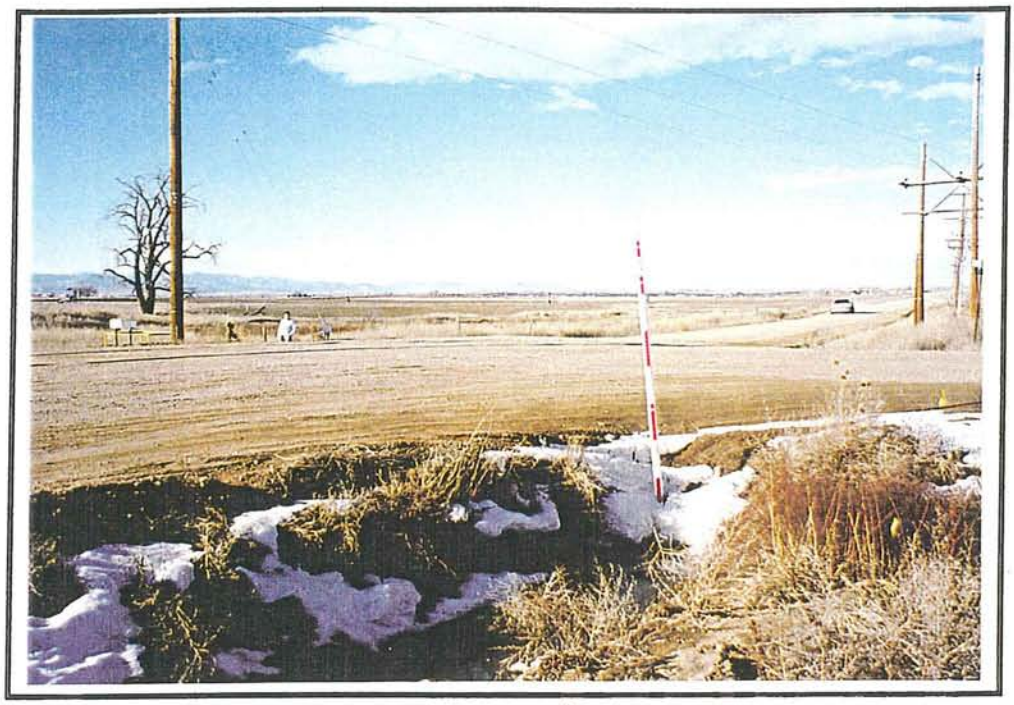
Setting
XSEC Location:
Erosion Protection
U/S: none
D/S: "
Channel Configuration
U/S:
D/S: roadside drainage cut (1' wide channel, 5' top width)

Condition
Structure Material: corrugated plastic, good
Scour/Deposition
U/S: none
D/S: "
Channel Banks
U/S: open field
D/S: 3:1
Vegetation
U/S: weeds
D/S: "
Debris Potential: moderate (weeds)
Freeboard/Spill Location: 3'; @ road intersection

Comments:

Structure Type: 15" ADS Location: GODDINGOLLOW WCR 11/WCR 12 EAST TRIBUTARY Station: _____

Photograph: Roll # 3 Photo # 13



FROM LB 30' U/S, LKG D/S AT CULVERT

Photograph: Roll # 3 Photo # 14

FROM RB 20' D/S, LKG U/S AT CULVERT

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/26/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Godding Hollow
Number:
Location: WCR 12 (flows south to north) Approx. 100' West of WCR 11/WCR 12 Corner
Type: CMP (no photos taken)

Geometry
Diameter: 18"
Width: –
Height: –
Length: 45'
Skew: 90° (from R to L)
Headwall
U/S: none
D/S: "
Wingwalls
U/S: none
D/S: "

Setting
XSEC Location:
Erosion Protection
U/S: none
D/S: "
Channel Configuration
U/S: roadside ditch
D/S: flat open swale

Condition
Structure Material: corrugated metal, good
Scour/Deposition
U/S: Some sed. (~0.4-0.5') @ inlet
D/S: " " " " @ outlet
Channel Banks
U/S: little roadside cut
D/S: 2' incised channel, flat banks
Vegetation
U/S: weeds & grasses
D/S: " " "
Debris Potential: high (entrance clogged w/ weeds)
Freeboard/Spill Location: 1', @ road

Comments:

I-C

FIELD SURVEY DATA

Note: Data provided by TST, Inc.

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
9008	105351.671	86981.975	4913.766	NW23
822	78771.224	88462.506	5049.932	INV MID SITE26
819	78727.549	88457.327	5046.296	INV S SITE26
818	78741.558	88684.114	5056.658	CL RD SITE26
817	78743.393	88629.985	5054.757	CL RD SITE26
816	78744.087	88559.78	5052.489	CL RD SITE26
815	78744.656	88507.568	5051.277	CL RD SITE26
814	78745.006	88454.754	5050.631	CL RD SITE26
813	78744.844	88399.73	5051.113	CL RD SITE26
812	78744.203	88344.31	5052.644	CL RD SITE26
811	78743.185	88290.293	5054.549	CL RD SITE26
810	78742.746	88238.963	5055.631	CL RD SITE26
809	78742.638	88167.678	5056.878	CL RD SITE26
808	78742.21	88103.836	5057.744	CL RD SITE26
807	78740.754	88049.82	5058.256	CL RD SITE26
806	78738.653	87993.13	5058.566	CL RD SITE26
805	75161.435	86260.613	5094.43	INV 72CMP-SITE16
804	75171.168	86329.84	5093.11	INV 72CMP-SITE16
803	75640.853	86221.88	5108.845	TB RR SITE18
802	75589.468	86240.816	5109.175	TB RR SITE18
801	75538.231	86255.732	5109.081	TB RR SITE18
800	75487.465	86266.118	5109.366	TB RR SITE18
799	75435.76	86273.986	5109.674	TB RR SITE18
798	75382.611	86281.743	5109.792	TB RR SITE18
797	75328.905	86287.031	5110.347	TB RR SITE18
796	75273.602	86289.653	5111.185	TB RR SITE18
795	75218.714	86289.875	5110.917	TB RR SITE18
794	75168.535	86287.363	5111.466	TB RR SITE18
793	75113.776	86281.405	5112.364	TB RR SITE18
792	75060.473	86273.767	5113.827	TB RR SITE18
791	75006.155	86263.337	5115.153	TB RR SITE18
790	74953.233	86251.502	5116.455	TB RR SITE18
789	74901.393	86235.828	5117.699	TB RR SITE18
788	74852.094	86217.536	5118.669	TB RR SITE18
787	74800.635	86196.327	5119.454	TB RR SITE18
786	74752.215	86174.03	5120.665	TB RR SITE18
785	74704.929	86148.752	5121.206	TB RR SITE18
784	74657.5	86120.806	5122.22	TB RR SITE18
783	74613.979	86091.587	5122.813	TB RR SITE18
782	74613.952	86091.537	5122.885	TB RR SITE18
781	78753.043	86016.184	5062.467	INV PIPE SITE16
780	78716.357	85997.081	5062.806	INV PIPE SITE16
779	78733.287	86302.802	5068.379	CL RD
778	78733.158	86250.74	5068.3	CL RD
777	78732.663	86198.174	5067.524	CL RD
776	78732.538	86143.947	5066.821	CL RD
775	78733.327	86087.175	5066.346	CL RD
774	78733.876	86027.653	5066.589	CL RD
773	78735.472	85964.698	5067.389	CL RD
772	78736.802	85899.427	5068.938	CL RD

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
771	78737.797	85835.387	5071.033	CL RD
770	78737.753	85773.198	5072.864	CL RD
769	78734.867	85711.858	5074.137	CL RD
768	78732.553	85656.96	5074.723	CL RD
767	78730.375	85595.84	5074.935	CL RD
766	77729.2	84325.655	5105.084	CL RR
765	77589.978	84461.887	5103.743	CL RR
764	77300.158	84745.891	5103.826	CL RR
763	77139.005	84903.038	5104.904	CL RR
762	77453.586	84591.671	5103.955	RAIL AT ABUTMT
761	77420.726	84623.484	5104.044	RAIL AT ABUTMT
760	77412.814	84572.955	5098.937	US SWALE SITE17
759	77547.528	84625.571	5096.435	ds SWALE SITE17
758	79991.034	80767.78	5100.337	bb rr bank
757	80041.563	80650.917	5099.158	bb rr bank
756	80082.687	80560.186	5099.688	bb rr bank
755	80135.421	80446.565	5099.982	bb rr bank
754	80176.9	80360.257	5098.182	inv 24 cmp 1-2 s
753	80207.371	80265.522	5099.207	bb rr bank
752	80240.052	80263.228	5105.378	cl rr
751	80209.396	80334.341	5105.111	cl rr
750	80170.108	80425.161	5104.89	cl rr
749	80128.981	80518.619	5105.098	cl rr
748	80089.153	80612.544	5105.368	cl rr
747	80055.278	80690.535	5105.827	cl rr
746	80019.858	80772.213	5106.541	cl rr
745	79975.845	80871.998	5107.59	cl rr
744	79937.516	80961.307	5108.813	cl rr
743	79894.767	81060.151	5110.1	cl rr
742	79852.974	81154.446	5111.482	cl rr
741	79812.351	81248.964	5112.898	cl rr
740	89422.035	85555.19	4994.514	9
739	84105.291	89657.85	4994.065	36cmp s site 13
738	84064.297	89661.412	4994.396	36cmp s site 13
737	84085.938	89904.24	5005.946	cl rd site13
736	84084.887	89840.836	5004.671	cl rd site13
735	84084.545	89784.165	5003.1	cl rd site13
734	84084.162	89728.294	5001.335	cl rd site13
733	84083.667	89671.182	5000.26	cl rd site13
732	84082.985	89605.487	5000.372	cl rd site13
731	84080.727	89536.522	5001.54	cl rd site13
730	84080.251	89468.46	5003.513	cl rd site13
729	84081.272	89403.91	5005.203	cl rd site13
728	84081.571	89342.656	5006.895	cl rd site13
727	84081.473	89285.327	5008.412	cl rd site13
726	84080.939	89231.04	5009.312	cl rd site13
725	84080.886	89178.43	5009.998	cl rd site13
724	84080.856	89126.497	5010.587	cl rd site13
723	84080.957	89073.982	5011.223	cl rd site13
722	84080.26	89021.54	5012.027	cl rd site13

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
721	84078.723	88969.575	5013.041	cl rd site13
720	84077.586	88917.639	5013.79	cl rd site13
719	84076.596	88864.774	5014.482	cl rd site13
718	84075.225	88813.99	5015.085	cl rd site13
717	84072.924	88763.46	5015.817	cl rd site13
716	84071.165	88711.849	5016.644	cl rd site13
715	84069.967	88657.038	5017.736	cl rd site13
714	84069.098	88598.237	5019.03	cl rd site13
713	84067.547	88539.974	5020.687	cl rd site13
712	84065.024	88474.385	5022.743	cl rd site13
711	84063.547	88419.898	5024.378	cl rd site13
710	84060.507	88366.702	5025.812	
709	89404.138	85594.419	4995.01	708
708	89404.15	85594.362	4994.994	chkinit
10	85150.473	86962.382	5048.206	no4 rebar set
707	84072.16	88736.997	5016.202	cl rd site13
706	84086.468	89739.413	5001.693	cl rd site13
705	84086.93	89798.316	5003.54	cl rd site13
704	84092.745	89944.367	5006.545	cl rd site13
703	84095.122	90010.035	5007.5	cl rd site13
702	88752.897	90941.345	4977.045	cl rd site12
701	88726.589	90987.44	4977.245	cl rd site12
700	88698.922	91031.321	4977.573	cl rd site12
699	88671.622	91077.146	4977.617	cl rd site12
698	88644.822	91122.004	4977.823	cl rd site12
697	88619.032	91168.747	4977.933	cl rd site12
696	88589.603	91209.848	4977.757	cl rd site12
695	88564.619	91257.572	4977.529	cl rd site12
694	88538.295	91302.743	4977.38	cl rd site12
693	88514.753	91346.887	4976.964	cl rd site12
692	88487.467	91392.898	4977.031	cl rd site12
691	88469.484	91440.509	4978.115	cl rd site12
690	88465.748	91492.967	4979.071	cl rd site12
689	88491.332	91541.188	4979.35	cl rd site12
688	88530.766	91186.302	4962.939	inv culv site12
687	88606.033	91226.679	4962.659	inv culv site12
9020	110657.541	89598.676	4869.443	CHK9016
686	110626.042	89742.415	4861.385	INV US SITE5
685	109893.571	89539.632	4876.554	CHK682
684	109759.978	89664.462	4866.17	CL SITE 4
683	109979.168	89572.789	4862.985	CL SITE 4
9019	109963.304	89455.394	4873.074	CHK INIT
9018	109963.302	89455.393	4873.045	CHK INIT
682	109893.579	89539.594	4876.555	TOP FLUME SITE 4
681	110695.234	89691.068	4860.412	inv ds site 5
680	110658.157	89149.051	4871.634	CROWN SITE 5
679	110656.163	89281.139	4871.735	CROWN SITE 5
678	110655.313	89414.695	4871.22	CROWN SITE 5
677	110656.211	89552.47	4870.413	CROWN SITE 5
9017	110657.368	89598.777	4869.353	S1-4 11

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
9016	110657.364	89598.769	4869.354	S1-4 11
676	110654.271	89770.331	4869.672	CROWN SITE 4
675	110656.749	89867.536	4869.047	CROWN SITE 4
674	110655.297	89945.174	4869.134	CROWN SITE 4
673	110654.035	90072.713	4870.674	CROWN SITE 4
672	110652.078	90191.321	4871.584	CROWN SITE 4
671	110650.979	90316.331	4871.894	CROWN SITE 4
670	110651.319	90440.057	4872.211	CROWN SITE 4
669	110650.703	90567.373	4875.533	CROWN SITE 4
668	110649.824	90691.824	4880.138	CROWN SITE 4
667	115966.022	90392.769	4842.991	CROWN SITE 2
666	115964.662	90562.354	4842.841	CROWN SITE 2
665	115964.564	90662.314	4842.725	CROWN SITE 2
664	115962.91	90761.318	4842.589	CROWN SITE 2
663	115962.711	90860.175	4842.446	CROWN SITE 2
662	115961.841	90959.06	4842.537	CROWN SITE 2
661	115960.816	91089.803	4842.044	CROWN SITE 2
660	115959.991	91221.091	4841.713	CROWN SITE 2
659	115959.169	91338.607	4841.53	CROWN SITE 2
658	115958.713	91465.382	4841.801	CROWN SITE 2
657	115957.643	91578.132	4842.065	CROWN SITE 2
656	115956.969	91682.063	4842.298	CROWN SITE 2
655	115956.089	91786.521	4843.443	CROWN SITE 2
654	115956.359	91850.591	4843.611	CROWN SITE 2
653	115955.367	91956.353	4845.263	crown site 2
543	115955.383	91956.359	4845.257	crown rd site 2
652	115977.422	91773.236	4834.924	INV DS SITE 2
651	115938.771	91771.008	4835.054	INV US SITE 2
650	115938.993	91770.957	4835.088	INV US SITE 2
649	105349.49	88378.048	4901.55	CROWN SITE 6
648	105348.49	88435.021	4900.678	CROWN SITE 6
647	105348.2	88498.816	4900.094	CROWN SITE 6
646	105347.469	88564.237	4899.479	CROWN SITE 6
645	105347.69	88632.582	4899.054	CROWN SITE 6
644	105347.573	88700.559	4898.551	CROWN SITE 6
643	105347.186	88767.847	4897.836	CROWN SITE 6
642	105347.138	88834.236	4896.893	CROWN SITE 6
641	105345.931	88898.87	4896.263	CROWN SITE 6
640	105345.009	88961.227	4895.758	CROWN SITE 6
639	105345.752	89024.454	4895.537	CROWN SITE 6
638	105345.714	89087.628	4895.257	CROWN SITE 6
637	105346.134	89149.102	4895.047	CROWN SITE 6
636	105346.482	89209.378	4894.891	CROWN SITE 6
635	105345.809	89271.354	4894.653	CROWN SITE 6
634	105345.518	89335.221	4894.662	CROWN SITE 6
633	105345.682	89395.016	4894.57	CROWN SITE 6
632	105345.333	89456.863	4894.476	CROWN SITE 6
631	105345.376	89519.053	4894.585	CROWN SITE 6
630	105345.84	89580.405	4894.664	CROWN SITE 6
629	105345.59	89641.713	4894.427	CROWN SITE 6

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
628	105346.006	89703.277	4894.42	CROWN SITE 6
627	105345.978	89764.317	4894.441	CROWN SITE 6
626	105345.311	89824.488	4894.34	CROWN SITE 6
625	105345.262	89886.92	4894.189	CROWN SITE 6
624	105345.028	89949.271	4894.049	CROWN SITE 6
623	105344.652	90010.959	4894.13	CROWN SITE 6
622	105344.726	90071.813	4893.752	CROWN SITE 6
621	105344.168	90131.933	4893.626	CROWN SITE 6
620	105343.274	90191.759	4893.973	CROWN SITE 6
619	105343.02	90252.449	4893.414	CROWN SITE 6
618	105342.591	90313.206	4892.746	CROWN SITE 6
617	105342.667	90373.288	4892.8	CROWN SITE 6
616	105341.878	90444.983	4893.238	CROWN SITE 6
615	105341.722	90496.368	4894.001	CROWN SITE 6
614	105342.372	90567.312	4893.928	CROWN SITE 6
613	105343.321	90617.667	4893.46	CROWN SITE 6
612	105346.017	90676.304	4893.236	CROWN SITE 6
611	105349.854	90734.513	4893.143	CROWN SITE 6
610	105343.571	90790.358	4893.495	CROWN SITE 6
609	105343.379	90855.24	4893.961	CROWN SITE 6
608	105342.943	90918.518	4894.388	CROWN SITE 6
607	105342.707	90969.669	4894.769	CROWN SITE 6
606	105342.036	91034.818	4895.131	CROWN SITE 6
605	105341.883	91086.019	4895.432	CROWN SITE 6
604	105341.609	91139.987	4895.71	CROWN SITE 6
603	105340.959	91264.777	4896.739	CROWN SITE 6
602	105339.761	91323.02	4897.742	CROWN SITE 6
601	105338.294	91379.872	4898.97	CROWN SITE 6
600	105336.793	91435.891	4900.123	CROWN SITE 6
599	105333.684	91508.089	4902.012	CROWN SITE 6
598	105330.909	91559.761	4903.444	CROWN SITE 6
597	105331.682	91637.704	4906.337	CROWN SITE 6
596	105341.538	91706.805	4909.015	CROWN SITE 6
594	105368.181	90521.926	4886.113	INV DS SITE 6
593	105314.15	90525.913	4887.386	INV US SITE 6
592	100076.306	90059.614	4912.531	INV DS SITE 7
591	100017.851	90049.647	4913.089	INV US SITE 7
590	100045.819	88521.726	4922.777	CROWN SITE 7
589	100046.45	88579.935	4922.45	CROWN SITE 7
588	100046.096	88649.856	4922.017	CROWN SITE 7
587	100046.16	88700.784	4921.797	CROWN SITE 7
586	100046.057	88775.749	4921.651	CROWN SITE 7
585	100045.512	88837.639	4921.354	CROWN SITE 7
584	100046.25	88898.159	4921.06	CROWN SITE 7
583	100046.921	88956.263	4920.861	CROWN SITE 7
582	100047.262	89009.909	4920.794	CROWN SITE 7
581	100046.178	89073.769	4920.63	CROWN SITE 7
580	100046.739	89134.291	4920.606	CROWN SITE 7
579	100047.011	89195.648	4920.629	CROWN SITE 7
578	100046.528	89258.73	4920.666	CROWN SITE 7

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
577	100046.638	89323.456	4920.755	CROWN SITE 7
576	100047.605	89386.678	4920.664	CROWN SITE 7
575	100047.933	89437.676	4920.636	CROWN SITE 7
574	100048.256	89491.982	4920.654	CROWN SITE 7
573	100048.891	89630.876	4920.823	CROWN SITE 7
572	100049.183	89687.547	4920.844	CROWN SITE 7
571	100048.728	89746.002	4920.937	CROWN SITE 7
570	100048.874	89799.768	4921.061	CROWN SITE 7
569	100047.817	89882.067	4921.462	CROWN SITE 7
568	100047.893	89933.98	4921.509	CROWN SITE 7
567	100047.468	89999.685	4921.393	CROWN SITE 7
566	100047.284	90063.591	4921.4	CROWN SITE 7
565	100046.543	90113.725	4921.677	CROWN SITE 7
564	100045.712	90164.777	4921.916	CROWN SITE 7
563	100046.551	90228.673	4922.124	CROWN SITE 7
562	100046.867	90294.059	4922.268	CROWN SITE 7
561	100046.874	90347.144	4922.549	CROWN SITE 7
560	100046.88	90413.786	4923.098	CROWN SITE 7
559	100047.434	90472.404	4923.58	CROWN SITE 7
558	100046.875	90524.705	4924.103	CROWN SITE 7
557	100047.146	90583.536	4924.713	CROWN SITE 7
556	100046.815	90641.45	4925.459	CROWN SITE 7
555	100046.798	90743.007	4926.979	CROWN SITE 7
554	100047.352	90833.052	4928.806	CROWN SITE 7
553	100047.035	90883.065	4929.916	CROWN SITE 7
552	100046.403	90942.498	4931.188	CROWN SITE 7
551	100045.438	90994.365	4932.367	CROWN SITE 7
550	100044.842	91052.455	4933.743	CROWN SITE 7
549	100044.457	91162.794	4936.275	CROWN SITE 7
548	100044.672	91226.612	4937.732	CROWN SITE 7
547	100045.823	91303.913	4939.529	CROWN SITE 7
546	100047.024	91370.14	4941.121	CROWN SITE 7
9015	100043.708	92244.636	4965.66	CHK INIT
9014	100043.696	92244.574	4965.642	CHK INIT
545	94698.24	90322.454	4934.899	INV US SITE 8
544	94733.517	90309.149	4935.047	INV DS SITE 8
9013	94733.519	90309.136	4937.385	INV DS SITE 8
542	94712.407	90299.481	4938.952	CROWN RD SITE 8
541	94715.368	87839.195	4958.267	CROWN RD SITE 8
540	94715.586	87897.586	4957.604	CROWN RD SITE 8
539	94715.986	87951.367	4957.072	CROWN RD SITE 8
538	94715.835	88005.697	4956.706	CROWN RD SITE 8
537	94715.595	88058.228	4956.368	CROWN RD SITE 8
536	94715.724	88122.484	4955.967	CROWN RD SITE 8
535	94716.093	88186.341	4955.59	CROWN RD SITE 8
534	94715.761	88241.269	4955.183	CROWN RD SITE 8
533	94716.122	88310.647	4954.659	CROWN RD SITE 8
532	94716.291	88448.7	4953.379	CROWN RD SITE 8
531	94714.291	88535.809	4952.695	CROWN RD SITE 8
530	94712.865	88599.317	4952.139	CROWN RD SITE 8

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
529	94713.89	88662.348	4951.715	CROWN RD SITE 8
528	94715.438	88724.674	4951.324	CROWN RD SITE 8
527	94716.046	88789.442	4950.936	CROWN RD SITE 8
526	94715.724	88854.696	4950.453	CROWN RD SITE 8
525	94715.957	88921.995	4949.962	CROWN RD SITE 8
524	94716.941	88991.025	4949.678	CROWN RD SITE 8
523	94717.504	89057.432	4949.246	CROWN RD SITE 8
522	94717.123	89120.516	4948.852	CROWN RD SITE 8
521	94717.004	89179.871	4948.556	CROWN RD SITE 8
520	94716.744	89238.253	4948.25	CROWN RD SITE 8
519	94716.712	89295.931	4947.877	CROWN RD SITE 8
518	94717.038	89353.46	4947.398	CROWN RD SITE 8
517	94717.635	89410.543	4946.863	CROWN RD SITE 8
516	94718.026	89465.727	4946.63	CROWN RD SITE 8
515	94718.269	89518.022	4946.481	CROWN RD SITE 8
514	94718.621	89573.327	4946.223	CROWN RD SITE 8
513	94718.051	89626.331	4945.79	CROWN RD SITE 8
512	94717.339	89677.874	4945.401	CROWN RD SITE 8
511	94716.522	89728.688	4944.821	CROWN RD SITE 8
510	94716.412	89779.441	4944.188	CROWN RD SITE 8
509	94716.296	89829.647	4943.665	CROWN RD SITE 8
508	94716.463	89894.576	4943.103	CROWN RD SITE 8
507	94716.822	89949.929	4942.624	CROWN RD SITE 8
506	94716.998	90002.756	4942.039	CROWN RD SITE 8
505	94717.658	90059.007	4941.167	CROWN RD SITE 8
504	94718.251	90109.663	4940.476	CROWN RD SITE 8
503	94718.754	90166.111	4940.115	CROWN RD SITE 8
502	94717.462	90223.963	4940.162	CROWN RD SITE 8
501	94717.456	90224.996	4940.19	CROWN RD SITE 8
500	94716.996	90316.613	4940.78	CROWN RD SITE 8
499	94717.307	90362.47	4941.12	CROWN RD SITE 8
498	94716.486	90453.081	4941.995	CROWN RD SITE 8
9012	94716.509	90453.077	4942.007	9002 CHK
9011	100000.115	99999.923	4972.836	9002 CHK
497	94716.144	90328.129	4940.854	rd crown site 8
496	94715.335	90387.992	4941.222	rd crown site 8
495	94717.119	90438.75	4941.798	rd crown site 8
494	94718.308	90493.779	4942.555	rd crown site 8
493	94718.651	90545.152	4943.407	rd crown site 8
492	94718.049	90596.515	4944.59	rd crown site 8
491	94717.749	90648.927	4946.079	rd crown site 8
490	94717.596	90702.17	4947.73	rd crown site 8
489	94720.173	90855.052	4953.059	rd crown site 8
488	89374.496	91707.967	4960.129	INV US SITE 11
487	89445.689	91707.807	4959.998	INV DS SITE 11
486	89403.646	91149.28	4975.731	CROWN RD SITE 11
485	89402.5	91064.451	4975.488	CROWN RD SITE 11
484	89402.375	90982.949	4975.287	CROWN RD SITE 11
483	89402.688	90903.036	4975.144	CROWN RD SITE 11
482	89402.81	90823.59	4975.041	CROWN RD SITE 11

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
481	89402.939	90744.845	4974.901	CROWN RD SITE 11
480	89402.549	90666.678	4975.005	CROWN RD SITE 11
479	89401.876	90593.925	4975.4	CROWN RD SITE 11
478	89402.416	90496.641	4976.17	CROWN RD SITE 11
477	89402.345	90435.765	4976.85	CROWN RD SITE 11
476	89401.287	90353.029	4978.106	CROWN RD SITE 11
475	89398.796	90266.594	4979.531	CROWN RD SITE 11
474	89390.723	90216.633	4980.305	CROWN RD SITE 11
473	89389.748	90799.652	4974.57	CROWN RD SITE 11
472	89390.414	90744.454	4974.556	CROWN RD SITE 11
471	89392.783	90682.107	4974.7	CROWN RD SITE 11
470	89398.629	90607.925	4975.2	CROWN RD SITE 11
469	89401.451	90526.954	4975.847	CROWN RD SITE 11
468	89401.647	90444.071	4976.705	CROWN RD SITE 11
467	89402.697	90238.402	4980.074	CROWN RD SITE 11
466	89403.061	90156.83	4981.811	CROWN RD SITE 11
465	89402.351	90076.547	4983.402	CROWN RD SITE 11
464	89401.807	89997.721	4984.978	CROWN RD SITE 11
463	89401.822	89920.631	4986.538	CROWN RD SITE 11
462	89401.628	89844.569	4987.854	CROWN RD SITE 11
461	89401.421	89770.977	4989.191	CROWN RD SITE 11
460	89399.775	89707.049	4990.479	CROWN RD SITE 11
459	89391.385	89632.357	4992.022	CROWN RD SITE 11
458	89383.586	89573.602	4992.932	CROWN RD SITE 11
457	89381.081	81660.931	5014.236	CROWN RD
456	89371.328	81713.474	5014.283	CROWN RD
455	89371.907	81770.798	5013.982	CROWN RD
454	89373.021	81840.376	5013.684	CROWN RD
453	89371.343	81921.535	5013.426	CROWN RD
452	89369.835	82010.746	5013.164	CROWN RD
451	89368.813	82103.235	5012.887	CROWN RD
450	89368.994	82197.802	5012.69	CROWN RD
449	89370.956	82294.47	5012.465	CROWN RD
448	89371.85	82393.59	5012.076	CROWN RD
447	89372.281	82444.097	5011.988	CROWN RD
446	89372.665	82494.811	5011.878	CROWN RD
445	89372.284	82545.582	5011.801	CROWN RD
444	89372.327	82647.115	5011.676	CROWN RD
443	89371.9	82697.819	5011.662	CROWN RD
442	89371.299	82748.474	5011.652	CROWN RD
441	89371.084	82799.116	5011.552	CROWN RD
440	89371.286	82900.443	5011.5	CROWN RD
439	89371.451	82951.144	5011.472	CROWN RD
438	89371.47	83001.905	5011.523	CROWN RD
437	89371.564	83103.466	5011.554	CROWN RD
436	89371.442	83154.334	5011.518	CROWN RD
435	89371.377	83205.272	5011.56	CROWN RD
434	89371.399	83256.277	5011.602	CROWN RD
433	89371.97	83357.194	5011.711	CROWN RD
432	89371.88	83454.759	5011.508	CROWN RD

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
431	89371.186	83548.624	5011.473	CROWN RD
430	89370.575	83641.477	5011.1	CROWN RD
429	89369.779	83732.143	5010.633	CROWN RD
428	89369.744	83821.431	5010.131	CROWN RD
427	89369.31	83907.922	5009.736	CROWN RD
426	89369.521	83992.513	5009.272	CROWN RD
425	89369.908	84072.632	5008.853	CROWN RD
424	89370.225	84148.101	5008.483	CROWN RD
423	89370.24	84218.436	5008.199	CROWN RD
422	89370.903	84282.679	5007.897	CROWN RD
421	89371.586	84340.836	5007.392	CROWN RD
420	89373.733	84422.445	5006.74	CROWN RD
419	89375.299	84496.158	5006.22	CROWN RD
418	89336.156	84546.706	5005.25	CROWN RD
417	89336.16	84546.715	5005.254	CROWN RD
416	89365.743	82299.168	5012.521	CROWN RD
415	89364.693	82245.706	5012.622	CROWN RD
414	89363.535	82192.87	5012.746	CROWN RD
413	89362.607	82140.864	5012.925	CROWN RD
412	89361.181	82039.418	5013.21	CROWN RD
411	89359.348	81942.558	5013.632	CROWN RD
410	89357.465	81852.693	5013.982	CROWN RD
409	89355.719	81768.484	5014.386	CROWN RD
408	89354.705	81693.425	5014.827	CROWN RD
407	89354.128	81627.958	5015.587	CROWN RD
406	89353.328	81569.256	5016.242	CROWN RD
405	89350.667	81518.017	5016.92	CROWN RD
404	89337.487	81453.048	5017.261	CROWN RD
403	89331.027	82923.76	5006.184	INV 36CMP
402	89330.894	82918.643	5006.247	INV 36CMP
401	89407.811	82925.04	5005.352	INV 36CMP
400	89407.842	82920.238	5005.316	INV 36CMP
9	89421.993	85555.208	4994.508	HARN CHEVY
9008	105351.529	86982.08	4913.752	1010 NW23
1010	105351.552	86981.934	4913.8	NW23
7	110505.709	102534.709	4925	SE7
9007	110505.672	102534.654	4925.084	SE7
9005	121383.212	97596.029	4814.412	PT 5
9003	110559.277	97578.157	4900.873	PT 3
9002	99999.956	99999.939	4974.57	N1-4 30
6	105368.013	81670.02	4881.2	NW22
5	121383.089	97596.023	4814.85	NW6
4	115862.479	102648.772	4864.66	SE6
3	110559.296	97578.195	4901.03	SW7
2	100000	100000	4974.57	N1-4 30
1	99644.339	100662.122	4992.276	BASE

I-D

HYDRAULIC EVALUATION OF STRUCTURES

Q_{OT} = 210cfs GH 26

ANDERSON CONSULTING ENGINEERS, INC
Civil • Water Resources • Environmental

Project Number	Page	Of
CO-WELD-01		

Owner-Project	By	Date
WELD COUNTY 1-25 MDP	DCS	5/26/99

ct	Checked By	Date
GODDING HOLLOW BASIN WCR 26	CJP	05/26/99

The structure at WCR 26 is a 8.5' wide by 3.2' high RCB at an irrigation lateral o/h of the last chance ditch.

Orifice equation:

$$Q_o = CA(2gh)^{1/2}$$

C = Orifice Equation Coefficient (.6)
A = Area of opening
g = gravitational constant
h = distance from centroid of the opening to the water surface elevation, in this case the overtopping elevation.

$$Q_o = (.6)(8.5\,ft)(3.2\,ft)\left(2 \cdot 32.2\,ft/s^2 \cdot (1' + 1.6')\right)^{1/2}$$

overtopping occurs at one foot above culvert opening (on bank)

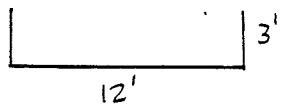
$$\boxed{Q_o = 211\,cfs}$$

The channel oversteepens immediately downstream of the structure, therefore the orifice equation will provide a sufficient approximation for the capacity of the structure.

Qot ≈ 3 Ucfs GH LCD FLUME

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number CO-WELD-01	Page 1 Of 1
Owner-Project Weld County I-25 MDP	By BLV	Date 9/2/99
Last Chance Ditch flume overtopping analysis	Checked By CJP	Date 10/29/99

3' H x 12' W concrete rectangular channel



$$Q = \frac{1.486}{n} A R^{2/3} S^{1/2}$$

$n = 0.013$

$A = 12(3) = 36\ ft^2$

$R = \frac{36}{12 + 2(3)} = 2\ ft$

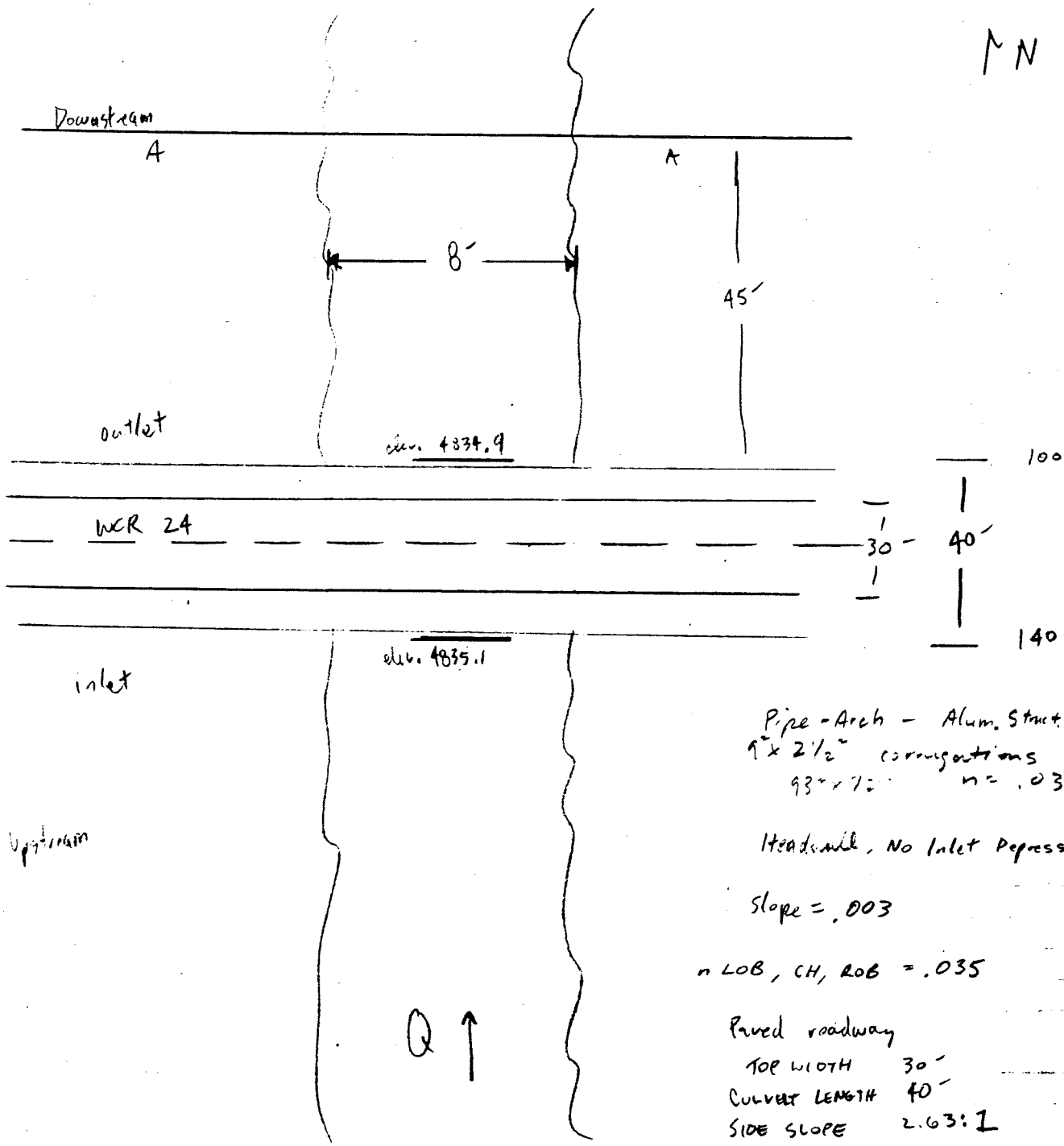
$S = \frac{10}{3050} = 0.0033$ (from USGS)

$$Q = \frac{1.486}{0.013}(36)(2)^{2/3}(0.0033)^{1/2} = \underline{375\ cfs}$$

Q_{OT} = 240 cfs

GH 24

ANDERSON CONSULTING ENGINEERS, INC Civil • Water Resources • Environmental	Project Number CO-WELD-01	Page 1 Of 6
Owner-Project Weld County - I-25 MDP	By DCS	Date 3/12/99
ct GODDING HOLLOW BASIN WCR 24 (2)	Checked By CJP	Date 04/13/99



Pipe-Arch - Alum. Struct. Plate
9" x 2 1/2" corrugations
93" x 71" n = .035

Headwall, No Inlet Depression

Slope = .003

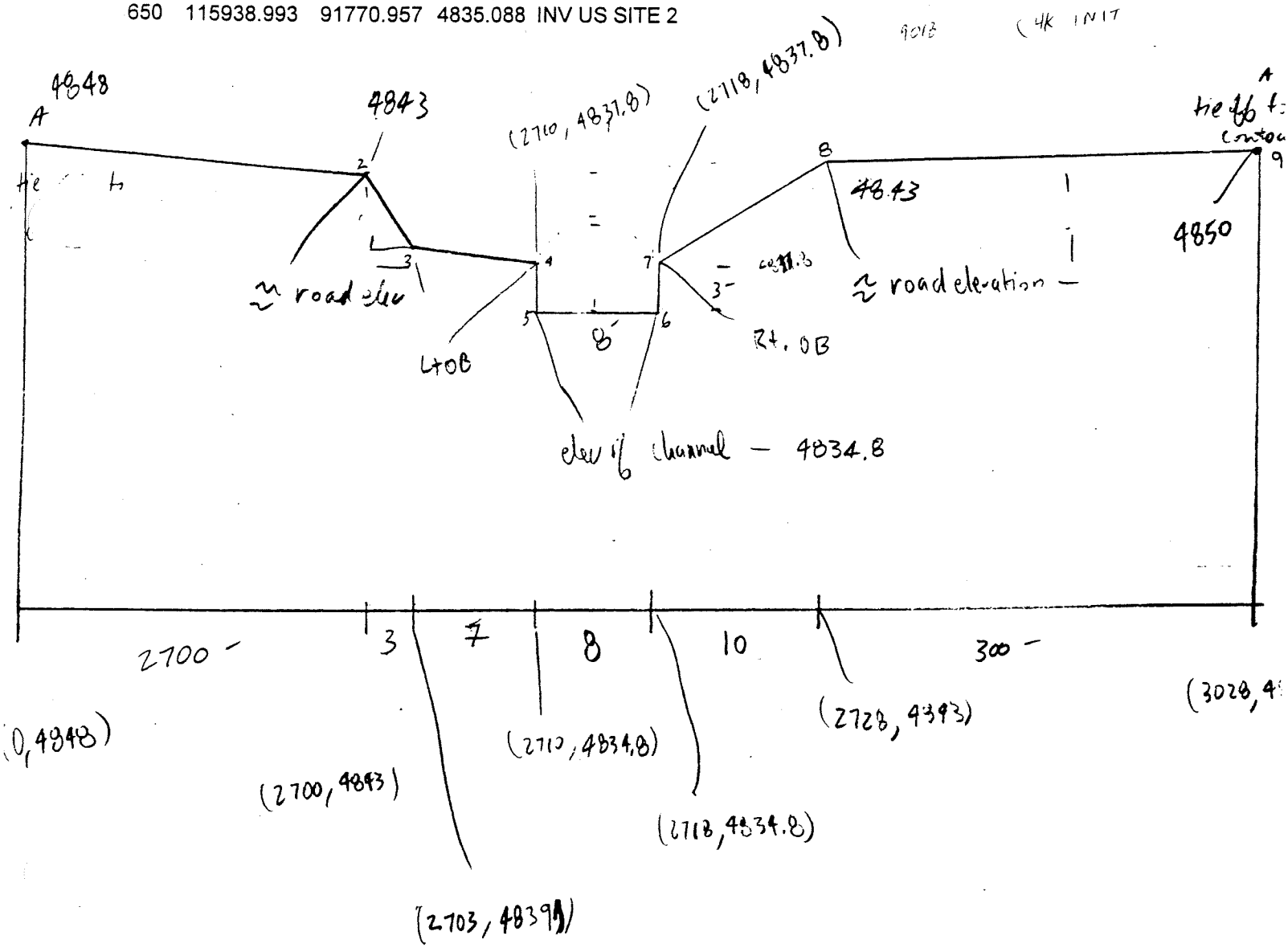
n LOB, CH, ROB = .035

Paved roadway
TOP WIDTH 30'
CULVERT LENGTH 40'
SIDE SLOPE 2.63:1

GH24
2/6

	x	y	distance	Station	elevation	
667	115966.022	90392.769		0.000	4842.991	CROWN SITE 2
666	115964.662	90562.354	169.590	169.590	4842.841	CROWN SITE 2
665	115964.564	90662.314	99.960	269.551	4842.725	CROWN SITE 2
664	115962.910	90761.318	99.018	368.568	4842.589	CROWN SITE 2
663	115962.711	90860.175	98.857	467.426	4842.446	CROWN SITE 2
662	115961.841	90959.060	98.889	566.314	4842.537	CROWN SITE 2
661	115960.816	91089.803	130.747	697.061	4842.044	CROWN SITE 2
660	115959.991	91221.091	131.291	828.352	4841.713	CROWN SITE 2
659	115959.169	91338.607	117.519	945.871	4841.530	CROWN SITE 2 — PRO. X-ING
658	115958.713	91465.382	126.776	1072.647	4841.801	CROWN SITE 2
657	115957.643	91578.132	112.755	1185.402	4842.065	CROWN SITE 2
656	115956.969	91682.063	103.933	1289.335	4842.298	CROWN SITE 2
655	115956.089	91786.521	104.462	1393.797	4843.443	CROWN SITE 2 — EX. CMP
654	115956.359	91850.591	64.071	1457.867	4843.611	CROWN SITE 2
653	115955.367	91956.353	105.767	1563.634	4845.263	crown site 2
543	115955.383	91956.359	0.017	1563.651	4845.257	crown rd site 2

652	115977.422	91773.236	4834.924	INV DS SITE 2
651	115938.771	91771.008	4835.054	INV US SITE 2
650	115938.993	91770.957	4835.088	INV US SITE 2



GH24

3/6

CURRENT DATE: 03-12-1999
CURRENT TIME: 09:30:35

FILE DATE: 03-12-1999
FILE NAME: GWCR24

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS	SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4835.10	4834.90	40.00	1	CAPA	7.75	6.00	.035	CONVENTIONAL
2									
3									
4									
5									
6									

SUMMARY OF CULVERT FLOWS (cfs) FILE: GWCR24 DATE: 03-12-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
4835.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4837.25	40.0	40.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4838.45	80.0	80.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4839.35	120.0	120.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4840.13	160.0	160.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4840.82	200.0	200.0	0.0	0.0	0.0	0.0	0.0	0.00	1
52	240.0	238.5	0.0	0.0	0.0	0.0	0.0	0.00	9
78	280.0	239.5	0.0	0.0	0.0	0.0	0.0	38.04	13
[illegible].88	320.0	230.9	0.0	0.0	0.0	0.0	0.0	91.26	6
4841.97	360.0	200.0	0.0	0.0	0.0	0.0	0.0	157.55	10
4842.03	400.0	180.1	0.0	0.0	0.0	0.0	0.0	216.05	7
4841.53	239.9	239.9	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: GWCR24 DATE: 03-12-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4835.10	0.000	0.00	0.00	0.00
4837.25	0.000	40.00	0.00	0.00
4838.45	0.000	80.00	0.00	0.00
4839.35	0.000	120.00	0.00	0.00
4840.13	0.000	160.00	0.00	0.00
4840.82	0.000	200.00	0.00	0.00
4841.52	-0.010	240.00	1.52	0.63
4841.78	-0.002	280.00	2.50	0.89
4841.88	0.001	320.00	-2.20	-0.69
4841.97	-0.001	360.00	2.45	0.68
4842.03	-0.002	400.00	3.85	0.96

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

GH24

4/6

CURRENT DATE: 03-12-1999 FILE DATE: 03-12-1999
TIME: 09:30:35 FILE NAME: GWCR24

PERFORMANCE CURVE FOR CULVERT 1 - 1(7.75 (ft) BY 6.00 (ft)) CAPA

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4835.10	0.00	-0.20	0-NF	0.00	0.00	0.00	-0.10	0.00	0.00
40.00	4837.25	1.82	2.15	3-M2t	1.96	1.34	1.77	1.77	4.02	2.74
80.00	4838.45	2.67	3.35	3-M1t	2.92	1.96	2.93	2.93	4.27	3.35
120.00	4839.35	3.41	4.25	3-M2t	3.80	2.45	3.69	3.69	4.89	3.89
160.00	4840.13	4.11	5.03	3-M2t	4.86	2.86	4.25	4.25	5.60	4.26
200.00	4840.82	4.79	5.72	3-M2t	6.00	3.23	4.69	4.69	6.37	4.55
238.48	4841.51	5.45	6.41	3-M2t	6.00	3.57	5.07	5.07	7.10	4.79
239.46	4841.77	5.47	6.67	3-M2t	6.00	3.58	5.43	5.43	6.75	5.01
230.94	4841.87	5.32	6.77	3-M2t	6.00	3.50	5.74	5.74	6.36	5.20
200.00	4841.78	4.79	6.68	3-M1f	6.00	3.23	6.00	6.04	5.39	5.37
180.10	4842.03	4.45	6.93	4-FFt	6.00	3.06	6.00	6.31	4.89	5.53

El. inlet face invert 4835.10 ft El. outlet invert 4834.90 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	140.00 ft
INLET ELEVATION	4835.10 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	4834.90 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0050
CULVERT LENGTH ALONG SLOPE	40.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	PIPE ARCH
BARREL SPAN	7.75 ft
BARREL RISE	6.00 ft
BARREL MATERIAL	ALUMINUM STRUCTURAL PLATE
BARREL MANNING'S n	0.035
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	HEADWALL
INLET DEPRESSION	NONE

GH 24

5/6

CURRENT DATE: 03-12-1999
CUR TIME: 09:30:35

FILE DATE: 03-12-1999
FILE NAME: GWCR24

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION

FILE NAME: GWCR24
FILE DATE: 03-12-1999

MAIN CHANNEL AND LT & RT OVER BANKS

LEFT CHANNEL BOUNDARY	4
RIGHT CHANNEL BOUNDARY	7
MANNING n LEFT OVER BANK	0.035
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.035
SLOPE OF CHANNEL	0.0030 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	4848.00
2	2700.00	4843.00
3	2703.00	4839.00
4	2710.00	4837.80
5	2710.00	4834.80
6	2718.00	4834.80
7	2718.00	4837.80
8	2728.00	4843.00
9	3028.00	4850.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	4834.80	0.000	-0.10	0.00	0.00
40.00	4836.67	0.352	1.77	2.74	0.24
80.00	4837.83	0.339	2.93	3.35	0.32
120.00	4838.59	0.352	3.69	3.89	0.41
160.00	4839.15	0.360	4.25	4.26	0.47
200.00	4839.59	0.366	4.69	4.55	0.51
240.00	4839.97	0.371	5.07	4.79	0.55
280.00	4840.33	0.375	5.43	5.01	0.59
320.00	4840.64	0.379	5.74	5.20	0.63
360.00	4840.94	0.382	6.04	5.37	0.66
400.00	4841.21	0.385	6.31	5.53	0.69

Note: Shear stress was calculated using R.

GH 24

6/6

CURRENT DATE: 03-12-1999
TIME: 09:30:35

FILE DATE: 03-12-1999
FILE NAME: GWCR24

ROADWAY OVERTOPPING DATA

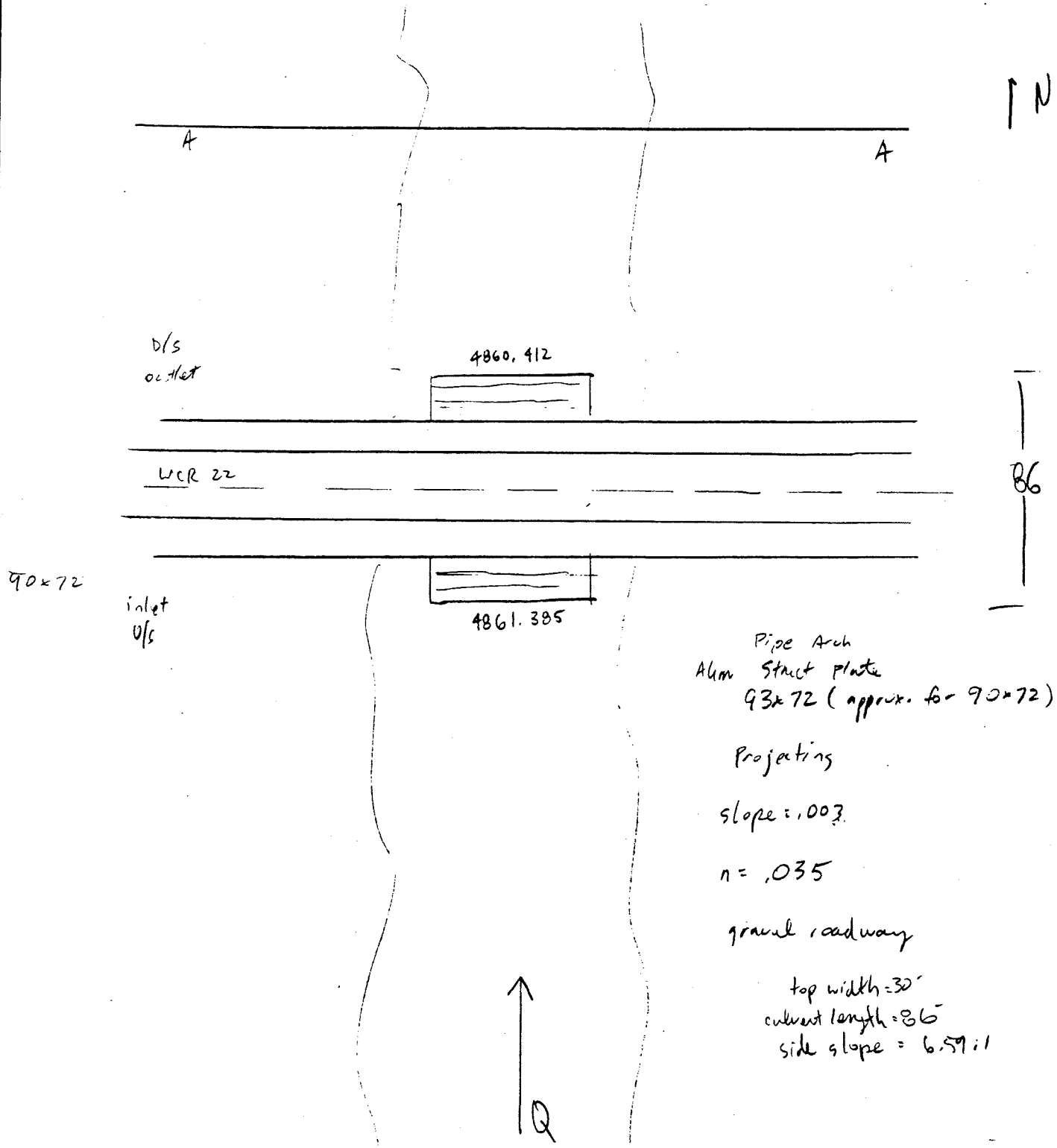
ROADWAY SURFACE PAVED
EMBANKMENT TOP WIDTH 30.00 ft
***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	4842.90
2	169.59	4842.84
3	269.55	4842.72
4	368.57	4842.59
5	467.43	4842.45
6	566.31	4842.53
7	697.06	4842.04
8	828.35	4841.71
9	945.87	4841.53
10	1072.65	4841.80
11	1185.40	4842.06
12	1289.33	4842.30
13	1393.80	4843.44
14	1457.87	4843.61
15	1563.63	4845.26

Q @ OT = 300 cfs

GH 22

ANDERSON CONSULTING ENGINEERS, INC Civil • Water Resources • Environmental	Project Number CO WELD02	Page 1 Of 6
Owner-Project	By DCS	Date 3/12/99
ct -R22 GODDING HOLLOW BASIN UCR 22 (7)	Checked By CJP	Date 04/13/99



Pipe Arch
Alum Struct Plate
93x72 (approx. for 90x72)

Projecting

slope = .003

n = .035

gravel roadway

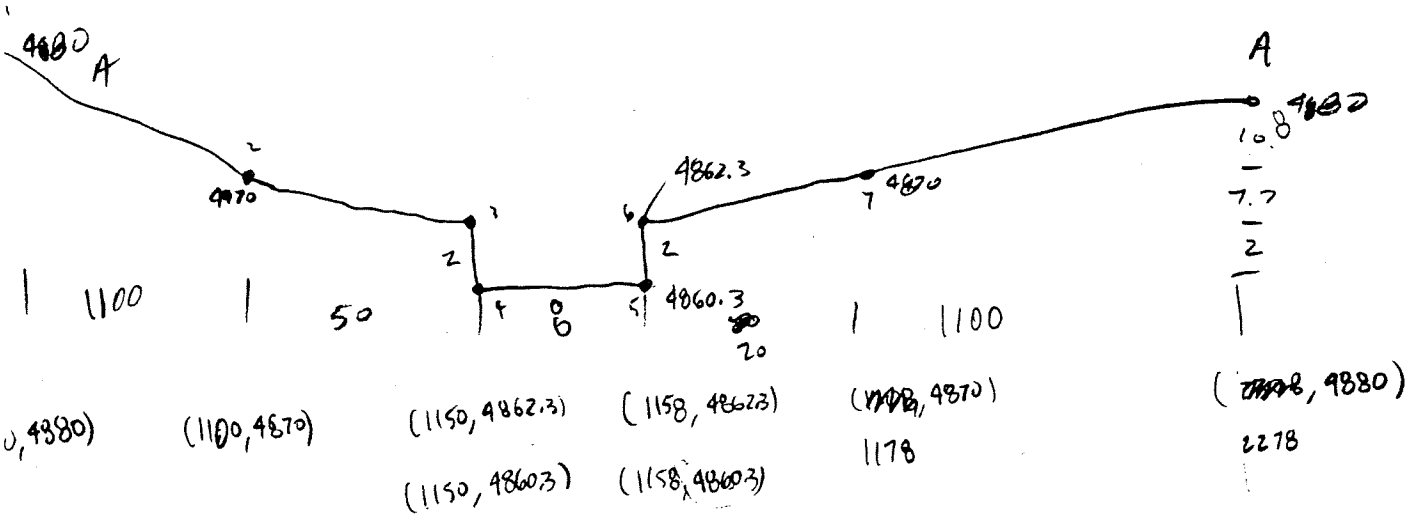
top width = 30'
culvert length = 86'
side slope = 6.59:1

GH 22
2/6

GWCR22

	x	y	distance	station	elevation	
680	110658.157	89149.051		0.000	4871.634	CROWN SITE 5
679	110656.163	89281.139	132.103	132.103	4871.735	CROWN SITE 5
678	110655.313	89414.695	133.559	265.662	4871.220	CROWN SITE 5
677	110656.211	89552.470	137.778	403.440	4870.413	CROWN SITE 5
9017	110657.368	89598.777	46.321	449.761	4869.353	S1-4 11 ← EX CAP
676	110654.271	89770.331	171.582	621.343	4869.672	CROWN SITE 4
675	110656.749	89867.536	97.237	718.580	4869.047	CROWN SITE 4
674	110655.297	89945.174	77.652	796.231	4869.134	CROWN SITE 4
673	110654.035	90072.713	127.545	923.776	4870.674	CROWN SITE 4
672	110652.078	90191.321	118.624	1042.401	4871.584	CROWN SITE 4
671	110650.979	90316.331	125.015	1167.415	4871.894	CROWN SITE 4
670	110651.319	90440.057	123.726	1291.142	4872.211	CROWN SITE 4
669	110650.703	90567.373	127.317	1418.459	4875.533	CROWN SITE 4
668	110649.824	90691.824	124.454	1542.914	4880.138	CROWN SITE 4
686	110626.042	89742.415	4861.385	INV US SITE5		
681	110695.234	89691.068	4860.412	inv ds site 5		

69 51



$\sqrt{2g}$

$Q = .62(7 \times 6)\sqrt{2(32.2)(4.7)}$

GH22

3/6

CURRENT DATE: 03-12-1999
CURRENT TIME: 09:01:13

FILE DATE: 03-12-1999
FILE NAME: GWCR22

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4861.38	4860.41	86.01	1 CAPA	7.75	6.00	.035	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: GWCR24 DATE: 03-12-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
4861.38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4863.60	40.0	40.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4864.66	80.0	80.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4865.52	120.0	120.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4866.30	160.0	160.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4867.04	200.0	200.0	0.0	0.0	0.0	0.0	0.0	0.00	1
77	240.0	240.0	0.0	0.0	0.0	0.0	0.0	0.00	1
.53	280.0	280.0	0.0	0.0	0.0	0.0	0.0	0.00	1
.18	320.0	312.0	0.0	0.0	0.0	0.0	0.0	6.50	8
4869.37	360.0	320.0	0.0	0.0	0.0	0.0	0.0	39.28	8
4869.48	400.0	320.0	0.0	0.0	0.0	0.0	0.0	76.47	8
4869.05	305.1	305.1	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: GWCR24 DATE: 03-12-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4861.38	0.000	0.00	0.00	0.00
4863.60	0.000	40.00	0.00	0.00
4864.66	0.000	80.00	0.00	0.00
4865.52	0.000	120.00	0.00	0.00
4866.30	0.000	160.00	0.00	0.00
4867.04	0.000	200.00	0.00	0.00
4867.77	0.000	240.00	0.00	0.00
4868.53	0.000	280.00	0.00	0.00
4869.18	-0.005	320.00	1.46	0.46
4869.37	-0.009	360.00	0.72	0.20
4869.48	-0.004	400.00	3.53	0.88

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

GH 22

4/6

CURRENT DATE: 03-12-1999 FILE DATE: 03-12-1999
CU TIME: 09:01:13 FILE NAME: GWCR22

PERFORMANCE CURVE FOR CULVERT 1 - 1(7.75 (ft) BY 6.00 (ft)) CAPA

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4861.38	0.00	-0.97	0-NF	0.00	0.00	0.00	-0.11	0.00	0.00
40.00	4863.61	1.93	2.22	3-M1t	1.57	1.34	1.77	1.77	4.04	2.74
80.00	4864.66	2.83	3.28	3-M1t	2.30	1.96	2.65	2.65	4.81	3.50
120.00	4865.52	3.68	4.14	3-M1t	2.91	2.45	3.24	3.24	5.68	3.97
160.00	4866.30	4.46	4.92	3-M1t	3.49	2.86	3.67	3.67	6.57	4.30
200.00	4867.04	5.19	5.65	3-M2t	4.10	3.23	4.02	4.02	7.42	4.57
240.00	4867.77	5.93	6.39	3-M2t	4.84	3.58	4.33	4.33	8.25	4.79
280.00	4868.53	6.71	7.15	3-M2t	6.00	3.88	4.60	4.60	9.08	4.99
312.03	4869.18	7.39	7.80	3-M2t	6.00	4.12	4.84	4.84	9.62	5.16
320.00	4869.49	7.57	8.11	3-M2t	6.00	4.18	5.06	5.06	9.55	5.31
320.00	4868.96	7.57	7.52	3-M2t	6.00	4.18	5.26	5.26	9.26	5.45

El. inlet face invert 4861.38 ft El. outlet invert 4860.41 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	186.00 ft
INLET ELEVATION	4861.38 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	4860.41 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0113
CULVERT LENGTH ALONG SLOPE	86.01 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	PIPE ARCH
BARREL SPAN	7.75 ft
BARREL RISE	6.00 ft
BARREL MATERIAL	ALUMINUM STRUCTURAL PLATE
BARREL MANNING'S n	0.035
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	PROJECTING
INLET DEPRESSION	NONE

GH 22
5/6

CURRENT DATE: 03-12-1999 FILE DATE: 03-12-1999
CL TIME: 09:01:13 FILE NAME: GWCR22

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION FILE NAME: GWCR22
MAIN CHANNEL AND LT & RT OVER BANKS FILE DATE: 03-11-1999

LEFT CHANNEL BOUNDARY	3
RIGHT CHANNEL BOUNDARY	6
MANNING n LEFT OVER BANK	0.035
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.035
SLOPE OF CHANNEL	0.0030 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	4880.00
2	1100.00	4870.00
3	1150.00	4862.30
4	1150.00	4860.30
5	1158.00	4860.30
6	1158.00	4862.30
7	1178.00	4870.00
8	2278.00	4880.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	4860.30	0.000	-0.11	0.00	0.00
40.00	4862.18	0.352	1.77	2.74	0.24
80.00	4863.07	0.371	2.65	3.50	0.34
120.00	4863.65	0.383	3.24	3.97	0.42
160.00	4864.08	0.390	3.67	4.30	0.47
200.00	4864.44	0.396	4.02	4.57	0.52
240.00	4864.74	0.401	4.33	4.79	0.55
280.00	4865.01	0.405	4.60	4.99	0.59
320.00	4865.26	0.408	4.84	5.16	0.62
360.00	4865.47	0.411	5.06	5.31	0.65
400.00	4865.67	0.414	5.26	5.45	0.67

Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE GRAVEL
EMBANKMENT TOP WIDTH 30.00 ft

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	4871.63
2	132.10	4871.73
3	265.66	4871.22
4	403.44	4870.41
5	449.76	4869.35
6	621.34	4869.67
7	718.58	4869.05
8	796.23	4869.13
9	923.78	4870.67
10	1042.40	4871.58

GH22

6/6

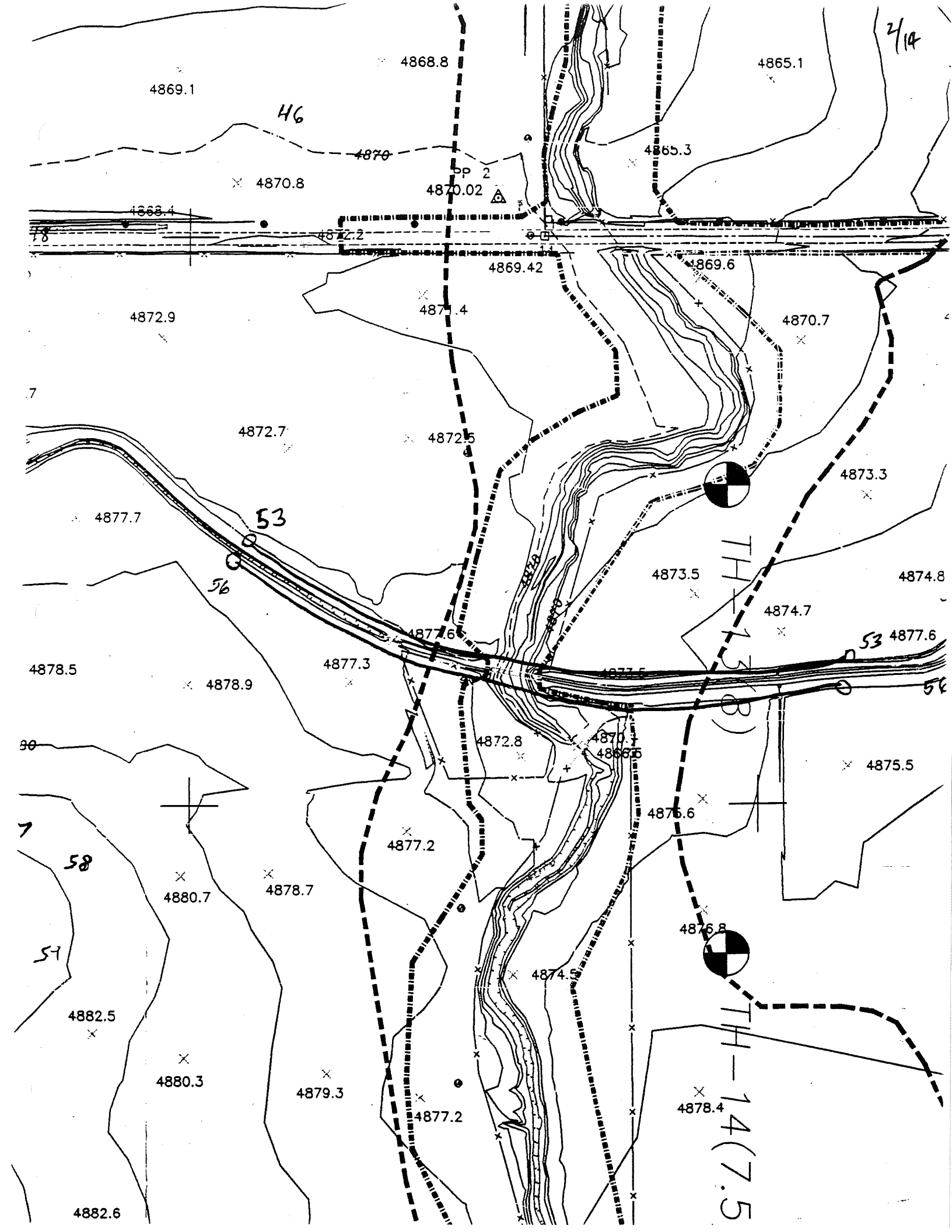
11	1167.42	4871.89
12	1291.14	4872.21
13	1418.46	4875.53
14	1542.91	4880.14

Q100 - 3000 CFS

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number CO-WELD-02	Page 1 Of 14
Owner-Project WELD COUNTY I-25 MDP	By DCS	Date 5/28/95
GODDING HOLLOW BASIN GODDING DITCH FLUME CROSSING	Checked By	Date

This HEC-2 Deck models a 60' wide steel flume that crosses the main channel of the Godding Hollow Basin.

A HEC-2 deck provided to ACE (from Rocky Mountain Consultants, File: Greenpr2.dat, Sept. 10 1996) was modified to incorporate a special bridge analysis of the flume. Input data for the existing deck was checked against new survey data provided to ACE by TST (2/99), and found to be accurate.


2/14
4868.8
4865.1
4869.1
46
4870
4865.3
BP 2
4870.8
4870.02
4868.4
4872.2
4869.42
4869.6
4872.9
4871.4
4870.7
4872.7
4872.5
4873.3
4877.7
53
56
4873.5
4874.8
4874.7
4877.6
53
4877.6
4878.5
4877.3
4878.9
4872.8
4875.5
4876.6
4877.2
58
4880.7
4878.7
4876.8
54
4874.5
4882.5
4880.3
4879.3
4877.2
4878.4
4882.6
TH-14(7.5)

3/14

```
*****************************************
*  HEC-2 WATER SURFACE PROFILES          *
*                                        *
*  Version   4.6.2;  May 1991            *
*                                        *
*      DATE    28MAY99    TIME   08:56:50 *
*      ************************************
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*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*          (916) 756-1104               *
*****************************************
```

```
X     X  XXXXXXX   XXXXX             XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                 X
X     X. X        X     X           X
X     X  XXXXXXX   XXXXX            XXXXXXX
```

THIS RUN EXECUTED 28MAY99 08:56:50

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*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************
```

T1 GODDING HOLLOW-EXISTING/PRE-PROJECT
T2 WELD COUNTY, COLORADO-WITH 6'x 11' CULVERT BLOCKED, AQUADUCT REMOVED
T3 100 YEAR FLOOD FILE: GHFLUME.DAT MAY 1999

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	0	.0042	0		0	4854.	0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1							

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

150 100

J5 LPRNT NUMSEC ********REQUESTED SECTION NUMBERS********

-10

NC	.05	.05	.03	.1	.3					
QT	7	2000	2500	2800	3000	3200	3400	3600		
X1	40	16	768	796.5	0	0	0		4800	
GR	54	500	53.19	597	50	725	49.12	768	50	769
GR	48	773	46	778	44.25	779	45.15	783	46	787
GR	47.82	796.5	48	798.5	50	805	52	810	54	821
GR	56	856								
X1	41	17	1048	1067	450	460	455		4800	
GR	56	765	56	869	56	1000	54	1010	52	1024
GR	50	1036	48.66	1048	48	1050	46.16	1051	47.12	1063
GR	48	1065	49.28	1067	50	1072	52	1095	54	1103
GR	56	1111	58	1137						
NC	.04	.05	.025							
X	42	17	844	865.5	332	336	334		4800	
GR	57	656	56	760	54	840	52.81	844	52	845
GR	50	851	47.65	855	47.85	859	50	863	52	864.5
GR	53.08	865.5	54	879	56	887	58	934	60	963

GR	60	1168	62	1174						
	.04	.045	.03							
X1	43	18	934	953.5	420	420	420		4800	
GR	59.2	676	58	920	56	926	54	932.5	53.4	934
GR	52	937.5	50	941	49.43	943	48.63	949	50	951
GR	52	953	53.11	953.5	54	954.5	56	962	58	989
GR	60	1068	60	1170	62	1232				
NC	.04	.04	.035							
X1	44	16	820	835	475	460	467		4800	
GR	63.2	347	62	675	62	700	60	730	58.6	760
GR	58	804	56	813	54.8	820	51.23	828	51.01	831
GR	54.42	835	56	848	58	853	60	857	62	887
GR	64	1115								
NC	.04	.04	.03							
X1	45	15	1079	1113	650	670	660		4800	
GR	66	1000	65.24	1079	62	1086	60	1090	58	1095
GR	56	1099	54.08	1103	54.26	1108	56	1111	56.86	1113
GR	58	1122	60	1147	62	1205	64	1325	66	1630
NC	.04	.04	.05	.3	.5					
X1	46	15	1003	1044	675	673	672		4800	
GR	70	500	68	980	66	993	64	1003	62	1012
GR	60	1021	59.32	1025	59.58	1032.5	60	1034	62	1038
GR	65.64	1044	64	1074	66	1364	68	1554	70	1655
NH	4	.03	1646	.08	1706	.045	1733	.04	2563	
X1	47	17	1696	1733	130	120	125		4800	
GR	72	1000	70	1622	68	1646	66	1696	64	1701.5
GR	62	1706	60	1711	59.4	1714	59.44	1719	60	1723
GR	62	1727	64	1733	66	1843	68	2123	70	2293
GR	72	2523	74	2563						
NH	3	.03	1350	.045	2380	.035	2720			
X1	48	9	1350	2140	42	42	42		4800	
GR	72.	500	72	1150	72.2	1310	72	1350	69.5	1850
GR	70	2140	72	2380	74	2650	76	2720		
X1	49				25	25	25			
NH	3	.035	1305	.04	1322.5	.035	2086			
X1	50	19	1309.5	1317.75	15	15	15		4800	
GR	72.9	500	72	915	70	1207	68	1265	66	1287
GR	65.5	1305	63.29	1309.5	61.95	1312.25	61.76	1315	64	1317.75
GR	64	1320.5	64	1322.5	66	1333	68	1347	69.45	1350
GR	69.04	1420	70	1536	72	1678	74	2086		
NC	.035	.035	.04							
X1	51	16	1919	1931	240	250	245		4800	
GR	74	611	72	1500	70	1780	68	1857	66	1878
GR	64.76	1919	64	1920	61.48	1922	61.48	1929	63.57	1931
GR	64	1932	66	1958	68	1962	70	1974	72	2204
GR	74	2523								

NH	4	.03	1003	.07	1006	.04	1018	.03	1489	
X1	52	20	1003	1018	340	350	345		4800	
	74	0	72.5	700	72	910	71.21	964	70	973
	68	980	66	988	65.2	1003	64	1006	62.6	1008
[illegible]	60.4	1016.25	64	1017	64.3	1018	66	1020	68	1025
GR	70	1030	70.29	1034.3	70.81	1119	72	1189	74	1489
NC	.03	.03	.04	.3	.5					
ET		9.1	9.1	9.1	9.1	9.1	9.1	9.1	992	1026
X1	53	15	966	1048	340	346	343		4800	
GR	78	500	76	818	74	966	72	973	70	979
GR	68	986	66	1001	64.04	1003	63.89	1017	66	1019
GR	68	1027	70	1033	72	1043	74	1048	76	1074
SB		1.6	3	999	10	0	240	1.8	4864.09	4863.89
ET		9.1	9.1	9.1	9.1	9.1	9.1	9.1	992	1026
X1	56				11	11	11		.2	
X2			1	4873	4876.5					
NC	.04	.04	.05							
X1	57	12	1060	1230	190	130	157		4800	
GR	78	708	76	972	74	1050	72	1060	70.4	1120
GR	72	1230	74	1250	76	1500	76	1524	75.5	1700
GR	76	1900	78	2288						
X1	58				20	20	20		.1	
	.03	.04	.045							
X1	59	18	860	876	390	520	450		4800	
GR	84	500	82	580	80	683	78	826	76.72	830
GR	76	840	74	846	72	852	70	859	69.02	860
GR	66.78	862	66.83	874.5	69.0	876	70	879	72	882
GR	74	891	76	961	77.2	1237				
NC	.03	.03	.03	.1	.3					
X1	60	18	1175	1212.5	515	510	512		4800	
GR	80	721	78	1091	76.28	1162.5	76	1164	74	1172
GR	73.6	1175	72	1180	70	1190	67.42	1191.5	67.65	1196.5
GR	70	1198	72	1207	74	1211	74.76	1212.5	76	1230.5
GR	78.25	1260	79.2	1450	80	2100				
NC			.045							
X1	61	23	938	952	650	640	645		4800	
GR	84	20	82	213	80	500	78.05	680	78	908
GR	78	926	76	931	74	936	72.72	938	72	941.5
GR	70.08	945	70.23	949	72	950.5	72.42	952	74	953.5
GR	76	957	78	961.8	80	966.5	82	984.5	82	1282.5
GR	80.9	1517.5	82	1935.	84	1995				
X1	62	15	741	749.5	400	400	400		4800	
GR	80	500	79.45	610	78	722	76	728	74	736
GR	73.7	741	72	743	71.01	745	72	746.5	74	749.5
GR	76	753	78	757	80	767.5	83.21	782	83.17	863
NC	.03	.035	.045							
X1	63	15	860	894.4	465	500	575		4800	

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GR	81.06	705	80.8	804	80	811	78	817	76	821
GR	74.4	822	75.37	831	80	840	80.8	860	80	872
GR	72.03	878.6	71.81	885.3	81.01	894.4	82	909	84	929

Q=2500 CFS

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	3	0	0	.0042	0		0	4854.	0
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2	0	-1							0

T3 Q=2800 CFS

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	4	0	0	.0042	0		0	4854.	0
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3	0	-1							0

T3 Q=3000 CFS

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	5	0	0	.0042	0		0	4854.	0
	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	4	0	-1							0

T3 Q=3200 CFS

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	6	0	0	.0042	0		0	4854.	0
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	5	0	-1							0

T3 Q=3400 CFS

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	7	0	0	.0042	0		0	4854.	0
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	6	0	-1							0

T3 Q=3600 CFS

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	8	0	0	.0042	0		0	4854.	0

NDF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
15	0	-1							0

THIS RUN EXECUTED 28MAY99 08:56:51

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

100 YEAR FLOOD FILE:

Q = 3000 cfs at overtopping

SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
	56.000	4873.52	4873.00	4873.86	4876.50	2000.00	.00	10.00	.00	8.76	4872.85	8.10	4873.86
	56.000	4874.36	4873.00	4875.19	4876.50	2500.00	.00	10.00	.00	9.92	4874.01	8.72	4875.19
*	56.000	4874.86	4873.00	4876.06	4876.50	2800.00	.00	10.00	.00	10.74	4874.83	8.90	4876.06
*	56.000	4875.19	4873.00	4876.67	4876.50	2961.58	61.80	30.00	.00	11.20	4875.29	9.08	4876.58
*	56.000	4875.53	4873.00	4877.31	4876.50	2966.55	240.48	30.00	.00	11.11	4875.20	9.78	4876.69
	56.000	4875.87	4873.00	4877.97	4876.50	2968.65	445.85	30.00	.00	10.96	4875.05	10.55	4876.78
	56.000	4876.21	4873.00	4878.63	4876.50	2975.12	649.62	30.00	.00	10.73	4874.82	11.46	4876.86

100 YEAR FLOOD FILE:

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	40.000	.00	.00	.00	4844.25	2000.00	4852.00	.00	4852.92	41.38	9.09	367.42	310.92
	40.000	.00	.00	.00	4844.25	2500.00	4852.47	.00	4853.45	41.67	9.66	450.99	387.27
	40.000	.00	.00	.00	4844.25	2800.00	4852.74	.00	4853.74	41.35	9.92	502.54	435.46
	40.000	.00	.00	.00	4844.25	3000.00	4852.88	.00	4853.91	42.02	10.16	531.39	462.79
	40.000	.00	.00	.00	4844.25	3200.00	4853.04	.00	4854.08	42.04	10.33	563.55	493.56
	40.000	.00	.00	.00	4844.25	3400.00	4853.18	.00	4854.24	42.10	10.49	595.08	524.03
	40.000	.00	.00	.00	4844.25	3600.00	4853.32	.00	4854.38	42.06	10.63	625.25	555.08
	41.000	455.00	.00	.00	4846.16	2000.00	4853.69	.00	4854.83	39.77	10.29	306.62	317.14
	41.000	455.00	.00	.00	4846.16	2500.00	4854.17	.00	4855.52	44.57	11.41	350.67	374.48
	41.000	455.00	.00	.00	4846.16	2800.00	4854.41	.00	4855.90	47.55	12.06	373.87	406.03
	41.000	455.00	.00	.00	4846.16	3000.00	4854.57	.00	4856.14	49.29	12.46	389.23	427.31
	41.000	455.00	.00	.00	4846.16	3200.00	4854.71	.00	4856.37	51.26	12.86	403.22	446.93
	41.000	455.00	.00	.00	4846.16	3400.00	4854.84	.00	4856.59	53.27	13.27	416.54	465.86
	41.000	455.00	.00	.00	4846.16	3600.00	4854.95	.00	4856.81	55.74	13.70	427.94	482.21
*	42.000	334.00	.00	.00	4847.65	2000.00	4856.54	4856.54	4857.71	26.63	10.02	353.90	387.53
*	42.000	334.00	.00	.00	4847.65	2500.00	4857.03	4857.03	4858.20	26.77	10.52	464.49	483.18
*	42.000	334.00	.00	.00	4847.65	2800.00	4857.37	4857.37	4858.43	24.34	10.35	553.86	567.52
*	42.000	334.00	.00	.00	4847.65	3000.00	4857.52	4857.52	4858.58	24.58	10.52	591.11	605.15
*	42.000	334.00	.00	.00	4847.65	3200.00	4857.62	4857.62	4858.72	25.37	10.79	620.02	635.26
*	42.000	334.00	.00	.00	4847.65	3400.00	4857.72	4857.72	4858.85	26.18	11.05	647.48	664.54
*	42.000	334.00	.00	.00	4847.65	3600.00	4857.83	4857.83	4858.98	26.71	11.27	676.78	696.52
	43.000	420.00	.00	.00	4848.63	2000.00	4857.47	4857.47	4859.69	58.72	12.70	198.92	261.00
*	43.000	420.00	.00	.00	4848.63	2500.00	4859.39	4859.39	4860.27	22.29	9.20	560.64	529.49
*	43.000	420.00	.00	.00	4848.63	2800.00	4859.59	4859.59	4860.46	22.81	9.44	634.91	586.29

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*	43.000	420.00	.00	.00	4848.63	3000.00	4859.72	4859.72	4860.58	22.96	9.56	683.87	626.13
*	43.000	420.00	.00	.00	4848.63	3200.00	4859.90	4859.90	4860.70	21.70	9.42	754.86	686.99
*	43.000	420.00	.00	.00	4848.63	3400.00	4859.98	4859.98	4860.81	22.76	9.69	783.59	712.60
*	43.000	420.00	.00	.00	4848.63	3600.00	4859.91	4859.91	4860.91	27.29	10.56	757.32	689.17
*	4.000	467.00	.00	.00	4851.01	2000.00	4860.83	.00	4861.23	17.41	6.66	463.54	479.29
	4.000	467.00	.00	.00	4851.01	2500.00	4860.81	.00	4861.45	27.60	8.37	460.72	475.88
	44.000	467.00	.00	.00	4851.01	2800.00	4861.00	.00	4861.70	29.93	8.85	490.08	511.77
	44.000	467.00	.00	.00	4851.01	3000.00	4861.10	.00	4861.85	31.83	9.20	506.26	531.78
	44.000	467.00	.00	.00	4851.01	3200.00	4861.16	.00	4861.98	34.74	9.66	515.22	542.92
	44.000	467.00	.00	.00	4851.01	3400.00	4861.28	.00	4862.13	35.73	9.89	535.92	568.83
	44.000	467.00	.00	.00	4851.01	3600.00	4861.53	.00	4862.34	33.45	9.75	578.16	622.46
	45.000	660.00	.00	.00	4854.08	2000.00	4862.17	.00	4862.93	35.28	8.35	333.75	336.70
	45.000	660.00	.00	.00	4854.08	2500.00	4862.75	.00	4863.50	33.98	8.54	419.33	428.85
	45.000	660.00	.00	.00	4854.08	2800.00	4863.05	.00	4863.80	33.34	8.63	472.22	484.95
	45.000	660.00	.00	.00	4854.08	3000.00	4863.25	.00	4863.99	32.79	8.67	508.90	523.92
	45.000	660.00	.00	.00	4854.08	3200.00	4863.46	.00	4864.18	31.57	8.63	551.65	569.56
	45.000	660.00	.00	.00	4854.08	3400.00	4863.64	.00	4864.35	30.99	8.64	590.01	610.79
	45.000	660.00	.00	.00	4854.08	3600.00	4863.77	.00	4864.49	31.41	8.77	619.21	642.38

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	46.000	672.00	.00	.00	4859.32	2000.00	4865.83	.00	4866.27	70.09	6.50	460.54	238.90
	46.000	672.00	.00	.00	4859.32	2500.00	4866.18	.00	4866.56	58.78	6.27	592.96	326.07
	46.000	672.00	.00	.00	4859.32	2800.00	4866.37	.00	4866.73	53.91	6.15	665.95	381.37
	46.000	672.00	.00	.00	4859.32	3000.00	4866.48	.00	4866.83	51.26	6.09	713.84	419.02
	46.000	672.00	.00	.00	4859.32	3200.00	4866.58	.00	4866.93	50.14	6.10	754.68	451.94
	46.000	672.00	.00	.00	4859.32	3400.00	4866.68	.00	4867.02	48.23	6.06	800.32	489.56
	46.000	672.00	.00	.00	4859.32	3600.00	4866.80	.00	4867.13	45.38	5.97	853.47	534.43
	47.000	125.00	.00	.00	4859.40	2000.00	4866.68	.00	4867.12	68.63	6.21	407.07	241.41
	47.000	125.00	.00	.00	4859.40	2500.00	4866.93	.00	4867.44	75.47	6.73	478.65	287.78
	47.000	125.00	.00	.00	4859.40	2800.00	4867.07	.00	4867.60	78.75	7.00	521.08	315.52
	47.000	125.00	.00	.00	4859.40	3000.00	4867.15	.00	4867.71	80.76	7.16	548.86	333.82
	47.000	125.00	.00	.00	4859.40	3200.00	4867.24	.00	4867.81	81.84	7.28	578.82	353.72
	7.000	125.00	.00	.00	4859.40	3400.00	4867.32	.00	4867.90	83.06	7.41	607.71	373.05
	7.000	125.00	.00	.00	4859.40	3600.00	4867.40	.00	4868.00	83.69	7.51	638.05	393.52
*	48.000	42.00	.00	.00	4869.50	2000.00	4870.65	4870.65	4871.01	317.93	4.89	419.71	112.17
*	48.000	42.00	.00	.00	4869.50	2500.00	4870.78	4870.78	4871.18	306.17	5.17	498.28	142.88
*	48.000	42.00	.00	.00	4869.50	2800.00	4870.85	4870.85	4871.27	300.78	5.32	543.70	161.45
*	48.000	42.00	.00	.00	4869.50	3000.00	4870.90	4870.90	4871.33	294.27	5.38	575.72	174.88
*	48.000	42.00	.00	.00	4869.50	3200.00	4870.94	4870.94	4871.39	292.37	5.47	604.42	187.15
*	48.000	42.00	.00	.00	4869.50	3400.00	4870.98	4870.98	4871.44	288.08	5.54	634.73	200.32
*	48.000	42.00	.00	.00	4869.50	3600.00	4871.02	4871.02	4871.49	285.13	5.62	663.88	213.20
*	49.000	25.00	.00	.00	4869.50	2000.00	4871.25	.00	4871.34	47.20	2.50	831.92	291.10
*	49.000	25.00	.00	.00	4869.50	2500.00	4871.41	.00	4871.52	48.89	2.69	966.45	357.54
*	49.000	25.00	.00	.00	4869.50	2800.00	4871.50	.00	4871.62	49.69	2.80	1043.77	397.20
*	49.000	25.00	.00	.00	4869.50	3000.00	4871.56	.00	4871.68	50.39	2.86	1092.29	422.60
*	49.000	25.00	.00	.00	4869.50	3200.00	4871.61	.00	4871.74	50.76	2.92	1142.22	449.14
*	49.000	25.00	.00	.00	4869.50	3400.00	4871.66	.00	4871.79	51.36	2.98	1189.09	474.41
*	49.000	25.00	.00	.00	4869.50	3600.00	4871.71	.00	4871.85	51.79	3.04	1236.34	500.22
*	50.000	15.00	.00	.00	4861.76	2000.00	4871.31	.00	4871.37	4.05	2.94	1144.46	994.37
*	50.000	15.00	.00	.00	4861.76	2500.00	4871.48	.00	4871.55	5.24	3.39	1248.22	1091.98
*	50.000	15.00	.00	.00	4861.76	2800.00	4871.57	.00	4871.65	5.95	3.64	1306.87	1147.97
*	50.000	15.00	.00	.00	4861.76	3000.00	4871.62	.00	4871.71	6.43	3.79	1343.47	1183.22
*	50.000	15.00	.00	.00	4861.76	3200.00	4871.68	.00	4871.77	6.88	3.94	1381.40	1219.97
*	50.000	15.00	.00	.00	4861.76	3400.00	4871.73	.00	4871.83	7.34	4.08	1417.57	1255.24
*	50.000	15.00	.00	.00	4861.76	3600.00	4871.78	.00	4871.88	7.79	4.22	1452.58	1289.58
	51.000	245.00	.00	.00	4861.48	2000.00	4871.40	.00	4871.46	3.10	2.57	1107.43	1135.16
	51.000	245.00	.00	.00	4861.48	2500.00	4871.59	.00	4871.66	4.08	2.98	1218.59	1238.35
	51.000	245.00	.00	.00	4861.48	2800.00	4871.70	.00	4871.78	4.64	3.21	1284.30	1299.75
	51.000	245.00	.00	.00	4861.48	3000.00	4871.76	.00	4871.85	5.03	3.35	1325.32	1338.26
	51.000	245.00	.00	.00	4861.48	3200.00	4871.83	.00	4871.92	5.39	3.49	1367.39	1377.92
	51.000	245.00	.00	.00	4861.48	3400.00	4871.89	.00	4871.99	5.76	3.62	1408.88	1417.19
	51.000	245.00	.00	.00	4861.48	3600.00	4871.95	.00	4872.05	6.11	3.74	1449.65	1455.95

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K

*	52.000	345.00	.00	.00	4860.40	2000.00	4871.43	.00	4871.85	18.96	5.18	420.62	459.37
*	52.000	345.00	.00	.00	4860.40	2500.00	4871.64	.00	4872.18	24.45	5.98	466.62	505.62
*	52.000	345.00	.00	.00	4860.40	2800.00	4871.76	.00	4872.36	27.45	6.39	495.21	534.39
*	52.000	345.00	.00	.00	4860.40	3000.00	4871.83	.00	4872.47	29.36	6.64	514.26	553.63
*	2.000	345.00	.00	.00	4860.40	3200.00	4871.91	.00	4872.58	31.15	6.88	533.76	573.40
	2.000	345.00	.00	.00	4860.40	3400.00	4871.98	.00	4872.68	32.89	7.10	552.89	592.86
	52.000	345.00	.00	.00	4860.40	3600.00	4872.06	.00	4872.78	34.22	7.29	574.86	615.39
*	53.000	343.00	.00	.00	4863.89	2000.00	4872.14	.00	4873.32	63.00	8.70	229.83	251.98
*	53.000	343.00	.00	.00	4863.89	2500.00	4872.50	.00	4874.15	84.53	10.33	242.09	271.91
*	53.000	343.00	.00	.00	4863.89	2800.00	4872.68	.00	4874.66	98.43	11.27	248.35	282.23
*	53.000	343.00	.00	.00	4863.89	3000.00	4872.79	.00	4874.99	108.21	11.90	252.07	288.40
*	53.000	343.00	.00	.00	4863.89	3200.00	4872.89	.00	4875.33	118.47	12.53	255.42	294.00
*	53.000	343.00	.00	.00	4863.89	3400.00	4872.98	.00	4875.67	129.23	13.15	258.46	299.09
*	53.000	343.00	.00	.00	4863.89	3600.00	4873.04	.00	4876.01	141.51	13.82	260.57	302.63
	56.000	11.00	4876.50	4873.00	4864.09	2000.00	4872.85	.00	4873.86	50.99	8.10	247.06	280.09
	56.000	11.00	4876.50	4873.00	4864.09	2500.00	4874.01	.00	4875.19	51.77	8.72	286.75	347.46
*	56.000	11.00	4876.50	4873.00	4864.09	2800.00	4874.83	.00	4876.06	49.83	8.90	314.61	396.67
*	56.000	11.00	4876.50	4873.00	4864.09	3000.00	4875.29	.00	4876.58	49.85	9.08	330.25	424.91
*	56.000	11.00	4876.50	4873.00	4864.09	3200.00	4875.20	.00	4876.69	58.28	9.78	327.09	419.18
	56.000	11.00	4876.50	4873.00	4864.09	3400.00	4875.05	.00	4876.78	68.70	10.55	322.13	410.20
	56.000	11.00	4876.50	4873.00	4864.09	3600.00	4874.82	.00	4876.86	82.70	11.46	314.16	395.87
*	57.000	157.00	.00	.00	4870.40	2000.00	4874.51	.00	4874.67	25.77	3.34	626.10	393.99
*	57.000	157.00	.00	.00	4870.40	2500.00	4875.74	.00	4875.83	10.49	2.64	1120.20	771.94
*	57.000	157.00	.00	.00	4870.40	2800.00	4876.55	.00	4876.59	4.83	2.00	1881.56	1273.99
*	57.000	157.00	.00	.00	4870.40	3000.00	4877.04	.00	4877.07	3.00	1.67	2465.15	1731.98
*	57.000	157.00	.00	.00	4870.40	3200.00	4877.21	.00	4877.24	2.79	1.64	2682.39	1914.15
*	57.000	157.00	.00	.00	4870.40	3400.00	4877.38	.00	4877.40	2.59	1.61	2913.52	2114.01
*	57.000	157.00	.00	.00	4870.40	3600.00	4877.55	.00	4877.57	2.39	1.58	3152.84	2327.01
	58.000	20.00	.00	.00	4870.50	2000.00	4874.56	.00	4874.73	27.06	3.40	614.27	384.45
	58.000	20.00	.00	.00	4870.50	2500.00	4875.76	.00	4875.86	11.38	2.72	1072.24	740.96
	58.000	20.00	.00	.00	4870.50	2800.00	4876.55	.00	4876.61	5.42	2.09	1783.55	1202.29
	58.000	20.00	.00	.00	4870.50	3000.00	4877.04	.00	4877.08	3.36	1.75	2349.11	1637.08
	58.000	20.00	.00	.00	4870.50	3200.00	4877.22	.00	4877.25	3.11	1.71	2565.05	1815.04
	58.000	20.00	.00	.00	4870.50	3400.00	4877.38	.00	4877.41	2.89	1.68	2783.28	2000.65
	8.000	20.00	.00	.00	4870.50	3600.00	4877.55	.00	4877.58	2.66	1.65	3017.96	2206.23
	59.000	450.00	.00	.00	4866.78	2000.00	4875.71	.00	4876.52	39.75	8.07	306.33	317.24
*	59.000	450.00	.00	.00	4866.78	2500.00	4876.26	.00	4877.14	41.48	8.59	378.75	388.15
*	59.000	450.00	.00	.00	4866.78	2800.00	4876.73	.00	4877.46	34.95	8.16	493.84	473.65
*	59.000	450.00	.00	.00	4866.78	3000.00	4877.12	.00	4877.69	27.92	7.49	629.05	567.74
*	59.000	450.00	.00	.00	4866.78	3200.00	4877.29	.00	4877.82	26.97	7.44	694.59	616.13
*	59.000	450.00	.00	.00	4866.78	3400.00	4877.44	.00	4877.95	25.74	7.34	760.09	670.18
*	59.000	450.00	.00	.00	4866.78	3600.00	4877.61	.00	4878.09	24.33	7.21	827.28	729.82

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	60.000	512.00	.00	.00	4867.42	2000.00	4877.25	.00	4877.97	21.09	7.24	330.05	435.52
*	60.000	512.00	.00	.00	4867.42	2500.00	4877.86	.00	4878.62	20.96	7.68	415.04	546.01
	60.000	512.00	.00	.00	4867.42	2800.00	4878.07	.00	4878.90	22.20	8.07	451.83	594.27
	60.000	512.00	.00	.00	4867.42	3000.00	4878.21	.00	4879.06	22.83	8.29	478.90	627.83
	60.000	512.00	.00	.00	4867.42	3200.00	4878.33	.00	4879.22	23.55	8.51	506.27	659.43
	60.000	512.00	.00	.00	4867.42	3400.00	4878.44	4877.62	4879.36	24.29	8.73	535.45	689.87
	60.000	512.00	.00	.00	4867.42	3600.00	4878.55	4878.10	4879.48	24.84	8.91	568.83	722.27
	61.000	645.00	.00	.00	4870.08	2000.00	4879.18	.00	4879.49	25.10	6.16	532.81	399.23
	61.000	645.00	.00	.00	4870.08	2500.00	4879.68	.00	4879.91	17.54	5.37	741.10	596.93
	61.000	645.00	.00	.00	4870.08	2800.00	4879.94	.00	4880.14	15.36	5.12	852.73	714.51
	61.000	645.00	.00	.00	4870.08	3000.00	4880.08	.00	4880.28	14.19	4.98	924.82	796.48
	61.000	645.00	.00	.00	4870.08	3200.00	4880.22	.00	4880.41	13.35	4.88	991.80	875.81
	61.000	645.00	.00	.00	4870.08	3400.00	4880.35	.00	4880.54	12.70	4.80	1057.06	954.22
*	61.000	645.00	.00	.00	4870.08	3600.00	4880.47	.00	4880.65	12.22	4.75	1119.03	1029.72
	62.000	400.00	.00	.00	4871.01	2000.00	4880.20	.00	4880.57	28.09	6.10	420.45	377.38
	62.000	400.00	.00	.00	4871.01	2500.00	4880.46	.00	4880.89	31.18	6.56	488.62	447.74
*	62.000	400.00	.00	.00	4871.01	2800.00	4880.62	.00	4881.07	31.56	6.69	533.30	498.39
	2.000	400.00	.00	.00	4871.01	3000.00	4880.71	.00	4881.18	32.16	6.81	558.92	528.97
	2.000	400.00	.00	.00	4871.01	3200.00	4880.81	.00	4881.29	32.44	6.89	585.51	561.84
	62.000	400.00	.00	.00	4871.01	3400.00	4880.90	.00	4881.40	32.76	6.98	610.69	593.99
*	62.000	400.00	.00	.00	4871.01	3600.00	4880.99	.00	4881.51	33.04	7.05	635.24	626.30

63.000	575.00	.00	.00	4871.81	2000.00	4881.61	.00	4882.01	29.24	4.42	402.68	369.89
63.000	575.00	.00	.00	4871.81	2500.00	4881.98	.00	4882.42	30.70	4.76	477.76	451.17
63.000	575.00	.00	.00	4871.81	2800.00	4882.17	.00	4882.64	31.84	4.97	515.55	496.19
63.000	575.00	.00	.00	4871.81	3000.00	4882.29	.00	4882.78	32.43	5.09	540.13	526.83
63.000	575.00	.00	.00	4871.81	3200.00	4882.40	.00	4882.92	33.09	5.21	563.02	556.28
3.000	575.00	.00	.00	4871.81	3400.00	4882.51	.00	4883.05	33.66	5.32	585.52	586.06
3.000	575.00	.00	.00	4871.81	3600.00	4882.61	.00	4883.18	34.24	5.43	607.01	615.24

100 YEAR FLOOD FILE:

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	40.000	2000.00	4852.00	.00	.00	-2.00	165.25	.00
	40.000	2500.00	4852.47	.47	.00	-1.53	186.91	.00
	40.000	2800.00	4852.74	.27	.00	-1.26	199.09	.00
	40.000	3000.00	4852.88	.14	.00	-1.12	205.60	.00
	40.000	3200.00	4853.04	.15	.00	-.96	212.62	.00
	40.000	3400.00	4853.18	.15	.00	-.82	219.28	.00
	40.000	3600.00	4853.32	.13	.00	-.68	235.44	.00
	41.000	2000.00	4853.69	.00	1.69	.00	89.58	455.00
	41.000	2500.00	4854.17	.48	1.69	.00	94.50	455.00
	41.000	2800.00	4854.41	.24	1.67	.00	96.69	455.00
	41.000	3000.00	4854.57	.16	1.68	.00	98.11	455.00
	41.000	3200.00	4854.71	.14	1.67	.00	99.38	455.00
	41.000	3400.00	4854.84	.13	1.66	.00	100.58	455.00
	41.000	3600.00	4854.95	.11	1.63	.00	101.60	455.00
*	42.000	2000.00	4856.54	.00	2.86	.00	196.23	334.00
*	42.000	2500.00	4857.03	.49	2.86	.00	255.20	334.00
*	42.000	2800.00	4857.37	.34	2.97	.00	263.30	334.00
*	42.000	3000.00	4857.52	.14	2.95	.00	266.61	334.00
*	42.000	3200.00	4857.62	.11	2.92	.00	269.14	334.00
	2.000	3400.00	4857.72	.10	2.89	.00	271.53	334.00
	2.000	3600.00	4857.83	.11	2.88	.00	274.05	334.00
*	43.000	2000.00	4857.47	.00	.92	.00	60.19	420.00
*	43.000	2500.00	4859.39	1.93	2.36	.00	367.95	420.00
*	43.000	2800.00	4859.59	.20	2.22	.00	375.84	420.00
*	43.000	3000.00	4859.72	.13	2.21	.00	380.95	420.00
*	43.000	3200.00	4859.90	.18	2.28	.00	388.24	420.00
*	43.000	3400.00	4859.98	.07	2.25	.00	391.15	420.00
*	43.000	3600.00	4859.91	-.07	2.08	.00	388.49	420.00
*	44.000	2000.00	4860.83	.00	3.36	.00	151.87	467.00
	44.000	2500.00	4860.81	-.02	1.42	.00	151.32	467.00
	44.000	2800.00	4861.00	.19	1.41	.00	157.03	467.00
	44.000	3000.00	4861.10	.10	1.38	.00	160.09	467.00
	44.000	3200.00	4861.16	.05	1.25	.00	161.76	467.00
	44.000	3400.00	4861.28	.13	1.30	.00	165.55	467.00
	44.000	3600.00	4861.53	.25	1.62	.00	173.04	467.00
	45.000	2000.00	4862.17	.00	1.34	.00	129.93	660.00
	45.000	2500.00	4862.75	.58	1.94	.00	165.89	660.00
	45.000	2800.00	4863.05	.30	2.06	.00	184.65	660.00
	45.000	3000.00	4863.25	.20	2.15	.00	196.61	660.00
	45.000	3200.00	4863.46	.21	2.30	.00	209.69	660.00
	45.000	3400.00	4863.64	.18	2.36	.00	220.77	660.00
	45.000	3600.00	4863.77	.14	2.24	.00	228.84	660.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
46.000	2000.00	4865.83	.00	3.66	.00	344.27	672.00
46.000	2500.00	4866.18	.35	3.43	.00	389.34	672.00
6.000	2800.00	4866.37	.18	3.31	.00	407.92	672.00
6.000	3000.00	4866.48	.11	3.23	.00	419.67	672.00
46.000	3200.00	4866.58	.10	3.12	.00	429.43	672.00
46.000	3400.00	4866.68	.10	3.04	.00	440.09	672.00
46.000	3600.00	4866.80	.12	3.02	.00	452.18	672.00

	47.000	2000.00	4866.68	.00	.85	.00	259.23	125.00
	47.000	2500.00	4866.93	.25	.75	.00	301.37	125.00
	47.000	2800.00	4867.07	.14	.70	.00	323.76	125.00
	47.000	3000.00	4867.15	.08	.67	.00	337.62	125.00
	7.000	3200.00	4867.24	.09	.66	.00	351.96	125.00
	47.000	3400.00	4867.32	.08	.64	.00	365.25	125.00
	47.000	3600.00	4867.40	.08	.60	.00	378.71	125.00
*	48.000	2000.00	4870.65	.00	3.97	.00	598.59	42.00
*	48.000	2500.00	4870.78	.13	3.84	.00	639.22	42.00
*	48.000	2800.00	4870.85	.07	3.78	.00	661.56	42.00
*	48.000	3000.00	4870.90	.05	3.74	.00	676.88	42.00
*	48.000	3200.00	4870.94	.04	3.70	.00	690.31	42.00
*	48.000	3400.00	4870.98	.04	3.66	.00	704.22	42.00
*	48.000	3600.00	4871.02	.04	3.62	.00	717.34	42.00
*	49.000	2000.00	4871.25	.00	.60	.00	788.75	25.00
*	49.000	2500.00	4871.41	.16	.63	.00	841.56	25.00
*	49.000	2800.00	4871.50	.09	.65	.00	870.47	25.00
*	49.000	3000.00	4871.56	.05	.66	.00	888.13	25.00
*	49.000	3200.00	4871.61	.06	.67	.00	905.94	25.00
*	49.000	3400.00	4871.66	.05	.68	.00	922.34	25.00
*	49.000	3600.00	4871.71	.05	.69	.00	938.59	25.00
*	50.000	2000.00	4871.31	.00	.07	.00	614.66	15.00
*	50.000	2500.00	4871.48	.17	.07	.00	650.26	15.00
*	50.000	2800.00	4871.57	.09	.07	.00	669.55	15.00
*	50.000	3000.00	4871.62	.05	.07	.00	681.31	15.00
*	50.000	3200.00	4871.68	.05	.07	.00	693.28	15.00
*	50.000	3400.00	4871.73	.05	.06	.00	704.51	15.00
*	50.000	3600.00	4871.78	.05	.06	.00	715.21	15.00
	51.000	2000.00	4871.40	.00	.09	.00	551.72	245.00
	51.000	2500.00	4871.59	.19	.11	.00	600.90	245.00
	51.000	2800.00	4871.70	.11	.13	.00	628.17	245.00
	51.000	3000.00	4871.76	.07	.14	.00	644.61	245.00
	51.000	3200.00	4871.83	.06	.15	.00	661.04	245.00
	51.000	3400.00	4871.89	.06	.16	.00	676.86	245.00
	1.000	3600.00	4871.95	.06	.17	.00	692.05	245.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	52.000	2000.00	4871.43	.00	.03	.00	206.84	345.00
*	52.000	2500.00	4871.64	.21	.05	.00	233.42	345.00
*	52.000	2800.00	4871.76	.12	.06	.00	248.51	345.00
*	52.000	3000.00	4871.83	.08	.07	.00	258.07	345.00
*	52.000	3200.00	4871.91	.07	.08	.00	267.51	345.00
*	52.000	3400.00	4871.98	.07	.09	.00	276.45	345.00
*	52.000	3600.00	4872.06	.07	.11	.00	310.73	345.00
*	53.000	2000.00	4872.14	.00	.71	.00	34.00	343.00
*	53.000	2500.00	4872.50	.36	.86	.36	34.00	343.00
*	53.000	2800.00	4872.68	.18	.92	.54	34.00	343.00
*	53.000	3000.00	4872.79	.11	.96	.65	34.00	343.00
*	53.000	3200.00	4872.89	.10	.98	.75	34.00	343.00
*	53.000	3400.00	4872.98	.09	1.00	.84	34.00	343.00
*	53.000	3600.00	4873.04	.06	.99	.90	34.00	343.00
	56.000	2000.00	4872.85	.00	.71	.00	34.00	11.00
	56.000	2500.00	4874.01	1.17	1.52	1.17	34.00	11.00
*	56.000	2800.00	4874.83	.82	2.15	1.99	34.00	11.00
*	56.000	3000.00	4875.29	.46	2.50	2.45	34.00	11.00
*	56.000	3200.00	4875.20	-.09	2.31	2.35	34.00	11.00
	56.000	3400.00	4875.05	-.15	2.07	2.20	34.00	11.00
	56.000	3600.00	4874.82	-.23	1.78	1.97	34.00	11.00
*	57.000	2000.00	4874.51	.00	1.66	.00	281.76	157.00
*	57.000	2500.00	4875.74	1.23	1.72	1.23	660.69	157.00
*	57.000	2800.00	4876.55	.81	1.71	2.04	1105.49	157.00
*	7.000	3000.00	4877.04	.49	1.75	2.53	1265.94	157.00
*	7.000	3200.00	4877.21	.17	2.01	2.70	1320.70	157.00
*	57.000	3400.00	4877.38	.17	2.33	2.87	1376.57	157.00
*	57.000	3600.00	4877.55	.17	2.73	3.04	1432.12	157.00

12/14

	58.000	2000.00	4874.56	.00	.05	.00	274.79	20.00
	58.000	2500.00	4875.76	1.20	.02	1.20	590.47	20.00
	58.000	2800.00	4876.55	.80	.01	2.00	1076.20	20.00
	58.000	3000.00	4877.04	.49	.00	2.49	1235.69	20.00
	58.000	3200.00	4877.22	.17	.00	2.66	1291.41	20.00
	58.000	3400.00	4877.38	.17	.00	2.82	1345.37	20.00
	58.000	3600.00	4877.55	.17	.00	2.99	1401.08	20.00
	59.000	2000.00	4875.71	.00	1.15	.00	109.83	450.00
*	59.000	2500.00	4876.26	.56	.51	.56	182.80	450.00
*	59.000	2800.00	4876.73	.47	.18	1.03	299.13	450.00
*	59.000	3000.00	4877.12	.39	.08	1.42	390.52	450.00
*	59.000	3200.00	4877.29	.16	.07	1.58	408.77	450.00
*	59.000	3400.00	4877.44	.16	.06	1.74	409.27	450.00
*	59.000	3600.00	4877.61	.16	.06	1.90	409.78	450.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	60.000	2000.00	4877.25	.00	1.55	.00	124.82	512.00
*	60.000	2500.00	4877.86	.60	1.59	.60	157.71	512.00
	60.000	2800.00	4878.07	.22	1.34	.82	180.72	512.00
	60.000	3000.00	4878.21	.14	1.09	.96	208.29	512.00
	60.000	3200.00	4878.33	.12	1.05	1.08	248.33	512.00
	60.000	3400.00	4878.44	.11	1.00	1.19	290.06	512.00
	60.000	3600.00	4878.55	.11	.94	1.30	331.41	512.00
	61.000	2000.00	4879.18	.00	1.93	.00	388.67	645.00
	61.000	2500.00	4879.68	.51	1.83	.51	436.46	645.00
	61.000	2800.00	4879.94	.25	1.86	.76	460.03	645.00
	61.000	3000.00	4880.08	.15	1.87	.91	479.53	645.00
	61.000	3200.00	4880.22	.14	1.89	1.05	500.38	645.00
	61.000	3400.00	4880.35	.13	1.91	1.17	519.89	645.00
*	61.000	3600.00	4880.47	.12	1.92	1.29	537.76	645.00
	62.000	2000.00	4880.20	.00	1.02	.00	268.40	400.00
	62.000	2500.00	4880.46	.26	.77	.26	269.55	400.00
*	62.000	2800.00	4880.62	.16	.68	.42	270.30	400.00
	62.000	3000.00	4880.71	.09	.63	.51	270.72	400.00
	62.000	3200.00	4880.81	.10	.59	.61	271.17	400.00
*	62.000	3400.00	4880.90	.09	.55	.70	271.59	400.00
*	62.000	3600.00	4880.99	.09	.52	.79	272.00	400.00
	63.000	2000.00	4881.61	.00	1.41	.00	198.25	575.00
	63.000	2500.00	4881.98	.37	1.52	.37	203.76	575.00
	63.000	2800.00	4882.17	.18	1.55	.56	205.68	575.00
	63.000	3000.00	4882.29	.12	1.57	.68	206.87	575.00
	63.000	3200.00	4882.40	.11	1.59	.79	207.97	575.00
	63.000	3400.00	4882.51	.11	1.60	.90	209.05	575.00
	63.000	3600.00	4882.61	.10	1.62	1.00	210.08	575.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION SECNO=     42.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     42.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     42.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     42.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     42.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     42.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     42.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     42.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     42.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     42.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     42.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     42.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
        SECNO=     42.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
        SECNO=     42.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     42.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     42.000  PROFILE=  6  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     42.000  PROFILE=  6  PROBABLE MINIMUM SPECIFIC ENERGY
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CAUTION SECNO=     42.000  PROFILE=  6  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     42.000  PROFILE=  7  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     42.000  PROFILE=  7  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     42.000  PROFILE=  7  20 TRIALS ATTEMPTED TO BALANCE WSEL

         SECNO=    43.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
         SECNO=    43.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
    ION SECNO=     43.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     43.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     43.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     43.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     43.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     43.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     43.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     43.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     43.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     43.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     43.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     43.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     43.000  PROFILE=  6  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     43.000  PROFILE=  6  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     43.000  PROFILE=  6  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     43.000  PROFILE=  7  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     43.000  PROFILE=  7  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     43.000  PROFILE=  7  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=     44.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     48.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     48.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     48.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     48.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     48.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     48.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL


CAUTION SECNO=     48.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     48.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
         SECNO=    48.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
         SECNO=    48.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     48.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     48.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     48.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     48.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     48.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     48.000  PROFILE=  6  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     48.000  PROFILE=  6  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     48.000  PROFILE=  6  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     48.000  PROFILE=  7  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     48.000  PROFILE=  7  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     48.000  PROFILE=  7  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=     49.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     49.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     49.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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WARNING SECNO=     50.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     50.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     50.000  PROFILE=  6  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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WARNING SECNO=     53.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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WARNING SECNO=     62.000  PROFILE=  7  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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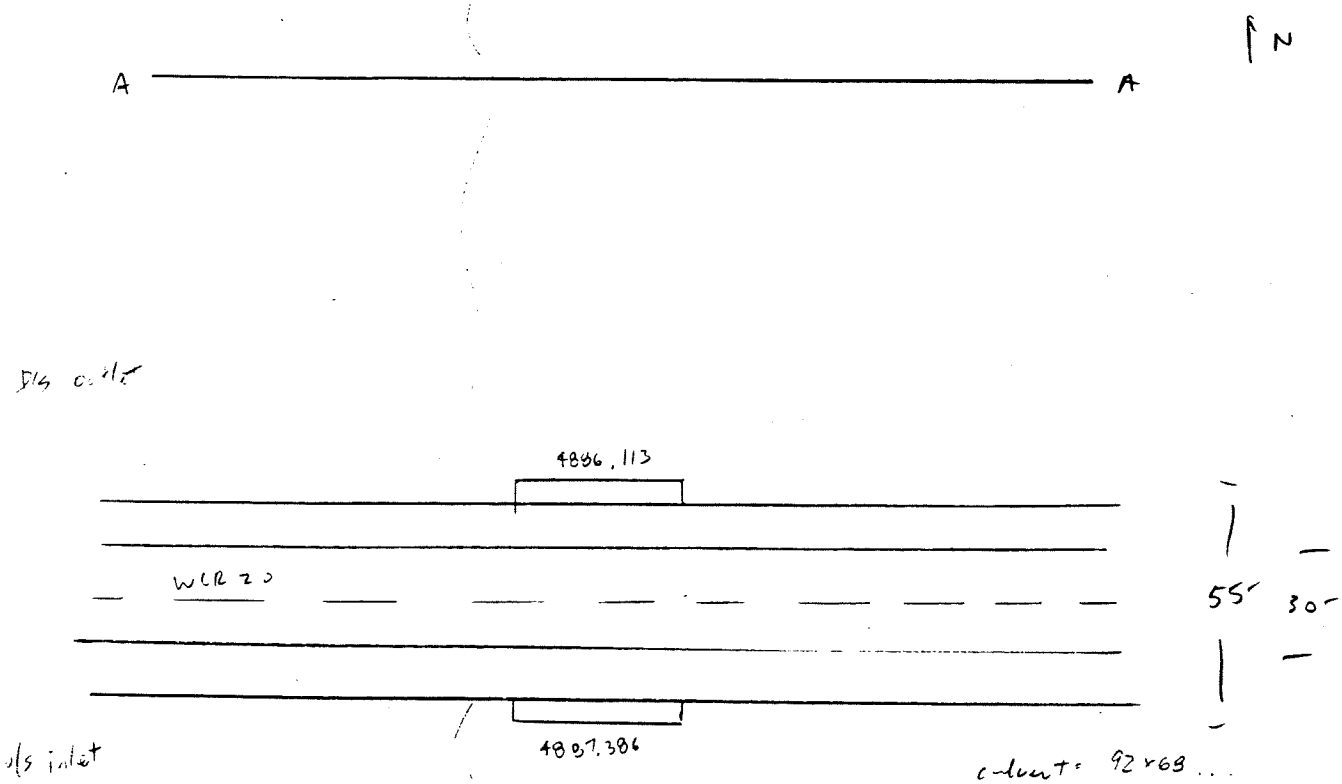
Q @ OT ≈ 210 cfs GH20

ANDERSON CONSULTING ENGINEERS, INC
Civil • Water Resources • Environmental

Project Number	Page	Of
COWELD01	1	6

Owner-Project	By	Date
	DCS	3-12-99

	Checked By	Date
GOODING HOLLOW BASIN WCR 20 (6)	CJP	04/13/99



culvert: 92x68 ...

Alum Struct. Plate
93x72

Projecting, no inlet depression

n=.035
gravel roadway

top width: 30'
culvert length: 55'

GH 20

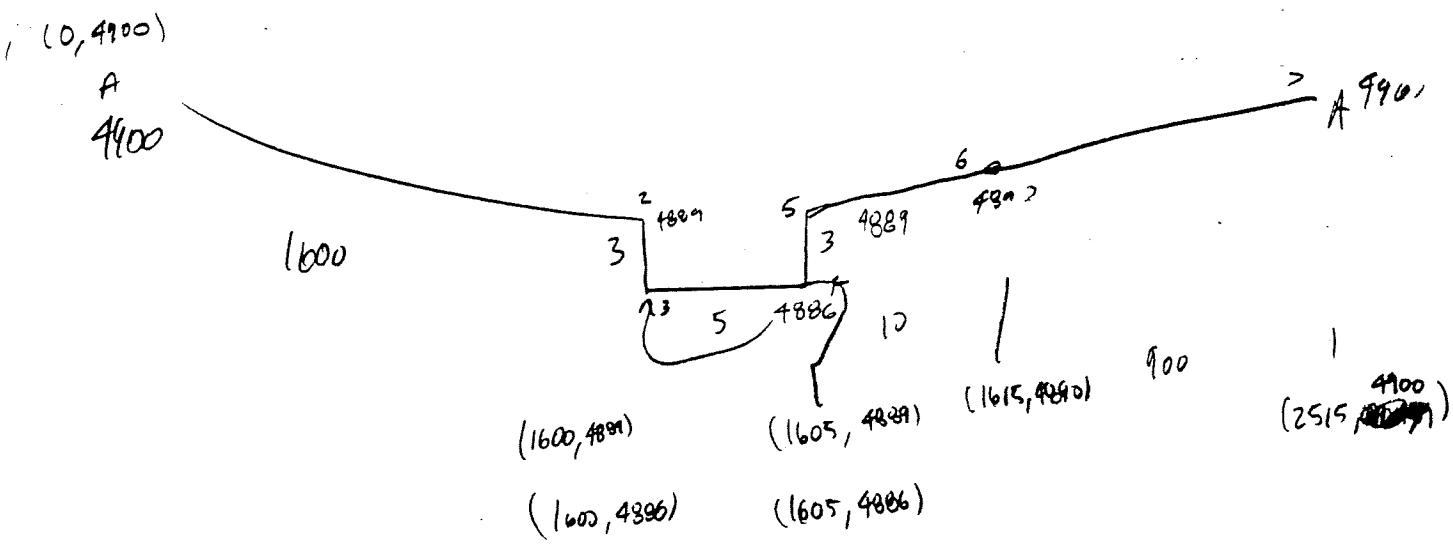
2/6

GWCR20

	x	y	distance	station	elevation	
630	105345.840	89580.405		0.000	4894.664	CROWN SITE 6
628	105346.006	89703.277	122.872	122.872	4894.420	CROWN SITE 6
627	105345.978	89764.317	61.040	183.912	4894.441	CROWN SITE 6
624	105345.028	89949.271	184.956	368.869	4894.049	CROWN SITE 6
623	105344.652	90010.959	61.689	430.558	4894.130	CROWN SITE 6 ≈450 4.0
621	105344.168	90131.933	120.975	551.533	4893.626	CROWN SITE 6
620	105343.274	90191.759	59.833	611.365	4893.973	CROWN SITE 6
618	105342.591	90313.206	121.449	732.814	4892.746	CROWN SITE 6 OT ELV. ↑ 1.3
617	105342.667	90373.288	60.082	792.896	4892.800	CROWN SITE 6
615	105341.722	90496.368	123.084	915.980	4894.001	CROWN SITE 6 915 4.0
614	105342.372	90567.312	70.947	986.927	4893.928	CROWN SITE 6 EX CMP ↑ 360'
611	105349.854	90734.513	167.368	1154.295	4893.143	CROWN SITE 6 1272 4.0
607	105342.707	90969.669	235.265	1389.560	4894.769	CROWN SITE 6
606	105342.036	91034.818	65.152	1454.712	4895.131	CROWN SITE 6
603	105340.959	91264.777	229.962	1684.674	4896.739	CROWN SITE 6

594	105368.181	90521.926	4886.113	INV DS SITE 6
593	105314.150	90525.913	4887.386	INV US SITE 6

US CROWN @ 4893.4



GH 20

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CURRENT DATE: 03-12-1999
CURRENT TIME: 09:57:02

FILE DATE: 03-12-1999
FILE NAME: GWCR20

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

C U L V NO.	SITE DATA INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4887.39	4886.11	55.01	1 CAPA	7.75	6.00	.035	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: GWCR20 DATE: 03-12-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
4887.39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4889.95	50.0	50.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4890.61	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4891.62	150.0	150.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4892.54	200.0	200.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4893.01	250.0	224.8	0.0	0.0	0.0	0.0	0.0	23.18	7
[illegible].21	300.0	225.6	0.0	0.0	0.0	0.0	0.0	72.03	10
[illegible].34	350.0	225.6	0.0	0.0	0.0	0.0	0.0	121.14	9
[illegible].43	400.0	225.6	0.0	0.0	0.0	0.0	0.0	170.45	8
4893.51	450.0	225.6	0.0	0.0	0.0	0.0	0.0	221.00	8
4893.57	500.0	225.6	0.0	0.0	0.0	0.0	0.0	269.50	7
4892.74	210.4	210.4	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: GWCR20 DATE: 03-12-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4887.39	0.000	0.00	0.00	0.00
4889.95	0.000	50.00	0.00	0.00
4890.61	0.000	100.00	0.00	0.00
4891.62	0.000	150.00	0.00	0.00
4892.54	0.000	200.00	0.00	0.00
4893.01	-0.010	250.00	2.00	0.80
4893.21	-0.004	300.00	2.41	0.80
4893.34	-0.003	350.00	3.31	0.95
4893.43	-0.003	400.00	4.00	1.00
4893.51	-0.002	450.00	3.44	0.76
4893.57	-0.003	500.00	4.95	0.99

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

GH 20

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CURRENT DATE: 03-12-1999 FILE DATE: 03-12-1999
CUP TIME: 09:57:02 FILE NAME: GWCR20

PERFORMANCE CURVE FOR CULVERT 1 - 1(7.75 (ft) BY 6.00 (ft)) CAPA

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4887.39	0.00	-1.27	0-NF	0.00	0.00	0.00	-0.11	0.00	0.00
50.00	4889.95	2.16	2.56	1-S2n	1.46	1.51	1.46	2.41	6.48	4.05
100.00	4890.61	3.22	3.16	1-S2n	2.13	2.21	2.01	3.34	8.52	4.69
150.00	4891.62	4.24	3.85	1-S2n	2.69	2.76	2.56	3.57	9.43	4.90
200.00	4892.54	5.16	4.66	1-S2n	3.20	3.23	3.13	3.72	9.84	5.03
224.82	4893.00	5.61	5.11	1-S2n	3.45	3.45	3.35	3.84	10.22	5.14
225.55	4893.01	5.62	5.13	1-S2n	3.46	3.46	3.36	3.95	10.23	5.23
225.55	4893.01	5.62	5.13	1-S2n	3.46	3.46	3.36	4.03	10.23	5.30
225.55	4893.68	5.62	6.30	3-M1t	3.46	3.46	4.11	4.11	8.17	5.37
225.55	4893.71	5.62	6.32	3-M1t	3.46	3.46	4.18	4.18	8.03	5.43
225.55	4893.75	5.62	6.36	3-M1t	3.46	3.46	4.24	4.24	7.90	5.48

El. inlet face invert 4887.39 ft El. outlet invert 4886.11 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	155.00 ft
INLET ELEVATION	4887.39 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	4886.11 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0232
CULVERT LENGTH ALONG SLOPE	55.01 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	PIPE ARCH
BARREL SPAN	7.75 ft
BARREL RISE	6.00 ft
BARREL MATERIAL	ALUMINUM STRUCTURAL PLATE
BARREL MANNING'S n	0.035
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	PROJECTING
INLET DEPRESSION	NONE

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CURRENT DATE: 03-12-1999
CUP TIME: 09:57:02

FILE DATE: 03-12-1999
FILE NAME: GWCR20

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION

FILE NAME: GWCR20
FILE DATE: 03-12-1999

MAIN CHANNEL AND LT & RT OVER BANKS

LEFT CHANNEL BOUNDARY	2
RIGHT CHANNEL BOUNDARY	5
MANNING n LEFT OVER BANK	0.035
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.035
SLOPE OF CHANNEL	0.0067 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	4900.00
2	1600.00	4889.00
3	1600.00	4886.00
4	1605.00	4886.00
5	1605.00	4889.00
6	1615.00	4890.00
7	2515.00	4900.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	4886.00	0.000	-0.11	0.00	0.00
50.00	4888.52	0.449	2.41	4.05	0.52
100.00	4889.45	0.445	3.34	4.69	0.66
150.00	4889.68	0.450	3.57	4.90	0.70
200.00	4889.83	0.453	3.72	5.03	0.73
250.00	4889.95	0.455	3.84	5.14	0.75
300.00	4890.06	0.457	3.95	5.23	0.77
350.00	4890.15	0.459	4.03	5.30	0.79
400.00	4890.23	0.460	4.11	5.37	0.80
450.00	4890.29	0.462	4.18	5.43	0.82
500.00	4890.35	0.463	4.24	5.48	0.83

Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	GRAVEL
EMBANKMENT TOP WIDTH	30.00 ft

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	4894.66
2	122.87	4894.42
3	183.91	4894.44
4	368.87	4894.05
5	430.56	4894.13
6	551.53	4893.63
7	611.36	4893.97
8	732.81	4892.74
9	792.90	4892.80
10	915.98	4894.00
11	986.93	4893.93

GH 20

46

12	1154.29	4893.14
13	1389.56	4894.76
14	1454.71	4895.13
15	1684.67	4896.74

Q @ 01 = 190cfs

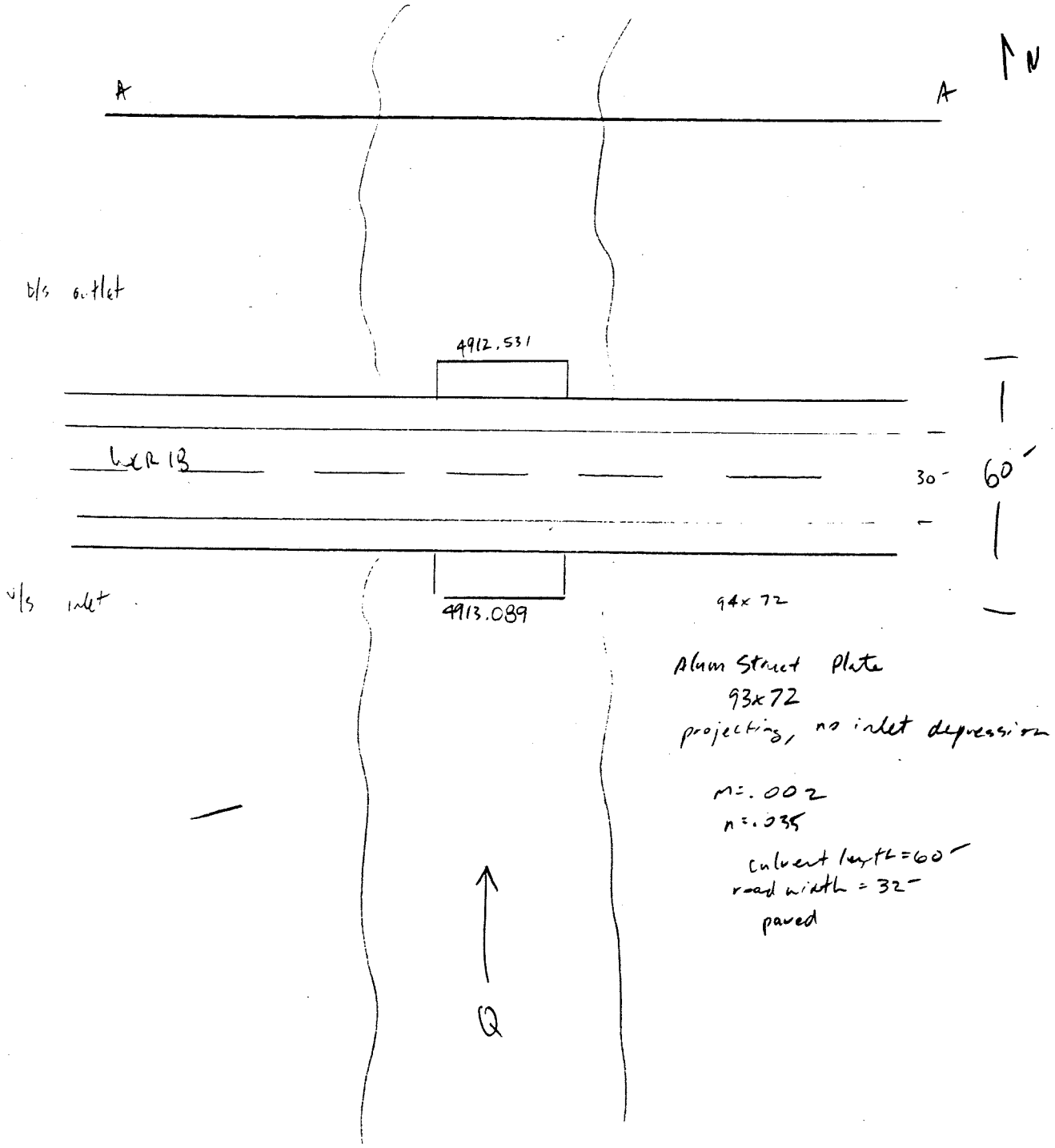
GH18

ANDERSON CONSULTING ENGINEERS, INC
Civil • Water Resources • Environmental

Project Number	Page	Of
COWGLD-01	1	6

Owner-Project	By	Date
	DCS	3/12/99

	Checked By	Date
GODDING HOLLOW BASIN WCR 18 (7)	CJP	04/13/99



Alum Struct Plate
93x72
projecting, no inlet depression

m=.002
n=.035

culvert length=60'
road width = 32'
paved

GH 18

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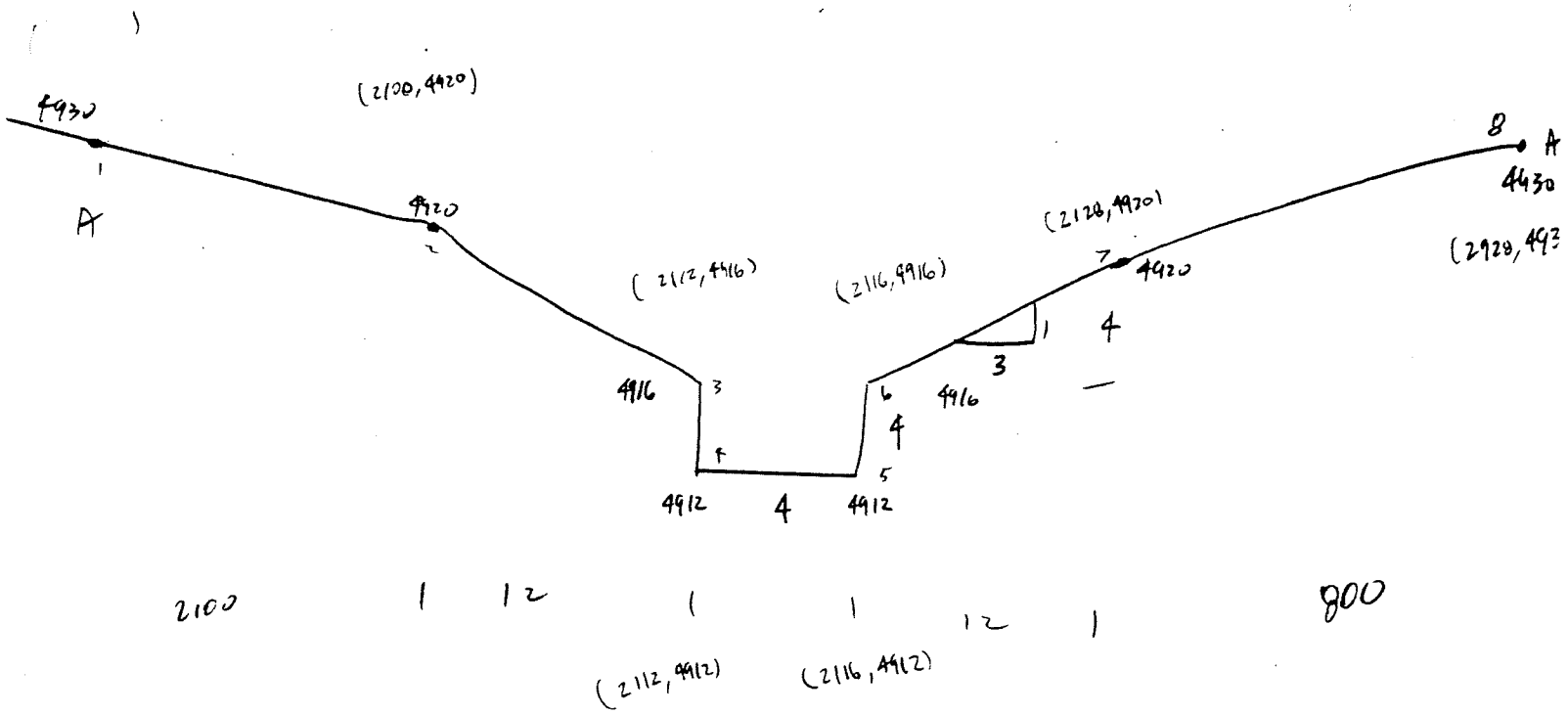
GWCR18

	x	y	distance	station	elevation	
590	100045.819	88521.726		0.000	4922.777	CROWN SITE 7
582	100047.262	89009.909	488.185	488.185	4920.794	CROWN SITE 7
580	100046.739	89134.291	124.383	612.568	4920.606	CROWN SITE 7
577	100046.638	89323.456	189.165	801.733	4920.755	CROWN SITE 7
575	100047.933	89437.676	114.227	915.961	4920.636	CROWN SITE 7
571	100048.728	89746.002	308.327	1224.288	4920.937	CROWN SITE 7
570	100048.874	89799.768	53.766	1278.054	4921.061	CROWN SITE 7
568	100047.893	89933.980	134.216	1412.269	4921.509	CROWN SITE 7
566	100047.284	90063.591	129.612	1541.882	4921.400	CROWN SITE 7 EX CHP
564	100045.712	90164.777	101.198	1643.080	4921.916	CROWN SITE 7
562	100046.867	90294.059	129.287	1772.367	4922.268	CROWN SITE 7
558	100046.875	90524.705	230.646	2003.013	4924.103	CROWN SITE 7
555	100046.798	90743.007	218.302	2221.315	4926.979	CROWN SITE 7
553	100047.035	90883.065	140.058	2361.373	4929.916	CROWN SITE 7
550	100044.842	91052.455	169.404	2530.778	4933.743	CROWN SITE 7

592	100076.306	90059.614	4912.531	INV DS SITE 7
591	100017.851	90049.647	4913.089	INV US SITE 7



CURRENT DATE: 03-12-1999
CURRENT TIME: 10:57:22

FILE DATE: 03-12-1999
FILE NAME: GWCR18

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS / SHAPE / MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4913.09	4912.53	60.00	1 CAPA	7.75	6.00	.035	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: GWCR18 DATE: 03-12-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
4913.09	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4915.75	30.0	30.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4917.44	60.0	60.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4918.30	90.0	90.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4919.06	120.0	120.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4919.57	150.0	150.0	0.0	0.0	0.0	0.0	0.0	0.00	1
36	180.0	180.0	0.0	0.0	0.0	0.0	0.0	0.00	1
70	200.0	188.7	0.0	0.0	0.0	0.0	0.0	7.25	30
.81	240.0	168.1	0.0	0.0	0.0	0.0	0.0	69.68	12
4920.91	270.0	90.0	0.0	0.0	0.0	0.0	0.0	177.73	10
4920.94	300.0	90.0	0.0	0.0	0.0	0.0	0.0	212.91	9
4920.61	190.1	190.1	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: GWCR18 DATE: 03-12-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4913.09	0.000	0.00	0.00	0.00
4915.75	0.000	30.00	0.00	0.00
4917.44	0.000	60.00	0.00	0.00
4918.30	0.000	90.00	0.00	0.00
4919.06	0.000	120.00	0.00	0.00
4919.57	0.000	150.00	0.00	0.00
4920.36	0.000	180.00	0.00	0.00
4920.70	-0.002	200.00	4.04	2.02
4920.81	-0.001	240.00	2.25	0.94
4920.91	-0.001	270.00	2.27	0.84
4920.94	0.000	300.00	-2.90	-0.97

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

GH 18

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CURRENT DATE: 03-12-1999 FILE DATE: 03-12-1999
CU" TIME: 10:57:22 FILE NAME: GWCR18

PERFORMANCE CURVE FOR CULVERT 1 - 1(7.75 (ft) BY 6.00 (ft)) CAPA

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4913.09	0.00	-0.56	0-NF	0.00	0.00	0.00	-0.53	0.00	0.00
30.00	4915.75	1.66	2.66	3-M1t	1.42	1.16	2.95	2.95	1.58	2.23
60.00	4917.44	2.42	4.35	3-M1t	2.07	1.68	4.62	4.62	1.94	2.72
90.00	4918.30	3.04	5.21	3-M1t	2.60	2.09	5.40	5.40	2.55	2.99
120.00	4919.06	3.69	5.97	3-M1t	3.10	2.45	5.95	5.95	3.25	3.17
150.00	4919.57	4.28	6.48	3-M1f	3.57	2.76	6.00	6.37	4.05	3.31
180.00	4920.36	4.83	7.27	4-FFt	4.07	3.06	6.00	6.74	4.89	3.42
188.71	4920.69	4.99	7.61	4-FFt	4.22	3.14	6.00	6.96	5.13	3.49
168.07	4920.82	4.62	7.73	4-FFt	3.87	2.95	6.00	7.33	4.57	3.61
90.00	4920.82	3.04	7.74	4-FFt	2.60	2.09	6.00	8.02	2.45	3.82
89.98	4920.92	3.04	7.83	4-FFt	2.60	2.09	6.00	8.12	2.45	3.85

El. inlet face invert 4913.09 ft El. outlet invert 4912.53 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	160.00 ft
INLET ELEVATION	4913.09 ft
UTLET STATION	100.00 ft
UTLET ELEVATION	4912.53 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0093
CULVERT LENGTH ALONG SLOPE	60.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	PIPE ARCH
BARREL SPAN	7.75 ft
BARREL RISE	6.00 ft
BARREL MATERIAL	ALUMINUM STRUCTURAL PLATE
BARREL MANNING'S n	0.035
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	PROJECTING
INLET DEPRESSION	NONE

CURRENT DATE: 03-12-1999 FILE DATE: 03-12-1999
CUP TIME: 10:57:22 FILE NAME: GWCR18

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION FILE NAME: GWCR18
MAIN CHANNEL AND LT & RT OVER BANKS FILE DATE: 03-12-1999

LEFT CHANNEL BOUNDARY	3
RIGHT CHANNEL BOUNDARY	6
MANNING n LEFT OVER BANK	0.035
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.035
SLOPE OF CHANNEL	0.0020 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	4930.00
2	2100.00	4920.00
3	2112.00	4916.00
4	2112.00	4912.00
5	2116.00	4912.00
6	2116.00	4916.00
7	2128.00	4920.00
8	2928.00	4930.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	4912.00	0.000	-0.53	0.00	0.00
30.00	4915.48	0.210	2.95	2.23	0.16
60.00	4917.15	0.211	4.62	2.72	0.21
90.00	4917.93	0.216	5.40	2.99	0.25
120.00	4918.48	0.220	5.95	3.17	0.27
150.00	4918.90	0.222	6.37	3.31	0.29
180.00	4919.27	0.224	6.74	3.42	0.30
200.00	4919.49	0.225	6.96	3.49	0.31
240.00	4919.86	0.227	7.33	3.61	0.33
270.00	4920.55	0.230	8.02	3.82	0.36
300.00	4920.65	0.230	8.12	3.85	0.36

Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	32.00 ft

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	4922.77
2	488.18	4920.79
3	612.57	4920.61
4	801.73	4920.75
5	915.96	4920.64
6	1224.28	4920.94
7	1278.05	4921.06
8	1412.27	4921.51
9	1541.88	4921.40
10	1643.08	4921.92

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11	1772.37	4922.27
12	2003.01	4924.10
13	2221.32	4926.98
14	2361.37	4929.92
15	2530.78	4933.74

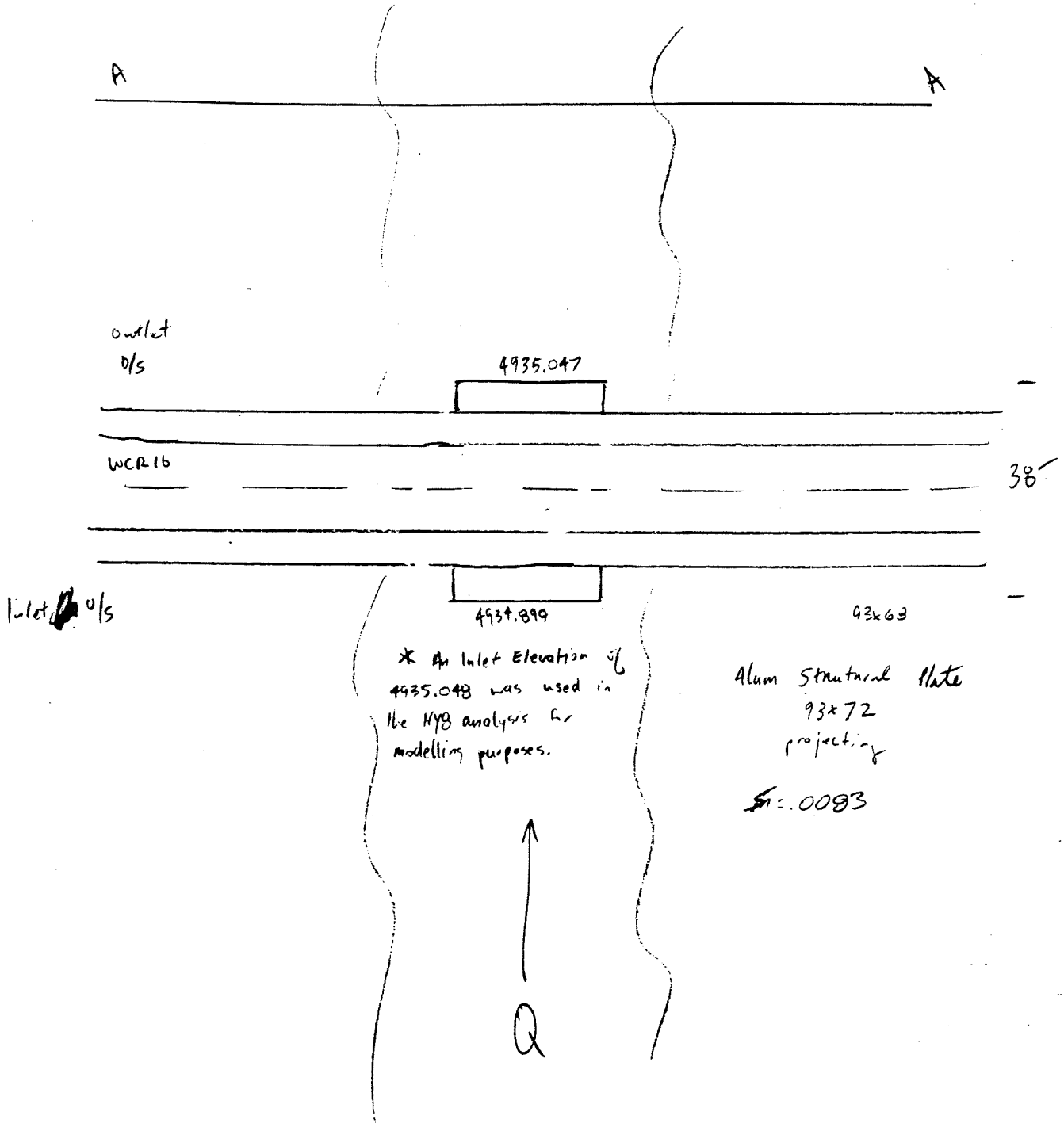
Qot ≈ 160cfs GH 16

ANDERSON CONSULTING ENGINEERS, INC
Civil • Water Resources • Environmental

Project Number	Page	Of
COWELD02	1	6

Owner-Project	By	Date
WELD COUNTY, I-25 MDP	DCS	3/12/99

t	Checked By	Date
GODDING HOLLOW BASIN WCR16 (8)	CJP	04/13/99



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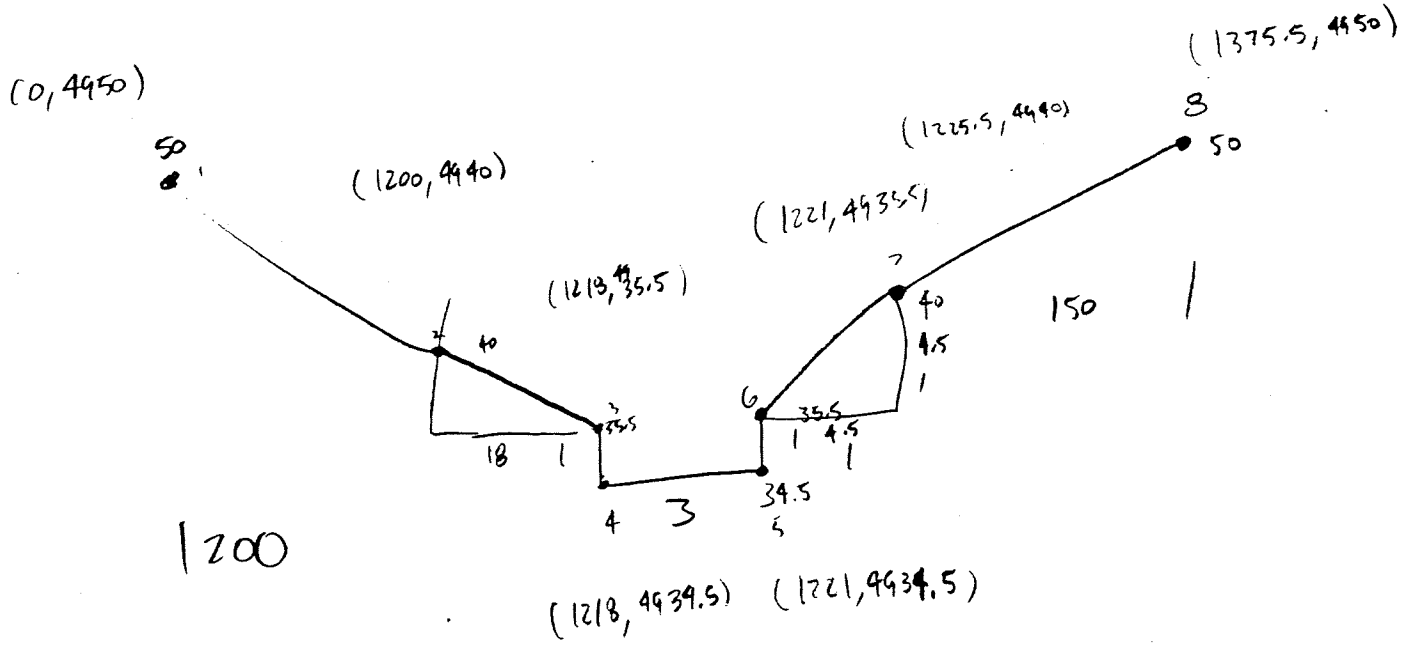
	x	y	distance	station	elevation	
541	94715.368	87839.195		0.000	4958.267	CROWN RD SI
519	94716.712	89295.931	1456.737	1456.737	4947.877	CROWN RD SI
516	94718.026	89465.727	169.801	1626.538	4946.630	CROWN RD SI
511	94716.522	89728.688	262.965	1889.503	4944.821	CROWN RD SI — 1850 45
509	94716.296	89829.647	100.959	1990.462	4943.665	CROWN RD SI
505	94717.658	90059.007	229.364	2219.826	4941.167	CROWN RD SI
503	94718.754	90166.111	107.110	2326.936	4940.115	CROWN RD SI
501	94717.456	90224.996	58.899	2385.835	4940.190	CROWN RD SI — 800 ↑ 5'
500	94716.996	90316.613	91.618	2477.453	4940.780	CROWN RD SI — EX CAP
499	94717.307	90362.470	45.858	2523.311	4941.120	CROWN RD SI
495	94717.119	90438.750	76.280	2599.592	4941.798	rd crown site 8
492	94718.049	90596.515	157.768	2757.359	4944.590	rd crown site 8 — 2770 45
489	94720.173	90855.052	258.546	3015.905	4953.059	rd crown site 8
545	94698.240	90322.454	4934.899	INV US SITE 8		
544	94733.517	90309.149	4935.047	INV DS SITE 8		



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CURRENT DATE: 03-15-1999
CURRENT TIME: 16:52:37

FILE DATE: 03-15-1999
FILE NAME: GWCR16

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS	SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4935.05	4935.05	38.00	1	CAPA	7.75	6.00	.035	CONVENTIONAL
2									
3									
4									
5									
6									

SUMMARY OF CULVERT FLOWS (cfs) FILE: GWCR16 DATE: 03-15-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
4935.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4937.40	40.0	40.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4938.44	80.0	80.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4939.29	120.0	120.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4940.06	160.0	160.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4940.38	200.0	176.3	0.0	0.0	0.0	0.0	0.0	22.38	9
53	240.0	182.1	0.0	0.0	0.0	0.0	0.0	55.90	7
.64	280.0	184.4	0.0	0.0	0.0	0.0	0.0	92.98	6
.73	320.0	186.7	0.0	0.0	0.0	0.0	0.0	130.66	6
4940.80	360.0	200.0	0.0	0.0	0.0	0.0	0.0	162.19	3
4940.86	400.0	200.0	0.0	0.0	0.0	0.0	0.0	199.89	3
4940.12	163.0	163.0	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: GWCR16 DATE: 03-15-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4935.05	0.000	0.00	0.00	0.00
4937.40	0.000	40.00	0.00	0.00
4938.44	0.000	80.00	0.00	0.00
4939.29	0.000	120.00	0.00	0.00
4940.06	0.000	160.00	0.00	0.00
4940.38	-0.004	200.00	1.37	0.69
4940.53	-0.004	240.00	2.00	0.83
4940.64	-0.005	280.00	2.63	0.94
4940.73	-0.004	320.00	2.64	0.83
4940.80	0.002	360.00	-2.19	-0.61
4940.86	0.000	400.00	0.11	0.03

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

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CURRENT DATE: 03-15-1999 FILE DATE: 03-15-1999
TIME: 16:52:37 FILE NAME: GWCR16

PERFORMANCE CURVE FOR CULVERT 1 - 1(7.75 (ft) BY 6.00 (ft)) CAPA

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4935.05	0.00	0.00	0-NF	0.00	0.00	0.00	-0.55	0.00	0.00
40.00	4937.40	1.95	2.35	3-M2t	6.00	1.34	1.68	1.68	4.32	4.68
80.00	4938.44	2.86	3.39	3-M2t	6.00	1.96	2.36	2.36	5.58	5.60
120.00	4939.30	3.71	4.25	3-M2t	6.00	2.45	2.83	2.83	6.66	6.20
160.00	4940.06	4.49	5.01	3-M2t	6.00	2.86	3.21	3.21	7.65	6.65
176.25	4940.38	4.79	5.34	3-M2t	6.00	3.03	3.53	3.53	7.55	7.02
182.11	4940.54	4.90	5.49	3-M2t	6.00	3.08	3.81	3.81	7.17	7.34
184.40	4940.65	4.94	5.60	3-M2t	6.00	3.10	4.06	4.06	6.77	7.62
186.70	4940.73	4.98	5.68	3-M2t	6.00	3.12	4.29	4.29	6.47	7.88
200.00	4940.99	5.23	5.94	3-M2t	6.00	3.23	4.50	4.50	6.62	8.10
200.00	4941.15	5.23	6.10	3-M2t	6.00	3.23	4.70	4.70	6.35	8.30

El. inlet face invert 4935.05 ft El. outlet invert 4935.05 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	138.00 ft
INLET ELEVATION	4935.05 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	4935.05 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0000
CULVERT LENGTH ALONG SLOPE	38.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	PIPE ARCH
BARREL SPAN	7.75 ft
BARREL RISE	6.00 ft
BARREL MATERIAL	ALUMINUM STRUCTURAL PLATE
BARREL MANNING'S n	0.035
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	PROJECTING
INLET DEPRESSION	NONE

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CURRENT DATE: 03-15-1999
CU TIME: 16:52:37

FILE DATE: 03-15-1999
FILE NAME: GWCR16

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION

FILE NAME: GWCR16
FILE DATE: 03-12-1999

MAIN CHANNEL AND LT & RT OVER BANKS
LEFT CHANNEL BOUNDARY 3
RIGHT CHANNEL BOUNDARY 6
MANNING n LEFT OVER BANK 0.035
MANNING n MAIN CHANNEL 0.035
MANNING n RIGHT OVER BANK 0.035
SLOPE OF CHANNEL 0.0083 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	4950.00
2	1200.00	4940.00
3	1218.00	4935.50
4	1218.00	4934.50
5	1221.00	4934.50
6	1221.00	4935.50
7	1225.50	4940.00
8	1375.50	4950.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	4934.50	0.000	-0.55	0.00	0.00
40.00	4936.72	0.554	1.68	4.68	0.69
80.00	4937.41	0.579	2.36	5.60	0.90
120.00	4937.88	0.594	2.83	6.20	1.05
160.00	4938.26	0.605	3.21	6.65	1.17
200.00	4938.58	0.613	3.53	7.02	1.27
240.00	4938.86	0.620	3.81	7.34	1.35
280.00	4939.11	0.625	4.06	7.62	1.43
320.00	4939.34	0.631	4.29	7.88	1.50
360.00	4939.55	0.635	4.50	8.10	1.57
400.00	4939.74	0.639	4.70	8.30	1.63

Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE GRAVEL
EMBANKMENT TOP WIDTH 30.00 ft

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	4958.27
2	1456.74	4947.88
3	1626.54	4946.63
4	1889.50	4944.82
5	1990.46	4943.66
6	2219.83	4941.17
7	2326.94	4940.12
8	2385.84	4940.19
9	2477.45	4940.78
10	2523.31	4941.12

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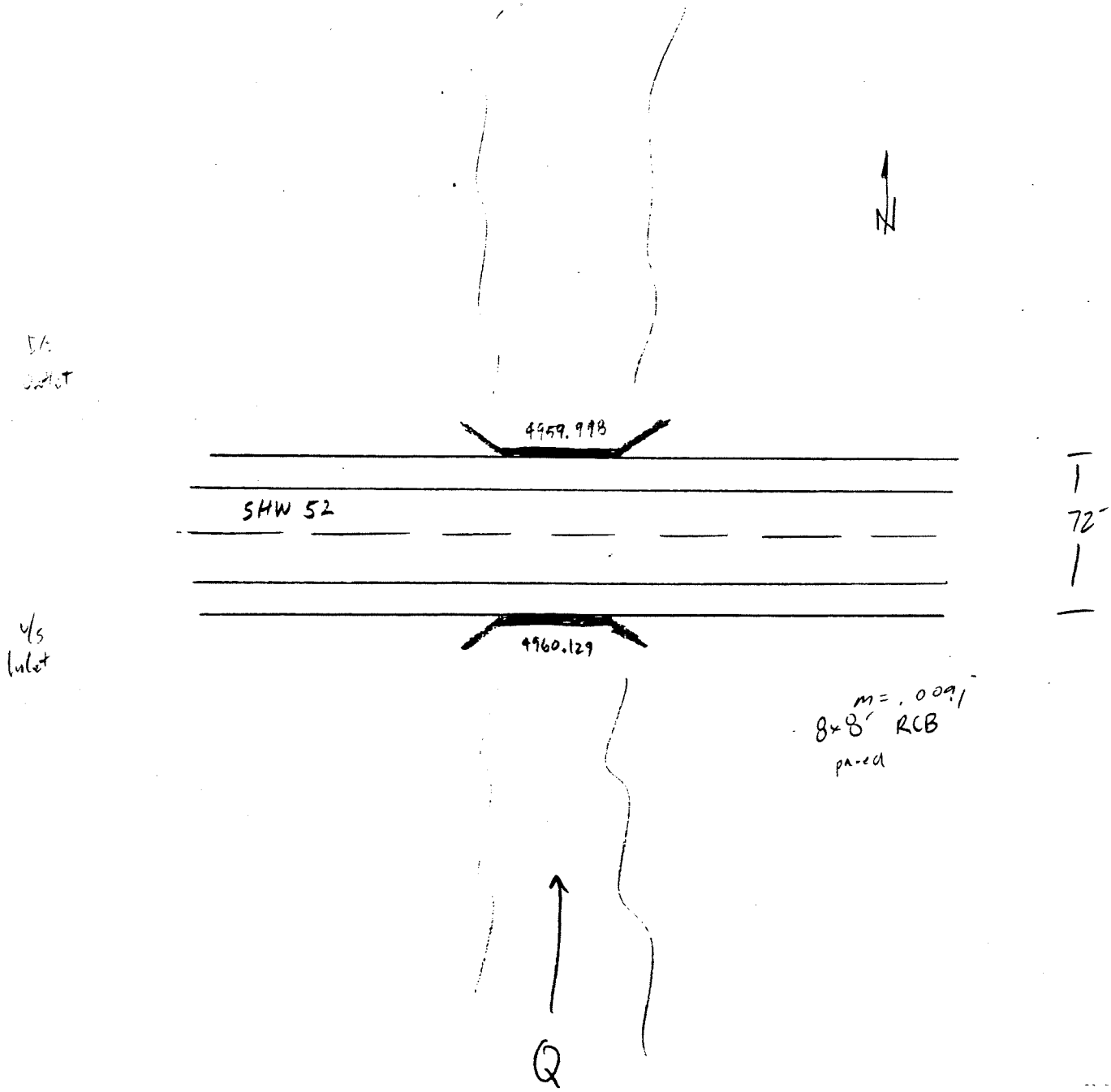
11	2599.59	4941.80
12	2757.36	4944.59
13	3015.91	4953.06

OT @ 1000 cfs

GH52

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number COWECD07	Page 1 Of 10
Owner-Project WELD COUNTY I-25 MDP	By DCS	Date 3-15-99
GODDING HOLLOW BASIN SHW 52 (11)	Checked By CJP	Date 04/12/99



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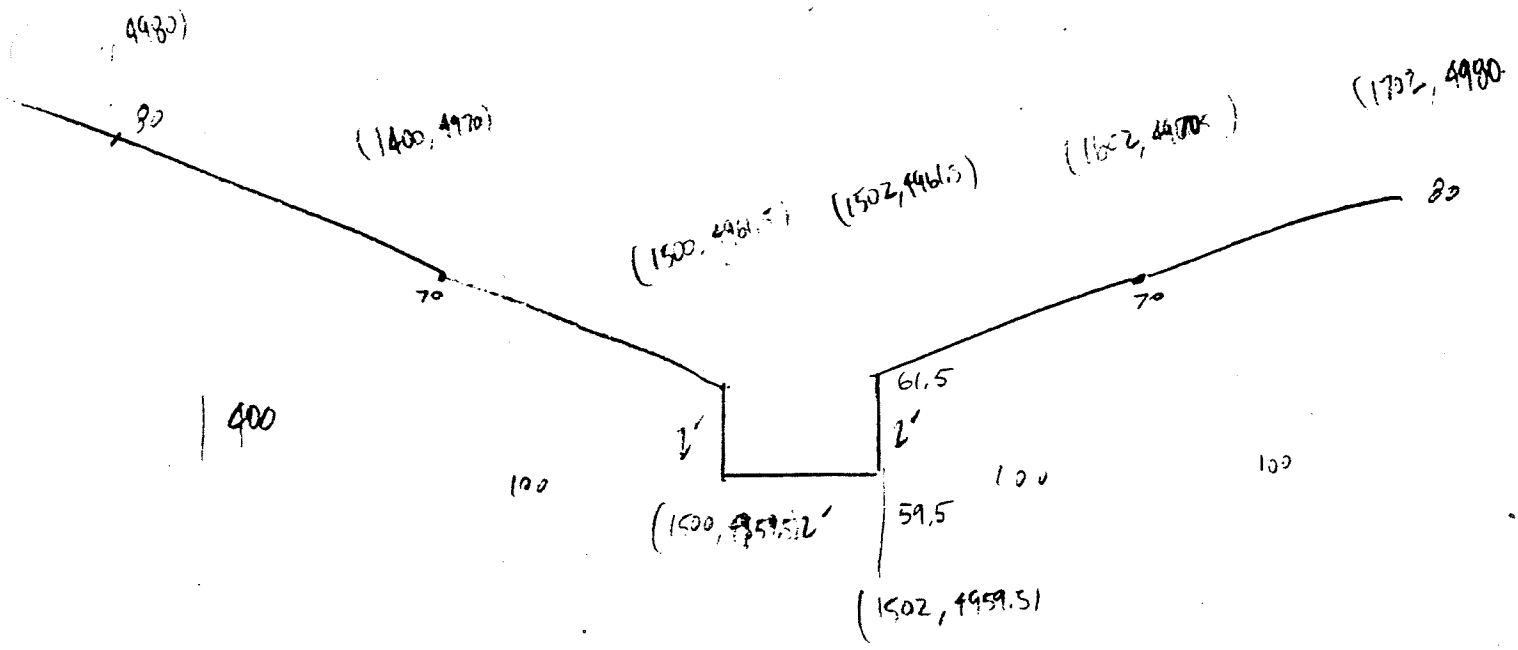
GSHW52

	x	y	distance	station	elevation	
486	89403.646	91149.280		0.000	4975.731	CROWN RD SITE 11
482	89402.810	90823.590	325.691	325.691	4975.041	CROWN RD SITE 11
473	89389.748	90799.652	27.270	352.961	4974.570	CROWN RD SITE 11
481	89402.939	90744.845	56.372	409.333	4974.901	CROWN RD SITE 11
471	89392.783	90682.107	63.555	472.888	4974.700	CROWN RD SITE 11
480	89402.549	90666.678	18.260	491.148	4975.005	CROWN RD SITE 11
479	89401.876	90593.925	72.756	563.904	4975.400	CROWN RD SITE 11
478	89402.416	90496.641	97.285	661.189	4976.170	CROWN RD SITE 11
476	89401.287	90353.029	143.616	804.806	4978.106	CROWN RD SITE 11
474	89390.723	90216.633	136.804	941.610	4980.305	CROWN RD SITE 11
466	89403.061	90156.830	61.062	1002.673	4981.811	CROWN RD SITE 11
465	89402.351	90076.547	80.286	1082.959	4983.402	CROWN RD SITE 11
463	89401.822	89920.631	155.917	1238.876	4986.538	CROWN RD SITE 11
461	89401.421	89770.977	149.655	1388.530	4989.191	CROWN RD SITE 11
460	89399.775	89707.049	63.949	1452.479	4990.479	CROWN RD SITE 11
			distance			
488	89374.496	91707.967	72		4960.129	INV US SITE 11
487	89445.689	91707.807			4959.998	INV DS SITE 11

RB → LB



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GSHW52

	x	y	distance	station	elevation	
486	89403.646	91149.280		0.000	4975.731	CROWN RD SITE 11
485	89402.500	91064.451	84.837	84.837	4975.488	CROWN RD SITE 11
484	89402.375	90982.949	81.502	166.339	4975.287	CROWN RD SITE 11
483	89402.688	90903.036	79.914	246.252	4975.144	CROWN RD SITE 11
482	89402.810	90823.590	79.446	325.699	4975.041	CROWN RD SITE 11
481	89402.939	90744.845	78.745	404.444	4974.901	CROWN RD SITE 11
480	89402.549	90666.678	78.168	482.612	4975.005	CROWN RD SITE 11
479	89401.876	90593.925	72.756	555.368	4975.400	CROWN RD SITE 11
478	89402.416	90496.641	97.285	652.653	4976.170	CROWN RD SITE 11
477	89402.345	90435.765	60.876	713.529	4976.850	CROWN RD SITE 11
476	89401.287	90353.029	82.743	796.272	4978.106	CROWN RD SITE 11
475	89398.796	90266.594	86.471	882.743	4979.531	CROWN RD SITE 11
474	89390.723	90216.633	50.609	933.352	4980.305	CROWN RD SITE 11
473	89389.748	90799.652	583.020	1516.372	4974.570	CROWN RD SITE 11
~~472~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~CROWN RD SITE 11~~
471	89392.783	90682.107	62.392	1633.966	4974.700	CROWN RD SITE 11
470	~~89398.829~~	~~90607.555~~	~~[illegible]~~	~~1708.070~~	~~[illegible]~~	~~CROWN RD SITE 11~~
469	~~89401.451~~	~~90526.954~~	~~[illegible]~~	~~[illegible]~~	~~4975.847~~	~~CROWN RD SITE 11~~
~~468~~	~~89401.647~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~CROWN RD SITE 11~~
~~467~~	~~89402.697~~	~~90238.462~~	~~285.672~~	~~2077.953~~	~~4980.074~~	~~CROWN RD SITE 11~~
466	89403.061	90156.830	81.573	2159.526	4981.811	CROWN RD SITE 11
465	89402.351	90076.547	80.286	2239.812	4983.402	CROWN RD SITE 11
464	89401.807	89997.721	78.828	2318.640	4984.978	CROWN RD SITE 11
463	89401.822	89920.631	77.090	2395.730	4986.538	CROWN RD SITE 11
462	89401.628	89844.569	76.062	2471.792	4987.854	CROWN RD SITE 11
461	89401.421	89770.977	73.592	2545.384	4989.191	CROWN RD SITE 11
460	89399.775	89707.049	63.949	2609.333	4990.479	CROWN RD SITE 11
459	89391.385	89632.357	75.162	2684.495	4992.022	CROWN RD SITE 11
458	89383.586	89573.602	59.270	2743.766	4992.932	CROWN RD SITE 11
488	89374.496	91707.967			4960.129	INV US SITE 11
487	89445.689	91707.807			4959.998	INV DS SITE 11

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CURRENT DATE: 03-15-1999
CURRENT TIME: 11:17:23

FILE DATE: 03-15-1999
FILE NAME: GSH52

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4960.13	4960.00	72.00	1 RCB	8.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: GSH52 DATE: 03-15-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
4960.13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4963.60	120.0	120.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4964.52	200.0	200.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4966.48	360.0	360.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4967.82	480.0	480.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4969.06	600.0	600.0	0.0	0.0	0.0	0.0	0.0	0.00	1
50	720.0	720.0	0.0	0.0	0.0	0.0	0.0	0.00	1
08	840.0	840.0	0.0	0.0	0.0	0.0	0.0	0.00	1
.82	960.0	960.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4974.96	1080.0	1032.9	0.0	0.0	0.0	0.0	0.0	37.78	7
4975.20	1200.0	1047.6	0.0	0.0	0.0	0.0	0.0	141.67	6
4974.57	1008.5	1008.5	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: GSH52 DATE: 03-15-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4960.13	0.000	0.00	0.00	0.00
4963.60	0.000	120.00	0.00	0.00
4964.52	0.000	200.00	0.00	0.00
4966.48	0.000	360.00	0.00	0.00
4967.82	0.000	480.00	0.00	0.00
4969.06	0.000	600.00	0.00	0.00
4970.50	0.000	720.00	0.00	0.00
4972.08	0.000	840.00	0.00	0.00
4973.82	0.000	960.00	0.00	0.00
4974.96	-0.008	1080.00	9.35	0.87
4975.20	-0.007	1200.00	10.77	0.90

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

GH52

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CURRENT DATE: 03-15-1999 FILE DATE: 03-15-1999
C' TIME: 11:17:23 FILE NAME: GSH52

PERFORMANCE CURVE FOR CULVERT 1 - 1(8.00 (ft) BY 8.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4960.13	0.00	-0.13	0-NF	0.00	0.00	0.00	-0.50	0.00	0.00
120.00	4963.60	2.85	3.47	3-M1t	2.23	1.92	3.01	3.01	4.98	4.50
200.00	4964.53	4.01	4.40	3-M1t	3.23	2.69	3.39	3.39	7.37	4.82
360.00	4966.48	6.09	6.35	2-M2c	5.01	3.99	3.99	3.92	11.29	5.24
480.00	4967.82	7.50	7.69	2-M2c	6.28	4.83	4.83	4.21	12.43	5.47
600.00	4969.06	8.91	8.93	2-M2c	8.00	5.60	5.60	4.47	13.39	5.67
720.00	4970.50	10.37	10.08	2-M2c	8.00	6.33	6.33	4.70	14.23	5.84
840.00	4972.08	11.95	11.17	2-M2c	8.00	7.01	7.01	4.90	14.98	5.99
960.00	4973.82	13.69	12.43	2-M2c	8.00	7.66	7.66	5.08	15.66	6.12
1032.87	4974.96	14.83	13.20	6-FFc	8.00	8.00	7.66	5.24	16.85	6.24
1047.56	4975.20	15.07	13.36	6-FFc	8.00	8.00	7.66	5.40	17.09	6.36

El. inlet face invert 4960.13 ft El. outlet invert 4960.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** EMBANKMENT TOE **********

UPSTREAM STATION	172.00 ft
UPSTREAM ELEVATION	4960.13 ft
UPSTREAM EMBANKMENT SLOPE (X:1)	0.01
DOWNSTREAM STATION	100.00 ft
DOWNSTREAM ELEVATION	4960.00 ft
DOWNSTREAM EMBANKMENT SLOPE (X:1)	0.01

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	8.00 ft
BARREL RISE	8.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	1:1 BEVEL (45 DEG. FLARE)
INLET DEPRESSION	NONE

GH52
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CURRENT DATE: 03-15-1999 FILE DATE: 03-15-1999
TIME: 11:17:23 FILE NAME: GSH52

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION FILE NAME: GSH52
MAIN CHANNEL AND LT & RT OVER BANKS FILE DATE: 03-03-1999

LEFT CHANNEL BOUNDARY	3
RIGHT CHANNEL BOUNDARY	6
MANNING n LEFT OVER BANK	0.035
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.035
SLOPE OF CHANNEL	0.0091 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	1.00	4980.00
2	1400.00	4970.00
3	1500.00	4961.50
4	1500.00	4959.50
5	1502.00	4959.50
6	1502.00	4961.50
7	1602.00	4970.00
8	1702.00	4980.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	4959.50	0.000	-0.50	0.00	0.00
120.00	4963.01	0.423	3.01	4.50	0.66
200.00	4963.39	0.430	3.39	4.82	0.74
360.00	4963.92	0.439	3.92	5.24	0.84
480.00	4964.21	0.444	4.21	5.47	0.89
600.00	4964.47	0.448	4.47	5.67	0.94
720.00	4964.70	0.452	4.70	5.84	0.98
840.00	4964.89	0.454	4.90	5.99	1.02
960.00	4965.07	0.457	5.08	6.12	1.05
1080.00	4965.24	0.459	5.24	6.24	1.09
1200.00	4965.40	0.461	5.40	6.36	1.12

Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	70.00 ft

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	4975.73
2	325.69	4975.04
3	352.96	4974.57
4	409.33	4974.90
5	472.89	4974.70
6	491.15	4975.00
7	563.90	4975.40
8	661.19	4976.17
9	804.81	4978.11
10	941.61	4980.31

GH52

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11	1002.67	4981.81
12	1082.96	4983.40
13	1238.88	4986.54
14	1388.53	4989.19
15	1452.48	4990.48

Re-ran w/ higher flows

GH52

8/10

CURRENT DATE: 03-23-1999
CURRENT TIME: 11:21:56

FILE DATE: 03-23-1999
FILE NAME: GSH52

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4960.13	4960.00	72.00	1 RCB	8.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: GSH52 DATE: 03-23-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
☆ 4960.13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
☆ 4968.04	500.0	500.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4975.04	1100.0	1037.1	0.0	0.0	0.0	0.0	0.0	62.47	9
4975.62	1650.0	1072.8	0.0	0.0	0.0	0.0	0.0	570.87	5
4975.90	2200.0	1089.4	0.0	0.0	0.0	0.0	0.0	1101.30	4
4976.12	2750.0	1101.8	0.0	0.0	0.0	0.0	0.0	1643.08	4
4976.30	3300.0	1112.8	0.0	0.0	0.0	0.0	0.0	2168.36	3
4976.47	3850.0	1122.6	0.0	0.0	0.0	0.0	0.0	2710.24	3
4976.63	4400.0	1131.5	0.0	0.0	0.0	0.0	0.0	3253.26	3
4976.78	4950.0	1139.9	0.0	0.0	0.0	0.0	0.0	3797.97	3
☆ 4976.92	5500.0	1147.7	0.0	0.0	0.0	0.0	0.0	4340.71	3
4974.57	1008.5	1008.5	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

WSE even w/ top of culvert

SHN52 begins to overtop

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: GSH52 DATE: 03-23-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4960.13	0.000	0.00	0.00	0.00
4968.04	0.000	500.00	0.00	0.00
4975.04	1.000	1100.00	0.40	0.04
4975.62	-0.003	1650.00	6.33	0.38
4975.90	-0.003	2200.00	9.31	0.42
4976.12	-0.008	2750.00	5.16	0.19
4976.30	-0.005	3300.00	18.83	0.57
4976.47	-0.004	3850.00	17.21	0.45
4976.63	-0.003	4400.00	15.23	0.35
4976.78	-0.003	4950.00	12.16	0.25
4976.92	-0.002	5500.00	11.61	0.21

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

Elev. of culvert crown = 4968.10 ft

☆ Used for UDSWMM model rating curve for Element No. 308

GH52

9/10

CURRENT DATE: 03-23-1999 FILE DATE: 03-23-1999
CURRENT TIME: 11:21:56 FILE NAME: GSH52

PERFORMANCE CURVE FOR CULVERT 1 - 1(8.00 (ft) BY 8.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4960.13	0.00	-0.13	0-NF	0.00	0.00	0.00	-0.50	0.00	0.00
500.00	4968.04	7.74	7.91	2-M2c	6.49	4.96	4.96	4.26	12.60	5.51
1037.12	4975.03	14.90	13.25	6-FFc	8.00	8.00	4.96	5.27	26.13	6.26
1072.79	4975.62	15.49	13.63	6-FFc	8.00	8.00	4.96	5.91	27.03	6.71
1089.38	4975.90	15.77	13.80	6-FFc	8.00	8.00	4.96	6.43	27.45	7.07
1101.75	4976.11	15.98	13.94	6-FFc	8.00	8.00	4.96	6.88	27.76	7.38
1112.81	4976.30	16.17	14.06	6-FFc	8.00	8.00	4.96	7.26	28.04	7.63
1122.55	4976.47	16.34	14.17	6-FFc	8.00	8.00	4.96	7.60	28.28	7.86
1131.51	4976.63	16.50	14.27	6-FFc	8.00	8.00	4.96	7.92	28.51	8.06
1139.87	4976.77	16.64	14.59	4-FFt	8.00	8.00	4.96	8.22	28.72	8.25
1147.68	4976.91	16.78	14.95	4-FFt	8.00	8.00	4.96	8.49	28.92	8.42

El. inlet face invert 4960.13 ft El. outlet invert 4960.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** EMBANKMENT TOE **********

UPSTREAM STATION	172.00 ft
UPSTREAM ELEVATION	4960.13 ft
UPSTREAM EMBANKMENT SLOPE (X:1)	0.01
DOWMSTREAM STATION	100.00 ft
DOWNSTREAM ELEVATION	4960.00 ft
DOWNSTREAM EMBANKMENT SLOPE (X:1)	0.01

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	8.00 ft
BARREL RISE	8.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	1:1 BEVEL (45 DEG. FLARE)
INLET DEPRESSION	NONE

GH52
10/10

CURRENT DATE: 03-23-1999
CURRENT TIME: 11:21:56

FILE DATE: 03-23-1999
FILE NAME: GSH52

°°
°°°°°°°°°°°°°°°°°°°°°°°°°° TAILWATER °°°°°°°°°°°°°°°°°°°°°°°°°°
°°

***** USER DEFINED CHANNEL CROSS-SECTION — FILE NAME: GSH52
MAIN CHANNEL AND LT & RT OVER BANKS — FILE DATE: 03-03-1999

LEFT CHANNEL BOUNDARY	3
RIGHT CHANNEL BOUNDARY	6
MANNING n LEFT OVER BANK	0.035
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.035
SLOPE OF CHANNEL	0.0091 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	1.00	4980.00
2	1400.00	4970.00
3	1500.00	4961.50
4	1500.00	4959.50
5	1502.00	4959.50
6	1502.00	4961.50
7	1602.00	4970.00
8	1702.00	4980.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	4959.50	0.000	-0.50	0.00	0.00
500.00	4964.26	0.445	4.26	5.51	0.90
1100.00	4965.27	0.459	5.27	6.26	1.09
1650.00	4965.90	0.468	5.91	6.71	1.21
2200.00	4966.42	0.474	6.43	7.07	1.31
2750.00	4966.87	0.479	6.88	7.38	1.40
3300.00	4967.26	0.483	7.26	7.63	1.47
3850.00	4967.60	0.486	7.60	7.86	1.53
4400.00	4967.92	0.489	7.92	8.06	1.59
4950.00	4968.22	0.492	8.22	8.25	1.65
5500.00	4968.49	0.495	8.49	8.42	1.70

Note: Shear stress was calculated using R.

°°
°°°°°°°°°°°°°°°°°°°°°°°°°° ROADWAY OVERTOPPING DATA °°°°°°°°°°°°°°°°°°°°°°°°°°
°°°

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	70.00 ft

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	4975.73
2	325.69	4975.04
3	352.96	4974.57
4	409.33	4974.90
5	472.89	4974.70
6	491.15	4975.00
7	563.90	4975.40
8	661.19	4976.17
9	804.81	4978.11
10	941.61	4980.31
11	1002.67	4981.81
12	1082.96	4983.40
13	1238.88	4986.54
14	1388.53	4989.19
15	1452.48	4990.48

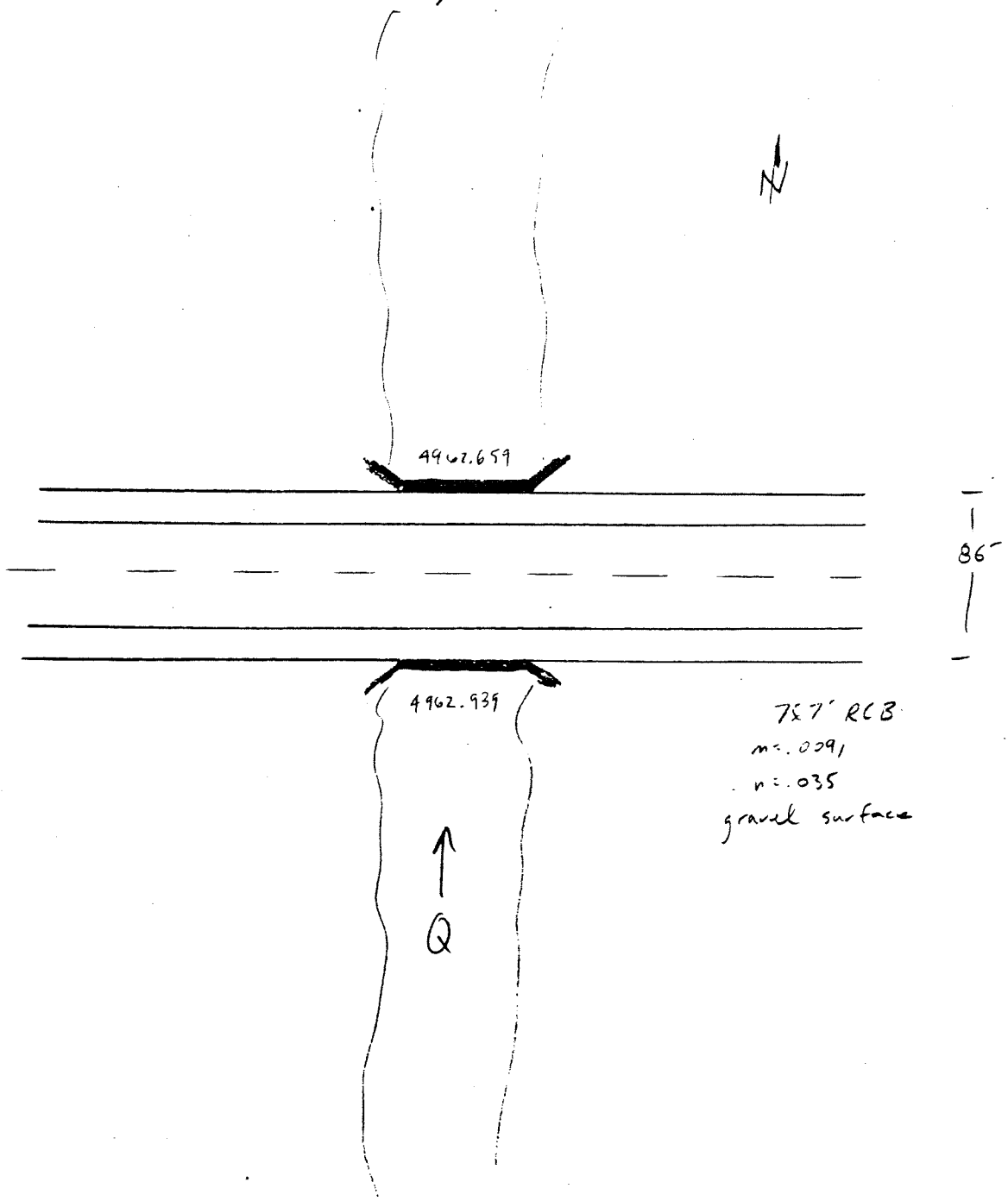
°°

ANDERSON CONSULTING ENGINEERS, INC
Civil • Water Resources • Environmental

Project Number	Page	Of
COWELD-01	1	8

Owner-Project	By	Date
WELD COUNTY 1-25 MDP	DCS	3-15-99

	Checked By	Date
GODDING HOLLOW BASIN Coalridge Canal, U/S SHW 52	CJP	04/12/99



GH CC
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GSHW52C

	x	y	distance	station	elevation	
702	88752.897	90941.345		0.000	4977.045	cl rd site12
701	88726.589	90987.440	53.074	53.074	4977.245	cl rd site12
700	88698.922	91031.321	51.875	104.949	4977.573	cl rd site12
699	88671.622	91077.146	53.341	158.290	4977.617	cl rd site12
698	88644.822	91122.004	52.254	210.544	4977.823	cl rd site12
697	88619.032	91168.747	53.386	263.929	4977.933	cl rd site12
696	88589.603	91209.848	50.551	314.480	4977.757	cl rd site12
695	88564.619	91257.572	53.868	368.348	4977.529	cl rd site12
694	88538.295	91302.743	52.282	420.630	4977.380	cl rd site12
693	88514.753	91346.887	50.029	470.659	4976.964	cl rd site12
692	88487.467	91392.898	53.493	524.152	4977.031	cl rd site12
691	88469.484	91440.509	50.894	575.046	4978.115	cl rd site12
690	88465.748	91492.967	52.591	627.637	4979.071	cl rd site12
689	88491.332	91541.188	54.588	682.225	4979.350	cl rd site12
688	88530.766	91186.302			4962.939	inv culv site12
687	88606.033	91226.679			4962.659	inv culv site12

The tailwater for this culvert will be controlled by conditions upstream at the structure at the crossing of SHW 52 (WCR 14).

Elev	Total Q
4960.13	0
63.00	120
64.52	200
[illegible]	360
[illegible]	480
[illegible]	600
70.50	720
[illegible]	840
73.32	960
[illegible]	1080
75.20	1200

Tailwater, from HY-8 run at SHW 52.

GHCC
3/8

CURRENT DATE: 03-15-1999
CURRENT TIME: 16:24:59

FILE DATE: 03-15-1999
FILE NAME: GSH52C

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4962.94	4962.66	86.00	1 RCB	7.00	7.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: GSH52C DATE: 03-15-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
4962.94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4967.33	120.0	120.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4967.99	200.0	200.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4969.88	360.0	360.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4971.47	480.0	480.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4973.36	600.0	600.0	0.0	0.0	0.0	0.0	0.0	0.00	1
52	720.0	720.0	0.0	0.0	0.0	0.0	0.0	0.00	1
40	840.0	774.8	0.0	0.0	0.0	0.0	0.0	72.74	8
.48	960.0	108.7	0.0	0.0	0.0	0.0	0.0	108.94	10
4977.61	1080.0	187.7	0.0	0.0	0.0	0.0	0.0	188.05	11
4977.70	1200.0	263.7	0.0	0.0	0.0	0.0	0.0	264.17	12
4976.96	791.0	791.0	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: GSH52C DATE: 03-15-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4962.94	0.000	0.00	0.00	0.00
4967.33	0.000	120.00	0.00	0.00
4967.99	0.000	200.00	0.00	0.00
4969.88	0.000	360.00	0.00	0.00
4971.47	0.000	480.00	0.00	0.00
4973.36	0.000	600.00	0.00	0.00
4975.52	0.000	720.00	0.00	0.00
4977.40	0.005	840.00	-7.55	-0.90
4977.48	0.000	960.00	742.39	77.33
4977.61	0.000	1080.00	704.28	65.21
4977.70	0.000	1200.00	672.14	56.01

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

GHCC

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CURRENT DATE: 03-15-1999 FILE DATE: 03-15-1999
CUR TIME: 16:24:59 FILE NAME: GSH52C

PERFORMANCE CURVE FOR CULVERT 1 - 1(7.00 (ft) BY 7.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4962.94	0.00	-0.28	0-NF	0.00	0.00	0.00	-2.53	0.00	0.00
120.00	4967.33	3.11	4.39	1-S2n	2.03	2.09	2.03	0.94	8.45	0.00
200.00	4967.99	4.44	5.05	1-S2n	2.93	2.94	2.93	1.86	9.75	0.00
360.00	4969.88	6.79	6.94	2-M2c	4.57	4.36	4.36	3.82	11.81	0.00
480.00	4971.47	8.53	8.39	2-M2c	5.73	5.28	5.28	5.16	12.99	0.00
600.00	4973.36	10.42	9.74	3-M2t	7.00	6.12	6.40	6.40	13.39	0.00
720.00	4975.53	12.59	7.56	3-M2t	7.00	6.92	6.40	7.84	16.07	0.00
774.82	4977.40	13.68	14.46	4-FFt	7.00	7.00	7.00	9.42	15.81	0.00
108.67	4973.92	2.92	10.98	4-FFt	1.89	1.96	7.00	11.16	2.22	0.00
187.68	4975.27	4.24	12.33	4-FFt	2.80	2.82	7.00	12.30	3.83	0.00
263.69	4975.81	5.41	12.87	4-FFt	3.60	3.54	7.00	12.54	5.38	0.00

El. inlet face invert 4962.94 ft El. outlet invert 4962.66 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** EMBANKMENT TOE **********

UPSTREAM STATION	186.00 ft
UPSTREAM ELEVATION	4962.94 ft
'PSTREAM EMBANKMENT SLOPE (X:1)	0.01
OWMSTREAM STATION	100.00 ft
DOWNSTREAM ELEVATION	4962.66 ft
DOWNSTREAM EMBANKMENT SLOPE (X:1)	0.01

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	7.00 ft
BARREL RISE	7.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	1:1 BEVEL (45 DEG. FLARE)
INLET DEPRESSION	NONE

GHCC

5/8

CURRENT DATE: 03-15-1999
CUF TIME: 16:24:59

FILE DATE: 03-15-1999
FILE NAME: GSH52C

TAILWATER

TAILWATER RATING CURVE

FLOW (cfs)	W.S.E.(ft)	DEPTH (ft)
0	4960.13	-2.53
120	4963.60	0.94
200	4964.52	1.86
360	4966.48	3.82
480	4967.82	5.16
600	4969.06	6.40
720	4970.50	7.84
840	4972.08	9.42
960	4973.82	11.16
1080	4974.96	12.30
1200	4975.20	12.54

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE GRAVEL
MBANKMENT TOP WIDTH 80.00 ft
ER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	4977.04
2	53.07	4977.25
3	104.95	4977.57
4	158.29	4977.62
5	210.54	4977.82
6	263.93	4977.93
7	314.48	4977.76
8	368.35	4977.53
9	420.63	4977.38
10	470.66	4976.96
11	524.15	4977.03
12	575.05	4978.12
13	627.64	4979.07
14	682.22	4979.35

re-ran w/ higher flows

GHCC
6/8

CURRENT DATE: 03-23-1999
CURRENT TIME: 11:46:12

FILE DATE: 03-23-1999
FILE NAME: GSH52C

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS	SHAPE	MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4962.94	4962.66	86.00	1	RCB		7.00	7.00	.012	CONVENTIONAL
2										
3										
4										
5										
6										

SUMMARY OF CULVERT FLOWS (cfs) FILE: GSH52C DATE: 03-23-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
★ 4962.94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
★ 4971.77	500.0	500.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4977.94	1100.0	571.5	0.0	0.0	0.0	0.0	0.0	541.99	15
4978.10	1650.0	816.4	0.0	0.0	0.0	0.0	0.0	817.24	28
4978.24	2200.0	1088.2	0.0	0.0	0.0	0.0	0.0	1090.29	19
4978.28	2750.0	1162.8	0.0	0.0	0.0	0.0	0.0	1168.14	5
4978.48	3300.0	1632.4	0.0	0.0	0.0	0.0	0.0	1634.85	17
4978.51	3850.0	1720.8	0.0	0.0	0.0	0.0	0.0	1722.10	7
4978.63	4400.0	2030.2	0.0	0.0	0.0	0.0	0.0	2031.50	28
4978.73	4950.0	2321.6	0.0	0.0	0.0	0.0	0.0	2323.06	29
★ 4978.82	5500.0	2599.6	0.0	0.0	0.0	0.0	0.0	2601.07	30
4976.96	790.8	790.8	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

Culvert drawned out

Canal road begins to overtop

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: GSH52C DATE: 03-23-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4962.94	0.000	0.00	0.00	0.00
4971.77	0.000	500.00	0.00	0.00
4977.94	0.000	1100.00	-13.51	-1.23
4978.10	0.000	1650.00	16.37	0.99
4978.24	-0.001	2200.00	21.49	0.98
4978.28	0.000	2750.00	419.05	15.24
4978.48	-0.001	3300.00	32.77	0.99
4978.51	0.000	3850.00	407.04	10.57
4978.63	0.000	4400.00	338.33	7.69
4978.73	0.000	4950.00	305.32	6.17
4978.82	0.000	5500.00	299.33	5.44

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

Elev. of culvert crown = 4969.94 ft

★ Used for UDSWMM model rating curve for Element No. 308

GHCC

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CURRENT DATE: 03-23-1999 FILE DATE: 03-23-1999
CURRENT TIME: 11:46:12 FILE NAME: GSH52C

PERFORMANCE CURVE FOR CULVERT 1 - 1(7.00 (ft) BY 7.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4962.94	0.00	-0.28	0-NF	0.00	0.00	0.00	-2.53	0.00	0.00
500.00	4971.77	8.83	8.63	2-M2c	5.92	5.42	5.42	5.38	13.17	0.00
571.52	4975.04	9.95	12.10	2-M2c	7.00	5.93	5.42	12.38	13.17	0.00
816.39	4981.52	14.56	18.58	4-FFt	7.00	7.00	7.00	12.96	16.66	0.00
1088.22	4986.39	21.46	23.45	4-FFt	7.00	7.00	7.00	13.24	22.21	0.00
1162.81	4988.10	24.00	25.16	4-FFt	7.00	7.00	7.00	13.46	23.73	0.00
1632.38	5006.84	43.91	36.97	4-FFt	7.00	7.00	5.42	13.64	43.00	0.00
1720.85	5011.34	48.40	39.77	4-FFt	7.00	7.00	5.42	13.81	45.33	0.00
2030.17	5028.94	66.00	50.21	4-FFt	7.00	7.00	5.42	13.97	53.48	0.00
2321.61	5048.17	85.23	61.60	4-FFt	7.00	7.00	5.42	14.12	61.16	0.00
2599.60	5068.91	105.97	73.87	4-FFt	7.00	7.00	5.42	14.26	68.48	0.00

El. inlet face invert 4962.94 ft El. outlet invert 4962.66 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** EMBANKMENT TOE **********

UPSTREAM STATION	186.00 ft
UPSTREAM ELEVATION	4962.94 ft
UPSTREAM EMBANKMENT SLOPE (X:1)	0.01
DOWMSTREAM STATION	100.00 ft
DOWNSTREAM ELEVATION	4962.66 ft
DOWNSTREAM EMBANKMENT SLOPE (X:1)	0.01

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	7.00 ft
BARREL RISE	7.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	1:1 BEVEL (45 DEG. FLARE)
INLET DEPRESSION	NONE

GHCC
8/8

CURRENT DATE: 03-23-1999 FILE DATE: 03-23-1999
CURRENT TIME: 11:46:12 FILE NAME: GSH52C

TAILWATER

TAILWATER RATING CURVE

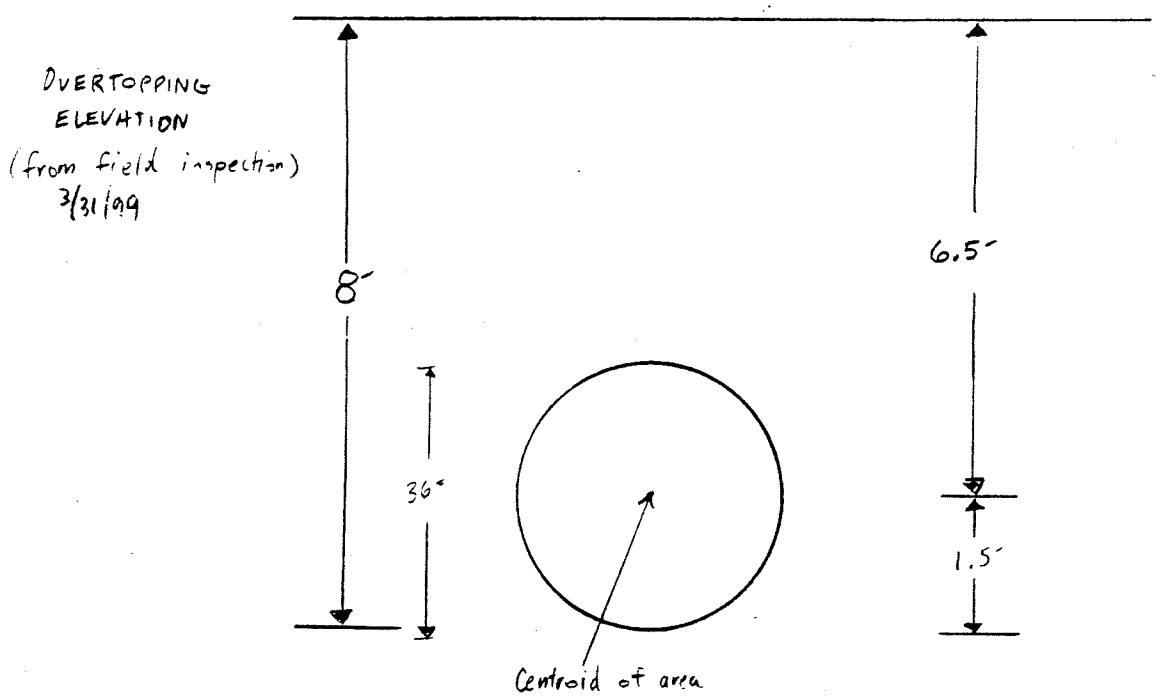
FLOW (cfs)	W.S.E.(ft)	DEPTH (ft)
0	4960.13	-2.53
500	4968.04	5.38
1100	4975.04	12.38
1650	4975.62	12.96
2200	4975.90	13.24
2750	4976.12	13.46
3300	4976.30	13.64
3850	4976.47	13.81
4400	4976.63	13.97
4950	4976.78	14.12
5500	4976.92	14.26

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE GRAVEL
EMBANKMENT TOP WIDTH 30.00 ft
***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	4977.04
2	53.07	4977.25
3	104.95	4977.57
4	158.29	4977.62
5	210.54	4977.82
6	263.93	4977.93
7	314.48	4977.76
8	368.35	4977.53
9	420.63	4977.38
10	470.66	4976.96
11	524.15	4977.03
12	575.05	4978.12
13	627.64	4979.07
14	682.22	4979.35

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number COWLD01	Page 1 Of 2
Owner-Project ELD COUNTY – I 25 MDP	By DCS	Date 4/8/99
GODDING HOLLOW BASIN 1-25, N:6 WCR14, 36"=RCP/cmp	Checked By CJP	Date 04/09/99



$Q = CA\sqrt{2gh}$

Q = orifice flow

A = Area

g = 32.2 ft/s² (gravitational constant)

h = head (Distance from OTing elevation to centroid of area)

C = orifice equation coefficient, = .6

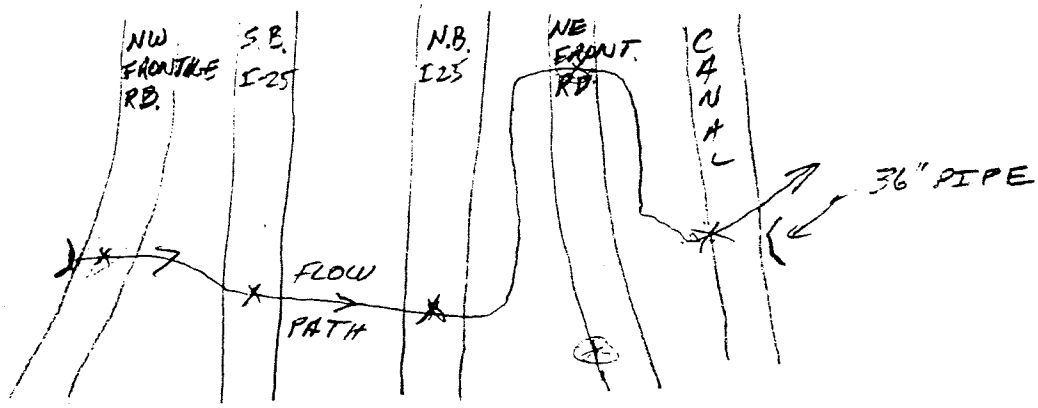
$A = \frac{1}{2}\pi r^2$

$Q = (0.6)\left(\frac{1}{2}(\pi)(\cancel{1.5}\,3.0\,ft)^2\right)\sqrt{2(32.2\,ft/s^2)(6.5\,ft)}$

$\boxed{Q = \cancel{43}\ 87\ cfs}$ corrected BLV ✓

Lidstone & Anderson, Inc.
Water Resources and Environmental Consultants

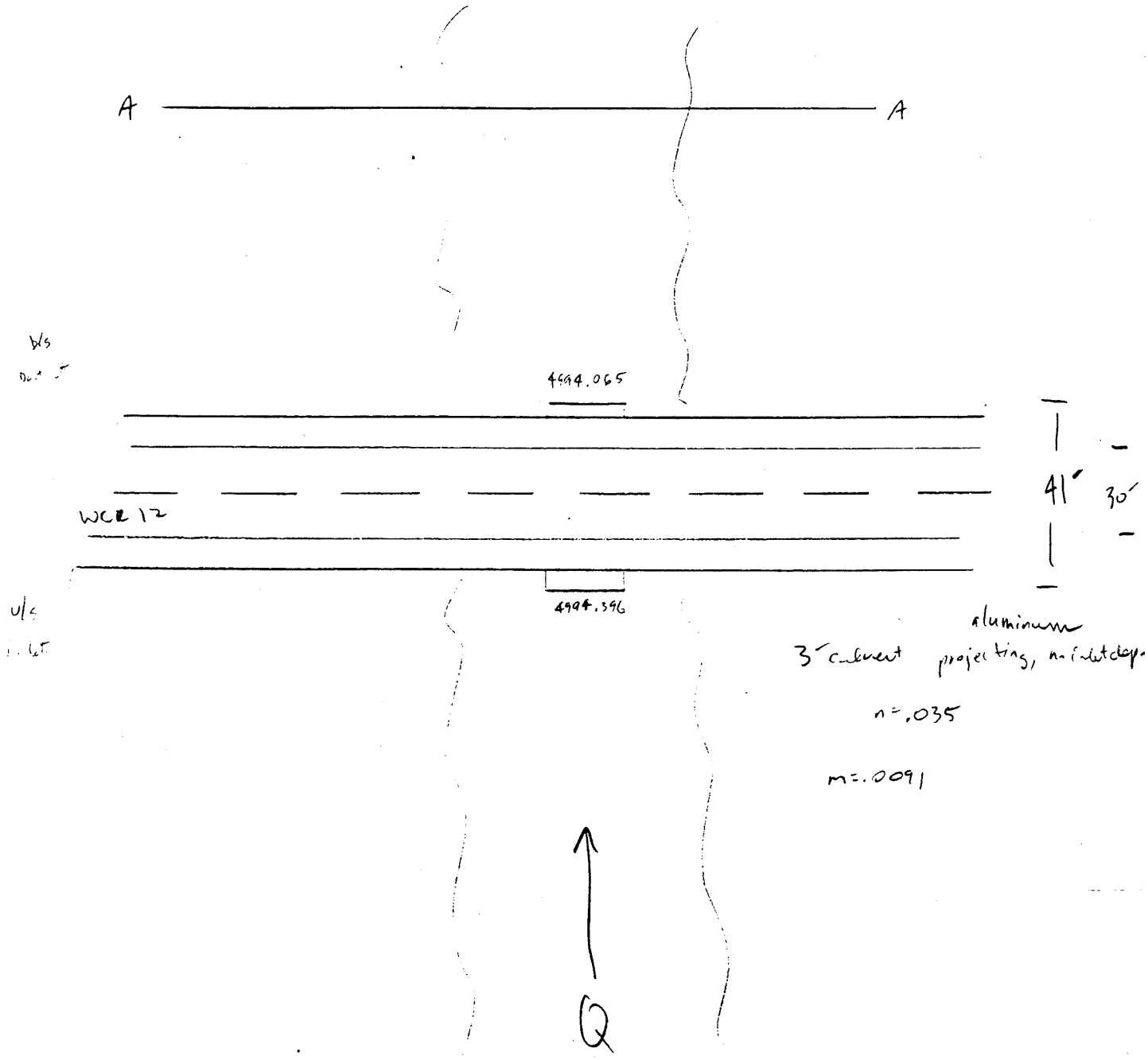
OWNER–PROJECT	BY	DATE	PROJECT NO.
WELD COUNTY – I 25 MDP	CJP	03/31/99	LOWELD-01
SUBJECT	CHECKED BY	DATE	SHEET OF
SH402/I-25 Field Survey	—	—	2 2



OT ELV. @ ≈ 3 – 7' above pipe invert

∴ ≈ 4729'

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number COWELD-01	Page 1 Of 6
Owner-Project Weld County, I-25 MDP	By DCS	Date 3/12/99
GODDING HOLLOW BASIN WCR 12 (13)	Checked By CJP	Date 04/13/99



GH12

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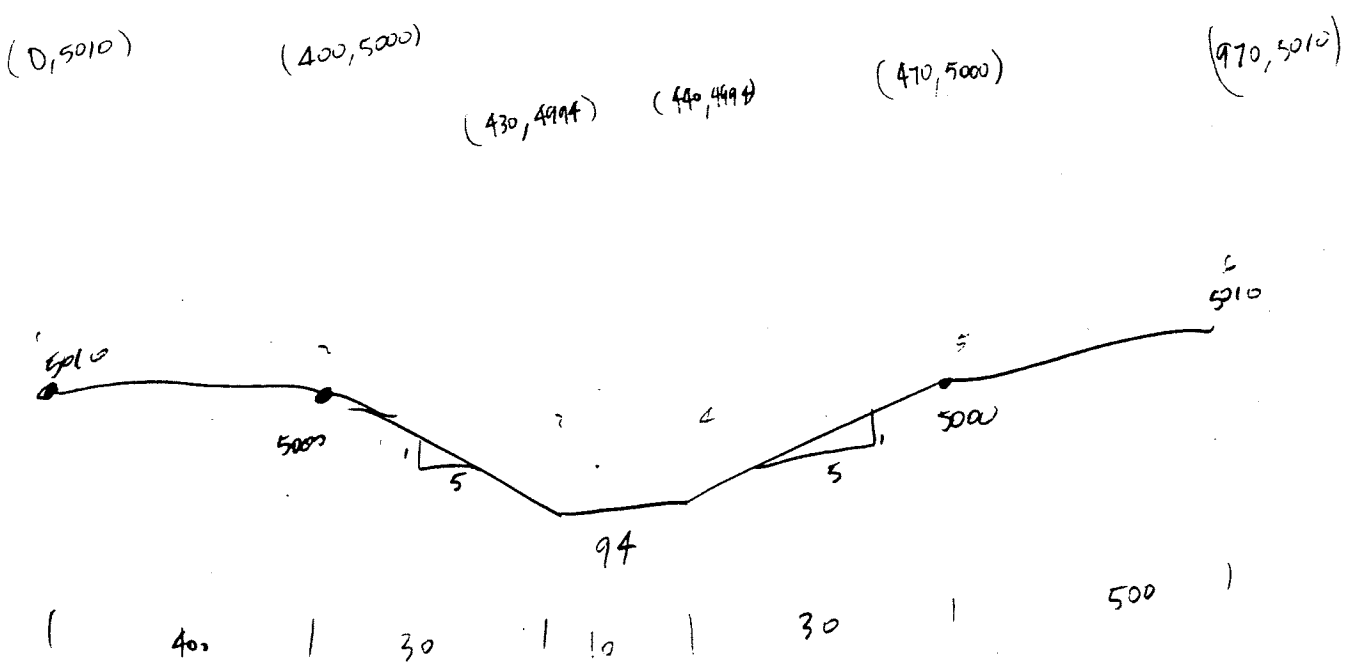
GWCR12

	x	y	distance	station	elevation	
737	84085.938	89904.240		0.000	5005.946	cl rd site13
735	84084.545	89784.165	120.083	120.083	5003.100	cl rd site13
733	84083.667	89671.182	112.986	233.069	5000.260	cl rd site13
731	84080.727	89536.522	134.692	367.762	5001.540	cl rd site13
729	84081.272	89403.910	132.613	500.375	5005.203	cl rd site13
728	84081.571	89342.656	61.255	561.629	5006.895	cl rd site13
727	84081.473	89285.327	57.329	618.959	5008.412	cl rd site13
726	84080.939	89231.040	54.290	673.248	5009.312	cl rd site13
724	84080.856	89126.497	104.543	777.791	5010.587	cl rd site13
723	84080.957	89073.982	52.515	830.306	5011.223	cl rd site13
720	84077.586	88917.639	156.379	986.686	5013.790	cl rd site13
719	84076.596	88864.774	52.874	1039.560	5014.482	cl rd site13
718	84075.225	88813.990	50.803	1090.362	5015.085	cl rd site13
714	84069.098	88598.237	215.840	1306.202	5019.030	cl rd site13
[redacted]						

2.0 158
1.5 175
275'
2.0 437

739	84105.291	89657.850	4994.065	36cmp s site 13
738	84064.297	89661.412	4994.396	36cmp s site 13



$$Q = CA\sqrt{2gh} = .62(\pi 1.5^2)\sqrt{2(32.2)(6')}$$
$$= 86 \text{ cfs}$$

GH 12

3/6

CURRENT DATE: 03-12-1999
CURRENT TIME: 14:23:50

FILE DATE: 03-12-1999
FILE NAME: GWCR12

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4994.40	4994.06	41.00	1 CSP	3.00	3.00	.031	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: GWCR12 DATE: 03-12-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
4994.40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4997.00	22.5	22.5	0.0	0.0	0.0	0.0	0.0	0.00	1
4998.71	45.0	45.0	0.0	0.0	0.0	0.0	0.0	0.00	1
5000.58	67.5	58.3	0.0	0.0	0.0	0.0	0.0	8.73	6
5000.78	90.0	59.7	0.0	0.0	0.0	0.0	0.0	29.41	8
5000.90	112.5	60.6	0.0	0.0	0.0	0.0	0.0	50.93	7
00	135.0	60.9	0.0	0.0	0.0	0.0	0.0	72.79	6
.08	157.5	61.4	0.0	0.0	0.0	0.0	0.0	95.01	6
..15	180.0	61.9	0.0	0.0	0.0	0.0	0.0	116.75	5
5001.21	200.0	62.3	0.0	0.0	0.0	0.0	0.0	136.37	5
5001.27	225.0	62.8	0.0	0.0	0.0	0.0	0.0	161.08	5
5000.26	55.8	55,8	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: GWCR12 DATE: 03-12-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4994.40	0.000	0.00	0.00	0.00
4997.00	0.000	22.50	0.00	0.00
4998.71	0.000	45.00	0.00	0.00
5000.58	-0.005	67.50	0.48	0.71
5000.78	-0.004	90.00	0.88	0.98
5000.90	-0.003	112.50	0.95	0.84
5001.00	-0.004	135.00	1.31	0.97
5001.08	-0.003	157.50	1.10	0.70
5001.15	-0.005	180.00	1.36	0.76
5001.21	-0.004	200.00	1.32	0.66
5001.27	-0.004	225.00	1.16	0.52

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

GH 12

4/6

CURRENT DATE: 03-12-1999 FILE DATE: 03-12-1999
CI TIME: 14:23:50 FILE NAME: GWCR12

PERFORMANCE CURVE FOR CULVERT 1 - 1(3.00 (ft) BY 3.00 (ft)) CSP

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4994.40	0.00	-0.33	0-NF	0.00	0.00	0.00	-0.06	0.00	0.00
22.50	4997.00	2.39	2.60	2-M2c	2.22	1.52	1.52	0.60	6.24	2.65
45.00	4998.71	4.12	4.31	2-M2c	3.00	2.18	2.18	0.89	8.20	3.24
58.29	5000.58	5.54	6.19	2-M2c	3.00	2.46	2.46	1.12	9.42	3.64
59.71	5000.78	5.72	6.38	2-M2c	3.00	2.48	2.48	1.30	9.58	3.95
60.62	5000.90	5.84	6.50	2-M2c	3.00	2.50	2.50	1.47	9.68	4.20
60.90	5000.99	5.88	6.59	7-M2c	3.00	2.50	2.50	1.61	9.71	4.41
61.39	5001.08	5.94	6.68	2-M2c	3.00	2.51	2.51	1.75	9.76	4.61
61.89	5001.15	6.01	6.75	2-M2c	3.00	2.52	2.52	1.87	9.81	4.77
62.31	5001.21	6.06	6.81	2-M2c	3.00	2.52	2.52	1.97	9.85	4.91
62.77	5001.27	6.12	6.87	2-M2c	3.00	2.53	2.53	2.09	9.90	5.07

El. inlet face invert 4994.40 ft El. outlet invert 4994.06 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	141.00 ft
INLET ELEVATION	4994.40 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	4994.06 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0081
CULVERT LENGTH ALONG SLOPE	41.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	3.00 ft
BARREL MATERIAL	CORRUGATED ALUMINUM
BARREL MANNING'S n	0.031
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	THIN EDGE PROJECTING
INLET DEPRESSION	NONE

GH12
5/6

CURRENT DATE: 03-12-1999 FILE DATE: 03-12-1999
CUF TIME: 14:23:50 FILE NAME: GWCR12

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION FILE NAME: GWCR12
MAIN CHANNEL ONLY FILE DATE: 03-12-1999
LEFT CHANNEL BOUNDARY 0
RIGHT CHANNEL BOUNDARY 0
MANNING n LEFT OVER BANK 0.000
MANNING n MAIN CHANNEL 0.035
MANNING n RIGHT OVER BANK 0.000
SLOPE OF CHANNEL 0.0091 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	5010.00
2	400.00	5000.00
3	430.00	4994.00
4	440.00	4994.00
5	470.00	5000.00
6	970.00	5010.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	4994.00	0.000	-0.06	0.00	0.00
22.50	4994.67	0.639	0.60	2.65	0.30
45.00	4994.96	0.672	0.89	3.24	0.41
67.50	4995.18	0.691	1.12	3.64	0.48
90.00	4995.37	0.705	1.30	3.95	0.55
112.50	4995.53	0.716	1.47	4.20	0.60
135.00	4995.68	0.725	1.61	4.41	0.65
157.50	4995.81	0.732	1.75	4.61	0.69
180.00	4995.93	0.739	1.87	4.77	0.73
200.00	4996.03	0.744	1.97	4.91	0.76
225.00	4996.15	0.750	2.09	5.07	0.79

Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE PAVED
EMBANKMENT TOP WIDTH 30.00 ft
***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	120.08	5003.10
2	233.07	5000.26
3	367.76	5001.54
4	500.38	5005.20
5	561.63	5006.90
6	618.96	5008.41
7	673.25	5009.31
8	777.79	5010.59
9	830.31	5011.22
10	986.69	5013.79
11	1039.56	5014.48
12	1090.36	5015.08

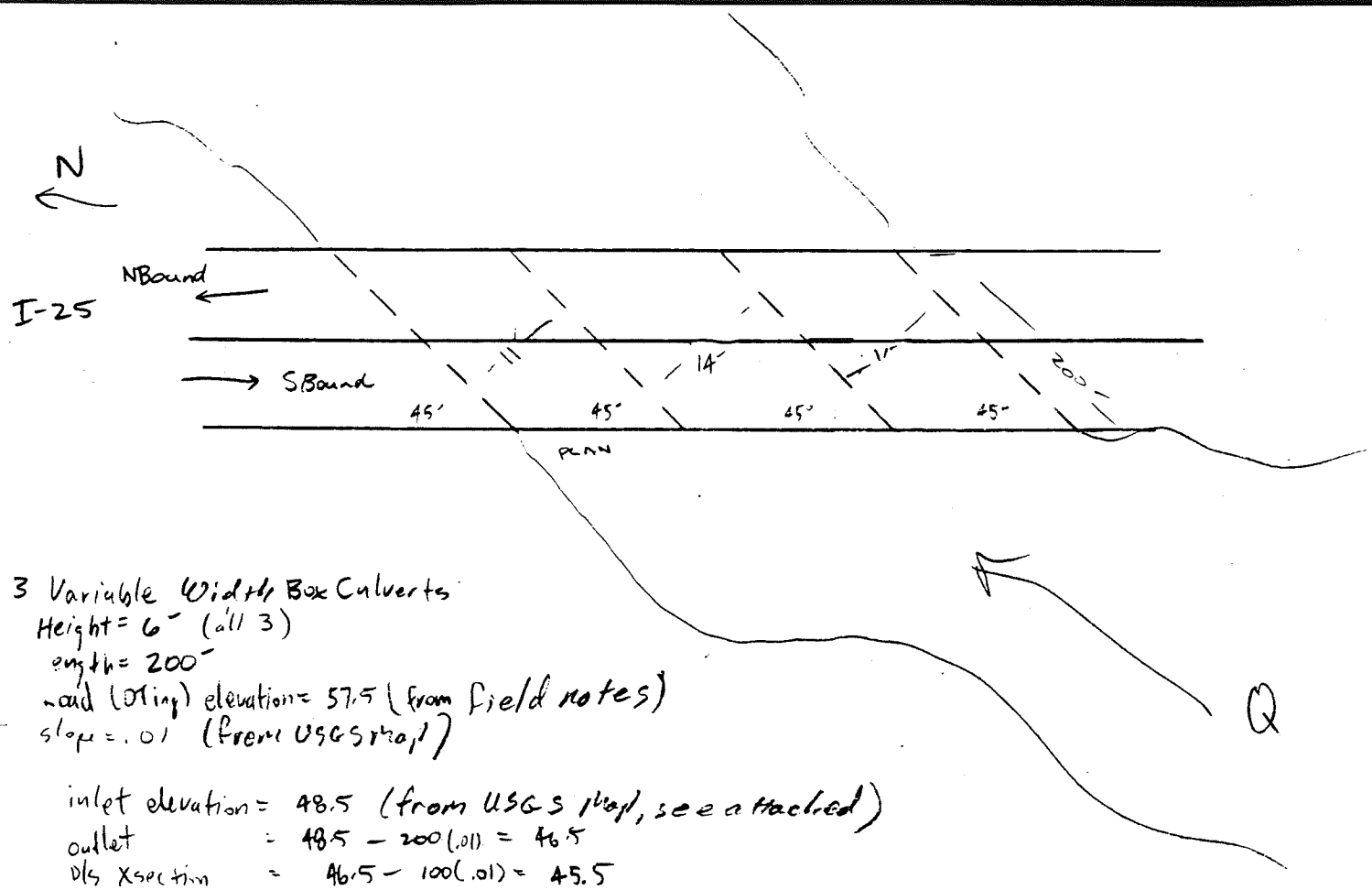
13	1306.20	5019.03

ANDERSON CONSULTING ENGINEERS, INC
Civil • Water Resources • Environmental

Project Number	Page Of
COWELD01	1 10

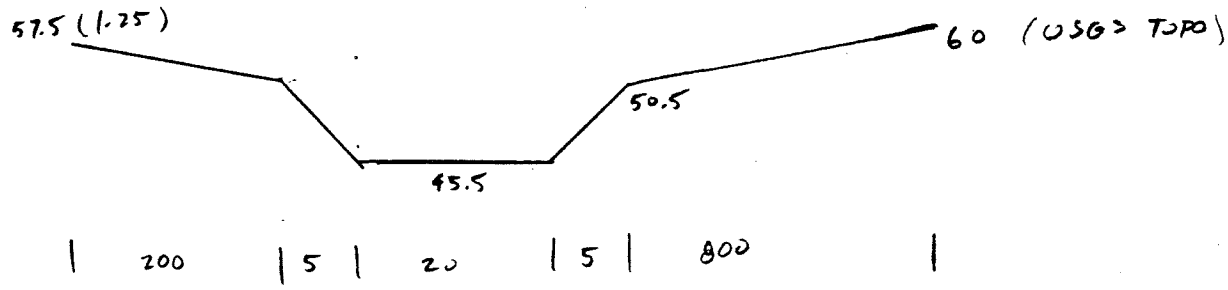
Owner-Project	By	Date
	DCS	4/8/99

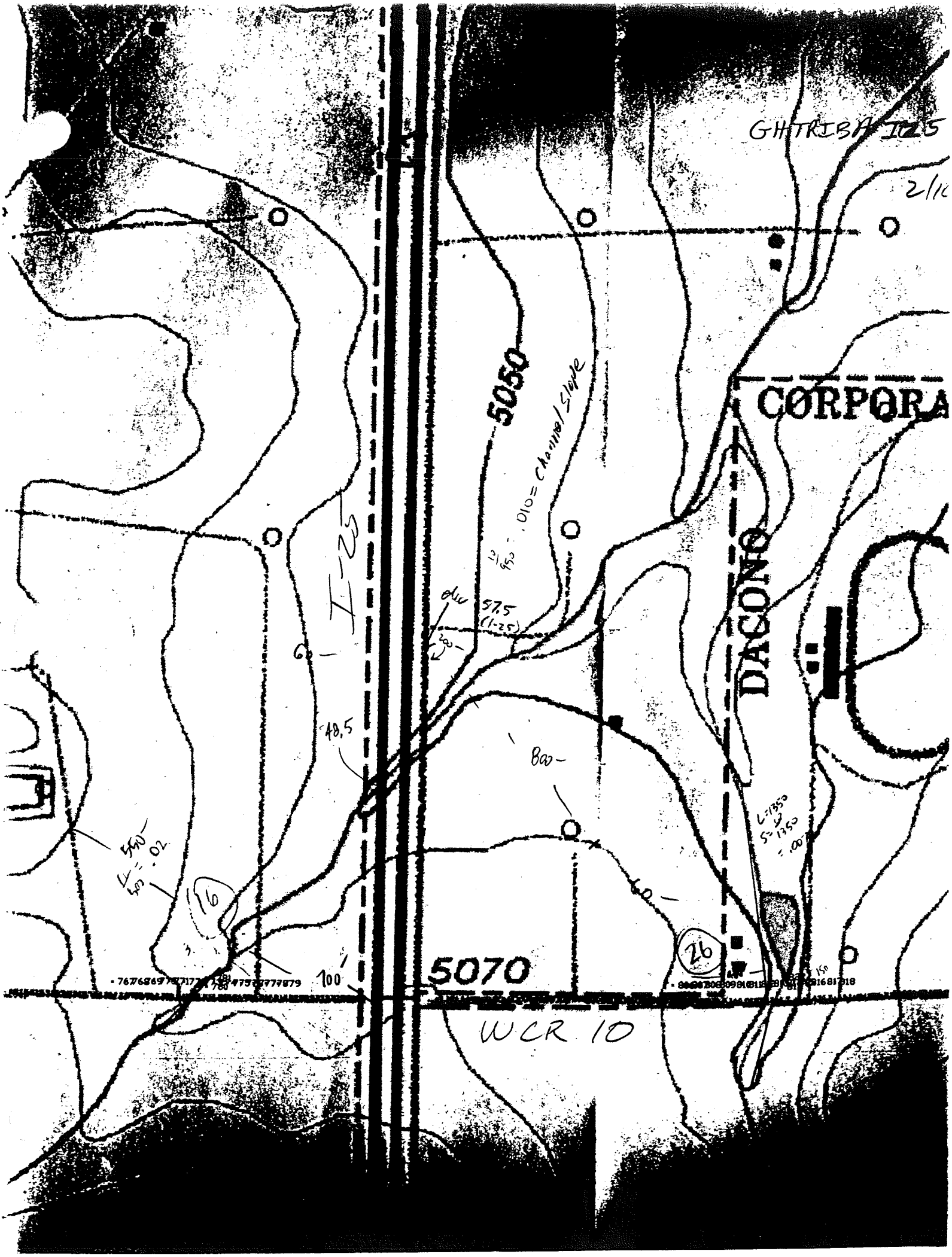
	Checked By	Date
GODDING HOLLOW BASIN 3RCB's N of WCR10 on I-25	CJP	04/12/99



3 Variable Width Box Culverts
Height = 6' (all 3)
length = 200'
road (DTing) elevation = 57.5 (from field notes)
slope = .01 (from USGS map)

inlet elevation = 48.5 (from USGS map, see attached)
outlet = 48.5 − 200(.01) = 46.5
D/S Xsection = 46.5 − 100(.01) = 45.5




GHTRIBA I25
2/1
CORPORA
DACONO
5050
5070
WCR 10
I-25
.010 = Channel Slope
57.5
(I-25)
48.5
60
80
100
16
26

3/10

CONELDOI
WELD
I-25 MOP
HOPPING Harrow
3 PCB's NO WELD
M 175
TITLE SHEET

FEDERAL ROAD REGION NO	DIVISION	PROJECT NO	SHEET NO
VIII	COLORADO	EHS I 25-3(48)229	1

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS—STATE OF COLORADO

AS CONSTRUCTED
REVISED DATE 18 JUN 73

PLAN AND PROFILE OF PROPOSED

FEDERAL AID PROJECT NO. EHS-I 25-3(48)229

STATE HIGHWAY NO. 25

WELD COUNTY

CONVENTIONAL SIGNS

CENTER LINE
COUNTY LINE
TOWNSHIP OR RANGE LINE
LAND LINES — SECTION LINE
CITY LIMITS
RAILROAD — PLAN SHEET
BARBED WIRE FENCE
WOVEN WIRE - COMBINATION FENCE — TO BE REMOVED
TELE. & TELEG LINE
POWER LINE — RELOCATED
PRESENT ROAD (PLAN SHEETS)
RIGHT OF WAY LINE — R.O.W. MARKER
ACCESS POINTS (FREEWAYS)
C OF A LINE (CONTROL OF ACCESS)
ACCESS DENIED BY DEED
TOP OF CUTS
TOE OF FILLS
DETOUR

SCALES OF ORIGINAL DRAWINGS

ON PLAN, 1 IN = 100 FT
ON PROFILE { 1 IN = 100 FT HORIZONTAL, 1 IN = 10 FT VERTICAL }
GRADE LINE ON PROFILE IS SHOWN AS GRADE OF FINISHED ROAD
GROSS LENGTH OF PROJECT } 28,100.0 FT. = 5.322 MILES
NET LENGTH OF PROJECT }

Contractor: Siegrist Construction Company
Resident Engr: Kenneth F. Moore
Project Engr: Dale C. Pyle & Eugene F. Grosser
Project Started: 3 APR 72
Project Completed: 18 JUN 73

TABULATION OF LENGTH

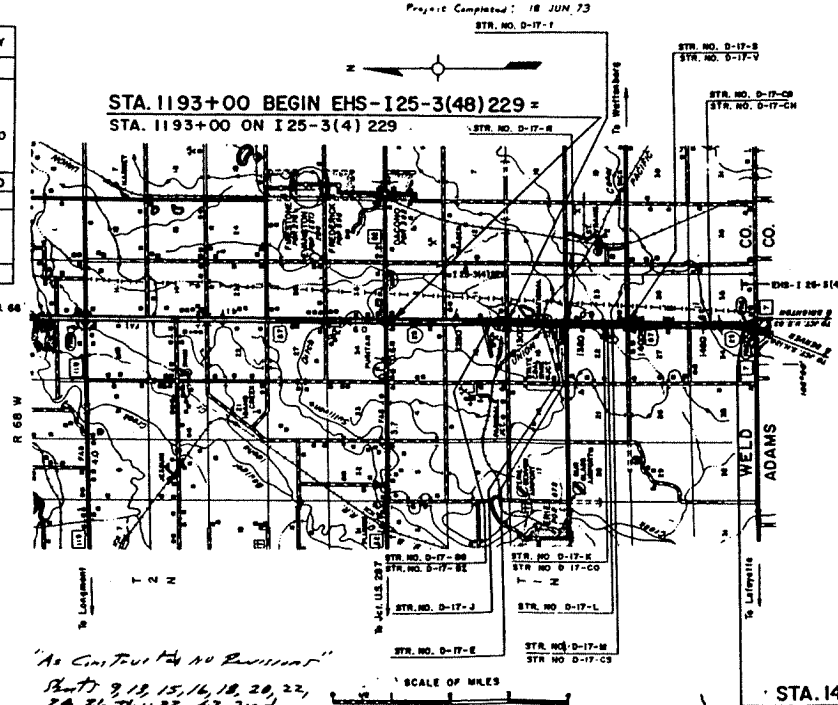
STATION	ROADWAY LIN. FT.
1193+00 BEGIN EHS-I 25-3(48)229 = 1193+00 ON I 25-3(4)229	
1474+00 END EHS-I 25-3(48)229 = 1474+00 ON I 25-3(4)229 = 1474+00 BEGIN EHS-I 25-3(49)229	28,100.0
TOTAL	28,100.0

SUMMARY	LIN. FT.	MILES
ROADWAY	28,100.0	5.322
TOTALS NET AND GROSS LENGTH	28,100.0	5.322

For Design Data see Project I 25-3(4)229

Design Traffic Volume { 42,830 A.D.T. 5,140 D.H.V.

STA. 1193+00 BEGIN EHS-I 25-3(48)229 =
STA. 1193+00 ON I 25-3(4)229



STA. 1474+00 END EHS-I 25-3(48)229 =
STA. 1474+00 ON I 25-3(4)229 =
STA. 1474+00 BEGIN EHS-I 25-3(49)229

"As Constructed" No Revision
Sheets 9, 12, 15, 16, 18, 20, 22, 24, 26 Thru 32, 42 and 44 Thru 55

Division of Highways
As Constructed Plans Final Approval
Dale C. Pyle — Date 8/5/75
District Construction Engineer

D.H.H.

INDEX OF SHEETS

SHEET NO 1 TITLE PAGE, SKETCH MAP & TABULATION OF LENGTH.
2 TYPICAL SECTIONS, GENERAL NOTES AND DELINEATORS.
3-5 SUMMARY OF APPROXIMATE QUANTITIES.
6-7 STRUCTURE QUANTITIES.
8 GUARD RAIL TABULATION & DETAIL OF GUARD RAIL TYPE 5.
9 DETAIL OF ACCELERATION LANES.
10-13 11 X 14 X 11 CBC WIDENING STR. D-17-BG & BI.
14-15 BRIDGE RAIL FOR CBC STR. D-17-I.
16 GUARD RAIL CONNECTION TO STR. D-17-J.
17-18 BRIDGE RAIL FOR CBC STR. D-17-E.
19-20 REPLACE BRIDGE RAILING STR. D-17-R.
21-22 20 X 5 CBC WIDENING STR. D-17-CQ.
23-24 20 X 5 CBC WIDENING STR. D-17-CS.
25-32 BRIDGE WIDENING STR. D-17-CG & CH.
33-42 PLAN AND PROFILE SHEETS.
43-55 SIGNING PLANS.
~~56-61 STRUCTURE CROSS SECTIONS.~~
62-67 Unclassified & Ditch Excavation Cross Sections
68-88 Borrow Pit Cross Sections
89-124 Embankment Cross Sections & Unclassified Excavation
M-203-B APPROACH ROADS, FLARING, CUT SLOPE TREATMENT, BRIDGE AND CREST WIDENING. 4-27
M-203-C DITCH TYPES. 7-27
M-206-AA EXCAVATION AND BACKFILL FOR STRUCTURES. (2 SHEETS) 2-16
M-500-A LETTERS AND FIGURES FOR STRUCTURE NUMBERS. 7-1
M-601-A SINGLE AND DOUBLE CONCRETE BOX CULVERTS. 5-10
M-601-B TRIPLE CONCRETE BOX CULVERTS. 5-10
M-601-C WINGWALLS FOR CONCRETE BOX CULVERTS-4:1 SIDE SLOPES. (2 SHEETS) 10-2
M-603-CA CONCRETE AND METAL END SECTIONS. 6-27
M-603-M METAL CULVERT PIPE - H-20 LOADING. 2-1
M-603-RC REINFORCED CONCRETE PIPE. 3-
M-604-BA INLET, TYPE C. 5-2
M-604-D STEPS FOR MANHOLES AND INLETS. 7-2
M-606-B GUARD RAIL, TYPE 5, BOX BEAM MEDIAN BARRIER - STEEL. (2 SHEETS) 12-2
M-607-A WIRE FENCES AND GATES. (2 SHEETS) 8-17
M-612-A MARKER POSTS AND BENCH MARKS. 6-3
M-612-C DELINEATORS (2 SHEETS) 7-1
M-613-AA HIGHWAY LIGHTING. 9-16-70
M-614-A TIMBER BARRICADES. 4-23-69
M-614-1C STANDARD CONSTRUCTION IDENTIFICATION SIGNS. (2 SHEETS) 9-25-70
M-614-TB TRAFFIC SIGNING FOR HIGHWAY CONSTRUCTION. (3 SHEETS) 11-22-71
S-614-19B TYPICAL GROUND SIGN PLACEMENT. 11-17-71
S-614-20B CLASS I GROUND SIGN INSTALLATIONS. 11-17-71
S-614-21B CLASS II GROUND SIGN INSTALLATIONS. 12-2-69
S-614-22C TYPICAL MARKER ASSEMBLY INSTALLATIONS. 6-16-71
S-614-23C LAMINATED ALUMINUM PANELS AND POST SPACING TABLE FOR CLASS III SIGNS (2 SHEETS) 10-20-69
S-614-26B BREAK-AWAY SIGN SUPPORT DETAILS FOR GROUND SIGNS. (2 SHEETS) 12-9-68
S-614-27B PEDESTALS, FOOTINGS AND SIGN ISLANDS FOR CLASS III SIGNS. (2 SHEETS) 5-16-69
S-614-32B AUXILIARY MARKERS. 11-16-71
S-614-35A TYPICAL MULTI-SIGN INSTALLATIONS. 11-17-71

JUN 6 1974
INACTIVE

SEE SPECIAL PROVISIONS FOR NOTICE TO BIDDERS

Division of Highways
APPROVED L. C. Brown 2-24-
Chief Engineer — Date

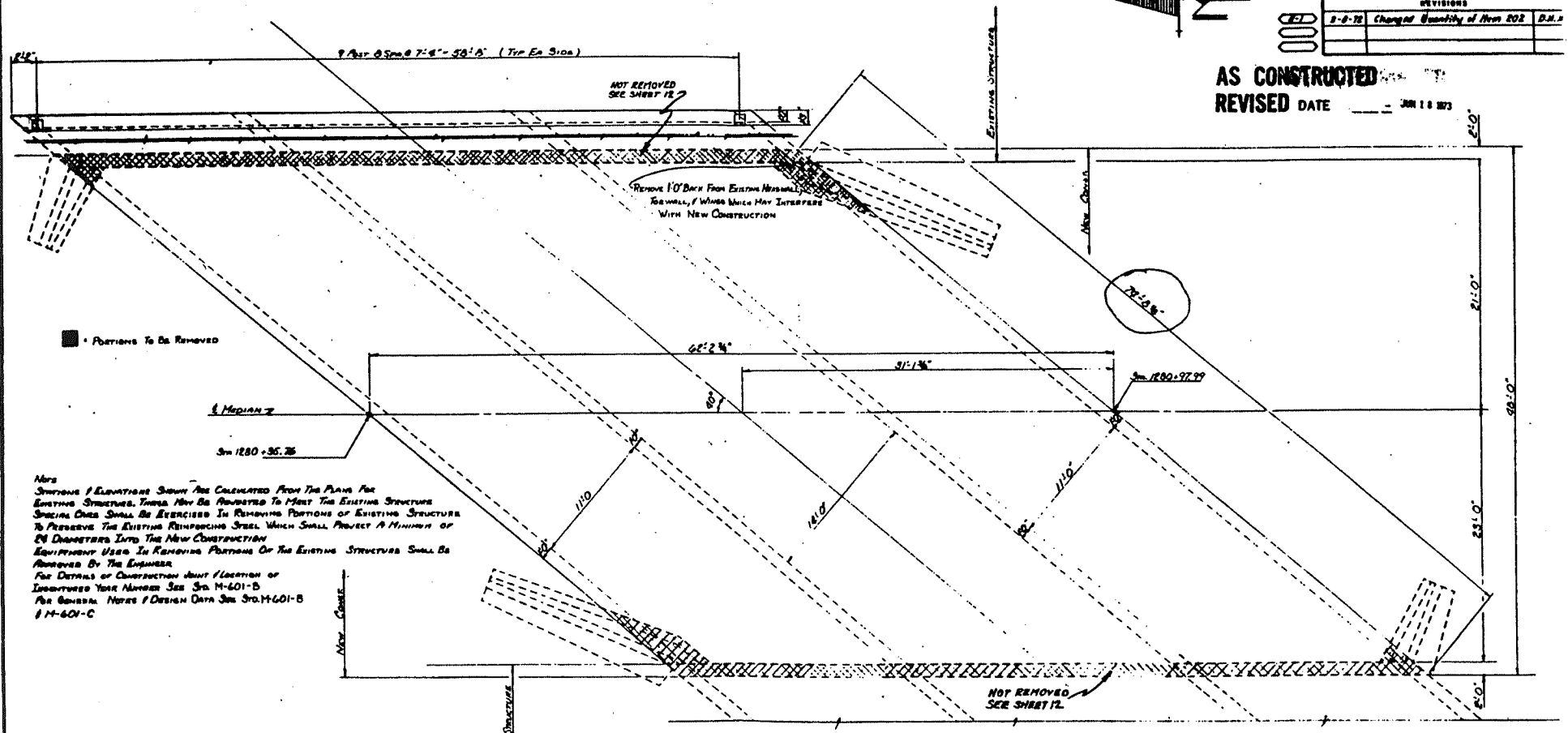
Department of Transportation
Federal Highway Administration
APPROVED — Date
Division Engineer

Federal Project Number	District	Fiscal No.	Sheet No.	Total Sheets
XXXX	Colorado	EHSI25-3(48)229	10	

Revisions

(R-1)	3-8-78	Changed Quantity of Item 202

AS CONSTRUCTED
REVISED DATE ____ JAN 18 1973



Note
Stations & Elevations Shown Are Calculated From The Plans For Existing Structures. These May Be Adjusted To Meet The Existing Structure
Special Care Shall Be Exercised In Removing Portions of Existing Structure To Preserve The Existing Reinforcing Steel Which Shall Project A Minimum of 24 Diameters Into The New Construction
Equipment Used In Removing Portions Of The Existing Structure Shall Be Approved By The Engineer
For Details of Construction Joint & Location of Longitudinal Joint Number See Std. M-601-B
For General Notes & Design Data See Std. M-601-B & M-601-C

Summary of Quantities

Item No	Description	Unit	Total
(R-1) 202	Removal of Portions of Present Structure	Ea	2
206	Structure Excavation	Cu Yd	155
206	Structure Backfill (Class 2)	Cu Yd	65
509	Structural Steel Galvanized	Lb	4730
601	Concrete Class A (Box Culvert)	Cu Yd	348
			287.67 See Sheet 12
602	Reinforcing Steel	Lb	38,719
			44,882 See bar list & sheet 12

Bar List

Mark	No Pcs	Length	Type	Dimensions H	V	D
401	120	20'-0"	Str			
402	164	36'-6"	Str			
404	108	7'-9"	Str			
405	9	4'-8"	I	0'-10"	1'-2"	
407	6	40'-0"	Str			
408	6	23'-0"	Str			
409	30	1'-4"	III			
* 410		8'-4"			2'-2"	
20	168	B.E.I.	II		B.E.I.	
* 460		5'-0"			2'-6"	
	110					
503	160	7'-9"	Str			

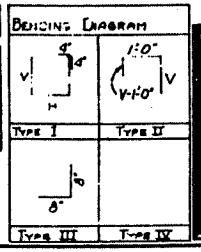
Bar List

Mark	No Pcs	Length	Type	Dimensions H	V	D
601	180	39'-6"	Str			
602	88	39'-7"				
70	84	B.E.I.	Str			
610	4	2'-2"				
610	30	10"	Str			
	168					
615	200	29'-0"	Str			
616	40	27'-8"				
70	84	B.E.I.	Str			
616A		3'-2"				
619	31	11'-9"	Str			

Bar Summary

No. Lin. Ft.	Bar Size	Lb/Lin. Ft.	Weight Lb
12,000	#4	0.669	8,028
3,480	#5	1.043	[illegible]
1,320	#6	1.502	[illegible]
16,800		Total =	37,719
			44,882

Bending Diagram



Type I | Type II | Type III | Type IV

DIVISION OF HIGHWAYS

Construction Layout

Approved: R. Schwendig, P.E. Bridge Engineer
Date: Feb. 14, 1972

Designed: J. Greer | Detailed: O. Sant

Structure Number: D-17-BG
Structure Number: D-17-BT

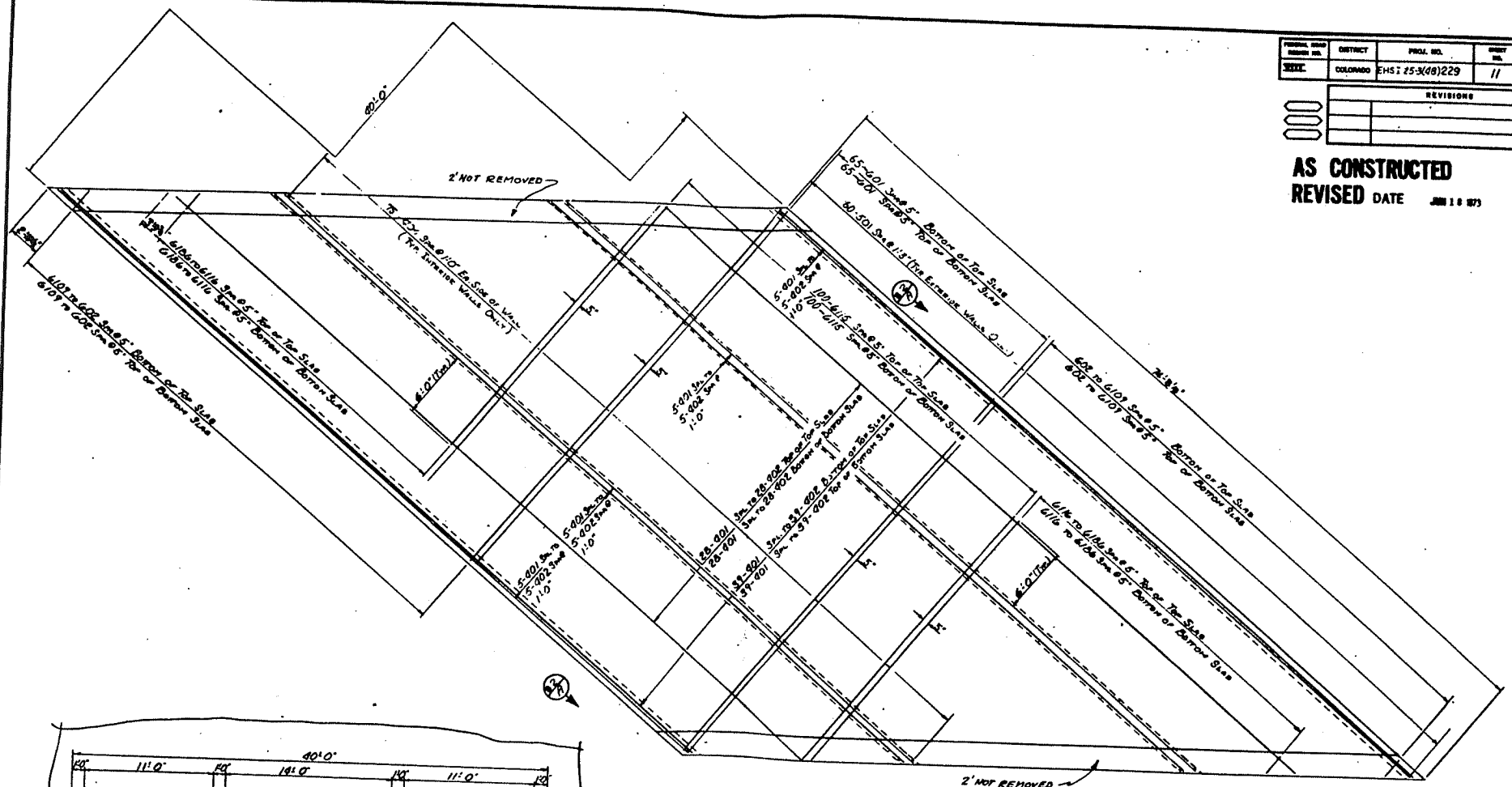
DWG. No. 8 of 8

GATRIBAIDES

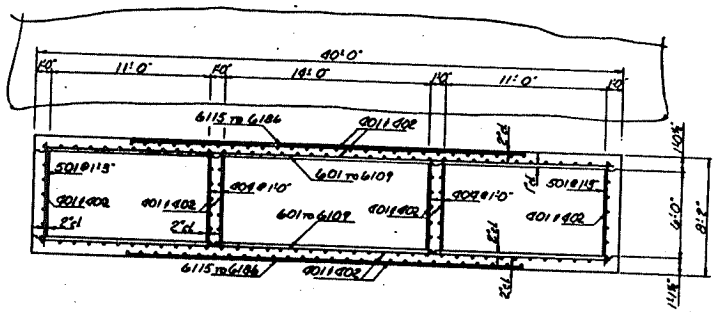
FEDERAL ROAD REGION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
	COLORADO	EHSI 25-3(48)229	11	

REVISIONS

AS CONSTRUCTED
REVISED DATE JUN 18 1973



PLAN



SECTION B2/A

DIVISION OF HIGHWAYS

REINFORCING STEEL

Approved: [signature] P.E.
Bridge Engineer
Date: Feb. 14, 1972

Designed: J. Barrett | Checked: D. Solt
Structure Number: D-17-86
D-17-87
DWG. No. B 2 of 6

PROFILE

PLAN

1255

30" x 301' Siphon

1261+00 – Remove End Sections Lt. and Rt. of N.B.L. and Rt. of Lt. Frontage Road. Extend 24" R.C.P. N.B.L. 12' Lt. and 16' Rt., Extend 24" R.C.P. Lt. Frontage Road 16' Rt., Regd Inlet Type C (H=3'-6") in ℄ and Lt. Frontage Road Median.

S.E. ¼ Sec. 10 T.1N., R.68 W.

N.W. ¼ Sec. 11 T.1N., R.68 W.

1260

24" x 48' R.C.P.
24" x 34' R.C.P.

1261+ to 1268+ – Adjust ℄ and Lt. Frontage Road Medians to Drain.

24" x 301' Siphon

1265

1268+00 – Remove End Sections Lt. and Rt. of N.B.L. and Rt. of Lt. Frontage Road, Extend 24" R.C.P. N.B.L. 12' Lt. and 16' Rt., Extend 24" R.C.P. Lt. Frontage Road 14' Rt., Regd Inlet Type C (H=3'-6") in ℄ and Lt. Frontage Road Medians.

24" x 48' R.C.P.
24" x 48' R.C.P.

1270

S 00°01'30" E

24" x 301' Siphon

1275

18" x 26' C.M.P.

18" x 26' C.M.P.

S.E. ¼ Sec. 10 T.1N., R.68 W.

S.W. ¼ Sec. 11 T.1N., R.68 W.

96" x 220' R.C.P.

1280+35 – Remove Concrete Slope and Ditch Paving, Connect Existing C.B.C. (Detail Sheet Nos. 10-13) Regd Inlet Type C (H=3'-6") in ℄ Median, 12" x 4' R.C.P. to Connect Inlet to C.B.C.

Bridge Str. No. 0-17-0

1280

Triple Box Str. No. 0-17-B6

Concrete Slope and Ditch Paving (Median)

Triple Box Str. No. 0-17-B2

L=200'

1285

AS CONSTRUCTED

FEDERAL AID PROJECT NO.	VIII
CONTRACT NO.	
PROJ. NO.	EHS-125-2(69)229
SHEET NO.	3F
STATE	

GATKIVALES 7/10

CURRENT DATE: 04-08-1999
CURRENT TIME: 16:07:23

FILE DATE: 04-08-1999
FILE NAME: G3RCBI25

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	48.50	46.50	200.01	1 RCB	14.00	6.00	.012	CONVENTIONAL
2	48.50	46.50	200.01	2 RCB	11.00	6.00	.012	CONVENTIONAL
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: G3RCBI25 DATE: 04-08-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
48.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
50.47	300.0	117.4	184.9	0.0	0.0	0.0	0.0	0.00	3
51.63	600.0	233.6	366.2	0.0	0.0	0.0	0.0	0.00	4
52.62	900.0	349.9	550.0	0.0	0.0	0.0	0.0	0.00	2
52.93	1000.0	388.8	611.1	0.0	0.0	0.0	0.0	0.00	3
54.37	1500.0	584.4	917.6	0.0	0.0	0.0	0.0	0.00	3
55.25	1800.0	700.6	1100.9	0.0	0.0	0.0	0.0	0.00	2
56.21	2100.0	817.2	1283.5	0.0	0.0	0.0	0.0	0.00	2
57.25	2400.0	930.5	1462.1	0.0	0.0	0.0	0.0	0.00	4
57.81	2700.0	986.3	1550.5	0.0	0.0	0.0	0.0	154.52	4
58.07	3000.0	1011.0	1589.1	0.0	0.0	0.0	0.0	386.50	3
57.50	2459.0	956.3	1502.6	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: G3RCBI25 DATE: 04-08-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
48.50	0.000	0.00	0.00	0.00
50.47	0.007	300.00	-2.21	-0.74
51.63	-0.001	600.00	0.20	0.03
52.62	0.000	900.00	0.07	0.01
52.93	0.000	1000.00	0.03	0.00
54.37	0.006	1500.00	-1.96	-0.13
55.25	0.004	1800.00	-1.51	-0.08
56.21	0.002	2100.00	-0.70	-0.03
57.25	-0.009	2400.00	7.40	0.31
57.81	-0.007	2700.00	8.63	0.32
58.07	-0.009	3000.00	13.50	0.45

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

GHTRIBHI25 8/12

CURRENT DATE: 04-08-1999 FILE DATE: 04-08-1999
CURRENT TIME: 16:07:23 FILE NAME: G3RCBI25

PERFORMANCE CURVE FOR CULVERT 1 - 1(14.00 (ft) BY 6.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	48.50	0.00	-2.00	0-NF	0.00	0.00	0.00	-1.00	0.00	0.00
117.37	50.48	1.98	1.70	1-S2n	0.80	1.30	0.84	1.15	9.99	6.34
233.57	51.63	3.13	2.23	1-S2n	1.27	2.06	1.34	2.24	12.48	7.99
349.87	52.62	4.12	2.81	1-S2n	1.65	2.69	1.79	3.11	13.94	9.09
388.84	52.93	4.43	3.01	1-S2n	1.77	2.89	1.94	3.38	14.32	9.41
584.41	54.37	5.87	4.18	1-S2n	2.32	3.79	2.62	4.43	15.93	10.76
700.64	55.25	6.75	4.99	1-S2n	2.62	4.28	2.98	4.84	16.81	11.39
817.22	56.21	7.71	5.88	1-S2n	2.91	4.74	3.34	5.14	17.48	11.85
930.46	57.24	8.74	6.84	5-S2n	3.18	5.17	3.71	5.40	17.92	12.23
986.31	57.80	9.30	7.35	5-S2n	3.30	5.37	3.87	5.61	18.19	12.54
1010.95	58.06	9.56	7.64	5-S2n	3.36	5.46	3.95	5.79	18.27	12.80

El. inlet face invert 48.50 ft El. outlet invert 46.50 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	300.00 ft
INLET ELEVATION	48.50 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	46.50 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0100
CULVERT LENGTH ALONG SLOPE	200.01 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	14.00 ft
BARREL RISE	6.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

GHTRIBAI25
9/12
3

CURRENT DATE: 04-08-1999 FILE DATE: 04-08-1999
CURRENT TIME: 16:07:23 FILE NAME: G3RCBI25

PERFORMANCE CURVE FOR CULVERT 2 - 2(11.00 (ft) BY 6.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	48.50	0.00	-2.00	0-NF	0.00	0.00	0.00	-1.00	0.00	0.00
184.85	50.48	1.98	1.70	1-S2n	0.81	1.30	0.85	1.15	9.90	6.34
366.23	51.63	3.13	2.24	1-S2n	1.29	2.05	1.35	2.24	12.31	7.99
550.05	52.62	4.12	2.82	1-S2n	1.69	2.69	1.81	3.11	13.79	9.09
611.13	52.93	4.43	3.03	1-S2n	1.82	2.89	1.96	3.38	14.18	9.41
917.56	54.37	5.87	4.20	1-S2n	2.39	3.79	2.66	4.43	15.69	10.76
1100.87	55.25	6.75	5.02	1-S2n	2.70	4.28	3.05	4.84	16.42	11.39
1283.49	56.20	7.70	5.93	1-S2n	3.01	4.74	3.42	5.14	17.07	11.85
1462.14	57.24	8.74	6.91	5-S2n	3.30	5.17	3.77	5.40	17.64	12.23
1550.53	57.81	9.31	7.43	5-S2n	3.44	5.37	3.94	5.61	17.87	12.54
1589.05	58.06	9.56	7.72	5-S2n	3.50	5.46	4.01	5.79	18.00	12.80

El. inlet face invert 48.50 ft El. outlet invert 46.50 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	300.00 ft
INLET ELEVATION	48.50 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	46.50 ft
NUMBER OF BARRELS	2
SLOPE (V/H)	0.0100
CULVERT LENGTH ALONG SLOPE	200.01 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	11.00 ft
BARREL RISE	6.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

GHTRIB HI-25 10/1

CURRENT DATE: 04-08-1999
CURRENT TIME: 16:07:23

FILE DATE: 04-08-1999
FILE NAME: G3RCBI25

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION

FILE NAME: G3RCBI25
FILE DATE: 04-08-1999

MAIN CHANNEL AND LT & RT OVER BANKS	
LEFT CHANNEL BOUNDARY	2
RIGHT CHANNEL BOUNDARY	5
MANNING n LEFT OVER BANK	0.035
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.035
SLOPE OF CHANNEL	0.0100 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	57.50
2	200.00	50.50
3	205.00	45.50
4	225.00	45.50
5	230.00	50.50
6	1030.00	60.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	45.50	0.000	-1.00	0.00	0.00
300.00	47.65	0.798	1.15	6.34	1.14
600.00	48.74	0.835	2.24	7.99	1.61
900.00	49.61	0.855	3.11	9.09	1.96
1000.00	49.88	0.860	3.38	9.41	2.06
1500.00	50.93	0.885	4.43	10.76	2.52
1800.00	51.34	0.898	4.84	11.39	2.74
2100.00	51.64	0.906	5.14	11.85	2.91
2400.00	51.90	0.914	5.40	12.23	3.05
2700.00	52.11	0.919	5.61	12.54	3.17
3000.00	52.29	0.924	5.79	12.80	3.27

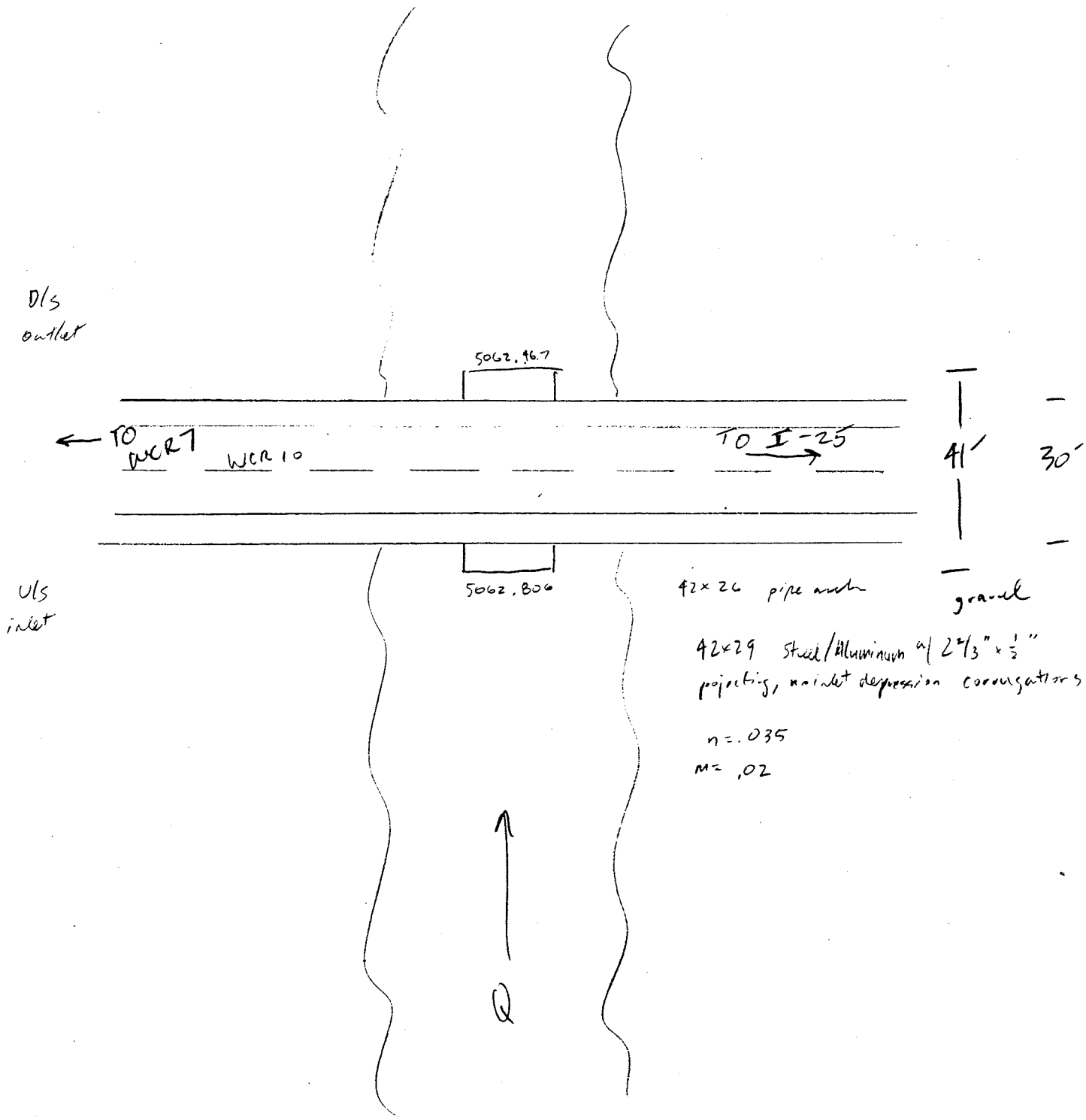
Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	180.00 ft
CREST LENGTH	300.00 ft
OVERTOPPING CREST ELEVATION	57.50 ft

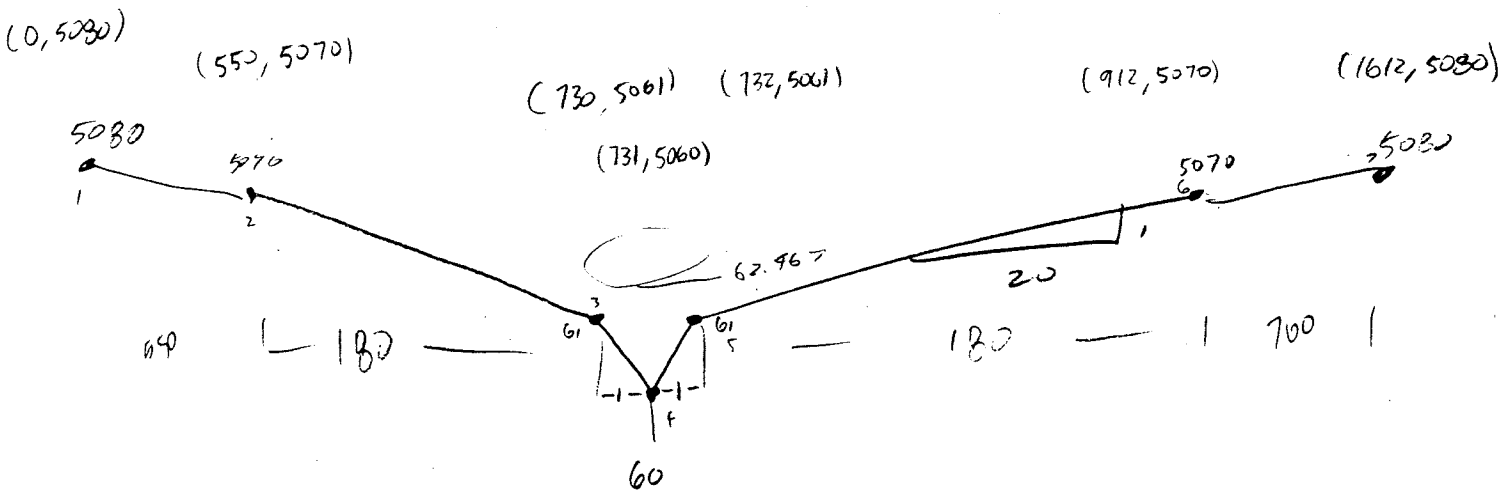
Q @ OT = 40 cfs GHTRIBA10

ANDERSON CONSULTING ENGINEERS, INC Civil • Water Resources • Environmental	Project Number COWEDO01	Page 1 Of 6
Owner-Project WELD COUNTY, I-25 MDP	By DCS	Date 3-12-99
Subject GODDING HOLLOW BASIN WCR 10 A (16)	Checked By CJP	Date 04/13/99



GWCR10A

	x	y	distance	station	elevation	
779	78733.287	86302.802		0.000	5068.379	CL RD
778	78733.158	86250.740	52.062	52.062	5068.300	CL RD
777	78732.663	86198.174	52.568	104.630	5067.524	CL RD
776	78732.538	86143.947	54.227	158.858	5066.821	CL RD
775	78733.327	86087.175	56.777	215.635	5066.346	CL RD
774	78733.876	86027.653	59.525	275.160	5066.589	CL RD
773	78735.472	85964.698	62.975	338.135	5067.389	CL RD
772	78736.802	85899.427	65.285	403.419	5068.938	CL RD
771	78737.797	85835.387	64.048	467.467	5071.033	CL RD
770	78737.753	85773.198	62.189	529.656	5072.864	CL RD
769	78734.867	85711.858	61.408	591.064	5074.137	CL RD
768	78732.553	85656.960	54.947	646.011	5074.723	CL RD
767	78730.375	85595.840	61.159	707.170	5074.935	CL RD
		781	78753.043	86016.184	5062.467	INV PIPE SITE16
		780	78716.357	85997.081	5062.806	INV PIPE SITE16



GHTRIBAIC

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CURRENT DATE: 03-12-1999
CURRENT TIME: 14:55:06

FILE DATE: 03-12-1999
FILE NAME: GWCR10

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS / SHAPE / MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	5062.81	5062.47	41.00	1 CMPA	3.50	2.42	.025	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: GWCR10 DATE: 03-12-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
5062.81	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
5066.11	40.0	40.0	0.0	0.0	0.0	0.0	0.0	0.00	1
5066.74	80.0	46.2	0.0	0.0	0.0	0.0	0.0	33.24	8
5066.89	120.0	46.9	0.0	0.0	0.0	0.0	0.0	72.04	7
5067.00	160.0	47.3	0.0	0.0	0.0	0.0	0.0	111.38	6
5067.09	200.0	48.1	0.0	0.0	0.0	0.0	0.0	151.03	6
17	240.0	48.7	0.0	0.0	0.0	0.0	0.0	189.65	5
24	280.0	49.3	0.0	0.0	0.0	0.0	0.0	229.36	5
7.31	320.0	49.8	0.0	0.0	0.0	0.0	0.0	267.08	4
5067.37	360.0	50.4	0.0	0.0	0.0	0.0	0.0	306.85	4
5067.42	400.0	50.8	0.0	0.0	0.0	0.0	0.0	347.01	4
5066.35	42.5	42.5	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: GWCR10 DATE: 03-12-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
5062.81	0.000	0.00	0.00	0.00
5066.11	0.000	40.00	0.00	0.00
5066.74	-0.004	80.00	0.61	0.76
5066.89	-0.003	120.00	1.02	0.85
5067.00	-0.003	160.00	1.32	0.83
5067.09	-0.002	200.00	0.88	0.44
5067.17	-0.004	240.00	1.67	0.70
5067.24	-0.003	280.00	1.33	0.48
5067.31	-0.007	320.00	3.06	0.96
5067.37	-0.007	360.00	2.78	0.77
5067.42	-0.006	400.00	2.14	0.54

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

GHTRIBA10

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CURRENT DATE: 03-12-1999 FILE DATE: 03-12-1999
CU TIME: 14:55:06 FILE NAME: GWCR10

PERFORMANCE CURVE FOR CULVERT 1 - 1(3.50 (ft) BY 2.42 (ft)) CMPA

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	5062.81	0.00	-0.34	0-NF	0.00	0.00	0.00	-2.47	0.00	0.00
40.00	5066.11	3.31	3.30	2-M2c	2.42	1.67	1.67	-0.78	7.63	5.35
46.15	5066.73	3.91	3.93	2-M2c	2.42	1.80	1.80	-0.53	8.25	6.07
46.94	5066.88	4.00	4.07	7-M2c	2.42	1.82	1.82	-0.36	8.33	6.55
47.30	5067.00	4.03	4.19	2-M2c	2.42	1.82	1.82	-0.22	8.36	6.91
48.09	5067.10	4.12	4.29	2-M2c	2.42	1.84	1.84	-0.10	8.44	7.22
48.67	5067.17	4.19	4.36	2-M2c	2.42	1.85	1.85	0.00	8.49	7.49
49.30	5067.24	4.26	4.43	2-M2c	2.42	1.87	1.87	0.10	8.55	7.73
49.85	5067.30	4.32	4.50	2-M2c	2.42	1.88	1.88	0.18	8.60	7.94
50.37	5067.36	4.39	4.56	2-M2c	2.42	1.89	1.89	0.26	8.65	8.13
50.85	5067.42	4.44	4.61	2-M2c	2.42	1.90	1.90	0.33	8.69	8.31

El. inlet face invert 5062.81 ft El. outlet invert 5062.47 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	141.00 ft
INLET ELEVATION	5062.81 ft
'JTLET STATION	100.00 ft
JTLET ELEVATION	5062.47 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0083
CULVERT LENGTH ALONG SLOPE	41.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	PIPE ARCH
BARREL SPAN	3.50 ft
BARREL RISE	2.42 ft
BARREL MATERIAL	STEEL OR ALUMINUM
BARREL MANNING'S n	0.025
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	PROJECTING
INLET DEPRESSION	NONE

GHTRIBA10
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CURRENT DATE: 03-12-1999 FILE DATE: 03-12-1999
CU TIME: 14:55:06 FILE NAME: GWCR10

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION FILE NAME: GWCR10
MAIN CHANNEL AND LT & RT OVER BANKS FILE DATE: 03-12-1999

LEFT CHANNEL BOUNDARY	3
RIGHT CHANNEL BOUNDARY	5
MANNING n LEFT OVER BANK	0.035
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.035
SLOPE OF CHANNEL	0.0200 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	5080.00
2	550.00	5070.00
3	730.00	5061.00
4	731.00	5060.00
5	732.00	5061.00
6	912.00	5070.00
7	1612.00	5080.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	5060.00	0.000	-2.47	0.00	0.00
40.00	5061.69	0.865	-0.78	5.35	1.05
80.00	5061.94	0.892	-0.53	6.07	1.27
120.00	5062.11	0.909	-0.36	6.55	1.42
160.00	5062.25	0.922	-0.22	6.91	1.54
200.00	5062.37	0.932	-0.10	7.22	1.65
240.00	5062.47	0.940	0.00	7.49	1.74
280.00	5062.57	0.948	0.10	7.73	1.82
320.00	5062.65	0.954	0.18	7.94	1.90
360.00	5062.73	0.960	0.26	8.13	1.97
400.00	5062.80	0.965	0.33	8.31	2.03

Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE GRAVEL
EMBANKMENT TOP WIDTH 30.00 ft

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	5068.38
2	52.06	5068.30
3	104.63	5067.52
4	158.86	5066.82
5	215.64	5066.35
6	275.16	5066.59
7	338.14	5067.39
8	403.42	5068.94
9	467.47	5071.03
10	529.66	5072.86
11	591.06	5074.72

GH TRIBA10

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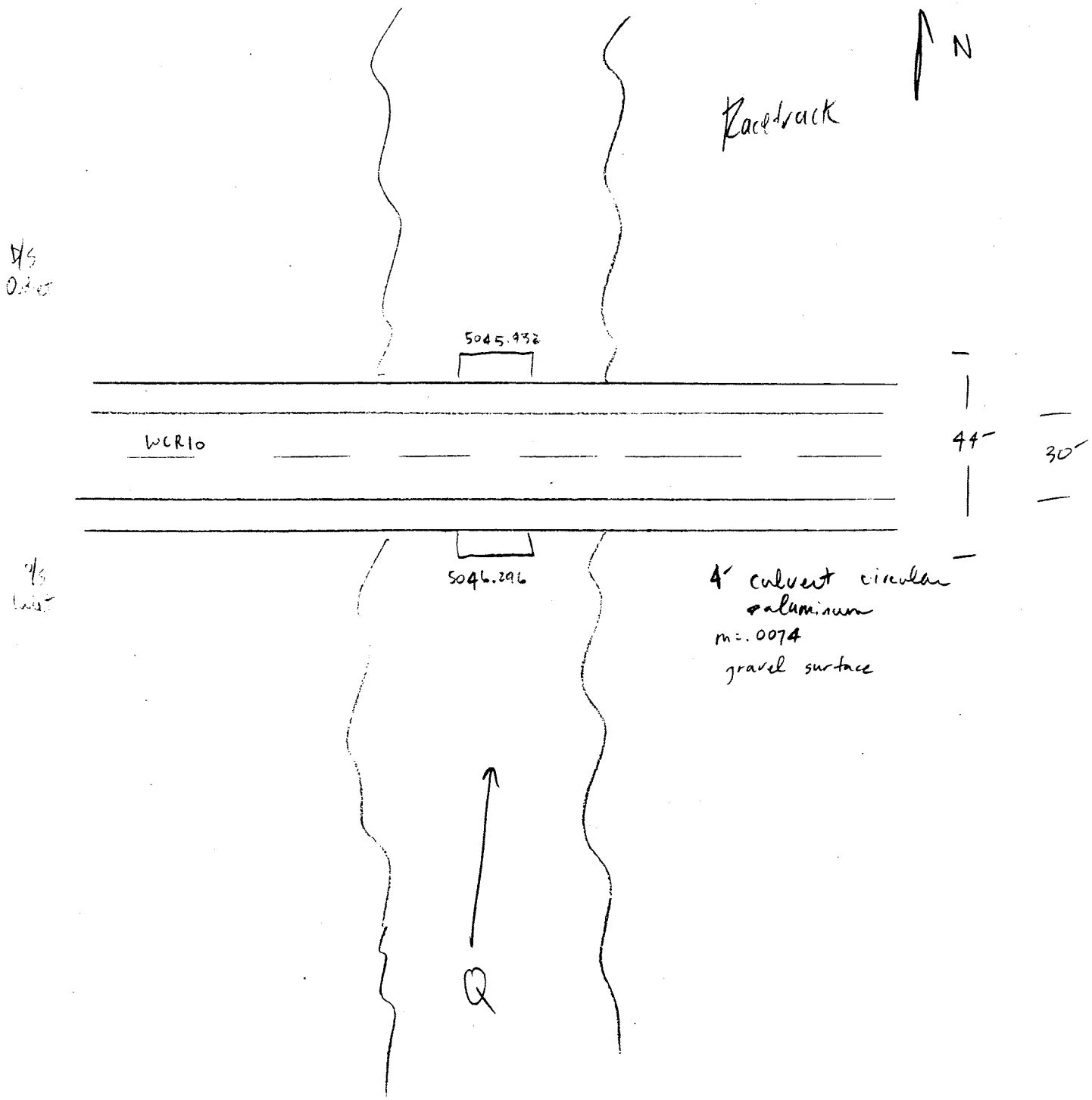
12	646.01	5074.72
13	707.17	5074.94

QEOT = 10cfs GH10

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number COWED 01	Page 1 Of 6
Owner-Project	By DCS	Date 3-12-99
* Check invert elevations (assumed crown elev, subtracted 4' from D/S) GODDING HOLLOW BASIN WCR10 B (26)	Checked By CJP	Date 04/13/99



Weld County I-25 Master Drainage Plan
Sub-basin information used for CUHP hydrologic model
Project number: CO-WELD-01

Godding Hollow Basin - Future conditions

Sub-basin No.	Sub-basin Area (acres)	Sub-basin Area (mi^2)	Sub-basin Length (ft)	Sub-basin Length (miles)	Distance to Centroid (ft)	Distance to Centroid (miles)	Sub-basin % Impervious	Weighted Basin Slope (ft/ft)	Depression storage: Perv. retention (in)	Depression storage: Imp. retention (in)	Soil Type	Soil Type Area (acres)	Soil Type Area (%)	Infiltration rates: Weighted Initial Rate (in/hr)	Infiltration rates: Initial rate used for sub-basin (in/hr)	Infiltration rates: Weighted Final Rate (in/hr)	Infiltration rates: Final rate used for sub-basin (in/hr)	Decay coefficient
23	418.5	0.654	6300	1.193	3000	0.568	36.4	0.0115	0.4	0.1	B	20.6	4.92	0.2	3.1	0.0	0.5	0.0018
											C	397.9	95.08	2.9		0.5		
											Total:	418.5	100.0	3.1		0.5		
24	376.9	0.589	6000	1.136	2300	0.436	37.0	0.0154	0.4	0.1	C	376.9	100.00	3.0	3.0	0.5	0.5	0.0018
											Total:	376.9	100.0	3.0		0.5		
25	83.2	0.130	3300	0.625	800	0.152	32.3	0.0140	0.4	0.1	B	15.9	19.11	0.9	3.3	0.1	0.5	0.0018
											C	67.3	80.89	2.4		0.4		
											Total:	83.2	100.0	3.3		0.5		
26	38.6	0.060	3600	0.682	1100	0.208	73.4	0.0169	0.4	0.1	B	8.8	22.80	1.0	3.3	0.1	0.5	0.0018
											C	29.8	77.20	2.3		0.4		
											Total:	38.6	100.0	3.3		0.5		
27	407.7	0.637	7800	1.477	2800	0.530	22.1	0.0189	0.4	0.1	A	2.0	0.49	0.0	3.2	0.0	0.5	0.0018
											B	39.1	9.59	0.4		0.1		
											C	366.6	89.92	2.7		0.4		
											Total:	407.7	100.0	3.2		0.5		
30	437.5	0.684	8300	1.572	4300	0.814	76.2	0.0142	0.4	0.1	B	4.5	1.03	0.0	3.0	0.0	0.5	0.0018
											C	433.0	98.97	3.0		0.5		
											Total:	437.5	100.0	3.0		0.5		
31	215.4	0.337	6900	1.307	1600	0.303	68.1	0.0126	0.4	0.1	B	46.6	21.63	1.0	3.3	0.1	0.5	0.0018
											C	168.8	78.37	2.4		0.4		
											Total:	215.4	100.0	3.3		0.5		
32	599.3	0.936	9600	1.818	4000	0.758	22.1	0.0148	0.4	0.1	B	105.6	17.62	0.8	3.3	0.1	0.5	0.0018
											C	493.7	82.38	2.5		0.4		
											Total:	599.3	100.0	3.3		0.5		
33	210.9	0.330	6200	1.174	2400	0.455	15.8	0.0079	0.4	0.1	A	7.6	3.60	0.2	3.1	0.0	0.5	0.0018
											B	10.4	4.93	0.2		0.0		
											C	192.9	91.47	2.7		0.5		
											Total:	210.9	100.0	3.1		0.5		
34	208.7	0.326	7800	1.477	3900	0.739	82.4	0.0186	0.4	0.1	B	21.7	10.40	0.5	3.2	0.1	0.5	0.0018
											C	187.0	89.60	2.7		0.4		
											Total:	208.7	100.0	3.2		0.5		
35	95.7	0.150	4500	0.852	1600	0.303	73.6	0.0142	0.4	0.1	C	95.7	100.00	3.0	3.0	0.5	0.5	0.0018
											Total:	95.7	100.0	3.0		0.5		
36	348.6	0.545	7100	1.345	1900	0.360	61.8	0.0140	0.4	0.1	B	16.3	4.68	0.2	3.1	0.0	0.5	0.0018
											C	332.3	95.32	2.9		0.5		
											Total:	348.6	100.0	3.1		0.5		
37	541.0	0.845	7400	1.402	2500	0.473	69.6	0.0260	0.4	0.1	A	8.8	1.63	0.1	3.3	0.0	0.5	0.0018
											B	92.9	17.17	0.8		0.1		
											C	439.3	81.20	2.4		0.4		
											Total:	541.0	100.0	3.3		0.5		
40	225.6	0.353	5300	1.004	2300	0.436	65.6	0.0116	0.4	0.1	B	71.8	31.83	1.4	3.5	0.2	0.5	0.0018
											C	153.8	68.17	2.0		0.3		
											Total:	225.6	100.0	3.5		0.5		
41	342.8	0.536	6200	1.174	2300	0.436	48.0	0.0113	0.4	0.1	B	153.2	44.69	2.0	3.7	0.3	0.5	0.0018
											C	189.6	55.31	1.7		0.3		
											Total:	342.8	100.0	3.7		0.5		
42	122.5	0.191	2800	0.530	1400	0.265	79.4	0.0080	0.4	0.1	B	101.4	82.78	3.7	4.2	0.5	0.6	0.0018
											C	21.1	17.22	0.5		0.1		
											Total:	122.5	100.0	4.2		0.6		
43	156.5	0.245	5300	1.004	2600	0.492	75.4	0.0035	0.4	0.1	B	17.7	11.31	0.5	3.2	0.1	0.5	0.0018
											C	109.8	70.16	2.1		0.4		
											D	29.0	18.53	0.6		0.1		
											Total:	156.5	100.0	3.2		0.5		
Total:	12408.7	19.389																

Weld County I-25 Master Drainage Plan
Sub-basin information used for CUHP hydrologic model
Project number: CO-WELD-01

Godding Hollow Basin - Future conditions

Sub-basin No.	Sub-basin Area (acres)	Sub-basin Area (mi^2)	Sub-basin Length (ft)	Sub-basin Length (miles)	Distance to Centroid (ft)	Distance to Centroid (miles)	Sub-basin % Impervious	Weighted Basin Slope (ft/ft)	Depression storage: Perv. retention (in)	Depression storage: Imp. retention (in)	Soil Type	Soil Type Area (acres)	Soil Type Area (%)	Infiltration rates: Weighted Initial Rate (in/hr)	Infiltration rates: Initial rate used for sub-basin (in/hr)	Infiltration rates: Weighted Final Rate (in/hr)	Infiltration rates: Final rate used for sub-basin (in/hr)	Decay coefficient
1	779.3	1.218	6300	1.193	1800	0.341	39.7	0.0043	0.4	0.1	B	9.9	1.27	0.1	3.0	0.0	0.5	0.0018
											C	69.9	8.97	0.3		0.0		
											D	699.5	89.76	2.7		0.4		
											Total:	779.3	100.0	3.0		0.5		
2	284.2	0.444	7300	1.383	3800	0.720	65.1	0.0029	0.4	0.1	B	17.3	6.09	0.3	3.1	0.0	0.5	0.0018
											C	161.9	56.97	1.7		0.3		
											D	105.0	36.95	1.1		0.2		
											Total:	284.2	100.0	3.1		0.5		
3	687.9	1.075	10000	1.894	3800	0.720	63.4	0.0065	0.4	0.1	A	22.9	3.33	0.2	3.8	0.0	0.6	0.0018
											B	334.9	48.68	2.2		0.3		
											C	151.3	21.99	0.7		0.1		
											D	178.8	25.99	0.8		0.1		
											Total:	687.9	100.0	3.8		0.6		
4	772.4	1.207	9000	1.705	3300	0.625	55.5	0.0080	0.4	0.1	B	668.9	86.60	3.9	4.3	0.5	0.6	0.0018
											C	103.5	13.40	0.4		0.1		
											Total:	772.4	100.0	4.3		0.6		
5	836.8	1.308	9400	1.780	3300	0.625	41.2	0.0074	0.4	0.1	B	533.5	63.75	2.9	4.0	0.4	0.6	0.0018
											C	288.9	34.52	1.0		0.2		
											D	14.4	1.72	0.1		0.0		
											Total:	836.8	100.0	4.0		0.6		
6	886.5	1.385	9600	1.818	3000	0.568	51.0	0.0069	0.4	0.1	B	684.5	77.21	3.5	4.2	0.5	0.6	0.0018
											C	202.0	22.79	0.7		0.1		
											Total:	886.5	100.0	4.2		0.6		
7	946.2	1.478	10700	2.027	3000	0.568	43.5	0.0071	0.4	0.1	B	516.5	54.59	2.5	3.8	0.3	0.6	0.0018
											C	429.7	45.41	1.4		0.2		
											Total:	946.2	100.0	3.8		0.6		
8	265.5	0.415	6800	1.288	1800	0.341	64.0	0.0102	0.4	0.1	B	84.9	31.98	1.4	3.5	0.2	0.5	0.0018
											C	180.6	68.02	2.0		0.3		
											Total:	265.5	100.0	3.5		0.5		
9	185.4	0.290	6200	1.174	1400	0.265	68.0	0.0114	0.4	0.1	B	33.8	18.23	0.8	3.3	0.1	0.5	0.0018
											C	151.6	81.77	2.5		0.4		
											Total:	185.4	100.0	3.3		0.5		
10	142.5	0.223	3700	0.701	800	0.152	72.8	0.0181	0.4	0.1	B	43.9	30.81	1.4	3.5	0.2	0.5	0.0018
											C	98.6	69.19	2.1		0.3		
											Total:	142.5	100.0	3.5		0.5		
11	117.3	0.183	3800	0.720	900	0.170	60.1	0.0123	0.4	0.1	B	0.8	0.68	0.0	3.0	0.0	0.5	0.0018
											C	116.5	99.32	3.0		0.5		
											Total:	117.3	100.0	3.0		0.5		
12	65.1	0.102	3700	0.701	1400	0.265	42.8	0.0125	0.4	0.1	C	65.1	100.00	3.0	3.0	0.5	0.5	0.0018
											Total:	65.1	100.0	3.0		0.5		
13	193.2	0.302	4700	0.890	1800	0.341	78.1	0.0186	0.4	0.1	C	193.2	100.00	3.0	3.0	0.5	0.5	0.0018
											Total:	193.2	100.0	3.0		0.5		
14	154.1	0.241	4600	0.871	1900	0.360	75.0	0.0188	0.4	0.1	C	154.1	100.00	3.0	3.0	0.5	0.5	0.0018
											Total:	154.1	100.0	3.0		0.5		
15	61.3	0.096	2250	0.426	700	0.133	81.2	0.0133	0.4	0.1	C	61.3	100.00	3.0	3.0	0.5	0.5	0.0018
											Total:	61.3	100.0	3.0		0.5		
16	131.1	0.205	3700	0.701	1600	0.303	71.0	0.0146	0.4	0.1	C	131.1	100.00	3.0	3.0	0.5	0.5	0.0018
											Total:	131.1	100.0	3.0		0.5		
17	223.1	0.349	4400	0.833	1500	0.284	84.5	0.0255	0.4	0.1	B	13.7	6.14	0.3	3.1	0.0	0.5	0.0018
											C	209.4	93.86	2.8		0.5		
											Total:	223.1	100.0	3.1		0.5		
20	154.4	0.241	4400	0.833	1800	0.341	67.5	0.0119	0.4	0.1	B	4.6	2.98	0.1	3.0	0.0	0.5	0.0018
											C	149.8	97.02	2.9		0.5		
											Total:	154.4	100.0	3.0		0.5		
21	372.0	0.581	6700	1.269	3000	0.568	60.3	0.0086	0.4	0.1	B	191.0	51.34	2.3	3.8	0.3	0.6	0.0018
											C	181.0	48.66	1.5		0.2		
											Total:	372.0	100.0	3.8		0.6		
22	321.0	0.502	5900	1.117	2700	0.511	70.0	0.0151	0.4	0.1	B	60.4	18.82	0.8	3.3	0.1	0.5	0.0018
											C	260.6	81.18	2.4		0.4		
											Total:	321.0	100.0	3.3		0.5		

Future Conditions Land Use - Godding Hollow Basin

Basin ID	Parks/Open Space	SFR (very low)	SFR (low)	SFR (medium)	SFR (high)	Commercial	Total basin area
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
1	485.7			9.3		284.3	779.3
2				176.7		107.5	284.2
3	64.3			329.7		293.9	687.9
4	185.1			282.3	28.1	276.9	772.4
5	334.3			352.3		150.2	836.8
6	272.4			319.5		294.6	886.4
7	406.2			287.6		252.3	946.2
8	86.4					179.1	265.5
9	51.0					134.4	185.4
10	30.7					111.8	142.5
11	43.8					73.5	117.3
12	38.4					26.7	65.1
13	26.8			4.0		162.4	193.2
14	17.6			22.7		113.9	154.1
15	6.8					54.5	61.3
16	31.1					100.0	131.1
17	15.2					207.8	223.1
20	43.4					111.0	154.4
21	52.8		136.6			182.6	372.0
22	56.1		38.7			226.2	321.0
23	49.9		368.6				418.5
24	37.5		339.5				376.9
25	21.3		61.9				83.2
26	8.0					30.6	38.6
27	265.2		129.5			13.0	407.7
30	75.5					362.0	437.5
31	58.9					156.5	215.4
32	299.6	239.2				60.5	599.3
33	88.6	122.4					210.9
34	19.9					188.8	208.7
35	19.6					76.1	95.7
36	123.0					225.6	348.6
37	137.7					403.4	541.0
40	13.9		87.7			123.9	225.6
41	118.1	70.9				153.8	342.8
42	16.2					106.4	122.5
43	28.2			0.7		127.7	156.5

SFR = single family residence; the description indicates density of homes per acre

	Runoff coefficients (C values)						
	2 year	5 year	10 year	25 year*	50 year*	100 year	% impervious
Commercial Areas	0.87	0.87	0.88	0.88	0.89	0.89	90
SFR (low, medium)	0.40	0.45	0.50	0.52	0.54	0.60	40
SFR (very low)	0.30	0.35	0.40	0.43	0.49	0.60	20
Apartments (high)	0.65	0.70	0.70	0.72	0.74	0.80	70
Parks/Open Space (sandy soil)	0.00	0.01	0.05	0.08	0.12	0.20	10
Parks/Open Space (clayey soil)	0.05	0.15	0.25	0.29	0.36	0.50	10

50

Existing conditions - Godding Hollow Basin
Time of concentration calculations (for basins less than 90 acres only)

Sub-basin No.	Description	Runoff coefficients (C values)						Overland flow length (ft)	Overland flow length slope (%)	Initial or overland flow time (T_i), min						Water course slope (%)	Velocity (fps)	Water course length (ft)	Travel time (T_t), min						Time of concentration (T_c), min						
		2 year	5 year	10 year	25 year*	50 year*	100 year			2 year	5 year	10 year	25 year	50 year	100 year				2 year	5 year	10 year	25 year	50 year	100 year	2 year	5 year	10 year	25 year	50 year	100 year	
12	100% clay soils	0.05	0.15	0.25	0.29	0.36	0.50	500	1.82	34.61	31.32	28.02	26.70	24.39	19.78	1.04	0.7 short grass or pasture	2300	54.76	54.76	54.76	54.76	54.76	54.76	89.38	86.08	82.78	81.46	79.16	74.54	non-urban procedure
15	16.6% SFR (very low), 83.4% clayey soils	0.09	0.18	0.27	0.31	0.38	0.52	500	0.50	51.14	46.49	41.84	39.89	36.43	29.58	1.33	0.5 fallow	1950	65.00	65.00	65.00	65.00	65.00	65.00	116.14	111.49	106.84	104.89	101.43	94.58	non-urban procedure
25	24.1% SFR (very low), 75.9% clayey soils	0.11	0.20	0.29	0.32	0.39	0.52	500	1.38	35.75	32.58	29.41	28.05	25.61	20.81	1.43	1.2 nearly bare ground	1400	19.44	19.44	19.44	19.44	19.44	19.44	55.20	52.02	48.85	47.49	45.05	40.25	non-urban procedure
26	16.4% SFR (very low), 83.6% clayey soils	0.09	0.18	0.27	0.31	0.38	0.52	400	1.00	36.33	33.02	29.72	28.34	25.88	21.01	1.70	1.9 grassed waterway	3300	28.95	28.95	28.95	28.95	28.95	28.95	65.28	61.97	58.67	57.28	54.82	49.96	non-urban procedure

* Values linearly interpolated from Table 3-1, USDCM

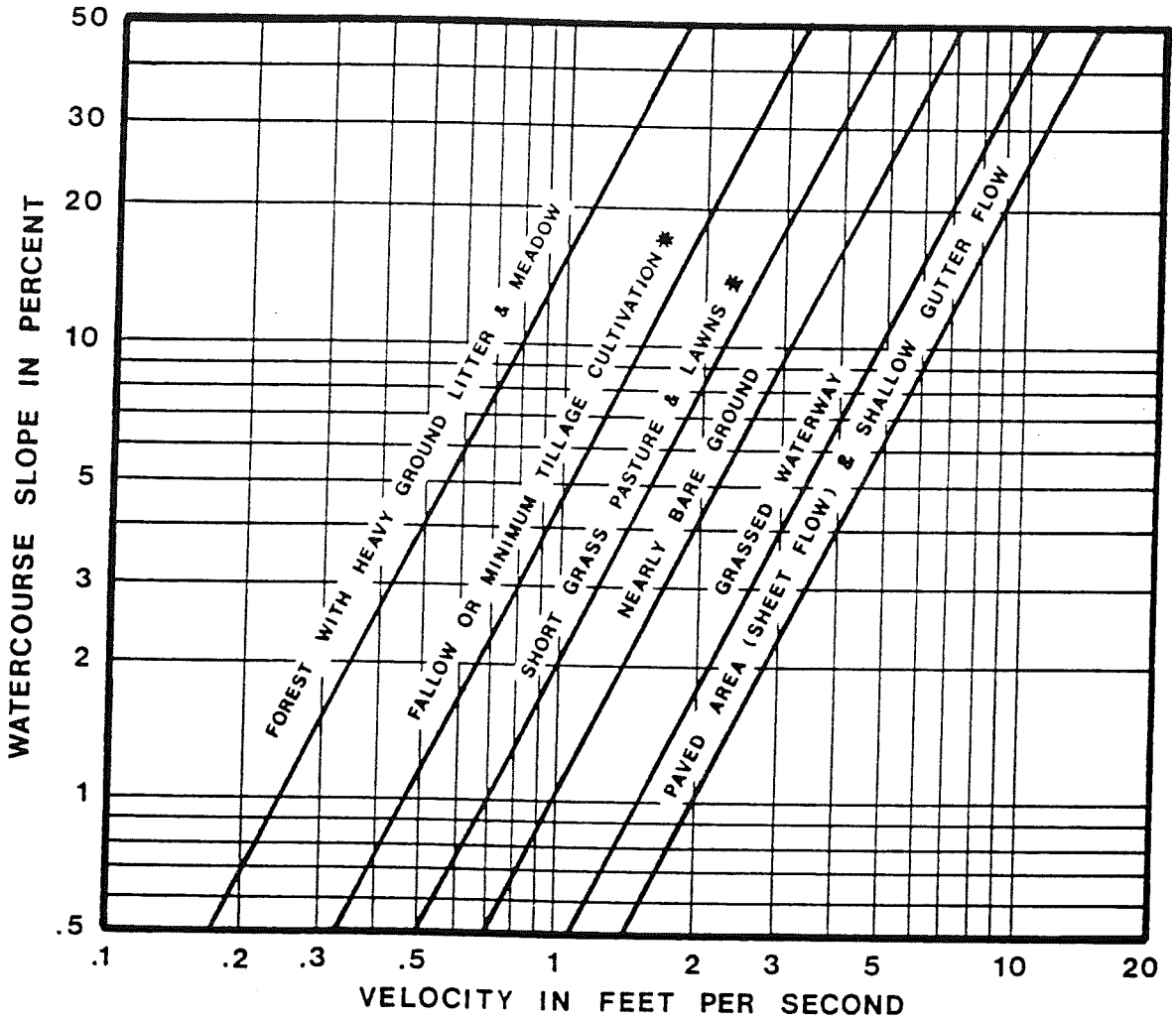


FIGURE 3-2. ESTIMATE OF AVERAGE FLOW VELOCITY FOR USE WITH THE RATIONAL FORMULA.

* MOST FREQUENTLY OCCURRING "UNDEVELOPED" LAND SURFACES IN THE DENVER REGION.

REFERENCE: "Urban Hydrology For Small Watersheds" Technical Release No. 55, USDA, SCS Jan. 1975.

Weld County I-25 Master Drainage Plan
Sub-basin information used for CUHP hydrologic model
Project number: CO-WELD-01

Godding Hollow Basin - Existing conditions

Sub-basin No.	Sub-basin Area (acres)	Sub-basin Area (mi^2)	Sub-basin Length (ft)	Sub-basin Length (miles)	Distance to Centroid (ft)	Distance to Centroid (miles)	Sub-basin % Impervious	Weighted Basin Slope (ft/ft)	Depression storage Perv. retention (in)	Depression storage Imp. retention (in)	Soil Type	Soil Type Area (acres)	Soil Type Area (%)	Infiltration rates Weighted Initial Rate (in/hr)	Infiltration rates Initial rate used for sub-basin (in/hr)	Infiltration rates Weighted Final Rate (in/hr)	Infiltration rates Final rate used for sub-basin (in/hr)	Decay coefficient
23	418.5	0.654	6000	1.136	3000	0.568	10.5	0.0115	0.4	0.1	B	20.6	4.92	0.2	3.1	0.0	0.5	0.0018
											C	397.9	95.08	2.9		0.5		
											Total:	418.5	100.0	3.1		0.5		
24	376.9	0.589	5700	1.080	2300	0.436	11.4	0.0154	0.4	0.1	C	376.9	100.00	3.0	3.0	0.5	0.5	0.0018
											Total:	376.9	100.0	3.0		0.5		
25	83.2	0.130	3000	0.568	800	0.152	12.4	0.0140	0.4	0.1	B	15.9	19.11	0.9	3.3	0.1	0.5	0.0018
											C	67.3	80.89	2.4		0.4		
											Total:	83.2	100.0	3.3		0.5		
26	38.6	0.060	3300	0.625	1100	0.208	11.6	0.0169	0.4	0.1	B	8.8	22.80	1.0	3.3	0.1	0.5	0.0018
											C	29.8	77.20	2.3		0.4		
											Total:	38.6	100.0	3.3		0.5		
27	407.7	0.637	7500	1.420	2800	0.530	11.7	0.0189	0.4	0.1	A	2.0	0.49	0.0	3.2	0.0	0.5	0.0018
											B	39.1	9.59	0.4		0.1		
											C	366.6	89.92	2.7		0.4		
											Total:	407.7	100.0	3.2		0.5		
30	437.5	0.684	8000	1.515	4300	0.814	12.4	0.0142	0.4	0.1	B	4.5	1.03	0.0	3.0	0.0	0.5	0.0018
											C	433.0	98.97	3.0		0.5		
											Total:	437.5	100.0	3.0		0.5		
31	215.4	0.337	6600	1.250	1600	0.303	10.0	0.0126	0.4	0.1	B	46.6	21.63	1.0	3.3	0.1	0.5	0.0018
											C	168.8	78.37	2.4		0.4		
											Total:	215.4	100.0	3.3		0.5		
32	599.3	0.936	9300	1.761	4000	0.758	18.4	0.0148	0.4	0.1	B	105.6	17.62	0.8	3.3	0.1	0.5	0.0018
											C	493.7	82.38	2.5		0.4		
											Total:	599.3	100.0	3.3		0.5		
33	210.9	0.330	5900	1.117	2400	0.455	10.4	0.0079	0.4	0.1	A	7.6	3.60	0.2	3.1	0.0	0.5	0.0018
											B	10.4	4.93	0.2		0.0		
											C	192.9	91.47	2.7		0.5		
											Total:	210.9	100.0	3.1		0.5		
34	208.7	0.326	7500	1.420	3900	0.739	14.1	0.0186	0.4	0.1	B	21.7	10.40	0.5	3.2	0.1	0.5	0.0018
											C	187.0	89.60	2.7		0.4		
											Total:	208.7	100.0	3.2		0.5		
35	95.7	0.150	4200	0.795	1600	0.303	55.2	0.0142	0.4	0.1	C	95.7	100.00	3.0	3.0	0.5	0.5	0.0018
											Total:	95.7	100.0	3.0		0.5		
36	348.6	0.545	6800	1.288	1900	0.360	10.0	0.0140	0.4	0.1	B	16.3	4.68	0.2	3.1	0.0	0.5	0.0018
											C	332.3	95.32	2.9		0.5		
											Total:	348.6	100.0	3.1		0.5		
37	541.0	0.845	7100	1.345	2500	0.473	19.7	0.0260	0.4	0.1	A	8.8	1.63	0.1	3.3	0.0	0.5	0.0018
											B	92.9	17.17	0.8		0.1		
											C	439.3	81.20	2.4		0.4		
											Total:	541.0	100.0	3.3		0.5		
40	225.6	0.353	5000	0.947	2300	0.436	14.6	0.0116	0.4	0.1	B	71.8	31.83	1.4	3.5	0.2	0.5	0.0018
											C	153.8	68.17	2.0		0.3		
											Total:	225.6	100.0	3.5		0.5		
41	342.8	0.536	5900	1.117	2300	0.436	10.3	0.0113	0.4	0.1	B	153.2	44.69	2.0	3.7	0.3	0.5	0.0018
											C	189.6	55.31	1.7		0.3		
											Total:	342.8	100.0	3.7		0.5		
42	122.5	0.191	2500	0.473	1400	0.265	54.4	0.0080	0.4	0.1	B	101.4	82.78	3.7	4.2	0.5	0.6	0.0018
											C	21.1	17.22	0.5		0.1		
											Total:	122.5	100.0	4.2		0.6		
43	156.5	0.245	5000	0.947	2600	0.492	10.0	0.0035	0.4	0.1	B	17.7	11.31	0.5	3.2	0.1	0.5	0.0018
											C	109.8	70.16	2.1		0.4		
											D	29.0	18.53	0.6		0.1		
											Total:	156.5	100.0	3.2		0.5		
Total:	12408.7	19.389																

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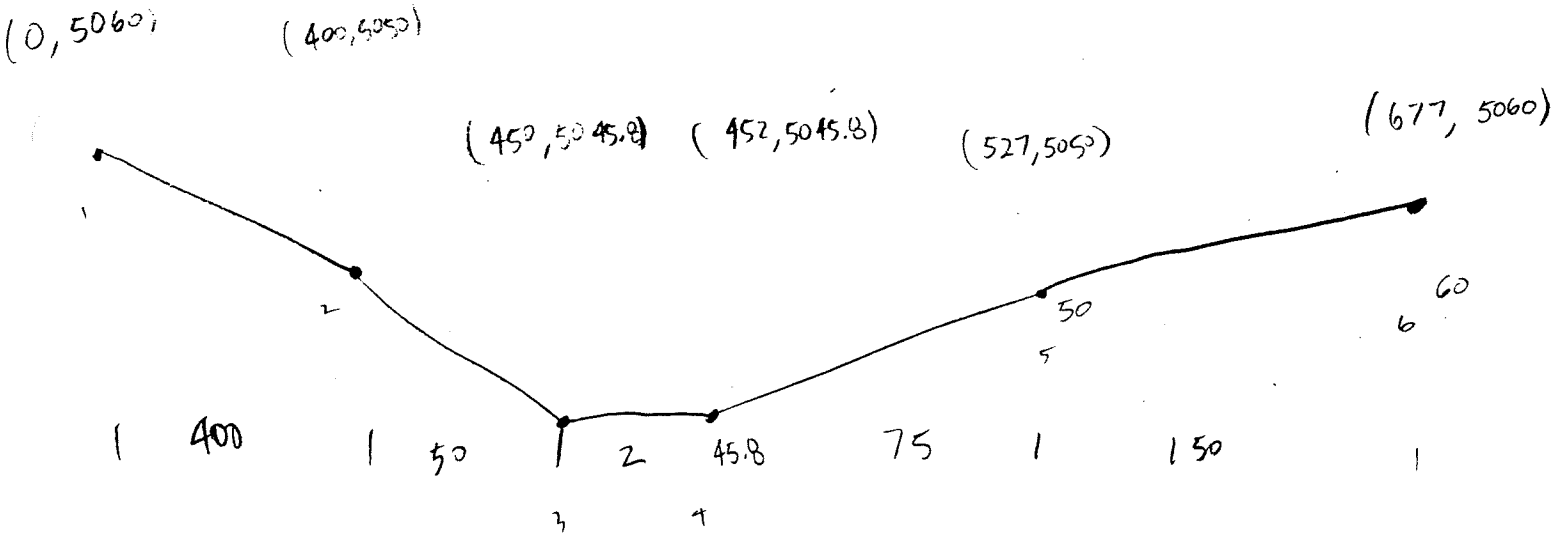
GWCR10B

	x	y	distance	station	elevation	
818	78741.558	88684.114		0.000	5056.658	CL RD SITE26
817	78743.393	88629.985	54.160	54.160	5054.757	CL RD SITE26
816	78744.087	88559.780	70.208	124.369	5052.489	CL RD SITE26
815	78744.656	88507.568	52.215	176.584	5051.277	CL RD SITE26
814	78745.006	88454.754	52.815	229.399	5050.631	CL RD SITE26
813	78744.844	88399.730	55.024	284.423	5051.113	CL RD SITE26
812	78744.203	88344.310	55.424	339.847	5052.644	CL RD SITE26
811	78743.185	88290.293	54.027	393.873	5054.549	CL RD SITE26
810	78742.746	88238.963	51.332	445.205	5055.631	CL RD SITE26
809	78742.638	88167.678	71.285	516.490	5056.878	CL RD SITE26
808	78742.210	88103.836	63.843	580.334	5057.744	CL RD SITE26
807	78740.754	88049.820	54.036	634.369	5058.256	CL RD SITE26
806	78738.653	87993.130	56.729	691.098	5058.566	CL RD SITE26
822	78771.224	88462.506			5049.932	INV MID SITE26
819	78727.549	88457.327			5046.296	INV S SITE26

D/S ? CROWN CULVERT

44' Long CMP



GH10

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CURRENT DATE: 03-12-1999
CURRENT TIME: 16:16:17

FILE DATE: 03-12-1999
FILE NAME: GWCR10B

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	5046.30	5045.93	44.00	1 CSP	4.00	4.00	.031	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: GWCR10B DATE: 03-12-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
5046.30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
5049.44	40.0	40.0	0.0	0.0	0.0	0.0	0.0	0.00	1
5050.90	80.0	72.6	0.0	0.0	0.0	0.0	0.0	6.77	12
5051.17	120.0	78.6	0.0	0.0	0.0	0.0	0.0	40.23	7
5051.33	160.0	81.6	0.0	0.0	0.0	0.0	0.0	77.63	6
5051.44	200.0	84.6	0.0	0.0	0.0	0.0	0.0	114.59	5
5054	240.0	86.1	0.0	0.0	0.0	0.0	0.0	151.62	4
5053	280.0	87.5	0.0	0.0	0.0	0.0	0.0	190.50	4
5051.71	320.0	89.4	0.0	0.0	0.0	0.0	0.0	228.95	4
5051.79	360.0	92.3	0.0	0.0	0.0	0.0	0.0	266.30	4
5051.86	400.0	93.4	0.0	0.0	0.0	0.0	0.0	305.06	4
5050.63	66.6	66.6	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: GWCR10B DATE: 03-12-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
5046.30	0.000	0.00	0.00	0.00
5049.44	0.000	40.00	0.00	0.00
5050.90	-0.004	80.00	0.66	0.83
5051.17	-0.006	120.00	1.16	0.97
5051.33	-0.003	160.00	0.76	0.47
5051.44	-0.004	200.00	0.78	0.39
5051.54	-0.010	240.00	2.33	0.97
5051.63	-0.008	280.00	2.01	0.72
5051.71	-0.007	320.00	1.66	0.52
5051.79	-0.005	360.00	1.40	0.39
5051.86	-0.005	400.00	1.49	0.37

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

GH10

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CURRENT DATE: 03-12-1999 FILE DATE: 03-12-1999
CUR TIME: 16:16:17 FILE NAME: GWCR10B

PERFORMANCE CURVE FOR CULVERT 1 - 1(4.00 (ft) BY 4.00 (ft)) CSP

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	5046.30	0.00	-0.36	0-NF	0.00	0.00	0.00	-0.13	0.00	0.00
40.00	5049.44	2.91	3.14	2-M2c	2.53	1.88	1.88	0.88	6.89	2.40
72.57	5050.90	4.41	4.60	2-M2c	4.00	2.57	2.57	1.19	8.53	2.85
78.61	5051.17	4.71	4.88	2-M2c	4.00	2.68	2.68	1.41	8.80	3.15
81.61	5051.32	4.87	5.02	2-M2c	4.00	2.73	2.73	1.59	8.93	3.38
84.62	5051.44	5.04	5.14	2-M2c	4.00	2.79	2.79	1.74	9.06	3.58
86.05	5051.56	5.12	5.26	2-M2c	4.00	2.81	2.81	1.88	9.12	3.75
87.49	5051.63	5.20	5.34	2-M2c	4.00	2.83	2.83	2.01	9.19	3.89
89.39	5051.70	5.31	5.41	2-M2c	4.00	2.86	2.86	2.12	9.31	4.02
92.30	5051.78	5.48	5.47	2-M2c	4.00	2.90	2.90	2.22	9.46	4.14
93.45	5051.85	5.55	5.54	2-M2c	4.00	2.92	2.92	2.32	9.52	4.25

El. inlet face invert 5046.30 ft El. outlet invert 5045.93 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	144.00 ft
INLET ELEVATION	5046.30 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	5045.93 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0083
CULVERT LENGTH ALONG SLOPE	44.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	4.00 ft
BARREL MATERIAL	CORRUGATED ALUMINUM
BARREL MANNING'S n	0.031
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	THIN EDGE PROJECTING
INLET DEPRESSION	NONE

GH10

5/6

CURRENT DATE: 03-12-1999 FILE DATE: 03-12-1999
CUF TIME: 16:16:17 FILE NAME: GWCR10B

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION FILE NAME: GWCR10B
MAIN CHANNEL ONLY FILE DATE: 03-12-1999

LEFT CHANNEL BOUNDARY	0
RIGHT CHANNEL BOUNDARY	0
MANNING n LEFT OVER BANK	0.000
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.000
SLOPE OF CHANNEL	0.0074 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	5060.00
2	400.00	5050.00
3	450.00	5045.80
4	452.00	5045.80
5	527.00	5050.00
6	677.00	5060.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	5045.80	0.000	-0.13	0.00	0.00
40.00	5046.81	0.579	0.88	2.40	0.25
80.00	5047.12	0.604	1.19	2.85	0.32
120.00	5047.34	0.619	1.41	3.15	0.37
160.00	5047.52	0.631	1.59	3.38	0.41
200.00	5047.68	0.640	1.74	3.58	0.45
240.00	5047.82	0.647	1.88	3.75	0.48
280.00	5047.94	0.653	2.01	3.89	0.51
320.00	5048.05	0.659	2.12	4.02	0.53
360.00	5048.15	0.663	2.22	4.14	0.56
400.00	5048.25	0.668	2.32	4.25	0.58

Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	GRAVEL
EMBANKMENT TOP WIDTH	30.00 ft

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	5056.66
2	54.16	5054.76
3	124.37	5052.49
4	176.58	5051.28
5	229.40	5050.63
6	284.42	5051.11
7	339.85	5052.64
8	393.87	5054.55
9	445.20	5055.63
10	516.49	5056.88
11	580.33	5057.74
12	634.37	5058.26

GH10

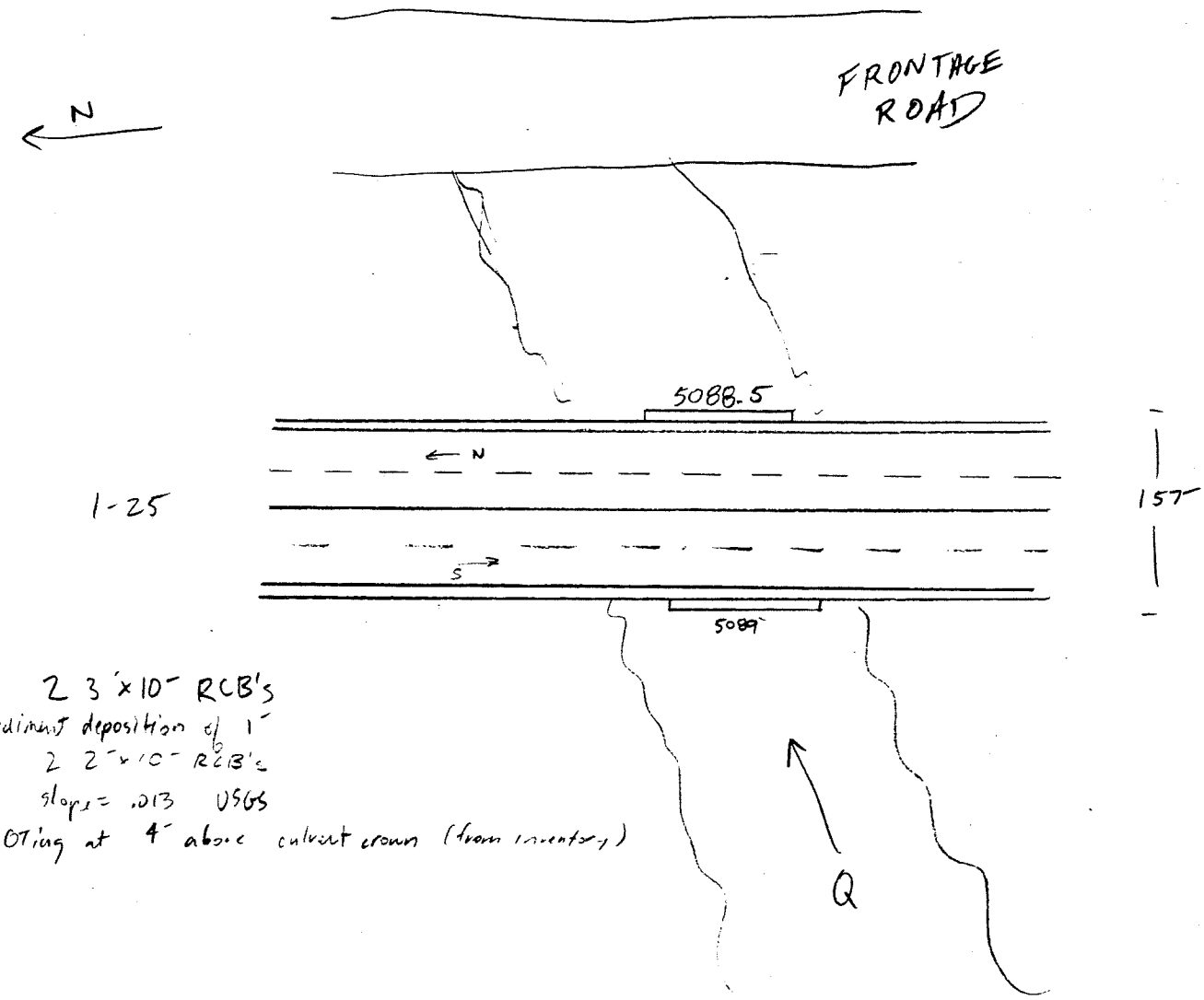
6/6

13	691.10	5058.57

QOT – 1 SUCTS GHI25

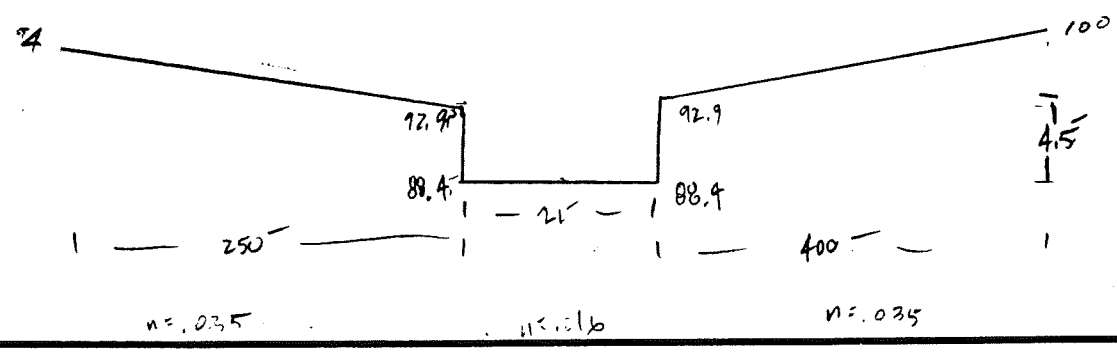
ANDERSON CONSULTING ENGINEERS, INC Civil • Water Resources • Environmental	Project Number COWELD01	Page 1 Of 7
Owner-Project WELD COUNTY 1-25 MDP	By DCS	Date 4/9/99
...t GODDING HOLLOW BASIN 2 RCB's along 1-25, N of WCR8	Checked By CJP	Date 04/13/99

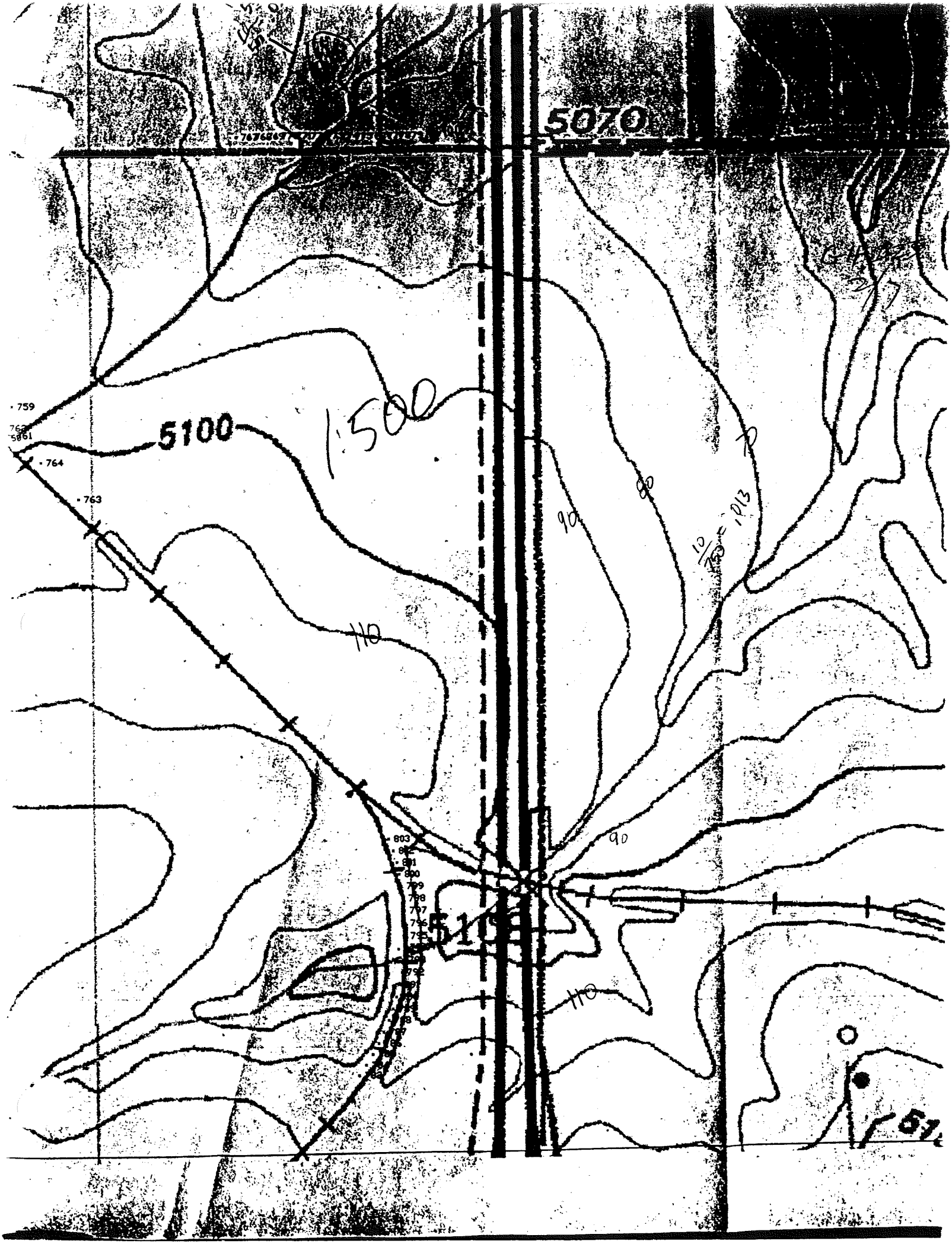
FILE: GWCR8 RCB



2 3'x10' RCB's
Sediment deposition of 1'
2 2'x10' RCB's
slope = .013 USGS
OTing at 4' above culvert crown (from inventory)

D/S X-Section (30 ft. D/S)




5070
5100
1:500
759
764
763
803
90
80
70
110
90
110

FEDERAL ROAD REGION NO	DIVISION	PROJECT NO	SHE
VIII	COLORADO	EHS I 25-3(48)229	

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS—STATE OF COLORADO

AS CONSTRUCTED
REVISED DATE 18 JUN 73

PLAN AND PROFILE OF PROPOSED

FEDERAL AID PROJECT NO. EHS-I 25-3(48)229

STATE HIGHWAY NO. 25

WELD COUNTY

CONVENTIONAL SIGNS

CENTER LINE (PLAN SHEET)
COUNTY LINE
TOWNSHIP OR RANGE LINE
LAND LINES — SECTION LINE, ¼ SECTION LINE, ⅛ SECTION LINE
CITY LIMITS
RAILROAD (PLAN SHEET / TITLE SHEET)
BARBED WIRE FENCE
WOVEN WIRE - COMBINATION FENCE
TELE & TELEG LINE — TO BE REMOVED
POWER LINE — RELOCATED
PRESENT ROAD (PLAN SHEETS)
RIGHT OF WAY LINE — R.O.W. MARKER
ACCESS POINTS (FREEWAYS)
C OF A LINE (CONTROL OF ACCESS)
ACCESS DENIED BY DEED — NO OP / OPENING / NO OP
TOP OF CUTS
TOE OF FILLS
DETOUR

SCALES OF ORIGINAL DRAWINGS

ON PLAN, 1 IN = 100 FT
ON PROFILE { 1 IN = 100 FT HORIZONTAL; 1 IN = 10 FT VERTICAL }

GRADE LINE ON PROFILE IS SHOWN AS GRADE OF FINISHED ROAD
GROSS LENGTH OF PROJECT } 28,100.0 FT. = 5.322 MILES
NET LENGTH OF PROJECT }

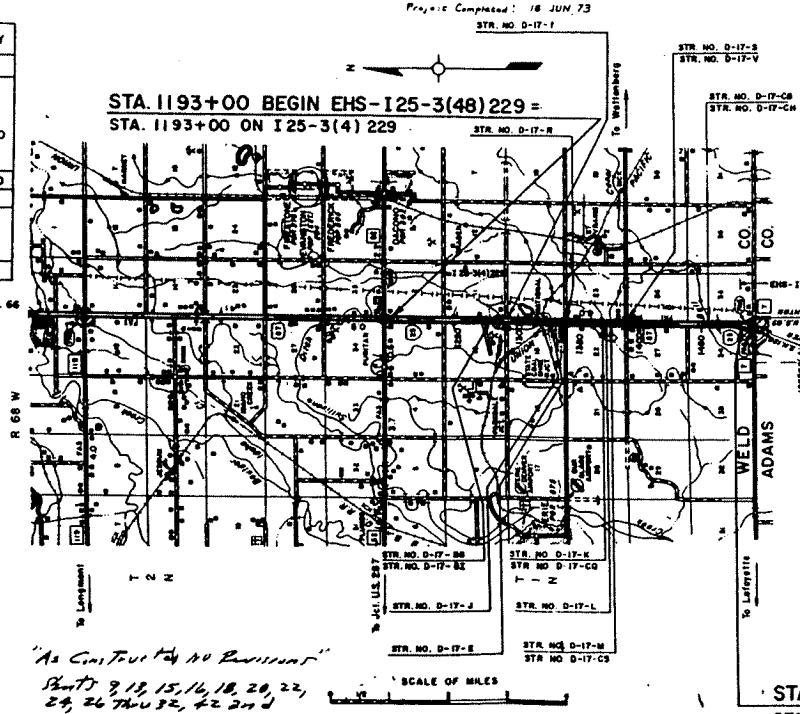
Contractor: Sisgrist Construction Company
Resident Engr: Kenneth F. Mauro
Project Engr: Dale C. Pyle & Eugene F. Gieser
Project Started: 5 APR 72
Project Completed: 18 JUN 73

TABULATION OF LENGTH

STATION		ROADWAY LIN. FT.
1193+00 BEGIN EHS-I 25-3(48)229 = 1193+00 ON I 25-3(4)229		
1474+00 END EHS-I 25-3(48)229 = 1474+00 ON I 25-3(4)229 = 1474+00 BEGIN EHS-I 25-3(49)229		28,100.0
TOTAL		28,100.0
SUMMARY	LIN. FT.	MILES
ROADWAY	28,100.0	5.322
TOTALS NET AND GROSS LENGTH	28,100.0	5.322

For Design Data see Project I 25-3(4)229

Design Traffic Volume { 42,830 A.D.T. ; 5,140 D.H.V. }



INDEX OF SHEETS

SHEET NO 1	TITLE PAGE, SKETCH MAP & TABULATION OF LENGTH.	
2	TYPICAL SECTIONS, GENERAL NOTES AND DELINEATORS.	
3-5	SUMMARY OF APPROXIMATE QUANTITIES.	
6-7	STRUCTURE QUANTITIES.	
8	GUARD RAIL TABULATION & DETAIL OF GUARD RAIL TYPE 5.	
9	DETAIL OF ACCELERATION LANES.	
10-13	11 X 14 X 11 CBC WIDENING STR. D-17-BG & BI.	
14-15	BRIDGE RAIL FOR CBC STR. D-17-I.	
16	GUARD RAIL CONNECTION TO STR. D-17-J.	
17-18	BRIDGE RAIL FOR CBC STR. D-17-E.	
19-20	REPLACE BRIDGE RAILING STR. D-17-R.	
21-22	20 X 5 CBC WIDENING STR. D-17-CQ.	
23-24	20 X 5 CBC WIDENING STR. D-17-CS.	
25-32	BRIDGE WIDENING STR. D-17-CG & CH.	
33-42	PLAN AND PROFILE SHEETS.	
43-55	SIGNING PLANS.	
~~56-61~~	~~STRUCTURE CROSS SECTIONS.~~	
62-67	Unclassified & Ditch Excavation Cross Sections	
68-88	Borrow Pit Cross Sections	
89-124	Embankment Cross Sections & Unclassified Excavation	
M-203-8	APPROACH ROADS, FLARING, CUT SLOPE TREATMENT, BRIDGE AND CREST WIDENING.	4-
M-203-[illegible]	DITCH TYPES.	7-
M-206-[illegible]	EXCAVATION AND BACKFILL FOR STRUCTURES. (2 SHEETS)	2-
M-500-A	LETTERS AND FIGURES FOR STRUCTURE NUMBERS.	7-
M-601-A	SINGLE AND DOUBLE CONCRETE BOX CULVERTS.	5-
M-601-B	TRIPLE CONCRETE BOX CULVERT.	5-
M-601-C	WINGWALLS FOR CONCRETE BOX CULVERTS - 4:1 SIDE SLOPES. (2 SHEETS)	10-
M-603-CA	CONCRETE AND METAL END SECTIONS.	6-
M-603-M	METAL CULVERT PIPE - H-20 LOADING.	2-
M-603-RC	REINFORCED CONCRETE PIPE.	3-
M-604-BA	INLET, TYPE C.	5-
M-604-D	STEPS FOR MANHOLES AND INLETS.	7-
M-606-B	GUARD RAIL, TYPE 5, BOX BEAM MEDIAN BARRIER - STEEL. (2 SHEETS)	12-
M-607-A	WIRE FENCES AND GATES. (2 SHEETS)	8-
M-612-A	MARKER POSTS AND BENCH MARKS.	6-
M-612-C	DELINEATORS (2 SHEETS)	7-
M-613-AA	HIGHWAY LIGHTING. 9-16-70	
M-614-A	TIMBER BARRICADES. 4-23-69	
M-614-IC	STANDARD CONSTRUCTION IDENTIFICATION SIGNS. (2 SHEETS) 9-25-70	
M-614-TB	TRAFFIC SIGNING FOR HIGHWAY CONSTRUCTION. (3 SHEETS) 11-22-71	
S-614-19B	TYPICAL GROUND SIGN PLACEMENT. 11-17-71	
S-614-20B	CLASS I GROUND SIGN INSTALLATIONS. 11-17-71	
S-614-21B	CLASS II GROUND SIGN INSTALLATIONS. 12-2-69	
S-614-22C	TYPICAL MARKER ASSEMBLY INSTALLATIONS. 6-16-71	
S-614-23C	LAMINATED ALUMINUM PANELS AND POST SPACING TABLE FOR CLASS III SIGNS (2 SHEETS) 10-20-69	
S-614-26B	BREAK-AWAY SIGN SUPPORT DETAILS FOR GROUND SIGNS. (2 SHEETS) 12-9-68	
S-614-27B	PEDESTALS, FOOTINGS AND SIGN ISLANDS FOR CLASS III SIGNS. (2 SHEETS) 5-16-69	
S-614-32B	AUXILIARY MARKERS. 11-16-71	
S-614-35A	TYPICAL MULTI-SIGN INSTALLATIONS. 11-17-71	

JUN 6 1974

INACTIVE

SEE SPECIAL PROVISIONS FOR NOTICE TO BIDDERS

DIVISION OF HIGHWAYS
APPROVED [signature] 8-26
CHIEF ENGINEER DATE

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED DATE
DIVISION ENGINEER

Division of Highways
As Constructed Plans
Final Approval [signature] 9-15-75
District Construction Engineer Date

"As Constructed" No Revisions
Sheets 9, 13, 15, 16, 18, 20, 22, 24, 26 Thru 32, 42 and 44 Thru 55

D.H.H.

TITLE SHEET

CONEJOS/WELD CTY/I-25 MP
GODDING-HANSEN
LACB N 9 WRBC
S14 9 N 9 WRBC

WEBCAM/125MP
G-HOLLOW
2RCB NOTHERN
SW 125
4/3/09

GHI25
4/7

GHI25
5/7

CURRENT DATE: 04-13-1999
CURRENT TIME: 15:15:02

FILE DATE: 04-13-1999
FILE NAME: GWCR8RCB

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	89.00	88.50	157.00	2 RCB	10.00	2.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: GWCR8RCB DATE: 04-13-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
89.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
90.00	60.0	60.0	0.0	0.0	0.0	0.0	0.0	0.00	1
90.60	120.0	120.0	0.0	0.0	0.0	0.0	0.0	0.00	1
91.14	180.0	180.0	0.0	0.0	0.0	0.0	0.0	0.00	1
91.33	200.0	200.0	0.0	0.0	0.0	0.0	0.0	0.00	1
92.49	300.0	300.0	0.0	0.0	0.0	0.0	0.0	0.00	1
53	360.0	360.0	0.0	0.0	0.0	0.0	0.0	0.00	1
79	420.0	420.0	0.0	0.0	0.0	0.0	0.0	0.00	1
.19	480.0	428.6	0.0	0.0	0.0	0.0	0.0	47.52	6
95.33	540.0	424.3	0.0	0.0	0.0	0.0	0.0	111.64	4
95.44	600.0	419.1	0.0	0.0	0.0	0.0	0.0	178.70	4
95.00	429.2	429.2	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: GWCR8RCB DATE: 04-13-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
89.00	0.000	0.00	0.00	0.00
90.00	0.000	60.00	0.00	0.00
90.60	0.000	120.00	0.00	0.00
91.14	0.000	180.00	0.00	0.00
91.33	0.000	200.00	0.00	0.00
92.49	0.000	300.00	0.00	0.00
93.53	0.000	360.00	0.00	0.00
94.79	0.000	420.00	0.00	0.00
95.19	-0.006	480.00	3.91	0.81
95.33	-0.005	540.00	4.08	0.76
95.44	-0.010	600.00	2.22	0.37

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

GHI25
6/7

CURRENT DATE: 04-13-1999 FILE DATE: 04-13-1999
CURRENT TIME: 15:15:02 FILE NAME: GWCR8RCB

PERFORMANCE CURVE FOR CULVERT 1 - 2(10.00 (ft) BY 2.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	89.00	0.00	-0.50	0-NF	0.00	0.00	0.00	-0.10	0.00	0.00
60.00	90.00	1.00	0.91	1-S2n	0.63	0.66	0.56	0.66	5.40	3.84
120.00	90.60	1.60	1.33	1-S2n	0.98	1.04	0.84	1.06	7.14	4.97
180.00	91.14	2.14	1.88	1-S2n	1.27	1.36	1.16	1.39	7.74	5.78
200.00	91.33	2.33	2.10	5-S2n	1.36	1.46	1.26	1.49	7.92	6.01
300.00	92.49	3.49	3.42	5-S2n	1.78	1.92	1.72	1.96	8.74	6.96
360.00	93.53	4.42	4.53	4-FFt	2.00	2.00	2.00	2.22	9.00	7.42
420.00	94.79	5.53	5.79	4-FFt	2.00	2.00	2.00	2.46	10.50	7.83
428.57	95.18	5.70	6.18	4-FFt	2.00	2.00	2.00	2.69	10.71	8.20
424.29	95.32	5.62	6.32	4-FFt	2.00	2.00	2.00	2.92	10.61	8.54
419.08	95.44	5.51	6.44	4-FFt	2.00	2.00	2.00	3.13	10.48	8.85

El. inlet face invert 89.00 ft El. outlet invert 88.50 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	257.00 ft
INLET ELEVATION	89.00 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	88.50 ft
NUMBER OF BARRELS	2
SLOPE (V/H)	0.0032
CULVERT LENGTH ALONG SLOPE	157.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 ft
BARREL RISE	2.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

GHI25

7/7

CURRENT DATE: 04-13-1999
CUR TIME: 15:15:02

FILE DATE: 04-13-1999
FILE NAME: GWCR8RCB

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION
MAIN CHANNEL AND LT & RT OVER BANKS

FILE NAME: GWCR8RCB
FILE DATE: 04-13-1999

LEFT CHANNEL BOUNDARY	2
RIGHT CHANNEL BOUNDARY	5
MANNING n LEFT OVER BANK	0.035
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.035
SLOPE OF CHANNEL	0.0130 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	94.00
2	250.00	92.90
3	250.00	88.40
4	271.00	88.40
5	271.00	92.90
6	671.00	100.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	88.40	0.000	-0.10	0.00	0.00
60.00	89.16	0.778	0.66	3.84	0.57
120.00	89.56	0.815	1.06	4.97	0.85
180.00	89.89	0.835	1.39	5.78	1.06
200.00	89.99	0.839	1.49	6.01	1.12
300.00	90.46	0.854	1.96	6.96	1.40
360.00	90.72	0.859	2.22	7.42	1.54
420.00	90.96	0.863	2.46	7.83	1.67
480.00	91.19	0.865	2.69	8.20	1.79
540.00	91.42	0.867	2.92	8.54	1.90
600.00	91.63	0.867	3.13	8.85	2.01

Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	150.00 ft
CREST LENGTH	200.00 ft
OVERTOPPING CREST ELEVATION	95.00 ft

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number CO-WELD-01	Page 1 Of 1
Owner-Project Weld County I-25 MDP	By BLV	Date 9/2/99
6.5' CMP overtopping analysis - UPRR spur @ WCR8/I-25	Checked By CJP	Date 10/29/99

Orifice equation: $Q = CA\sqrt{2g\Delta h}$

$C = 0.6$

$A = \frac{\pi D^2}{4} = \frac{\pi}{4}(6.5)^2 = 33.2 \text{ ft}^2$

From survey information,

Upstream invert elevation = 5094.43 ft
Minimum embankment elevation = 5108.85 ft

Head from culvert invert to minimum embankment elevation = 5108.85 − 5094.43

= 14.42 ft

Head from centroid of culvert to minimum embankment elevation = 14.42 − 3.25

= 11.17 ft

$\therefore \underline{Q} = 0.6(33.2)\sqrt{2(32.2)(11.17)} \cong \underline{530 \text{ cfs}}$

II

CUHP RUNOFF MODELING

II-A

DEFINITIONS OF MODEL INPUT PARAMETERS

USER MANUAL

COLORADO URBAN HYDROGRAPH PROCEDURE COMPUTER PROGRAM - PC VERSION

(CUHPF/PC)

July, 1995

Urban Drainage and Flood Control District
2480 West 26th Avenue
Suite 156-B
Denver, Colorado 80211

Telephone (303) 455-6277
FAX (303) 455-7880

INPUT PARAMETERS

The user needs to input the following catchment parameters to generate a unit and storm hydrograph:

A. Input Parameters

The following catchment parameters are needed for the program to generate a unit and storm hydrograph.

1. *Area* - Catchment area in square miles
2. *Catchment Length* - The length in miles from the downstream design point of the catchment or sub-catchment along the main drainageway to the high point on its respective catchment or sub-catchment. When a catchment is subdivided into a series of sub-catchments, the sub-catchment length used shall include the distance required for runoff to reach the major channel from the farthest point in the sub-catchment.
3. *Centroid Distance* - Distance in miles from the design point of the catchment or sub-catchment along the main drainageway to its respective catchment or sub-catchment centroid.
4. *Percent Impervious* - The fraction of the catchment surface which is impervious in percent.
5. *Catchment Slope* - The length weighted average slope of the catchment in feet per foot. See instructions in the USDCM to determine the weighted slope.
6. As an option for small urbanized areas, (e.g. less than 90 acres), you may enter time of concentration in minutes. Procedure for estimating time of concentration is given in the USDCM, Vol. 1. By specifying the time of concentration, hydrograph peaks will be computed and displayed using both the CUHP method and the Rational Formula. This option will be exercised only if the 1-hour rainfall option is used for Card B2*.
7. *Pervious retention* - Maximum depression storage on pervious surfaces in inches.
8. *Impervious retention* - Maximum depression storage on impervious surfaces in inches.
9. *Infiltration rate* - Initial infiltration rate for pervious surfaces in the catchment in inches per hour. If this entry is used by itself, it will be used as a constant infiltration rate

* Card B2 is equivalent to line 2 of the CUHPF/PC input file.

throughout the storm. If the next two entries are made, then this value will be used as the initial infiltration rate in Horton's equation.

10. *Decay* - Exponential decay coefficient in Horton's equation in "per second" units.
11. *Final infiltration* - Final infiltration rate in Horton's equation in inches per hour.
12. *Nullifier of Rainfall Loss Adjustment Factors Entered with Rainfall* - To be used if rainfall loss adjustment factors entered with rainfall data are to be nullified (*optional*).

B. Optional Input Parameters For Hydrograph Shaping

The unit hydrograph is developed by the computer using the algorithm used in the 1984 revision of the USDCM. As noted before, the coefficients C_t and C_p are computed by the program; however, they can be specified by the user as an option.

The shaping of the unit hydrograph also relies on proportioning the widths at 50% and 75% of the unit hydrograph peak. The proportioning is based on 0.35 of the width at 50% of peak being ahead of the "time to peak" and 0.45 of the width at 75% of peak being ahead of the "time to peak". These proportioning factors were selected after observing a number of unit hydrographs derived from the rainfall/runoff data collected by the U.S.G.S. for the District. It is possible for the user to override the unit hydrograph widths and the proportioning of these widths built into the program. For drainage and flood studies within the District, the program values shall be used. If the user has derived unit hydrographs from reliable rainfall-runoff data for a study catchment and can develop a "calibrated" unit hydrograph for this catchment, this option permits reshaping the unit hydrograph accordingly.

C. Optional Parameters For Modeling of Minimized DCIA

The following catchment parameters are optional inputs for adjusting the pervious/impervious area relationships.

1. *DCIA* - Specifies the DCIA Level of practice as defined in USDCM, Vol. 3, Structural BMPs. Input is 1, 2, or 3.
2. *D* - Defines the fraction of the total impervious area directly connected to the drainage system. Values from 0.01 to 1.0.
3. *R* - Defines the fraction of total pervious area receiving runoff from the "disconnected" impervious areas. Values from 0.01 to 1.0.

4. *WQCV* - Defines the water quality capture volume to be modeled as detained in swales and/or berms, in watershed-inches.

5. *DTIME* - Defines the duration over which the WQCV is released, in hours (up to 40 hours).

II-B

DESIGN STORM

II-B.1

DEPTHS

Lidstone & Anderson, Inc.
Water Resources and Environmental Consultants

PROJECT	BY	DATE	PROJECT NO.
eld County	BFS	1/18/99	COWELD01
FIGURE	**CHECKED BY**	**DATE**	**SHEET OF**
Precipitation Frequency Analysis Based on NOAA Atlas	CJP	02/09/99	1 20

Reference: Precipitation Frequency Atlas of the Western United States
J. F. Miller, R. H. Frederick, and R. J. Tracey
Volume III - Colorado
U.S. Department of Commerce 1973

Task: Determine 2 Hr. values for the 2, 5, 10, 25, 50, and 100-Yr. return periods

Methodology:

1- Calculate 1 Hr. values for the 2-Yr and 100-Yr return period For Frederick, Colorado located in the South Platte Drainage (Region 1) at an average basin elevation of 5000 FT.

- Using the following equations from Table 11, calculate the 2-Yr. and 100 Yr., 6 Hr. and 24 hr values (Based on Isopluvial Maps)

$$Y_2 = 0.218 + 0.709\,(X_1^2/X_2)$$

$$Y_{100} = 1.897 + 0.439\,(X_3^2/X_4) - 0.008\,Z$$

where: X_1 = 2-Yr. 6-Hr. Value
X_2 = 2-Yr. 24-Hr. Value
X_3 = 100-Yr. 6-Hr. Value
X_4 = 100-Yr. 24-Hr. Value
} From Precipitation Frequency Maps
Z = elevation in hundreds of feet

X_1 = 1.5 (Figure 20)
X_2 = 2.1 (Figure 26)
X_3 = 3.7 (Figure 25)
X_4 = 5.1 (Figure 31)

$Y_2 = 0.218 + 0.709(1.5^2/2.1) =$ <u>0.98 in = 2-Yr 1-Hr Precip</u>

$Y_{100} = 1.897 + 0.439(3.7^2/5.1) - 0.008(5000/100) =$ <u>2.68 in = 100-Yr. 1-Hr. Precip</u>

Basin Elevation

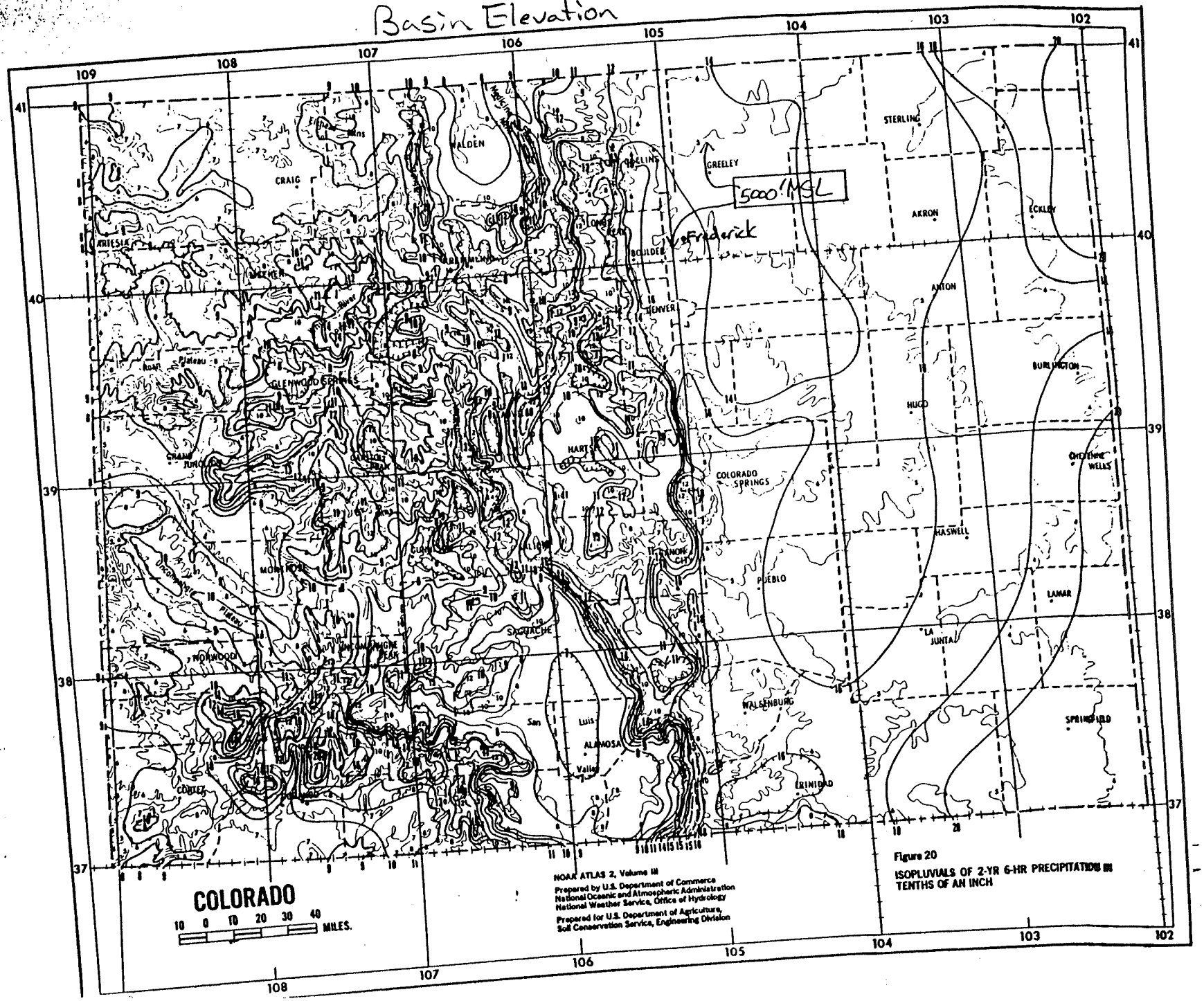


Figure 20

ISOPLUVIALS OF 2-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH

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Table 11. Equations for estimating 1-hr values in Colorado with statistical parameters for each equation.

Discussion of Maps

Figures 20 through 43 present precipitation-frequency maps for Colorado for 6- and 24-hr durations. Figures 20 through 31 are for annual (or all-season) values for the 2-, 5-, 10-, 25-, 50, and 100-yr return periods. Figures 32 through 43 are for the May through October season and are for probabilities of 0.50, 0.20, 0.10, 0.04, 0.02, and 0.01. The isopluvial maps represent the 360- and 1,440-min durations for the partial-duration series. Data were tabulated for clock and observation-day intervals for the annual series and were adjusted by the empirical factors given in the ANALYSIS section.

Isoline interval. The isoline interval selected was designed to provide a reasonably complete description of the isopluvial pattern in various regions of the state. The isoline interval over most of the state on maps for the 24-hr duration is 0.2 in. for precipitation-frequency values below 3.0 in., 0.4 in. between 3.0 in. and 5.0 in., and 0.5 in. at values greater than 5.0 in. However, in southwestern Colorado along the San Juan Mountains, the annual maps use an isoline interval of 0.2 in. below precipitation-frequency values of 2.0 in., and 0.5 in. for values over 2.0 in. On the maps for the 6-hr duration, the interval is 0.1 in. for precipitation-frequency values under 1.2 in. at the 2-yr and 0.50 and 0.20 probability level (on maps for the May through October season). At longer return periods (or lower probabilities), the upper limit of the 0.1-in. isoline interval increases in order to maintain the isopluvial gradient and degree of detail. On all maps for the 6-hr duration, the isoline interval changes from 0.2 in. below 3.0 in. to 0.4 in. over 3.0-in. precipitation-frequency values. Dashed intermediate lines have been placed between widely separated isolines and in regions where a linear interpolation between the normal isopluvial interval would lead to erroneous interpolation. "Lows" that close within the boundaries of a particular map have been hatched on the low-valued side of the isoline.

Importance of snow in precipitation-frequency values. The annual maps in this Atlas represent frequency values of precipitation regardless of type. For many hydrologic purposes, precipitation falling as rain must be treated in a different manner from that falling as snow. The contribution of snow amounts to precipitation-frequency values in Colorado and the Rocky Mountain States (roughly Montana, Wyoming, Colorado, New Mexico, and Utah) was investigated. In this area, there were about 50 stations per state having 10 to 15 yrs of observation of snowfall as part of the precipitation observing program. For each such station, two data series were formed as discussed under Interpretation of Results, Importance of Snow in Estimating Frequency Values.

A ratio was formed of the 2-yr 24-hr value for the series containing maximum annual events without regard to the type of precipitation and the 2-yr 24-hr value for the series with snow occurrences eliminated. A plot of this ratio vs. latitude (fig. 15) shows that the ratio tends to be at a maximum in the latitude of Colorado and Utah. Over all of Colorado, the all-precipitation series tends to average about 10 percent higher than the series with snow eliminated. However, examination of the data shows that in the relatively flat areas east of a smoothed 6,000-ft contour the differences between the two series are minor. With data from this area eliminated, the difference between the two series averages about 15 percent, with some individual differences as large as 40 to 50 percent. About half the stations have differences greater than 10 percent. These differences indicate that frequency values computed from an annual series of rainfall amounts only would be different from those composed of all-precipitation values, and two separate sets of precipitation-frequency maps were needed.

Snowfall observations are made at only about 15 percent of the precipitation stations used in this study. For this reason, a rainfall-frequency study could not be made by direct methods. Since most snowfall occurs during the colder half of the year, a series containing only values for the May to October season was compared with the series that was based on rainfall only. The two series were in good agreement, except for a slight bias toward higher values for the May to October season. This bias results from some large amounts in late October and early May occurring as snow and thus excluded from the rainfall-only series. The average difference is only about 4 percent, with no consistent preference toward higher elevations or particular geographic regions.

Two sets of maps were prepared for Colorado. The first set consists of annual maps based on precipitation data from all months of the year without regard to the type of precipitation; rain, rain and snow mixed, all snow, hail, etc. The second series takes precipitation values from the months May to October. No attempt was made in this second series to differentiate between types of precipitation occurring within these months, but the investigations mentioned in the preceding paragraph indicate that these maps will approximate the values that would be obtained by using a data series made up of precipitation events that are exclusively rain. Since data for only part of the year were used, these maps have been labeled with the appropriate probabilities rather than with a return period in years (figs. 32–43).

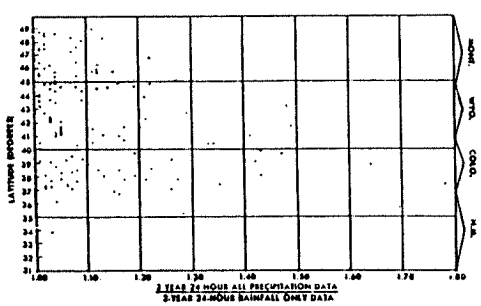

Figure 15. *Ratio of 2-yr 24-hr value for all data to 2-yr 24-hr value for rainfall only vs. latitude.*

Region of applicability*	Equation	Corr. coeff.	No. of stations	Mean of computed stn. values (inches)	Standard error of estimate (inches)
South Platte, Republican, Arkansas, and Cimarron River Basins (1)	$Y_2 = 0.218 + 0.709[(X_1)(X_1/X_3)]$	0.94	75	1.01	0.074
	$Y_{100} = 1.897 + 0.439[(X_4)(X_4/X_4)] - 0.008Z$	.84	75	2.68	.317
San Juan, Upper Rio Grande, Upper Colorado, and Gunnison River Basins and Green River Basin below confluence with the Yampa River (2)	$Y_2 = -0.011 + 0.942[(X_1)(X_1/X_3)]$	.95	86	0.72	.085
	$Y_{100} = 0.494 + 0.755[(X_4)(X_4/X_4)]$	.90	85	1.96	.290
Yampa and Green River Basins above confluence of Green and Yampa Rivers (3)	$Y_2 = 0.019 + 0.711[(X_1)(X_1/X_3)] + 0.001Z$	.82	98	0.40	.031
	$Y_{100} = 0.338 + 0.670[(X_4)(X_4/X_4)] + 0.001Z$	.80	79	1.04	.141
North Platte (4)	$Y_2 = 0.028 + 0.890[(X_1)(X_1/X_3)]$	.93	90	0.60	.062
	$Y_{100} = 0.671 + 0.757[(X_4)(X_4/X_4)] - 0.003Z$	.91	88	1.71	.236

*Numbers in parentheses refer to geographic regions shown in figure 19. See text for more complete description.

List of variables

Y_2 = 2-yr 1-hr estimated value
Y_{100} = 100-yr 1-hr estimated value
X_1 = 2-yr 6-hr value from precipitation-frequency maps
X_3 = 2-yr 24-hr value from precipitation-frequency maps
X_3 = 100-yr 6-hr value from precipitation-frequency maps
X_4 = 100-yr 24-hr value from precipitation-frequency maps
Z = point elevation in hundreds of feet

Duration (min)	5	10	15	30
Ratio to 1-hr	0.29	0.45	0.57	0.79

(Adopted from *U.S. Weather Bureau Technical Paper* No. 40, 1961.)

Procedures for Estimating Values for Durations Other Than 6 and 24 Hrs

The isopluvial maps in this Atlas are for 6- and 24-hr durations. For many hydrologic purposes, values for other durations are necessary. Such values can be estimated using the 6- and 24-hr maps and the empirical methods outlined in the following section. The procedures detailed below for obtaining 1-, 2-, and 3-hr estimates were developed specifically for this Atlas. The procedure for obtaining estimates for less than 1-hr duration and for duration were adopted from *Weather Bureau Technical Paper* 40 (U.S. Weather Bureau 1961) only after investigation demonstrated their applicability to data from the area covered by the Atlas.

Procedures for estimating 1-hr (60-min) precipitation-frequency values. Multiple-regression screening techniques were used to develop equations for estimating 1-hr duration values. Factors considered in the screening process were restricted to those that could be determined easily from the maps of this Atlas or other generally available topographic maps.

The 11 western states were separated into several geographic regions. The regions were chosen on the basis of meteorological and climatological homogeneity and are generally combinations of river basins separated by prominent divides. Four of these geographic regions are partially within Colorado. For convenience and use as an overlay on the precipitation-frequency maps, these regions are outlined on figure 19. The first Colorado region is that of the region that lies to the east of the Continental Divide, the crest of the Sangre de Cristo and Sacramento Mountains, and is south of the divide separating the drainage basins of the Platte and South Platte Rivers. It consists of that portion of Colorado drained by the South Platte, Republican, Arkansas, and Cimarron Rivers (Region 1, fig. 19). The second region consists of the area drained by the San Juan, Upper Rio Grande, Upper Colorado, Gunnison Rivers and by the Green River below its confluence with the Yampa River (Region 2, fig. 19). This is part of a larger region that extends from southwestern Colorado, westward to the Wasatch Mountains of Utah, and southward through Arizona and the northern half of New Mexico. The third region is the mountainous portion of the area between the Continental Divide and the crest of the Cascade Range. The portion that lies within Colorado is the northwestern portion of the State that is drained by the Yampa River and the Green River above its confluence with the Yampa (Region 3, fig. 19). A small portion of Colorado drained by the North Platte is Region 4, figure 19. The larger region of which this is a part includes that portion of Wyoming and Montana east of the Continental Divide. Equations to provide estimates for 1-hr duration for 2- and 100-yr return periods are shown in table 11. Also listed are the statistical parameters associated with each equation. In these equations, the variable $[(X_1)(X_1/X$

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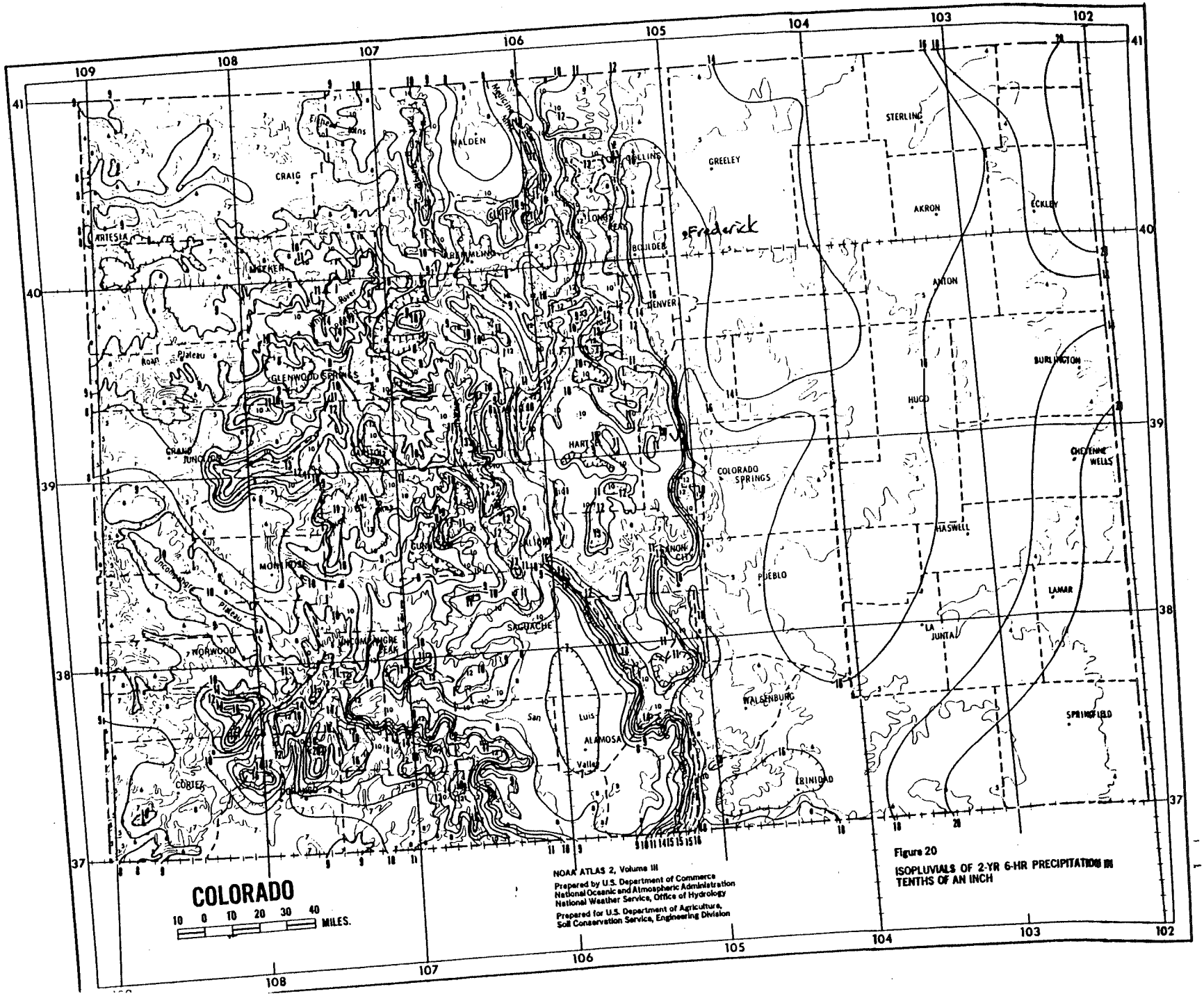
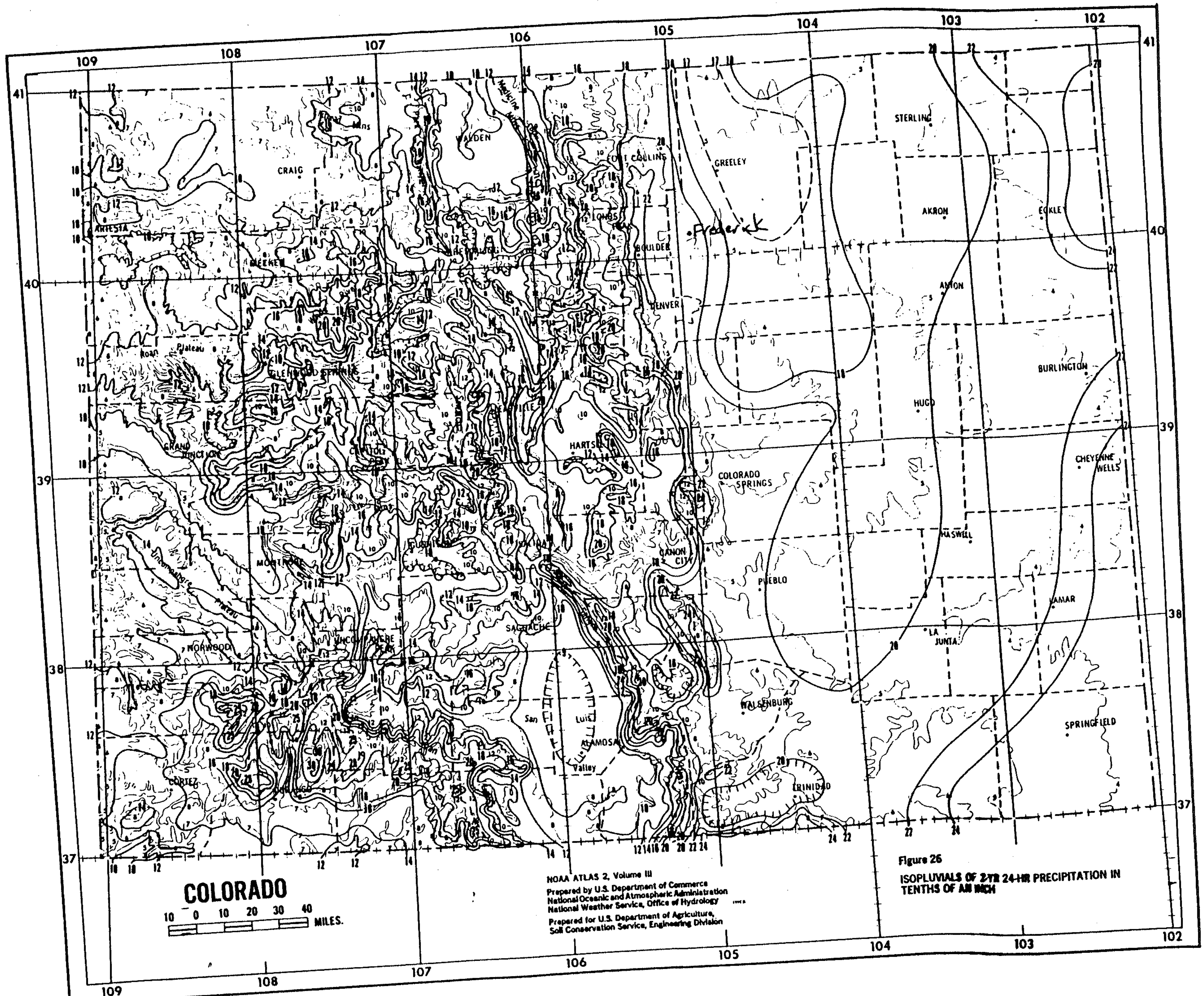


Figure 20

ISOPLUVIALS OF 2-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH

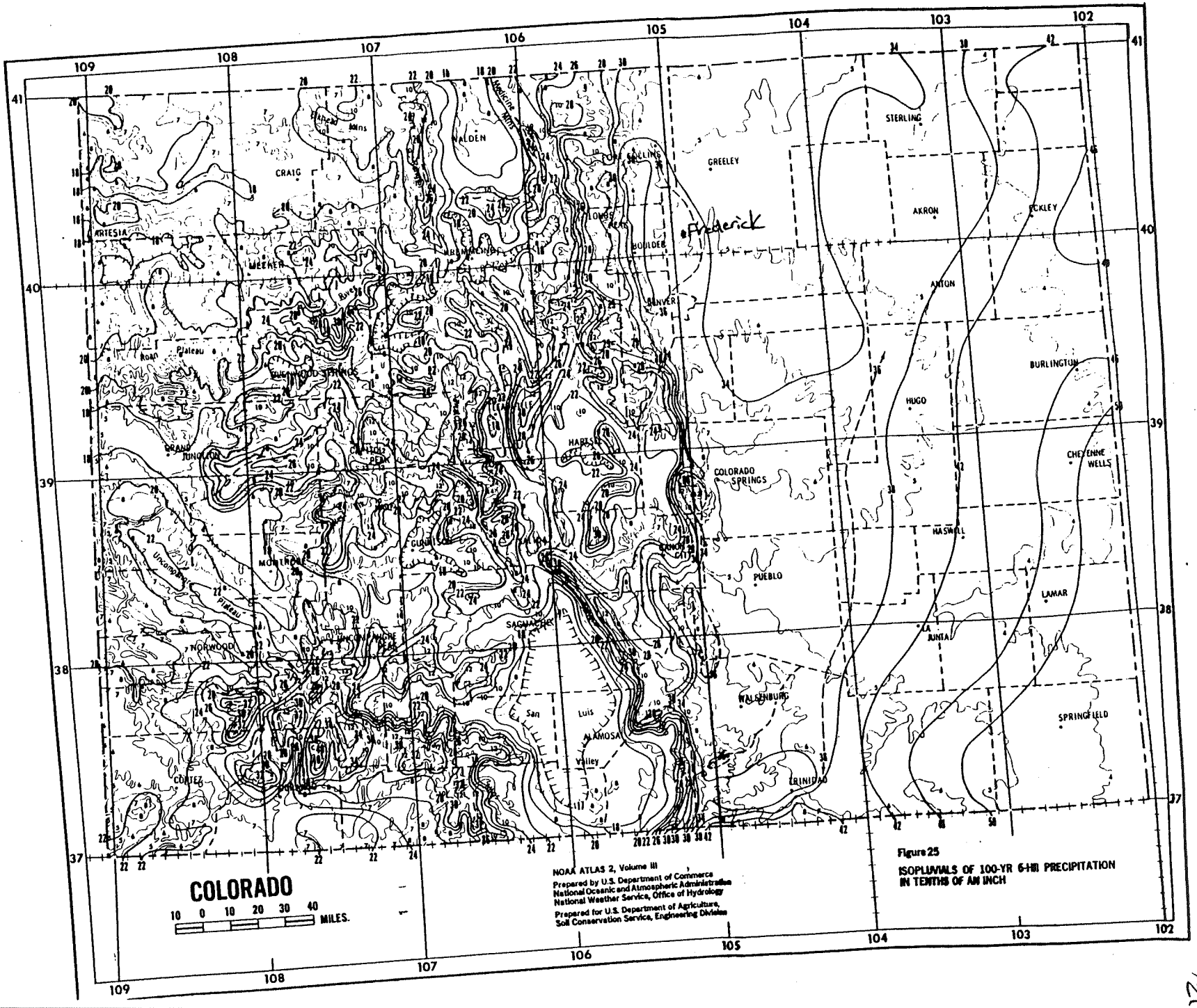
4/20



NOAA ATLAS 2, Volume III
Prepared by U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service, Office of Hydrology
Prepared for U.S. Department of Agriculture,
Soil Conservation Service, Engineering Division

Figure 26
ISOPLUVIALS OF 2-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH

5/20


COLORADO
10 0 10 20 30 40 MILES.
STERLING
GREELEY
AKRON
ECKLEY
ANTON
BURLINGTON
HUGO
CHEYENNE WELLS
HASWELL
LAMAR
JUNTA
SPRINGFIELD
TRINIDAD
WALSENBURG
PUEBLO
COLORADO SPRINGS
CANON CITY
SALIDA
ALAMOSA
San Luis Valley
GUNNISON
MONTROSE
GRAND JUNCTION
COLLBRAN
RIFLE
GLENWOOD SPRINGS
NORWOOD
CORTEZ
DURANGO
ARTESIA
CRAIG
MEEKER
WALDEN
BRIGHTON
BOULDER
DENVER
Frederick
Uncompahgre Plateau
Roan Plateau
Medicine Bow Mts
Park Range
Flat Tops
Elkhead Mts
Sangre de Cristo Mts
Sawatch Range
Elk Mts
Uncompahgre Mts
San Juan Mts
Wet Mts
Sangre de Cristo Mts
Raton Mesa
Figure 25
ISOPLUVIALS OF 100-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH
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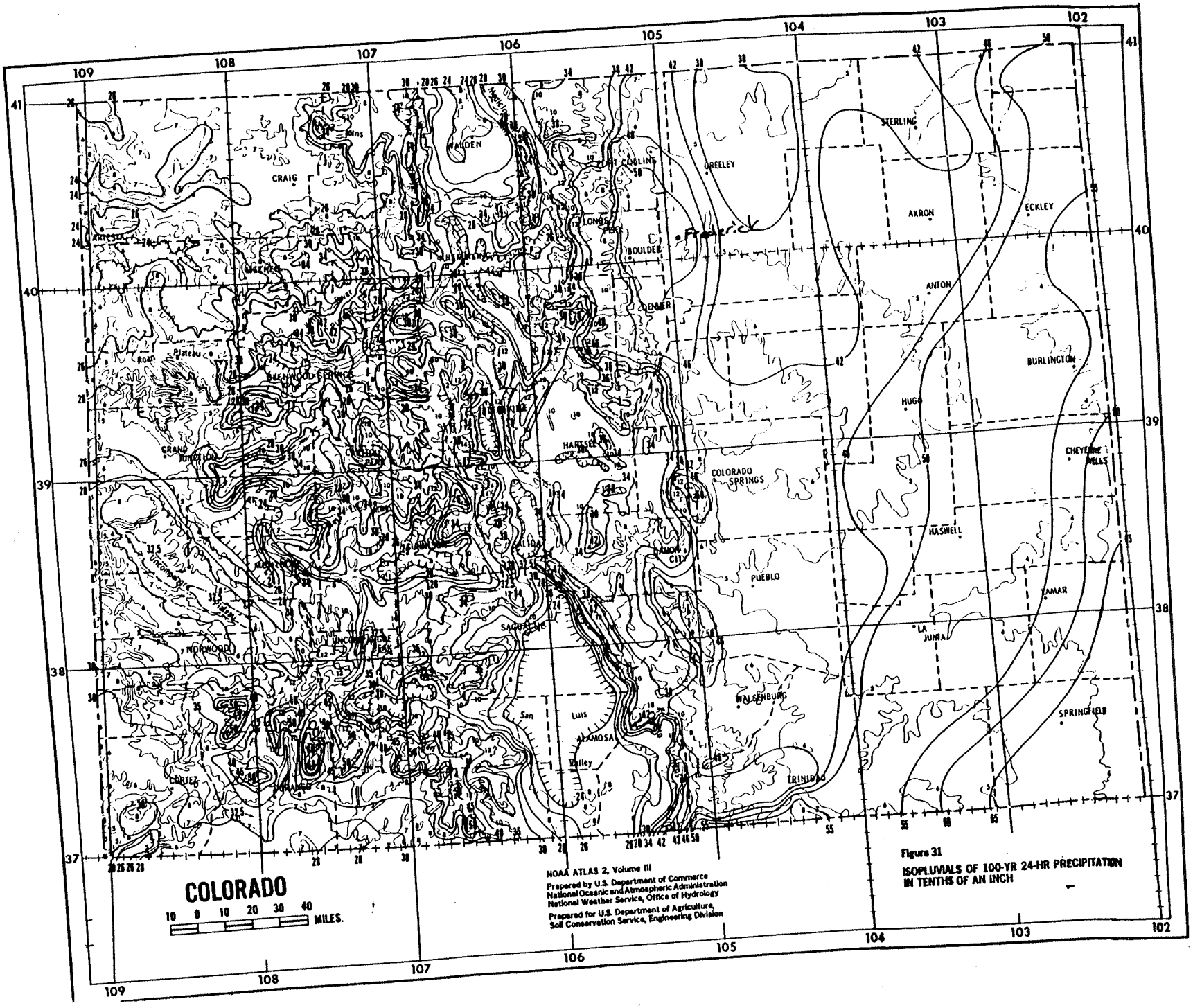
Prepared for U.S. Department of Agriculture,
Soil Conservation Service, Engineering Division



NOAA ATLAS 2, Volume III
Prepared by U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service, Office of Hydrology
Prepared for U.S. Department of Agriculture,
Soil Conservation Service, Engineering Division

Figure 31
ISOPLUVIALS OF 100-YR 24-HR PRECIPITATION
IN TENTHS OF AN INCH

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Water Resources and Environmental Consultants

PROJECT	BY	DATE	PROJECT NO.
eld County	BFS	1/18/98	COWELD01
FEATURE	CHECKED BY	DATE	SHEET OF
Precipitation Frequency Analysis Based on NOAA Atlas	CJP	02/09/99	8 20

(2) - Using 1-Hr. and 6-Hr., 2-Yr and 100-Yr values estimate 2-Hr, 2-Yr and 100-Yr values

Equation 3 for 2-hr value for Region 1 (mathematical solution from the data used to develop Figure 16A)

$$2\text{-Hr.} = 0.342(6\text{-Hr.}) + 0.658(1\text{-Hr.})$$

$$2\text{-Hr}_2 = 0.342(1.5) + 0.658(0.98) = \underline{1.16 \text{ in.} = 2\text{-Yr } 2\text{-Hr. Precip}}$$

$$2\text{-Hr}_{100} = 0.342(3.7) + 0.658(2.68) = \underline{3.03 \text{ in.} = 100\text{-Yr } 2\text{-Hr Precip}}$$

(3) - Estimate 5, 10, 25, 50-Yr, 1-Hr values using Nomograph on Figure 6

2-YR = 0.98 in. (Calculated in Step 1)
5-YR = 1.39 in.
10-YR = 1.68 in.
25-YR = 2.04 in.
50-YR = 2.37 in.
100-YR = 2.68 in. (calculated in Step 1)

$[(X_a)(X_a/X_d)]$ can be regarded as the 6-hr value times the slope of the line connecting the 6- and 24-hr values for the appropriate return period.

As with any separation into regions, the boundary can only be regarded as the sharpest portion of a zone of transition between regions. These equations have been tested for boundary discontinuities by computing values using equations from both sides of the boundary. Differences were found to be mostly under 15 percent. However, it is suggested that when computing estimates along or within a few miles of a regional boundary computations be made using equations applicable to each region and that the average of such computations be adopted.

Estimates of 1-hr precipitation-frequency values for return periods between 2 and 100 yrs. The 1-hr values for the 2- and 100-yr return periods can be plotted on the nomogram of figure 6 to obtain values for return periods greater than 2 yrs or less than 100 yrs. Draw a straight line connecting the 2- and 100-yr values and read the desired return-period value from the nomogram.

Estimates for 2- and 3-hr (120- and 180-min) precipitation-frequency values. To obtain estimates of precipitation-frequency values for 2 or 3 hrs, plot the 1- and 6-hr values from the Atlas on the appropriate nomogram of figure 16. Draw a straight line connecting the 1- and 6-hr values, and read the 2- and 3-hr values from the nomogram. This nomogram is independent of return period. It was developed using data from the same regions used to develop the 1-hr equations.

The mathematical solution from the data used to develop figure 16 gives the following equations for estimating the 2- and 3-hr values:

For Region 1, figure 19	2-hr = 0.342 (6-hr) + 0.658 (1-hr)	(3)
	3-hr = 0.597 (6-hr) + 0.403 (1-hr)	(4)
For Region 2, figure 19	2-hr = 0.341 (6-hr) + 0.659 (1-hr)	(5)
	3-hr = 0.569 (6-hr) + 0.431 (1-hr)	(6)
For Regions 3 and 4, figure 19	2-hr = 0.250 (6-hr) + 0.750 (1-hr)	(7)
	3-hr = 0.467 (6-hr) + 0.533 (1-hr)	(8)

Estimates for 12-hr (720-min) precipitation-frequency values. To obtain estimates for the 12-hr duration, plot values from the 6- and 24-hr maps on figure 17. Read the 12-hr estimates at the intersection of the line connecting these points with the 12-hr duration line of the nomogram.

Estimates for less than 1 hr. To obtain estimates for durations of less than 1 hr, apply the values in table 12 to the 1-hr value for the return period of interest.

	1-hr	2-hr	3-hr	6-hr	24-hr
2-yr	*0.71*	*0.83*	*0.91*	1.05	1.58
5-yr				1.38	1.99
10-yr				1.59	2.27
25-yr				1.90	2.65
50-yr				2.19	2.95
100-yr	*1.86*			2.39	3.35

Table 13. *Precipitation data for depth-frequency atlas computation point 106°00′ W., 39°00′ N.*

Illustration of Use of Precipitation-Frequency Maps, Diagrams, and Equations

To illustrate the use of these maps, values were read from figures 20 to 31 for the point at 39°00′ N. and 106°00′ W. These values are shown in boldface type in table 13. The values read from the maps should be plotted on the return-period diagram of figure 6 because (1) not all points are as easy to locate on a series of maps as are latitude-longitude intersections, (2) there may be some slight registration differences in printing, and (3) precise interpolation between isolines is difficult. This has been done for the 24-hr values in table 13 (fig. 18a) and a line of best fit has been drawn subjectively. On this nomogram, the line fits the data rather well. Had any points deviated noticeably from the line, the value would have been reread from the line and the new value substituted in table 13 and adopted in preference to the original readings.

The 2- and 100-yr 1-hr values for the point were computed from the equations applicable to Region 1, figure 19 (table 11), since the point is east of the Continental Divide. The 2-yr 1-hr value is estimated at 0.71 in. (2-yr 6- and 24-hr values from table 13); the estimated 100-yr 1-hr value is 1.86 in. (100-yr 6- and 24-hr values from table 13 and elevation of 9,500 ft). By plotting these 1-hr values on figure 6 and connecting them with a straight line, one can obtain estimates for return periods of 5, 10, 25, and 50 yrs.

The 2- and 3-hr values can be estimated by using the nomogram of figure 16 or equations (3) and (4). The 1- and 6-hr values for the desired return period are obtained as above. Plot these points on the nomogram of figure 16 and connect them with a straight line. Read the estimates for 2 or 3 hrs at the intersections of the connecting line and the 2- and 3-hr vertical lines. An example is shown in figure 18b for the 2-yr return period. The 2-yr 2-hr (0.83 in.) and 2-yr 3-hr (0.91 in.) values are in italics on table 13.

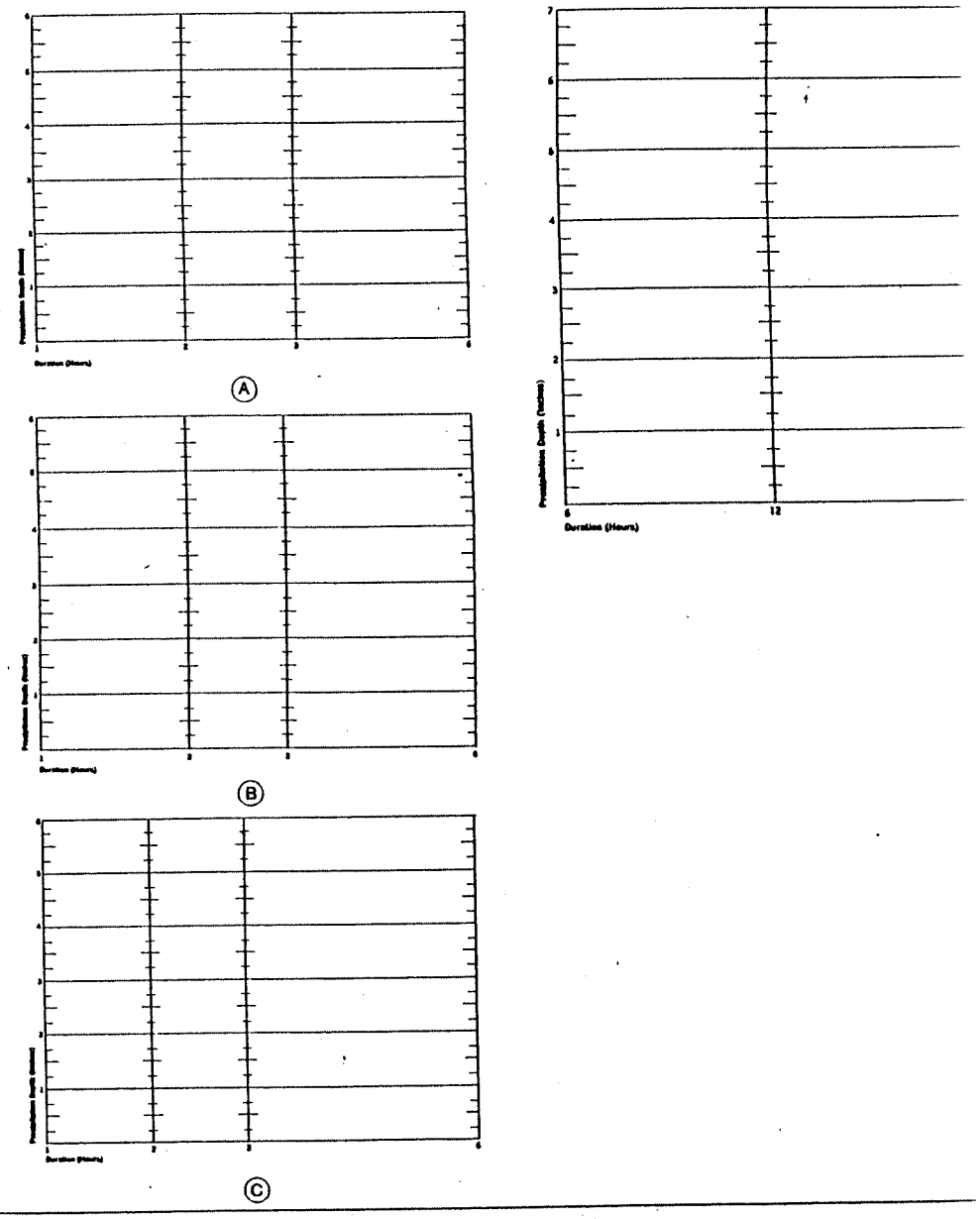

Figure 16. *Precipitation depth-duration diagram (1- to 6-hr).*
a. South Platte, Republican, Arkansas, and Cimarron River Basins (Region 1, fig. 19).
b. San Juan, Upper Rio Grande, Upper Colorado, and Gunnison River Basins and Green River Basin

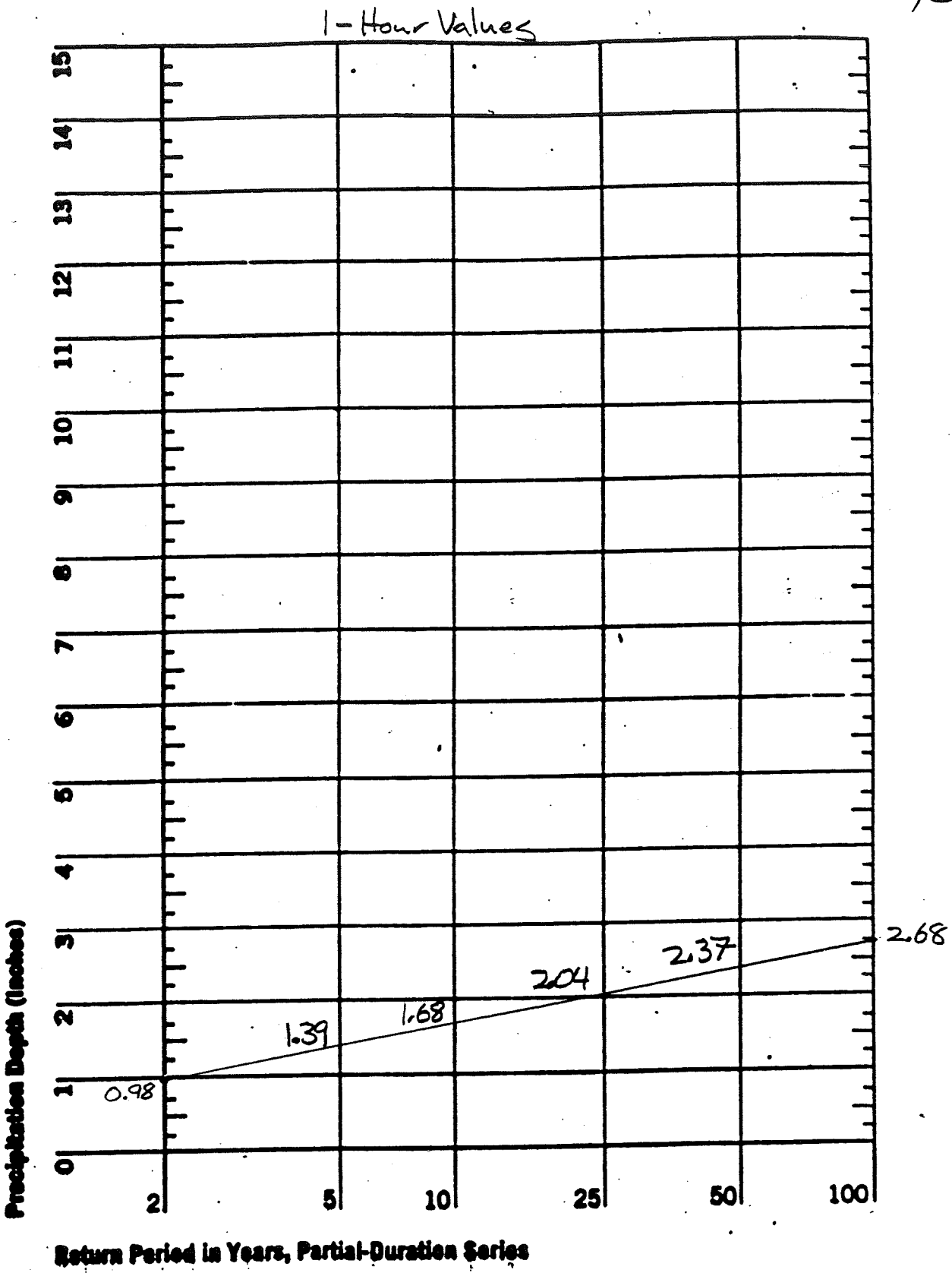

Figure 6. *Precipitation depth versus return period for partial-duration series.*

PROJECT:	WELD COUNTY - I-25 CORRIDOR MASTER DRAINAGE PLAN	BY: BFS	DATE: 02/24/99	PROJECT NO. COWELD01
FEATURE:	DURATION/FREQUENCY/INTENSITY COMPUTATIONS	CHK BY: CJP	DATE: 03/04/99	SHEET: FREQUENCY

REGION 1 : South Platte, Republican, Arkansas, and Cimarron River Basins
LOCATION: Frederick
LAT: n/a
LONG: n/a
ELEVATION: 5000 feet

DURATION	5-MIN		10-MIN		15-MIN		30-MIN		1-HR		2-HR		3-HR		6-HR		24-HR	
DURATION FACTORS	0.29		0.45		0.57		0.79		1.00									
FREQUENCY	Depth (in)	Intensity (in/hr)	Depth (in)	Intensity (in/hr)	Depth (in)	Intensity (in/hr)	Depth (in)	Intensity (in/hr)	Depth (in)	Intensity (in/hr)	Depth (in)	Intensity (in/hr)	Depth (in)	Intensity (in/hr)	Depth (in)	Intensity (in/hr)	Depth (in)	Intensity (in/hr)
2-YR	*0.28*	*3.41*	*0.44*	*2.65*	*0.56*	*2.23*	*0.77*	1.55	*0.98*	*0.98*	*1.16*	*0.58*	*1.29*	*0.43*	**1.50**	**0.25**	**2.10**	0.09
5-YR	*0.40*	*4.84*	*0.63*	*3.75*	*0.79*	*3.17*	*1.10*	2.20	**1.39**	*1.39*	*1.60*	*0.80*	*1.75*	*0.58*	**2.00**	**0.33**	**2.80**	0.12
10-YR	*0.49*	*5.85*	*0.76*	*4.54*	*0.96*	*3.83*	*1.33*	2.65	**1.68**	*1.68*	*1.91*	*0.95*	*2.08*	*0.69*	**2.35**	**0.39**	**3.20**	0.13
25-YR	*0.59*	*7.10*	*0.92*	*5.51*	*1.16*	*4.65*	*1.61*	3.22	**2.04**	*2.04*	*2.32*	*1.16*	*2.54*	*0.85*	**2.87**	**0.48**	**4.00**	0.17
50-YR	*0.69*	*8.25*	*1.07*	*6.40*	*1.35*	*5.40*	*1.87*	3.74	**2.37**	*2.37*	*2.67*	*1.34*	*2.90*	*0.97*	**3.25**	**0.54**	**4.60**	0.19
100-YR	*0.78*	*9.33*	*1.21*	*7.24*	*1.53*	*6.11*	*2.12*	4.23	*2.68*	*2.68*	*3.03*	*1.51*	*3.29*	*1.10*	**3.70**	**0.62**	**5.10**	0.21

Notes:

1. **BOLD = Input from Atlas Isopluvials or Graphing (Figure 6.)**

2. *ITALICS = Computed Values*

3. EQUATIONS USED:

1HR, 2YR = .218 + .709(2YR6HR^2 / 2YR24HR)
1HR, 100YR = 1.897 + .439(100YR6HR^2 / 100YR24HR) - .008(ELEVATION/100)
2HR = .342(6HR) + .658(1HR)
3HR = .597(6HR) + .403(1HR)
5MIN = .290(1HR)
10MIN = .450(1HR)
15MIN = .570(1HR)
30MIN = .790(1HR)

4. SAMPLE CALCULATIONS:

1HR, 2YR=	0.218	+	0.709	*(	1.500	^2 /	2.100	) =	0.978	inches						
1HR, 100YR=	1.897	+	0.439	*(	3.700	^2 /	5.100	) -	0.008	*(	5000 / 100	)=	2.675	inches		
2HR, 10YR=	0.342	*(	2.350	) +	0.658	*(	1.680	) =	1.909	inches						
3HR, 50YR=	0.597	*(	3.250	) +	0.403	*(	2.370	) =	2.895	inches						
30MIN, 5YR=	0.790	*(	1.390	) =	1.098	inches										
5MIN, 25YR=	0.290	*(	2.040	) =	0.592	inches										

11/20

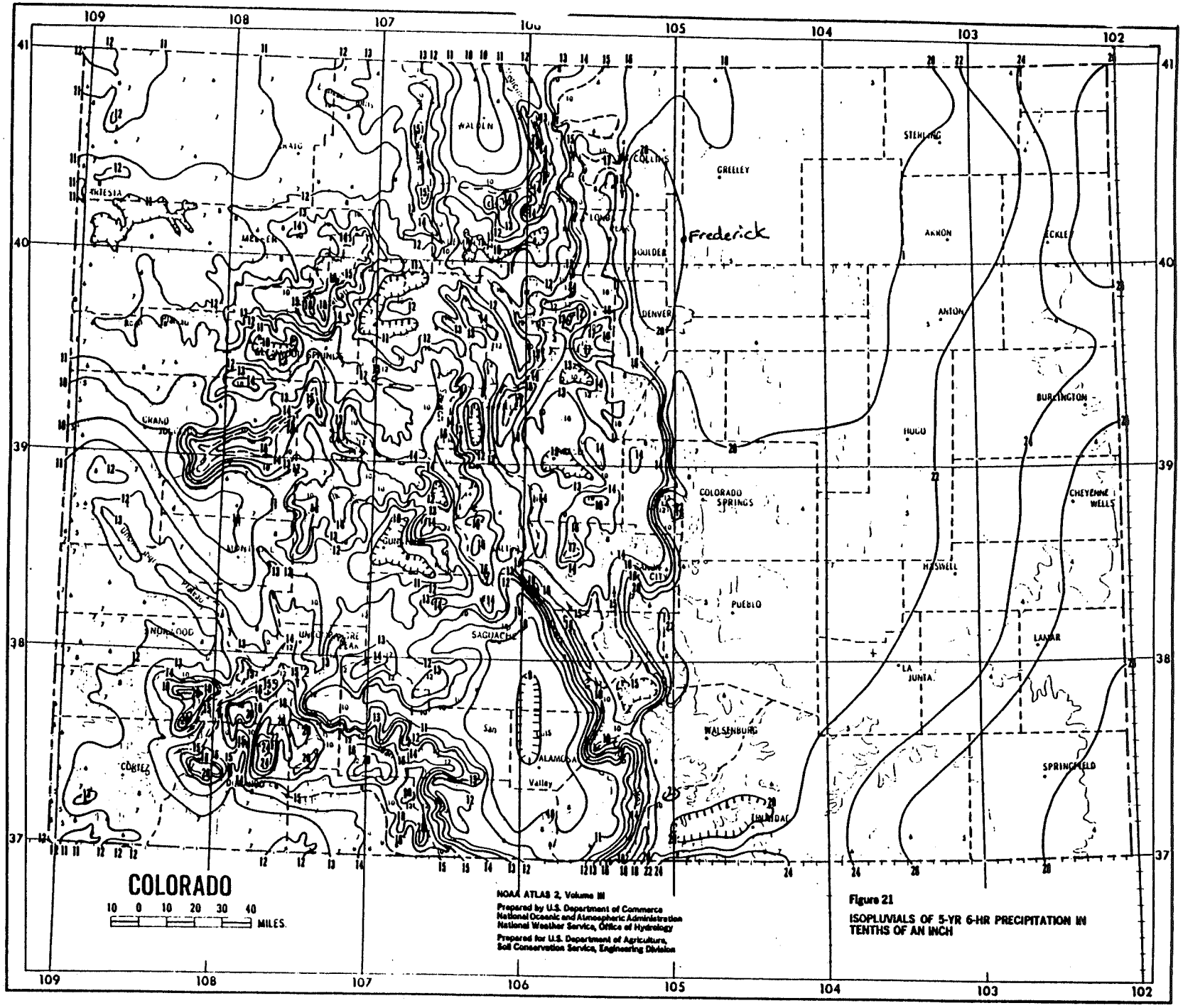

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Figure 21

ISOPLUVIALS OF 5-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH

12/20

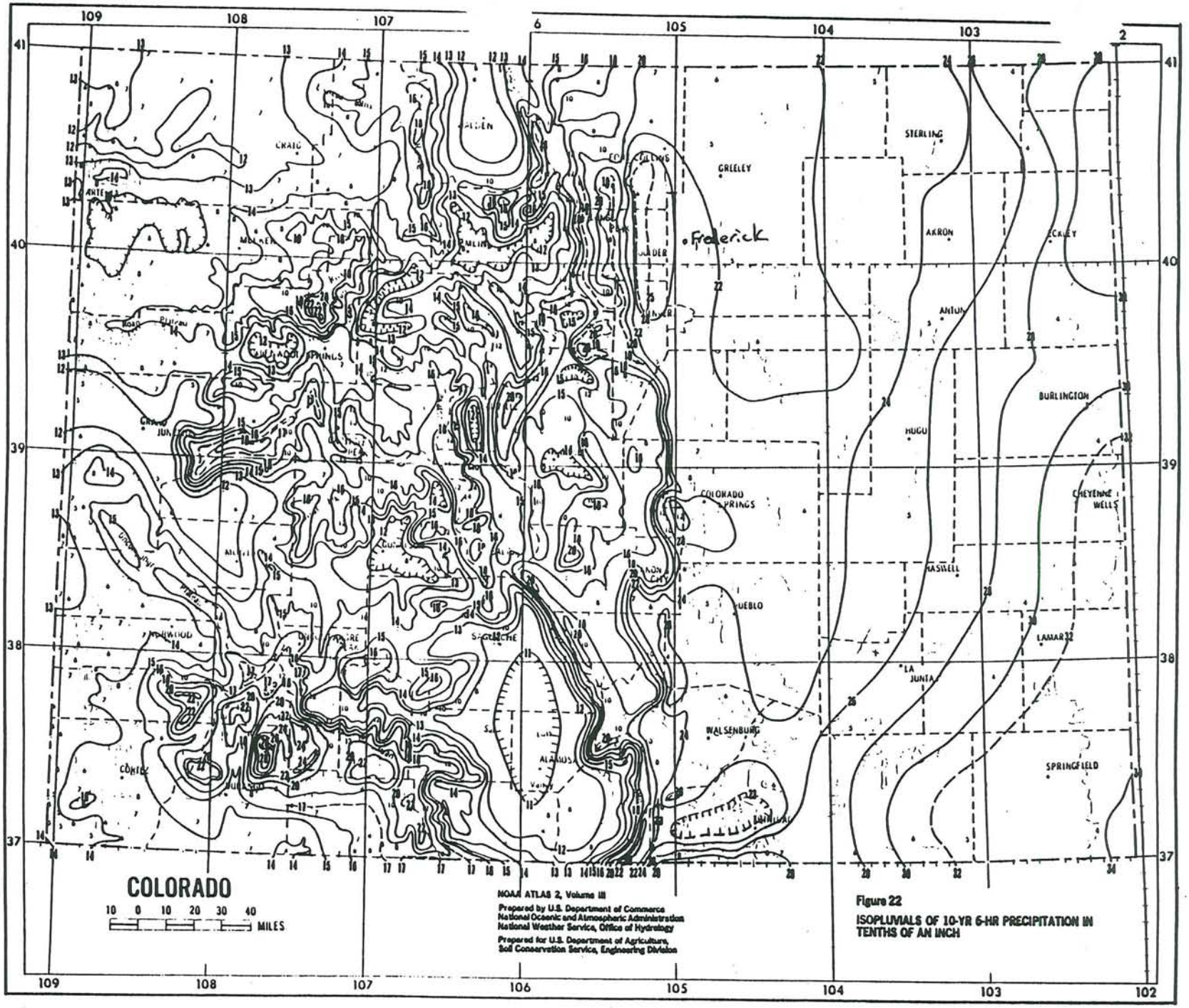

Figure 22

ISOPLUVIALS OF 10-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH

15/20

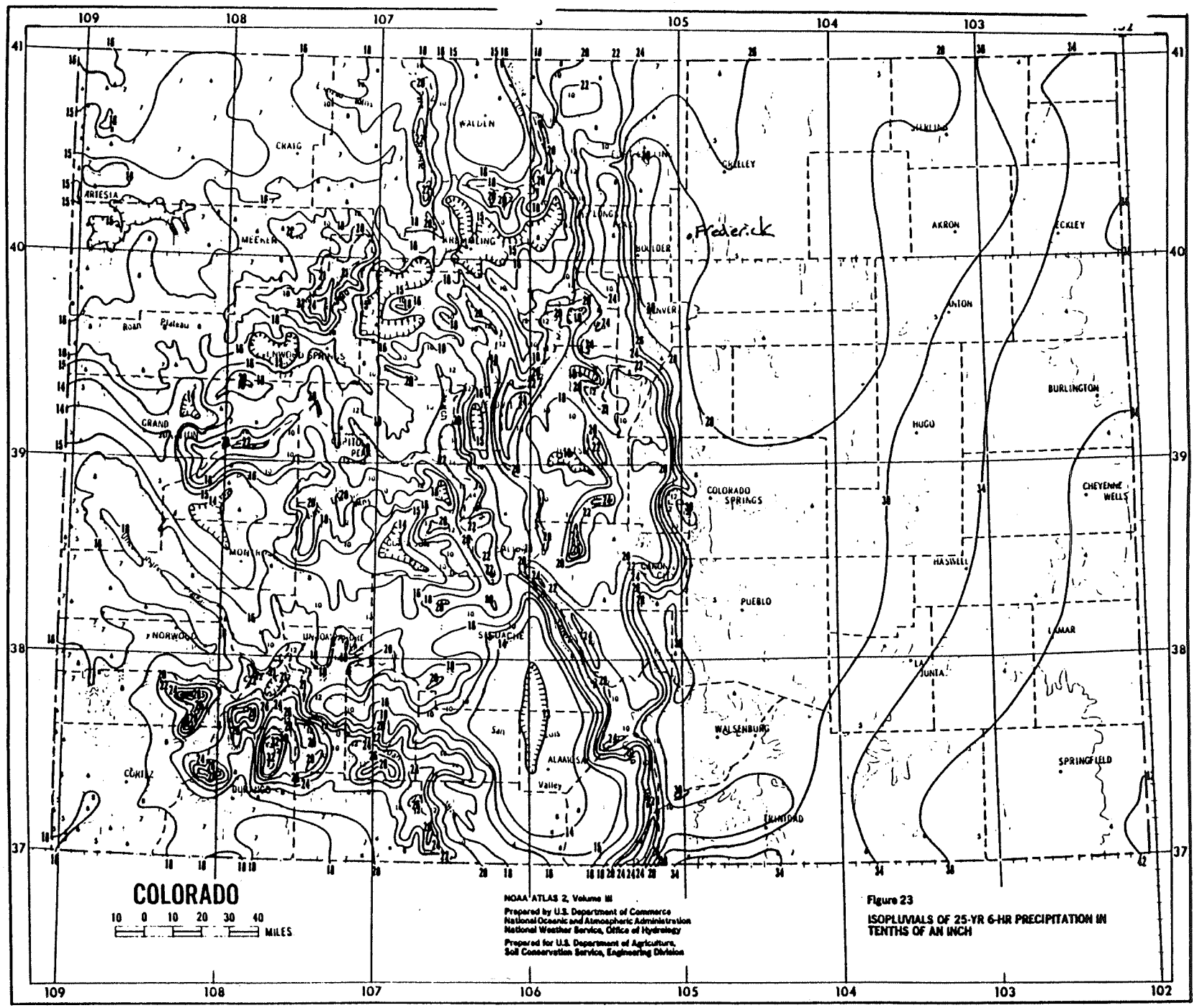

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Figure 23

ISOPLUVIALS OF 25-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH

14/20

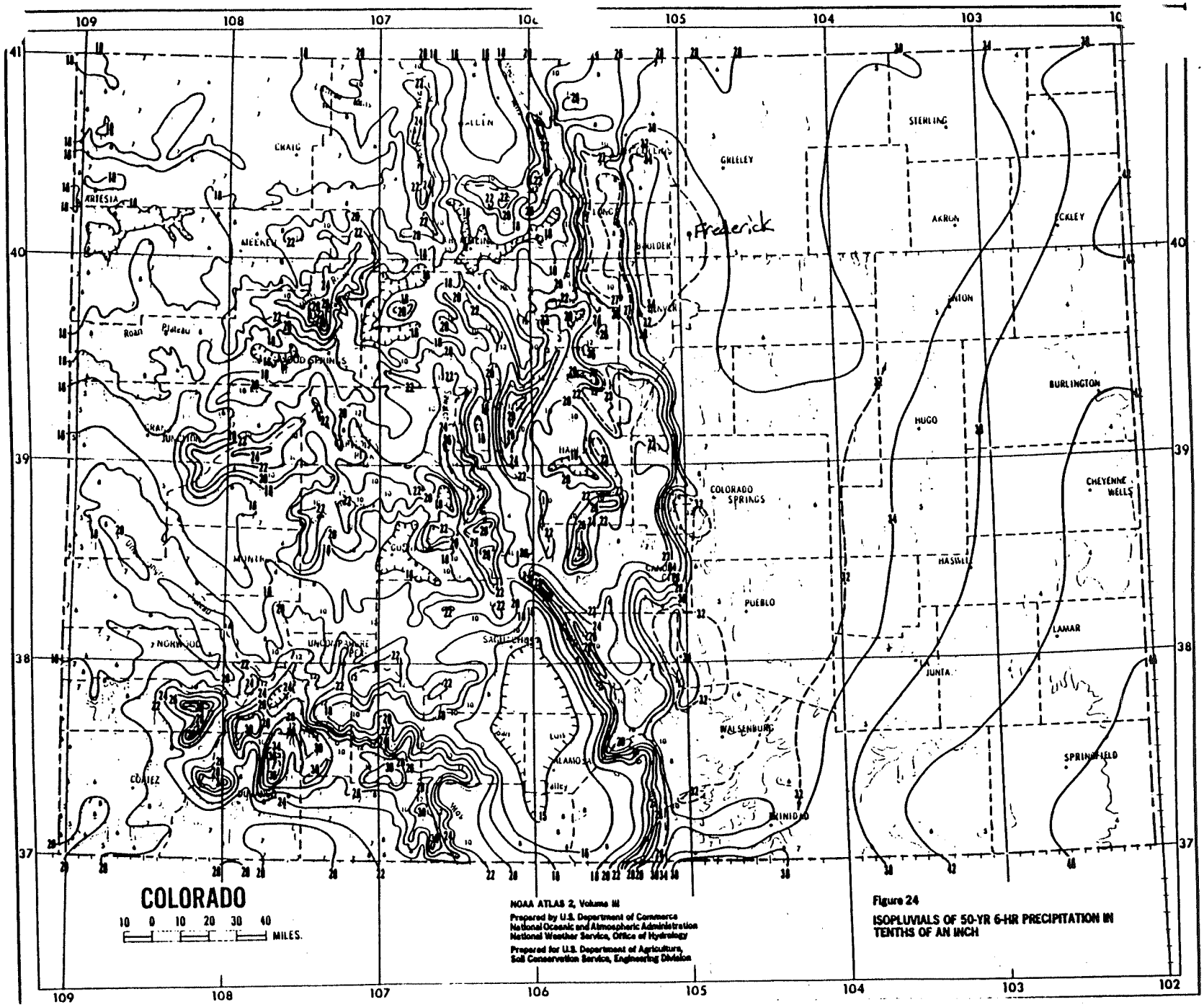

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Figure 24

ISOPLUVIALS OF 50-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH

15/20

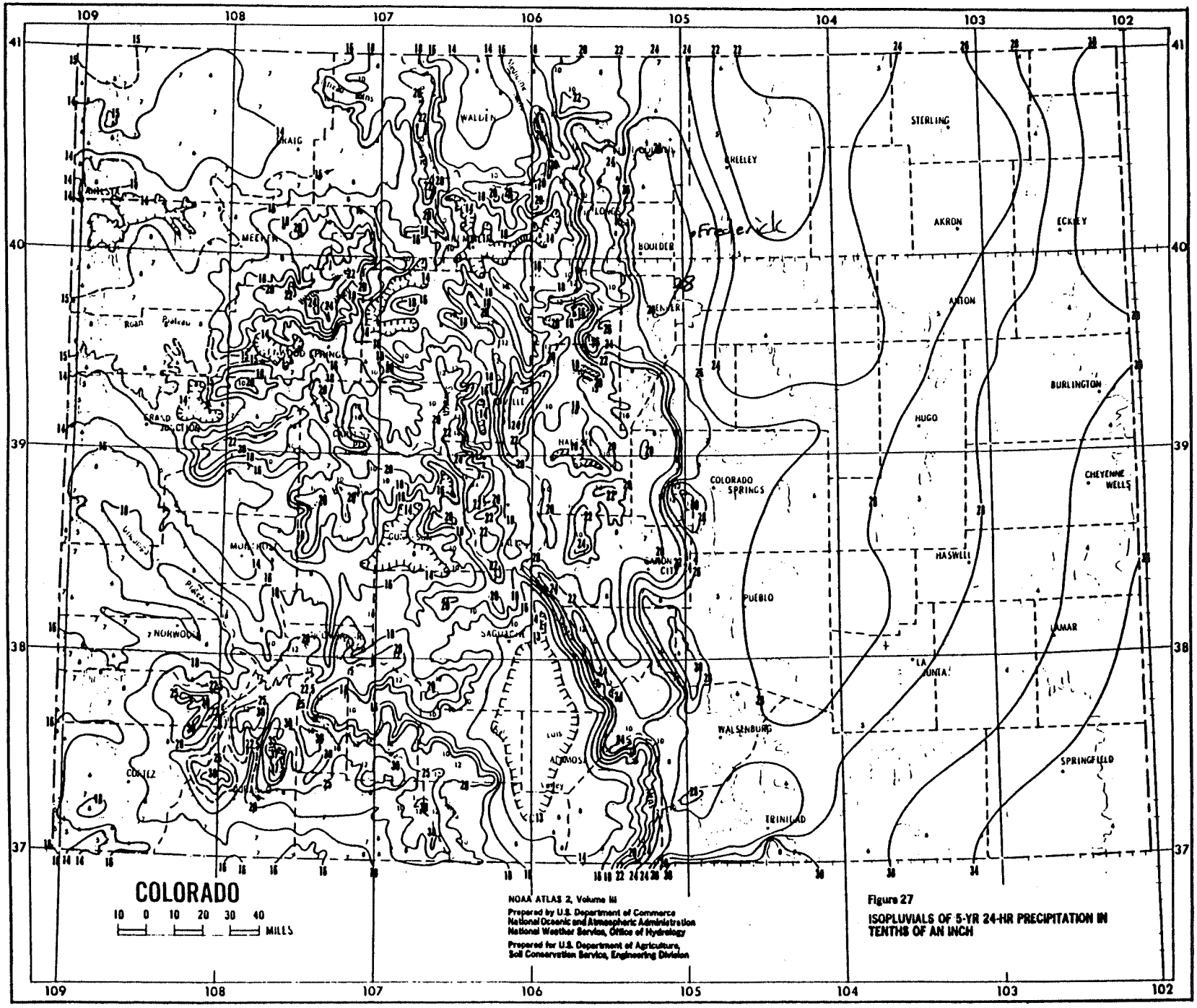

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Figure 27

ISOPLUVIALS OF 5-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH

161/20

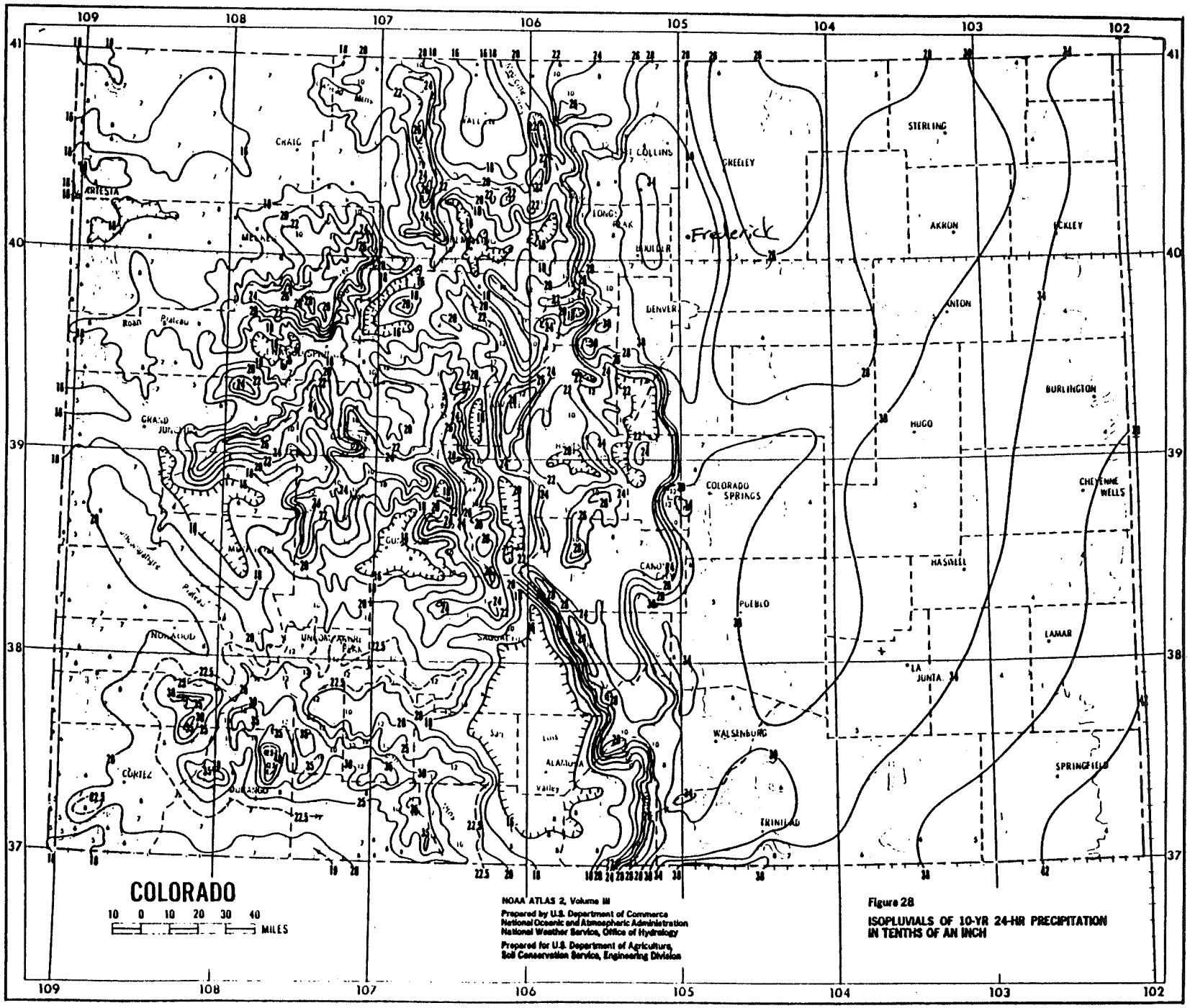

Figure 28

ISOPLUVIALS OF 10-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH

11/20

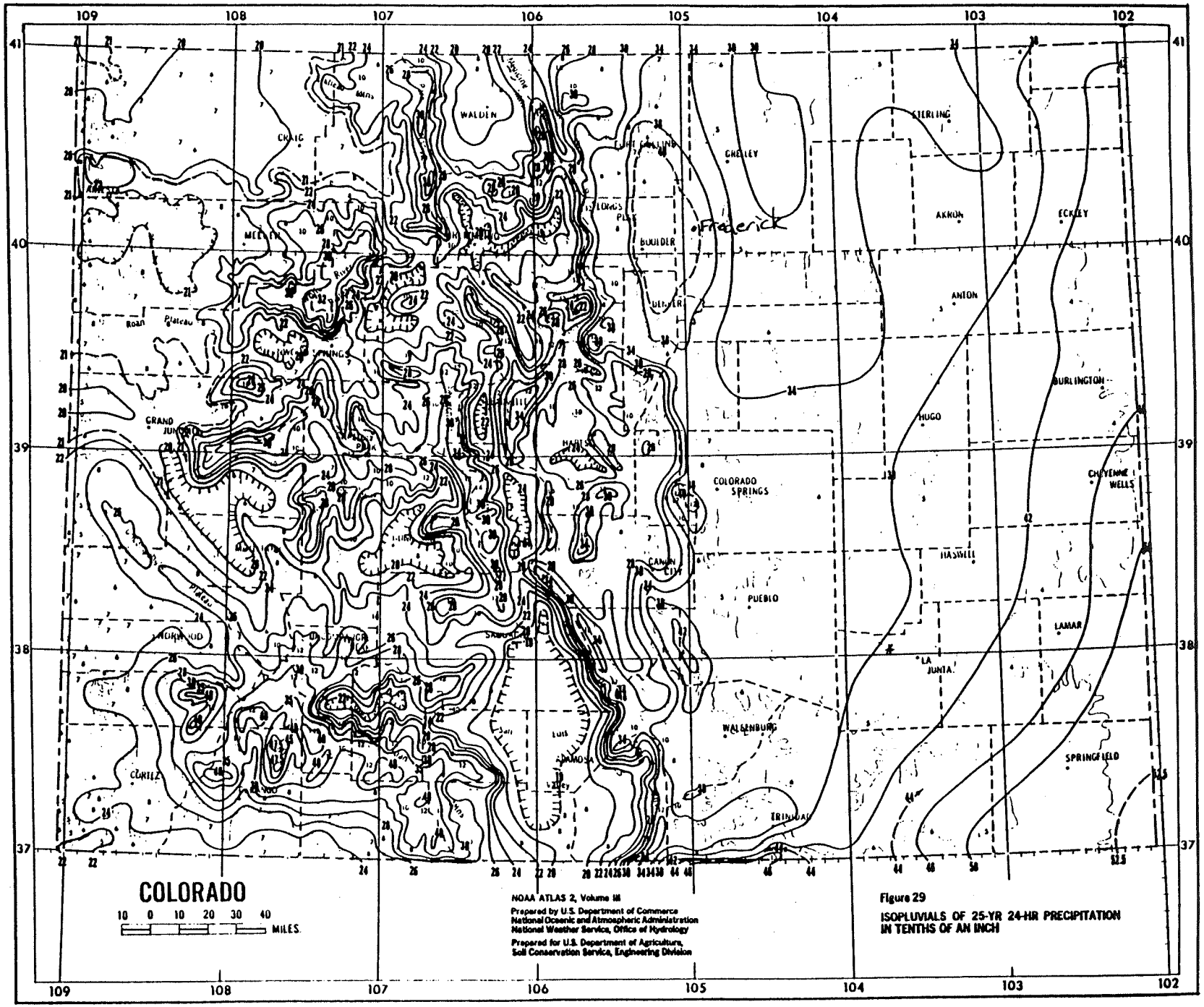

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Figure 29

ISOPLUVIALS OF 25-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH

18/20

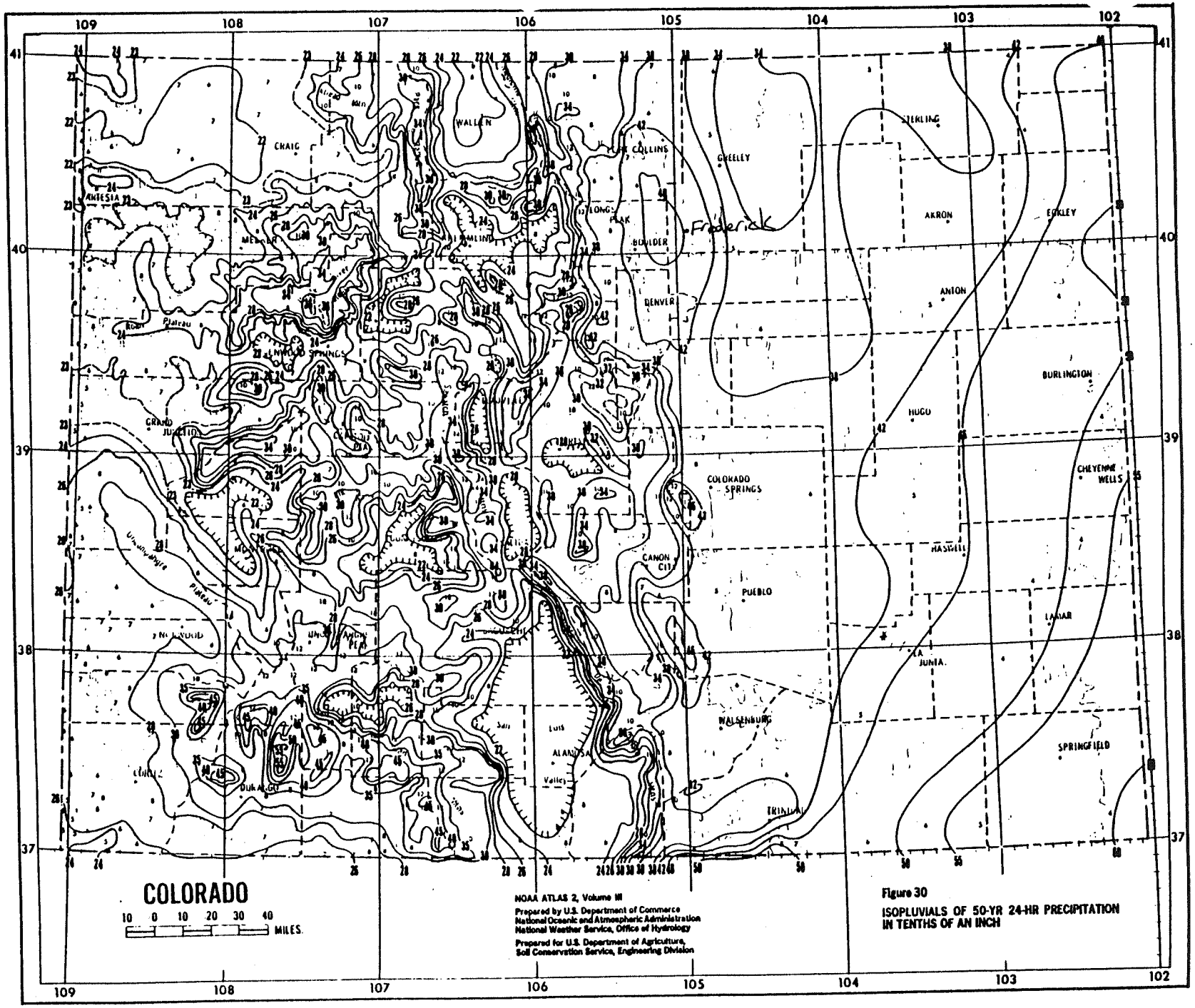
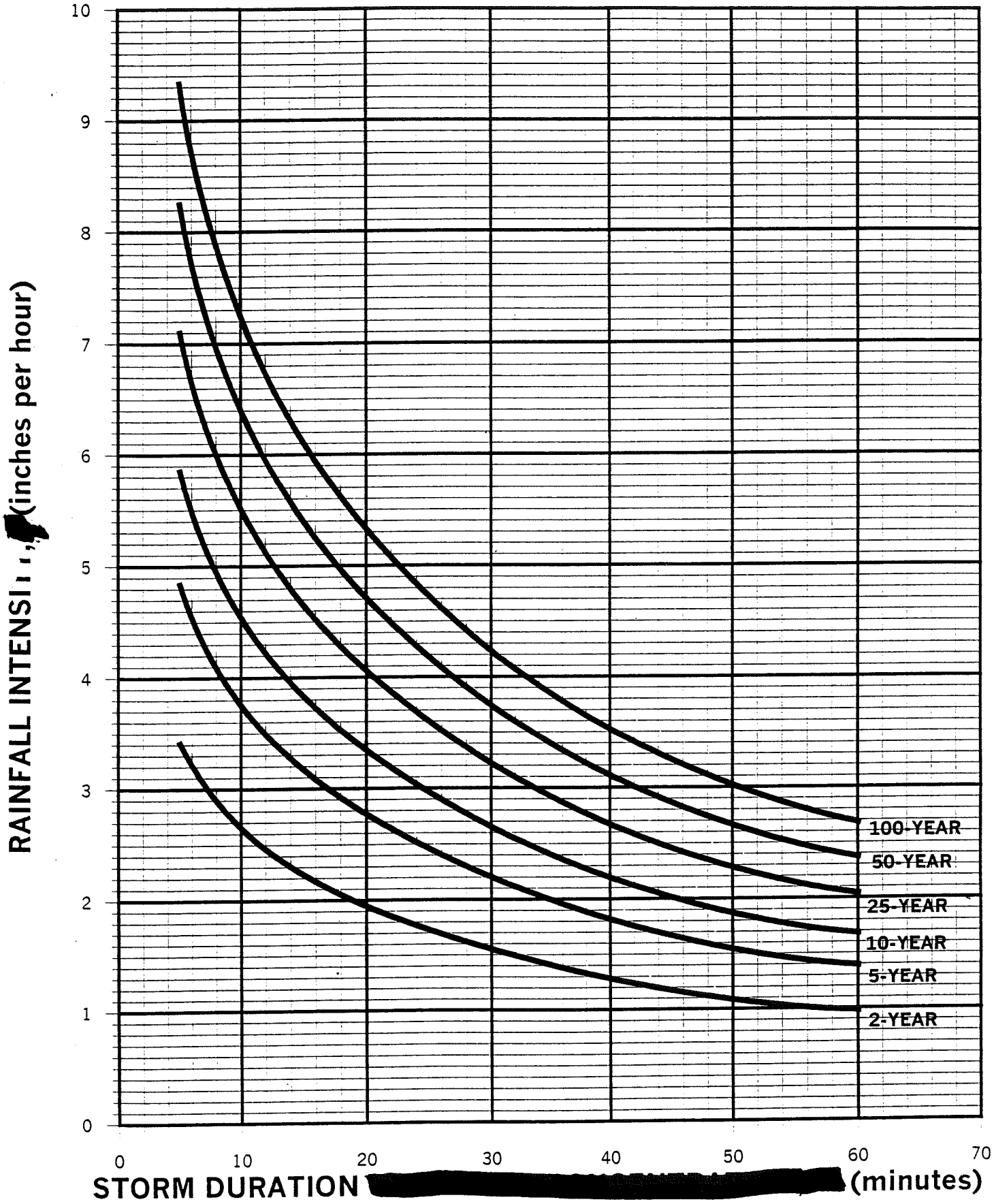


Figure 30
ISOPLUVIALS OF 50-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH

19/20

TIME - INTENSITY - FREQUENCY CURVES



REF: "Precipitation Frequency Atlas of the Western United States", NOAA 1973.

II-B.2

DISTRIBUTION

3. DESIGN STORM DISTRIBUTION FOR CUHP

3.1 Temporal Distribution

The 1982 version of the CUHP (see RUNOFF) was designed to be used with THE NOAA 1-hour rainfall depths provided under 2.1. To obtain a temoral distribution for a design storm in the Denver region, the 1-hour depth is transferred into a 2-hour design storm by multiplying the 1-hour depth(s) by the percentages for each time increment given in Table 3-1. The resultant design storm(s) may then be used with the 1982 version of the CUHP.

3.2 Example: Develop a 2-Hour Design Storm

Develop a 2-hour, 10-year design storm using the 1-hour, 10-year depth of 1.6 inches from Example in 2.3. Set up a working table (Table 3-2) with columns for "Time", "Percent of 1-hour Rainfall", and "Incremental Rainfall". Take the "Percent of 1-Hour NOAA Rainfall Atlas Depth" for the 10-year case from Table 3-1 and enter in the second column of Table 3-2. For each time increment multiply the 1.60-inch 1-hour depth by the value in the second lumn. After dividing the answer by 100 and rounding off to two decimal aces enter the result in the third column under "Incremental Rainfall". The third column then is the 5-minute incremental tabulation of the 10-year design rainfall.

You will note that the total of all the incremental depths for the first hour does not agree with the 1-hour depth of 1.60-inches from Example in Section 3.2. Do not be alarmed. The temporal distribution was calibrated to work with the CUHP procedure and the first hour of the design storm is not intended to be the same as the 1-hour depth obtained from the NOAA Atlas. Nevertheless, the NOAA Atlas value is "imbeded" in the most intense portion of the 2-hour design storm.

Table 3-1

Design Storm Distributions of 1-Hour NOAA Atlas Depths

Time Minutes	Percent of 1-Hour NOAA Rainfall Atlas Depth				
	2-year	5-year	10-year	50-year	100-year
5	2.0	2.0	2.0	1.3	1.0
10	4.0	3.7	3.7	3.5	3.0
15	8.4	8.7	8.2	5.0	4.6
20	16.0	15.3	15.0	8.0	8.0
25	25.0	25.0	25.0	15.0	14.0
30	14.0	13.0	12.0	25.0	25.0
35	6.3	5.8	5.6	12.0	14.0
40	5.0	4.4	4.3	8.0	8.0
45	3.0	3.6	3.8	5.0	6.2
50	3.0	3.6	3.2	5.0	5.0
55	3.0	3.0	3.2	3.2	4.0
60	3.0	3.0	3.2	3.2	4.0
65	3.0	3.0	3.2	3.2	4.0
70	2.0	3.0	3.2	2.4	2.0
75	2.0	2.5	3.2	2.4	2.0
80	2.0	2.2	2.5	1.8	1.2
85	2.0	2.2	1.9	1.8	1.2
90	2.0	2.2	1.9	1.4	1.2
95	2.0	2.2	1.9	1.4	1.2
100	2.0	1.5	1.9	1.4	1.2
105	2.0	1.5	1.9	1.4	1.2
110	2.0	1.5	1.9	1.4	1.2
115	1.0	1.5	1.7	1.4	1.2
120	1.0	1.3	1.3	1.4	1.2
Totals	115.7	115.7	115.7	115.6	115.6

Table 3-2

Example 3.2 Design Storm Calculation 2-HOUR, 10-YR

10-Year Design Storm
1-Hour Depth = 1.60 Inches

Time (Minutes)	Percent of 1-Hour Rainfall	Incremental Rainfall - Inches
5	2.0	0.03
10	3.7	0.06
15	8.2	0.13
20	15.0	0.24
25	25.0	0.40
30	12.0	0.19
35	5.6	0.09
40	4.3	0.07
45	3.8	0.06
50	3.2	0.05
55	3.2	0.05
60	3.2	0.05
65	3.2	0.05
70	3.2	0.05
75	3.2	0.05
80	2.5	0.04
85	1.9	0.03
90	1.9	0.03
95	1.9	0.03
100	1.9	0.03
105	1.9	0.03
110	1.9	0.03
115	1.7	0.03
120	1.3	0.02
Total	115.7	1.84*

* Note that the 2-hour total is close, but not exactly the same value of the 2-hour, 10-year depth shown in example in 2.1.2. These small differances are considered to be acceptable.

4. ADJUSTMENTS FOR LARGER WATERSHEDS

4.1 Adjustments for Larger Watersheds

As the watershed size increases, it is necessary to also increase the duration of the design storm and to adjust for its distribution. Whenever a duration of more than 2-hours is required, it is recommended for the Denver region that the difference between the rainfall depth at 2-hour duration and the depth at greater than 2-hour duration be distributed uniformly at the end of the 2-hour storm. It is also recommended that the design storm duration and the need for area adjustment be done in accordance with Table 4-1.

Table 4-1

Recommended Area-Storm Duration Adjustments

Watershed Area Square Miles	Minimum Duration	Need for Area Adjustment
Less than 5.0	2 hours	No
5.0 to 10.0	2 hours	Yes
10.0 to 20.0	3 hours	Yes
20.0 or larger	6 hours	Yes

The NOAA Atlas (1) provides guidelines for adjusting the rainfall depths with increasing area. Area-depth adjustments are given in the Atlas for durations of ½-, 1-, 3-, 6- and 24-hours and Figure 4-1 was taken from the NOAA Atlas. The 15-minute curve was mathematically extrapolated by UDFCD from the information on Figure 4-1. The fast response times of urbanized watersheds and sharp rainstorm distribution gradients in the Denver area require adjustments of rainfall depths for durations that are less than ½-hour.

The area adjustment procedure can be tedious and time consuming; therefore Table 4-2 is provided to assist the engineer with the area-depth adjustment calculations. To adjust the design storm distribution to account for the averaging effects of larger watersheds, follow these 3 steps:

Step 1 - Begin with the unadjusted design rainstorm

Step 2 - On the basis of total watershed size select the appropriate column(s) of adjustment coefficients in Table 4-2.

Table 4-2

Area Adjustment Factors For Design Rainfall Distributions

Time Minutes	2-, 5- and 10-year Design Rainfall					50- and 100-year Design Rainfall				
	Area - Square Miles					Area - Square Miles				
	5-10	10-20	20-30	30-50	50-75	5-10	10-20	20-30	30-50	50-75
5	1.00	1.00	1.00	1.10	1.00	1.00	1.00	1.00	1.05	1.10
10	1.00	1.00	1.00	1.05	1.10	1.00	1.00	1.00	1.05	1.10
15	1.00	1.00	1.00	1.05	1.00	1.00	1.00	1.00	1.05	1.10
20	0.96	0.90	0.81	0.74	0.62	1.00	1.00	1.00	1.05	1.00
25	0.96	0.90	0.81	0.74	0.62	0.96	0.90	0.81	0.74	0.60
30	0.96	0.90	0.81	0.74	0.62	0.96	0.90	0.81	0.74	0.60
35	1.00	1.00	1.00	1.05	1.00	0.96	0.90	0.81	0.74	0.70
40	1.00	1.00	1.00	1.05	1.10	1.00	1.00	1.00	1.05	1.00
45	1.00	1.00	1.00	1.05	1.10	1.00	1.00	1.00	1.05	1.10
50	1.00	1.00	1.00	1.05	1.10	1.00	1.00	1.00	1.05	1.10
55	1.00	1.00	1.00	1.05	1.10	1.00	1.00	1.00	1.05	1.10
60	1.00	1.00	1.00	1.05	1.10	1.00	1.00	1.00	1.05	1.10
65 - 120	1.00	1.00	1.00	1.05	1.10	1.00	1.00	1.00	1.05	1.10
125 - 180	N/A	1.00	1.15	1.20	1.40	N/A	1.00	1.15	1.20	1.40
185 - 360	N/A	N/A	1.15	1.20	1.20	N/A	N/A	1.15	1.20	1.20

Step 3 - Multiply each incremental design storm depth by an adjustment factor for that time increment.

4.2 Example: Area Adjustment of Design Storm

Adjust the 2-hour, 10-year design storm developed for Example 3.2 for a watershed area of 11.0 square miles. First convert the 2-hour storm into a 3-hour storm as recommended by Table 4-1. Do this by subtracting the 2-hour rainfall total in Table 3-2 from the 3-hour depth given in Section 2.3:

1.99 - 1.84 = 0.15 inches

Divide 0.15 inches by 12 (i.e. 12 time increments of 5-minutes each in the 1-hour past the 2-hour storm):

0.15 / 12 = 0.0125-inches/5-minutes

Use 0.02-inches for each 5-minute increment between 125 and 135 minutes of the design storm and 0.01-inches for each 5-minutes for the remainder of e 3-hour storm.

Next, set up a Table 4-3 using the area adjustment factors for 10-year design rainfall and 10 to 20 square mile area. Calculate the area adjusted design storm using the steps outlined in Section 4.1.

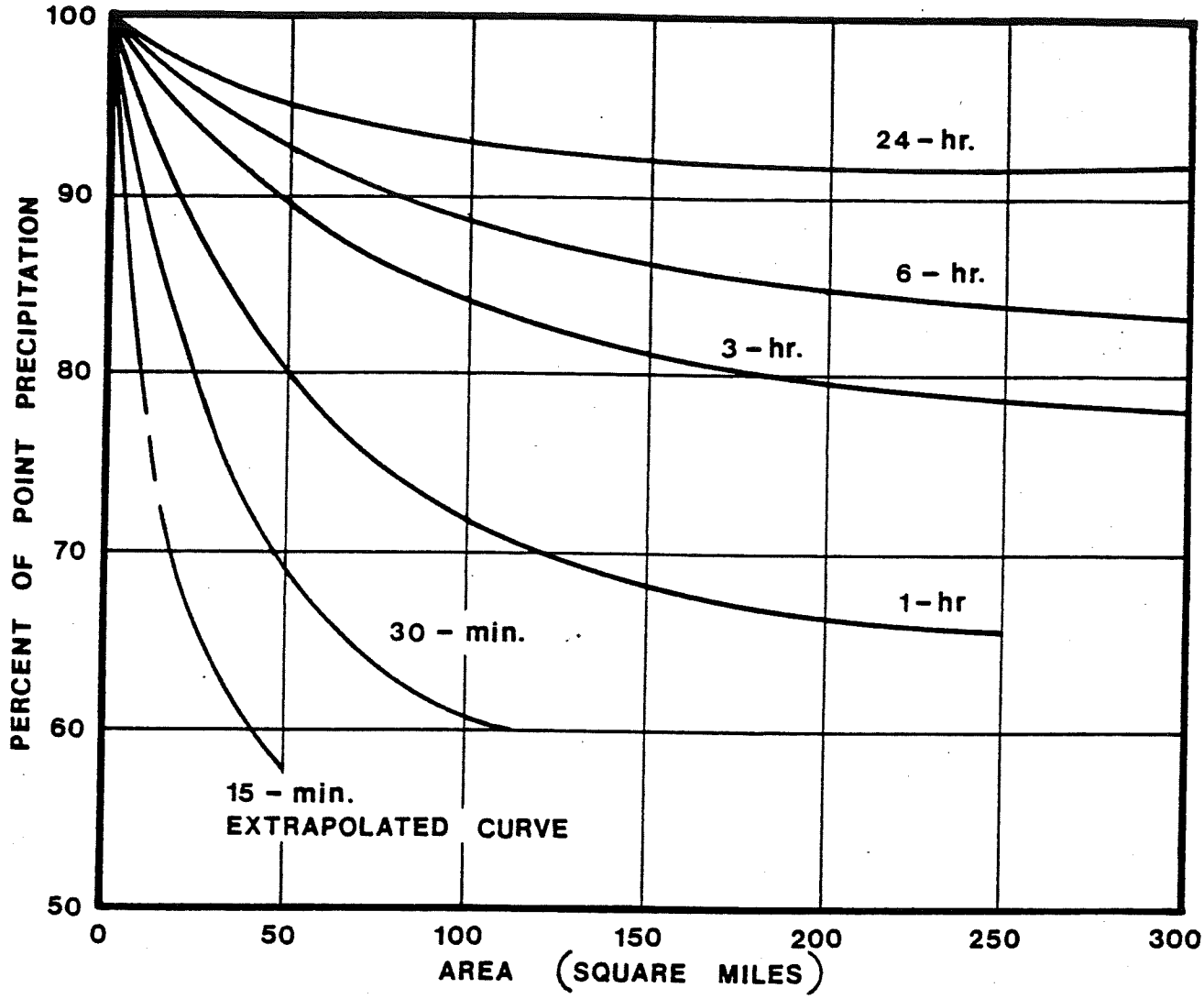


FIGURE 4-1. DEPTH - AREA ADJUSTMENT CURVES

SOURCE: NOAA ATLAS 2, VOL III COLORADO, 1973

5-1-84

URBAN DRAINAGE & FLOOD CONTROL DISTRICT

Table 4-3

Example 4.2 Area Adjusted Design Storm

10-year Design Storms

Time (minutes)	Unadjusted Depths - (Inches)	Adjustment Factor	Adjusted Depths - (Inches)
5	.03	1.0	.03
10	.06	1.0	.06
15	.13	1.0	.13
20	.24	0.90	.22
25	.40	0.90	.36
30	.19	0.90	.18
35	.09	1.0	.09
40	.07	1.0	.07
45	.06	1.0	.06
50	.05	1.0	.05
55	.05	1.0	.05
60	.05	1.0	.05
65	.05	1.0	.05
70	.05	1.0	.05
75	.05	1.0	.05
80	.04	1.0	.04
85	.03	1.0	.03
90	.03	1.0	.03
95	.03	1.0	.03
100	.03	1.0	.03
105	.03	1.0	.03
110	.03	1.0	.03
115	.03	1.0	.03
120	.02	1.0	.02
125	.02	1.0	.02
130	.02	1.0	.02
135	.02	1.0	.02
140	.01	1.0	.01
145	.01	1.0	.01
150	.01	1.0	.01
155	.01	1.0	.01
160	.01	1.0	.01
165	.01	1.0	.01
170	.01	1.0	.01
175	.01	1.0	.01
180	.01	1.0	.01
Total	1.99	N/A	1.92

PROJECT: WELD COUNTY I-25 CORRIDOR MASTER DRAINAGE PLAN
SUBJECT: CUHP STORM DISTRIBUTION

BY: CJP
DATE: 04/19/99

Table 3-1 2-Hour Design Storm Distributions of 1-Hour NOAA Atlas Depth

Time (min)	Percent of 1-Hour NOAA Rainfall Atlas Depth 2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
5	2.0	2.0	2.0	1.5	1.3	1.0
10	4.0	3.7	3.7	3.6	3.5	3.0
15	8.4	8.7	8.2	5.2	5.0	4.6
20	16.0	15.3	15.0	8.2	8.0	8.0
25	25.0	25.0	25.0	16.0	15.0	14.0
30	14.0	13.0	12.0	25.0	25.0	25.0
35	6.3	5.8	5.6	10.0	12.0	14.0
40	5.0	4.4	4.3	7.4	8.0	8.0
45	3.0	3.6	3.8	4.4	5.0	6.2
50	3.0	3.6	3.2	4.1	5.0	5.0
55	3.0	3.0	3.2	3.2	3.2	4.0
60	3.0	3.0	3.2	3.2	3.2	4.0
65	3.0	3.0	3.2	3.2	3.2	4.0
70	2.0	3.0	3.2	2.8	2.4	2.0
75	2.0	2.5	3.2	2.8	2.4	2.0
80	2.0	2.2	2.5	2.2	1.8	1.2
85	2.0	2.2	1.9	1.9	1.8	1.2
90	2.0	2.2	1.9	1.7	1.4	1.2
95	2.0	2.2	1.9	1.7	1.4	1.2
100	2.0	1.5	1.9	1.7	1.4	1.2
105	2.0	1.5	1.9	1.7	1.4	1.2
110	2.0	1.5	1.9	1.7	1.4	1.2
115	1.0	1.5	1.7	1.6	1.4	1.2
120	1.0	1.3	1.3	1.4	1.4	1.2
Totals	115.7	115.7	115.7	115.7	115.6	115.6

Table 3-2 2-Hour Design Storm Calculation

	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
1-Hour Depth = (inches)	**0.98**	**1.39**	**1.68**	**2.04**	**2.37**	**2.68**
Time (min)	Incremental Rainfall (inches) 2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
5	0.02	0.03	0.03	0.03	0.03	0.03
10	0.04	0.05	0.06	0.07	0.08	0.08
15	0.08	0.12	0.14	0.11	0.12	0.12
20	0.16	0.21	0.25	0.17	0.19	0.21
25	0.25	0.35	0.42	0.33	0.36	0.38
30	0.14	0.18	0.20	0.51	0.59	0.67
35	0.06	0.08	0.09	0.20	0.28	0.38
40	0.05	0.06	0.07	0.15	0.19	0.21
45	0.03	0.05	0.06	0.09	0.12	0.17
50	0.03	0.05	0.05	0.08	0.12	0.13
55	0.03	0.04	0.05	0.07	0.08	0.11
60	0.03	0.04	0.05	0.07	0.08	0.11
65	0.03	0.04	0.05	0.07	0.08	0.11
70	0.02	0.04	0.05	0.06	0.06	0.05
75	0.02	0.03	0.05	0.06	0.06	0.05
80	0.02	0.03	0.04	0.04	0.04	0.03
85	0.02	0.03	0.03	0.04	0.04	0.03
90	0.02	0.03	0.03	0.03	0.03	0.03
95	0.02	0.03	0.03	0.03	0.03	0.03
100	0.02	0.02	0.03	0.03	0.03	0.03
105	0.02	0.02	0.03	0.03	0.03	0.03
110	0.02	0.02	0.03	0.03	0.03	0.03
115	0.01	0.02	0.03	0.03	0.03	0.03
120	0.01	0.02	0.02	0.03	0.03	0.03
Totals	1.13	1.61	1.94	2.36	2.74	3.10

Unadjusted 3-Hour Depths (inches)

	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
3-Hour Depth =	**1.29**	**1.75**	**2.08**	**2.54**	**2.90**	**3.29**
2-Hour Depth =	1.13	1.61	1.94	2.36	2.74	3.10
Time (min)	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
5	0.02	0.03	0.03	0.03	0.03	0.03
10	0.04	0.05	0.06	0.07	0.08	0.08
15	0.08	0.12	0.14	0.11	0.12	0.12
20	0.16	0.21	0.25	0.17	0.19	0.21
25	0.25	0.35	0.42	0.33	0.36	0.38
30	0.14	0.18	0.20	0.51	0.59	0.67
35	0.06	0.08	0.09	0.20	0.28	0.38
40	0.05	0.06	0.07	0.15	0.19	0.21
45	0.03	0.05	0.06	0.09	0.12	0.17
50	0.03	0.05	0.05	0.08	0.12	0.13
55	0.03	0.04	0.05	0.07	0.08	0.11
60	0.03	0.04	0.05	0.07	0.08	0.11
65	0.03	0.04	0.05	0.07	0.08	0.11
70	0.02	0.04	0.05	0.06	0.06	0.05
75	0.02	0.03	0.05	0.06	0.06	0.05
80	0.02	0.03	0.04	0.04	0.04	0.03
85	0.02	0.03	0.03	0.04	0.04	0.03
90	0.02	0.03	0.03	0.03	0.03	0.03
95	0.02	0.03	0.03	0.03	0.03	0.03
100	0.02	0.02	0.03	0.03	0.03	0.03
105	0.02	0.02	0.03	0.03	0.03	0.03
110	0.02	0.02	0.03	0.03	0.03	0.03
115	0.01	0.02	0.03	0.03	0.03	0.03
120	0.01	0.02	0.02	0.03	0.03	0.03
125	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**
130	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**
135	**0.02**	**0.01**	**0.01**	**0.02**	**0.02**	**0.02**
140	**0.02**	**0.01**	**0.01**	**0.02**	**0.01**	**0.02**
145	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.02**
150	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.02**
155	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
160	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
165	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
170	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
175	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
180	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
TotalS	1.29	1.75	2.08	2.52	2.89	3.28
Error	0.3%	-0.1%	0.2%	-0.7%	-0.4%	-0.4%

Table 4-2 Area Adjustment Factors for Design Rainfall Distributions

	2-, 5- and 10-year Design Rainfall Area - (square miles) 5-10	10-20	20-30	30-50	50-75	50- and 100-year Design Rainfall Area - (square miles) 5-10	10-20	20-30	30-50	50-75
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		0.90					1.00			
		0.90					0.90			
		0.90					0.90			
		1.00					0.90			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			
		1.00					1.00			

Table 4-3 Adjusted 3-Hour Depths (inches)

	10-20 square mile area 2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
	0.02	0.03	0.03	0.03	0.03	0.03
	0.04	0.05	0.06	0.07	0.08	0.08
	0.08	0.12	0.14	0.11	0.12	0.12
	0.14	0.19	0.23	0.17	0.19	0.21
	0.22	0.31	0.38	0.29	0.32	0.34
	0.12	0.16	0.18	0.46	0.53	0.60
	0.06	0.08	0.09	0.18	0.26	0.34
	0.05	0.06	0.07	0.15	0.19	0.21
	0.03	0.05	0.06	0.09	0.12	0.17
	0.03	0.05	0.05	0.08	0.12	0.13
	0.03	0.04	0.05	0.07	0.08	0.11
	0.03	0.04	0.05	0.07	0.08	0.11
	0.03	0.04	0.05	0.07	0.08	0.11
	0.02	0.04	0.05	0.06	0.06	0.05
	0.02	0.03	0.05	0.06	0.06	0.05
	0.02	0.03	0.04	0.04	0.04	0.03
	0.02	0.03	0.03	0.04	0.04	0.03
	0.02	0.03	0.03	0.03	0.03	0.03
	0.02	0.03	0.03	0.03	0.03	0.03
	0.02	0.02	0.03	0.03	0.03	0.03
	0.02	0.02	0.03	0.03	0.03	0.03
	0.02	0.02	0.03	0.03	0.03	0.03
	0.01	0.02	0.03	0.03	0.03	0.03
	0.01	0.02	0.02	0.03	0.03	0.03
	0.02	0.02	0.02	0.02	0.02	0.02
	0.02	0.02	0.02	0.02	0.02	0.02
	0.02	0.01	0.01	0.02	0.02	0.02
	0.02	0.01	0.01	0.02	0.01	0.02
	0.01	0.01	0.01	0.01	0.01	0.02
	0.01	0.01	0.01	0.01	0.01	0.02
	0.01	0.01	0.01	0.01	0.01	0.01
	0.01	0.01	0.01	0.01	0.01	0.01
	0.01	0.01	0.01	0.01	0.01	0.01
	0.01	0.01	0.01	0.01	0.01	0.01
	0.01	0.01	0.01	0.01	0.01	0.01
	0.01	0.01	0.01	0.01	0.01	0.01
	1.24	1.67	2.00	2.42	2.77	3.14

NOTES:

1. BOLD VALUES MANUALLY INPUT
2. 1-HOUR AND 3-HOUR DEPTHS FROM NOAA DEPTH ANALYSIS

9/19

II-C

CUHP MODEL INPUT PARAMETERS

Existing Conditions Land Use - Godding Hollow Basin

Basin ID	Parks/Open Space	SFR (very low)	SFR (low)	SFR (medium)	SFR (high)	Commercial	Total basin area
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
1	764.5		14.8				779.3
2	252.4		6.2			25.6	284.2
3	590.0	17.0	9.2			71.7	687.9
4	644.4	48.8	6.9			72.3	772.4
5	736.5	76.0				24.3	836.8
6	702.6	75.0				108.8	886.4
7	929.5	16.7					946.2
8	263.8	1.7					265.5
9	185.4						185.4
10	59.6					82.9	142.5
11	88.4					28.9	117.3
12	65.1						65.1
13	193.2						193.2
14	154.1						154.1
15	51.1	10.2					61.3
16	131.1						131.1
17	211.3	11.8					223.1
20	154.4						154.4
21	334.0	38.0					372.0
22	301.8					19.2	321.0
23	398.3	20.2					418.5
24	325.9	51.0					376.9
25	62.9	20.3					83.2
26	32.3	6.3					38.6
27	339.5	68.2					407.7
30	423.6	1.0				12.9	437.5
31	215.4						215.4
32	470.6	74.9				53.8	599.3
33	203.0	7.9					210.9
34	198.1					10.6	208.7
35	41.6					54.1	95.7
36	348.6						348.6
37	475.4					65.6	541.0
40	122.6	103.0					225.6
41	332.8	10.0					342.8
42	24.1	34.8				63.6	122.5
43	156.5						156.5

SFR = single family residence; the description indicates density of homes per acre

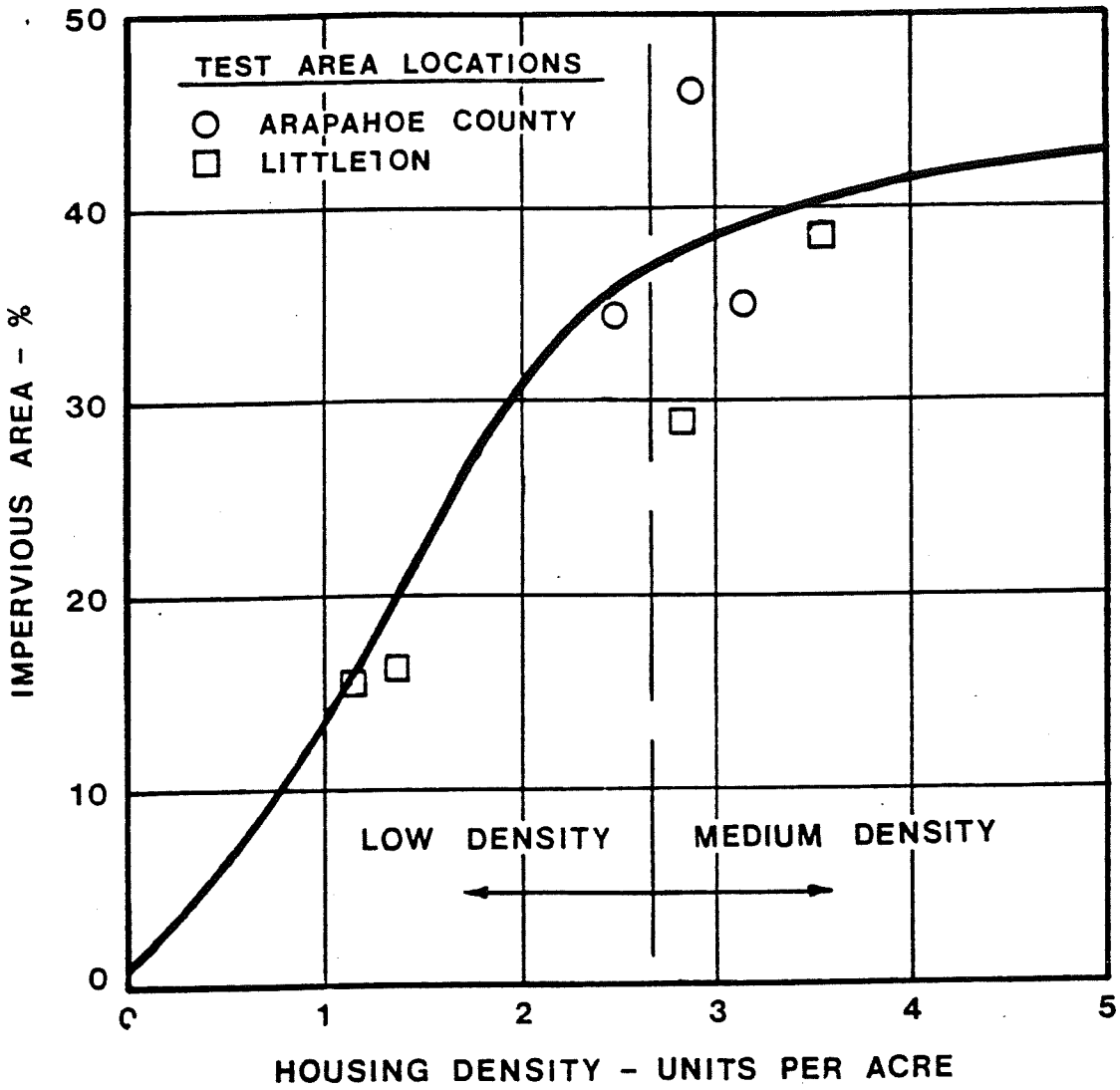


FIGURE 2-1. RESIDENTIAL HOUSING DENSITY
vs.
IMPERVIOUS AREA

$$f = f_o + (f_i - f_o)\, e^{-at} \qquad (2\text{-}1)$$

In which f = infiltration rate (inches/hour)
f_i = initial infiltration rate (inches/hour)
f_o = final infiltration rate (inches/hour)
e = natural logarithm base
a = decay coefficient (1/second)
t = time in seconds

In developing Equation 2-1 Horton observed that infiltration is high early in the storm and eventually decays to a steady state constant value as the pores in the soil become saturated. The coefficients and initial and final infiltration values are site specific and depend on the soils and vegetative cover complex. It is possible to develop these values for each site if sufficient rainfall/runoff observations are made. However, such an approach is not always practical.

The Urban Drainage and Flood Control District analyzed a considerable amount of rainfall/runoff data. On the basis of this analysis, the values in Table 2-2 are recommended for use within the District in conjunction with the 1982 version of the CUHP. The Soil Conservation Service (SCS) Hydrologic Soil Groups C and D occur most frequently within the District; however areas of SCS Group A and B soils are fairly common. Consult SCS Soil surveys for appropriate soil classifications.

TABLE 2-2

RECOMMENDED HORTON'S EQUATION PARAMETERS

SCS Hydrologic Soil Group	Infiltration (in/hr) Initial - f_i	Final - f_o	Decay Coefficient
A	5.0	1.0	0.0007
B	4.5	0.6	0.0018
C	3.0	0.5	0.0018
D	3.0	0.5	0.0018

To calculate the amount of maximum infiltration depths that may occur at each time increment, it is necessary to integrate Equation 2-1 and calculate the values for each time increment. Very little accuracy is lost if instead

TABLE 3-1 (42)

RECOMMENDED RUNOFF COEFFICIENTS AND PERCENT IMPERVIOUS

LAND USE OR SURFACE CHARACTERISTICS	PERCENT IMPERVIOUS	FREQUENCY 2	5	10	100
Business:					
Commercial Areas	95	.87	.87	.88	.89
Neighborhood Areas	70	.60	.65	.70	.80
Residential:					
Single-Family	*	.40	.45	.50	.60
Multi-Unit (detached)	50	.45	.50	.60	.70
Multi-Unit (attached)	70	.60	.65	.70	.80
1/2 Acre Lot or Larger	*	.30	.35	.40	.60
Apartments	70	.65	.70	.70	.80
Industrial:					
Light Areas	80	.71	.72	.76	.82
Heavy Acres	90	.80	.80	.85	.90
Parks, Cemetaries:	7	.10	.18	.25	.45
Playgrounds:	13	.15	.20	.30	.50
Schools:	50	.45	.50	.60	.70
Railroad Yard Areas	20	.20	.25	.35	.45
Undeveloped Areas:					
Historic Flow Analysis- Greenbelts, Agricultural	2	(See "Lawns")			
Offsite Flow Analysis (when land use not defined)	45	.43	.47	.55	.65
Streets:					
Paved	100	.87	.88	.90	.93
Gravel (Packed)	40	.40	.45	.50	.60
Drive and Walks:	96	.87	.87	.88	.89
Roofs:	90	.80	.85	.90	.90
Lawns, Sandy Soil	0	.00	.01	.05	.20
Lawns, Clayey Soil	0	.05	.15	.25	.50

NOTE: These Rational Formula coefficients may not be valid for large basins.

*See Figure 2-1 for percent impervious.

The CUHP model is sensitive to the "percent impervious" parameter. Since the value of this parameter depends, to a degree, on the density of the esidential development, Figure 2-1 is provided to assist in estimating the percent impervious values for low to medium density residential areas. It is based on the observed trends in the urbanized portions of the Urban Drainage and Flood Control District (39), and reflects the densities found in built-up areas. Figure 2-1 does not account for parks or large open areas.

2.2 Depression Losses

Rain water that is collected and held in small depressions and does not become part of the general surface runoff is called depression storage. Most of this water eventually infiltrates or is evaporated. Depression losses also include water intercepted by trees and bushes and water that is detained on the surface and does not run off. The CUHP Method in Chapter 4, requires numerical values of retention loss as input in calculating the effective rainfall. Table 2-1 can be used as a guide in estimating the amount of depression retention storage to be used with CUHP.

TABLE 2-1

TYPICAL DEPRESSION RETENTION FOR VARIOUS LAND COVERS
(all values in inches)
(For use with CUHP Method)

Land Cover	Depression & Detention	Recommended
Impervious:		
Large Paved Areas	0.05 - 0.15	0.1
Roofs - Flat	0.1 - 0.3	0.1
Roofs - Sloped	0.05 - 0.1	0.05
Pervious		
Lawn Grass	0.2 - 0.5	0.35
Wooded Area and Open Fields	0.2 - 0.6	0.4

When an area is analyzed for depression retention storage, the pervious and impervious storage values for all parts of the basin must be considered

Weld County I-25 Master Drainage Plan
Sub-basin information used for CUHP hydrologic model
Project number: CO-WELD-01

Godding Hollow Basin - Existing conditions

Sub-basin No.	Sub-basin Area (acres)	Sub-basin Area (mi^2)	Sub-basin Length (ft)	Sub-basin Length (miles)	Distance to Centroid (ft)	Distance to Centroid (miles)	Sub-basin % Impervious	Weighted Basin Slope (ft/ft)	Depression storage Perv. retention (in)	Depression storage Imp. retention (in)	Soil Type	Soil Type Area (acres)	Soil Type Area (%)	Infiltration rates Weighted Initial Rate (in/hr)	Infiltration rates Initial rate used for sub-basin (in/hr)	Infiltration rates Weighted Final Rate (in/hr)	Infiltration rates Final rate used for sub-basin (in/hr)	Decay coefficient
1	779.3	1.218	6000	1.136	1800	0.341	10.6	0.0043	0.4	0.1	B	9.9	1.27	0.1	3.0	0.0	0.5	0.0018
											C	69.9	8.97	0.3		0.0		
											D	699.5	89.76	2.7		0.4		
											Total:	779.3	100.0	3.0		0.5		
2	284.2	0.444	7000	1.326	3800	0.720	17.9	0.0029	0.4	0.1	B	17.3	6.09	0.3	3.1	0.0	0.5	0.0018
											C	161.9	56.97	1.7		0.3		
											D	105.0	36.95	1.1		0.2		
											Total:	284.2	100.0	3.1		0.5		
3	687.9	1.075	9700	1.837	3800	0.720	19.0	0.0065	0.4	0.1	A	22.9	3.33	0.2	3.8	0.0	0.6	0.0018
											B	334.9	48.68	2.2		0.3		
											C	151.3	21.99	0.7		0.1		
											D	178.8	25.99	0.8		0.1		
											Total:	687.9	100.0	3.8		0.6		
4	772.4	1.207	8700	1.648	3300	0.625	18.4	0.0080	0.4	0.1	B	668.9	86.60	3.9	4.3	0.5	0.6	0.0018
											C	103.5	13.40	0.4		0.1		
											Total:	772.4	100.0	4.3		0.6		
5	836.8	1.308	9100	1.723	3300	0.625	13.2	0.0074	0.4	0.1	B	533.5	63.75	2.9	4.0	0.4	0.6	0.0018
											C	288.9	34.52	1.0		0.2		
											D	14.4	1.72	0.1		0.0		
											Total:	836.8	100.0	4.0		0.6		
6	886.5	1.385	9300	1.761	3000	0.568	20.7	0.0069	0.4	0.1	B	684.5	77.21	3.5	4.2	0.5	0.6	0.0018
											C	202.0	22.79	0.7		0.1		
											Total:	886.5	100.0	4.2		0.6		
7	946.2	1.478	10400	1.970	3000	0.568	10.2	0.0071	0.4	0.1	B	516.5	54.59	2.5	3.8	0.3	0.6	0.0018
											C	429.7	45.41	1.4		0.2		
											Total:	946.2	100.0	3.8		0.6		
8	265.5	0.415	6500	1.231	1800	0.341	10.1	0.0102	0.4	0.1	B	84.9	31.98	1.4	3.5	0.2	0.5	0.0018
											C	180.6	68.02	2.0		0.3		
											Total:	265.5	100.0	3.5		0.5		
9	185.4	0.290	5900	1.117	1400	0.265	10.0	0.0114	0.4	0.1	B	33.8	18.23	0.8	3.3	0.1	0.5	0.0018
											C	151.6	81.77	2.5		0.4		
											Total:	185.4	100.0	3.3		0.5		
10	142.5	0.223	3400	0.644	800	0.152	56.5	0.0181	0.4	0.1	B	43.9	30.81	1.4	3.5	0.2	0.5	0.0018
											C	98.6	69.19	2.1		0.3		
											Total:	142.5	100.0	3.5		0.5		
11	117.3	0.183	3500	0.663	900	0.170	29.7	0.0123	0.4	0.1	B	0.8	0.68	0.0	3.0	0.0	0.5	0.0018
											C	116.5	99.32	3.0		0.5		
											Total:	117.3	100.0	3.0		0.5		
12	65.1	0.102	3400	0.644	1400	0.265	10.0	0.0125	0.4	0.1	C	65.1	100.00	3.0	3.0	0.5	0.5	0.0018
											Total:	65.1	100.0	3.0		0.5		
13	193.2	0.302	4400	0.833	1800	0.341	10.0	0.0186	0.4	0.1	C	193.2	100.00	3.0	3.0	0.5	0.5	0.0018
											Total:	193.2	100.0	3.0		0.5		
14	154.1	0.241	4300	0.814	1900	0.360	10.0	0.0188	0.4	0.1	C	154.1	100.00	3.0	3.0	0.5	0.5	0.0018
											Total:	154.1	100.0	3.0		0.5		
15	61.3	0.096	1950	0.369	700	0.133	11.7	0.0133	0.4	0.1	C	61.3	100.00	3.0	3.0	0.5	0.5	0.0018
											Total:	61.3	100.0	3.0		0.5		
16	131.1	0.205	3400	0.644	1600	0.303	10.0	0.0146	0.4	0.1	C	131.1	100.00	3.0	3.0	0.5	0.5	0.0018
											Total:	131.1	100.0	3.0		0.5		
17	223.1	0.349	4100	0.777	1500	0.284	10.5	0.0255	0.4	0.1	B	13.7	6.14	0.3	3.1	0.0	0.5	0.0018
											C	209.4	93.86	2.8		0.5		
											Total:	223.1	100.0	3.1		0.5		
20	154.4	0.241	4100	0.777	1800	0.341	10.0	0.0119	0.4	0.1	B	4.6	2.98	0.1	3.0	0.0	0.5	0.0018
											C	149.8	97.02	2.9		0.5		
											Total:	154.4	100.0	3.0		0.5		
21	372.0	0.581	6400	1.212	3000	0.568	11.0	0.0086	0.4	0.1	B	191.0	51.34	2.3	3.8	0.3	0.6	0.0018
											C	181.0	48.66	1.5		0.2		
											Total:	372.0	100.0	3.8		0.6		
22	321.0	0.502	5600	1.061	2700	0.511	14.8	0.0151	0.4	0.1	B	60.4	18.82	0.8	3.3	0.1	0.5	0.0018
											C	260.6	81.18	2.4		0.4		
											Total:	321.0	100.0	3.3		0.5		

Future Conditions - Godding Hollow Basin
Time of concentration calculations (for basins less than 90 acres only)

Sub-basin No.	Sub-basin Length (ft)	Time of concentration (T_c), min						
		2 year	5 year	10 year	25 year	50 year	100 year	
12	3700	30.56	30.56	30.56	30.56	30.56	30.56	urban procedure
15	2250	22.50	22.50	22.50	22.50	22.50	22.50	urban procedure
25	3300	28.33	28.33	28.33	28.33	28.33	28.33	urban procedure
26	3600	30.00	30.00	30.00	30.00	30.00	30.00	urban procedure

II-D

EXISTING CONDITION INPUT FILES

```
 1      Weld County I-25 Master Drainage Plan - Existing Conditions, ACE 4/99
01 2 YEAR   0.020.040.080.140.220.120.060.050.030.030.030.030.030.020.020.020.02
01 2 YEAR   0.020.020.020.020.020.010.010.020.020.020.020.010.010.010.010.010.01
01 2 YEAR   0.010.01

 701 1 05.GHSB1 001                                        0
1.2181.136.341 10.600.00400.00.4   .1   3.000.00180.500         00.00 0.00
 701 1 05.GHSB2 002
.444 1.326.72  17.900.00300.00.4   .1   3.100.00180.500         0
 701 1 05.GHSB3 003
1.0751.837.72  19.000.00700.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB4 004
1.2071.648.625 18.400.00800.00.4   .1   4.300.00180.600         0
 701 1 05.GHSB5 005
1.3081.723.625 13.200.00700.00.4   .1   4.000.00180.600         0
 701 1 05.GHSB6 006
1.3851.761.568 20.700.00700.00.4   .1   4.200.00180.600         0
 701 1 05.GHSB7 007
1.4781.97 0.56810.200.00700.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB8 008
.415 1.231.341 10.100.01000.00.4   .1   3.500.00180.500         0
 701 1 05.GHSB9 009
.29  1.117.265 10.000.01100.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB10010
.223 .644 .152 56.500.01800.00.4   .1   3.500.00180.500         0
 701 1 05.GHSB11011
.183 .663 .17  29.700.01200.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB12012
.102 .644 .265 10.000.01389.380.4  0.1  3.000.00180.500         0
 701 1 05.GHSB13013
.302 .833 .341 10.000.01900.00.4   .1   3.000.00180.500         0
 701 1 05.GHSB14014
.241 .814 .36  10.000.01900.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB15015
.096 .369 .133 11.700.013116.10.4  0.1  3.000.00180.500         0
 701 1 05.GHSB16016
.205 .644 .303 10.000.01500.00.4   .1   3.000.00180.500         0
 701 1 05.GHSB17017
.349 .777 .284 10.500.02600.00.4   .1   3.100.00180.500         0
 701 1 05.GHSB20020
.241 .777 .341 10.000.01200.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB21021
.581 1.212.568 11.000.00900.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB22022
.502 1.061.511 14.800.01500.00.4   .1   3.300.00180.500         0
 701 1 05.GHSB23023
.654 1.136.568 10.500.01200.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB24024
.589 1.08 .436 11.400.01500.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB25025
.13  .568 .152 12.400.01455.20.4   .1   3.300.00180.500         0
 711 1 05.GHSB26026
.06  .625 .208 11.600.01765.280.4  0.1  3.300.00180.500         0
 701 1 05.GHSB27027
.637 1.42 .53  11.700.01900.00.4   .1   3.200.00180.500         0
 701 1 05.GHSB30030
.684 1.515.814 12.400.01400.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB31031
.337 1.25 .303 10.000.01300.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB32032
.936 1.761.758 18.400.01500.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB33033
.33  1.117.455 10.400.00800.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB34034
.326 1.42 .739 14.100.01900.000.4  0.1  3.200.00180.500         0
 701 1 05.GHSB35035
.15  .795 .303 55.200.01400.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB36036
.545 1.288.36  10.000.01400.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB37037
.845 1.345.473 19.700.02600.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB40040
.353 .947 .436 14.600.01200.000.4  0.1  3.500.00180.500         0
 701 1 05.GHSB41041
.536 1.117.436 10.300.01100.000.4  0.1  3.700.00180.500         0
 701 1 05.GHSB42042
.191 .473 .265 54.400.00800.00.4   .1   4.200.00180.600         0
 701 1 05.GHSB43043
.245 .947 .492 10.000.00400.000.4  0.1  3.200.00180.500         0
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 1      Weld County I-25 Master Drainage Plan - Existing Conditions, ACE 4/99
01 5 YEAR   0.030.050.120.190.310.160.080.060.050.050.040.040.040.040.030.030.03
01 5 YEAR   0.030.030.020.020.020.020.020.020.020.010.010.010.010.010.010.010.01
01 5 YEAR   0.010.01

 701 1 05.GHSB1 001                                        0
1.2181.136.341 10.600.00400.00.4   .1   3.000.00180.500         00.00 0.00
 701 1 05.GHSB2 002
.444 1.326.72  17.900.00300.00.4   .1   3.100.00180.500         0
 701 1 05.GHSB3 003
1.0751.837.72  19.000.00700.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB4 004
1.2071.648.625 18.400.00800.00.4   .1   4.300.00180.600         0
 701 1 05.GHSB5 005
1.3081.723.625 13.200.00700.00.4   .1   4.000.00180.600         0
 701 1 05.GHSB6 006
1.3851.761.568 20.700.00700.00.4   .1   4.200.00180.600         0
 701 1 05.GHSB7 007
1.4781.97 0.56810.200.00700.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB8 008
.415 1.231.341 10.100.01000.00.4   .1   3.500.00180.500         0
 701 1 05.GHSB9 009
.29  1.117.265 10.000.01100.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB10010
.223 .644 .152 56.500.01800.00.4   .1   3.500.00180.500         0
 701 1 05.GHSB11011
.183 .663 .17  29.700.01200.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB12012
.102 .644 .265 10.000.01386.080.4  0.1  3.000.00180.500         0
 701 1 05.GHSB13013
.302 .833 .341 10.000.01900.00.4   .1   3.000.00180.500         0
 701 1 05.GHSB14014
.241 .814 .36  10.000.01900.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB15015
.096 .369 .133 11.700.013111.50.4  0.1  3.000.00180.500         0
 701 1 05.GHSB16016
.205 .644 .303 10.000.01500.00.4   .1   3.000.00180.500         0
 701 1 05.GHSB17017
.349 .777 .284 10.500.02600.00.4   .1   3.100.00180.500         0
 701 1 05.GHSB20020
.241 .777 .341 10.000.01200.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB21021
.581 1.212.568 11.000.00900.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB22022
.502 1.061.511 14.800.01500.00.4   .1   3.300.00180.500         0
 701 1 05.GHSB23023
.654 1.136.568 10.500.01200.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB24024
.589 1.08 .436 11.400.01500.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB25025
.13  .568 .152 12.400.01452.02.4   .1   3.300.00180.500         0
 711 1 05.GHSB26026
.06  .625 .208 11.600.01761.970.4  0.1  3.300.00180.500         0
 701 1 05.GHSB27027
.637 1.42 .53  11.700.01900.00.4   .1   3.200.00180.500         0
 701 1 05.GHSB30030
.684 1.515.814 12.400.01400.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB31031
.337 1.25 .303 10.000.01300.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB32032
.936 1.761.758 18.400.01500.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB33033
.33  1.117.455 10.400.00800.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB34034
.326 1.42 .739 14.100.01900.000.4  0.1  3.200.00180.500         0
 701 1 05.GHSB35035
.15  .795 .303 55.200.01400.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB36036
.545 1.288.36  10.000.01400.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB37037
.845 1.345.473 19.700.02600.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB40040
.353 .947 .436 14.600.01200.000.4  0.1  3.500.00180.500         0
 701 1 05.GHSB41041
.536 1.117.436 10.300.01100.000.4  0.1  3.700.00180.500         0
 701 1 05.GHSB42042
.191 .473 .265 54.400.00800.00.4   .1   4.200.00180.600         0
 701 1 05.GHSB43043
.245 .947 .492 10.000.00400.000.4  0.1  3.200.00180.500         0
E
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 1      Weld County I-25 Master Drainage Plan - Existing Conditions, ACE 4/99
01 10 YEAR  0.030.060.140.230.380.180.090.070.060.050.050.050.050.050.050.040.03
01 10 YEAR  0.030.030.030.030.030.030.020.020.020.010.010.010.010.010.010.010.01
01 10 YEAR  0.010.01

 701 1 05.GHSB1 001                                        0
1.2181.136.341 10.600.00400.00.4   .1   3.000.00180.500          00.00 0.00
 701 1 05.GHSB2 002
.444 1.326.72  17.900.00300.00.4   .1   3.100.00180.500          0
 701 1 05.GHSB3 003
1.0751.837.72  19.000.00700.00.4   .1   3.800.00180.600          0
 701 1 05.GHSB4 004
1.2071.648.625 18.400.00800.00.4   .1   4.300.00180.600          0
 701 1 05.GHSB5 005
1.3081.723.625 13.200.00700.00.4   .1   4.000.00180.600          0
 701 1 05.GHSB6 006
1.3851.761.568 20.700.00700.00.4   .1   4.200.00180.600          0
 701 1 05.GHSB7 007
1.4781.97 0.56810.200.00700.00.4   .1   3.800.00180.600          0
 701 1 05.GHSB8 008
.415 1.231.341 10.100.01000.00.4   .1   3.500.00180.500          0
 701 1 05.GHSB9 009
.29  1.117.265 10.000.01100.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB10010
.223 .644 .152 56.500.01800.00.4   .1   3.500.00180.500          0
 701 1 05.GHSB11011
.183 .663 .17  29.700.01200.00.4   .1   3.000.00180.500          0
 711 1 05.GHSB12012
.102 .644 .265 10.000.01382.780.4  0.1  3.000.00180.500          0
 701 1 05.GHSB13013
.302 .833 .341 10.000.01900.00.4   .1   3.000.00180.500          0
 701 1 05.GHSB14014
.241 .814 .36  10.000.01900.00.4   .1   3.000.00180.500          0
 711 1 05.GHSB15015
.096 .369 .133 11.700.013106.80.4  0.1  3.000.00180.500          0
 701 1 05.GHSB16016
.205 .644 .303 10.000.01500.00.4   .1   3.000.00180.500          0
 701 1 05.GHSB17017
.349 .777 .284 10.500.02600.00.4   .1   3.100.00180.500          0
 701 1 05.GHSB20020
.241 .777 .341 10.000.01200.000.4  0.1  3.000.00180.500          0
 701 1 05.GHSB21021
.581 1.212.568 11.000.00900.00.4   .1   3.800.00180.600          0
 701 1 05.GHSB22022
.502 1.061.511 14.800.01500.00.4   .1   3.300.00180.500          0
 701 1 05.GHSB23023
.654 1.136.568 10.500.01200.000.4  0.1  3.100.00180.500          0
 701 1 05.GHSB24024
.589 1.08 .436 11.400.01500.00.4   .1   3.000.00180.500          0
 711 1 05.GHSB25025
.13  .568 .152 12.400.01448.85.4   .1   3.300.00180.500          0
 711 1 05.GHSB26026
.06  .625 .208 11.600.01758.670.4  0.1  3.300.00180.500          0
 701 1 05.GHSB27027
.637 1.42 .53  11.700.01900.00.4   .1   3.200.00180.500          0
 701 1 05.GHSB30030
.684 1.515.814 12.400.01400.000.4  0.1  3.000.00180.500          0
 701 1 05.GHSB31031
.337 1.25 .303 10.000.01300.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB32032
.936 1.761.758 18.400.01500.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB33033
.33  1.117.455 10.400.00800.000.4  0.1  3.100.00180.500          0
 701 1 05.GHSB34034
.326 1.42 .739 14.100.01900.000.4  0.1  3.200.00180.500          0
 701 1 05.GHSB35035
.15  .795 .303 55.200.01400.000.4  0.1  3.000.00180.500          0
 701 1 05.GHSB36036
.545 1.288.36  10.000.01400.000.4  0.1  3.100.00180.500          0
 701 1 05.GHSB37037
.845 1.345.473 19.700.02600.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB40040
.353 .947 .436 14.600.01200.000.4  0.1  3.500.00180.500          0
 701 1 05.GHSB41041
.536 1.117.436 10.300.01100.000.4  0.1  3.700.00180.500          0
 701 1 05.GHSB42042
.191 .473 .265 54.400.00800.00.4   .1   4.200.00180.600          0
 701 1 05.GHSB43043
.245 .947 .492 10.000.00400.000.4  0.1  3.200.00180.500          0
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 1      Weld County I-25 Master Drainage Plan - Existing Conditions, ACE 4/99
01 25 YEAR  0.030.070.110.170.290.460.180.150.090.080.070.070.070.060.060.040.04
01 25 YEAR  0.030.030.030.030.030.030.030.020.020.020.020.010.010.010.010.010.01
01 25 YEAR  0.010.01

 701 1 05.GHSB1 001                                        0
1.2181.136.341 10.600.00400.00.4   .1   3.000.00180.500         00.00 0.00
 701 1 05.GHSB2 002
.444 1.326.72  17.900.00300.00.4   .1   3.100.00180.500         0
 701 1 05.GHSB3 003
1.0751.837.72  19.000.00700.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB4 004
1.2071.648.625 18.400.00800.00.4   .1   4.300.00180.600         0
 701 1 05.GHSB5 005
1.3081.723.625 13.200.00700.00.4   .1   4.000.00180.600         0
 701 1 05.GHSB6 006
1.3851.761.568 20.700.00700.00.4   .1   4.200.00180.600         0
 701 1 05.GHSB7 007
1.4781.97 0.56810.200.00700.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB8 008
.415 1.231.341 10.100.01000.00.4   .1   3.500.00180.500         0
 701 1 05.GHSB9 009
.29  1.117.265 10.000.01100.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB10010
.223 .644 .152 56.500.01800.00.4   .1   3.500.00180.500         0
 701 1 05.GHSB11011
.183 .663 .17  29.700.01200.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB12012
.102 .644 .265 10.000.01381.460.4  0.1  3.000.00180.500         0
 701 1 05.GHSB13013
.302 .833 .341 10.000.01900.00.4   .1   3.000.00180.500         0
 701 1 05.GHSB14014
.241 .814 .36  10.000.01900.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB15015
.096 .369 .133 11.700.013104.90.4  0.1  3.000.00180.500         0
 701 1 05.GHSB16016
.205 .644 .303 10.000.01500.00.4   .1   3.000.00180.500         0
 701 1 05.GHSB17017
.349 .777 .284 10.500.02600.00.4   .1   3.100.00180.500         0
 701 1 05.GHSB20020
.241 .777 .341 10.000.01200.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB21021
.581 1.212.568 11.000.00900.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB22022
.502 1.061.511 14.800.01500.00.4   .1   3.300.00180.500         0
 701 1 05.GHSB23023
.654 1.136.568 10.500.01200.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB24024
.589 1.08 .436 11.400.01500.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB25025
.13  .568 .152 12.400.01447.49.4   .1   3.300.00180.500         0
 711 1 05.GHSB26026
.06  .625 .208 11.600.01757.280.4  0.1  3.300.00180.500         0
 701 1 05.GHSB27027
.637 1.42 .53  11.700.01900.00.4   .1   3.200.00180.500         0
 701 1 05.GHSB30030
.684 1.515.814 12.400.01400.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB31031
.337 1.25 .303 10.000.01300.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB32032
.936 1.761.758 18.400.01500.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB33033
.33  1.117.455 10.400.00800.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB34034
.326 1.42 .739 14.100.01900.000.4  0.1  3.200.00180.500         0
 701 1 05.GHSB35035
.15  .795 .303 55.200.01400.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB36036
.545 1.288.36  10.000.01400.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB37037
.845 1.345.473 19.700.02600.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB40040
.353 .947 .436 14.600.01200.000.4  0.1  3.500.00180.500         0
 701 1 05.GHSB41041
.536 1.117.436 10.300.01100.000.4  0.1  3.700.00180.500         0
 701 1 05.GHSB42042
.191 .473 .265 54.400.00800.00.4   .1   4.200.00180.600         0
 701 1 05.GHSB43043
.245 .947 .492 10.000.00400.000.4  0.1  3.200.00180.500         0
E
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 1      Weld County I-25 Master Drainage Plan - Existing Conditions, ACE 4/99
01 50 YEAR  0.030.080.120.190.320.530.260.190.120.120.080.080.080.060.060.040.04
01 50 YEAR  0.030.030.030.030.030.030.030.020.020.020.010.010.010.010.010.010.01
01 50 YEAR  0.010.01

 701 1 05.GHSB1 001                                      0
1.2181.136.341 10.600.00400.00.4   .1   3.000.00180.500         00.00 0.00
 701 1 05.GHSB2 002
.444 1.326.72  17.900.00300.00.4   .1   3.100.00180.500         0
 701 1 05.GHSB3 003
1.0751.837.72  19.000.00700.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB4 004
1.2071.648.625 18.400.00800.00.4   .1   4.300.00180.600         0
 701 1 05.GHSB5 005
1.3081.723.625 13.200.00700.00.4   .1   4.000.00180.600         0
 701 1 05.GHSB6 006
1.3851.761.568 20.700.00700.00.4   .1   4.200.00180.600         0
 701 1 05.GHSB7 007
1.4781.97 0.56810.200.00700.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB8 008
.415 1.231.341 10.100.01000.00.4   .1   3.500.00180.500         0
 701 1 05.GHSB9 009
.29  1.117.265 10.000.01100.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB10010
.223 .644 .152 56.500.01800.00.4   .1   3.500.00180.500         0
 701 1 05.GHSB11011
.183 .663 .17  29.700.01200.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB12012
.102 .644 .265 10.000.01379.160.4  0.1  3.000.00180.500         0
 701 1 05.GHSB13013
.302 .833 .341 10.000.01900.00.4   .1   3.000.00180.500         0
 701 1 05.GHSB14014
.241 .814 .36  10.000.01900.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB15015
.096 .369 .133 11.700.013101.40.4  0.1  3.000.00180.500         0
 701 1 05.GHSB16016
.205 .644 .303 10.000.01500.00.4   .1   3.000.00180.500         0
 701 1 05.GHSB17017
.349 .777 .284 10.500.02600.00.4   .1   3.100.00180.500         0
 701 1 05.GHSB20020
.241 .777 .341 10.000.01200.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB21021
.581 1.212.568 11.000.00900.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB22022
.502 1.061.511 14.800.01500.00.4   .1   3.300.00180.500         0
 701 1 05.GHSB23023
.654 1.136.568 10.500.01200.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB24024
.589 1.08 .436 11.400.01500.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB25025
.13  .568 .152 12.400.01445.05.4   .1   3.300.00180.500         0
 711 1 05.GHSB26026
.06  .625 .208 11.600.01754.820.4  0.1  3.300.00180.500         0
 701 1 05.GHSB27027
.637 1.42 .53  11.700.01900.00.4   .1   3.200.00180.500         0
 701 1 05.GHSB30030
.684 1.515.814 12.400.01400.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB31031
.337 1.25 .303 10.000.01300.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB32032
.936 1.761.758 18.400.01500.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB33033
.33  1.117.455 10.400.00800.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB34034
.326 1.42 .739 14.100.01900.000.4  0.1  3.200.00180.500         0
 701 1 05.GHSB35035
.15  .795 .303 55.200.01400.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB36036
.545 1.288.36  10.000.01400.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB37037
.845 1.345.473 19.700.02600.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB40040
.353 .947 .436 14.600.01200.000.4  0.1  3.500.00180.500         0
 701 1 05.GHSB41041
.536 1.117.436 10.300.01100.000.4  0.1  3.700.00180.500         0
 701 1 05.GHSB42042
.191 .473 .265 54.400.00800.00.4   .1   4.200.00180.600         0
 701 1 05.GHSB43043
.245 .947 .492 10.000.00400.000.4  0.1  3.200.00180.500         0
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 1      Weld County I-25 Master Drainage Plan - Existing Conditions, ACE 4/99
01 100 YEAR 0.030.080.120.210.340.600.340.210.170.130.110.110.110.050.050.030.03
01 100 YEAR 0.030.030.030.030.030.030.030.020.020.020.020.020.020.010.010.010.01
01 100 YEAR 0.010.01

 701 1 05.GHSB1 001                                        0
1.2181.136.341 10.600.00400.00.4   .1   3.000.00180.500         00.00 0.00
 701 1 05.GHSB2 002
.444 1.326.72  17.900.00300.00.4   .1   3.100.00180.500         0
 701 1 05.GHSB3 003
1.0751.837.72  19.000.00700.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB4 004
1.2071.648.625 18.400.00800.00.4   .1   4.300.00180.600         0
 701 1 05.GHSB5 005
1.3081.723.625 13.200.00700.00.4   .1   4.000.00180.600         0
 701 1 05.GHSB6 006
1.3851.761.568 20.700.00700.00.4   .1   4.200.00180.600         0
 701 1 05.GHSB7 007
1.4781.97 0.56810.200.00700.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB8 008
.415 1.231.341 10.100.01000.00.4   .1   3.500.00180.500         0
 701 1 05.GHSB9 009
.29  1.117.265 10.000.01100.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB10010
.223 .644 .152 56.500.01800.00.4   .1   3.500.00180.500         0
 701 1 05.GHSB11011
.183 .663 .17  29.700.01200.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB12012
.102 .644 .265 10.000.01374.540.4  0.1  3.000.00180.500         0
 701 1 05.GHSB13013
.302 .833 .341 10.000.01900.00.4   .1   3.000.00180.500         0
 701 1 05.GHSB14014
.241 .814 .36  10.000.01900.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB15015
.096 .369 .133 11.700.01394.58.4  0.1   3.000.0018.500         00
 701 1 05.GHSB16016
.205 .644 .303 10.000.01500.00.4   .1   3.000.00180.500         0
 701 1 05.GHSB17017
.349 .777 .284 10.500.02600.00.4   .1   3.100.00180.500         0
 701 1 05.GHSB20020
.241 .777 .341 10.000.01200.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB21021
.581 1.212.568 11.000.00900.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB22022
.502 1.061.51I 14.800.01500.00.4   .1   3.300.00180.500         0
 701 1 05.GHSB23023
.654 1.136.568 10.500.01200.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB24024
.589 1.08 .436 11.400.01500.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB25025
.13  .568 .152 12.400.01440.25.4   .1   3.300.00180.500         0
 711 1 05.GHSB26026
.06  .625 .208 11.600.01749.960.4  0.1  3.300.00180.500         0
 701 1 05.GHSB27027
.637 1.42 .53  11.700.01900.00.4   .1   3.200.00180.500         0
 701 1 05.GHSB30030
.684 1.515.814 12.400.01400.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB31031
.337 1.25 .303 10.000.01300.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB32032
.936 1.761.758 18.400.01500.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB33033
.33  1.117.455 10.400.00800.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB34034
.326 1.42 .739 14.100.01900.000.4  0.1  3.200.00180.500         0
 701 1 05.GHSB35035
.15  .795 .303 55.200.01400.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB36036
.545 1.288.36  10.000.01400.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB37037
.845 1.345.473 19.700.02600.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB40040
.353 .947 .436 14.600.01200.000.4  0.1  3.500.00180.500         0
 701 1 05.GHSB41041
.536 1.117.436 10.300.01100.000.4  0.1  3.700.00180.500         0
 701 1 05.GHSB42042
.191 .473 .265 54.400.00800.00.4   .1   4.200.00180.600         0
 701 1 05.GHSB43043
.245 .947 .492 10.000.00400.000.4  0.1  3.200.00180.500         0
E
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II-E

FUTURE CONDITION INPUT FILES

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 1      Weld County I-25 Master Drainage Plan - Future Conditions, ACE 4/99
01 2 YEAR   0.020.040.080.140.220.120.060.050.030.030.030.030.030.020.020.020.02
01 2 YEAR   0.020.020.020.020.020.010.010.020.020.020.020.010.010.010.010.010.01
01 2 YEAR   0.010.01

 701 1 05.GHSB1 001                                        0
1.2181.193.341 39.700.00400.00.4   .1   3.000.00180.500         00.00 0.00
 701 1 05.GHSB2 002
.444 1.383.72  65.100.00300.00.4   .1   3.100.00180.500         0
 701 1 05.GHSB3 003
1.0751.894.72  63.400.00700.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB4 004
1.2071.705.625 55.500.00800.00.4   .1   4.300.00180.600         0
 701 1 05.GHSB5 005
1.3081.78 .625 41.200.00700.00.4   .1   4.000.00180.600         0
 701 1 05.GHSB6 006
1.3851.818.568 51.000.00700.00.4   .1   4.200.00180.600         0
 701 1 05.GHSB7 007
1.4782.0270.56843.500.00700.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB8 008
.415 1.288.341 64.000.01000.00.4   .1   3.500.00180.500         0
 701 1 05.GHSB9 009
.29  1.174.265 68.000.01100.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB10010
.223 .701 .152 72.800.01800.00.4   .1   3.500.00180.500         0
 701 1 05.GHSB11011
.183 .720 .17  60.100.01200.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB12012
.102 .701 .265 42.800.01330.560.4  0.1  3.000.00180.500         0
 701 1 05.GHSB13013
.302 .890 .341 78.100.01900.00.4   .1   3.000.00180.500         0
 701 1 05.GHSB14014
.241 .871 .36  75.000.01900.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB15015
.096 .426 .133 81.200.01322.500.4  0.1  3.000.00180.500         0
 701 1 05.GHSB16016
.205 .701 .303 71.000.01500.00.4   .1   3.000.00180.500         0
 701 1 05.GHSB17017
.349 .833 .284 84.500.02600.00.4   .1   3.100.00180.500         0
 701 1 05.GHSB20020
.241 .833 .341 67.500.01200.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB21021
.581 1.269.568 60.300.00900.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB22022
.502 1.117.511 70.000.01500.00.4   .1   3.300.00180.500         0
 701 1 05.GHSB23023
.654 1.193.568 36.400.01200.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB24024
.589 1.136.436 37.000.01500.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB25025
.13  .625 .152 32.300.01428.33.4   .1   3.300.00180.500         0
 711 1 05.GHSB26026
.06  .682 .208 73.400.01730.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB27027
.637 1.477.53  22.100.01900.00.4   .1   3.200.00180.500         0
 701 1 05.GHSB30030
.684 1.572.814 76.200.01400.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB31031
.337 1.307.303 68.100.01300.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB32032
.936 1.818.758 22.100.01500.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB33033
.33  1.174.455 15.800.00800.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB34034
.326 1.477.739 82.400.01900.000.4  0.1  3.200.00180.500         0
 701 1 05.GHSB35035
.15  .852 .303 73.600.01400.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB36036
.545 1.345.36  61.800.01400.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB37037
.845 1.402.473 69.600.02600.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB40040
.353 1.004.436 65.600.01200.000.4  0.1  3.500.00180.500         0
 701 1 05.GHSB41041
.536 1.174.436 48.000.01100.000.4  0.1  3.700.00180.500         0
 701 1 05.GHSB42042
.191 .530 .265 79.400.00800.00.4   .1   4.200.00180.600         0
 701 1 05.GHSB43043
.245 1.004.492 75.400.00400.000.4  0.1  3.200.00180.500         0
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 1      Weld County I-25 Master Drainage Plan - Future Conditions, ACE 4/99
01 5 YEAR   0.030.050.120.190.310.160.080.060.050.050.040.040.040.040.030.030.03
01 5 YEAR   0.030.030.020.020.020.020.020.020.020.010.010.010.010.010.010.010.01
01 5 YEAR   0.010.01

 701 1 05.GHSB1 001                                        0
1.2181.193.341 39.700.00400.00.4   .1   3.000.00180.500          00.00 0.00
 701 1 05.GHSB2 002
.444 1.383.72  65.100.00300.00.4   .1   3.100.00180.500          0
 701 1 05.GHSB3 003
1.0751.894.72  63.400.00700.00.4   .1   3.800.00180.600          0
 701 1 05.GHSB4 004
1.2071.705.625 55.500.00800.00.4   .1   4.300.00180.600          0
 701 1 05.GHSB5 005
1.3081.78 .625 41.200.00700.00.4   .1   4.000.00180.600          0
 701 1 05.GHSB6 006
1.3851.818.568 51.000.00700.00.4   .1   4.200.00180.600          0
 701 1 05.GHSB7 007
1.4782.0270.56843.500.00700.00.4   .1   3.800.00180.600          0
 701 1 05.GHSB8 008
.415 1.288.341 64.000.01000.00.4   .1   3.500.00180.500          0
 701 1 05.GHSB9 009
.29  1.174.265 68.000.01100.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB10010
.223 .701 .152 72.800.01800.00.4   .1   3.500.00180.500          0
 701 1 05.GHSB11011
.183 .720 .17  60.100.01200.00.4   .1   3.000.00180.500          0
 711 1 05.GHSB12012
.102 .701 .265 42.800.01330.560.4  0.1  3.000.00180.500          0
 701 1 05.GHSB13013
.302 .890 .341 78.100.01900.00.4   .1   3.000.00180.500          0
 701 1 05.GHSB14014
.241 .871 .36  75.000.01900.00.4   .1   3.000.00180.500          0
 711 1 05.GHSB15015
.096 .426 .133 81.200.01322.500.4  0.1  3.000.00180.500          0
 701 1 05.GHSB16016
.205 .701 .303 71.000.01500.00.4   .1   3.000.00180.500          0
 701 1 05.GHSB17017
.349 .833 .284 84.500.02600.00.4   .1   3.100.00180.500          0
 701 1 05.GHSB20020
.241 .833 .341 67.500.01200.000.4  0.1  3.000.00180.500          0
 701 1 05.GHSB21021
.581 1.269.568 60.300.00900.00.4   .1   3.800.00180.600          0
 701 1 05.GHSB22022
.502 1.117.511 70.000.01500.00.4   .1   3.300.00180.500          0
 701 1 05.GHSB23023
.654 1.193.568 36.400.01200.000.4  0.1  3.100.00180.500          0
 701 1 05.GHSB24024
.589 1.136.436 37.000.01500.00.4   .1   3.000.00180.500          0
 711 1 05.GHSB25025
.13  .625 .152 32.300.01428.33.4   .1   3.300.00180.500          0
 711 1 05.GHSB26026
.06  .682 .208 73.400.01730.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB27027
.637 1.477.53  22.100.01900.00.4   .1   3.200.00180.500          0
 701 1 05.GHSB30030
.684 1.572.814 76.200.01400.000.4  0.1  3.000.00180.500          0
 701 1 05.GHSB31031
.337 1.307.303 68.100.01300.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB32032
.936 1.818.758 22.100.01500.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB33033
.33  1.174.455 15.800.00800.000.4  0.1  3.100.00180.500          0
 701 1 05.GHSB34034
.326 1.477.739 82.400.01900.000.4  0.1  3.200.00180.500          0
 701 1 05.GHSB35035
.15  .852 .303 73.600.01400.000.4  0.1  3.000.00180.500          0
 701 1 05.GHSB36036
.545 1.345.36  61.800.01400.000.4  0.1  3.100.00180.500          0
 701 1 05.GHSB37037
.845 1.402.473 69.600.02600.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB40040
.353 1.004.436 65.600.01200.000.4  0.1  3.500.00180.500          0
 701 1 05.GHSB41041
.536 1.174.436 48.000.01100.000.4  0.1  3.700.00180.500          0
 701 1 05.GHSB42042
.191 .530 .265 79.400.00800.00.4   .1   4.200.00180.600          0
 701 1 05.GHSB43043
.245 1.004.492 75.400.00400.000.4  0.1  3.200.00180.500          0
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 1      Weld County I-25 Master Drainage Plan - Future Conditions, ACE 4/99
01 10 YEAR  0.030.060.140.230.380.180.090.070.060.050.050.050.050.050.050.040.03
01 10 YEAR  0.030.030.030.030.030.030.020.020.020.010.010.010.010.010.010.010.01
01 10 YEAR  0.010.01

 701 1 05.GHSB1 001                                        0
1.2181.193.341 39.700.00400.00.4   .1   3.000.00180.500         00.00 0.00
 701 1 05.GHSB2 002
.444 1.383.72  65.100.00300.00.4   .1   3.100.00180.500         0
 701 1 05.GHSB3 003
1.0751.894.72  63.400.00700.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB4 004
1.2071.705.625 55.500.00800.00.4   .1   4.300.00180.600         0
 701 1 05.GHSB5 005
1.3081.78 .625 41.200.00700.00.4   .1   4.000.00180.600         0
 701 1 05.GHSB6 006
1.3851.818.568 51.000.00700.00.4   .1   4.200.00180.600         0
 701 1 05.GHSB7 007
1.4782.0270.56843.500.00700.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB8 008
.415 1.288.341 64.000.01000.00.4   .1   3.500.00180.500         0
 701 1 05.GHSB9 009
.29  1.174.265 68.000.01100.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB10010
.223 .701 .152 72.800.01800.00.4   .1   3.500.00180.500         0
 701 1 05.GHSB11011
.183 .720 .17  60.100.01200.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB12012
.102 .701 .265 42.800.01330.560.4  0.1  3.000.00180.500         0
 701 1 05.GHSB13013
.302 .890 .341 78.100.01900.00.4   .1   3.000.00180.500         0
 701 1 05.GHSB14014
.241 .871 .36  75.000.01900.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB15015
.096 .426 .133 81.200.01322.500.4  0.1  3.000.00180.500         0
 701 1 05.GHSB16016
.205 .701 .303 71.000.01500.00.4   .1   3.000.00180.500         0
 701 1 05.GHSB17017
.349 .833 .284 84.500.02600.00.4   .1   3.100.00180.500         0
 701 1 05.GHSB20020
.241 .833 .341 67.500.01200.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB21021
.581 1.269.568 60.300.00900.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB22022
.502 1.117.511 70.000.01500.00.4   .1   3.300.00180.500         0
 701 1 05.GHSB23023
.654 1.193.568 36.400.01200.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB24024
.589 1.136.436 37.000.01500.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB25025
.13  .625 .152 32.300.01428.33.4   .1   3.300.00180.500         0
 711 1 05.GHSB26026
.06  .682 .208 73.400.01730.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB27027
.637 1.477.53  22.100.01900.00.4   .1   3.200.00180.500         0
 701 1 05.GHSB30030
.684 1.572.814 76.200.01400.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB31031
.337 1.307.303 68.100.01300.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB32032
.936 1.818.758 22.100.01500.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB33033
.33  1.174.455 15.800.00800.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB34034
.326 1.477.739 82.400.01900.000.4  0.1  3.200.00180.500         0
 701 1 05.GHSB35035
.15  .852 .303 73.600.01400.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB36036
.545 1.345.36  61.800.01400.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB37037
.845 1.402.473 69.600.02600.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB40040
.353 1.004.436 65.600.01200.000.4  0.1  3.500.00180.500         0
 701 1 05.GHSB41041
.536 1.174.436 48.000.01100.000.4  0.1  3.700.00180.500         0
 701 1 05.GHSB42042
.191 .530 .265 79.400.00800.00.4   .1   4.200.00180.600         0
 701 1 05.GHSB43043
.245 1.004.492 75.400.00400.000.4  0.1  3.200.00180.500         0
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 1      Weld County I-25 Master Drainage Plan - Future Conditions, ACE 4/99
01 25 YEAR  0.030.070.110.170.290.460.180.150.090.080.070.070.070.060.060.040.04
01 25 YEAR  0.030.030.030.030.030.030.030.020.020.020.020.010.010.010.010.010.01
01 25 YEAR  0.010.01

 701 1 05.GHSB1 001                                        0
1.2181.193.341 39.700.00400.00.4   .1   3.000.00180.500          00.00 0.00
 701 1 05.GHSB2 002
.444 1.383.72  65.100.00300.00.4   .1   3.100.00180.500          0
 701 1 05.GHSB3 003
1.0751.894.72  63.400.00700.00.4   .1   3.800.00180.600          0
 701 1 05.GHSB4 004
1.2071.705.625 55.500.00800.00.4   .1   4.300.00180.600          0
 701 1 05.GHSB5 005
1.3081.78 .625 41.200.00700.00.4   .1   4.000.00180.600          0
 701 1 05.GHSB6 006
1.3851.818.568 51.000.00700.00.4   .1   4.200.00180.600          0
 701 1 05.GHSB7 007
1.4782.0270.56843.500.00700.00.4   .1   3.800.00180.600          0
 701 1 05.GHSB8 008
.415 1.288.341 64.000.01000.00.4   .1   3.500.00180.500          0
 701 1 05.GHSB9 009
.29  1.174.265 68.000.01100.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB10010
.223 .701 .152 72.800.01800.00.4   .1   3.500.00180.500          0
 701 1 05.GHSB11011
.183 .720 .17  60.100.01200.00.4   .1   3.000.00180.500          0
 711 1 05.GHSB12012
.102 .701 .265 42.800.01330.560.4  0.1  3.000.00180.500          0
 701 1 05.GHSB13013
.302 .890 .341 78.100.01900.00.4   .1   3.000.00180.500          0
 701 1 05.GHSB14014
.241 .871 .36  75.000.01900.00.4   .1   3.000.00180.500          0
 711 1 05.GHSB15015
.096 .426 .133 81.200.01322.500.4  0.1  3.000.00180.500          0
 701 1 05.GHSB16016
.205 .701 .303 71.000.01500.00.4   .1   3.000.00180.500          0
 701 1 05.GHSB17017
.349 .833 .284 84.500.02600.00.4   .1   3.100.00180.500          0
 701 1 05.GHSB20020
.241 .833 .341 67.500.01200.000.4  0.1  3.000.00180.500          0
 701 1 05.GHSB21021
.581 1.269.568 60.300.00900.00.4   .1   3.800.00180.600          0
 701 1 05.GHSB22022
.502 1.117.511 70.000.01500.00.4   .1   3.300.00180.500          0
 701 1 05.GHSB23023
.654 1.193.568 36.400.01200.000.4  0.1  3.100.00180.500          0
 701 1 05.GHSB24024
.589 1.136.436 37.000.01500.00.4   .1   3.000.00180.500          0
 711 1 05.GHSB25025
.13  .625 .152 32.300.01428.33.4   .1   3.300.00180.500          0
 711 1 05.GHSB26026
.06  .682 .208 73.400.01730.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB27027
.637 1.477.53  22.100.01900.00.4   .1   3.200.00180.500          0
 701 1 05.GHSB30030
.684 1.572.814 76.200.01400.000.4  0.1  3.000.00180.500          0
 701 1 05.GHSB31031
.337 1.307.303 68.100.01300.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB32032
.936 1.818.758 22.100.01500.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB33033
.33  1.174.455 15.800.00800.000.4  0.1  3.100.00180.500          0
 701 1 05.GHSB34034
.326 1.477.739 82.400.01900.000.4  0.1  3.200.00180.500          0
 701 1 05.GHSB35035
.15  .852 .303 73.600.01400.000.4  0.1  3.000.00180.500          0
 701 1 05.GHSB36036
.545 1.345.36  61.800.01400.000.4  0.1  3.100.00180.500          0
 701 1 05.GHSB37037
.845 1.402.473 69.600.02600.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB40040
.353 1.004.436 65.600.01200.000.4  0.1  3.500.00180.500          0
 701 1 05.GHSB41041
.536 1.174.436 48.000.01100.000.4  0.1  3.700.00180.500          0
 701 1 05.GHSB42042
.191 .530 .265 79.400.00800.00.4   .1   4.200.00180.600          0
 701 1 05.GHSB43043
.245 1.004.492 75.400.00400.000.4  0.1  3.200.00180.500          0
E
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 1      Weld County I-25 Master Drainage Plan - Future Conditions, ACE 4/99
01 50 YEAR  0.030.080.120.190.320.530.260.190.120.120.080.080.080.060.060.040.04
01 50 YEAR  0.030.030.030.030.030.030.030.020.020.020.010.010.010.010.010.010.01
01 50 YEAR  0.010.01

 701 1 05.GHSB1 001                                        0
1.2181.193.341 39.700.00400.00.4   .1   3.000.00180.500         00.00 0.00
 701 1 05.GHSB2 002
.444 1.383.72  65.100.00300.00.4   .1   3.100.00180.500         0
 701 1 05.GHSB3 003
1.0751.894.72  63.400.00700.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB4 004
1.2071.705.625 55.500.00800.00.4   .1   4.300.00180.600         0
 701 1 05.GHSB5 005
1.3081.78 .625 41.200.00700.00.4   .1   4.000.00180.600         0
 701 1 05.GHSB6 006
1.3851.818.568 51.000.00700.00.4   .1   4.200.00180.600         0
 701 1 05.GHSB7 007
1.4782.0270.56843.500.00700.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB8 008
.415 1.288.341 64.000.01000.00.4   .1   3.500.00180.500         0
 701 1 05.GHSB9 009
.29  1.174.265 68.000.01100.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB10010
.223 .701 .152 72.800.01800.00.4   .1   3.500.00180.500         0
 701 1 05.GHSB11011
.183 .720 .17  60.100.01200.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB12012
.102 .701 .265 42.800.01330.560.4  0.1  3.000.00180.500         0
 701 1 05.GHSB13013
.302 .890 .341 78.100.01900.00.4   .1   3.000.00180.500         0
 701 1 05.GHSB14014
.241 .871 .36  75.000.01900.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB15015
.096 .426 .133 81.200.01322.500.4  0.1  3.000.00180.500         0
 701 1 05.GHSB16016
.205 .701 .303 71.000.01500.00.4   .1   3.000.00180.500         0
 701 1 05.GHSB17017
.349 .833 .284 84.500.02600.00.4   .1   3.100.00180.500         0
 701 1 05.GHSB20020
.241 .833 .341 67.500.01200.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB21021
.581 1.269.568 60.300.00900.00.4   .1   3.800.00180.600         0
 701 1 05.GHSB22022
.502 1.117.511 70.000.01500.00.4   .1   3.300.00180.500         0
 701 1 05.GHSB23023
.654 1.193.568 36.400.01200.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB24024
.589 1.136.436 37.000.01500.00.4   .1   3.000.00180.500         0
 711 1 05.GHSB25025
.13  .625 .152 32.300.01428.33.4   .1   3.300.00180.500         0
 711 1 05.GHSB26026
.06  .682 .208 73.400.01730.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB27027
.637 1.477.53  22.100.01900.00.4   .1   3.200.00180.500         0
 701 1 05.GHSB30030
.684 1.572.814 76.200.01400.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB31031
.337 1.307.303 68.100.01300.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB32032
.936 1.818.758 22.100.01500.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB33033
.33  1.174.455 15.800.00800.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB34034
.326 1.477.739 82.400.01900.000.4  0.1  3.200.00180.500         0
 701 1 05.GHSB35035
.15  .852 .303 73.600.01400.000.4  0.1  3.000.00180.500         0
 701 1 05.GHSB36036
.545 1.345.36  61.800.01400.000.4  0.1  3.100.00180.500         0
 701 1 05.GHSB37037
.845 1.402.473 69.600.02600.000.4  0.1  3.300.00180.500         0
 701 1 05.GHSB40040
.353 1.004.436 65.600.01200.000.4  0.1  3.500.00180.500         0
 701 1 05.GHSB41041
.536 1.174.436 48.000.01100.000.4  0.1  3.700.00180.500         0
 701 1 05.GHSB42042
.191 .530 .265 79.400.00800.00.4   .1   4.200.00180.600         0
 701 1 05.GHSB43043
.245 1.004.492 75.400.00400.000.4  0.1  3.200.00180.500         0
E
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 1      Weld County I-25 Master Drainage Plan - Future Conditions, ACE 4/99
01 100 YEAR 0.030.080.120.210.340.600.340.210.170.130.110.110.110.050.050.030.03
01 100 YEAR 0.030.030.030.030.030.030.030.020.020.020.020.020.020.010.010.010.01
01 100 YEAR 0.010.01

 701 1 05.GHSB1 001                                        0
1.2181.193.341 39.700.00400.00.4   .1   3.000.00180.500          00.00 0.00
 701 1 05.GHSB2 002
.444 1.383.72  65.100.00300.00.4   .1   3.100.00180.500          0
 701 1 05.GHSB3 003
1.0751.894.72  63.400.00700.00.4   .1   3.800.00180.600          0
 701 1 05.GHSB4 004
1.2071.705.625 55.500.00800.00.4   .1   4.300.00180.600          0
 701 1 05.GHSB5 005
1.3081.78 .625 41.200.00700.00.4   .1   4.000.00180.600          0
 701 1 05.GHSB6 006
1.3851.818.568 51.000.00700.00.4   .1   4.200.00180.600          0
 701 1 05.GHSB7 007
1.4782.0270.56843.500.00700.00.4   .1   3.800.00180.600          0
 701 1 05.GHSB8 008
.415 1.288.341 64.000.01000.00.4   .1   3.500.00180.500          0
 701 1 05.GHSB9 009
.29  1.174.265 68.000.01100.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB10010
.223 .701 .152 72.800.01800.00.4   .1   3.500.00180.500          0
 701 1 05.GHSB11011
.183 .720 .17  60.100.01200.00.4   .1   3.000.00180.500          0
 711 1 05.GHSB12012
.102 .701 .265 42.800.01330.560.4  0.1  3.000.00180.500          0
 701 1 05.GHSB13013
.302 .890 .341 78.100.01900.00.4   .1   3.000.00180.500          0
 701 1 05.GHSB14014
.241 .871 .36  75.000.01900.00.4   .1   3.000.00180.500          0
 711 1 05.GHSB15015
.096 .426 .133 81.200.01322.500.4  0.1  3.000.00180.500          0
 701 1 05.GHSB16016
.205 .701 .303 71.000.01500.00.4   .1   3.000.00180.500          0
 701 1 05.GHSB17017
.349 .833 .284 84.500.02600.00.4   .1   3.100.00180.500          0
 701 1 05.GHSB20020
.241 .833 .341 67.500.01200.000.4  0.1  3.000.00180.500          0
 701 1 05.GHSB21021
.581 1.269.568 60.300.00900.00.4   .1   3.800.00180.600          0
 701 1 05.GHSB22022
.502 1.117.511 70.000.01500.00.4   .1   3.300.00180.500          0
 701 1 05.GHSB23023
.654 1.193.568 36.400.01200.000.4  0.1  3.100.00180.500          0
 701 1 05.GHSB24024
.589 1.136.436 37.000.01500.00.4   .1   3.000.00180.500          0
 711 1 05.GHSB25025
.13  .625 .152 32.300.01428.33.4   .1   3.300.00180.500          0
 711 1 05.GHSB26026
.06  .682 .208 73.400.01730.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB27027
.637 1.477.53  22.100.01900.00.4   .1   3.200.00180.500          0
 701 1 05.GHSB30030
.684 1.572.814 76.200.01400.000.4  0.1  3.000.00180.500          0
 701 1 05.GHSB31031
.337 1.307.303 68.100.01300.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB32032
.936 1.818.758 22.100.01500.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB33033
.33  1.174.455 15.800.00800.000.4  0.1  3.100.00180.500          0
 701 1 05.GHSB34034
.326 1.477.739 82.400.01900.000.4  0.1  3.200.00180.500          0
 701 1 05.GHSB35035
.15  .852 .303 73.600.01400.000.4  0.1  3.000.00180.500          0
 701 1 05.GHSB36036
.545 1.345.36  61.800.01400.000.4  0.1  3.100.00180.500          0
 701 1 05.GHSB37037
.845 1.402.473 69.600.02600.000.4  0.1  3.300.00180.500          0
 701 1 05.GHSB40040
.353 1.004.436 65.600.01200.000.4  0.1  3.500.00180.500          0
 701 1 05.GHSB41041
.536 1.174.436 48.000.01100.000.4  0.1  3.700.00180.500          0
 701 1 05.GHSB42042
.191 .530 .265 79.400.00800.00.4   .1   4.200.00180.600          0
 701 1 05.GHSB43043
.245 1.004.492 75.400.00400.000.4  0.1  3.200.00180.500          0
E
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II-F

CUHP OUTPUT SUMMARY PROGRAM

```
update$ = "06/08/99"      'Date Last Updated
title$ = "CUHPSUM.BAS - CUHP INPUT & OUTPUT DATA STRIPPER"
CONST maxevents = 6
CONST maxbasins = 50
DIM id(maxbasins) AS STRING
DIM area(maxbasins)
DIM basinlength(maxbasins)
DIM distance(maxbasins)
DIM imperv(maxbasins)
DIM slope(maxbasins)
DIM duration(maxbasins)
DIM runoff(maxevents, maxbasins)
DIM totalvol(maxevents)
DIM peakq(maxevents, maxbasins)
DIM peaktime(maxevents, maxbasins)
DIM outname(maxevents) AS STRING
DIM sumname(maxevents) AS STRING
DIM search$(4)
search$(1) = "BASIN ID:"
search$(2) = "VOLUME OF EXCESS PRECIP ="
search$(3) = "(MIN)"

CLS
PRINT title$
PRINT "PROGRAM LAST UPDATED ON: "; update$
PRINT
err1:
INPUT "Enter 1 for Godding or 2 for Tri-Town or 3 for Other"; mainbasin
INPUT "Enter 1 for Historic, 2 for Existing or 3 for Future"; condition
SELECT CASE mainbasin
  CASE 1
        SELECT CASE condition
        CASE 1
        PRINT "No Historic Condition Available"
        GOTO err1:
        CASE 2
        outname(1) = "P:\coweld01\existi~1\Goddin~1\2_Year\cuhp\ghxc2yr.cho"
        sumname(1) = "P:\coweld01\existi~1\Goddin~1\2_Year\cuhp\ghxc2yr.txt"
        outname(2) = "P:\coweld01\existi~1\Goddin~1\5_Year\cuhp\ghxc5yr.cho"
        sumname(2) = "P:\coweld01\existi~1\Goddin~1\5_Year\cuhp\ghxc5yr.txt"
        outname(3) = "P:\coweld01\existi~1\Goddin~1\10_Year\cuhp\ghxc10yr.cho"
        sumname(3) = "P:\coweld01\existi~1\Goddin~1\10_Year\cuhp\ghxc10yr.txt"
        outname(4) = "P:\coweld01\existi~1\Goddin~1\25_Year\cuhp\ghxc25yr.cho"
        sumname(4) = "P:\coweld01\existi~1\Goddin~1\25_Year\cuhp\ghxc25yr.txt"
        outname(5) = "P:\coweld01\existi~1\Goddin~1\50_Year\cuhp\ghxc50yr.cho"
        sumname(5) = "P:\coweld01\existi~1\Goddin~1\50_Year\cuhp\ghxc50yr.txt"
        outname(6) = "P:\coweld01\existi~1\Goddin~1\100_Year\cuhp\ghxc100y.cho"
        sumname(6) = "P:\coweld01\existi~1\Goddin~1\100_Year\cuhp\ghxc100y.txt"
        numevents = 6
        CASE 3
        outname(1) = "P:\coweld01\future~1\Goddin~1\2_Year\cuhp\ghfc2yr.cho"
        sumname(1) = "P:\coweld01\future~1\Goddin~1\2_Year\cuhp\ghfc2yr.txt"
        outname(2) = "P:\coweld01\future~1\Goddin~1\5_Year\cuhp\ghfc5yr.cho"
        sumname(2) = "P:\coweld01\future~1\Goddin~1\5_Year\cuhp\ghfc5yr.txt"
        outname(3) = "P:\coweld01\future~1\Goddin~1\10_Year\cuhp\ghfc10yr.cho"
        sumname(3) = "P:\coweld01\future~1\Goddin~1\10_Year\cuhp\ghfc10yr.txt"
        outname(4) = "P:\coweld01\future~1\Goddin~1\25_Year\cuhp\ghfc25yr.cho"
        sumname(4) = "P:\coweld01\future~1\Goddin~1\25_Year\cuhp\ghfc25yr.txt"
        outname(5) = "P:\coweld01\future~1\Goddin~1\50_Year\cuhp\ghfc50yr.cho"
        sumname(5) = "P:\coweld01\future~1\Goddin~1\50_Year\cuhp\ghfc50yr.txt"
        outname(6) = "P:\coweld01\future~1\Goddin~1\100_Year\cuhp\ghfc100y.cho"
        sumname(6) = "P:\coweld01\future~1\Goddin~1\100_Year\cuhp\ghfc100y.txt"
        numevents = 6
        END SELECT      'condition
  CASE 2
        SELECT CASE condition
        CASE 1
        outname(1) = "P:\coweld01\histor~1\TriTow~1\2_Year\cuhp\tthc2yr.cho"
        sumname(1) = "P:\coweld01\histor~1\TriTow~1\2_Year\cuhp\tthc2yr.txt"
        numevents = 1
        CASE 2
        outname(1) = "P:\coweld01\existi~1\TriTow~1\2_Year\cuhp\ttxc2yr.cho"
        sumname(1) = "P:\coweld01\existi~1\TriTow~1\2_Year\cuhp\ttxc2yr.txt"
        outname(2) = "P:\coweld01\existi~1\TriTow~1\5_Year\cuhp\ttxc5yr.cho"
        sumname(2) = "P:\coweld01\existi~1\TriTow~1\5_Year\cuhp\ttxc5yr.txt"
        outname(3) = "P:\coweld01\existi~1\TriTow~1\10_Year\cuhp\ttxc10yr.cho"
        sumname(3) = "P:\coweld01\existi~1\TriTow~1\10_Year\cuhp\ttxc10yr.txt"
        outname(4) = "P:\coweld01\existi~1\TriTow~1\25_Year\cuhp\ttxc25yr.cho"
        sumname(4) = "P:\coweld01\existi~1\TriTow~1\25_Year\cuhp\ttxc25yr.txt"
        outname(5) = "P:\coweld01\existi~1\TriTow~1\50_Year\cuhp\ttxc50yr.cho"
        sumname(5) = "P:\coweld01\existi~1\TriTow~1\50_Year\cuhp\ttxc50yr.txt"
        outname(6) = "P:\coweld01\existi~1\TriTow~1\100_Year\cuhp\ttxc100y.cho"
        sumname(6) = "P:\coweld01\existi~1\TriTow~1\100_Year\cuhp\ttxc100y.txt"
        numevents = 6
        CASE 3
        outname(1) = "P:\coweld01\future~1\TriTow~1\2_Year\cuhp\ttfc2yr.cho"
        sumname(1) = "P:\coweld01\future~1\TriTow~1\2_Year\cuhp\ttfc2yr.txt"
        outname(2) = "P:\coweld01\future~1\TriTow~1\5_Year\cuhp\ttfc5yr.cho"
        sumname(2) = "P:\coweld01\future~1\TriTow~1\5_Year\cuhp\ttfc5yr.txt"
        outname(3) = "P:\coweld01\future~1\TriTow~1\10_Year\cuhp\ttfc10yr.cho"
        sumname(3) = "P:\coweld01\future~1\TriTow~1\10_Year\cuhp\ttfc10yr.txt"
        outname(4) = "P:\coweld01\future~1\TriTow~1\25_Year\cuhp\ttfc25yr.cho"
        sumname(4) = "P:\coweld01\future~1\TriTow~1\25_Year\cuhp\ttfc25yr.txt"
        outname(5) = "P:\coweld01\future~1\TriTow~1\50_Year\cuhp\ttfc50yr.cho"
        sumname(5) = "P:\coweld01\future~1\TriTow~1\50_Year\cuhp\ttfc50yr.txt"
        outname(6) = "P:\coweld01\future~1\TriTow~1\100_Year\cuhp\ttfc100y.cho"
        sumname(6) = "P:\coweld01\future~1\TriTow~1\100_Year\cuhp\ttfc100y.txt"
        numevents = 6
        END SELECT      'condition
  CASE 3
```

```
'        outname(1) = "a:\cuhp\ghxc10yr.cho"
'        sumname(1) = "a:\cuhp\ghxc10yr.txt"
        numevents = 1
END SELECT      'mainbasin

FOR eventnum = 1 TO numevents

PRINT "Now Working On:"
PRINT outname(eventnum); eventnum
OPEN outname(eventnum) FOR INPUT AS #1
OPEN sumname(eventnum) FOR OUTPUT AS #2

numbasins = 0: basinnum = 0

WHILE NOT EOF(1)

WHILE INSTR(sent$, search$(1)) = 0 AND NOT EOF(1)
  LINE INPUT #1, sent$
WEND
basinnum = basinnum + 1

'PRINT sent$
id(basinnum) = LTRIM$(MID$(sent$, INSTR(sent$, search$(1)) + LEN(search$(1)), 8))
'PRINT basinnum
'PRINT id(basinnum)

WHILE INSTR(sent$, search$(3)) = 0 AND NOT EOF(1)
  LINE INPUT #1, sent$
WEND
IF NOT EOF(1) THEN LINE INPUT #1, sent$
IF NOT EOF(1) THEN INPUT #1, area(basinnum), basinlength(basinnum), distance(basinnum), imperv(basinnum), slope(basinnum),
duration(basinnum)
'PRINT area(basinnum), basinlength(basinnum), distance(basinnum), imperv(basinnum), slope(basinnum), area(basinnum), basinlength(basinnum),
distance(basinnum), imperv(basinnum), slope(basinnum), duration(basinnum)
'WHILE INKEY$ = "": WEND
'PRINT

WHILE INSTR(sent$, search$(2)) = 0 AND NOT EOF(1)
'WHILE NOT EOF(1) AND LEFT$(sent$, 16) <> "          VOLUME" AND NOT EOF(1)
  LINE INPUT #1, sent$
WEND
runoff(eventnum, basinnum) = VAL(MID$(sent$, INSTR(sent$, search$(2)) + LEN(search$(2)), 8))
IF NOT EOF(1) THEN LINE INPUT #1, sent$
peakq(eventnum, basinnum) = VAL(MID$(sent$, INSTR(sent$, "PEAK Q =") + LEN("PEAK Q ="), 6))
peaktime(eventnum, basinnum) = VAL(MID$(sent$, INSTR(sent$, "TIME OF PEAK =") + LEN("TIME OF PEAK ="), 5))
PRINT runoff(eventnum, basinnum), peakq(eventnum, basinnum), peaktime(eventnum, basinnum)
IF NOT EOF(1) THEN LINE INPUT #1, sent$

WEND 'not eof(1)
numbasins = basinnum - 1
totalarea = 0: totalbasinlength = 0: totaldistance = 0: totalimperv = 0
totalslope = 0:  totalduration = 0:   totalrunoff = 0: totalpeakq = 0
totalpeaktime = 0: totalqa = 0
'FOR x = 1 TO numbasins: totalarea = totalarea + area(x): NEXT
'PRINT totalarea
CLOSE #1

PRINT #2, DATE$; "  "; TIME$
PRINT #2, "Summary File: "; sumname(eventnum)
PRINT #2, "BASIN "; " AREA"; " LENGTH"; " DIST. "; "IMPERV."; " SLOPE "; "DURATION"; " VOLUME "; " PEAKQ "; " PEAKT "; "  Q/AREA "
PRINT #2, "ID   "; " (SQMI)"; " (MI) "; " (MI)  "; "  (%)  "; "(FT/FT)"; "  (MIN) "; " (ACFT) "; " (CFS) "; " (MIN) "; " (CFS/AC)"
FOR x = 1 TO numbasins
 PRINT #2, id(x); area(x); basinlength(x); distance(x); imperv(x); slope(x); duration(x); runoff(eventnum, x); peakq(eventnum, x);
peaktime(eventnum, x); INT(peakq(eventnum, x) / area(x) / 640 * 100) / 100
 totalarea = totalarea + area(x)
 totalbasinlength = totalbasinlength + basinlength(x)
 totaldistance = totaldistance + distance(x)
 totalimperv = totalimperv + imperv(x)
 totalslope = totalslope + slope(x)
 totalduration = totalduration + duration(x)
 totalrunoff = totalrunoff + runoff(eventnum, x)
 totalpeakq = totalpeakq + peakq(eventnum, x)
 totalpeaktime = totalpeaktime + peaktime(eventnum, x)
 totalqa = totalqa + INT(peakq(eventnum, x) / area(x) / 640 * 100) / 100
NEXT x
PRINT #2,
PRINT #2, USING "Total ###.# ###.# ##.## & & & ####.# ###### & &"; totalarea; totalbasinlength; totaldistance; "_"; "_"; "_"; totalrunoff;
totalpeakq; "_"; "_"
PRINT #2, USING "Average ###.# ###.# ##.## ###.# #.### "; totalarea / numbasins; totalbasinlength / numbasins; totaldistance / numbasins;
totalimperv / numbasins; totalslope / numbasins;
PRINT #2, USING "##.# ####.# ###### ### ##.#"; totalduration / numbasins; totalrunoff / numbasins; totalpeakq / numbasins; totalpeaktime /
numbasins; totalqa / numbasins
PRINT #2,

CLOSE #2

NEXT eventnum
SELECT CASE mainbasin
  CASE 1
        SELECT CASE condition
          CASE 1
          CASE 2
                filename$ = "P:\coweld01\existi-1\Goddin-1\ghexcuhp.txt"
          CASE 3
                filename$ = "P:\coweld01\future-1\Goddin-1\ghfucuhp.txt"
        END SELECT
  CASE 2
        SELECT CASE condition
          CASE 1
          CASE 2
```

```
            filename$ = "P:\coweld01\existi-1\TriTow-1\ttexcuhp.txt"
        CASE 3
            filename$ = "P:\coweld01\future-1\TriTow-1\ttfucuhp.txt"
      END SELECT

  CASE 3
      SELECT CASE condition
        CASE 1
            filename$ = "P:\coweld01\histor-1\TriTow-1\tthccuhp.txt"
        CASE 2
            filename$ = "A:\ghexcuhp.txt"
        CASE 3
      END SELECT

END SELECT
'PRINT mainbasin, condition, "fn =", filename$
'WHILE INKEY$ = "": WEND
OPEN filename$ FOR OUTPUT AS #2
FOR eventnum = 1 TO numevents: totalvol(eventnum) = 0:  NEXT eventnum
PRINT #2, DATE$; "  "; TIME$
PRINT #2, "Summary File: "; filename$
PRINT #2, "_ "; "2-YrVol "; "5-YrVol "; "10-YrVol "; "25-YrVol "; "50-YrVol "; "100-YrVol "
PRINT #2, "BASIN "; "2-YEAR "; "5-YEAR "; "10-YEAR "; "25-YEAR "; "50-YEAR "; "100-YEAR "
PRINT #2, "ID "; "VOLUME "; "VOLUME "; "VOLUME "; "VOLUME "; "VOLUME "; "VOLUME "
PRINT #2, "_ "; "(ac.ft.) "; "(ac.ft.) "; "(ac.ft.) "; "(ac.ft.) "; "(ac.ft.) "; "(ac.ft.) "
FOR basinnum = 1 TO numbasins
  PRINT #2, id(basinnum);
  FOR eventnum = 1 TO numevents
   PRINT #2, USING "####.# "; runoff(eventnum, basinnum);
   totalvol(eventnum) = totalvol(eventnum) + runoff(eventnum, basinnum)
  NEXT eventnum
  PRINT #2,
NEXT basinnum
PRINT #2, "Total ";
FOR eventnum = 1 TO numevents: PRINT #2, USING " #####.# "; totalvol(eventnum); : NEXT eventnum
PRINT #2,
PRINT #2, "Average ";
FOR eventnum = 1 TO numevents: PRINT #2, USING " ####.# "; totalvol(eventnum) / numbasins; : NEXT eventnum

FOR eventnum = 1 TO numevents: totalpeakq(eventnum) = 0: totalpeaktime(eventnum) = 0: NEXT eventnum
PRINT #2,
PRINT #2, "_ "
PRINT #2, DATE$; "  "; TIME$
PRINT #2, "Summary File: "; filename$
PRINT #2, "_ "; "2-YrPkQ "; "2-YrPkT "; "5-YrPkQ "; "5-YrPkT "; "10-YrPkQ "; "10-YrPkT "; "25-YrPkQ "; "25-YrPkT "; "50-YrPkQ "; "50-YrPkT
"; "100-YrPkQ "; "100-YrPkT "
PRINT #2, "BASIN "; "2-YEAR "; "_ "; "5-YEAR "; "_ "; "10-YEAR "; "_ "; "25-YEAR "; "_ "; "50-YEAR "; "_ "; "100-YEAR "
PRINT #2, "ID "; "PEAK_Q "; "TIME_Pk "; "PEAK_Q "; "TIME_Pk "; "PEAK_Q "; "TIME_Pk "; "PEAK_Q "; "TIME_Pk "; "PEAK_Q "; "TIME_Pk "; "PEAK_Q
"; "TIME_Pk "
PRINT #2, "_ "; "(cfs) "; "(min) "; "(cfs) "; "(min) "; "(cfs) "; "(min) "; "(cfs) "; "(min) "; "(cfs) "; "(min) "; "(cfs) "; "(min) "
FOR basinnum = 1 TO numbasins
  PRINT #2, id(basinnum);
  FOR eventnum = 1 TO numevents
   PRINT #2, peakq(eventnum, basinnum), peaktime(eventnum, basinnum);
   totalpeakq(eventnum) = totalpeakq(eventnum) + peakq(eventnum, basinnum)
   totalpeaktime(eventnum) = totalpeaktime(eventnum) + peaktime(eventnum, basinnum)
  NEXT eventnum
  PRINT #2,
NEXT basinnum
PRINT #2, "Total ";
FOR eventnum = 1 TO numevents: PRINT #2, totalpeakq(eventnum); " _ "; : NEXT eventnum
PRINT #2,
PRINT #2, "Average ";
FOR eventnum = 1 TO numevents
  PRINT #2, USING " ####  #### "; totalpeakq(eventnum) / numbasins; totalpeaktime(eventnum) / numbasins;
NEXT eventnum

CLOSE #2

END
```

II-G

CUHP SUMMARY OUTPUT

6/8/99 14:04:05

Summary File: P:\coweld01\existi~1\Goddin~1\2_Year\cuhp\ghxc2yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
GHSB1	1.22	1.14	0.34	10.6	0.004	5	4.75	40	50	0.05
GHSB2	0.44	1.33	0.72	17.9	0.003	5	3.34	17	60	0.06
GHSB3	1.08	1.84	0.72	19.0	0.007	5	7.89	49	55	0.07
GHSB4	1.21	1.65	0.63	18.4	0.008	5	8.35	59	50	0.07
GHSB5	1.31	1.72	0.63	13.2	0.007	5	5.87	38	55	0.04
GHSB6	1.38	1.76	0.57	20.7	0.007	5	11.23	83	50	0.09
GHSB7	1.48	1.97	0.57	10.2	0.007	5	4.73	31	55	0.03
GHSB8	0.41	1.23	0.34	10.1	0.01	5	1.48	12	45	0.04
GHSB9	0.29	1.12	0.26	10.0	0.011	5	1.04	9	40	0.04
GHSB10	0.22	0.64	0.15	56.5	0.018	5	6.76	132	30	0.93
GHSB11	0.18	0.66	0.17	29.7	0.012	5	2.56	39	30	0.33
GHSB12	0.10	0.64	0.26	10.0	0.013	5	0.37	2	45	0.03
GHSB13	0.30	0.83	0.34	10.0	0.019	5	1.10	11	40	0.05
GHSB14	0.24	0.81	0.36	10.0	0.019	5	0.88	9	40	0.05
GHSB15	0.10	0.37	0.13	11.7	0.013	5	0.42	2	50	0.03
GHSB16	0.20	0.64	0.30	10.0	0.015	5	0.74	8	40	0.06
GHSB17	0.35	0.78	0.28	10.5	0.026	5	1.34	17	40	0.07
GHSB20	0.24	0.78	0.34	10.0	0.012	5	0.88	8	40	0.05
GHSB21	0.58	1.21	0.57	11.0	0.009	5	2.06	15	50	0.04
GHSB22	0.50	1.06	0.51	14.8	0.015	5	2.95	25	45	0.07
GHSB23	0.65	1.14	0.57	10.5	0.012	5	2.51	20	45	0.04
GHSB24	0.59	1.08	0.44	11.4	0.015	5	2.51	23	45	0.06
GHSB25	0.13	0.57	0.15	12.4	0.014	5	0.61	6	40	0.07
GHSB26	0.06	0.63	0.21	11.6	0.017	5	0.26	2	40	0.05
GHSB27	0.64	1.42	0.53	11.7	0.019	5	2.78	22	45	0.05
GHSB30	0.68	1.51	0.81	12.4	0.014	5	3.24	21	55	0.04
GHSB31	0.34	1.25	0.30	10.0	0.013	5	1.20	11	45	0.05
GHSB32	0.94	1.76	0.76	18.4	0.015	5	7.23	50	50	0.08
GHSB33	0.33	1.12	0.46	10.4	0.008	5	1.25	9	45	0.04
GHSB34	0.33	1.42	0.74	14.1	0.019	5	1.81	12	50	0.05
GHSB35	0.15	0.80	0.30	55.2	0.014	5	4.45	72	30	0.74
GHSB36	0.55	1.29	0.36	10.0	0.014	5	1.97	18	45	0.05
GHSB37	0.85	1.35	0.47	19.7	0.026	5	7.10	72	40	0.13
GHSB40	0.35	0.95	0.44	14.6	0.012	5	2.02	17	45	0.07
GHSB41	0.54	1.12	0.44	10.3	0.011	5	1.94	16	45	0.04
GHSB42	0.19	0.47	0.26	54.4	0.008	5	5.45	97	30	0.79
GHSB43	0.25	0.95	0.49	10.0	0.004	5	0.88	5	50	0.03
Total	19.4	41	15.92	_	_	_	115.9	1079	_	_
Average	0.5	1.1	0.43	16.5	0.013	5	3.1	29	45	0.1

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Summary File: P:\coweld01\existi~1\Goddin~1\5_Year\cuhp\ghxc5yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
GHSB1	1.22	1.14	0.34	10.6	0.004	5	17.80	166	50	0.21
GHSB2	0.44	1.33	0.72	17.9	0.003	5	8.50	48	60	0.17
GHSB3	1.08	1.84	0.72	19.0	0.007	5	16.53	110	55	0.15
GHSB4	1.21	1.65	0.63	18.4	0.008	5	17.20	128	50	0.16
GHSB5	1.31	1.72	0.63	13.2	0.007	5	14.43	99	55	0.11
GHSB6	1.38	1.76	0.57	20.7	0.007	5	22.21	174	50	0.19
GHSB7	1.48	1.97	0.57	10.2	0.007	5	13.80	95	55	0.10
GHSB8	0.41	1.23	0.34	10.1	0.010	5	5.43	49	45	0.18
GHSB9	0.29	1.12	0.26	10.0	0.011	5	3.92	39	45	0.21
GHSB10	0.22	0.64	0.15	56.5	0.018	5	10.32	220	30	1.56
GHSB11	0.18	0.66	0.17	29.7	0.012	5	5.02	87	35	0.75
GHSB12	0.10	0.64	0.26	10.0	0.013	5	1.45	11	45	0.17
GHSB13	0.30	0.83	0.34	10.0	0.019	5	4.30	50	40	0.26
GHSB14	0.24	0.81	0.36	10.0	0.019	5	3.43	38	40	0.24
GHSB15	0.10	0.37	0.13	11.7	0.013	5	1.47	9	50	0.14
GHSB16	0.20	0.64	0.30	10.0	0.015	5	2.92	35	40	0.27
GHSB17	0.35	0.78	0.28	10.5	0.026	5	4.99	69	40	0.30
GHSB20	0.24	0.78	0.34	10.0	0.012	5	3.43	36	40	0.23
GHSB21	0.58	1.21	0.57	11.0	0.009	5	5.73	44	50	0.11
GHSB22	0.50	1.06	0.51	14.8	0.015	5	8.34	78	45	0.24
GHSB23	0.65	1.14	0.57	10.5	0.012	5	9.35	81	50	0.19
GHSB24	0.59	1.08	0.44	11.4	0.015	5	8.90	90	45	0.23
GHSB25	0.13	0.57	0.15	12.4	0.014	5	1.95	23	40	0.27
GHSB26	0.06	0.63	0.21	11.6	0.017	5	0.87	8	40	0.20
GHSB27	0.64	1.42	0.53	11.7	0.019	5	9.44	83	50	0.20
GHSB30	0.68	1.51	0.81	12.4	0.014	5	10.77	75	55	0.17
GHSB31	0.34	1.25	0.30	10.0	0.013	5	4.55	44	45	0.20
GHSB32	0.94	1.76	0.76	18.4	0.015	5	17.81	136	55	0.22
GHSB33	0.33	1.12	0.46	10.4	0.008	5	4.70	37	50	0.17
GHSB34	0.33	1.42	0.74	14.1	0.019	5	5.34	38	50	0.17
GHSB35	0.15	0.80	0.30	55.2	0.014	5	6.89	122	35	1.27
GHSB36	0.55	1.29	0.36	10.0	0.014	5	7.63	75	45	0.21
GHSB37	0.85	1.35	0.47	19.7	0.026	5	16.82	187	40	0.34
GHSB40	0.35	0.95	0.44	14.6	0.012	5	5.65	53	45	0.23
GHSB41	0.54	1.12	0.44	10.3	0.011	5	6.81	61	45	0.17
GHSB42	0.19	0.47	0.26	54.4	0.008	5	8.06	157	30	1.29
GHSB43	0.25	0.95	0.49	10.0	0.004	5	3.37	23	50	0.14
Total	19.40	41.00	15.92	_	_	_	300.10	2878	_	_
Average	0.50	1.10	0.43	16.5	0.013	5	8.10	78	46	0.30

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Summary File: P:\coweld01\existi~1\Goddin~1\10_Year\cuhp\ghxc10yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
GHSB1	1.22	1.14	0.34	10.6	0.004	5	32.87	288	45	0.36
GHSB2	0.44	1.33	0.72	17.9	0.003	5	14.13	78	55	0.27
GHSB3	1.08	1.84	0.72	19.0	0.007	5	28.34	198	55	0.28
GHSB4	1.21	1.65	0.63	18.4	0.008	5	29.93	237	50	0.30
GHSB5	1.31	1.72	0.63	13.2	0.007	5	28.06	202	55	0.24
GHSB6	1.38	1.76	0.57	20.7	0.007	5	37.17	309	50	0.34
GHSB7	1.48	1.97	0.57	10.2	0.007	5	29.08	207	55	0.21
GHSB8	0.41	1.23	0.34	10.1	0.010	5	10.54	90	45	0.34
GHSB9	0.29	1.12	0.26	10.0	0.011	5	7.49	71	40	0.38
GHSB10	0.22	0.64	0.15	56.5	0.018	5	13.41	302	30	2.14
GHSB11	0.18	0.66	0.17	29.7	0.012	5	7.43	129	30	1.11
GHSB12	0.10	0.64	0.26	10.0	0.013	5	2.71	20	45	0.31
GHSB13	0.30	0.83	0.34	10.0	0.019	5	8.03	87	40	0.45
GHSB14	0.24	0.81	0.36	10.0	0.019	5	6.41	66	40	0.42
GHSB15	0.10	0.37	0.13	11.7	0.013	5	2.66	16	45	0.24
GHSB16	0.20	0.64	0.30	10.0	0.015	5	5.45	61	40	0.47
GHSB17	0.35	0.78	0.28	10.5	0.026	5	9.31	120	35	0.53
GHSB20	0.24	0.78	0.34	10.0	0.012	5	6.41	63	40	0.41
GHSB21	0.58	1.21	0.57	11.0	0.009	5	11.78	94	50	0.25
GHSB22	0.50	1.06	0.51	14.8	0.015	5	14.65	133	45	0.41
GHSB23	0.65	1.14	0.57	10.5	0.012	5	17.44	141	45	0.33
GHSB24	0.59	1.08	0.44	11.4	0.015	5	16.21	154	45	0.40
GHSB25	0.13	0.57	0.15	12.4	0.014	5	3.57	41	35	0.49
GHSB26	0.06	0.63	0.21	11.6	0.017	5	1.62	14	40	0.36
GHSB27	0.64	1.42	0.53	11.7	0.019	5	17.35	146	45	0.35
GHSB30	0.68	1.51	0.81	12.4	0.014	5	19.30	128	50	0.29
GHSB31	0.34	1.25	0.30	10.0	0.013	5	8.71	79	45	0.36
GHSB32	0.94	1.76	0.76	18.4	0.015	5	29.71	222	50	0.36
GHSB33	0.33	1.12	0.46	10.4	0.008	5	8.78	65	45	0.30
GHSB34	0.33	1.42	0.74	14.1	0.019	5	9.43	64	50	0.30
GHSB35	0.15	0.80	0.30	55.2	0.014	5	8.96	168	30	1.74
GHSB36	0.55	1.29	0.36	10.0	0.014	5	14.35	132	45	0.37
GHSB37	0.85	1.35	0.47	19.7	0.026	5	27.61	305	40	0.56
GHSB40	0.35	0.95	0.44	14.6	0.012	5	10.08	91	45	0.40
GHSB41	0.54	1.12	0.44	10.3	0.011	5	13.43	115	45	0.33
GHSB42	0.19	0.47	0.26	54.4	0.008	5	10.49	217	30	1.78
GHSB43	0.25	0.95	0.49	10.0	0.004	5	6.39	41	50	0.25
Total	19.40	41.00	15.92	_	_	_	529.30	4894	_	_
Average	0.50	1.10	0.43	16.5	0.013	5	14.30	132	44	0.50

6/8/99 14:04:08
Summary File: P:\coweld01\existi~1\Goddin~1\25_Year\cuhp\ghxc25yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
GHSB1	1.22	1.14	0.34	10.6	0.004	5	59.68	519	50	0.66
GHSB2	0.44	1.33	0.72	17.9	0.003	5	23.96	136	65	0.48
GHSB3	1.08	1.84	0.72	19.0	0.007	5	52.32	368	60	0.53
GHSB4	1.21	1.65	0.63	18.4	0.008	5	57.31	455	55	0.58
GHSB5	1.31	1.72	0.63	13.2	0.007	5	57.38	406	60	0.48
GHSB6	1.38	1.76	0.57	20.7	0.007	5	68.50	574	55	0.64
GHSB7	1.48	1.97	0.57	10.2	0.007	5	61.91	425	60	0.44
GHSB8	0.41	1.23	0.34	10.1	0.010	5	19.67	167	50	0.63
GHSB9	0.29	1.12	0.26	10.0	0.011	5	13.87	129	45	0.69
GHSB10	0.22	0.64	0.15	56.5	0.018	5	18.47	402	35	2.85
GHSB11	0.18	0.66	0.17	29.7	0.012	5	11.51	202	35	1.75
GHSB12	0.10	0.64	0.26	10.0	0.013	5	4.96	36	45	0.56
GHSB13	0.30	0.83	0.34	10.0	0.019	5	14.67	155	45	0.80
GHSB14	0.24	0.81	0.36	10.0	0.019	5	11.71	118	45	0.76
GHSB15	0.10	0.37	0.13	11.7	0.013	5	4.78	29	50	0.45
GHSB16	0.20	0.64	0.30	10.0	0.015	5	9.96	108	45	0.84
GHSB17	0.35	0.78	0.28	10.5	0.026	5	16.99	213	45	0.95
GHSB20	0.24	0.78	0.34	10.0	0.012	5	11.71	113	45	0.73
GHSB21	0.58	1.21	0.57	11.0	0.009	5	24.69	188	55	0.50
GHSB22	0.50	1.06	0.51	14.8	0.015	5	25.73	234	50	0.73
GHSB23	0.65	1.14	0.57	10.5	0.012	5	31.84	256	50	0.61
GHSB24	0.59	1.08	0.44	11.4	0.015	5	29.19	274	50	0.72
GHSB25	0.13	0.57	0.15	12.4	0.014	5	6.44	75	45	0.90
GHSB26	0.06	0.63	0.21	11.6	0.017	5	2.94	26	40	0.67
GHSB27	0.64	1.42	0.53	11.7	0.019	5	31.39	263	50	0.64
GHSB30	0.68	1.51	0.81	12.4	0.014	5	34.37	230	60	0.52
GHSB31	0.34	1.25	0.30	10.0	0.013	5	16.12	144	45	0.66
GHSB32	0.94	1.76	0.76	18.4	0.015	5	50.42	384	55	0.63
GHSB33	0.33	1.12	0.46	10.4	0.008	5	16.04	118	50	0.55
GHSB34	0.33	1.42	0.74	14.1	0.019	5	16.62	114	55	0.53
GHSB35	0.15	0.80	0.30	55.2	0.014	5	12.36	241	35	2.51
GHSB36	0.55	1.29	0.36	10.0	0.014	5	26.34	239	50	0.67
GHSB37	0.85	1.35	0.47	19.7	0.026	5	46.33	518	45	0.95
GHSB40	0.35	0.95	0.44	14.6	0.012	5	17.87	162	50	0.72
GHSB41	0.54	1.12	0.44	10.3	0.011	5	25.24	214	50	0.61
GHSB42	0.19	0.47	0.26	54.4	0.008	5	14.85	317	35	2.60
GHSB43	0.25	0.95	0.49	10.0	0.004	5	11.78	75	55	0.46
Total	19.40	41.00	15.92	–	–	–	959.90	8627	–	–
Average	0.50	1.10	0.43	16.5	0.013	5	25.90	233	49	0.80

6/8/99 14:04:10
Summary File: P:\coweld01\existi~1\Goddin~1\50_Year\cuhp\ghxc50yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
GHSB1	1.22	1.14	0.34	10.6	0.004	5	82.29	736	55	0.94
GHSB2	0.44	1.33	0.72	17.9	0.003	5	32.17	189	65	0.67
GHSB3	1.08	1.84	0.72	19.0	0.007	5	71.82	520	60	0.75
GHSB4	1.21	1.65	0.63	18.4	0.008	5	79.17	646	60	0.83
GHSB5	1.31	1.72	0.63	13.2	0.007	5	81.09	587	60	0.70
GHSB6	1.38	1.76	0.57	20.7	0.007	5	93.57	806	55	0.91
GHSB7	1.48	1.97	0.57	10.2	0.007	5	88.77	622	65	0.65
GHSB8	0.41	1.23	0.34	10.1	0.010	5	27.38	237	50	0.90
GHSB9	0.29	1.12	0.26	10.0	0.011	5	19.26	183	55	0.98
GHSB10	0.22	0.64	0.15	56.5	0.018	5	22.51	515	35	3.65
GHSB11	0.18	0.66	0.17	29.7	0.012	5	14.87	264	35	2.29
GHSB12	0.10	0.64	0.26	10.0	0.013	5	6.85	51	50	0.79
GHSB13	0.30	0.83	0.34	10.0	0.019	5	20.28	218	50	1.13
GHSB14	0.24	0.81	0.36	10.0	0.019	5	16.18	165	45	1.07
GHSB15	0.10	0.37	0.13	11.7	0.013	5	6.56	41	50	0.64
GHSB16	0.20	0.64	0.30	10.0	0.015	5	13.77	154	50	1.20
GHSB17	0.35	0.78	0.28	10.5	0.026	5	23.47	298	45	1.33
GHSB20	0.24	0.78	0.34	10.0	0.012	5	16.18	157	45	1.02
GHSB21	0.58	1.21	0.57	11.0	0.009	5	35.24	273	55	0.73
GHSB22	0.50	1.06	0.51	14.8	0.015	5	35.03	327	50	1.02
GHSB23	0.65	1.14	0.57	10.5	0.012	5	43.98	363	55	0.87
GHSB24	0.59	1.08	0.44	11.4	0.015	5	40.12	385	50	1.01
GHSB25	0.13	0.57	0.15	12.4	0.014	5	8.85	110	45	1.32
GHSB26	0.06	0.63	0.21	11.6	0.017	5	4.05	38	55	0.98
GHSB27	0.64	1.42	0.53	11.7	0.019	5	43.21	369	55	0.90
GHSB30	0.68	1.51	0.81	12.4	0.014	5	47.06	325	60	0.74
GHSB31	0.34	1.25	0.30	10.0	0.013	5	22.38	204	50	0.93
GHSB32	0.94	1.76	0.76	18.4	0.015	5	67.73	533	60	0.88
GHSB33	0.33	1.12	0.46	10.4	0.008	5	22.17	166	55	0.78
GHSB34	0.33	1.42	0.74	14.1	0.019	5	22.66	161	55	0.76
GHSB35	0.15	0.80	0.30	55.2	0.014	5	15.08	296	35	3.08
GHSB36	0.55	1.29	0.36	10.0	0.014	5	36.46	338	50	0.96
GHSB37	0.85	1.35	0.47	19.7	0.026	5	61.94	706	45	1.29
GHSB40	0.35	0.95	0.44	14.6	0.012	5	24.41	227	50	1.01
GHSB41	0.54	1.12	0.44	10.3	0.011	5	35.18	305	50	0.88
GHSB42	0.19	0.47	0.26	54.4	0.008	5	18.28	396	35	3.25
GHSB43	0.25	0.95	0.49	10.0	0.004	5	16.33	106	55	0.66
Total	19.40	41.00	15.92	_	_	_	1316.30	12017	_	_
Average	0.50	1.10	0.43	16.5	0.013	5	35.60	325	51	1.10

Godding Hollow, Existing Conditions, 100 Year Storm

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Summary File: P:\coweld01\existi~1\Goddin~1\100_Year\cuhp\ghxc100y.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
GHSB1	1.22	1.14	0.34	10.6	0.004	5	104.07	926	55	1.18
GHSB2	0.44	1.33	0.72	17.9	0.003	5	40.08	239	65	0.84
GHSB3	1.08	1.84	0.72	19.0	0.007	5	90.94	666	65	0.96
GHSB4	1.21	1.65	0.63	18.4	0.008	5	100.65	826	60	1.06
GHSB5	1.31	1.72	0.63	13.2	0.007	5	104.44	760	65	0.90
GHSB6	1.38	1.76	0.57	20.7	0.007	5	118.19	1022	60	1.15
GHSB7	1.48	1.97	0.57	10.2	0.007	5	115.22	812	65	0.85
GHSB8	0.41	1.23	0.34	10.1	0.010	5	34.81	300	60	1.14
GHSB9	0.29	1.12	0.26	10.0	0.011	5	24.45	232	55	1.25
GHSB10	0.22	0.64	0.15	56.5	0.018	5	26.46	619	35	4.39
GHSB11	0.18	0.66	0.17	29.7	0.012	5	18.11	318	35	2.76
GHSB12	0.10	0.64	0.26	10.0	0.013	5	8.67	70	65	1.09
GHSB13	0.30	0.83	0.34	10.0	0.019	5	25.68	274	50	1.42
GHSB14	0.24	0.81	0.36	10.0	0.019	5	20.50	207	50	1.34
GHSB15	0.10	0.37	0.13	11.7	0.013	5	8.27	55	70	0.85
GHSB16	0.20	0.64	0.30	10.0	0.015	5	17.43	193	50	1.50
GHSB17	0.35	0.78	0.28	10.5	0.026	5	29.71	374	45	1.66
GHSB20	0.24	0.78	0.34	10.0	0.012	5	20.50	199	55	1.29
GHSB21	0.58	1.21	0.57	11.0	0.009	5	45.64	350	55	0.94
GHSB22	0.50	1.06	0.51	14.8	0.015	5	43.98	408	50	1.27
GHSB23	0.65	1.14	0.57	10.5	0.012	5	55.68	457	55	1.09
GHSB24	0.59	1.08	0.44	11.4	0.015	5	50.64	482	50	1.27
GHSB25	0.13	0.57	0.15	12.4	0.014	5	11.17	148	45	1.77
GHSB26	0.06	0.63	0.21	11.6	0.017	5	5.12	52	50	1.35
GHSB27	0.64	1.42	0.53	11.7	0.019	5	54.59	465	55	1.13
GHSB30	0.68	1.51	0.81	12.4	0.014	5	59.27	410	60	0.94
GHSB31	0.34	1.25	0.30	10.0	0.013	5	28.41	257	50	1.18
GHSB32	0.94	1.76	0.76	18.4	0.015	5	84.40	670	60	1.11
GHSB33	0.33	1.12	0.46	10.4	0.008	5	28.07	211	65	0.99
GHSB34	0.33	1.42	0.74	14.1	0.019	5	28.48	201	55	0.95
GHSB35	0.15	0.80	0.30	55.2	0.014	5	17.74	343	35	3.57
GHSB36	0.55	1.29	0.36	10.0	0.014	5	46.21	424	50	1.20
GHSB37	0.85	1.35	0.47	19.7	0.026	5	76.98	871	50	1.60
GHSB40	0.35	0.95	0.44	14.6	0.012	5	30.71	285	55	1.27
GHSB41	0.54	1.12	0.44	10.3	0.011	5	44.76	387	60	1.11
GHSB42	0.19	0.47	0.26	54.4	0.008	5	21.67	470	35	3.86
GHSB43	0.25	0.95	0.49	10.0	0.004	5	20.71	134	55	0.83
Total	19.40	41.00	15.92	_	_	_	1662.40	15117	_	_
Average	0.50	1.10	0.43	16.5	0.013	5	44.90	409	54	1.40

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Summary File: P:\coweld01\future~1\Goddin~1\2_Year\cuhp\ghfc2yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
GHSB1	1.22	1.19	0.34	39.7	0.004	5	24.87	308	40	0.39
GHSB2	0.44	1.38	0.72	65.1	0.003	5	15.91	168	45	0.59
GHSB3	1.08	1.89	0.72	63.4	0.007	5	36.93	433	45	0.62
GHSB4	1.21	1.71	0.63	55.5	0.008	5	35.26	423	40	0.54
GHSB5	1.31	1.78	0.63	41.2	0.007	5	26.97	272	45	0.32
GHSB6	1.38	1.82	0.57	51.0	0.007	5	36.61	427	45	0.48
GHSB7	1.48	2.03	0.57	43.5	0.007	5	32.51	341	45	0.36
GHSB8	0.41	1.29	0.34	64.0	0.010	5	14.55	228	35	0.86
GHSB9	0.29	1.17	0.26	68.0	0.011	5	10.92	181	30	0.97
GHSB10	0.22	0.70	0.15	72.8	0.018	5	9.11	174	30	1.23
GHSB11	0.18	0.72	0.17	60.1	0.012	5	5.98	109	30	0.94
GHSB12	0.10	0.70	0.26	42.8	0.013	5	2.27	27	35	0.42
GHSB13	0.30	0.89	0.34	78.1	0.019	5	13.49	262	30	1.36
GHSB14	0.24	0.87	0.36	75.0	0.019	5	10.23	191	30	1.24
GHSB15	0.10	0.43	0.13	81.2	0.013	5	4.50	66	35	1.03
GHSB16	0.20	0.70	0.30	71.0	0.015	5	8.14	153	30	1.19
GHSB17	0.35	0.83	0.28	84.5	0.026	5	17.03	322	30	1.43
GHSB20	0.24	0.83	0.34	67.5	0.012	5	9.01	154	30	1.00
GHSB21	0.58	1.27	0.57	60.3	0.009	5	18.79	250	40	0.67
GHSB22	0.50	1.12	0.51	70.0	0.015	5	19.58	313	35	0.97
GHSB23	0.65	1.19	0.57	36.4	0.012	5	11.89	133	40	0.31
GHSB24	0.59	1.14	0.44	37.0	0.015	5	10.96	138	35	0.36
GHSB25	0.13	0.63	0.15	32.3	0.014	5	2.01	27	35	0.32
GHSB26	0.06	0.68	0.21	73.4	0.017	5	2.48	28	40	0.72
GHSB27	0.64	1.48	0.53	22.1	0.019	5	6.18	55	45	0.13
GHSB30	0.68	1.57	0.81	76.2	0.014	5	29.59	403	40	0.92
GHSB31	0.34	1.31	0.30	68.1	0.013	5	12.72	206	35	0.94
GHSB32	0.94	1.82	0.76	22.1	0.015	5	9.06	66	50	0.10
GHSB33	0.33	1.17	0.46	15.8	0.008	5	2.12	15	45	0.07
GHSB34	0.33	1.48	0.74	82.4	0.019	5	15.52	218	35	1.03
GHSB35	0.15	0.85	0.30	73.6	0.014	5	6.22	112	30	1.16
GHSB36	0.55	1.35	0.36	61.8	0.014	5	18.38	295	35	0.83
GHSB37	0.85	1.40	0.47	69.6	0.026	5	32.73	546	35	1.00
GHSB40	0.35	1.00	0.44	65.6	0.012	5	12.74	201	35	0.89
GHSB41	0.54	1.17	0.44	48.0	0.011	5	13.47	182	35	0.52
GHSB42	0.19	0.53	0.26	79.4	0.008	5	8.73	164	30	1.34
GHSB43	0.25	1.00	0.49	75.4	0.004	5	10.46	137	35	0.85
Total	19.40	43.10	15.92	_	_	_	557.90	7728	_	_
Average	0.50	1.20	0.43	59.3	0.013	5	15.10	209	37	0.80

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Summary File: P:\coweld01\future~1\Goddin~1\5_Year\cuhp\ghfc5yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
GHSB1	1.22	1.19	0.34	39.7	0.004	5	42.50	595	40	0.76
GHSB2	0.44	1.38	0.72	65.1	0.003	5	23.56	270	45	0.95
GHSB3	1.08	1.89	0.72	63.4	0.007	5	53.42	675	45	0.97
GHSB4	1.21	1.71	0.63	55.5	0.008	5	51.90	677	40	0.87
GHSB5	1.31	1.78	0.63	41.2	0.007	5	42.08	465	45	0.55
GHSB6	1.38	1.82	0.57	51.0	0.007	5	54.76	690	45	0.78
GHSB7	1.48	2.03	0.57	43.5	0.007	5	50.46	582	45	0.61
GHSB8	0.41	1.29	0.34	64.0	0.010	5	21.52	364	35	1.38
GHSB9	0.29	1.17	0.26	68.0	0.011	5	15.96	285	35	1.53
GHSB10	0.22	0.70	0.15	72.8	0.018	5	13.06	267	30	1.89
GHSB11	0.18	0.72	0.17	60.1	0.012	5	9.06	179	30	1.55
GHSB12	0.10	0.70	0.26	42.8	0.013	5	3.78	50	35	0.78
GHSB13	0.30	0.89	0.34	78.1	0.019	5	19.03	383	30	1.99
GHSB14	0.24	0.87	0.36	75.0	0.019	5	14.61	286	30	1.86
GHSB15	0.10	0.43	0.13	81.2	0.013	5	6.27	98	35	1.53
GHSB16	0.20	0.70	0.30	71.0	0.015	5	11.80	235	30	1.83
GHSB17	0.35	0.83	0.28	84.5	0.026	5	23.60	461	30	2.05
GHSB20	0.24	0.83	0.34	67.5	0.012	5	13.24	242	30	1.57
GHSB21	0.58	1.27	0.57	60.3	0.009	5	27.43	393	40	1.05
GHSB22	0.50	1.12	0.51	70.0	0.015	5	28.38	489	35	1.52
GHSB23	0.65	1.19	0.57	36.4	0.012	5	21.06	265	40	0.63
GHSB24	0.59	1.14	0.44	37.0	0.015	5	19.33	273	40	0.72
GHSB25	0.13	0.63	0.15	32.3	0.014	5	3.74	56	35	0.67
GHSB26	0.06	0.68	0.21	73.4	0.017	5	3.55	44	40	1.14
GHSB27	0.64	1.48	0.53	22.1	0.019	5	13.86	137	45	0.33
GHSB30	0.68	1.57	0.81	76.2	0.014	5	42.09	615	40	1.41
GHSB31	0.34	1.31	0.30	68.1	0.013	5	18.57	325	35	1.49
GHSB32	0.94	1.82	0.76	22.1	0.015	5	20.16	163	50	0.27
GHSB33	0.33	1.17	0.46	15.8	0.008	5	5.85	47	45	0.22
GHSB34	0.33	1.48	0.74	82.4	0.019	5	21.55	319	35	1.51
GHSB35	0.15	0.85	0.30	73.6	0.014	5	8.93	170	30	1.77
GHSB36	0.55	1.35	0.36	61.8	0.014	5	27.59	483	35	1.37
GHSB37	0.85	1.40	0.47	69.6	0.026	5	47.52	854	35	1.56
GHSB40	0.35	1.00	0.44	65.6	0.012	5	18.73	319	35	1.42
GHSB41	0.54	1.17	0.44	48.0	0.011	5	21.32	314	35	0.90
GHSB42	0.19	0.53	0.26	79.4	0.008	5	11.99	234	30	1.92
GHSB43	0.25	1.00	0.49	75.4	0.004	5	14.89	208	35	1.30
Total	19.40	43.10	15.92	_	_	_	847.10	12512	_	_
Average	0.50	1.20	0.43	59.3	0.013	5	22.90	338	37	1.20

Godding Hollow, Future Conditions, 10 Year Storm

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Summary File: P:\coweld01\future~1\Goddin~1\10_Year\cuhp\ghfc10yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
GHSB1	1.22	1.19	0.34	39.7	0.004	5	58.75	841	40	1.07
GHSB2	0.44	1.38	0.72	65.1	0.003	5	29.82	349	45	1.23
GHSB3	1.08	1.89	0.72	63.4	0.007	5	67.74	889	45	1.28
GHSB4	1.21	1.71	0.63	55.5	0.008	5	67.25	922	40	1.19
GHSB5	1.31	1.78	0.63	41.2	0.007	5	57.79	682	45	0.81
GHSB6	1.38	1.82	0.57	51.0	0.007	5	72.06	956	45	1.08
GHSB7	1.48	2.03	0.57	43.5	0.007	5	68.55	841	45	0.88
GHSB8	0.41	1.29	0.34	64.0	0.010	5	27.35	480	35	1.82
GHSB9	0.29	1.17	0.26	68.0	0.011	5	20.07	376	30	2.02
GHSB10	0.22	0.70	0.15	72.8	0.018	5	16.25	344	30	2.44
GHSB11	0.18	0.72	0.17	60.1	0.012	5	11.61	244	30	2.11
GHSB12	0.10	0.70	0.26	42.8	0.013	5	5.15	71	35	1.10
GHSB13	0.30	0.89	0.34	78.1	0.019	5	23.40	497	30	2.58
GHSB14	0.24	0.87	0.36	75.0	0.019	5	18.07	374	30	2.43
GHSB15	0.10	0.43	0.13	81.2	0.013	5	7.67	122	35	1.90
GHSB16	0.20	0.70	0.30	71.0	0.015	5	14.72	311	30	2.42
GHSB17	0.35	0.83	0.28	84.5	0.026	5	28.72	582	30	2.59
GHSB20	0.24	0.83	0.34	67.5	0.012	5	16.65	325	30	2.11
GHSB21	0.58	1.27	0.57	60.3	0.009	5	35.08	524	40	1.41
GHSB22	0.50	1.12	0.51	70.0	0.015	5	35.52	632	35	1.97
GHSB23	0.65	1.19	0.57	36.4	0.012	5	29.75	381	40	0.91
GHSB24	0.59	1.14	0.44	37.0	0.015	5	27.17	395	35	1.04
GHSB25	0.13	0.63	0.15	32.3	0.014	5	5.46	82	35	0.98
GHSB26	0.06	0.68	0.21	73.4	0.017	5	4.41	56	35	1.45
GHSB27	0.64	1.48	0.53	22.1	0.019	5	22.05	214	45	0.52
GHSB30	0.68	1.57	0.81	76.2	0.014	5	51.95	775	40	1.78
GHSB31	0.34	1.31	0.30	68.1	0.013	5	23.35	418	35	1.92
GHSB32	0.94	1.82	0.76	22.1	0.015	5	32.20	256	50	0.42
GHSB33	0.33	1.17	0.46	15.8	0.008	5	10.01	78	45	0.36
GHSB34	0.33	1.48	0.74	82.4	0.019	5	26.31	402	35	1.90
GHSB35	0.15	0.85	0.30	73.6	0.014	5	11.08	222	30	2.31
GHSB36	0.55	1.35	0.36	61.8	0.014	5	35.23	637	35	1.80
GHSB37	0.85	1.40	0.47	69.6	0.026	5	59.53	1100	35	2.02
GHSB40	0.35	1.00	0.44	65.6	0.012	5	23.71	416	35	1.85
GHSB41	0.54	1.17	0.44	48.0	0.011	5	28.61	444	35	1.28
GHSB42	0.19	0.53	0.26	79.4	0.008	5	14.66	295	30	2.42
GHSB43	0.25	1.00	0.49	75.4	0.004	5	18.42	267	35	1.66
Total	19.40	43.10	15.92	_	_	_	1106.10	16800	_	_
Average	0.50	1.20	0.43	59.3	0.013	5	29.90	454	37	1.60

CUHP Summarized Output

6/8/99 14:04:56
Summary File: P:\coweld01\future~1\Goddin~1\25_Year\cuhp\ghfc25yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
GHSB1	1.22	1.19	0.34	39.7	0.004	5	86.06	1251	45	1.60
GHSB2	0.44	1.38	0.72	65.1	0.003	5	39.94	481	50	1.70
GHSB3	1.08	1.89	0.72	63.4	0.007	5	92.26	1235	50	1.78
GHSB4	1.21	1.71	0.63	55.5	0.008	5	94.88	1347	45	1.73
GHSB5	1.31	1.78	0.63	41.2	0.007	5	87.41	1060	50	1.26
GHSB6	1.38	1.82	0.57	51.0	0.007	5	103.66	1412	45	1.59
GHSB7	1.48	2.03	0.57	43.5	0.007	5	101.89	1279	50	1.35
GHSB8	0.41	1.29	0.34	64.0	0.010	5	36.81	645	40	2.45
GHSB9	0.29	1.17	0.26	68.0	0.011	5	26.69	521	35	2.80
GHSB10	0.22	0.70	0.15	72.8	0.018	5	21.36	443	30	3.14
GHSB11	0.18	0.72	0.17	60.1	0.012	5	15.77	330	35	2.86
GHSB12	0.10	0.70	0.26	42.8	0.013	5	7.45	104	40	1.62
GHSB13	0.30	0.89	0.34	78.1	0.019	5	30.34	658	35	3.42
GHSB14	0.24	0.87	0.36	75.0	0.019	5	23.60	501	35	3.26
GHSB15	0.10	0.43	0.13	81.2	0.013	5	9.88	156	40	2.43
GHSB16	0.20	0.70	0.30	71.0	0.015	5	19.41	417	35	3.25
GHSB17	0.35	0.83	0.28	84.5	0.026	5	36.78	738	35	3.29
GHSB20	0.24	0.83	0.34	67.5	0.012	5	22.15	448	35	2.91
GHSB21	0.58	1.27	0.57	60.3	0.009	5	48.30	736	40	1.98
GHSB22	0.50	1.12	0.51	70.0	0.015	5	47.00	832	40	2.60
GHSB23	0.65	1.19	0.57	36.4	0.012	5	44.39	581	45	1.39
GHSB24	0.59	1.14	0.44	37.0	0.015	5	40.36	602	40	1.59
GHSB25	0.13	0.63	0.15	32.3	0.014	5	8.36	126	40	1.51
GHSB26	0.06	0.68	0.21	73.4	0.017	5	5.78	76	40	1.97
GHSB27	0.64	1.48	0.53	22.1	0.019	5	36.19	358	50	0.87
GHSB30	0.68	1.57	0.81	76.2	0.014	5	67.66	1014	45	2.32
GHSB31	0.34	1.31	0.30	68.1	0.013	5	31.04	571	35	2.62
GHSB32	0.94	1.82	0.76	22.1	0.015	5	52.97	433	55	0.71
GHSB33	0.33	1.17	0.46	15.8	0.008	5	17.31	135	50	0.63
GHSB34	0.33	1.48	0.74	82.4	0.019	5	33.82	528	40	2.49
GHSB35	0.15	0.85	0.30	73.6	0.014	5	14.52	298	35	3.10
GHSB36	0.55	1.35	0.36	61.8	0.014	5	47.62	855	40	2.42
GHSB37	0.85	1.40	0.47	69.6	0.026	5	78.84	1425	40	2.61
GHSB40	0.35	1.00	0.44	65.6	0.012	5	31.76	551	40	2.45
GHSB41	0.54	1.17	0.44	48.0	0.011	5	40.70	651	40	1.88
GHSB42	0.19	0.53	0.26	79.4	0.008	5	19.08	386	35	3.17
GHSB43	0.25	1.00	0.49	75.4	0.004	5	24.04	360	40	2.25
Total	19.40	43.10	15.92	_	_	_	1546.10	23544	_	_
Average	0.50	1.20	0.43	59.3	0.013	5	41.80	636	41	2.20

Godding Hollow, Future Conditions, 50 Year Storm

6/8/99 14:04:57
Summary File: P:\coweld01\future~1\Goddin~1\50_Year\cuhp\ghfc50yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
GHSB1	1.22	1.19	0.34	39.7	0.004	5	108.35	1632	45	2.09
GHSB2	0.44	1.38	0.72	65.1	0.003	5	47.96	602	50	2.13
GHSB3	1.08	1.89	0.72	63.4	0.007	5	111.55	1561	50	2.25
GHSB4	1.21	1.71	0.63	55.5	0.008	5	116.57	1694	45	2.18
GHSB5	1.31	1.78	0.63	41.2	0.007	5	110.99	1394	50	1.66
GHSB6	1.38	1.82	0.57	51.0	0.007	5	128.57	1826	50	2.06
GHSB7	1.48	2.03	0.57	43.5	0.007	5	128.56	1672	50	1.76
GHSB8	0.41	1.29	0.34	64.0	0.010	5	44.31	807	40	3.07
GHSB9	0.29	1.17	0.26	68.0	0.011	5	31.92	623	35	3.35
GHSB10	0.22	0.70	0.15	72.8	0.018	5	25.37	545	35	3.87
GHSB11	0.18	0.72	0.17	60.1	0.012	5	19.08	411	35	3.56
GHSB12	0.10	0.70	0.26	42.8	0.013	5	9.31	134	40	2.09
GHSB13	0.30	0.89	0.34	78.1	0.019	5	35.76	782	35	4.07
GHSB14	0.24	0.87	0.36	75.0	0.019	5	27.93	597	35	3.88
GHSB15	0.10	0.43	0.13	81.2	0.013	5	11.60	191	40	2.98
GHSB16	0.20	0.70	0.30	71.0	0.015	5	23.10	503	35	3.92
GHSB17	0.35	0.83	0.28	84.5	0.026	5	43.02	884	35	3.94
GHSB20	0.24	0.83	0.34	67.5	0.012	5	26.50	537	35	3.49
GHSB21	0.58	1.27	0.57	60.3	0.009	5	58.74	923	45	2.48
GHSB22	0.50	1.12	0.51	70.0	0.015	5	56.05	1032	40	3.22
GHSB23	0.65	1.19	0.57	36.4	0.012	5	56.38	763	45	1.83
GHSB24	0.59	1.14	0.44	37.0	0.015	5	51.15	779	40	2.06
GHSB25	0.13	0.63	0.15	32.3	0.014	5	10.75	167	40	2.00
GHSB26	0.06	0.68	0.21	73.4	0.017	5	6.86	92	45	2.39
GHSB27	0.64	1.48	0.53	22.1	0.019	5	47.94	491	50	1.19
GHSB30	0.68	1.57	0.81	76.2	0.014	5	79.94	1251	45	2.87
GHSB31	0.34	1.31	0.30	68.1	0.013	5	37.12	684	40	3.14
GHSB32	0.94	1.82	0.76	22.1	0.015	5	70.24	595	55	0.98
GHSB33	0.33	1.17	0.46	15.8	0.008	5	23.41	187	50	0.88
GHSB34	0.33	1.48	0.74	82.4	0.019	5	39.66	631	40	2.98
GHSB35	0.15	0.85	0.30	73.6	0.014	5	17.22	357	35	3.71
GHSB36	0.55	1.35	0.36	61.8	0.014	5	57.48	1074	40	3.05
GHSB37	0.85	1.40	0.47	69.6	0.026	5	94.07	1785	40	3.28
GHSB40	0.35	1.00	0.44	65.6	0.012	5	38.13	692	40	3.08
GHSB41	0.54	1.17	0.44	48.0	0.011	5	50.46	827	40	2.39
GHSB42	0.19	0.53	0.26	79.4	0.008	5	22.49	466	35	3.83
GHSB43	0.25	1.00	0.49	75.4	0.004	5	28.44	433	40	2.70
Total	19.40	43.10	15.92	_	_	_	1897.00	29624	_	_
Average	0.50	1.20	0.43	59.3	0.013	5	51.30	801	42	2.70

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Summary File: P:\coweld01\future~1\Goddin~1\100_Year\cuhp\ghfc100y.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
GHSB1	1.22	1.19	0.34	39.7	0.004	5	129.94	1964	45	2.51
GHSB2	0.44	1.38	0.72	65.1	0.003	5	55.81	709	50	2.51
GHSB3	1.08	1.89	0.72	63.4	0.007	5	130.63	1854	50	2.68
GHSB4	1.21	1.71	0.63	55.5	0.008	5	137.96	2010	50	2.59
GHSB5	1.31	1.78	0.63	41.2	0.007	5	134.19	1695	50	2.02
GHSB6	1.38	1.82	0.57	51.0	0.007	5	153.11	2205	50	2.49
GHSB7	1.48	2.03	0.57	43.5	0.007	5	154.76	2025	50	2.13
GHSB8	0.41	1.29	0.34	64.0	0.010	5	51.65	953	40	3.63
GHSB9	0.29	1.17	0.26	68.0	0.011	5	37.05	713	35	3.84
GHSB10	0.22	0.70	0.15	72.8	0.018	5	29.32	650	35	4.61
GHSB11	0.18	0.72	0.17	60.1	0.012	5	22.32	482	35	4.18
GHSB12	0.10	0.70	0.26	42.8	0.013	5	11.12	160	40	2.49
GHSB13	0.30	0.89	0.34	78.1	0.019	5	41.14	892	35	4.64
GHSB14	0.24	0.87	0.36	75.0	0.019	5	32.21	682	35	4.44
GHSB15	0.10	0.43	0.13	81.2	0.013	5	13.31	223	40	3.48
GHSB16	0.20	0.70	0.30	71.0	0.015	5	26.73	579	35	4.52
GHSB17	0.35	0.83	0.28	84.5	0.026	5	49.23	1019	35	4.54
GHSB20	0.24	0.83	0.34	67.5	0.012	5	30.76	615	35	4.00
GHSB21	0.58	1.27	0.57	60.3	0.009	5	69.04	1105	45	2.97
GHSB22	0.50	1.12	0.51	70.0	0.015	5	64.94	1212	40	3.78
GHSB23	0.65	1.19	0.57	36.4	0.012	5	67.96	921	45	2.21
GHSB24	0.59	1.14	0.44	37.0	0.015	5	61.59	930	40	2.46
GHSB25	0.13	0.63	0.15	32.3	0.014	5	13.05	203	40	2.43
GHSB26	0.06	0.68	0.21	73.4	0.017	5	7.93	109	45	2.83
GHSB27	0.64	1.48	0.53	22.1	0.019	5	59.27	606	50	1.47
GHSB30	0.68	1.57	0.81	76.2	0.014	5	92.10	1463	45	3.36
GHSB31	0.34	1.31	0.30	68.1	0.013	5	43.09	814	40	3.74
GHSB32	0.94	1.82	0.76	22.1	0.015	5	86.88	738	60	1.22
GHSB33	0.33	1.17	0.46	15.8	0.008	5	29.30	233	55	1.10
GHSB34	0.33	1.48	0.74	82.4	0.019	5	45.46	722	40	3.41
GHSB35	0.15	0.85	0.30	73.6	0.014	5	19.88	409	35	4.26
GHSB36	0.55	1.35	0.36	61.8	0.014	5	67.12	1270	40	3.60
GHSB37	0.85	1.40	0.47	69.6	0.026	5	109.03	2114	40	3.88
GHSB40	0.35	1.00	0.44	65.6	0.012	5	44.38	820	40	3.66
GHSB41	0.54	1.17	0.44	48.0	0.011	5	59.95	982	40	2.84
GHSB42	0.19	0.53	0.26	79.4	0.008	5	25.89	541	35	4.44
GHSB43	0.25	1.00	0.49	75.4	0.004	5	32.79	498	45	3.11
Total	19.40	43.10	15.92	_	_	_	2240.90	35120	_	_
Average	0.50	1.20	0.43	59.3	0.013	5	60.60	949	42	3.20

III

UDSWMM ROUTING MODELING

III-A

UDSWMM MODEL DESCRIPTION
(Pages from Manual)

URBAN DRAINAGE AND STORM WATER MANAGEMENT

Using
the Personal Computer Model

UDSWMM

Developed by

the Environmental Protect Agency

Revised by

the Urban Drainage and Flood Control District
Denver, Colorado

Supported by

the Urban Drainage and Flood Control District
and Metro Denver Cities and Counties, Colorado

January 1995

URBAN DRAINAGE AND FLOOD CONTROL DISTRICT-69

L. Scott Tucker, Executive Director

December 17, 1985

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MEMORANDUM

TO : All Owners of the UDSWM2 Computer Program

FROM : Ben Urbonas

SUBJECT: UDSWM-PC Program Use - WARNING

It has been brought to my attention that two problems are being experienced by users of the UDSWM2-PC Program. Both of the problems are the result of not fully understanding the user manual or how the system works. The first one is as follows:

WHENEVER YOU USE ROUTING ELEMENT OPTION 3 (DIRECT FLOW), BE SURE TO INCLUDE A POSITIVE LENGTH, (i.e. ONE-FOOT) IN THE LENGTH FIELD OF YOUR INPUT. (If you do not include a positive number in the length field for routing option 3, the program will not link the routing elements together properly.)

The second problem arises whenever a user generates more storm hydrographs using CUHPE/PC than you will use for routing in a single run using the UDSWM2-PC program. As an example, if you generate 22 storm hydrographs to be used later by UDSWM2-PC, you have to call up <u>all</u> the 22 hydrographs when you run UDSWM2-PC.

THUS, BE SURE THAT THE FILE CONTAINING CUHP STORM HYDROGRAPHS THAT YOU CALL USING UDSWM2-PC CONTAINS THE EXACT NUMBER OF HYDROGRAPHS THAT YOU SPECIFY IN THE UDSWM2-PC RUN. (If you do not follow this restriction, you will find that some of your routing elements will be registering zero flow instead of the specified hydrograph.)

BRU/gb

Storm Water Computer Software Library, Inc.
P.O. Box 27517, Denver, Colorado 80227, USA
Telephone: 303-947-3413, Fax: 303-985-8882

To: Users of the UDSWM386 Computer Program
From: James C.Y. Guo, PhD, P.E.
Date: January 31, 1996

The computer program, UDSWM386, is the revised version of the UDSWM2-pc program. The major revisions were completed in January 1996. They include:

(A) Improvements on the Program Capacity
(1) Increase of the number of sub-basins from 399 to 1500,
(2) Increase of the number of gutters from 399 to 1500, and
(3) Increase of the total number of nodes for detention, inflow, and diversion from 25 to 100.

(B) Corrections on Modeling Algorithms
(1) The averaging algorithm used with the inflow option in the older version often resulted in 5% to 15% more runoff than the user-defined inflow hydrograph. This problem has been corrected. The new version of UDSWM386 transfer hydrograph without numerical mistake.
(2) The direct step method for channel hydrograph routing was found to occasionally produce fluctuations on the computed hydrograph. The numerical method associated with the continuity principle was revised to produce stable and smooth computed hydrograph.

(C) Input and Output Management
(1) The older version had problem to accept the stored hydrographs from a watershed with seven sub-basins. This problem was caused by an incorrect printing format.
(2) The older version saved and printed gutter storm hydrographs in computer machine language. The new version allows the user to print out hydrographs at all nodes and links in a spread sheet format which is ready for hydrograph plottings. This revision is very helpful for visual presentations of inflow and outflow hydrographs at detention facilities, basin diversions, and confluence points.

(D) Additional notes for storm water modeling using UDSWM386 was attached in the back of this user operation manual.

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INTRODUCTION

UDSWM2 is the name assigned by the Urban Drainage and Flood Control District (UDFCD) to the Runoff Block of the EPA's SWMM (Storm Water Management Model, Version 2) as modified by the Missouri River Division (MRD) of the U.S. Corps of Engineers. This model is being used by UDFCD in its master planning studies only after it has been calibrated against the Colorado Urban Hydrograph Procedure (CUHP). The UDSWM2 offers channel, pipe and reservoir routing and the ability to analyze sub-basins having areas less than 90 acres which is the lower limit of the CUHP described in the 1984 version of the Urban Storm Drainage Criteria Manual (USDCM).

UDSWM2-PC is a personal computer version of the UDSWM2. It includes additional modifications made by Boyle Engineering Corporation under the direction of Ben Urbonas of Urban Drainage and Flood Control District. Major modifications incorporated into this version are as follows:

1. Subroutines of UDSWM2 were reconstructed in such a way that the model can be conjunctively used with the Colorado Urban Hydrograph Computer Program-Personal Computer Version (CUHPE/PC). The UDSWM2-PC has an option to take hydrographs developed by the CUHPE/PC, and to combine and route them through conveyance facilities as specified by a user. The CUHPE/PC is a personal computer version of the CUHPE (Colorado Urban Hydrograph Procedure Computer

Program) orginally developed by the UDFCD and modified by Boyle Engineering Corporation.

2. Dimensional and common statements and some of the logic in the earlier version were modified to be adoptable on a personal computer (IBM PC-XT, PC-AT or compatible equipment).

3. Plotting routines which were included in the earlier version were eliminated.

4. Some program "bugs" found during the conversion process were corrected. These included a divergence problem experienced with the Newton-Raphson Procedure used in the model, incorrect initialization of some variables, and incorrect procedure to account for diversions.

PROGRAM DESCRIPTION

The Runoff Block was developed as part of the EPA Storm Water Management Model (SWMM). It simulates both the quantity and quality runoff from an urban drainage basin and the routing of flow and contaminant to the major sewer lines. The model was later modified by the Missouri River Division (MRD) of the U.S. Corps of Engineers to improve deficiencies experienced with the original model. The Runoff Block for this personal computer version permits simulation of quantity runoff only, and can be conjunctively used with the Colorado Urban Hydrograph Computer Program-Personal Computer Version (CUHPE/PC).

The Runoff Block represents the basin by an aggregate of idealized subcatchments, channels, gutters and pipes. The program accepts rainfall hyetographs and makes a step by step accounting of rainfall infiltration losses in pervious areas, surface retention, overland flow, and gutter flow, leading to the calculation of hydrographs.

With the UDSWM2-PC, the drainage basin may be subdivided into a maximum of 399 subcatchment areas. The resulting hydrographs from all subcatchments can be routed through a maximum of 399 gutters or pipes to compute hydrographs at the inlet points. Overbank floodway sections may be used in conjunction with gutters and pipes. Up to 25 detention basins with a specified storage-outflow relationship may be used. Also, the program allows the user to specify a flow diversion table for up to 25 routing elements. All pipes, gutters, diversion and detentions are sometimes referred to as "conveyance elements" in this manual.

The user can also specify hydrographs developed by other models and utilize only the hydrograph routing routines built in the model. The input format for hydrographs is consistent with that used in the CUHPE/PC for outputs.

Surface Flows and Flow Routing

The core of the Runoff Block is the routing of hydrographs through the drainageway system. This is accomplished by a combination of overland flow and channel, gutter, reservoir and pipe routing.

Two types of elements are available to the user:

1. Subcatchment elements (overland flow)

2. Conveyance elements (channel flow, pipe flow, sotrage, etc.)

The subcatchment elements receive rainfall, account for infiltration loss using Horton's equation, permit surface storage such as ponding or retention on grass or shrubbery, and route excess rainfall to develop overland flows. The overland flows are then routed through the conveyance elements of the study watershed. Pipes and initial channel sections are permitted to surcharge when full or, if desired, overflow sections may be provided to convey the flow exceeding the pipe or the initial channel capacity. The routing is based on a kinematic wave approach utilizing Manning's equation both for subcatchment and conveyance elements.

There are five standard types of conveyance elements and three special flow routing conveyance elements. The five standard conveyance elements are as follows:

1. Channel. A trapezoidal channel to represent or approximate an open channel/gutter condition.

2. Pipe. A circular pipe of any diameter.

3. Direct flow. This element provides only instantaneous direct translation of the flows from the upstream to the downstream conveyance element and does not modify the hydrograph.

4. Channel with overflow channel. Same as the channel element above except that a larger trapezoidal channel is also specified to accept the flows exceeding the capacity of the initial channel cross-section.

5. Pipe with overflow channel. Same as the pipe element above except that a trapezoidal channel is also specified to accept the flows exceeding the capacity of the pipe.

The three special flow routing conveyance elements are as follows:

1. Diversion. A table of flows in a conveyance element versus the flow divereted to another conveyance element may be specified using this option. This option may be used with any routing elements but is limited to 25 diversion tables.

2. Storage reservoir. A table of reservoir storage in acre-feet versus outflow in cubic feet per second may be specified using this option. This option may be used in conjunction with the "pipe" routing element. The pipe capacity has to be exceeded before the storage-outflow function is utilized. The user may specify up to 25 reservoir routing elements.

3. Inflow hydrograph. This option may be used to specify an input hydrograph table of time in hours versus the flow in cfs for any routing element, but the user is limited to use 25 such tables.

Note that the total number of the three special conveyance elements has to be less than or equal to 25.

Subroutine Descriptions

The Runoff Block for this personal computer version has six core subroutines. Their functions and relationships are described below.

Subroutine RUNOFF This is the subroutine called by the main program. This subroutine prints "entry made to the Runoff Model" and then computes or reads in the hydrograph ordinates with the assistance of five subroutines, RHYDRW, WSHED, INPUTW, RHYDRG, and GUTTER. The subroutines, RHYDRW, WSHED, INPUTW and GUTTER, are called if the option index IOPT = 0. This option calls for estimation of the hydrographs from subcatchments for given rainfall and watershed parmeters. The subcatchment hydrographs are then routed through conveyance elements. If IOPT = 1, the subroutines, INPUTW, RHYDRG and GUTTER, are called instead, and hydrographs specified by the user will be read in and routed through conveyance elements.

Subroutine RHYDRW This subroutine is called by RUNOFF to read in the rainfall hyetograph and information related to the subcatchment areas and to perform some initial preparatory work, such as unit conversion and error detection.

There are three basis categories of input data read in by this subroutine. The general information includes a number representing the subcatchment area, period of simulation, and a key indicating if the rainfall hyetograph is different from that of the previous basin. A new rainfall hyetograph will be read if it is so indicated. Otherwise, this part of the "read" operation will be skipped and the rainfall of the previous drainage basin will be used. The first basin must have a rainfall input.

The program proceeds to read subcatchment data, e.g., the size, width, ground slope.

It must be noted that the program can detect only logical errors such as indexing numbers. However, the input data are printed so the user can check the data for correctness.

Subroutine WSHED This subroutine is called by RUNOFF to compute the depth and the rate of overland flow. A DO loop is formed to compute the hydrograph coordinate for each incremental time-step. In each step, the rainfall intensity is first interpolated from the designated rainfall hyetograph for each subcatchment. This rainfall intensity is assumed uniform over each subcatchment.

A DO loop is set up to treat the subcatchments, one at a time. For a subcatchment, the amount of infiltration loss is calculated using Horton's equation,

$$\text{Infiltration loss} = f_0+(f_i-f_o)e^{-at} \qquad (1)$$

in which f_o, f_i and a are coefficients and t is the time from the start of rainfall. The loss is compared with the amount of water existing on the subcatchment plus the rainfall. If the loss is larger, it is set equal to the amount available and the ramainder of the computation is skipped.

The water depth will increase without inducing an outflow until it reaches the specified surface detention requirement. Beyond that, the surface flow rate is calculated by Manning's equation using depth as the hydraulic radius. An iterative procedure termed Newton-

Raphson's technique is used to determine the excess water depth and the outflow rate so that the continuity of water mass is satisfied.

During the process of computation, an accounting is made of the rainfall accumulation which is compared against runoff, detention, and infiltration loss. A mass continuity is therefore be checked and printed for reference.

Upon completion, the subroutine will return or, as an option, create a data file containing hydrograph values of all subcatchments, for the subsequent routing through the conveyance elements.

Subroutine INPUTW This subroutine is called by RUNOFF to read in subcatchment hydrographs and the realtionship between subcatchments and conveyance elements when the option , IOPT = 1, is specified. If IOPT = 1 is specified, the subroutines RHYDRW and WSHED are skipped.

The data file containing subcatchment hydrographs may be created either by the CUHPE/PC model using print option NSW=7,8 or 9 or by the UDSWM2-PC with IOPT=0 and NSAVE in Card Group 1.7 being specified. This data file is an ASCII file and the output format used in both models has been set to be consistent with the input format used in the subroutine INPUTW.

Subroutine RHYDRC This subroutine is called by RUNOFF to read in the information regarding the routing elements (gutters, pipes, channels, etc.). The subroutine also sequences the computational order for

all the routing elements according to the upstream and downstream relationships.

Subroutine GUTTER The function of subroutine GUTTER is very similar to that of WSHED. It calculates a complete set of water depths and flows for all channels, gutters, pipes and other types of routing elements for each time step within a DO loop.

The computation also proceeds one routing element at a time. First, the inflow into the routing element from tributary subcatchments and other routing elements is computed. The Newton-Raphson's iterative procedure is then used to determine the depth and outflow of the routing elements so that the mass (volume) of water is conserved. The flow is computed by Manning's equation.

The hydraulic radius of trapezoidal channels and circular pipes is calculated separately in different paths of the subroutine. The storage reservoir elements are computed using a modified Puls routing procedure and the diversion and inflow hydrograph values are calculated using table interpolation routines.

A pipe or channel may surcharge when it is full and the inflow is larger than the capacity of the conveyance element. In this case, the surcharged volume is computed and stored at the upstream end of the element unless an overflow conveyance element is specified. A message will be printed to indicate the time, location, and total volume of the surcharge. The pipe or initial channel will remain full

until the stored water is completely drained. If an overflow element is provided, the flow exceeding the pipe or initial channel capacity will be routed through the overflow section.

III-B

UDSWMM INPUT FILES

```
   2   1   1   2
   3   4
WATERSHED   1
GODDING HOLLOW EXISTING CONDITIONS UDSWMM MODEL; ALL EVENTS
ANDERSON CONSULTING ENGINEERS, JUNE 1999
        72  0 0  5.0                                                          1
         1  201
         2  202
         3  203
         4  204
         5  205
         6  206
         7  207
         8  208
         9  209
        10  210
        11  211
        12  212
        13  213
        14  214
        15  215
        16  216
        17  217
        20  220
        21  221
        22  222
        23  223
        24  224
        25  225
        26  226
        27  227
        30  230
        31  231
        32  232
        33  233
        34  234
        35  235
        36  236
        37  237
        40  240
        41  241
        42  242
        43  243

   0  201  998  0 3              1.
   0  151  999  0 4     4.0   1600.  0.0063     1.0     1.0   0.035     5.0
                       20.0   1600.  0.0063   300.0    60.0   0.035   100.0
   0  202  151  0 3              1.
   0   51  202  0 4     4.0   2850.  0.0039     1.0     1.0   0.035     3.0
                       20.0   2850.  0.0039   500.0   300.0   0.035   100.0
  -1  751   51 20 3      .1      1.
     0.00       0.0      0.25       1.0      0.50      98.0      0.75     674.0
     1.00    1311.0      1.25    1938.0      1.50    2568.0      1.75    3155.0
     2.00    3641.0      2.25    3917.0      2.42    3957.0      2.50    3935.0
     2.75    3729.0      3.00    3378.0      3.25    2950.0      3.50    2500.0
     4.00    1714.0      4.50    1088.0      5.00     655.0      6.00     261.0
   0  103  751  0 4     6.0   4100.  0.0022     0.5     0.5   0.035    10.0
                       10.0   4100.  0.0022   500.0   500.0   0.035   100.0
   0  203  103  0 3              1.
   0    3  203  0 4     5.0   3700.  0.0027     2.0     2.0   0.035     5.0
                       20.0   3700.  0.0027   300.0    30.0   0.035   100.0
   0  703    3  0 3              1.
   0  104  703  0 4     5.0   2700.  0.0044     3.0     3.0   0.035     5.0
```

```
                        50.0   2700.  0.0044    10.0    30.0   0.035   100.0
0  204  104  0 3              1.
0  105  204  0 4         5.0   5600.  0.0052     1.0     1.0   0.035     4.0
                        60.0   5600.  0.0052    90.0    70.0   0.035   100.0
0  205  105  0 3              1.
0  106  205  0 4         5.0   5800.  0.0045     1.0     1.0   0.035     4.0
                        20.0   5800.  0.0045    50.0   130.0   0.035   100.0
0  206  106  0 3              1.
0  107  206  0 4         5.0   5500.  0.0056     1.0     1.0   0.035     4.0
                        20.0   5500.  0.0056    80.0    40.0   0.035   100.0
0  207  107  0 3              1.
0    7  207  0 4         5.0   2450.  0.0053     0.5     0.5   0.035    10.0
                        30.0   2450.  0.0053   130.0    30.0   0.035   100.0
0  707    7  0 3              1.
0  108  707  0 4         5.0   3450.  0.0035     1.0     1.0   0.035     8.0
                        30.0   3450.  0.0035    20.0    20.0   0.035   100.0
0  308  108  5 2         0.1      1.                                     0.1
   0.0       0.0          5.9     500.0      58.2    1009.0      80.0    2200.0
 107.5    6850.0
0  708  308  0 3              1.
0  309  708  6 2         0.1      1.                                     0.1
   0.0       0.0          2.1     442.0       5.4     500.0      31.9     791.0
  40.2    1100.0         68.5    6600.0
0  208  309  0 3              1.
0  109  208  0 4         4.0   3200.  0.0053     1.0     1.0   0.035     3.0
                       100.0   3200.  0.0053    30.0    40.0   0.035   100.0
0  709  109  0 3              1.
0  209  709  0 3              1.
0  110  209  0 4         3.0   2650.  0.0079     1.0     1.0   0.035     2.0
                       100.0   2650.  0.0079    30.0    20.0   0.035   100.0
0  210  110  0 3              1.
0  111  210  0 4         3.0   1200.  0.0083     1.0     1.0   0.035     2.0
                        20.0   1200.  0.0083    40.0    30.0   0.035   100.0
0  711  111  0 3              1.
0  211  711  0 3              1.
0  112  211  0 4         3.0   2000.  0.0085     1.0     1.0   0.035     2.0
                        20.0   2000.  0.0085    80.0    60.0   0.035   100.0
0  712  112  0 3              1.
0  212  712  0 3              1.
0  113  212  0 4        20.0   2200.  0.0105     1.0     1.0   0.035     5.0
                        50.0   2200.  0.0105    50.0    40.0   0.035   100.0
0  213  113  0 3              1.
0  116  213  0 4         4.0   1300.  0.0131     1.0     1.0   0.035     3.0
                        30.0   1300.  0.0131    50.0    20.0   0.035   100.0
0  216  116  0 3              1.
0  117  216  0 4         1.0   1900.  0.0158     1.0     1.0   0.035     2.0
                        50.0   1900.  0.0158    90.0    50.0   0.035   100.0
0  217  117  0 3              1.
0  114  213  0 1         8.0   2800.  0.0004     5.0     5.0   0.035   100.0
0  214  114  0 3              1.
0  115  214  0 1         8.0   1400.  0.0007     5.0     5.0   0.035   100.0
0  215  115  0 3              1.
0  143  703  0 4         4.0   2100.  0.0029     1.0     1.0   0.035     3.0
                        10.0   2100.  0.0029   500.0   300.0   0.035   100.0
0  243  143  0 3              1.
0  141  206  0 4         3.0   3400.  0.0118     3.0     3.0   0.035     3.0
                        20.0   3400.  0.0118   100.0   160.0   0.035   100.0
0  341  141  5 2         0.1      1.                                     0.1
   0.0       0.0          4.0      40.0      19.5      80.0     169.5     136.0
 177.0    3040.0
0  741  341  0 3              1.
0  142  741  0 1         3.0   1400.  0.0007     3.0     3.0   0.035   100.0
0  242  142  0 3              1.
```

```
     0  241  741  0 3              1.
     0  140  741  0 1     3.0   4600.  0.0067     3.0     3.0   0.035   100.0
     0  240  140  0 3              1.
     0  121  707  0 4     5.0   4400.  0.0068     1.5     1.5   0.035     5.0
                         20.0   4400.  0.0068   100.0   110.0   0.035   100.0
     0  720  121  0 3              1.
     0  321  720  3 2     0.1      1.                                     0.1
        0.0       0.0      82.0      87.0     162.0    3764.0
     0  721  321  0 3              1.
     0  222  721  0 3              1.
   720  220  222  6 3              1.
       40.0      20.0      90.0      45.0     130.0      65.0     180.0      90.0
      230.0     115.0     280.0     140.0
     0  221  721  0 3              1.
     0  123  221  0 4     2.0   4200.  0.0076     1.0     1.0   0.035     3.0
                         20.0   4200.  0.0076    70.0    40.0   0.035   100.0
     0  223  123  0 3              1.
     0  124  223  0 4     1.0   5400.  0.0078     1.0     1.0   0.035     3.0
                         10.0   5400.  0.0078   150.0    40.0   0.035   100.0
     0  224  124  0 3              1.
     0  125  224  0 4     1.0   4200.  0.0117     1.0     1.0   0.035     3.0
                         10.0   4200.  0.0117   120.0    50.0   0.035   100.0
     0  325  125  5 2     0.1      1.                                     0.1
        0.0       0.0       8.3       0.0       8.7      10.0      11.0     800.0
       11.4    1000.0
     0  225  325  0 3              1.
     0  127  225  0 4     1.0   1500.  0.0133     1.0     1.0   0.035     3.0
                         10.0   1500.  0.0133    60.0    40.0   0.035   100.0
     0  227  127  0 3              1.
     0  126  224  0 4     1.0   4800.  0.0156     1.0     1.0   0.035     3.0
                         10.0   4800.  0.0156    80.0    40.0   0.035   100.0
     0  226  126  0 3              1.
     0  230  708  0 3              1.
     0  133  230  0 4     1.0   8700.  0.0118     1.0     1.0   0.035     3.0
                         10.0   8700.  0.0118   140.0   120.0   0.035   100.0
     0  233  133  0 3              1.
     0  231  709  0 3              1.
     0  132  231  0 4     4.0   2700.  0.0122     1.0     1.0   0.035     3.0
                         10.0   2700.  0.0122    60.0    20.0   0.035   100.0
     0  232  132  0 3              1.
     0  234  711  0 3              1.
     0  235  712  0 3              1.
     0  136  235  0 4     2.0   2600.  0.0081     1.0     1.0   0.035     3.0
                         10.0   2600.  0.0081    30.0    30.0   0.035   100.0
     0  236  136  0 3              1.
     0  137  236  0 4     2.0   3700.  0.0111     1.0     1.0   0.035     3.0
                         10.0   3700.  0.0111    40.0    20.0   0.035   100.0
     0  237  137  0 3              1.

     0
    50
   999  151  202   51  751  103  203    3  703  104  204  105  205  106  206  107
   207    7  707  108  308  708  309  208  109  709  209  110  210  111  711  211
   112  712  212  113  213  116  216  117  217  741  341  721  321  720  225  325
   237  236
ENDPROGRAM
```

```
   2   1   1   2
   3   4
WATERSHED   1
GODDING HOLLOW FUTURE CONDITIONS WITH ON-SITE DET. UDSWMM MODEL; ALL EVENTS
DET. PONDS RELEASING AT 10 YR AND 100 YR EX. COND. RELEASE RATE  ACE, JUNE 1999
        72  0 0  5.0                                                                1
         1  401
         2  402
         3  403
         4  404
         5  405
         6  406
         7  407
         8  408
         9  409
        10  410
        11  411
        12  412
        13  413
        14  414
        15  415
        16  416
        17  417
        20  420
        21  421
        22  422
        23  423
        24  424
        25  425
        26  426
        27  427
        30  430
        31  431
        32  432
        33  433
        34  434
        35  435
        36  436
        37  437
        40  440
        41  441
        42  442
        43  443

   0  201  998  0 3              1.
   0  151  999  0 4     4.0   1600.  0.0063     1.0     1.0   0.035     5.0
                       20.0   1600.  0.0063   300.0    60.0   0.035   100.0
   0  202  151  0 3              1.
   0   51  202  0 4     4.0   2850.  0.0039     1.0     1.0   0.035     3.0
                       20.0   2850.  0.0039   500.0   300.0   0.035   100.0
  -1  751   51 20 3      .1      1.
     0.00       0.0      0.25       0.0      0.50      15.0      0.75     197.0
     1.00     652.0      1.25    1338.0      1.50    2062.0      1.75    2642.0
     2.00    3005.0      2.25    3159.0      2.33    3167.0      2.50    3128.0
     2.75    2957.0      3.00    2714.0      3.25    2450.0      3.50    2197.0
     4.00    1740.0      4.50    1354.0      5.00    1029.0      6.00     650.0
   0  103  751  0 4      6.0   4100.  0.0022     0.5     0.5   0.035    10.0
                       10.0   4100.  0.0022   500.0   500.0   0.035   100.0
   0  203  103  0 3              1.
   0    3  203  0 4     5.0   3700.  0.0027     2.0     2.0   0.035     5.0
                       20.0   3700.  0.0027   300.0    30.0   0.035   100.0
   0  703    3  0 3              1.
   0  104  703  0 4     5.0   2700.  0.0044     3.0     3.0   0.035     5.0
                       50.0   2700.  0.0044    10.0    30.0   0.035   100.0
   0  204  104  0 3              1.
   0  105  204  0 4     5.0   5600.  0.0052     1.0     1.0   0.035     4.0
                       60.0   5600.  0.0052    90.0    70.0   0.035   100.0
   0  205  105  0 3              1.
   0  106  205  0 4     5.0   5800.  0.0045     1.0     1.0   0.035     4.0
                       20.0   5800.  0.0045    50.0   130.0   0.035   100.0
   0  206  106  0 3              1.
```

```
  0  107  206  0 4     5.0   5500.  0.0056     1.0     1.0   0.035     4.0
                      20.0   5500.  0.0056    80.0    40.0   0.035   100.0
  0  207  107  0 3             1.
  0    7  207  0 4     5.0   2450.  0.0053     0.5     0.5   0.035    10.0
                      30.0   2450.  0.0053   130.0    30.0   0.035   100.0
  0  707    7  0 3             1.
  0  108  707  0 4     5.0   3450.  0.0035     1.0     1.0   0.035     8.0
                      30.0   3450.  0.0035    20.0    20.0   0.035   100.0
  0  308  108  5 2     0.1      1.                                     0.1
     0.0       0.0       5.9     500.0      58.2    1009.0      80.0    2200.0
   107.5    6850.0
  0  708  308  0 3             1.
  0  309  708  6 2     0.1      1.                                     0.1
     0.0       0.0       2.1     442.0       5.4     500.0      31.9     791.0
    40.2    1100.0      68.5    6600.0
  0  208  309  0 3             1.
  0  109  208  0 4     4.0   3200.  0.0053     1.0     1.0   0.035     3.0
                     100.0   3200.  0.0053    30.0    40.0   0.035   100.0
  0  709  109  0 3             1.
  0  209  709  0 3             1.
  0  110  209  0 4     3.0   2650.  0.0079     1.0     1.0   0.035     2.0
                     100.0   2650.  0.0079    30.0    20.0   0.035   100.0
  0  210  110  0 3             1.
  0  111  210  0 4     3.0   1200.  0.0083     1.0     1.0   0.035     2.0
                      20.0   1200.  0.0083    40.0    30.0   0.035   100.0
  0  711  111  0 3             1.
  0  211  711  0 3             1.
  0  112  211  0 4     3.0   2000.  0.0085     1.0     1.0   0.035     2.0
                      20.0   2000.  0.0085    80.0    60.0   0.035   100.0
  0  712  112  0 3             1.
  0  212  712  0 3             1.
  0  113  212  0 4    20.0   2200.  0.0105     1.0     1.0   0.035     5.0
                      50.0   2200.  0.0105    50.0    40.0   0.035   100.0
  0  213  113  0 3             1.
  0  116  213  0 4     4.0   1300.  0.0131     1.0     1.0   0.035     3.0
                      30.0   1300.  0.0131    50.0    20.0   0.035   100.0
  0  216  116  0 3             1.
  0  117  216  0 4     1.0   1900.  0.0158     1.0     1.0   0.035     2.0
                      50.0   1900.  0.0158    90.0    50.0   0.035   100.0
  0  217  117  0 3             1.
  0  114  213  0 1     8.0   2800.  0.0004     5.0     5.0   0.035   100.0
  0  214  114  0 3             1.
  0  115  214  0 1     8.0   1400.  0.0007     5.0     5.0   0.035   100.0
  0  215  115  0 3             1.
  0  143  703  0 4     4.0   2100.  0.0029     1.0     1.0   0.035     3.0
                      10.0   2100.  0.0029   500.0   300.0   0.035   100.0
  0  243  143  0 3             1.
  0  141  206  0 4     3.0   3400.  0.0118     3.0     3.0   0.035     3.0
                      20.0   3400.  0.0118   100.0   160.0   0.035   100.0
  0  341  141  5 2     0.1      1.                                     0.1
     0.0       0.0       4.0      40.0      19.5      80.0     169.5     136.0
   177.0    3040.0
  0  741  341  0 3             1.
  0  142  741  0 1     3.0   1400.  0.0007     3.0     3.0   0.035   100.0
  0  242  142  0 3             1.
  0  241  741  0 3             1.
  0  140  741  0 1     3.0   4600.  0.0067     3.0     3.0   0.035   100.0
  0  240  140  0 3             1.
  0  121  707  0 4     5.0   4400.  0.0068     1.5     1.5   0.035     5.0
                      20.0   4400.  0.0068   100.0   110.0   0.035   100.0
  0  720  121  0 3             1.
  0  321  720  3 2     0.1      1.                                     0.1
     0.0       0.0      82.0      87.0     162.0    3764.0
  0  721  321  0 3             1.
  0  222  721  0 3             1.
720  220  222  6 3             1.
    40.0      20.0      90.0      45.0     130.0      65.0     180.0      90.0
   230.0     115.0     280.0     140.0
  0  221  721  0 3             1.
  0  123  221  0 4     2.0   4200.  0.0076     1.0     1.0   0.035     3.0
                      20.0   4200.  0.0076    70.0    40.0   0.035   100.0
```

```
0  223  123  0 3              1.
0  124  223  0 4     1.0   5400.  0.0078     1.0     1.0   0.035     3.0
                    10.0   5400.  0.0078   150.0    40.0   0.035   100.0
0  224  124  0 3              1.
0  125  224  0 4     1.0   4200.  0.0117     1.0     1.0   0.035     3.0
                    10.0   4200.  0.0117   120.0    50.0   0.035   100.0
0  325  125  5 2     0.1      1.                                     0.1
   0.0        0.0      8.3       0.0       8.7      10.0      11.0     800.0
  11.4     1000.0
0  225  325  0 3              1.
0  127  225  0 4     1.0   1500.  0.0133     1.0     1.0   0.035     3.0
                    10.0   1500.  0.0133    60.0    40.0   0.035   100.0
0  227  127  0 3              1.
0  126  224  0 4     1.0   4800.  0.0156     1.0     1.0   0.035     3.0
                    10.0   4800.  0.0156    80.0    40.0   0.035   100.0
0  226  126  0 3              1.
0  230  708  0 3              1.
0  133  230  0 4     1.0   8700.  0.0118     1.0     1.0   0.035     3.0
                    10.0   8700.  0.0118   140.0   120.0   0.035   100.0
0  233  133  0 3              1.
0  231  709  0 3              1.
0  132  231  0 4     4.0   2700.  0.0122     1.0     1.0   0.035     3.0
                    10.0   2700.  0.0122    60.0    20.0   0.035   100.0
0  232  132  0 3              1.
0  234  711  0 3              1.
0  235  712  0 3              1.
0  136  235  0 4     2.0   2600.  0.0081     1.0     1.0   0.035     3.0
                    10.0   2600.  0.0081    30.0    30.0   0.035   100.0
0  236  136  0 3              1.
0  137  236  0 4     2.0   3700.  0.0111     1.0     1.0   0.035     3.0
                    10.0   3700.  0.0111    40.0    20.0   0.035   100.0
0  237  137  0 3              1.
0  401  201  3 2     0.1      1.                                     0.1
   0.0        0.0     27.6    288.0      61.1     926.0
0  402  202  3 2     0.1      1.                                     0.1
   0.0        0.0     18.2     78.0      32.6     239.0
0  403  203  3 2     0.1      1.                                     0.1
   0.0        0.0     39.4    198.0      73.3     666.0
0  404  204  3 2     0.1      1.                                     0.1
   0.0        0.0     36.5    237.0      72.7     826.0
0  405  205  3 2     0.1      1.                                     0.1
   0.0        0.0     30.7    202.0      67.3     760.0
0  406  206  3 2     0.1      1.                                     0.1
   0.0        0.0     34.9    309.0      73.7    1022.0
0  407  207  3 2     0.1      1.                                     0.1
   0.0        0.0     39.7    207.0      84.0     812.0
0  408  208  3 2     0.1      1.                                     0.1
   0.0        0.0     15.8     90.0      29.7     300.0
0  409  209  3 2     0.1      1.                                     0.1
   0.0        0.0     11.2     71.0      20.8     232.0
0  410  210  3 2     0.1      1.                                     0.1
   0.0        0.0      1.8    302.0       2.9     619.0
0  411  211  3 2     0.1      1.                                     0.1
   0.0        0.0      3.2    129.0       5.9     318.0
0  412  212  3 2     0.1      1.                                     0.1
   0.0        0.0      2.9     20.0       5.8      70.0
0  413  213  3 2     0.1      1.                                     0.1
   0.0        0.0     12.4     87.0      21.7     274.0
0  414  214  3 2     0.1      1.                                     0.1
   0.0        0.0      9.7     66.0      17.4     207.0
0  415  215  3 2     0.1      1.                                     0.1
   0.0        0.0      5.2     16.0       8.6      55.0
0  416  216  3 2     0.1      1.                                     0.1
   0.0        0.0      7.4     61.0      13.5     193.0
0  417  217  3 2     0.1      1.                                     0.1
   0.0        0.0     12.3    120.0      20.9     374.0
0  420  220  3 2     0.1      1.                                     0.1
   0.0        0.0      9.0     63.0      16.8     199.0
0  421  221  3 2     0.1      1.                                     0.1
   0.0        0.0     21.5     94.0      40.9     350.0
0  422  222  3 2     0.1      1.                                     0.1
```

```
      0.0        0.0       19.0      133.0       35.1      408.0
    0  423  223  3 2      0.1       1.                                    0.1
      0.0        0.0       13.8      141.0       31.1      457.0
    0  424  224  3 2      0.1       1.                                    0.1
      0.0        0.0       11.6      154.0       26.7      482.0
    0  425  225  3 2      0.1       1.                                    0.1
      0.0        0.0        1.9       41.0        3.8      148.0
    0  426  226  3 2      0.1       1.                                    0.1
      0.0        0.0        2.6       14.0        4.1       52.0
    0  427  227  3 2      0.1       1.                                    0.1
      0.0        0.0        5.5      146.0       14.9      465.0
    0  430  230  3 2      0.1       1.                                    0.1
      0.0        0.0       32.7      128.0       56.6      410.0
    0  431  231  3 2      0.1       1.                                    0.1
      0.0        0.0       13.3       79.0       24.5      257.0
    0  432  232  3 2      0.1       1.                                    0.1
      0.0        0.0        4.0      222.0       11.9      670.0
    0  433  233  3 2      0.1       1.                                    0.1
      0.0        0.0        1.5       65.0        4.5      211.0
    0  434  234  3 2      0.1       1.                                    0.1
      0.0        0.0       16.5       64.0       27.7      201.0
    0  435  235  3 2      0.1       1.                                    0.1
      0.0        0.0        1.7      168.0        3.0      343.0
    0  436  236  3 2      0.1       1.                                    0.1
      0.0        0.0       19.3      132.0       37.0      424.0
    0  437  237  3 2      0.1       1.                                    0.1
      0.0        0.0       26.9      305.0       50.4      871.0
    0  440  240  3 2      0.1       1.                                    0.1
      0.0        0.0       12.6       91.0       23.9      285.0
    0  441  241  3 2      0.1       1.                                    0.1
      0.0        0.0       15.3      115.0       31.9      387.0
    0  442  242  3 2      0.1       1.                                    0.1
      0.0        0.0        2.4      217.0        3.8      470.0
    0  443  243  3 2      0.1       1.                                    0.1
      0.0        0.0       12.0       41.0       20.7      134.0

    0
   50
  999  151  202   51  751  103  203    3  703  104  204  105  205  106  206  107
  207    7  707  108  308  708  309  208  109  709  209  110  210  111  711  211
  112  712  212  113  213  116  216  117  217  741  341  721  321  720  225  325
  237  236
ENDPROGRAM
```

```
   2   1   1   2
   3   4
WATERSHED   1
GODDING HOLLOW FUT. COND. WITH ON-SITE AND REG. DET. UDSWMM MODEL; ALL EVENTS
DET. PONDS RELEASING AT 10 YR AND 100 YR EX. COND. RELEASE RATE  ACE, JUNE 1999
       108  0 0  5.0                                                                1
         1  401
         2  402
         3  403
         4  404
         5  405
         6  406
         7  407
         8  408
         9  409
        10  410
        11  411
        12  412
        13  413
        14  414
        15  415
        16  416
        17  417
        20  420
        21  421
        22  422
        23  423
        24  424
        25  425
        26  426
        27  427
        30  430
        31  431
        32  432
        33  433
        34  434
        35  435
        36  436
        37  437
        40  440
        41  441
        42  442
        43  443

   0  201  998  0 3              1.
   0  151  999  0 4    4.0   1600.  0.0063     1.0     1.0   0.035     5.0
                      20.0   1600.  0.0063   300.0    60.0   0.035   100.0
   0  202  151  0 3              1.
   0   51  202  0 4    4.0   2850.  0.0039     1.0     1.0   0.035     3.0
                      20.0   2850.  0.0039   500.0   300.0   0.035   100.0
  -1  751   51 20 3     .1      1.
     0.00       0.0     0.50      14.0      1.00     580.0      1.50    1313.0
     1.75    1404.0     2.00    1369.0      2.50    1174.0      3.00    1013.0
     3.50     944.0     4.00     892.0      4.50     849.0      5.00     816.0
     5.50     790.0     6.00     769.0      6.50     752.0      7.00     737.0
     7.50     724.0     8.00     712.0      8.50     700.0      9.00     688.0
   0  103  751  0 4    6.0   4100.  0.0022     0.5     0.5   0.035    10.0
                      10.0   4100.  0.0022   500.0   500.0   0.035   100.0
   0  203  103  0 3              1.
   0    3  203  0 4    5.0   3700.  0.0027     2.0     2.0   0.035     5.0
                      20.0   3700.  0.0027   300.0    30.0   0.035   100.0
   0  703    3  0 3              1.
   0  104  703  0 4    5.0   2700.  0.0044     3.0     3.0   0.035     5.0
                      50.0   2700.  0.0044    10.0    30.0   0.035   100.0
   0  204  104  0 3              1.
   0  105  204  0 4    5.0   5600.  0.0052     1.0     1.0   0.035     4.0
                      60.0   5600.  0.0052    90.0    70.0   0.035   100.0
   0  205  105  0 3              1.
   0  106  205  0 4    5.0   5800.  0.0045     1.0     1.0   0.035     4.0
                      20.0   5800.  0.0045    50.0   130.0   0.035   100.0
   0  206  106  0 3              1.
```

```
0  107  206  0 4     5.0   5500.  0.0056     1.0     1.0   0.035     4.0
                    20.0   5500.  0.0056    80.0    40.0   0.035   100.0
0  207  107  0 3            1.
0    7  207  0 4     5.0   2450.  0.0053     0.5     0.5   0.035    10.0
                    30.0   2450.  0.0053   130.0    30.0   0.035   100.0
0  707    7  0 3            1.
0  108  707  0 4     5.0   3450.  0.0035     1.0     1.0   0.035     8.0
                    30.0   3450.  0.0035    20.0    20.0   0.035   100.0
0  308  108  3 2     0.1      1.                                     0.1
   0.0      0.0      24.8     960.0     166.1    1960.0
0  708  308  0 3            1.
0  208  708  0 3            1.
0  109  208  0 4     4.0   3200.  0.0053     1.0     1.0   0.035     3.0
                   100.0   3200.  0.0053    30.0    40.0   0.035   100.0
0  709  109  0 3            1.
0  209  709  0 3            1.
0  110  209  0 4     3.0   2650.  0.0079     1.0     1.0   0.035     2.0
                   100.0   2650.  0.0079    30.0    20.0   0.035   100.0
0  210  110  0 3            1.
0  111  210  0 4     3.0   1200.  0.0083     1.0     1.0   0.035     2.0
                    20.0   1200.  0.0083    40.0    30.0   0.035   100.0
0  711  111  0 3            1.
0  211  711  0 3            1.
0  112  211  0 4     3.0   2000.  0.0085     1.0     1.0   0.035     2.0
                    20.0   2000.  0.0085    80.0    60.0   0.035   100.0
0  712  112  0 3            1.
0  212  712  0 3            1.
0  113  212  0 4    20.0   2200.  0.0105     1.0     1.0   0.035     5.0
                    50.0   2200.  0.0105    50.0    40.0   0.035   100.0
0  213  113  0 3            1.
0  116  213  0 4     4.0   1300.  0.0131     1.0     1.0   0.035     3.0
                    30.0   1300.  0.0131    50.0    20.0   0.035   100.0
0  216  116  0 3            1.
0  117  216  0 4     1.0   1900.  0.0158     1.0     1.0   0.035     2.0
                    50.0   1900.  0.0158    90.0    50.0   0.035   100.0
0  217  117  0 3            1.
0  317  217  2 2     0.1      1.                                     0.1
   0.0      0.0      22.3     100.0
0  114  213  0 1     8.0   2800.  0.0004     5.0     5.0   0.035   100.0
0  214  114  0 3            1.
0  115  214  0 1     8.0   1400.  0.0007     5.0     5.0   0.035   100.0
0  215  115  0 3            1.
0  143  703  0 4     4.0   2100.  0.0029     1.0     1.0   0.035     3.0
                    10.0   2100.  0.0029   500.0   300.0   0.035   100.0
0  243  143  0 3            1.
0  141  206  0 4     3.0   3400.  0.0118     3.0     3.0   0.035     3.0
                    20.0   3400.  0.0118   100.0   160.0   0.035   100.0
0  341  141  5 2     0.1      1.                                     0.1
   0.0      0.0       4.0      40.0      19.5      80.0     169.5     136.0
 177.0    3040.0
0  741  341  0 3            1.
0  142  741  0 1     3.0   1400.  0.0007     3.0     3.0   0.035   100.0
0  242  142  0 3            1.
0  241  741  0 3            1.
0  140  741  0 1     3.0   4600.  0.0067     3.0     3.0   0.035   100.0
0  240  140  0 3            1.
0  307  707  3 2     0.1      1.                                     0.1
   0.0      0.0      23.8     450.0     143.7     790.0
0  121  307  0 4     5.0   1700.  0.0059     1.5     1.5   0.035     5.0
                    20.0   1700.  0.0059   100.0   110.0   0.035   100.0
0  720  121  0 3            1.
0  721  720  0 3            1.
0  222  721  0 3            1.
0  220  720  0 3            1.
0  221  721  0 3            1.
0  123  221  0 4     2.0   4200.  0.0076     1.0     1.0   0.035     3.0
                    20.0   4200.  0.0076    70.0    40.0   0.035   100.0
0  223  123  0 3            1.
0  124  223  0 4     1.0   5400.  0.0078     1.0     1.0   0.035     3.0
                    10.0   5400.  0.0078   150.0    40.0   0.035   100.0
0  224  124  0 3            1.
```

```
0  125  224  0 4     1.0   4200.  0.0117     1.0     1.0   0.035     3.0
                    10.0   4200.  0.0117   120.0    50.0   0.035   100.0
0  325  125  5 2     0.1      1.                                     0.1
   0.0        0.0      8.3        0.0       8.7      10.0      11.0     800.0
  11.4     1000.0
0  225  325  0 3              1.
0  127  225  0 4     1.0   1500.  0.0133     1.0     1.0   0.035     3.0
                    10.0   1500.  0.0133    60.0    40.0   0.035   100.0
0  227  127  0 3              1.
0  126  224  0 4     1.0   4800.  0.0156     1.0     1.0   0.035     3.0
                    10.0   4800.  0.0156    80.0    40.0   0.035   100.0
0  226  126  0 3              1.
0  230  708  0 3              1.
0  133  230  0 4     1.0   8700.  0.0118     1.0     1.0   0.035     3.0
                    10.0   8700.  0.0118   140.0   120.0   0.035   100.0
0  233  133  0 3              1.
0  331  709  3 2     0.1      1.                                     0.1
   0.0        0.0     16.0     133.0      76.5     218.0
0  231  331  0 3              1.
0  132  231  0 4     4.0   2700.  0.0122     1.0     1.0   0.035     3.0
                    10.0   2700.  0.0122    60.0    20.0   0.035   100.0
0  232  132  0 3              1.
0  234  711  0 3              1.
0  235  712  0 3              1.
0  136  235  0 4     2.0   2600.  0.0081     1.0     1.0   0.035     3.0
                    10.0   2600.  0.0081    30.0    30.0   0.035   100.0
0  236  136  0 3              1.
0  137  236  0 4     2.0   3700.  0.0111     1.0     1.0   0.035     3.0
                    10.0   3700.  0.0111    40.0    20.0   0.035   100.0
0  237  137  0 3              1.
0  337  237  2 2     0.1      1.                                     0.1
   0.0        0.0     33.0     531.0
0  401  201  3 2     0.1      1.                                     0.1
   0.0        0.0     27.6     288.0      61.1     926.0
0  402  202  3 2     0.1      1.                                     0.1
   0.0        0.0     18.2      78.0      32.6     239.0
0  403  203  3 2     0.1      1.                                     0.1
   0.0        0.0     39.4     198.0      73.3     666.0
0  404  204  3 2     0.1      1.                                     0.1
   0.0        0.0     36.5     237.0      72.7     826.0
0  405  205  3 2     0.1      1.                                     0.1
   0.0        0.0     30.7     202.0      67.3     760.0
0  406  206  3 2     0.1      1.                                     0.1
   0.0        0.0     34.9     309.0      73.7    1022.0
0  407  207  3 2     0.1      1.                                     0.1
   0.0        0.0     39.7     207.0      84.0     812.0
0  408  208  3 2     0.1      1.                                     0.1
   0.0        0.0     15.8      90.0      29.7     300.0
0  409  209  3 2     0.1      1.                                     0.1
   0.0        0.0     11.2      71.0      20.8     232.0
0  410  210  3 2     0.1      1.                                     0.1
   0.0        0.0      1.8     302.0       2.9     619.0
0  411  211  3 2     0.1      1.                                     0.1
   0.0        0.0      3.2     129.0       5.9     318.0
0  412  212  3 2     0.1      1.                                     0.1
   0.0        0.0      2.9      20.0       5.8      70.0
0  413  213  3 2     0.1      1.                                     0.1
   0.0        0.0     12.4      87.0      21.7     274.0
0  414  214  3 2     0.1      1.                                     0.1
   0.0        0.0      9.7      66.0      17.4     207.0
0  415  215  3 2     0.1      1.                                     0.1
   0.0        0.0      5.2      16.0       8.6      55.0
0  416  216  3 2     0.1      1.                                     0.1
   0.0        0.0      7.4      61.0      13.5     193.0
0  417  317  3 2     0.1      1.                                     0.1
   0.0        0.0     12.3     120.0      20.9     374.0
0  420  220  3 2     0.1      1.                                     0.1
   0.0        0.0      9.0      63.0      16.8     199.0
0  421  221  3 2     0.1      1.                                     0.1
   0.0        0.0     21.5      94.0      40.9     350.0
0  422  222  3 2     0.1      1.                                     0.1
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      0.0        0.0       19.0      133.0       35.1      408.0
    0  423   223  3 2      0.1       1.                                    0.1
      0.0        0.0       13.8      141.0       31.1      457.0
    0  424   224  3 2      0.1       1.                                    0.1
      0.0        0.0       11.6      154.0       26.7      482.0
    0  425   225  3 2      0.1       1.                                    0.1
      0.0        0.0        1.9       41.0        3.8      148.0
    0  426   226  3 2      0.1       1.                                    0.1
      0.0        0.0        2.6       14.0        4.1       52.0
    0  427   227  3 2      0.1       1.                                    0.1
      0.0        0.0        5.5      146.0       14.9      465.0
    0  430   230  3 2      0.1       1.                                    0.1
      0.0        0.0       32.7      128.0       56.6      410.0
    0  431   231  3 2      0.1       1.                                    0.1
      0.0        0.0       13.3       79.0       24.5      257.0
    0  432   232  3 2      0.1       1.                                    0.1
      0.0        0.0        4.0      222.0       11.9      670.0
    0  433   233  3 2      0.1       1.                                    0.1
      0.0        0.0        1.5       65.0        4.5      211.0
    0  434   234  3 2      0.1       1.                                    0.1
      0.0        0.0       16.5       64.0       27.7      201.0
    0  435   235  3 2      0.1       1.                                    0.1
      0.0        0.0        1.7      168.0        3.0      343.0
    0  436   236  3 2      0.1       1.                                    0.1
      0.0        0.0       19.3      132.0       37.0      424.0
    0  437   337  3 2      0.1       1.                                    0.1
      0.0        0.0       26.9      305.0       50.4      871.0
    0  440   240  3 2      0.1       1.                                    0.1
      0.0        0.0       12.6       91.0       23.9      285.0
    0  441   241  3 2      0.1       1.                                    0.1
      0.0        0.0       15.3      115.0       31.9      387.0
    0  442   242  3 2      0.1       1.                                    0.1
      0.0        0.0        2.4      217.0        3.8      470.0
    0  443   243  3 2      0.1       1.                                    0.1
      0.0        0.0       12.0       41.0       20.7      134.0

    0
   53
  999  151  202   51  751  103  203    3  703  104  204  105  205  106  206  107
  207    7  707  108  308  708  208  109  709  209  110  210  111  711  211  112
  712  212  113  213  116  216  117  217  741  341  720  225  325  237  236  121
  307  331  231  337  317
ENDPROGRAM
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III-C

UDSWMM MODEL NETWORK SCHEMATICS

III-D

EXISTING AND FUTURE CONDITION WITH ON-SITE DETENTION POND ANALYSES

ANDERSON CONSULTING ENGINEERS, INC Civil • Water Resources • Environmental	Project Number CO-WELD-01	Page 1 Of 5
Owner-Project WELD COUNTY – I25 MDP	By CJP/BLV	Date 04/09/99
Subject GODDING HOLLOW EXISTING DETENTION @ ELEMENT 308 SHW 52	Checked By	Date

ELEV. (FT.)	SURFACE AREA (AC.) [FROM USGS QUAD]	INCRE. DEPTH (FT.)	INCRE. VOL. (AC-FT)	CUM. VOL. (AC-FT)	RELEASE Q (CFS)
4960.1	0	—	—	0	0
4968.1 (Inlet Submerged)	2.2	8.0	5.9	5.9	500
4974.6 (SHW52 Overtops)	16.0	6.5	52.3	58.2	1009
4975.9	17.5 (Interpolated)	1.3	21.8	80.0	2200
4977.4	19.2	1.5	27.5	107.5	6850
				111.0	7400

Qs From HY-8

→ added this point to the rating curve only in the 100 yr, future conditions model; only model to exceed the original rating curve due to the new rainfall (2hr to 3hr storm)

CURRENT DATE: 03-23-1999 FILE DATE: 03-23-1999
CURRENT TIME: 11:21:56 FILE NAME: GSH52

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4960.13	4960.00	72.00	1 RCB	8.00	8.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: GSH52 DATE: 03-23-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
☆ 4960.13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
☆ 4968.04	500.0	500.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4975.04	1100.0	1037.1	0.0	0.0	0.0	0.0	0.0	62.47	9
4975.62	1650.0	1072.8	0.0	0.0	0.0	0.0	0.0	570.87	5
4975.90	2200.0	1089.4	0.0	0.0	0.0	0.0	0.0	1101.30	4
4976.12	2750.0	1101.8	0.0	0.0	0.0	0.0	0.0	1643.08	4
4976.30	3300.0	1112.8	0.0	0.0	0.0	0.0	0.0	2168.36	3
4976.47	3850.0	1122.6	0.0	0.0	0.0	0.0	0.0	2710.24	3
4976.63	4400.0	1131.5	0.0	0.0	0.0	0.0	0.0	3253.26	3
4976.78	4950.0	1139.9	0.0	0.0	0.0	0.0	0.0	3797.97	3
☆ 4976.92	5500.0	1147.7	0.0	0.0	0.0	0.0	0.0	4340.71	3
4974.57	1008.5	1008.5	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

77.37 5950
6400
77.37 6850

WSE even w/ top of culvert

SHW 52 begins to overtop

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: GSH52 DATE: 03-23-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4960.13	0.000	0.00	0.00	0.00
4968.04	0.000	500.00	0.00	0.00
4975.04	1.000	1100.00	0.40	0.04
4975.62	-0.003	1650.00	6.33	0.38
4975.90	-0.003	2200.00	9.31	0.42
4976.12	-0.008	2750.00	5.16	0.19
4976.30	-0.005	3300.00	18.83	0.57
4976.47	-0.004	3850.00	17.21	0.45
4976.63	-0.003	4400.00	15.23	0.35
4976.78	-0.003	4950.00	12.16	0.25
4976.92	-0.002	5500.00	11.61	0.21

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

Elev. of culvert crown = 4968.10 ft

☆ Used for UDSWMM model rating curve for Element No. 308

CURRENT DATE: 03-23-1999 FILE DATE: 03-23-1999
CURRENT TIME: 11:21:56 FILE NAME: GSH52

PERFORMANCE CURVE FOR CULVERT 1 - 1(8.00 (ft) BY 8.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4960.13	0.00	-0.13	0-NF	0.00	0.00	0.00	-0.50	0.00	0.00
500.00	4968.04	7.74	7.91	2-M2c	6.49	4.96	4.96	4.26	12.60	5.51
1037.12	4975.03	14.90	13.25	6-FFc	8.00	8.00	4.96	5.27	26.13	6.26
1072.79	4975.62	15.49	13.63	6-FFc	8.00	8.00	4.96	5.91	27.03	6.71
1089.38	4975.90	15.77	13.80	6-FFc	8.00	8.00	4.96	6.43	27.45	7.07
1101.75	4976.11	15.98	13.94	6-FFc	8.00	8.00	4.96	6.88	27.76	7.38
1112.81	4976.30	16.17	14.06	6-FFc	8.00	8.00	4.96	7.26	28.04	7.63
1122.55	4976.47	16.34	14.17	6-FFc	8.00	8.00	4.96	7.60	28.28	7.86
1131.51	4976.63	16.50	14.27	6-FFc	8.00	8.00	4.96	7.92	28.51	8.06
1139.87	4976.77	16.64	14.59	4-FFt	8.00	8.00	4.96	8.22	28.72	8.25
1147.68	4976.91	16.78	14.95	4-FFt	8.00	8.00	4.96	8.49	28.92	8.42

El. inlet face invert 4960.13 ft El. outlet invert 4960.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** EMBANKMENT TOE **********

UPSTREAM STATION	172.00 ft
UPSTREAM ELEVATION	4960.13 ft
UPSTREAM EMBANKMENT SLOPE (X:1)	0.01
DOWMSTREAM STATION	100.00 ft
DOWNSTREAM ELEVATION	4960.00 ft
DOWNSTREAM EMBANKMENT SLOPE (X:1)	0.01

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	8.00 ft
BARREL RISE	8.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	1:1 BEVEL (45 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 03-23-1999 FILE DATE: 03-23-1999
CURRENT TIME: 11:21:56 FILE NAME: GSH52

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION FILE NAME: GSH52
MAIN CHANNEL AND LT & RT OVER BANKS FILE DATE: 03-03-1999

LEFT CHANNEL BOUNDARY	3
RIGHT CHANNEL BOUNDARY	6
MANNING n LEFT OVER BANK	0.035
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.035
SLOPE OF CHANNEL	0.0091 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	1.00	4980.00
2	1400.00	4970.00
3	1500.00	4961.50
4	1500.00	4959.50
5	1502.00	4959.50
6	1502.00	4961.50
7	1602.00	4970.00
8	1702.00	4980.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	4959.50	0.000	-0.50	0.00	0.00
500.00	4964.26	0.445	4.26	5.51	0.90
1100.00	4965.27	0.459	5.27	6.26	1.09
1650.00	4965.90	0.468	5.91	6.71	1.21
2200.00	4966.42	0.474	6.43	7.07	1.31
2750.00	4966.87	0.479	6.88	7.38	1.40
3300.00	4967.26	0.483	7.26	7.63	1.47
3850.00	4967.60	0.486	7.60	7.86	1.53
4400.00	4967.92	0.489	7.92	8.06	1.59
4950.00	4968.22	0.492	8.22	8.25	1.65
5500.00	4968.49	0.495	8.49	8.42	1.70

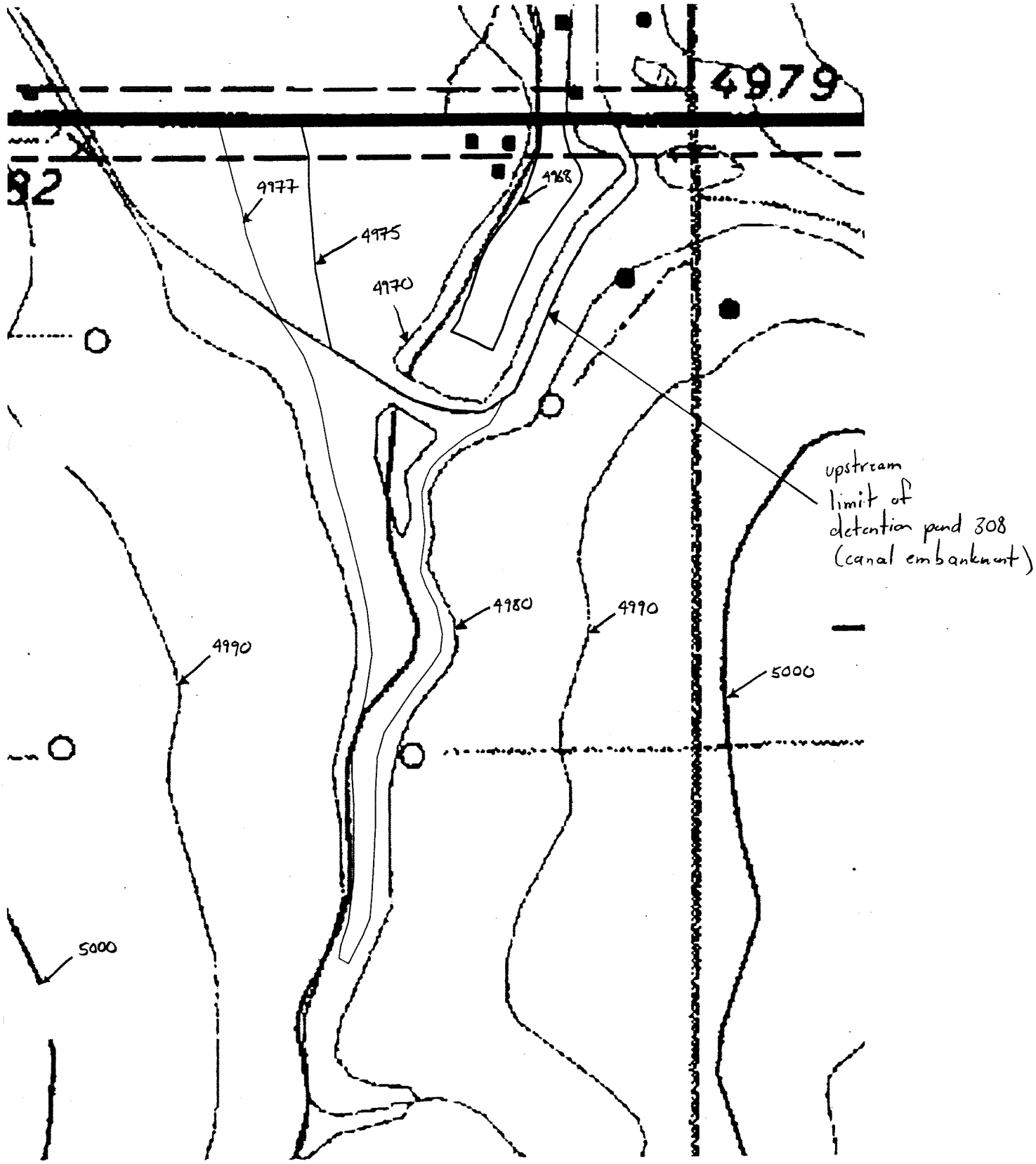
Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	70.00 ft

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	4975.73
2	325.69	4975.04
3	352.96	4974.57
4	409.33	4974.90
5	472.89	4974.70
6	491.15	4975.00
7	563.90	4975.40
8	661.19	4976.17
9	804.81	4978.11
10	941.61	4980.31
11	1002.67	4981.81
12	1082.96	4983.40
13	1238.88	4986.54
14	1388.53	4989.19
15	1452.48	4990.48


4979
4977
4975
4970
4968
upstream limit of detention pond 308 (canal embankment)
4980
4990
4990
5000
5000

ANDERSON CONSULTING ENGINEERS, INC Civil • Water Resources • Environmental	Project Number CO-WELD-01	Page 1 Of 5
Owner-Project WELD COUNTY – I25 MDP	By CJP/BLU	Date 04/09/99
Subject GOALRIDGE CANAL GODDING HOLLOW EXISTING DETENTION @ ELEMENT 309	Checked By	Date

ELEV. (FT.)	SURFACE AREA (AC) [FROM USGS QUAD]	INCRE. DEPTH (FT.)	INCRE. VOL. (AC-FT)	CUM. VOL. (AC-FT)	RELEASE Q (CFS)	
4962.9	0	—	—	0	0	
4969.9 (Submerged Inlet)	0.9	7.0	2.1	2.1	442	← $Q_o = .6(7\times7)\sqrt{2(32.2)(3.5)} = 441.4$
4971.8 (Submerged Outlet)	2.8	1.9	3.3	5.4	500	Q = From HY-8 ↓
4977.0 (w/Rd. Overtops)	7.8	5.2	26.5	31.9	791	
4977.9	10.7 (Interpolated)	0.9	8.3	40.2	1100	
4980.0	16.5	2.1	28.3	68.5	6600	
				70.0	6800	

↳ added this point only to the 100 yr, future conditions model; only model to exceed the original rating curve due to the new rainfall (2hr to 3hr storm)

CURRENT DATE: 03-23-1999 FILE DATE: 03-23-1999
CURRENT TIME: 11:46:12 FILE NAME: GSH52C

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4962.94	4962.66	86.00	1 RCB	7.00	7.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: GSH52C DATE: 03-23-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
★ 4962.94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
★ 4971.77	500.0	500.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4977.94	1100.0	571.5	0.0	0.0	0.0	0.0	0.0	541.99	15
4978.10	1650.0	816.4	0.0	0.0	0.0	0.0	0.0	817.24	28
4978.24	2200.0	1088.2	0.0	0.0	0.0	0.0	0.0	1090.29	19
4978.28	2750.0	1162.8	0.0	0.0	0.0	0.0	0.0	1168.14	5
4978.48	3300.0	1632.4	0.0	0.0	0.0	0.0	0.0	1634.85	17
4978.51	3850.0	1720.8	0.0	0.0	0.0	0.0	0.0	1722.10	7
4978.63	4400.0	2030.2	0.0	0.0	0.0	0.0	0.0	2031.50	28
4978.73	4950.0	2321.6	0.0	0.0	0.0	0.0	0.0	2323.06	29
★ 4978.82	5500.0	2599.6	0.0	0.0	0.0	0.0	0.0	2601.07	30
4976.96	790.8	790.8	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	
4980	6600								

Culvert drawned out

Canal road begins to overtop

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: GSH52C DATE: 03-23-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4962.94	0.000	0.00	0.00	0.00
4971.77	0.000	500.00	0.00	0.00
4977.94	0.000	1100.00	-13.51	-1.23
4978.10	0.000	1650.00	16.37	0.99
4978.24	-0.001	2200.00	21.49	0.98
4978.28	0.000	2750.00	419.05	15.24
4978.48	-0.001	3300.00	32.77	0.99
4978.51	0.000	3850.00	407.04	10.57
4978.63	0.000	4400.00	338.33	7.69
4978.73	0.000	4950.00	305.32	6.17
4978.82	0.000	5500.00	299.33	5.44

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

Elev. of culvert crown = 4969.94 ft

★ Used for UDSWMM model rating curve for Element No. 308

CURRENT DATE: 03-23-1999 FILE DATE: 03-23-1999
CURRENT TIME: 11:46:12 FILE NAME: GSH52C

PERFORMANCE CURVE FOR CULVERT 1 - 1(7.00 (ft) BY 7.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4962.94	0.00	-0.28	0-NF	0.00	0.00	0.00	-2.53	0.00	0.00
500.00	4971.77	8.83	8.63	2-M2c	5.92	5.42	5.42	5.38	13.17	0.00
571.52	4975.04	9.95	12.10	2-M2c	7.00	5.93	5.42	12.38	13.17	0.00
816.39	4981.52	14.56	18.58	4-FFt	7.00	7.00	7.00	12.96	16.66	0.00
1088.22	4986.39	21.46	23.45	4-FFt	7.00	7.00	7.00	13.24	22.21	0.00
1162.81	4988.10	24.00	25.16	4-FFt	7.00	7.00	7.00	13.46	23.73	0.00
1632.38	5006.84	43.91	36.97	4-FFt	7.00	7.00	5.42	13.64	43.00	0.00
1720.85	5011.34	48.40	39.77	4-FFt	7.00	7.00	5.42	13.81	45.33	0.00
2030.17	5028.94	66.00	50.21	4-FFt	7.00	7.00	5.42	13.97	53.48	0.00
2321.61	5048.17	85.23	61.60	4-FFt	7.00	7.00	5.42	14.12	61.16	0.00
2599.60	5068.91	105.97	73.87	4-FFt	7.00	7.00	5.42	14.26	68.48	0.00

El. inlet face invert 4962.94 ft El. outlet invert 4962.66 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** EMBANKMENT TOE **********

UPSTREAM STATION	186.00 ft
UPSTREAM ELEVATION	4962.94 ft
UPSTREAM EMBANKMENT SLOPE (X:1)	0.01
DOWMSTREAM STATION	100.00 ft
DOWNSTREAM ELEVATION	4962.66 ft
DOWNSTREAM EMBANKMENT SLOPE (X:1)	0.01

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	7.00 ft
BARREL RISE	7.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	1:1 BEVEL (45 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 03-23-1999 FILE DATE: 03-23-1999
CURRENT TIME: 11:46:12 FILE NAME: GSH52C

TAILWATER

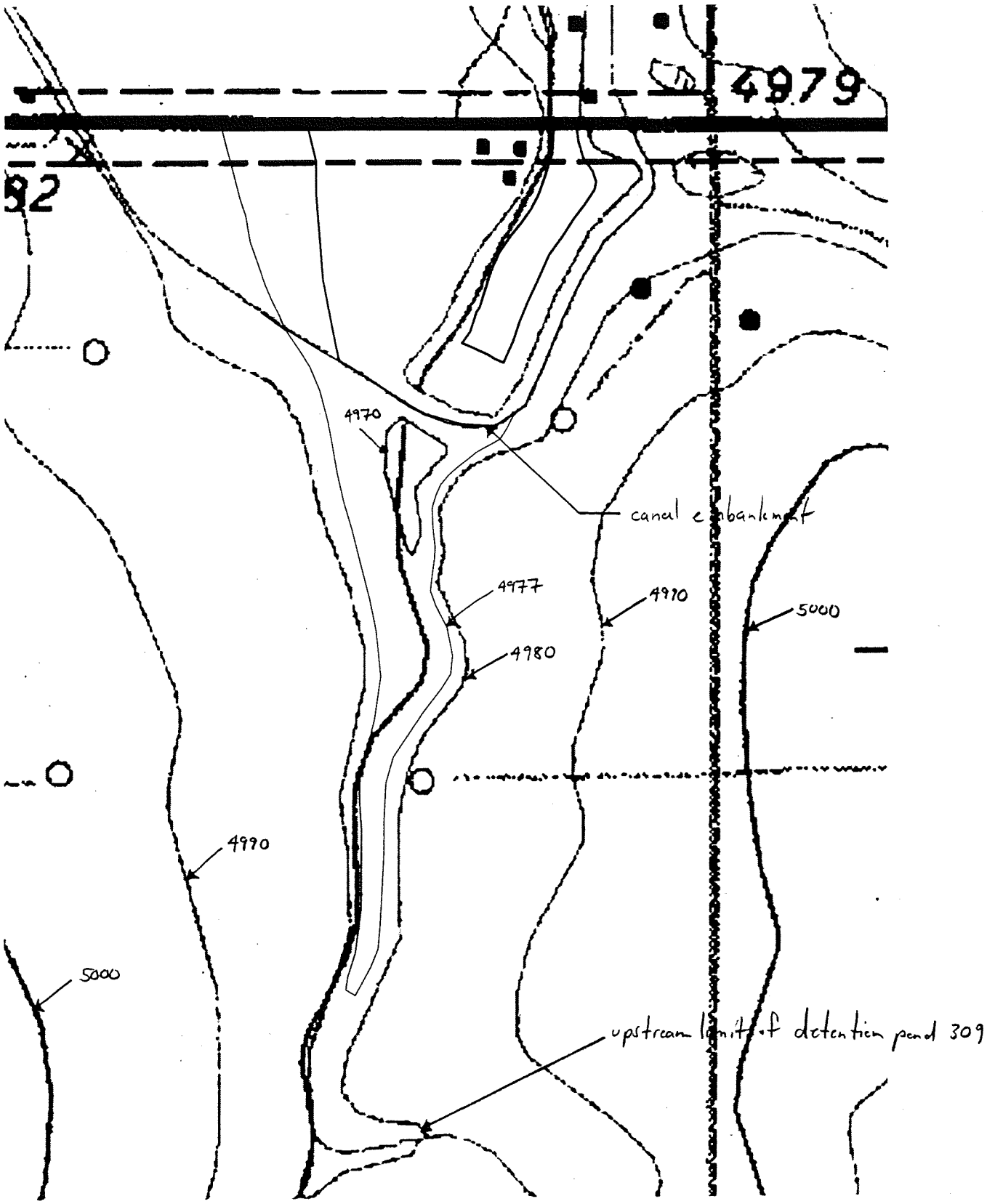
TAILWATER RATING CURVE

FLOW (cfs)	W.S.E.(ft)	DEPTH (ft)
0	4960.13	-2.53
500	4968.04	5.38
1100	4975.04	12.38
1650	4975.62	12.96
2200	4975.90	13.24
2750	4976.12	13.46
3300	4976.30	13.64
3850	4976.47	13.81
4400	4976.63	13.97
4950	4976.78	14.12
5500	4976.92	14.26

ROADWAY OVERTOPPING DATA

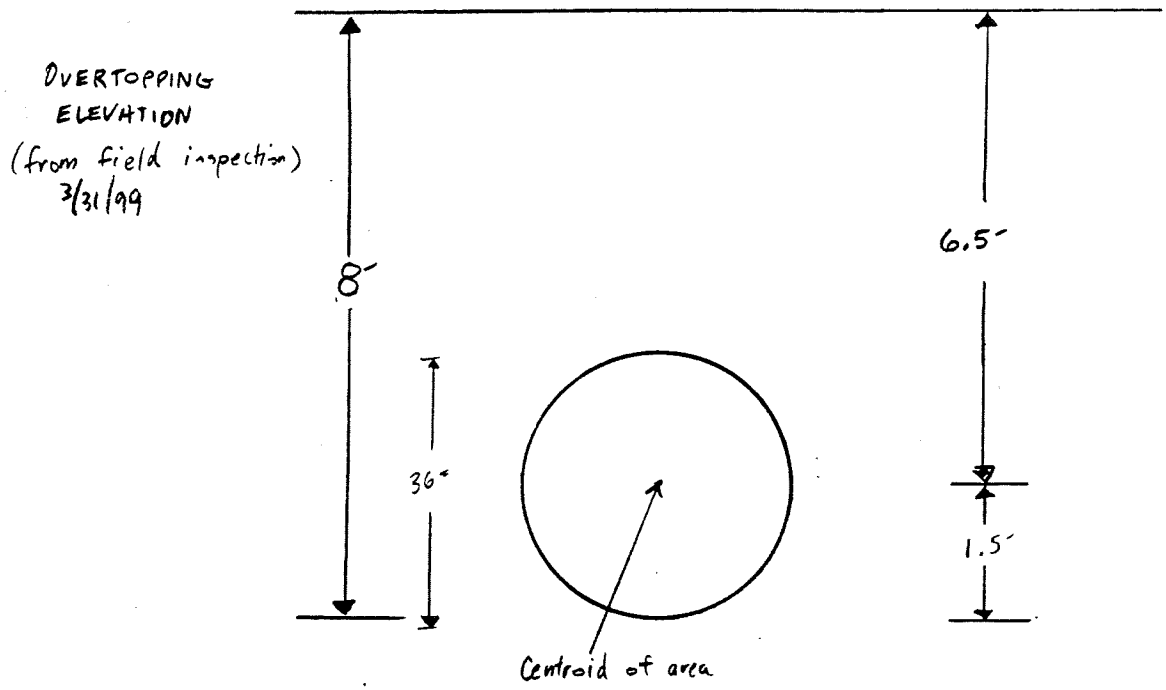
ROADWAY SURFACE GRAVEL
EMBANKMENT TOP WIDTH 80.00 ft
***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	4977.04
2	53.07	4977.25
3	104.95	4977.57
4	158.29	4977.62
5	210.54	4977.82
6	263.93	4977.93
7	314.48	4977.76
8	368.35	4977.53
9	420.63	4977.38
10	470.66	4976.96
11	524.15	4977.03
12	575.05	4978.12
13	627.64	4979.07
14	682.22	4979.35


4979
92
4970
canal embankment
4977
4990
5000
4980
4990
5000
upstream limit of detention pond 309

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number CO-WELD-01	Page 1 Of 4
Owner-Project Weld County - I-25 MDP	By CJP/BLV	Date 04/09/99
Project Godding Hollow Existing Detention @ I-25/SH 52 Element 321	Checked By	Date

ELV. (ft.)	SURFACE AREA (ac.)	Incra. Depth. (ft.)	Incra. Vol. (ac-ft)	CUM. VOL. (ac-ft)	Q (cfs)
4980	0	—	—	0	0
4988	30.7	8	81.8	82	~~43~~ 87 corrected ✓ BLV ← Orifice Eqn.
4990	49.6	2	79.5	162	~~3677~~ 3764 corrected ✓ BLV ← Assume L = 500' $Q = 2.6(500)(4990-4988)^{3/2}$



$Q = CA\sqrt{2gh}$

Q = orifice flow

A = Area

g = 32.2 ft/s² (gravitational constant)

h = head (Distance from OTing elevation to centroid of area)

C = orifice equation coefficient, = .6

$A = \frac{1}{2}\pi r^2$

$Q = (0.6)\left(\frac{1}{2}(\pi)(1.5ft)^2\right)\sqrt{2(32.2\,ft/s^2)(6.5ft)}$

$\boxed{Q = \cancel{43}\ cfs}$ → should be $\pi/4\, D^2$

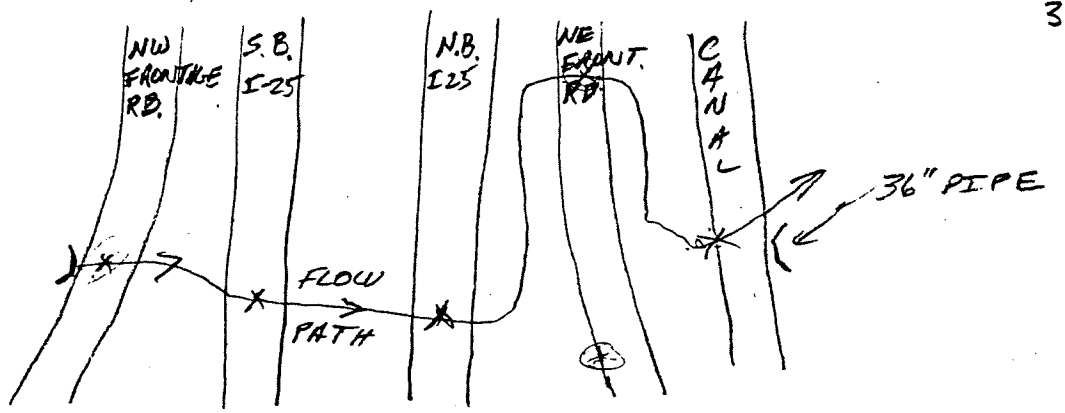
87

corrected ✓ BLV

Lidstone & Anderson, Inc.
Water Resources and Environmental Consultants

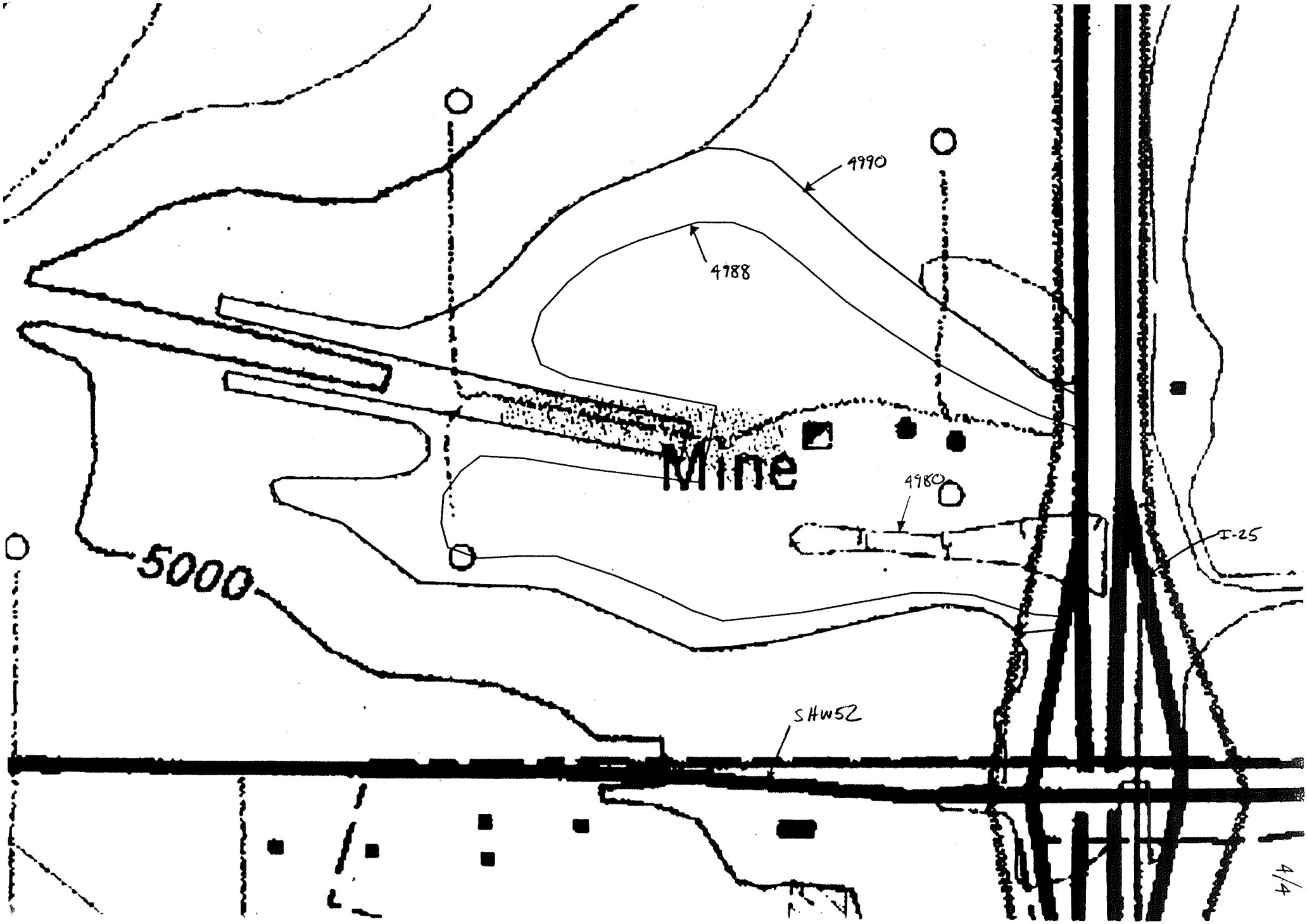
OWNER–PROJECT	BY	DATE	PROJECT NO.
WELD COUNTY – I 25 MDP	CJP	03/31/99	COWELD-01
...URE SHW52/I-25 Field Survey	CHECKED BY —	DATE —	SHEET 2 OF 4

3 4



OT ELV. @ ≈ 8 – 9' above pipe invert

∴ ≈ 4989'


4990
4988
Mine
4980
5000
I-25
SHW52

ANDERSON CONSULTING ENGINEERS, INC Civil • Water Resources • Environmental	Project Number CO-WELD-01	Page 1 Of 5
Owner-Project WELD COUNTY – I25 MDP	By CJP/BLU	Date 04/09/99
UPRR. EMBK. JUDDING HOLLOW EXISTING DETENTION @ ELEMENT 325	Checked By	Date

NOTE: NO VISIBLE OUTLET FROM THIS POND

ELV. (FT.)	SURFACE AREA ([redacted] AC.)	INCRE. DEPTH (FT.)	INCRE VOL. (AC-FT)	CUM. VOL. (AC-FT)	RELEASE Q (CFS)
5098.2	0	—	—	0	0
5104.9	ACAD 3.7	6.7	8.3	8.3	0
5105.0	3.8	0.1	0.4	8.7	10
5105.6	ACAD 4.0	0.6	2.3	11.0	800
5105.7	4.1	0.1	0.4	11.4	1000

FROM HEC-2

GODDING HOLLOW

EXISTING DETENTION ELEMENT 325

2/5

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1*****************************************                    ****************************************
 *  HEC-2 WATER SURFACE PROFILES          *                    *  U.S. ARMY CORPS OF ENGINEERS        *
 *                                        *                    *  HYDROLOGIC ENGINEERING CENTER       *
 *  Version   4.6.0;  February 1991       *                    *  609 SECOND STREET, SUITE D          *
 *                                        *                    *  DAVIS, CALIFORNIA 95616-4687        *
 *  RUN DATE    09APR99    TIME   10:56:13 *                    *          (916) 756-1104              *
 *****************************************                    ****************************************


                                        X     X  XXXXXXX   XXXXX              XXXXX
                                        X     X  X        X     X            X     X
                                        X     X  X        X                        X
                                        XXXXXXX  XXXX     X          XXXXX    XXXXX
                                        X     X  X        X                  X
                                        X     X  X        X     X            X
                                        X     X  XXXXXXX   XXXXX             XXXXXXX
1
   09APR99      10:56:13                                                                          PAGE    1


                                                                  THIS RUN EXECUTED 09APR99    10:56:13
 ************************************
  HEC-2 WATER SURFACE PROFILES

  Version   4.6.0;  February 1991
 ************************************


 T1   WEIR FLOW OVER UPRR EMBANKMENT
 T2   WELD COUNTY I-25 MDP  CO-WELD01

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0         2         0         0        -1         0         0         0         0         0

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1         0        -1


 NC    0.035     0.035     0.035       0.1        0.3
 QT        3        10       800      1000
 X1        1        13         0    1074.5
 GR   5110.0         0    5105.4       190     5105.1     267.4     5104.9     366.4     5105.1     468.5
 GR   5105.4     570.5    5105.8     655.5     5106.5     744.6     5107.6     953.6     5108.8     950.8
 GR   5110.1    1058.5    5111.5    1161.6     5112.9    1264.5
1
   09APR99      10:56:13                                                                          PAGE    2


     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *PROF 1
0

 CCHV=      .100 CEHV=      .300
 *SECNO 1.000
 2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED
 3720 CRITICAL DEPTH ASSUMED
      1.000       .12   5105.02   5105.02       .00   5105.05       .03       .00       .00   5110.00
       10.0        .0      10.0        .0        .0       7.0        .0        .0        .0   5110.10
        .00       .00      1.43       .00      .000      .035      .000      .000   5104.90    307.97
    .049006        0.        0.        0.         0        23         0       .00    118.70    426.66


1
   09APR99      10:56:13                                                                          PAGE    3


 T1   WEIR FLOW OVER UPRR EMBANKMENT
 T2   WELD COUNTY I-25 MDP  CO-WELD01

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0         3         0         0        -1         0         0         0         0         0

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      2         0        -1

1
   09APR99      10:56:13                                                                          PAGE    4
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

 *PROF 2
0

 CCHV=      .100 CEHV=      .300
 *SECNO 1.000
 2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED
 3720 CRITICAL DEPTH ASSUMED
      1.000       .74   5105.64   5105.64       .00   5105.87       .23       .00       .00   5110.00
      800.0        .0     800.0        .0        .0     206.7        .0        .0        .0   5110.10
        .00       .00      3.87       .00      .000      .035      .000      .000   5104.90    180.02
    .022887        0.        0.        0.         0        13         0       .00    441.86    621.87

1
   09APR99      10:56:13                                                                                  PAGE    5

 T1   WEIR FLOW OVER UPRR EMBANKMENT
 T2   WELD COUNTY I-25 MDP  CO-WELD01

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

        0         4         0         0        -1         0         0         0         0         0

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      15         0        -1


1
   09APR99      10:56:13                                                                                  PAGE    6

     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

 *PROF 3
0

 CCHV=      .100 CEHV=      .300
 *SECNO 1.000
 2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED
 3720 CRITICAL DEPTH ASSUMED
      1.000       .82   5105.72   5105.72       .00   5105.98       .26       .00       .00   5110.00
     1000.0        .0    1000.0        .0        .0     242.7        .0        .0        .0   5110.10
        .00       .00      4.12       .00      .000      .035      .000      .000   5104.90    176.73
    .022235        0.        0.        0.         0        16         0       .00    462.06    638.79

1
   09APR99      10:56:13                                                                                  PAGE    7


                                                                                THIS RUN EXECUTED 09APR99    10:56:13
 ************************************
  HEC-2 WATER SURFACE PROFILES

  Version   4.6.0;  February 1991
 ************************************

 NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

 □□□□□□□□□□□□□□□□□□□□□□□□

 SUMMARY PRINTOUT TABLE  150

       SECNO     XLCH      ELTRD     ELLC      ELMIN       Q        CWSEL     CRIWS      EG        10*KS      VCH      AREA      .01K

 *      1.000       .00       .00       .00   5104.90     10.00   5105.02   5105.02   5105.05    490.06     1.43      7.01       .45
 *      1.000       .00       .00       .00   5104.90    800.00   5105.64   5105.64   5105.87    228.87     3.87    206.69     52.88
 *      1.000       .00       .00       .00   5104.90   1000.00   5105.72   5105.72   5105.98    222.35     4.12    242.67     67.06

1
   09APR99      10:56:13                                                                                  PAGE    8

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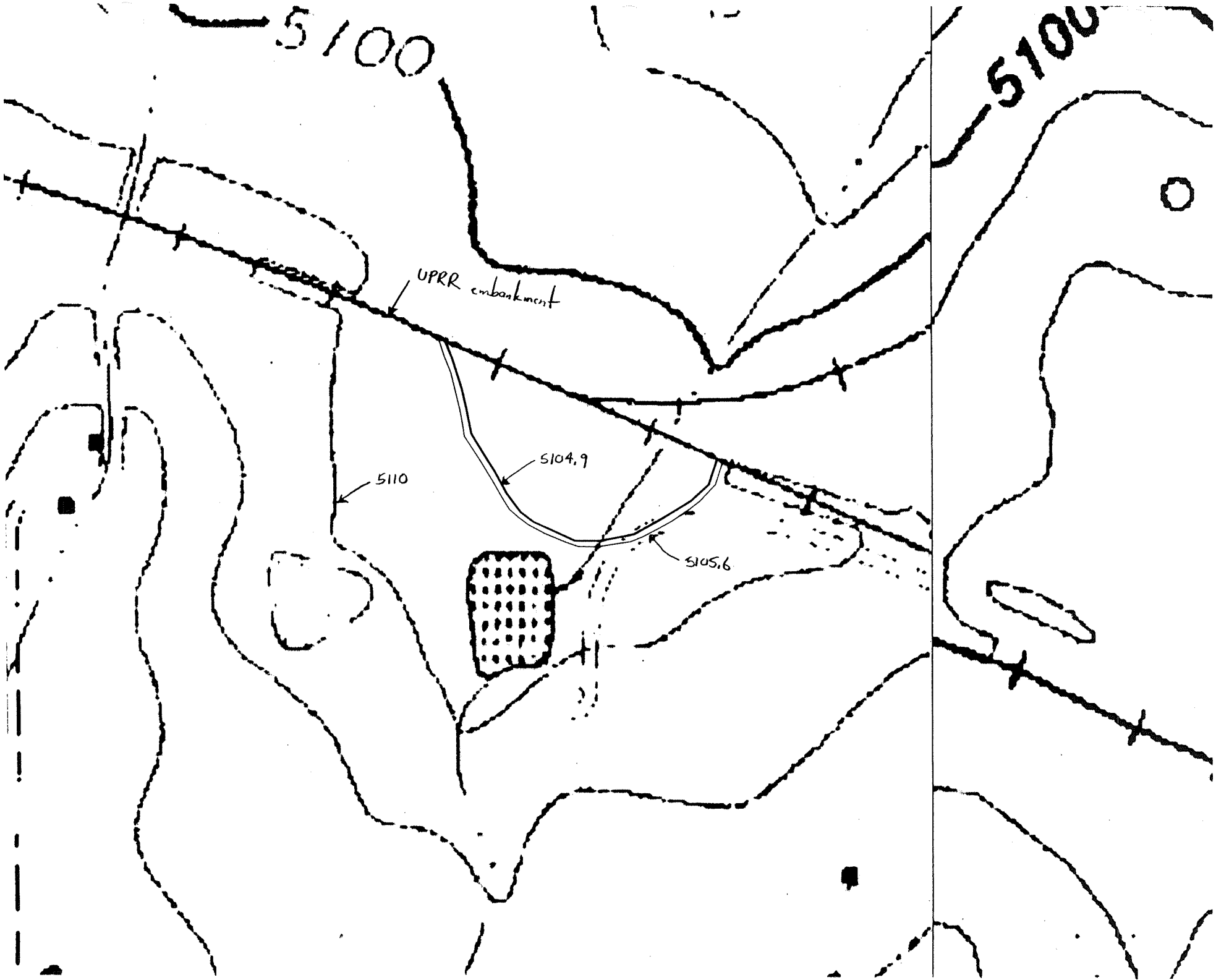
 SUMMARY PRINTOUT TABLE  150
```

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1.000	10.00	5105.02	.00	.00	.00	118.70	.00
*	1.000	800.00	5105.64	.62	.00	.00	441.86	.00
*	1.000	1000.00	5105.72	.08	.00	.00	462.06	.00

1

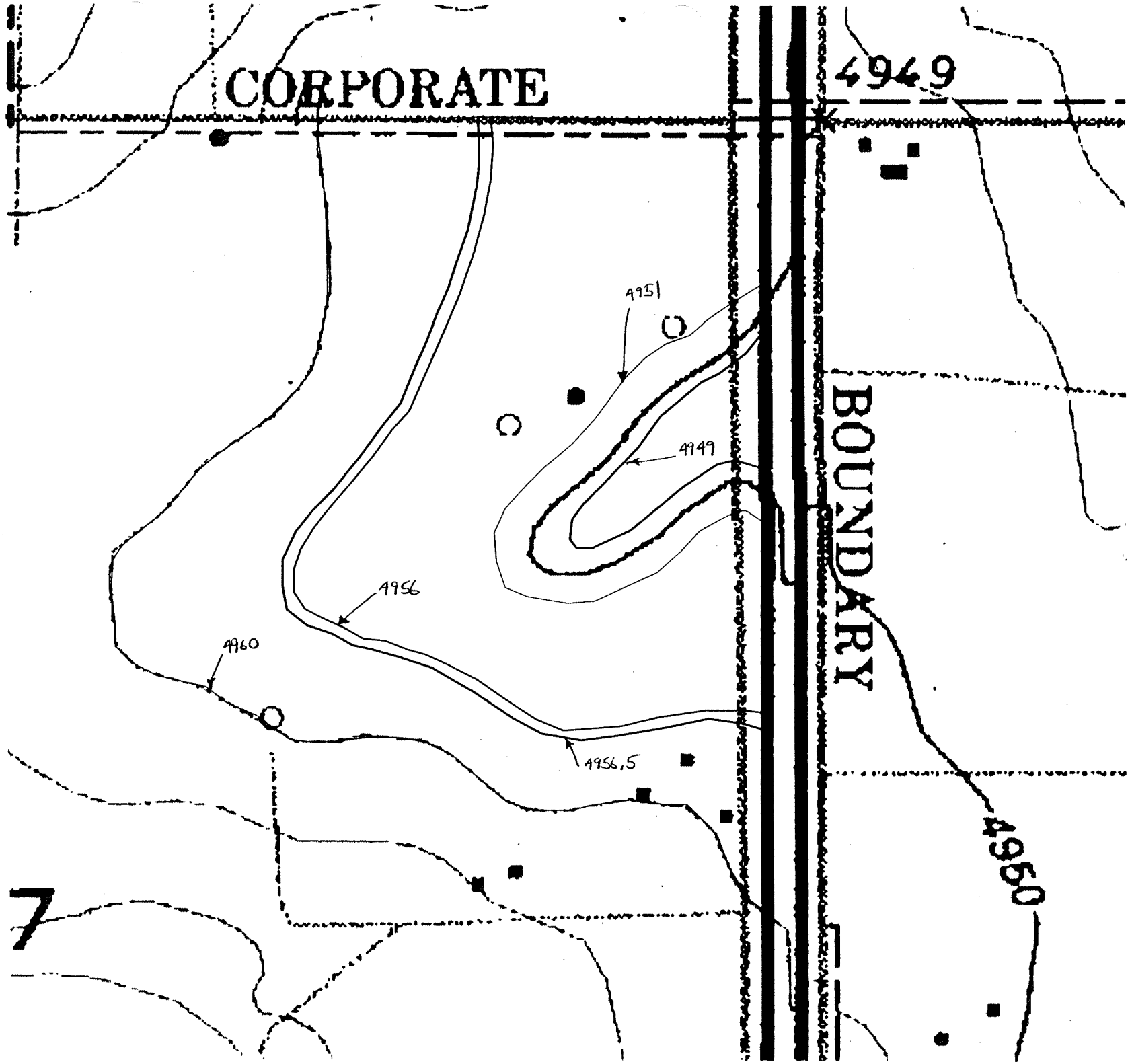
SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=      1.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      1.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      1.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
```


5100
5100
UPRR embankment
5104.9
5110
5105.6

ANDERSON CONSULTING ENGINEERS, INC Civil • Water Resources • Environmental	Project Number CO-WELD-01	Page 1 Of 2
Owner-Project WELD COUNTY – I25 MDP	By CJP/BLU	Date 04/09/99
ct I-25/WCR 16 3/4 GODDING HOLLOW EXISTING DETENTION @ ELEMENT 341	Checked By	Date

ELEV. (FT.)	SURFACE AREA (AC.)	INCRE. DEPTH (FT.)	INCRE. VOL. (AC-FT)	CUM. VOL. (AC-FT)	RELEASE Q (CFS)	
4946.0 (From USGS QUAD)	0	—	—	0	0	
4949.0 ("low" pipe Submerged)	4	3	4	4	40	← $Q_{O_L} = .6\left(\frac{\pi 3^2}{4}\right)\sqrt{2(32.2)(1.0)}$ $= 41.7 \approx 40$
4951.0 ("high" pipe submerged)	12.2	2	15.5	19.5	80	← $Q_{O_U} = .6\left(\frac{\pi 2^2}{4}\right)\sqrt{2(32.2)(1.0)}$ $= 15.1 \approx 15$ $Q_{O_L} = .6\left(\frac{\pi 3^2}{4}\right)\sqrt{2(32.2)(3.5)}$ $= 63.7 \approx 64$
4956.0 (assumed overtopping elev. of I-25)	52.5	5	150.0	169.5	136	← $Q_{O_L} = .6\left(\frac{\pi 3^2}{4}\right)\sqrt{2(32.2)(3.5)}$ $= 99.2 \approx 99$ $Q_{O_U} = .6\left(\frac{\pi 2^2}{4}\right)\sqrt{2(32.2)(6.0)}$ $= 37.1 \approx 37$
4956.5	55.5	.5	27.0	177.0	3,040	← $Q_{O_L} = .6\left(\frac{\pi 3^2}{4}\right)\sqrt{2(32.2)(9.0)}$ $= 102.1 \approx 102$ $Q_{O_U} = .6\left(\frac{\pi 2^2}{4}\right)\sqrt{2(32.2)(6.5)}$ $= 38.6 \approx 39$ $Q_W = 2.6(600)(1.5)^{3/2} = 2,866$ L = 600 EST. From USGS ≈ 2,900
4960.0	87.4	3.5	248.0	275.0	NOT USED	← $Q_{O_L} = .6\left(\frac{\pi 3^2}{4}\right)\sqrt{2(32.2)(12.5)}$ $= 120.3 \approx 120$ $Q_{O_U} = .6\left(\frac{\pi 2^2}{4}\right)\sqrt{2(32.2)(10.0)}$ $= 47.3 \approx 48$ $Q_W = 2.6(1900')(4)^{3/2}$ = NOT USED L = 1900' FROM USGS



2/2

III-E

FUTURE CONDITION REGIONAL DETENTION POND ANALYSIS

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number CO-WELD-01	Page 1 Of 3
Owner-Project Weld County I-25 MDP	By BLV	Date 5/21/99
Regional off-line detention pond in Sub-basin 7 (DP307)	Checked By	Date

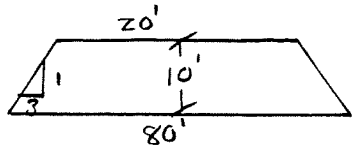
A large, open farm field exists just to the northeast of the SH152/I-25 interchange. Propose a regional detention facility here.

The peak 100-yr future condition w/ regional detention discharge coming to the pond ≈ 1700 cfs. Try and cut flows in half.

Build the detention pond @ a min. elev. = 4960.0 ft (USGS quad) and assume a 5' embankment for the north and south ends of the pond and a 10' embankment for the downstream end. Buy 40 ac. of land.

Elev. (ft)	Area (ac)	ΔD (ft)	Total D (ft)	ΔS (ac-ft)	Total S (ac-ft)	Q (cfs)
4960.0	0.0	0.0	0.0	0.0	0.0	0.0
4965.0	14.3	5.0	5.0	23.8	23.8	450.0
4970.0	35.2	5.0	10.0	119.9	143.7	790.0

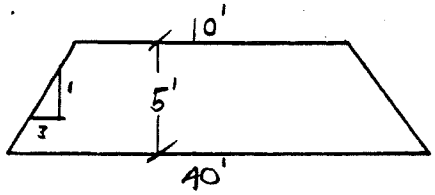
The fill required for the embankment is as follows:



Longitudinal cross section of downstream embankment

$A = \frac{1}{2}(10')(20' + 80') = 500\ ft^2$

Fill volume: $\frac{(500\ ft^2)\ 1100\ \text{linear feet}}{27\ ft^3/yd^3} = 20{,}400\ yd^3$



Longitudinal cross section of side embankment

$A = \frac{1}{2}(5')(10' + 40') = 125\ ft^2$

Fill volume: $\frac{(125\ ft^2)\ 1700 \text{ linear feet}}{27\ ft^3/yd^3} = 7{,}900\ yd^3$

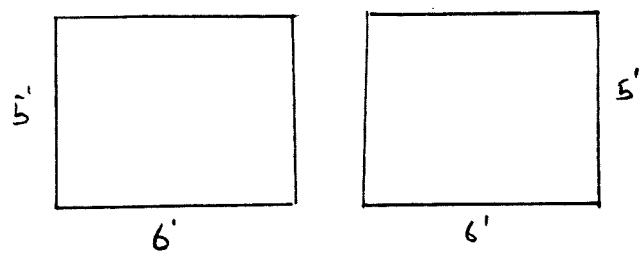
Total fill: $20{,}400 + 7{,}900 = \underline{28{,}300\ yd^3}$

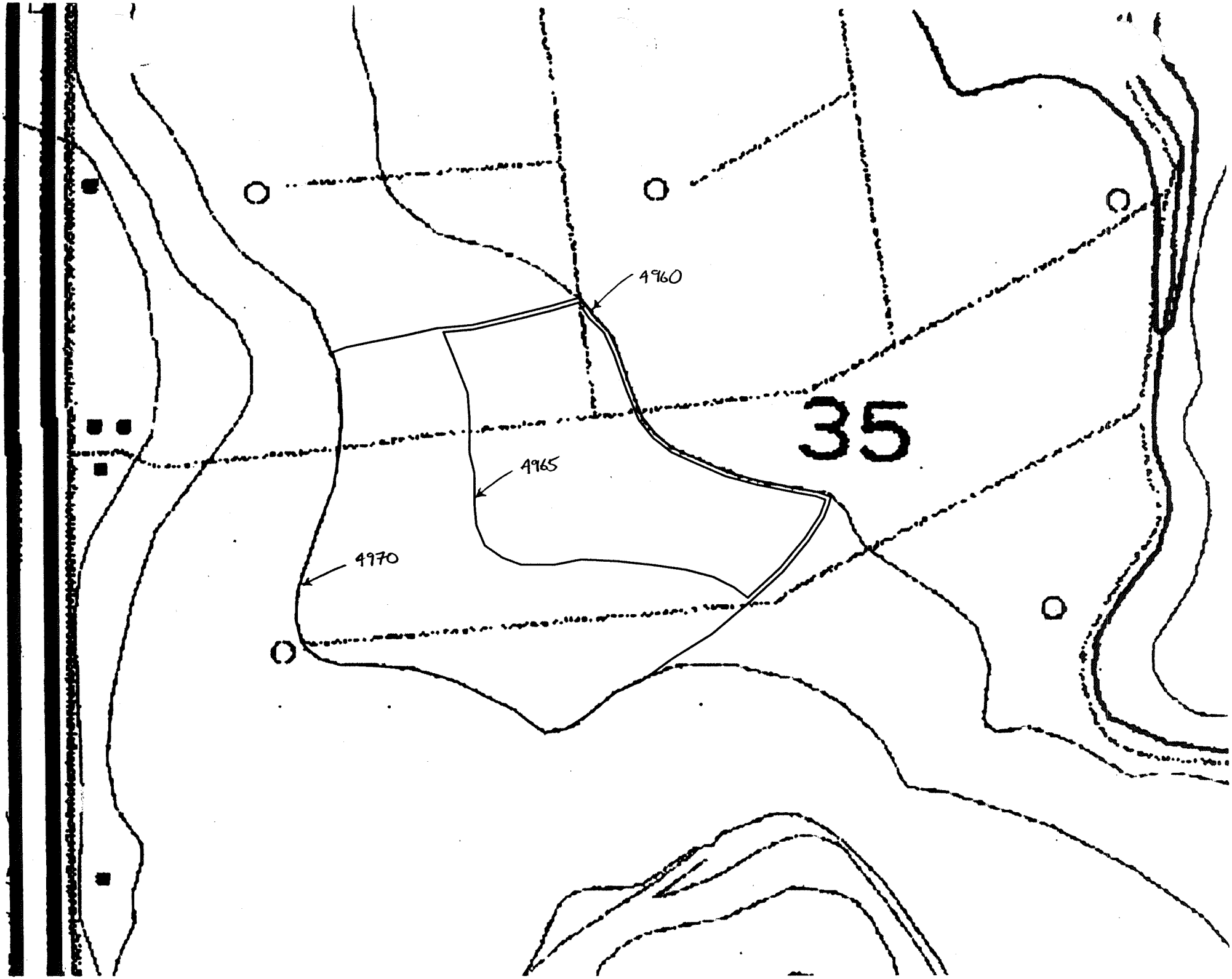
The release rate out of the pond was determined using the orifice equation. Two 5' H x 6' W RCB's were used in the final analysis. The release rates are as follows:

1) At EL 4965.0: $Q = 0.6\ (30\ ft^2)\sqrt{2(32.2)\ 2.5'} = 228\ cfs\ (2) = 450\ cfs$

2) At EL 4970.0: $Q = 0.6\ (30\ ft^2)\sqrt{2(32.2)\ 7.5'} = 396\ cfs\ (2) = 790\ cfs$

2 RCB's




4960
35
4965
4970

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number CO-WELD-01	Page 1 Of 5
Owner-Project Weld County I-25 MDP	By BLV	Date 5/21/99
S Regional on-line detention facility in Sub-basin 8 (DP 308)	Checked By	Date

There exists @ SHWSZ east of I-25 a large natural storage area. Prepare to maximize the existing storage @ the embankment, making a larger pond.

The peak, 100-yr future conditions w/ regional detention discharge coming to this point ≈ 2800 cfs. Try and reduce this by half.

Maintain the current existing minimum elev. of 4960.10 ft (TJT survey), re-route the Coalridge Ditch to the north side of SHWSZ, and raise SHWSZ approx. 4' over a distance of approx. 1600 ft.

Elev. (ft)	Area (ac)	ΔD (ft)	Total D (ft)	ΔS (ac-ft)	Total S (ac-ft)	Q (cfs)
4960.1	0.0	0.0	0.0	0.0	0.0	0.0
4970.0	7.5	9.9	9.9	24.8	24.8	960.0
4978.0	30.4	8.0	17.9	141.3	166.1	1960.0

The release rate out of the pond was determined by replacing the existing 8'H x 8'W RCB w/ a 10'H x 11'W RCB. The release rates were determined using HY-8.

CURRENT DATE: 11-29-1999
CURRENT TIME: 11:38:15

FILE DATE: 06-02-1999
FILE NAME: GSH52

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4960.13	4960.00	92.00	1 RCB	11.00	10.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: GSH52 DATE: 06-02-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
4960.13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4964.85	300.0	300.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4966.53	500.0	500.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4969.59	900.0	900.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4971.63	1200.0	1200.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4974.07	1500.0	1500.0	0.0	0.0	0.0	0.0	0.0	0.00	1
76.80	1800.0	1800.0	0.0	0.0	0.0	0.0	0.0	0.00	1
9.06	2100.0	2021.1	0.0	0.0	0.0	0.0	0.0	62.69	16
9.17	2400.0	2032.2	0.0	0.0	0.0	0.0	0.0	345.69	5
4979.26	2700.0	2040.2	0.0	0.0	0.0	0.0	0.0	636.14	4
4979.34	3000.0	2047.2	0.0	0.0	0.0	0.0	0.0	937.66	4
4979.00	2015.8	2015.8	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: GSH52 DATE: 06-02-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4960.13	0.000	0.00	0.00	0.00
4964.85	0.000	300.00	0.00	0.00
4966.53	0.000	500.00	0.00	0.00
4969.59	0.000	900.00	0.00	0.00
4971.63	0.000	1200.00	0.00	0.00
4974.07	0.000	1500.00	0.00	0.00
4976.80	0.000	1800.00	0.00	0.00
4979.06	-0.005	2100.00	16.17	0.77
4979.17	-0.008	2400.00	22.15	0.92
4979.26	-0.004	2700.00	23.67	0.88
4979.34	-0.007	3000.00	15.14	0.50

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

CURRENT DATE: 11-29-1999 FILE DATE: 06-02-1999
CURRENT TIME: 11:38:15 FILE NAME: GSH52

PERFORMANCE CURVE FOR CULVERT 1 - 1(11.00 (ft) BY 10.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4960.13	0.00	-0.13	0-NF	0.00	0.00	0.00	-0.50	0.00	0.00
300.00	4964.85	4.25	4.72	3-M1t	3.52	2.85	3.74	3.74	7.29	5.10
500.00	4966.53	6.04	6.40	3-M2t	5.11	4.01	4.26	4.26	10.67	5.51
900.00	4969.59	9.21	9.46	2-M2c	8.01	5.94	5.94	4.98	13.78	6.05
1200.00	4971.63	11.50	11.45	2-M2c	10.00	7.19	7.19	5.40	15.17	6.35
1500.00	4974.07	13.94	13.30	2-M2c	10.00	8.35	8.35	5.75	16.34	6.61
1800.00	4976.80	16.67	15.21	2-M2c	10.00	9.42	9.42	6.06	17.36	6.82
2021.14	4979.06	18.93	16.72	6-FFc	10.00	10.00	9.42	6.34	19.50	7.02
2032.17	4979.17	19.05	16.79	6-FFc	10.00	10.00	9.42	6.59	19.60	7.19
2040.19	4979.26	19.13	16.85	6-FFc	10.00	10.00	9.42	6.82	19.68	7.34
2047.20	4979.34	19.21	16.90	6-FFc	10.00	10.00	9.42	7.05	19.75	7.49

El. inlet face invert 4960.13 ft El. outlet invert 4960.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** EMBANKMENT TOE **********

UPSTREAM STATION	172.00 ft
UPSTREAM ELEVATION	4960.13 ft
UPSTREAM EMBANKMENT SLOPE (X:1)	0.01
DOWMSTREAM STATION	80.00 ft
DOWNSTREAM ELEVATION	4960.00 ft
DOWNSTREAM EMBANKMENT SLOPE (X:1)	0.01

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	11.00 ft
BARREL RISE	10.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	1:1 BEVEL (45 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 11-29-1999
CURRENT TIME: 11:38:15

FILE DATE: 06-02-1999
FILE NAME: GSH52

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION
MAIN CHANNEL AND LT & RT OVER BANKS

FILE NAME: GSH52
FILE DATE: 03-03-1999

LEFT CHANNEL BOUNDARY	3
RIGHT CHANNEL BOUNDARY	6
MANNING n LEFT OVER BANK	0.035
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.035
SLOPE OF CHANNEL	0.0091 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	1.00	4980.00
2	1400.00	4970.00
3	1500.00	4961.50
4	1500.00	4959.50
5	1502.00	4959.50
6	1502.00	4961.50
7	1602.00	4970.00
8	1702.00	4980.00

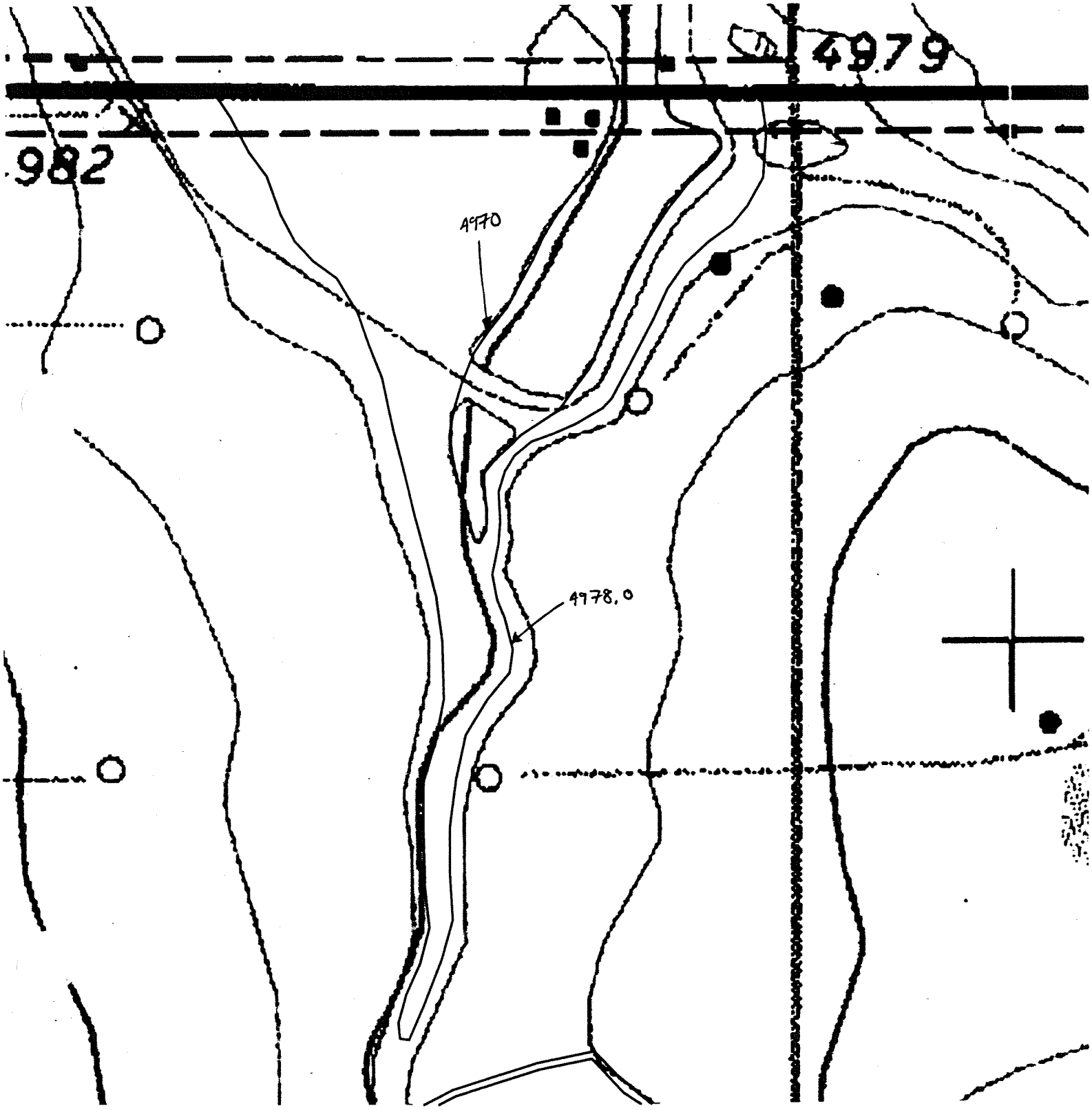
******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	4959.50	0.000	-0.50	0.00	0.00
300.00	4963.74	0.436	3.74	5.10	0.80
500.00	4964.26	0.445	4.26	5.51	0.90
900.00	4964.98	0.456	4.98	6.05	1.04
1200.00	4965.40	0.461	5.40	6.35	1.12
1500.00	4965.75	0.466	5.75	6.61	1.18
1800.00	4966.06	0.469	6.06	6.82	1.24
2100.00	4966.34	0.473	6.34	7.02	1.29
2400.00	4966.59	0.476	6.59	7.19	1.34
2700.00	4966.82	0.478	6.82	7.34	1.38
3000.00	4967.05	0.481	7.05	7.49	1.43

Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	70.00 ft
CREST LENGTH	1600.00 ft
OVERTOPPING CREST ELEVATION	4979.00 ft


4979
982
4970
4978.0

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number CO-WELD-01	Page 1 Of 2
Owner-Project Weld County I-25 MDP	By BLV	Date 5/19/99
Su Regional off-line detention pond in Sub-basin 17 (DP 317)	Checked By	Date

A natural depression area exists upstream of the UPRR. Propose a detention pond here, maximizing existing storage.

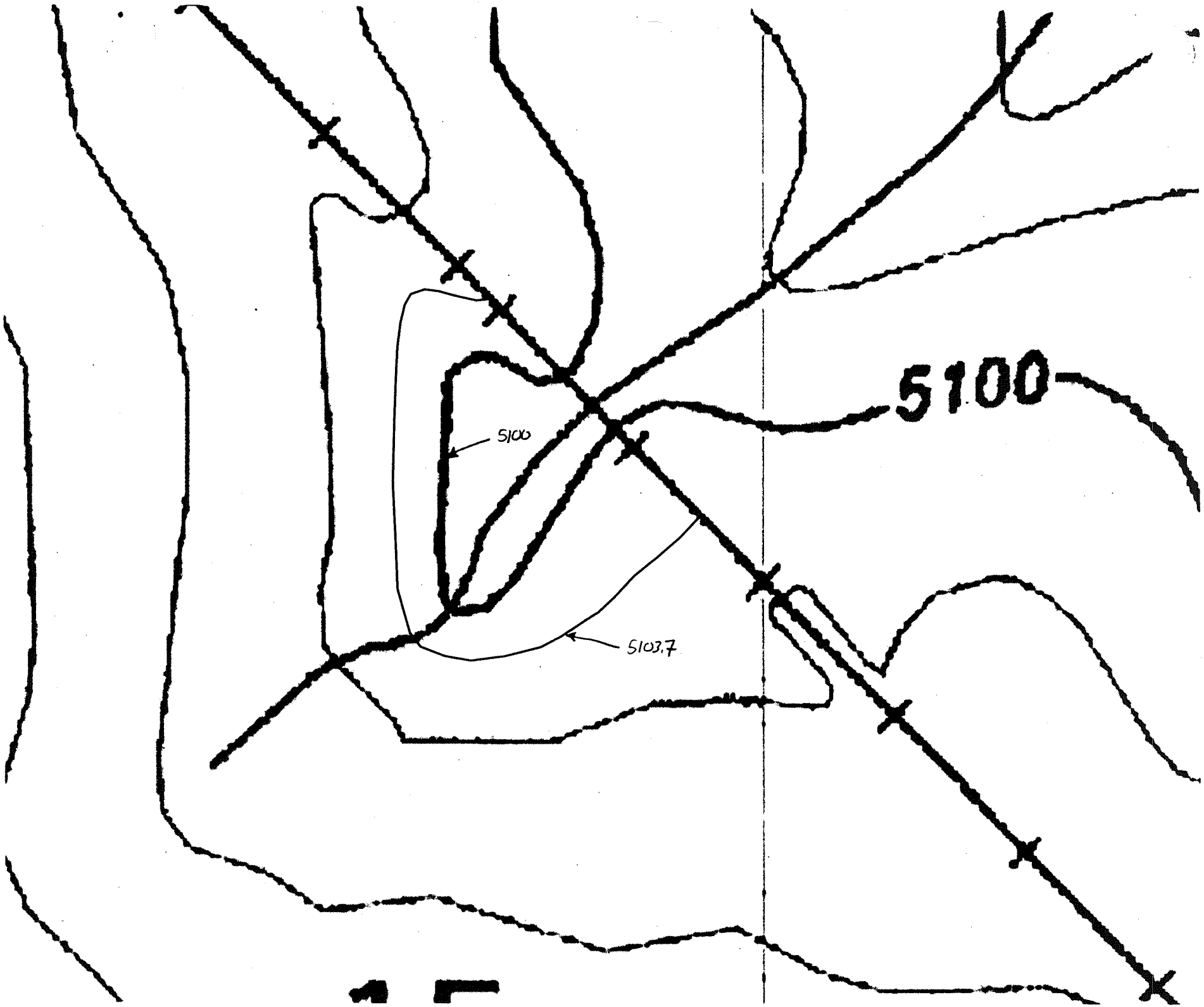
The peak, 100-yr future conditions w/ regional detention discharge coming to the UPRR bridge ≈ 370 cfs. Try and reduce this by half.

Build the detention pond @ a min. elev. = 5098.9 ft (TST survey).

Elev. (ft)	Area (ac)	ΔD (ft)	Total D (ft)	ΔS (ac-ft)	Total S (ac-ft)	Q (cfs)
5098.9	0.0	0.0	0.0	0.0	0.0	0
5100.0	2.9	1.1	1.1	1.1	1.1	100
5103.7 (OT elev. of UPRR emb.)	7.8	3.7	4.8	19.1	20.2	↓

In order to maximize the existing storage, various release rates were iterated through the model in order to closely maximize the existing storage of 20.2 ac-ft. At a max. release rate of 100 cfs, the volume needed was equal to 22.3 ac-ft. ∴ an additional 2.1 ac-ft of storage is needed.

$$2.1 \text{ ac-ft} \left(\frac{43560 \text{ ft}^2}{\text{ac}}\right) \frac{\text{yd}^3}{27 \text{ ft}^3} = \underline{3{,}400 \text{ yd}^3 \text{ of excavation}}$$


5100
5100
5103.7

There is a confluence in Sub-basin 31 w/ the main stem and a tributary. Propose a regional detention pond @ the confluence, w/ a goal of cutting flows in half.

The peak, 100 yr future conditions w/ regional detention discharge coming to the confluence ≈ 900 cfs. Try and reduce this by half.

Build the detention pond to a min. elev. of 4980.0 ft (USGS quad), cut to fill to an elev. = 4985.0, and build a downstream embankment ~ 6' high. Buy 17 ac of land.

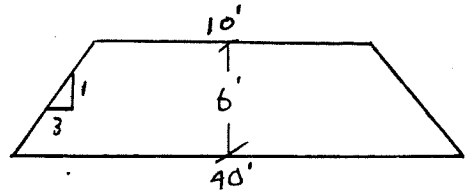
Elev. (ft)	Area (ac)	ΔD (ft)	Total D (ft)	ΔS (ac-ft)	Total S (ac-ft)	Q (cfs)
4980.0	0.0	0.0	0.0	0.0	0.0	0.0
4985.0	9.6	5.0	5.0	16.0	16.0	133.0
4990.0	14.8	5.0	10.0	60.5	76.5	218.0

The cut/fill volumes are determined as follows:

1) Grade out pond to a 4985.0 elevation. There will be an avg. cut/fill elevation across the entire pond bottom.

Cut/fill volume: $\dfrac{(9.6\text{ ac})\,\dfrac{43560\text{ ft}^2}{\text{ac}}\,(2')}{27\text{ ft}^3/\text{yd}^3} = 31{,}000\text{ yd}^3$

2)



Longitudinal cross section of downstream embankment

$A = \frac{1}{2}(6')(10' + 40') = 150\text{ ft}^2$

Fill volume: $\dfrac{(150\text{ ft}^2)\ 1000\text{ linear feet}}{27\text{ ft}^3/\text{yd}^3} = 5{,}500\text{ yd}^3$

Total earthwork volumes: 36,500 yd^3

The release rates were determined using the orifice equation. Use a 4' H x 4' W RCB as the outlet structure to the pond.

1) At Elev. 4985.0: $Q = 0.6\,(16\,ft^2)\sqrt{2(32.2)\,3'} = 133$ cfs

2) At Elev. 4990.0: $Q = 0.6\,(16\,ft^2)\sqrt{2(32.2)\,8'} = 218$ cfs

4990
4985
4980
5000

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number CO-WELD-01	Page 1 Of 4
Owner-Project Weld County I-25 MDP	By BLV	Date 5/20/99
Regional detention pond in Basin 37	Checked By	Date

A pond is proposed @ the railroad spur in basin 37. The approximate drainage area contributing to this point is

273 acres (determined using Autocad)

~~The runoff from a 2 year, existing conditions rainfall for the entire basin 37 is~~

~~72 cfs (CUHP)~~

~~Using an area-weighting method, the runoff contributing to the detention pond is~~

$$\frac{273}{541}(72) = 36 \text{ cfs}$$

~~We will set the release rate for the pond to 5 cfs to maximize storage potential and minimize release rates.~~

The pond will apply to the future conditions w/ on-site detention scenario. Currently, pond 437 is draining basin 37 @ a 10 yr / 100 yr existing conditions release rate.

Pond 437 rating curve

Storage (ac-ft)	Discharge (cfs)
0	0
26.9	305
50.4	871

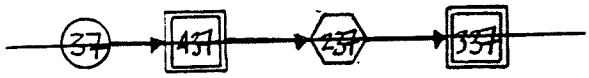
These releases will be directly input into pond 337, the new regional pond. Because the pond is only draining 273 of the 541 acres, a weighted release rate must be determined to account for all of the flows coming off of Basin 37.

Total release off of Basin 37 after on-site detention = 871 cfs (100 year)

~~Release rate for 273 of the 541 acres = 5 cfs~~

Release rate for remaining 268 acres = $\left(\frac{268}{541}\right) 871 = 431$ cfs

~~∴ Peak release rate out of Pond 337 = 5 + 431 = 436 cfs (50% decrease)~~



ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number CO WELD 01	Page 2 Of 4
Owner-Project WELD COUNTY I-25 MDP	By BLV	Date 5/20/99
Regional Detention Pond in Basin 37 - Godding Hollow - E. Trib.	Checked By	Date

Basin 37 pond — Alternative analysis

Determine what "natural" storage exists @ the railroad spur.

Elev. (ft)	Area (ac)	ΔD (ft)	Total D (ft)	ΔS (ac-ft)	Total S (ac-ft)	Q (cfs)
5094.4	0	0	0	0	0	0
5100.0	1.3	5.6	5.6	2.4	2.4	408
5108.8 (OT elev. of UPRR spur)	4.4	8.8	14.4	23.7	26.1	534

~~$Q = \frac{1.49}{n} A R^{2/3} S^{1/2}$ (determine flow @ 5100.0 through existing 6.5' CMP)~~

~~n = 0.024 (corrugated metal, Table 4.8, p.125, French)~~

~~$d/D = 5.6/6.5 = 0.86 \Rightarrow A = 0.7186\, D^2 = 30.36\ ft^2$~~

~~$R = 0.3026\,(6.5) = 1.97\ ft$~~

~~$S = \frac{1.32}{70} = 0.019$~~

~~$Q = \frac{1.49}{0.024}(30.36)(1.97)^{2/3}(0.019)^{1/2} = 408\ cfs$~~

~~Determine flow @ 5108.8: $Q = CA\sqrt{2g\,\Delta h}$~~

~~$Q = 0.6\left[\frac{\pi}{4}(6.5)^2\right]\sqrt{2(32.2)(11.15)} = 534\ cfs$~~

Alternative 1

Use existing railroad embankment, maximizing existing storage volume as much as possible, thus creating a jurisdictional structure (i.e., embankment 710' high (approx. 14-15' high new)). Set release rate @ 100 cfs, and drain same area as before (~273 acres).

Rating curve for Pond 337

Storage (ac-ft)	Discharge (cfs)
0	0
26.1	531 (431 cfs release from un-detained portion of Basin 37; 100 cfs release from pond)

Results: 28.8 ac-ft @ Q = 587 cfs

Iterated model until a storage volume of 33.0 acre-ft was obtained.

∴ Additional volume needed = 33 − 26.1 = 6.9 ac-ft = 11,100 yd³ of excavation

~~Additional volume needed if release rate set @ 50 cfs: 36.8 − 26.1 = 10.7 ac-ft = 17,300 yd³~~
~~$: 86,500~~

Buy 5 ac. of land.

Alternative 2

Build a pond that will drain that portion of Basin 37 west of I-25, and build it so that it is non-jurisdictional.

Drainage area: 433 acres

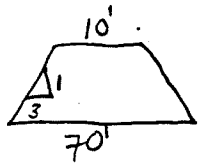
Q draining to pond = $\left(\frac{433}{541}\right)$ 871 = 697 cfs (174 cfs releasing undetained)

Set release rate @ 100 cfs

Rating curve for Pond 337

Storage (ac-ft)	Discharge (cfs)	
0	0	
60.9	224	(174 cfs un-detained, 50 cfs to start)
0	0	
54.7	274	100 cfs

Fill needed:



1d

½ (10) (10+70) = 400 ft² w/ 1500 lineal feet = 22,200 yd³

$: 111,000

Land costs of $200,000 (20 ac)

5100
5108.8
5110

III-F

UDSWMM OUTPUT SUMMARY PROGRAM

```
update$ = "11/23/99"       'Date Last Updated
title$ = "SWMMSUM.BAS - SWMM INPUT & OUTPUT DATA STRIPPER"

CONST maxevents = 6
CONST maxelements = 150       '85 max with out getting out of string space
CONST maxtimesteps = 90
DIM outname(10) AS STRING
DIM sumname(10) AS STRING
DIM search$(6)
DIM storcase AS STRING * 4
DIM elementid(maxelements) AS STRING
DIM area(maxelements) AS SINGLE
DIM hydrographid(maxelements) AS STRING
DIM swmmcase AS STRING * 4
DIM hr AS INTEGER
DIM min AS INTEGER
DIM peakq(maxevents, maxelements) AS INTEGER
DIM peakhr(maxevents, maxelements) AS INTEGER
DIM peakmin(maxevents, maxelements) AS INTEGER
DIM storatpk(maxevents, maxelements) AS INTEGER
DIM caseatpk(maxevents, maxelements) AS STRING
'*********************************************************************
CLS
PRINT DATE$; "  "; TIME$
PRINT title$

INPUT "Enter 1 for Godding or 2 for Tri-Town or 3 for Other"; mainbasin
PRINT "1. Existing"
PRINT "2. Future"
PRINT "3. Future w/ Onsite Detention"
PRINT "4. Future w/ Regional Detention"
INPUT "Select Condition:"; condition
SELECT CASE mainbasin
  CASE 1
       SELECT CASE condition
       CASE 1
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       SELECT CASE condition
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        sumname(3) = "P:\coweld01\future-3\TriTow-1\10_Year\udswmm\ttfc10yr.txt"
        outname(4) = "P:\coweld01\future-3\TriTow-1\25_Year\udswmm\ttfc25yr.swo"
        sumname(4) = "P:\coweld01\future-3\TriTow-1\25_Year\udswmm\ttfc25yr.txt"
        outname(5) = "P:\coweld01\future-3\TriTow-1\50_Year\udswmm\ttfc50yr.swo"
        sumname(5) = "P:\coweld01\future-3\TriTow-1\50_Year\udswmm\ttfc50yr.txt"
        outname(6) = "P:\coweld01\future-3\TriTow-1\100_Year\udswmm\ttfc100y.swo"
        sumname(6) = "P:\coweld01\future-3\TriTow-1\100_Year\udswmm\ttfc100y.txt"
        numevents = 6
        CASE 3
        outname(1) = "P:\coweld01\future-2\TriTow-1\2_Year\udswmm\ttod2yr.swo"
        sumname(1) = "P:\coweld01\future-2\TriTow-1\2_Year\udswmm\ttod2yr.txt"
        outname(2) = "P:\coweld01\future-2\TriTow-1\5_Year\udswmm\ttod5yr.swo"
        sumname(2) = "P:\coweld01\future-2\TriTow-1\5_Year\udswmm\ttod5yr.txt"
        outname(3) = "P:\coweld01\future-2\TriTow-1\10_Year\udswmm\ttod10yr.swo"
        sumname(3) = "P:\coweld01\future-2\TriTow-1\10_Year\udswmm\ttod10yr.txt"
        outname(4) = "P:\coweld01\future-2\TriTow-1\25_Year\udswmm\ttod25yr.swo"
        sumname(4) = "P:\coweld01\future-2\TriTow-1\25_Year\udswmm\ttod25yr.txt"
        outname(5) = "P:\coweld01\future-2\TriTow-1\50_Year\udswmm\ttod50yr.swo"
        sumname(5) = "P:\coweld01\future-2\TriTow-1\50_Year\udswmm\ttod50yr.txt"
        outname(6) = "P:\coweld01\future-2\TriTow-1\100_Year\udswmm\ttod100y.swo"
        sumname(6) = "P:\coweld01\future-2\TriTow-1\100_Year\udswmm\ttod100y.txt"
        numevents = 6
        CASE 4
        outname(1) = "P:\coweld01\future-1\TriTow-1\2_Year\udswmm\ttrd2yr.swo"
        sumname(1) = "P:\coweld01\future-1\TriTow-1\2_Year\udswmm\ttrd2yr.txt"
        outname(2) = "P:\coweld01\future-1\TriTow-1\5_Year\udswmm\ttrd5yr.swo"
        sumname(2) = "P:\coweld01\future-1\TriTow-1\5_Year\udswmm\ttrd5yr.txt"
        outname(3) = "P:\coweld01\future-1\TriTow-1\10_Year\udswmm\ttrd10yr.swo"
        sumname(3) = "P:\coweld01\future-1\TriTow-1\10_Year\udswmm\ttrd10yr.txt"
        outname(4) = "P:\coweld01\future-1\TriTow-1\25_Year\udswmm\ttrd25yr.swo"
        sumname(4) = "P:\coweld01\future-1\TriTow-1\25_Year\udswmm\ttrd25yr.txt"
        outname(5) = "P:\coweld01\future-1\TriTow-1\50_Year\udswmm\ttrd50yr.swo"
        sumname(5) = "P:\coweld01\future-1\TriTow-1\50_Year\udswmm\ttrd50yr.txt"
        outname(6) = "P:\coweld01\future-1\TriTow-1\100_Year\fredst-2\ttrd100y.swo"
        sumname(6) = "P:\coweld01\future-1\TriTow-1\100_Year\fredst-2\ttrd100y.txt"

        numevents = 6
        END SELECT  'condition
  CASE 3
        outname(1) = "C:\CJPSTUFF\ghrd100y.swo"
        sumname(1) = "C:\CJPSTUFF\ghrdtest.txt"
'        outname(1) = "A:\udswmm\ghxc10yr.swo"
'        sumname(1) = "A:\udswmm\ghxc10yr.txt"
        numevents = 1
END SELECT  'mainbasin

FOR eventnum = 1 TO numevents

PRINT "Now Working On:"
PRINT outname(eventnum); "  Event: "; eventnum
OPEN outname(eventnum) FOR INPUT AS #1

numhydrographs = 0: hydrographnum = 0
FOR x = 1 TO maxelements: hydrographid(x) = "": NEXT x
'try eliminating this loop

WHILE NOT EOF(1)

search$(3) = "NUMBER OF TIME STEPS"
WHILE INSTR(sent$, search$(3)) = 0 AND NOT EOF(1): LINE INPUT #1, sent$: WEND
numtimesteps = VAL(MID$(sent$, INSTR(sent$, search$(3)) + LEN(search$(3)), 6))
PRINT "Numtimesteps = "; numtimesteps
'***
'***SEARCH AND LOAD GUTTERS/PIPES INFORMATION***
'***
search$(4) = "TOTAL NUMBER OF GUTTERS/PIPES,"
WHILE INSTR(sent$, search$(4)) = 0 AND NOT EOF(1): LINE INPUT #1, sent$: WEND
modelements = VAL(MID$(sent$, INSTR(sent$, search$(4)) + LEN(search$(4)), 5))
PRINT "Model Elements = "; modelements
search$(5) = "TRIBUTARY GUTTER/PIPE"
WHILE INSTR(sent$, search$(5)) = 0 ÂND NOT EOF(1): LINE INPUT #1, sent$: WEND
LINE INPUT #1, sent$
 numelements = 0
 FOR elementx = 1 TO modelements
  INPUT #1, junk
  numelements = numelements + 1
  elementid(numelements) = RTRIM$(LTRIM$(STR$(junk)))
  FOR x = 1 TO 21: INPUT #1, area(numelements): NEXT x
  INPUT #1, sent$
 NEXT elementx
PRINT "Number Elements Saved ="; numelements

'***
'***SEARCH AND LOAD LISTED CONVEYANCE ELEMENT HYDROGRAPHS***
'***
search$(1) = "HYDROGRAPHS ARE LISTED FOR THE FOLLOWING"
```

```
WHILE INSTR(sent$, search$(1)) = 0 AND NOT EOF(1): LINE INPUT #1, sent$: WEND
numhydrographs = VAL(MID$(sent$, INSTR(sent$, search$(1)) + LEN(search$(1)), 4))
PRINT "Numhydrographs = "; numhydrographs

'***READ IN THE REQUESTED HYDROGRAPH IDs
search$(2) = "TIME(HR/MIN)"
WHILE INSTR(sent$, search$(2)) = 0 AND NOT EOF(1): LINE INPUT #1, sent$: WEND
hydrographnum = 1
WHILE hydrographnum <= numhydrographs
        IF hydrographnum = 1 THEN hydrographid(hydrographnum) = RTRIM$(LTRIM$(MID$(sent$, INSTR(sent$, search$(2)) + LEN(search$(2)), 6)))
        IF hydrographnum > 1 AND hydrographnum < 11 THEN
          hydrographid(hydrographnum) = RTRIM$(LTRIM$(MID$(sent$, INSTR(sent$, search$(2)) + LEN(search$(2)) + 6 + ((hydrographnum - 2) *
10), 10)))
        END IF
        IF hydrographnum > 10 THEN
                INPUT #1, junk
                hydrographid(hydrographnum) = RTRIM$(LTRIM$(STR$(junk)))
        END IF 'numhydrographs >10
'PRINT hydrographnum, hydrographid(hydrographnum)
'WHILE INKEY$ = "": WEND
        hydrographnum = hydrographnum + 1
 WEND  'hydrographnum <= numhydrographs

'***
'***READ IN THE DISCHARGE VALUES
'***
IF eventnum = 1 THEN
        OPEN "P:\coweld01\qbasic\hgtemp.txt" FOR OUTPUT AS #3
        OPEN "P:\coweld01\qbasic\stortemp.txt" FOR OUTPUT AS #4
       OPEN "P:\coweld01\qbasic\casetemp.txt" FOR OUTPUT AS #5
ELSE
        OPEN "P:\coweld01\qbasic\hgtemp.txt" FOR APPEND AS #3
        OPEN "P:\coweld01\qbasic\stortemp.txt" FOR APPEND AS #4
        OPEN "P:\coweld01\qbasic\casetemp.txt" FOR APPEND AS #5
END IF
IF eventnum = 1 THEN
'       OPEN "c:\cjpstuff\hgtemp.txt" FOR OUTPUT AS #3
'       OPEN "c:\cjpstuff\stortemp.txt" FOR OUTPUT AS #4
'       OPEN "c:\cjpstuff\casetemp.txt" FOR OUTPUT AS #5
ELSE
'       OPEN "c:\cjpstuff\hgtemp.txt" FOR APPEND AS #3
'       OPEN "c:\cjpstuff\stortemp.txt" FOR APPEND AS #4
'       OPEN "c:\cjpstuff\casetemp.txt" FOR APPEND AS #5
END IF
PRINT #3, "EVENTNUM"
PRINT #3, eventnum
LINE INPUT #1, sent$
'PRINT "sent$", sent$
FOR timestep = 1 TO numtimesteps
  INPUT #1, hr, min
'PRINT "hr= ", hr, "min= ", min
'WHILE INKEY$ = "": WEND
  PRINT #3, timestep
  PRINT #3, hr
  PRINT #3, min
  FOR hydrographnum = 1 TO numhydrographs
    INPUT #1, hg
    PRINT #3, hg;
'PRINT "timestep="; timestep, "hydrographnum="; hydrographnum, "id ="; hydrographid(hydrographnum), "Q= "; hg
'WHILE INKEY$ = "": WEND

'READ, LOCATE, AND STRIP STORAGE VALUES FOR PREVIOUS LINE OF ELEMENTS
    IF hydrographnum MOD 10 = 0 THEN
              x = hydrographnum - 9
              prevperiod = -4
              INPUT #1, junk$
              FOR letter = 1 TO LEN(junk$)
                  IF MID$(junk$, letter, 1) = "." THEN
                     stor = VAL(MID$(junk$, prevperiod + 5, letter + 1 - prevperiod + 5))
                     PRINT #4, stor;
                     IF MID$(junk$, letter + 3, 1) = " " THEN
'PRINT "x="; x, "let="; letter, "stor="; stor, "time="; timestep
                      swmmcase = "(_) "
                      PRINT #5, "(_) "
                     ELSE
                      swmmcase = MID$(junk$, letter + 2, 4)
                      PRINT #5, MID$(junk$, letter + 2, 5)
                     END IF
'PRINT "x="; x, "let="; letter, "stor="; stor
                     prevperiod = letter
'PRINT "hydrographnum="; x; "id="; hydrographid(x), "stor ="; stor, "case="; swmmcase
                     x = x + 1
                  END IF
              NEXT letter
              LINE INPUT #1, sent$
'PRINT "sent$="; sent$
    END IF  'hydrographnum MOD 10 = 0
  NEXT hydrographnum

'***AFTER LAST DISCHARGE READ; INPUT NEXT SENT., LOCATE, AND STRIP REMAINING
'***STORAGE VALUES
        IF (hydrographnum - 1) MOD 10 <> 0 THEN
                INPUT #1, junk$
'PRINT "hydrographnum=", hydrographnum - 1, "mod=", (hydrographnum - 1) MOD 10
'PRINT junk$
'WHILE INKEY$ = "": WEND
                x = hydrographnum - ((hydrographnum - 1) MOD 10)
                prevperiod = -4
                FOR letter = 1 TO LEN(junk$)
                  IF MID$(junk$, letter, 1) = "." THEN
```

```
                    stor = VAL(MID$(junk$, prevperiod + 5, letter + 1))
                    PRINT #4, VAL(MID$(junk$, prevperiod + 5, letter + 1));
                    IF MID$(junk$, letter + 3, 1) = " " THEN
                      swmmcase = "(_) "
                      PRINT #5, "(_) "
                    ELSE
                      swmmcase = MID$(junk$, letter + 2, 4)
                      PRINT #5, MID$(junk$, letter + 2, 5)
                    END IF
'PRINT "x="; x, "let="; letter, "stor="; stor
                    prevperiod = letter
'PRINT "hydrographnum="; x; "id="; hydrographid(x), "stor ="; stor, "case="; swmmcase
                    x = x + 1
                  END IF
                NEXT letter
              LINE INPUT #1, sent$
'PRINT "sent$="; sent$
        END IF  'hydrographnum mod 10 <> 0
  PRINT #3,
  PRINT #4,
NEXT timestep

WHILE NOT EOF(1): LINE INPUT #1, sent$: WEND
WEND 'not eof(1)
CLOSE #1
CLOSE #3
CLOSE #4
CLOSE #5

NEXT eventnum  '***
'*****************************************************************************
'*****************************************************************************
'***
'***CLEAR PEAK ARRAYS
'***
FOR eventnum = 1 TO numevents
  FOR hydrographnum = 1 TO numhydrographs
       peakq(eventnum, hydrographnum) = 0
       peakhr(eventnum, hydrographnum) = 0
       peakmin(eventnum, hydrographnum) = 0
       storatpk(eventnum, hydrographnum) = 0
       caseatpk(eventnum, hydrographnum) = " "
  NEXT hydrographnum
NEXT eventnum
'***
'***LOAD PEAK ARRAYS
'***
OPEN "P:\coweld01\qbasic\hgtemp.txt" FOR INPUT AS #3
OPEN "P:\coweld01\qbasic\stortemp.txt" FOR INPUT AS #4
OPEN "P:\coweld01\qbasic\casetemp.txt" FOR INPUT AS #5
'        OPEN "c:\cjpstuff\hgtemp.txt" FOR INPUT AS #3
'        OPEN "c:\cjpstuff\stortemp.txt" FOR INPUT AS #4
'        OPEN "c:\cjpstuff\casetemp.txt" FOR INPUT AS #5

FOR eventnum = 1 TO numevents
  INPUT #3, junk$
  INPUT #3, txteventnum
'PRINT junk$, "txteventnum=", txteventnum
'WHILE INKEY$ = "": WEND
  FOR j = 1 TO numtimesteps
   INPUT #3, timestep
   INPUT #3, hr, min
'PRINT "en="; eventnum; " ts="; timestep, hr, min
   hydrographnum = 1
   WHILE hydrographnum <= numhydrographs AND NOT EOF(3)
     INPUT #3, hg
     INPUT #4, stor
     INPUT #5, storcase
'PRINT "en="; eventnum; " ts="; timestep, hr, min, hydrographid(hydrographnum), hg, stor, storcase
     IF hg > peakq(eventnum, hydrographnum) THEN
'PRINT "en="; eventnum; "  "; hydrographid(hydrographnum); "hg=", hg, "peakq=", peakq(eventnum, hydrographnum)
       peakq(eventnum, hydrographnum) = hg
       peakhr(eventnum, hydrographnum) = hr
       peakmin(eventnum, hydrographnum) = min
       storatpk(eventnum, hydrographnum) = stor
       caseatpk(eventnum, hydrographnum) = storcase
     END IF
     hydrographnum = hydrographnum + 1
   WEND 'hydrographnum
  NEXT j
NEXT eventnum
CLOSE #3
CLOSE #4
CLOSE #5

'***
'*** EVENT SUMMARY OF ELEMENTS AND HYDROGRAPHS
'***
FOR eventnum = 1 TO numevents
OPEN sumname(eventnum) FOR OUTPUT AS #2
PRINT #2, "Time(Hrs) "; " Time(Min) ";
FOR hydrographnum = 1 TO numhydrographs
 PRINT #2, " Elem" + hydrographid(hydrographnum);
NEXT hydrographnum

PRINT #2, " TotalTime(Hrs) "
'OPEN "c:\cjpstuff\hgtemp.txt" FOR INPUT AS #3
OPEN "P:\coweld01\qbasic\hgtemp.txt" FOR INPUT AS #3
timestep = 0
  FOR x = 1 TO eventnum
```

```
   search$(5) = "EVENTNUM"
   WHILE INSTR(sent$, search$(5)) = 0 AND NOT EOF(3): LINE INPUT #3, sent$:  WEND
   sent$ = "???"
  NEXT x
  INPUT #3, txteventnum

'FOR x = 1 TO (eventnum - 1) * (5 + numhydrographs): INPUT #3, junk: NEXT x
'INPUT #3, junk, txteventnum
PRINT "eventnum="; txteventnum
'WHILE INKEY$ = "": WEND
WHILE timestep <= numtimesteps
  INPUT #3, timestep
  INPUT #3, hr, min
'PRINT timestep, hr, min
  PRINT #2, LTRIM$(STR$(hr)); min;
'PRINT LTRIM$(STR$(hr)); min
  hydrographnum = 1
  WHILE hydrographnum <= numhydrographs AND NOT EOF(3)
'  FOR hydrographnum = 1 TO numhydrographs
    INPUT #3, hg
    PRINT #2, hg;
    hydrographnum = hydrographnum + 1
  WEND
'  NEXT hydrographnum
  PRINT #2, USING " ###.## "; hr + min / 60
  timestep = timestep + 1
WEND 'timestep
CLOSE #3

PRINT #2, "Peak (cfs)";
FOR hydrographnum = 1 TO numhydrographs: PRINT #2, peakq(eventnum, hydrographnum); : NEXT hydrographnum
PRINT #2,
PRINT #2, "Peak (hrs)";
FOR hydrographnum = 1 TO numhydrographs: PRINT #2, peakhr(eventnum, hydrographnum); : NEXT hydrographnum
PRINT #2,
PRINT #2, "Peak (min)";
FOR hydrographnum = 1 TO numhydrographs: PRINT #2, peakmin(eventnum, hydrographnum); : NEXT hydrographnum
PRINT #2,
PRINT #2, "Peak (cfs_or_ac.ft.)";
FOR hydrographnum = 1 TO numhydrographs: PRINT #2, storatpk(eventnum, hydrographnum); : NEXT hydrographnum
PRINT #2,
PRINT #2, "Case ((),S,I,D,O) ";
FOR hydrographnum = 1 TO numhydrographs: PRINT #2, " "; caseatpk(eventnum, hydrographnum); : NEXT hydrographnum
PRINT #2,
PRINT #2, "Area (ac)";

FOR hydrographnum = 1 TO numhydrographs
  elementnum = 0
  WHILE hydrographid(hydrographnum) <> elementid(elementnum) AND elementnum <= numelements
'PRINT hydrographnum, hydrographid(hydrographnum), elementnum, elementid(elementnum)
    elementnum = elementnum + 1
  WEND
  IF elementnum <= numelements THEN
        PRINT #2, USING " ######.# "; area(elementnum);
  ELSE
        PRINT #2, " n/a ";
        PRINT "WARNING: REQUESTED HYDROGRAPH, "; hydrographid(hydrographnum); " IS NOT A DEFINED ELEMENT"
'        PRINT "PRESS ANY KEY TO CONTINUE"
'        WHILE INKEY$ = "": WEND
  END IF
NEXT hydrographnum
PRINT #2,
PRINT #2, "Peak/Area (cfs/ac)";

FOR hydrographnum = 1 TO numhydrographs
  elementnum = 0
  WHILE hydrographid(hydrographnum) <> elementid(elementnum) AND elementnum <= numelements
'PRINT hydrographnum, hydrographid(hydrographnum), elementnum, elementid(elementnum)
    elementnum = elementnum + 1
  WEND
  IF elementnum <= numelements THEN
'PRINT hydrographnum; "hydroid="; hydrographid(hydrographnum), peakq(eventnum, hydrographnum), elementnum; "elemid="; elementid(elementnum),
area(elementnum)
'WHILE INKEY$ = "": WEND
        PRINT #2, USING " ####.## "; peakq(eventnum, hydrographnum) / area(elementnum);
  ELSE
        PRINT #2, " n/a ";
  END IF
NEXT hydrographnum
PRINT #2,
PRINT #2, DATE$; "  "; TIME$
PRINT #2, "Summary File: "; sumname(eventnum)

CLOSE #2
NEXT eventnum

'***
'***MODEL SUMMARY FILE
'***
SELECT CASE mainbasin
  CASE 1
        filename2$ = "P:\coweld01\qbasic\ghexsta.txt"
        SELECT CASE condition
          CASE 1
                filename$ = "P:\coweld01\existi-1\Goddin-1\ghexswmm.txt"
                filename3$ = "P:\coweld01\existi-1\Goddin-1\ghexprof.txt"
          CASE 2
                filename$ = "P:\coweld01\future-1\Goddin-1\ghfuswmm.txt"
                filename3$ = "P:\coweld01\future-1\Goddin-1\ghfuprof.txt"
          CASE 3
```

```
            filename$ = "P:\coweld01\future-2\Goddin-1\ghodswmm.txt"
            filename3$ = "P:\coweld01\future-2\Goddin-1\ghodprof.txt"
        CASE 4
            filename$ = "P:\coweld01\future-3\Goddin-1\ghrdswmm.txt"
            filename2$ = "P:\coweld01\qbasic\ghrdsta.txt"
            filename3$ = "P:\coweld01\future-3\Goddin-1\ghrdprof.txt"
        END SELECT
  CASE 2
      filename2$ = "P:\coweld01\qbasic\ttexsta.txt"
      SELECT CASE condition
        CASE 1
            filename$ = "P:\coweld01\existi-1\TriTow-1\ttexswmm.txt"
            filename3$ = "P:\coweld01\existi-1\TriTow-1\ttexprof.txt"
        CASE 2
            filename$ = "P:\coweld01\future-1\TriTow-1\ttfuswmm.txt"
            filename3$ = "P:\coweld01\future-1\TriTow-1\ttfuprof.txt"
        CASE 3
            filename$ = "P:\coweld01\future-2\TriTow-1\ttodswmm.txt"
            filename3$ = "P:\coweld01\future-2\TriTow-1\ttodprof.txt"
        CASE 4
            filename$ = "P:\coweld01\future-3\TriTow-1\ttrdswmm.txt"
            filename2$ = "P:\coweld01\qbasic\ttrdsta.txt"
            filename3$ = "P:\coweld01\future-3\TriTow-1\ttrdprof.txt"
        END SELECT
  CASE 3
      SELECT CASE condition
        CASE 1
            filename$ = "c:\cjpstuff\ghexswts.txt"
            filename2$ = "c:\cjpstuff\ghexsta.txt"
            filename3$ = "c:\cjpstuff\ghexprts.txt"
'            filename$ = "A:\ghexswmm.txt"
'            filename3$ = "A:\ghexprof.txt"
        CASE 2
'           filename$= "P:\coweld01\hogan'-1\junk.sum"
        CASE 3
      END SELECT
END SELECT
'***
'*** PRINT OUT PEAK AND TIME TO PEAK SUMMARY
'***
OPEN filename$ FOR OUTPUT AS #2
SELECT CASE numevents
      CASE 1
        PRINT #2, "Element "; "100-YrPkQ "; "100-YrPkT "
      CASE 6
        PRINT #2, "Element "; "2-YrPkQ "; "2-YrPkT "; "5-YrPkQ "; "5-YrPkT "; "10-YrPkQ "; "10-YrPkT "; "25-YrPkQ "; "25-YrPkT ";
"50-YrPkQ "; "50-YrPkT "; "100-YrPkQ "; "100-YrPkT "
END SELECT
FOR hydrographnum = 1 TO numhydrographs
  PRINT #2, hydrographid(hydrographnum);
'PRINT hydrographid(hydrographnum);
  FOR eventnum = 1 TO numevents
    PRINT #2, peakq(eventnum, hydrographnum), peakhr(eventnum, hydrographnum) * 60 + peakmin(eventnum, hydrographnum);
'PRINT hydrographid(hydrographnum), eventnum; peakhr(eventnum, hydrographnum), peakmin(eventnum, hydrographnum), peakq(eventnum,
hydrographnum), peakhr(eventnum, hydrographnum) * 60 + peakmin(eventnum, hydrographnum)
  NEXT eventnum
  PRINT #2,
PRINT
'WHILE INKEY$ = "": WEND
NEXT hydrographnum
PRINT #2,
PRINT #2, DATE$; "  "; TIME$
PRINT #2, "Summary File: "; filename$
CLOSE #2
'***
'*** PRINT OUT PEAK AND TIME TO PEAK PROFILE TABLE
'***
'PRINT filename2$
OPEN filename2$ FOR INPUT AS #1
OPEN filename3$ FOR OUTPUT AS #2

IF condition = 4 THEN
  PRINT #2, "Element "; "100-YrPkQ "; "100-YrPkT "; "Station "; "Description "
ELSE
  PRINT #2, "Element "; "2-YrPkQ "; "2-YrPkT "; "5-YrPkQ "; "5-YrPkT "; "10-YrPkQ "; "10-YrPkT "; "25-YrPkQ "; "25-YrPkT "; "50-YrPkQ ";
"50-YrPkT "; "100-YrPkQ "; "100-YrPkT "; "Station "; "Description "
END IF
LINE INPUT #1, junk$
'PRINT junk$
WHILE NOT EOF(1)
  INPUT #1, sta, profelement, descrip$
'PRINT "***"
'PRINT sta, profelement, descrip$
  hydrographnum = 0
  WHILE hydrographid(hydrographnum) <> RTRIM$(LTRIM$(STR$(profelement))) AND hydrographnum <= numhydrographs
'PRINT hydrographnum, hydrographid(hydrographnum), RTRIM$(LTRIM$(STR$(profelement)))
    hydrographnum = hydrographnum + 1
  WEND
'PRINT "GOT MATCH"
'WHILE INKEY$ = "": WEND
  IF hydrographid <= numhydrographs THEN
        PRINT #2, hydrographid(hydrographnum);
        FOR eventnum = 1 TO numevents: PRINT #2, peakq(eventnum, hydrographnum); peakhr(eventnum, hydrographnum) * 60 + peakmin(eventnum,
hydrographnum); : NEXT eventnum
        PRINT #2, sta, descrip$
        PRINT #2,
  ELSE
        PRINT "WARNING: REQUESTED PROFILE ELEMENT "; RTRIM$(LTRIM$(STR$(profelement))); " WAS NOT IN THE OUTPUT HYDROGRAPH LISTING"
        WHILE INKEY$ = "": WEND
  END IF  'hydrographid <= numhydrographs
```

```
WEND 'NOT EOF(1)
PRINT #2,
PRINT #2, DATE$; "  "; TIME$
PRINT #2, "Summary File: "; filename3$

CLOSE #2
CLOSE #1
END
```

III-G

UDSWMM SUMMARY OUTPUT

GODDING HOLLOW BASIN, EXISTING CONDITION

2-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	0	0	1	0	7	0	1	0	0	0	2	0	1
0	25	0	0	3	1	13	0	6	0	1	1	9	0	4
0	30	2	2	9	5	21	1	15	0	3	3	22	0	13
0	35	7	7	20	12	44	3	27	0	10	9	39	2	27
0	40	19	19	38	26	69	7	39	2	21	20	55	6	45
0	45	37	37	61	46	96	13	49	5	35	34	71	14	64
0	50	61	61	86	70	116	21	60	12	52	49	85	26	83
0	55	84	84	101	84	137	30	71	21	69	65	99	40	100
1	0	99	99	108	91	159	40	83	34	85	81	113	56	116
1	5	109	109	116	99	178	52	96	49	101	97	128	73	132
1	10	118	118	125	109	198	65	110	65	118	113	143	91	148
1	15	128	128	137	121	220	79	126	82	134	130	159	109	166
1	20	140	140	150	134	238	94	142	100	151	147	175	128	184
1	25	154	154	164	149	258	109	158	118	168	163	191	148	203
1	30	169	169	180	165	278	126	174	136	184	180	206	166	211
1	35	185	185	196	182	300	142	190	154	200	195	219	181	219
1	40	202	202	215	201	323	159	205	171	212	208	225	189	227
1	45	221	221	234	220	345	175	219	187	221	217	226	193	235
1	50	241	241	254	242	371	190	230	199	226	222	229	197	242
1	55	262	262	276	264	395	204	238	209	230	226	232	202	249
2	0	282	282	299	287	417	216	245	217	234	230	236	208	255
2	5	294	294	322	310	439	226	250	224	237	234	240	213	261
2	10	309	309	345	334	460	234	254	229	241	238	244	219	266
2	15	326	326	368	357	479	241	258	234	245	242	248	225	271
2	20	345	345	390	380	496	247	261	239	249	246	253	231	276
2	25	366	366	412	403	512	252	265	243	254	251	257	236	279
2	30	387	387	433	424	528	257	268	248	258	255	262	242	282
2	35	408	408	453	444	539	261	272	252	262	260	266	247	284
2	40	428	428	472	463	550	265	275	257	266	264	269	251	285
2	45	448	448	489	480	560	269	278	261	270	267	273	256	286
2	50	467	467	504	496	565	273	281	265	273	271	275	260	286
2	55	484	484	517	510	570	276	284	268	276	274	278	263	285
3	0	500	500	529	522	575	279	287	272	278	276	280	265	283
3	5	514	514	539	532	575	282	289	274	280	278	281	268	281
3	10	526	526	547	541	575	285	290	277	282	280	282	269	278
3	15	536	536	554	547	575	287	292	279	283	281	281	270	274
3	20	544	544	558	552	571	288	292	280	283	281	281	270	270
3	25	551	551	561	555	566	290	292	281	282	280	279	270	264
3	30	555	555	562	557	561	290	291	281	280	279	277	269	258
3	35	558	558	562	557	554	290	290	280	279	278	275	267	252
3	40	560	560	561	556	547	290	288	279	276	275	272	264	245
3	45	559	559	558	553	539	289	285	278	273	273	268	261	237
3	50	558	558	554	550	529	287	283	275	270	269	264	258	230
3	55	555	555	549	545	520	285	279	273	266	265	259	254	222
4	0	551	551	543	539	509	282	275	269	261	261	254	249	214
4	5	546	546	536	532	499	279	271	265	257	256	249	244	205
4	10	540	540	528	524	487	276	267	261	251	251	243	239	197
4	15	533	533	519	516	475	272	262	257	246	246	237	233	188
4	20	526	526	510	507	463	268	256	252	240	240	231	227	178
4	25	517	517	500	498	451	263	250	246	234	233	224	220	158
4	30	508	508	490	487	438	258	244	241	227	227	215	212	142
4	35	499	499	479	477	425	252	238	234	219	219	207	204	129
4	40	489	489	468	466	412	246	231	227	211	211	198	196	118
4	45	478	478	457	454	398	240	223	220	203	202	190	188	108
4	50	467	467	445	443	384	233	215	212	191	191	166	164	100
4	55	456	456	433	431	370	225	204	202	174	174	144	144	92
5	0	445	445	420	418	353	216	191	189	156	156	128	128	86
5	5	432	432	406	405	335	206	177	175	140	140	115	115	80
5	10	420	420	392	390	315	195	163	161	126	126	104	104	74
5	15	406	406	376	375	294	183	149	148	115	115	95	95	68
5	20	392	392	357	359	273	170	134	136	105	105	87	87	64
5	25	377	377	344	342	252	158	126	125	96	96	81	81	60
5	30	361	361	324	325	232	146	113	114	88	88	75	75	57
5	35	345	345	309	308	213	136	107	106	82	82	70	70	54
5	40	328	328	289	291	195	126	96	98	76	76	65	65	51
5	45	312	312	275	274	177	117	92	91	71	71	62	62	49
5	50	294	294	255	257	160	108	83	84	67	67	58	58	46
5	55	268	268	242	240	144	101	80	79	63	63	55	55	44
6	0	237	237	223	224	129	94	72	74	59	59	52	52	42
Peak	(cfs)	560	560	562	557	575	290	292	281	283	281	282	270	286
Peak	(hrs)	3	3	3	3	3	3	3	3	3	3	3	3	2
Peak	(min)	40	40	30	30	0	25	15	25	15	15	10	15	45
Peak	(cfs_or_ac.ft.)	0	6	0	4	295	7	0	5	0	4	0	4	0
Case	(()S,I,D,O)	( )	( )	( )	( )	(I)	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6
Peak/Area	(cfs/ac)	n/a	0.05	0.05	0.05	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03

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GODDING HOLLOW BASIN, EXISTING CONDITION

2-YEAR

Time(Hrs)	Time(Min)	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108	Elem308	Elem708	Elem309	Elem208	Elem109	Elem709
0	5	0	0	0	0	0	2	0	0	0	0	0	0	0
0	10	0	0	0	0	0	4	0	0	0	0	0	0	0
0	15	0	1	0	1	1	7	0	0	0	0	0	0	1
0	20	0	3	0	3	3	10	0	0	1	0	1	1	12
0	25	0	14	0	8	5	12	0	2	7	4	9	6	48
0	30	2	33	1	15	8	14	0	8	23	16	29	23	75
0	35	7	57	3	25	10	17	2	21	51	39	58	49	115
0	40	17	79	7	35	14	24	7	43	88	70	95	83	150
0	45	30	97	13	47	20	36	19	70	118	97	109	97	175
0	50	45	112	21	61	31	55	37	95	135	112	120	108	190
0	55	62	125	31	78	47	77	58	116	148	124	134	122	200
1	0	78	138	44	98	68	101	81	134	162	138	148	137	206
1	5	95	155	61	120	91	123	103	150	176	152	162	151	211
1	10	113	174	80	142	114	144	123	164	189	165	174	164	214
1	15	132	194	100	164	136	163	142	178	201	177	184	175	215
1	20	152	213	122	183	157	180	159	190	210	186	192	183	213
1	25	172	232	143	200	175	196	174	201	216	194	198	190	209
1	30	183	249	163	215	191	209	186	208	220	198	201	193	203
1	35	192	265	182	227	205	219	197	214	221	201	202	195	196
1	40	202	277	196	237	216	228	205	217	221	201	200	194	188
1	45	211	282	204	245	225	233	210	218	218	199	198	192	180
1	50	219	287	211	250	231	237	213	217	214	196	193	188	172
1	55	227	291	217	253	235	238	215	215	209	192	188	183	163
2	0	235	294	223	253	237	238	214	211	203	186	182	178	154
2	5	242	296	228	252	237	236	211	206	196	180	176	172	145
2	10	248	297	231	250	235	232	208	200	189	174	169	165	138
2	15	254	298	234	246	232	227	203	193	181	167	162	159	131
2	20	259	297	235	240	227	222	197	186	174	160	156	152	125
2	25	264	296	235	235	222	216	191	179	167	154	149	146	119
2	30	267	293	235	228	216	209	185	172	160	147	143	140	113
2	35	270	289	233	221	210	203	178	165	153	141	137	134	106
2	40	272	285	231	214	204	196	171	158	147	135	131	129	100
2	45	273	280	228	207	197	189	165	151	140	130	126	123	95
2	50	274	274	224	200	190	183	158	145	134	124	120	118	88
2	55	273	268	220	193	184	176	151	139	128	118	115	113	82
3	0	272	261	215	186	178	170	145	132	122	113	110	108	77
3	5	271	254	210	179	171	164	139	127	117	108	105	103	71
3	10	268	247	204	173	165	158	133	121	112	103	100	99	66
3	15	265	239	198	166	159	152	127	116	107	99	96	95	61
3	20	261	229	191	160	153	147	122	111	102	95	92	92	56
3	25	257	216	180	154	148	141	116	104	92	85	76	76	53
3	30	251	204	170	148	142	135	110	96	79	73	65	65	48
3	35	245	194	162	141	136	128	103	86	68	63	56	56	37
3	40	239	184	154	134	129	119	95	76	59	53	47	47	30
3	45	232	175	147	126	121	111	86	66	50	45	40	40	25
3	50	224	165	139	117	113	102	78	57	42	38	34	34	22
3	55	217	155	131	108	104	93	69	49	37	33	29	29	19
4	0	209	146	123	100	96	85	61	42	32	28	25	25	17
4	5	201	136	115	92	88	78	54	37	28	25	22	22	15
4	10	193	127	107	84	81	72	48	32	25	22	20	20	13
4	15	184	118	99	78	75	66	42	28	22	19	18	18	12
4	20	174	110	92	72	69	61	37	25	20	17	16	16	11
4	25	155	102	86	66	64	57	33	22	18	15	14	14	10
4	30	140	95	80	62	59	53	30	20	16	14	13	13	9
4	35	127	88	74	58	55	50	27	18	14	12	11	11	8
4	40	116	82	69	54	52	47	24	16	12	11	10	10	7
4	45	106	77	65	51	49	44	21	14	11	10	9	9	6
4	50	98	72	61	48	46	42	19	12	10	9	8	8	6
4	55	91	66	57	45	43	40	17	11	9	8	8	8	5
5	0	84	62	54	43	41	38	15	10	8	7	7	7	4
5	5	78	59	50	39	39	36	14	9	7	7	6	6	4
5	10	73	55	47	37	37	35	12	8	6	6	5	5	3
5	15	68	52	45	36	36	33	11	7	6	5	5	5	3
5	20	64	49	42	34	34	32	10	6	5	5	4	4	3
5	25	60	47	40	33	33	31	9	6	5	4	4	4	2
5	30	57	44	38	32	32	30	8	5	4	4	4	4	2
5	35	54	42	37	31	31	29	8	5	4	4	3	3	2
5	40	51	41	35	30	30	28	7	4	4	3	3	3	2
5	45	49	39	34	29	29	27	6	4	3	3	3	3	2
5	50	46	37	33	28	28	27	6	4	3	3	3	3	2
5	55	44	36	32	27	27	26	5	3	3	3	2	2	2
6	0	42	35	31	27	27	26	5	3	3	2	2	2	1
Peak	(cfs)	274	298	235	253	237	238	215	218	221	201	202	195	215
Peak	(hrs)	2	2	2	1	2	1	1	1	1	1	1	1	1
Peak	(min)	50	15	20	55	0	55	55	45	35	35	35	35	15
Peak	(cfs_or_ac.ft.)	4	0	4	0	6	0	5	3	0	1	0	3	0
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	(S)	( )	(S)	( )	( )	( )
Area	(ac)	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8	4197.8	4197.8	3548.8	3548.8	3283.2	3283.2
Peak/Area	(cfs/ac)	0.03	0.03	0.03	0.03	0.04	0.04	0.05	0.05	0.05	0.06	0.06	0.06	0.07
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Summary	File:													

GODDING HOLLOW BASIN, EXISTING CONDITION

2-YEAR

Time(Hrs)	Time(Min)	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	1	1	12	0	2	2	0	3	0	0	0	0	0
0	20	12	11	57	3	12	11	3	17	0	0	1	0	1
0	25	45	43	135	20	44	43	16	47	1	0	4	1	4
0	30	65	60	182	50	86	82	42	78	2	1	12	4	11
0	35	94	86	172	72	101	93	54	90	6	4	22	11	18
0	40	116	107	159	90	110	100	66	100	13	11	30	18	22
0	45	130	121	150	104	118	107	79	114	21	19	34	21	23
0	50	138	129	147	115	126	114	92	124	28	25	35	23	23
0	55	144	135	151	124	134	123	103	129	32	29	34	22	21
1	0	149	141	157	132	140	129	112	130	33	31	32	20	19
1	5	155	147	163	138	144	133	118	128	33	31	30	19	18
1	10	159	152	163	142	144	134	121	123	33	30	29	17	16
1	15	162	155	160	142	141	131	120	115	31	29	26	16	14
1	20	162	156	156	140	136	126	117	107	29	27	24	14	13
1	25	161	155	151	135	129	120	112	99	27	25	22	13	11
1	30	158	153	145	129	121	113	106	92	25	24	20	11	10
1	35	154	149	138	122	114	106	100	85	24	22	19	10	9
1	40	149	145	131	115	107	99	94	79	22	20	17	9	8
1	45	143	139	124	109	101	93	88	73	20	19	16	8	7
1	50	137	134	118	102	94	87	82	68	19	17	15	7	6
1	55	131	128	109	96	88	81	77	63	17	16	14	6	5
2	0	124	121	99	90	82	75	71	56	15	15	13	6	5
2	5	117	114	95	84	76	70	66	51	14	14	12	5	4
2	10	111	108	92	78	71	65	61	49	13	13	11	4	4
2	15	106	103	88	73	67	62	58	47	12	12	10	4	2
2	20	101	99	85	69	64	59	54	45	11	11	9	3	2
2	25	96	94	78	65	60	55	51	42	10	10	8	2	2
2	30	91	89	71	62	56	52	48	38	9	9	7	2	1
2	35	86	84	66	58	52	48	45	35	9	9	7	2	1
2	40	81	79	62	54	47	43	40	32	8	8	5	1	1
2	45	76	75	57	49	41	37	35	29	7	7	4	1	0
2	50	70	70	53	45	37	34	31	27	6	6	4	1	0
2	55	66	66	48	40	34	31	28	25	5	5	3	1	0
3	0	62	62	42	34	32	29	26	24	5	5	3	0	0
3	5	57	57	36	32	30	26	24	22	4	4	3	0	0
3	10	53	53	31	29	26	23	22	19	4	4	3	0	0
3	15	49	49	25	25	22	20	20	16	4	4	2	0	0
3	20	46	46	22	22	20	17	17	13	3	3	2	0	0
3	25	43	43	19	19	17	15	15	12	3	3	2	0	0
3	30	39	39	17	17	15	13	13	10	3	3	2	0	0
3	35	28	28	15	15	13	11	11	9	3	3	2	0	0
3	40	22	22	13	13	12	10	10	8	2	2	2	0	0
3	45	18	18	12	12	11	9	9	7	2	2	2	0	0
3	50	15	15	11	11	10	8	8	7	2	2	2	0	0
3	55	13	13	10	10	9	7	7	6	2	2	1	0	0
4	0	12	12	8	8	7	7	7	5	2	2	1	0	0
4	5	10	10	7	7	6	6	6	5	2	2	1	0	0
4	10	9	9	6	6	5	5	5	4	2	2	1	0	0
4	15	8	8	5	5	5	5	5	4	2	2	1	0	0
4	20	7	7	5	5	4	4	4	3	2	2	1	0	0
4	25	6	6	4	4	4	4	4	3	1	1	1	0	0
4	30	5	5	4	4	3	3	3	3	1	1	1	0	0
4	35	5	5	4	4	3	3	3	2	1	1	1	0	0
4	40	4	4	3	3	3	3	3	2	1	1	1	0	0
4	45	4	4	3	3	3	3	3	2	1	1	1	0	0
4	50	4	4	3	3	2	2	2	2	1	1	1	0	0
4	55	3	3	2	2	2	2	2	2	1	1	1	0	0
5	0	3	3	2	2	2	2	2	2	1	1	1	0	0
5	5	3	3	2	2	2	2	2	1	1	1	1	0	0
5	10	3	3	2	2	2	2	2	1	1	1	1	0	0
5	15	2	2	2	2	2	2	2	1	1	1	1	0	0
5	20	2	2	2	2	2	2	2	1	1	1	1	0	0
5	25	2	2	2	2	1	1	1	1	1	1	1	0	0
5	30	2	2	1	1	1	1	1	1	1	1	1	0	0
5	35	2	2	1	1	1	1	1	1	1	1	1	0	0
5	40	2	2	1	1	1	1	1	1	1	1	1	0	0
5	45	2	2	1	1	1	1	1	1	1	1	1	0	0
5	50	2	2	1	1	1	1	1	1	1	1	0	0	0
5	55	1	1	1	1	1	1	1	1	1	1	0	0	0
6	0	1	1	1	1	1	1	1	1	1	1	0	0	0
Peak	(cfs)	162	156	182	142	144	134	121	130	33	31	35	23	23
Peak	(hrs)	1	1	0	1	1	1	1	1	1	1	0	0	0
Peak	(min)	15	20	30	10	5	10	10	0	0	0	50	50	45
Peak	(cfs_or_ac.ft.)	0	2	0	3	0	0	2	0	0	0	0	1	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6
Peak/Area	(cfs/ac)	0.07	0.07	0.08	0.07	0.07	0.07	0.07	0.07	0.04	0.04	0.05	0.06	0.06
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Summary	File:													

GODDING HOLLOW BASIN, EXISTING CONDITION

2-YEAR

Time(Hrs)	Time(Min)	Elem117	Elem217	Elem741	Elem341	Elem721	Elem321	Elem720	Elem225	Elem325	Elem237	Elem236	TotalTime(Hrs)
0	5	0	0	0	0	0	0	40	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	0	0	0	0	0	0	40	0	0	1	0	0.25
0	20	0	1	3	0	0	0	0	0	0	5	1	0.33
0	25	1	6	16	1	0	0	40	3	0	22	6	0.42
0	30	5	13	42	3	0	0	0	9	0	47	21	0.50
0	35	10	16	68	6	27	0	40	16	0	65	41	0.58
0	40	14	17	82	11	27	0	0	22	0	72	60	0.67
0	45	15	16	83	16	44	1	41	26	0	70	73	0.75
0	50	15	14	78	20	37	1	1	27	0	66	78	0.83
0	55	14	13	71	23	51	1	41	27	0	61	78	0.92
1	0	13	12	64	26	42	2	2	26	0	56	76	1.00
1	5	12	11	59	29	54	2	42	25	0	52	72	1.08
1	10	11	9	55	31	43	2	2	24	0	48	68	1.17
1	15	10	8	50	32	53	3	43	23	0	43	63	1.25
1	20	9	7	46	33	40	3	3	21	0	38	58	1.33
1	25	7	6	42	34	48	3	43	19	0	34	53	1.42
1	30	7	5	39	34	34	3	3	18	0	31	48	1.50
1	35	6	5	37	35	42	4	44	16	0	28	44	1.58
1	40	5	4	35	35	28	4	4	15	0	26	40	1.67
1	45	4	4	33	35	36	4	44	14	0	23	36	1.75
1	50	4	3	31	34	22	4	4	13	0	22	33	1.83
1	55	4	3	30	34	30	4	44	12	0	20	31	1.92
2	0	3	2	28	34	16	5	5	11	0	18	28	2.00
2	5	3	2	26	33	24	5	45	10	0	16	26	2.08
2	10	2	2	24	33	11	5	5	8	0	15	24	2.17
2	15	2	2	23	32	20	5	45	8	0	15	22	2.25
2	20	2	2	23	32	7	5	5	7	0	14	21	2.33
2	25	2	2	22	31	16	5	45	7	0	13	19	2.42
2	30	1	0	21	30	3	5	5	6	0	12	18	2.50
2	35	1	0	20	30	11	5	45	6	0	11	17	2.58
2	40	1	0	19	29	0	5	5	5	0	10	16	2.67
2	45	0	0	17	28	5	5	45	5	0	10	15	2.75
2	50	0	0	16	27	0	5	5	5	0	9	14	2.83
2	55	0	0	15	27	0	5	45	4	0	8	13	2.92
3	0	0	0	14	26	0	5	5	4	0	8	12	3.00
3	5	0	0	14	25	0	5	45	4	0	7	11	3.08
3	10	0	0	12	24	0	5	5	4	0	6	10	3.17
3	15	0	0	11	23	0	5	45	3	0	5	9	3.25
3	20	0	0	9	23	0	5	5	3	0	4	8	3.33
3	25	0	0	8	22	0	5	45	3	0	3	6	3.42
3	30	0	0	7	21	0	4	4	3	0	3	5	3.50
3	35	0	0	4	20	0	4	44	2	0	2	4	3.58
3	40	0	0	4	19	0	4	4	2	0	2	4	3.67
3	45	0	0	3	18	0	4	44	2	0	2	3	3.75
3	50	0	0	3	17	0	4	4	2	0	1	3	3.83
3	55	0	0	2	16	0	4	44	1	0	0	2	3.92
4	0	0	0	2	15	0	4	4	1	0	0	2	4.00
4	5	0	0	2	14	0	4	44	0	0	0	1	4.08
4	10	0	0	2	13	0	3	3	0	0	0	1	4.17
4	15	0	0	1	12	0	3	43	0	0	0	1	4.25
4	20	0	0	1	12	0	3	3	0	0	0	1	4.33
4	25	0	0	1	11	0	3	43	0	0	0	1	4.42
4	30	0	0	1	10	0	3	3	0	0	0	1	4.50
4	35	0	0	1	10	0	3	43	0	0	0	0	4.58
4	40	0	0	1	9	0	2	2	0	0	0	0	4.67
4	45	0	0	1	8	0	2	42	0	0	0	0	4.75
4	50	0	0	1	8	0	2	2	0	0	0	0	4.83
4	55	0	0	1	7	0	2	42	0	0	0	0	4.92
5	0	0	0	1	7	0	2	2	0	0	0	0	5.00
5	5	0	0	0	7	0	2	42	0	0	0	0	5.08
5	10	0	0	0	6	0	2	2	0	0	0	0	5.17
5	15	0	0	0	6	0	1	41	0	0	0	0	5.25
5	20	0	0	0	5	0	1	1	0	0	0	0	5.33
5	25	0	0	0	5	0	1	41	0	0	0	0	5.42
5	30	0	0	0	5	0	1	1	0	0	0	0	5.50
5	35	0	0	0	4	0	1	41	0	0	0	0	5.58
5	40	0	0	0	4	0	1	1	0	0	0	0	5.67
5	45	0	0	0	4	0	1	41	0	0	0	0	5.75
5	50	0	0	0	4	0	0	0	0	0	0	0	5.83
5	55	0	0	0	3	0	0	40	0	0	0	0	5.92
6	0	0	0	0	3	0	0	0	0	0	0	0	6.00
Peak	(cfs)	15	17	83	35	54	5	45	27	0	72	78	
Peak	(hrs)	0	0	0	1	1	2	2	0	0	0	0	
Peak	(min)	45	40	45	35	5	0	5	50	0	40	50	
Peak	(cfs_or_ac.ft.)	2	0	0	4	0	4	0	0	0	0	0	
Case	(()S,I,D,O)	( )	( )	( )	(S)	( )	(S)	( )	( )	( )	( )		
Area	(ac)	223.4	223.4	691.2	691.2	2172.2	2172.2	2172.2	490.9	490.9	540.8	889.6	
Peak/Area	(cfs/ac)	0.07	0.08	0.12	0.05	0.02	0.00	0.02	0.06	0.00	0.13	0.09	
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Summary	File:							P:\coweld01\existi~1\Goddin~1\2_Year\udswmm\ghxc2yr.txt					

GODDING HOLLOW BASIN, EXISTING CONDITION

5-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	1	0	0	0	0	0	0	0	0
0	15	0	0	0	0	1	0	1	0	0	0	1	0	0
0	20	0	0	2	1	15	0	3	0	0	0	4	0	2
0	25	1	1	9	5	30	0	13	0	2	2	19	0	10
0	30	8	8	25	14	46	2	32	0	9	8	47	2	32
0	35	25	25	54	33	99	8	59	2	27	25	86	8	69
0	40	60	60	102	70	158	20	88	8	59	53	128	23	115
0	45	101	101	130	91	224	38	119	22	101	91	171	49	166
0	50	132	132	153	107	263	61	153	46	149	135	213	85	214
0	55	158	158	176	128	307	90	191	80	198	181	255	128	260
1	0	184	184	203	155	356	124	231	122	245	226	295	171	286
1	5	212	212	233	186	406	162	274	168	284	265	312	194	303
1	10	245	245	268	222	458	203	314	212	310	291	319	206	322
1	15	280	280	307	263	510	244	348	250	327	308	328	220	342
1	20	302	302	352	308	568	283	375	281	341	321	338	236	362
1	25	329	329	400	357	621	318	395	305	352	333	349	253	385
1	30	364	364	450	409	670	348	410	325	363	345	361	271	408
1	35	405	405	502	462	727	371	417	336	375	357	375	291	433
1	40	452	452	555	517	778	388	422	345	389	371	391	311	458
1	45	503	503	609	573	825	401	427	355	403	387	408	334	484
1	50	558	558	663	628	877	411	433	364	419	403	426	357	509
1	55	613	613	717	685	928	420	439	375	436	421	445	381	533
2	0	670	670	772	741	978	428	446	386	454	440	465	405	556
2	5	727	727	826	796	1021	437	455	398	473	460	485	429	577
2	10	783	783	877	849	1063	445	464	411	492	480	505	454	596
2	15	838	838	928	901	1106	454	475	425	512	500	525	477	613
2	20	891	891	975	949	1131	464	487	440	531	520	545	500	629
2	25	941	941	1017	993	1157	475	499	455	550	540	563	522	642
2	30	987	987	1056	1033	1183	486	512	471	565	555	581	543	654
2	35	1029	1029	1091	1069	1198	498	525	487	577	567	597	562	664
2	40	1066	1066	1120	1100	1204	510	537	502	590	581	612	579	672
2	45	1099	1099	1145	1125	1212	523	550	517	604	596	626	595	678
2	50	1126	1126	1164	1145	1209	535	562	531	618	610	638	610	684
2	55	1148	1148	1177	1159	1204	545	575	546	631	623	649	623	687
3	0	1165	1165	1185	1169	1193	550	588	560	642	635	658	634	689
3	5	1176	1176	1189	1173	1178	555	600	574	653	646	666	643	689
3	10	1182	1182	1187	1172	1162	559	612	588	662	655	672	651	687
3	15	1183	1183	1182	1168	1147	564	623	600	669	663	676	657	681
3	20	1181	1181	1174	1161	1129	570	633	612	674	669	678	660	672
3	25	1175	1175	1164	1151	1112	575	642	622	678	672	677	661	659
3	30	1166	1166	1152	1140	1094	581	649	632	679	674	674	659	644
3	35	1156	1156	1139	1128	1079	586	655	639	677	672	668	655	626
3	40	1144	1144	1125	1114	1062	592	660	645	674	669	660	648	606
3	45	1131	1131	1110	1100	1046	598	663	649	668	663	650	639	585
3	50	1117	1117	1095	1086	1030	603	664	652	659	655	638	628	564
3	55	1102	1102	1080	1071	1015	608	664	652	649	645	624	615	543
4	0	1088	1088	1065	1057	999	612	662	651	637	634	609	601	521
4	5	1073	1073	1050	1042	988	616	657	647	624	621	593	586	500
4	10	1058	1058	1036	1028	975	619	652	642	610	607	576	570	479
4	15	1044	1044	1022	1015	963	621	644	636	594	591	559	553	459
4	20	1030	1030	1008	1002	949	623	635	628	578	576	542	536	440
4	25	1016	1016	994	988	935	624	625	618	562	560	524	519	421
4	30	1002	1002	980	974	919	623	614	607	542	540	506	502	403
4	35	988	988	966	960	903	622	601	595	517	515	488	484	385
4	40	974	974	950	945	885	620	586	580	496	495	471	467	369
4	45	959	959	935	930	867	616	570	565	477	476	453	451	352
4	50	943	943	918	914	847	612	555	550	459	459	436	434	335
4	55	927	927	901	897	827	607	539	534	442	441	419	418	317
5	0	911	911	883	879	805	601	522	518	425	424	402	401	299
5	5	893	893	865	861	790	594	506	502	408	407	385	385	282
5	10	876	876	847	844	773	586	490	486	391	390	368	368	266
5	15	858	858	830	827	756	578	473	470	374	374	352	352	250
5	20	841	841	812	809	738	569	456	454	358	358	337	337	236
5	25	823	823	794	792	719	558	440	439	343	343	322	322	222
5	30	805	805	774	774	695	544	423	423	328	328	307	307	209
5	35	786	786	751	751	640	497	407	407	313	313	293	293	196
5	40	764	764	723	723	594	460	391	391	299	299	279	279	182
5	45	738	738	692	692	557	432	375	375	285	285	265	265	165
5	50	711	711	661	661	524	409	359	359	272	271	251	251	143
5	55	682	682	630	630	495	388	342	342	258	258	237	237	127
6	0	653	653	600	600	465	367	318	318	244	244	223	223	114
Peak	(cfs)	1183	1183	1189	1173	1212	624	664	652	679	674	678	661	689
Peak	(hrs)	3	3	3	3	2	4	3	3	3	3	3	3	3
Peak	(min)	15	15	5	5	45	25	50	50	30	30	20	25	0
Peak	(cfs_or_ac.ft.)	0	6	0	4	692	10	0	6	0	5	0	5	0
Case	(),S,I,D,O)	( )	( )	( )	( )	(I)	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6
Peak/Area	(cfs/ac)	n/a	0.10	0.10	0.10	0.11	0.05	0.06	0.06	0.06	0.06	0.06	0.07	0.07

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Summary File: P:\coweld01\existi~1\Goddin~1\5_Year\udswmm\ghxc5yr.txt

GODDING HOLLOW BASIN, EXISTING CONDITION

5-YEAR

Time(Hrs)	Time(Min)	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108	Elem308	Elem708	Elem309	Elem208	Elem109	Elem709
0	5	0	0	0	0	0	2	0	0	0	0	0	0	0
0	10	0	0	0	0	0	4	0	0	0	0	0	0	0
0	15	0	1	0	1	1	7	0	0	0	0	0	0	3
0	20	0	7	0	4	3	10	0	1	2	1	3	2	28
0	25	1	27	0	11	5	12	0	4	15	9	19	13	68
0	30	6	67	2	28	8	15	1	18	56	37	65	46	151
0	35	20	118	7	53	11	22	7	51	127	88	131	96	264
0	40	44	168	18	82	19	41	24	103	202	142	174	128	362
0	45	78	214	36	116	36	75	57	163	270	193	232	183	433
0	50	118	255	60	157	67	125	105	227	341	254	299	251	488
0	55	161	294	94	209	114	187	166	295	413	321	368	321	533
1	0	189	335	137	270	177	257	234	363	480	387	432	387	566
1	5	209	386	191	339	248	330	306	429	535	443	488	445	589
1	10	231	413	222	410	323	400	375	478	542	451	532	493	604
1	15	254	442	256	477	393	457	430	501	553	462	566	529	610
1	20	279	474	295	529	449	494	466	505	564	475	589	555	606
1	25	305	508	335	565	488	516	486	509	575	489	601	570	594
1	30	332	541	374	585	513	530	499	514	584	501	603	575	575
1	35	361	572	411	597	529	540	507	518	587	508	598	571	553
1	40	391	599	443	604	540	548	514	523	590	514	585	561	527
1	45	421	621	472	609	548	555	520	527	590	519	568	545	499
1	50	450	640	497	612	555	561	525	531	589	522	546	525	469
1	55	477	654	518	615	562	567	529	535	586	523	521	502	440
2	0	504	667	536	617	567	572	533	538	582	521	495	478	411
2	5	528	676	551	619	572	576	536	541	575	519	468	452	382
2	10	550	684	563	620	577	580	539	543	567	514	441	427	356
2	15	571	690	574	621	580	583	541	544	558	508	414	401	330
2	20	589	694	583	621	583	586	543	545	547	500	388	376	305
2	25	605	697	590	621	585	587	544	544	529	485	362	352	280
2	30	619	698	596	620	587	588	543	543	511	470	338	328	258
2	35	631	699	600	618	587	587	542	540	492	453	314	305	237
2	40	642	698	603	615	587	585	540	535	436	400	292	284	218
2	45	650	697	605	611	584	581	535	525	334	301	271	264	201
2	50	657	694	606	604	579	573	527	512	300	268	252	245	185
2	55	663	690	604	593	569	558	511	481	277	247	235	228	171
3	0	666	683	600	570	548	519	472	384	257	230	218	213	158
3	5	668	671	590	528	507	462	414	323	240	214	203	198	146
3	10	667	652	574	477	457	409	361	282	223	199	189	185	134
3	15	663	626	551	427	409	365	317	252	208	186	176	172	122
3	20	655	597	525	385	368	330	283	229	194	173	164	160	110
3	25	643	566	496	349	334	302	255	210	180	160	152	149	101
3	30	629	535	467	320	306	280	232	194	167	149	142	138	91
3	35	612	504	439	296	283	260	212	179	156	139	132	129	83
3	40	594	476	413	275	263	244	196	166	145	129	122	120	75
3	45	574	449	388	258	246	229	181	154	134	119	112	112	68
3	50	553	424	365	242	231	216	168	143	124	111	106	106	62
3	55	533	401	344	228	218	203	156	133	117	104	100	100	57
4	0	512	379	324	215	206	193	145	124	110	98	95	95	53
4	5	491	360	306	203	195	183	135	116	104	93	88	88	50
4	10	471	341	289	193	185	174	126	108	91	81	70	70	38
4	15	452	324	273	183	175	164	117	97	75	66	55	55	31
4	20	433	308	259	173	166	154	107	84	61	53	45	45	26
4	25	415	293	245	162	156	143	96	71	50	43	37	37	22
4	30	397	278	231	151	145	132	85	60	42	35	31	31	19
4	35	380	263	218	140	134	121	75	51	36	30	27	27	17
4	40	364	248	204	129	124	111	65	43	31	26	23	23	15
4	45	347	228	187	119	114	103	57	37	27	22	20	20	13
4	50	330	202	164	110	106	95	49	32	24	19	18	18	12
4	55	313	182	146	102	98	89	43	28	22	17	16	16	10
5	0	296	165	131	95	92	83	38	24	19	15	14	14	9
5	5	279	150	120	89	86	79	34	22	17	13	12	12	8
5	10	263	139	110	84	81	74	30	19	13	12	11	11	7
5	15	247	129	102	80	77	71	26	16	12	11	10	10	7
5	20	233	120	95	75	73	67	23	14	11	10	9	9	6
5	25	219	112	89	72	69	64	20	12	10	9	8	8	6
5	30	207	106	83	68	66	62	18	11	9	8	7	7	5
5	35	194	100	79	65	63	59	16	10	8	7	7	7	5
5	40	182	94	75	63	61	57	14	9	7	7	6	6	5
5	45	165	90	71	61	59	56	13	8	7	6	6	6	4
5	50	143	85	68	59	57	54	12	7	6	6	6	6	4
5	55	127	81	65	54	55	53	11	7	6	5	5	5	4
6	0	114	77	62	56	54	52	10	6	6	5	5	5	4
Peak	(cfs)	668	699	606	621	587	588	544	545	590	523	603	575	610
Peak	(hrs)	3	2	2	2	2	2	2	2	1	1	1	1	1
Peak	(min)	5	35	50	15	30	30	25	20	40	55	30	30	15
Peak	(cfs_or_ac.ft.)	5	0	5	0	9	0	8	10	0	7	0	4	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	(S)	( )	(S)	( )	( )	( )
Area	(ac)	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8	4197.8	4197.8	3548.8	3548.8	3283.2	3283.2
Peak/Area	(cfs/ac)	0.08	0.08	0.08	0.08	0.09	0.09	0.13	0.13	0.14	0.15	0.17	0.18	0.19
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Summary	File:													

GODDING HOLLOW BASIN, EXISTING CONDITION

5-YEAR

Time(Hrs)	Time(Min)	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	3	3	31	1	5	5	1	7	0	0	0	0	0
0	20	27	26	96	8	24	23	7	32	0	0	1	0	1
0	25	60	54	227	43	84	79	32	77	2	0	10	2	10
0	30	120	102	301	81	154	142	60	145	10	6	44	17	39
0	35	195	163	308	139	207	184	97	212	38	30	93	47	66
0	40	252	213	310	198	255	223	148	273	83	72	125	70	78
0	45	291	252	330	253	305	268	206	321	120	109	137	81	84
0	50	326	288	365	305	350	312	260	354	140	129	143	86	87
0	55	362	325	397	350	385	348	305	375	149	139	144	86	86
1	0	395	360	424	385	409	373	338	383	150	141	139	83	81
1	5	423	391	444	407	422	388	357	381	147	137	132	78	75
1	10	445	416	456	420	426	392	366	372	140	131	124	72	68
1	15	460	433	454	423	420	388	365	357	132	123	116	66	62
1	20	464	440	443	416	407	376	357	338	124	116	108	60	56
1	25	460	438	429	403	390	360	344	318	116	108	100	54	51
1	30	450	430	411	386	370	342	328	298	108	100	93	49	46
1	35	436	417	391	366	349	323	311	280	101	94	87	45	43
1	40	418	401	367	346	328	303	293	260	94	87	79	39	34
1	45	397	382	343	325	306	283	274	238	85	79	69	32	28
1	50	374	361	320	303	283	261	254	216	77	71	62	26	23
1	55	352	339	297	281	261	240	234	195	70	64	56	23	20
2	0	329	318	275	260	239	220	214	177	63	58	51	20	17
2	5	307	297	255	239	220	202	196	161	58	53	46	17	15
2	10	286	277	235	220	201	185	179	146	53	48	42	15	13
2	15	265	257	215	202	184	169	164	132	49	44	39	13	12
2	20	245	237	195	185	167	153	149	115	45	40	35	11	10
2	25	225	219	177	168	151	137	134	102	41	37	32	10	9
2	30	207	201	161	153	136	124	121	91	38	34	30	9	7
2	35	190	185	147	139	124	112	109	83	35	31	27	7	5
2	40	175	170	134	126	112	101	99	75	32	28	24	5	3
2	45	161	156	123	115	103	92	90	68	29	26	21	3	2
2	50	148	144	113	105	94	84	82	62	26	23	18	2	1
2	55	137	133	104	97	86	77	75	56	24	20	16	2	1
3	0	127	123	97	89	79	71	68	51	21	18	13	1	0
3	5	117	114	86	81	72	64	62	46	19	16	12	1	0
3	10	107	105	76	74	64	57	57	40	17	14	11	1	0
3	15	97	96	67	67	58	51	51	35	15	13	10	0	0
3	20	88	88	61	61	53	46	46	30	14	12	10	0	0
3	25	81	81	55	55	46	40	40	27	13	11	9	0	0
3	30	74	74	48	48	37	31	31	23	10	10	8	0	0
3	35	68	68	42	42	31	26	26	21	9	9	8	0	0
3	40	61	61	31	31	27	23	23	19	9	9	8	0	0
3	45	55	55	27	27	24	20	20	17	8	8	7	0	0
3	50	50	50	24	24	22	18	18	15	8	8	7	0	0
3	55	46	46	22	22	20	16	16	13	8	8	6	0	0
4	0	43	43	19	19	18	14	14	12	7	7	6	0	0
4	5	41	41	17	17	16	13	13	11	7	7	6	0	0
4	10	29	29	16	16	14	11	11	10	7	7	6	0	0
4	15	23	23	14	14	12	10	10	9	6	6	5	0	0
4	20	18	18	12	12	9	9	9	8	6	6	5	0	0
4	25	15	15	10	10	9	9	9	7	6	6	5	0	0
4	30	13	13	9	9	8	8	8	7	5	5	5	0	0
4	35	11	11	8	8	7	7	7	6	5	5	4	0	0
4	40	10	10	8	8	7	7	7	6	5	5	4	0	0
4	45	9	9	7	7	6	6	6	6	5	5	4	0	0
4	50	8	8	7	7	6	6	6	5	5	5	4	0	0
4	55	8	8	6	6	6	6	6	5	4	4	4	0	0
5	0	7	7	6	6	5	5	5	5	4	4	3	0	0
5	5	7	7	5	5	5	5	5	4	4	4	3	0	0
5	10	6	6	5	5	5	5	5	4	4	4	3	0	0
5	15	6	6	5	5	4	4	4	4	4	4	3	0	0
5	20	5	5	5	5	4	4	4	4	3	3	3	0	0
5	25	5	5	4	4	4	4	4	3	3	3	3	0	0
5	30	5	5	4	4	4	4	4	3	3	3	2	0	0
5	35	5	5	4	4	4	4	4	3	3	3	2	0	0
5	40	4	4	4	4	3	3	3	3	3	3	2	0	0
5	45	4	4	3	3	3	3	3	3	3	3	2	0	0
5	50	4	4	3	3	3	3	3	3	2	2	2	0	0
5	55	4	4	3	3	3	3	3	2	2	2	2	0	0
6	0	3	3	3	3	3	3	3	2	2	2	2	0	0
Peak	(cfs)	464	440	456	423	426	392	366	383	150	141	144	86	87
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	0	0	0
Peak	(min)	20	20	10	15	10	10	10	0	0	0	55	50	50
Peak	(cfs_or_ac.ft.)	0	3	0	3	0	0	3	0	0	1	0	2	0
Case	((),S,I,D,O)	()	()	()	()	()	()	()	()	()	()	()	()	()
Area	(ac)	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6
Peak/Area	(cfs/ac)	0.19	0.19	0.20	0.20	0.20	0.20	0.20	0.21	0.18	0.18	0.19	0.24	0.25
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Summary	File:													

GODDING HOLLOW BASIN, EXISTING CONDITION

5-YEAR

Time(Hrs)	Time(Min)	Elem117	Elem217	Elem741	Elem341	Elem721	Elem321	Elem720	Elem225	Elem325	Elem237	Elem236	TotalTime(Hrs)
0	5	0	0	0	0	0	0	40	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	0	0	1	0	0	0	40	0	0	2	0	0.25
0	20	0	2	7	0	0	0	0	1	0	11	2	0.33
0	25	3	14	33	2	0	0	40	8	0	44	16	0.42
0	30	18	44	87	6	54	0	0	27	0	105	60	0.50
0	35	33	65	145	13	107	1	41	56	0	162	129	0.58
0	40	43	69	176	23	163	2	2	82	0	187	177	0.67
0	45	50	65	183	33	192	3	43	95	0	187	204	0.75
0	50	55	60	176	41	214	5	5	99	0	176	217	0.83
0	55	55	54	166	43	212	6	46	99	0	163	221	0.92
1	0	54	47	155	45	219	8	8	97	0	147	219	1.00
1	5	50	41	145	47	211	9	49	93	0	133	211	1.08
1	10	47	36	134	49	214	11	11	88	0	120	199	1.17
1	15	43	32	125	50	203	12	52	82	0	109	186	1.25
1	20	39	28	116	51	204	13	13	74	0	98	173	1.33
1	25	35	24	107	52	190	15	55	68	0	88	160	1.42
1	30	32	21	100	53	189	16	16	63	0	79	147	1.50
1	35	30	19	93	54	175	17	57	58	0	72	135	1.58
1	40	22	16	86	55	174	18	18	53	0	65	123	1.67
1	45	18	14	80	55	159	19	59	49	0	58	110	1.75
1	50	15	12	74	56	156	20	20	45	1	51	96	1.83
1	55	12	10	68	56	141	21	61	41	8	45	84	1.92
2	0	11	9	62	56	138	22	22	37	29	40	74	2.00
2	5	9	7	58	56	122	23	63	34	36	36	66	2.08
2	10	8	6	54	56	120	24	24	31	32	32	59	2.17
2	15	7	6	50	56	106	24	64	28	29	29	53	2.25
2	20	6	5	46	56	105	25	25	25	26	26	48	2.33
2	25	5	4	42	56	92	25	65	22	23	23	43	2.42
2	30	4	3	38	55	92	26	26	19	20	20	39	2.50
2	35	4	2	35	55	80	26	66	17	18	18	35	2.58
2	40	3	2	32	55	81	27	27	16	16	16	31	2.67
2	45	2	0	29	54	68	27	67	14	15	14	28	2.75
2	50	1	0	27	54	66	27	27	13	14	13	25	2.83
2	55	1	0	25	53	53	28	68	12	12	12	23	2.92
3	0	0	0	23	53	52	28	28	11	11	11	21	3.00
3	5	0	0	22	52	39	28	68	10	10	9	19	3.08
3	10	0	0	20	52	41	28	28	9	10	7	17	3.17
3	15	0	0	18	51	30	28	68	8	10	6	14	3.25
3	20	0	0	15	50	32	28	28	8	10	5	13	3.33
3	25	0	0	13	50	22	28	68	7	9	4	11	3.42
3	30	0	0	12	49	24	28	28	6	9	3	10	3.50
3	35	0	0	10	48	14	28	68	6	8	3	8	3.58
3	40	0	0	9	48	17	28	28	5	8	2	7	3.67
3	45	0	0	7	47	8	28	68	5	7	2	5	3.75
3	50	0	0	6	46	11	28	28	4	7	2	3	3.83
3	55	0	0	5	46	2	28	68	4	6	0	3	3.92
4	0	0	0	3	45	7	27	27	3	6	0	2	4.00
4	5	0	0	3	44	0	27	67	3	6	0	2	4.08
4	10	0	0	2	43	2	27	27	2	5	0	1	4.17
4	15	0	0	2	43	0	27	67	1	4	0	1	4.25
4	20	0	0	2	42	0	27	27	1	4	0	1	4.33
4	25	0	0	2	41	0	26	66	0	3	0	1	4.42
4	30	0	0	1	41	0	26	26	0	3	0	1	4.50
4	35	0	0	1	39	0	26	66	0	2	0	1	4.58
4	40	0	0	1	37	0	26	26	0	2	0	0	4.67
4	45	0	0	1	35	0	25	65	0	2	0	0	4.75
4	50	0	0	1	32	0	25	25	0	1	0	0	4.83
4	55	0	0	1	30	0	25	65	0	1	0	0	4.92
5	0	0	0	1	28	0	25	25	0	1	0	0	5.00
5	5	0	0	1	26	0	24	64	0	1	0	0	5.08
5	10	0	0	1	25	0	24	24	0	1	0	0	5.17
5	15	0	0	1	23	0	24	64	0	1	0	0	5.25
5	20	0	0	1	22	0	23	23	0	1	0	0	5.33
5	25	0	0	0	20	0	23	63	0	0	0	0	5.42
5	30	0	0	0	19	0	23	23	0	0	0	0	5.50
5	35	0	0	0	18	0	23	63	0	0	0	0	5.58
5	40	0	0	0	16	0	22	22	0	0	0	0	5.67
5	45	0	0	0	15	0	22	62	0	0	0	0	5.75
5	50	0	0	0	14	0	22	22	0	0	0	0	5.83
5	55	0	0	0	13	0	21	61	0	0	0	0	5.92
6	0	0	0	0	13	0	21	21	0	0	0	0	6.00
Peak	(cfs)	55	69	183	56	219	28	68	99	36	187	221	
Peak	(hrs)	0	0	0	1	1	2	2	0	2	0	0	
Peak	(min)	50	40	45	50	0	55	55	50	5	40	55	
Peak	(cfs_or_ac.ft.)	2	0	0	10	0	26	0	0	9	0	0	
Case	(),S,I,D,O)	(_)	(_)	(_)	(S)	(_)	(S)	(_)	(_)	(S)	(_)	(_)	
Area	(ac)	223.4	223.4	691.2	691.2	2172.2	2172.2	2172.2	490.9	490.9	540.8	889.6	
Peak/Area	(cfs/ac)	0.25	0.31	0.26	0.08	0.10	0.01	0.03	0.20	0.07	0.35	0.25	
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Summary	File:							P:\coweld01\existi~1\Goddin~1\5_Year\udswmm\ghxc5yr.txt					

GODDING HOLLOW BASIN, EXISTING CONDITION

10-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	1	0	0	0	0	0	0	0	0
0	15	0	0	0	0	1	0	1	0	0	0	1	0	0
0	20	0	0	3	2	28	0	5	0	0	0	7	0	3
0	25	4	4	19	11	55	1	22	0	3	3	32	1	21
0	30	20	20	51	30	86	5	60	1	20	18	89	6	70
0	35	58	58	106	68	171	19	112	6	62	55	168	24	148
0	40	108	108	148	93	268	46	172	24	135	120	259	64	247
0	45	154	154	186	119	380	87	241	63	230	207	354	128	351
0	50	199	199	233	158	470	142	321	126	330	300	429	192	406
0	55	251	251	288	210	572	210	405	207	408	374	450	217	446
1	0	295	295	353	275	684	287	481	288	456	420	468	246	478
1	5	331	331	428	353	790	362	529	344	488	452	487	278	508
1	10	382	382	513	440	884	425	549	372	515	478	510	311	541
1	15	448	448	604	531	963	474	567	397	540	503	534	345	577
1	20	529	529	699	626	1057	512	584	421	565	528	560	382	614
1	25	620	620	795	724	1142	542	600	445	589	553	587	419	651
1	30	717	717	889	820	1207	551	615	468	606	570	615	458	687
1	35	816	816	980	913	1287	558	630	491	627	593	643	497	721
1	40	914	914	1070	1006	1366	565	644	514	651	618	672	536	753
1	45	1010	1010	1159	1098	1445	572	660	538	676	646	701	574	783
1	50	1104	1104	1245	1187	1518	580	677	562	704	674	730	611	811
1	55	1196	1196	1330	1275	1592	589	695	587	731	704	758	648	836
2	0	1285	1285	1413	1360	1666	598	715	613	759	733	786	683	859
2	5	1372	1372	1492	1441	1716	608	735	639	786	761	811	716	880
2	10	1453	1453	1564	1516	1768	619	756	666	812	788	835	746	897
2	15	1530	1530	1631	1586	1820	631	776	692	836	814	857	775	913
2	20	1600	1600	1691	1648	1844	644	797	719	858	837	877	801	926
2	25	1663	1663	1742	1701	1869	658	817	744	879	859	894	825	936
2	30	1718	1718	1786	1748	1895	672	837	769	897	878	910	846	945
2	35	1765	1765	1823	1786	1899	688	856	793	914	896	924	866	952
2	40	1805	1805	1850	1816	1902	703	874	816	928	911	936	882	958
2	45	1836	1836	1872	1839	1907	720	892	837	941	925	946	897	963
2	50	1859	1859	1885	1855	1890	736	907	857	952	937	955	910	967
2	55	1875	1875	1891	1862	1874	753	922	875	961	947	963	921	970
3	0	1884	1884	1890	1863	1858	770	935	891	969	956	969	930	972
3	5	1886	1886	1884	1858	1828	786	947	906	975	963	974	938	974
3	10	1881	1881	1871	1846	1798	802	957	919	981	969	978	945	974
3	15	1870	1870	1853	1830	1768	818	966	931	985	974	981	951	975
3	20	1855	1855	1831	1809	1735	833	974	941	988	977	983	955	974
3	25	1835	1835	1807	1786	1702	848	980	950	990	980	984	959	973
3	30	1812	1812	1779	1760	1668	861	985	957	991	982	984	961	970
3	35	1786	1786	1751	1732	1638	874	989	964	991	983	983	963	968
3	40	1759	1759	1722	1704	1607	886	992	969	991	983	982	963	964
3	45	1730	1730	1692	1675	1575	897	995	973	989	982	980	963	960
3	50	1701	1701	1662	1646	1549	908	996	976	988	980	977	962	954
3	55	1672	1672	1633	1618	1522	917	996	978	985	978	974	960	948
4	0	1643	1643	1604	1590	1493	925	996	979	982	975	970	957	941
4	5	1614	1614	1576	1563	1472	933	995	979	978	971	965	953	933
4	10	1587	1587	1550	1538	1450	939	993	978	973	967	959	948	922
4	15	1560	1560	1524	1513	1427	945	990	977	967	961	952	942	909
4	20	1534	1534	1499	1488	1403	949	987	974	960	955	943	934	894
4	25	1509	1509	1474	1464	1378	953	982	971	951	947	933	925	875
4	30	1484	1484	1449	1440	1352	956	977	966	941	938	920	913	852
4	35	1459	1459	1425	1416	1334	958	970	960	929	926	905	899	824
4	40	1435	1435	1402	1393	1315	959	962	953	915	913	888	882	793
4	45	1412	1412	1380	1372	1295	959	953	945	898	896	866	862	760
4	50	1389	1389	1358	1350	1273	957	942	934	879	877	843	840	724
4	55	1367	1367	1336	1329	1251	955	929	922	857	856	817	815	687
5	0	1345	1345	1314	1307	1228	952	915	908	834	833	790	788	651
5	5	1324	1324	1292	1286	1211	947	898	892	808	808	762	760	615
5	10	1302	1302	1272	1266	1193	940	880	875	782	781	733	731	581
5	15	1281	1281	1251	1246	1173	933	859	855	754	753	701	701	547
5	20	1261	1261	1230	1226	1153	924	837	835	725	725	672	672	516
5	25	1240	1240	1209	1206	1130	914	815	812	696	696	642	642	486
5	30	1219	1219	1188	1186	1107	902	791	789	668	667	613	613	457
5	35	1197	1197	1166	1164	1082	889	767	766	639	639	584	584	430
5	40	1176	1176	1143	1142	1057	875	741	741	612	612	556	556	405
5	45	1153	1153	1119	1119	1030	860	717	717	585	585	529	529	379
5	50	1130	1130	1095	1095	1002	844	692	692	559	559	503	503	355
5	55	1107	1107	1070	1070	974	828	667	667	525	525	478	478	333
6	0	1082	1082	1045	1045	945	811	640	640	491	491	453	453	312
Peak	(cfs)	1886	1886	1891	1863	1907	959	996	979	991	983	984	963	975
Peak	(hrs)	3	3	2	3	2	4	3	4	3	3	3	3	3
Peak	(min)	5	5	55	0	45	40	50	0	30	35	25	35	15
Peak	(cfs_or_ac.ft.)	0	7	0	4	1193	11	0	6	0	6	0	5	0
Case	(()S,I,D,O)	( )	( )	( )	( )	(I)	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6
Peak/Area	(cfs/ac)	n/a	0.16	0.16	0.16	0.17	0.08	0.09	0.09	0.09	0.09	0.09	0.10	0.10
11-23-1999	16:03:41													
Summary	File:	P:\coweld01\existi~1\Goddin~1\10_Year\udswmm\ghxc10yr.txt												

GODDING HOLLOW BASIN, EXISTING CONDITION

10-YEAR

Time(Hrs)	Time(Min)	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108	Elem308	Elem708	Elem309	Elem208	Elem109	Elem709
0	5	0	0	0	0	0	2	0	0	0	0	0	0	0
0	10	0	0	0	0	0	4	0	0	0	0	0	0	0
0	15	0	2	0	1	1	7	0	0	0	0	0	0	5
0	20	0	10	0	5	3	10	0	1	4	2	5	4	39
0	25	2	46	1	21	5	12	0	9	33	19	39	23	105
0	30	13	120	5	59	8	17	3	39	116	74	129	85	265
0	35	43	218	20	114	15	34	17	99	230	150	199	127	457
0	40	96	318	48	177	31	75	54	185	349	234	302	215	614
0	45	168	410	92	250	69	144	119	290	484	343	426	335	719
0	50	207	491	153	337	136	240	211	404	601	445	551	464	809
0	55	244	551	212	438	231	349	317	499	627	464	673	589	890
1	0	282	583	255	538	335	439	405	509	658	495	785	703	958
1	5	322	621	305	617	423	494	458	520	685	521	881	803	1008
1	10	363	665	359	668	484	529	491	531	715	550	958	883	1041
1	15	406	709	414	701	524	554	515	544	747	582	1016	945	1057
1	20	451	750	465	721	552	574	533	558	778	615	1053	987	1054
1	25	496	786	512	735	574	592	550	574	806	648	1070	1008	1031
1	30	540	817	554	746	594	610	566	589	831	678	1066	1009	992
1	35	583	842	591	755	612	629	582	606	851	706	1046	994	945
1	40	624	863	623	764	631	647	598	622	867	729	1014	966	894
1	45	662	880	651	774	649	666	615	639	879	749	974	929	842
1	50	698	895	676	785	668	684	631	654	887	763	928	887	790
1	55	730	909	698	794	684	697	641	670	891	774	879	842	736
2	0	760	920	718	801	698	710	653	684	890	779	829	795	686
2	5	787	929	735	808	712	724	665	697	886	781	779	747	639
2	10	810	936	750	817	726	739	677	709	877	779	729	701	593
2	15	832	941	764	821	737	753	689	720	866	774	682	656	549
2	20	850	945	776	824	746	766	701	729	851	765	636	612	506
2	25	866	948	786	829	756	778	711	736	835	754	591	570	465
2	30	880	950	795	834	766	789	720	742	816	741	548	529	427
2	35	892	951	804	839	775	798	728	746	795	725	508	491	392
2	40	902	953	811	843	785	806	734	749	774	708	470	454	359
2	45	911	954	818	848	793	812	739	749	751	690	435	420	329
2	50	918	955	825	851	800	817	743	749	727	670	402	389	302
2	55	925	956	830	854	806	819	744	746	702	649	371	359	277
3	0	930	957	835	855	811	821	744	743	677	628	343	332	253
3	5	935	957	839	855	814	820	743	738	652	606	317	307	231
3	10	938	955	842	854	816	818	740	731	627	584	292	283	210
3	15	941	953	845	852	816	815	736	724	602	562	269	261	189
3	20	943	951	846	848	815	810	731	715	577	540	247	240	171
3	25	944	947	846	843	812	804	724	705	553	518	227	220	154
3	30	944	942	844	837	808	796	716	695	526	494	208	203	138
3	35	943	936	842	829	803	788	707	683	490	460	191	186	126
3	40	941	929	839	821	796	777	696	666	370	342	175	171	114
3	45	939	922	834	810	787	764	682	642	222	196	160	158	104
3	50	935	913	828	798	776	746	665	614	185	161	148	146	95
3	55	930	902	820	782	762	726	644	585	168	145	137	135	87
4	0	925	890	810	761	743	696	614	558	155	134	126	126	79
4	5	917	874	796	720	703	660	578	531	143	123	117	117	71
4	10	908	852	776	676	661	630	548	506	133	115	109	109	65
4	15	896	825	752	633	618	574	492	369	124	108	103	103	59
4	20	882	793	722	569	556	487	405	257	116	101	97	97	55
4	25	863	753	684	490	477	401	320	192	109	96	93	93	52
4	30	841	707	639	414	402	335	253	152	99	87	78	78	39
4	35	815	656	590	351	341	285	204	125	83	72	61	61	31
4	40	785	604	541	302	292	247	166	102	67	57	48	48	25
4	45	751	555	494	263	254	217	137	84	55	45	39	39	21
4	50	716	510	451	232	224	193	114	68	45	37	32	32	18
4	55	680	469	411	207	199	174	95	56	38	31	27	27	16
5	0	645	431	375	187	179	158	79	47	33	26	23	23	14
5	5	609	398	343	170	163	145	67	39	27	22	20	20	13
5	10	575	368	314	156	149	135	57	33	23	19	17	17	11
5	15	542	340	288	144	138	126	48	28	20	17	15	15	10
5	20	511	316	265	134	129	118	41	24	18	15	14	14	9
5	25	481	294	244	126	121	112	35	20	15	13	12	12	8
5	30	454	275	226	119	114	106	31	17	13	12	11	11	8
5	35	427	257	208	113	109	102	26	15	12	11	10	10	7
5	40	403	237	190	108	104	98	23	13	11	10	9	9	6
5	45	379	209	163	104	100	95	20	12	10	9	8	8	6
5	50	355	189	143	100	96	92	18	11	9	8	8	8	6
5	55	333	174	129	96	93	89	16	10	8	7	7	7	5
6	0	312	162	118	88	91	87	14	9	8	7	7	7	5
Peak	(cfs)	944	957	846	855	816	821	744	749	891	781	1070	1009	1057
Peak	(hrs)	3	3	3	3	3	3	2	2	1	2	1	1	1
Peak	(min)	25	0	20	0	10	0	55	40	55	5	25	30	15
Peak	(cfs_or_ac.ft.)	6	0	6	0	10	0	8	31	0	31	0	4	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	(S)	( )	(S)	( )	( )	( )
Area	(ac)	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8	4197.8	4197.8	3548.8	3548.8	3283.2	3283.2
Peak/Area	(cfs/ac)	0.11	0.11	0.12	0.12	0.13	0.13	0.18	0.18	0.21	0.22	0.30	0.31	0.32
11-23-1999	16:03:41													
Summary	File:													

GODDING HOLLOW BASIN, EXISTING CONDITION

10-YEAR

Time(Hrs)	Time(Min)	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	5	4	40	1	7	7	1	9	0	0	0	0	0
0	20	37	35	121	13	35	33	10	41	0	0	3	0	3
0	25	84	68	315	59	137	128	45	112	7	3	34	10	32
0	30	193	151	434	132	240	214	85	248	38	28	110	49	82
0	35	316	253	450	232	334	290	164	371	111	95	186	97	118
0	40	406	335	479	338	432	374	268	471	191	171	229	131	142
0	45	478	408	541	443	528	465	376	554	241	222	249	147	155
0	50	549	481	611	540	609	544	472	608	264	245	256	152	157
0	55	619	554	674	617	667	605	545	639	272	254	257	153	150
1	0	683	622	725	673	706	646	595	652	272	254	252	148	140
1	5	737	679	759	708	727	668	623	649	266	248	240	139	130
1	10	776	722	776	725	731	673	632	633	254	236	225	125	120
1	15	800	749	776	726	721	664	626	609	241	224	214	116	111
1	20	806	758	758	713	699	643	611	582	229	212	203	107	102
1	25	793	749	723	688	667	614	588	549	215	200	189	98	93
1	30	767	727	685	656	630	580	560	513	201	187	175	88	83
1	35	733	697	646	620	592	545	528	477	187	173	161	79	74
1	40	696	663	607	582	553	510	495	443	173	160	148	70	66
1	45	657	628	570	545	516	475	462	409	160	147	136	63	59
1	50	619	592	534	509	481	442	430	378	147	136	125	56	53
1	55	581	557	499	474	447	411	399	349	136	125	115	51	48
2	0	544	522	463	441	414	380	370	322	126	116	107	46	44
2	5	507	487	427	409	383	350	342	294	116	106	96	39	34
2	10	472	454	395	378	352	322	315	267	105	96	84	32	27
2	15	437	421	361	348	322	294	288	240	95	86	75	26	23
2	20	403	388	329	319	293	267	262	214	85	77	68	22	20
2	25	371	357	299	291	266	242	237	192	78	70	61	19	17
2	30	340	328	273	265	241	218	215	172	70	63	55	16	13
2	35	312	301	249	241	218	197	194	154	64	57	49	12	10
2	40	286	276	227	219	198	178	175	138	58	51	44	10	8
2	45	262	254	206	198	179	160	158	120	52	46	39	8	6
2	50	240	233	187	180	160	143	141	105	47	41	35	6	5
2	55	220	213	170	162	144	128	126	93	43	37	31	5	4
3	0	201	195	154	146	130	115	113	84	38	33	27	4	2
3	5	184	178	137	132	117	103	101	75	35	30	24	3	2
3	10	166	162	121	119	104	91	91	66	31	27	22	2	1
3	15	149	147	107	107	94	82	82	58	28	24	19	1	1
3	20	135	133	96	96	84	73	73	49	24	21	17	1	0
3	25	122	121	87	87	75	65	65	43	21	19	16	1	0
3	30	110	110	78	78	67	58	58	38	19	18	15	1	0
3	35	100	100	70	70	60	51	51	33	16	16	14	0	0
3	40	91	91	63	63	54	46	46	30	15	15	13	0	0
3	45	83	83	57	57	46	39	39	26	14	14	12	0	0
3	50	76	76	50	50	38	31	31	23	13	13	11	0	0
3	55	70	70	43	43	32	26	26	21	12	12	11	0	0
4	0	63	63	33	33	29	23	23	19	12	12	10	0	0
4	5	57	57	28	28	25	20	20	17	11	11	10	0	0
4	10	52	52	24	24	22	18	18	15	11	11	9	0	0
4	15	47	47	21	21	19	16	16	14	10	10	9	0	0
4	20	44	44	18	18	16	14	14	12	10	10	8	0	0
4	25	42	42	16	16	15	13	13	11	9	9	8	0	0
4	30	30	30	14	14	12	12	12	11	9	9	7	0	0
4	35	23	23	12	12	11	11	11	10	8	8	7	0	0
4	40	18	18	11	11	10	10	10	9	8	8	6	0	0
4	45	15	15	10	10	10	10	10	8	7	7	6	0	0
4	50	13	13	10	10	9	9	9	8	7	7	6	0	0
4	55	12	12	9	9	8	8	8	7	6	6	5	0	0
5	0	11	11	8	8	8	8	8	7	6	6	5	0	0
5	5	10	10	8	8	7	7	7	6	6	6	5	0	0
5	10	9	9	7	7	7	7	7	6	5	5	4	0	0
5	15	8	8	7	7	6	6	6	5	5	5	4	0	0
5	20	8	8	6	6	6	6	6	5	5	5	4	0	0
5	25	7	7	6	6	5	5	5	5	4	4	3	0	0
5	30	7	7	6	6	5	5	5	4	4	4	3	0	0
5	35	6	6	5	5	5	5	5	4	4	4	3	0	0
5	40	6	6	5	5	5	5	5	4	4	4	3	0	0
5	45	5	5	5	5	4	4	4	4	3	3	3	0	0
5	50	5	5	4	4	4	4	4	3	3	3	3	0	0
5	55	5	5	4	4	4	4	4	3	3	3	2	0	0
6	0	5	5	4	4	4	4	4	3	3	3	2	0	0
Peak	(cfs)	806	758	776	726	731	673	632	652	272	254	257	153	157
Peak	(hrs)	1	1	1	1	1	1	1	1	0	0	0	0	0
Peak	(min)	20	20	10	15	10	10	10	0	55	55	55	55	50
Peak	(cfs_or_ac.ft.)	0	3	0	4	0	0	3	0	0	2	0	3	0
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6
Peak/Area	(cfs/ac)	0.33	0.33	0.34	0.34	0.34	0.35	0.35	0.36	0.33	0.33	0.34	0.43	0.44
11-23-1999	16:03:41													
Summary	File:													

GODDING HOLLOW BASIN, EXISTING CONDITION

10-YEAR

Time(Hrs)	Time(Min)	Elem117	Elem217	Elem741	Elem341	Elem721	Elem321	Elem720	Elem225	Elem325	Elem237	Elem236	TotalTime(Hrs)
0	5	0	0	0	0	0	0	40	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	0	1	1	0	0	0	40	0	0	3	0	0.25
0	20	1	5	11	0	0	0	0	3	0	17	4	0.33
0	25	12	42	55	3	26	0	40	23	0	85	41	0.42
0	30	36	94	148	9	151	1	1	68	0	194	134	0.50
0	35	58	120	243	22	229	2	51	116	0	277	229	0.58
0	40	81	119	292	38	332	4	16	140	0	305	299	0.67
0	45	95	112	299	44	340	7	57	160	0	297	342	0.75
0	50	100	102	286	48	380	9	19	170	0	277	361	0.83
0	55	99	91	269	52	364	12	60	171	0	254	366	0.92
1	0	94	81	253	56	392	14	21	166	0	231	360	1.00
1	5	87	74	237	59	371	17	62	161	0	212	346	1.08
1	10	80	67	224	62	395	20	23	154	8	196	329	1.17
1	15	74	62	212	65	370	22	64	147	151	182	312	1.25
1	20	68	55	200	68	390	25	25	140	143	169	294	1.33
1	25	62	48	188	70	358	28	68	131	135	152	274	1.42
1	30	56	41	174	72	372	30	30	122	126	136	253	1.50
1	35	50	36	160	74	337	32	72	113	117	120	232	1.58
1	40	45	31	147	75	351	35	35	104	108	107	211	1.67
1	45	40	27	136	76	317	37	77	95	99	96	192	1.75
1	50	36	23	126	77	332	39	39	88	91	86	175	1.83
1	55	33	21	116	78	298	41	81	80	83	78	159	1.92
2	0	30	18	108	78	312	43	43	70	75	70	144	2.00
2	5	22	15	99	79	277	45	85	63	66	62	130	2.08
2	10	17	13	91	79	290	46	46	56	59	55	115	2.17
2	15	14	11	83	79	255	48	88	50	53	48	98	2.25
2	20	12	9	76	79	267	50	50	45	47	42	86	2.33
2	25	10	8	69	79	231	51	91	41	43	37	75	2.42
2	30	8	6	62	79	243	52	52	37	39	32	66	2.50
2	35	6	4	56	79	207	54	94	33	35	28	59	2.58
2	40	5	3	51	78	220	55	55	29	31	25	52	2.67
2	45	4	3	47	78	184	56	96	26	27	22	46	2.75
2	50	3	2	43	77	196	57	57	24	25	19	41	2.83
2	55	3	2	39	76	160	58	98	22	23	17	37	2.92
3	0	2	2	36	76	172	59	59	20	21	15	33	3.00
3	5	2	0	33	75	137	59	99	18	19	12	29	3.08
3	10	1	0	30	74	150	60	60	17	17	9	26	3.17
3	15	1	0	27	73	117	60	100	15	16	8	22	3.25
3	20	0	0	24	73	130	61	61	14	14	6	19	3.33
3	25	0	0	21	72	97	61	101	12	13	5	17	3.42
3	30	0	0	18	71	112	62	62	11	12	4	15	3.50
3	35	0	0	16	70	79	62	102	10	11	4	13	3.58
3	40	0	0	14	69	96	62	62	9	10	3	10	3.67
3	45	0	0	12	68	64	62	102	8	10	2	8	3.75
3	50	0	0	10	67	80	62	62	8	10	2	6	3.83
3	55	0	0	8	66	49	62	102	7	9	2	5	3.92
4	0	0	0	6	65	61	62	62	6	9	0	3	4.00
4	5	0	0	5	64	23	62	102	4	8	0	2	4.08
4	10	0	0	3	63	39	62	62	3	7	0	2	4.17
4	15	0	0	3	62	8	62	102	3	7	0	1	4.25
4	20	0	0	2	61	26	61	61	2	6	0	1	4.33
4	25	0	0	2	60	0	61	101	1	5	0	1	4.42
4	30	0	0	2	59	15	60	60	1	5	0	1	4.50
4	35	0	0	2	58	0	60	100	1	4	0	1	4.58
4	40	0	0	1	57	0	60	60	0	4	0	1	4.67
4	45	0	0	1	56	0	59	99	0	3	0	0	4.75
4	50	0	0	1	55	0	59	59	0	3	0	0	4.83
4	55	0	0	1	54	0	58	98	0	2	0	0	4.92
5	0	0	0	1	53	0	58	58	0	2	0	0	5.00
5	5	0	0	1	52	0	57	97	0	2	0	0	5.08
5	10	0	0	1	51	0	57	57	0	1	0	0	5.17
5	15	0	0	1	50	0	56	96	0	1	0	0	5.25
5	20	0	0	1	49	0	56	56	0	1	0	0	5.33
5	25	0	0	1	48	0	55	95	0	1	0	0	5.42
5	30	0	0	1	48	0	55	55	0	1	0	0	5.50
5	35	0	0	0	47	0	54	94	0	1	0	0	5.58
5	40	0	0	0	46	0	54	54	0	0	0	0	5.67
5	45	0	0	0	45	0	53	93	0	0	0	0	5.75
5	50	0	0	0	44	0	53	53	0	0	0	0	5.83
5	55	0	0	0	44	0	52	92	0	0	0	0	5.92
6	0	0	0	0	43	0	52	52	0	0	0	0	6.00
Peak	(cfs)	100	120	299	79	395	62	102	171	151	305	366	
Peak	(hrs)	0	0	0	2	1	3	3	0	1	0	0	
Peak	(min)	50	35	45	5	10	30	35	55	15	40	55	
Peak	(cfs_or_ac.ft.)	2	0	0	19	0	58	0	0	9	0	0	
Case	(()S,I,D,O)	(_)	(_)	(_)	(S)	(_)	(S)	(_)	(_)	(S)	(_)	(_)	
Area	(ac)	223.4	223.4	691.2	691.2	2172.2	2172.2	2172.2	490.9	490.9	540.8	889.6	
Peak/Area	(cfs/ac)	0.45	0.54	0.43	0.11	0.18	0.03	0.05	0.35	0.31	0.56	0.41	
11-23-1999	16:03:41												
Summary	File:							P:\coweld01\existi~1\Goddin~1\10_Year\udswmm\ghxc10yr.txt					

GODDING HOLLOW BASIN, EXISTING CONDITION

25-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	1	0	0	0	0	0	0	0	0
0	15	0	0	0	0	1	0	1	0	0	0	1	0	0
0	20	0	0	2	1	22	0	3	0	0	0	4	0	2
0	25	2	2	12	9	44	0	11	0	1	1	17	0	9
0	30	13	13	39	23	68	3	51	0	13	12	79	3	58
0	35	49	49	104	64	198	16	126	4	59	54	200	21	169
0	40	112	112	168	99	350	52	229	25	167	150	366	75	337
0	45	184	184	236	139	532	117	361	83	336	303	556	175	508
0	50	265	265	324	207	729	216	522	192	517	469	659	224	627
0	55	319	319	438	308	958	347	689	330	642	582	736	281	730
1	0	388	388	579	444	1194	484	761	393	723	656	800	349	818
1	5	492	492	741	605	1361	559	814	449	798	729	861	424	896
1	10	630	630	907	773	1476	582	863	509	870	801	926	504	971
1	15	789	789	1071	939	1592	607	916	572	941	871	993	587	1049
1	20	960	960	1236	1105	1739	634	970	638	1012	942	1059	672	1123
1	25	1135	1135	1401	1272	1890	665	1025	706	1080	1011	1121	758	1190
1	30	1312	1312	1567	1441	2044	699	1078	776	1146	1076	1179	842	1248
1	35	1488	1488	1732	1611	2200	736	1130	847	1207	1139	1234	923	1297
1	40	1663	1663	1897	1782	2359	775	1181	917	1261	1197	1285	998	1337
1	45	1837	1837	2063	1954	2520	817	1231	986	1311	1251	1332	1068	1372
1	50	2009	2009	2227	2124	2664	861	1280	1051	1358	1301	1374	1131	1401
1	55	2179	2179	2388	2290	2809	907	1327	1114	1400	1347	1411	1188	1427
2	0	2345	2345	2546	2454	2956	954	1372	1173	1437	1387	1445	1239	1454
2	5	2507	2507	2698	2610	3067	1002	1414	1229	1472	1424	1476	1286	1484
2	10	2661	2661	2839	2755	3178	1050	1453	1280	1503	1458	1506	1331	1519
2	15	2807	2807	2971	2892	3289	1098	1489	1328	1532	1490	1535	1374	1560
2	20	2942	2942	3091	3016	3354	1145	1522	1372	1560	1520	1566	1418	1607
2	25	3064	3064	3195	3124	3419	1191	1552	1414	1589	1552	1599	1464	1660
2	30	3173	3173	3287	3220	3483	1236	1582	1453	1620	1585	1635	1512	1716
2	35	3267	3267	3364	3301	3503	1279	1611	1492	1654	1621	1675	1562	1774
2	40	3345	3345	3423	3364	3521	1322	1640	1529	1691	1660	1717	1614	1830
2	45	3408	3408	3470	3413	3539	1363	1670	1568	1731	1701	1761	1667	1882
2	50	3457	3457	3502	3448	3522	1404	1702	1607	1772	1744	1806	1719	1927
2	55	3490	3490	3518	3468	3504	1444	1734	1646	1814	1788	1849	1769	1964
3	0	3509	3509	3523	3476	3486	1483	1768	1687	1855	1830	1888	1816	1990
3	5	3516	3516	3518	3473	3449	1522	1803	1727	1893	1870	1923	1856	2005
3	10	3513	3513	3503	3461	3413	1561	1837	1767	1927	1906	1951	1890	2009
3	15	3500	3500	3481	3441	3375	1599	1870	1805	1956	1935	1972	1916	2003
3	20	3479	3479	3452	3415	3333	1637	1900	1840	1978	1958	1985	1934	1987
3	25	3452	3452	3419	3384	3289	1674	1928	1872	1992	1974	1990	1943	1963
3	30	3420	3420	3382	3349	3244	1710	1951	1899	1998	1981	1986	1945	1933
3	35	3384	3384	3342	3310	3195	1744	1968	1921	1997	1981	1976	1938	1898
3	40	3344	3344	3298	3269	3144	1775	1981	1937	1989	1974	1959	1924	1859
3	45	3301	3301	3252	3224	3091	1804	1987	1947	1974	1960	1937	1905	1818
3	50	3256	3256	3203	3176	3034	1829	1988	1951	1954	1940	1909	1881	1776
3	55	3207	3207	3151	3126	2974	1851	1983	1949	1928	1915	1878	1852	1732
4	0	3155	3155	3096	3072	2910	1868	1972	1941	1898	1886	1844	1820	1688
4	5	3102	3102	3040	3018	2860	1882	1957	1928	1865	1854	1808	1786	1645
4	10	3047	3047	2985	2964	2806	1891	1937	1910	1830	1819	1769	1750	1602
4	15	2992	2992	2930	2910	2747	1895	1913	1888	1793	1783	1730	1712	1559
4	20	2937	2937	2873	2854	2685	1896	1885	1863	1754	1745	1690	1674	1517
4	25	2880	2880	2813	2796	2618	1892	1855	1834	1714	1706	1650	1635	1476
4	30	2821	2821	2751	2735	2547	1885	1823	1803	1673	1666	1609	1596	1435
4	35	2761	2761	2690	2674	2497	1874	1788	1770	1632	1626	1569	1557	1394
4	40	2701	2701	2631	2617	2444	1860	1752	1736	1591	1586	1528	1517	1355
4	45	2642	2642	2574	2560	2387	1842	1715	1700	1550	1546	1488	1478	1315
4	50	2585	2585	2516	2503	2328	1822	1678	1663	1509	1506	1446	1439	1275
4	55	2527	2527	2458	2446	2267	1800	1639	1626	1467	1465	1405	1401	1235
5	0	2469	2469	2399	2388	2203	1775	1600	1588	1427	1425	1365	1362	1195
5	5	2411	2411	2341	2330	2157	1748	1561	1550	1386	1385	1326	1323	1154
5	10	2354	2354	2286	2276	2109	1720	1521	1511	1347	1345	1286	1283	1109
5	15	2300	2300	2233	2224	2059	1691	1481	1473	1306	1306	1245	1243	1061
5	20	2246	2246	2181	2172	2009	1660	1440	1434	1266	1265	1202	1201	1010
5	25	2193	2193	2127	2121	1957	1628	1399	1395	1224	1223	1157	1157	957
5	30	2140	2140	2074	2070	1904	1595	1359	1356	1180	1180	1111	1111	902
5	35	2088	2088	2022	2019	1851	1561	1318	1316	1136	1136	1065	1065	848
5	40	2036	2036	1970	1967	1797	1527	1277	1275	1091	1090	1017	1017	793
5	45	1984	1984	1917	1915	1742	1492	1235	1234	1044	1044	969	969	742
5	50	1931	1931	1864	1862	1687	1456	1193	1192	998	998	921	921	694
5	55	1879	1879	1809	1809	1631	1420	1149	1149	951	951	874	874	650
6	0	1825	1825	1756	1756	1574	1383	1106	1106	906	905	829	829	608
Peak	(cfs)	3516	3516	3523	3476	3539	1896	1988	1951	1998	1981	1990	1945	2009
Peak	(hrs)	3	3	3	3	2	4	3	3	3	3	3	3	3
Peak	(min)	5	5	0	0	45	20	50	50	30	30	25	30	10
Peak	(cfs_or_ac.ft.)	0	7	0	5	2188	11	0	7	0	7	0	6	0
Case	(),S,I,D,O)	( )	( )	( )	( )	(I)	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6
Peak/Area	(cfs/ac)	n/a	0.30	0.30	0.31	0.31	0.17	0.18	0.18	0.19	0.19	0.19	0.20	0.21
11-23-1999	16:03:42													
Summary	File:	P:\coweld01\existi~1\Goddin~1\25_Year\udswmm\ghxc25yr.txt												

GODDING HOLLOW BASIN, EXISTING CONDITION

25-YEAR

Time(Hrs)	Time(Min)	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108	Elem308	Elem708	Elem309	Elem208	Elem109	Elem709
0	5	0	0	0	0	0	2	0	0	0	0	0	0	0
0	10	0	0	0	0	0	4	0	0	0	0	0	0	0
0	15	0	1	0	1	1	7	0	0	0	0	0	0	4
0	20	0	6	0	4	3	10	0	1	2	1	3	2	28
0	25	1	25	0	11	5	12	0	4	14	9	18	13	64
0	30	8	106	3	52	8	15	1	24	82	49	96	58	217
0	35	40	256	18	133	13	29	11	83	226	138	214	121	517
0	40	114	443	58	244	28	72	46	192	425	272	381	243	838
0	45	201	637	129	375	71	162	126	350	660	444	609	447	1072
0	50	261	798	214	528	158	295	250	501	739	477	854	687	1277
0	55	333	892	275	690	281	421	368	519	811	522	1098	936	1476
1	0	412	969	351	825	401	505	445	540	871	573	1339	1177	1655
1	5	495	1043	439	915	492	563	498	563	934	636	1555	1397	1800
1	10	581	1119	528	971	557	607	537	590	1007	710	1738	1584	1901
1	15	669	1186	614	1008	606	645	571	619	1088	790	1876	1729	1954
1	20	755	1241	693	1038	648	683	606	658	1340	1044	1964	1827	1959
1	25	838	1282	764	1063	688	722	643	722	1945	1655	2002	1875	1919
1	30	915	1314	827	1086	729	765	683	810	2210	1930	1994	1878	1845
1	35	985	1336	881	1092	756	824	740	901	2232	1964	1949	1843	1750
1	40	1048	1351	927	1106	792	894	808	986	2179	1923	1877	1781	1645
1	45	1103	1364	968	1136	844	1003	914	1260	2094	1850	1787	1699	1535
1	50	1151	1381	1011	1196	925	1168	1078	1508	1992	1760	1687	1607	1427
1	55	1195	1408	1061	1292	1039	1349	1256	1644	1881	1660	1583	1510	1321
2	0	1238	1451	1125	1414	1179	1505	1410	1701	1767	1556	1478	1411	1220
2	5	1282	1510	1204	1542	1322	1618	1520	1704	1653	1452	1375	1314	1124
2	10	1331	1582	1294	1659	1454	1704	1584	1670	1541	1350	1275	1220	1033
2	15	1386	1661	1390	1760	1569	1783	1606	1612	1432	1252	1180	1130	948
2	20	1446	1742	1487	1847	1669	1846	1594	1539	1329	1158	1090	1045	870
2	25	1510	1821	1581	1914	1749	1880	1558	1460	1253	1091	1006	965	797
2	30	1577	1894	1667	1959	1805	1886	1507	1389	1215	1063	926	889	726
2	35	1645	1955	1741	1978	1836	1868	1450	1326	1164	1023	851	817	660
2	40	1711	2001	1799	1973	1841	1828	1392	1265	1105	976	781	750	602
2	45	1771	2031	1839	1948	1824	1777	1334	1205	1043	925	717	689	550
2	50	1825	2044	1861	1907	1792	1720	1275	1144	980	871	658	633	502
2	55	1869	2040	1866	1856	1749	1658	1216	1082	917	816	604	581	458
3	0	1902	2023	1856	1797	1698	1592	1157	1023	875	782	555	534	418
3	5	1923	1993	1833	1733	1641	1528	1106	1002	850	764	509	491	380
3	10	1933	1953	1800	1668	1583	1468	1067	991	824	744	467	450	345
3	15	1933	1907	1760	1606	1526	1418	1038	979	796	722	428	413	310
3	20	1922	1856	1715	1548	1474	1374	1015	966	768	699	391	377	279
3	25	1903	1803	1668	1496	1427	1334	996	953	739	676	357	344	249
3	30	1878	1751	1620	1447	1384	1297	978	938	710	651	325	313	223
3	35	1847	1699	1573	1402	1343	1260	962	922	681	626	296	285	201
3	40	1812	1649	1527	1359	1304	1225	945	906	652	601	269	260	181
3	45	1775	1601	1482	1318	1268	1189	929	888	623	576	243	237	162
3	50	1735	1554	1439	1279	1232	1155	912	870	595	551	221	217	147
3	55	1695	1509	1397	1241	1197	1121	894	851	567	526	201	198	133
4	0	1654	1466	1356	1203	1163	1087	876	832	540	502	184	182	121
4	5	1613	1424	1317	1167	1129	1054	858	812	501	466	169	167	110
4	10	1572	1383	1278	1131	1096	1021	838	788	394	362	156	154	101
4	15	1532	1343	1241	1095	1063	986	816	757	212	183	143	143	92
4	20	1492	1304	1204	1059	1029	947	790	720	171	145	132	132	83
4	25	1452	1266	1167	1022	994	907	761	684	155	130	123	123	75
4	30	1413	1228	1130	983	957	865	730	649	142	120	114	114	68
4	35	1375	1189	1093	943	918	823	698	616	132	112	107	107	62
4	40	1336	1150	1056	902	880	784	666	584	123	105	100	100	57
4	45	1298	1109	1018	863	842	749	635	554	116	99	95	95	53
4	50	1259	1069	981	822	803	699	588	526	108	93	89	89	41
4	55	1221	1029	942	777	759	655	546	486	94	80	67	67	31
5	0	1182	985	899	695	678	578	471	305	75	62	51	51	25
5	5	1141	930	845	583	568	471	365	197	60	49	41	41	21
5	10	1098	866	781	482	467	378	273	132	47	39	33	33	18
5	15	1051	797	712	396	383	308	203	92	38	32	28	28	16
5	20	1000	727	644	328	316	256	152	66	31	26	23	23	14
5	25	948	662	579	277	265	218	115	49	27	22	20	20	12
5	30	894	602	520	238	227	191	89	38	23	19	17	17	11
5	35	841	549	467	209	199	171	70	31	20	17	15	15	10
5	40	789	502	420	187	178	157	56	25	16	15	14	14	9
5	45	739	461	379	170	162	145	45	21	15	13	12	12	9
5	50	692	425	344	158	150	137	37	18	13	12	11	11	8
5	55	648	394	313	147	140	130	31	15	12	11	10	10	7
6	0	607	367	286	137	133	124	26	14	11	10	9	9	7
Peak	(cfs)	1933	2044	1866	1978	1841	1886	1606	1704	2232	1964	2002	1878	1959
Peak	(hrs)	3	2	2	2	2	2	2	2	1	1	1	1	1
Peak	(min)	10	50	55	35	40	30	15	5	35	35	25	30	20
Peak	(cfs_or_ac.ft.)	6	0	6	0	12	0	10	71	0	45	0	5	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	(S)	( )	(S)	( )	( )	( )
Area	(ac)	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8	4197.8	4197.8	3548.8	3548.8	3283.2	3283.2
Peak/Area	(cfs/ac)	0.22	0.23	0.26	0.27	0.29	0.30	0.38	0.41	0.53	0.55	0.56	0.57	0.60
11-23-1999	16:03:42													
Summary	File:													

GODDING HOLLOW BASIN, EXISTING CONDITION

25-YEAR

Time(Hrs)	Time(Min)	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	4	3	34	1	6	6	1	8	0	0	0	0	0
0	20	27	26	93	8	23	22	8	32	0	0	1	0	1
0	25	57	53	209	40	77	74	31	71	1	0	8	2	8
0	30	161	123	484	102	237	216	67	198	22	13	88	31	76
0	35	361	275	645	242	407	355	153	443	111	89	231	109	152
0	40	561	443	721	426	589	507	314	646	256	225	336	171	226
0	45	724	595	835	629	786	683	514	846	376	340	405	221	270
0	50	872	744	978	835	975	862	720	1002.00	452	416	458	263	292
0	55	1027	899	1129	1021	1133	1019	900	1118.00	498	464	486	284	292
1	0	1176	1053	1260	1170	1251	1140	1038	1186.00	519	485	491	286	281
1	5	1309	1191	1360	1275	1327	1218	1129	1213.00	521	487	482	277	265
1	10	1411	1298	1415	1337	1363	1252	1174	1206.00	511	476	467	262	247
1	15	1473	1367	1430	1359	1360	1251	1183	1174.00	494	460	447	245	229
1	20	1492	1394	1401	1344	1325	1219	1164	1123.00	471	439	423	227	209
1	25	1472	1382	1345	1301	1267	1166	1122	1057.00	443	413	394	207	187
1	30	1422	1341	1273	1239	1194	1100	1065	984	412	384	363	187	165
1	35	1354	1281	1192	1164	1112	1024	999	908	381	354	333	167	145
1	40	1275	1210	1109	1083	1031	949	928	833	350	325	304	149	127
1	45	1193	1134	1028	1003	950	873	856	758	317	293	267	122	111
1	50	1110	1056	949	924	871	799	785	685	284	262	239	104	97
1	55	1028	980	873	848	796	729	716	621	257	236	217	91	85
2	0	949	906	801	777	728	665	653	565	234	214	197	81	75
2	5	874	835	732	711	665	606	596	514	214	195	179	71	66
2	10	803	768	668	650	606	552	543	466	195	177	163	63	58
2	15	736	705	611	594	553	502	495	423	178	162	148	56	52
2	20	675	647	559	543	505	458	451	384	163	148	135	50	46
2	25	619	594	509	497	461	417	412	349	149	134	122	43	38
2	30	567	544	463	454	420	379	374	313	135	121	107	35	29
2	35	518	498	422	414	381	343	339	279	121	107	93	26	20
2	40	474	456	384	376	344	309	306	247	107	95	81	19	15
2	45	433	417	348	340	310	277	274	219	95	84	72	14	11
2	50	395	381	315	308	279	248	246	194	85	74	64	11	9
2	55	361	348	286	278	251	223	220	173	76	66	55	9	7
3	0	329	317	259	251	226	200	197	154	68	58	49	7	5
3	5	299	288	231	226	203	178	176	135	61	52	44	6	4
3	10	270	261	205	203	181	158	157	114	55	46	39	4	2
3	15	242	236	182	182	159	138	138	99	49	41	35	3	1
3	20	217	213	161	161	141	121	121	83	42	37	31	2	1
3	25	194	191	143	143	124	106	106	72	37	33	27	1	0
3	30	175	172	127	127	110	93	93	63	32	30	25	1	0
3	35	157	155	113	113	98	82	82	56	29	27	23	1	0
3	40	142	140	101	101	87	73	73	50	27	25	22	1	0
3	45	127	127	91	91	78	65	65	43	23	23	20	0	0
3	50	115	115	82	82	70	57	57	38	22	22	19	0	0
3	55	104	104	73	73	63	51	51	33	20	20	18	0	0
4	0	95	95	66	66	57	46	46	30	19	19	17	0	0
4	5	87	87	59	59	49	39	39	27	18	18	16	0	0
4	10	79	79	52	52	40	31	31	24	17	17	15	0	0
4	15	72	72	45	45	32	27	27	22	16	16	14	0	0
4	20	65	65	34	34	28	23	23	20	15	15	14	0	0
4	25	58	58	27	27	24	21	21	18	14	14	13	0	0
4	30	53	53	24	24	21	19	19	16	14	14	12	0	0
4	35	48	48	21	21	19	17	17	15	13	13	11	0	0
4	40	44	44	19	19	17	16	16	14	12	12	10	0	0
4	45	42	42	17	17	15	15	15	13	11	11	10	0	0
4	50	32	32	15	15	14	14	14	12	11	11	9	0	0
4	55	24	24	14	14	13	13	13	11	10	10	8	0	0
5	0	19	19	12	12	12	12	12	10	9	9	8	0	0
5	5	16	16	12	12	11	11	11	9	9	9	7	0	0
5	10	14	14	11	11	10	10	10	9	8	8	7	0	0
5	15	13	13	10	10	9	9	9	8	8	8	6	0	0
5	20	12	12	9	9	9	9	9	8	7	7	6	0	0
5	25	11	11	9	9	8	8	8	7	7	7	5	0	0
5	30	10	10	8	8	7	7	7	7	6	6	5	0	0
5	35	9	9	8	8	7	7	7	6	6	6	5	0	0
5	40	8	8	7	7	6	6	6	6	5	5	4	0	0
5	45	8	8	7	7	6	6	6	5	5	5	4	0	0
5	50	7	7	6	6	6	6	6	5	5	5	4	0	0
5	55	7	7	6	6	5	5	5	5	4	4	3	0	0
6	0	6	6	5	5	5	5	5	4	4	4	3	0	0
Peak	(cfs)	1492	1394	1430	1359	1363	1252	1183	1213.00	521	487	491	286	292
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1	0
Peak	(min)	20	20	15	15	10	10	15	5	5	5	0	0	50
Peak	(cfs_or_ac.ft.)	0	4	0	4	0	0	4	0	0	3	0	4	0
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6
Peak/Area	(cfs/ac)	0.60	0.61	0.63	0.63	0.64	0.65	0.65	0.67	0.63	0.64	0.64	0.81	0.82
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Summary	File:													

GODDING HOLLOW BASIN, EXISTING CONDITION

25-YEAR

Time(Hrs)	Time(Min)	Elem117	Elem217	Elem741	Elem341	Elem721	Elem321	Elem720	Elem225	Elem325	Elem237	Elem236	TotalTime(Hrs)
0	5	0	0	0	0	0	0	40	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	0	1	1	0	0	0	40	0	0	2	0	0.25
0	20	0	2	7	0	0	0	0	1	0	10	2	0.33
0	25	3	12	31	2	0	0	40	7	0	39	14	0.42
0	30	31	97	122	7	117	0	0	58	0	175	101	0.50
0	35	64	181	284	20	292	2	62	142	0	355	259	0.58
0	40	118	213	431	41	465	5	38	198	0	477	411	0.67
0	45	162	213	503	48	570	8	85	255	0	518	537	0.75
0	50	184	204	516	56	634	13	48	297	0	505	614	0.83
0	55	190	187	499	64	675	17	92	315	0	478	650	0.92
1	0	185	171	479	72	704	22	55	316	187	444	661	1.00
1	5	175	158	457	79	728	27	98	311	324	412	652	1.08
1	10	163	144	435	81	749	33	60	302	305	383	630	1.17
1	15	151	131	412	82	762	38	103	291	296	354	600	1.25
1	20	138	116	386	82	770	43	64	276	283	322	564	1.33
1	25	125	100	357	83	768	48	106	258	266	287	523	1.42
1	30	110	85	326	84	760	54	67	239	247	252	478	1.50
1	35	97	72	297	84	749	59	109	219	227	220	433	1.58
1	40	85	62	269	85	735	64	71	200	208	192	391	1.67
1	45	74	53	245	85	719	68	113	182	190	168	351	1.75
1	50	64	45	223	86	700	73	75	166	173	148	315	1.83
1	55	56	39	203	86	679	78	118	151	158	131	283	1.92
2	0	49	34	186	86	655	82	82	138	144	116	254	2.00
2	5	44	29	171	87	629	86	126	126	131	102	228	2.08
2	10	39	24	156	87	601	194	194	114	119	90	204	2.17
2	15	34	21	142	87	572	301	341	101	107	79	183	2.25
2	20	31	17	129	87	543	371	371	91	95	69	163	2.33
2	25	25	15	118	87	513	414	454	82	86	60	145	2.42
2	30	17	12	107	87	485	437	437	74	77	52	128	2.50
2	35	13	8	97	87	456	446	486	63	68	45	108	2.58
2	40	10	6	87	87	428	445	445	56	59	39	92	2.67
2	45	7	5	79	87	401	437	477	50	52	34	80	2.75
2	50	6	4	72	87	376	424	424	44	47	30	70	2.83
2	55	4	3	65	87	350	407	447	40	42	26	62	2.92
3	0	3	2	60	87	324	388	388	36	38	23	55	3.00
3	5	3	2	54	87	301	367	407	33	34	20	49	3.08
3	10	2	0	49	87	279	346	346	30	31	14	42	3.17
3	15	1	0	44	87	258	325	365	27	28	11	37	3.25
3	20	1	0	39	87	239	304	304	25	26	9	31	3.33
3	25	0	0	34	87	221	284	324	22	23	7	27	3.42
3	30	0	0	30	87	202	264	264	20	21	6	23	3.50
3	35	0	0	26	86	183	244	284	18	19	5	20	3.58
3	40	0	0	23	86	168	226	226	17	17	4	17	3.67
3	45	0	0	20	86	154	208	248	15	16	3	12	3.75
3	50	0	0	18	86	141	191	191	14	14	2	10	3.83
3	55	0	0	13	86	129	176	216	12	13	2	8	3.92
4	0	0	0	10	85	118	162	162	11	12	1	6	4.00
4	5	0	0	8	85	108	148	188	9	10	0	5	4.08
4	10	0	0	7	85	97	136	136	7	10	0	4	4.17
4	15	0	0	6	85	88	124	164	5	9	0	2	4.25
4	20	0	0	5	85	80	113	113	4	8	0	1	4.33
4	25	0	0	3	84	70	103	143	3	8	0	1	4.42
4	30	0	0	2	84	62	93	93	2	7	0	1	4.50
4	35	0	0	2	84	46	87	127	2	6	0	1	4.58
4	40	0	0	2	84	32	87	87	1	5	0	1	4.67
4	45	0	0	2	84	21	86	126	1	5	0	1	4.75
4	50	0	0	1	83	13	86	86	0	4	0	0	4.83
4	55	0	0	1	83	6	85	125	0	3	0	0	4.92
5	0	0	0	1	83	2	84	84	0	3	0	0	5.00
5	5	0	0	1	83	0	84	124	0	2	0	0	5.08
5	10	0	0	1	83	0	83	83	0	2	0	0	5.17
5	15	0	0	1	82	0	83	123	0	2	0	0	5.25
5	20	0	0	1	82	0	82	82	0	1	0	0	5.33
5	25	0	0	1	82	0	81	121	0	1	0	0	5.42
5	30	0	0	1	82	0	81	81	0	1	0	0	5.50
5	35	0	0	1	82	0	80	120	0	1	0	0	5.58
5	40	0	0	1	81	0	79	79	0	1	0	0	5.67
5	45	0	0	0	81	0	79	119	0	1	0	0	5.75
5	50	0	0	0	81	0	78	78	0	1	0	0	5.83
5	55	0	0	0	81	0	77	117	0	0	0	0	5.92
6	0	0	0	0	81	0	77	77	0	0	0	0	6.00
Peak	(cfs)	190	213	516	87	770	446	486	316	324	518	661	
Peak	(hrs)	0	0	0	2	1	2	2	1	1	0	1	
Peak	(min)	55	40	50	5	20	35	35	0	5	45	0	
Peak	(cfs_or_ac.ft.)	2	0	0	37	0	90	0	0	10	0	0	
Case	(()S,I,D,O)	(_)	(_)	(_)	(S)	(_)	(S)	(_)	(_)	(S)	(_)	(_)	
Area	(ac)	223.4	223.4	691.2	691.2	2172.2	2172.2	2172.2	490.9	490.9	540.8	889.6	
Peak/Area	(cfs/ac)	0.85	0.95	0.75	0.13	0.35	0.21	0.22	0.64	0.66	0.96	0.74	
11-23-1999	16:03:42												
Summary	File:												

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GODDING HOLLOW BASIN, EXISTING CONDITION

50-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	1	0	0	0	0	0	0	0	0
0	15	0	0	0	0	1	0	1	0	0	0	1	0	0
0	20	0	0	3	2	28	0	4	0	0	0	5	0	2
0	25	3	3	16	12	56	0	14	0	2	2	21	0	12
0	30	18	18	52	31	87	4	64	1	18	16	101	5	76
0	35	67	67	134	82	262	24	166	7	84	76	268	32	229
0	40	145	145	205	113	469	75	312	40	240	215	504	112	467
0	45	236	236	305	176	721	171	507	130	474	426	729	207	665
0	50	314	314	440	282	1024	319	739	284	680	610	879	273	843
0	55	392	392	618	440	1359	498	892	391	823	749	1007	363	1003
1	0	521	521	829	642	1590	574	988	468	966	887	1116	470	1142
1	5	699	699	1051	862	1775	611	1075	556	1098	1016	1219	590	1264
1	10	912	912	1276	1089	1966	652	1160	655	1221	1137	1323	716	1378
1	15	1144	1144	1503	1319	2163	701	1251	761	1339	1253	1427	846	1488
1	20	1386	1386	1735	1554	2382	755	1343	874	1451	1363	1525	977	1588
1	25	1634	1634	1971	1794	2609	817	1436	990	1556	1467	1615	1105	1673
1	30	1884	1884	2210	2039	2841	884	1527	1107	1653	1563	1697	1226	1743
1	35	2135	2135	2450	2287	3071	957	1614	1222	1741	1651	1771	1338	1801
1	40	2386	2386	2692	2536	3304	1033	1698	1334	1820	1731	1838	1441	1852
1	45	2637	2637	2934	2787	3541	1113	1778	1441	1890	1803	1898	1534	1908
1	50	2887	2887	3174	3035	3753	1196	1854	1541	1954	1869	1957	1623	1980
1	55	3133	3133	3408	3277	3966	1279	1926	1635	2015	1932	2018	1712	2077
2	0	3374	3374	3639	3515	4180	1363	1994	1723	2077	1997	2088	1807	2203
2	5	3608	3608	3858	3740	4341	1447	2060	1808	2147	2069	2171	1913	2355
2	10	3830	3830	4060	3949	4502	1530	2125	1891	2226	2151	2270	2033	2521
2	15	4038	4038	4250	4145	4662	1613	2193	1976	2319	2247	2382	2165	2690
2	20	4230	4230	4422	4323	4767	1695	2267	2065	2424	2356	2506	2307	2848
2	25	4404	4404	4574	4480	4873	1778	2346	2159	2534	2475	2634	2453	2987
2	30	4558	4558	4706	4617	4951	1862	2432	2259	2652	2600	2761	2595	3101
2	35	4691	4691	4814	4730	4991	1948	2524	2364	2772	2725	2881	2729	3186
2	40	4801	4801	4900	4822	5039	2036	2622	2474	2888	2844	2987	2849	3242
2	45	4891	4891	4973	4899	5084	2128	2722	2585	2993	2952	3077	2951	3270
2	50	4965	4965	5031	4961	5096	2221	2820	2693	3082	3044	3146	3031	3272
2	55	5023	5023	5072	5006	5105	2316	2913	2796	3153	3118	3195	3089	3251
3	0	5066	5066	5103	5040	5119	2412	2998	2889	3204	3170	3221	3125	3209
3	5	5097	5097	5122	5063	5101	2506	3071	2970	3233	3202	3227	3139	3152
3	10	5116	5116	5128	5073	5085	2596	3130	3036	3242	3213	3214	3133	3080
3	15	5123	5123	5125	5072	5058	2682	3172	3086	3232	3204	3183	3109	2999
3	20	5120	5120	5111	5062	5023	2760	3199	3119	3204	3178	3137	3070	2910
3	25	5106	5106	5088	5041	4973	2829	3209	3135	3162	3137	3079	3018	2815
3	30	5083	5083	5054	5010	4919	2888	3203	3135	3106	3083	3010	2955	2718
3	35	5050	5050	5012	4971	4860	2936	3182	3119	3040	3019	2934	2883	2619
3	40	5008	5008	4963	4924	4794	2973	3148	3091	2966	2946	2851	2806	2521
3	45	4959	4959	4906	4869	4711	2997	3103	3050	2886	2867	2765	2724	2425
3	50	4901	4901	4838	4804	4622	3010	3048	2999	2802	2783	2677	2639	2331
3	55	4834	4834	4761	4728	4516	3011	2985	2939	2714	2697	2587	2553	2240
4	0	4757	4757	4673	4643	4404	3001	2915	2873	2626	2610	2498	2467	2152
4	5	4670	4670	4578	4549	4294	2981	2841	2802	2537	2522	2410	2382	2068
4	10	4577	4577	4477	4450	4179	2953	2763	2727	2450	2435	2323	2298	1987
4	15	4477	4477	4370	4345	4052	2916	2683	2650	2363	2350	2239	2215	1910
4	20	4370	4370	4257	4233	3923	2873	2602	2571	2279	2266	2157	2136	1837
4	25	4258	4258	4137	4114	3783	2824	2520	2492	2196	2185	2078	2059	1768
4	30	4139	4139	4011	3990	3643	2770	2438	2413	2115	2106	2002	1985	1703
4	35	4017	4017	3886	3865	3527	2712	2358	2334	2038	2030	1929	1913	1641
4	40	3894	3894	3764	3745	3414	2651	2279	2257	1964	1957	1860	1845	1582
4	45	3773	3773	3644	3626	3292	2588	2201	2181	1892	1888	1793	1780	1526
4	50	3653	3653	3524	3507	3175	2523	2126	2107	1824	1820	1726	1718	1471
4	55	3535	3535	3405	3389	3051	2458	2053	2036	1757	1754	1664	1658	1419
5	0	3417	3417	3286	3271	2932	2392	1982	1966	1694	1691	1605	1600	1369
5	5	3300	3300	3171	3157	2837	2325	1913	1899	1634	1632	1548	1545	1320
5	10	3187	3187	3064	3050	2748	2260	1847	1834	1576	1575	1494	1492	1272
5	15	3080	3080	2961	2949	2654	2195	1783	1771	1521	1520	1442	1440	1225
5	20	2978	2978	2862	2851	2566	2130	1719	1711	1468	1467	1391	1389	1176
5	25	2878	2878	2764	2756	2474	2067	1659	1654	1417	1416	1339	1339	1123
5	30	2781	2781	2669	2664	2388	2005	1602	1598	1365	1365	1289	1289	1068
5	35	2687	2687	2578	2574	2299	1944	1546	1543	1315	1314	1238	1238	1011
5	40	2595	2595	2488	2485	2216	1884	1492	1490	1264	1264	1185	1185	950
5	45	2506	2506	2401	2398	2129	1826	1440	1438	1213	1212	1132	1132	891
5	50	2419	2419	2315	2313	2049	1770	1388	1386	1161	1160	1079	1079	834
5	55	2334	2334	2230	2230	1965	1714	1335	1335	1109	1108	1025	1025	780
6	0	2250	2250	2147	2147	1887	1660	1284	1284	1057	1056	973	973	729
Peak	(cfs)	5123	5123	5128	5073	5119	3011	3209	3135	3242	3213	3227	3139	3272
Peak	(hrs)	3	3	3	3	3	3	3	3	3	3	3	3	2
Peak	(min)	15	15	10	10	0	55	25	25	10	10	5	5	50
Peak	(cfs_or_ac.ft.)	0	7	0	5	2748	12	0	7	0	8	0	6	0
Case	(),S,I,D,O)	( )	( )	( )	( )	(I)	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6
Peak/Area	(cfs/ac)	n/a	0.44	0.44	0.45	0.45	0.27	0.28	0.29	0.30	0.31	0.31	0.32	0.34
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Summary	File:	P:\coweld01\existi~1\Goddin~1\50_Year\udswmm\ghxc50yr.txt												

GODDING HOLLOW BASIN, EXISTING CONDITION

50-YEAR

Time(Hrs)	Time(Min)	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108	Elem308	Elem708	Elem309	Elem208	Elem109	Elem709
0	5	0	0	0	0	0	2	0	0	0	0	0	0	0
0	10	0	0	0	0	0	4	0	0	0	0	0	0	0
0	15	0	2	0	1	1	7	0	0	0	0	0	0	6
0	20	0	8	0	4	3	10	0	1	3	2	4	3	35
0	25	1	31	0	12	5	12	0	5	18	12	23	17	73
0	30	12	134	5	66	8	17	2	31	106	64	125	75	273
0	35	56	336	26	178	15	37	16	107	294	177	272	147	683
0	40	162	598	84	335	37	99	65	254	571	363	525	334	1117
0	45	238	876	190	525	100	221	172	441	766	469	863	636	1466
0	50	327	1063	262	739	213	367	305	517	887	522	1231	993	1791
0	55	435	1210	353	939	349	485	410	544	982	588	1604	1369	2112
1	0	555	1330	465	1088	469	568	483	575	1081	675	1970	1736	2390
1	5	681	1433	587	1183	561	632	538	612	1188	781	2294	2066	2602
1	10	809	1526	708	1241	632	689	589	663	1626	1219	2555	2336	2734
1	15	936	1604	819	1287	696	750	645	763	2770	2363	2736	2529	2784
1	20	1057	1662	920	1318	747	816	706	904	3103	2701	2833	2640	2757
1	25	1168	1700	1007	1338	793	936	822	1208	3207	2814	2851	2674	2669
1	30	1268	1731	1085	1397	881	1180	1064	1840	3203	2824	2802	2641	2538
1	35	1358	1768	1169	1532	1048	1557	1437	2340	3130	2767	2704	2558	2383
1	40	1441	1833	1279	1776	1325	2046	1891	2877	3009	2664	2573	2440	2217
1	45	1527	1950	1436	2135	1716	2562	2301	2919	2859	2530	2422	2301	2051
1	50	1627	2129	1652	2551	2162	2950	2538	2814	2693	2380	2263	2153	1891
1	55	1749	2364	1920	2918	2556	3118	2623	2661	2520	2222	2103	2004	1739
2	0	1899	2620	2207	3166	2829	3164	2603	2494	2348	2065	1948	1857	1597
2	5	2072	2862	2476	3297	2983	3141	2521	2325	2181	1912	1800	1717	1464
2	10	2259	3063	2702	3336	3044	3081	2408	2183	2021	1765	1659	1584	1338
2	15	2446	3211	2873	3317	3046	3014	2298	2107	1868	1627	1526	1458	1222
2	20	2623	3305	2989	3266	3014	2946	2199	2009	1725	1496	1402	1340	1115
2	25	2778	3352	3057	3197	2962	2866	2098	1898	1590	1374	1286	1230	1017
2	30	2907	3361	3084	3111	2894	2771	1993	1780	1465	1261	1180	1129	927
2	35	3007	3338	3078	3012	2810	2662	1884	1662	1349	1156	1081	1036	846
2	40	3076	3289	3044	2901	2713	2545	1775	1551	1271	1089	991	950	771
2	45	3117	3218	2987	2781	2607	2425	1669	1456	1229	1057	908	870	700
2	50	3130	3132	2913	2658	2496	2308	1571	1376	1177	1014	831	797	634
2	55	3119	3033	2826	2536	2385	2197	1483	1303	1118	964	759	729	576
3	0	3087	2927	2731	2416	2276	2090	1403	1235	1055	910	694	667	525
3	5	3039	2817	2630	2300	2170	1986	1328	1167	990	855	635	610	477
3	10	2976	2705	2526	2188	2067	1885	1257	1101	922	799	581	558	431
3	15	2902	2592	2422	2079	1967	1787	1189	1039	888	776	530	509	387
3	20	2820	2481	2317	1975	1870	1695	1129	1004	858	756	483	464	347
3	25	2733	2371	2215	1877	1780	1618	1083	994	827	735	439	422	309
3	30	2641	2266	2116	1789	1699	1553	1049	982	797	712	398	383	277
3	35	2549	2167	2023	1711	1627	1495	1024	969	765	687	361	348	248
3	40	2456	2074	1935	1640	1562	1439	1002	955	734	662	328	316	222
3	45	2364	1987	1852	1570	1498	1366	983	939	703	637	294	287	199
3	50	2275	1904	1773	1500	1433	1303	965	923	672	611	266	261	179
3	55	2188	1825	1698	1435	1373	1253	948	906	641	585	241	237	161
4	0	2104	1750	1627	1376	1318	1208	930	888	611	559	219	216	146
4	5	2024	1680	1560	1322	1269	1168	912	869	581	534	200	198	133
4	10	1946	1614	1498	1273	1224	1129	894	849	552	509	183	182	122
4	15	1873	1553	1439	1228	1182	1092	875	829	515	475	167	167	111
4	20	1803	1497	1385	1185	1143	1056	856	807	459	424	154	154	101
4	25	1736	1443	1334	1144	1105	1019	834	776	225	192	143	143	91
4	30	1673	1393	1286	1104	1067	980	808	739	176	146	132	132	82
4	35	1613	1345	1240	1063	1029	937	779	702	157	130	122	122	74
4	40	1557	1298	1195	1021	989	893	748	666	144	120	114	114	67
4	45	1502	1250	1151	978	949	849	715	632	134	112	106	106	60
4	50	1450	1205	1108	935	908	806	682	599	125	104	100	100	54
4	55	1399	1160	1066	893	868	768	650	568	117	98	95	95	48
5	0	1350	1117	1023	851	827	725	612	539	107	90	83	83	35
5	5	1303	1074	982	807	785	677	567	510	90	75	62	62	28
5	10	1256	1030	939	754	734	613	505	376	68	58	47	47	23
5	15	1210	978	887	629	610	514	407	234	53	45	38	38	19
5	20	1162	912	823	523	506	412	306	150	42	36	31	31	17
5	25	1111	841	752	429	413	331	226	99	34	29	25	25	14
5	30	1057	769	681	353	338	270	166	69	29	24	21	21	13
5	35	1000	700	612	294	280	227	124	50	24	21	18	18	11
5	40	943	637	548	250	237	196	94	37	20	18	16	16	10
5	45	886	579	491	217	205	174	72	29	17	16	14	14	10
5	50	831	528	441	193	181	158	57	23	15	14	13	13	9
5	55	778	484	397	174	164	146	45	19	14	12	12	12	8
6	0	727	445	358	157	151	137	37	16	12	11	10	10	8
Peak	(cfs)	3130	3361	3084	3336	3046	3164	2623	2919	3207	2824	2851	2674	2784
Peak	(hrs)	2	2	2	2	2	2	1	1	1	1	1	1	1
Peak	(min)	50	30	30	10	15	0	55	45	25	30	25	25	15
Peak	(cfs_or_ac.ft.)	7	0	7	0	12	0	11	84	0	49	0	6	0
Case	(()S,I,D,O)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(S)	(_)	(S)	(_)	(_)	(_)
Area	(ac)	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8	4197.8	4197.8	3548.8	3548.8	3283.2	3283.2
Peak/Area	(cfs/ac)	0.35	0.38	0.42	0.46	0.48	0.50	0.62	0.70	0.76	0.80	0.80	0.81	0.85
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Summary	File:													

GODDING HOLLOW BASIN, EXISTING CONDITION

50-YEAR

Time(Hrs)	Time(Min)	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	3	0	0	0	0	1	0	0	0	0	0
0	15	6	5	40	1	7	7	1	10	0	0	0	0	0
0	20	34	33	106	11	29	28	10	37	0	0	2	0	2
0	25	64	58	238	46	92	87	37	82	2	1	11	3	11
0	30	200	150	581	125	288	261	77	244	33	19	116	41	94
0	35	471	355	828	313	528	459	195	570	162	130	312	146	208
0	40	759	595	970	576	794	684	425	875	364	319	449	220	318
0	45	1002	821	1153	875	1090	949	720	1170.00	532	481	572	313	384
0	50	1236	1054	1394	1187	1385	1229	1030	1423.00	652	601	660	380	419
0	55	1485	1302	1630	1475	1634	1474	1305	1608.00	725	676	706	411	422
1	0	1717	1539	1820	1701	1811	1653	1512	1707.00	758	708	714	413	405
1	5	1910	1740	1957	1851	1915	1760	1638	1738.00	758	707	699	397	379
1	10	2045	1885	2016	1927	1949	1794	1692	1715.00	737	687	672	373	351
1	15	2110	1961	2011	1936	1924	1772	1687	1651.00	705	657	637	345	320
1	20	2109	1972	1949	1891	1853	1706	1638	1561.00	665	620	595	315	288
1	25	2053	1929	1852	1808	1751	1613	1560	1454.00	619	577	549	283	255
1	30	1960	1849	1735	1701	1633	1504	1463	1340.00	570	531	502	252	223
1	35	1845	1745	1609	1580	1506	1386	1357	1224.00	522	485	456	222	195
1	40	1719	1629	1483	1457	1382	1271	1248	1113.00	476	441	413	195	169
1	45	1592	1511	1362	1337	1264	1160	1142	1010.00	433	401	374	171	147
1	50	1467	1395	1248	1223	1154	1056	1041	914	394	363	338	151	128
1	55	1349	1284	1142	1117	1051	960	946	824	355	326	298	125	112
2	0	1238	1179	1043	1018	955	870	858	741	317	290	265	104	98
2	5	1133	1081	947	926	865	786	776	667	285	260	239	92	85
2	10	1034	987	859	841	784	711	702	601	259	235	216	80	75
2	15	943	900	780	764	711	643	636	543	235	213	196	70	65
2	20	859	821	707	694	646	582	576	491	214	193	177	62	57
2	25	782	748	641	631	586	527	522	442	195	175	161	55	51
2	30	712	682	583	574	532	477	473	399	178	160	146	48	45
2	35	649	622	530	522	484	433	429	360	161	144	128	38	29
2	40	592	568	483	475	438	391	388	320	143	127	109	27	20
2	45	541	519	439	431	395	351	348	283	126	110	95	19	14
2	50	493	474	397	390	356	315	312	250	111	97	84	14	10
2	55	449	432	359	351	319	281	279	221	99	85	72	10	8
3	0	409	393	324	316	286	251	249	195	87	74	63	8	6
3	5	371	357	289	285	257	224	222	172	77	66	56	6	5
3	10	335	323	257	255	228	198	198	151	69	58	50	4	2
3	15	299	291	228	228	203	175	175	127	59	52	44	3	1
3	20	268	262	203	203	179	152	152	105	51	47	40	2	1
3	25	240	236	180	180	157	132	132	90	45	42	35	1	1
3	30	215	212	159	159	138	115	115	78	40	37	32	1	0
3	35	192	190	141	141	122	101	101	68	36	34	30	1	0
3	40	172	171	125	125	108	88	88	59	31	31	27	1	0
3	45	153	153	111	111	96	78	78	53	29	29	26	0	0
3	50	138	138	99	99	86	69	69	46	27	27	24	0	0
3	55	125	125	89	89	77	61	61	41	25	25	23	0	0
4	0	113	113	80	80	69	55	55	36	24	24	21	0	0
4	5	103	103	72	72	62	49	49	33	23	23	20	0	0
4	10	94	94	65	65	56	44	44	29	21	21	19	0	0
4	15	86	86	57	57	43	36	36	26	20	20	18	0	0
4	20	78	78	49	49	35	30	30	24	19	19	17	0	0
4	25	70	70	40	40	30	26	26	21	18	18	16	0	0
4	30	63	63	30	30	26	23	23	20	17	17	14	0	0
4	35	56	56	26	26	23	21	21	18	16	16	13	0	0
4	40	51	51	23	23	21	19	19	16	15	15	12	0	0
4	45	47	47	20	20	17	17	17	15	14	14	11	0	0
4	50	43	43	17	17	16	16	16	14	13	13	10	0	0
4	55	39	39	16	16	15	15	15	13	12	12	10	0	0
5	0	28	28	15	15	13	13	13	12	11	11	9	0	0
5	5	22	22	13	13	12	12	12	11	10	10	8	0	0
5	10	18	18	12	12	11	11	11	10	9	9	8	0	0
5	15	16	16	11	11	11	11	11	9	9	9	7	0	0
5	20	14	14	11	11	10	10	10	9	8	8	6	0	0
5	25	12	12	10	10	9	9	9	8	7	7	6	0	0
5	30	11	11	9	9	8	8	8	7	7	7	5	0	0
5	35	10	10	8	8	8	8	8	7	6	6	5	0	0
5	40	10	10	8	8	7	7	7	6	6	6	5	0	0
5	45	9	9	7	7	7	7	7	6	6	6	4	0	0
5	50	8	8	7	7	6	6	6	5	5	5	4	0	0
5	55	8	8	6	6	6	6	6	5	5	5	4	0	0
6	0	7	7	6	6	5	5	5	5	5	5	4	0	0
Peak	(cfs)	2110	1972	2016	1936	1949	1794	1692	1738.00	758	708	714	413	422
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1	0
Peak	(min)	15	20	10	15	10	10	10	5	0	0	0	0	55
Peak	(cfs_or_ac.ft.)	0	4	0	5	0	0	4	0	0	4	0	4	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6
Peak/Area	(cfs/ac)	0.85	0.86	0.88	0.90	0.91	0.93	0.93	0.96	0.91	0.93	0.94	1.16	1.19
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Summary	File:													

GODDING HOLLOW BASIN, EXISTING CONDITION

50-YEAR

Time(Hrs)	Time(Min)	Elem117	Elem217	Elem741	Elem341	Elem721	Elem321	Elem720	Elem225	Elem325	Elem237	Elem236	TotalTime(Hrs)
0	5	0	0	0	0	0	0	40	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	0	1	1	0	0	0	40	0	0	3	0	0.25
0	20	0	3	10	0	0	0	0	2	0	13	3	0.33
0	25	4	15	38	2	0	0	40	10	0	48	18	0.42
0	30	35	127	153	8	159	1	5	81	0	221	133	0.50
0	35	88	246	370	25	390	3	77	188	0	465	334	0.58
0	40	169	295	577	44	629	6	60	273	0	640	552	0.67
0	45	233	298	687	54	775	11	110	362	0	706	739	0.75
0	50	265	292	717	66	892	17	76	425	0	700	858	0.83
0	55	274	272	704	77	957	24	123	451	334	672	918	0.92
1	0	266	248	680	81	1022	31	87	452	462	627	938	1.00
1	5	251	226	647	83	1054	38	130	444	447	579	924	1.08
1	10	232	204	611	84	1101	46	93	429	436	531	887	1.17
1	15	212	181	571	85	1114	54	136	409	418	483	836	1.25
1	20	191	158	527	87	1138	61	99	384	395	432	777	1.33
1	25	169	135	482	88	1127	69	141	355	367	381	712	1.42
1	30	148	115	437	89	1129	77	103	325	338	332	645	1.50
1	35	129	97	396	89	1101	84	146	296	309	288	580	1.58
1	40	112	83	357	90	1090	267	284	269	281	251	519	1.67
1	45	97	70	323	91	1051	486	540	244	255	218	463	1.75
1	50	84	60	293	91	1030	638	648	222	231	191	413	1.83
1	55	73	51	266	92	982	739	785	201	210	167	369	1.92
2	0	63	44	243	92	954	801	805	183	191	147	329	2.00
2	5	55	37	221	93	901	836	877	166	173	129	294	2.08
2	10	48	32	202	93	867	849	849	147	155	113	263	2.17
2	15	42	27	183	93	808	846	886	133	139	98	234	2.25
2	20	37	23	166	93	772	831	831	119	125	85	208	2.33
2	25	33	19	150	94	714	807	847	108	113	74	185	2.42
2	30	30	16	136	94	680	777	777	97	102	64	165	2.50
2	35	20	10	123	94	625	743	783	88	92	55	146	2.58
2	40	13	7	111	94	594	706	706	80	83	48	125	2.67
2	45	9	5	100	94	542	668	708	70	74	41	105	2.75
2	50	7	4	91	94	515	630	630	60	64	36	91	2.83
2	55	5	3	83	94	467	592	632	53	56	31	79	2.92
3	0	4	2	75	94	440	554	554	48	50	27	69	3.00
3	5	3	2	69	94	396	517	557	44	46	23	61	3.08
3	10	2	0	62	94	376	481	481	40	42	17	53	3.17
3	15	1	0	56	94	337	447	487	36	38	13	45	3.25
3	20	1	0	49	94	322	415	415	33	34	10	39	3.33
3	25	1	0	43	93	286	385	425	30	31	8	33	3.42
3	30	0	0	38	93	273	356	356	27	28	6	29	3.50
3	35	0	0	33	93	237	328	368	24	25	5	25	3.58
3	40	0	0	29	93	228	302	302	22	23	4	21	3.67
3	45	0	0	26	93	197	278	318	20	21	3	15	3.75
3	50	0	0	22	93	191	255	255	18	19	2	11	3.83
3	55	0	0	16	92	164	234	274	16	17	2	9	3.92
4	0	0	0	12	92	161	214	214	15	15	1	7	4.00
4	5	0	0	10	92	136	196	236	12	13	0	5	4.08
4	10	0	0	8	92	134	180	180	9	10	0	4	4.17
4	15	0	0	6	92	112	164	204	7	10	0	2	4.25
4	20	0	0	5	91	112	150	150	5	9	0	1	4.33
4	25	0	0	3	91	91	137	177	4	8	0	1	4.42
4	30	0	0	3	91	92	124	124	3	8	0	1	4.50
4	35	0	0	2	91	68	112	152	2	7	0	1	4.58
4	40	0	0	2	90	68	100	100	1	6	0	1	4.67
4	45	0	0	2	90	48	89	129	1	5	0	1	4.75
4	50	0	0	2	90	41	87	87	0	4	0	0	4.83
4	55	0	0	1	90	18	86	126	0	4	0	0	4.92
5	0	0	0	1	90	19	86	86	0	3	0	0	5.00
5	5	0	0	1	89	2	85	125	0	3	0	0	5.08
5	10	0	0	1	89	8	85	85	0	2	0	0	5.17
5	15	0	0	1	89	0	84	124	0	2	0	0	5.25
5	20	0	0	1	89	0	83	83	0	2	0	0	5.33
5	25	0	0	1	88	0	83	123	0	1	0	0	5.42
5	30	0	0	1	88	0	82	82	0	1	0	0	5.50
5	35	0	0	1	88	0	82	122	0	1	0	0	5.58
5	40	0	0	1	88	0	81	81	0	1	0	0	5.67
5	45	0	0	1	88	0	80	120	0	1	0	0	5.75
5	50	0	0	0	87	0	80	80	0	1	0	0	5.83
5	55	0	0	0	87	0	79	119	0	1	0	0	5.92
6	0	0	0	0	87	0	78	78	0	0	0	0	6.00
Peak	(cfs)	274	298	717	94	1138	849	886	452	462	706	938	
Peak	(hrs)	0	0	0	2	1	2	2	1	1	0	1	
Peak	(min)	55	45	50	25	20	10	15	0	0	45	0	
Peak	(cfs_or_ac.ft.)	3	0	0	56	0	99	0	0	10	0	0	
Case	(),S,I,D,O)	( )	( )	( )	(S)	( )	(S)	( )	( )	(S)	( )	( )	
Area	(ac)	223.4	223.4	691.2	691.2	2172.2	2172.2	2172.2	490.9	490.9	540.8	889.6	
Peak/Area	(cfs/ac)	1.23	1.33	1.04	0.14	0.52	0.39	0.41	0.92	0.94	1.31	1.05	
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Summary	File:							P:\coweld01\existi~1\Goddin~1\50_Year\udswmm\ghxc50yr.txt					

GODDING HOLLOW BASIN, EXISTING CONDITION

100-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	1	0	0	0	0	0	0	0	0
0	15	0	0	0	0	1	0	1	0	0	0	1	0	0
0	20	0	0	4	2	33	0	4	0	0	0	6	0	3
0	25	4	4	20	15	66	1	16	0	2	2	23	0	14
0	30	24	24	63	38	103	5	76	1	22	20	119	6	92
0	35	80	80	151	88	320	30	201	10	107	95	328	41	283
0	40	170	170	241	129	578	96	388	55	309	275	628	145	568
0	45	282	282	370	212	896	222	642	176	600	538	880	230	808
0	50	350	350	552	357	1300	414	916	348	794	718	1081	320	1041
0	55	470	470	787	567	1665	567	1067	436	1000	918	1257	442	1255
1	0	657	657	1054	821	1923	612	1200	539	1202	1113	1414	589	1447
1	5	901	901	1336	1097	2186	666	1329	663	1392	1297	1569	753	1622
1	10	1185	1185	1627	1389	2460	731	1460	804	1572	1473	1726	929	1784
1	15	1491	1491	1927	1693	2745	807	1597	958	1744	1640	1874	1110	1935
1	20	1810	1810	2236	2006	3042	894	1735	1123	1905	1797	2008	1290	2063
1	25	2138	2138	2552	2328	3349	991	1870	1291	2050	1940	2126	1463	2167
1	30	2470	2470	2872	2657	3665	1097	2000	1460	2180	2068	2231	1624	2255
1	35	2804	2804	3195	2990	3974	1210	2124	1623	2294	2183	2327	1773	2343
1	40	3140	3140	3519	3325	4287	1328	2242	1779	2397	2287	2419	1913	2455
1	45	3475	3475	3845	3661	4605	1450	2354	1926	2496	2387	2518	2055	2613
1	50	3810	3810	4167	3994	4891	1574	2462	2065	2598	2492	2633	2209	2825
1	55	4139	4139	4481	4318	5178	1699	2568	2200	2714	2610	2773	2385	3084
2	0	4461	4461	4790	4636	5466	1825	2676	2335	2851	2751	2943	2588	3371
2	5	4774	4774	5083	4938	5685	1951	2792	2475	3014	2917	3141	2816	3663
2	10	5070	5070	5354	5216	5905	2080	2920	2626	3204	3110	3360	3062	3937
2	15	5346	5346	5610	5479	6129	2212	3063	2790	3413	3323	3587	3315	4172
2	20	5604	5604	5844	5721	6286	2349	3222	2970	3632	3545	3810	3560	4357
2	25	5839	5839	6053	5938	6449	2493	3395	3161	3848	3765	4015	3787	4486
2	30	6051	6051	6242	6132	6581	2645	3576	3359	4049	3969	4191	3983	4560
2	35	6238	6238	6403	6299	6668	2803	3759	3558	4223	4147	4331	4141	4583
2	40	6400	6400	6540	6442	6767	2968	3934	3748	4364	4291	4432	4258	4563
2	45	6540	6540	6662	6570	6863	3136	4095	3922	4465	4396	4492	4333	4507
2	50	6662	6662	6767	6680	6916	3303	4232	4073	4519	4463	4514	4369	4423
2	55	6765	6765	6851	6769	6958	3465	4342	4194	4540	4491	4502	4369	4317
3	0	6849	6849	6918	6841	6997	3618	4422	4286	4529	4485	4459	4338	4194
3	5	6915	6915	6967	6894	6991	3758	4472	4346	4489	4448	4391	4281	4060
3	10	6961	6961	6994	6925	6975	3881	4492	4375	4423	4386	4302	4202	3917
3	15	6986	6986	7000	6935	6933	3985	4485	4377	4337	4302	4197	4105	3769
3	20	6991	6991	6985	6923	6870	4068	4452	4352	4234	4201	4078	3994	3619
3	25	6973	6973	6947	6889	6778	4130	4397	4305	4118	4087	3950	3874	3468
3	30	6933	6933	6887	6832	6672	4170	4323	4238	3992	3963	3816	3747	3319
3	35	6873	6873	6808	6757	6556	4189	4233	4154	3859	3832	3678	3615	3172
3	40	6794	6794	6714	6665	6427	4187	4130	4058	3723	3697	3538	3481	3029
3	45	6699	6699	6602	6557	6273	4168	4018	3951	3584	3560	3398	3346	2892
3	50	6586	6586	6474	6432	6109	4131	3898	3837	3446	3423	3260	3213	2760
3	55	6458	6458	6330	6290	5923	4080	3774	3717	3309	3287	3125	3082	2634
4	0	6314	6314	6171	6133	5732	4016	3646	3594	3174	3154	2993	2954	2515
4	5	6157	6157	6003	5967	5549	3941	3517	3469	3043	3024	2866	2831	2403
4	10	5991	5991	5830	5796	5365	3858	3389	3344	2916	2898	2744	2712	2296
4	15	5819	5819	5651	5619	5167	3767	3262	3221	2793	2777	2628	2598	2196
4	20	5642	5642	5467	5437	4970	3671	3137	3099	2676	2660	2516	2489	2101
4	25	5459	5459	5277	5249	4762	3572	3015	2980	2563	2549	2410	2386	2011
4	30	5271	5271	5084	5057	4559	3469	2897	2864	2454	2443	2309	2287	1927
4	35	5081	5081	4892	4867	4379	3365	2782	2752	2351	2342	2213	2193	1848
4	40	4893	4893	4706	4683	4206	3260	2671	2644	2253	2246	2122	2104	1773
4	45	4709	4709	4524	4502	4026	3156	2565	2539	2161	2155	2036	2020	1703
4	50	4529	4529	4346	4325	3854	3053	2463	2439	2072	2067	1950	1940	1636
4	55	4352	4352	4169	4150	3676	2951	2365	2343	1987	1983	1871	1864	1573
5	0	4177	4177	3995	3977	3508	2851	2271	2251	1906	1904	1798	1792	1513
5	5	4007	4007	3829	3812	3374	2753	2182	2163	1831	1829	1728	1724	1456
5	10	3844	3844	3676	3659	3249	2658	2096	2080	1760	1758	1662	1659	1401
5	15	3692	3692	3531	3516	3120	2566	2015	2000	1693	1692	1599	1597	1348
5	20	3547	3547	3394	3380	3001	2476	1934	1924	1629	1628	1539	1537	1297
5	25	3409	3409	3258	3249	2878	2389	1859	1852	1568	1567	1480	1480	1246
5	30	3276	3276	3130	3123	2764	2305	1789	1783	1509	1509	1425	1425	1193
5	35	3148	3148	3006	3001	2647	2224	1722	1718	1453	1452	1370	1370	1137
5	40	3025	3025	2887	2884	2540	2146	1658	1655	1398	1397	1315	1315	1075
5	45	2906	2906	2772	2769	2429	2071	1596	1594	1343	1342	1260	1260	1014
5	50	2792	2792	2660	2658	2328	1999	1537	1535	1288	1287	1203	1203	953
5	55	2681	2681	2552	2550	2222	1930	1478	1478	1233	1232	1147	1147	893
6	0	2573	2573	2445	2445	2126	1863	1421	1421	1177	1177	1091	1091	835
Peak	(cfs)	6991	6991	7000	6935	6997	4189	4492	4377	4540	4491	4514	4369	4583
Peak	(hrs)	3	3	3	3	3	3	3	3	2	2	2	2	2
Peak	(min)	20	20	15	15	0	35	10	15	55	55	50	50	35
Peak	(cfs_or_ac.ft.)	0	8	0	5	3436	12	0	8	0	9	0	7	0
Case	(()S,I,D,O)	( )	( )	( )	( )	(I)	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6
Peak/Area	(cfs/ac)	n/a	0.60	0.60	0.61	0.62	0.37	0.40	0.41	0.43	0.43	0.43	0.45	0.47
11-23-1999	16:03:44													
Summary	File:	P:\coweld01\existi~1\Goddin~1\100_Year\udswmm\ghxc100y.txt												

GODDING HOLLOW BASIN, EXISTING CONDITION

100-YEAR

Time(Hrs)	Time(Min)	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108	Elem308	Elem708	Elem309	Elem208	Elem109	Elem709
0	5	0	0	0	0	0	2	0	0	0	0	0	0	0
0	10	0	0	0	0	0	4	0	0	0	0	0	0	0
0	15	0	2	0	1	1	7	0	0	0	0	0	0	6
0	20	0	9	0	4	3	10	0	1	4	2	5	4	37
0	25	2	34	1	14	5	12	0	7	23	14	27	19	83
0	30	14	157	6	78	8	18	3	39	131	78	153	91	327
0	35	70	408	34	220	17	45	21	132	359	215	328	173	838
0	40	189	738	110	420	47	126	85	312	702	443	661	424	1372
0	45	273	1068	221	664	128	273	212	504	863	493	1104	821	1835
0	50	389	1307	310	929	262	428	348	531	1002	558	1592	1293	2276
0	55	532	1504	431	1161	407	539	444	566	1136	651	2089	1791	2711
1	0	693	1667	578	1325	527	623	515	608	1277	774	2580	2280	3094
1	5	862	1808	732	1435	623	698	578	673	1960	1448	3020	2722	3392
1	10	1035	1934	883	1512	707	779	650	802	3365	2848	3369	3081	3569
1	15	1204	2028	1021	1549	764	866	730	985	3876	3357	3597	3326	3612
1	20	1362	2088	1142	1596	839	1103	961	1844	4102	3590	3698	3450	3546
1	25	1504	2137	1261	1744	1023	1667	1501	3059	4170	3672	3687	3462	3403
1	30	1635	2221	1414	2106	1427	2556	2279	3860	4124	3646	3592	3387	3213
1	35	1768	2393	1652	2716	2082	3447	2985	4007	3996	3540	3436	3249	2995
1	40	1924	2685	2003	3417	2828	3991	3423	3931	3812	3379	3242	3073	2769
1	45	2121	3077	2448	4011	3465	4295	3616	3764	3597	3184	3029	2876	2546
1	50	2369	3509	2928	4422	3915	4426	3636	3556	3365	2972	2810	2671	2333
1	55	2661	3918	3380	4652	4180	4439	3548	3329	3130	2756	2596	2469	2135
2	0	2979	4259	3759	4735	4297	4373	3396	3098	2900	2545	2390	2276	1951
2	5	3300	4508	4044	4713	4306	4255	3212	2871	2680	2343	2197	2093	1782
2	10	3600	4662	4229	4619	4240	4103	3013	2654	2472	2153	2016	1922	1624
2	15	3860	4727	4325	4476	4124	3929	2812	2448	2277	1976	1847	1762	1479
2	20	4068	4720	4345	4303	3977	3743	2614	2255	2095	1810	1691	1614	1347
2	25	4218	4654	4304	4116	3813	3565	2439	2146	1927	1658	1548	1478	1227
2	30	4312	4547	4220	3931	3649	3409	2297	2052	1772	1517	1417	1354	1120
2	35	4354	4414	4107	3754	3492	3261	2173	1941	1629	1389	1298	1240	1022
2	40	4350	4265	3977	3584	3341	3110	2054	1822	1499	1272	1189	1136	932
2	45	4310	4108	3837	3416	3190	2955	1936	1700	1379	1165	1089	1041	849
2	50	4240	3945	3689	3249	3038	2797	1819	1585	1292	1091	997	954	773
2	55	4148	3778	3537	3081	2886	2642	1708	1486	1250	1060	913	874	703
3	0	4038	3611	3383	2918	2736	2495	1606	1403	1197	1017	834	799	632
3	5	3915	3445	3228	2760	2592	2357	1514	1328	1137	967	761	729	572
3	10	3783	3281	3076	2611	2454	2228	1430	1257	1072	913	693	665	516
3	15	3645	3122	2927	2469	2324	2105	1353	1188	1006	856	631	605	461
3	20	3504	2969	2782	2335	2200	1988	1280	1120	939	798	572	549	413
3	25	3362	2821	2643	2207	2081	1875	1210	1058	907	775	519	497	367
3	30	3221	2680	2510	2086	1969	1770	1146	1008	877	754	469	450	327
3	35	3082	2545	2382	1973	1865	1680	1095	999	842	732	424	407	293
3	40	2946	2418	2261	1871	1771	1605	1059	987	807	708	384	368	262
3	45	2814	2299	2149	1782	1689	1541	1032	974	773	683	343	334	234
3	50	2688	2190	2044	1702	1616	1481	1009	960	738	657	309	302	211
3	55	2568	2089	1948	1629	1549	1421	990	945	705	631	279	274	189
4	0	2454	1996	1859	1556	1482	1340	971	928	672	604	253	250	171
4	5	2346	1908	1775	1483	1414	1277	953	910	640	578	230	228	155
4	10	2244	1824	1695	1415	1351	1226	935	892	608	552	210	208	141
4	15	2147	1745	1619	1354	1294	1181	917	872	577	526	191	191	129
4	20	2056	1672	1549	1299	1244	1139	898	852	547	501	175	175	117
4	25	1970	1604	1483	1249	1198	1100	879	831	505	464	162	162	106
4	30	1889	1541	1423	1202	1155	1062	859	806	379	342	149	149	95
4	35	1813	1482	1366	1158	1114	1023	835	773	209	175	138	138	85
4	40	1741	1426	1313	1115	1074	980	808	735	170	139	127	127	76
4	45	1673	1370	1263	1071	1033	935	777	698	153	125	118	118	68
4	50	1609	1319	1214	1026	991	890	745	662	141	115	109	109	60
4	55	1547	1269	1167	981	949	844	712	628	130	107	102	102	54
5	0	1489	1221	1121	937	906	802	679	595	121	100	96	96	47
5	5	1434	1175	1075	893	865	763	647	564	112	93	88	88	34
5	10	1380	1129	1031	850	824	718	606	534	92	79	64	64	26
5	15	1329	1084	987	805	780	671	561	505	70	60	48	48	21
5	20	1279	1037	942	743	720	598	490	333	53	45	37	37	18
5	25	1230	981	886	613	592	489	382	204	42	36	30	30	15
5	30	1178	913	818	503	484	388	283	129	34	29	25	25	13
5	35	1124	840	745	410	392	311	206	85	28	24	21	21	12
5	40	1067	766	672	336	319	254	151	58	22	20	18	18	11
5	45	1008	696	602	280	265	214	111	41	19	17	15	15	10
5	50	949	632	538	239	224	186	84	30	16	15	13	13	9
5	55	890	575	481	208	195	166	64	24	15	13	12	12	8
6	0	833	524	431	181	173	151	50	19	13	12	11	11	7
Peak	(cfs)	4354	4727	4345	4735	4306	4439	3636	4007	4170	3672	3698	3462	3612
Peak	(hrs)	2	2	2	2	2	1	1	1	1	1	1	1	1
Peak	(min)	35	15	20	0	5	55	50	35	25	25	20	25	15
Peak	(cfs_or_ac.ft.)	7	0	7	0	13	0	12	91	0	53	0	6	0
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	(S)	( )	(S)	( )	( )	( )
Area	(ac)	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8	4197.8	4197.8	3548.8	3548.8	3283.2	3283.2
Peak/Area	(cfs/ac)	0.49	0.53	0.59	0.65	0.68	0.70	0.87	0.95	0.99	1.03	1.04	1.05	1.10
11-23-1999	16:03:44													
Summary	File:													

GODDING HOLLOW BASIN, EXISTING CONDITION

100-YEAR

Time(Hrs)	Time(Min)	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	3	0	0	0	0	1	0	0	0	0	0
0	15	6	5	40	1	7	7	1	10	0	0	0	0	0
0	20	36	35	113	12	32	30	10	38	0	0	2	0	2
0	25	70	61	264	51	109	103	41	94	4	1	19	5	18
0	30	235	173	668	148	337	304	88	295	49	30	148	55	114
0	35	575	430	1002	383	642	558	240	693	216	173	374	168	260
0	40	943	741	1197	720	987	852	538	1090.00	467	407	564	278	401
0	45	1267	1041	1461	1112	1382	1208	925	1478.00	685	617	730	402	487
0	50	1586	1357	1787	1527	1774	1579	1332	1817.00	841	773	844	486	530
0	55	1924	1692	2105	1908	2105	1903	1691	2055.00	934	868	904	524	536
1	0	2243	2014	2370	2206	2342	2142	1957	2193.00	979	910	920	527	519
1	5	2510	2287	2559	2406	2487	2287	2122	2247.00	985	916	912	511	495
1	10	2684	2473	2618	2506	2531	2330	2195	2227.00	966	898	883	484	461
1	15	2747	2553	2583	2509	2487	2291	2187	2136.00	925	861	834	448	417
1	20	2716	2541	2485	2436	2380	2193	2113	2005.00	865	807	773	405	369
1	25	2620	2462	2344	2311	2232	2057	1997	1850.00	798	744	707	360	323
1	30	2481	2339	2183	2155	2065	1901	1856	1691.00	730	679	641	317	281
1	35	2318	2191	2012	1987	1890	1739	1707	1534.00	663	616	579	277	243
1	40	2146	2032	1843	1818	1723	1582	1558	1386.00	601	557	521	241	210
1	45	1973	1871	1682	1657	1566	1435	1416	1249.00	543	502	469	210	182
1	50	1808	1716	1532	1507	1420	1298	1282	1125.00	491	453	423	184	158
1	55	1652	1570	1394	1369	1288	1174	1160	1013.00	445	409	381	161	137
2	0	1508	1434	1268	1243	1167	1062	1049	913	403	370	343	140	119
2	5	1375	1308	1149	1128	1056	958	948	818	360	329	297	111	104
2	10	1251	1191	1039	1021	953	862	854	730	321	292	268	97	90
2	15	1136	1083	940	924	861	776	769	657	290	263	242	85	79
2	20	1032	985	853	836	779	700	693	592	262	237	218	74	69
2	25	939	896	775	759	706	633	627	534	238	215	197	65	60
2	30	855	817	705	689	641	573	567	482	216	194	178	57	52
2	35	779	745	640	627	583	519	514	435	196	176	160	48	42
2	40	710	679	580	570	528	469	465	389	176	157	139	36	28
2	45	646	619	526	518	477	422	419	345	155	138	119	25	18
2	50	589	564	477	468	430	379	376	305	136	120	104	18	13
2	55	536	514	431	423	386	339	336	268	120	104	88	13	9
3	0	487	467	388	380	346	301	299	235	104	90	77	10	7
3	5	441	423	346	341	308	267	265	203	88	79	68	7	5
3	10	397	382	306	305	273	235	233	176	76	70	59	5	2
3	15	353	343	271	271	241	205	205	153	66	62	53	3	1
3	20	315	308	240	240	213	180	180	132	58	55	47	2	1
3	25	281	276	214	214	188	158	158	110	52	50	43	1	1
3	30	252	248	189	189	165	137	137	94	46	45	38	1	0
3	35	225	222	167	167	145	119	119	80	40	40	35	1	0
3	40	201	199	148	148	128	104	104	71	37	37	32	1	0
3	45	179	179	131	131	114	91	91	62	34	34	30	0	0
3	50	161	161	117	117	102	81	81	54	32	32	28	0	0
3	55	145	145	105	105	91	71	71	47	30	30	26	0	0
4	0	131	131	94	94	81	63	63	42	28	28	24	0	0
4	5	119	119	84	84	73	56	56	37	26	26	23	0	0
4	10	108	108	76	76	65	50	50	33	24	24	21	0	0
4	15	98	98	67	67	55	45	45	29	22	22	19	0	0
4	20	89	89	58	58	44	37	37	26	21	21	18	0	0
4	25	80	80	49	49	35	30	30	23	19	19	16	0	0
4	30	72	72	40	40	29	25	25	21	18	18	15	0	0
4	35	64	64	30	30	25	22	22	19	16	16	14	0	0
4	40	57	57	25	25	22	20	20	17	15	15	12	0	0
4	45	51	51	21	21	18	18	18	15	14	14	11	0	0
4	50	47	47	18	18	16	16	16	14	13	13	10	0	0
4	55	43	43	16	16	15	15	15	13	12	12	9	0	0
5	0	38	38	15	15	14	14	14	12	11	11	9	0	0
5	5	27	27	14	14	12	12	12	11	10	10	8	0	0
5	10	21	21	12	12	11	11	11	10	9	9	7	0	0
5	15	17	17	11	11	11	11	11	9	9	9	7	0	0
5	20	15	15	11	11	10	10	10	8	8	8	6	0	0
5	25	13	13	10	10	9	9	9	8	7	7	6	0	0
5	30	12	12	9	9	8	8	8	7	7	7	5	0	0
5	35	10	10	8	8	8	8	8	7	6	6	5	0	0
5	40	10	10	8	8	7	7	7	6	6	6	5	0	0
5	45	9	9	7	7	7	7	7	6	5	5	4	0	0
5	50	8	8	7	7	6	6	6	5	5	5	4	0	0
5	55	8	8	6	6	6	6	6	5	5	5	4	0	0
6	0	7	7	6	6	5	5	5	5	4	4	3	0	0
Peak	(cfs)	2747	2553	2618	2509	2531	2330	2195	2247.00	985	916	920	527	536
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1	0
Peak	(min)	15	15	10	15	10	10	10	5	5	5	0	0	55
Peak	(cfs_or_ac.ft.)	0	4	0	5	0	0	4	0	0	4	0	4	0
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6
Peak/Area	(cfs/ac)	1.11	1.12	1.15	1.17	1.18	1.21	1.21	1.24	1.19	1.20	1.20	1.49	1.51
11-23-1999	16:03:44													
Summary	File:													

GODDING HOLLOW BASIN, EXISTING CONDITION

100-YEAR

Time(Hrs)	Time(Min)	Elem117	Elem217	Elem741	Elem341	Elem721	Elem321	Elem720	Elem225	Elem325	Elem237	Elem236	TotalTime(Hrs)
0	5	0	0	0	0	0	0	40	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	0	1	1	0	0	0	40	0	0	3	0	0.25
0	20	1	4	10	0	0	0	0	3	0	15	4	0.33
0	25	7	24	43	2	1	0	40	17	0	59	25	0.42
0	30	41	156	179	9	204	1	11	115	0	265	167	0.50
0	35	112	303	446	30	478	3	90	242	0	563	404	0.58
0	40	217	364	710	47	778	8	78	351	0	781	680	0.67
0	45	297	374	854	60	957	14	132	466	0	870	920	0.75
0	50	337	367	899	74	1130	22	100	543	222	871	1077	0.83
0	55	348	346	888	81	1211	30	149	575	587	842	1158	0.92
1	0	340	322	865	83	1326	39	116	580	576	798	1191	1.00
1	5	325	302	837	85	1378	49	163	574	577	751	1185	1.08
1	10	304	272	799	87	1471	59	127	556	564	695	1147	1.17
1	15	277	235	743	89	1483	69	170	528	540	624	1081	1.25
1	20	246	201	674	91	1527	79	132	491	507	547	996	1.33
1	25	215	170	606	92	1499	189	274	449	467	473	902	1.42
1	30	186	144	544	93	1511	549	587	407	425	409	810	1.50
1	35	160	121	489	94	1460	805	877	368	385	353	723	1.58
1	40	138	103	440	95	1453	983	1010	333	348	306	643	1.67
1	45	118	87	397	96	1384	1102	1164	301	315	265	571	1.75
1	50	102	74	359	97	1361	1176	1193	272	285	231	507	1.83
1	55	88	63	326	97	1279	1215	1269	246	257	202	450	1.92
2	0	76	54	297	98	1246	1228	1238	219	231	177	401	2.00
2	5	66	46	270	98	1157	1221	1268	197	206	154	357	2.08
2	10	58	39	245	99	1120	1198	1202	178	186	134	317	2.17
2	15	50	33	223	99	1028	1164	1206	160	168	116	282	2.25
2	20	44	28	202	99	990	1122	1122	145	152	101	251	2.33
2	25	38	23	183	100	899	1073	1113	131	137	88	223	2.42
2	30	34	19	167	100	864	1021	1021	119	124	77	198	2.50
2	35	30	13	152	100	777	966	1006	106	112	67	176	2.58
2	40	19	9	138	100	748	910	910	97	101	58	156	2.67
2	45	12	7	125	100	667	855	895	88	92	50	137	2.75
2	50	9	5	113	100	643	800	800	80	83	44	115	2.83
2	55	6	4	102	100	568	747	787	72	75	38	99	2.92
3	0	5	3	93	100	548	695	695	63	67	33	86	3.00
3	5	4	2	84	100	478	645	685	55	58	28	75	3.08
3	10	2	0	76	100	466	598	598	50	52	20	65	3.17
3	15	1	0	68	100	403	553	593	45	47	15	55	3.25
3	20	1	0	60	100	397	512	512	41	42	11	47	3.33
3	25	1	0	53	100	340	472	512	37	38	9	40	3.42
3	30	0	0	46	100	337	436	436	33	35	7	35	3.50
3	35	0	0	40	100	281	401	441	30	32	5	30	3.58
3	40	0	0	35	100	283	368	368	27	29	4	25	3.67
3	45	0	0	31	99	233	338	378	25	26	3	18	3.75
3	50	0	0	27	99	239	310	310	23	23	2	13	3.83
3	55	0	0	19	99	193	284	324	20	21	2	10	3.92
4	0	0	0	15	99	202	261	261	18	19	2	8	4.00
4	5	0	0	12	99	159	239	279	15	16	0	6	4.08
4	10	0	0	9	98	170	218	218	11	13	0	4	4.17
4	15	0	0	7	98	129	199	239	8	10	0	2	4.25
4	20	0	0	6	98	143	182	182	6	9	0	2	4.33
4	25	0	0	3	98	104	166	206	5	9	0	1	4.42
4	30	0	0	3	97	120	151	151	3	8	0	1	4.50
4	35	0	0	3	97	78	137	177	2	7	0	1	4.58
4	40	0	0	2	97	93	123	123	1	6	0	1	4.67
4	45	0	0	2	97	55	110	150	1	5	0	1	4.75
4	50	0	0	2	96	73	97	97	0	5	0	0	4.83
4	55	0	0	2	96	33	87	127	0	4	0	0	4.92
5	0	0	0	1	96	44	87	87	0	3	0	0	5.00
5	5	0	0	1	96	5	86	126	0	3	0	0	5.08
5	10	0	0	1	95	25	86	86	0	2	0	0	5.17
5	15	0	0	1	95	0	85	125	0	2	0	0	5.25
5	20	0	0	1	95	7	84	84	0	2	0	0	5.33
5	25	0	0	1	95	0	84	124	0	1	0	0	5.42
5	30	0	0	1	94	0	83	83	0	1	0	0	5.50
5	35	0	0	1	94	0	83	123	0	1	0	0	5.58
5	40	0	0	1	94	0	82	82	0	1	0	0	5.67
5	45	0	0	1	94	0	81	121	0	1	0	0	5.75
5	50	0	0	1	94	0	81	81	0	1	0	0	5.83
5	55	0	0	0	93	0	80	120	0	1	0	0	5.92
6	0	0	0	0	93	0	79	79	0	0	0	0	6.00
Peak	(cfs)	348	374	899	100	1527	1228	1269	580	587	871	1191	
Peak	(hrs)	0	0	0	2	1	2	1	1	0	0	1	
Peak	(min)	55	45	50	25	20	0	55	0	55	50	0	
Peak	(cfs_or_ac.ft.)	3	0	0	72	0	107	0	0	10	0	0	
Case	(()S,I,D,O)	( )	( )	( )	(S)	( )	(S)	( )	( )	(S)	( )	( )	
Area	(ac)	223.4	223.4	691.2	691.2	2172.2	2172.2	2172.2	490.9	490.9	540.8	889.6	
Peak/Area	(cfs/ac)	1.56	1.67	1.30	0.14	0.70	0.57	0.58	1.18	1.20	1.61	1.34	
11-23-1999	16:03:44												
Summary	File:							P:\coweld01\existi~1\Goddin~1\100_Year\udswmm\ghxc100y.txt					

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

2-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	0	0	0	0	2	0	0	0	0	0	1	0	0
0	25	0	0	1	0	4	0	2	0	0	0	3	0	2
0	30	0	0	3	1	6	0	5	0	1	1	9	0	6
0	35	2	2	8	3	24	1	13	0	4	3	20	1	13
0	40	6	6	19	11	43	2	24	0	11	9	38	2	27
0	45	18	18	37	24	65	6	40	2	24	20	59	7	47
0	50	37	37	62	45	102	13	57	6	43	37	83	16	73
0	55	66	66	97	76	143	23	76	15	67	58	110	31	105
1	0	94	94	113	89	187	37	99	29	96	85	141	52	142
1	5	114	114	128	101	221	55	127	50	129	116	176	80	184
1	10	132	132	146	117	260	78	159	76	167	152	217	115	230
1	15	152	152	168	137	303	105	196	109	208	192	259	154	263
1	20	176	176	195	162	350	137	237	147	251	234	296	188	287
1	25	205	205	226	192	402	174	280	187	287	269	309	199	312
1	30	238	238	262	227	457	214	321	226	312	293	324	213	338
1	35	277	277	304	268	513	254	357	261	333	313	340	229	364
1	40	299	299	349	313	568	294	388	291	352	332	358	247	392
1	45	327	327	398	361	621	331	416	318	372	351	378	267	422
1	50	362	362	450	412	672	364	434	336	393	372	400	289	454
1	55	404	404	502	464	718	391	448	349	415	394	424	314	486
2	0	451	451	555	516	759	414	462	363	439	417	450	340	519
2	5	502	502	606	568	799	434	476	378	464	443	477	368	552
2	10	555	555	656	618	837	452	492	394	491	470	505	398	584
2	15	607	607	704	666	875	470	508	411	519	498	534	428	615
2	20	659	659	751	713	911	488	527	430	548	527	564	459	645
2	25	710	710	797	759	948	506	546	450	576	554	594	491	672
2	30	759	759	841	803	985	525	567	471	596	574	624	522	698
2	35	806	806	884	846	1017	543	587	492	621	599	653	553	722
2	40	851	851	923	886	1038	551	609	514	648	626	682	583	743
2	45	893	893	959	922	1059	558	631	538	676	654	709	611	763
2	50	932	932	991	954	1074	565	654	562	704	682	735	639	780
2	55	967	967	1020	983	1089	574	678	587	731	709	759	665	796
3	0	999	999	1045	1009	1106	583	703	612	756	735	781	689	810
3	5	1027	1027	1068	1032	1119	593	727	638	781	759	801	711	822
3	10	1052	1052	1089	1054	1133	605	751	664	803	782	820	732	833
3	15	1075	1075	1108	1073	1143	618	775	689	823	802	837	751	842
3	20	1096	1096	1125	1090	1154	631	798	713	841	821	851	768	849
3	25	1114	1114	1141	1107	1166	646	819	737	858	837	864	783	856
3	30	1131	1131	1155	1122	1179	662	839	759	872	852	875	797	861
3	35	1147	1147	1169	1136	1187	678	858	780	884	864	884	809	864
3	40	1161	1161	1181	1149	1196	694	875	799	894	875	892	819	867
3	45	1174	1174	1192	1161	1206	711	890	816	903	884	898	828	868
3	50	1186	1186	1203	1172	1212	728	904	832	910	891	902	836	869
3	55	1197	1197	1212	1183	1220	745	916	847	915	897	905	842	868
4	0	1207	1207	1221	1192	1226	762	926	859	919	901	908	846	867
4	5	1216	1216	1229	1201	1232	778	935	870	922	904	909	850	865
4	10	1224	1224	1236	1209	1236	793	942	880	923	906	909	853	863
4	15	1232	1232	1242	1216	1240	808	948	888	924	907	908	854	859
4	20	1238	1238	1248	1222	1243	822	953	894	923	907	906	855	855
4	25	1244	1244	1252	1227	1246	835	956	899	922	906	903	854	851
4	30	1249	1249	1256	1232	1246	848	958	903	920	904	900	853	846
4	35	1253	1253	1259	1235	1247	859	959	906	916	901	896	851	839
4	40	1257	1257	1261	1238	1245	869	958	908	913	898	891	848	833
4	45	1259	1259	1261	1239	1243	878	957	908	908	894	886	845	825
4	50	1260	1260	1261	1240	1240	886	955	908	903	889	879	840	816
4	55	1260	1260	1260	1239	1236	893	952	906	897	883	872	835	804
5	0	1260	1260	1258	1238	1230	899	948	904	889	876	864	828	791
5	5	1258	1258	1255	1235	1226	904	943	900	881	868	854	820	775
5	10	1256	1256	1252	1233	1220	908	937	896	872	859	843	810	758
5	15	1253	1253	1247	1229	1214	910	931	891	861	849	830	798	738
5	20	1249	1249	1243	1225	1207	912	923	884	849	837	816	786	717
5	25	1244	1244	1237	1219	1199	913	914	877	836	824	800	771	696
5	30	1239	1239	1230	1213	1189	912	904	868	821	810	783	756	674
5	35	1232	1232	1223	1206	1179	911	893	858	805	794	765	739	652
5	40	1225	1225	1214	1198	1167	908	881	847	789	777	747	722	631
5	45	1217	1217	1205	1189	1154	905	867	835	771	760	728	704	610
5	50	1208	1208	1194	1179	1140	900	853	822	752	742	708	685	589
5	55	1199	1199	1183	1168	1126	894	838	808	734	723	689	667	570
6	0	1188	1188	1171	1157	1110	888	822	793	715	704	669	648	551
Peak	(cfs)	1260	1260	1261	1240	1247	913	959	908	924	907	909	855	869
Peak	(hrs)	4	4	4	4	4	5	4	4	4	4	4	4	3
Peak	(min)	50	50	40	50	35	25	35	40	15	15	5	20	50
Peak	(cfs_or_ac.ft.)	0	6	0	4	393	11	0	6	0	6	0	5	0
Case	(()S,I,D,O)	(_)	(_)	(_)	(_)	(I)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6
Peak/Area	(cfs/ac)	n/a	0.11	0.11	0.11	0.11	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09
11-23-1999	16:04:40													
Summary	File:	P:\coweld01\future~2\Goddin~1\2_Year\udswmm\ghod2yr.txt												

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

2-YEAR

Time(Hrs)	Time(Min)	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108	Elem308	Elem708	Elem309	Elem208	Elem109	Elem709
0	5	0	0	0	0	0	2	0	0	0	0	0	0	0
0	10	0	0	0	0	0	4	0	0	0	0	0	0	0
0	15	0	0	0	1	1	7	0	0	0	0	0	0	1
0	20	0	1	0	3	3	10	0	0	1	1	1	0	8
0	25	0	4	0	7	5	12	0	2	6	4	8	5	43
0	30	0	12	1	12	8	14	0	7	23	16	29	20	76
0	35	2	28	2	21	10	17	2	22	57	43	66	49	127
0	40	6	53	6	34	14	24	8	49	108	83	116	92	183
0	45	16	84	12	52	21	40	22	86	153	119	135	105	234
0	50	32	119	22	77	35	65	47	124	188	145	164	129	281
0	55	54	157	38	108	57	98	79	162	227	176	201	163	325
1	0	84	199	60	147	88	137	116	201	271	215	245	205	368
1	5	119	244	90	192	127	179	158	244	320	260	292	251	410
1	10	160	293	127	241	170	225	203	290	372	307	341	298	449
1	15	189	345	171	294	218	274	251	338	423	355	388	345	482
1	20	210	388	208	348	270	326	301	388	472	402	433	389	508
1	25	232	418	234	404	323	378	352	435	514	442	472	429	529
1	30	256	451	264	459	376	428	400	473	521	448	505	462	545
1	35	282	486	299	510	425	470	441	497	531	456	533	490	556
1	40	309	523	336	553	466	500	470	502	542	466	555	512	563
1	45	339	561	374	583	496	518	486	505	553	477	572	530	568
1	50	370	598	411	603	516	530	497	509	565	489	585	542	569
1	55	402	631	445	617	528	538	504	513	577	500	593	551	568
2	0	436	661	476	626	538	545	509	517	584	507	597	556	564
2	5	469	687	504	634	545	552	514	522	591	514	598	557	557
2	10	502	710	528	640	552	558	519	526	596	520	597	556	550
2	15	534	729	549	646	559	564	524	531	601	525	593	553	543
2	20	564	746	567	652	565	570	529	536	606	530	589	549	537
2	25	592	760	584	658	571	577	533	540	610	534	584	544	531
2	30	619	773	598	663	577	583	538	545	613	537	578	538	522
2	35	643	785	611	669	583	589	543	549	615	540	570	531	513
2	40	666	794	623	674	589	594	547	554	616	542	562	524	502
2	45	687	803	633	679	595	600	551	558	617	543	553	515	492
2	50	706	810	642	684	601	605	556	562	616	543	543	506	481
2	55	723	815	651	688	606	611	560	565	615	543	533	496	471
3	0	738	821	658	692	611	615	563	568	613	542	522	487	460
3	5	752	825	665	695	616	620	566	571	610	540	512	477	450
3	10	764	829	671	698	620	624	569	573	607	538	501	466	438
3	15	774	831	677	701	624	627	572	575	602	534	489	455	425
3	20	784	833	682	703	628	631	574	577	597	531	476	444	410
3	25	792	834	686	705	631	633	576	578	591	526	462	431	396
3	30	799	834	690	705	633	636	577	579	584	521	448	418	382
3	35	805	833	693	706	636	637	578	579	577	515	434	405	367
3	40	809	832	695	705	637	638	578	579	569	509	419	391	353
3	45	813	830	697	704	638	639	578	578	560	502	405	378	339
3	50	815	827	698	703	639	639	578	576	548	491	390	364	325
3	55	817	824	699	700	639	638	576	574	534	478	376	351	312
4	0	818	821	699	698	638	637	574	571	519	466	362	338	298
4	5	818	816	698	694	636	635	571	567	505	453	348	325	285
4	10	817	812	697	690	634	631	568	562	480	429	334	312	272
4	15	816	806	695	685	630	627	563	554	392	343	320	299	260
4	20	814	800	692	678	625	620	555	543	366	318	307	287	248
4	25	811	794	689	668	618	611	546	531	349	303	294	275	236
4	30	808	786	684	657	609	600	535	518	335	290	282	263	224
4	35	803	776	677	645	598	589	524	506	321	278	269	251	214
4	40	798	766	669	629	584	567	502	455	308	266	258	240	203
4	45	792	753	659	602	558	527	462	386	295	254	246	230	193
4	50	784	735	644	562	520	480	414	342	283	243	236	220	184
4	55	774	713	624	518	477	439	373	313	271	232	225	210	175
5	0	762	687	600	479	439	406	340	291	260	222	215	201	167
5	5	748	659	574	445	407	380	314	275	249	213	206	192	160
5	10	731	630	548	418	382	359	293	261	239	204	197	184	152
5	15	713	602	522	396	361	342	276	249	229	195	189	176	146
5	20	693	576	498	377	343	327	261	238	220	187	181	169	139
5	25	673	551	475	361	329	315	249	228	212	179	174	162	133
5	30	652	528	454	348	316	304	238	219	203	172	167	155	128
5	35	631	507	434	335	305	294	228	210	196	165	160	149	122
5	40	611	487	416	324	294	284	218	202	188	158	154	143	117
5	45	591	469	399	313	285	275	210	194	181	152	148	138	113
5	50	571	452	384	304	276	267	202	187	175	147	143	133	108
5	55	552	436	370	294	268	259	194	180	169	141	137	128	104
6	0	534	422	357	286	260	252	187	174	163	136	132	123	100
Peak	(cfs)	818	834	699	706	639	639	578	579	617	543	598	557	569
Peak	(hrs)	4	3	3	3	3	3	3	3	2	2	2	2	1
Peak	(min)	0	25	55	35	50	45	35	30	45	45	5	5	50
Peak	(cfs_or_ac.ft.)	5	0	5	0	9	0	8	14	0	9	0	4	0
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	(S)	( )	(S)	( )	( )	( )
Area	(ac)	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8	4197.8	4197.8	3548.8	3548.8	3283.2	3283.2
Peak/Area	(cfs/ac)	0.09	0.09	0.10	0.10	0.10	0.10	0.14	0.14	0.15	0.15	0.17	0.17	0.17
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Summary	File:													

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

2-YEAR

Time(Hrs)	Time(Min)	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	7	0	1	1	0	1	0	0	0	0	0
0	20	7	6	40	1	7	7	1	9	0	0	2	0	2
0	25	39	35	112	11	29	27	8	32	1	1	10	3	10
0	30	65	55	194	42	74	69	31	73	6	4	31	13	28
0	35	105	88	217	68	118	109	56	123	21	19	63	34	50
0	40	147	124	222	108	159	144	85	179	50	46	90	52	60
0	45	184	156	233	153	205	185	126	234	81	76	109	64	70
0	50	216	185	257	201	250	227	173	268	106	101	124	74	79
0	55	249	216	289	248	290	264	216	296	126	120	136	82	86
1	0	283	249	325	289	325	296	254	320	140	134	145	88	90
1	5	319	285	359	325	354	324	286	341	151	144	152	91	93
1	10	354	319	386	355	379	347	314	358	158	151	157	93	94
1	15	386	351	407	380	398	366	336	371	164	156	160	94	94
1	20	413	377	423	399	413	380	354	380	167	160	162	94	94
1	25	435	400	437	414	424	391	367	386	170	162	163	94	93
1	30	452	418	447	424	432	398	376	389	171	163	164	92	92
1	35	466	432	453	431	436	402	382	390	171	163	163	91	90
1	40	476	442	458	436	438	404	386	389	171	163	163	89	89
1	45	483	449	459	438	438	404	387	387	170	163	162	88	87
1	50	487	454	460	438	437	402	386	384	170	162	162	86	85
1	55	489	456	456	436	434	399	384	380	169	161	161	85	84
2	0	487	454	450	433	430	395	381	374	168	160	159	83	82
2	5	483	451	444	429	424	389	376	367	166	159	157	81	80
2	10	479	447	440	423	418	383	371	361	164	157	155	79	78
2	15	475	443	437	417	412	378	365	356	162	155	153	77	76
2	20	471	440	433	412	407	372	360	350	160	153	151	76	75
2	25	466	435	426	406	402	367	354	345	158	151	150	74	74
2	30	460	429	417	401	396	361	349	339	157	150	148	73	72
2	35	452	422	408	394	389	354	343	332	155	148	146	72	71
2	40	444	414	399	387	381	347	336	325	152	146	144	70	69
2	45	435	406	391	380	373	339	329	317	150	143	141	68	67
2	50	426	398	383	372	365	331	322	310	147	141	138	66	65
2	55	418	390	375	364	357	324	315	302	144	138	135	64	63
3	0	409	382	367	356	349	316	308	295	141	135	132	62	61
3	5	400	374	357	348	341	308	300	287	138	132	129	61	59
3	10	390	364	345	340	332	299	293	278	135	129	126	59	57
3	15	379	354	333	330	322	289	284	268	131	126	122	57	55
3	20	367	343	321	320	310	279	275	257	127	122	118	54	53
3	25	355	331	309	309	299	268	265	245	123	118	114	52	50
3	30	342	320	297	297	287	257	254	235	118	114	109	49	48
3	35	330	309	286	286	275	246	244	224	114	109	105	47	46
3	40	318	297	274	274	263	235	233	214	109	105	101	45	44
3	45	305	286	263	263	252	224	223	203	105	101	96	42	39
3	50	293	275	252	252	241	214	213	193	100	96	90	37	35
3	55	282	264	240	240	230	203	203	182	94	90	84	34	32
4	0	270	253	229	229	218	193	192	171	89	85	80	32	30
4	5	258	242	218	218	208	183	182	162	84	81	76	30	28
4	10	247	231	208	208	197	173	173	153	80	77	73	28	26
4	15	236	221	197	197	187	163	163	142	77	74	70	26	25
4	20	225	211	187	187	177	154	154	134	73	70	66	24	23
4	25	214	201	177	177	167	145	145	126	70	67	63	23	22
4	30	204	191	168	168	159	137	137	119	67	64	60	22	21
4	35	194	182	160	160	151	129	129	113	64	61	58	20	19
4	40	185	173	152	152	143	123	123	107	61	59	55	19	18
4	45	176	165	144	144	137	116	116	102	58	56	53	18	17
4	50	168	157	138	138	130	110	110	97	56	53	50	17	16
4	55	160	150	131	131	124	105	105	92	53	51	48	16	15
5	0	153	143	125	125	118	100	100	87	51	49	46	15	14
5	5	146	137	119	119	113	95	95	83	49	47	44	14	13
5	10	140	131	114	114	108	90	90	79	46	45	42	13	13
5	15	134	125	109	109	103	86	86	75	44	43	40	12	12
5	20	128	120	104	104	99	82	82	71	43	41	38	12	11
5	25	123	115	100	100	94	78	78	68	41	39	37	11	10
5	30	118	110	95	95	90	74	74	64	39	37	35	10	10
5	35	113	105	91	91	86	71	71	61	37	36	33	10	9
5	40	108	101	87	87	83	67	67	58	36	34	32	9	9
5	45	104	97	84	84	79	64	64	56	34	33	31	9	8
5	50	99	93	80	80	76	61	61	53	33	31	29	8	8
5	55	95	89	77	77	72	58	58	50	31	30	28	8	7
6	0	92	86	74	74	69	56	56	48	30	29	27	7	7
Peak	(cfs)	489	456	460	438	438	404	387	390	171	163	164	94	94
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	55	55	50	45	40	40	45	35	30	30	30	15	10
Peak	(cfs_or_ac.ft.)	0	3	0	3	0	0	3	0	0	2	0	2	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6
Peak/Area	(cfs/ac)	0.20	0.20	0.20	0.20	0.20	0.21	0.21	0.21	0.21	0.21	0.21	0.27	0.27
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Summary	File:													

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

2-YEAR

Time(Hrs)	Time(Min)	Elem117	Elem217	Elem741	Elem341	Elem721	Elem321	Elem720	Elem225	Elem325	Elem237	Elem236	TotalTime(Hrs)
0	5	0	0	0	0	0	0	40	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	0	1	0	0	0	0	40	0	0	0	0	0.25
0	20	1	4	2	0	0	0	0	1	0	4	1	0.33
0	25	5	15	10	0	0	0	40	2	0	16	7	0.42
0	30	15	32	33	2	2	0	0	6	0	44	23	0.50
0	35	30	49	70	5	47	0	40	13	0	80	54	0.58
0	40	35	59	106	11	58	1	1	21	0	111	93	0.67
0	45	43	64	129	18	102	1	41	29	0	133	132	0.75
0	50	50	66	140	26	109	2	2	37	0	146	153	0.83
0	55	55	66	141	33	147	3	43	42	0	152	171	0.92
1	0	59	66	139	40	148	4	4	46	0	154	184	1.00
1	5	62	66	136	42	182	5	45	49	0	154	194	1.08
1	10	63	65	133	43	179	6	6	50	0	153	200	1.17
1	15	64	64	130	45	203	8	48	51	0	150	205	1.25
1	20	64	63	127	46	191	9	9	50	0	147	207	1.33
1	25	63	62	124	48	212	10	50	49	0	143	207	1.42
1	30	62	60	121	49	199	12	12	47	0	139	205	1.50
1	35	61	59	118	50	218	13	53	46	0	135	203	1.58
1	40	60	58	116	52	203	15	15	43	0	131	200	1.67
1	45	59	56	114	53	221	16	56	41	0	128	196	1.75
1	50	58	55	112	54	205	18	18	39	0	124	192	1.83
1	55	57	54	110	55	222	19	59	37	0	121	189	1.92
2	0	56	53	108	56	204	20	20	35	0	117	185	2.00
2	5	54	51	106	57	220	22	62	33	0	113	180	2.08
2	10	53	50	103	57	201	23	23	31	0	109	176	2.17
2	15	52	49	101	58	216	25	65	29	0	106	172	2.25
2	20	51	48	100	59	196	26	26	27	0	104	168	2.33
2	25	50	47	99	60	211	27	67	26	0	102	164	2.42
2	30	49	46	97	60	191	28	28	24	0	99	161	2.50
2	35	48	45	96	61	205	30	70	23	0	96	157	2.58
2	40	46	43	93	62	184	31	31	22	0	93	153	2.67
2	45	45	42	91	62	197	32	72	20	0	90	149	2.75
2	50	44	40	88	63	176	33	33	19	0	86	145	2.83
2	55	43	39	85	63	188	34	74	18	0	83	140	2.92
3	0	41	38	83	63	167	35	35	17	0	80	136	3.00
3	5	40	36	80	64	179	36	76	16	0	77	131	3.08
3	10	39	35	78	64	157	37	37	15	0	74	126	3.17
3	15	37	33	75	64	169	38	78	14	0	70	120	3.25
3	20	36	31	71	64	146	39	39	13	0	65	113	3.33
3	25	34	29	67	64	156	40	80	12	0	61	107	3.42
3	30	33	27	64	64	130	41	41	10	0	56	101	3.50
3	35	31	25	60	64	140	41	81	9	0	52	96	3.58
3	40	30	23	57	64	115	42	42	8	0	48	90	3.67
3	45	26	22	54	64	126	43	83	8	0	45	84	3.75
3	50	23	21	51	64	102	43	43	7	0	41	79	3.83
3	55	21	19	48	64	113	44	84	6	0	38	74	3.92
4	0	19	18	46	63	91	44	44	5	0	35	70	4.00
4	5	18	17	43	63	102	44	84	5	0	33	65	4.08
4	10	17	16	41	63	80	45	45	4	0	30	61	4.17
4	15	16	15	39	62	92	45	85	3	0	28	58	4.25
4	20	15	14	37	62	70	45	45	3	0	26	54	4.33
4	25	14	13	35	61	82	45	85	2	0	24	51	4.42
4	30	13	12	33	61	61	46	46	2	0	22	48	4.50
4	35	12	11	32	60	74	46	86	2	0	20	45	4.58
4	40	11	10	30	60	53	46	46	1	0	19	42	4.67
4	45	11	10	29	59	66	46	86	1	0	17	40	4.75
4	50	10	9	27	59	45	46	46	1	0	16	37	4.83
4	55	9	9	26	58	59	46	86	1	0	15	35	4.92
5	0	9	8	25	58	39	46	46	1	0	14	33	5.00
5	5	8	7	24	57	53	46	86	1	0	13	31	5.08
5	10	8	7	22	57	33	46	46	1	0	12	29	5.17
5	15	7	7	21	56	47	46	86	0	0	11	27	5.25
5	20	7	6	20	55	27	46	46	0	0	10	26	5.33
5	25	6	6	19	55	42	46	86	0	0	9	24	5.42
5	30	6	5	18	54	22	46	46	0	0	9	23	5.50
5	35	6	5	18	53	37	46	86	0	0	8	22	5.58
5	40	5	5	17	53	18	46	46	0	0	7	20	5.67
5	45	5	4	16	52	33	45	85	0	0	7	19	5.75
5	50	5	4	15	51	14	45	45	0	0	6	18	5.83
5	55	4	4	14	51	29	45	85	0	0	6	17	5.92
6	0	4	4	14	50	11	45	45	0	0	5	16	6.00
Peak	(cfs)	64	66	141	64	222	46	86	51	0	154	207	
Peak	(hrs)	1	0	0	3	1	4	4	1	0	1	1	
Peak	(min)	15	50	55	5	55	30	35	15	0	0	20	
Peak	(cfs_or_ac.ft.)	2	0	0	13	0	43	0	0	0	0	0	
Case	(().S,I,D,O)	(_)	(_)	(_)	(S)	(_)	(S)	(_)	(_)	(_)	(_)		
Area	(ac)	223.4	223.4	691.2	691.2	2172.2	2172.2	2172.2	490.9	490.9	540.8	889.6	
Peak/Area	(cfs/ac)	0.29	0.30	0.20	0.09	0.10	0.02	0.04	0.10	0.00	0.28	0.23	
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Summary	File:							P:\coweld01\future~2\Goddin~1\2_Year\udswmm\ghod2yr.txt					

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

5-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	0	0	0	0	4	0	1	0	0	0	1	0	1
0	25	0	0	2	1	7	0	3	0	0	0	5	0	3
0	30	1	1	5	2	11	0	9	0	2	2	15	0	10
0	35	4	4	15	8	43	1	21	0	8	6	35	2	24
0	40	15	15	37	23	78	5	41	1	22	18	65	6	49
0	45	38	38	70	50	116	12	66	6	46	39	101	16	86
0	50	73	73	109	82	167	26	96	16	81	70	144	35	134
0	55	107	107	128	94	224	45	132	35	125	111	193	66	191
1	0	132	132	151	112	288	72	176	65	179	161	251	108	257
1	5	159	159	181	138	352	108	228	107	240	218	313	159	305
1	10	192	192	218	171	425	151	288	158	300	277	356	194	343
1	15	233	233	264	214	505	203	351	215	350	324	380	212	382
1	20	281	281	318	266	594	261	412	270	388	361	407	234	423
1	25	310	310	382	328	685	322	466	321	422	394	436	260	467
1	30	349	349	454	398	772	378	497	348	455	425	467	290	512
1	35	402	402	532	474	856	425	521	370	489	458	501	323	560
1	40	467	467	614	555	932	464	544	392	524	493	538	360	608
1	45	543	543	697	637	1002	498	568	415	562	530	577	400	657
1	50	625	625	780	720	1076	530	594	440	594	562	619	443	705
1	55	711	711	863	802	1138	549	619	466	624	592	662	488	751
2	0	797	797	942	881	1190	558	646	493	660	628	705	534	795
2	5	881	881	1015	955	1239	566	674	523	701	669	749	580	837
2	10	961	961	1085	1025	1289	576	704	554	744	712	793	627	876
2	15	1037	1037	1151	1091	1341	588	737	588	788	756	836	673	912
2	20	1109	1109	1214	1154	1383	601	772	624	833	800	878	718	946
2	25	1176	1176	1273	1214	1427	616	808	663	876	844	918	762	976
2	30	1239	1239	1329	1270	1473	633	845	702	918	886	956	803	1004
2	35	1298	1298	1381	1323	1506	653	884	743	958	926	992	842	1029
2	40	1353	1353	1429	1371	1540	674	922	783	996	964	1025	879	1051
2	45	1404	1404	1474	1417	1577	698	960	824	1031	999	1055	913	1070
2	50	1452	1452	1516	1460	1606	723	997	864	1063	1032	1083	945	1087
2	55	1496	1496	1554	1499	1630	750	1033	903	1092	1062	1107	973	1102
3	0	1536	1536	1589	1535	1657	779	1068	940	1119	1089	1130	999	1115
3	5	1573	1573	1621	1568	1677	808	1101	975	1143	1113	1150	1023	1127
3	10	1607	1607	1650	1598	1698	839	1131	1009	1164	1135	1167	1044	1137
3	15	1637	1637	1677	1626	1719	870	1160	1040	1183	1154	1183	1063	1146
3	20	1665	1665	1702	1652	1735	902	1186	1069	1200	1171	1196	1080	1154
3	25	1691	1691	1724	1675	1750	933	1209	1095	1214	1186	1207	1095	1160
3	30	1714	1714	1744	1696	1765	964	1230	1119	1226	1198	1216	1109	1166
3	35	1735	1735	1761	1715	1774	994	1248	1141	1236	1209	1224	1121	1171
3	40	1754	1754	1777	1731	1784	1023	1265	1160	1244	1217	1230	1131	1175
3	45	1770	1770	1790	1746	1792	1050	1278	1177	1251	1225	1235	1140	1178
3	50	1784	1784	1802	1759	1799	1077	1290	1192	1256	1231	1239	1148	1180
3	55	1796	1796	1811	1770	1803	1102	1300	1205	1260	1235	1241	1154	1181
4	0	1807	1807	1819	1779	1807	1125	1308	1216	1263	1239	1243	1160	1182
4	5	1816	1816	1826	1786	1809	1147	1314	1226	1265	1241	1244	1164	1182
4	10	1823	1823	1831	1792	1809	1167	1319	1234	1266	1242	1244	1168	1181
4	15	1828	1828	1834	1796	1807	1185	1323	1240	1266	1243	1243	1170	1180
4	20	1831	1831	1835	1799	1804	1201	1325	1245	1265	1243	1242	1172	1177
4	25	1833	1833	1835	1799	1799	1216	1326	1249	1263	1242	1239	1173	1174
4	30	1833	1833	1832	1798	1792	1229	1326	1252	1261	1240	1236	1173	1171
4	35	1832	1832	1829	1796	1786	1241	1325	1253	1258	1237	1233	1172	1166
4	40	1829	1829	1825	1792	1779	1251	1323	1254	1254	1234	1229	1170	1161
4	45	1825	1825	1819	1788	1769	1259	1320	1253	1250	1230	1224	1168	1156
4	50	1820	1820	1812	1782	1759	1267	1317	1252	1245	1226	1218	1165	1149
4	55	1813	1813	1804	1774	1747	1272	1313	1250	1239	1220	1212	1161	1142
5	0	1805	1805	1794	1766	1734	1277	1308	1247	1233	1215	1205	1156	1135
5	5	1796	1796	1784	1756	1724	1280	1302	1244	1226	1208	1198	1151	1126
5	10	1787	1787	1774	1747	1714	1283	1296	1240	1219	1201	1190	1145	1117
5	15	1776	1776	1763	1737	1702	1284	1289	1235	1211	1194	1181	1139	1108
5	20	1766	1766	1751	1726	1689	1284	1282	1229	1202	1186	1172	1132	1098
5	25	1755	1755	1739	1715	1675	1283	1274	1223	1193	1177	1163	1124	1087
5	30	1743	1743	1727	1703	1661	1282	1265	1216	1184	1168	1153	1115	1076
5	35	1730	1730	1713	1690	1645	1279	1256	1209	1174	1158	1142	1106	1064
5	40	1717	1717	1699	1676	1629	1276	1247	1201	1163	1147	1131	1097	1050
5	45	1703	1703	1684	1662	1611	1272	1236	1192	1151	1136	1119	1086	1036
5	50	1688	1688	1668	1647	1594	1267	1226	1183	1139	1125	1106	1075	1020
5	55	1673	1673	1652	1631	1575	1261	1214	1173	1127	1112	1092	1062	1002
6	0	1657	1657	1634	1614	1556	1255	1203	1163	1113	1099	1077	1048	982
Peak	(cfs)	1833	1833	1835	1799	1809	1284	1326	1254	1266	1243	1244	1173	1182
Peak	(hrs)	4	4	4	4	4	5	4	4	4	4	4	4	4
Peak	(min)	25	25	20	20	5	15	25	40	10	15	5	25	0
Peak	(cfs_or_ac.ft.)	0	6	0	4	672	11	0	6	0	6	0	6	0
Case	(()S,I,D,O)	( )	( )	( )	( )	(I)	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6
Peak/Area	(cfs/ac)	n/a	0.16	0.16	0.16	0.16	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12
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Summary	File:	P:\coweld01\future~2\Goddin~1\5_Year\udswmm\ghod5yr.txt												

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

5-YEAR

Time(Hrs)	Time(Min)	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108	Elem308	Elem708	Elem309	Elem208	Elem109	Elem709
0	5	0	0	0	0	0	2	0	0	0	0	0	0	0
0	10	0	0	0	0	0	4	0	0	0	0	0	0	0
0	15	0	0	0	1	1	7	0	0	0	0	0	0	2
0	20	0	2	0	4	3	10	0	1	2	1	3	1	20
0	25	0	7	0	8	5	12	0	3	12	8	16	10	62
0	30	1	21	1	16	8	15	1	14	40	30	52	36	120
0	35	4	48	4	30	11	20	4	39	99	76	117	90	218
0	40	13	89	9	52	17	33	17	81	164	125	153	113	323
0	45	32	141	20	83	29	60	42	133	228	173	210	161	420
0	50	62	200	38	125	54	102	82	194	307	237	288	232	509
0	55	104	263	67	181	93	159	138	266	400	317	378	317	593
1	0	156	332	109	251	150	231	207	350	502	408	473	409	670
1	5	194	409	166	335	223	313	287	430	554	450	567	501	738
1	10	223	474	215	428	306	396	367	492	580	469	656	588	797
1	15	255	525	255	515	387	461	430	506	612	495	736	667	845
1	20	291	578	301	586	451	502	469	513	640	517	805	736	882
1	25	330	634	350	635	496	529	493	522	667	540	862	792	908
1	30	373	687	400	668	525	548	510	533	695	565	907	837	926
1	35	419	737	448	692	547	564	524	544	723	591	940	871	936
1	40	466	782	493	712	565	580	538	557	750	617	964	896	939
1	45	514	822	534	729	581	595	551	570	777	643	979	911	937
1	50	562	858	572	745	597	611	564	584	802	668	986	919	928
1	55	609	890	606	761	613	627	578	599	824	691	986	920	916
2	0	654	918	637	777	629	644	593	614	844	712	981	916	900
2	5	698	943	665	793	646	661	608	630	862	732	971	907	883
2	10	739	966	692	809	663	678	623	645	878	749	958	895	865
2	15	777	987	716	824	680	693	636	661	891	763	943	880	846
2	20	813	1005	739	837	694	705	646	676	901	776	925	864	825
2	25	846	1021	760	848	708	720	658	691	909	786	905	845	802
2	30	876	1035	779	861	722	735	671	706	921	800	884	825	779
2	35	904	1047	797	872	735	750	685	720	935	816	861	804	755
2	40	929	1057	813	878	745	767	699	734	940	824	838	782	732
2	45	952	1065	827	887	756	783	712	747	938	824	814	760	709
2	50	972	1073	840	897	768	798	726	759	931	819	791	738	687
2	55	990	1080	853	907	781	813	739	770	919	810	768	716	665
3	0	1006	1087	865	918	795	827	751	779	904	798	745	695	644
3	5	1021	1093	877	928	808	840	762	787	893	789	723	674	623
3	10	1034	1100	889	938	821	852	771	794	885	783	700	652	602
3	15	1046	1106	900	948	833	862	780	799	875	776	677	631	579
3	20	1057	1111	911	956	844	871	787	804	865	768	654	610	556
3	25	1067	1116	921	964	854	880	793	807	853	759	631	588	534
3	30	1076	1120	931	970	864	886	798	810	840	749	608	566	512
3	35	1084	1123	940	975	872	892	802	811	826	738	585	545	491
3	40	1091	1126	948	979	880	897	806	812	812	726	563	524	470
3	45	1098	1128	955	982	886	900	808	811	796	713	540	504	450
3	50	1103	1129	961	984	891	903	809	810	781	700	519	483	431
3	55	1108	1129	966	985	895	904	809	808	764	686	498	464	411
4	0	1111	1128	970	985	898	904	808	804	747	671	477	444	393
4	5	1114	1127	973	984	900	903	806	800	730	656	457	426	375
4	10	1116	1125	975	982	901	901	803	795	712	641	438	408	358
4	15	1118	1122	976	979	900	898	799	789	694	626	419	390	341
4	20	1118	1118	977	975	899	895	795	782	676	610	401	373	325
4	25	1118	1114	976	970	897	890	789	775	659	594	384	357	309
4	30	1117	1108	974	964	894	884	783	767	641	578	367	341	294
4	35	1115	1102	971	958	889	878	776	758	623	562	350	325	280
4	40	1112	1096	967	950	885	871	768	748	605	546	335	311	266
4	45	1108	1088	963	942	879	863	760	739	587	530	320	297	253
4	50	1104	1080	958	933	872	855	751	728	569	514	305	283	241
4	55	1099	1071	951	924	865	846	742	717	551	498	291	270	229
5	0	1093	1062	945	914	857	836	732	706	525	474	278	258	218
5	5	1087	1052	937	903	848	825	721	693	501	451	266	246	207
5	10	1080	1042	928	892	839	813	709	677	393	345	254	235	197
5	15	1072	1030	919	879	828	800	695	656	311	264	243	224	188
5	20	1064	1018	909	865	816	783	679	633	287	241	232	214	180
5	25	1054	1005	898	849	802	764	660	610	274	229	222	205	172
5	30	1044	990	886	832	786	745	640	588	263	219	212	196	164
5	35	1033	974	873	811	767	717	613	567	252	210	204	188	157
5	40	1022	957	857	786	743	688	584	546	242	201	195	180	150
5	45	1008	935	838	742	701	663	559	526	233	193	187	173	144
5	50	993	909	815	705	665	641	537	507	224	185	180	166	138
5	55	976	882	789	672	633	602	499	415	215	178	173	159	132
6	0	958	851	761	625	588	538	435	323	207	171	166	153	127
Peak	(cfs)	1118	1129	977	985	901	904	809	812	940	824	986	920	939
Peak	(hrs)	4	3	4	3	4	3	3	3	2	2	1	1	1
Peak	(min)	15	50	20	55	10	55	50	40	40	40	50	55	40
Peak	(cfs_or_ac.ft.)	6	0	6	0	11	0	9	38	0	33	0	4	0
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	(S)	( )	(S)	( )	( )	( )
Area	(ac)	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8	4197.8	4197.8	3548.8	3548.8	3283.2	3283.2
Peak/Area	(cfs/ac)	0.13	0.13	0.13	0.13	0.14	0.14	0.19	0.19	0.22	0.23	0.28	0.28	0.29
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Summary	File:													

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

5-YEAR

Time(Hrs)	Time(Min)	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	2	1	17	0	2	2	0	3	0	0	1	0	1
0	20	18	16	73	4	15	14	3	18	0	0	4	1	5
0	25	54	47	181	25	53	50	18	55	3	2	19	7	18
0	30	101	84	291	61	119	112	50	120	14	11	54	26	46
0	35	178	150	340	112	187	172	85	209	44	39	97	53	67
0	40	255	217	356	182	264	242	143	300	89	82	135	76	88
0	45	319	274	384	264	342	313	216	361	135	126	166	97	107
0	50	375	327	431	344	412	378	288	415	173	163	192	115	122
0	55	432	381	485	417	474	435	355	463	202	191	212	128	132
1	0	490	436	536	480	527	485	414	506	224	212	226	136	139
1	5	545	491	583	534	572	528	465	540	239	226	236	140	142
1	10	597	542	625	578	609	563	508	568	249	236	242	142	143
1	15	644	588	658	615	639	591	542	589	256	243	247	143	143
1	20	682	627	682	643	661	612	569	603	261	247	250	143	142
1	25	713	657	699	664	676	627	588	611	264	250	251	141	140
1	30	735	680	712	678	685	635	600	614	265	251	251	139	138
1	35	752	697	719	686	690	639	607	614	265	251	251	137	136
1	40	762	708	720	689	690	639	610	611	265	251	250	134	133
1	45	766	713	716	688	686	635	609	604	263	249	248	132	130
1	50	765	712	708	684	679	628	604	595	261	247	245	129	127
1	55	760	708	699	676	670	618	597	584	258	245	242	125	124
2	0	752	701	689	666	658	607	587	572	254	241	238	122	120
2	5	742	692	677	655	646	595	577	560	250	237	234	119	117
2	10	731	682	665	643	633	582	565	547	246	233	230	115	114
2	15	718	670	650	630	620	569	553	534	241	229	226	112	110
2	20	703	656	633	616	606	555	540	520	237	225	221	109	107
2	25	687	641	615	602	590	540	527	505	232	220	216	105	103
2	30	669	625	598	586	574	524	512	489	226	215	210	101	100
2	35	651	608	581	570	557	508	497	474	220	209	205	98	96
2	40	633	591	564	553	540	492	482	458	214	204	199	94	92
2	45	616	575	548	537	524	476	467	443	208	198	193	90	88
2	50	598	559	531	520	508	461	452	428	202	192	187	87	85
2	55	581	542	515	504	492	446	438	414	196	187	182	84	82
3	0	564	527	500	489	477	431	423	400	190	181	176	80	79
3	5	547	511	483	474	462	417	409	386	185	176	171	77	76
3	10	529	494	464	458	446	402	395	372	179	171	166	74	73
3	15	510	476	445	443	430	386	381	357	173	165	160	71	70
3	20	491	459	427	427	413	371	367	342	167	159	154	68	66
3	25	473	441	410	410	396	355	352	326	161	153	148	65	63
3	30	454	424	394	394	380	339	337	312	154	147	142	61	59
3	35	436	408	377	377	364	324	322	297	148	141	135	58	56
3	40	419	391	361	361	347	309	308	282	142	135	130	55	53
3	45	402	375	345	345	332	294	293	267	136	130	124	52	50
3	50	385	360	330	330	316	280	279	253	130	124	119	49	48
3	55	368	344	314	314	301	265	265	240	125	119	114	47	45
4	0	352	329	300	300	286	252	252	227	119	114	108	44	42
4	5	337	314	285	285	273	239	239	215	113	108	102	40	37
4	10	321	300	272	272	259	226	226	202	107	102	96	36	34
4	15	307	286	258	258	246	214	214	190	101	96	90	33	32
4	20	293	273	246	246	233	202	202	179	96	91	86	31	29
4	25	279	260	233	233	222	191	191	170	91	87	82	29	28
4	30	266	248	222	222	210	181	181	160	87	83	78	27	26
4	35	253	236	210	210	200	171	171	150	83	79	75	26	24
4	40	241	225	200	200	189	161	161	140	79	75	71	24	23
4	45	229	214	189	189	179	152	152	133	76	72	68	23	22
4	50	218	203	180	180	170	143	143	126	72	69	65	21	20
4	55	208	194	171	171	161	136	136	119	69	66	62	20	19
5	0	198	184	162	162	154	129	129	113	66	63	59	19	18
5	5	189	175	155	155	146	122	122	107	63	60	57	18	17
5	10	180	167	147	147	140	116	116	102	60	57	54	17	16
5	15	172	160	141	141	133	110	110	97	58	55	52	16	15
5	20	164	153	134	134	127	105	105	92	55	52	49	15	14
5	25	157	146	128	128	122	100	100	88	53	50	47	14	13
5	30	150	140	123	123	116	95	95	83	50	48	45	13	12
5	35	144	134	117	117	111	91	91	79	48	46	43	12	12
5	40	138	128	112	112	107	86	86	76	46	44	41	11	11
5	45	132	123	108	108	102	82	82	72	44	42	39	11	10
5	50	126	118	103	103	98	78	78	69	42	40	38	10	10
5	55	121	113	99	99	94	75	75	65	40	39	36	10	9
6	0	116	108	95	95	90	71	71	62	39	37	35	9	8
Peak	(cfs)	766	713	720	689	690	639	610	614	265	251	251	143	143
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	45	45	40	40	35	35	40	30	30	30	25	15	10
Peak	(cfs_or_ac.ft.)	0	3	0	4	0	0	3	0	0	2	0	3	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6
Peak/Area	(cfs/ac)	0.31	0.31	0.32	0.32	0.32	0.33	0.34	0.34	0.32	0.33	0.33	0.40	0.40
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Summary	File:													

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

5-YEAR

Time(Hrs)	Time(Min)	Elem117	Elem217	Elem741	Elem341	Elem721	Elem321	Elem720	Elem225	Elem325	Elem237	Elem236	TotalTime(Hrs)
0	5	0	0	0	0	0	0	40	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	0	1	0	0	0	0	40	0	0	1	0	0.25
0	20	2	8	4	0	0	0	0	1	0	8	3	0.33
0	25	9	25	20	1	0	0	40	4	0	29	14	0.42
0	30	27	50	60	4	32	0	0	13	0	72	42	0.50
0	35	36	73	118	9	75	1	41	27	0	128	94	0.58
0	40	49	87	172	18	124	1	1	47	0	177	154	0.67
0	45	64	94	206	30	168	2	43	67	0	210	197	0.75
0	50	76	97	220	41	211	4	6	86	0	229	234	0.83
0	55	85	98	223	44	245	5	49	99	0	239	266	0.92
1	0	90	98	220	47	267	7	11	105	0	242	290	1.00
1	5	93	97	216	50	284	9	54	111	0	242	308	1.08
1	10	95	96	211	53	301	11	16	114	0	240	319	1.17
1	15	95	95	207	55	314	13	58	116	0	236	326	1.25
1	20	95	93	204	58	328	16	20	116	0	231	329	1.33
1	25	94	91	200	61	337	18	62	115	0	225	329	1.42
1	30	92	89	196	63	347	20	24	112	0	219	326	1.50
1	35	91	88	192	65	352	23	66	108	0	212	322	1.58
1	40	89	86	188	68	359	25	29	104	36	206	316	1.67
1	45	87	83	184	70	362	27	71	99	107	199	310	1.75
1	50	85	81	180	72	365	30	33	94	95	192	303	1.83
1	55	83	78	175	74	366	32	75	88	90	184	295	1.92
2	0	80	76	170	75	369	35	37	82	85	177	286	2.00
2	5	78	73	165	77	369	37	78	74	78	170	278	2.08
2	10	76	71	160	78	371	40	40	69	71	164	269	2.17
2	15	74	69	156	80	370	42	82	64	66	158	261	2.25
2	20	71	66	151	80	370	44	44	59	61	151	252	2.33
2	25	69	64	147	80	367	47	87	54	56	145	244	2.42
2	30	66	61	141	81	365	49	49	50	52	138	235	2.50
2	35	64	58	136	81	359	51	91	46	48	131	226	2.58
2	40	61	56	131	81	355	54	54	42	44	124	217	2.67
2	45	59	53	126	81	347	56	96	39	40	118	209	2.75
2	50	57	51	121	81	341	58	58	35	37	112	200	2.83
2	55	54	49	117	81	332	60	100	33	34	107	192	2.92
3	0	52	47	113	81	325	62	62	30	31	102	185	3.00
3	5	50	45	109	81	316	64	104	27	28	97	177	3.08
3	10	48	43	105	81	308	66	66	25	26	93	170	3.17
3	15	46	41	101	81	296	67	107	23	24	87	162	3.25
3	20	44	38	96	81	287	69	69	20	21	81	155	3.33
3	25	42	36	91	81	275	70	110	18	19	76	147	3.42
3	30	40	33	86	82	265	72	72	16	17	70	139	3.50
3	35	38	31	81	82	253	73	113	15	15	65	128	3.58
3	40	36	29	77	82	243	75	75	13	14	60	119	3.67
3	45	34	27	73	82	232	76	116	11	12	56	110	3.75
3	50	32	25	69	81	222	77	77	10	11	52	103	3.83
3	55	31	24	66	81	211	78	118	9	10	48	96	3.92
4	0	28	22	62	81	202	79	79	8	10	44	90	4.00
4	5	24	21	59	81	191	80	120	7	9	41	85	4.08
4	10	21	19	56	81	183	80	80	6	9	38	80	4.17
4	15	20	18	53	81	173	81	121	5	8	35	75	4.25
4	20	18	17	51	81	165	82	82	4	8	32	70	4.33
4	25	17	16	48	81	155	82	122	4	7	30	66	4.42
4	30	16	15	46	81	147	83	83	3	6	28	62	4.50
4	35	15	14	44	81	138	83	123	3	6	25	58	4.58
4	40	14	13	41	81	130	84	84	2	5	24	55	4.67
4	45	13	12	39	81	120	84	124	2	5	22	52	4.75
4	50	12	11	37	81	108	84	84	2	4	20	49	4.83
4	55	12	11	36	80	96	84	124	1	4	19	46	4.92
5	0	11	10	34	80	89	84	84	1	3	17	43	5.00
5	5	10	9	32	80	81	84	124	1	3	16	40	5.08
5	10	9	9	31	80	76	84	84	1	3	15	38	5.17
5	15	9	8	29	80	69	84	124	1	2	14	36	5.25
5	20	8	8	28	79	65	84	84	1	2	13	34	5.33
5	25	8	7	26	78	60	84	124	0	2	12	32	5.42
5	30	7	7	25	77	57	84	84	0	2	11	30	5.50
5	35	7	6	24	76	52	84	124	0	1	10	28	5.58
5	40	6	6	23	75	49	83	83	0	1	9	27	5.67
5	45	6	5	22	74	45	83	123	0	1	9	25	5.75
5	50	6	5	21	73	43	83	83	0	1	8	24	5.83
5	55	5	5	20	72	39	82	122	0	1	7	22	5.92
6	0	5	4	19	71	37	82	82	0	1	7	21	6.00
Peak	(cfs)	95	98	223	82	371	84	124	116	107	242	329	
Peak	(hrs)	1	0	0	3	2	4	4	1	1	1	1	
Peak	(min)	10	55	55	30	10	40	45	15	45	0	20	
Peak	(cfs_or_ac.ft.)	2	0	0	24	0	79	0	0	9	0	0	
Case	(()S,I,D,O)	(_)	(_)	(_)	(S)	(_)	(S)	(_)	(_)	(S)	(_)	(_)	
Area	(ac)	223.4	223.4	691.2	691.2	2172.2	2172.2	2172.2	490.9	490.9	540.8	889.6	
Peak/Area	(cfs/ac)	0.43	0.44	0.32	0.12	0.17	0.04	0.06	0.24	0.22	0.45	0.37	
11-23-1999	16:04:41												
Summary	File:							P:\coweld01\future~2\Goddin~1\5_Year\udswmm\ghod5yr.txt					

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

10-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	0	0	0	0	5	0	1	0	0	0	2	0	1
0	25	0	0	2	1	9	0	4	0	0	0	7	0	4
0	30	1	1	7	3	14	0	12	0	3	2	20	1	14
0	35	6	6	21	11	60	2	28	0	11	9	46	3	34
0	40	22	22	52	35	108	7	53	2	31	26	87	10	70
0	45	57	57	101	74	163	18	88	9	66	57	140	26	125
0	50	98	98	127	92	227	37	131	26	117	103	202	56	195
0	55	131	131	154	111	300	66	183	56	182	163	275	104	278
1	0	163	163	189	139	384	106	247	103	260	236	355	164	342
1	5	203	203	234	178	479	158	322	165	337	310	404	199	392
1	10	253	253	291	230	586	222	403	235	399	369	439	224	444
1	15	298	298	361	296	701	295	481	304	450	418	477	254	498
1	20	336	336	444	376	825	368	533	350	497	462	518	289	556
1	25	393	393	539	469	940	434	567	379	543	506	562	329	616
1	30	468	468	643	570	1046	489	601	408	589	552	610	375	678
1	35	561	561	752	677	1157	537	634	438	621	583	662	425	741
1	40	666	666	862	787	1238	555	667	470	663	624	715	479	803
1	45	777	777	970	893	1312	566	701	503	713	673	771	536	864
1	50	890	890	1073	996	1394	579	738	541	766	726	828	595	922
1	55	1002	1002	1174	1096	1477	593	779	581	823	783	886	656	977
2	0	1111	1111	1273	1195	1563	610	822	625	882	841	943	717	1029
2	5	1216	1216	1370	1292	1639	629	868	673	941	900	1000	777	1077
2	10	1319	1319	1464	1386	1718	651	917	723	1000	959	1056	836	1122
2	15	1418	1418	1555	1478	1801	676	968	776	1057	1016	1108	893	1162
2	20	1514	1514	1643	1566	1862	704	1020	831	1112	1071	1158	948	1199
2	25	1605	1605	1725	1649	1926	735	1073	886	1164	1124	1205	999	1232
2	30	1691	1691	1804	1729	1993	769	1125	941	1213	1173	1248	1047	1262
2	35	1773	1773	1877	1803	2038	806	1177	996	1259	1219	1287	1092	1289
2	40	1848	1848	1943	1870	2085	846	1227	1050	1301	1261	1323	1134	1314
2	45	1918	1918	2005	1933	2134	887	1275	1102	1339	1300	1356	1172	1338
2	50	1983	1983	2061	1991	2167	930	1320	1151	1374	1335	1386	1208	1360
2	55	2041	2041	2111	2042	2200	975	1363	1198	1405	1367	1414	1241	1381
3	0	2094	2094	2157	2089	2234	1019	1404	1242	1434	1397	1439	1272	1401
3	5	2141	2141	2198	2131	2258	1065	1441	1283	1461	1424	1462	1301	1421
3	10	2184	2184	2234	2169	2281	1110	1475	1321	1485	1449	1484	1328	1442
3	15	2222	2222	2266	2202	2304	1154	1507	1357	1508	1472	1505	1354	1462
3	20	2256	2256	2295	2232	2320	1197	1537	1390	1529	1494	1525	1379	1484
3	25	2285	2285	2319	2258	2335	1239	1563	1421	1549	1515	1544	1403	1508
3	30	2311	2311	2341	2281	2348	1280	1588	1449	1569	1535	1563	1428	1533
3	35	2333	2333	2359	2300	2357	1319	1610	1476	1588	1554	1583	1453	1559
3	40	2353	2353	2374	2317	2365	1357	1631	1501	1607	1574	1603	1478	1585
3	45	2368	2368	2386	2331	2370	1392	1651	1525	1626	1594	1623	1504	1611
3	50	2382	2382	2396	2342	2374	1426	1670	1549	1646	1615	1644	1529	1635
3	55	2392	2392	2403	2351	2376	1458	1689	1571	1665	1635	1664	1554	1655
4	0	2400	2400	2409	2358	2376	1489	1707	1593	1685	1655	1683	1578	1672
4	5	2406	2406	2413	2363	2378	1518	1725	1615	1703	1674	1700	1600	1685
4	10	2411	2411	2415	2367	2378	1546	1742	1635	1720	1691	1715	1619	1693
4	15	2414	2414	2417	2370	2377	1573	1758	1655	1735	1707	1727	1636	1697
4	20	2415	2415	2417	2371	2374	1598	1773	1673	1747	1720	1737	1649	1697
4	25	2416	2416	2415	2372	2370	1622	1786	1690	1757	1730	1743	1659	1692
4	30	2415	2415	2413	2370	2365	1645	1798	1705	1764	1738	1746	1665	1684
4	35	2413	2413	2410	2369	2363	1666	1808	1718	1767	1742	1745	1668	1673
4	40	2410	2410	2407	2366	2359	1685	1815	1729	1767	1742	1741	1668	1659
4	45	2407	2407	2403	2364	2353	1703	1820	1737	1764	1740	1734	1664	1642
4	50	2403	2403	2398	2360	2346	1719	1823	1742	1758	1734	1724	1657	1623
4	55	2398	2398	2391	2355	2337	1733	1823	1745	1749	1726	1712	1648	1603
5	0	2392	2392	2384	2348	2325	1745	1820	1744	1737	1715	1697	1635	1581
5	5	2385	2385	2376	2341	2318	1755	1814	1741	1723	1701	1680	1621	1558
5	10	2377	2377	2367	2333	2309	1762	1806	1735	1706	1685	1661	1605	1533
5	15	2368	2368	2358	2325	2298	1768	1795	1727	1688	1667	1640	1586	1508
5	20	2359	2359	2347	2316	2284	1770	1782	1717	1668	1647	1618	1567	1483
5	25	2349	2349	2336	2305	2268	1771	1767	1704	1646	1626	1595	1546	1457
5	30	2337	2337	2322	2292	2249	1769	1750	1689	1623	1604	1571	1524	1430
5	35	2324	2324	2307	2278	2229	1765	1731	1672	1600	1580	1546	1501	1403
5	40	2309	2309	2289	2261	2206	1759	1711	1654	1575	1556	1520	1477	1376
5	45	2292	2292	2270	2243	2181	1751	1689	1634	1549	1531	1494	1453	1349
5	50	2273	2273	2249	2222	2155	1741	1667	1613	1523	1505	1467	1428	1321
5	55	2253	2253	2226	2200	2126	1730	1643	1591	1496	1479	1440	1402	1293
6	0	2230	2230	2201	2176	2096	1716	1618	1568	1469	1452	1412	1377	1265
Peak	(cfs)	2416	2416	2417	2372	2378	1771	1823	1745	1767	1742	1746	1668	1697
Peak	(hrs)	4	4	4	4	4	5	4	4	4	4	4	4	4
Peak	(min)	25	25	15	25	5	25	50	55	35	35	30	35	15
Peak	(cfs_or_ac.ft.)	0	7	0	4	873	11	0	7	0	7	0	6	0
Case	((),S,I,D,O)	( )	( )	( )	( )	(I)	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6
Peak/Area	(cfs/ac)	n/a	0.21	0.21	0.21	0.21	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.17
11-23-1999	16:04:42													
Summary	File:	P:\coweld01\future~2\Goddin~1\10_Year\udswmm\ghod10yr.txt												

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

10-YEAR

Time(Hrs)	Time(Min)	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108	Elem308	Elem708	Elem309	Elem208	Elem109	Elem709
0	5	0	0	0	0	0	2	0	0	0	0	0	0	0
0	10	0	0	0	0	0	4	0	0	0	0	0	0	0
0	15	0	0	0	1	1	7	0	0	0	0	0	0	3
0	20	0	2	0	4	3	10	0	1	3	2	4	2	27
0	25	0	9	0	9	5	12	0	5	16	11	22	14	73
0	30	1	27	1	19	8	15	1	18	54	40	69	50	162
0	35	6	63	5	38	11	22	6	50	122	92	136	100	303
0	40	20	121	12	68	19	40	23	101	206	155	197	146	452
0	45	47	194	28	112	36	77	57	171	305	231	294	230	587
0	50	91	275	55	172	70	136	113	260	429	335	415	343	709
0	55	152	361	98	253	128	219	193	365	556	444	546	468	807
1	0	197	457	160	354	211	317	288	459	591	463	676	594	900
1	5	232	540	218	466	307	410	377	504	635	494	798	713	986
1	10	273	605	264	568	397	477	441	514	674	523	911	824	1062
1	15	318	672	318	647	466	519	479	526	716	555	1011	923	1126
1	20	368	740	376	702	513	548	506	539	760	591	1099	1009	1179
1	25	422	806	434	741	546	572	527	555	805	631	1171	1081	1217
1	30	480	868	491	773	573	595	545	573	851	672	1228	1138	1239
1	35	540	924	545	800	596	617	564	592	896	714	1269	1180	1249
1	40	601	974	594	825	619	639	584	613	939	756	1296	1207	1249
1	45	662	1018	641	849	642	663	605	636	988	805	1310	1222	1241
1	50	721	1056	683	874	667	689	628	663	1103	920	1314	1227	1228
1	55	778	1091	723	897	691	710	646	694	1190	1009	1310	1224	1210
2	0	832	1122	760	919	714	734	667	728	1256	1076	1299	1214	1189
2	5	883	1149	794	941	737	763	693	766	1365	1188	1283	1199	1164
2	10	930	1174	826	956	753	797	724	807	1430	1255	1261	1179	1133
2	15	973	1195	855	976	776	834	758	847	1422	1250	1235	1155	1100
2	20	1014	1215	882	999	802	873	794	884	1395	1226	1206	1127	1067
2	25	1051	1234	910	1026	832	912	829	916	1362	1197	1174	1097	1033
2	30	1085	1254	937	1056	865	948	863	944	1327	1165	1140	1066	998
2	35	1116	1273	966	1085	898	982	894	967	1289	1131	1106	1033	964
2	40	1146	1293	994	1115	932	1013	923	987	1253	1099	1071	1000	930
2	45	1175	1314	1023	1143	964	1041	948	1004	1238	1089	1036	968	897
2	50	1202	1334	1052	1171	996	1072	976	1054	1219	1073	1002	935	865
2	55	1228	1355	1081	1199	1029	1110	1011	1102	1195	1053	968	903	834
3	0	1253	1376	1111	1231	1064	1150	1047	1127	1168	1030	935	872	804
3	5	1278	1399	1141	1266	1104	1202	1077	1136	1139	1005	903	842	774
3	10	1303	1425	1174	1310	1152	1270	1097	1132	1109	978	872	812	745
3	15	1328	1454	1210	1361	1207	1335	1107	1120	1077	950	840	782	714
3	20	1355	1487	1250	1414	1264	1386	1108	1101	1045	922	808	753	684
3	25	1383	1522	1293	1462	1317	1419	1102	1078	1012	892	777	723	655
3	30	1412	1558	1336	1500	1359	1434	1089	1052	979	863	746	694	627
3	35	1443	1592	1377	1525	1388	1434	1071	1023	945	833	716	666	599
3	40	1474	1620	1413	1536	1404	1423	1051	1006	912	803	687	639	573
3	45	1504	1643	1442	1536	1408	1407	1034	999	891	785	658	612	548
3	50	1532	1657	1463	1528	1405	1391	1020	992	877	775	631	586	523
3	55	1557	1665	1477	1515	1396	1373	1009	984	862	764	604	561	500
4	0	1578	1666	1484	1499	1383	1354	999	975	846	751	578	537	477
4	5	1595	1662	1485	1479	1368	1333	989	966	829	738	554	514	455
4	10	1607	1653	1481	1458	1350	1312	979	957	812	723	530	492	433
4	15	1615	1639	1473	1435	1331	1290	970	947	794	708	506	470	413
4	20	1618	1623	1461	1412	1311	1267	960	936	776	693	484	449	393
4	25	1617	1604	1447	1387	1290	1244	950	925	757	677	462	429	374
4	30	1612	1582	1430	1362	1268	1221	940	914	738	660	442	409	356
4	35	1604	1559	1411	1337	1246	1198	929	902	719	644	422	391	338
4	40	1593	1535	1391	1311	1224	1174	917	889	699	627	403	373	322
4	45	1579	1510	1369	1285	1201	1151	905	876	680	610	384	355	306
4	50	1564	1484	1347	1259	1178	1127	893	863	661	593	367	339	291
4	55	1546	1458	1324	1234	1155	1104	881	849	641	576	350	323	277
5	0	1526	1431	1300	1208	1132	1080	868	835	622	559	334	308	264
5	5	1505	1404	1276	1182	1109	1056	854	821	604	542	319	294	251
5	10	1483	1377	1252	1156	1086	1032	840	806	585	525	304	281	238
5	15	1461	1350	1227	1130	1063	1008	826	791	567	508	291	268	227
5	20	1437	1323	1202	1105	1039	984	812	776	544	488	278	256	216
5	25	1413	1296	1177	1079	1015	959	797	760	518	463	265	244	206
5	30	1388	1269	1152	1052	991	933	782	743	478	424	254	233	197
5	35	1363	1242	1127	1026	967	907	765	721	328	276	243	223	188
5	40	1338	1214	1102	998	942	878	746	694	294	244	232	214	180
5	45	1312	1187	1076	970	915	849	725	668	279	230	222	204	172
5	50	1286	1158	1049	941	888	819	702	642	267	220	213	196	165
5	55	1260	1130	1023	911	861	792	678	618	257	211	205	188	158
6	0	1234	1101	996	882	833	766	655	594	247	202	196	180	151
Peak	(cfs)	1618	1666	1485	1536	1408	1434	1108	1136	1430	1255	1314	1227	1249
Peak	(hrs)	4	4	4	3	3	3	3	3	2	2	1	1	1
Peak	(min)	20	0	5	40	45	30	20	5	10	10	50	50	35
Peak	(cfs_or_ac.ft.)	6	0	6	0	11	0	9	60	0	41	0	5	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	(S)	( )	(S)	( )	( )	( )
Area	(ac)	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8	4197.8	4197.8	3548.8	3548.8	3283.2	3283.2
Peak/Area	(cfs/ac)	0.18	0.19	0.20	0.21	0.22	0.23	0.26	0.27	0.34	0.35	0.37	0.37	0.38
11-23-1999	16:04:42													
Summary	File:													

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

10-YEAR

Time(Hrs)	Time(Min)	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	2	2	22	0	3	3	0	3	0	0	1	0	1
0	20	24	22	92	6	19	18	4	22	1	0	6	1	6
0	25	63	54	235	34	70	66	25	70	4	3	25	9	24
0	30	134	112	373	75	152	142	59	159	20	17	69	34	56
0	35	243	206	437	147	245	227	110	278	61	55	123	66	82
0	40	346	297	460	246	349	320	192	382	120	110	170	96	111
0	45	428	371	501	354	448	412	287	459	177	166	211	124	136
0	50	502	439	561	457	537	494	379	529	224	211	243	145	154
0	55	574	508	627	548	613	565	463	588	257	242	260	154	166
1	0	645	577	692	625	677	625	536	639	279	262	277	163	173
1	5	714	645	751	689	731	677	598	684	296	279	290	170	176
1	10	779	709	803	742	778	721	651	721	310	291	300	174	177
1	15	837	766	848	787	816	758	694	749	320	301	307	176	177
1	20	886	815	882	824	846	786	728	770	327	308	312	176	176
1	25	925	854	903	851	867	806	753	782	333	313	316	176	175
1	30	952	881	912	870	879	817	770	787	336	316	318	175	173
1	35	968	898	916	879	883	820	778	784	337	317	317	172	170
1	40	976	907	916	881	880	817	780	778	336	317	316	169	166
1	45	978	910	911	878	874	810	776	769	334	315	313	166	162
1	50	976	909	903	870	864	800	769	757	331	312	310	162	158
1	55	969	903	893	860	852	788	760	744	327	308	306	158	154
2	0	959	894	879	847	838	774	748	730	323	305	302	154	150
2	5	945	882	861	833	822	759	735	714	318	300	297	151	146
2	10	929	866	841	817	805	742	720	697	313	296	292	147	142
2	15	909	848	821	799	786	723	703	679	307	290	285	142	137
2	20	888	828	797	780	766	703	685	658	299	283	276	135	133
2	25	864	806	772	759	743	681	665	635	290	275	269	130	128
2	30	840	783	748	736	719	658	645	614	282	267	261	125	122
2	35	814	760	724	713	696	636	624	592	274	259	253	120	117
2	40	789	737	701	690	673	614	603	571	265	251	245	115	112
2	45	765	713	678	667	650	592	582	550	257	243	237	110	108
2	50	740	691	655	644	628	570	561	530	249	235	229	105	103
2	55	716	668	633	622	606	550	541	510	241	228	222	101	99
3	0	693	646	612	601	585	530	521	491	233	220	214	97	95
3	5	670	625	589	580	564	510	502	473	225	213	207	93	91
3	10	646	602	565	560	544	490	484	454	218	206	200	89	87
3	15	621	579	541	539	522	470	465	434	210	199	193	85	83
3	20	597	556	518	518	501	450	446	415	202	192	185	81	78
3	25	573	534	497	497	480	430	427	396	194	184	177	76	74
3	30	549	512	476	476	459	410	408	377	186	176	170	72	70
3	35	527	491	455	455	439	391	390	359	178	169	162	68	66
3	40	505	471	436	436	419	373	372	342	170	161	155	64	62
3	45	484	451	416	416	401	355	354	325	163	154	148	61	59
3	50	463	432	398	398	382	338	337	308	156	148	141	58	56
3	55	443	413	379	379	364	321	321	291	149	141	135	54	53
4	0	424	395	362	362	346	305	304	275	142	135	129	52	50
4	5	405	377	344	344	329	289	288	260	136	129	124	49	47
4	10	386	360	328	328	313	273	273	246	130	124	118	47	45
4	15	368	343	312	312	298	259	259	233	124	118	112	43	40
4	20	351	327	296	296	283	245	245	220	118	112	105	38	36
4	25	335	312	282	282	269	232	232	207	111	105	99	35	33
4	30	319	297	268	268	255	219	219	195	105	100	94	32	31
4	35	304	283	254	254	242	207	207	184	100	95	89	30	29
4	40	290	270	242	242	230	196	196	174	95	90	85	29	27
4	45	276	257	230	230	218	186	186	165	91	86	81	27	26
4	50	263	244	218	218	207	175	175	154	87	82	78	25	24
4	55	250	233	207	207	197	165	165	145	83	78	74	24	23
5	0	238	222	197	197	186	156	156	137	79	75	71	22	21
5	5	227	211	187	187	177	148	148	130	75	72	68	21	20
5	10	216	201	178	178	168	140	140	123	72	68	65	20	19
5	15	206	191	169	169	160	133	133	117	69	65	62	19	18
5	20	197	182	161	161	153	126	126	111	66	62	59	17	17
5	25	188	174	154	154	146	120	120	106	63	60	56	16	16
5	30	179	166	147	147	140	114	114	100	60	57	54	15	15
5	35	171	159	141	141	133	108	108	96	58	55	52	14	14
5	40	164	152	134	134	128	103	103	91	55	52	49	14	13
5	45	157	146	129	129	122	98	98	87	53	50	47	13	12
5	50	150	139	123	123	117	94	94	82	51	48	45	12	11
5	55	144	134	118	118	112	89	89	79	48	46	43	11	11
6	0	138	128	113	113	107	85	85	75	46	44	41	11	10
Peak	(cfs)	978	910	916	881	883	820	780	787	337	317	318	176	177
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	45	45	35	40	35	35	40	30	35	35	30	15	10
Peak	(cfs_or_ac.ft.)	0	3	0	4	0	0	4	0	0	2	0	3	0
Case	((),S,I,D,O)	()	()	()	()	()	()	()	()	()	()	()	()	()
Area	(ac)	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6
Peak/Area	(cfs/ac)	0.40	0.40	0.40	0.41	0.41	0.42	0.43	0.43	0.41	0.42	0.42	0.50	0.50
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Summary	File:													

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

10-YEAR

Time(Hrs)	Time(Min)	Elem117	Elem217	Elem741	Elem341	Elem721	Elem321	Elem720	Elem225	Elem325	Elem237	Elem236	TotalTime(Hrs)
0	5	0	0	0	0	0	0	40	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	0	2	1	0	0	0	40	0	0	1	0	0.25
0	20	2	11	6	0	0	0	0	2	0	10	4	0.33
0	25	12	31	27	1	0	0	40	7	0	37	18	0.42
0	30	31	62	80	5	53	0	0	21	0	93	57	0.50
0	35	43	91	157	12	100	1	41	46	0	166	126	0.58
0	40	62	108	228	24	175	2	4	78	0	227	193	0.67
0	45	81	116	270	39	223	3	49	108	0	268	249	0.75
0	50	96	119	287	44	286	5	14	126	0	291	300	0.83
0	55	106	120	289	48	306	7	57	144	0	302	341	0.92
1	0	112	120	284	53	347	9	20	159	0	305	372	1.00
1	5	115	119	278	57	360	12	63	170	0	304	394	1.08
1	10	116	118	272	60	397	15	26	176	0	301	408	1.17
1	15	117	117	268	64	406	17	69	180	0	298	416	1.25
1	20	116	115	265	68	439	20	32	181	53	293	420	1.33
1	25	116	114	263	71	444	23	75	179	191	288	421	1.42
1	30	114	111	259	74	472	27	38	176	176	281	419	1.50
1	35	112	108	254	78	474	30	81	170	173	272	413	1.58
1	40	110	105	247	80	500	33	43	163	166	263	406	1.67
1	45	107	102	241	81	499	37	86	156	159	253	397	1.75
1	50	104	99	235	81	523	40	49	148	151	244	387	1.83
1	55	102	97	229	81	520	44	92	139	143	235	377	1.92
2	0	99	94	223	82	541	47	55	131	134	226	366	2.00
2	5	96	91	218	82	534	51	98	123	126	218	356	2.08
2	10	94	88	212	82	551	54	61	115	118	209	345	2.17
2	15	91	85	205	83	540	58	104	107	110	201	334	2.25
2	20	88	82	198	83	552	61	67	99	102	192	322	2.33
2	25	84	78	190	83	536	65	109	91	94	182	310	2.42
2	30	81	74	183	84	543	68	72	84	87	172	298	2.50
2	35	78	71	175	84	523	72	115	75	79	163	286	2.58
2	40	74	67	167	84	526	75	77	66	70	154	273	2.67
2	45	71	64	160	84	503	78	119	60	63	146	262	2.75
2	50	68	61	154	84	504	81	82	55	57	138	250	2.83
2	55	65	59	148	85	478	84	124	50	52	131	239	2.92
3	0	62	56	142	85	477	93	93	45	47	124	228	3.00
3	5	60	54	137	85	450	194	234	41	43	118	218	3.08
3	10	57	51	132	85	447	264	264	37	39	111	209	3.17
3	15	54	48	126	85	419	310	350	34	35	104	199	3.25
3	20	52	45	120	85	415	339	339	30	32	97	189	3.33
3	25	49	42	114	85	385	356	396	27	28	91	179	3.42
3	30	46	39	108	85	380	363	363	24	25	84	169	3.50
3	35	44	37	102	85	351	364	404	21	22	78	160	3.58
3	40	41	34	97	85	346	360	360	19	20	72	150	3.67
3	45	39	32	92	86	317	352	392	16	17	67	141	3.75
3	50	37	30	87	86	314	342	342	14	15	62	129	3.83
3	55	35	28	82	86	286	330	370	13	13	57	119	3.92
4	0	33	26	78	86	283	318	318	11	12	53	111	4.00
4	5	31	24	74	85	256	305	345	10	10	49	103	4.08
4	10	30	23	70	85	255	291	291	8	10	45	97	4.17
4	15	25	21	67	85	230	278	318	7	10	42	91	4.25
4	20	22	20	64	85	230	265	265	6	9	38	85	4.33
4	25	20	19	60	85	205	252	292	5	9	36	80	4.42
4	30	19	17	58	85	207	239	239	4	8	33	75	4.50
4	35	18	16	55	85	183	227	267	4	7	30	71	4.58
4	40	16	15	52	85	186	215	215	3	7	28	67	4.67
4	45	15	14	49	85	163	204	244	3	6	26	63	4.75
4	50	14	13	47	85	166	193	193	2	6	24	59	4.83
4	55	14	12	45	85	143	183	223	2	5	22	56	4.92
5	0	13	12	43	85	146	172	172	2	4	21	52	5.00
5	5	12	11	41	85	125	162	202	1	4	19	49	5.08
5	10	11	10	39	84	128	153	153	1	4	18	46	5.17
5	15	10	10	37	84	101	142	182	1	3	16	44	5.25
5	20	10	9	35	84	103	131	131	1	3	15	41	5.33
5	25	9	8	33	84	81	120	160	1	2	14	39	5.42
5	30	9	8	32	84	87	110	110	1	2	13	37	5.50
5	35	8	7	30	84	68	101	141	1	2	12	35	5.58
5	40	7	7	29	84	75	93	93	0	2	11	33	5.67
5	45	7	6	27	84	58	87	127	0	1	10	31	5.75
5	50	7	6	26	83	66	87	87	0	1	9	29	5.83
5	55	6	6	25	83	49	87	127	0	1	9	27	5.92
6	0	6	5	24	83	58	86	86	0	1	8	26	6.00
Peak	(cfs)	117	120	289	86	552	364	404	181	191	305	421	
Peak	(hrs)	1	0	0	3	2	3	3	1	1	1	1	
Peak	(min)	15	55	55	45	20	35	35	20	25	0	25	
Peak	(cfs_or_ac.ft.)	2	0	0	34	0	88	0	0	9	0	0	
Case	(),S,I,D,O)	( )	( )	( )	(S)	( )	(S)	( )	( )	(S)	( )	( )	
Area	(ac)	223.4	223.4	691.2	691.2	2172.2	2172.2	2172.2	490.9	490.9	540.8	889.6	
Peak/Area	(cfs/ac)	0.52	0.54	0.42	0.12	0.25	0.17	0.19	0.37	0.39	0.56	0.47	
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Summary	File:							P:\coweld01\future~2\Goddin~1\10_Year\udswmm\ghod10yr.txt					

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

25-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	0	0	0	0	4	0	1	0	0	0	1	0	1
0	25	0	0	2	1	7	0	3	0	0	0	5	0	3
0	30	1	1	5	2	11	0	10	0	2	2	16	0	11
0	35	5	5	18	10	58	1	24	0	9	7	40	2	30
0	40	20	20	49	33	109	6	49	2	26	22	83	8	67
0	45	55	55	100	74	165	16	89	8	64	55	150	25	132
0	50	99	99	133	93	255	37	145	25	126	111	237	60	225
0	55	139	139	169	117	358	73	217	61	215	193	344	120	343
1	0	183	183	218	155	479	125	310	123	333	304	485	191	425
1	5	242	242	287	215	668	202	448	215	464	428	583	223	549
1	10	302	302	389	304	888	310	611	327	587	542	677	270	671
1	15	359	359	528	427	1122	433	704	383	667	613	769	333	791
1	20	454	454	697	583	1357	545	781	434	757	696	863	408	911
1	25	590	590	881	757	1506	572	856	491	855	788	958	495	1029
1	30	758	758	1068	936	1654	597	931	556	955	886	1055	592	1142
1	35	946	946	1254	1117	1810	627	1008	629	1056	986	1152	696	1249
1	40	1142	1142	1440	1301	1971	662	1086	709	1158	1086	1247	804	1347
1	45	1341	1341	1626	1485	2138	703	1165	795	1257	1186	1339	913	1435
1	50	1538	1538	1807	1667	2281	749	1247	887	1354	1282	1427	1021	1512
1	55	1731	1731	1983	1845	2430	801	1329	981	1447	1374	1510	1124	1580
2	0	1917	1917	2155	2019	2584	858	1413	1078	1534	1462	1587	1222	1641
2	5	2097	2097	2319	2187	2701	920	1496	1174	1615	1544	1658	1314	1699
2	10	2268	2268	2473	2344	2823	986	1577	1269	1690	1620	1725	1401	1759
2	15	2429	2429	2619	2494	2948	1056	1656	1361	1760	1691	1789	1483	1824
2	20	2581	2581	2755	2634	3036	1129	1731	1450	1826	1758	1851	1565	1900
2	25	2720	2720	2877	2761	3127	1204	1802	1535	1889	1824	1916	1647	1988
2	30	2849	2849	2991	2879	3219	1280	1870	1616	1952	1891	1985	1733	2089
2	35	2966	2966	3094	2986	3283	1357	1936	1696	2020	1961	2061	1825	2202
2	40	3071	3071	3185	3082	3347	1434	2001	1774	2096	2040	2153	1923	2320
2	45	3166	3166	3267	3169	3412	1511	2068	1854	2181	2127	2250	2027	2437
2	50	3251	3251	3341	3248	3462	1588	2138	1937	2273	2221	2350	2135	2549
2	55	3327	3327	3407	3319	3513	1666	2217	2023	2370	2321	2453	2244	2656
3	0	3396	3396	3468	3384	3565	1746	2303	2113	2469	2422	2554	2352	2747
3	5	3459	3459	3525	3445	3608	1828	2391	2205	2568	2523	2651	2455	2820
3	10	3517	3517	3578	3501	3654	1913	2481	2300	2663	2620	2739	2550	2875
3	15	3571	3571	3629	3554	3701	1999	2571	2395	2751	2709	2816	2633	2911
3	20	3623	3623	3678	3605	3743	2087	2659	2488	2828	2788	2879	2704	2930
3	25	3673	3673	3725	3653	3785	2176	2743	2577	2894	2854	2929	2760	2933
3	30	3720	3720	3770	3699	3828	2265	2821	2659	2946	2907	2964	2801	2922
3	35	3765	3765	3812	3744	3863	2352	2889	2733	2984	2946	2984	2828	2899
3	40	3807	3807	3852	3785	3895	2437	2948	2796	3007	2970	2991	2842	2865
3	45	3847	3847	3888	3823	3924	2518	2996	2849	3017	2980	2985	2842	2823
3	50	3883	3883	3920	3857	3946	2593	3032	2890	3014	2978	2969	2831	2775
3	55	3916	3916	3948	3887	3961	2662	3056	2918	3000	2965	2942	2811	2721
4	0	3944	3944	3971	3911	3969	2724	3068	2935	2976	2942	2907	2782	2664
4	5	3966	3966	3988	3930	3977	2778	3070	2941	2943	2910	2865	2745	2604
4	10	3984	3984	4001	3944	3976	2823	3061	2937	2903	2871	2818	2703	2541
4	15	3997	3997	4007	3952	3965	2859	3043	2923	2857	2825	2765	2655	2477
4	20	4003	4003	4006	3953	3946	2886	3016	2900	2806	2775	2709	2604	2413
4	25	4003	4003	3998	3947	3918	2904	2982	2871	2751	2721	2651	2550	2349
4	30	3995	3995	3982	3932	3881	2913	2942	2834	2693	2664	2590	2494	2286
4	35	3980	3980	3960	3911	3848	2914	2897	2793	2633	2605	2528	2436	2223
4	40	3958	3958	3933	3885	3807	2907	2847	2747	2572	2544	2466	2378	2162
4	45	3931	3931	3900	3854	3759	2894	2794	2697	2510	2483	2404	2320	2102
4	50	3899	3899	3861	3816	3704	2874	2739	2645	2448	2421	2342	2261	2044
4	55	3860	3860	3816	3773	3644	2848	2681	2590	2386	2360	2280	2204	1987
5	0	3816	3816	3766	3724	3579	2817	2622	2534	2325	2299	2220	2147	1933
5	5	3767	3767	3712	3671	3522	2782	2562	2478	2265	2240	2161	2091	1880
5	10	3715	3715	3656	3617	3461	2743	2502	2421	2206	2181	2104	2037	1830
5	15	3659	3659	3598	3560	3397	2701	2443	2363	2148	2124	2048	1984	1782
5	20	3602	3602	3538	3501	3330	2657	2383	2307	2092	2068	1994	1933	1736
5	25	3542	3542	3475	3439	3261	2610	2324	2250	2037	2014	1942	1883	1692
5	30	3480	3480	3411	3376	3191	2562	2267	2195	1984	1962	1891	1835	1649
5	35	3416	3416	3344	3310	3119	2513	2210	2141	1933	1911	1843	1789	1609
5	40	3350	3350	3276	3243	3047	2463	2155	2088	1884	1862	1796	1745	1569
5	45	3283	3283	3207	3175	2975	2412	2101	2037	1836	1815	1751	1702	1532
5	50	3214	3214	3137	3105	2902	2362	2048	1986	1790	1770	1707	1660	1495
5	55	3145	3145	3066	3035	2830	2311	1998	1938	1746	1726	1665	1620	1460
6	0	3075	3075	2995	2965	2758	2262	1948	1890	1703	1684	1625	1582	1425
Peak	(cfs)	4003	4003	4007	3953	3977	2914	3070	2941	3017	2980	2991	2842	2933
Peak	(hrs)	4	4	4	4	4	4	4	4	3	3	3	3	3
Peak	(min)	20	20	15	20	5	35	5	5	45	45	40	40	25
Peak	(cfs_or_ac.ft.)	0	7	0	5	1222	12	0	7	0	8	0	6	0
Case	(()S,I,D,O)	( )	( )	( )	( )	(I)	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6
Peak/Area	(cfs/ac)	n/a	0.34	0.34	0.35	0.35	0.26	0.27	0.28	0.28	0.28	0.28	0.29	0.30
11-23-1999	16:04:44													
Summary	File:	P:\coweld01\future~2\Goddin~1\25_Year\udswmm\ghod25yr.txt												

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

25-YEAR

Time(Hrs)	Time(Min)	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108	Elem308	Elem708	Elem309	Elem208	Elem109	Elem709
0	5	0	0	0	0	0	2	0	0	0	0	0	0	0
0	10	0	0	0	0	0	4	0	0	0	0	0	0	0
0	15	0	0	0	1	1	7	0	0	0	0	0	0	2
0	20	0	2	0	4	3	10	0	1	2	1	3	1	21
0	25	0	7	0	8	5	12	0	4	12	8	17	10	61
0	30	1	22	1	17	8	15	1	14	42	31	53	38	127
0	35	5	55	4	34	11	20	5	41	106	81	127	95	288
0	40	17	115	11	65	17	36	19	91	198	149	197	142	514
0	45	45	207	27	116	33	72	51	168	325	246	330	254	738
0	50	97	321	57	191	68	139	112	281	509	397	520	424	960
0	55	175	448	109	297	134	239	204	406	607	463	756	629	1158
1	0	220	639	188	430	232	358	314	502	680	507	994	848	1341
1	5	278	778	244	603	345	457	406	516	772	551	1224	1067	1521
1	10	348	904	311	760	443	523	464	536	865	608	1444	1279	1698
1	15	430	1025	394	878	515	572	506	560	956	676	1650	1482	1860
1	20	523	1138	486	966	569	612	540	589	1050	754	1836	1667	1990
1	25	622	1240	580	1034	614	652	574	625	1247	939	1991	1823	2076
1	30	726	1328	672	1092	658	697	615	682	1736	1420	2105	1942	2116
1	35	830	1404	760	1144	703	743	657	769	2316	1997	2175	2018	2115
1	40	932	1466	843	1185	744	801	711	874	2469	2151	2203	2053	2082
1	45	1028	1516	917	1213	778	876	782	979	2505	2189	2195	2053	2024
1	50	1118	1556	984	1257	833	1007	910	1342	2489	2179	2158	2024	1950
1	55	1201	1596	1052	1338	927	1224	1122	1698	2443	2139	2100	1973	1867
2	0	1278	1645	1130	1470	1074	1478	1373	1923	2376	2079	2028	1908	1778
2	5	1352	1714	1225	1645	1265	1714	1605	2054	2294	2005	1946	1832	1690
2	10	1429	1806	1344	1844	1481	1930	1792	2116	2205	1923	1860	1752	1602
2	15	1512	1923	1486	2053	1706	2145	1923	2129	2111	1838	1772	1671	1518
2	20	1605	2060	1647	2263	1933	2343	2001	2108	2015	1751	1686	1590	1441
2	25	1710	2216	1822	2455	2142	2484	2036	2064	1921	1666	1604	1514	1372
2	30	1828	2383	1999	2602	2306	2536	2035	2005	1833	1587	1530	1442	1307
2	35	1956	2538	2165	2694	2414	2556	2009	1937	1750	1513	1460	1374	1245
2	40	2090	2671	2309	2742	2479	2554	1966	1865	1671	1444	1394	1310	1186
2	45	2223	2776	2425	2756	2508	2534	1911	1792	1595	1378	1330	1249	1126
2	50	2348	2852	2512	2745	2512	2499	1849	1718	1521	1315	1268	1190	1072
2	55	2461	2899	2570	2713	2495	2453	1782	1644	1450	1254	1210	1134	1023
3	0	2559	2921	2603	2669	2463	2398	1714	1572	1382	1197	1156	1082	978
3	5	2638	2922	2614	2620	2419	2336	1645	1502	1321	1144	1106	1034	936
3	10	2699	2906	2607	2561	2366	2269	1577	1436	1267	1099	1059	989	895
3	15	2741	2876	2586	2497	2307	2201	1513	1379	1246	1084	1014	946	855
3	20	2766	2833	2553	2429	2245	2134	1454	1333	1219	1063	970	905	816
3	25	2776	2781	2511	2360	2181	2071	1401	1292	1187	1037	928	865	778
3	30	2770	2723	2461	2292	2119	2010	1353	1253	1152	1008	888	827	743
3	35	2753	2660	2408	2226	2058	1950	1309	1215	1115	976	849	790	708
3	40	2725	2595	2351	2161	1998	1891	1268	1177	1076	943	811	755	675
3	45	2689	2528	2293	2097	1940	1833	1228	1139	1037	909	775	721	644
3	50	2646	2461	2233	2033	1881	1774	1189	1101	998	875	741	689	613
3	55	2598	2393	2173	1970	1823	1715	1150	1062	959	840	708	658	585
4	0	2546	2325	2113	1907	1765	1656	1112	1023	921	807	676	628	557
4	5	2491	2258	2052	1845	1708	1600	1077	1005	895	785	646	600	531
4	10	2433	2191	1992	1786	1653	1551	1050	997	880	774	617	572	505
4	15	2374	2126	1933	1730	1603	1508	1030	989	864	762	589	546	481
4	20	2314	2063	1876	1680	1557	1469	1014	980	846	748	562	521	458
4	25	2254	2002	1821	1632	1513	1429	1001	971	828	734	537	497	435
4	30	2195	1944	1768	1584	1470	1378	989	961	809	718	512	474	414
4	35	2137	1888	1717	1536	1426	1337	977	951	790	702	488	452	393
4	40	2079	1834	1668	1491	1384	1302	966	940	771	686	466	431	373
4	45	2023	1782	1620	1449	1346	1271	955	928	751	669	444	410	354
4	50	1968	1732	1574	1411	1312	1242	944	916	731	652	423	391	336
4	55	1915	1685	1531	1376	1280	1214	932	903	711	635	403	372	320
5	0	1864	1640	1490	1343	1250	1187	920	890	691	617	384	354	304
5	5	1815	1598	1452	1311	1222	1161	907	876	671	599	366	338	289
5	10	1767	1558	1415	1281	1195	1135	894	863	651	582	350	322	275
5	15	1722	1520	1380	1251	1168	1110	881	848	631	564	333	307	262
5	20	1678	1484	1347	1222	1142	1084	867	833	612	547	318	293	249
5	25	1637	1449	1315	1194	1117	1059	853	818	593	530	304	279	237
5	30	1597	1416	1284	1166	1091	1034	839	803	574	513	290	266	226
5	35	1558	1383	1254	1138	1066	1008	824	788	553	494	277	254	215
5	40	1522	1351	1225	1111	1041	982	809	772	526	468	265	243	205
5	45	1486	1320	1196	1083	1016	956	794	755	500	444	253	232	196
5	50	1451	1290	1167	1055	991	929	777	733	349	295	242	222	188
5	55	1418	1260	1139	1027	964	900	758	707	299	247	232	213	180
6	0	1385	1230	1111	997	937	869	737	680	282	230	223	204	172
Peak	(cfs)	2776	2922	2614	2756	2512	2556	2036	2129	2505	2189	2203	2053	2116
Peak	(hrs)	3	3	3	2	2	2	2	2	1	1	1	1	1
Peak	(min)	25	5	5	45	50	35	25	15	45	45	40	40	30
Peak	(cfs_or_ac.ft.)	7	0	7	0	12	0	11	79	0	46	0	5	0
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	(S)	( )	(S)	( )	( )	( )
Area	(ac)	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8	4197.8	4197.8	3548.8	3548.8	3283.2	3283.2
Peak/Area	(cfs/ac)	0.31	0.33	0.36	0.38	0.39	0.40	0.49	0.51	0.60	0.62	0.62	0.63	0.64
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Summary	File:													

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

25-YEAR

Time(Hrs)	Time(Min)	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	2	1	19	0	3	2	0	3	0	0	1	0	1
0	20	19	17	73	4	15	15	3	18	0	0	5	1	5
0	25	54	47	172	25	52	49	18	53	3	2	19	7	18
0	30	107	90	348	63	128	121	51	127	14	12	55	27	48
0	35	236	202	562	131	237	221	96	268	50	44	113	59	78
0	40	406	352	623	255	407	378	190	440	115	105	181	98	122
0	45	551	482	688	422	565	524	322	567	203	188	270	150	189
0	50	695	598	784	586	705	653	465	701	300	282	352	194	252
0	55	825	710	881	736	840	780	618	855	394	371	430	247	292
1	0	948	824	999	884	989	917	782	1015.00	473	445	487	285	310
1	5	1079	950	1142	1041	1149	1062	943	1148.00	528	495	519	305	314
1	10	1220	1089	1287	1195	1287	1189	1082	1241.00	558	522	533	309	308
1	15	1359	1228	1407	1322	1390	1285	1188	1298.00	571	534	537	305	299
1	20	1478	1349	1488	1412	1456	1345	1258	1323.00	573	534	532	296	287
1	25	1563	1438	1528	1465	1486	1372	1295	1321.00	567	528	522	284	272
1	30	1611	1490	1535	1484	1486	1370	1303	1296.00	554	515	505	269	254
1	35	1625	1510	1516	1474	1460	1345	1287	1255.00	535	498	485	252	236
1	40	1611	1503	1479	1442	1417	1303	1253	1202.00	512	476	461	234	217
1	45	1577	1475	1428	1394	1361	1250	1206	1141.00	487	453	437	217	201
1	50	1528	1432	1369	1336	1298	1190	1152	1079.00	462	430	415	202	188
1	55	1469	1379	1306	1273	1233	1128	1094	1021.00	439	409	396	190	179
2	0	1406	1321	1243	1210	1171	1069	1038	967	419	391	379	180	172
2	5	1341	1261	1181	1150	1113	1014	986	920	402	376	367	174	167
2	10	1277	1201	1122	1094	1059	964	938	878	388	364	357	168	161
2	15	1215	1144	1067	1043	1011	919	895	840	376	354	347	162	156
2	20	1159	1090	1019	996	966	877	856	805	365	344	337	157	151
2	25	1108	1040	973	953	925	840	821	775	354	334	328	152	146
2	30	1059	994	930	913	887	806	789	745	344	325	318	147	140
2	35	1014	950	890	876	851	773	758	716	333	314	306	140	135
2	40	971	909	852	840	816	742	728	686	320	302	293	132	129
2	45	931	871	817	806	781	711	699	658	308	291	283	126	123
2	50	893	835	783	772	748	682	671	631	297	280	272	121	118
2	55	857	801	751	740	718	654	644	606	286	270	262	115	113
3	0	823	769	722	711	691	628	619	582	276	260	253	110	108
3	5	791	739	693	684	664	603	594	558	266	251	243	106	103
3	10	760	709	663	657	638	577	570	534	256	241	234	101	99
3	15	728	679	633	631	611	552	546	510	246	232	224	96	94
3	20	697	651	605	605	585	527	523	486	236	222	215	91	89
3	25	668	623	579	579	559	502	499	462	225	213	205	86	84
3	30	639	596	553	553	534	479	476	440	215	203	196	82	79
3	35	611	570	528	528	509	456	454	418	206	194	186	77	75
3	40	585	546	504	504	486	434	432	398	196	185	178	73	70
3	45	559	522	481	481	463	412	411	378	187	177	169	69	66
3	50	535	498	459	459	442	392	391	358	179	169	162	65	63
3	55	511	476	438	438	421	373	372	340	170	161	154	61	59
4	0	488	455	418	418	401	354	353	322	163	154	147	58	56
4	5	466	434	398	398	381	336	335	304	155	147	140	55	53
4	10	445	414	378	378	362	318	317	287	148	140	134	52	50
4	15	424	395	360	360	344	301	300	271	142	134	128	49	48
4	20	404	377	342	342	327	285	284	256	135	128	122	47	45
4	25	385	359	325	325	310	269	269	242	129	122	115	43	39
4	30	367	342	309	309	295	255	255	228	122	115	108	38	36
4	35	350	325	294	294	280	241	241	214	115	109	102	35	33
4	40	333	310	279	279	265	227	227	202	109	103	97	33	31
4	45	317	295	265	265	252	215	215	191	103	98	92	30	29
4	50	302	280	251	251	239	203	203	181	99	93	88	29	27
4	55	287	267	239	239	227	192	192	171	94	89	84	27	26
5	0	274	254	227	227	216	182	182	162	90	85	80	25	24
5	5	261	242	216	216	206	172	172	151	86	81	77	24	23
5	10	249	231	206	206	195	163	163	142	82	77	73	22	21
5	15	237	220	195	195	185	154	154	135	78	74	70	21	20
5	20	226	209	186	186	176	145	145	128	75	71	67	20	19
5	25	215	199	177	177	168	138	138	122	71	67	64	19	18
5	30	205	190	168	168	160	131	131	115	68	65	61	17	17
5	35	196	181	161	161	153	124	124	110	65	62	58	16	16
5	40	187	173	153	153	146	118	118	104	63	59	56	15	15
5	45	179	165	147	147	139	113	113	99	60	57	53	15	14
5	50	171	158	140	140	133	107	107	95	57	54	51	14	13
5	55	164	152	134	134	128	102	102	90	55	52	49	13	12
6	0	157	145	129	129	122	97	97	86	52	50	47	12	11
Peak	(cfs)	1625	1510	1535	1484	1486	1372	1303	1323.00	573	534	537	309	314
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	35	35	30	30	25	25	30	20	20	15	15	10	5
Peak	(cfs_or_ac.ft.)	0	4	0	4	0	0	4	0	0	3	0	4	0
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6
Peak/Area	(cfs/ac)	0.66	0.66	0.67	0.69	0.69	0.71	0.72	0.73	0.69	0.70	0.70	0.87	0.89
11-23-1999	16:04:44													
Summary	File:													

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

25-YEAR

Time(Hrs)	Time(Min)	Elem117	Elem217	Elem741	Elem341	Elem721	Elem321	Elem720	Elem225	Elem325	Elem237	Elem236	TotalTime(Hrs)
0	5	0	0	0	0	0	0	40	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	0	1	0	0	0	0	40	0	0	1	0	0.25
0	20	2	9	4	0	0	0	0	1	0	8	3	0.33
0	25	9	24	20	1	0	0	40	4	0	29	14	0.42
0	30	27	52	62	4	33	0	0	15	0	73	43	0.50
0	35	39	91	145	10	92	1	41	42	0	150	107	0.58
0	40	64	138	261	23	174	2	7	86	0	246	194	0.67
0	45	105	195	353	41	263	3	57	141	0	347	280	0.75
0	50	151	217	396	46	363	5	31	187	0	453	395	0.83
0	55	183	219	435	53	445	8	80	231	0	506	514	0.92
1	0	199	213	458	60	535	12	47	269	0	523	606	1.00
1	5	204	203	470	67	609	16	93	297	0	520	668	1.08
1	10	201	193	474	74	674	20	58	314	188	507	703	1.17
1	15	195	183	473	80	728	25	102	322	329	489	717	1.25
1	20	186	173	468	81	778	31	66	323	322	467	716	1.33
1	25	177	160	458	82	818	36	110	317	320	441	702	1.42
1	30	166	147	443	83	852	42	73	306	311	411	678	1.50
1	35	154	133	424	84	877	48	116	292	298	379	646	1.58
1	40	141	121	401	85	897	54	79	278	284	347	610	1.67
1	45	131	116	378	86	908	60	123	262	269	316	571	1.75
1	50	123	113	355	86	915	67	86	245	252	297	533	1.83
1	55	118	109	333	87	914	73	130	228	235	285	500	1.92
2	0	113	106	312	88	910	79	94	211	218	273	471	2.00
2	5	109	103	293	88	899	85	138	195	202	261	446	2.08
2	10	106	99	276	89	886	226	237	180	186	250	423	2.17
2	15	102	96	259	89	868	404	454	166	172	239	402	2.25
2	20	99	92	244	90	852	529	538	153	159	228	387	2.33
2	25	95	89	234	90	830	614	663	142	147	218	371	2.42
2	30	92	85	224	90	808	670	678	131	135	207	357	2.50
2	35	88	81	214	91	782	704	751	120	124	196	342	2.58
2	40	84	77	205	91	757	722	728	110	114	186	327	2.67
2	45	81	73	196	91	728	728	773	101	105	175	313	2.75
2	50	77	70	187	91	702	724	729	92	96	165	298	2.83
2	55	74	67	179	92	677	715	758	83	87	156	285	2.92
3	0	70	64	172	92	653	701	704	74	78	148	272	3.00
3	5	67	61	165	92	627	684	726	64	69	139	259	3.08
3	10	64	57	158	92	603	665	666	58	60	131	247	3.17
3	15	61	54	151	92	577	645	685	52	54	123	235	3.25
3	20	58	50	143	93	552	623	623	47	49	115	223	3.33
3	25	55	47	136	93	525	600	640	42	44	107	211	3.42
3	30	52	44	129	93	501	576	576	37	39	99	200	3.50
3	35	49	41	122	93	476	552	592	32	34	91	188	3.58
3	40	46	39	115	93	453	528	528	28	30	85	177	3.67
3	45	43	36	109	93	429	504	544	25	26	78	167	3.75
3	50	41	34	104	93	408	481	481	22	23	72	157	3.83
3	55	38	32	98	93	385	458	498	19	20	67	147	3.92
4	0	36	29	93	93	365	435	435	16	17	62	134	4.00
4	5	34	28	89	93	344	413	453	14	15	57	124	4.08
4	10	33	26	84	93	325	392	392	12	13	53	115	4.17
4	15	31	24	80	93	306	371	411	11	11	49	108	4.25
4	20	30	23	76	93	290	351	351	9	10	45	101	4.33
4	25	24	21	72	93	272	332	372	8	10	42	94	4.42
4	30	22	20	69	93	258	313	313	6	9	39	89	4.50
4	35	20	18	65	93	242	296	336	5	9	36	83	4.58
4	40	19	17	62	93	229	280	280	5	8	33	78	4.67
4	45	17	16	59	93	215	264	304	4	8	31	74	4.75
4	50	16	15	56	93	204	249	249	3	7	28	69	4.83
4	55	15	14	54	92	192	235	275	3	6	26	65	4.92
5	0	14	13	51	92	182	222	222	2	6	24	61	5.00
5	5	13	12	48	92	171	209	249	2	5	22	58	5.08
5	10	12	12	46	92	161	198	198	2	5	21	55	5.17
5	15	12	11	44	92	150	186	226	1	4	19	51	5.25
5	20	11	10	42	92	141	175	175	1	4	18	48	5.33
5	25	10	9	40	92	130	164	204	1	3	16	46	5.42
5	30	10	9	38	92	122	154	154	1	3	15	43	5.50
5	35	9	8	36	92	106	143	183	1	3	14	41	5.58
5	40	8	8	34	91	96	131	131	1	2	13	38	5.67
5	45	8	7	33	91	86	120	160	1	2	12	36	5.75
5	50	7	7	31	91	80	110	110	0	2	11	34	5.83
5	55	7	6	29	91	72	101	141	0	2	10	32	5.92
6	0	6	6	28	91	68	92	92	0	1	9	30	6.00
Peak	(cfs)	204	219	474	93	915	728	773	323	329	523	717	
Peak	(hrs)	1	0	1	3	1	2	2	1	1	1	1	
Peak	(min)	5	55	10	20	50	45	45	20	15	0	15	
Peak	(cfs_or_ac.ft.)	3	0	0	53	0	96	0	0	10	0	0	
Case	(()S,I,D,O)	( )	( )	( )	(S)	( )	(S)	( )	( )	(S)	( )	( )	
Area	(ac)	223.4	223.4	691.2	691.2	2172.2	2172.2	2172.2	490.9	490.9	540.8	889.6	
Peak/Area	(cfs/ac)	0.91	0.98	0.69	0.13	0.42	0.34	0.36	0.66	0.67	0.97	0.81	
11-23-1999	16:04:44												
Summary	File:							P:\coweld01\future~2\Goddin~1\25_Year\udswmm\ghod25yr.txt					

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

50-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	0	0	0	0	5	0	1	0	0	0	2	0	1
0	25	0	0	2	1	9	0	4	0	0	0	6	0	4
0	30	1	1	7	3	14	0	11	0	3	2	19	0	13
0	35	7	7	22	13	72	2	28	0	11	9	47	3	36
0	40	26	26	62	43	133	7	58	3	33	28	100	11	83
0	45	68	68	116	84	202	21	107	11	80	69	185	33	165
0	50	116	116	152	104	336	48	179	34	161	142	298	80	286
0	55	165	165	205	141	491	94	277	86	295	266	499	160	434
1	0	229	229	280	202	680	176	467	181	478	436	669	215	605
1	5	304	304	410	301	983	307	688	318	646	588	811	273	777
1	10	374	374	585	451	1315	467	825	393	776	707	947	354	948
1	15	496	496	800	646	1585	565	937	463	915	841	1083	456	1118
1	20	673	673	1036	868	1801	599	1047	544	1060	983	1220	576	1285
1	25	895	895	1283	1104	2024	640	1158	640	1208	1127	1358	712	1445
1	30	1145	1145	1536	1350	2256	690	1272	749	1356	1273	1496	859	1595
1	35	1410	1410	1792	1602	2477	748	1390	869	1504	1418	1631	1012	1732
1	40	1682	1682	2047	1856	2707	816	1510	999	1647	1559	1760	1166	1854
1	45	1954	1954	2303	2114	2946	892	1631	1136	1784	1695	1883	1318	1964
1	50	2223	2223	2554	2367	3142	978	1754	1277	1914	1824	1998	1465	2067
1	55	2485	2485	2794	2611	3346	1071	1875	1419	2037	1945	2107	1606	2176
2	0	2737	2737	3028	2850	3556	1170	1995	1560	2152	2061	2215	1745	2303
2	5	2979	2979	3250	3078	3715	1276	2112	1698	2266	2175	2327	1887	2459
2	10	3208	3208	3455	3289	3879	1387	2227	1834	2382	2292	2449	2039	2646
2	15	3421	3421	3650	3490	4046	1501	2341	1969	2506	2417	2587	2204	2859
2	20	3621	3621	3832	3678	4180	1619	2457	2106	2643	2555	2742	2386	3085
2	25	3806	3806	3995	3848	4291	1739	2578	2246	2794	2709	2912	2581	3308
2	30	3973	3973	4142	4003	4409	1863	2705	2393	2960	2876	3091	2784	3515
2	35	4125	4125	4275	4142	4497	1990	2840	2547	3134	3052	3272	2988	3694
2	40	4260	4260	4394	4268	4593	2122	2983	2709	3311	3231	3446	3185	3839
2	45	4383	4383	4505	4385	4689	2258	3132	2876	3482	3405	3607	3367	3948
2	50	4496	4496	4608	4495	4775	2399	3285	3046	3645	3570	3757	3527	4022
2	55	4601	4601	4705	4598	4862	2545	3436	3214	3792	3720	3885	3662	4062
3	0	4700	4700	4798	4697	4955	2693	3583	3376	3918	3849	3984	3769	4073
3	5	4795	4795	4889	4793	5041	2842	3723	3526	4013	3952	4056	3847	4060
3	10	4886	4886	4978	4888	5131	2992	3852	3661	4083	4029	4101	3900	4031
3	15	4976	4976	5065	4980	5215	3139	3963	3777	4129	4079	4123	3928	3982
3	20	5063	5063	5149	5069	5294	3280	4053	3872	4152	4105	4121	3934	3918
3	25	5148	5148	5230	5153	5360	3413	4122	3945	4152	4108	4099	3919	3840
3	30	5228	5228	5305	5230	5419	3534	4168	3997	4132	4091	4059	3887	3753
3	35	5302	5302	5372	5299	5463	3642	4194	4028	4095	4055	4004	3838	3658
3	40	5369	5369	5429	5358	5495	3736	4199	4039	4043	4003	3936	3777	3558
3	45	5425	5425	5474	5405	5508	3813	4186	4031	3977	3939	3858	3706	3455
3	50	5469	5469	5506	5439	5508	3874	4157	4007	3901	3864	3772	3626	3350
3	55	5500	5500	5524	5459	5488	3919	4113	3968	3817	3781	3680	3540	3246
4	0	5517	5517	5526	5463	5455	3947	4057	3916	3727	3691	3584	3450	3142
4	5	5519	5519	5514	5452	5407	3960	3990	3854	3632	3597	3485	3357	3039
4	10	5507	5507	5488	5428	5349	3959	3914	3783	3535	3501	3385	3263	2939
4	15	5480	5480	5448	5389	5273	3944	3832	3706	3435	3402	3284	3167	2840
4	20	5440	5440	5394	5337	5190	3918	3745	3623	3335	3303	3184	3072	2745
4	25	5386	5386	5328	5273	5091	3880	3654	3536	3236	3204	3085	2978	2652
4	30	5320	5320	5250	5196	4988	3834	3561	3446	3137	3106	2988	2886	2562
4	35	5244	5244	5164	5112	4887	3779	3466	3355	3040	3010	2892	2795	2476
4	40	5159	5159	5072	5022	4783	3718	3370	3264	2945	2915	2799	2706	2394
4	45	5068	5068	4975	4926	4670	3651	3275	3172	2852	2823	2709	2620	2315
4	50	4972	4972	4873	4825	4556	3580	3180	3081	2762	2733	2622	2537	2240
4	55	4870	4870	4765	4720	4435	3506	3087	2991	2674	2647	2539	2457	2169
5	0	4764	4764	4654	4610	4316	3429	2995	2902	2590	2563	2458	2380	2100
5	5	4655	4655	4543	4499	4209	3350	2906	2816	2509	2482	2380	2306	2035
5	10	4545	4545	4433	4391	4104	3270	2818	2732	2430	2405	2306	2234	1972
5	15	4436	4436	4325	4284	3996	3190	2734	2650	2355	2330	2234	2166	1913
5	20	4328	4328	4217	4177	3891	3109	2652	2571	2283	2258	2166	2101	1857
5	25	4222	4222	4110	4072	3783	3030	2572	2494	2214	2190	2101	2038	1803
5	30	4115	4115	4004	3966	3680	2951	2496	2420	2148	2124	2038	1979	1753
5	35	4010	4010	3898	3862	3574	2873	2422	2349	2085	2062	1979	1922	1705
5	40	3905	3905	3794	3759	3473	2797	2351	2281	2024	2002	1922	1868	1659
5	45	3801	3801	3690	3656	3371	2722	2283	2215	1967	1945	1868	1816	1615
5	50	3699	3699	3588	3555	3273	2649	2217	2152	1911	1890	1816	1767	1574
5	55	3598	3598	3488	3456	3174	2578	2154	2091	1859	1838	1767	1719	1534
6	0	3498	3498	3389	3358	3081	2509	2094	2033	1809	1788	1720	1674	1495
Peak	(cfs)	5519	5519	5526	5463	5508	3960	4199	4039	4152	4108	4123	3934	4073
Peak	(hrs)	4	4	4	4	3	4	3	3	3	3	3	3	3
Peak	(min)	5	5	0	0	45	5	40	40	20	25	15	20	0
Peak	(cfs_or_ac.ft.)	0	8	0	5	1727	12	0	8	0	8	0	7	0
Case	((),S,I,D,O)	()	()	()	()	(I)	()	()	()	()	()	()	()	()
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6
Peak/Area	(cfs/ac)	n/a	0.47	0.48	0.48	0.49	0.35	0.37	0.38	0.39	0.39	0.39	0.40	0.42
11-23-1999	16:04:45													
Summary	File:	P:\coweld01\future~2\Goddin~1\50_Year\udswmm\ghod50yr.txt												

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

50-YEAR

Time(Hrs)	Time(Min)	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108	Elem308	Elem708	Elem309	Elem208	Elem109	Elem709
0	5	0	0	0	0	0	2	0	0	0	0	0	0	0
0	10	0	0	0	0	0	4	0	0	0	0	0	0	0
0	15	0	0	0	1	1	7	0	0	0	0	0	0	4
0	20	0	2	0	4	3	10	0	1	3	2	4	2	27
0	25	0	9	0	9	5	12	0	5	15	11	20	13	67
0	30	1	26	1	19	8	15	1	17	50	37	64	46	150
0	35	6	65	5	39	11	22	6	48	121	91	140	102	356
0	40	21	138	13	77	19	41	23	106	232	174	241	175	655
0	45	57	253	33	141	39	88	63	203	409	313	438	342	985
0	50	124	398	72	240	85	175	139	338	595	456	740	589	1280
0	55	202	642	141	378	171	300	251	479	705	505	1072	882	1566
1	0	267	871	225	616	289	425	363	516	836	558	1411	1198	1852
1	5	354	1055	302	832	409	516	442	541	961	633	1747	1520	2134
1	10	460	1227	403	1003	505	582	499	572	1089	726	2069	1836	2399
1	15	583	1385	520	1133	580	638	546	613	1316	926	2366	2131	2621
1	20	719	1527	644	1235	644	699	599	686	2151	1743	2619	2387	2780
1	25	861	1651	769	1324	708	766	658	806	2942	2523	2812	2586	2864
1	30	1004	1756	889	1384	757	844	731	954	3229	2804	2935	2719	2878
1	35	1145	1841	1001	1443	816	1013	894	1482	3356	2931	2989	2783	2835
1	40	1279	1916	1109	1554	934	1329	1206	2081	3395	2975	2982	2788	2750
1	45	1405	1999	1232	1762	1158	1813	1685	2883	3371	2958	2926	2743	2636
1	50	1530	2119	1393	2108	1524	2412	2232	3216	3299	2895	2834	2663	2506
1	55	1663	2301	1618	2573	2012	2972	2650	3238	3193	2800	2718	2559	2368
2	0	1815	2556	1914	3065	2528	3361	2887	3157	3064	2683	2589	2439	2228
2	5	1997	2863	2261	3472	2961	3541	2978	3036	2922	2553	2453	2312	2091
2	10	2210	3183	2619	3747	3262	3626	2973	2898	2774	2417	2315	2183	1958
2	15	2449	3478	2949	3905	3446	3647	2909	2752	2625	2281	2179	2055	1832
2	20	2700	3722	3226	3973	3540	3624	2808	2604	2478	2146	2047	1932	1715
2	25	2948	3904	3439	3976	3568	3569	2689	2459	2335	2017	1922	1814	1605
2	30	3179	4022	3588	3933	3549	3491	2560	2317	2198	1893	1804	1704	1506
2	35	3381	4083	3677	3857	3497	3398	2431	2192	2069	1778	1695	1602	1419
2	40	3548	4108	3715	3762	3426	3309	2319	2134	1950	1672	1598	1509	1340
2	45	3678	4095	3715	3662	3348	3227	2227	2059	1841	1577	1510	1425	1267
2	50	3772	4052	3684	3560	3267	3140	2140	1974	1742	1491	1430	1347	1200
2	55	3831	3988	3633	3455	3182	3046	2055	1886	1651	1412	1356	1275	1136
3	0	3859	3909	3565	3345	3092	2945	1969	1798	1565	1339	1286	1207	1072
3	5	3860	3818	3485	3231	2995	2838	1883	1711	1484	1270	1219	1143	1017
3	10	3838	3717	3395	3113	2894	2729	1799	1628	1409	1205	1158	1085	966
3	15	3796	3609	3298	2995	2790	2619	1716	1548	1343	1145	1101	1030	918
3	20	3739	3497	3197	2883	2684	2510	1636	1474	1288	1097	1048	979	873
3	25	3668	3384	3093	2772	2579	2405	1562	1412	1265	1080	998	931	831
3	30	3587	3269	2988	2664	2476	2307	1495	1359	1229	1056	950	887	790
3	35	3499	3155	2884	2560	2379	2216	1435	1312	1190	1027	906	844	752
3	40	3406	3043	2782	2462	2286	2131	1381	1267	1149	995	863	804	716
3	45	3309	2934	2682	2369	2199	2050	1330	1223	1107	960	823	766	681
3	50	3210	2829	2585	2280	2116	1973	1283	1180	1065	925	785	731	648
3	55	3112	2728	2492	2195	2037	1897	1237	1137	1022	889	749	696	617
4	0	3013	2630	2402	2114	1961	1824	1193	1094	981	853	714	664	587
4	5	2916	2536	2316	2035	1887	1752	1150	1051	940	818	681	633	559
4	10	2821	2445	2232	1958	1815	1682	1108	1011	905	789	650	603	532
4	15	2728	2358	2152	1884	1746	1619	1072	1002	889	777	620	575	506
4	20	2637	2274	2074	1816	1683	1567	1046	994	872	765	591	548	481
4	25	2549	2194	2000	1754	1626	1521	1026	986	853	751	564	522	457
4	30	2464	2119	1931	1698	1575	1479	1010	976	835	737	538	498	434
4	35	2382	2049	1866	1647	1528	1437	997	967	815	721	512	474	412
4	40	2304	1983	1806	1597	1481	1385	985	956	796	705	488	451	391
4	45	2230	1921	1748	1545	1434	1337	973	945	776	688	465	429	371
4	50	2158	1861	1692	1495	1388	1297	961	933	755	671	443	409	352
4	55	2090	1803	1639	1450	1347	1264	950	921	735	654	421	389	334
5	0	2025	1749	1588	1409	1309	1233	938	908	714	636	401	370	317
5	5	1963	1697	1541	1371	1275	1204	925	895	694	618	382	352	301
5	10	1904	1649	1496	1336	1243	1176	913	882	674	601	365	335	287
5	15	1848	1604	1454	1302	1213	1149	900	867	654	583	348	320	273
5	20	1794	1561	1415	1271	1184	1122	886	853	634	565	332	305	259
5	25	1744	1521	1378	1240	1157	1096	872	838	614	547	316	290	247
5	30	1696	1483	1342	1210	1130	1070	858	823	594	530	302	277	235
5	35	1650	1447	1308	1181	1104	1044	844	807	575	513	288	264	224
5	40	1607	1412	1276	1152	1078	1018	829	792	554	494	276	253	214
5	45	1566	1378	1245	1124	1052	992	814	775	527	468	263	241	204
5	50	1526	1345	1214	1096	1026	965	798	758	501	444	252	231	195
5	55	1488	1313	1184	1067	1000	937	781	737	348	292	241	221	187
6	0	1452	1282	1155	1038	973	908	762	710	299	245	231	212	179
Peak	(cfs)	3860	4108	3715	3976	3568	3647	2978	3238	3395	2975	2989	2788	2878
Peak	(hrs)	3	2	2	2	2	2	2	1	1	1	1	1	1
Peak	(min)	5	40	40	25	25	15	5	55	40	40	35	40	30
Peak	(cfs_or_ac.ft.)	7	0	7	0	13	0	12	86	0	50	0	6	0
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	(S)	( )	(S)	( )	( )	( )
Area	(ac)	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8	4197.8	4197.8	3548.8	3548.8	3283.2	3283.2
Peak/Area	(cfs/ac)	0.43	0.46	0.51	0.54	0.56	0.57	0.71	0.77	0.81	0.84	0.84	0.85	0.88
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Summary	File:													

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

50-YEAR

Time(Hrs)	Time(Min)	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	2	0	0	0	0	0	0	0	0	0	0
0	15	3	3	24	0	4	4	0	4	0	0	1	0	1
0	20	24	22	85	6	19	18	4	22	1	0	6	1	6
0	25	59	50	197	31	61	58	23	62	4	2	23	9	22
0	30	126	107	408	71	146	137	56	148	18	15	64	32	54
0	35	293	253	688	158	292	274	114	325	61	54	131	68	89
0	40	517	453	794	324	511	478	235	535	145	133	230	125	163
0	45	734	628	878	543	721	673	408	723	272	254	365	189	271
0	50	927	785	1023	768	925	864	616	949	427	400	502	275	359
0	55	1115	950	1198	1000	1163	1073	855	1204.00	576	539	619	357	412
1	0	1312	1135	1403	1250	1411	1295	1112	1441.00	688	645	694	407	434
1	5	1523	1341	1622	1496	1638	1505	1354	1625.00	756	707	731	427	432
1	10	1737	1555	1819	1710	1820	1675	1548	1740.00	786	734	741	426	419
1	15	1929	1750	1966	1871	1947	1794	1680	1795.00	791	737	734	412	398
1	20	2075	1902	2051	1971	2009	1852	1751	1800.00	780	725	715	392	373
1	25	2164	1998	2075	2011	2017	1859	1771	1768.00	758	704	689	367	346
1	30	2194	2037	2052	2001	1983	1826	1750	1707.00	728	675	656	341	318
1	35	2177	2029	1996	1954	1918	1764	1700	1627.00	692	641	620	313	289
1	40	2123	1986	1917	1880	1833	1683	1628	1535.00	653	605	582	286	262
1	45	2045	1917	1825	1790	1735	1590	1543	1438.00	613	567	544	260	237
1	50	1952	1833	1725	1692	1632	1493	1452	1342.00	574	531	509	236	216
1	55	1850	1740	1623	1590	1530	1396	1360	1249.00	537	497	477	216	199
2	0	1746	1643	1523	1490	1432	1304	1271	1164.00	504	467	449	201	186
2	5	1643	1547	1427	1396	1340	1217	1188	1088.00	475	441	425	188	176
2	10	1543	1453	1336	1308	1256	1139	1112	1020.00	450	418	404	178	170
2	15	1448	1364	1253	1228	1180	1067	1043	959	427	399	386	171	164
2	20	1359	1281	1177	1156	1111	1004	982	907	409	382	372	165	158
2	25	1277	1205	1107	1090	1049	947	928	859	392	368	359	159	152
2	30	1204	1135	1044	1030	992	895	879	815	377	355	346	153	145
2	35	1138	1071	987	975	940	849	834	776	362	342	333	147	139
2	40	1078	1014	937	925	893	806	794	740	347	328	317	138	133
2	45	1024	961	890	879	849	767	756	705	332	313	302	130	127
2	50	974	914	848	837	808	731	721	673	317	300	290	124	121
2	55	929	870	808	797	770	698	689	643	305	287	279	119	116
3	0	886	829	771	761	735	667	658	616	293	276	268	113	111
3	5	846	791	736	726	702	638	630	589	281	265	257	108	106
3	10	808	755	700	695	673	610	603	563	270	255	247	103	101
3	15	771	720	667	665	644	582	576	537	259	244	236	99	96
3	20	736	687	637	636	615	555	550	511	248	234	225	94	91
3	25	703	656	608	608	587	528	525	485	237	223	215	89	86
3	30	672	627	580	580	559	502	500	461	226	213	205	84	81
3	35	642	599	554	554	533	477	476	438	215	203	195	79	76
3	40	613	572	528	528	508	454	452	416	205	193	185	74	72
3	45	585	546	503	503	484	431	430	395	195	184	177	70	68
3	50	559	521	480	480	461	410	409	374	186	176	168	66	64
3	55	534	497	457	457	439	389	388	355	177	167	160	63	61
4	0	509	475	436	436	418	369	369	336	169	160	153	59	57
4	5	486	453	415	415	398	350	350	318	161	152	146	56	54
4	10	464	432	395	395	378	332	331	300	154	145	139	53	51
4	15	442	412	375	375	359	314	314	283	147	139	133	50	49
4	20	421	392	357	357	341	297	297	267	140	132	127	48	46
4	25	401	374	339	339	324	281	281	252	134	126	120	44	41
4	30	382	356	322	322	307	266	266	238	127	119	112	39	37
4	35	364	339	306	306	291	251	251	224	119	113	106	36	34
4	40	347	322	290	290	276	237	237	211	113	106	100	33	32
4	45	330	307	276	276	262	224	224	199	107	101	96	31	30
4	50	314	292	262	262	249	212	212	189	102	96	91	29	28
4	55	299	278	249	249	237	200	200	179	97	92	87	28	26
5	0	285	264	237	237	225	190	190	169	93	88	83	26	25
5	5	271	252	225	225	214	180	180	160	89	84	79	24	23
5	10	259	240	214	214	204	170	170	149	85	80	76	23	22
5	15	247	229	204	204	193	160	160	141	81	76	72	22	21
5	20	235	218	194	194	184	152	152	133	77	73	69	20	19
5	25	224	207	184	184	175	144	144	126	74	70	66	19	18
5	30	213	198	175	175	166	136	136	120	71	67	63	18	17
5	35	204	189	167	167	159	129	129	114	68	64	60	17	16
5	40	194	180	160	160	152	123	123	109	65	61	58	16	15
5	45	186	172	152	152	145	117	117	103	62	58	55	15	14
5	50	178	164	146	146	139	111	111	98	59	56	53	14	13
5	55	170	157	139	139	133	106	106	94	57	53	50	13	13
6	0	163	151	133	133	127	101	101	89	54	51	48	12	12
Peak	(cfs)	2194	2037	2075	2011	2017	1859	1771	1800.00	791	737	741	427	434
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	30	30	25	25	25	25	25	20	15	15	10	5	0
Peak	(cfs_or_ac.ft.)	0	4	0	5	0	0	4	0	0	4	0	4	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6
Peak/Area	(cfs/ac)	0.89	0.89	0.91	0.94	0.94	0.96	0.98	0.99	0.95	0.97	0.97	1.20	1.22
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Summary	File:													

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

50-YEAR

Time(Hrs)	Time(Min)	Elem117	Elem217	Elem741	Elem341	Elem721	Elem321	Elem720	Elem225	Elem325	Elem237	Elem236	TotalTime(Hrs)
0	5	0	0	0	0	0	0	40	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	0	2	1	0	0	0	40	0	0	1	1	0.25
0	20	3	10	6	0	0	0	0	1	0	10	4	0.33
0	25	11	28	25	1	0	0	40	5	0	35	17	0.42
0	30	30	59	73	4	45	0	0	19	0	83	51	0.50
0	35	43	105	177	13	108	1	41	54	0	174	127	0.58
0	40	83	202	326	28	212	2	12	121	0	291	225	0.67
0	45	151	272	448	43	344	4	75	190	0	486	363	0.75
0	50	217	299	543	51	495	7	52	259	0	618	552	0.83
0	55	260	302	596	60	639	11	105	326	0	686	721	0.92
1	0	279	291	628	70	773	16	74	381	0	710	849	1.00
1	5	281	274	646	80	868	22	121	419	331	703	930	1.08
1	10	272	256	651	82	965	28	87	441	438	679	971	1.17
1	15	259	237	645	83	1034	36	132	449	445	647	979	1.25
1	20	242	217	631	84	1109	43	97	446	447	608	963	1.33
1	25	224	197	609	86	1157	51	141	434	439	565	930	1.42
1	30	206	177	581	87	1211	59	105	416	424	518	885	1.50
1	35	187	158	549	88	1237	68	149	393	403	471	831	1.58
1	40	169	141	514	89	1268	76	113	368	379	425	773	1.67
1	45	152	126	480	90	1271	85	158	343	353	383	714	1.75
1	50	138	118	446	91	1280	338	367	319	329	345	657	1.83
1	55	128	114	414	92	1263	593	658	296	306	312	604	1.92
2	0	121	110	385	93	1254	775	797	272	282	295	557	2.00
2	5	116	107	358	94	1221	901	961	250	260	282	518	2.08
2	10	111	103	334	94	1197	985	1002	229	238	269	484	2.17
2	15	107	99	310	95	1150	1037	1091	209	217	257	455	2.25
2	20	103	96	288	96	1115	1063	1074	190	198	244	428	2.33
2	25	99	91	267	96	1061	1070	1120	173	180	232	402	2.42
2	30	95	87	247	96	1027	1063	1072	158	165	219	383	2.50
2	35	91	83	232	97	973	1046	1094	145	151	207	365	2.58
2	40	87	79	220	97	937	1021	1028	133	138	195	348	2.67
2	45	83	75	210	97	884	991	1037	121	126	184	331	2.75
2	50	79	71	200	98	850	957	962	111	115	173	316	2.83
2	55	75	68	191	98	800	921	965	101	105	163	300	2.92
3	0	72	65	183	98	769	884	887	92	95	154	286	3.00
3	5	68	62	175	98	724	846	889	83	87	146	273	3.08
3	10	65	58	168	99	699	809	811	74	78	137	260	3.17
3	15	62	55	160	99	658	774	815	63	67	128	247	3.25
3	20	59	51	152	99	634	739	739	56	59	119	234	3.33
3	25	56	48	144	99	594	705	745	50	52	111	221	3.42
3	30	52	45	137	99	572	671	671	44	46	103	209	3.50
3	35	49	42	129	99	533	639	679	39	41	95	197	3.58
3	40	47	39	123	99	513	607	607	34	36	88	186	3.67
3	45	44	37	116	99	478	577	617	29	31	81	175	3.75
3	50	41	34	110	99	460	547	547	26	27	75	164	3.83
3	55	39	32	105	99	427	519	559	22	24	70	154	3.92
4	0	37	30	99	99	411	492	492	19	20	64	143	4.00
4	5	35	28	94	99	379	465	505	16	18	60	131	4.08
4	10	33	26	90	99	366	440	440	14	15	55	121	4.17
4	15	31	25	85	99	336	416	456	12	13	51	113	4.25
4	20	30	23	81	99	325	392	392	10	11	47	106	4.33
4	25	26	21	77	99	297	370	410	9	10	44	99	4.42
4	30	22	20	73	99	288	349	349	7	10	40	93	4.50
4	35	20	19	70	99	263	329	369	6	9	37	87	4.58
4	40	19	18	66	99	256	310	310	5	9	34	82	4.67
4	45	18	16	63	99	233	292	332	4	8	32	77	4.75
4	50	17	15	60	99	227	275	275	4	7	29	73	4.83
4	55	15	14	57	99	206	259	299	3	7	27	68	4.92
5	0	14	13	54	99	203	244	244	3	6	25	64	5.00
5	5	14	13	51	99	183	230	270	2	6	23	61	5.08
5	10	13	12	49	98	180	217	217	2	5	22	57	5.17
5	15	12	11	47	98	161	204	244	2	5	20	54	5.25
5	20	11	10	44	98	159	192	192	1	4	18	51	5.33
5	25	10	10	42	98	140	181	221	1	4	17	48	5.42
5	30	10	9	40	98	139	169	169	1	3	16	45	5.50
5	35	9	8	38	98	121	159	199	1	3	15	43	5.58
5	40	9	8	36	98	116	148	148	1	3	14	40	5.67
5	45	8	7	35	97	95	136	176	1	2	12	38	5.75
5	50	7	7	33	97	94	125	125	1	2	12	36	5.83
5	55	7	6	31	97	77	114	154	0	2	11	34	5.92
6	0	7	6	30	97	79	104	104	0	2	10	32	6.00
Peak	(cfs)	281	302	651	99	1280	1070	1120	449	447	710	979	
Peak	(hrs)	1	0	1	3	1	2	2	1	1	1	1	
Peak	(min)	5	55	10	10	50	25	25	15	20	0	15	
Peak	(cfs_or_ac.ft.)	3	0	0	69	0	103	0	0	10	0	0	
Case	(),S,I,D,O)	( )	( )	( )	(S)	( )	(S)	( )	( )	(S)	( )	( )	
Area	(ac)	223.4	223.4	691.2	691.2	2172.2	2172.2	2172.2	490.9	490.9	540.8	889.6	
Peak/Area	(cfs/ac)	1.26	1.35	0.94	0.14	0.59	0.49	0.52	0.91	0.91	1.31	1.10	
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Summary	File:							P:\coweld01\future~2\Goddin~1\50_Year\udswmm\ghod50yr.txt					

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

100-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	0	0	1	0	5	0	1	0	0	0	2	0	1
0	25	0	0	2	1	10	0	4	0	0	0	7	0	4
0	30	1	1	7	3	15	0	12	0	3	2	20	1	14
0	35	7	7	25	14	78	2	30	0	12	10	51	3	40
0	40	29	29	68	48	144	8	64	3	37	31	112	12	94
0	45	74	74	122	86	221	24	122	13	93	80	212	39	192
0	50	126	126	166	111	405	56	208	42	196	174	374	97	343
0	55	186	186	235	162	619	118	370	111	380	343	644	191	551
1	0	279	279	358	249	887	235	626	240	617	559	834	243	765
1	5	344	344	536	390	1290	409	855	369	777	705	1017	326	983
1	10	460	460	773	597	1670	561	1007	447	960	882	1200	439	1205
1	15	646	646	1050	850	1941	603	1154	542	1156	1073	1385	580	1426
1	20	896	896	1347	1129	2234	654	1305	658	1358	1269	1572	746	1644
1	25	1193	1193	1661	1431	2539	718	1461	796	1561	1466	1757	931	1850
1	30	1520	1520	1987	1750	2858	796	1619	952	1761	1661	1937	1129	2038
1	35	1864	1864	2318	2079	3142	887	1780	1124	1955	1851	2109	1331	2207
1	40	2213	2213	2647	2409	3440	991	1944	1307	2140	2032	2272	1533	2363
1	45	2562	2562	2977	2742	3749	1107	2108	1496	2315	2205	2428	1731	2521
1	50	2905	2905	3297	3068	3998	1235	2272	1687	2482	2370	2582	1928	2702
1	55	3238	3238	3603	3380	4256	1372	2434	1878	2644	2533	2742	2132	2927
2	0	3557	3557	3899	3684	4522	1517	2594	2068	2812	2700	2919	2351	3203
2	5	3862	3862	4179	3972	4726	1670	2756	2259	2993	2883	3122	2594	3522
2	10	4148	4148	4438	4239	4937	1829	2923	2454	3197	3088	3354	2864	3866
2	15	4416	4416	4684	4493	5153	1994	3100	2658	3426	3319	3613	3159	4210
2	20	4667	4667	4914	4732	5334	2167	3291	2876	3680	3575	3890	3470	4529
2	25	4900	4900	5125	4951	5493	2347	3498	3108	3951	3849	4172	3784	4805
2	30	5115	5115	5321	5155	5666	2537	3720	3355	4227	4128	4444	4086	5026
2	35	5314	5314	5502	5346	5807	2737	3955	3612	4496	4399	4694	4362	5186
2	40	5499	5499	5672	5523	5962	2947	4195	3874	4743	4648	4909	4602	5286
2	45	5672	5672	5837	5696	6122	3166	4433	4132	4957	4865	5081	4798	5330
2	50	5839	5839	5996	5863	6268	3391	4657	4376	5129	5041	5207	4946	5324
2	55	5999	5999	6149	6023	6413	3619	4860	4597	5257	5172	5287	5046	5278
3	0	6154	6154	6299	6180	6558	3843	5035	4790	5341	5259	5331	5100	5199
3	5	6304	6304	6442	6330	6685	4060	5177	4948	5386	5307	5337	5114	5095
3	10	6447	6447	6577	6471	6803	4263	5284	5071	5393	5316	5307	5091	4972
3	15	6581	6581	6701	6601	6898	4449	5355	5157	5364	5291	5246	5038	4837
3	20	6704	6704	6812	6718	6981	4614	5399	5207	5306	5236	5163	4963	4701
3	25	6813	6813	6906	6818	7036	4756	5409	5222	5218	5158	5062	4869	4558
3	30	6905	6905	6982	6899	7070	4872	5388	5206	5113	5061	4947	4762	4411
3	35	6979	6979	7038	6961	7081	4961	5340	5164	4997	4949	4821	4644	4262
3	40	7034	7034	7076	7000	7070	5024	5270	5100	4871	4827	4688	4518	4112
3	45	7069	7069	7091	7017	7028	5061	5182	5017	4738	4697	4549	4386	3964
3	50	7081	7081	7082	7010	6967	5074	5080	4921	4601	4561	4407	4251	3818
3	55	7070	7070	7050	6980	6880	5065	4967	4813	4460	4421	4264	4115	3676
4	0	7036	7036	6995	6927	6777	5036	4846	4697	4318	4281	4122	3979	3538
4	5	6981	6981	6921	6856	6664	4989	4718	4574	4177	4140	3980	3843	3405
4	10	6907	6907	6832	6768	6541	4928	4586	4447	4036	4000	3841	3710	3276
4	15	6817	6817	6727	6665	6400	4854	4452	4318	3898	3863	3705	3580	3153
4	20	6713	6713	6609	6549	6253	4769	4317	4187	3762	3728	3573	3454	3035
4	25	6594	6594	6479	6420	6093	4676	4182	4057	3631	3597	3445	3331	2921
4	30	6465	6465	6338	6281	5931	4576	4049	3927	3503	3470	3321	3212	2812
4	35	6325	6325	6190	6135	5769	4470	3917	3800	3379	3347	3202	3097	2708
4	40	6179	6179	6038	5984	5608	4361	3788	3675	3259	3228	3087	2987	2609
4	45	6028	6028	5882	5830	5440	4250	3662	3553	3144	3113	2976	2881	2515
4	50	5873	5873	5722	5672	5275	4136	3539	3434	3033	3003	2871	2779	2426
4	55	5715	5715	5561	5512	5105	4023	3420	3318	2927	2898	2769	2682	2341
5	0	5555	5555	5398	5351	4940	3909	3305	3207	2825	2796	2673	2589	2261
5	5	5394	5394	5238	5192	4793	3797	3194	3099	2727	2700	2581	2500	2185
5	10	5237	5237	5084	5039	4653	3686	3087	2995	2635	2607	2493	2416	2113
5	15	5084	5084	4935	4891	4510	3577	2984	2896	2546	2519	2409	2336	2044
5	20	4936	4936	4789	4747	4374	3470	2886	2800	2461	2435	2329	2259	1979
5	25	4791	4791	4646	4605	4236	3366	2791	2708	2380	2355	2253	2186	1918
5	30	4650	4650	4507	4467	4105	3264	2700	2620	2304	2279	2181	2117	1859
5	35	4511	4511	4371	4332	3972	3165	2613	2536	2230	2206	2112	2051	1805
5	40	4376	4376	4237	4200	3847	3070	2530	2455	2161	2137	2047	1989	1753
5	45	4243	4243	4107	4070	3721	2977	2450	2378	2095	2072	1985	1929	1703
5	50	4114	4114	3979	3944	3602	2888	2375	2305	2032	2009	1926	1873	1657
5	55	3987	3987	3855	3820	3482	2801	2302	2235	1972	1950	1871	1819	1612
6	0	3864	3864	3733	3700	3369	2718	2233	2168	1915	1893	1817	1768	1570
Peak	(cfs)	7081	7081	7091	7017	7081	5074	5409	5222	5393	5316	5337	5114	5330
Peak	(hrs)	3	3	3	3	3	3	3	3	3	3	3	3	2
Peak	(min)	50	50	45	45	35	50	25	25	10	10	5	5	45
Peak	(cfs_or_ac.ft.)	0	8	0	5	2159	12	0	8	0	9	0	7	0
Case	(()S,I,D,O)	( )	( )	( )	( )	(I)	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6
Peak/Area	(cfs/ac)	n/a	0.61	0.61	0.62	0.62	0.45	0.48	0.49	0.51	0.51	0.51	0.53	0.55
11-23-1999	16:04:46													
Summary	File:	P:\coweld01\future~2\Goddin~1\100_Year\udswmm\ghod100y.txt												

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

100-YEAR

Time(Hrs)	Time(Min)	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108	Elem308	Elem708	Elem309	Elem208	Elem109	Elem709
0	5	0	0	0	0	0	2	0	0	0	0	0	0	0
0	10	0	0	0	0	0	4	0	0	0	0	0	0	0
0	15	0	0	0	1	1	7	0	0	0	0	0	0	4
0	20	0	2	0	4	3	10	0	1	3	2	4	2	28
0	25	0	9	0	9	5	12	0	5	16	11	21	14	70
0	30	1	28	1	20	8	15	1	18	53	40	69	50	167
0	35	7	71	5	42	12	22	7	51	130	98	149	107	413
0	40	24	155	15	85	20	45	26	116	260	196	279	205	779
0	45	67	289	38	161	44	101	73	234	491	381	553	422	1205
0	50	152	503	85	281	100	205	161	383	638	475	938	742	1571
0	55	227	816	179	504	201	343	282	505	807	533	1361	1119	1942
1	0	313	1072	260	777	330	469	391	530	965	610	1799	1528	2332
1	5	428	1302	361	1018	454	559	466	563	1126	713	2243	1954	2724
1	10	569	1518	490	1210	553	633	526	609	1402	943	2676	2378	3086
1	15	731	1718	638	1363	637	709	591	699	2586	2094	3070	2770	3369
1	20	909	1898	794	1495	721	794	666	851	3520	3005	3390	3096	3546
1	25	1094	2049	948	1578	776	912	776	1149	3931	3403	3613	3330	3618
1	30	1278	2171	1096	1682	870	1203	1060	2065	4151	3620	3735	3466	3600
1	35	1456	2286	1252	1901	1094	1840	1691	3458	4250	3723	3762	3510	3512
1	40	1631	2437	1453	2345	1555	2763	2529	4042	4253	3734	3712	3477	3374
1	45	1815	2678	1750	3026	2260	3656	3215	4170	4179	3673	3604	3385	3203
1	50	2027	3036	2166	3771	3034	4199	3637	4129	4050	3558	3455	3251	3016
1	55	2286	3487	2673	4391	3687	4526	3835	4009	3882	3406	3281	3092	2823
2	0	2596	3968	3209	4828	4160	4703	3878	3846	3691	3231	3095	2918	2632
2	5	2951	4419	3712	5094	4460	4774	3820	3658	3490	3046	2905	2741	2449
2	10	3330	4798	4138	5222	4623	4768	3699	3459	3286	2858	2718	2565	2275
2	15	3707	5083	4468	5247	4684	4707	3544	3257	3084	2673	2538	2395	2112
2	20	4060	5271	4699	5199	4669	4605	3369	3058	2890	2496	2366	2233	1962
2	25	4368	5370	4837	5097	4600	4473	3187	2866	2705	2328	2206	2082	1826
2	30	4619	5393	4896	4959	4493	4320	3005	2684	2531	2171	2058	1943	1703
2	35	4808	5354	4890	4795	4359	4154	2827	2512	2371	2026	1922	1815	1593
2	40	4934	5266	4833	4615	4208	3981	2657	2354	2223	1894	1799	1699	1495
2	45	5003	5146	4737	4426	4046	3805	2497	2207	2087	1773	1688	1595	1408
2	50	5022	5009	4613	4237	3882	3645	2362	2146	1964	1665	1589	1500	1328
2	55	4999	4854	4471	4057	3727	3507	2257	2070	1852	1569	1501	1415	1256
3	0	4942	4691	4321	3890	3584	3375	2162	1985	1751	1482	1420	1337	1189
3	5	4858	4527	4168	3732	3447	3243	2072	1896	1658	1402	1345	1264	1125
3	10	4754	4362	4015	3578	3314	3110	1983	1807	1570	1328	1275	1196	1060
3	15	4635	4199	3864	3426	3182	2977	1895	1719	1487	1258	1208	1132	1002
3	20	4507	4038	3714	3277	3051	2844	1808	1633	1408	1192	1144	1071	949
3	25	4371	3879	3565	3129	2921	2714	1723	1550	1337	1130	1086	1015	900
3	30	4232	3723	3421	2994	2793	2588	1641	1476	1292	1092	1031	963	854
3	35	4089	3572	3280	2864	2669	2469	1566	1413	1265	1072	980	914	811
3	40	3947	3427	3145	2739	2551	2359	1498	1361	1232	1046	932	869	771
3	45	3806	3287	3015	2622	2440	2258	1437	1314	1193	1015	887	826	733
3	50	3666	3154	2891	2512	2336	2165	1383	1268	1147	981	844	786	697
3	55	3531	3027	2773	2410	2240	2077	1332	1223	1101	945	804	748	663
4	0	3399	2906	2661	2313	2149	1992	1283	1177	1055	909	766	713	630
4	5	3271	2792	2555	2221	2062	1911	1236	1131	1010	872	730	679	599
4	10	3149	2683	2454	2133	1979	1832	1190	1086	967	836	696	646	570
4	15	3031	2580	2358	2048	1900	1755	1145	1042	924	801	663	616	542
4	20	2918	2481	2266	1966	1823	1682	1102	1007	901	783	632	586	515
4	25	2810	2386	2178	1888	1750	1618	1067	1000	883	771	603	559	489
4	30	2706	2296	2094	1817	1684	1564	1042	992	865	758	574	532	464
4	35	2606	2212	2015	1753	1625	1517	1023	983	846	743	547	506	440
4	40	2512	2133	1942	1696	1572	1473	1007	973	826	728	521	481	417
4	45	2422	2059	1873	1643	1524	1430	994	963	806	712	496	458	396
4	50	2337	1991	1809	1590	1475	1374	981	952	786	695	472	435	375
4	55	2256	1925	1749	1537	1426	1325	969	941	765	678	449	414	356
5	0	2180	1863	1691	1486	1379	1286	957	929	744	661	427	394	338
5	5	2107	1803	1635	1440	1337	1252	945	916	724	643	407	374	321
5	10	2039	1747	1583	1398	1299	1221	933	903	703	625	387	356	305
5	15	1973	1695	1534	1360	1264	1192	920	889	682	607	369	339	290
5	20	1911	1646	1489	1325	1232	1164	907	875	662	589	352	323	276
5	25	1853	1600	1446	1291	1202	1137	894	861	642	571	335	308	262
5	30	1798	1557	1406	1259	1173	1110	880	846	622	553	320	294	250
5	35	1745	1516	1368	1228	1145	1083	866	831	602	536	306	280	238
5	40	1696	1478	1332	1198	1118	1057	851	815	583	519	292	267	227
5	45	1649	1441	1298	1169	1091	1031	837	800	564	502	279	255	217
5	50	1605	1405	1265	1140	1065	1005	821	783	537	476	267	244	207
5	55	1563	1371	1234	1111	1039	978	806	767	510	452	255	233	198
6	0	1523	1338	1203	1083	1013	950	789	746	401	344	244	224	189
Peak	(cfs)	5022	5393	4896	5247	4684	4774	3878	4170	4253	3734	3762	3510	3618
Peak	(hrs)	2	2	2	2	2	2	2	1	1	1	1	1	1
Peak	(min)	50	30	30	15	15	5	0	45	40	40	35	35	25
Peak	(cfs_or_ac.ft.)	7	0	8	0	13	0	12	92	0	54	0	6	0
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	(S)	( )	(S)	( )	( )	( )
Area	(ac)	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8	4197.8	4197.8	3548.8	3548.8	3283.2	3283.2
Peak/Area	(cfs/ac)	0.56	0.61	0.67	0.72	0.74	0.75	0.92	0.99	1.01	1.05	1.06	1.07	1.10
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Summary	File:													

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

100-YEAR

Time(Hrs)	Time(Min)	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	2	0	0	0	0	0	0	0	0	0	0
0	15	3	3	24	0	4	4	0	4	0	0	1	0	1
0	20	25	23	89	6	20	19	5	23	1	0	6	1	6
0	25	61	52	212	33	65	62	24	66	4	3	24	9	23
0	30	140	119	461	76	158	148	59	161	20	16	68	33	57
0	35	340	296	795	179	339	319	126	368	68	60	143	73	97
0	40	616	541	944	381	598	562	271	620	174	159	286	147	203
0	45	898	760	1058	650	859	805	488	873	342	319	451	227	341
0	50	1138	957	1238	941	1143	1061	760	1184.00	546	509	635	349	452
0	55	1384	1175	1501	1259	1471	1349	1083	1525.00	738	690	784	454	517
1	0	1659	1436	1795	1599	1803	1651	1424	1829.00	878	821	876	514	542
1	5	1958	1728	2097	1926	2101	1928	1735	2057.00	959	895	922	536	541
1	10	2251	2020	2347	2200	2331	2144	1980	2207.00	996	929	938	534	526
1	15	2494	2266	2505	2394	2474	2277	2143	2272.00	1003	933	929	517	500
1	20	2655	2437	2580	2502	2538	2337	2223	2266.00	986	916	900	489	464
1	25	2735	2528	2587	2532	2528	2327	2231	2204.00	949	880	856	452	422
1	30	2741	2549	2536	2494	2459	2263	2182	2104.00	899	832	803	412	379
1	35	2690	2512	2444	2408	2351	2160	2093	1980.00	842	778	747	371	338
1	40	2596	2432	2323	2289	2219	2036	1980	1845.00	784	723	692	332	301
1	45	2474	2323	2187	2154	2077	1902	1854	1708.00	726	670	639	297	268
1	50	2336	2196	2045	2012	1932	1766	1724	1577.00	672	620	591	266	240
1	55	2191	2062	1905	1872	1793	1634	1598	1453.00	623	575	548	240	218
2	0	2047	1928	1770	1737	1662	1511	1478	1340.00	579	534	511	219	201
2	5	1908	1797	1643	1612	1541	1397	1367	1239.00	540	499	479	202	188
2	10	1776	1673	1524	1497	1431	1294	1267	1149.00	506	469	450	189	176
2	15	1652	1556	1416	1392	1331	1201	1176	1069.00	476	442	424	179	169
2	20	1538	1450	1320	1297	1241	1118	1096	999	449	417	402	171	163
2	25	1435	1353	1235	1213	1162	1045	1025	939	426	398	386	164	157
2	30	1343	1267	1160	1138	1093	982	963	887	407	381	371	158	151
2	35	1262	1191	1093	1073	1032	927	909	841	390	367	357	152	145
2	40	1190	1121	1031	1014	977	877	861	799	375	353	344	147	140
2	45	1125	1058	974	961	927	832	818	760	359	339	328	139	134
2	50	1065	1001	924	912	880	790	778	724	343	324	313	131	128
2	55	1011	949	878	867	837	752	741	691	329	310	301	126	123
3	0	962	902	836	825	797	717	707	661	315	298	288	120	118
3	5	916	858	796	786	760	685	676	632	303	286	277	115	112
3	10	873	817	756	750	725	654	646	604	291	274	265	110	107
3	15	831	777	717	715	690	624	618	575	278	263	254	105	102
3	20	791	739	682	681	657	594	589	547	266	251	242	99	96
3	25	753	703	650	650	627	565	562	520	254	240	230	94	91
3	30	718	670	620	620	598	538	535	494	242	228	219	89	86
3	35	685	639	591	591	570	511	509	469	230	217	209	84	81
3	40	654	610	564	564	543	486	484	445	219	207	198	79	76
3	45	624	582	537	537	517	461	460	422	209	197	189	74	72
3	50	596	555	512	512	492	438	437	400	199	187	179	70	68
3	55	568	530	487	487	468	416	415	379	189	178	171	66	64
4	0	542	505	464	464	446	394	394	359	180	170	162	62	60
4	5	517	482	442	442	424	374	374	340	172	162	155	59	57
4	10	493	460	421	421	403	355	354	321	164	154	147	56	54
4	15	470	438	400	400	383	336	335	303	156	147	141	53	51
4	20	448	417	380	380	364	317	317	286	149	140	134	50	48
4	25	427	397	361	361	345	300	300	270	142	134	128	48	46
4	30	407	378	343	343	328	284	284	255	135	128	121	44	40
4	35	387	360	326	326	311	268	268	240	128	121	113	39	37
4	40	369	343	309	309	295	253	253	226	121	114	107	36	34
4	45	351	326	294	294	280	239	239	213	114	107	101	33	32
4	50	334	310	279	279	265	226	226	201	108	102	97	31	30
4	55	318	295	265	265	252	214	214	191	103	97	92	29	28
5	0	302	281	252	252	240	202	202	180	98	93	88	28	26
5	5	288	267	239	239	228	192	192	171	94	88	84	26	25
5	10	274	254	228	228	217	182	182	162	90	84	80	24	23
5	15	262	243	217	217	206	172	172	151	86	81	76	23	22
5	20	249	231	206	206	196	162	162	142	82	77	73	22	21
5	25	238	220	196	196	186	153	153	135	78	74	70	20	19
5	30	227	210	186	186	177	145	145	128	75	70	67	19	18
5	35	216	200	178	178	169	138	138	121	71	67	64	18	17
5	40	206	191	169	169	161	131	131	116	68	64	61	17	16
5	45	197	182	162	162	154	124	124	110	65	62	58	16	15
5	50	188	174	154	154	147	118	118	105	63	59	56	15	14
5	55	180	166	148	148	140	113	113	100	60	56	53	14	13
6	0	172	159	141	141	134	107	107	95	57	54	51	13	13
Peak	(cfs)	2741	2549	2587	2532	2538	2337	2231	2272.00	1003	933	938	536	542
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	30	30	25	25	20	20	25	15	15	15	10	5	0
Peak	(cfs_or_ac.ft.)	0	4	0	5	0	0	4	0	0	4	0	4	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6
Peak/Area	(cfs/ac)	1.11	1.12	1.13	1.18	1.19	1.21	1.23	1.25	1.21	1.22	1.23	1.51	1.53
11-23-1999	16:04:46													
Summary	File:													

GODDING HOLLOW BASIN, FUTURE CONDITION WITH ON SITE DETENTION

100-YEAR

Time(Hrs)	Time(Min)	Elem117	Elem217	Elem741	Elem341	Elem721	Elem321	Elem720	Elem225	Elem325	Elem237	Elem236	TotalTime(Hrs)
0	5	0	0	0	0	0	0	40	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	0	2	1	0	0	0	40	0	0	1	1	0.25
0	20	3	11	6	0	0	0	0	2	0	10	4	0.33
0	25	12	29	26	1	0	0	40	6	0	36	18	0.42
0	30	31	64	79	5	51	0	0	22	0	90	55	0.50
0	35	47	116	200	14	120	1	42	64	0	192	140	0.58
0	40	100	257	381	32	246	2	21	152	0	353	252	0.67
0	45	191	338	551	46	424	5	89	235	0	599	453	0.75
0	50	275	370	675	56	633	8	70	325	0	757	691	0.83
0	55	327	373	743	67	810	14	126	412	0	841	902	0.92
1	0	349	361	780	79	979	20	97	481	217	871	1062	1.00
1	5	351	343	804	82	1106	27	147	530	530	868	1164	1.08
1	10	341	324	817	84	1240	36	115	560	546	847	1217	1.17
1	15	324	297	815	86	1338	45	162	571	567	810	1230	1.25
1	20	301	266	795	87	1440	55	127	566	568	756	1207	1.33
1	25	274	234	760	89	1501	65	172	549	557	691	1157	1.42
1	30	245	204	715	91	1567	76	136	524	535	622	1087	1.50
1	35	217	178	667	92	1595	87	180	493	506	555	1007	1.58
1	40	192	156	618	94	1629	490	538	458	473	494	925	1.67
1	45	170	138	571	95	1627	801	883	422	437	440	844	1.75
1	50	152	124	527	96	1631	1027	1064	390	404	393	769	1.83
1	55	137	117	486	97	1600	1188	1261	360	373	352	700	1.92
2	0	127	113	449	98	1578	1298	1326	331	343	317	637	2.00
2	5	120	110	416	99	1525	1367	1432	303	314	296	584	2.08
2	10	115	106	385	100	1485	1405	1426	276	287	283	539	2.17
2	15	110	102	356	101	1416	1417	1476	251	261	269	501	2.25
2	20	106	98	329	101	1363	1410	1425	228	237	256	467	2.33
2	25	102	94	304	102	1286	1387	1439	206	215	243	438	2.42
2	30	98	91	281	102	1231	1352	1363	186	195	231	411	2.50
2	35	94	87	260	103	1157	1308	1359	169	176	220	387	2.58
2	40	90	83	242	103	1108	1260	1269	154	160	209	370	2.67
2	45	87	80	230	103	1038	1209	1257	141	146	198	353	2.75
2	50	83	76	219	104	992	1156	1163	129	134	187	337	2.83
2	55	79	72	208	104	927	1102	1149	117	122	177	322	2.92
3	0	76	69	199	104	887	1049	1054	107	111	167	307	3.00
3	5	72	65	190	104	828	997	1041	97	101	157	293	3.08
3	10	69	62	182	105	792	945	949	88	92	148	279	3.17
3	15	66	58	173	105	738	896	938	79	83	138	265	3.25
3	20	62	54	164	105	710	849	850	69	73	129	251	3.33
3	25	59	51	155	105	662	804	845	59	63	120	238	3.42
3	30	55	48	147	105	638	762	762	52	55	111	225	3.50
3	35	52	44	139	105	592	722	762	46	48	103	212	3.58
3	40	49	42	132	105	570	684	684	40	42	95	199	3.67
3	45	46	39	125	105	529	647	687	35	37	88	188	3.75
3	50	44	36	119	106	510	612	612	30	32	81	176	3.83
3	55	41	34	113	106	471	579	619	26	28	75	166	3.92
4	0	39	32	107	106	455	547	547	22	24	69	155	4.00
4	5	37	30	102	106	418	517	557	19	21	64	144	4.08
4	10	35	28	96	106	405	488	488	17	18	59	132	4.17
4	15	33	26	92	106	370	461	501	14	15	55	122	4.25
4	20	31	24	87	105	359	434	434	12	13	51	114	4.33
4	25	30	23	83	105	327	409	449	10	11	47	107	4.42
4	30	25	21	79	105	318	386	386	9	10	43	100	4.50
4	35	22	20	75	105	289	363	403	7	10	40	94	4.58
4	40	20	19	71	105	282	342	342	6	9	37	88	4.67
4	45	19	17	68	105	255	322	362	5	9	34	83	4.75
4	50	18	16	64	105	250	303	303	4	8	32	78	4.83
4	55	16	15	61	105	225	285	325	4	7	29	74	4.92
5	0	15	14	58	105	222	268	268	3	7	27	69	5.00
5	5	14	13	55	105	199	252	292	3	6	25	65	5.08
5	10	13	12	53	105	198	238	238	2	5	23	61	5.17
5	15	13	12	50	104	176	224	264	2	5	22	58	5.25
5	20	12	11	48	104	176	211	211	2	4	20	55	5.33
5	25	11	10	45	104	154	198	238	1	4	18	51	5.42
5	30	10	9	43	104	155	186	186	1	4	17	48	5.50
5	35	10	9	41	104	134	175	215	1	3	16	46	5.58
5	40	9	8	39	104	135	164	164	1	3	15	43	5.67
5	45	8	8	37	103	113	153	193	1	2	13	41	5.75
5	50	8	7	35	103	109	141	141	1	2	12	38	5.83
5	55	7	7	34	103	88	130	170	0	2	12	36	5.92
6	0	7	6	32	103	90	119	119	0	2	11	34	6.00
Peak	(cfs)	351	373	817	106	1631	1417	1476	571	568	871	1230	
Peak	(hrs)	1	0	1	3	1	2	2	1	1	1	1	
Peak	(min)	5	55	10	50	50	15	15	15	20	0	15	
Peak	(cfs_or_ac.ft.)	3	0	0	88	0	111	0	0	10	0	0	
Case	((),S,I,D,O)	(_)	(_)	(_)	(S)	(_)	(S)	(_)	(_)	(S)	(_)	(_)	
Area	(ac)	223.4	223.4	691.2	691.2	2172.2	2172.2	2172.2	490.9	490.9	540.8	889.6	
Peak/Area	(cfs/ac)	1.57	1.67	1.18	0.15	0.75	0.65	0.68	1.16	1.16	1.61	1.38	

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GODDING HOLLOW BASIN, FUTURE CONDITION WITH REGIONAL DETENTION

2-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108
0	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	0	0	1	1	4	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
0	25	0	0	2	1	5	0	2	0	0	0	3	0	2	0	4	0	2	0	0	0
0	30	1	1	4	2	6	0	5	0	1	1	9	0	6	0	11	0	5	0	1	0
0	35	3	3	9	5	27	1	13	0	4	3	20	1	13	2	26	1	11	0	4	1
0	40	8	8	22	14	48	2	24	0	11	9	38	2	26	6	49	2	22	2	13	5
0	45	21	21	41	29	72	6	40	2	24	20	59	7	46	14	78	5	38	7	30	15
0	50	41	41	66	49	99	13	57	6	42	36	83	15	70	29	110	13	62	20	58	31
0	55	68	68	96	75	129	23	76	15	66	58	109	29	100	49	145	26	95	44	90	52
1	0	94	94	111	87	163	37	99	29	94	84	138	49	135	76	185	46	136	77	129	78
1	5	111	111	123	96	191	55	126	49	126	114	172	75	174	109	230	76	182	117	172	106
1	10	126	126	138	109	224	77	157	74	163	148	210	108	219	149	279	113	232	161	217	137
1	15	142	142	156	124	261	104	193	106	203	186	252	146	257	183	332	158	284	209	263	168
1	20	162	162	177	144	302	135	233	143	245	228	292	184	282	205	381	201	336	257	309	200
1	25	185	185	203	169	349	171	276	183	282	264	307	196	306	227	411	227	387	305	354	232
1	30	212	212	233	198	398	210	317	222	308	289	321	209	331	250	441	255	436	352	398	263
1	35	244	244	267	231	444	251	353	256	329	310	336	225	357	275	474	286	482	397	440	294
1	40	279	279	305	268	489	290	384	287	348	328	354	242	384	301	508	321	526	439	479	323
1	45	299	299	345	308	531	327	411	313	368	347	373	262	413	329	545	357	567	480	516	351
1	50	324	324	387	349	570	360	431	333	388	367	394	283	444	360	582	395	605	517	550	377
1	55	354	354	429	391	603	388	445	347	409	388	417	307	475	392	620	434	640	552	582	401
2	0	389	389	470	432	632	411	459	360	432	411	442	333	509	425	658	473	672	583	611	424
2	5	427	427	510	472	656	431	473	374	457	435	469	360	543	460	695	511	701	612	637	444
2	10	466	466	547	509	679	449	488	390	483	462	497	390	578	496	730	548	726	638	660	463
2	15	505	505	582	544	701	466	504	406	511	490	526	421	614	532	763	583	749	662	681	479
2	20	543	543	615	577	722	483	522	425	541	519	557	453	650	569	795	617	769	682	699	494
2	25	579	579	646	608	745	501	541	445	572	550	590	487	685	605	824	647	787	700	715	507
2	30	614	614	676	638	768	520	562	466	592	571	623	521	720	641	851	676	802	716	728	519
2	35	647	647	705	667	792	540	583	488	619	597	657	557	754	675	875	702	815	729	739	529
2	40	678	678	732	694	806	549	605	510	650	628	692	592	786	709	897	725	822	737	749	538
2	45	707	707	757	719	818	556	629	535	682	661	725	628	816	740	914	745	827	743	756	545
2	50	734	734	778	741	830	564	654	561	716	695	758	663	844	769	929	762	832	749	762	550
2	55	758	758	798	761	843	572	680	589	750	728	791	697	870	796	941	776	836	755	765	555
3	0	781	781	817	780	857	582	708	618	783	762	821	729	893	821	951	789	840	759	767	557
3	5	801	801	835	798	873	593	737	648	816	794	851	761	914	843	959	799	841	762	767	559
3	10	821	821	852	816	890	606	766	678	846	825	878	790	932	863	965	808	842	763	765	559
3	15	839	839	869	834	908	620	795	709	875	855	903	817	948	881	969	815	840	763	762	558
3	20	857	857	887	853	929	636	825	740	902	882	926	843	961	896	971	820	837	762	757	556
3	25	876	876	906	872	950	653	853	770	927	907	947	866	972	908	971	823	833	759	751	553
3	30	894	894	925	891	973	671	880	800	949	929	965	886	980	919	968	824	826	755	743	548
3	35	913	913	944	912	994	690	906	828	969	949	980	905	986	927	964	824	818	748	733	542
3	40	933	933	965	933	1017	711	931	855	986	966	993	921	990	933	958	822	808	740	722	536
3	45	953	953	985	954	1040	732	953	880	1000	981	1003	934	992	936	950	817	794	728	709	528
3	50	973	973	1006	976	1064	754	974	903	1012	993	1011	945	991	938	939	810	773	709	695	519
3	55	995	995	1028	998	1087	775	993	923	1021	1003	1017	953	988	937	926	801	756	694	681	510
4	0	1016	1016	1050	1021	1111	797	1009	942	1028	1011	1021	960	983	934	912	790	739	679	666	500
4	5	1038	1038	1072	1044	1133	819	1023	959	1033	1016	1022	963	976	929	896	778	721	664	650	490
4	10	1060	1060	1094	1067	1155	840	1035	973	1035	1018	1021	965	967	922	879	765	704	648	634	479
4	15	1082	1082	1116	1090	1175	860	1045	984	1035	1019	1018	964	956	913	862	751	686	632	618	468
4	20	1104	1104	1137	1112	1193	879	1052	994	1033	1017	1013	962	944	903	844	736	668	616	601	457
4	25	1126	1126	1158	1133	1211	897	1057	1001	1029	1013	1006	957	931	891	826	721	650	599	584	446
4	30	1146	1146	1177	1153	1227	914	1060	1006	1023	1008	997	951	917	879	807	705	631	583	568	434
4	35	1166	1166	1195	1172	1241	930	1061	1008	1016	1001	987	943	901	865	788	689	613	566	551	423
4	40	1185	1185	1212	1189	1252	944	1060	1009	1007	992	976	933	885	851	769	672	595	550	535	412
4	45	1203	1203	1228	1206	1263	956	1056	1007	996	982	964	923	868	835	749	655	577	533	519	400
4	50	1219	1219	1241	1220	1271	967	1052	1004	984	970	950	911	851	820	730	639	559	517	502	389
4	55	1233	1233	1254	1233	1278	975	1045	999	971	957	935	898	833	803	711	622	542	501	487	378
5	0	1246	1246	1264	1244	1282	983	1037	993	957	944	920	884	815	787	692	605	525	486	471	367
5	5	1258	1258	1273	1254	1285	988	1027	985	942	929	904	869	797	770	673	588	508	470	456	356
5	10	1267	1267	1280	1261	1285	992	1016	975	926	914	887	854	779	752	654	572	492	455	441	345
5	15	1275	1275	1285	1267	1284	994	1004	965	910	898	870	839	760	735	636	555	475	440	426	334
5	20	1281	1281	1289	1271	1281	994	991	953	893	881	852	822	742	718	617	539	460	426	412	324
5	25	1285	1285	1290	1273	1277	993	977	940	876	864	835	806	723	700	600	523	444	411	398	313
5	30	1288	1288	1290	1273	1272	991	963	927	859	847	817	789	705	683	582	508	429	398	384	303
5	35	1289	1289	1288	1272	1264	987	947	913	841	829	798	772	687	666	565	492	414	384	371	293
5	40	1287	1287	1285	1269	1254	982	931	898	823	812	780	755	669	649	548	477	400	371	358	284
5	45	1285	1285	1280	1264	1244	975	915	883	805	794	762	738	651	632	532	462	386	358	345	274
5	50	1280	1280	1273	1258	1233	968	898	867	787	776	744	721	634	615	516	448	373	345	333	265
5	55	1275	1275	1265	1250	1220	959	881	851	769	758	726	704	617	599	500	434	360	333	321	256
6	0	1267	1267	1256	1242	1207	950	864	834	751	740	708	687	600	583	485	420	347	322	310	248
6	5	1259	1259	1245	1232	1193	940	846	818	733	723	691	671	583	567	470	406	335	310	299	240
6	10	1249	1249	1234	1221	1178	929	829	801	715	705	673	654	567	552	455	393	323	300	288	232
6	15	1238	1238	1222	1209	1162	917	811	785	698	688	656	638	551	536	441	381	312	289	278	224
6	20	1226	1226	1208	1196	1146	905	793	768	680	671	639	621	535	521	428	368	301	279	268	216
6	25	1214	1214	1194	1182	1130	893	776	751	663	654	622	605	520	507	414	356	291	269	259	209
6	30	1200	1200	1180	1168	1113	880	758	735	647	638	606	590	505	493	402	345	280	260	250	202
6	35	1186	1186	1164	1153	1095	866	741	718	630	622	590	574	491	479	389	334	271	251	241	196
6	40	1171	1171	1148	1137	1077	853	724	702	614	606	574	559	477	465	377	323	261	242	233	189
6	45	1156	1156	1132	1121	1059	839	707	686	599	590	559	545	463	452	366	312	253	234	225	183
6	50	1140	1140	1115	1105	1041	825	690	670	584	575	544	530	450	439	355	302	244	226	217	177
6	55	1123	1123	1098	1088	1023	811	674	654	569	561	529	516	437	427	344	292	236	219	210	172
7	0	1106	1106	1081	1071	1004	796	658	639	553	545	515	502	424	415	333	283	228	211	203	166
7	5	1089	1089	1063	1053	987	782	641	623	531	523	501	489	412	403	323	274	220	204	196	161
7	10	1072	1072	1045	1036	968	768	624	606	514	506	487	476	400	392	313	265	213	198	190	156
7	15	1055	1055	1028	1019	950	753	607	590	499	492	474	463	389	380	304	257	206	191	184	151
7	20	1037	1037	1010	1001	932	739	591	574	485	478	461	451	378	370	295	248	199	185	178	147
7	25	1019	1019	992	983	914	725	575	559	472	465	448	439	367	359	285	240	193	179	172	142
7	30	1002	1002	974	966	896	710	559	544	459	452	436	427	356	349	276	233	187	173	167	138
7	35	984	984	956	948	879	696	545	529	446	440	424	415	346	339	267	225	181	168	162	134
7	40	967	967	939	931	861	682	530	515	434	428	413	404	336	329	257	218	175	163	157	131
7	45	949	949	921	913	844	668	516	502	423	416	401	393	326	319	248	211	170	158	152	127
7	50	932	932	904	896	827	655	502	489	411	405	390	382	316	310	239	203	165	153	147	123
7	55	914	914	886	879	811	641	489	476	400	394	380	372	307	301	230	196	159	148	142	118
8	0	897	897	869	862	794	628	476	463	389	383	369	362	297	291	217	185	154	143	136	114
8	5	880	880	853	846	778	615	463	451	378	373	359	352	287	281	204	174	148	137	130	109
8	10	863	863	836	829	762	602	451	439	368	362	348	342	277	271	193	165	142	132	125	104
8	15	847	847	820	813	747	590	439	427	357	352	338	332	266	261	183	156	136	126	119	99
8	20	830	830	804	797	731	577	427	416	347	342	328	322	256	252	175	149	130	121	114	95
8	25	814	814	788	782	716	565	415	405	337	332	318	312	247	242	167	142	125	116	109	91
8	30	798	798	771	766	698	550	404	393	327	322	308	303	237	233	159	136	120	111	105	87
8	35	782	782	752	746	650	505	392	382	317	312	298	293	228	224	152	130	115	107	101	84
8	40	762	762	727	721	604	461	380	371	307	303	289	284	219	215	146	125	110	102	97	81
8	45	740	740	698	693	570	429	368	359	298	293	280	275	211	207	139	120	106	98	93	77
8	50	715	715	670	665	543	405	356	347	288	284	271	266	202	198	134	115	102	95	89	74
8	55	689	689	643	638	520	385	343	334	279	275	262	257	194	190	128	111	98	91	86	71
9	0	663	663	617	612	500	367	325	317	270	266	253	249	185	182	123	106	94	87	82	68
Peak	(cfs)	1289	1289	1290	1273	1285	994	1061	1009	1035	1019	1022	965	992	938	971	824	842	763	767	559
Peak	(hrs)	5	5	5	5	5	5	4	4	4	4	4	4	3	3	3	3	3	3	3	3
Peak	(min)	35	35	25	25	5	15	35	40	10	15	5	10	45	50	20	30	10	10	0	5
Peak	(cfs_or_ac.ft.)	0	6	0	4	298	11	0	6	0	6	0	5	0	6	0	6	0	10	0	8
Case	((),S,I,D,O)	(_)	(_)	(_)	(_)	(I)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8
Peak/Area	(cfs/ac)	n/a	0.11	0.11	0.11	0.11	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.13

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GODDING HOLLOW BASIN, FUTURE CONDITION WITH REGIONAL DETENTION

2-YEAR

Time(Hrs)	Time(Min)	Elem308	Elem708	Elem208	Elem109	Elem709	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216	Elem117	Elem217
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	7	0	1	1	0	1	0	0	0	0	0	0	0
0	20	0	1	1	0	7	7	6	40	1	7	7	1	9	0	0	2	0	1	0	0
0	25	1	10	8	4	39	39	35	112	11	29	27	8	32	1	0	9	1	5	0	0
0	30	6	33	26	17	66	65	55	194	42	73	68	30	70	5	3	23	6	12	0	1
0	35	17	72	58	41	106	105	87	216	67	116	106	53	107	14	12	42	13	20	1	2
0	40	36	124	100	75	149	146	123	217	103	148	133	73	136	31	28	59	21	26	2	4
0	45	61	161	127	97	185	180	152	218	138	176	156	98	160	51	46	72	27	31	3	6
0	50	88	188	145	110	214	205	175	225	169	200	177	122	179	68	63	81	32	34	5	7
0	55	115	217	167	129	238	227	194	238	196	220	194	146	196	82	76	89	35	37	7	9
1	0	142	248	192	152	261	246	212	254	218	238	210	167	209	92	85	95	38	39	8	11
1	5	171	280	219	178	284	265	230	271	237	253	223	186	220	100	93	100	40	41	10	13
1	10	200	312	247	205	306	283	248	284	253	267	235	202	233	106	99	105	42	43	12	14
1	15	230	343	275	232	326	298	263	294	266	279	247	217	245	112	104	109	43	44	14	16
1	20	260	372	302	259	343	312	277	303	279	290	257	231	257	116	109	113	45	46	15	17
1	25	290	399	327	283	359	324	289	313	290	301	267	244	268	120	112	116	46	47	17	19
1	30	318	423	349	306	373	335	301	324	301	311	277	256	277	123	115	118	47	48	18	20
1	35	345	445	370	327	387	346	312	334	312	320	286	267	286	126	118	121	48	48	20	21
1	40	371	464	389	346	400	356	322	343	321	329	294	276	293	128	120	122	49	49	21	22
1	45	395	482	406	363	412	366	332	351	329	336	302	285	299	130	122	124	50	50	22	23
1	50	417	498	422	379	423	375	341	359	337	343	308	292	304	132	124	126	50	51	23	24
1	55	438	513	436	394	433	383	350	364	343	349	314	298	308	133	125	127	51	51	24	25
2	0	457	526	448	407	440	389	356	365	349	352	317	303	311	134	127	127	51	52	25	26
2	5	475	536	459	418	445	392	360	367	352	355	320	307	312	134	127	128	52	52	26	27
2	10	490	544	467	427	450	396	364	372	355	356	322	309	313	135	127	128	52	52	27	28
2	15	503	551	475	435	454	400	368	376	357	358	323	311	314	135	128	128	52	52	28	28
2	20	515	557	481	441	459	404	372	380	359	360	325	313	316	135	128	128	52	53	28	29
2	25	526	563	487	447	462	407	375	380	360	362	327	314	316	135	128	128	53	53	29	29
2	30	535	567	492	452	464	408	377	378	361	362	327	315	315	135	128	128	53	53	29	30
2	35	543	570	495	456	463	407	377	374	361	360	326	314	313	135	128	128	53	53	30	30
2	40	549	571	496	458	462	405	375	372	360	358	323	313	309	134	127	127	53	52	30	31
2	45	554	570	496	459	459	402	373	368	357	354	320	311	306	133	126	125	52	52	30	31
2	50	558	568	495	458	456	399	370	365	354	351	317	308	302	131	125	124	52	51	30	31
2	55	560	565	493	457	452	395	367	361	350	346	313	304	298	130	124	122	51	51	31	32
3	0	561	561	490	454	447	391	364	357	346	342	309	300	294	128	122	121	51	51	31	32
3	5	560	556	486	451	442	386	359	350	341	337	304	296	289	126	121	119	51	50	31	32
3	10	559	551	482	448	436	380	354	342	336	331	299	292	283	125	119	117	50	50	31	32
3	15	556	544	476	443	427	372	347	332	330	324	292	287	277	123	117	115	50	49	31	32
3	20	552	535	469	436	418	363	339	324	323	316	285	281	269	120	115	113	49	48	32	32
3	25	547	525	460	429	408	354	331	315	315	308	277	274	262	118	113	110	48	48	32	32
3	30	541	515	451	421	399	345	323	307	307	300	270	267	254	115	110	107	47	47	32	32
3	35	533	504	442	413	389	336	315	299	299	291	262	260	247	112	107	104	47	46	32	32
3	40	525	492	432	404	379	327	307	291	291	283	255	253	240	109	105	102	46	45	32	32
3	45	516	480	422	395	369	318	299	283	283	275	247	246	233	106	102	99	45	44	32	31
3	50	506	468	411	386	359	310	291	274	274	267	240	239	225	103	99	96	44	44	32	31
3	55	496	456	401	376	349	301	283	266	266	259	232	231	217	100	97	94	43	43	31	31
4	0	485	444	391	367	339	292	275	258	258	250	224	224	209	97	94	91	42	42	31	30
4	5	474	432	380	357	329	283	267	250	250	242	217	216	201	95	91	89	42	41	31	30
4	10	463	420	370	348	320	274	259	241	241	233	209	209	194	92	89	86	41	40	31	29
4	15	451	408	359	338	310	266	251	233	233	225	202	201	187	89	86	84	40	40	31	29
4	20	440	396	349	329	300	257	243	225	225	217	194	194	179	87	84	81	39	39	30	29
4	25	428	385	339	319	290	248	235	217	217	210	187	187	173	84	82	79	39	38	30	28
4	30	417	373	329	310	281	240	227	210	210	202	180	180	166	82	79	76	38	37	29	28
4	35	405	362	318	300	271	232	219	202	202	195	173	173	159	79	77	74	36	35	28	27
4	40	394	351	309	291	262	224	212	195	195	187	166	166	152	76	74	71	35	34	27	27
4	45	382	340	299	282	253	216	204	187	187	180	160	160	145	74	71	68	34	33	27	26
4	50	371	329	289	273	244	208	197	180	180	172	152	152	137	71	69	66	33	32	26	26
4	55	360	318	280	264	235	201	190	173	173	165	145	145	130	69	67	64	32	31	26	25
5	0	349	308	270	256	227	193	183	165	165	157	139	139	124	67	65	62	31	31	25	25
5	5	338	298	261	247	218	185	176	158	158	151	132	132	119	65	63	60	30	30	25	24
5	10	327	287	252	238	209	178	169	151	151	144	127	127	114	62	61	58	30	29	24	24
5	15	317	278	243	230	201	171	162	145	145	139	121	121	109	60	59	56	29	28	24	23
5	20	306	268	235	222	193	164	156	139	139	133	116	116	104	59	57	55	28	27	23	23
5	25	296	259	226	214	186	158	150	134	134	128	111	111	100	57	55	53	27	27	23	22
5	30	286	250	218	206	179	152	144	129	129	123	107	107	96	55	53	51	26	26	22	22
5	35	277	241	210	199	172	146	138	124	124	118	102	102	92	53	52	49	26	25	22	21
5	40	267	233	203	192	166	140	133	119	119	113	98	98	88	51	50	48	25	25	21	21
5	45	258	225	196	185	159	135	128	114	114	109	94	94	84	50	48	46	24	24	21	20
5	50	249	217	189	179	154	130	123	110	110	105	90	90	81	48	47	45	24	23	20	20
5	55	241	210	182	173	148	125	119	106	106	101	87	87	78	47	45	43	23	23	20	19
6	0	233	203	176	167	142	120	114	102	102	97	83	83	74	45	44	42	22	22	19	19
6	5	225	196	170	161	137	116	110	98	98	93	80	80	71	44	43	41	22	21	19	18
6	10	217	189	164	155	132	112	106	94	94	90	77	77	68	42	41	39	21	21	18	18
6	15	210	183	158	150	127	108	103	91	91	86	74	74	66	41	40	38	21	20	18	17
6	20	203	177	153	145	123	104	99	87	87	83	71	71	63	40	39	37	20	20	17	17
6	25	196	171	148	140	118	100	95	84	84	80	68	68	60	38	38	36	19	19	17	16
6	30	190	166	143	136	114	97	92	81	81	77	65	65	58	37	36	35	19	18	16	16
6	35	183	161	138	131	110	93	89	78	78	74	63	63	56	36	35	33	18	18	16	16
6	40	177	155	134	127	106	90	86	75	75	71	60	60	53	35	34	32	18	17	16	15
6	45	172	151	130	123	103	87	83	72	72	69	58	58	51	34	33	31	17	17	15	15
6	50	166	146	126	119	99	84	80	70	70	66	56	56	49	33	32	30	17	16	15	14
6	55	161	142	122	116	95	81	77	67	67	64	54	54	47	32	31	29	16	16	14	14
7	0	156	137	118	112	92	78	75	65	65	61	51	51	45	31	30	29	16	15	14	14
7	5	151	133	115	109	89	76	72	62	62	59	49	49	43	30	29	28	15	15	14	13
7	10	146	130	111	106	86	73	70	60	60	57	48	48	42	29	28	27	15	15	13	13
7	15	142	126	108	103	83	71	67	58	58	55	46	46	40	28	27	26	14	14	13	13
7	20	138	122	105	100	80	68	65	56	56	53	44	44	39	27	27	25	14	14	13	12
7	25	134	119	103	98	78	66	63	54	54	50	42	42	37	26	26	24	14	13	12	12
7	30	130	116	100	95	75	64	61	51	51	47	38	38	36	25	25	24	13	13	12	12
7	35	127	114	98	93	72	62	59	49	49	45	36	36	34	25	24	23	13	13	12	11
7	40	123	111	95	91	70	59	57	46	46	43	35	35	33	24	23	22	12	12	11	11
7	45	119	100	85	81	67	57	55	44	44	41	33	33	32	23	23	21	12	12	11	11
7	50	114	93	79	75	65	55	53	43	43	40	32	32	31	22	22	21	12	11	11	10
7	55	108	88	74	70	62	53	51	40	40	38	31	31	29	22	21	20	11	11	10	10
8	0	103	84	70	67	60	51	49	38	38	37	30	30	28	21	21	19	11	11	10	10
8	5	98	80	67	63	58	49	47	37	37	36	29	29	27	20	20	19	11	10	10	9
8	10	94	77	64	61	56	48	46	35	35	34	28	28	26	20	19	18	10	10	10	9
8	15	90	75	62	59	54	46	45	34	34	33	27	27	25	19	19	18	10	10	9	9
8	20	86	72	60	57	53	45	43	33	33	32	26	26	24	19	18	17	10	10	9	9
8	25	82	70	58	55	51	44	42	32	32	31	25	25	24	18	18	17	10	9	9	8
8	30	79	68	56	53	50	43	42	31	31	30	24	24	23	17	17	16	9	9	9	8
8	35	76	65	54	51	45	38	36	30	30	29	23	23	22	17	17	16	9	9	8	8
8	40	73	62	51	48	41	35	33	29	29	28	22	22	21	16	16	15	9	8	8	8
8	45	70	58	47	45	38	32	31	28	28	27	21	21	20	16	16	15	8	8	8	8
8	50	67	55	45	42	37	31	29	27	27	26	21	21	20	15	15	14	8	8	8	7
8	55	64	52	42	40	35	29	28	26	26	25	20	20	19	15	15	14	8	8	7	7
9	0	61	50	40	38	34	28	27	25	25	24	19	19	18	15	14	13	8	8	7	7
Peak	(cfs)	561	571	496	459	464	408	377	380	361	362	327	315	316	135	128	128	53	53	32	32
Peak	(hrs)	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2
Peak	(min)	0	40	40	45	30	30	30	20	30	25	25	30	20	10	15	5	25	20	20	55
Peak	(cfs_or_ac.ft.)	14	0	0	4	0	0	3	0	3	0	0	3	0	0	1	0	2	0	2	0
Case	((),S,I,D,O)	(S)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)
Area	(ac)	4197.8	4197.8	3548.8	3283.2	3283.2	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6	223.4	223.4
Peak/Area	(cfs/ac)	0.13	0.14	0.14	0.14	0.14	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.15	0.15	0.14	0.14
11-23-1999	16:05:18																				
Summary	File:																				

GODDING HOLLOW BASIN, FUTURE CONDITION WITH REGIONAL DETENTION

2-YEAR

Time(Hrs)	Time(Min)	Elem741	Elem341	Elem720	Elem225	Elem325	Elem237	Elem238	Elem121	Elem307	Elem331	Elem231	Elem337	Elem317	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0.25
0	20	2	0	3	1	0	0	1	0	0	0	1	0	0	0.33
0	25	10	0	11	2	0	1	5	2	0	0	4	1	0	0.42
0	30	33	2	31	6	0	4	14	9	1	1	11	4	1	0.50
0	35	70	5	58	13	0	10	28	27	3	1	22	10	2	0.58
0	40	106	11	87	21	0	19	42	54	8	3	36	19	4	0.67
0	45	129	18	113	29	0	30	57	84	15	5	50	30	6	0.75
0	50	140	26	137	37	0	42	72	113	25	8	65	42	7	0.83
0	55	141	33	158	42	0	53	86	138	37	12	76	53	9	0.92
1	0	139	40	177	46	0	63	100	160	51	15	85	63	11	1.00
1	5	136	42	193	49	0	73	113	179	66	19	91	73	13	1.08
1	10	133	43	208	50	0	81	125	195	80	24	94	81	14	1.17
1	15	130	45	215	51	0	89	135	208	95	28	96	89	16	1.25
1	20	127	46	220	50	0	95	144	215	109	31	96	95	17	1.33
1	25	124	48	224	49	0	100	150	220	123	35	94	100	19	1.42
1	30	121	49	227	47	0	105	153	224	135	38	92	105	20	1.50
1	35	118	50	230	46	0	108	157	228	146	41	90	108	21	1.58
1	40	116	52	231	43	0	111	160	230	156	44	87	111	22	1.67
1	45	114	53	233	41	0	113	163	232	165	46	84	113	23	1.75
1	50	112	54	233	39	0	114	165	233	173	48	82	114	24	1.83
1	55	110	55	233	37	0	115	167	233	181	50	79	115	25	1.92
2	0	108	56	233	35	0	115	168	233	187	51	76	115	26	2.00
2	5	106	57	231	33	0	115	168	232	193	53	73	115	27	2.08
2	10	103	57	229	31	0	115	168	231	197	54	71	115	28	2.17
2	15	101	58	227	29	0	114	168	229	201	55	68	114	28	2.25
2	20	100	59	225	27	0	113	167	226	205	55	66	113	29	2.33
2	25	99	60	223	26	0	112	167	224	207	56	64	112	29	2.42
2	30	97	60	220	24	0	111	165	222	209	56	62	111	30	2.50
2	35	96	61	217	23	0	110	164	219	210	57	61	110	30	2.58
2	40	93	62	213	22	0	108	162	216	211	57	59	108	31	2.67
2	45	91	62	209	20	0	106	160	212	212	57	57	106	31	2.75
2	50	88	63	204	19	0	104	157	208	211	57	55	104	31	2.83
2	55	85	63	200	18	0	102	155	203	211	57	53	102	32	2.92
3	0	83	63	195	17	0	100	152	199	209	56	51	100	32	3.00
3	5	80	64	191	16	0	98	149	194	208	56	49	98	32	3.08
3	10	78	64	186	15	0	95	146	190	206	56	48	95	32	3.17
3	15	75	64	181	14	0	93	142	185	204	55	46	93	32	3.25
3	20	71	64	175	13	0	90	138	179	201	55	44	90	32	3.33
3	25	67	64	167	12	0	87	134	173	198	54	42	87	32	3.42
3	30	64	64	159	10	0	84	130	166	195	53	39	84	32	3.50
3	35	60	64	151	9	0	81	125	158	190	52	37	81	32	3.58
3	40	57	64	144	8	0	78	121	150	186	51	35	78	32	3.67
3	45	54	64	137	8	0	75	115	143	181	50	34	75	31	3.75
3	50	51	64	131	7	0	71	109	136	176	49	32	71	31	3.83
3	55	48	64	125	6	0	68	104	130	171	48	30	68	31	3.92
4	0	46	63	119	5	0	65	99	124	166	47	28	65	30	4.00
4	5	43	63	114	5	0	61	94	119	160	46	27	61	30	4.08
4	10	41	63	108	4	0	58	90	113	155	45	25	58	29	4.17
4	15	39	62	103	3	0	55	85	108	149	44	24	55	29	4.25
4	20	37	62	98	3	0	52	81	103	144	43	23	52	29	4.33
4	25	35	61	94	2	0	49	77	98	139	42	22	49	28	4.42
4	30	33	61	89	2	0	47	73	94	133	41	20	47	28	4.50
4	35	32	60	85	2	0	44	69	89	128	39	19	44	27	4.58
4	40	30	60	81	1	0	41	66	85	123	38	18	41	27	4.67
4	45	29	59	77	1	0	39	62	81	118	37	17	39	26	4.75
4	50	27	59	74	1	0	37	59	77	114	36	16	37	26	4.83
4	55	26	58	70	1	0	34	56	74	109	35	15	34	25	4.92
5	0	25	58	67	1	0	32	53	71	104	34	14	32	25	5.00
5	5	24	57	64	1	0	30	50	67	100	33	13	30	24	5.08
5	10	22	57	61	1	0	28	47	64	96	31	13	28	24	5.17
5	15	21	56	58	0	0	27	45	61	92	30	12	27	23	5.25
5	20	20	55	56	0	0	25	42	59	88	29	11	25	23	5.33
5	25	19	55	53	0	0	23	40	56	84	28	11	23	22	5.42
5	30	18	54	51	0	0	22	38	54	81	27	10	22	22	5.50
5	35	18	53	49	0	0	20	35	51	77	26	10	20	21	5.58
5	40	17	53	47	0	0	19	33	49	74	25	9	19	21	5.67
5	45	16	52	45	0	0	18	31	47	71	25	9	18	20	5.75
5	50	15	51	43	0	0	17	30	45	68	24	9	17	20	5.83
5	55	14	51	41	0	0	16	28	43	65	23	8	16	19	5.92
6	0	14	50	39	0	0	15	26	41	62	22	8	15	19	6.00
6	5	13	50	37	0	0	14	25	39	59	21	7	14	18	6.08
6	10	12	49	36	0	0	13	23	38	57	20	7	13	18	6.17
6	15	12	48	34	0	0	12	22	36	54	20	7	12	17	6.25
6	20	11	48	33	0	0	11	21	35	52	19	7	11	17	6.33
6	25	11	47	31	0	0	10	20	33	50	18	6	10	16	6.42
6	30	10	46	30	0	0	10	18	32	48	18	6	10	16	6.50
6	35	10	46	29	0	0	9	17	31	46	17	6	9	16	6.58
6	40	9	45	28	0	0	8	16	29	44	16	6	8	15	6.67
6	45	9	44	27	0	0	8	15	28	42	16	5	8	15	6.75
6	50	8	44	25	0	0	7	15	27	40	15	5	7	14	6.83
6	55	8	43	24	0	0	7	14	26	38	15	5	7	14	6.92
7	0	8	43	23	0	0	6	13	25	37	14	5	6	14	7.00
7	5	7	42	23	0	0	6	12	24	35	14	5	6	13	7.08
7	10	7	41	22	0	0	5	11	23	34	13	4	5	13	7.17
7	15	7	41	21	0	0	5	11	22	32	13	4	5	13	7.25
7	20	6	40	20	0	0	5	10	21	31	12	4	5	12	7.33
7	25	6	38	19	0	0	4	10	20	30	12	4	4	12	7.42
7	30	6	36	18	0	0	4	9	19	29	11	4	4	12	7.50
7	35	5	34	18	0	0	4	9	19	27	11	4	4	11	7.58
7	40	5	32	17	0	0	3	8	18	26	10	3	3	11	7.67
7	45	5	30	16	0	0	3	8	17	25	10	3	3	11	7.75
7	50	5	28	16	0	0	3	7	17	24	10	3	3	10	7.83
7	55	5	27	15	0	0	3	7	16	23	9	3	3	10	7.92
8	0	4	25	15	0	0	3	6	15	22	9	3	3	10	8.00
8	5	4	24	14	0	0	2	6	15	22	9	3	2	9	8.08
8	10	4	23	13	0	0	2	6	14	21	8	3	2	9	8.17
8	15	4	21	13	0	0	2	5	14	20	8	3	2	9	8.25
8	20	4	20	12	0	0	2	5	13	19	8	2	2	9	8.33
8	25	3	19	12	0	0	2	5	13	18	7	2	2	8	8.42
8	30	3	18	12	0	0	2	4	12	18	7	2	2	8	8.50
8	35	3	17	11	0	0	2	4	12	17	7	2	2	8	8.58
8	40	3	16	11	0	0	1	4	11	16	6	2	1	8	8.67
8	45	3	15	10	0	0	1	4	11	16	6	2	1	8	8.75
8	50	3	14	10	0	0	1	4	11	15	6	2	1	7	8.83
8	55	3	14	10	0	0	1	3	10	14	6	2	1	7	8.92
9	0	2	13	9	0	0	1	3	10	14	6	2	1	7	9.00
Peak	(cfs)	141	64	233	51	0	115	168	233	212	57	96	115	32	
Peak	(hrs)	0	3	1	1	0	1	2	1	2	2	1	1	2	
Peak	(min)	55	5	45	15	0	55	0	50	45	35	15	55	55	
Peak	(cfs_or_ac.ft.)	0	13	0	0	0	0	0	4	11	7	0	7	7	
Case	(()S,I,D,O)	(_)	(S)	(_)	(_)	(_)	(_)	(_)	(S)	(S)	(_)	(S)	(S)		
Area	(ac)	691.2	691.2	2172.2	490.9	490.9	540.8	889.6	2172.2	2172.2	814.7	814.7	540.8	223.4	
Peak/Area	(cfs/ac)	0.20	0.09	0.11	0.10	0.00	0.21	0.19	0.11	0.10	0.07	0.12	0.21	0.14	
11-23-1999	16:05:18														
Summary	File:														P:\coweld01\future~1\Goddin~1\2_Year\udswmm\ghrd2yr.txt

GODDING HOLLOW BASIN, FUTURE CONDITION WITH REGIONAL DETENTION

5-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108
0	5	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	1	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	0	0	2	2	7	0	1	0	0	0	1	0	1	0	2	0	1	0	0	0
0	25	1	1	4	3	9	0	3	0	0	0	5	0	3	0	7	0	3	0	0	0
0	30	2	2	8	4	11	0	9	0	2	2	15	0	10	1	20	0	9	0	2	1
0	35	7	7	17	10	43	1	21	0	8	6	35	2	24	4	45	1	20	1	9	3
0	40	18	18	39	26	78	5	41	1	21	18	64	6	48	12	84	5	39	4	25	11
0	45	41	41	72	52	116	12	66	6	46	39	101	16	84	30	134	13	70	17	55	28
0	50	75	75	109	82	161	26	96	16	80	70	143	34	130	58	190	29	115	43	99	54
0	55	107	107	127	93	211	45	132	35	124	110	191	63	185	98	252	56	173	86	156	90
1	0	131	131	148	110	269	72	175	65	177	159	247	104	249	148	321	98	244	143	223	134
1	5	155	155	175	132	320	107	227	105	236	215	308	154	301	190	398	154	325	213	298	186
1	10	184	184	207	160	378	151	286	156	297	273	355	192	339	219	468	210	413	292	378	242
1	15	219	219	246	195	445	202	349	212	347	322	378	210	378	251	518	248	504	375	460	301
1	20	261	261	291	238	518	260	409	268	386	359	404	231	418	286	572	295	595	461	542	361
1	25	295	295	344	289	593	319	464	318	420	391	433	257	462	325	633	350	684	545	621	421
1	30	324	324	403	346	665	376	496	347	452	423	464	287	509	369	699	413	770	627	698	478
1	35	364	364	466	408	722	423	519	368	486	455	498	320	560	418	770	482	850	705	770	531
1	40	413	413	529	471	772	462	542	390	521	490	536	358	615	472	842	554	903	756	837	581
1	45	470	470	592	533	817	497	567	414	560	528	577	400	673	531	911	623	943	795	898	627
1	50	531	531	653	593	859	528	592	439	594	562	622	446	735	592	975	689	985	836	939	654
1	55	594	594	710	650	890	548	618	465	626	594	671	497	797	655	1036	751	1025	877	979	682
2	0	655	655	762	701	909	557	645	493	667	635	722	551	860	720	1092	811	1065	918	1018	710
2	5	712	712	807	746	926	566	675	524	714	682	777	608	923	784	1145	867	1105	958	1056	737
2	10	763	763	847	786	944	576	708	558	766	734	833	667	985	848	1195	921	1143	997	1090	763
2	15	810	810	882	822	963	588	745	596	822	790	892	728	1045	910	1242	972	1179	1035	1121	786
2	20	851	851	915	855	985	602	785	638	880	848	951	791	1103	971	1286	1020	1213	1070	1148	806
2	25	888	888	946	886	1009	619	829	684	940	908	1010	853	1159	1029	1327	1065	1243	1102	1172	824
2	30	922	922	975	917	1036	638	876	732	1001	968	1069	916	1212	1085	1363	1107	1269	1131	1191	839
2	35	954	954	1005	947	1067	660	925	784	1061	1029	1127	977	1262	1137	1396	1146	1292	1155	1207	851
2	40	986	986	1035	977	1101	685	977	838	1120	1088	1182	1037	1308	1186	1425	1180	1310	1177	1219	860
2	45	1017	1017	1066	1010	1138	714	1030	894	1177	1146	1236	1094	1351	1232	1449	1211	1325	1194	1227	868
2	50	1049	1049	1099	1044	1179	745	1085	951	1233	1202	1287	1149	1389	1274	1471	1238	1335	1207	1232	870
2	55	1082	1082	1134	1080	1222	780	1140	1009	1286	1255	1335	1201	1424	1312	1488	1261	1342	1216	1233	871
3	0	1117	1117	1172	1118	1269	818	1194	1066	1336	1306	1380	1250	1455	1346	1501	1280	1345	1222	1231	870
3	5	1154	1154	1212	1159	1317	859	1248	1123	1383	1353	1421	1295	1482	1376	1511	1295	1345	1224	1226	867
3	10	1194	1194	1254	1202	1367	901	1300	1177	1426	1396	1459	1336	1505	1402	1517	1306	1341	1224	1218	862
3	15	1235	1235	1298	1247	1419	946	1350	1230	1465	1436	1492	1373	1523	1424	1519	1313	1335	1220	1208	855
3	20	1279	1279	1345	1295	1472	993	1398	1281	1501	1472	1521	1406	1538	1442	1517	1317	1325	1213	1196	847
3	25	1325	1325	1393	1344	1527	1040	1442	1328	1532	1503	1546	1435	1549	1456	1512	1318	1313	1204	1182	838
3	30	1373	1373	1443	1395	1582	1088	1483	1372	1558	1531	1567	1460	1556	1466	1504	1315	1299	1193	1165	827
3	35	1423	1423	1494	1447	1632	1135	1520	1413	1581	1553	1584	1481	1558	1472	1493	1309	1282	1179	1147	815
3	40	1474	1474	1545	1499	1682	1183	1553	1449	1599	1572	1596	1497	1558	1475	1479	1301	1263	1164	1127	801
3	45	1525	1525	1595	1551	1730	1228	1583	1482	1613	1587	1604	1510	1554	1474	1463	1290	1243	1146	1105	787
3	50	1576	1576	1645	1602	1777	1273	1608	1510	1622	1597	1609	1518	1547	1470	1444	1277	1220	1127	1082	772
3	55	1626	1626	1694	1652	1822	1315	1629	1534	1629	1604	1610	1523	1537	1463	1424	1261	1197	1106	1058	755
4	0	1676	1676	1741	1701	1862	1355	1646	1554	1631	1607	1608	1525	1524	1454	1402	1244	1172	1084	1032	739
4	5	1723	1723	1786	1746	1897	1392	1659	1570	1630	1606	1603	1523	1509	1442	1378	1224	1146	1061	1007	721
4	10	1769	1769	1828	1789	1929	1426	1668	1583	1626	1602	1595	1518	1492	1427	1353	1204	1119	1038	980	704
4	15	1812	1812	1867	1829	1957	1458	1673	1591	1618	1595	1583	1511	1473	1411	1327	1182	1092	1013	954	686
4	20	1852	1852	1902	1866	1983	1485	1675	1596	1608	1586	1570	1500	1452	1392	1300	1158	1064	988	927	668
4	25	1889	1889	1935	1900	2005	1510	1674	1597	1595	1574	1554	1487	1429	1372	1272	1134	1036	962	900	650
4	30	1923	1923	1964	1930	2024	1531	1669	1595	1580	1559	1536	1472	1405	1351	1244	1109	1007	937	874	632
4	35	1953	1953	1989	1956	2036	1548	1662	1590	1563	1542	1516	1455	1380	1328	1215	1084	977	909	836	603
4	40	1979	1979	2011	1979	2046	1563	1652	1582	1544	1524	1495	1437	1354	1304	1185	1057	945	879	804	580
4	45	2002	2002	2028	1997	2051	1573	1639	1572	1523	1503	1472	1416	1327	1279	1154	1029	913	850	775	560
4	50	2021	2021	2042	2012	2054	1581	1624	1559	1501	1481	1448	1394	1299	1253	1123	1001	882	820	748	541
4	55	2036	2036	2052	2023	2053	1586	1607	1544	1477	1458	1422	1371	1270	1227	1092	972	851	792	721	524
5	0	2047	2047	2059	2031	2050	1587	1588	1527	1452	1433	1396	1347	1241	1199	1060	943	820	763	695	507
5	5	2055	2055	2063	2035	2042	1586	1567	1509	1426	1408	1368	1322	1211	1171	1028	913	786	731	669	490
5	10	2059	2059	2062	2035	2032	1582	1545	1489	1399	1381	1340	1296	1180	1142	994	881	729	676	644	474
5	15	2060	2060	2059	2033	2019	1576	1521	1467	1371	1353	1311	1269	1148	1112	957	846	695	644	620	459
5	20	2058	2058	2052	2027	2004	1567	1497	1444	1342	1325	1281	1241	1116	1082	921	812	667	618	596	443
5	25	2052	2052	2043	2019	1986	1556	1471	1420	1312	1296	1251	1212	1083	1050	886	780	641	594	573	428
5	30	2044	2044	2031	2007	1967	1543	1444	1395	1282	1266	1220	1183	1050	1019	853	750	617	571	551	414
5	35	2033	2033	2017	1994	1945	1528	1416	1368	1251	1236	1188	1153	1017	987	822	721	593	549	529	399
5	40	2019	2019	2000	1978	1922	1512	1387	1341	1220	1205	1156	1122	985	956	793	693	571	528	509	386
5	45	2003	2003	1982	1960	1897	1494	1358	1314	1189	1174	1124	1092	953	926	764	667	549	507	489	372
5	50	1985	1985	1961	1940	1871	1474	1328	1285	1157	1142	1093	1061	922	896	737	642	528	488	470	359
5	55	1965	1965	1938	1918	1843	1454	1298	1256	1125	1111	1061	1031	892	867	711	619	507	469	452	347
6	0	1944	1944	1914	1894	1814	1432	1267	1227	1094	1080	1030	1001	863	839	686	596	488	451	434	334
6	5	1920	1920	1889	1869	1784	1409	1236	1198	1063	1049	999	972	835	812	662	574	469	434	417	323
6	10	1895	1895	1862	1843	1754	1385	1205	1168	1032	1018	969	943	807	786	639	553	451	417	401	311
6	15	1869	1869	1834	1816	1722	1361	1175	1139	1002	989	940	915	781	760	617	533	434	401	386	300
6	20	1842	1842	1805	1787	1690	1336	1144	1109	972	959	911	887	755	735	596	513	418	386	371	290
6	25	1813	1813	1775	1758	1657	1310	1114	1080	943	931	883	860	731	712	576	495	402	371	357	280
6	30	1784	1784	1744	1728	1624	1284	1084	1051	915	903	856	834	707	689	556	477	387	357	343	270
6	35	1754	1754	1713	1697	1592	1258	1054	1023	887	875	829	808	684	666	538	460	372	344	330	260
6	40	1723	1723	1682	1666	1559	1232	1025	995	860	849	804	784	662	645	520	443	359	331	318	251
6	45	1692	1692	1650	1635	1526	1205	996	967	834	823	779	760	640	624	502	427	345	319	306	243
6	50	1660	1660	1618	1603	1494	1179	968	940	809	798	755	736	620	604	486	412	333	307	295	234
6	55	1629	1629	1586	1571	1461	1153	941	914	785	774	731	714	600	585	470	398	320	296	284	226
7	0	1597	1597	1554	1540	1429	1126	915	888	761	750	709	692	581	567	454	384	309	285	274	219
7	5	1565	1565	1521	1508	1397	1100	889	863	738	728	687	671	562	549	439	370	298	274	264	211
7	10	1533	1533	1490	1476	1366	1075	863	839	716	706	666	650	544	532	425	357	287	265	254	204
7	15	1502	1502	1458	1445	1334	1050	839	815	695	685	645	631	527	515	411	345	277	255	245	197
7	20	1470	1470	1427	1414	1304	1025	815	792	674	664	626	612	511	499	398	333	267	246	237	191
7	25	1439	1439	1396	1383	1274	1000	792	769	654	644	607	593	495	484	386	322	258	238	228	185
7	30	1408	1408	1365	1353	1244	976	769	748	635	625	588	575	480	469	374	311	249	229	220	179
7	35	1378	1378	1335	1323	1216	953	747	727	616	607	571	558	465	455	362	300	240	221	213	173
7	40	1348	1348	1305	1294	1188	929	726	706	598	590	553	542	451	441	351	290	232	214	206	167
7	45	1318	1318	1276	1265	1160	907	706	686	581	573	537	526	437	428	340	281	224	207	199	162
7	50	1289	1289	1247	1237	1134	885	686	667	565	557	521	510	424	415	329	271	217	200	192	157
7	55	1261	1261	1219	1209	1107	863	666	648	544	535	506	495	411	403	319	262	209	193	186	152
8	0	1233	1233	1192	1182	1082	842	647	629	522	514	491	481	399	391	310	254	203	187	180	148
8	5	1205	1205	1165	1156	1056	822	627	610	504	497	476	467	387	379	300	245	196	181	174	143
8	10	1178	1178	1139	1130	1032	802	608	592	489	481	463	454	376	368	291	237	190	175	169	139
8	15	1152	1152	1113	1104	1008	782	590	574	474	467	449	441	365	358	282	230	184	170	164	135
8	20	1126	1126	1088	1079	985	763	572	557	461	453	436	428	354	347	274	222	178	165	159	132
8	25	1101	1101	1063	1055	961	744	555	541	448	440	424	416	344	337	266	215	173	160	154	128
8	30	1076	1076	1039	1031	939	726	539	525	435	428	412	404	334	328	257	208	167	155	148	124
8	35	1052	1052	1015	1007	917	708	524	510	423	416	400	393	324	318	249	200	161	149	143	119
8	40	1029	1029	992	985	897	691	509	495	411	404	389	382	315	309	240	192	156	144	137	114
8	45	1006	1006	970	963	876	674	494	481	399	393	378	372	305	300	226	179	149	138	131	109
8	50	983	983	948	941	857	658	480	468	388	382	367	361	295	290	215	169	143	133	125	104
8	55	961	961	927	920	837	643	467	455	377	371	357	351	285	280	205	160	138	127	120	100
9	0	940	940	907	900	819	627	454	442	367	361	347	341	275	271	197	152	132	122	115	96
Peak	(cfs)	2060	2060	2063	2035	2054	1587	1675	1597	1631	1607	1610	1525	1558	1475	1519	1318	1345	1224	1233	871
Peak	(hrs)	5	5	5	5	4	5	4	4	4	4	3	4	3	3	3	3	3	3	2	2
Peak	(min)	15	15	5	5	50	0	20	25	0	0	55	0	35	40	15	25	0	5	55	55
Peak	(cfs_or_ac.ft.)	0	7	0	4	476	11	0	7	0	7	0	6	0	6	0	6	0	11	0	9
Case	(()S,I,D,O)	( )	( )	( )	( )	(I)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8
Peak/Area	(cfs/ac)	n/a	0.18	0.18	0.18	0.18	0.14	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.17	0.17	0.18	0.18	0.19	0.19	0.21

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Summary File: P:\coweld01\future~1\Goddin~1\5_Year\udswmm\ghrd5yr.txt

GODDING HOLLOW BASIN, FUTURE CONDITION WITH REGIONAL DETENTION

5-YEAR

Time(Hrs)	Time(Min)	Elem308	Elem708	Elem208	Elem109	Elem709	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216	Elem117	Elem217
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	2	2	1	17	0	2	2	0	3	0	0	1	0	0	0	0
0	20	1	3	3	1	18	18	16	73	4	15	14	3	18	0	0	4	0	3	0	0
0	25	3	18	15	9	55	54	47	181	25	52	50	18	54	2	1	16	3	9	0	1
0	30	11	56	46	31	102	101	84	291	61	118	110	49	112	10	7	38	11	20	0	2
0	35	30	123	101	73	180	177	150	337	109	179	164	77	176	29	25	67	22	32	1	4
0	40	58	181	142	102	257	252	214	344	171	239	217	119	227	59	52	93	34	42	3	6
0	45	94	237	181	132	318	308	264	354	233	292	262	166	266	90	82	113	44	48	5	9
0	50	135	301	231	175	368	352	303	375	289	334	300	210	292	116	106	128	50	54	7	11
0	55	182	369	286	226	412	388	337	400	333	367	328	248	310	135	124	140	55	58	10	14
1	0	234	437	343	279	452	421	367	422	366	391	349	278	329	150	138	150	59	61	13	16
1	5	290	502	398	332	489	449	394	441	392	411	367	305	349	162	149	158	63	64	16	19
1	10	347	562	450	383	522	474	418	460	413	430	384	329	370	171	158	165	65	67	18	21
1	15	404	616	498	430	553	496	440	476	433	448	400	352	390	179	165	171	68	69	21	23
1	20	459	664	541	472	580	514	459	490	451	465	416	373	407	186	172	177	70	71	23	26
1	25	512	707	580	510	603	531	475	503	467	480	431	392	423	191	177	181	71	72	26	28
1	30	562	743	613	544	625	546	491	517	483	495	444	410	437	196	181	185	73	73	28	30
1	35	609	775	643	574	645	560	505	530	497	508	457	425	449	199	185	188	74	75	30	31
1	40	651	802	669	601	664	573	519	541	510	519	468	439	460	202	188	190	74	74	30	33
1	45	689	826	693	625	679	584	531	548	521	529	477	451	468	204	190	191	74	74	31	35
1	50	724	846	712	645	692	592	540	554	529	535	484	460	473	204	190	191	74	74	32	36
1	55	755	862	729	663	701	599	547	559	536	540	488	467	476	204	190	190	74	74	33	37
2	0	781	875	743	678	709	604	553	562	540	543	491	472	478	203	190	190	74	74	34	39
2	5	804	884	754	690	715	608	558	565	543	545	493	475	479	203	190	190	74	74	35	40
2	10	824	891	762	699	720	610	562	566	544	545	494	477	479	202	189	189	74	74	36	41
2	15	840	896	769	707	722	611	564	565	545	545	494	478	478	201	189	188	74	74	38	42
2	20	854	898	773	712	721	610	563	561	544	543	492	477	475	200	188	187	74	75	39	42
2	25	864	898	774	715	718	606	561	555	541	539	489	475	470	198	187	185	74	74	40	43
2	30	872	894	773	715	713	601	557	549	537	533	483	471	464	196	185	183	74	74	41	44
2	35	876	889	770	713	706	595	552	542	531	526	477	466	458	194	183	181	74	74	42	44
2	40	878	881	765	709	699	588	546	535	524	519	470	461	451	191	180	178	74	73	43	45
2	45	878	872	758	704	690	580	539	528	517	511	463	454	443	188	178	176	73	73	43	45
2	50	875	862	750	698	681	572	532	520	509	502	456	447	435	185	175	173	73	72	44	45
2	55	871	850	742	690	671	563	525	511	500	494	448	439	427	182	173	170	72	72	44	45
3	0	864	838	732	682	660	554	517	503	492	485	439	432	418	179	170	167	71	71	44	45
3	5	857	825	721	672	649	544	508	492	483	475	431	423	409	176	167	165	71	70	45	45
3	10	848	811	710	662	636	533	498	479	473	465	421	414	399	173	164	161	70	69	45	45
3	15	837	796	697	651	621	520	486	465	462	453	410	405	388	169	161	158	69	68	45	45
3	20	826	779	683	638	606	506	474	451	451	440	398	394	376	165	157	154	68	67	45	45
3	25	813	761	667	624	590	492	461	438	438	427	386	383	364	161	153	150	67	66	45	45
3	30	798	743	651	610	573	478	448	425	425	414	374	372	352	157	149	146	65	65	45	44
3	35	783	723	635	595	557	464	435	412	412	401	362	360	341	152	145	141	64	63	45	44
3	40	767	704	618	579	541	450	422	399	399	389	350	349	330	148	141	137	63	62	44	44
3	45	750	684	601	564	525	436	410	387	387	376	339	338	319	144	137	133	61	61	44	43
3	50	732	665	584	548	509	423	397	374	374	364	328	327	308	139	133	130	60	59	44	43
3	55	714	645	567	533	493	409	385	362	362	352	317	316	297	135	129	126	59	58	43	42
4	0	696	626	550	518	478	396	373	350	350	340	306	305	286	131	126	122	58	57	43	42
4	5	677	607	534	502	463	383	361	339	339	328	295	295	275	127	122	118	56	56	42	41
4	10	658	589	518	487	448	371	350	327	327	317	284	284	265	123	118	115	55	54	42	40
4	15	640	570	502	472	433	358	338	316	316	306	274	274	255	119	115	111	54	53	41	40
4	20	621	552	486	458	418	346	327	305	305	295	264	264	245	116	111	108	53	52	41	39
4	25	603	535	470	443	404	334	316	294	294	284	253	253	234	112	108	104	51	51	40	38
4	30	585	517	455	429	390	323	305	283	283	272	243	243	224	109	105	101	50	49	39	38
4	35	567	500	440	415	376	311	294	272	272	262	233	233	214	105	101	98	49	48	39	37
4	40	549	484	425	401	363	299	283	261	261	251	223	223	204	102	98	95	48	47	38	36
4	45	532	467	411	388	349	288	273	251	251	241	214	214	195	99	95	92	47	46	38	35
4	50	515	452	397	374	336	277	262	240	240	231	205	205	187	96	92	89	45	45	37	35
4	55	498	436	383	361	323	267	252	231	231	222	196	196	179	93	90	86	44	44	36	34
5	0	482	421	369	348	311	256	242	222	222	213	188	188	171	90	87	84	43	43	36	33
5	5	466	406	356	336	299	246	233	213	213	204	180	180	164	87	84	81	42	42	35	33
5	10	450	392	343	324	288	237	224	204	204	196	172	172	156	84	82	79	41	41	34	32
5	15	435	378	330	312	277	227	215	196	196	187	164	164	147	82	79	76	40	40	34	31
5	20	420	364	318	301	266	218	207	187	187	179	156	156	140	79	77	74	39	39	33	30
5	25	405	351	307	290	255	210	199	179	179	171	149	149	134	77	74	72	38	38	32	30
5	30	391	339	295	279	245	201	191	172	172	164	142	142	128	74	72	69	37	37	32	29
5	35	377	326	284	269	235	193	183	164	164	157	136	136	123	72	70	67	36	36	31	28
5	40	364	314	273	258	226	185	175	158	158	151	130	130	118	70	68	65	36	35	31	28
5	45	351	303	263	249	217	178	168	151	151	145	125	125	113	68	66	63	35	34	30	27
5	50	338	292	253	239	208	171	162	145	145	139	120	120	108	66	64	61	34	32	28	26
5	55	326	281	244	230	200	164	156	140	140	134	115	115	103	63	62	58	32	31	27	26
6	0	314	271	235	222	192	158	150	134	134	128	110	110	99	61	59	56	30	29	26	25
6	5	303	262	226	214	185	152	144	129	129	123	105	105	94	58	57	54	29	28	25	24
6	10	292	252	218	206	178	146	139	124	124	118	101	101	90	56	55	52	28	28	24	24
6	15	282	244	210	199	171	140	133	119	119	113	96	96	86	54	53	50	27	27	24	23
6	20	272	235	202	191	165	135	128	114	114	109	92	92	82	52	51	49	27	26	23	23
6	25	262	227	195	184	158	130	123	110	110	104	88	88	79	51	49	47	26	25	23	22
6	30	253	219	188	178	152	125	119	105	105	100	85	85	76	49	48	46	25	25	22	21
6	35	244	212	181	172	146	120	114	101	101	96	81	81	73	47	46	44	24	24	21	21
6	40	236	204	175	166	141	116	110	98	98	93	78	78	70	46	45	43	24	23	21	20
6	45	227	197	169	160	136	112	106	94	94	89	75	75	67	44	43	41	23	22	20	20
6	50	220	191	163	154	131	108	102	90	90	86	72	72	64	43	42	40	22	22	20	19
6	55	212	184	157	149	126	104	99	87	87	83	69	69	62	42	41	39	22	21	19	19
7	0	205	178	152	144	121	100	95	84	84	80	67	67	59	40	39	38	21	21	19	18
7	5	198	172	147	139	117	96	92	81	81	77	64	64	57	39	38	36	20	20	18	18
7	10	191	167	142	135	113	93	89	78	78	74	62	62	55	38	37	35	20	19	18	17
7	15	185	162	137	130	109	90	86	75	75	71	59	59	52	37	36	34	19	19	17	17
7	20	179	156	133	126	105	87	83	72	72	69	57	57	50	35	35	33	19	18	17	16
7	25	173	152	129	122	101	84	80	70	70	66	55	55	48	34	34	32	18	18	16	16
7	30	167	147	125	118	98	81	77	67	67	64	53	53	47	33	33	31	18	17	16	15
7	35	162	142	121	115	94	78	75	65	65	62	51	51	45	32	32	30	17	17	15	15
7	40	157	138	117	111	91	76	72	63	63	60	49	49	43	31	31	29	17	16	15	15
7	45	152	134	114	108	88	73	70	61	61	57	47	47	41	30	30	28	16	16	15	14
7	50	147	130	110	105	85	71	68	59	59	55	45	45	40	29	29	27	16	15	14	14
7	55	143	127	107	102	82	69	66	57	57	54	44	44	38	28	28	26	15	15	14	13
8	0	139	123	104	99	80	66	63	54	54	50	41	41	37	28	27	26	15	14	13	13
8	5	135	120	102	97	77	64	61	52	52	47	38	38	36	27	26	25	14	14	13	13
8	10	131	117	99	95	74	62	59	49	49	45	36	36	34	26	25	24	14	13	13	12
8	15	128	115	97	93	71	60	57	47	47	44	35	35	33	25	25	23	13	13	12	12
8	20	124	109	92	88	69	58	55	45	45	42	33	33	32	24	24	23	13	13	12	12
8	25	119	100	83	79	66	56	53	43	43	41	32	32	31	24	23	22	13	12	12	11
8	30	114	94	77	73	64	54	52	41	41	39	31	31	30	23	22	21	12	12	11	11
8	35	109	89	73	69	62	52	50	39	39	38	30	30	29	22	22	21	12	12	11	11
8	40	103	85	69	66	60	50	48	37	37	37	29	29	28	21	21	20	12	11	11	10
8	45	99	81	66	63	58	48	47	36	36	35	28	28	27	21	20	19	11	11	10	10
8	50	94	78	64	60	56	47	45	35	35	34	27	27	26	20	20	19	11	11	10	10
8	55	90	76	62	58	54	46	44	34	34	33	26	26	25	20	19	18	11	10	10	9
9	0	86	73	59	56	53	45	43	33	33	32	25	25	24	19	19	18	10	10	9	9
Peak	(cfs)	878	898	774	715	722	611	564	566	545	545	494	478	479	204	190	191	74	75	45	45
Peak	(hrs)	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	3	2
Peak	(min)	40	20	25	25	15	15	15	10	15	5	10	15	5	45	45	45	35	35	5	40
Peak	(cfs_or_ac.ft.)	23	0	0	4	0	0	3	0	4	0	0	3	0	0	2	0	2	0	2	0
Case	(),S,I,D,O)	(S)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	4197.8	4197.8	3548.8	3283.2	3283.2	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6	223.4	223.4
Peak/Area	(cfs/ac)	0.21	0.21	0.22	0.22	0.22	0.25	0.25	0.25	0.25	0.25	0.26	0.26	0.26	0.25	0.25	0.25	0.21	0.21	0.20	0.20
11-23-1999	16:05:19																				
Summary	File:																				

5-YEAR

Time(Hrs)	Time(Min)	Elem741	Elem341	Elem720	Elem225	Elem325	Elem237	Elem236	Elem121	Elem307	Elem331	Elem231	Elem337	Elem317	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	0	0	1	0	0	0	0	0	0	0	0	0	0	0.25
0	20	4	0	6	1	0	1	3	0	0	0	2	1	0	0.33
0	25	20	1	21	4	0	2	10	4	0	0	7	2	1	0.42
0	30	60	4	51	13	0	7	24	19	2	1	20	7	2	0.50
0	35	118	9	95	27	0	17	46	50	6	3	40	17	4	0.58
0	40	172	18	143	47	0	31	71	96	14	6	68	31	6	0.67
0	45	206	30	189	67	0	48	95	146	27	10	101	48	9	0.75
0	50	220	41	233	86	0	66	119	195	45	16	133	66	11	0.83
0	55	223	44	269	99	0	84	143	239	66	23	161	84	14	0.92
1	0	220	47	291	105	0	100	166	272	89	31	181	100	16	1.00
1	5	216	50	309	111	0	115	186	295	113	40	193	115	19	1.08
1	10	211	53	325	114	0	128	197	313	136	49	199	128	21	1.17
1	15	207	55	339	116	0	140	209	329	159	57	201	140	23	1.25
1	20	204	58	352	116	0	150	219	343	180	65	200	150	26	1.33
1	25	200	61	362	115	0	158	229	355	201	73	196	158	28	1.42
1	30	196	63	370	112	0	165	237	364	220	79	190	165	30	1.50
1	35	192	65	377	108	0	170	245	372	238	85	184	170	31	1.58
1	40	188	68	382	104	36	174	251	378	255	91	177	174	33	1.67
1	45	184	70	385	99	107	177	256	383	270	95	170	177	35	1.75
1	50	180	72	387	94	95	179	260	386	284	99	163	179	36	1.83
1	55	175	74	389	88	90	180	262	388	297	103	156	180	37	1.92
2	0	170	75	390	82	85	180	263	389	308	105	149	180	39	2.00
2	5	165	77	391	74	78	179	264	390	318	108	141	179	40	2.08
2	10	160	78	391	69	71	178	263	391	327	109	135	178	41	2.17
2	15	156	80	391	64	66	176	261	391	335	110	128	176	42	2.25
2	20	151	80	390	59	61	174	259	390	342	111	122	174	42	2.33
2	25	147	80	388	54	56	171	256	389	347	112	116	171	43	2.42
2	30	141	81	384	50	52	168	252	386	352	112	110	168	44	2.50
2	35	136	81	380	46	48	164	247	382	356	111	104	164	44	2.58
2	40	131	81	374	42	44	161	242	378	359	111	98	161	45	2.67
2	45	126	81	368	39	40	156	237	372	361	110	93	156	45	2.75
2	50	121	81	361	35	37	152	232	365	362	109	89	152	45	2.83
2	55	117	81	353	33	34	148	226	358	362	108	84	148	45	2.92
3	0	113	81	345	30	31	143	220	350	361	106	80	143	45	3.00
3	5	109	81	336	27	28	139	214	342	359	105	76	139	45	3.08
3	10	105	81	327	25	26	134	208	333	357	103	72	134	45	3.17
3	15	101	81	317	23	24	129	201	324	353	101	69	129	45	3.25
3	20	96	81	307	20	21	125	194	314	349	99	65	125	45	3.33
3	25	91	81	296	18	19	120	188	303	344	97	61	120	45	3.42
3	30	86	82	285	16	17	115	181	293	338	95	58	115	44	3.50
3	35	81	82	274	15	15	110	174	282	332	93	55	110	44	3.58
3	40	77	82	263	13	14	105	167	271	325	91	51	105	44	3.67
3	45	73	82	252	11	12	100	160	260	318	89	48	100	43	3.75
3	50	69	81	242	10	11	95	153	250	310	86	46	95	43	3.83
3	55	66	81	232	9	10	90	146	239	302	84	43	90	42	3.92
4	0	62	81	222	8	10	86	140	229	294	82	41	86	42	4.00
4	5	59	81	212	7	9	81	133	219	285	79	38	81	41	4.08
4	10	56	81	203	6	9	77	126	210	277	77	36	77	40	4.17
4	15	53	81	194	5	8	72	120	201	268	75	34	72	40	4.25
4	20	51	81	185	4	8	68	112	192	259	72	32	68	39	4.33
4	25	48	81	176	4	7	64	104	183	250	70	30	64	38	4.42
4	30	46	81	167	3	6	61	98	174	242	68	29	61	38	4.50
4	35	44	81	158	3	6	57	92	165	233	65	27	57	37	4.58
4	40	41	81	150	2	5	54	87	157	224	63	25	54	36	4.67
4	45	39	81	141	2	5	50	82	148	215	61	24	50	35	4.75
4	50	37	81	127	2	4	47	78	138	207	59	22	47	35	4.83
4	55	36	80	117	1	4	44	73	126	197	57	21	44	34	4.92
5	0	34	80	108	1	3	42	69	116	188	55	20	42	33	5.00
5	5	32	80	101	1	3	39	65	108	179	53	19	39	33	5.08
5	10	31	80	95	1	3	37	62	101	170	51	17	37	32	5.17
5	15	29	80	90	1	2	34	58	95	161	49	16	34	31	5.25
5	20	28	79	85	1	2	32	55	90	153	47	16	32	30	5.33
5	25	26	78	80	0	2	30	52	85	145	45	15	30	30	5.42
5	30	25	77	76	0	2	28	49	80	137	44	14	28	29	5.50
5	35	24	76	72	0	1	26	46	76	130	42	13	26	28	5.58
5	40	23	75	69	0	1	24	44	73	123	40	13	24	28	5.67
5	45	22	74	66	0	1	23	41	69	117	39	12	23	27	5.75
5	50	21	73	62	0	1	21	39	66	111	37	12	21	26	5.83
5	55	20	72	60	0	1	20	36	63	105	36	11	20	26	5.92
6	0	19	71	57	0	1	18	34	60	100	35	11	18	25	6.00
6	5	18	70	54	0	1	17	32	57	95	33	10	17	24	6.08
6	10	17	69	52	0	1	16	30	54	90	32	10	16	24	6.17
6	15	16	68	49	0	0	15	29	52	85	31	9	15	23	6.25
6	20	15	67	47	0	0	14	27	50	81	29	9	14	23	6.33
6	25	15	67	45	0	0	13	25	48	77	28	9	13	22	6.42
6	30	14	66	43	0	0	12	24	45	73	27	8	12	21	6.50
6	35	13	65	41	0	0	11	23	43	70	26	8	11	21	6.58
6	40	13	64	39	0	0	10	21	42	67	25	8	10	20	6.67
6	45	12	63	38	0	0	10	20	40	63	24	7	10	20	6.75
6	50	11	62	36	0	0	9	19	38	60	23	7	9	19	6.83
6	55	11	61	35	0	0	8	18	37	58	22	7	8	19	6.92
7	0	10	60	33	0	0	8	17	35	55	21	6	8	18	7.00
7	5	10	59	32	0	0	7	16	34	52	21	6	7	18	7.08
7	10	9	58	30	0	0	7	15	32	50	20	6	7	17	7.17
7	15	9	58	29	0	0	6	14	31	48	19	6	6	17	7.25
7	20	9	57	28	0	0	6	13	30	46	18	5	6	16	7.33
7	25	8	56	27	0	0	5	12	28	44	18	5	5	16	7.42
7	30	8	55	26	0	0	5	12	27	42	17	5	5	15	7.50
7	35	7	54	25	0	0	5	11	26	40	16	5	5	15	7.58
7	40	7	53	24	0	0	4	10	25	38	16	5	4	15	7.67
7	45	7	53	23	0	0	4	10	24	36	15	4	4	14	7.75
7	50	6	52	22	0	0	4	9	23	35	14	4	4	14	7.83
7	55	6	51	21	0	0	3	9	22	33	14	4	3	13	7.92
8	0	6	50	20	0	0	3	8	21	32	13	4	3	13	8.00
8	5	6	49	19	0	0	3	8	21	31	13	4	3	13	8.08
8	10	5	49	19	0	0	3	7	20	29	12	4	3	12	8.17
8	15	5	48	18	0	0	3	7	19	28	12	3	3	12	8.25
8	20	5	47	17	0	0	2	7	18	27	11	3	2	12	8.33
8	25	5	46	17	0	0	2	6	18	26	11	3	2	11	8.42
8	30	4	46	16	0	0	2	6	17	25	10	3	2	11	8.50
8	35	4	45	15	0	0	2	5	16	24	10	3	2	11	8.58
8	40	4	44	15	0	0	2	5	16	23	10	3	2	10	8.67
8	45	4	43	14	0	0	2	5	15	22	9	3	2	10	8.75
8	50	4	43	14	0	0	2	5	15	21	9	3	2	10	8.83
8	55	3	42	13	0	0	1	4	14	20	8	2	1	9	8.92
9	0	3	41	13	0	0	1	4	13	19	8	2	1	9	9.00
Peak	(cfs)	223	82	391	116	107	180	264	391	362	112	201	180	45	
Peak	(hrs)	0	3	2	1	1	1	2	2	2	2	1	1	2	
Peak	(min)	55	30	5	15	45	55	5	10	50	25	15	55	40	
Peak	(cfs_or_ac.ft.)	0	24	0	0	9	0	0	5	19	13	0	11	10	
Case	((),S,I,D,O)	(_)	(S)	(_)	(_)	(S)	(_)	(_)	(_)	(S)	(S)	(_)	(S)	(S)	
Area	(ac)	691.2	691.2	2172.2	490.9	490.9	540.8	889.6	2172.2	2172.2	814.7	814.7	540.8	223.4	
Peak/Area	(cfs/ac)	0.32	0.12	0.18	0.24	0.22	0.33	0.30	0.18	0.17	0.14	0.25	0.33	0.20	
11-23-1999	16:05:19														
Summary	File:														

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GODDING HOLLOW BASIN, FUTURE CONDITION WITH REGIONAL DETENTION

10-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108
0	5	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	1	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	0	0	3	2	9	0	1	0	0	0	2	0	1	0	2	0	1	0	0	0
0	25	1	1	5	4	12	0	4	0	0	0	7	0	4	0	9	0	4	0	1	0
0	30	4	4	10	6	14	0	12	0	3	2	20	0	14	1	26	0	12	0	3	1
0	35	10	10	23	14	55	2	28	0	11	9	46	3	34	6	61	2	28	1	13	5
0	40	25	25	52	34	98	7	53	2	31	26	87	9	69	19	116	8	56	7	35	16
0	45	56	56	95	69	148	18	88	9	66	57	140	25	122	45	186	21	101	26	76	39
0	50	95	95	124	89	206	37	131	26	116	102	201	55	191	87	266	46	165	64	136	75
0	55	127	127	149	105	274	66	182	56	181	162	273	101	271	146	352	88	247	123	213	124
1	0	157	157	180	130	352	106	246	102	258	234	351	161	339	194	448	150	346	203	305	186
1	5	192	192	220	164	428	158	321	163	334	307	403	198	388	229	536	213	457	299	407	258
1	10	235	235	268	208	515	221	401	233	397	367	438	222	440	269	601	260	577	407	516	337
1	15	284	284	327	262	611	294	479	302	448	416	475	252	495	314	674	319	700	520	626	419
1	20	315	315	396	328	708	367	532	349	495	460	516	287	554	366	757	392	823	634	735	501
1	25	358	358	473	403	797	432	566	378	540	504	560	327	618	424	848	476	935	740	840	581
1	30	416	416	555	483	876	488	599	407	588	551	610	374	688	490	941	565	992	792	931	647
1	35	486	486	639	565	939	536	633	437	621	582	663	427	763	563	1031	651	1054	851	1002	694
1	40	565	565	719	643	972	555	666	469	665	625	722	485	842	640	1116	737	1119	913	1076	745
1	45	645	645	790	714	998	566	701	503	717	678	784	550	923	721	1198	821	1188	981	1149	797
1	50	723	723	854	777	1025	579	740	542	777	737	852	619	1006	805	1277	904	1259	1052	1219	846
1	55	795	795	911	833	1054	593	782	585	843	803	923	693	1089	890	1355	987	1328	1122	1279	887
2	0	861	861	963	885	1086	610	829	633	914	873	998	772	1173	976	1429	1068	1393	1188	1327	916
2	5	920	920	1011	933	1120	630	881	686	989	948	1076	853	1258	1061	1501	1146	1451	1247	1366	939
2	10	975	975	1057	979	1156	653	938	744	1067	1026	1156	936	1337	1145	1568	1220	1500	1298	1400	957
2	15	1025	1025	1101	1024	1197	681	1000	808	1147	1107	1236	1021	1416	1227	1629	1288	1541	1341	1422	971
2	20	1073	1073	1146	1069	1242	712	1065	876	1229	1188	1317	1106	1491	1306	1683	1350	1572	1375	1437	983
2	25	1120	1120	1191	1114	1291	748	1135	948	1311	1270	1396	1190	1562	1381	1729	1404	1596	1402	1449	994
2	30	1167	1167	1237	1162	1345	788	1207	1023	1392	1352	1473	1273	1627	1451	1768	1451	1613	1422	1461	1003
2	35	1215	1215	1286	1212	1404	833	1282	1101	1471	1431	1547	1352	1687	1514	1799	1491	1626	1439	1471	1011
2	40	1264	1264	1338	1265	1467	883	1358	1181	1547	1508	1618	1428	1739	1572	1823	1525	1637	1453	1480	1018
2	45	1317	1317	1394	1322	1535	936	1434	1260	1620	1581	1683	1499	1785	1623	1842	1552	1644	1465	1488	1024
2	50	1372	1372	1453	1383	1607	994	1509	1340	1687	1649	1743	1565	1825	1667	1857	1575	1650	1475	1494	1029
2	55	1431	1431	1516	1447	1682	1056	1583	1417	1750	1712	1798	1625	1859	1706	1867	1594	1655	1484	1500	1033
3	0	1493	1493	1583	1515	1760	1120	1654	1492	1807	1770	1846	1679	1887	1738	1874	1609	1658	1491	1504	1037
3	5	1560	1560	1653	1586	1836	1186	1722	1564	1858	1821	1889	1727	1910	1766	1879	1621	1659	1497	1507	1039
3	10	1629	1629	1724	1659	1913	1254	1785	1631	1904	1867	1927	1770	1928	1789	1881	1630	1660	1501	1509	1041
3	15	1701	1701	1798	1734	1992	1323	1844	1694	1943	1907	1958	1807	1941	1807	1881	1637	1659	1505	1510	1041
3	20	1774	1774	1873	1810	2063	1391	1898	1751	1977	1941	1984	1838	1951	1822	1878	1642	1656	1507	1509	1041
3	25	1849	1849	1946	1885	2133	1458	1946	1803	2005	1970	2005	1864	1958	1833	1874	1645	1653	1507	1508	1040
3	30	1923	1923	2019	1959	2201	1524	1989	1850	2027	1993	2021	1885	1961	1840	1868	1646	1648	1507	1505	1037
3	35	1997	1997	2090	2031	2261	1587	2025	1891	2044	2011	2033	1902	1961	1845	1860	1646	1642	1505	1501	1034
3	40	2068	2068	2157	2100	2318	1647	2057	1926	2057	2025	2040	1915	1958	1847	1852	1644	1635	1502	1495	1030
3	45	2137	2137	2221	2166	2371	1704	2083	1957	2066	2034	2044	1925	1954	1847	1842	1641	1626	1498	1488	1026
3	50	2202	2202	2282	2228	2420	1757	2103	1982	2071	2040	2045	1930	1947	1845	1830	1636	1617	1493	1481	1020
3	55	2265	2265	2339	2287	2465	1805	2120	2002	2073	2042	2043	1933	1939	1841	1818	1630	1606	1486	1472	1013
4	0	2323	2323	2392	2341	2506	1849	2132	2018	2071	2041	2038	1933	1929	1835	1805	1623	1594	1478	1461	1006
4	5	2377	2377	2441	2392	2541	1889	2139	2029	2067	2038	2031	1931	1917	1827	1791	1614	1581	1469	1450	998
4	10	2427	2427	2485	2437	2571	1924	2143	2037	2060	2032	2022	1926	1905	1819	1776	1605	1567	1459	1434	989
4	15	2473	2473	2524	2478	2597	1955	2144	2041	2052	2024	2012	1920	1891	1808	1759	1593	1547	1443	1401	978
4	20	2513	2513	2559	2514	2618	1982	2142	2042	2041	2014	1999	1912	1875	1797	1740	1579	1519	1418	1360	957
4	25	2549	2549	2589	2545	2635	2004	2137	2041	2029	2002	1985	1901	1858	1783	1717	1560	1483	1386	1310	926
4	30	2580	2580	2615	2572	2648	2022	2129	2037	2015	1989	1970	1889	1839	1767	1689	1536	1440	1346	1257	891
4	35	2607	2607	2636	2595	2658	2037	2119	2030	1999	1974	1952	1876	1817	1748	1656	1508	1392	1302	1203	854
4	40	2630	2630	2654	2614	2664	2048	2108	2021	1982	1957	1933	1859	1792	1726	1619	1474	1342	1255	1151	819
4	45	2648	2648	2667	2628	2667	2055	2094	2010	1963	1938	1911	1841	1764	1701	1578	1437	1291	1207	1101	785
4	50	2662	2662	2677	2639	2666	2060	2078	1997	1941	1918	1887	1820	1732	1672	1535	1397	1240	1159	1053	752
4	55	2673	2673	2683	2646	2663	2061	2060	1982	1918	1894	1861	1797	1698	1641	1489	1355	1191	1112	1008	722
5	0	2680	2680	2686	2650	2656	2059	2040	1965	1892	1869	1832	1771	1661	1607	1443	1311	1143	1068	966	693
5	5	2683	2683	2685	2651	2648	2055	2018	1945	1863	1841	1801	1742	1622	1570	1396	1268	1097	1025	925	666
5	10	2683	2683	2682	2648	2636	2048	1994	1923	1833	1811	1767	1711	1582	1532	1350	1224	1054	983	887	640
5	15	2681	2681	2676	2643	2622	2038	1968	1900	1800	1779	1732	1678	1540	1493	1304	1181	1010	943	840	607
5	20	2675	2675	2666	2635	2606	2026	1939	1874	1765	1744	1695	1643	1498	1452	1259	1138	966	901	796	574
5	25	2666	2666	2655	2624	2587	2012	1909	1846	1728	1708	1656	1607	1455	1411	1214	1095	922	859	758	548
5	30	2655	2655	2640	2611	2568	1995	1877	1816	1690	1671	1616	1569	1411	1370	1169	1053	881	820	723	526
5	35	2641	2641	2624	2595	2541	1976	1843	1784	1651	1632	1575	1531	1368	1328	1125	1011	841	782	691	506
5	40	2625	2625	2604	2576	2515	1955	1808	1751	1611	1592	1534	1491	1325	1287	1083	970	801	744	661	486
5	45	2606	2606	2582	2555	2486	1931	1771	1716	1570	1552	1492	1451	1281	1245	1038	927	737	682	633	468
5	50	2585	2585	2558	2531	2455	1906	1733	1680	1528	1510	1450	1411	1238	1203	991	882	689	637	606	451
5	55	2561	2561	2531	2505	2423	1879	1694	1643	1486	1469	1407	1370	1194	1160	946	839	656	606	581	434
6	0	2535	2535	2503	2478	2389	1851	1655	1605	1444	1427	1364	1328	1150	1118	904	799	628	579	556	418
6	5	2507	2507	2472	2447	2347	1821	1614	1566	1401	1385	1321	1287	1107	1077	866	762	602	555	533	403
6	10	2476	2476	2437	2414	2304	1790	1574	1527	1359	1342	1279	1246	1066	1037	830	727	577	532	511	388
6	15	2442	2442	2400	2377	2260	1758	1532	1488	1316	1300	1237	1205	1025	998	797	695	554	510	490	374
6	20	2406	2406	2361	2339	2215	1724	1491	1448	1274	1259	1195	1165	987	960	766	665	531	489	470	360
6	25	2368	2368	2320	2298	2169	1690	1449	1408	1233	1218	1154	1126	950	925	737	638	510	469	451	347
6	30	2328	2328	2278	2257	2122	1655	1408	1368	1192	1177	1115	1087	915	890	709	611	490	450	432	334
6	35	2286	2286	2234	2213	2075	1619	1367	1328	1152	1138	1076	1050	881	858	683	586	470	432	415	322
6	40	2243	2243	2189	2169	2027	1583	1326	1289	1114	1099	1039	1014	849	827	659	563	452	415	399	311
6	45	2199	2199	2144	2124	1979	1547	1286	1250	1076	1062	1003	979	818	797	636	541	434	399	383	300
6	50	2154	2154	2097	2079	1930	1511	1247	1212	1040	1026	968	945	789	769	614	520	417	383	368	289
6	55	2109	2109	2051	2033	1882	1474	1208	1174	1005	991	935	913	762	742	593	500	401	368	354	279
7	0	2062	2062	2004	1986	1834	1438	1171	1138	971	958	903	882	735	717	573	481	386	354	340	269
7	5	2016	2016	1957	1940	1788	1402	1134	1102	938	926	872	852	710	693	554	463	371	341	327	259
7	10	1970	1970	1911	1894	1743	1366	1099	1068	907	895	843	824	686	669	536	446	358	328	315	250
7	15	1924	1924	1865	1849	1698	1330	1064	1034	877	865	815	797	663	647	519	429	344	316	303	242
7	20	1878	1878	1819	1804	1654	1296	1031	1002	848	836	788	770	642	626	503	414	332	304	292	234
7	25	1833	1833	1775	1760	1611	1261	998	971	821	809	762	745	621	606	487	399	319	293	281	226
7	30	1789	1789	1730	1716	1568	1228	967	940	794	783	737	721	601	587	472	384	308	282	271	218
7	35	1745	1745	1687	1673	1528	1195	937	911	769	758	714	698	582	569	458	371	297	272	261	211
7	40	1702	1702	1645	1631	1488	1163	908	883	745	734	691	676	564	551	443	358	286	262	252	204
7	45	1659	1659	1603	1590	1449	1131	880	856	722	711	669	655	546	534	429	345	276	253	243	197
7	50	1618	1618	1563	1550	1411	1101	853	830	699	689	649	635	530	518	416	333	266	244	235	190
7	55	1578	1578	1523	1510	1374	1071	827	805	678	668	629	616	513	502	403	322	257	236	226	184
8	0	1538	1538	1484	1472	1338	1042	802	781	658	648	609	597	498	487	391	311	248	227	219	178
8	5	1500	1500	1447	1435	1304	1014	778	758	638	628	591	579	483	473	379	300	240	220	211	173
8	10	1462	1462	1410	1399	1271	987	755	735	619	610	573	562	468	458	367	290	232	212	204	167
8	15	1426	1426	1375	1364	1239	961	733	714	601	592	556	545	454	445	356	280	224	205	197	162
8	20	1390	1390	1340	1329	1207	935	712	693	584	575	539	529	441	432	345	271	216	198	191	157
8	25	1355	1355	1307	1296	1176	910	692	673	568	559	524	514	428	419	335	262	209	192	185	152
8	30	1322	1322	1274	1264	1147	887	672	654	548	540	508	499	415	407	325	253	202	186	179	148
8	35	1289	1289	1243	1233	1119	863	652	635	526	517	494	485	403	395	315	245	196	180	173	143
8	40	1258	1258	1212	1202	1092	841	632	615	508	500	479	471	391	384	306	237	190	174	168	139
8	45	1227	1227	1183	1173	1065	819	612	596	492	484	466	457	380	373	297	229	184	169	163	135
8	50	1197	1197	1154	1145	1039	798	594	578	478	470	452	445	369	363	288	222	178	164	158	131
8	55	1168	1168	1126	1117	1014	777	576	561	464	457	440	432	359	352	280	215	173	159	153	127
9	0	1140	1140	1099	1090	989	757	559	545	451	444	427	420	349	342	272	207	167	154	147	123
Peak	(cfs)	2683	2683	2686	2651	2667	2061	2144	2042	2073	2042	2045	1933	1961	1847	1881	1646	1660	1507	1510	1041
Peak	(hrs)	5	5	5	5	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3
Peak	(min)	5	5	0	5	45	55	15	20	55	55	50	55	30	40	10	30	10	20	15	10
Peak	(cfs_or_ac.ft.)	0	7	0	5	614	11	0	7	0	7	0	6	0	6	0	6	0	11	0	9
Case	((),S,I,D,O)	(_)	(_)	(_)	(_)	(I)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8
Peak/Area	(cfs/ac)	n/a	0.23	0.23	0.23	0.24	0.18	0.19	0.19	0.19	0.19	0.19	0.20	0.20	0.21	0.21	0.22	0.23	0.24	0.24	0.25
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Summary	File:	P:\coweld01\future~1\Goddin~1\10_Year\udswmm\ghrd10yr.txt																			

GODDING HOLLOW BASIN, FUTURE CONDITION WITH REGIONAL DETENTION

10-YEAR

Time(Hrs)	Time(Min)	Elem308	Elem708	Elem208	Elem109	Elem709	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216	Elem117	Elem217
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	2	2	2	22	0	3	3	0	3	0	0	1	0	1	0	0
0	20	1	5	4	2	25	24	22	92	6	19	18	4	22	1	0	5	1	4	0	0
0	25	4	24	20	12	63	63	54	235	34	69	66	24	69	3	2	20	4	12	0	1
0	30	15	74	61	41	135	134	112	372	75	150	140	57	147	14	11	49	14	26	1	2
0	35	39	160	130	94	245	242	205	433	143	234	215	99	232	42	35	87	30	41	2	5
0	40	75	225	173	121	349	340	292	443	228	315	287	158	298	81	72	119	45	53	4	7
0	45	120	312	238	174	428	413	356	460	313	384	348	222	344	121	109	144	56	62	6	11
0	50	177	409	315	243	492	468	405	487	384	437	394	279	369	152	138	162	64	68	10	14
0	55	243	507	395	317	548	513	447	516	437	473	425	323	393	175	160	176	70	73	13	17
1	0	316	601	473	391	598	551	483	542	475	501	450	360	418	192	176	188	75	77	16	20
1	5	393	687	546	462	643	584	515	567	505	526	471	392	444	206	189	199	79	80	20	23
1	10	472	765	613	526	688	614	544	591	530	549	493	422	470	218	199	208	82	83	23	26
1	15	549	834	674	585	725	642	571	615	554	573	514	451	496	227	209	216	85	86	26	29
1	20	623	897	728	639	763	668	597	637	578	597	536	478	521	236	217	223	87	89	29	32
1	25	694	952	777	687	796	690	619	653	602	619	557	504	543	244	224	229	89	90	30	34
1	30	760	999	820	730	825	709	638	665	622	637	575	527	560	249	229	233	90	90	31	36
1	35	821	1039	858	768	849	724	654	677	640	652	589	547	574	252	233	235	90	90	32	39
1	40	876	1073	890	801	870	737	668	689	654	663	600	563	585	254	235	236	90	90	34	41
1	45	926	1099	916	828	883	748	680	699	666	673	609	576	594	255	236	237	90	91	36	43
1	50	962	1120	937	850	894	758	691	708	675	681	617	587	602	256	237	238	91	91	38	44
1	55	970	1135	954	868	904	767	701	716	683	688	624	596	608	257	238	239	92	92	40	46
2	0	978	1147	967	883	912	774	709	720	689	693	629	603	612	257	239	240	92	93	42	48
2	5	986	1155	978	894	917	779	715	721	694	696	633	608	614	257	239	239	93	93	44	49
2	10	994	1160	985	903	919	780	718	720	696	697	633	611	613	256	239	239	94	94	46	50
2	15	1002	1162	989	909	919	779	718	717	696	694	631	611	610	255	238	237	94	94	47	51
2	20	1010	1160	991	912	915	775	716	710	693	690	627	609	604	253	237	235	94	94	49	52
2	25	1017	1154	989	912	909	768	711	701	687	682	621	605	597	250	234	232	93	93	50	53
2	30	1023	1146	984	909	900	760	704	692	680	673	612	599	588	247	231	229	93	93	51	54
2	35	1029	1135	977	904	891	750	695	682	670	663	603	591	578	243	228	225	92	92	52	54
2	40	1033	1122	968	897	880	739	686	671	660	652	593	582	567	239	225	222	91	91	53	55
2	45	1037	1107	957	889	868	727	676	660	649	640	582	572	557	235	221	218	91	90	54	55
2	50	1040	1091	946	879	856	715	665	648	637	628	571	561	545	230	217	214	90	89	54	55
2	55	1042	1075	933	868	843	702	654	636	625	615	559	551	533	226	213	210	89	88	55	55
3	0	1043	1057	919	856	829	689	642	623	612	603	547	539	521	221	209	206	88	87	55	56
3	5	1044	1040	905	844	815	675	630	609	599	590	535	527	509	217	205	202	87	86	55	56
3	10	1043	1021	890	830	799	659	616	592	586	575	522	515	495	212	201	197	86	85	55	55
3	15	1041	1001	874	816	781	642	600	574	571	560	507	502	480	207	196	192	84	84	55	55
3	20	1039	979	856	800	763	624	584	556	556	543	492	488	465	202	192	187	83	82	55	55
3	25	1036	957	837	783	744	606	567	539	539	526	476	473	449	197	187	182	81	80	55	55
3	30	1031	934	818	766	725	587	550	522	522	509	460	458	434	191	181	177	80	79	55	54
3	35	1026	910	798	748	706	569	534	506	506	493	445	443	419	185	176	172	78	77	55	54
3	40	1020	887	778	730	688	551	517	489	489	476	430	429	405	180	171	167	76	75	54	53
3	45	1013	863	758	712	669	534	501	473	473	460	415	414	391	175	166	162	75	74	54	53
3	50	1005	840	738	694	651	516	485	458	458	445	401	400	377	169	161	157	73	72	53	52
3	55	997	817	719	676	633	499	469	442	442	430	387	386	363	164	157	152	71	71	53	51
4	0	988	794	699	658	616	483	454	427	427	415	373	372	349	159	152	147	70	69	52	50
4	5	978	772	680	641	597	466	439	412	412	400	359	359	336	154	147	143	68	67	51	50
4	10	968	749	660	622	577	450	424	398	398	386	346	346	323	149	143	139	67	66	51	49
4	15	944	726	640	604	557	435	410	383	383	372	333	333	311	145	138	134	65	64	50	48
4	20	890	703	620	585	537	420	396	370	370	358	320	320	298	140	134	130	64	63	49	47
4	25	843	680	599	566	518	405	382	356	356	345	308	308	286	136	130	126	62	61	48	46
4	30	802	657	579	547	499	390	368	343	343	332	296	296	275	131	126	122	61	60	48	46
4	35	765	635	560	528	481	376	355	330	330	319	284	284	263	127	122	118	59	58	47	45
4	40	732	613	540	510	463	362	342	318	318	307	273	273	252	123	118	114	58	57	46	44
4	45	701	591	521	493	446	349	330	305	305	294	261	261	240	119	114	111	56	55	45	43
4	50	673	571	503	475	429	336	317	293	293	282	250	250	229	115	111	107	55	54	44	42
4	55	647	551	485	458	413	323	305	281	281	270	239	239	218	112	107	104	53	53	43	41
5	0	622	531	467	441	397	310	293	269	269	259	228	228	208	108	104	101	52	51	43	40
5	5	598	512	450	425	381	298	282	258	258	248	218	218	199	105	101	97	51	50	42	39
5	10	576	493	433	409	366	286	271	247	247	237	209	209	190	101	98	94	49	49	41	38
5	15	554	475	417	394	351	275	260	237	237	228	200	200	182	98	95	91	48	47	40	38
5	20	533	457	401	379	337	264	250	228	228	218	191	191	174	95	92	88	47	46	39	37
5	25	513	440	386	365	323	253	240	218	218	209	183	183	166	92	89	86	46	45	38	36
5	30	494	424	371	351	310	243	230	209	209	200	175	175	157	89	86	83	44	44	38	35
5	35	476	408	357	337	298	233	221	200	200	191	166	166	149	86	83	80	43	43	37	34
5	40	458	393	343	324	286	224	212	192	192	183	158	158	142	84	81	78	42	41	36	33
5	45	441	379	330	312	274	215	203	183	183	175	151	151	136	81	78	75	41	40	35	33
5	50	425	364	317	300	262	206	195	175	175	167	144	144	130	78	76	73	40	39	34	32
5	55	409	351	305	288	252	197	187	168	168	160	138	138	124	76	73	71	39	38	34	31
6	0	394	338	293	277	241	189	179	161	161	154	132	132	119	74	71	69	38	37	33	30
6	5	379	325	281	266	232	182	172	155	155	148	127	127	114	71	69	67	37	36	32	29
6	10	365	313	271	256	222	175	165	149	149	142	121	121	110	69	67	65	36	36	32	29
6	15	351	301	260	246	214	168	159	143	143	137	117	117	105	67	65	63	35	35	31	28
6	20	338	290	250	237	205	161	153	138	138	132	112	112	101	65	63	61	34	34	30	27
6	25	326	280	241	228	197	155	147	132	132	127	108	108	97	63	61	59	34	33	30	27
6	30	314	270	232	219	190	150	142	128	128	122	103	103	93	61	59	57	32	31	27	26
6	35	302	260	223	211	183	144	137	123	123	117	99	99	89	59	57	54	30	29	26	25
6	40	291	251	215	204	176	139	132	118	118	113	95	95	85	56	55	52	29	28	25	24
6	45	281	242	207	196	169	134	127	114	114	108	91	91	81	54	52	50	28	27	25	24
6	50	271	234	200	189	163	129	122	109	109	104	87	87	77	52	51	48	27	26	24	23
6	55	261	226	193	183	157	124	118	105	105	100	84	84	74	50	49	46	26	26	23	23
7	0	252	218	186	176	151	120	114	101	101	96	80	80	71	48	47	45	25	25	23	22
7	5	243	211	179	170	145	115	110	97	97	92	77	77	68	47	46	44	25	24	22	21
7	10	235	204	173	164	140	111	106	93	93	89	74	74	66	45	44	42	24	23	21	21
7	15	227	197	167	158	134	107	102	90	90	86	71	71	63	44	43	41	23	23	21	20
7	20	219	190	161	153	129	103	98	87	87	82	68	68	61	43	41	40	22	22	20	20
7	25	211	184	156	148	125	99	95	83	83	79	65	65	58	41	40	38	22	21	20	19
7	30	204	178	150	143	120	96	91	80	80	77	63	63	56	40	39	37	21	21	19	19
7	35	197	172	145	138	116	93	88	78	78	74	61	61	54	39	38	36	21	20	19	18
7	40	191	166	141	133	112	89	85	75	75	71	58	58	52	37	37	35	20	19	18	18
7	45	184	161	136	129	108	86	82	72	72	69	56	56	50	36	35	34	19	19	18	17
7	50	178	156	132	125	104	83	80	70	70	66	54	54	48	35	34	33	19	18	17	17
7	55	172	151	127	121	100	81	77	67	67	64	52	52	46	34	33	32	18	18	17	16
8	0	167	147	123	117	97	78	75	65	65	62	50	50	44	33	32	31	18	17	16	16
8	5	162	142	120	114	93	75	72	63	63	60	48	48	43	32	31	30	17	17	16	15
8	10	157	138	116	110	90	73	70	61	61	58	47	47	41	31	30	29	17	16	15	15
8	15	152	134	113	107	87	71	68	59	59	56	45	45	40	30	29	28	16	16	15	14
8	20	147	130	109	104	84	68	66	57	57	54	43	43	38	29	28	27	16	15	14	14
8	25	143	127	106	101	81	66	63	54	54	50	40	40	37	28	28	26	15	15	14	14
8	30	139	123	104	99	79	64	61	52	52	48	38	38	35	27	27	25	15	14	14	13
8	35	135	120	101	96	76	62	59	49	49	46	36	36	34	27	26	25	14	14	13	13
8	40	131	117	99	94	73	60	57	47	47	44	35	35	33	26	25	24	14	14	13	12
8	45	127	115	97	92	70	58	55	45	45	42	33	33	32	25	24	23	13	13	12	12
8	50	123	107	89	85	68	56	53	44	44	41	32	32	31	24	24	22	13	13	12	12
8	55	119	98	81	77	66	54	52	42	42	40	31	31	30	23	23	22	13	12	12	11
9	0	113	92	76	72	63	52	50	39	39	38	30	30	29	23	22	21	12	12	11	11
Peak	(cfs)	1044	1162	991	912	919	780	718	721	696	697	633	611	614	257	239	240	94	94	55	56
Peak	(hrs)	3	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	3
Peak	(min)	5	15	20	20	10	10	10	5	10	10	5	10	5	55	0	0	10	10	55	0
Peak	(cfs_or_ac.ft.)	37	0	0	4	0	0	3	0	4	0	0	3	0	0	2	0	2	0	2	0
Case	((),S,I,D,O)	(S)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	4197.8	4197.8	3548.8	3283.2	3283.2	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6	223.4	223.4
Peak/Area	(cfs/ac)	0.25	0.28	0.28	0.28	0.28	0.32	0.31	0.32	0.33	0.33	0.33	0.34	0.34	0.31	0.31	0.31	0.27	0.27	0.25	0.25
11-23-1999	16:05:20																				
Summary	File:																				

GODDING HOLLOW BASIN, FUTURE CONDITION WITH REGIONAL DETENTION

10-YEAR

Time(Hrs)	Time(Min)	Elem741	Elem341	Elem720	Elem225	Elem325	Elem237	Elem236	Elem121	Elem307	Elem331	Elem231	Elem337	Elem317	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	1	0	1	0	0	0	0	0	0	0	0	0	0	0.25
0	20	6	0	7	2	0	1	3	1	0	0	3	1	0	0.33
0	25	27	1	26	7	0	3	12	6	0	0	10	3	1	0.42
0	30	80	5	67	21	0	10	32	26	2	1	28	10	2	0.50
0	35	157	12	126	46	0	22	61	69	8	4	61	22	5	0.58
0	40	228	24	191	78	0	40	94	131	19	8	107	40	7	0.67
0	45	270	39	255	108	0	62	125	201	37	15	158	62	11	0.75
0	50	287	44	308	126	0	85	156	265	61	25	207	85	14	0.83
0	55	289	48	342	144	0	107	187	314	89	35	234	107	17	0.92
1	0	284	53	372	159	0	128	213	350	119	47	255	128	20	1.00
1	5	278	57	398	170	0	146	230	379	149	59	272	146	23	1.08
1	10	272	60	422	176	0	163	246	403	178	71	283	163	26	1.17
1	15	268	64	444	180	0	177	262	420	207	83	290	177	29	1.25
1	20	265	68	464	181	53	190	278	437	234	95	292	190	32	1.33
1	25	263	71	481	179	191	200	292	454	260	106	291	200	34	1.42
1	30	259	74	497	176	176	209	304	470	285	116	287	209	36	1.50
1	35	254	78	511	170	173	216	315	486	308	125	281	216	39	1.58
1	40	247	80	524	163	166	222	323	500	331	133	273	222	41	1.67
1	45	241	81	535	156	159	225	329	513	352	134	263	225	43	1.75
1	50	235	81	545	148	151	228	334	525	373	136	252	228	44	1.83
1	55	229	81	554	139	143	229	337	536	392	137	241	229	46	1.92
2	0	223	82	562	131	134	229	339	546	410	138	230	229	48	2.00
2	5	218	82	568	123	126	228	339	554	427	138	218	228	49	2.08
2	10	212	82	571	115	118	227	338	561	443	139	205	227	50	2.17
2	15	205	83	572	107	110	225	335	566	451	140	190	225	51	2.25
2	20	198	83	571	99	102	222	332	568	454	140	179	222	52	2.33
2	25	190	83	567	91	94	218	327	569	456	141	168	218	53	2.42
2	30	183	84	560	84	87	214	322	566	458	141	159	214	54	2.50
2	35	175	84	552	75	79	209	315	562	460	141	149	209	54	2.58
2	40	167	84	542	66	70	204	308	555	462	141	141	204	55	2.67
2	45	160	84	530	60	63	198	301	547	464	141	132	198	55	2.75
2	50	154	84	518	55	57	192	293	537	465	141	124	192	55	2.83
2	55	148	85	505	50	52	186	285	525	466	141	117	186	55	2.92
3	0	142	85	491	45	47	180	277	513	467	140	111	180	56	3.00
3	5	137	85	476	41	43	174	269	500	468	140	104	174	56	3.08
3	10	132	85	461	37	39	167	260	486	469	140	99	167	55	3.17
3	15	126	85	445	34	35	161	251	471	469	139	93	161	55	3.25
3	20	120	85	428	30	32	155	242	455	469	139	87	155	55	3.33
3	25	114	85	411	27	28	148	233	438	468	138	82	148	55	3.42
3	30	108	85	394	24	25	142	224	420	468	138	77	142	54	3.50
3	35	102	85	377	21	22	136	215	401	466	137	73	136	54	3.58
3	40	97	85	360	19	20	129	206	375	465	136	68	129	53	3.67
3	45	92	86	344	16	17	123	197	355	463	136	64	123	53	3.75
3	50	87	86	327	14	15	117	189	339	461	135	60	117	52	3.83
3	55	82	86	312	13	13	111	180	323	458	134	57	111	51	3.92
4	0	78	86	297	11	12	105	172	308	455	133	53	105	50	4.00
4	5	74	85	283	10	10	99	164	293	452	131	50	99	50	4.08
4	10	70	85	269	8	10	94	156	279	445	127	47	94	49	4.17
4	15	67	85	256	7	10	88	148	265	424	122	44	88	48	4.25
4	20	64	85	243	6	9	83	141	253	404	118	42	83	47	4.33
4	25	60	85	232	5	9	78	133	240	384	113	39	78	46	4.42
4	30	58	85	220	4	8	74	126	229	366	109	37	74	46	4.50
4	35	55	85	210	4	7	69	119	218	349	105	34	69	45	4.58
4	40	52	85	199	3	7	65	109	207	332	101	32	65	44	4.67
4	45	49	85	190	3	6	61	102	197	316	97	30	61	43	4.75
4	50	47	85	180	2	6	57	96	187	301	93	28	57	42	4.83
4	55	45	85	170	2	5	54	90	178	287	90	27	54	41	4.92
5	0	43	85	160	2	4	50	85	168	273	86	25	50	40	5.00
5	5	41	85	151	1	4	47	80	159	259	83	24	47	39	5.08
5	10	39	84	142	1	4	44	75	149	246	79	22	44	38	5.17
5	15	37	84	127	1	3	41	71	138	234	76	21	41	38	5.25
5	20	35	84	116	1	3	39	67	126	221	73	20	39	37	5.33
5	25	33	84	108	1	2	36	63	116	209	70	19	36	36	5.42
5	30	32	84	100	1	2	34	60	107	197	67	18	34	35	5.50
5	35	30	84	94	1	2	31	56	100	186	64	17	31	34	5.58
5	40	29	84	89	0	2	29	53	94	175	62	16	29	33	5.67
5	45	27	84	84	0	1	27	50	89	165	59	15	27	33	5.75
5	50	26	83	79	0	1	26	47	84	155	57	14	26	32	5.83
5	55	25	83	75	0	1	24	44	80	146	54	14	24	31	5.92
6	0	24	83	72	0	1	22	42	76	138	52	13	22	30	6.00
6	5	22	83	68	0	1	21	39	72	130	50	13	21	29	6.08
6	10	21	83	65	0	1	19	37	68	123	48	12	19	29	6.17
6	15	20	83	62	0	1	18	35	65	116	46	12	18	28	6.25
6	20	19	82	59	0	1	17	33	62	109	44	11	17	27	6.33
6	25	18	82	57	0	0	16	31	59	104	42	11	16	27	6.42
6	30	17	82	54	0	0	14	29	57	98	40	10	14	26	6.50
6	35	17	82	52	0	0	13	27	54	93	39	10	13	25	6.58
6	40	16	82	49	0	0	13	26	52	88	37	9	13	24	6.67
6	45	15	82	47	0	0	12	24	50	83	35	9	12	24	6.75
6	50	14	81	45	0	0	11	23	48	79	34	9	11	23	6.83
6	55	14	81	43	0	0	10	22	45	75	33	8	10	23	6.92
7	0	13	81	41	0	0	9	20	44	71	31	8	9	22	7.00
7	5	12	81	40	0	0	9	19	42	68	30	8	9	21	7.08
7	10	12	81	38	0	0	8	18	40	65	29	7	8	21	7.17
7	15	11	81	36	0	0	7	17	38	61	27	7	7	20	7.25
7	20	11	80	35	0	0	7	16	37	59	26	7	7	20	7.33
7	25	10	80	33	0	0	6	15	35	56	25	6	6	19	7.42
7	30	10	80	32	0	0	6	14	34	53	24	6	6	19	7.50
7	35	9	79	31	0	0	6	13	32	51	23	6	6	18	7.58
7	40	9	78	30	0	0	5	13	31	48	22	6	5	18	7.67
7	45	8	76	28	0	0	5	12	30	46	21	5	5	17	7.75
7	50	8	75	27	0	0	4	11	29	44	20	5	4	17	7.83
7	55	8	74	26	0	0	4	11	28	42	20	5	4	16	7.92
8	0	7	73	25	0	0	4	10	27	40	19	5	4	16	8.00
8	5	7	72	24	0	0	4	9	26	39	18	5	4	15	8.08
8	10	7	70	23	0	0	3	9	25	37	17	4	3	15	8.17
8	15	6	69	22	0	0	3	8	24	35	16	4	3	14	8.25
8	20	6	68	21	0	0	3	8	23	34	16	4	3	14	8.33
8	25	6	67	21	0	0	3	8	22	32	15	4	3	14	8.42
8	30	5	66	20	0	0	2	7	21	31	14	4	2	13	8.50
8	35	5	65	19	0	0	2	7	20	30	14	4	2	13	8.58
8	40	5	64	18	0	0	2	6	19	29	13	3	2	12	8.67
8	45	5	63	18	0	0	2	6	19	27	13	3	2	12	8.75
8	50	5	62	17	0	0	2	6	18	26	12	3	2	12	8.83
8	55	4	61	16	0	0	2	5	17	25	12	3	2	11	8.92
9	0	4	60	16	0	0	2	5	17	24	11	3	2	11	9.00
Peak	(cfs)	289	86	572	181	191	229	339	569	469	141	292	229	56	
Peak	(hrs)	0	3	2	1	1	1	2	2	3	2	1	1	3	
Peak	(min)	55	45	15	20	25	55	0	25	10	25	20	55	0	
Peak	(cfs_or_ac.ft.)	0	34	0	0	9	0	0	6	30	21	0	14	12	
Case	((),S,I,D,O)	(_)	(S)	(_)	(_)	(S)	(_)	(_)	(_)	(S)	(S)	(_)	(S)	(S)	
Area	(ac)	691.2	691.2	2172.2	490.9	490.9	540.8	889.6	2172.2	2172.2	814.7	814.7	540.8	223.4	
Peak/Area	(cfs/ac)	0.42	0.12	0.26	0.37	0.39	0.42	0.38	0.26	0.22	0.17	0.36	0.42	0.25	
11-23-1999	16:05:20														
Summary	File:														

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GODDING HOLLOW BASIN, FUTURE CONDITION WITH REGIONAL DETENTION

25-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108
0	5	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	1	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	0	0	2	2	7	0	1	0	0	0	1	0	1	0	2	0	1	0	0	0
0	25	1	1	4	3	9	0	3	0	0	0	5	0	3	0	7	0	3	0	0	0
0	30	2	2	8	4	11	0	10	0	2	2	16	0	11	1	21	0	9	0	2	1
0	35	8	8	21	13	63	1	24	0	9	7	40	2	29	4	52	2	24	1	10	3
0	40	24	24	55	39	118	6	49	2	26	22	83	8	66	16	110	6	53	5	30	13
0	45	61	61	107	80	179	16	89	8	64	55	150	24	130	43	200	19	104	22	70	35
0	50	105	105	135	95	250	37	145	25	126	110	236	59	221	93	311	47	183	60	139	74
0	55	142	142	170	118	336	72	217	61	214	192	341	118	337	169	437	98	292	129	239	136
1	0	183	183	215	152	439	125	309	123	331	302	484	190	422	217	631	179	431	233	369	224
1	5	234	234	274	202	583	202	447	213	463	426	581	221	546	274	777	243	630	372	526	338
1	10	293	293	359	274	759	310	610	326	586	541	675	269	668	345	913	321	858	540	707	469
1	15	339	339	474	373	949	433	703	382	665	612	767	331	792	431	1060	430	1094	731	902	615
1	20	413	413	609	495	1129	545	781	433	755	695	862	407	920	531	1211	559	1216	819	1052	712
1	25	518	518	754	629	1223	571	855	490	854	788	960	497	1051	645	1356	697	1340	920	1191	800
1	30	646	646	894	762	1316	597	931	555	957	887	1062	599	1185	768	1495	839	1468	1034	1312	869
1	35	785	785	1024	887	1364	627	1008	629	1062	992	1168	712	1318	900	1627	984	1587	1146	1383	926
1	40	923	923	1139	999	1417	662	1087	711	1172	1100	1276	834	1450	1036	1750	1126	1684	1244	1440	975
1	45	1052	1052	1242	1102	1476	703	1170	801	1284	1212	1387	962	1579	1172	1859	1260	1762	1328	1492	1018
1	50	1170	1170	1337	1197	1540	750	1257	898	1398	1326	1500	1094	1701	1307	1955	1383	1825	1401	1541	1058
1	55	1277	1277	1425	1287	1611	803	1349	1001	1513	1441	1613	1227	1816	1436	2036	1493	1876	1465	1586	1095
2	0	1375	1375	1511	1375	1689	863	1444	1109	1629	1557	1724	1360	1921	1558	2104	1589	1918	1521	1629	1129
2	5	1468	1468	1593	1461	1760	928	1544	1222	1742	1671	1832	1488	2017	1670	2161	1673	1953	1573	1669	1160
2	10	1556	1556	1674	1545	1838	1000	1646	1338	1853	1782	1936	1611	2102	1772	2207	1745	1983	1620	1707	1190
2	15	1641	1641	1755	1629	1922	1078	1749	1454	1959	1889	2032	1727	2176	1863	2244	1807	2009	1662	1742	1216
2	20	1725	1725	1836	1715	2011	1162	1851	1570	2057	1989	2120	1834	2239	1944	2274	1860	2032	1702	1773	1241
2	25	1809	1809	1920	1804	2104	1250	1950	1683	2146	2081	2200	1931	2292	2014	2300	1905	2050	1737	1802	1262
2	30	1894	1894	2006	1894	2195	1341	2046	1792	2226	2165	2270	2019	2338	2076	2327	1944	2066	1770	1828	1282
2	35	1981	1981	2092	1985	2285	1435	2136	1896	2298	2240	2333	2097	2376	2131	2349	1976	2079	1799	1851	1298
2	40	2068	2068	2180	2077	2377	1531	2220	1993	2364	2308	2395	2165	2408	2178	2365	2004	2089	1825	1870	1312
2	45	2157	2157	2268	2170	2468	1627	2297	2083	2425	2371	2448	2225	2433	2219	2377	2026	2096	1848	1887	1324
2	50	2246	2246	2357	2264	2560	1721	2368	2167	2477	2426	2492	2276	2454	2253	2384	2044	2100	1867	1901	1334
2	55	2336	2336	2446	2357	2649	1814	2438	2244	2523	2473	2530	2321	2476	2281	2388	2059	2101	1884	1912	1341
3	0	2425	2425	2534	2450	2736	1905	2503	2313	2561	2514	2562	2360	2492	2304	2388	2070	2103	1897	1920	1346
3	5	2515	2515	2621	2541	2818	1993	2560	2374	2593	2548	2588	2393	2504	2322	2388	2079	2108	1908	1925	1349
3	10	2603	2603	2707	2630	2898	2077	2609	2429	2620	2576	2609	2420	2512	2336	2386	2087	2111	1916	1928	1350
3	15	2690	2690	2792	2716	2972	2157	2652	2476	2641	2599	2625	2443	2516	2346	2383	2093	2111	1922	1929	1349
3	20	2775	2775	2873	2799	3042	2232	2689	2517	2658	2617	2636	2460	2517	2353	2378	2097	2109	1924	1928	1347
3	25	2857	2857	2950	2878	3105	2302	2719	2552	2669	2630	2643	2474	2516	2358	2370	2100	2104	1925	1924	1343
3	30	2935	2935	3022	2952	3164	2365	2743	2581	2677	2638	2646	2483	2511	2359	2361	2100	2097	1924	1919	1338
3	35	3008	3008	3089	3021	3214	2423	2761	2604	2680	2642	2645	2489	2504	2359	2350	2098	2088	1920	1911	1331
3	40	3076	3076	3150	3084	3259	2475	2774	2622	2680	2643	2641	2492	2495	2356	2338	2094	2077	1914	1902	1323
3	45	3138	3138	3206	3141	3298	2521	2783	2636	2676	2640	2635	2491	2484	2350	2323	2088	2064	1907	1892	1314
3	50	3195	3195	3255	3192	3331	2561	2787	2645	2670	2634	2625	2488	2471	2343	2307	2080	2050	1898	1880	1304
3	55	3245	3245	3298	3237	3358	2596	2787	2650	2661	2626	2614	2482	2456	2333	2290	2070	2034	1887	1866	1292
4	0	3290	3290	3336	3276	3381	2625	2784	2651	2649	2615	2600	2474	2440	2322	2271	2059	2017	1875	1851	1280
4	5	3328	3328	3368	3310	3398	2649	2777	2649	2635	2602	2584	2464	2422	2309	2251	2046	1998	1861	1835	1267
4	10	3361	3361	3394	3338	3412	2668	2768	2644	2619	2587	2566	2451	2403	2295	2230	2031	1979	1846	1817	1253
4	15	3388	3388	3416	3361	3420	2682	2756	2636	2602	2570	2547	2437	2382	2279	2208	2015	1958	1830	1798	1239
4	20	3411	3411	3433	3380	3425	2692	2741	2625	2582	2551	2526	2421	2360	2261	2185	1998	1936	1813	1779	1223
4	25	3428	3428	3444	3393	3424	2699	2724	2612	2561	2531	2504	2404	2337	2242	2160	1979	1913	1794	1758	1208
4	30	3441	3441	3452	3402	3422	2701	2706	2597	2539	2510	2481	2385	2313	2222	2135	1959	1889	1775	1737	1191
4	35	3449	3449	3455	3407	3415	2700	2685	2581	2516	2487	2457	2365	2288	2201	2110	1939	1865	1754	1715	1175
4	40	3453	3453	3455	3408	3407	2696	2663	2562	2491	2463	2431	2343	2262	2179	2083	1917	1840	1734	1693	1158
4	45	3453	3453	3452	3406	3395	2689	2640	2542	2465	2438	2405	2321	2235	2156	2057	1895	1815	1712	1670	1140
4	50	3450	3450	3445	3401	3381	2680	2615	2521	2439	2412	2378	2297	2208	2133	2029	1871	1789	1690	1647	1123
4	55	3444	3444	3436	3392	3364	2668	2589	2498	2412	2385	2350	2273	2180	2108	2002	1848	1763	1667	1623	1105
5	0	3435	3435	3423	3381	3346	2654	2562	2474	2383	2358	2321	2248	2152	2083	1973	1823	1737	1644	1599	1086
5	5	3423	3423	3408	3368	3325	2637	2534	2450	2355	2330	2292	2222	2123	2057	1945	1799	1710	1621	1575	1068
5	10	3409	3409	3391	3352	3304	2619	2506	2424	2325	2301	2263	2195	2094	2031	1917	1773	1683	1597	1550	1050
5	15	3392	3392	3373	3334	3280	2600	2476	2397	2295	2272	2233	2168	2065	2005	1888	1748	1656	1573	1526	1031
5	20	3374	3373	3352	3315	3256	2578	2446	2370	2265	2242	2202	2141	2035	1978	1859	1722	1629	1549	1501	1013
5	25	3353	3353	3329	3293	3229	2556	2416	2342	2235	2212	2172	2113	2005	1951	1830	1696	1601	1524	1470	988
5	30	3331	3331	3305	3270	3203	2532	2385	2313	2204	2181	2141	2084	1975	1923	1800	1669	1567	1493	1423	947
5	35	3307	3307	3280	3246	3174	2507	2353	2284	2172	2151	2110	2056	1945	1895	1768	1639	1525	1453	1364	895
5	40	3282	3282	3254	3221	3146	2482	2321	2255	2141	2120	2078	2027	1913	1865	1732	1605	1476	1406	1303	840
5	45	3256	3256	3226	3194	3115	2455	2289	2225	2109	2088	2046	1997	1880	1835	1692	1568	1421	1355	1243	787
5	50	3229	3229	3198	3166	3085	2428	2257	2195	2077	2057	2013	1966	1845	1802	1649	1526	1365	1301	1184	738
5	55	3201	3201	3168	3138	3053	2400	2224	2164	2044	2024	1979	1935	1808	1766	1601	1480	1303	1241	1098	694
6	0	3171	3171	3138	3109	3022	2371	2191	2133	2010	1991	1944	1901	1768	1728	1549	1430	1234	1174	1021	655
6	5	3141	3141	3107	3079	2989	2341	2157	2101	1975	1956	1907	1866	1725	1687	1493	1376	1162	1105	945	613
6	10	3111	3111	3076	3048	2957	2311	2122	2068	1938	1920	1869	1830	1680	1643	1434	1318	1090	1035	869	567
6	15	3079	3079	3044	3017	2924	2281	2087	2034	1900	1882	1828	1791	1631	1596	1372	1258	1021	967	809	534
6	20	3048	3048	3011	2985	2890	2250	2050	2000	1860	1842	1785	1749	1580	1546	1309	1197	957	905	759	508
6	25	3015	3015	2978	2952	2855	2218	2012	1964	1818	1800	1740	1706	1527	1495	1248	1137	899	849	716	486
6	30	2982	2982	2944	2919	2820	2185	1973	1926	1773	1756	1693	1661	1472	1442	1188	1079	847	798	677	467
6	35	2948	2948	2909	2885	2783	2151	1933	1887	1727	1711	1645	1614	1418	1388	1131	1023	796	749	641	449
6	40	2914	2914	2874	2850	2746	2116	1891	1847	1680	1664	1595	1565	1362	1335	1072	966	718	672	609	433
6	45	2879	2879	2837	2815	2707	2081	1847	1805	1631	1615	1544	1516	1307	1280	1012	907	659	616	579	417
6	50	2843	2843	2800	2778	2668	2044	1802	1761	1581	1565	1493	1465	1251	1226	956	851	621	579	551	402
6	55	2806	2806	2762	2741	2627	2006	1756	1717	1530	1515	1440	1414	1196	1172	904	801	590	550	525	387
7	0	2768	2768	2723	2703	2586	1968	1709	1671	1478	1464	1388	1363	1143	1120	858	756	562	523	500	373
7	5	2729	2729	2684	2664	2542	1928	1661	1624	1427	1412	1336	1312	1092	1070	816	715	537	499	477	359
7	10	2690	2690	2643	2623	2499	1887	1612	1577	1375	1361	1284	1261	1043	1022	778	677	512	476	455	346
7	15	2649	2649	2600	2582	2453	1846	1563	1529	1324	1310	1234	1212	997	976	743	643	490	455	435	333
7	20	2608	2608	2557	2539	2408	1803	1514	1481	1274	1261	1185	1164	953	933	710	612	468	434	415	321
7	25	2565	2565	2514	2496	2361	1760	1465	1433	1225	1212	1138	1118	912	893	681	583	448	415	397	309
7	30	2522	2522	2469	2452	2314	1717	1416	1385	1178	1165	1092	1073	873	855	653	556	429	397	380	298
7	35	2477	2477	2424	2407	2266	1673	1368	1338	1132	1120	1049	1030	836	819	627	531	411	380	364	287
7	40	2433	2433	2378	2362	2219	1630	1321	1292	1088	1076	1007	989	802	786	603	508	394	364	349	277
7	45	2387	2387	2331	2316	2170	1586	1275	1247	1046	1034	967	950	770	754	581	486	377	349	334	267
7	50	2341	2341	2285	2269	2123	1542	1230	1203	1005	994	929	913	740	725	559	465	362	335	321	257
7	55	2295	2295	2238	2223	2076	1499	1187	1161	967	955	893	878	711	697	539	446	348	321	308	248
8	0	2249	2249	2191	2177	2029	1456	1145	1119	930	919	859	844	684	671	521	428	334	308	295	239
8	5	2202	2202	2145	2131	1982	1414	1104	1079	895	884	826	812	659	646	503	410	321	296	284	230
8	10	2156	2156	2098	2085	1937	1372	1065	1041	862	851	796	782	635	623	486	394	308	284	272	222
8	15	2110	2110	2052	2039	1891	1332	1027	1004	830	820	766	753	612	601	470	379	296	273	262	214
8	20	2064	2064	2007	1994	1848	1292	991	969	800	790	739	726	591	580	455	364	285	263	252	207
8	25	2019	2019	1962	1950	1804	1253	956	935	772	762	712	701	571	560	441	350	274	253	242	200
8	30	1975	1975	1918	1906	1763	1216	923	903	745	735	687	676	552	541	427	337	264	243	233	193
8	35	1931	1931	1875	1863	1721	1179	891	872	719	710	664	653	533	524	414	324	254	234	225	186
8	40	1888	1888	1832	1821	1680	1143	861	842	695	685	641	631	516	507	402	313	245	226	216	180
8	45	1845	1845	1790	1779	1640	1109	832	814	672	663	620	610	500	491	390	301	236	218	209	174
8	50	1803	1803	1749	1738	1602	1076	805	787	650	641	599	590	484	476	378	290	228	210	201	168
8	55	1763	1763	1709	1699	1565	1044	778	761	629	620	580	571	469	461	368	280	220	202	194	163
9	0	1723	1723	1670	1660	1529	1013	753	736	609	601	561	553	455	447	357	270	212	195	187	157
Peak	(cfs)	3453	3453	3455	3408	3425	2701	2787	2651	2680	2643	2646	2492	2517	2359	2388	2100	2111	1925	1929	1350
Peak	(hrs)	4	4	4	4	4	4	3	4	3	3	3	3	3	3	2	3	3	3	3	3
Peak	(min)	40	40	35	40	20	30	50	0	35	40	30	40	20	30	55	25	10	25	15	10
Peak	(cfs_or_ac.ft.)	0	7	0	5	735	12	0	7	0	8	0	6	0	6	0	6	0	12	0	10
Case	((),S,I,D,O)	(_)	(_)	(_)	(_)	(I)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8
Peak/Area	(cfs/ac)	n/a	0.30	0.30	0.30	0.30	0.24	0.25	0.25	0.25	0.25	0.25	0.26	0.26	0.27	0.27	0.29	0.29	0.30	0.30	0.32
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Summary	File:	P:\coweld01\future~1\Goddin~1\25_Year\udswmm\ghrd25yr.txt																			

GODDING HOLLOW BASIN, FUTURE CONDITION WITH REGIONAL DETENTION

25-YEAR

Time(Hrs)	Time(Min)	Elem308	Elem708	Elem208	Elem109	Elem709	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216	Elem117	Elem217
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	2	2	1	19	0	3	2	0	3	0	0	1	0	1	0	0
0	20	1	4	3	1	19	19	17	73	4	15	15	3	18	0	0	4	0	3	0	0
0	25	3	19	15	9	54	54	47	172	25	52	49	18	52	2	1	15	3	9	0	1
0	30	11	58	47	32	108	107	90	347	63	127	119	49	118	10	8	39	11	21	0	2
0	35	33	145	120	88	239	236	201	559	127	228	212	87	232	34	28	81	26	40	1	4
0	40	68	225	176	121	409	401	348	608	241	378	350	162	362	79	69	130	47	60	3	7
0	45	120	351	271	195	552	537	467	649	383	503	462	259	448	142	127	193	73	90	6	12
0	50	193	512	400	304	686	659	563	707	509	597	545	357	517	215	197	259	100	113	11	18
0	55	291	703	559	432	797	755	641	752	607	671	611	449	595	283	261	303	119	126	17	24
1	0	409	883	710	564	891	831	707	803	688	745	673	538	671	334	306	332	131	135	24	30
1	5	542	1069	847	690	978	899	770	868	768	826	739	620	735	367	335	351	137	140	30	35
1	10	685	1229	972	808	1068	967	836	938	846	897	800	692	789	389	353	363	139	139	31	40
1	15	829	1367	1087	919	1157	1034	904	999	914	956	851	754	833	402	364	370	138	138	34	45
1	20	962	1488	1191	1022	1229	1094	965	1045	970	1003	892	805	869	409	371	374	137	137	37	49
1	25	989	1587	1278	1111	1279	1140	1015	1076	1013	1038	923	846	897	413	374	374	136	136	41	52
1	30	1020	1662	1346	1184	1315	1172	1052	1095	1044	1061	945	878	914	412	373	371	135	134	45	56
1	35	1051	1716	1397	1240	1338	1192	1078	1106	1064	1073	957	899	921	407	369	365	132	131	49	58
1	40	1084	1750	1431	1281	1350	1202	1093	1109	1072	1075	961	911	921	398	362	356	130	128	52	60
1	45	1116	1767	1452	1310	1354	1203	1101	1106	1072	1069	958	915	914	388	353	347	127	125	55	62
1	50	1147	1772	1461	1327	1351	1197	1101	1098	1064	1057	949	911	902	376	344	337	124	123	58	64
1	55	1177	1766	1462	1335	1343	1186	1096	1084	1051	1041	936	902	887	365	334	328	122	121	60	65
2	0	1204	1752	1456	1335	1329	1170	1085	1067	1034	1022	921	890	871	354	326	320	121	121	62	66
2	5	1230	1732	1443	1329	1311	1150	1070	1046	1015	1002	903	875	854	345	319	314	121	121	64	67
2	10	1253	1707	1425	1318	1289	1126	1051	1022	994	980	885	859	836	338	313	310	121	121	65	69
2	15	1274	1676	1403	1301	1264	1100	1029	996	972	957	865	841	817	331	309	305	121	121	67	69
2	20	1292	1642	1377	1281	1240	1075	1005	972	949	933	845	823	798	325	304	300	120	120	68	70
2	25	1308	1606	1350	1260	1215	1049	981	946	926	910	825	805	781	319	299	295	120	119	69	71
2	30	1322	1571	1325	1237	1189	1022	956	919	902	887	805	788	763	313	294	290	119	118	70	71
2	35	1333	1535	1298	1213	1162	994	930	893	879	863	785	770	744	307	288	284	117	117	70	72
2	40	1341	1497	1271	1187	1135	966	904	867	855	839	765	752	725	300	282	277	116	115	71	72
2	45	1348	1459	1242	1161	1108	939	879	843	832	815	745	733	706	293	276	271	115	114	71	72
2	50	1352	1420	1214	1135	1082	913	855	819	808	791	725	714	687	286	270	265	113	112	72	72
2	55	1354	1381	1186	1110	1056	887	831	796	785	769	705	696	669	279	263	259	112	111	72	72
3	0	1355	1342	1158	1084	1031	862	808	774	763	748	686	677	650	273	257	252	110	109	72	72
3	5	1353	1307	1131	1059	1007	838	786	752	743	728	667	658	631	266	251	246	108	108	72	71
3	10	1350	1273	1104	1034	982	814	763	728	722	707	646	639	611	259	245	240	107	106	71	71
3	15	1346	1239	1077	1010	956	788	739	703	701	685	625	620	590	252	238	233	105	104	71	70
3	20	1340	1205	1050	985	930	762	716	679	678	662	604	600	569	245	232	226	103	102	71	70
3	25	1333	1172	1022	959	904	737	692	656	656	639	583	579	549	237	225	219	101	100	70	69
3	30	1324	1138	995	934	879	712	669	633	633	617	562	559	529	230	218	212	98	97	70	69
3	35	1315	1105	967	909	854	688	647	611	611	595	541	539	509	223	211	206	96	95	69	68
3	40	1304	1073	940	884	830	664	625	590	590	574	521	520	490	215	205	199	94	93	68	67
3	45	1292	1042	914	860	806	641	603	569	569	553	502	501	472	209	198	193	92	91	68	66
3	50	1280	1011	888	836	782	619	583	549	549	533	483	483	454	202	192	187	90	89	67	65
3	55	1266	981	862	812	760	597	562	529	529	513	465	465	436	195	186	181	88	87	66	64
4	0	1252	952	837	789	738	575	542	510	510	495	448	447	419	189	180	175	86	85	65	63
4	5	1237	923	813	767	716	555	523	491	491	476	430	430	402	183	174	169	84	83	64	62
4	10	1221	895	789	745	695	535	504	473	473	458	414	413	386	177	169	164	82	81	63	61
4	15	1205	868	766	724	675	515	486	455	455	441	397	397	371	171	164	159	80	79	62	60
4	20	1189	842	744	703	655	496	469	438	438	424	382	382	356	166	158	154	78	77	61	59
4	25	1171	817	722	683	635	478	451	421	421	408	367	366	341	160	153	149	76	75	60	58
4	30	1154	792	701	663	616	460	435	405	405	392	352	352	327	155	148	144	74	73	59	56
4	35	1136	768	680	644	598	443	419	390	390	377	338	338	313	150	144	139	72	71	58	55
4	40	1118	745	660	625	580	426	403	374	374	362	324	324	300	145	139	135	70	69	57	54
4	45	1100	723	641	607	563	410	388	360	360	347	311	311	287	140	135	130	68	67	56	53
4	50	1081	701	622	590	546	394	373	346	346	334	298	298	275	136	130	126	67	66	55	52
4	55	1063	680	604	572	530	379	359	332	332	320	285	285	263	132	126	122	65	64	53	51
5	0	1044	660	586	556	514	365	345	319	319	307	273	273	250	127	122	118	63	62	52	50
5	5	1025	640	568	540	499	350	332	306	306	294	261	261	238	123	118	114	62	61	51	49
5	10	1006	621	552	524	484	337	319	293	293	281	249	249	227	119	115	111	60	59	50	47
5	15	988	602	535	509	469	323	306	280	280	269	237	237	216	115	111	107	58	57	49	46
5	20	969	584	519	494	455	310	293	268	268	257	227	227	206	112	107	104	57	56	48	45
5	25	911	567	504	479	441	297	281	257	257	246	217	217	197	108	104	100	55	54	47	44
5	30	828	550	488	465	427	285	270	246	246	236	207	207	188	104	101	97	54	53	46	43
5	35	761	533	474	451	415	273	259	236	236	226	198	198	180	101	98	94	52	51	45	42
5	40	705	517	460	438	402	262	248	226	226	217	189	189	172	98	94	91	51	50	44	41
5	45	659	502	446	425	390	251	238	217	217	207	180	180	162	95	91	88	50	49	43	40
5	50	621	487	433	413	379	241	229	207	207	198	172	172	154	92	89	85	48	47	42	39
5	55	588	473	420	401	368	231	219	198	198	189	164	164	147	89	86	83	47	46	41	38
6	0	559	459	408	389	357	222	210	189	189	181	156	156	140	86	83	80	46	45	40	37
6	5	534	446	396	378	347	212	201	181	181	173	149	149	134	83	81	78	44	44	39	36
6	10	512	433	385	367	337	204	193	174	174	166	142	142	129	81	78	75	43	42	38	35
6	15	492	420	373	356	322	195	185	167	167	159	136	136	123	78	76	73	42	41	37	34
6	20	473	406	360	344	308	187	178	160	160	153	131	131	118	76	73	71	41	40	36	33
6	25	456	392	347	332	295	180	171	154	154	147	125	125	114	73	71	68	40	39	35	32
6	30	439	378	335	320	282	173	164	148	148	141	120	120	109	71	69	66	39	38	34	32
6	35	423	364	322	308	270	166	158	142	142	136	116	116	105	69	67	64	38	37	34	31
6	40	407	350	309	296	259	160	152	137	137	131	111	111	100	67	65	62	37	36	33	30
6	45	392	337	297	284	248	154	146	132	132	126	107	107	97	65	63	60	36	35	32	29
6	50	378	324	286	273	237	149	141	127	127	122	103	103	93	63	61	59	35	34	31	28
6	55	364	312	274	262	228	143	136	122	122	117	99	99	89	61	59	57	34	33	31	28
7	0	350	300	264	252	218	138	131	118	118	113	95	95	86	59	58	55	33	33	30	27
7	5	337	289	253	242	210	133	127	114	114	109	91	91	83	57	56	54	32	31	29	26
7	10	325	278	244	233	201	129	122	110	110	105	88	88	79	55	54	51	30	29	27	25
7	15	312	268	234	224	193	124	118	106	106	101	84	84	75	53	52	49	29	28	26	25
7	20	301	258	225	215	185	120	114	102	102	97	81	81	72	51	49	47	27	27	25	24
7	25	290	249	217	207	178	116	110	98	98	93	78	78	69	49	48	45	26	26	24	23
7	30	279	240	209	199	171	111	106	94	94	90	74	74	66	47	46	44	26	25	23	23
7	35	269	231	201	192	164	108	102	91	91	86	71	71	63	45	44	42	25	24	23	22
7	40	259	223	193	185	157	104	99	87	87	83	68	68	61	44	43	41	24	24	22	21
7	45	249	215	186	178	151	100	95	84	84	80	66	66	58	43	41	40	23	23	21	21
7	50	240	207	179	171	145	96	92	81	81	77	63	63	56	41	40	38	23	22	21	20
7	55	232	200	173	165	139	93	89	78	78	74	61	61	54	40	39	37	22	22	20	20
8	0	223	193	166	159	134	90	86	75	75	72	59	59	52	39	38	36	21	21	20	19
8	5	215	186	160	153	129	87	83	73	73	69	56	56	50	37	37	35	21	20	19	18
8	10	208	179	154	148	124	84	80	70	70	67	54	54	48	36	35	34	20	20	19	18
8	15	200	173	149	142	119	81	77	68	68	64	52	52	46	35	34	33	20	19	18	17
8	20	193	167	144	137	114	78	75	65	65	62	50	50	45	34	33	32	19	19	17	17
8	25	186	162	139	133	110	76	73	63	63	60	49	49	43	33	32	31	18	18	17	16
8	30	180	156	134	128	106	73	70	61	61	58	47	47	41	32	31	30	18	17	16	16
8	35	174	151	129	124	102	71	68	59	59	56	45	45	40	31	30	29	17	17	16	16
8	40	168	146	125	120	98	69	66	57	57	54	44	44	39	30	29	28	17	16	16	15
8	45	162	142	121	116	95	67	64	55	55	51	41	41	37	29	29	27	16	16	15	15
8	50	157	137	117	112	91	64	62	52	52	48	38	38	36	28	28	26	16	15	15	14
8	55	152	133	114	109	88	62	60	50	50	46	36	36	35	27	27	25	15	15	14	14
9	0	147	129	110	106	84	60	58	48	48	44	35	35	33	27	26	25	15	14	14	13
Peak	(cfs)	1355	1772	1462	1335	1354	1203	1101	1109	1072	1075	961	915	921	413	374	374	139	140	72	72
Peak	(hrs)	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
Peak	(min)	0	50	55	55	45	45	45	40	40	40	40	45	35	25	25	20	10	5	50	35
Peak	(cfs_or_ac.ft.)	81	0	0	5	0	0	4	0	4	0	0	4	0	0	2	0	3	0	2	0
Case	(().S.I.D.O)	(S)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	4197.8	4197.8	3548.8	3283.2	3283.2	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6	223.4	223.4
Peak/Area	(cfs/ac)	0.32	0.42	0.41	0.41	0.41	0.49	0.48	0.49	0.50	0.50	0.50	0.50	0.51	0.50	0.49	0.49	0.39	0.39	0.32	0.32
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Summary	File:																				

25-YEAR

Time(Hrs)	Time(Min)	Elem741	Elem341	Elem720	Elem225	Elem325	Elem237	Elem238	Elem121	Elem307	Elem331	Elem231	Elem337	Elem317	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	0	0	1	0	0	0	0	0	0	0	0	0	0	0.25
0	20	4	0	6	1	0	1	3	0	0	0	2	1	0	0.33
0	25	20	1	21	4	0	2	10	4	0	0	7	2	1	0.42
0	30	62	4	53	15	0	8	25	19	2	1	20	8	2	0.50
0	35	145	10	113	42	0	18	55	56	6	3	52	18	4	0.58
0	40	261	23	199	86	0	37	98	124	16	7	109	37	7	0.67
0	45	353	41	298	141	0	65	144	218	35	15	186	65	12	0.75
0	50	396	46	408	187	0	100	208	327	64	27	266	100	18	0.83
0	55	435	53	498	231	0	140	279	421	102	42	333	140	24	0.92
1	0	458	60	590	269	0	179	326	480	145	60	393	179	30	1.00
1	5	470	67	666	297	0	215	364	546	190	80	442	215	35	1.08
1	10	474	74	730	314	188	246	399	615	238	101	478	246	40	1.17
1	15	473	80	785	322	329	273	430	680	288	123	501	273	45	1.25
1	20	468	81	832	323	322	294	457	740	339	135	512	294	49	1.33
1	25	458	82	872	317	320	311	479	793	392	139	513	311	52	1.42
1	30	443	83	903	306	311	323	494	838	443	142	505	323	56	1.50
1	35	424	84	926	292	298	331	503	875	457	146	490	331	58	1.58
1	40	401	85	941	278	284	334	506	904	465	149	471	334	60	1.67
1	45	378	86	950	262	269	334	504	924	474	152	447	334	62	1.75
1	50	355	86	954	245	252	331	499	938	483	155	423	331	64	1.83
1	55	333	87	951	228	235	327	491	945	492	157	397	327	65	1.92
2	0	312	88	944	211	218	322	481	947	501	159	373	322	66	2.00
2	5	293	88	933	195	202	316	470	943	509	161	348	316	67	2.08
2	10	276	89	917	180	186	310	458	934	517	163	325	310	69	2.17
2	15	259	89	899	166	172	303	446	921	525	164	303	303	69	2.25
2	20	244	90	881	153	159	296	437	906	533	165	282	296	70	2.33
2	25	234	90	859	142	147	288	428	888	540	167	265	288	71	2.42
2	30	224	90	836	131	135	280	417	868	546	167	248	280	71	2.50
2	35	214	91	810	120	124	272	407	846	552	168	231	272	72	2.58
2	40	205	91	782	110	114	263	395	822	558	169	215	263	72	2.67
2	45	196	91	754	101	105	255	383	796	563	169	195	255	72	2.75
2	50	187	91	726	92	96	246	372	770	567	169	179	246	72	2.83
2	55	179	92	700	83	87	237	360	743	571	169	166	237	72	2.92
3	0	172	92	675	74	78	228	348	717	574	169	155	228	72	3.00
3	5	165	92	649	64	69	219	336	691	576	169	145	219	71	3.08
3	10	158	92	623	58	60	210	324	666	578	169	136	210	71	3.17
3	15	151	92	597	52	54	202	311	641	580	168	127	202	70	3.25
3	20	143	93	572	47	49	193	299	615	581	168	119	193	70	3.33
3	25	136	93	546	42	44	184	287	590	581	167	111	184	69	3.42
3	30	129	93	521	37	39	176	275	564	581	167	104	176	69	3.50
3	35	122	93	496	32	34	167	263	540	580	166	97	167	68	3.58
3	40	115	93	473	28	30	159	252	515	579	165	90	159	67	3.67
3	45	109	93	450	25	26	151	240	491	578	165	84	151	66	3.75
3	50	104	93	427	22	23	143	229	467	576	164	79	143	65	3.83
3	55	98	93	405	19	20	135	218	443	574	163	74	135	64	3.92
4	0	93	93	384	16	17	128	208	419	571	162	69	128	63	4.00
4	5	89	93	364	14	15	121	198	391	568	161	65	121	62	4.08
4	10	84	93	345	12	13	114	188	360	564	160	61	114	61	4.17
4	15	80	93	326	11	11	107	178	339	560	159	57	107	60	4.25
4	20	76	93	309	9	10	101	169	321	555	158	54	101	59	4.33
4	25	72	93	293	8	10	95	160	304	551	157	50	95	58	4.42
4	30	69	93	277	6	9	89	152	288	546	156	47	89	56	4.50
4	35	65	93	263	5	9	84	144	273	541	155	43	84	55	4.58
4	40	62	93	249	5	8	78	136	259	535	154	40	78	54	4.67
4	45	59	93	236	4	8	74	128	246	530	153	37	74	53	4.75
4	50	56	93	224	3	7	69	121	233	524	152	35	69	52	4.83
4	55	54	92	212	3	6	65	111	221	519	151	32	65	51	4.92
5	0	51	92	201	2	6	60	103	210	513	150	30	60	50	5.00
5	5	48	92	191	2	5	57	96	199	507	148	28	57	49	5.08
5	10	46	92	181	2	5	53	90	189	501	147	26	53	47	5.17
5	15	44	92	170	1	4	49	85	179	495	146	25	49	46	5.25
5	20	42	92	160	1	4	46	80	169	488	145	23	46	45	5.33
5	25	40	92	151	1	3	43	75	159	482	144	22	43	44	5.42
5	30	38	92	141	1	3	40	71	149	476	142	21	40	43	5.50
5	35	36	92	126	1	3	38	67	138	469	141	20	38	42	5.58
5	40	34	91	115	1	2	35	63	125	463	140	19	35	41	5.67
5	45	33	91	106	1	2	33	59	115	456	139	18	33	40	5.75
5	50	31	91	99	0	2	30	56	106	446	138	17	30	39	5.83
5	55	29	91	93	0	2	28	52	99	404	137	16	28	38	5.92
6	0	28	91	87	0	1	26	49	93	366	135	15	26	37	6.00
6	5	27	91	83	0	1	25	46	87	333	134	15	25	36	6.08
6	10	25	90	78	0	1	23	44	83	302	133	14	23	35	6.17
6	15	24	90	74	0	1	21	41	78	275	127	13	21	34	6.25
6	20	23	90	71	0	1	20	39	74	251	121	13	20	33	6.33
6	25	22	90	67	0	1	18	37	71	229	115	12	18	32	6.42
6	30	21	90	64	0	1	17	34	67	210	109	12	17	32	6.50
6	35	20	90	61	0	1	16	32	64	192	104	11	16	31	6.58
6	40	19	89	58	0	0	15	31	61	176	98	11	15	30	6.67
6	45	18	89	56	0	0	14	29	59	162	94	10	14	29	6.75
6	50	17	89	53	0	0	13	27	56	149	89	10	13	28	6.83
6	55	16	89	51	0	0	12	25	54	138	84	10	12	28	6.92
7	0	16	89	49	0	0	11	24	51	127	80	9	11	27	7.00
7	5	15	88	47	0	0	10	23	49	118	76	9	10	26	7.08
7	10	14	88	45	0	0	10	21	47	109	73	8	10	25	7.17
7	15	13	88	43	0	0	9	20	45	102	69	8	9	25	7.25
7	20	13	88	41	0	0	8	19	43	95	66	8	8	24	7.33
7	25	12	88	39	0	0	8	18	41	88	62	7	8	23	7.42
7	30	12	87	38	0	0	7	17	40	82	59	7	7	23	7.50
7	35	11	87	36	0	0	7	16	38	77	56	7	7	22	7.58
7	40	11	87	35	0	0	6	15	36	72	54	7	6	21	7.67
7	45	10	87	33	0	0	6	14	35	68	51	6	6	21	7.75
7	50	10	87	32	0	0	5	13	34	64	49	6	5	20	7.83
7	55	9	86	31	0	0	5	13	32	60	46	6	5	20	7.92
8	0	9	86	29	0	0	5	12	31	56	44	6	5	19	8.00
8	5	8	86	28	0	0	4	11	30	53	42	5	4	18	8.08
8	10	8	86	27	0	0	4	10	29	50	40	5	4	18	8.17
8	15	7	86	26	0	0	4	10	27	48	38	5	4	17	8.25
8	20	7	85	25	0	0	3	9	26	45	36	5	3	17	8.33
8	25	7	85	24	0	0	3	9	25	43	34	5	3	16	8.42
8	30	6	85	23	0	0	3	8	24	41	33	4	3	16	8.50
8	35	6	85	22	0	0	3	8	24	39	31	4	3	16	8.58
8	40	6	85	21	0	0	2	7	23	37	29	4	2	15	8.67
8	45	6	84	21	0	0	2	7	22	35	28	4	2	15	8.75
8	50	5	84	20	0	0	2	7	21	33	27	4	2	14	8.83
8	55	5	84	19	0	0	2	6	20	32	25	4	2	14	8.92
9	0	5	84	18	0	0	2	6	19	30	24	3	2	13	9.00
Peak	(cfs)	474	93	954	323	329	334	506	947	581	169	513	334	72	
Peak	(hrs)	1	3	1	1	1	1	1	2	3	2	1	1	2	
Peak	(min)	10	20	50	20	15	40	40	0	20	40	25	40	35	
Peak	(cfs_or_ac.ft.)	0	53	0	0	10	0	0	6	70	41	0	21	16	
Case	((),S,I,D,O)	(_)	(S)	(_)	(_)	(S)	(_)	(_)	(_)	(S)	(S)	(_)	(S)	(S)	
Area	(ac)	691.2	691.2	2172.2	490.9	490.9	540.8	889.6	2172.2	2172.2	814.7	814.7	540.8	223.4	
Peak/Area	(cfs/ac)	0.69	0.13	0.44	0.66	0.67	0.62	0.57	0.44	0.27	0.21	0.63	0.62	0.32	

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Summary File: P:\coweld01\future~1\Goddin~1\25_Year\udswmm\ghrd25yr.txt

GODDING HOLLOW BASIN, FUTURE CONDITION WITH REGIONAL DETENTION

50-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108
0	5	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	1	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	0	0	3	2	9	0	1	0	0	0	2	0	1	0	2	0	1	0	0	0
0	25	1	1	5	4	12	0	4	0	0	0	6	0	4	0	8	0	4	0	1	0
0	30	4	4	10	6	14	0	11	0	3	2	19	0	13	1	25	0	11	0	3	1
0	35	11	11	28	19	88	2	28	0	11	9	47	3	35	6	62	2	29	1	12	4
0	40	35	35	77	58	166	7	58	3	33	28	100	11	82	20	133	8	65	7	36	16
0	45	79	79	123	91	252	21	107	11	80	69	184	32	163	55	245	25	130	29	88	44
0	50	127	127	162	114	351	48	179	34	161	142	297	78	282	120	388	63	233	79	177	95
0	55	176	176	215	151	470	94	276	85	294	265	496	158	431	199	633	132	379	172	313	182
1	0	237	237	285	207	623	175	466	180	477	434	668	214	602	264	871	224	644	318	496	311
1	5	303	303	398	290	848	306	687	317	645	588	810	272	775	351	1065	312	941	517	728	479
1	10	364	364	542	408	1103	467	824	393	775	705	946	353	950	462	1266	442	1245	747	976	658
1	15	463	463	711	558	1295	565	937	462	914	840	1083	456	1129	594	1468	603	1410	856	1157	765
1	20	601	601	889	721	1423	599	1047	544	1060	983	1223	579	1311	745	1660	777	1574	983	1306	853
1	25	766	766	1065	886	1558	640	1158	640	1211	1130	1368	722	1495	911	1840	958	1727	1112	1394	929
1	30	946	946	1239	1053	1702	690	1273	750	1365	1282	1517	880	1677	1087	2007	1140	1857	1230	1476	997
1	35	1129	1129	1404	1214	1780	748	1393	873	1523	1437	1668	1049	1854	1267	2155	1314	1966	1338	1555	1061
1	40	1305	1305	1551	1360	1868	816	1518	1007	1682	1594	1821	1227	2021	1445	2283	1477	2056	1437	1630	1122
1	45	1469	1469	1687	1497	1966	894	1647	1152	1841	1751	1972	1407	2176	1617	2391	1624	2132	1528	1704	1180
1	50	1619	1619	1815	1628	2073	982	1780	1304	1998	1907	2120	1587	2317	1779	2481	1756	2198	1613	1774	1236
1	55	1759	1759	1939	1757	2189	1078	1918	1462	2151	2059	2262	1761	2442	1929	2556	1873	2255	1693	1842	1288
2	0	1892	1892	2061	1883	2296	1184	2057	1622	2297	2206	2396	1926	2552	2064	2616	1975	2305	1768	1906	1338
2	5	2019	2019	2177	2005	2393	1297	2196	1782	2435	2344	2519	2080	2646	2184	2666	2065	2350	1839	1966	1384
2	10	2140	2140	2289	2123	2499	1418	2333	1940	2563	2473	2632	2221	2726	2291	2707	2143	2390	1905	2022	1426
2	15	2257	2257	2399	2239	2608	1544	2465	2093	2679	2590	2731	2348	2793	2383	2741	2211	2425	1966	2073	1464
2	20	2371	2371	2509	2356	2723	1674	2591	2239	2781	2694	2817	2461	2847	2463	2767	2271	2455	2022	2119	1498
2	25	2484	2484	2620	2474	2838	1806	2707	2375	2870	2785	2890	2559	2891	2531	2787	2323	2481	2073	2159	1528
2	30	2598	2598	2732	2592	2956	1939	2813	2501	2946	2862	2951	2644	2925	2588	2802	2367	2502	2119	2195	1554
2	35	2711	2711	2844	2711	3067	2069	2907	2614	3009	2927	2999	2716	2949	2636	2811	2405	2519	2159	2225	1576
2	40	2824	2824	2955	2828	3178	2196	2989	2715	3059	2979	3037	2776	2968	2677	2829	2437	2530	2194	2251	1593
2	45	2935	2935	3063	2944	3279	2318	3059	2803	3098	3021	3066	2825	2982	2712	2843	2462	2538	2224	2271	1607
2	50	3045	3045	3169	3055	3378	2433	3118	2879	3131	3055	3096	2865	2992	2742	2850	2483	2541	2248	2287	1617
2	55	3151	3151	3269	3162	3465	2541	3167	2944	3158	3086	3120	2897	2997	2766	2854	2498	2540	2268	2298	1623
3	0	3253	3253	3365	3264	3547	2640	3208	3000	3180	3111	3138	2922	2999	2785	2853	2509	2536	2283	2305	1627
3	5	3350	3350	3455	3360	3629	2730	3242	3046	3191	3130	3150	2942	3000	2800	2848	2515	2529	2294	2309	1628
3	10	3443	3443	3542	3452	3705	2812	3274	3083	3198	3144	3157	2956	3002	2810	2839	2518	2519	2301	2309	1626
3	15	3530	3530	3622	3537	3770	2887	3299	3112	3203	3153	3162	2968	3001	2815	2828	2517	2509	2304	2306	1621
3	20	3611	3611	3697	3617	3831	2954	3316	3135	3205	3158	3162	2975	2995	2816	2815	2514	2503	2304	2301	1615
3	25	3687	3687	3766	3689	3880	3012	3328	3152	3203	3160	3159	2979	2987	2814	2800	2510	2494	2300	2292	1606
3	30	3757	3757	3829	3754	3925	3063	3335	3165	3199	3157	3152	2980	2975	2809	2784	2504	2482	2294	2282	1596
3	35	3820	3820	3885	3812	3960	3107	3338	3172	3192	3151	3142	2977	2961	2802	2767	2496	2467	2286	2269	1585
3	40	3877	3877	3933	3862	3991	3144	3336	3176	3182	3142	3129	2971	2944	2792	2747	2486	2450	2275	2254	1571
3	45	3926	3926	3974	3905	4012	3175	3331	3176	3169	3130	3114	2962	2926	2780	2726	2474	2431	2262	2237	1557
3	50	3967	3967	4008	3941	4031	3200	3322	3172	3153	3115	3096	2950	2905	2765	2703	2460	2410	2246	2218	1541
3	55	4002	4002	4035	3970	4040	3218	3310	3165	3135	3098	3075	2936	2883	2749	2679	2444	2388	2229	2198	1524
4	0	4030	4030	4056	3993	4048	3232	3295	3155	3114	3078	3053	2920	2859	2731	2653	2426	2363	2210	2176	1506
4	5	4052	4052	4072	4010	4049	3241	3277	3142	3092	3057	3029	2901	2833	2710	2626	2406	2338	2190	2153	1487
4	10	4068	4068	4082	4022	4048	3245	3257	3126	3067	3033	3003	2881	2806	2689	2597	2384	2311	2168	2129	1467
4	15	4079	4079	4087	4029	4041	3245	3235	3108	3041	3008	2976	2859	2778	2665	2567	2361	2283	2145	2103	1447
4	20	4084	4084	4088	4031	4032	3242	3210	3088	3013	2981	2947	2835	2748	2640	2537	2337	2254	2121	2077	1426
4	25	4085	4085	4084	4029	4017	3234	3184	3066	2984	2952	2916	2810	2717	2614	2505	2311	2224	2096	2050	1404
4	30	4082	4082	4076	4023	4002	3224	3156	3042	2953	2922	2885	2783	2685	2587	2473	2284	2193	2069	2021	1382
4	35	4075	4075	4065	4013	3982	3210	3126	3016	2922	2891	2852	2755	2652	2558	2439	2256	2162	2042	1993	1360
4	40	4064	4064	4051	4000	3962	3194	3095	2988	2889	2859	2818	2725	2618	2529	2405	2227	2130	2014	1964	1338
4	45	4050	4050	4033	3985	3937	3175	3063	2960	2855	2826	2784	2695	2584	2498	2371	2198	2097	1986	1934	1315
4	50	4033	4033	4013	3966	3912	3154	3029	2930	2820	2792	2749	2663	2549	2467	2338	2168	2065	1957	1904	1292
4	55	4013	4013	3991	3945	3883	3131	2994	2898	2784	2757	2713	2631	2513	2435	2301	2137	2032	1928	1874	1269
5	0	3991	3991	3966	3921	3854	3106	2959	2866	2748	2721	2676	2598	2477	2402	2266	2105	1998	1899	1844	1246
5	5	3966	3966	3939	3896	3822	3080	2922	2833	2711	2685	2639	2564	2441	2369	2231	2074	1965	1869	1814	1223
5	10	3940	3940	3911	3869	3792	3052	2885	2799	2674	2648	2601	2530	2404	2336	2195	2042	1932	1839	1783	1200
5	15	3912	3912	3881	3840	3757	3022	2847	2764	2636	2611	2563	2495	2367	2302	2159	2010	1899	1809	1753	1177
5	20	3882	3882	3849	3809	3724	2991	2809	2728	2598	2573	2525	2460	2330	2268	2124	1977	1866	1779	1722	1154
5	25	3850	3850	3816	3778	3687	2959	2770	2692	2560	2536	2487	2425	2293	2234	2089	1945	1832	1749	1692	1131
5	30	3818	3818	3782	3745	3652	2926	2731	2656	2521	2498	2448	2389	2257	2200	2053	1912	1800	1719	1662	1108
5	35	3784	3784	3747	3710	3613	2892	2691	2619	2482	2459	2410	2353	2220	2165	2018	1880	1767	1689	1632	1086
5	40	3749	3749	3710	3675	3577	2857	2652	2581	2443	2421	2371	2317	2183	2131	1983	1848	1734	1659	1602	1064
5	45	3713	3713	3673	3639	3537	2822	2612	2544	2405	2383	2333	2281	2146	2096	1949	1815	1702	1630	1572	1042
5	50	3676	3676	3636	3603	3499	2786	2572	2506	2366	2345	2295	2245	2110	2062	1914	1783	1670	1600	1542	1020
5	55	3638	3638	3597	3565	3458	2749	2532	2469	2327	2307	2257	2209	2074	2028	1880	1751	1636	1569	1504	989
6	0	3600	3600	3558	3527	3419	2712	2492	2431	2289	2269	2219	2173	2037	1994	1845	1718	1596	1531	1447	941
6	5	3561	3561	3519	3488	3378	2675	2452	2393	2251	2231	2181	2137	2001	1959	1807	1682	1547	1484	1380	881
6	10	3522	3522	3479	3449	3339	2638	2412	2355	2213	2193	2143	2101	1964	1924	1765	1642	1490	1430	1311	820
6	15	3483	3483	3439	3410	3297	2600	2373	2318	2174	2155	2105	2065	1925	1887	1720	1598	1429	1370	1245	762
6	20	3443	3443	3399	3371	3258	2562	2333	2280	2136	2117	2066	2028	1884	1848	1670	1550	1367	1311	1184	709
6	25	3403	3403	3358	3331	3216	2524	2294	2242	2097	2079	2027	1990	1842	1807	1617	1499	1307	1252	1129	662
6	30	3362	3362	3317	3291	3177	2486	2254	2204	2058	2040	1986	1951	1797	1764	1564	1447	1248	1196	1073	613
6	35	3322	3322	3277	3251	3135	2448	2214	2166	2017	2000	1944	1911	1750	1718	1509	1394	1190	1140	1011	559
6	40	3281	3281	3236	3211	3096	2410	2174	2127	1975	1958	1901	1869	1702	1671	1453	1339	1129	1081	939	521
6	45	3241	3241	3195	3171	3054	2372	2133	2088	1932	1916	1856	1826	1652	1623	1396	1284	1065	1018	867	492
6	50	3200	3200	3154	3131	3014	2333	2091	2048	1888	1872	1810	1781	1601	1573	1338	1227	1001	955	805	469
6	55	3159	3159	3113	3091	2971	2294	2048	2007	1843	1827	1763	1735	1548	1522	1279	1169	939	896	752	450
7	0	3118	3118	3072	3050	2931	2255	2005	1965	1796	1781	1715	1688	1495	1470	1221	1112	882	840	705	433
7	5	3077	3077	3030	3009	2888	2215	1961	1922	1748	1733	1665	1640	1441	1417	1164	1055	829	788	663	418
7	10	3036	3036	2989	2968	2847	2174	1916	1878	1699	1685	1615	1591	1387	1364	1108	1000	775	736	626	404
7	15	2994	2994	2947	2926	2802	2134	1870	1833	1650	1635	1564	1541	1333	1311	1049	942	683	645	592	392
7	20	2952	2952	2904	2885	2760	2092	1823	1787	1599	1585	1513	1490	1278	1257	988	883	633	596	562	380
7	25	2910	2910	2861	2842	2714	2050	1775	1741	1548	1535	1461	1439	1222	1202	932	827	597	562	535	370
7	30	2867	2867	2818	2799	2671	2007	1727	1694	1497	1484	1408	1388	1168	1149	881	777	568	534	510	360
7	35	2824	2824	2774	2756	2624	1964	1678	1646	1445	1432	1356	1336	1115	1097	836	733	542	509	487	350
7	40	2781	2781	2730	2712	2580	1921	1628	1598	1394	1381	1304	1285	1065	1047	795	693	518	486	466	341
7	45	2737	2737	2685	2668	2533	1876	1579	1549	1342	1330	1253	1235	1017	1000	758	657	496	465	446	332
7	50	2692	2692	2640	2623	2487	1832	1529	1500	1292	1280	1203	1186	971	955	724	624	475	446	428	323
7	55	2648	2648	2594	2578	2439	1787	1480	1452	1242	1230	1155	1139	928	913	694	594	456	427	410	314
8	0	2602	2602	2548	2533	2393	1741	1430	1404	1194	1182	1108	1093	888	874	666	566	437	410	393	305
8	5	2557	2557	2502	2487	2344	1696	1382	1356	1147	1136	1064	1049	851	837	639	541	419	393	377	295
8	10	2511	2511	2455	2441	2298	1651	1334	1309	1102	1091	1021	1007	816	802	615	517	403	377	361	286
8	15	2464	2464	2408	2394	2248	1606	1287	1263	1059	1048	980	967	783	770	592	495	386	362	347	277
8	20	2418	2418	2361	2348	2203	1561	1242	1219	1018	1007	942	929	752	740	571	474	371	347	332	268
8	25	2371	2371	2314	2301	2154	1516	1198	1175	979	968	905	893	723	711	551	455	356	333	319	259
8	30	2325	2325	2268	2255	2109	1473	1155	1133	941	931	870	858	695	684	532	436	341	319	306	250
8	35	2278	2278	2221	2209	2061	1429	1114	1093	906	896	837	826	670	659	514	419	328	306	293	241
8	40	2232	2232	2175	2163	2017	1387	1074	1054	872	862	806	795	645	635	497	402	314	294	281	232
8	45	2186	2186	2129	2117	1971	1345	1036	1018	840	830	776	766	623	613	481	386	302	282	270	224
8	50	2141	2141	2084	2073	1929	1305	999	980	809	800	748	738	601	592	465	371	290	271	259	216
8	55	2096	2096	2039	2028	1885	1265	964	946	780	771	721	712	580	572	450	357	279	260	249	208
9	0	2051	2051	1996	1985	1845	1227	930	913	753	744	696	687	561	552	436	343	268	250	239	201
Peak	(cfs)	4085	4085	4088	4031	4049	3245	3338	3176	3205	3160	3162	2980	3002	2816	2854	2518	2541	2304	2309	1628
Peak	(hrs)	4	4	4	4	4	4	3	3	3	3	3	3	3	3	2	3	2	3	3	3
Peak	(min)	25	25	20	20	5	10	35	40	20	25	15	30	10	20	55	10	50	15	5	5
Peak	(cfs_or_ac.ft.)	0	7	0	5	812	12	0	7	0	8	0	6	0	7	0	7	0	12	0	10
Case	((),S,I,D,O)	( )	( )	( )	( )	(I)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8
Peak/Area	(cfs/ac)	n/a	0.35	0.35	0.36	0.36	0.29	0.29	0.30	0.30	0.30	0.30	0.31	0.31	0.32	0.32	0.34	0.35	0.36	0.36	0.39

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Summary File: P:\coweld01\future~1\Goddin~1\50_Year\udswmm\ghrd50yr.txt

GODDING HOLLOW BASIN, FUTURE CONDITION WITH REGIONAL DETENTION

50-YEAR

Time(Hrs)	Time(Min)	Elem308	Elem708	Elem208	Elem109	Elem709	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216	Elem117	Elem217
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	1	0	0	3	3	3	24	0	4	4	0	4	0	0	1	0	1	0	0
0	20	1	5	4	2	25	24	22	85	6	19	18	4	22	1	0	6	1	4	0	0
0	25	4	23	19	11	59	59	50	197	31	61	57	22	60	3	2	18	4	11	0	1
0	30	14	69	56	38	127	128	107	407	70	144	135	54	136	13	10	45	13	24	0	2
0	35	38	162	133	95	295	292	252	684	153	281	263	102	281	42	35	94	31	47	2	5
0	40	79	268	210	145	520	511	447	776	305	476	443	200	448	101	89	167	62	83	4	9
0	45	145	449	353	257	734	714	608	829	494	644	596	332	579	198	180	281	104	128	8	16
0	50	247	709	570	418	915	879	737	924	669	786	725	476	709	319	291	370	144	158	15	24
0	55	389	993	793	604	1075	1019	854	1021	823	928	838	620	829	413	376	419	157	176	24	33
1	0	566	1284	1007	793	1222	1141	964	1117	964	1052	937	754	929	473	429	458	171	185	30	41
1	5	764	1531	1203	976	1358	1250	1069	1210	1084	1155	1022	870	1017	514	465	483	180	185	33	48
1	10	962	1743	1380	1146	1482	1348	1166	1293	1183	1241	1096	969	1087	539	487	497	183	184	38	55
1	15	1003	1921	1532	1297	1572	1433	1254	1361	1267	1315	1163	1049	1141	553	499	505	183	183	44	60
1	20	1050	2063	1655	1423	1645	1501	1327	1413	1334	1369	1213	1112	1181	559	505	506	182	181	50	66
1	25	1101	2171	1752	1526	1700	1550	1384	1446	1382	1405	1247	1159	1209	558	504	502	180	178	56	70
1	30	1154	2247	1823	1606	1735	1580	1423	1462	1411	1424	1266	1191	1221	551	498	493	177	174	62	73
1	35	1207	2295	1870	1664	1753	1593	1446	1466	1424	1427	1273	1208	1222	539	488	481	174	169	66	76
1	40	1259	2318	1897	1703	1757	1593	1455	1459	1423	1418	1268	1213	1211	524	475	465	169	164	71	78
1	45	1310	2320	1907	1724	1750	1581	1453	1444	1410	1398	1254	1207	1192	505	459	449	164	159	74	80
1	50	1357	2306	1902	1732	1733	1560	1441	1421	1387	1371	1232	1191	1167	486	443	432	160	154	77	81
1	55	1402	2280	1887	1727	1708	1532	1421	1391	1358	1339	1205	1169	1137	466	426	415	155	150	79	82
2	0	1443	2244	1862	1712	1678	1498	1395	1358	1325	1302	1174	1142	1105	447	410	399	151	146	80	83
2	5	1480	2200	1831	1690	1642	1460	1363	1319	1288	1263	1141	1111	1070	428	395	384	147	143	82	84
2	10	1513	2150	1793	1661	1601	1416	1327	1275	1248	1222	1104	1078	1033	411	380	370	144	142	83	85
2	15	1542	2094	1750	1626	1556	1370	1286	1230	1206	1179	1066	1042	995	395	366	356	141	141	84	85
2	20	1567	2034	1703	1587	1509	1321	1243	1184	1163	1135	1028	1006	959	381	354	347	140	139	84	86
2	25	1588	1970	1652	1544	1460	1270	1198	1136	1120	1092	989	970	924	369	345	339	139	138	85	86
2	30	1604	1904	1599	1499	1413	1221	1152	1090	1077	1049	952	936	890	358	336	330	137	136	85	86
2	35	1617	1838	1547	1454	1367	1175	1107	1047	1035	1008	917	902	859	347	327	321	135	134	86	86
2	40	1626	1775	1498	1409	1322	1130	1065	1007	996	970	884	871	830	338	318	312	133	132	86	86
2	45	1632	1715	1451	1365	1281	1087	1025	970	959	935	853	842	803	328	310	304	131	130	86	86
2	50	1634	1657	1406	1323	1241	1047	987	935	924	901	825	814	777	319	301	295	129	128	86	85
2	55	1634	1602	1364	1283	1204	1010	952	903	892	870	798	788	752	310	293	287	127	126	85	85
3	0	1631	1549	1323	1244	1169	975	918	872	861	840	772	763	728	302	285	279	125	124	85	84
3	5	1626	1499	1284	1208	1135	941	886	840	831	810	746	738	703	293	278	272	123	122	84	83
3	10	1619	1450	1246	1173	1101	908	855	808	803	784	721	714	679	285	270	264	121	120	84	83
3	15	1610	1407	1209	1138	1068	875	824	778	776	756	695	689	653	277	262	256	118	117	83	82
3	20	1599	1365	1173	1105	1035	842	794	749	748	729	669	664	628	268	254	248	116	115	83	81
3	25	1587	1323	1138	1072	1004	812	765	721	721	702	643	640	604	259	246	240	113	112	82	80
3	30	1573	1277	1103	1040	973	782	737	695	695	675	618	615	580	251	238	232	111	110	81	79
3	35	1558	1234	1070	1009	943	753	710	669	669	650	594	592	557	243	230	224	108	107	80	78
3	40	1542	1192	1038	979	915	725	684	643	643	625	571	569	535	234	223	217	106	105	79	77
3	45	1524	1153	1006	949	887	698	659	619	619	601	548	547	514	227	216	210	103	102	78	76
3	50	1506	1116	976	921	860	672	634	596	596	578	527	526	493	219	208	203	101	100	77	74
3	55	1486	1080	946	894	834	647	611	573	573	556	506	505	473	212	202	196	98	97	76	73
4	0	1466	1045	917	867	809	623	588	551	551	534	486	485	454	205	195	190	96	95	74	72
4	5	1445	1011	890	841	784	599	566	530	530	514	466	466	435	198	189	183	94	92	73	71
4	10	1424	979	863	816	760	576	545	510	510	494	447	447	417	191	183	177	91	90	72	69
4	15	1402	948	837	792	737	554	524	490	490	474	429	429	400	185	177	172	89	88	71	68
4	20	1380	918	811	768	715	533	504	471	471	455	411	411	383	179	171	166	87	86	69	67
4	25	1357	889	787	746	693	513	485	452	452	437	395	394	367	173	165	160	85	83	68	65
4	30	1334	861	763	723	672	493	467	434	434	420	378	378	351	167	160	155	82	81	67	64
4	35	1311	835	740	702	652	474	449	417	417	403	363	363	336	162	155	150	80	79	65	63
4	40	1288	809	718	681	632	456	431	401	401	387	348	348	322	156	150	145	78	77	64	61
4	45	1264	784	697	661	614	438	415	385	385	372	333	333	308	151	145	141	76	75	63	60
4	50	1241	760	676	642	595	421	399	370	370	357	319	319	295	146	140	136	74	73	61	59
4	55	1217	737	656	623	577	405	383	355	355	342	306	306	282	142	136	132	72	71	60	57
5	0	1194	714	636	605	560	389	368	340	340	328	293	293	269	137	131	127	70	69	59	56
5	5	1171	693	617	587	544	374	354	327	327	314	280	280	256	132	127	123	68	67	58	55
5	10	1147	672	599	570	527	359	340	313	313	301	267	267	244	128	123	119	67	65	56	53
5	15	1124	652	581	553	512	344	326	300	300	288	255	255	232	124	119	115	65	64	55	52
5	20	1101	633	564	537	496	330	313	287	287	275	243	243	221	120	115	112	63	62	54	51
5	25	1079	614	547	521	481	316	300	274	274	263	232	232	211	116	112	108	61	60	53	50
5	30	1056	595	531	506	467	303	288	262	262	252	221	221	202	112	108	105	60	59	51	48
5	35	1034	578	515	491	453	291	276	251	251	241	212	212	192	109	105	101	58	57	50	47
5	40	1012	560	500	477	439	279	264	241	241	231	202	202	184	105	101	98	56	55	49	46
5	45	990	544	485	463	426	267	254	231	231	221	193	193	176	102	98	95	55	54	48	45
5	50	968	528	471	450	414	256	243	221	221	212	184	184	166	99	95	92	53	52	47	44
5	55	895	513	457	437	402	246	233	211	211	202	175	175	157	95	92	89	52	51	45	42
6	0	803	498	444	424	391	236	224	202	202	193	167	167	150	92	89	86	50	50	44	41
6	5	730	484	431	412	380	226	214	193	193	184	159	159	143	89	86	83	49	48	43	40
6	10	670	470	419	401	369	216	205	185	185	177	152	152	137	87	84	81	48	47	42	39
6	15	622	457	407	390	358	207	197	177	177	169	146	146	132	84	81	78	46	46	41	38
6	20	581	444	396	379	349	199	189	170	170	163	139	139	126	81	79	76	45	44	40	37
6	25	547	431	385	369	339	191	181	163	163	156	134	134	121	79	76	73	44	43	39	36
6	30	519	420	374	359	331	183	174	157	157	150	128	128	116	76	74	71	43	42	38	35
6	35	494	408	364	349	322	176	167	151	151	144	123	123	111	74	72	69	41	41	37	34
6	40	473	398	355	340	314	170	161	145	145	139	118	118	107	72	69	67	40	40	36	33
6	45	454	387	346	332	306	163	155	140	140	134	113	113	103	69	67	65	39	39	35	32
6	50	437	377	337	324	299	157	149	135	135	129	109	109	99	67	65	63	38	37	35	32
6	55	422	368	328	316	292	151	144	130	130	124	105	105	95	65	63	61	37	36	34	31
7	0	408	359	320	308	285	146	139	125	125	120	101	101	91	63	61	59	36	36	33	30
7	5	395	350	313	301	279	141	134	120	120	115	97	97	88	61	60	57	35	35	32	29
7	10	384	342	305	294	273	136	129	116	116	111	93	93	84	59	58	56	34	34	31	28
7	15	373	334	298	287	267	131	125	112	112	107	90	90	81	58	56	54	34	33	31	27
7	20	363	326	291	281	261	126	120	108	108	103	87	87	78	56	55	53	33	32	30	27
7	25	353	318	285	275	255	122	116	104	104	100	83	83	75	54	53	51	32	31	29	26
7	30	344	311	278	268	245	118	112	101	101	96	80	80	72	52	51	48	30	28	26	25
7	35	335	302	270	261	235	114	109	97	97	93	77	77	69	50	49	46	28	27	25	24
7	40	326	292	262	253	224	110	105	94	94	89	74	74	66	48	47	44	27	26	24	24
7	45	317	283	253	244	215	106	101	90	90	86	71	71	63	46	45	43	26	25	24	23
7	50	308	273	244	235	205	103	98	87	87	82	68	68	60	44	43	41	25	25	23	22
7	55	298	263	235	227	196	99	95	84	84	79	65	65	58	43	42	40	24	24	22	22
8	0	289	253	226	218	188	96	91	80	80	76	63	63	56	42	41	39	24	23	22	21
8	5	280	244	217	210	180	92	88	77	77	74	60	60	53	40	39	37	23	22	21	21
8	10	270	235	209	202	172	89	85	75	75	71	58	58	51	39	38	36	22	22	21	20
8	15	261	226	201	194	165	86	82	72	72	68	56	56	50	38	37	35	22	21	20	19
8	20	252	218	193	186	158	83	80	69	69	66	54	54	48	37	36	34	21	20	19	19
8	25	243	209	185	179	151	80	77	67	67	64	52	52	46	35	35	33	20	20	19	18
8	30	234	202	178	172	145	78	74	65	65	62	50	50	44	34	34	32	20	19	18	18
8	35	225	194	171	165	139	75	72	63	63	59	48	48	43	33	33	31	19	19	18	17
8	40	217	187	165	159	133	73	70	61	61	57	47	47	41	32	32	30	19	18	17	17
8	45	209	180	159	153	127	70	67	58	58	56	45	45	40	31	31	29	18	18	17	16
8	50	202	174	153	147	122	68	65	57	57	54	43	43	38	30	30	28	17	17	16	16
8	55	194	167	147	142	117	66	63	54	54	50	40	40	37	29	29	27	17	17	16	15
9	0	187	161	142	137	113	64	61	52	52	48	38	38	36	29	28	27	16	16	15	15
Peak	(cfs)	1634	2320	1907	1732	1757	1593	1455	1466	1424	1427	1273	1213	1222	559	505	506	183	185	86	86
Peak	(hrs)	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
Peak	(min)	50	45	45	50	40	35	40	35	35	35	35	40	35	20	20	20	10	0	35	20
Peak	(cfs_or_ac.ft.)	120	0	0	5	0	0	4	0	4	0	0	4	0	0	3	0	3	0	2	0
Case	((),S,I,D,O)	(S)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	4197.8	4197.8	3548.8	3283.2	3283.2	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6	223.4	223.4
Peak/Area	(cfs/ac)	0.39	0.55	0.54	0.53	0.54	0.65	0.64	0.64	0.67	0.67	0.66	0.67	0.67	0.67	0.66	0.66	0.52	0.52	0.38	0.38
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Summary	File:																				

50-YEAR

Time(Hrs)	Time(Min)	Elem741	Elem341	Elem720	Elem225	Elem325	Elem237	Elem236	Elem121	Elem307	Elem331	Elem231	Elem337	Elem317	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	1	0	1	0	0	0	1	0	0	0	0	0	0	0.25
0	20	6	0	7	1	0	1	3	1	0	0	3	1	0	0.33
0	25	25	1	24	5	0	3	11	6	0	0	9	3	1	0.42
0	30	73	4	61	19	0	9	29	24	2	1	24	9	2	0.50
0	35	177	13	132	54	0	21	65	68	8	4	64	21	5	0.58
0	40	326	28	238	121	0	44	117	150	20	9	138	44	9	0.67
0	45	448	43	399	190	0	80	194	282	44	19	252	80	16	0.75
0	50	543	51	556	259	0	129	300	429	82	35	353	129	24	0.83
0	55	596	60	717	328	0	184	385	525	130	56	451	184	33	0.92
1	0	628	70	848	381	0	238	445	640	186	80	540	238	41	1.00
1	5	646	80	952	419	331	287	498	760	249	108	612	287	48	1.08
1	10	651	82	1040	441	438	330	545	873	318	134	662	330	55	1.17
1	15	645	83	1115	449	445	365	586	974	392	139	692	365	60	1.25
1	20	631	84	1179	446	447	392	619	1061	453	144	704	392	66	1.33
1	25	609	86	1232	434	439	413	644	1135	465	150	700	413	70	1.42
1	30	581	87	1273	416	424	426	659	1196	479	155	684	426	73	1.50
1	35	549	88	1302	393	403	433	666	1244	493	160	659	433	76	1.58
1	40	514	89	1320	368	379	435	664	1280	508	165	627	435	78	1.67
1	45	480	90	1328	343	353	432	657	1303	523	169	591	432	80	1.75
1	50	446	91	1325	319	329	425	645	1316	539	173	555	425	81	1.83
1	55	414	92	1313	296	306	414	629	1317	554	176	518	414	82	1.92
2	0	385	93	1292	272	282	403	610	1309	568	179	482	403	83	2.00
2	5	358	94	1264	250	260	391	590	1293	582	182	448	391	84	2.08
2	10	334	94	1229	229	238	379	569	1268	596	185	415	379	85	2.17
2	15	310	95	1188	209	217	366	547	1237	609	187	385	366	85	2.25
2	20	288	96	1142	190	198	354	525	1199	620	188	356	354	86	2.33
2	25	267	96	1096	173	180	342	504	1157	631	190	328	342	86	2.42
2	30	247	96	1052	158	165	330	486	1114	641	191	302	330	86	2.50
2	35	232	97	1006	145	151	318	470	1070	650	192	281	318	86	2.58
2	40	220	97	960	133	138	305	454	1026	657	193	261	305	86	2.67
2	45	210	97	915	121	126	293	437	981	664	193	243	293	86	2.75
2	50	200	98	871	111	115	281	421	937	670	194	225	281	85	2.83
2	55	191	98	829	101	105	269	406	894	675	194	208	269	85	2.92
3	0	183	98	788	92	95	258	390	852	678	194	186	258	84	3.00
3	5	175	98	751	83	87	246	375	812	681	194	171	246	83	3.08
3	10	168	99	717	74	78	235	360	775	684	194	158	235	83	3.17
3	15	160	99	683	63	67	225	345	740	685	193	147	225	82	3.25
3	20	152	99	650	56	59	214	330	705	686	193	137	214	81	3.33
3	25	144	99	618	50	52	204	316	672	686	192	128	204	80	3.42
3	30	137	99	587	44	46	193	302	641	685	191	119	193	79	3.50
3	35	129	99	558	39	41	184	288	610	684	191	111	184	78	3.58
3	40	123	99	529	34	36	174	274	580	682	190	103	174	77	3.67
3	45	116	99	502	29	31	165	261	551	680	189	96	165	76	3.75
3	50	110	99	476	26	27	155	249	523	677	188	90	155	74	3.83
3	55	105	99	451	22	24	147	236	496	674	187	84	147	73	3.92
4	0	99	99	427	19	20	138	224	470	670	186	78	138	72	4.00
4	5	94	99	404	16	18	130	213	444	666	185	73	130	71	4.08
4	10	90	99	381	14	15	123	202	418	662	184	68	123	69	4.17
4	15	85	99	360	12	13	115	192	388	657	183	64	115	68	4.25
4	20	81	99	341	10	11	108	182	356	651	182	60	108	67	4.33
4	25	77	99	322	9	10	102	172	335	645	180	56	102	65	4.42
4	30	73	99	304	7	10	96	163	317	639	179	52	96	64	4.50
4	35	70	99	287	6	9	90	154	299	633	178	48	90	63	4.58
4	40	66	99	272	5	9	84	145	283	626	177	44	84	61	4.67
4	45	63	99	257	4	8	79	137	268	619	175	41	79	60	4.75
4	50	60	99	243	4	7	74	129	253	612	174	38	74	59	4.83
4	55	57	99	230	3	7	69	122	240	605	173	35	69	57	4.92
5	0	54	99	218	3	6	64	111	228	598	171	32	64	56	5.00
5	5	51	99	207	2	6	60	103	216	591	170	30	60	55	5.08
5	10	49	98	196	2	5	56	96	205	584	169	28	56	53	5.17
5	15	47	98	186	2	5	52	90	194	576	167	26	52	52	5.25
5	20	44	98	175	1	4	49	85	183	569	166	24	49	51	5.33
5	25	42	98	165	1	4	46	80	173	561	165	23	46	50	5.42
5	30	40	98	155	1	3	43	75	163	553	163	22	43	48	5.50
5	35	38	98	146	1	3	40	70	154	546	162	21	40	47	5.58
5	40	36	98	132	1	3	37	66	143	538	161	19	37	46	5.67
5	45	35	97	119	1	2	35	62	130	530	159	19	35	45	5.75
5	50	33	97	109	1	2	32	59	119	522	158	18	32	44	5.83
5	55	31	97	101	0	2	30	55	109	515	156	17	30	42	5.92
6	0	30	97	95	0	2	28	52	101	507	155	16	28	41	6.00
6	5	28	97	89	0	1	26	49	95	499	154	15	26	40	6.08
6	10	27	97	84	0	1	24	46	89	491	152	15	24	39	6.17
6	15	26	96	79	0	1	22	43	84	483	151	14	22	38	6.25
6	20	24	96	75	0	1	21	41	80	475	150	13	21	37	6.33
6	25	23	96	72	0	1	19	39	76	468	148	13	19	36	6.42
6	30	22	96	68	0	1	18	36	72	460	147	12	18	35	6.50
6	35	21	96	65	0	1	17	34	68	452	146	12	17	34	6.58
6	40	20	95	62	0	1	16	32	65	418	145	11	16	33	6.67
6	45	19	95	59	0	0	15	30	62	375	143	11	15	32	6.75
6	50	18	95	56	0	0	13	28	59	336	142	10	13	32	6.83
6	55	17	95	54	0	0	13	27	57	302	141	10	13	31	6.92
7	0	17	95	52	0	0	12	25	54	272	139	10	12	30	7.00
7	5	16	94	49	0	0	11	24	52	245	138	9	11	29	7.08
7	10	15	94	47	0	0	10	22	50	222	137	9	10	28	7.17
7	15	14	94	45	0	0	9	21	48	200	136	9	9	27	7.25
7	20	14	94	43	0	0	9	20	46	182	134	8	9	27	7.33
7	25	13	94	41	0	0	8	19	44	165	133	8	8	26	7.42
7	30	12	93	40	0	0	7	18	42	150	127	8	7	25	7.50
7	35	12	93	38	0	0	7	17	40	137	121	7	7	24	7.58
7	40	11	93	37	0	0	6	16	38	125	114	7	6	24	7.67
7	45	11	93	35	0	0	6	15	37	114	108	7	6	23	7.75
7	50	10	93	34	0	0	6	14	35	105	103	6	6	22	7.83
7	55	10	92	32	0	0	5	13	34	96	97	6	5	22	7.92
8	0	9	92	31	0	0	5	12	33	88	92	6	5	21	8.00
8	5	9	92	30	0	0	4	12	31	81	87	6	4	21	8.08
8	10	8	92	29	0	0	4	11	30	75	83	5	4	20	8.17
8	15	8	91	27	0	0	4	10	29	70	79	5	4	19	8.25
8	20	8	91	26	0	0	4	10	28	65	75	5	4	19	8.33
8	25	7	91	25	0	0	3	9	27	60	71	5	3	18	8.42
8	30	7	91	24	0	0	3	9	26	56	67	5	3	18	8.50
8	35	7	91	23	0	0	3	8	25	52	63	4	3	17	8.58
8	40	6	90	23	0	0	3	8	24	49	60	4	3	17	8.67
8	45	6	90	22	0	0	2	7	23	46	57	4	2	16	8.75
8	50	6	90	21	0	0	2	7	22	43	54	4	2	16	8.83
8	55	5	90	20	0	0	2	7	21	40	51	4	2	15	8.92
9	0	5	90	19	0	0	2	6	20	38	49	4	2	15	9.00
Peak	(cfs)	651	99	1328	449	447	435	666	1317	686	194	704	435	86	
Peak	(hrs)	1	3	1	1	1	1	1	1	3	2	1	1	2	
Peak	(min)	10	10	45	15	20	40	35	55	20	50	20	40	20	
Peak	(cfs_or_ac.ft.)	0	69	0	0	10	0	0	6	107	59	0	27	19	
Case	((),S,I,D,O)	(_)	(S)	(_)	(_)	(S)	(_)	(_)	(_)	(S)	(S)	(_)	(S)	(S)	
Area	(ac)	691.2	691.2	2172.2	490.9	490.9	540.8	889.6	2172.2	2172.2	814.7	814.7	540.8	223.4	
Peak/Area	(cfs/ac)	0.94	0.14	0.61	0.91	0.91	0.80	0.75	0.61	0.32	0.24	0.86	0.80	0.38	
11-23-1999	16:05:23														
Summary	File:														

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GODDING HOLLOW BASIN, FUTURE CONDITION WITH REGIONAL DETENTION

100-YEAR

Time(Hrs)	Time(Min)	Elem999	Elem151	Elem202	Elem51	Elem751	Elem103	Elem203	Elem3	Elem703	Elem104	Elem204	Elem105	Elem205	Elem106	Elem206	Elem107	Elem207	Elem7	Elem707	Elem108
0	5	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	1	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	0	0	3	2	9	0	1	0	0	0	2	0	1	0	2	0	1	0	0	0
0	25	1	1	5	4	12	0	4	0	0	0	7	0	4	0	9	0	4	0	1	0
0	30	4	4	10	6	14	0	12	0	3	2	20	1	14	1	27	0	12	0	3	1
0	35	12	12	33	23	110	2	30	0	12	10	51	3	39	6	68	2	32	1	13	5
0	40	44	44	95	75	211	8	64	3	37	31	112	12	93	23	150	10	73	8	41	18
0	45	94	94	135	99	321	24	121	13	93	80	212	38	189	64	281	30	151	34	101	50
0	50	146	146	187	133	447	56	208	42	196	173	372	95	338	147	493	76	276	95	210	114
0	55	209	209	259	186	604	118	370	111	379	341	643	190	549	224	809	171	514	211	380	226
1	0	291	291	375	265	815	235	626	240	616	558	833	242	762	310	1076	263	844	397	618	395
1	5	351	351	530	383	1109	409	854	369	776	704	1016	325	983	427	1328	386	1222	657	918	615
1	10	453	453	720	544	1380	561	1006	447	959	881	1199	438	1211	575	1584	557	1483	827	1137	743
1	15	605	605	930	730	1542	603	1154	542	1155	1072	1386	582	1447	752	1835	755	1684	958	1301	844
1	20	795	795	1142	924	1713	654	1305	658	1360	1271	1579	753	1687	952	2070	967	1871	1097	1409	936
1	25	1009	1009	1355	1125	1897	718	1461	796	1568	1473	1774	948	1924	1168	2283	1182	2032	1230	1513	1022
1	30	1234	1234	1568	1332	2094	796	1621	955	1778	1678	1970	1162	2151	1391	2468	1392	2169	1357	1616	1105
1	35	1460	1460	1773	1534	2212	887	1787	1131	1987	1883	2165	1387	2363	1612	2624	1590	2285	1478	1718	1185
1	40	1678	1678	1961	1722	2343	993	1958	1321	2193	2085	2356	1617	2558	1826	2755	1772	2385	1594	1818	1264
1	45	1882	1882	2137	1902	2488	1111	2134	1522	2394	2284	2541	1844	2732	2027	2863	1935	2472	1706	1915	1340
1	50	2071	2071	2303	2074	2608	1242	2313	1728	2587	2475	2717	2064	2885	2210	2952	2081	2549	1813	2010	1413
1	55	2248	2248	2458	2236	2739	1385	2492	1937	2769	2657	2880	2270	3017	2376	3025	2211	2619	1915	2099	1482
2	0	2413	2413	2609	2393	2881	1538	2669	2143	2938	2826	3029	2461	3128	2522	3085	2326	2682	2013	2184	1548
2	5	2571	2571	2754	2547	3010	1699	2841	2344	3091	2981	3161	2634	3222	2651	3135	2427	2738	2104	2262	1605
2	10	2722	2722	2896	2697	3146	1867	3005	2536	3228	3119	3277	2788	3298	2762	3176	2517	2788	2190	2334	1659
2	15	2868	2868	3036	2845	3285	2038	3158	2716	3347	3240	3376	2922	3360	2858	3210	2595	2832	2269	2399	1707
2	20	3012	3012	3174	2992	3425	2210	3298	2882	3449	3344	3458	3038	3409	2940	3237	2664	2870	2340	2457	1749
2	25	3153	3153	3312	3139	3563	2379	3422	3032	3534	3431	3525	3137	3447	3009	3258	2725	2902	2404	2508	1785
2	30	3293	3293	3449	3284	3697	2545	3531	3166	3602	3502	3578	3219	3475	3067	3273	2776	2927	2461	2551	1816
2	35	3431	3431	3583	3426	3829	2704	3625	3282	3658	3559	3618	3287	3494	3115	3284	2820	2947	2511	2588	1842
2	40	3567	3567	3714	3566	3952	2853	3703	3382	3697	3603	3648	3342	3506	3155	3290	2857	2961	2553	2618	1862
2	45	3700	3700	3841	3700	4066	2993	3767	3466	3727	3636	3668	3385	3513	3186	3295	2887	2969	2588	2641	1877
2	50	3827	3827	3960	3827	4167	3121	3817	3536	3747	3659	3679	3418	3515	3213	3306	2910	2971	2617	2659	1887
2	55	3947	3947	4071	3945	4256	3237	3854	3591	3758	3672	3684	3443	3514	3234	3310	2926	2969	2639	2671	1894
3	0	4059	4059	4172	4053	4333	3340	3880	3635	3764	3682	3692	3461	3509	3252	3308	2937	2962	2655	2678	1896
3	5	4162	4162	4265	4152	4412	3430	3897	3669	3768	3689	3695	3472	3501	3264	3301	2942	2951	2666	2680	1895
3	10	4256	4256	4350	4244	4479	3509	3908	3695	3769	3692	3694	3478	3490	3271	3290	2943	2936	2672	2678	1890
3	15	4342	4342	4426	4326	4534	3575	3911	3713	3765	3691	3687	3479	3475	3274	3274	2938	2918	2673	2672	1883
3	20	4418	4418	4493	4399	4580	3632	3918	3726	3756	3686	3677	3477	3466	3272	3254	2930	2897	2670	2662	1873
3	25	4486	4486	4550	4462	4617	3680	3918	3731	3738	3677	3665	3472	3452	3265	3231	2917	2872	2664	2650	1861
3	30	4544	4544	4598	4515	4645	3720	3912	3730	3718	3665	3650	3465	3433	3254	3205	2902	2855	2654	2634	1846
3	35	4592	4592	4638	4560	4668	3751	3900	3724	3698	3650	3631	3454	3412	3240	3178	2887	2835	2640	2616	1830
3	40	4634	4634	4673	4597	4684	3775	3885	3715	3677	3633	3610	3440	3388	3222	3151	2869	2813	2624	2596	1812
3	45	4668	4668	4700	4626	4693	3792	3867	3702	3654	3612	3586	3423	3361	3203	3122	2850	2788	2606	2573	1792
3	50	4696	4696	4719	4648	4696	3803	3846	3686	3629	3588	3559	3403	3333	3181	3092	2829	2761	2585	2549	1772
3	55	4716	4716	4732	4663	4693	3808	3822	3668	3601	3562	3530	3381	3302	3157	3060	2807	2732	2562	2523	1750
4	0	4729	4729	4739	4671	4684	3808	3796	3647	3572	3534	3500	3357	3270	3131	3027	2782	2702	2538	2495	1727
4	5	4735	4735	4739	4673	4673	3804	3767	3623	3541	3504	3467	3330	3237	3103	2993	2756	2670	2511	2466	1703
4	10	4736	4736	4735	4671	4658	3795	3737	3598	3508	3472	3432	3302	3202	3074	2957	2728	2637	2484	2436	1678
4	15	4732	4732	4726	4664	4639	3783	3705	3570	3473	3438	3396	3271	3165	3043	2921	2699	2602	2454	2404	1652
4	20	4723	4723	4712	4652	4616	3766	3670	3540	3436	3402	3359	3239	3128	3011	2883	2668	2567	2424	2371	1626
4	25	4710	4710	4695	4636	4590	3747	3634	3509	3399	3365	3321	3206	3089	2978	2844	2635	2530	2393	2338	1600
4	30	4693	4693	4674	4617	4561	3725	3597	3476	3360	3327	3281	3171	3050	2943	2804	2602	2493	2360	2304	1572
4	35	4672	4672	4649	4594	4531	3700	3558	3441	3320	3288	3240	3135	3009	2908	2764	2568	2455	2327	2269	1545
4	40	4648	4648	4622	4569	4498	3673	3518	3405	3279	3248	3198	3098	2968	2871	2723	2532	2417	2293	2233	1518
4	45	4622	4622	4593	4541	4464	3643	3477	3367	3237	3206	3156	3060	2926	2833	2682	2496	2378	2258	2198	1490
4	50	4592	4592	4561	4511	4427	3612	3434	3329	3194	3164	3113	3021	2884	2795	2640	2459	2338	2223	2162	1462
4	55	4561	4561	4527	4478	4389	3578	3391	3289	3150	3121	3069	2981	2841	2756	2599	2422	2299	2188	2126	1435
5	0	4527	4527	4491	4443	4349	3544	3347	3249	3106	3078	3024	2941	2798	2717	2556	2384	2260	2152	2090	1407
5	5	4491	4491	4453	4407	4308	3507	3302	3207	3062	3034	2980	2900	2754	2677	2514	2346	2220	2117	2053	1379
5	10	4453	4453	4414	4369	4266	3469	3257	3165	3017	2989	2935	2858	2710	2636	2472	2308	2181	2081	2017	1352
5	15	4415	4415	4374	4330	4223	3430	3211	3122	2971	2945	2889	2816	2667	2596	2430	2270	2142	2045	1981	1324
5	20	4374	4374	4332	4290	4179	3390	3165	3079	2925	2900	2844	2774	2623	2555	2388	2231	2103	2010	1945	1297
5	25	4333	4333	4289	4248	4134	3349	3118	3035	2880	2854	2798	2731	2579	2514	2347	2193	2064	1974	1910	1270
5	30	4290	4290	4245	4205	4089	3308	3071	2991	2834	2809	2752	2688	2535	2473	2305	2154	2025	1939	1874	1244
5	35	4246	4246	4200	4162	4043	3265	3024	2947	2788	2764	2707	2646	2492	2433	2264	2116	1987	1904	1839	1217
5	40	4202	4202	4155	4118	3997	3222	2977	2902	2742	2718	2661	2603	2449	2392	2223	2078	1949	1869	1804	1191
5	45	4157	4157	4109	4073	3950	3178	2929	2857	2696	2673	2616	2560	2406	2352	2183	2040	1912	1834	1769	1166
5	50	4111	4111	4063	4027	3903	3134	2882	2812	2651	2628	2571	2518	2363	2311	2143	2003	1874	1800	1735	1140
5	55	4065	4065	4016	3981	3855	3090	2835	2768	2605	2584	2527	2475	2321	2271	2103	1966	1838	1765	1701	1115
6	0	4018	4018	3968	3935	3807	3045	2788	2723	2560	2539	2482	2433	2279	2232	2064	1929	1801	1732	1667	1090
6	5	3971	3971	3921	3888	3760	3000	2741	2678	2516	2495	2438	2391	2238	2192	2026	1892	1765	1698	1634	1066
6	10	3924	3924	3873	3842	3712	2955	2695	2634	2472	2451	2395	2350	2197	2153	1988	1856	1730	1665	1601	1042
6	15	3876	3876	3825	3795	3664	2910	2648	2590	2428	2408	2352	2309	2156	2115	1950	1820	1695	1632	1568	1019
6	20	3828	3828	3777	3748	3617	2865	2603	2546	2384	2365	2309	2268	2116	2077	1912	1784	1657	1597	1523	982
6	25	3781	3781	3729	3701	3569	2821	2557	2502	2341	2322	2267	2228	2076	2039	1874	1748	1612	1554	1458	926
6	30	3733	3733	3681	3654	3522	2776	2512	2459	2299	2280	2225	2187	2036	2000	1832	1708	1557	1501	1385	862
6	35	3685	3685	3634	3607	3475	2731	2468	2417	2256	2238	2183	2147	1995	1961	1786	1663	1495	1441	1312	797
6	40	3638	3638	3586	3560	3428	2687	2423	2374	2214	2197	2141	2107	1953	1920	1738	1615	1429	1377	1244	738
6	45	3590	3590	3539	3513	3382	2643	2380	2332	2172	2155	2099	2066	1909	1877	1682	1562	1364	1314	1181	684
6	50	3543	3543	3492	3467	3336	2599	2336	2290	2130	2113	2056	2025	1862	1832	1626	1508	1302	1253	1126	637
6	55	3496	3496	3445	3421	3290	2556	2292	2248	2087	2070	2012	1982	1814	1785	1569	1452	1240	1193	1055	574
7	0	3450	3450	3398	3375	3244	2512	2249	2206	2043	2027	1967	1938	1764	1738	1511	1395	1178	1132	1000	528
7	5	3403	3403	3352	3329	3199	2469	2205	2163	1998	1982	1920	1893	1712	1686	1453	1338	1121	1078	959	494
7	10	3357	3357	3306	3284	3154	2426	2160	2120	1951	1936	1872	1846	1660	1635	1397	1282	1072	1030	925	469
7	15	3311	3311	3260	3239	3108	2383	2115	2076	1904	1889	1823	1798	1607	1583	1343	1230	1028	988	891	448
7	20	3265	3265	3214	3194	3063	2339	2069	2032	1856	1841	1774	1750	1554	1531	1291	1179	983	943	825	430
7	25	3220	3220	3169	3148	3017	2296	2023	1987	1807	1792	1724	1701	1502	1480	1241	1130	932	894	767	414
7	30	3174	3174	3123	3103	2971	2252	1976	1941	1757	1743	1673	1652	1451	1430	1191	1080	880	843	716	401
7	35	3129	3129	3077	3058	2925	2208	1928	1895	1707	1694	1623	1602	1400	1380	1140	1031	828	793	670	388
7	40	3083	3083	3031	3013	2879	2164	1880	1848	1657	1644	1573	1553	1349	1330	1090	982	776	742	630	377
7	45	3037	3037	2985	2967	2832	2120	1832	1801	1608	1594	1523	1504	1299	1281	1036	928	686	654	593	367
7	50	2991	2991	2939	2921	2785	2075	1784	1753	1558	1545	1473	1455	1248	1231	979	872	630	598	561	357
7	55	2945	2945	2892	2875	2738	2030	1735	1705	1508	1496	1423	1406	1196	1180	924	818	591	561	531	348
8	0	2899	2899	2845	2829	2690	1984	1686	1658	1458	1446	1373	1356	1145	1129	874	769	560	530	505	339
8	5	2852	2852	2798	2782	2643	1939	1637	1610	1409	1397	1323	1307	1095	1080	829	724	532	504	480	331
8	10	2806	2806	2751	2736	2595	1893	1589	1562	1360	1348	1274	1259	1047	1032	788	684	507	480	459	324
8	15	2759	2759	2704	2689	2548	1848	1540	1514	1311	1299	1225	1211	1000	987	751	647	485	458	439	316
8	20	2712	2712	2657	2642	2500	1802	1491	1467	1262	1251	1178	1164	956	943	718	614	464	438	420	309
8	25	2665	2665	2610	2595	2452	1756	1443	1420	1215	1204	1131	1118	915	902	687	584	445	420	404	303
8	30	2618	2618	2562	2548	2405	1711	1398	1373	1169	1158	1087	1074	876	864	659	557	427	404	388	296
8	35	2571	2571	2515	2502	2357	1665	1349	1327	1124	1113	1044	1031	839	827	633	531	411	388	374	290
8	40	2524	2524	2468	2455	2310	1620	1303	1282	1081	1070	1002	991	805	793	609	508	396	374	361	284
8	45	2477	2477	2421	2408	2263	1575	1258	1237	1039	1029	963	952	772	762	587	487	382	361	348	277
8	50	2430	2430	2374	2361	2216	1531	1214	1194	999	989	926	915	742	732	567	467	369	348	336	271
8	55	2384	2384	2327	2315	2170	1487	1172	1152	961	952	890	880	714	704	548	449	356	336	324	264
9	0	2337	2337	2281	2269	2125	1444	1130	1112	925	915	856	846	688	678	531	432	344	324	312	257
Peak	(cfs)	4736	4736	4739	4673	4696	3808	3918	3731	3769	3692	3695	3479	3515	3274	3310	2943	2971	2673	2680	1896
Peak	(hrs)	4	4	4	4	3	3	3	3	3	3	3	3	2	3	2	3	2	3	3	3
Peak	(min)	10	10	0	5	50	55	20	25	10	10	5	15	50	15	55	10	50	15	5	0
Peak	(cfs_or_ac.ft.)	0	7	0	5	896	12	0	8	0	8	0	7	0	7	0	7	0	12	0	10
Case	((),S,I,D,O)	( )	( )	( )	( )	(I)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	n/a	11632.0	11632.0	11347.8	11347.8	11347.8	11347.8	10659.8	10659.8	10503.0	10503.0	9730.6	9730.6	8893.4	8893.4	7315.8	7315.8	6369.9	6369.9	4197.8
Peak/Area	(cfs/ac)	n/a	0.41	0.41	0.41	0.41	0.34	0.35	0.35	0.35	0.35	0.35	0.36	0.36	0.37	0.37	0.40	0.41	0.42	0.42	0.45

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Summary File: P:\coweld01\future~1\Goddin~1\100_Year\alt8\ghrd100y.txt

GODDING HOLLOW BASIN, FUTURE CONDITION WITH REGIONAL DETENTION

	Time(Min)	Elem308	Elem708	Elem208	Elem109	Elem709	Elem209	Elem110	Elem210	Elem111	Elem711	Elem211	Elem112	Elem712	Elem212	Elem113	Elem213	Elem116	Elem216	Elem117	Elem217
	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
	15	0	1	0	0	3	3	3	24	0	4	4	0	4	0	0	1	0	1	0	0
0	20	1	5	4	2	25	25	23	89	6	20	19	5	23	1	0	6	1	4	0	0
0	25	4	24	19	12	61	61	52	212	33	65	61	24	64	3	2	19	4	11	0	1
0	30	15	74	61	42	141	140	119	460	75	156	146	57	149	14	11	49	14	26	1	2
0	35	40	173	141	99	342	338	294	790	174	326	306	114	320	48	39	104	35	52	2	5
0	40	87	305	240	166	619	609	534	923	360	559	523	232	526	124	110	215	76	107	4	10
0	45	168	557	446	315	898	875	737	1002	593	772	718	400	705	259	236	358	134	160	10	19
0	50	298	886	723	526	1122	1080	899	1118	820	973	891	590	882	408	370	450	164	196	19	29
0	55	483	1280	1007	765	1329	1261	1053	1273	1031	1166	1045	778	1034	517	468	522	191	219	29	40
1	0	712	1636	1280	1010	1530	1432	1209	1415	1220	1329	1178	950	1164	595	538	574	212	225	32	50
1	5	961	1951	1538	1249	1722	1589	1359	1548	1378	1465	1293	1100	1277	648	585	608	222	228	38	59
1	10	1015	2226	1767	1470	1866	1727	1495	1654	1508	1579	1392	1228	1375	683	616	631	227	231	45	67
1	15	1078	2450	1958	1659	1979	1833	1605	1722	1612	1664	1468	1333	1446	704	634	641	229	230	54	75
1	20	1147	2622	2107	1812	2058	1904	1686	1767	1689	1727	1526	1412	1490	710	640	640	228	225	62	81
1	25	1220	2740	2213	1929	2108	1947	1741	1795	1740	1762	1561	1464	1512	703	634	628	224	219	70	86
1	30	1294	2813	2282	2013	2135	1968	1776	1806	1764	1770	1574	1493	1514	687	620	609	218	211	77	90
1	35	1367	2848	2321	2069	2143	1970	1792	1801	1765	1760	1569	1502	1502	664	600	587	211	204	83	93
1	40	1438	2853	2335	2100	2135	1956	1792	1782	1748	1734	1551	1495	1478	638	578	563	203	196	88	95
1	45	1505	2836	2330	2111	2113	1928	1777	1752	1718	1698	1523	1475	1446	610	554	539	196	189	91	97
1	50	1567	2800	2308	2105	2080	1890	1751	1712	1679	1654	1488	1446	1406	582	529	514	189	182	94	98
1	55	1625	2750	2274	2085	2039	1844	1715	1666	1633	1605	1446	1410	1362	554	506	491	183	176	96	99
2	0	1677	2690	2230	2054	1990	1791	1672	1616	1583	1552	1401	1368	1315	528	483	469	177	171	97	99
2	5	1724	2622	2178	2014	1937	1734	1624	1560	1529	1496	1352	1323	1265	502	461	448	171	165	98	100
2	10	1765	2548	2120	1967	1878	1673	1570	1501	1473	1438	1301	1275	1214	478	441	427	166	160	99	100
2	15	1800	2469	2058	1915	1816	1608	1513	1439	1415	1379	1249	1224	1161	455	421	408	162	158	99	100
2	20	1830	2385	1991	1858	1753	1542	1454	1379	1356	1319	1195	1174	1110	434	403	391	159	157	100	100
2	25	1854	2300	1923	1799	1689	1477	1395	1320	1297	1261	1144	1124	1062	416	388	379	157	155	100	100
2	30	1873	2215	1854	1739	1627	1413	1337	1263	1241	1207	1096	1077	1019	402	376	368	155	153	100	100
2	35	1888	2131	1786	1679	1567	1352	1282	1209	1189	1156	1051	1033	978	389	365	358	153	151	100	99
2	40	1897	2049	1720	1620	1512	1296	1227	1156	1139	1108	1008	992	939	377	355	348	151	149	99	99
2	45	1903	1970	1657	1564	1458	1242	1175	1106	1092	1062	967	953	903	365	345	338	149	146	99	98
2	50	1904	1896	1598	1509	1407	1190	1125	1059	1048	1019	929	917	870	355	336	329	147	144	99	98
2	55	1902	1827	1543	1457	1359	1141	1079	1017	1006	979	894	883	839	345	326	320	145	142	98	97
3	0	1897	1760	1491	1408	1314	1096	1036	978	967	941	862	851	809	334	317	309	141	139	97	96
3	5	1889	1697	1442	1361	1272	1054	995	939	930	905	830	821	779	324	307	300	138	137	97	95
3	10	1878	1637	1395	1316	1230	1012	956	899	894	869	799	791	750	314	298	291	135	134	96	94
3	15	1865	1578	1349	1273	1188	971	916	860	858	834	768	761	720	304	288	282	133	131	95	93
3	20	1850	1520	1305	1231	1147	931	879	824	824	800	737	732	692	295	279	273	130	128	94	92
3	25	1833	1467	1261	1191	1109	893	843	792	791	769	708	704	664	285	270	263	127	125	93	91
3	30	1815	1419	1219	1151	1073	857	809	761	761	739	679	676	637	275	261	255	124	122	92	90
3	35	1795	1372	1179	1114	1038	824	778	731	731	710	652	650	611	266	253	246	121	120	91	88
3	40	1774	1327	1141	1078	1005	792	748	703	703	683	625	624	586	257	244	238	118	117	89	87
3	45	1751	1283	1105	1044	974	761	719	676	676	656	600	599	562	248	236	229	115	114	88	86
3	50	1728	1236	1070	1012	943	732	692	649	649	630	576	575	539	239	228	222	113	111	87	84
3	55	1704	1192	1036	980	914	703	665	624	624	605	552	552	517	231	220	214	110	108	85	83
4	0	1678	1150	1004	950	886	676	640	599	599	581	530	529	495	223	213	207	107	106	84	81
4	5	1652	1111	973	921	858	650	615	576	576	558	508	508	474	216	206	200	104	103	83	80
4	10	1625	1073	943	893	832	625	591	553	553	536	487	487	454	208	199	193	102	100	81	78
4	15	1598	1037	913	866	806	601	568	531	531	514	467	467	435	201	192	187	99	98	80	76
4	20	1571	1003	885	840	782	577	546	510	510	493	447	447	416	195	186	181	97	95	78	75
4	25	1543	971	858	814	758	555	525	490	490	474	429	429	399	188	180	175	94	93	77	73
4	30	1515	939	832	790	735	533	505	470	470	454	411	411	382	182	174	169	92	90	75	72
4	35	1487	909	807	766	712	512	485	451	451	436	393	393	365	176	168	163	89	88	73	70
4	40	1459	880	782	743	691	492	466	433	433	418	377	377	349	170	163	158	87	86	72	69
4	45	1431	853	759	721	670	472	448	416	416	401	361	361	334	164	158	153	85	83	70	67
4	50	1402	826	736	700	650	454	430	399	399	385	346	346	320	159	152	148	82	81	69	66
4	55	1374	801	714	679	630	436	413	383	383	369	331	331	306	154	148	143	80	79	67	64
5	0	1347	776	692	659	612	419	397	367	367	354	317	317	293	149	143	138	78	77	66	63
5	5	1319	753	672	640	594	402	381	352	352	340	303	303	279	144	138	134	76	75	64	61
5	10	1291	730	652	621	576	386	366	338	338	325	290	290	266	139	134	129	74	73	63	60
5	15	1264	708	633	603	559	371	352	324	324	311	277	277	253	134	129	125	72	71	61	58
5	20	1237	687	614	585	542	356	337	310	310	298	264	264	241	130	125	121	70	69	60	57
5	25	1210	667	596	568	526	341	324	297	297	285	252	252	230	126	121	117	68	67	59	55
5	30	1184	647	578	552	511	327	310	284	284	272	240	240	219	122	117	114	66	65	57	54
5	35	1158	628	561	536	495	313	297	272	272	260	229	229	209	118	114	110	64	63	56	53
5	40	1132	609	545	520	481	300	285	260	260	249	219	219	199	114	110	106	62	61	54	51
5	45	1107	591	529	505	467	288	273	249	249	239	209	209	191	110	107	103	61	60	53	50
5	50	1082	574	514	491	453	276	262	238	238	229	200	200	182	107	103	100	59	58	52	49
5	55	1058	557	499	477	441	265	251	228	228	219	191	191	173	103	100	96	57	56	51	47
6	0	1033	541	484	464	428	254	241	219	219	209	182	182	163	100	97	93	56	55	49	46
6	5	1010	526	471	451	416	243	231	209	209	200	173	173	155	97	94	90	54	53	48	45
6	10	986	511	457	438	404	233	221	200	200	191	165	165	149	94	91	88	53	52	47	44
6	15	963	497	445	426	393	223	212	191	191	183	158	158	142	91	88	85	51	50	46	43
6	20	865	483	432	414	382	214	203	183	183	175	151	151	136	88	85	82	50	49	45	41
6	25	773	470	420	403	372	205	195	176	176	168	144	144	131	85	83	80	48	48	43	40
6	30	700	457	409	392	362	197	187	169	169	161	138	138	125	82	80	77	47	46	42	39
6	35	642	444	398	382	353	189	180	162	162	155	133	133	120	80	77	75	46	45	41	38
6	40	594	433	387	372	344	182	173	156	156	149	127	127	116	77	75	72	44	44	40	37
6	45	555	421	377	363	336	175	166	150	150	144	122	122	111	75	73	70	43	42	39	36
6	50	522	411	368	354	328	168	160	144	144	138	118	118	107	73	71	68	42	41	38	35
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7	0	471	390	350	337	313	156	148	134	134	128	109	109	98	68	66	64	40	39	36	33
7	5	451	381	342	329	306	150	143	129	129	124	104	104	95	66	64	62	39	38	35	32
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7	20	404	355	318	307	286	135	129	116	116	111	93	93	84	60	59	57	36	35	33	30
7	25	391	347	311	301	280	130	124	112	112	107	90	90	81	59	57	55	35	34	32	29
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7	40	360	324	291	282	263	117	112	100	100	96	80	80	73	54	52	50	32	32	30	26
7	45	350	317	285	276	258	113	108	97	97	93	77	77	70	52	51	48	31	30	28	26
7	50	342	310	279	270	253	110	105	94	94	90	75	75	67	50	49	46	29	28	26	25
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8	0	326	297	268	260	243	102	98	87	87	83	69	69	61	46	45	42	26	26	24	23
8	5	318	291	263	255	238	99	95	84	84	80	66	66	58	44	43	41	25	25	24	23
8	10	311	285	257	250	233	96	92	81	81	77	63	63	56	42	42	39	25	24	23	22
8	15	304	279	252	245	229	92	88	78	78	74	61	61	54	41	40	38	24	23	22	22
8	20	298	273	247	240	225	89	85	75	75	71	58	58	52	40	39	37	23	23	22	21
8	25	291	268	243	236	220	86	83	72	72	69	56	56	50	38	38	36	22	22	21	20
8	30	285	262	238	231	215	83	80	70	70	66	54	54	48	37	36	35	22	21	20	20
8	35	279	256	232	226	205	80	77	67	67	64	52	52	46	36	35	34	21	21	20	19
8	40	273	249	226	220	196	78	75	65	65	62	50	50	45	35	34	33	21	20	19	19
8	45	266	241	218	213	187	75	72	63	63	60	48	48	43	34	33	32	20	19	19	18
8	50	259	233	211	206	178	73	70	61	61	58	47	47	41	33	32	31	19	19	18	17
8	55	252	225	203	198	171	70	68	59	59	56	45	45	40	32	31	30	19	18	18	17
9	0	245	217	196	191	163	68	66	57	57	54	44	44	39	31	30	29	18	18	17	16
Peak	(cfs)	1904	2853	2335	2111	2143	1970	1792	1806	1765	1770	1574	1502	1514	710	640	641	229	231	100	100
Peak	(hrs)	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
Peak	(min)	50	40	40	45	35	35	35	30	35	30	30	35	30	20	20	15	15	10	20	5
Peak	(cfs_or_ac.ft.)	158	0	0	5	0	0	4	0	5	0	0	4	0	0	3	0	3	0	2	0
Case	((),S,I,D,O)	(S)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)
Area	(ac)	4197.8	4197.8	3548.8	3283.2	3283.2	2468.5	2282.9	2282.9	2140.2	2140.2	1931.5	1814.4	1814.4	828.8	763.5	763.5	354.6	354.6	223.4	223.4
Peak/Area	(cfs/ac)	0.45	0.68	0.66	0.64	0.65	0.80	0.78	0.79	0.82	0.83	0.81	0.83	0.83	0.86	0.84	0.84	0.65	0.65	0.45	0.45
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Summary	File:																				

100-YEAR

Time(Hrs)	Time(Min)	Elem741	Elem341	Elem720	Elem225	Elem325	Elem237	Elem238	Elem121	Elem307	Elem331	Elem231	Elem337	Elem317	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0.17
0	15	1	0	1	0	0	0	1	0	0	0	0	0	0	0.25
0	20	6	0	8	2	0	1	3	1	0	0	3	1	0	0.33
0	25	26	1	25	6	0	3	12	6	0	0	9	3	1	0.42
0	30	79	5	66	22	0	9	31	25	2	1	27	9	2	0.50
0	35	200	14	147	64	0	23	72	75	8	4	74	23	5	0.58
0	40	381	32	279	152	0	49	132	174	22	11	163	49	10	0.67
0	45	551	46	494	235	0	94	251	345	51	23	307	94	19	0.75
0	50	675	56	709	325	0	155	377	493	96	42	433	155	29	0.83
0	55	743	67	907	412	0	223	473	635	153	68	558	223	40	0.92
1	0	780	79	1071	481	217	290	549	800	222	98	673	290	50	1.00
1	5	804	82	1211	530	530	350	618	967	303	133	767	350	59	1.08
1	10	817	84	1334	560	546	404	682	1122	394	139	835	404	67	1.17
1	15	815	86	1441	571	567	448	736	1261	457	146	875	448	75	1.25
1	20	795	87	1527	566	568	483	776	1380	473	153	890	483	81	1.33
1	25	760	89	1593	549	557	509	803	1478	492	160	883	509	86	1.42
1	30	715	91	1642	524	535	524	817	1555	512	167	859	524	90	1.50
1	35	667	92	1674	493	506	531	819	1612	532	174	822	531	93	1.58
1	40	618	94	1692	458	473	530	813	1652	554	180	778	530	95	1.67
1	45	571	95	1694	422	437	524	799	1675	575	185	730	524	97	1.75
1	50	527	96	1683	390	404	512	780	1683	596	190	680	512	98	1.83
1	55	486	97	1658	360	373	498	756	1676	617	195	632	498	99	1.92
2	0	449	98	1621	331	343	481	730	1655	638	199	585	481	99	2.00
2	5	416	99	1575	303	314	462	701	1624	657	202	541	462	100	2.08
2	10	385	100	1521	276	287	444	671	1582	675	205	500	444	100	2.17
2	15	356	101	1460	251	261	427	641	1531	692	208	461	427	100	2.25
2	20	329	101	1393	228	237	409	612	1474	708	210	425	409	100	2.33
2	25	304	102	1325	206	215	393	583	1411	722	212	391	393	100	2.42
2	30	281	102	1256	186	195	376	555	1346	735	214	360	376	100	2.50
2	35	260	103	1192	169	176	360	529	1281	746	215	331	360	99	2.58
2	40	242	103	1131	154	160	345	509	1218	756	216	305	345	99	2.67
2	45	230	103	1072	141	146	330	489	1157	764	217	283	330	98	2.75
2	50	219	104	1014	129	134	316	470	1098	771	217	263	316	98	2.83
2	55	208	104	959	117	122	302	451	1041	777	218	244	302	97	2.92
3	0	199	104	907	107	111	288	433	986	782	218	226	288	96	3.00
3	5	190	104	857	97	101	275	415	934	785	218	209	275	95	3.08
3	10	182	105	810	88	92	262	398	885	787	218	187	262	94	3.17
3	15	173	105	765	79	83	250	381	838	789	217	171	250	93	3.25
3	20	164	105	726	69	73	237	364	793	789	217	158	237	92	3.33
3	25	155	105	688	59	63	226	347	752	789	216	146	226	91	3.42
3	30	147	105	652	52	55	214	331	714	788	215	136	214	90	3.50
3	35	139	105	618	46	48	203	316	677	786	215	126	203	88	3.58
3	40	132	105	585	40	42	192	300	643	784	214	117	192	87	3.67
3	45	125	105	554	35	37	181	286	609	781	213	109	181	86	3.75
3	50	119	106	524	30	32	171	272	578	777	212	102	171	84	3.83
3	55	113	106	496	26	28	161	258	548	773	211	95	161	83	3.92
4	0	107	106	469	22	24	152	245	519	768	209	88	152	81	4.00
4	5	102	106	444	19	21	143	232	491	763	208	82	143	80	4.08
4	10	96	106	419	17	18	135	220	464	758	207	77	135	78	4.17
4	15	92	106	396	14	15	126	209	437	752	206	72	126	76	4.25
4	20	87	105	373	12	13	119	198	410	745	204	67	119	75	4.33
4	25	83	105	352	10	11	111	187	375	739	203	62	111	73	4.42
4	30	79	105	333	9	10	104	177	348	731	202	58	104	72	4.50
4	35	75	105	314	7	10	98	167	327	724	200	53	98	70	4.58
4	40	71	105	296	6	9	92	158	309	716	199	49	92	69	4.67
4	45	68	105	280	5	9	86	149	292	708	197	45	86	67	4.75
4	50	64	105	265	4	8	80	141	276	700	196	41	80	66	4.83
4	55	61	105	250	4	7	75	132	261	691	194	38	75	64	4.92
5	0	58	105	237	3	7	70	125	247	683	193	35	70	63	5.00
5	5	55	105	224	3	6	66	115	234	674	191	33	66	61	5.08
5	10	53	105	212	2	5	61	106	222	666	190	30	61	60	5.17
5	15	50	104	201	2	5	57	98	210	657	188	28	57	58	5.25
5	20	48	104	191	2	4	53	92	199	648	187	26	53	57	5.33
5	25	45	104	180	1	4	50	86	188	639	185	25	50	55	5.42
5	30	43	104	169	1	4	46	81	178	630	184	23	46	54	5.50
5	35	41	104	159	1	3	43	76	167	622	182	22	43	53	5.58
5	40	39	104	150	1	3	40	72	158	613	181	21	40	51	5.67
5	45	37	103	138	1	2	37	67	147	604	179	20	37	50	5.75
5	50	35	103	124	1	2	35	63	135	595	177	19	35	49	5.83
5	55	34	103	113	0	2	33	60	123	586	176	18	33	47	5.92
6	0	32	103	105	0	2	30	56	113	577	174	17	30	46	6.00
6	5	31	103	97	0	1	28	53	105	568	173	16	28	45	6.08
6	10	29	103	91	0	1	26	50	97	559	171	16	26	44	6.17
6	15	28	102	86	0	1	24	47	91	550	170	15	24	43	6.25
6	20	26	102	81	0	1	23	44	86	541	168	14	23	41	6.33
6	25	25	102	77	0	1	21	41	81	532	167	14	21	40	6.42
6	30	24	102	73	0	1	20	39	77	523	165	13	20	39	6.50
6	35	23	102	70	0	1	18	37	73	515	164	13	18	38	6.58
6	40	22	101	66	0	1	17	35	70	506	162	12	17	37	6.67
6	45	21	101	63	0	0	16	33	67	498	161	12	16	36	6.75
6	50	20	101	60	0	0	15	31	63	489	160	11	15	35	6.83
6	55	19	101	58	0	0	14	29	61	481	158	11	14	34	6.92
7	0	18	101	55	0	0	13	27	58	473	157	10	13	33	7.00
7	5	17	100	53	0	0	12	26	55	465	155	10	12	32	7.08
7	10	16	100	50	0	0	11	24	53	457	154	9	11	31	7.17
7	15	15	100	48	0	0	10	23	51	443	153	9	10	30	7.25
7	20	15	100	46	0	0	9	21	49	395	151	9	9	30	7.33
7	25	14	99	44	0	0	9	20	46	353	150	8	9	29	7.42
7	30	13	99	42	0	0	8	19	45	315	148	8	8	28	7.50
7	35	13	99	41	0	0	7	18	43	282	147	8	7	27	7.58
7	40	12	99	39	0	0	7	17	41	253	146	7	7	26	7.67
7	45	11	99	37	0	0	6	16	39	227	144	7	6	26	7.75
7	50	11	98	36	0	0	6	15	38	204	143	7	6	25	7.83
7	55	10	98	34	0	0	6	14	36	183	142	7	6	24	7.92
8	0	10	98	33	0	0	5	13	35	165	140	6	5	23	8.00
8	5	9	98	32	0	0	5	13	33	149	139	6	5	23	8.08
8	10	9	97	30	0	0	4	12	32	135	138	6	4	22	8.17
8	15	9	97	29	0	0	4	11	31	122	137	6	4	22	8.25
8	20	8	97	28	0	0	4	11	30	111	135	5	4	21	8.33
8	25	8	97	27	0	0	4	10	28	101	134	5	4	20	8.42
8	30	7	97	26	0	0	3	9	27	92	132	5	3	20	8.50
8	35	7	96	25	0	0	3	9	26	84	125	5	3	19	8.58
8	40	7	96	24	0	0	3	8	25	77	118	4	3	19	8.67
8	45	6	96	23	0	0	3	8	24	71	112	4	3	18	8.75
8	50	6	96	22	0	0	2	7	23	65	106	4	2	17	8.83
8	55	6	95	21	0	0	2	7	23	60	100	4	2	17	8.92
9	0	6	95	21	0	0	2	7	22	55	95	4	2	16	9.00
Peak	(cfs)	817	106	1694	571	568	531	819	1683	789	218	890	531	100	
Peak	(hrs)	1	3	1	1	1	1	1	1	3	2	1	1	2	
Peak	(min)	10	50	45	15	20	35	35	50	15	55	20	35	5	
Peak	(cfs_or_ac.ft.)	0	88	0	0	10	0	0	7	143	76	0	33	22	
Case	((),S,I,D,O)	(_)	(S)	(_)	(_)	(S)	(_)	(_)	(_)	(S)	(S)	(_)	(S)	(S)	
Area	(ac)	691.2	691.2	2172.2	490.9	490.9	540.8	889.6	2172.2	2172.2	814.7	814.7	540.8	223.4	
Peak/Area	(cfs/ac)	1.18	0.15	0.78	1.16	1.16	0.98	0.92	0.77	0.36	0.27	1.09	0.98	0.45	
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IV

COST ESTIMATES

DETENTION POND COST ESTIMATES

COSTS:
Earthwork = 5 $/cy
Property Acquisition:
Residential Unimproved = 10000 $/ac
Residential Structures = 80000 $/unit

	Reach Number and Pond Description	Earthwork Cut . cy	Earthwork Fill cy	Jurisdictional V in ac ft A in ac	Outlet Structure	Property Acquisition Unimproved ac	Structures units	Construction Costs Earthwork	Construction Costs Spillway or Canal Repl. ea.	Construction Costs Outlet Structure ea.	Cost	35% Contigency	Total	20% Engineering	Property Acquistion	Total Project Costs
	GODDING HOLLOW BASIN															
	GODDING HOLLOW BASIN															
9	Basin 37 (Spur)	11100	0	H=14 ft	Pipe	5	0	$55,500	$100,000	$7,200	$162,700	$56,945	$219,645	$43,929	$50,000	$313,574
9	Basin 17 (UPRR)	3400	0	No	Pipe	10	0	$17,000	$0	$6,800	$23,800	$8,330	$32,130	$6,426	$100,000	$138,556
8	Basin 31	36500	0	No	Pipe	17	0	$182,500	$0	$18,800	$201,300	$70,455	$271,755	$54,351	$170,000	$496,106
7	SWY 52	0	0	Exempt	RCBs	35	2	$0	$78,500	$0	$78,500	$27,475	$105,975	$21,195	$510,000	$637,170
10	W.Trib @I-25	0	28300	V=140, A=35	RCBs	40	0	$141,500	$100,000	$39,200	$280,700	$98,245	$378,945	$75,789	$400,000	$854,734
5	I-25/WCR 18	0	0	Exempt	Pipes	58	0	$0	$0	$0	$0	$0	$0	$0	$580,000	$580,000
							TOTALS	$396,500	$278,500	$72,000	$747,000	$261,450	$1,008,450	$201,690	$1,810,000	$3,020,140

BRIDGE IMPRC ..OST ESTIMATES

Assumptions:

1. Future channel invert and slope are same as in existing condition, unless channel and/or road improvements are specified
2. Under design conditions, structures are not under pressure flow

ROAD/BRIDGE CONSTANTS:

Deck & Pavement Thickness = 2 ft

COSTS:

Bridges = 80 $/sq.ft.
Road Demolition and Repair = 30 $/sq.yd.
Road Base Fill = 8 $/cy

	Reach Number and Road Crossing	Existing			Required				Existing Capacity cfs	Height Opening ft	Span Length ft	Road Width ft	Change Road Elevation ft	Road Fill cy	Road Surfacing sqyd	Construction Costs			Cost	35% Contigency	Total	20% Engineering	Property Acquistion	Total Project Costs
		Channel Invert ft, msl	Top Road ft, msl	Channel Slope ft/ft	Top Road ft, msl	Road Length ft	Low Chord ft, msl	100-Yr Regional Q cfs								Bridges	Road Fill	Road Surfacing						
	GODDING HOLLOW																							
9	WCR10W	5062.8	5066.3	0.0200	5067.5	250	5065.5	230	40	2.7	**5**	75	1.2	833	2083	$30,000	$6,667	$62,500	$99,167	$34,708	$133,875	$26,775	$0	$160,650
	I-25	5048.5	5057.5	0.0100	5057.5	0	5055.5	640	2460	7.0	**0**	75	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	WCR12	4994.4	5000.3	0.0070	5002.0	300	5000.0	1800	60	5.6	**35**	75	1.7	1417	2500	$210,000	$11,333	$75,000	$296,333	$103,717	$400,050	$80,010	$0	$480,060
7	SHW52	4960.1	4974.6	0.0091	4979.0	1600	4977.0	2000	1000	16.9	**11**	90	4.4	23467	16000	$79,200	$187,733	$480,000	$746,933	$261,427	$1,008,360	$201,672	$0	$1,210,032
6	WCR16	4935.1	4940.1	0.0058	4945.0	800	4943.0	3000	160	7.9	**40**	75	4.9	10889	6667	$240,000	$87,111	$200,000	$527,111	$184,489	$711,600	$142,320	$0	$853,920
5	WCR18	4913.1	4921.5	0.0020	4921.5	0	4919.5	3400	190	6.4	**90**	75	0	0	0	$540,000	$0	$0	$540,000	$189,000	$729,000	$145,800	$0	$874,800
4	WCR20	4887.4	4892.7	0.0030	4894.0	360	4892.0	3600	210	4.6	**135**	75	1.3	1300	3000	$810,000	$10,400	$90,000	$910,400	$318,640	$1,229,040	$245,808	$0	$1,474,848
3	WCR22	4861.4	4869.1	0.0030	4870.0	0	4868.0	3700	300	6.6	**80**	75	0.9	0	0	$480,000	$0	$0	$480,000	$168,000	$648,000	$129,600	$0	$777,600
3	WCR24	4828.0	4841.5	0.0010	4842.0	0	4840.0	3900	240	12.0	**58**	75	0.5	0	0	$348,000	$0	$0	$348,000	$121,800	$469,800	$93,960	$0	$563,760
1	WCR26	4814.0	4824.5	0.0040	4822.0	0	4820.0	4700	210	6.0	**100**	75	-2.5	0	0	$600,000	$0	$0	$600,000	$210,000	$810,000	$162,000	$0	$972,000
															Totals	$3,337,200	$303,244	$907,500	$4,547,944	$1,591,781	$6,139,725	$1,227,945	$0	$7,367,670

CHANNEL IMPROVEMENT COST ESTIMATES

COSTS:

Riprap =	85 $/cy	D50 =	1 ft
Earthwork =	5 $/cy	Manning's n =	0.035
Property Acquisition:		Channel Side Slopes =	4 H:1V
Residential Unimproved =	10000 $/ac	Access Road Width =	10 ft

Reach	Descrip.	Station	Length ft	Existing Ground ft, msl	Proposed Channel Invert ft, msl	Channel Slope ft/ft	100-Yr Discharge cfs	Depth Cut ft	Ave. Ch. Depth Cut ft	Bottom Width Cut ft	Top Width Cut ft	Area Of Cut ft^2	Earthwork Cut cy	Riprap cy	R.O.W. ac	Construction Costs: Earthwork Cut	Construction Costs: Riprap	Construction Costs: Cost	35% Contigency	Total	20% Engineering	Property Acquistion	Total Project Costs	Total Reach Costs
GODDING HOLLOW																								
		0		**4810**	**4805**			5																
G1	Transition		50			0.0600	4700		3.5	**400**	428	1449	2683	1585	0.5	$13,417	$134,741	$148,157	$51,855	$200,012	$40,003	$5,028	$245,043	
		50		**4810**	**4808**			2																
G1	Channel		1125			0.0044	4700		4	**400**	432	1664	69333	0	11.4	$346,667	$0	$346,667	$121,333	$468,000	$93,600	$114,153	$675,753	
		1175		**4819**	**4813**			6																
G1	Transition		175		0.75	0.0043	4700		5.625	**250**	295	1533	9935	1912	1.2	$49,674	$162,523	$212,198	$74,269	$286,467	$57,293	$12,253	$356,013	
		1350		**4819**	**4813.75**			5.25																
G1	Channel		75			0.0100	4700		5.375	**100**	143	653	1814	794	0.3	$9,070	$67,528	$76,598	$26,809	$103,407	$20,681	$2,634	$126,723	
		1425		**4820**	**4814.5**			5.5																
G1	Transition		150		0.25	0.0017	4700		5.375	**250**	293	1459	8107	1628	1.0	$40,536	$138,361	$178,898	$62,614	$241,512	$48,302	$10,434	$300,248	
		1575		**4820**	**4814.75**			5.25																
G1	Channel		1550			0.0044	4700		5.625	**400**	445	2377	136432	0	16.2	$682,161	$0	$682,161	$238,757	$920,918	$184,184	$161,903	$1,267,005	
		3125		**4827.5**	**4821.5**			6																
G1	Transition		125			0.0040	4700		6	**300**	348	1944	9000	3222	1.0	$45,000	$273,889	$318,889	$111,611	$430,500	$86,100	$10,273	$526,873	
		3250		**4828**	**4822**			6																
			3250										237305	9142	31.7	$1,186,526	$777,042	$1,963,568	$687,249	$2,650,816	$530,163	$316,678		$3,497,658
		5050		**4832**	**4825.8**			6.2																
G2	Transition		100			0.0020	3900		6.1	**100**	148.8	759	2811	1102	0.4	$14,053	$93,689	$107,741	$37,710	$145,451	$29,090	$3,646	$178,187	$178,187
		5150		**4832**	**4826**			6																
		8775		**4841**	**4825**			16																
G3	Transition		125			0.0240	3900		15	**100**	220	2400	11111	2037	0.7	$55,556	$173,148	$228,704	$80,046	$308,750	$61,750	$6,600	$377,100	
		8900		**4842**	**4828**			14																
G3	Channel		75			0.0013	3900		13.95	**58**	169.6	1588	4410	942	0.3	$22,049	$80,089	$102,138	$35,748	$137,886	$27,577	$3,092	$168,555	
		8975		**4842**	**4828.1**			13.9																
G3	Transition		125		0.1	0.0008	3900		14.1	**200**	312.8	3615	16737	1448	0.9	$83,686	$123,093	$206,779	$72,373	$279,151	$55,830	$9,263	$344,245	
		9100		**4842.5**	**4828.2**			14.3																
G3	Channel		3475			0.0057	3900		8.15	**390**	455.2	3444	443280	0	37.1	$2,216,400	$0	$2,216,400	$775,740	$2,992,140	$598,428	$371,113	$3,961,681	
		12575		**4850**	**4848**			2																
G3	Transition		0			ERR	3900		2	**0**	16	16	0	0	0.0	$0	$0	$0	$0	$0	$0	$0	$0	
		12575		**4850**	**4848**			2																
			3800										475538	4427	39.0	$2,377,690	$376,330	$2,754,020	$963,907	$3,717,927	$743,585	$390,069		$4,851,581
G4-G9	NONE																							
		0		**70**	**67**			3																
G10 In	Channel		1000			0.0050	1700		4.5	**126**	162	648	24000	60	3.9	$120,000	$5,100	$125,100	$43,785	$168,885	$33,777	$39,486	$242,148	
		1000		**78**	**72**			6																
		0		**55**	**49**			6																
G10 Out	Channel		1400			0.0043	800		5.5	**41**	85	347	17967	60	3.1	$89,833	$5,100	$94,933	$33,227	$128,160	$25,632	$30,533	$184,325	
		1400		**60**	**55**			5																
			2400										41967	120	7.0	$209,833	$10,200	$220,033	$77,012	$297,045	$59,409	$70,018		$426,472

Lidstone & Anderson, Inc.
Water Resources and Environmental Consultants

O[illegible]—PROJECT	BY	DATE	PROJECT NO.
	CJP	06/22/99	COWELD01
FEATURE	CHECKED BY	DATE	SHEET OF
GH – LAST CHANCE DITCH			

COST ESTIMATE: Assumed $Q_{DITCH} = 100cfs$

Length of Reallignment = 1200 ft
" " Siphon = 150 ft.

Assumed Q in Last Chance = 100 cfs

$$A = \frac{Q}{C_0\sqrt{2g\Delta h}} = \frac{100cfs}{.6\sqrt{2(32.2)(1)}} = 20.8\,ft^2$$

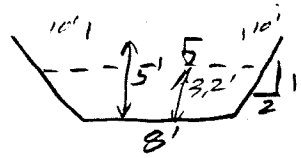
• 66-inch RCP = 23.7 sf Assumed Cost \$150/LF

Cost Pipe 150ft x \$150/LF = \$22,500
End Treatments (Trash Rack, End Section etc. Fence = \$10,000

Reallignment: 2:1 n = .035 BW = 8 S_{CH} = .001 ⟹ d = 3.2ft V = 2.2 fps

Assume 5 ft depth of cut

Cut: [2(2)(5)(5) + 5(8)] 1200/27 = 6222 cy



COST CUT: 6222cy (\$5/cy) ≅ \$31,000

PROPERTY ACQUISITION: (28 + 12 Road)(1200)/43560 sf/ac = 1.1ac = \$11,000

TOTAL CONST. COST = \$31,000 + \$22,500 + \$10,000 = \$63,500

CONTIG. (35%) \$22,225

TOTAL \$85,725

Engr. (20%) \$17,145

Prop. Acquisition \$11,000

TOTAL PROJ. COST \$113,870

VARIABLE SHEET — For Academic Use Only

St	Input	Name	Output	Unit	Comment
	100	Q		cfs	Discharge
		A	45.967043	sf	Cross Sectional Area
		V	2.1754717	ft/s	Flow Velocity
		d	3.1945665	ft	Flow Depth
	.035	n			Manning's n Coefficient
	.001	S		ft/ft	Bed Slope
	8	BW		ft	Bottom Width
	2	LZ		??H:1V	Left Side Slope
	2	RZ		??H:1V	Right Side Slope
		P	22.286536	ft	Wetted Perimeter
		R	2.0625477	ft	Hydraulic Radius
		TW	20.778266	ft	Top Width
		HD	2.2122656	ft	Hydraulic Depth
		Fr	.25775486		Froude Number
		Ac		sf	Critical Area
		Tc		ft	Critical Top Width
		dc		ft	Critical Depth

GH - LAST CHANCE DITCH
CH1 Realignment

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number C06EL001	Page / Of /
Owner-Project	By BAA/CJP	Date 06/23/99
GH - Coalridge Ditch Realignment @ SHW52	Checked By	Date

Channel

$\frac{10' + 22'}{2} \times 6 = \frac{90' \times 1700}{27} = 5666\ cy \times 5\$/cy = \$28,500$

Siphon

Headwalls - $5000 x 2 = $10,000
60" pipe - 100' x $150/ft = $15,000 } = $25,000

Spill Structure @ Siphon → = $15,000

CONST. COST $70,500

V

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REFERENCES

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VI

PROJECT COMPUTER FILES

Weld County I-25 MDP

Abbreviations

1) GH - Godding Hollow
2) XC - Existing conditions
3) FC - Future conditions
4) OD – on-site detention
5) RD – regional detention

File naming convention

1) *.CHI – CUHP input file
2) *.CHO – CUHP output file
3) *.INP – sub-basin inflow hydrographs
4) *.SWI – UDSWMM input file
5) *.SWO – UDSWMM output file

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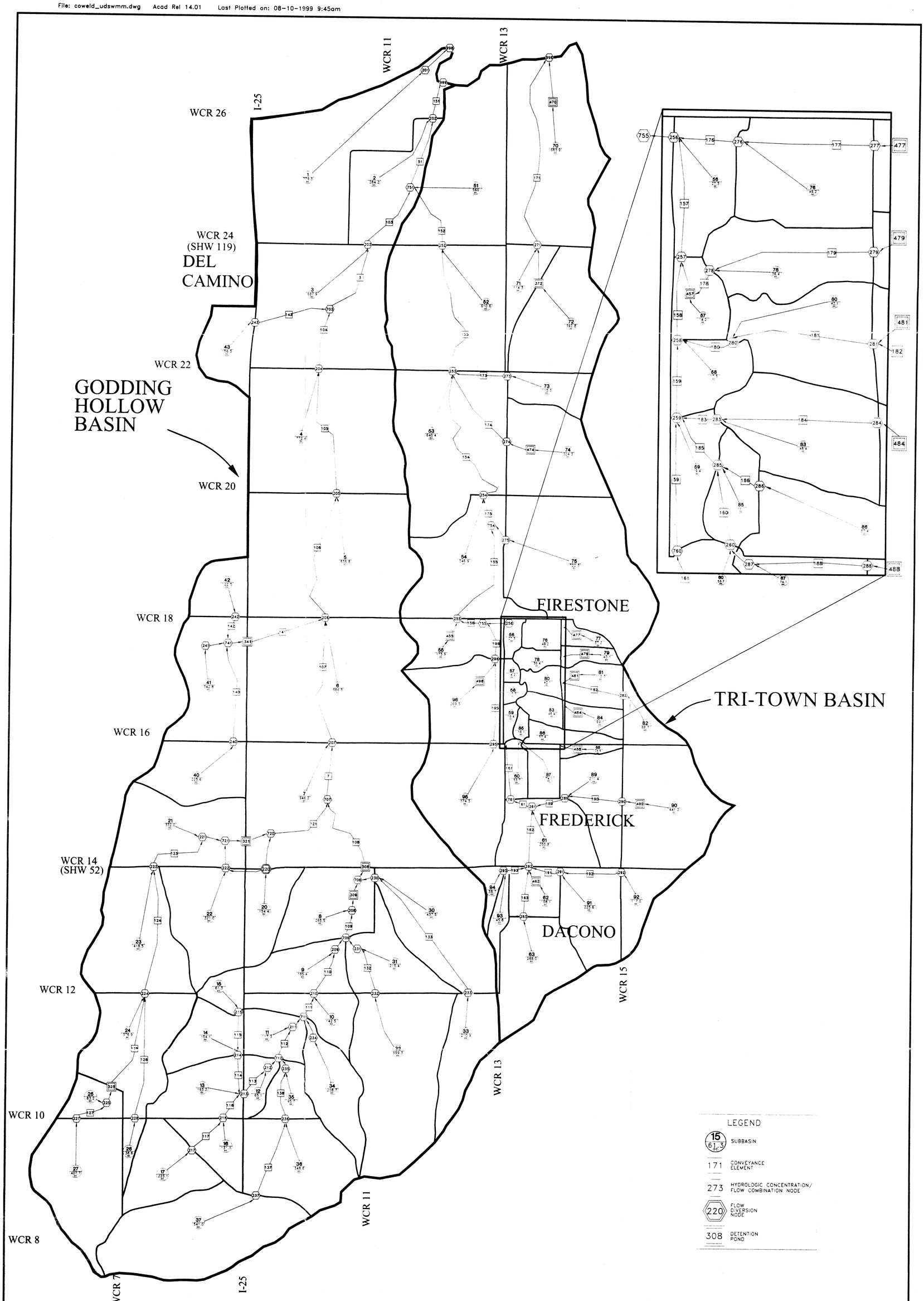
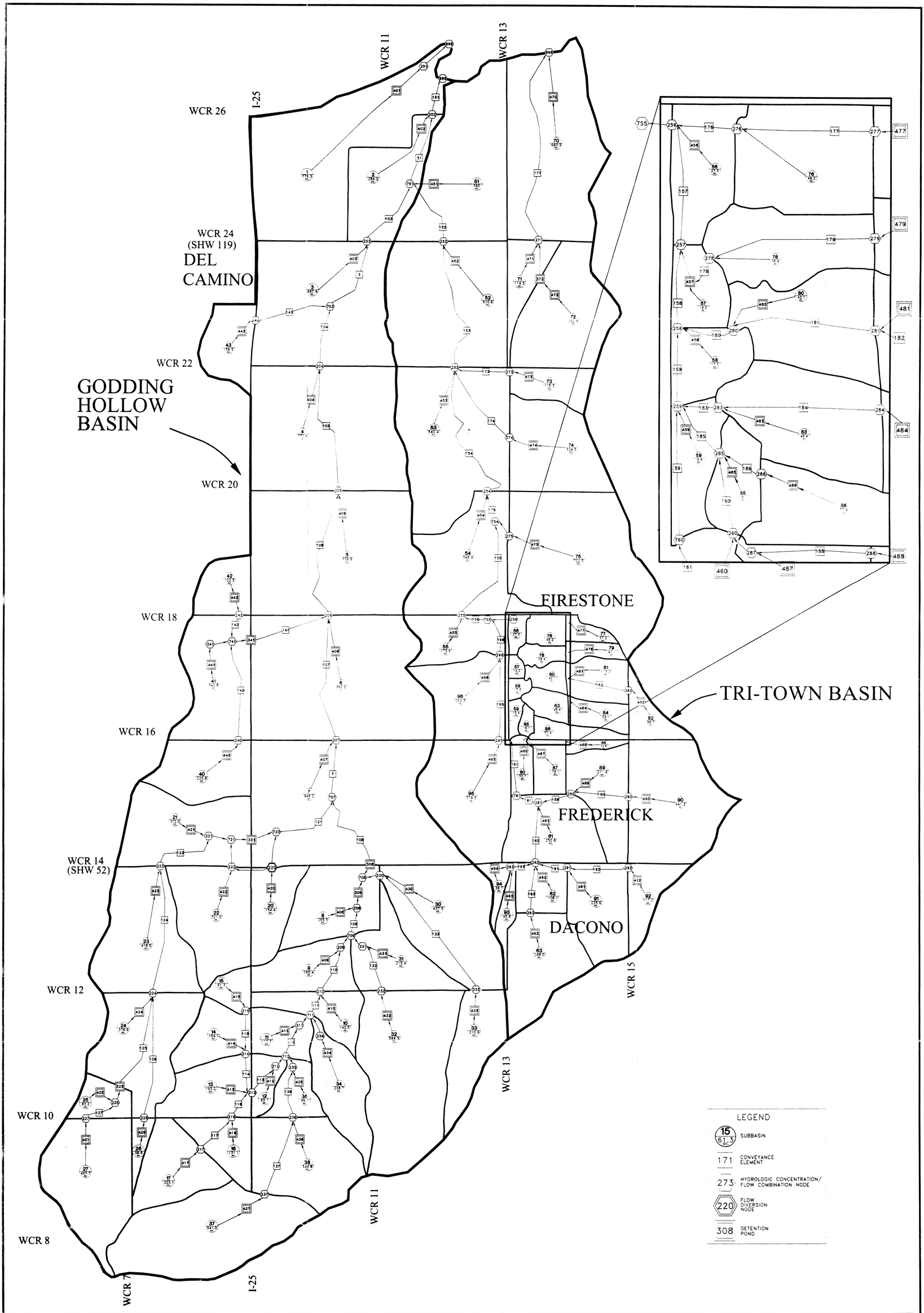


NOT TO SCALE	PROJECT NUMBER: COWELDO1	DRAWN BY: MRC	Anderson Consulting Engineers, Inc Civil · Water Resources · Environmental 2900 S. College Avenue, Suite 3B, Fort Collins, CO 80525 Phone (970) 226-0120 · Fax (970) 226-0121	SOUTH WELD COUNTY I-25 CORRIDOR MASTER DRAINAGE PLAN	UDSWMM MODEL NETWORK SCHEMATIC EXISTING CONDITIONS
	ACAD FILE: COWELD_UDSWMM	DESIGNED BY: BLV			SHEET A1
	DATE: 5/21/99 REVISED: 8/10/99	CHECKED BY: CJP			

File: coweld_udswmm.dwg Acad Rel 14.01 Last Plotted on: 08-10-1999 9:55am



NOT TO SCALE	PROJECT NUMBER: COWELD01	DRAWN BY: MRC	Anderson Consulting Engineers, Inc Civil · Water Resources · Environmental 2900 S. College Avenue, Suite 3B, Fort Collins, CO 80525 Phone (970) 226-0120 / Fax (970) 226-0121	SOUTH WELD COUNTY I-25 CORRIDOR MASTER DRAINAGE PLAN	UDSWMM MODEL NETWORK SCHEMATIC FUTURE CONDITIONS	SHEET A.2
	ACAD FILE: COWELD_UDSWMM	DESIGNED BY: BLV				
	DATE: 5/21/99 REVISED: 8/10/99	CHECKED BY: CJP				

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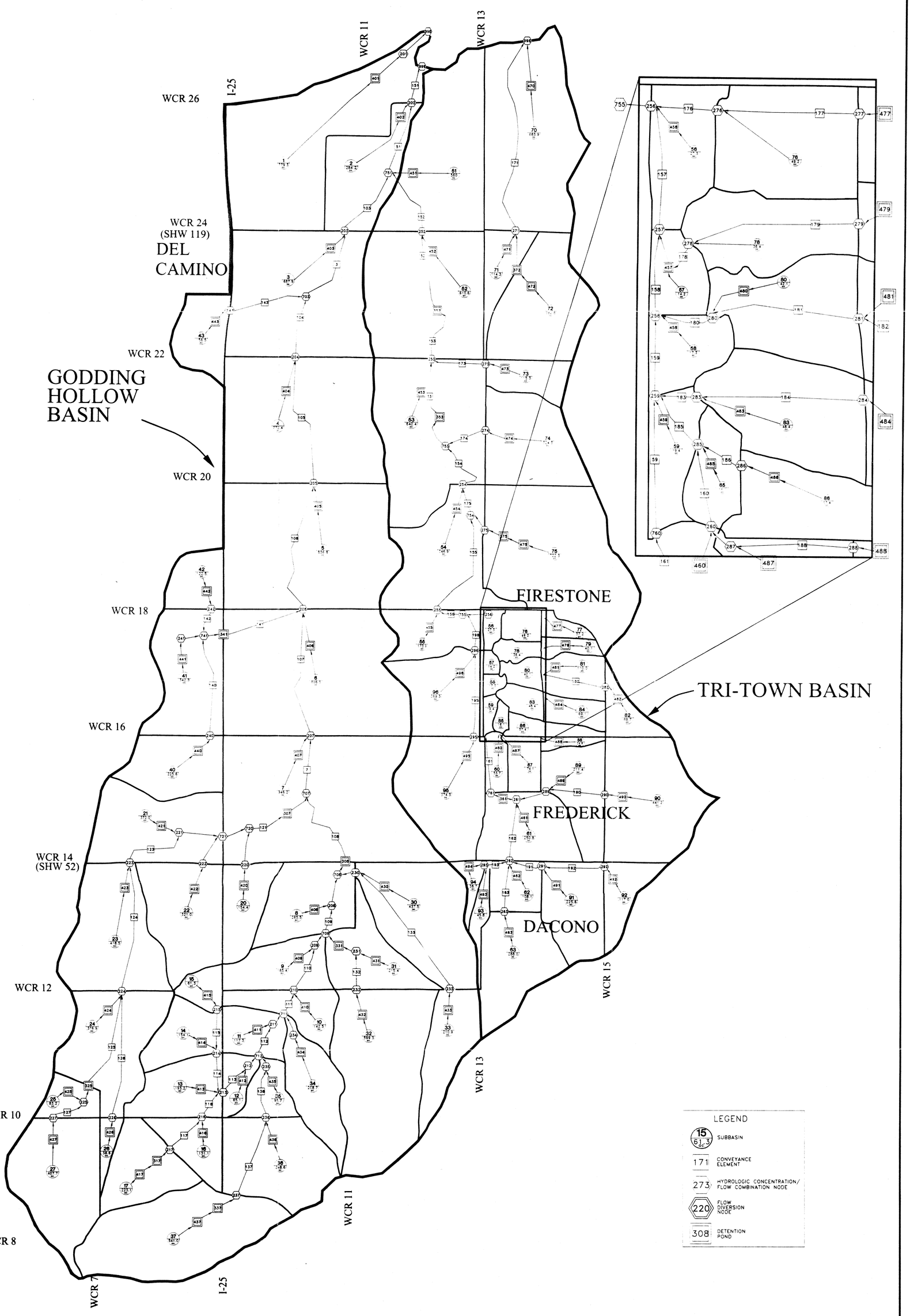

NOT TO SCALE	PROJECT NUMBER: COWELD01	DRAWN BY: MRC	Anderson Consulting Engineers, Inc Civil • Water Resources • Environmental 2900 S. College Avenue, Suite 3B, Fort Collins, CO 80525 Phone (970) 226-0120 / Fax (970) 226-0121	SOUTH WELD COUNTY I-25 CORRIDOR MASTER DRAINAGE PLAN	UDSWMM MODEL NETWORK SCHEMATIC FUTURE CONDITIONS WITH PROPOSED IMPROVEMENTS
	ACAD FILE: COWELD_UDSWMM	DESIGNED BY: BLV			SHEET A.3
	DATE: 6/21/99 REVISED: 8/10/99	CHECKED BY: CJP			

PROJECT NOTEBOOK

for

I-25 CORRIDOR MASTER DRAINAGE PLAN
SOUTH WELD COUNTY, COLORADO
VOLUME 2 OF 2, TRI-TOWN BASIN

PREPARED FOR:

Weld County
Public Works Department
933 North 11th Avenue
Greeley, CO 80632

PREPARED BY:

Anderson Consulting Engineers, Inc.
2900 S. College Avenue, Suite 3B
Fort Collins, CO 80525
(ACE Project No. COWELD01)

December 6, 1999

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III: UDSWMM ROUTING MODELING

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I

DRAINAGE FACILITIES INVENTORY/ANALYSIS

I-A

INVENTORY SUMMARY

Project Notebook Table 1. Inventory of Existing Drainage Facilities - Tri-Town Basin

Facility Name and/or Type	Location [UDSWMM ID]	Condition	Structure Dimensions	Maximum Storage Volume (acre-ft)	Maximum Discharge Capacity[1] (cfs)	Existing Condition Peak 2-Year Discharge (cfs)	Existing Condition Peak 10-Year Discharge (cfs)
MAIN CHANNEL							
WCR 24 Arch CMP	Between WCR 11 and WCR 13 [252]	poor	span=5' rise=3'	N/A	60	290	1,200
WCR 22 Arch CMP	Between WCR 11 and WCR 13 [253]	good	span=5' rise=3'	N/A	80	340	1,260
WCR 20 Arch CMP	Between WCR 11 and WCR 13 [254]	good	span=3.5' rise=2.5'	N/A	40	340	1,300
Milavec Lake Arch CMP	Access Road to Milavec Lake from WCR 13 [N/A]	good	span = 6' rise = 4'	N/A	190	330	1,180
WCR 18 Bridge	West of WCR 13 [255]	good	width=17.5' length=30'	N/A	750	330	1,180
WCR 13 Bridge	South of WCR 18 [256]	good	width=51' length=40'	N/A	1,500	270	910
WCR 16 RCB	East of WCR 13 [760]	good	span=10' rise=6'	N/A	710	190	650
Main St. RCB	Corner of 8th and Main St. in SW Frederick [761]	good	span=8' rise=6'	N/A	520	190	650
DHW 52, 4 CMP's	East of WCR 13 [262]	good	various diameters	N/A	N/A[2]	230	600
OTHER TRIBUTARY STRUCTURES							
WCR 13 CMP	Between WCR 20 and WCR 18, Sewage Plant Outfall [275]	good	diam.=3'	N/A	30	30	170
Abandoned UPRR Embankment Pond and Steel Pipe	Between WCR 22 and WCR 24 [372]	fair	diam.=2@3'	67[3]	190	10	40

[1] Maximum discharge capacity prior to street overtopping, assuming no obstructions
[2] Assumed to be ineffective due to potential debris loading
[3] Includes approved detention facility at St. Vrain Ranch P.U.D.

I-B

INVENTORY OF STRUCTURES

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/29/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: Tri-Town Basin
Number:
Location: WCR 24
Type: Plated arch CMP

Geometry

Diameter: N/A
Width: 5'
Height: 3'
Length: 45'
Skew: none
Headwall
U/S: none
D/S: "
Wingwalls
U/S: none
D/S: "

Setting

XSEC Location:
Erosion Protection
U/S: none
D/S: some scattered concrete rubble on both banks
Channel Configuration
U/S: straight, ~3-4' wide, 15' top width
D/S: " " " "

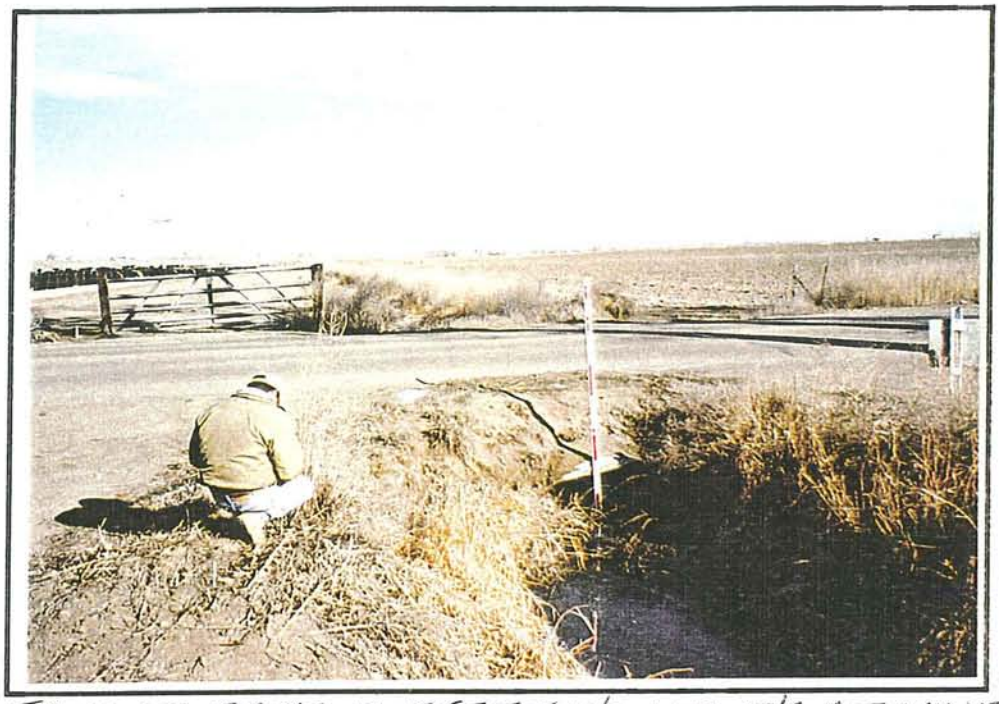
Condition

Structure Material: corrugated metal, poor (partially crushed)
Scour/Deposition
U/S: ~0.5' sed. in culvert
D/S: ~80% blocked w/ debris
Channel Banks
U/S: near vertical (~1:1), V-shaped channel
D/S: " " " " " "
Vegetation
U/S: scattered weeds & grasses along banks
D/S: " " " " "
Debris Potential: high (weeds blocking culvert entrance)
Freeboard/Spill Location: ~3'; along LB, then ~500-1000' along WCR 24

Comments: Culvert ~80% blocked

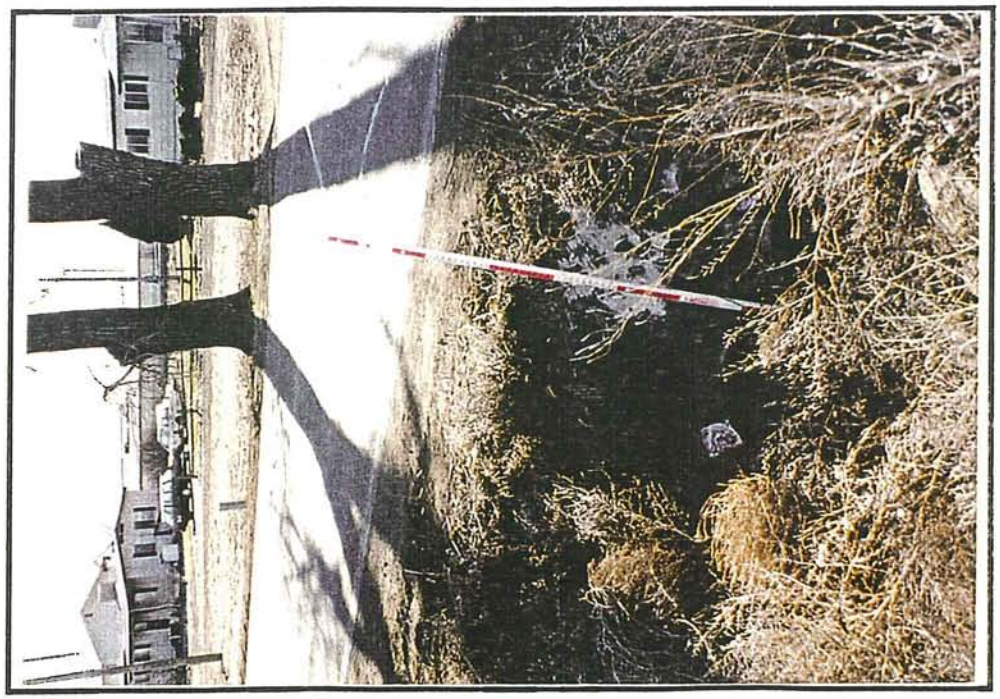
Structure Type: Plated Arch CMP Location: TRI-TOWN WCR 24 Station: _____

Photograph: Roll # 3 Photo # 17



FROM LT. BANK 35 FEET U/S, LKG. D/S AT CULVERT

Photograph: Roll # 3 Photo # 18



FROM LT. BANK 10 FEET D/S, LKG. U/S AT CULVERT

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/29/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Tri-Town Basin
Number:
Location: WCR22
Type: Plated arch CMP

Geometry
Diameter: N/A
Width: 5'
Height: 3'
Length: 45'
Skew: none
Headwall
U/S: none
D/S: "
Wingwalls
U/S: none
D/S: "

Setting
XSEC Location:
Erosion Protection
U/S: none
D/S: some riprap (~24") around outlet
Channel Configuration
U/S: straight swale through open field (no defined channel)
D/S: slightly incised (~2'), 2' wide channel

Condition
Structure Material: corrugated metal, good
Scour/Deposition
U/S: slight dep. in culvert (0.1-0.2')
D/S: riprap around outlet (~50% blocked)
Channel Banks
U/S: flat (20-30:1), some roadside drainage
D/S: " " " , open field overbank
Vegetation
U/S: thick weeds & brush immed. u/s, then open grassland
D/S: " " " " d/s, " " "
Debris Potential: high (some weeds blocking culvert entrance)
Freeboard/Spill Location: 2'; @ culvert crossing above culvert crest
Comments: Typical culvert crossing on county roads

Structure Type: 1-3'x5' Plated Arch CMP Location: TRI-TOWN WCR 22 Station: _____

Photograph: Roll # 3 Photo # 19

FROM LEFT BANK 10' U/S, L KG. D/S AT CULVERT

Photograph: Roll # 3 Photo # 20

FROM MIDDLE CHANNEL 10' D/S, LKG. AT CULVERT

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/29/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: Tri-Town Basin
Number:
Location: WCR 20
Type: Arch CMP

Geometry

Diameter: N/A
Width: ~~2.5'~~ 3.5'
Height: ~~3.5'~~ 2.5'
Length: 40'
Skew: none
Headwall
U/S: none
D/S: "
Wingwalls
U/S: none
D/S: "

Setting

XSEC Location:
Erosion Protection
U/S: none
D/S: "
Channel Configuration
U/S: no defined channel, (cattails)
D/S: more incised (~1'), sand/gravel bed, ~4-5' wide, sharp bend to right further dls

Condition

Structure Material: corrugated metal, good
Scour/Deposition
U/S: drop, u/s of culvert; lip of culvert bent up ~0.5'
D/S: ~3' of drop from culvert invert to channel invert (culvert perched)
Channel Banks
U/S: flat overbank areas (golf course on both sides)
D/S: steep LB further dls (1.5:1), flatter right overbank (10:1)
Vegetation
U/S: thick w/ cattails in channel area
D/S: thick weeds & grasses
Debris Potential: high (cattails)
Freeboard/Spill Location: ~1'; @ culvert above culvert crest

Comments: Golf course u/s, development d/s
Typical county road culvert crossing

Structure Type: Arch CMP Location: TRI-TOWN WCR 20 Station: _____

Photograph: Roll # 3 Photo # 21

FROM LB 20 FEET, LKG. D/S AT CULVERT

Photograph: Roll # 3 Photo # 22

FROM LB 40 FEET, LKG. U/S AT CULVERT

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 3/31/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: Tri Town
Number:
Location: Milavec Lake Rec. Parking
Type: Arch CMP

Geometry

Diameter: —
Width: 6'
Height: 4'
Length: 30'
Skew: —
Headwall
U/S: none
D/S: "
Wingwalls
U/S: none
D/S: "

Setting

XSEC Location: —
Erosion Protection
U/S: none
D/S: "
Channel Configuration
U/S: slightly sinuous, 6' bottom width
D/S: straight, 5' " "

Condition

Structure Material: corrugated metal, good condition
Scour/Deposition
U/S: none
D/S: "
Channel Banks
U/S: 1.5:1 (8' deep when flowing full)
D/S: 1.5:1
Vegetation
U/S: scattered trees
D/S: " " , weeds
Debris Potential: moderate (weeds)
Freeboard/Spill Location: along LB ~20' u/s; 4' from crown to spill elev.

Comments: new bridge may be placed here, replacing culvert

Structure Type: 4' x 6' ARCH CMP Location: TRI-TOWN WKR 18½ 13 MILAVEC LAKE REC. PARKING Station: _____

Photograph: Roll # 5 Photo # 22A

FROM LB Approx. 45 feet D/S, LKG. U/S at Culvert

Photograph: Roll # 5 Photo # 23A

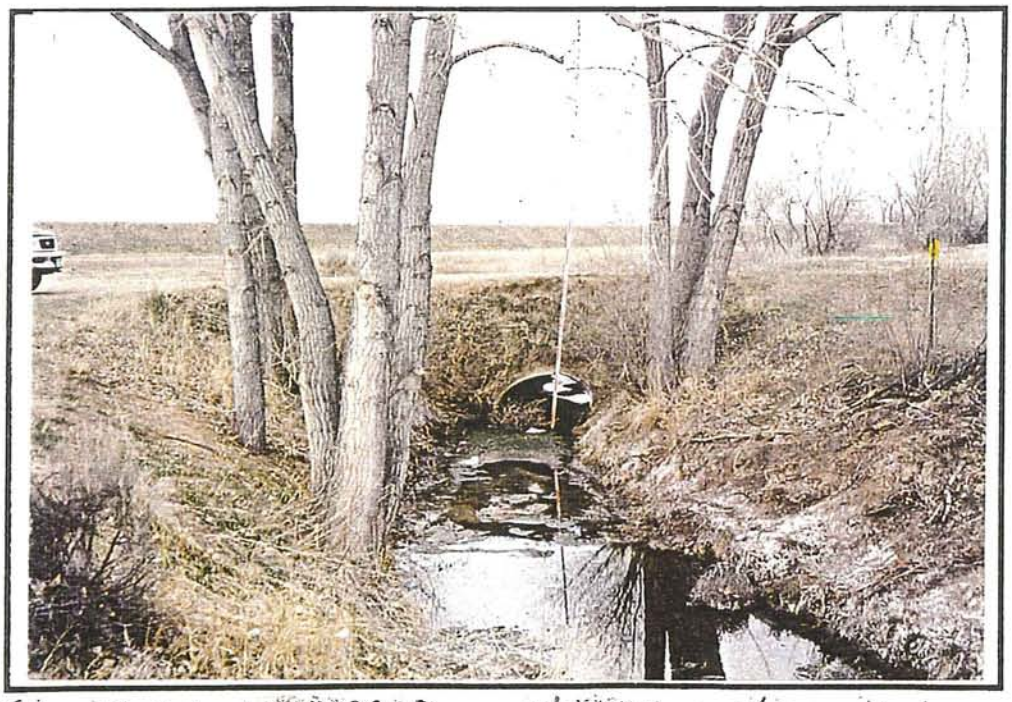
FROM Center Line Road, LKG. D/S at Channel.

Structure Type: 4'x6' Arch CMP Location: TRI-TOWN UCR 18½ @ MILAVEC LAKE REC. PARKING Station: _____

Photograph: Roll # ~~6~~ 5 Photo # ~~1~~ 24A

From LB at Centerline of road, LKG, U/S at Channel

Photograph: Roll # 6 Photo # 2



From LB Approx. 90 feet U/S, LKG D/S at Culvert.

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/29/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: Tri-Town
Number:
Location: WCR 13 (outfall to sewage treatment plant)
Type: CMP

Geometry

Diameter: 3'
Width: N/A
Height: N/A
Length:
Skew: none
Headwall
U/S: none
D/S: "
Wingwalls
U/S: none
D/S: "

Setting

XSEC Location:
Erosion Protection
U/S: none
D/S: "
Channel Configuration
U/S: slightly sinuous, wetlands
D/S: " / " , flat silty-clayey area

Condition

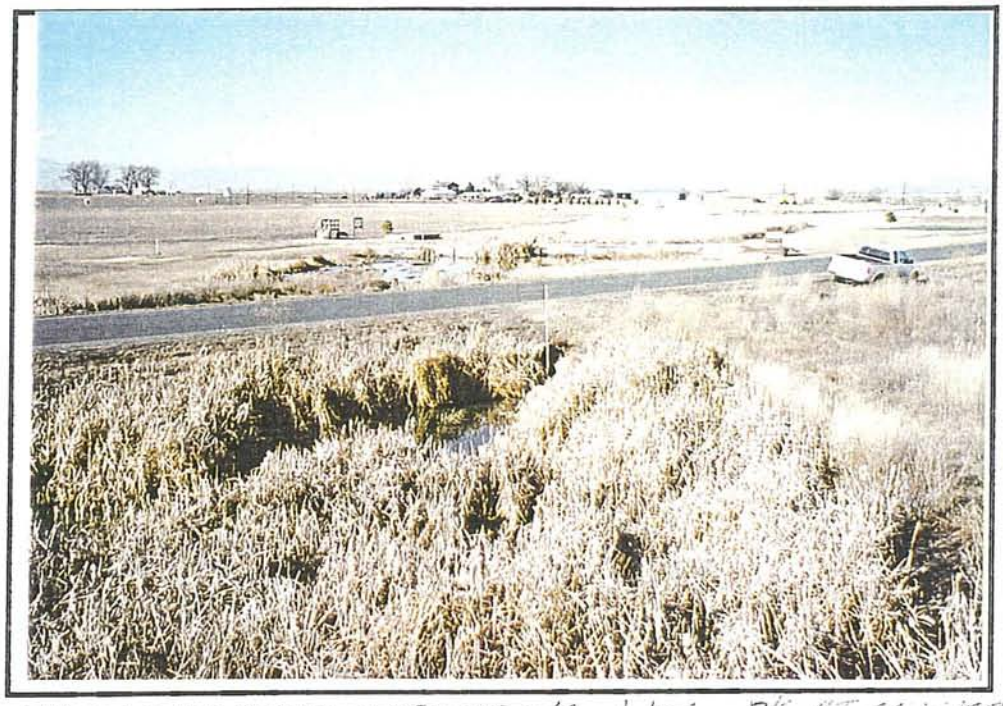
Structure Material: corrugated metal, good
Scour/Deposition
U/S: none
D/S: "
Channel Banks
U/S: flat
D/S: " (golf course)
Vegetation
U/S: thick cattails in channel, some weeds in overbank
D/S: " " further dls, some weeds
Debris Potential: moderate
Freeboard/Spill Location: ~4'; @ culvert crossing

Comments: Culvert looks new, drains ~1.25 mi^2
Some roadside drainage coming from LB

TRI-TOWN BASIN

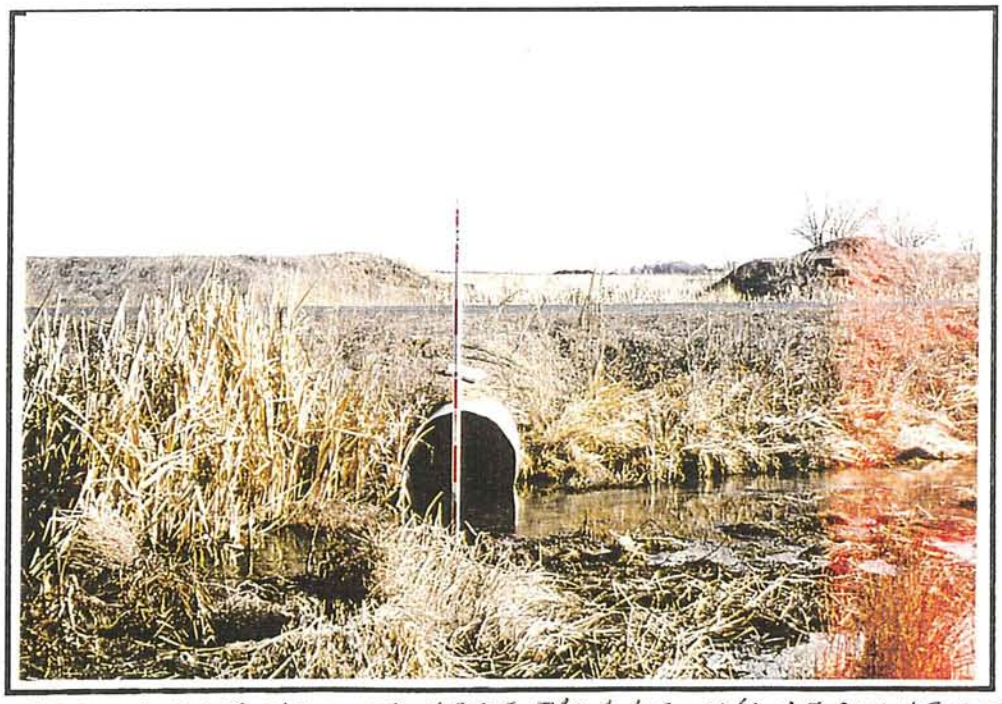
Structure Type: 36" CMP Location: Sanitary Outfall AT WCR 13 Station: _____

Photograph: Roll # 3 Photo # 23



FROM LEFT BANK 90 FEET U/S, LKG. D/S AT CULVERT AND WCR 13

Photograph: Roll # 3 Photo # 24



FROM LEFT BANK 50 FEET D/S, LKG. U/S AT CULVERT (MSD CHANNEL)

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/29/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Tri-Town (Tri-area drainage way)
Number:
Location: WCR18
Type: Clear span bridge (metal girder spans, wooden timber wing walls)

Geometry
Diameter: N/A
Width: 17.5'
Height: 6'
Length: 30'
Skew: none
Headwall
U/S: none
D/S: "
Wingwalls
U/S: 45° flared
D/S: " "

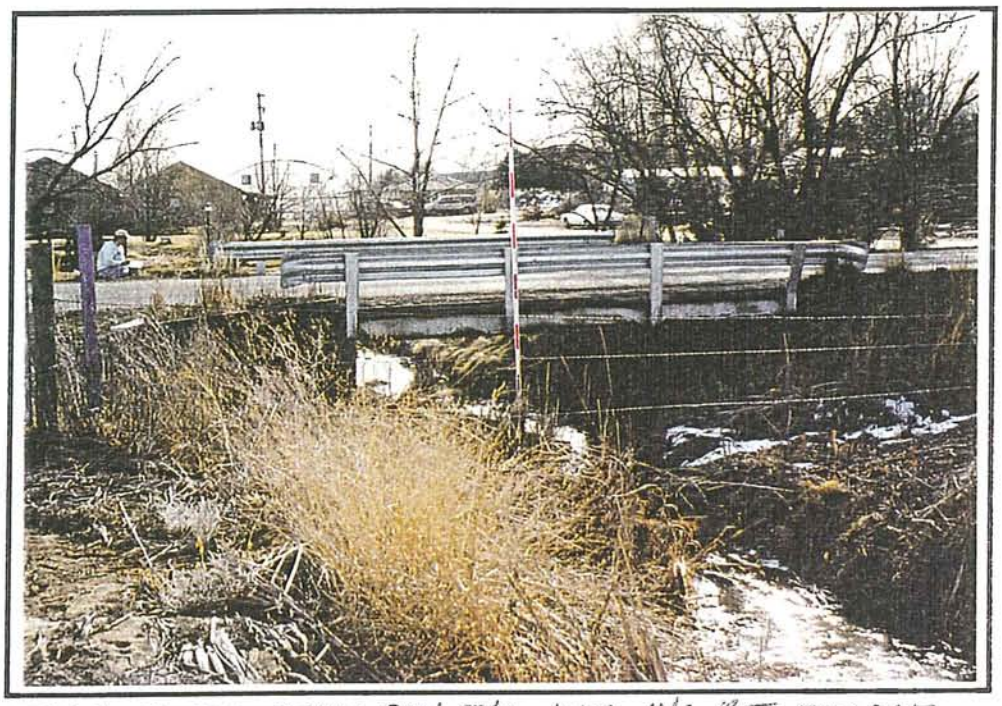
Setting
XSEC Location:
Erosion Protection
U/S: none
D/S: "
Channel Configuration
U/S: bends to right ~200' u/s, 5' bottom width, ~15' top width
D/S: straight, incised 2-3', ~5' " " , " " "

Condition
Structure Material: metal/wood, good
Scour/Deposition
U/S: none } some dep. through bridge opening (~1-2')
D/S: "
Channel Banks
U/S: ~4.5' high, ~1:1, flat overbank;
D/S: ~10-12' high, ~1.5-2:1
Vegetation
U/S: scattered grasses & weeds on banks, silty-clayey bed
D/S: thick weeds, cattails, silty-clayey bed
Debris Potential: low (structure clear)
Freeboard/Spill Location: ~2' (bottom of rail to top of road); @ bridge

Comments:

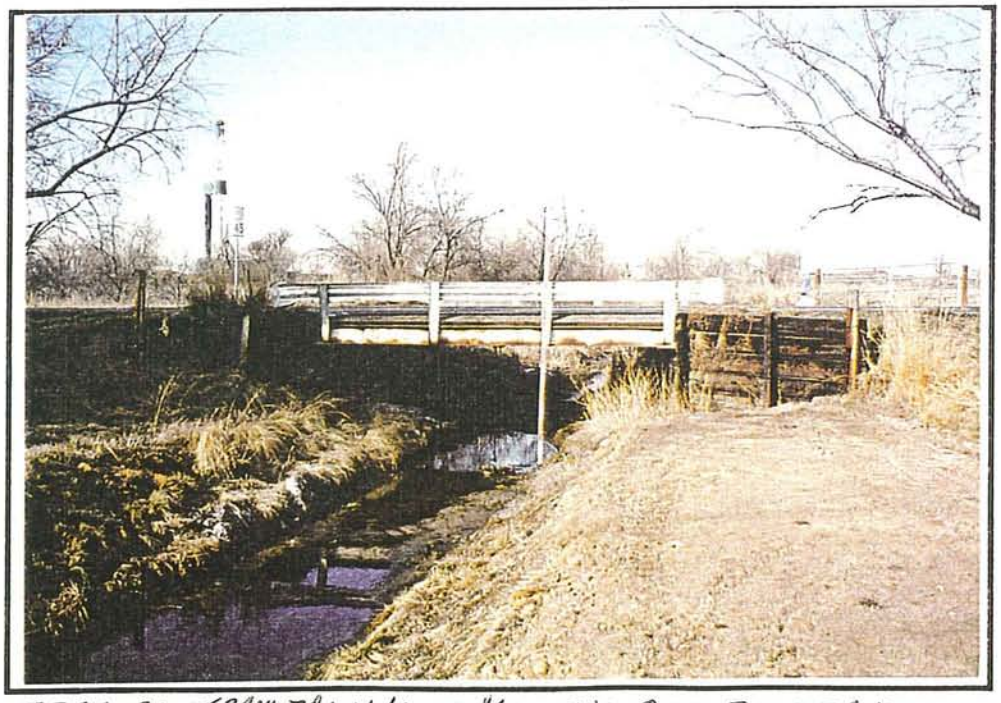
Structure Type: BRIDGE Location: TRI-AREA DRAINAGE WAY AT WCR 18 (GRANT AVE.) TRI-TOWN BASIN Station:

Photograph: Roll # 4 (3) Photo # 1 (25)



FROM RIGHT BANK 90' D/S, LKG. U/S AT BRIDGE

Photograph: Roll # 4 Photo # 2



FROM RIGHT BANK 70' U/S, LKG. D/S AT BRIDGE

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/29/99
Task: ACE Project No.: CO-WELD-01

Structure Identification
Name: Tri-town (Tri-area drainage way)
Number:
Location: WCR13
Type: Clear span bridge (steel I-beam cross members, concrete abutments)

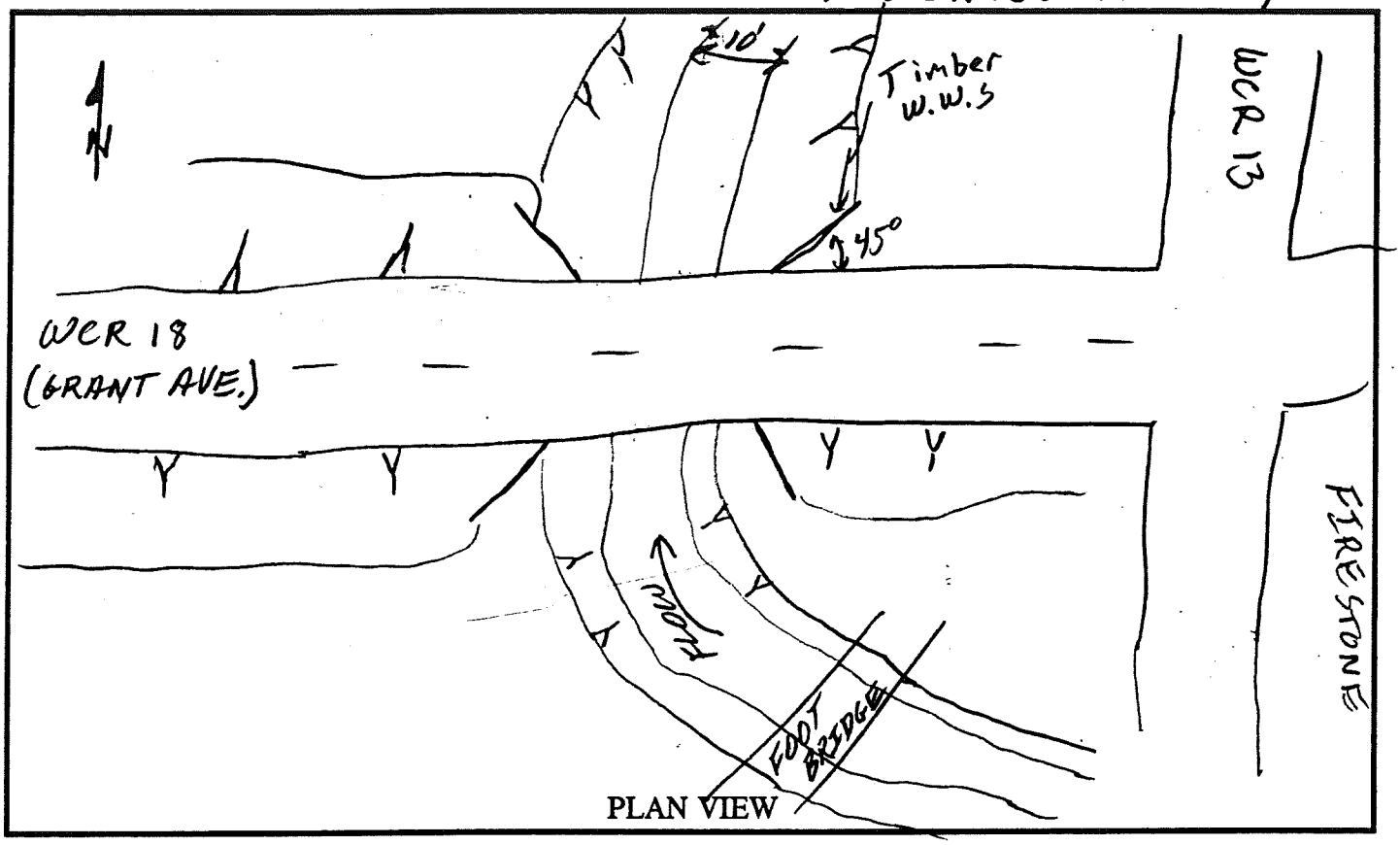
Geometry
Diameter: N/A
Width: 51'
Height: 6'
Length: 40'
Skew: ~45° from left to right (high flow)
Headwall
U/S: none
D/S: "
Wingwalls
U/S: 45° (~6-8' long)
D/S: none

Setting
XSEC Location:
Erosion Protection
U/S: none
D/S: "
Channel Configuration
U/S: bends sharply to the left, wide, flat bottom (~10')
D/S: " gradually to the right, narrower bottom (~6-8')

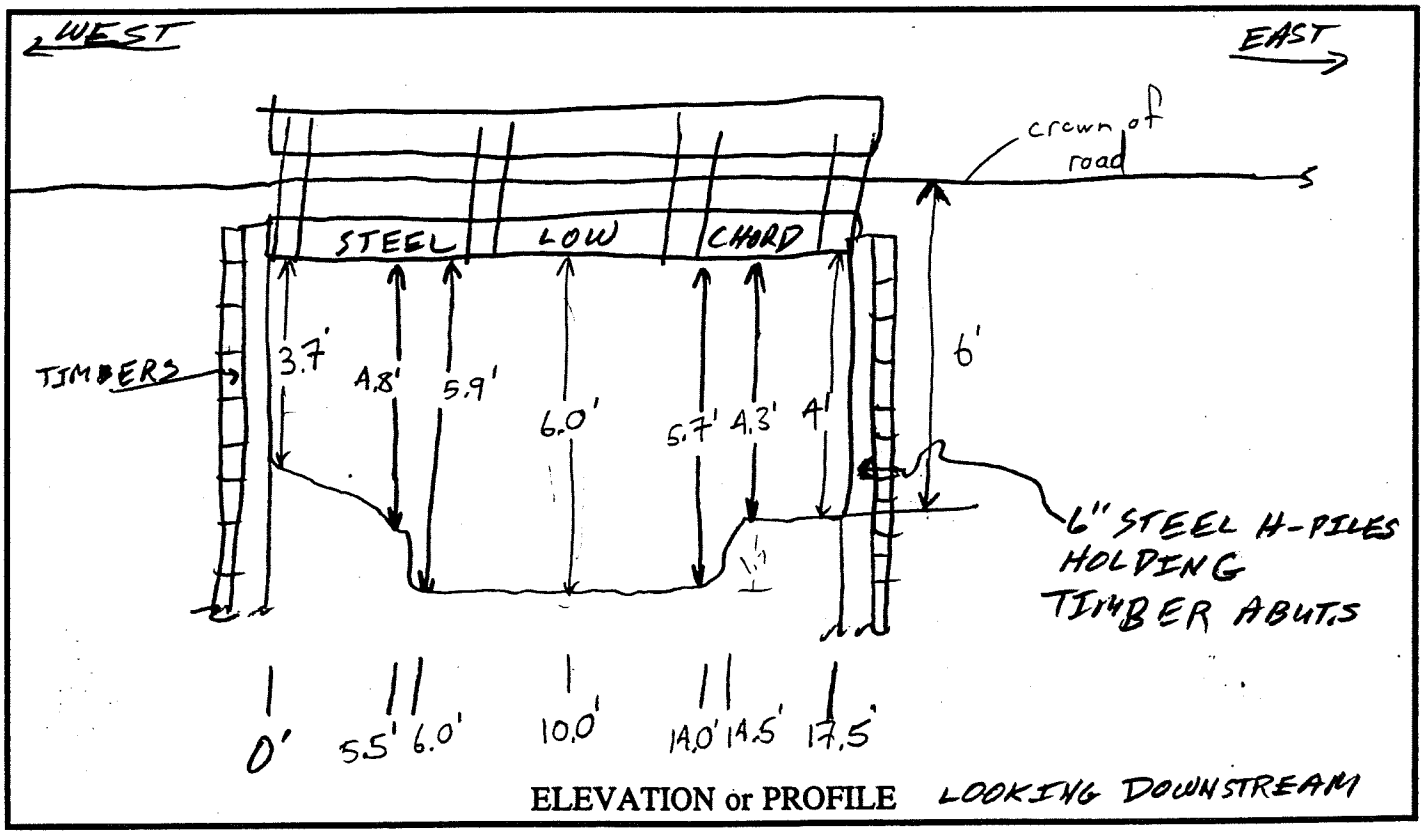
Condition
Structure Material: metal, good
Scour/Deposition
U/S: ~3' of dep. along left bank through bridge opening
D/S:
Channel Banks
U/S: steep (1:1), ~10-15' high
D/S: " " , " " "
Vegetation
U/S: scattered grass & weeds
D/S: " " " , some cattails
Debris Potential: moderate (weeds)
Freeboard/Spill Location: ~4'; @ bridge

Comments: Drainage captures flows from Tri-Towns- Frederick, Firestone, Dacono

Structure Type: BRIDGE Location: TRI-TOWN BASIN TRI-AREA DRAINAGEWAY AT WCR 18 (GRANT AVE.) Station:



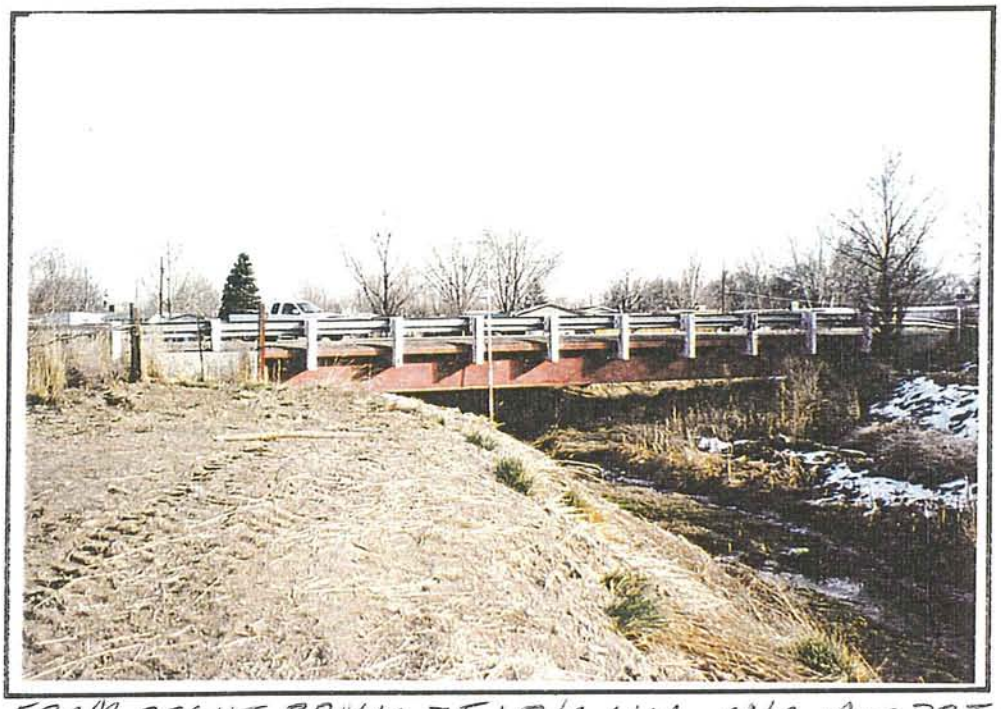
PLAN VIEW



ELEVATION or PROFILE LOOKING DOWNSTREAM

Structure Type: BRIDGE Location: TRI-TOWN BASIN TRI-AREA DRAINAGE WAY AT WCR 13 Station: _____

Photograph: Roll # 4 Photo # 3



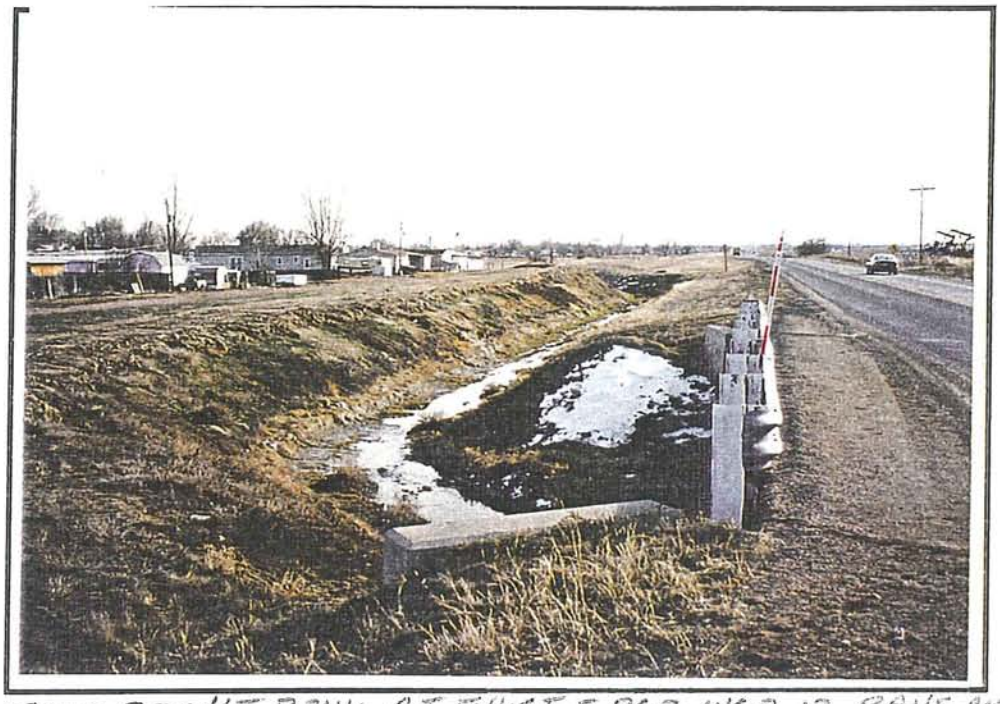
FROM RIGHT BANK 75' D/S, LKG. U/S AT BRIDGE

Photograph: Roll # 4 Photo # 4

FROM RIGHT BANK 110' U/S, LKG. D/S AT BRIDGE

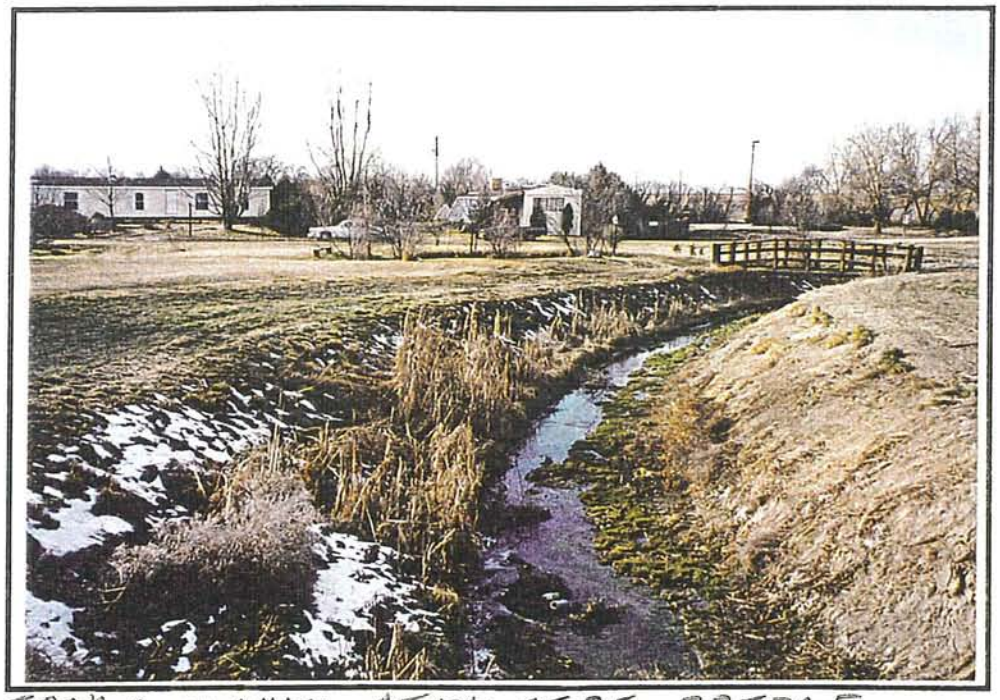
Structure Type: BRIDGE Location: TRI-TOWN BASIN TRI-CREEK DRAINAGE WAY AT WCR 13 Station: _____

Photograph: Roll # 4 Photo # 5



FROM RIGHT BANK AT EAST EDGE WCR 13 PAVEMENT, LKG. SOUTH-EAST AND U/S DRAINAGE WAY.

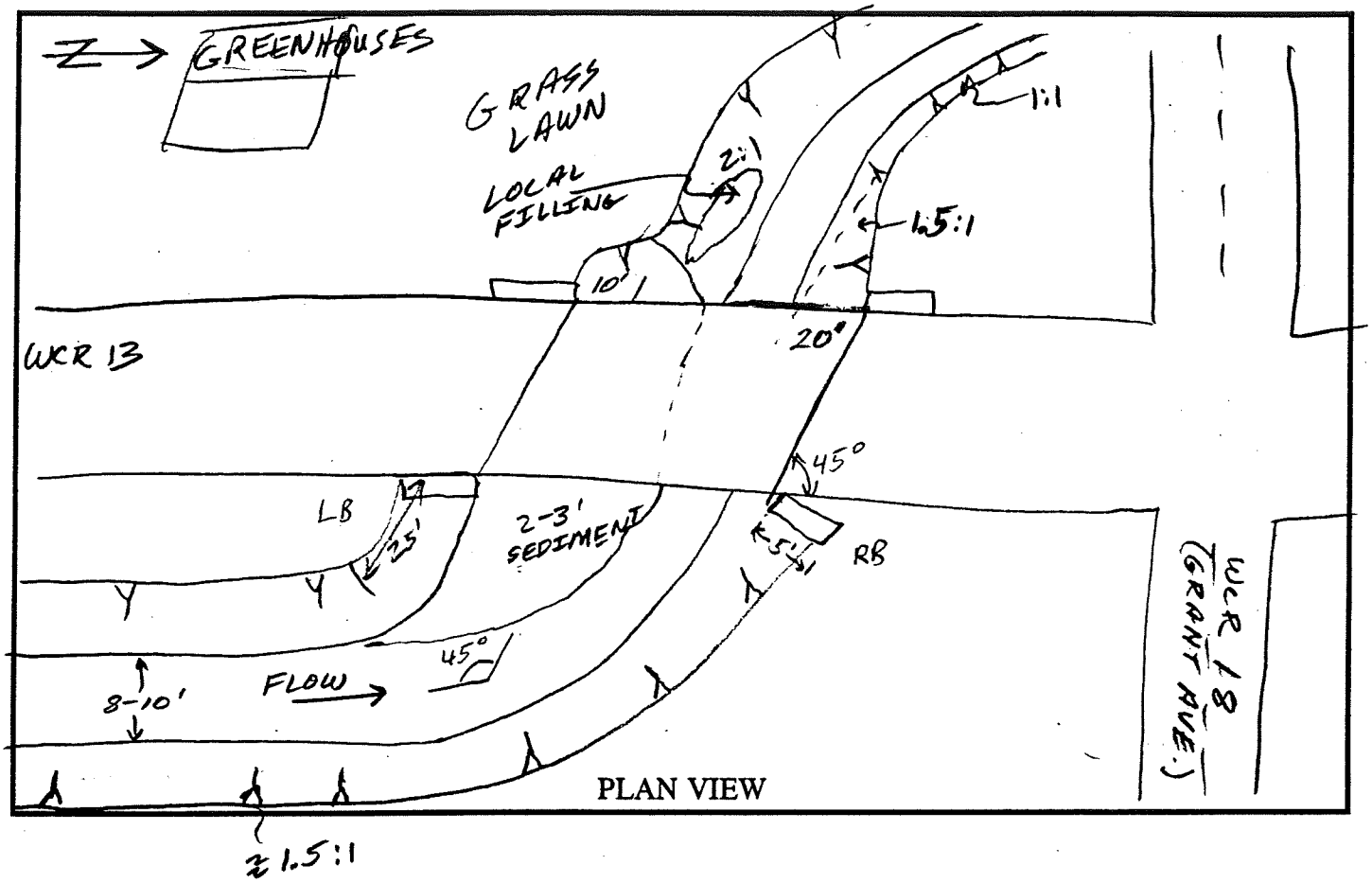
Photograph: Roll # 4 Photo # 6



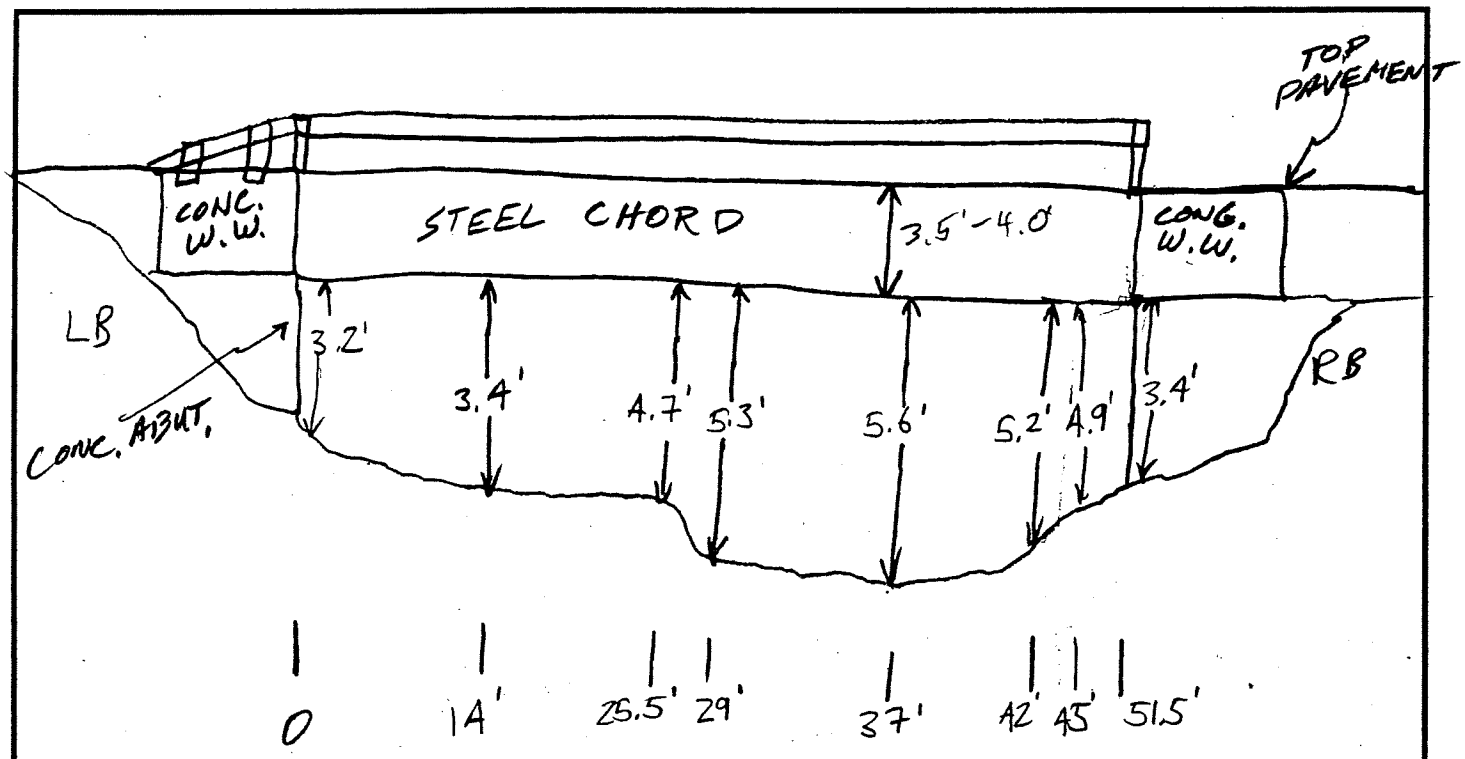
FROM ℄ CHANNEL AT D/S SIDE BRIDGE, LKG. DNE WEST & D/S.

TRI-TOWN BASIN

Structure Type: BRIDGE Location: TRI-AREA DRAINAGE WAY AT WCR13 Station:



PLAN VIEW



ELEVATION or PROFILE LOOKING DOWNSTREAM

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 1/29/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: Tri-Town
Number:
Location: WCR16
Type: RCB and 36" ADS pipe on Right bank
→ possible drainage from Frederick

Geometry

Diameter: N/A
Width: 10'
Height: 6'
Length: 95'
Skew: none
Headwall
U/S: none
D/S: none
Wingwalls
U/S: none
D/S: none

Setting

XSEC Location:
Erosion Protection
U/S: riprap (~12") on lower half of both banks around inlet
D/S: riprap (~12") on lower half of both banks " outlet
Channel Configuration
U/S: straight, ~10' bottom width, ~40-50' top width
D/S: straight, ~15' bottom width, ~40-50' top width

Condition

Structure Material: concrete, good
Scour/Deposition
U/S: ~0.5-1.0' of sed. in culvert, tumbleweeds partially (~50%) blocking inlet
D/S: ~0.5-1.0' of sed. in culvert, thick weeds @ outlet
Channel Banks
U/S: ~1:1 on LB, ~2:1 on RB
D/S: ~2:1, high (15-20')
Vegetation
U/S: scattered weeds on LB, RB clear
D/S: scattered weeds on banks
Debris Potential: moderate (some weeds in culvert)
Freeboard/Spill Location: 14", along RB ~50' u/s under wooden fence

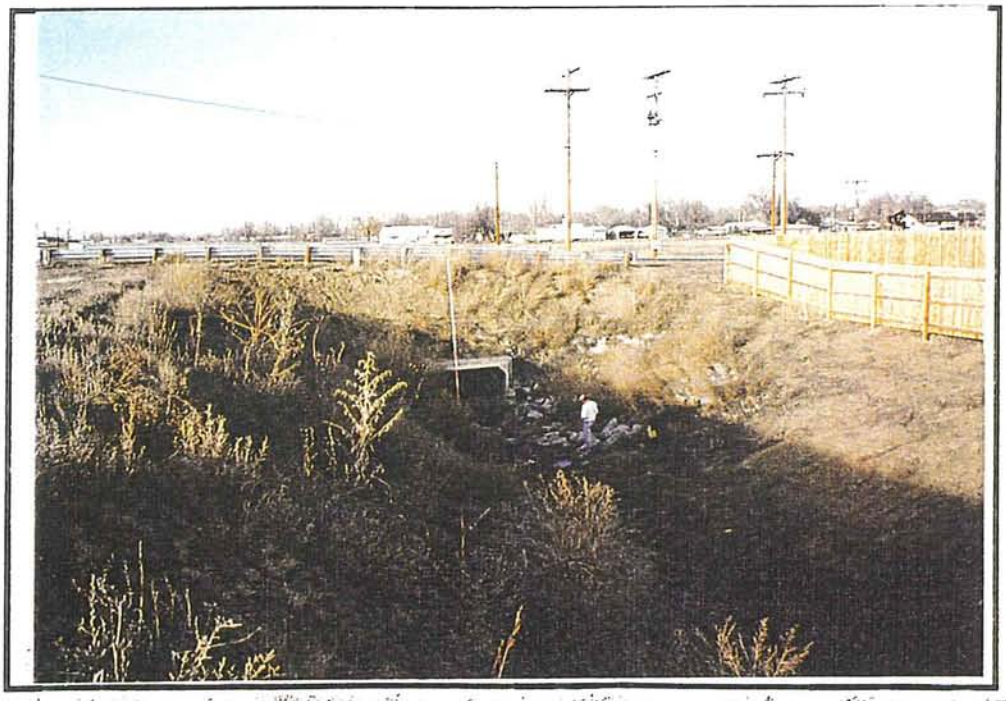
Comments: See sketch on back of culvert XS face

Structure Type: 1- 6' x 10' RCB (Pre-Cast) 1- 36" ADS AT D/S SIDE Location: TRI-TOWN BASIN TRI-AREA DRAINAGE WAY AT WCR 16 Station: _____

Photograph: Roll # 4 Photo # 7

FROM LEFT BANK 90 FEET D/S, LKG. U/S AT CULVERTS

Photograph: Roll # 4 Photo # 8



FROM LEFT BANK 120 FEET U/S, LKG. D/S AT CULVERT

Structure Type: 1-6' x 10' RCB Location: TRI-TOWN BASIN WCR 16 TRI-AREA DRAINAGE WAY Station:

Photograph: Roll # 5 Photo # 2DA

FROM D/S EDGE PAVEMENT WCR 16, LKG D/S ALONG DRAINAGE WAY

Photograph: Roll # 5 Photo # 21A

FROM U/S EDGE PAVEMENT, LKG U/S ALONG DRAINAGE WAY

STRUCTURE INVENTORY FORM

Project Name: Weld County I-25 MDP Date: 2/3/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: Tri-Town Basin
Number:
Location: Corner of Eighth St. and Main St in Frederick (SW corner of town)
Type: RCB (1979)

Geometry

Diameter: N/A
Width: 8'
Height: 6' (0.5' 45° bevel @ inlet & outlet of culvert on crown)
Length: 50'
Skew: none
Headwall
U/S: none
D/S: "
Wingwalls
U/S: 20° measured from ℄ of channel
D/S: 45° flare on RB, 2 45° flares on LB (see sketch)

Setting

XSEC Location:
Erosion Protection
U/S: concrete rubble, asphalt rubble along banks & in channel
D/S: " " in channel, left bank heavily grouted just dk of apron (see sketch)
Channel Configuration
U/S: straight, narrow bottom width (2-3'), wide top width (25-35')
D/S: " " " " (4-5'), " " " (20-30')

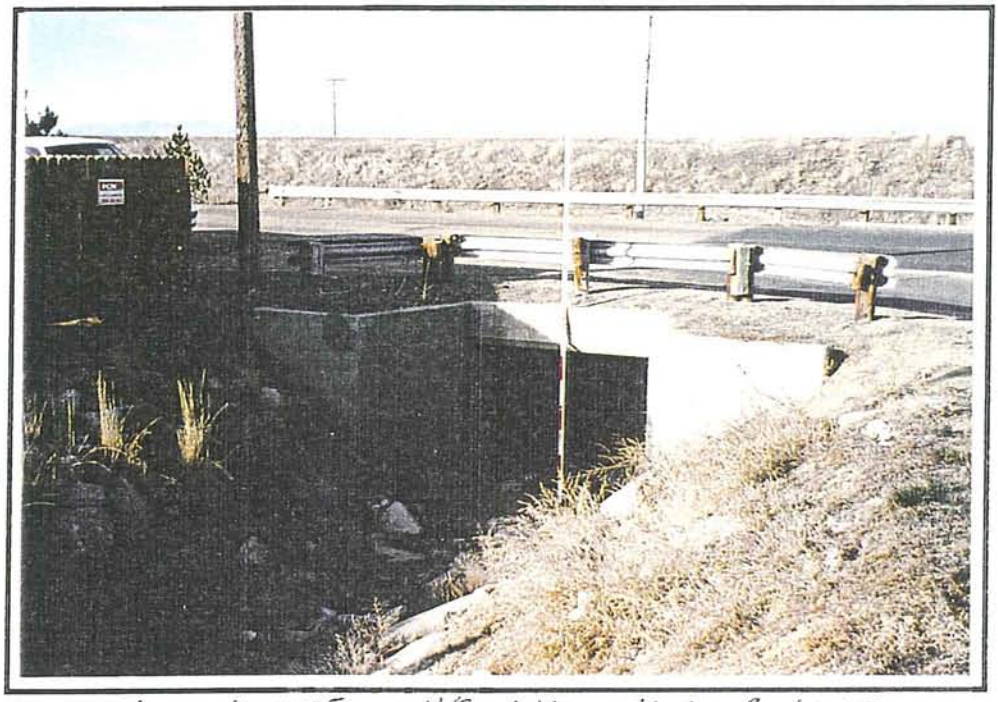
Condition

Structure Material: concrete, good
Scour/Deposition
U/S: none
D/S: "
Channel Banks
U/S: steep (1:1), V-shaped channel (10-15' high banks)
D/S: " " " " " " "
Vegetation
U/S: scattered grasses and weeds
D/S: " " " "
Debris Potential: low-moderate (concrete rubble in culvert)
Freeboard/Spill Location: 3'; @ culvert crossing

Comments:

Structure Type: 1 - 6.0' x 8' RCB Location: TRI-TOWN BASIN TRI-TOWN DRAINAGE WAY AT MAIN STREET Station: _____

Photograph: Roll # 4 Photo # 9



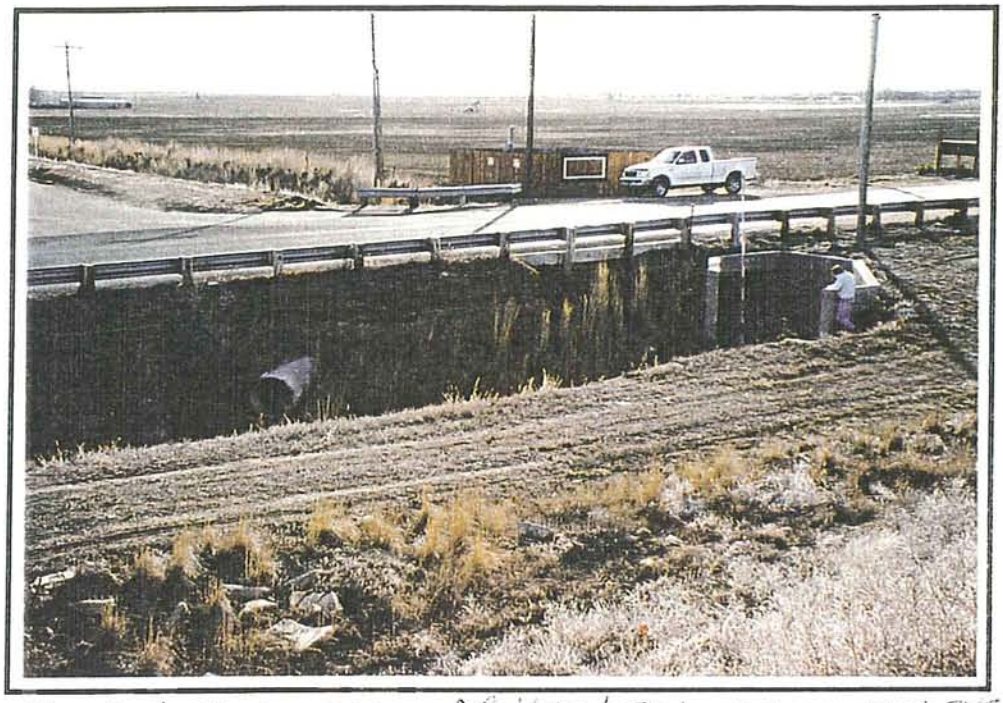
From Right Bank 45 Feet U/S, LKg. D/S At Culvert.

Photograph: Roll # 4 Photo # 10

From Left Bank 25' D/S, LKg. U/S At Culvert

Structure Type: 1- 6.0' x 8' RCB Location: TRI-TOWN BASIN TRI-AREA DRAINAGE WAY AT MAIN STR. Station: _____

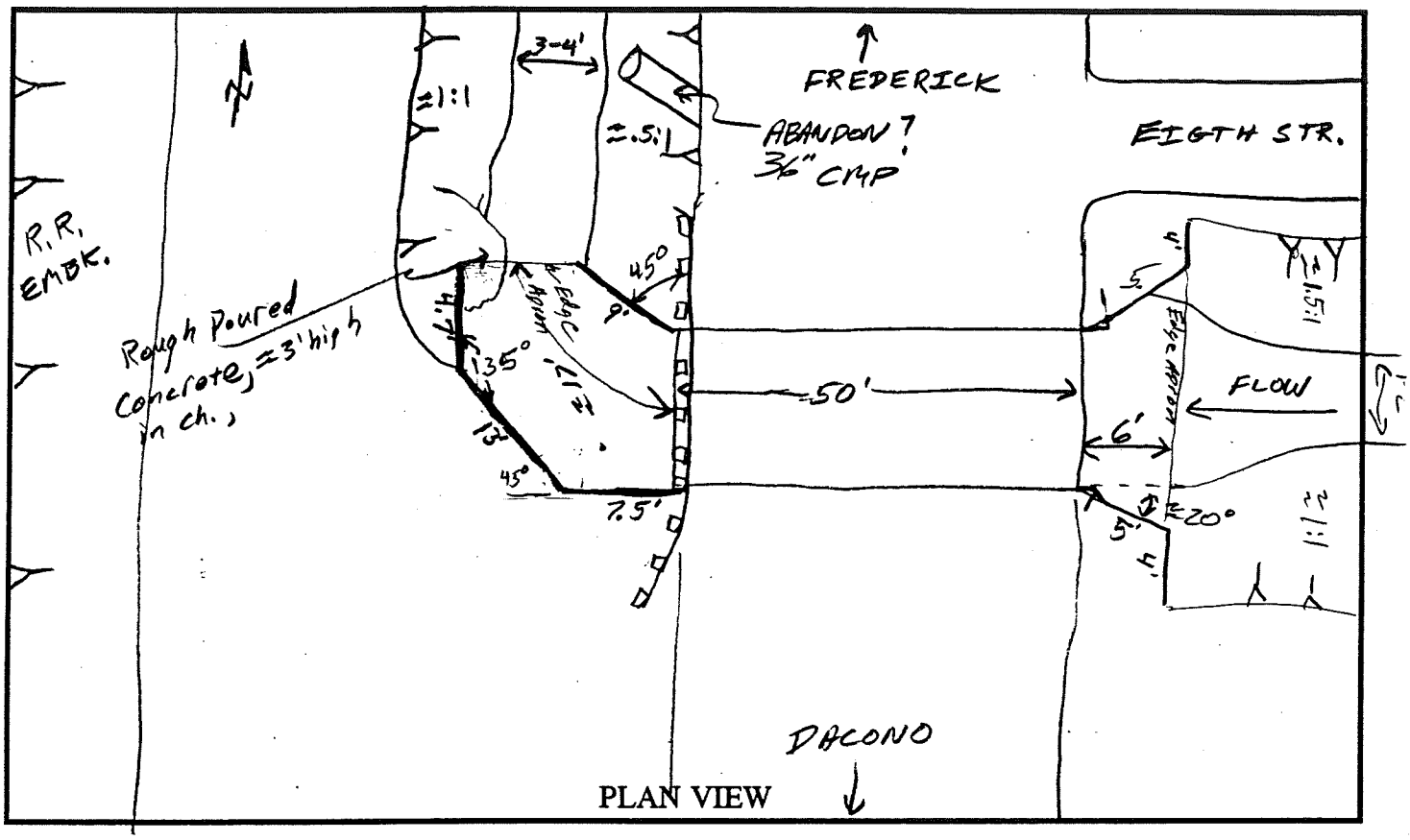
Photograph: Roll # 4 Photo # 11



From Left Bank on top of Railroad Embankment 100' DS, looking upstream at RCB culvert and CMP in Right Bank.

Photograph: Roll # _____ Photo # _____

Structure Type: 1-6.0' x 8' RCB Location: TRI-TOWN BASIN TRI-AREA DRAINAGE WAY MAIN STREET Station:



PLAN VIEW

ELEVATION or PROFILE

STRUCTURE INVENTORY FORM

1/

Project Name: Weld County I-25 MDP Date: 3/31/99
Task: ACE Project No.: CO-WELD-01

Structure Identification

Name: Tri Town
Number:
Location: SH52, Birch, e 8th St. (Dacono)
Type: 4 CMPs

Geometry

Diameter: various diameters (see blue line set)
Width: —
Height: —
Length: see blueline
Skew: —
Headwall
U/S: none
D/S: "
Wingwalls
U/S: none
D/S: "

Setting

XSEC Location: —
Erosion Protection
U/S: concrete around inlets
D/S: none
Channel Configuration
U/S: concrete pan
D/S: flat swale b/t farm fields

Condition

Structure Material: corrugated metal, good condition
Scour/Deposition
U/S: none
D/S: "
Channel Banks
U/S: N/A
D/S: flat
Vegetation
U/S: none
D/S: weeds, fallow
Debris Potential: low
Freeboard/Spill Location: @ culvert crossing

Comments: most overtopping flow will cross SH52

Structure Type: Multiple CMPs Location: TRI-TOWN SHW 52 Station: _____

Photograph: Roll # 5 Photo # 14A

From: Approx. 25 feet U/S of Frontage Rd. (8th Str.) looking D/S @ Culverts under Frontage Rd.

Photograph: Roll # 5 Photo # 15A

From RB on D/S Edge of Frontage Road, LKg D/S @ SHW 52 culverts

Structure Type: Multiple CMPs Location: TRI-TOWN SHW 52 Station: _____

Photograph: Roll # 5 Photo # 16A

From LB @ u/s side of SHW 52, Lkg u/s at Frontage Road Culverts

Photograph: Roll # 5 Photo # 17A

From LB Approx 20' D/S, Lkg. u/s at SHW 52 culverts.

Structure Type: Multiple Culverts Location: TRE-DAW SHW 52 Station: _____

Photograph: Roll # 5 Photo # 18A

From D/S side of SHW 52, Lkg D/S at Channel.

Photograph: Roll # 5 Photo # 19A

From U/S side of SHW 52, Lkg U/S at concrete swale & alley.

I-C

FIELD SURVEY DATA

Note: Data provided by TST, Inc.

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
1795	115936.01	100411.566	4865.756	CL ROAD
1794	115934.808	100447.794	4866.18	CL ROAD
1793	116050.465	97661.576	4847.874	GRND
1792	116047.974	97548.441	4847.642	GRND
1791	117508.576	97211.704	4847.408	GRND
1790	117483.336	97209.093	4849.276	TOP DITCH
1789	116909.651	97208.93	4849.671	TOP DITCH
1788	116425.097	97210.158	4851.354	TOP DITCH
1787	116019.49	97210.331	4851.947	TOP DITCH
1786	115904.264	97497.039	4848.603	GROUND
1785	115940.873	97654.658	4848.884	GROUND
1783	115477.58	97589.171	4855.861	CL ROAD
1782	115516.836	97589.422	4855.277	CL ROAD
1781	115556.679	97589.581	4854.761	CL ROAD
1780	115635.238	97589.731	4854.054	CL ROAD
1779	115673.529	97590.034	4853.775	CL ROAD
1778	115710.807	97590.036	4853.497	CL ROAD
1777	115746.88	97589.944	4853.309	CL ROAD
1776	115781.701	97589.914	4853.172	CL ROAD
1775	115846.626	97589.741	4852.914	CL ROAD
1774	115876.518	97589.714	4852.742	CL ROAD
1773	115904.687	97589.419	4852.668	CL ROAD
1772	115930.685	97588.9	4852.442	CL ROAD
1771	115975.553	97588.498	4852.001	CL ROAD
1770	116009.671	97588.433	4851.386	CL ROAD
1769	116043.574	97588.429	4851.153	CL ROAD
1768	116083.97	97588.458	4850.824	CL ROAD
1767	116109.905	97588.365	4850.631	CL ROAD
1766	116140.101	97588.276	4850.464	CL ROAD
1765	116175.254	97588.412	4850.104	CL ROAD
1764	116212.847	97588.563	4849.674	CL ROAD
1763	116251.331	97588.434	4849.323	CL ROAD
1762	116290.504	97588.205	4848.923	CL ROAD
1761	116330.4	97588.137	4848.507	CL ROAD
1760	116370.883	97588.063	4848.119	CL ROAD
1759	116411.806	97588.145	4847.729	CL ROAD
1758	116452.734	97588.255	4847.398	CL ROAD
1757	116493.498	97588.753	4847.22	CL ROAD
1756	116534.168	97588.982	4846.984	CL ROAD
1755	116616.087	97589.436	4846.831	CL ROAD
1754	116657.418	97589.395	4846.75	CL ROAD
1753	116698.945	97589.294	4846.556	CL ROAD
1752	116740.645	97589.343	4846.545	CL ROAD
1751	116782.216	97589.153	4846.531	CL ROAD
1750	116823.51	97588.999	4846.479	CL ROAD
1749	116864.611	97589.072	4846.379	CL ROAD
1748	116905.854	97589.221	4846.3	CL ROAD
1747	116947.109	97589.358	4846.204	CL ROAD
1746	116988.137	97589.365	4846.144	CL ROAD
1745	117028.722	97589.403	4846.143	CL ROAD

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
1744	117068.956	97589.337	4846.147	CL ROAD
1743	117108.878	97589.28	4846.149	CL ROAD
1742	117148.531	97589.299	4846.199	CL ROAD
1741	117187.889	97589.276	4846.305	CL ROAD
1740	117227.296	97589.236	4846.405	CL ROAD
1739	117266.571	97589.101	4846.482	CL ROAD
1738	117305.308	97589.006	4846.556	CL ROAD
1737	117343.586	97588.922	4846.689	CL ROAD
1736	117381.392	97589.069	4846.786	CL ROAD
1735	117418.852	97589.181	4846.746	CL ROAD
1734	117456.544	97589.216	4846.707	CL ROAD
1733	117494.681	97589.244	4846.655	CL ROAD
1732	117533.302	97589.415	4846.591	CL ROAD
1731	117572.413	97589.521	4846.54	CL ROAD
1730	117612.006	97589.574	4846.369	CL ROAD
1729	117652.105	97589.685	4846.227	CL ROAD
1728	117692.678	97589.739	4846.012	CL ROAD
1727	117733.514	97589.798	4845.855	CL ROAD
1726	117774.199	97589.943	4845.767	CL ROAD
1725	117814.559	97590.18	4845.664	CL ROAD
1724	117854.56	97590.32	4845.491	CL ROAD
1723	117894.238	97590.652	4845.321	CL ROAD
1722	117933.531	97590.924	4845.088	CL ROAD
1721	117972.384	97591.035	4844.998	CL ROAD
1720	118010.712	97591.074	4844.823	CL ROAD
1719	118048.469	97591.208	4844.696	CL ROAD
1718	118085.627	97591.237	4844.513	CL ROAD
1717	118122.148	97591.295	4844.345	CL ROAD
1716	118158.08	97591.335	4844.162	CL ROAD
1715	118193.401	97591.474	4843.93	CL ROAD
1714	118228.073	97591.604	4843.65	CL ROAD
1713	118262.238	97591.578	4843.406	CL ROAD
1712	118296.084	97591.411	4843.181	CL ROAD
1711	118329.891	97591.534	4842.88	CL ROAD
1710	118363.58	97591.587	4842.682	CL ROAD
1709	118397.006	97591.613	4842.55	CL ROAD
1708	118430.469	97591.646	4842.392	CL ROAD
1707	118463.573	97591.683	4842.23	CL ROAD
1706	118495.706	97591.836	4841.966	CL ROAD
1705	118526.746	97592.05	4841.622	CL ROAD
1704	118556.516	97592.183	4841.238	CL ROAD
1703	118584.909	97591.986	4840.948	CL ROAD
1702	118611.678	97591.919	4840.673	CL ROAD
1701	118658.04	97591.638	4840.184	CL ROAD
1700	118695.937	97591.014	4839.598	CL ROAD
1699	118726.614	97590.463	4839.07	CL ROAD
1698	115978.315	97584.393	4851.767	CL ROAD
1697	115975.083	97546.534	4851.44	CL ROAD
1696	115973.165	97519.722	4851.254	CL ROAD
1695	115969.962	97479.411	4850.748	CL ROAD

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
1694	115966.137	97422.016	4850.17	CL ROAD
1693	115964.631	97390.762	4849.856	CL ROAD
1692	115963.404	97358.746	4849.541	CL ROAD
1691	115962.546	97326.048	4849.232	CL ROAD
1690	115962.267	97292.686	4849.014	CL ROAD
1689	115962.402	97258.795	4848.818	CL ROAD
1688	115962.589	97224.562	4848.654	CL ROAD
1687	115962.677	97189.913	4848.494	CL ROAD
1686	115962.605	97154.841	4848.277	CL ROAD
1685	115962.618	97119.636	4848.053	CL ROAD
1684	115962.782	97084.68	4847.802	CL ROAD
1683	115962.903	97049.994	4847.599	CL ROAD
1682	115962.976	97015.18	4847.371	CL ROAD
1681	115963.212	96980.179	4847.256	CL ROAD
1680	115963.482	96944.976	4847.124	CL ROAD
1679	115963.654	96909.662	4847.055	CL ROAD
1678	115963.727	96874.357	4846.967	CL ROAD
1677	115963.902	96839.453	4846.778	CL ROAD
1676	115963.966	96805.225	4846.713	CL ROAD
1675	115964.116	96771.786	4846.631	CL ROAD
1674	115964.406	96739.293	4846.551	CL ROAD
1673	115964.646	96707.745	4846.493	CL ROAD
1672	115964.792	96677.294	4846.443	CL ROAD
1671	115964.891	96648.081	4846.411	CL ROAD
1670	115964.857	96620.58	4846.431	CL ROAD
1669	115964.871	96595.408	4846.386	CL ROAD
1668	115964.895	96552.915	4846.369	CL ROAD
1667	115964.848	96525.174	4846.282	CL ROAD
1666	115964.757	96497.396	4846.126	CL ROAD
1665	115963.893	96235.601	4845.307	CL ROAD
1664	115963.903	96199.1	4845.048	CL ROAD
1663	115963.798	96162.723	4844.961	CL ROAD
1662	115963.748	96126.573	4844.811	CL ROAD
1661	115963.607	96090.631	4844.781	CL ROAD
1660	115963.55	96054.994	4844.87	CL ROAD
1659	115963.478	96019.674	4844.908	CL ROAD
1658	115963.143	95984.701	4844.846	CL ROAD
1657	115962.837	95949.966	4844.898	CL ROAD
1656	115962.636	95915.378	4844.788	CL ROAD
1655	115962.58	95880.487	4844.587	CL ROAD
1654	115962.443	95845.382	4844.531	CL ROAD
1653	115962.261	95810.146	4844.416	CL ROAD
1652	115962.14	95775.092	4844.406	CL ROAD
1651	115961.911	95740.306	4844.399	CL ROAD
1650	115961.572	95705.916	4844.369	CL ROAD
1649	115961.337	95671.742	4844.361	CL ROAD
1648	115961.358	95637.831	4844.355	CL ROAD
1647	115961.218	95604.29	4844.227	CL ROAD
1646	115961.022	95571.061	4844.239	CL ROAD
1645	115960.836	95538.239	4844.372	CL ROAD

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
1644	115960.705	95505.891	4844.427	CL ROAD
1643	115960.649	95474.052	4844.532	CL ROAD
1642	115960.749	95442.725	4844.622	CL ROAD
1641	115960.712	95411.838	4844.68	CL ROAD
1640	115960.647	95381.394	4844.629	CL ROAD
1639	115960.579	95351.323	4844.645	CL ROAD
1638	115960.417	95321.629	4844.629	CL ROAD
1637	115960.423	95292.298	4844.67	CL ROAD
1636	115960.36	95262.943	4844.776	CL ROAD
1635	115959.96	95233.526	4844.867	CL ROAD
1634	115959.8	95204.143	4844.836	CL ROAD
1633	115959.778	95174.646	4844.8	CL ROAD
1632	115959.669	95145.455	4844.902	CL ROAD
1631	115959.579	95116.871	4844.947	CL ROAD
1630	115959.611	95088.997	4845.01	CL ROAD
1629	115959.722	95061.928	4845.144	CL ROAD
1628	115959.715	95035.103	4845.351	CL ROAD
1627	115959.628	95008.307	4845.638	CL ROAD
1626	115959.65	94981.652	4845.771	CL ROAD
1625	115959.514	94954.984	4845.854	CL ROAD
1624	115959.357	94928.18	4845.931	CL ROAD
1623	115958.956	94901.127	4845.767	CL ROAD
1622	115958.445	94874.487	4845.618	CL ROAD
1621	115958.139	94848.258	4845.467	CL ROAD
1620	115958.056	94822.627	4845.347	CL ROAD
1619	115958.016	94772.683	4845.186	CL ROAD
1618	115958.04	94725.099	4845.163	CL ROAD
1617	115957.941	94682.731	4845.124	CL ROAD
1616	115957.881	94645.439	4845.107	CL ROAD
1615	115998.066	97804.212	4851.616	CL ROAD
1614	116001.073	97836.05	4851.571	CL ROAD
1613	116004.126	97868.353	4851.544	CL ROAD
1612	116007.172	97901.051	4851.547	CL ROAD
1611	116010.078	97934.109	4851.58	CL ROAD
1610	116012.864	97967.621	4851.643	CL ROAD
1609	116015.415	98001.425	4851.705	CL ROAD
1608	116017.352	98035.085	4851.708	CL ROAD
1607	116018.629	98068.155	4851.696	CL ROAD
1606	116019.174	98100.632	4851.652	CL ROAD
1605	116018.41	98164.546	4851.37	CL ROAD
1604	116017.477	98196.67	4851.249	CL ROAD
1603	116016.279	98228.663	4851.127	CL ROAD
1602	116013.633	98293.389	4850.955	CL ROAD
1601	116012.438	98326.317	4850.869	CL ROAD
1600	116009.77	98392.474	4850.824	CL ROAD
1599	116008.47	98424.999	4850.813	CL ROAD
1598	116007.295	98457.099	4850.847	CL ROAD
1597	116006.185	98488.892	4850.856	CL ROAD
1596	116004.936	98520.891	4850.916	CL ROAD
1595	116003.544	98552.499	4850.953	CL ROAD

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
1594	116002.186	98583.528	4851.045	CL ROAD
1593	116000.937	98614.095	4851.119	CL ROAD
1592	115999.831	98644.197	4851.236	CL ROAD
1591	115998.805	98674.113	4851.312	CL ROAD
1590	115997.795	98703.942	4851.357	CL ROAD
1589	115996.729	98733.686	4851.571	CL ROAD
1588	115995.624	98763.362	4851.679	CL ROAD
1587	115994.573	98792.608	4851.816	CL ROAD
1586	115993.52	98822.225	4851.937	CL ROAD
1585	115992.429	98852.095	4852.09	CL ROAD
1584	115990.065	98912.837	4852.265	CL ROAD
1583	115988.87	98943.687	4852.4	CL ROAD
1582	115987.701	98974.834	4852.47	CL ROAD
1581	115986.658	99006.317	4852.517	CL ROAD
1580	115985.579	99038.142	4852.602	CL ROAD
1579	115983.14	99102.137	4852.991	CL ROAD
1578	115982.003	99134.072	4853.034	CL ROAD
1577	115981.16	99166.114	4853.197	CL ROAD
1576	115979.372	99230.14	4853.725	CL ROAD
1575	115978.112	99261.464	4854.012	CL ROAD
1574	115976.844	99292.11	4854.323	CL ROAD
1573	115975.596	99321.947	4854.772	CL ROAD
1572	115974.405	99351.651	4855.213	CL ROAD
1571	115973.263	99381.256	4855.74	CL ROAD
1570	115972.18	99410.773	4856.217	CL ROAD
1569	115971.15	99440.217	4856.626	CL ROAD
1568	115970.023	99469.637	4857.056	CL ROAD
1567	115968.916	99499.015	4857.465	CL ROAD
1566	115967.905	99528.391	4857.868	CL ROAD
1565	115966.847	99557.766	4858.263	CL ROAD
1564	115965.67	99587.111	4858.687	CL ROAD
1563	115964.598	99616.396	4859.186	CL ROAD
1562	115963.781	99645.517	4859.715	CL ROAD
1561	115961.873	99703.083	4860.985	CL ROAD
1560	115960.756	99731.495	4861.545	CL ROAD
1559	115959.635	99759.604	4862.07	CL ROAD
1558	115958.388	99787.525	4862.481	CL ROAD
1557	115957.148	99815.281	4862.739	CL ROAD
1556	115955.943	99842.802	4863.014	CL ROAD
1555	115954.692	99869.874	4863.191	CL ROAD
1554	115953.738	99896.115	4863.327	CL ROAD
1553	115952.806	99921.53	4863.423	CL ROAD
1552	115951.95	99947.035	4863.407	CL ROAD
1551	115950.249	99997.317	4863.308	CL ROAD
1550	115948.62	100045.522	4863.188	CL ROAD
1549	115946.899	100094.084	4863.22	CL ROAD
1548	115945.328	100141.243	4863.377	CL ROAD
1547	115943.925	100187.587	4863.666	CL ROAD
1546	115942.231	100231.507	4863.954	CL ROAD
1545	115940.56	100274.998	4864.324	CL ROAD

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
1544	115939.306	100316.586	4864.675	CL ROAD
1543	115938.226	100357.014	4865.131	CL ROAD
1542	115936.786	100395.518	4865.549	CL ROAD
1541	115936.063	100427.181	4865.906	CL ROAD
1540	115934.831	100454.789	4866.221	CL ROAD
1539	115983.145	97638.656	4851.798	CL ROAD
1538	115988.302	97695.438	4851.937	CL ROAD
1537	115991.541	97732.162	4851.887	CL ROAD
1536	115994.981	97770.603	4851.792	CL ROAD
1535	115998.892	97810.99	4851.693	CL ROAD
1534	116003.23	97856.609	4851.607	CL ROAD
1533	116012.31	97958.07	4851.719	CL ROAD
1532	116014.673	97986.58	4851.757	CL ROAD
1531	116016.834	98018.275	4851.782	CL ROAD
1530	116016.045	98242.621	4851.146	CL ROAD
1529	116014.965	98269.909	4851.069	CL ROAD
1528	116013.865	98297.144	4850.995	CL ROAD
1527	116012.819	98324.218	4850.954	CL ROAD
1526	116011.745	98351.057	4850.923	CL ROAD
1525	116010.644	98377.6	4850.9	CL ROAD
1524	116009.57	98404.081	4850.909	CL ROAD
1523	116008.447	98430.814	4850.887	CL ROAD
1522	116007.4	98457.906	4850.895	CL ROAD
1521	116006.351	98485.284	4850.905	CL ROAD
1520	116005.308	98512.759	4850.941	CL ROAD
1519	116004.272	98540.143	4850.981	CL ROAD
1518	116003.236	98567.17	4851.068	CL ROAD
1517	116002.135	98593.434	4851.139	CL ROAD
1516	116001.048	98619.456	4851.193	CL ROAD
1515	115999.979	98645.367	4851.262	CL ROAD
1514	115998.072	98695.865	4851.409	CL ROAD
1513	115996.322	98743.321	4851.62	CL ROAD
1512	115994.76	98785.904	4851.803	CL ROAD
1511	115993.474	98823.469	4851.974	CL ROAD
1510	115992.106	98858.023	4852.091	CL ROAD
1509	115990.739	98895.168	4852.208	CL ROAD
1508	115980.436	99183.185	4853.35	CL ROAD
1507	115979.532	99210.866	4853.586	CL ROAD
1506	115978.545	99238.626	4853.855	CL ROAD
1505	115977.585	99266.402	4854.105	CL ROAD
1504	115976.842	99293.925	4854.403	CL ROAD
1503	115976.071	99321.117	4854.75	CL ROAD
1502	115975.291	99347.797	4855.203	CL ROAD
1501	115974.283	99374.121	4855.654	CL ROAD
1500	115973.211	99400.08	4856.084	CL ROAD
1499	115972.187	99425.755	4856.465	CL ROAD
1498	115971.21	99451.096	4856.856	CL ROAD
1497	115968.842	99501.131	4857.533	CL ROAD
1496	115966.9	99550.728	4858.184	CL ROAD
1495	115965.055	99600.27	4858.942	CL ROAD

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
1494	115961.248	99708.389	4861.106	CL ROAD
1493	115960.125	99737.24	4861.658	CL ROAD
1492	115959.14	99765.575	4862.21	CL ROAD
1491	115958.046	99792.97	4862.574	CL ROAD
1490	115956.849	99819.705	4862.802	CL ROAD
1489	115954.923	99871.047	4863.26	CL ROAD
1488	115953.307	99919.322	4863.464	CL ROAD
1487	115951.795	99967.026	4863.42	CL ROAD
1486	115950.443	100016.509	4863.28	CL ROAD
1485	115944.74	100164.376	4863.555	CL ROAD
1484	115943.048	100210.692	4863.827	CL ROAD
1483	115941.49	100255.139	4864.178	CL ROAD
1482	115939.938	100299.756	4864.577	CL ROAD
100	99928.774	102671.179	5002.963	USGS BENCH
9022	99999.995	100000.099	4974.597	CHK PT2
1481	89409.758	91676.779	4977.845	CL CO RD 52
1480	89410.067	91766.152	4978.362	CL CO RD 52
1479	89410.186	91835.977	4978.663	CL CO RD 52
1478	89410.834	91889.779	4978.787	CL CO RD 52
1477	88630.663	91240.251	4962.294	FL END APRON
1475	89410.739	91812.38	4978.632	CL CO RD 52
1474	89410.864	91867.901	4978.742	CL CO RD 52
1473	89410.868	91923.016	4978.996	CL CO RD 52
1472	89410.526	91962.637	4979.313	CL CO RD 52
1470	89412.2	91913.032	4978.918	CL CO RD 52
1469	89412.336	92114.027	4979.894	CL CO RD 52
1468	89409.911	92164.31	4980.123	CL CO RD 52
1467	89409.226	92037.253	4979.354	CL CO RD 52
1466	89408.374	91911.431	4978.89	CL CO RD 52
1465	89408.379	91849.566	4978.613	CL CO RD 52
1464	89407.018	91483.772	4976.677	CL CO RD 52
1463	89406.682	91424.792	4976.575	CL CO RD 52
1462	89406.294	91366.685	4976.365	CL CO RD 52
1461	89406.047	91309.537	4976.082	CL CO RD 52
1460	89405.395	91198.454	4975.972	CL CO RD 52
1459	89404.746	91091.771	4975.748	CL CO RD 52
1458	89404.374	90936.734	4975.322	CL CO RD 52
1457	89403.956	90886.575	4975.23	CL CO RD 52
1456	89403.17	90789.571	4975.063	CL CO RD 52
1455	121308.922	94421.849	4819.604	CL CO RD 26
1454	121310.364	94468.534	4819.494	CL CO RD 26
1453	121310.975	94517.081	4819.214	CL CO RD 26
1452	121311.555	94565.626	4818.885	CL CO RD 26
1451	121312.137	94614.107	4818.64	CL CO RD 26
1450	121312.226	94661.707	4818.702	CL CO RD 26
1449	121312.785	94710.666	4818.911	CL CO RD 26
1448	121313.39	94759.294	4819.013	CL CO RD 26
1447	121314.36	94808.21	4819.363	CL CO RD 26
1446	121315.151	94856.777	4820.132	CL CO RD 26
1445	121315.081	94905.454	4820.961	CL CO RD 26

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
1444	121315.682	94953.845	4820.482	CL CO RD 26
1443	121317.087	95002.897	4819.627	CL CO RD 26
1442	121317.913	95051.912	4818.946	CL CO RD 26
1441	121318.411	95101.356	4818.777	CL CO RD 26
1440	121319.638	95150.739	4818.769	CL CO RD 26
1439	121320.997	95200.983	4818.711	CL CO RD 26
1438	121321.751	95252.766	4818.704	CL CO RD 26
1437	121322.865	95302.467	4818.564	CL CO RD 26
1436	121323.718	95353.697	4818.412	CL CO RD 26
1435	121325.959	94911.783	4816.783	FL 8'X3.25' CULV
1434	121304.055	94901.447	4816.696	FL 8'X3.25' CULV
1433	89471.025	97401.286	5018.959	CL HWY 52
1432	89469.26	97468.433	5018.417	CL HWY 52
1431	89468.047	97535.465	5018.021	CL HWY 52
1430	89467.043	97597.917	5018.498	CL HWY 52
1429	89466.816	97655.91	5018.262	CL HWY 52
1428	89466.411	97711.44	5017.267	CL HWY 52
1427	89464.395	97803.18	5015.819	CL HWY 52
1426	89463.374	97870.74	5014.725	CL HWY 52
1425	89462.921	97932.072	5013.881	CL HWY 52
1424	89462.425	97982.555	5013.286	CL HWY 52
1423	89461.733	98037.884	5012.594	CL HWY 52
1422	89461.609	98095.957	5012.224	CL HWY 52
1421	89461.226	98155.812	5012.028	CL HWY 52
1420	89460.766	98216.436	5011.69	CL HWY 52
1419	89459.889	98277.524	5011.699	CL HWY 52
1418	89458.816	98338.807	5011.558	CL HWY 52
1417	89458.218	98400.536	5011.448	CL HWY 52
1416	89458.072	98494.034	5011.367	CL HWY 52
1415	89457.777	98557.696	5011.231	CL HWY 52
1414	89457.302	98622.741	5011.293	CL HWY 52
1413	89456.855	98688.354	5011.247	CL HWY 52
1412	89456.823	98753.36	5011.53	CL HWY 52
1411	89457.366	98817.692	5011.63	CL HWY 52
1410	89457.243	98880.506	5011.994	CL HWY 52
1409	89456.555	98942.875	5012.329	CL HWY 52
1408	89455.888	99006.081	5012.957	CL HWY 52
1407	89455.127	99069.903	5013.656	CL HWY 52
1406	89454.814	99134.797	5014.295	CL HWY 52
1405	89454.413	99200.388	5015.053	CL HWY 52
1404	89454.147	99266.299	5015.951	CL HWY 52
1403	89454.018	99332.419	5016.726	CL HWY 52
1402	89453.851	99398.389	5017.437	CL HWY 52
1401	89453.848	99463.448	5018.23	CL HWY 52
1400	89453.422	99527.312	5018.883	CL HWY 52
1399	89453.192	99589.442	5019.613	CL HWY 52
1398	89452.383	99648.313	5020.417	CL HWY 52
1397	89451.977	99704.432	5021.051	CL HWY 52
1396	89451.834	99756.872	5021.791	CL HWY 52
1395	89451.666	99824.263	5022.411	CL HWY 52

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
1394	89452.994	99678.882	5020.754	CL HWY 52
1393	89451.14	99822.007	5022.342	CL HWY 52
1392	89485.16	98646.379	5004.234	FL 3.5FTCMP -N-
1391	89494.374	98649.546	5003.599	FL 4X2.5 CMP
1390	89497.466	98654.444	5003.432	FL 4X2.5 CMP
9021	89401.266	98672.045	5010.274	CHK WK PT 1389
1389	89401.212	98672.009	5010.266	WK PT 1389
1388	89422.742	98698.281	5004.74	FL 4X2.5FT CMP-S
1387	89419.83	98693.295	5004.781	FL 4X2.5FT CMP-S
1386	89427.208	98664.704	5005.329	FL 3.5FT CMP-S-
1385	89413.718	98669.785	5005.339	FL 3.5FT CMP-N-
1384	89367.966	98684.265	5005.74	FL 3.5FT CMP-S-
1383	89405.928	98696.717	5005.087	FL 4FL CMP-N-
1382	89375.394	98696.192	5005.162	FL 4FT CMP-S-
1381	99390.369	97589.332	4947.984	END SWALE -TOP
1380	99247.866	97592.382	4947.209	CL SWALE SEC13
1379	99135.359	97593.157	4947.068	CL SWALE SEC13
1378	99024.368	97591.84	4947.728	CL SWALE SEC13
1377	98917.9	97590.602	4947.637	CL SWALE SEC13
1376	98805.198	97590.113	4948.012	CL SWALE SEC13
1375	98694.248	97596.635	4949.252	CL SWALE SEC13
1374	98592.284	97599.174	4949.953	CL SWALE SEC13
1373	98489.789	97598.731	4950.479	CL SWALE SEC13
1372	98384.488	97596.061	4950.45	CL SWALE SEC13
1371	98268.768	97594.824	4951.466	CL SWALE SEC13
1370	98167.001	97592.632	4951.696	CL SWALE SEC13
1369	98066.221	97592.989	4951.912	CL SWALE SEC13
1368	97952.546	97590.686	4952.334	CL SWALE SEC13
1367	97842.699	97589.871	4952.327	CL SWALE SEC13
1366	97738.641	97588.45	4952.262	CL SWALE SEC13
1365	97628.304	97586.972	4952.371	CL SWALE SEC13
1364	97525.927	97585.731	4952.745	CL SWALE SEC13
1363	97411.197	97584.366	4953.439	CL SWALE SEC13
1362	97304.19	97587.466	4953.567	CL SWALE SEC13
1361	97200.463	97587.12	4953.824	CL SWALE SEC13
1360	97086.781	97587.687	4954.713	CL SWALE SEC13
1359	96984.959	97583.801	4956.145	CL SWALE SEC13
1358	96869.121	97581.824	4956.94	CL SWALE SEC13
1357	96764.532	97579.988	4957.414	CL SWALE SEC13
1356	96661.869	97569.488	4958.944	CL SWALE SEC13
1355	96555.484	97580.323	4957.245	CL SWALE SEC13
1354	96451.477	97579.296	4956.82	CL SWALE SEC13
1353	96348.702	97579.37	4957.199	CL SWALE SEC13
1352	96240.016	97573.104	4957.567	CL SWALE SEC13
1351	96138.343	97569.737	4958.644	CL SWALE SEC13
1350	96037.533	97569.479	4959.19	CL SWALE SEC13
1349	95932.915	97570.74	4959.115	CL SWALE SEC13
1348	95829.655	97571.619	4959.226	CL SWALE SEC13
1347	95725.436	97573.325	4960.19	CL SWALE SEC13
1346	95622.057	97573.093	4960.78	CL SWALE SEC13

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
1345	95514.667	97577.637	4960.67	CL SWALE SEC13
1344	95407.796	97577.324	4962.085	CL SWALE SEC13
1343	95293.843	97574.241	4964.121	CL SWALE SEC13
1342	95186.886	97572.089	4966.261	CL SWALE SEC13
1341	95070.187	97574.592	4968.583	CL SWALE SEC13
1340	94963.859	97575.776	4969.797	CL SWALE SEC13
1339	94861.457	97577.84	4970.027	CL SWALE SEC13
1338	94758.452	97576.636	4971.745	CL SWALE SEC13
1337	93231.788	97602.118	4988.336	TOP RR
1336	93282.901	97601.484	4987.99	TOP RR
1335	93315.583	97601.342	4982.128	GB RR
1334	93341.903	97600.449	4977.019	TOE RR
1333	93397.628	97601.375	4977.019	CL BREACH
1332	93449.449	97602.27	4977.565	TOE RR
1331	93472.499	97603.468	4981.852	GB RR
1330	93512.018	97603.898	4986.776	TOP RR
1329	93564.823	97604.634	4986.406	TOP RR
1328	94699.998	96780.979	4978.232	CL CO RD 16
1327	94700.341	96849.417	4976.806	CL CO RD 16
1326	94700.279	96923.55	4975.738	CL CO RD 16
1325	94700.158	96974.43	4975.237	CL CO RD 16
1324	94700.163	97026.264	4975.068	CL CO RD 16
1323	94700.56	97079.511	4975.04	CL CO RD 16
1322	94700.808	97134.587	4975.038	CL CO RD 16
1321	94700.906	97190.9	4974.937	CL CO RD 16
1320	94700.923	97246.727	4974.903	CL CO RD 16
1319	94701.194	97301.026	4975.004	CL CO RD 16
1318	94701.494	97353.89	4975.264	CL CO RD 16
1317	94702.284	97427.022	4976.113	CL CO RD 16
1316	94702.506	97488.646	4977.458	CL CO RD 16
1315	94704.798	97546.939	4978.693	CL CO RD 16
1314	98022.447	97198.509	4961.262	CL IRIS PKWY
1313	98022.011	97247.143	4959.224	CL IRIS PKWY
1312	98021.408	97298.745	4957.384	CL IRIS PKWY
1311	98021.405	97348.711	4956.49	CL IRIS PKWY
1310	98020.94	97399.089	4956.144	CL IRIS PKWY
1309	98020.341	97449.844	4955.876	CL IRIS PKWY
1308	98019.694	97502.224	4955.741	CL IRIS PKWY
1307	98019.267	97552.716	4956.208	CL CO RD13-IRIS
1306	94774.903	97646.821	4959.893	CL-FL STREAM
1305	94847.435	97666.674	4960.03	CL-FL STREAM
1304	94926.43	97710.487	4960.092	CL-FL STREAM
1303	94993.363	97703.549	4958.339	CL-FL STREAM
1302	95085.93	97701.247	4958.005	CL-FL STREAM
1301	95185.048	97702.11	4957.777	CL-FL STREAM
1300	95271.828	97700.26	4957.157	CL-FL STREAM
1299	95364.925	97699.105	4956.895	CL-FL STREAM
1298	95463.05	97695.107	4956.673	CL-FL STREAM
1297	95553.522	97695.404	4956.516	CL-FL STREAM
1296	95648.028	97697.989	4955.689	CL-FL STREAM

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
1295	95746.121	97695.508	4955.35	CL-FL STREAM
1294	95842.757	97696.715	4955.002	CL-FL STREAM
1293	95938.074	97698.856	4955.167	CL-FL STREAM
1292	96037.525	97699.209	4954.473	CL-FL STREAM
1291	96133.09	97699.763	4954.331	CL-FL STREAM
1290	96228.293	97702.617	4953.932	CL-FL STREAM
1289	96320.426	97703.295	4953.433	CL-FL STREAM
1288	96413.127	97703.003	4952.991	CL-FL STREAM
1287	96509.287	97703.611	4952.62	CL-FL STREAM
1286	96633.099	97709.952	4951.804	CL-FL STREAM
1285	96719.938	97706.557	4951.543	CL-FL STREAM
1284	96808.562	97706.852	4950.854	CL-FL STREAM
1283	96898.619	97704.279	4950.545	CL-FL STREAM
1282	96991.175	97705.245	4950.332	CL-FL STREAM
1281	97096.694	97705.524	4950.31	CL-FL STREAM
1280	97193.589	97702.673	4950.077	CL-FL STREAM
1279	97287.974	97705.307	4949.182	CL-FL STREAM
1278	97380.449	97705.644	4948.774	CL-FL STREAM
1277	97489.203	97697.605	4948.372	CL-FL STREAM
1276	97552.354	97690.781	4948.183	CL-FL STREAM
1275	97645.353	97683.336	4947.636	CL-FL STREAM
1274	97736.396	97682.937	4947.271	CL-FL STREAM
1273	97841.275	97682.674	4946.735	CL-FL STREAM
1272	97964.893	97684.36	4946.47	CL-FL STREAM
1271	98046.412	97684.877	4946.223	CL-FL STREAM
1270	98139.25	97687.202	4945.688	CL-FL STREAM
1269	98224.712	97687.237	4945.19	CL-FL STREAM
1268	98319.483	97690.502	4945.123	CL-FL STREAM
1267	98412.597	97688.914	4944.685	CL-FL STREAM
1266	98497.695	97688.389	4944.233	CL-FL STREAM
1265	98590.581	97687.532	4944.049	CL-FL STREAM
1264	98683.541	97685.595	4943.852	CL-FL STREAM
1263	98776.017	97682.42	4943.43	CL-FL STREAM
1262	98859.947	97682.187	4943.215	CL-FL STREAM
1261	98965.33	97680.445	4942.612	CL-FL STREAM
1260	99066.547	97678.205	4942.65	CL-FL STREAM
1259	99174.729	97679.29	4942.332	CL-FL STREAM
1258	99270.763	97680.982	4943.264	CL-FL STREAM
1257	99357.485	97671.472	4943.075	CL-FL STREAM
1256	99409.395	97594.096	4941.27	CL-FL STREAM
1255	100002.469	97632.087	4948.635	TOP RR
1254	99915.768	97633.298	4948.701	TOP RR
1253	99816.762	97633.071	4949.392	TOP RR
1252	99716.439	97632.98	4949.728	TOP RR
1251	99617.176	97632.021	4950.119	TOP RR
1250	99518.237	97630.268	4950.266	TOP RR
1249	99420.603	97625.488	4951.331	TOP RR
1248	99390.109	97625.78	4942.671	TOE RR
1247	99379.75	97625.78	4943.765	TOE RR
1246	99368.831	97624.782	4949.584	TOP RR

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
1245	99295.324	97629.614	4950.992	TOP RR
1244	99193.516	97629.704	4951.426	TOP RR
1243	99092.515	97629.628	4951.716	TOP RR
1242	98987.38	97629.142	4952.02	TOP RR
1241	98881.074	97629.076	4952.157	TOP RR
1240	98774.923	97628.3	4952.435	TOP RR
1239	98669.895	97628.545	4952.795	TOP RR
1238	98562.473	97628.088	4953.04	TOP RR
1237	98449.631	97627.291	4953.546	TOP RR
1236	98334.416	97626.949	4953.965	TOP RR
1235	98215.317	97626.121	4954.55	TOP RR
1234	98098.64	97625.85	4955.064	TOP RR
1233	97990.957	97625.367	4955.639	TOP RR
1232	97886.232	97625.481	4956.186	TOP RR
1231	97769.906	97624.824	4956.858	TOP RR
1230	97663.908	97624.204	4957.868	TOP RR
1229	97556.434	97624.086	4958.833	TOP RR
1228	97453.427	97623.576	4959.519	TOP RR
1227	97349.787	97623.713	4960.266	TOP RR
1226	97236.767	97623.298	4961.037	TOP RR
1225	97126.152	97622.806	4962.025	TOP RR
1224	97025.623	97621.995	4962.892	TOP RR
1223	96924.491	97621.202	4963.552	TOP RR
1222	96815.35	97619.209	4964.092	TOP RR
1221	96698.392	97618.623	4964.936	TOP RR
1220	96594.128	97618.595	4965.49	TOP RR
1219	96484.427	97618.104	4966.153	TOP RR
1218	96398.443	97616.511	4966.379	TOP RR
1217	96287.49	97615.814	4966.573	TOP RR
1216	96186.699	97616.385	4967.738	TOP RR
1215	96082.021	97615.792	4968.451	TOP RR
1214	95970.907	97614.049	4969.079	TOP RR
1213	95857.617	97614.422	4969.915	TOP RR
1212	95742.258	97614.387	4970.655	TOP RR
1211	95626.503	97613.58	4971.637	TOP RR
1210	95523.736	97613.028	4972.329	TOP RR
1209	95407.46	97612.946	4973.287	TOP RR
1208	95305.287	97612.108	4974.052	TOP RR
1207	95193.259	97611.509	4975.082	TOP RR
1206	95079.952	97610.776	4975.826	TOP RR
1205	94970.747	97607.804	4976.956	TOP RR
1204	94922.753	97609.386	4977.576	TOP RR
1203	94895.138	97608.666	4969.4	TOE RR
1202	94865.547	97606.961	4970.838	TOE RR
1201	94837.461	97606.163	4977.059	TOP RR
1200	94719.691	97608.373	4978.987	CL RR SEC8
1199	94795.592	97525.135	4978.34	CL CO RD13
1198	94868.829	97525.487	4977.984	CL CO RD13
1197	94951.575	97526.007	4977.602	CL CO RD13
1196	95037.62	97526.291	4976.771	CL CO RD13

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
1195	95125.506	97526.931	4975.509	CL CO RD13
1194	95215.698	97527.718	4973.878	CL CO RD13
1193	95308.54	97528.528	4972.014	CL CO RD13
1192	95403.678	97529.813	4969.975	CL CO RD13
1191	95501.045	97530.745	4968.028	CL CO RD13
1190	95600.493	97531.761	4966.21	CL CO RD13
1189	95650.808	97532.278	4965.47	CL CO RD13
1188	95752.199	97533.013	4964.404	CL CO RD13
1187	95803.127	97533.35	4963.935	CL CO RD13
1186	95904.766	97534.035	4963.264	CL CO RD13
1185	95955.159	97534.46	4962.969	CL CO RD13
1184	96005.256	97534.955	4962.785	CL CO RD13
1183	96104.425	97535.639	4962.117	CL CO RD13
1182	96202.15	97536.186	4961.456	CL CO RD13
1181	96298.104	97537.016	4961.091	CL CO RD13
1180	96392.186	97537.582	4960.963	CL CO RD13
1179	96485.718	97538.093	4961.123	CL CO RD13
1178	96577.38	97539.046	4961.314	CL CO RD13
1177	96666.778	97539.95	4961.587	CL CO RD13
1176	96753.977	97540.352	4961.604	CL CO RD13
1175	96838.987	97540.844	4961.684	CL CO RD13
1174	96923.157	97541.333	4961.298	CL CO RD13
1173	97008.836	97541.822	4960.83	CL CO RD13
1172	97096.146	97542.337	4960.222	CL CO RD13
1171	97184.436	97542.864	4959.392	CL CO RD13
1170	97273.902	97543.739	4958.683	CL CO RD13
1169	97364.434	97544.764	4957.743	CL CO RD13
1168	97456.232	97545.487	4957.075	CL CO RD13
1167	97549.187	97546.458	4956.777	CL CO RD13
1166	97642.435	97547.697	4956.39	CL CO RD13
1165	97735.76	97548.876	4956.161	CL CO RD13
1164	97828.756	97549.835	4956.154	CL CO RD13
1163	97921.274	97551.089	4956.159	CL CO RD13
1162	98013.326	97552.485	4956.144	CL CO RD13
1161	98104.895	97553.574	4956.08	CL CO RD13
1160	98196.476	97554.679	4955.901	CL CO RD13
1159	98288.038	97555.796	4955.659	CL CO RD13
1158	98379.535	97556.548	4955.284	CL CO RD13
1157	98470.938	97556.832	4954.761	CL CO RD13
1156	98562.42	97556.389	4954.436	CL CO RD13
1155	98654.185	97554.485	4953.946	CL CO RD13
1154	98746.542	97550.171	4953.489	CL CO RD13
1153	98839.425	97543.676	4952.947	CL CO RD13
1152	98931.791	97537.228	4952.517	CL CO RD13
1151	99023.656	97533.22	4952.055	CL CO RD13
1150	99115.068	97531.094	4951.753	CL CO RD13
1149	99207.579	97530.284	4951.483	CL CO RD13
1148	99301.039	97530.035	4950.991	CL CO RD13
1147	99391.929	97530.351	4950.796	CL CO RD13
1146	99479.882	97530.294	4950.502	CL CO RD13

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
1145	99564.635	97529.934	4950.27	CL CO RD13
1144	99645.417	97530.045	4950.035	CL CO RD13
1143	99722.242	97530.209	4949.81	CL CO RD13
1142	99794.202	97530.287	4950.011	CL CO RD13
1141	99860.715	97530.509	4949.611	CL CO RD13
1140	99921.385	97530.551	4949.306	CL CO RD13
1139	99975.107	97529.792	4949.206	CL CO RD13
1138	100070.281	97527.236	4948.695	CL CO RD13
1137	100130.007	97527.48	4948.49	CL CO RD13
1136	100180.677	97527.733	4948.24	CL CO RD13
1135	100247.117	97528.316	4947.798	CL CO RD13
1134	100321.851	97529.182	4947.476	CL CO RD13
1133	100401.72	97529.736	4947.205	CL CO RD13
1132	100483.798	97530.286	4947.432	CL CO RD13
1131	100566.98	97530.827	4947.576	CL CO RD13
1130	100650.439	97531.267	4947.635	CL CO RD13
1129	100735.598	97531.657	4948.168	CL CO RD13
1128	100821.977	97532.21	4949.495	CL CO RD13
1127	100906.424	97532.576	4951.697	CL CO RD13
1126	100987.583	97533.001	4952.714	CL CO RD13
1125	101107.267	97533.715	4951.899	CL CO RD13
1124	101187.642	97534.107	4950.888	CL CO RD13
1123	101269.251	97534.591	4949.586	CL CO RD13
1122	101351.029	97535.041	4948.472	CL CO RD13
1121	99657.529	97581.028	4940.759	STREAM FL
1120	99772.21	97551.227	4940.759	FL @ BRDG ABUTT
1119	99812.586	97511.299	4940.641	FL @ BRDG ABUTT
1118	100099.819	97349.142	4938.994	CL FL STREAM
1117	100044.698	97342.73	4946.852	N SIDE TOP BRDG
1116	100021.359	97341.729	4946.909	S SIDE TOP BRDG
1114	100036.433	96570.712	4947.833	CL ROAD CROSS7
1113	100036.216	96631.567	4947.476	CL ROAD CROSS7
1112	100036.039	96686.332	4947.105	CL ROAD CROSS7
1111	100035.608	96740.688	4946.835	CL ROAD CROSS7
1110	100035.93	96739.551	4946.835	CL ROAD CROSS7
1109	100035.617	96805.964	4946.687	CL ROAD CROSS7
1108	100035.62	96872.728	4946.529	CL ROAD CROSS7
1107	100035.652	96939.634	4946.492	CL ROAD CROSS7
1106	100035.626	97006.543	4946.548	CL ROAD CROSS7
1105	100035.299	97072.443	4946.653	CL ROAD CROSS7
1104	100034.811	97136.605	4946.651	CL ROAD CROSS7
1103	100034.45	97198.923	4946.93	CL ROAD CROSS7
1102	100033.842	97285.011	4947.085	CL ROAD CROSS7
1101	100033.486	97340.38	4947.346	CL ROAD CROSS7
1100	100033.296	97394.521	4947.433	CL ROAD CROSS7
1099	100033.29	97468.578	4947.998	CL ROAD CROSS7
1098	100035.556	97528.887	4948.913	CL ROAD CROSS7
1097	100041.996	97585.609	4948.846	CL ROAD CROSS7
1096	100041.996	97638.108	4949.01	CL ROAD CROSS7
1095	100041.404	97692.877	4949.105	CL ROAD CROSS7

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
1094	100041.178	97792.432	4949.588	CL ROAD CROSS7
1093	100040.448	97861.978	4949.813	CL ROAD CROSS7
1092	100039.27	97932.285	4949.731	CL ROAD CROSS7
1091	100038.035	98002.347	4949.664	CL ROAD CROSS7
1090	100036.774	98071.936	4949.496	CL ROAD CROSS7
1089	100035.835	98140.864	4949.407	CL ROAD CROSS7
9020	100000.045	99999.97	4974.57	CHK N QU PT 2
1088	104109.872	97520.017	4911.897	FL 36IN CMP
1087	104085.145	97574.535	4911.889	FL 36IN CMP
1086	103694.528	97546.813	4919.948	CL CO RD
1085	103792.459	97547.091	4919.3	CL CO RD
1084	103889.256	97547.195	4918.424	CL CO RD
1083	103985.322	97547.867	4917.929	CL CO RD
1082	104080.489	97548.653	4917.429	CL CO RD
1081	104175.437	97548.994	4917.256	CL CO RD
1080	104270.729	97549.482	4917.282	CL CO RD
1079	104366.322	97549.495	4917.339	CL CO RD
1078	104460.496	97549.943	4917.115	CL CO RD
1077	104552.545	97550.703	4916.587	CL CO RD
1076	104642.278	97551.515	4916.169	CL CO RD
1075	104729.63	97551.952	4915.641	CL CO RD
1074	104814.087	97552.381	4915.482	CL CO RD
1073	104894.983	97552.784	4915.368	CL CO RD
1072	104971.808	97552.619	4915.54	CL CO RD
1071	105044.244	97552.679	4915.662	CL CO RD
1070	105111.813	97552.899	4915.884	CL CO RD
1069	105173.393	97553.109	4916.21	CL CO RD
1068	105186.674	97558.36	4916.203	CL CO RD
1067	105098.405	97557.451	4915.745	CL CO RD
1066	105005.684	97555.689	4915.562	CL CO RD
1065	104911.573	97554.767	4915.351	CL CO RD
1064	104818.152	97554.451	4915.437	CL CO RD
1063	104726.245	97553.522	4915.66	CL CO RD
1062	103805.296	97549.882	4919.189	CL CO RD
1061	103721.463	97549.287	4919.749	CL CO RD
1060	103635.708	97548.892	4920.596	CL CO RD
1059	103548.279	97548.342	4921.605	CL CO RD
1058	103459.258	97547.912	4922.695	CL CO RD
1057	103369.076	97547.626	4923.492	CL CO RD
1056	103278.26	97548.05	4924.122	CL CO RD
1055	103186.877	97547.854	4924.896	CL CO RD
1054	103048.581	97547.083	4925.793	CL CO RD
1053	102955.419	97546.428	4926.261	CL CO RD
1052	102862.478	97546.166	4926.717	CL CO RD
1051	102770.301	97545.409	4927.199	CL CO RD
1050	102678.374	97545.238	4927.704	CL CO RD
1049	102587.887	97545.148	4928.417	CL CO RD
1048	102500.561	97544.385	4929.303	CL CO RD
1047	102413.005	97543.853	4930.09	CL CO RD
1046	102323.413	97543.513	4931.186	CL CO RD

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
1045	102231.917	97542.555	4932.388	CL CO RD
1044	102138.626	97541.879	4933.868	CL CO RD
1043	102043.862	97540.718	4935.377	CL CO RD
1042	101947.932	97539.814	4937.3	CL CO RD
1041	101851.04	97539.402	4939.049	CL CO RD
1040	101754.203	97539.062	4940.973	CL CO RD
1039	101610.068	97538.566	4943.695	CL CO RD
1038	101514.884	97538.1	4945.621	CL CO RD
1037	101420.799	97537.453	4947.539	CL CO RD
1036	101326.171	97537.135	4948.791	CL CO RD
1035	101230.214	97536.882	4950.284	CL CO RD
1034	101134.946	97536.615	4951.648	CL CO RD
1033	101040.19	97536.317	4952.538	CL CO RD
1032	100946.731	97536.216	4952.405	CL CO RD
1031	105052.55	97552.739	4915.783	CL CO RD
1030	105298.604	97555.256	4916.636	CL CO RD
1029	105379.967	97554.339	4916.321	CL CO RD
1028	105433.162	97555.226	4916.326	CL CO RD
1027	105314.238	96920.302	4906.367	FL CMP
1026	105351.216	96913.557	4904.821	FLcmp -3.25'channel
1025	105330.625	96917.204	4909.649	CL CO RD
1024	105330.685	96298.802	4920.888	CL CO RD
1023	105330.729	96357.52	4919.085	CL CO RD
1022	105330.406	96417.819	4917.618	CL CO RD
1021	105329.633	96476.23	4916.15	CL CO RD
1020	105329.383	96533.48	4914.69	CL CO RD
1019	105329.351	96589.161	4913.305	CL CO RD
1018	105329.233	96640.884	4912.104	CL CO RD
1017	105328.973	96714.273	4910.473	CL CO RD
1016	105329.259	96787.614	4909.694	CL CO RD
1015	105329.329	96839.955	4909.606	CL CO RD
1014	105329.16	96896.908	4909.675	CL CO RD
1013	105329.161	96956.015	4909.693	CL CO RD
1012	105329.358	97014.343	4909.519	CL CO RD
1011	105329.169	97070.727	4909.364	CL CO RD
1009	105328.833	97124.724	4909.315	CL CO RD
1008	105328.626	97176.732	4909.399	CL CO RD
1007	105329.328	97227.441	4909.789	CL CO RD
1006	105329.425	97288.615	4910.544	CL CO RD
1005	105329.485	97356.159	4911.756	CL CO RD
1004	105328.431	97430.124	4913.359	CL CO RD
1003	105328.064	97501.665	4915.288	CL CO RD
1002	105326.756	97557.994	4916.576	CL CO RD
1001	105328.662	97618.048	4916.811	CL CO RD
1000	107570.504	97670.221	4913.112	CL RR
999	107663.518	97670.25	4912.708	CL RR
998	107744.912	97669.833	4905.916	CL RR AT TOE
997	107756.761	97670.283	4905.885	CL RR AT TOE
996	107834.014	97671.4	4911.548	CL RR
995	107899.413	97671.866	4912.023	CL RR

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
994	110894.736	97686.637	4899.295	CL RR
993	110603.719	97685.032	4901.349	CL RR
992	110496.555	97685.944	4902.222	CL RR
991	110201.575	97682.998	4904.817	CL RR
990	110488.582	97721.378	4898.363	LOW POINT
989	109958.845	97577.666	4912.312	CL CO RD
988	110025.582	97578.053	4910.633	CL CO RD
987	110094.515	97578.379	4908.651	CL CO RD
986	110166.159	97578.894	4906.791	CL CO RD
985	110240.23	97579.304	4905.224	CL CO RD
984	110314.567	97579.391	4903.764	CL CO RD
983	110388.738	97579.054	4902.562	CL CO RD
982	110462.815	97578.851	4901.568	CL CO RD
981	110536.786	97578.98	4901.08	CL CO RD
980	110610.066	97579.14	4900.457	CL CO RD
979	110682.675	97578.919	4899.628	CL CO RD
978	110754.83	97579.03	4898.915	CL CO RD
977	110826.677	97579.354	4898.501	CL CO RD
976	110897.171	97579.495	4898.181	CL CO RD
975	110966.209	97579.629	4897.953	CL CO RD
974	111035.006	97580.133	4897.65	CL CO RD
973	111104.222	97580.396	4897.489	CL CO RD
972	111173.889	97580.666	4897.338	CL CO RD
971	111244.536	97581.064	4897.171	CL CO RD
970	111314.354	97581.291	4896.965	CL CO RD
969	111379.204	97581.063	4896.692	CL CO RD
968	111436.517	97581.221	4896.438	CL CO RD
967	111488.086	97581.595	4896.017	CL CO RD
966	110554.645	98055.616	4907.168	CL CO RD
965	110555.4	97968.244	4905.566	CL CO RD
964	110555.36	97907.501	4904.658	CL CO RD
963	110555.718	97845.908	4903.956	CL CO RD
962	110556.538	97786.37	4903.416	CL CO RD
961	110557.03	97731.753	4903.189	CL CO RD
960	110557.381	97659.411	4902.687	CL CO RD
959	110557.937	97603.332	4901.085	CL CO RD
958	110558.626	97550.185	4900.25	CL CO RD
957	110558.054	97497.966	4898.294	CL CO RD
956	110558.951	97437.292	4895.96	CL CO RD
955	110559.673	97366.22	4894.404	CL CO RD
954	110561.733	97247.446	4892.458	CL CO RD
953	110562.399	97153.87	4891.372	CL CO RD
952	110563.071	97084.071	4890.598	CL CO RD
951	110564.096	97021.887	4889.71	CL CO RD
950	110564.467	96953.547	4888.55	CL CO RD
949	110564.535	96888.528	4888.129	CL CO RD
948	110608.437	95448.999	4871.679	FL 18IN CMP
947	110570.754	95436.227	4872.713	FL 18IN CMP
946	110613.173	95326.779	4870.455	CL FL CMP
945	110572.561	95325.509	4871.716	CL FL CMP

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
944	110591.573	95444.465	4876.17	CL RD 22
943	110592.205	95325.123	4876.429	CL RD 22
942	110576.541	96211.816	4881.309	CL RD 22
941	110577.6	96152.6	4880.085	CL RD 22
940	110578.382	96092.052	4879.326	CL RD 22
939	110580.138	96034.925	4879.251	CL RD 22
938	110582.365	95961.798	4879.412	CL RD 22
937	110583.17	95905.952	4879.418	CL RD 22
936	110584.224	95851.159	4879.369	CL RD 22
935	110584.99	95797.064	4879.027	CL RD 22
934	110585.866	95744.436	4878.461	CL RD 22
933	110586.67	95688.811	4878.066	CL RD 22
932	110588.373	95620.709	4877.635	CL RD 22
931	110589.227	95559.925	4876.889	CL RD 22
930	110591.447	95433.455	4876.171	CL RD 22
929	110591.922	95376.762	4876.246	CL RD 22
928	110592.983	95322.338	4876.491	CL RD 22
927	110594.025	95247.784	4877.188	CL RD 22
926	110593.352	95188.711	4877.976	CL RD 22
925	110594.934	95135.791	4878.902	CL RD 22
924	110595.834	95064.672	4880.592	CL RD 22
923	110597.815	94970.573	4882.718	CL RD 22
922	110599.059	94902.906	4884.161	CL RD 22
921	110599.688	94837.578	4885.335	CL RD 22
920	110600.774	94776.402	4886.291	CL RD 22
919	110602.076	94721.216	4886.997	CL RD 22
918	110602.99	94660.569	4887.559	CL RD 22
917	110604.64	94590.204	4888.077	CL RD 22
916	110599.913	94747.939	4886.657	CL RD 22
915	110600.996	94686.565	4887.359	CL RD 22
914	110600.791	94579.548	4888.146	CL RD 22
9019	121383.085	97596.018	4814.455	CHK SEC COR PT5
9018	110505.664	102534.636	4925.093	CHK SEC COR PT7
913	115959.768	95028.433	4845.485	CL
912	115940.376	94950.043	4840.91	S END CULV
911	115980	94952.52	4840.535	N END CULV
910	115961.03	95240.267	4844.875	CL HWY 24
909	115960.216	95135.076	4845.076	CL HWY 24
908	115960.008	94949.09	4845.961	CL HWY 24
907	115959.335	94881.91	4845.804	CL HWY 24
906	115962.369	95366.635	4844.768	CL HWY 24
905	115962.453	95440.928	4844.775	CL HWY 24
904	115962.625	95515.378	4844.518	CL HWY 24
903	115962.908	95589.421	4844.399	CL HWY 24
902	115963.489	95662.093	4844.507	CL HWY 24
901	115964.025	95733.765	4844.496	CL HWY 24
900	115964.122	95804.62	4844.528	CL HWY 24
899	115964.379	95875.385	4844.725	CL HWY 24
898	115964.56	95941.438	4845.005	CL HWY 24
897	115964.94	96000.814	4844.972	CL HWY 24

Point No.	Northing (ft) Y	Easting (ft) X	Elev. (ft, NGVD) Z	Description
896	115965.574	96057.949	4844.948	CL HWY 24
895	115966.369	96138.477	4844.98	CL HWY 24
894	115966.4	96206.138	4845.162	CL HWY 24
893	115965.333	96281.961	4845.536	CL HWY 24
892	115964.407	96404.573	4845.882	CL HWY 24
891	115965.527	96481.59	4846.176	CL HWY 24
890	115966.056	96557.438	4846.437	CL HWY 24
889	115965.641	96633.171	4846.551	CL HWY 24
888	115965.41	96747.509	4846.731	CL HWY 24
887	115965.086	96862.965	4847.094	CL HWY 24
886	115964.669	96976.674	4847.39	CL HWY 24
885	115964.96	97049.565	4847.747	CL HWY 24
884	115965.43	97120.283	4848.215	CL HWY 24
883	115965.51	97220.63	4848.843	CL HWY 24
882	115965.586	97283.982	4849.104	CL HWY 24
881	115966.797	97375.242	4849.783	CL HWY 24
880	115970.139	97457.971	4850.709	CL HWY 24
879	115975.156	97529.739	4851.46	CL HWY 24
878	115981.447	97611.18	4851.968	CL HWY 24
877	115988.092	97679.706	4852.001	CL HWY 24
876	115957.674	94920.416	4845.96	CL HWY 24
875	115957.789	94851.075	4845.537	CL HWY 24
874	115957.724	94780.437	4845.287	CL HWY 24
873	115957.665	94707.936	4845.279	CL HWY 24
872	115957.677	94633.564	4845.167	CL HWY 24
871	115957.652	94558.309	4845.087	CL HWY 24
870	115957.305	94483.819	4845.246	CL HWY 24
869	115957.137	94408.74	4845.401	CL HWY 24
868	115956.823	94332.341	4845.609	CL HWY 24
867	115956.268	94256.414	4845.626	CL HWY 24
866	115955.4	94181.796	4845.95	CL HWY 24
865	115955.314	94108.385	4846.371	CL HWY 24
864	115955.521	94000.734	4847.157	CL HWY 24
863	115955.253	93930.959	4847.421	CL HWY 24
862	115954.772	93860.636	4847.218	CL HWY 24
861	115954.672	93787.695	4846.822	CL HWY 24
860	115954.628	93709.106	4846.684	CL HWY 24
859	115954.503	93622.551	4847.02	CL HWY 24
858	115954.648	93526.612	4847.466	CL HWY 24
857	115954.764	93429.793	4847.944	CL HWY 24
856	115954.123	93335.133	4848.398	CL HWY 24
855	115953.319	93243.054	4849.219	CL HWY 24
854	115952.238	93156.313	4850.404	CL HWY 24
853	115952.465	93075.955	4852.154	CL HWY 24
852	115952.415	92883.859	4857.599	CL HWY 24
851	115952.848	92822.375	4858.764	CL HWY 24
850	115950.927	92765.278	4858.906	CL HWY 24
9017	110559.249	97578.278	4900.867	CHK PT 3
9016	100000.085	100000.005	4974.576	CHK PT2
9008	105351.568	86981.963	4913.752	1010 NW23

I-D

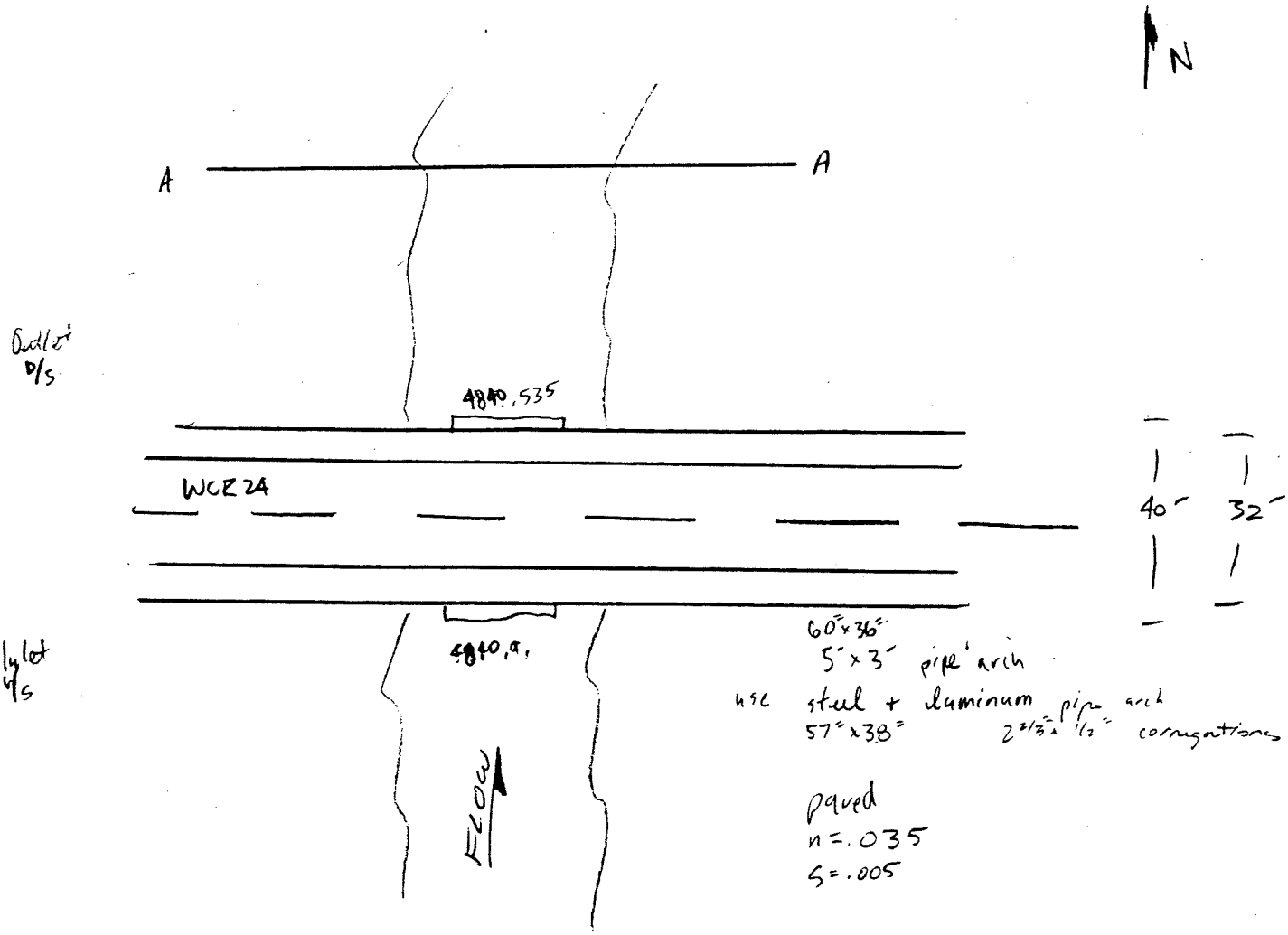
HYDRAULIC EVALUATION OF STRUCTURES

QOT - 61 CFS 7/24

ANDERSON CONSULTING ENGINEERS, INC
Civil • Water Resources • Environmental

Project Number	Page	Of
COWELD01	1	6

Owner-Project	By	Date
WELD COUNTY 1-25 MDP	DCS	3/24/99
	Checked By	**Date**
Tri Town Basin WCR 24 (1)	CJP	04/12/99



60"x36"
5'x3' pipe arch
use steel + aluminum pipe arch
57"x38" 2 2/3" x 1/2" corrugations

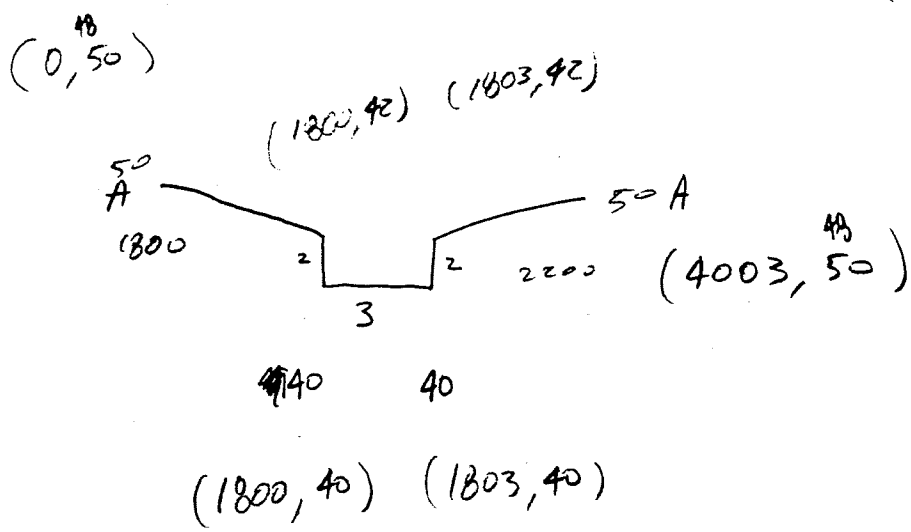
paved
n=.035
S=.005

TT24

2/6

TTWCR24

	X	Y	distance	station	elevation		
854	115952.238	93156.313		0.000	4850.404	CL HWY 24	
860	115954.628	93709.106	552.798	552.798	4846.684	CL HWY 24	
863	115955.253	93930.959	221.854	774.652	4847.421	CL HWY 24	
871	115957.652	94558.309	627.355	1402.007	4845.087	CL HWY 24	
908	115960.008	94949.090	390.788	1792.795	4845.961	CL HWY 24	CULVERT 1790
913	115959.768	95028.433	79.343	1872.138	4845.485	CL	
906	115962.369	95366.635	338.212	2210.350	4844.768	CL HWY 24	
905	115962.453	95440.928	74.293	2284.643	4844.775	CL HWY 24	
903	115962.908	95589.421	148.494	2433.137	4844.399	CL HWY 24	min
902	115963.489	95662.093	72.674	2505.811	4844.507	CL HWY 24	
901	115964.025	95733.765	71.674	2577.485	4844.496	CL HWY 24	
898	115964.560	95941.438	207.674	2785.159	4845.005	CL HWY 24	
896	115965.574	96057.949	116.515	2901.674	4844.948	CL HWY 24	
~~895~~	~~115965.369~~	~~96138.477~~	~~80.532~~	~~2982.206~~	~~4844.080~~	~~CL HWY 24~~	
891	115965.527	96481.590	343.114	3325.320	4846.176	CL HWY 24	
877	115988.092	97679.706	1198.328	4523.649	4852.001	CL HWY 24	
			L/40				
912	115940.376	94950.043			4840.910	S END CULV	
911	115980.000	94952.520			4840.535	N END CULV	



TT24 3/6

CURRENT DATE: 03-24-1999
CURRENT TIME: 16:15:26

FILE DATE: 03-24-1999
FILE NAME: TTWCR24

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4840.91	4840.54	40.00	1 CMPA	4.75	3.17	.024	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: TTWCR24 DATE: 03-24-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
4840.91	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4843.31	35.0	35.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4844.48	70.0	63.2	0.0	0.0	0.0	0.0	0.0	2.17	30
4844.63	105.0	66.6	0.0	0.0	0.0	0.0	0.0	37.49	22
4844.69	140.0	68.2	0.0	0.0	0.0	0.0	0.0	70.44	15
4844.75	175.0	69.5	0.0	0.0	0.0	0.0	0.0	104.16	14
4844.78	200.0	70.2	0.0	0.0	0.0	0.0	0.0	128.06	11
4844.83	245.0	71.3	0.0	0.0	0.0	0.0	0.0	171.50	10
4844.86	280.0	72.0	0.0	0.0	0.0	0.0	0.0	205.88	9
4844.89	315.0	72.8	0.0	0.0	0.0	0.0	0.0	239.26	8
4844.92	350.0	73.5	0.0	0.0	0.0	0.0	0.0	273.91	8
4844.40	61.2	61.2	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: TTWCR24 DATE: 03-24-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4840.91	0.000	0.00	0.00	0.00
4843.31	0.000	35.00	0.00	0.00
4844.48	-0.003	70.00	4.68	6.69
4844.63	0.000	105.00	0.90	0.86
4844.69	0.000	140.00	1.32	0.94
4844.75	0.000	175.00	1.30	0.74
4844.78	0.000	200.00	1.73	0.87
4844.83	-0.001	245.00	2.19	0.89
4844.86	-0.001	280.00	2.08	0.74
4844.89	-0.001	315.00	2.89	0.92
4844.92	-0.001	350.00	2.63	0.75

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

TT24 4/6

CURRENT DATE: 03-24-1999 FILE DATE: 03-24-1999
CURRENT TIME: 16:15:26 FILE NAME: TTWCR24

PERFORMANCE CURVE FOR CULVERT 1 - 1(4.75 (ft) BY 3.17 (ft)) CMPA

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4840.91	0.00	-0.38	0-NF	0.00	0.00	0.00	-0.54	0.00	0.00
35.00	4843.31	2.24	2.40	3-M1t	1.46	1.35	1.74	1.74	4.76	2.96
63.15	4844.48	3.39	3.57	2-M2c	2.32	1.90	1.90	1.89	7.85	3.08
66.61	4844.63	3.56	3.72	3-M2t	2.46	1.96	1.98	1.98	7.95	3.16
68.24	4844.70	3.63	3.79	3-M2t	2.52	1.98	2.05	2.05	7.88	3.22
69.53	4844.75	3.70	3.84	3-M2t	2.61	2.01	2.11	2.11	7.81	3.27
70.21	4844.78	3.73	3.87	3-M2t	2.65	2.02	2.15	2.15	7.75	3.30
71.32	4844.82	3.79	3.91	3-M2t	2.73	2.03	2.21	2.21	7.67	3.35
72.03	4844.85	3.82	3.94	3-M2t	2.78	2.05	2.26	2.26	7.60	3.38
72.85	4844.88	3.86	3.97	3-M2t	2.84	2.06	2.29	2.29	7.60	3.41
73.46	4844.91	3.89	4.00	3-M2t	3.17	2.07	2.33	2.33	7.56	3.44

El. inlet face invert 4840.91 ft El. outlet invert 4840.54 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	140.00 ft
INLET ELEVATION	4840.91 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	4840.54 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0094
CULVERT LENGTH ALONG SLOPE	40.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	PIPE ARCH
BARREL SPAN	4.75 ft
BARREL RISE	3.17 ft
BARREL MATERIAL	STEEL OR ALUMINUM
BARREL MANNING'S n	0.024
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	PROJECTING
INLET DEPRESSION	NONE

TT24

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CURRENT DATE: 03-24-1999
CURRENT TIME: 16:15:26

FILE DATE: 03-24-1999
FILE NAME: TTWCR24

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION
MAIN CHANNEL AND LT & RT OVER BANKS

FILE NAME: TTWCR24
FILE DATE: 03-24-1999

LEFT CHANNEL BOUNDARY	2
RIGHT CHANNEL BOUNDARY	5
MANNING n LEFT OVER BANK	0.035
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.035
SLOPE OF CHANNEL	0.0050 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	4850.00
2	1800.00	4842.00
3	1800.00	4840.00
4	1803.00	4840.00
5	1803.00	4842.00
6	4003.00	4850.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	4840.00	0.000	-0.54	0.00	0.00
35.00	4842.28	0.345	1.74	2.96	0.31
70.00	4842.43	0.349	1.89	3.08	0.32
105.00	4842.52	0.351	1.98	3.16	0.34
140.00	4842.59	0.352	2.05	3.22	0.35
175.00	4842.65	0.354	2.11	3.27	0.35
200.00	4842.69	0.355	2.15	3.30	0.36
245.00	4842.75	0.356	2.21	3.35	0.37
280.00	4842.79	0.357	2.26	3.38	0.37
315.00	4842.83	0.358	2.29	3.41	0.38
350.00	4842.87	0.358	2.33	3.44	0.38

Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	32.00 ft

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	4850.00
2	552.80	4846.68
3	774.65	4847.42
4	1402.01	4845.09
5	1792.80	4845.96
6	1872.14	4845.48
7	2210.35	4844.77
8	2284.64	4844.77
9	2433.14	4844.40
10	2505.81	4844.51
11	2577.49	4844.50
12	2785.16	4845.00

TT24

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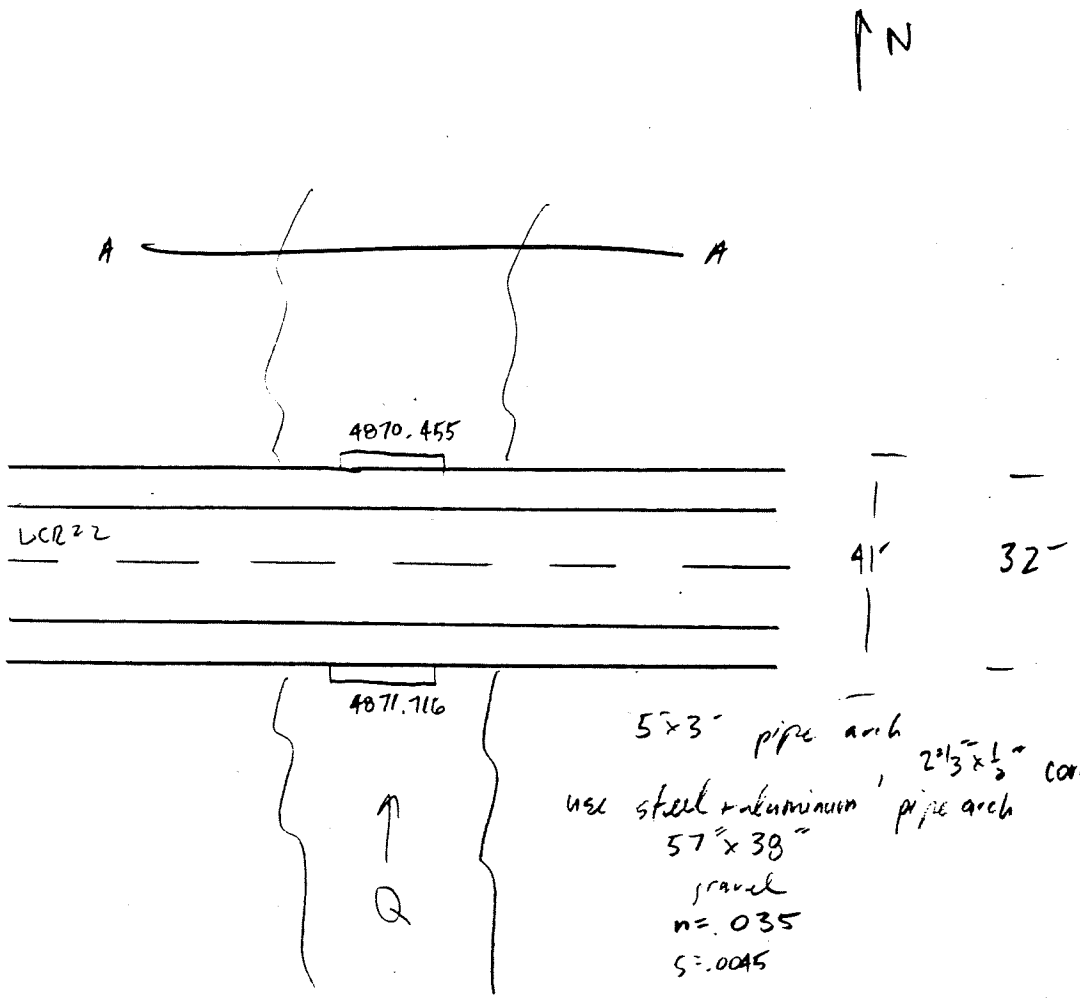
13	2901.67	4844.95
14	3325.32	4846.18
15	4523.65	4852.00

$Q_{OT} = 84 cfs$

TT22

ANDERSON CONSULTING ENGINEERS, INC Civil • Water Resources • Environmental	Project Number COWELD01	Page 1 Of 6
Owner-Project WELD COUNTY I-25 MDP	By DCS	Date 3/24/99
TRI TOWN BASIN WCR 22 (2)	Checked By CJP	Date 04/12/99



5'x3' pipe arch, 2 2/3"x1/2" corrugation

use steel + aluminum pipe arch

57"x38"

gravel

n=.035

S=.0045

TT22

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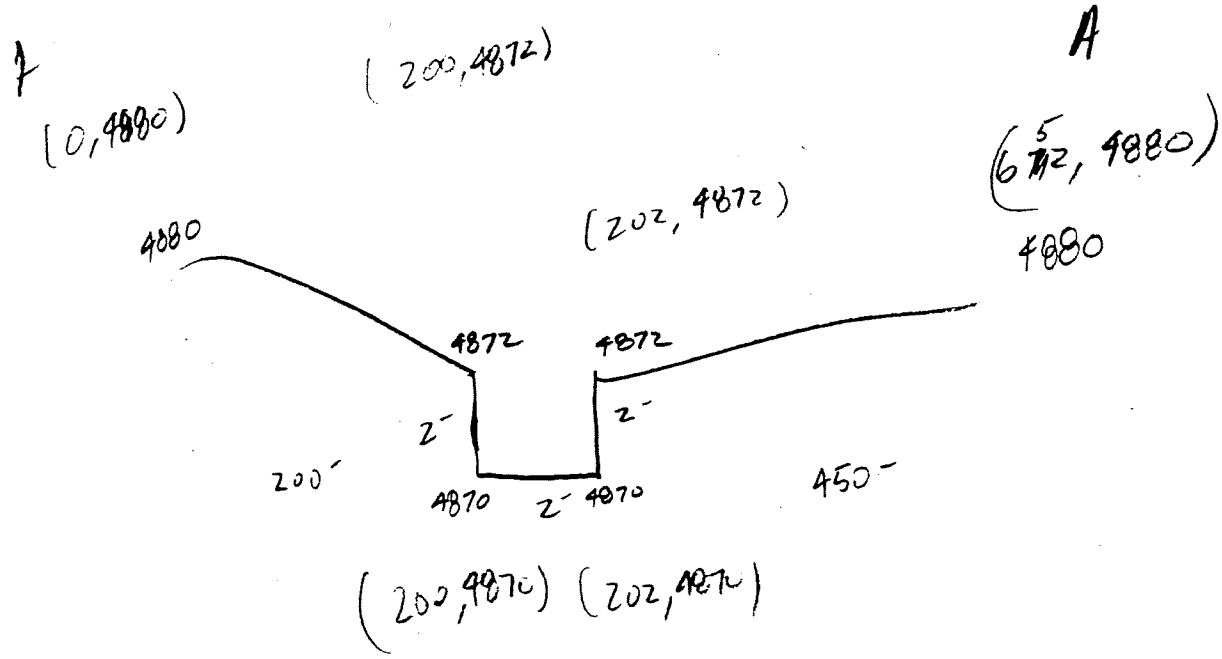
TTWCR22

	x	y	distance	station	elevation		
914	110600.791	94579.548		0.000	4888.146	CL RD 22	
921	110599.688	94837.578	258.032	258.032	4885.335	CL RD 22	
923	110597.815	94970.573	133.008	391.041	4882.718	CL RD 22	
924	110595.834	95064.672	94.120	485.160	4880.592	CL RD 22	
925	110594.934	95135.791	71.125	556.285	4878.902	CL RD 22	78° 612
927	110594.025	95247.784	111.997	668.282	4877.188	CL RD 22	500
930	110591.447	95433.455	185.689	853.971	4876.171	CL RD 22	
944	110591.573	95444.465	11.011	864.981	4876.170	CL RD 22	min 235
931	110589.227	95559.925	115.484	980.465	4876.889	CL RD 22	78° 1100
934	110585.866	95744.436	184.542	1165.007	4878.461	CL RD 22	
935	110584.990	95797.064	52.635	1217.642	4879.027	CL RD 22	
937	110583.170	95905.952	108.903	1326.545	4879.418	CL RD 22	
939	110580.138	96034.925	129.009	1455.554	4879.251	CL RD 22	
940	110578.382	96092.052	57.154	1512.708	4879.326	CL RD 22	
942	110576.541	96211.816	119.778	1632.486	4881.309	CL RD 22	
946	110613.173	95326.779			4870.455	CL FL CMP	
945	110572.561	95325.509			4871.716	CL FL CMP	



TT22

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CURRENT DATE: 03-24-1999
CURRENT TIME: 16:49:38

FILE DATE: 03-24-1999
FILE NAME: TTWCR22

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4871.72	4870.46	41.02	1 CMPA	4.75	3.17	.024	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: TTWCR22 DATE: 03-24-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
4871.72	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4873.92	35.0	35.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4875.40	70.0	70.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4876.44	105.0	88.4	0.0	0.0	0.0	0.0	0.0	15.72	10
4876.60	140.0	91.0	0.0	0.0	0.0	0.0	0.0	47.90	10
4876.71	175.0	92.4	0.0	0.0	0.0	0.0	0.0	80.85	8
76.78	200.0	93.4	0.0	0.0	0.0	0.0	0.0	105.19	7
,6.87	245.0	94.8	0.0	0.0	0.0	0.0	0.0	148.45	7
76.93	280.0	95.6	0.0	0.0	0.0	0.0	0.0	182.82	6
4876.98	315.0	96.4	0.0	0.0	0.0	0.0	0.0	216.35	5
4877.03	350.0	97.0	0.0	0.0	0.0	0.0	0.0	250.73	5
4876.17	84.0	84.0	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: TTWCR22 DATE: 03-24-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4871.72	0.000	0.00	0.00	0.00
4873.92	0.000	35.00	0.00	0.00
4875.40	0.000	70.00	0.00	0.00
4876.44	-0.001	105.00	0.89	0.85
4876.60	-0.002	140.00	1.14	0.81
4876.71	-0.002	175.00	1.71	0.98
4876.78	-0.002	200.00	1.42	0.71
4876.87	-0.002	245.00	1.79	0.73
4876.93	-0.002	280.00	1.56	0.56
4876.98	-0.003	315.00	2.30	0.73
4877.03	-0.003	350.00	2.23	0.64

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

TT22
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2

CURRENT DATE: 03-24-1999
CURRENT TIME: 16:49:38

FILE DATE: 03-24-1999
FILE NAME: TTWCR22

PERFORMANCE CURVE FOR CULVERT 1 - 1(4.75 (ft) BY 3.17 (ft)) CMPA

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4871.72	0.00	-1.26	0-NF	0.00	0.00	0.00	-0.46	0.00	0.00
35.00	4873.92	2.21	1.37	1-S2n	1.02	1.35	0.95	2.19	9.44	2.62
70.00	4875.40	3.69	2.83	1-S2n	1.57	2.01	1.51	2.44	11.05	2.78
88.40	4876.44	4.72	3.86	5-S2n	1.86	2.29	1.79	2.62	11.67	2.89
90.96	4876.60	4.89	4.03	5-S2n	1.90	2.33	1.83	2.76	11.77	2.98
92.45	4876.70	4.99	4.23	5-S2n	1.92	2.35	1.95	2.88	11.21	3.05
93.39	4876.77	5.05	4.36	5-S2n	1.94	2.36	1.98	2.95	11.17	3.10
94.76	4876.86	5.15	4.56	5-S2n	1.96	2.38	2.01	3.07	11.20	3.17
95.62	4876.92	5.21	4.69	5-S2n	1.98	2.39	2.02	3.15	11.22	3.22
96.36	4876.97	5.26	4.81	4-FFt	1.99	2.40	3.17	3.23	8.14	3.27
97.04	4877.02	5.31	4.92	4-FFt	2.00	2.41	3.17	3.30	8.20	3.31

El. inlet face invert 4871.72 ft El. outlet invert 4870.46 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	141.00 ft
INLET ELEVATION	4871.72 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	4870.46 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0307
CULVERT LENGTH ALONG SLOPE	41.02 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	PIPE ARCH
BARREL SPAN	4.75 ft
BARREL RISE	3.17 ft
BARREL MATERIAL	STEEL OR ALUMINUM
BARREL MANNING'S n	0.024
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	PROJECTING
INLET DEPRESSION	NONE

TT22
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CURRENT DATE: 03-24-1999
CURRENT TIME: 16:49:38

FILE DATE: 03-24-1999
FILE NAME: TTWCR22

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION
MAIN CHANNEL AND LT & RT OVER BANKS

FILE NAME: TTWCR22
FILE DATE: 03-24-1999

LEFT CHANNEL BOUNDARY	2
RIGHT CHANNEL BOUNDARY	5
MANNING n LEFT OVER BANK	0.035
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.035
SLOPE OF CHANNEL	0.0045 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	4880.00
2	200.00	4872.00
3	200.00	4870.00
4	202.00	4870.00
5	202.00	4872.00
6	652.00	4880.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	4870.00	0.000	-0.46	0.00	0.00
35.00	4872.64	0.284	2.19	2.62	0.25
70.00	4872.90	0.288	2.44	2.78	0.27
105.00	4873.07	0.291	2.62	2.89	0.29
140.00	4873.21	0.293	2.76	2.98	0.30
175.00	4873.33	0.295	2.88	3.05	0.31
200.00	4873.40	0.296	2.95	3.10	0.32
245.00	4873.52	0.298	3.07	3.17	0.33
280.00	4873.61	0.299	3.15	3.22	0.34
315.00	4873.68	0.300	3.23	3.27	0.34
350.00	4873.75	0.301	3.30	3.31	0.35

Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE GRAVEL
EMBANKMENT TOP WIDTH 32.00 ft

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	4888.15
2	258.03	4885.33
3	391.04	4882.72
4	485.16	4880.59
5	556.28	4878.90
6	668.28	4877.19
7	853.97	4876.17
8	864.98	4876.17
9	980.47	4876.89
10	1165.01	4878.46
11	1217.64	4879.03
12	1326.54	4879.42

TT22
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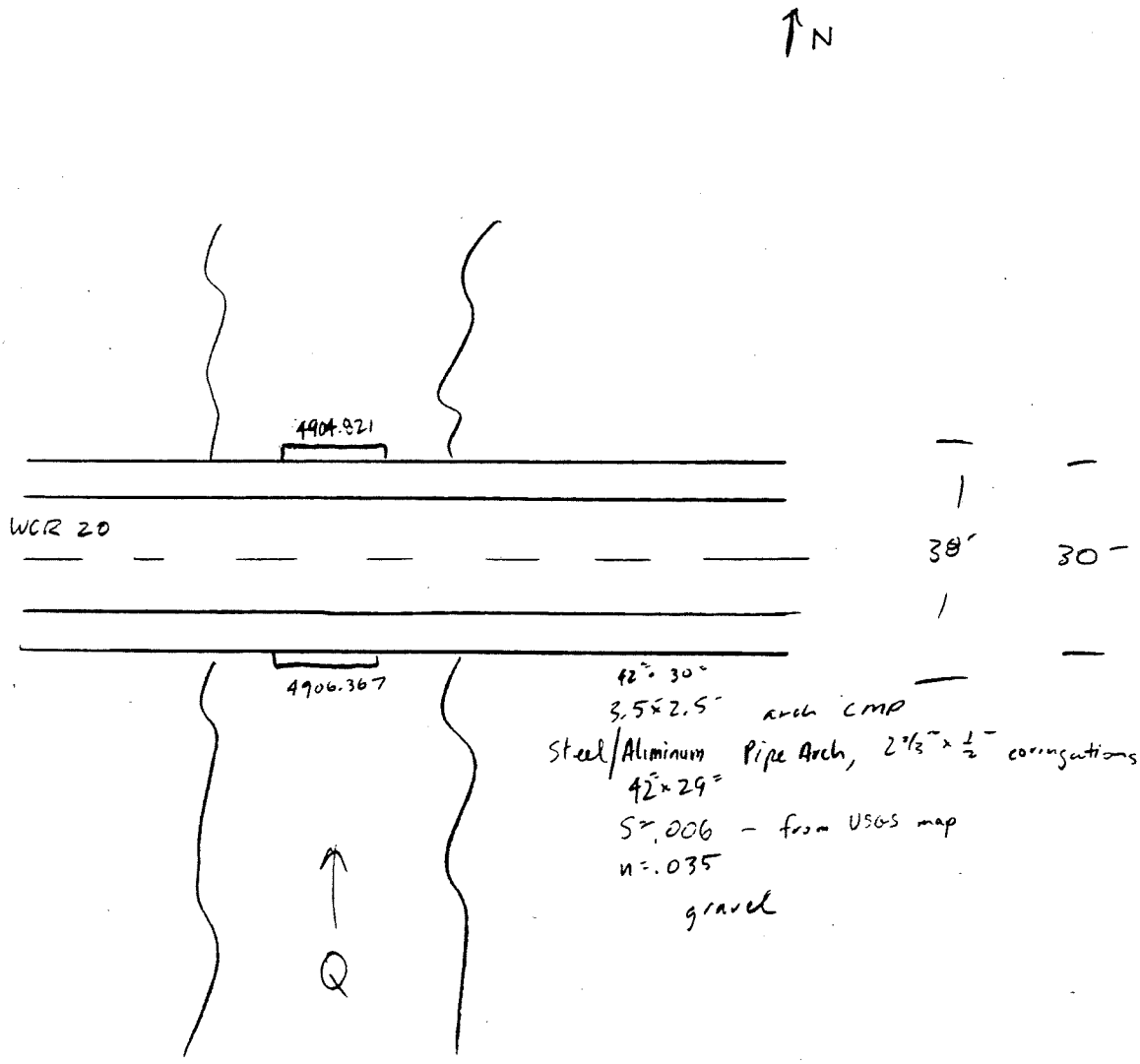
13	1455.55	4879.25
14	1512.71	4879.33
15	1632.49	4881.31

$Q_{OT} \equiv 36$ cfs TT20

ANDERSON CONSULTING ENGINEERS, INC Civil • Water Resources • Environmental	Project Number CO WELD 01	Page 1 Of 6
Owner-Project WELD COUNTY 1-25 MDP	By DCS	Date 3/25/99
Tritown Basin WCR 20 (5)	Checked By CJP	Date 04/12/99



42" × 30"
3.5 × 2.5' arch CMP
Steel/Aliminum Pipe Arch, 2 2/3" × 1/2" corrugations
42" × 29"
S = .006 – from USGS map
n = .035
gravel

1120

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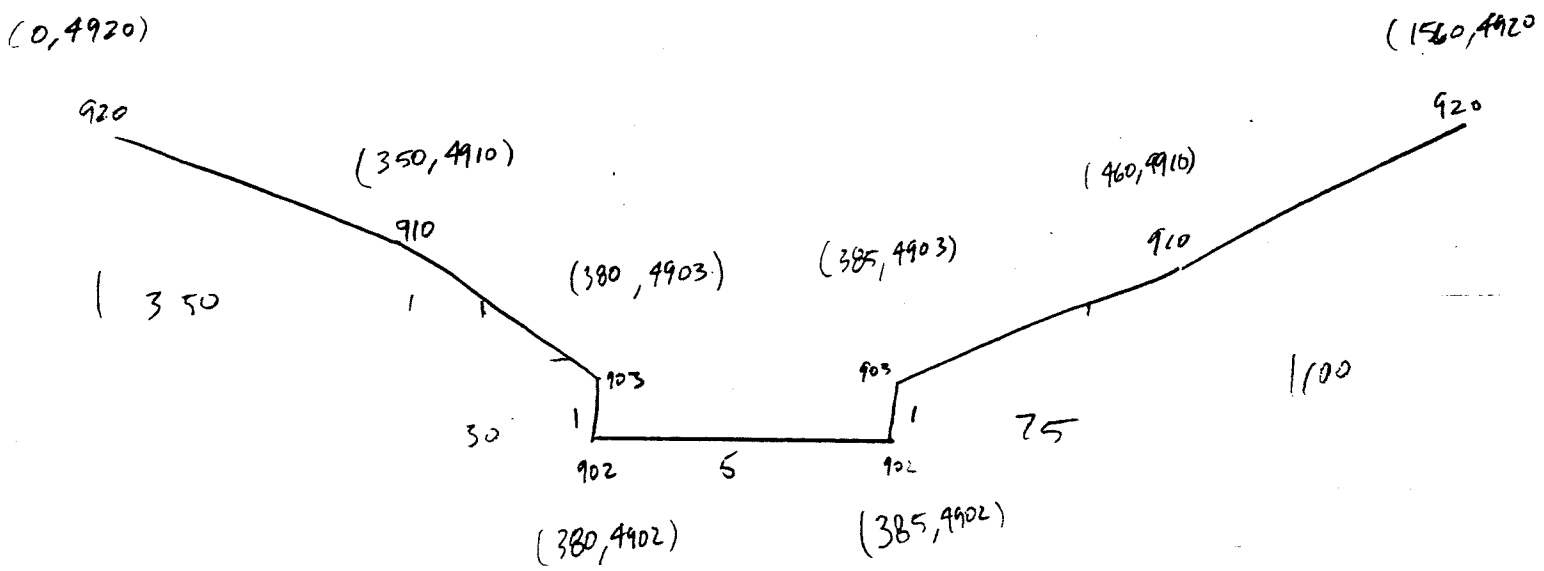
TTWCR20

	x	y	distance	station	elevation		
1023	105330.729	96357.520		0.000	4919.085	CL CO RD	
1022	105330.406	96417.819	60.300	60.300	4917.618	CL CO RD	
1020	105329.383	96533.480	115.666	175.965	4914.690	CL CO RD	
1018	105329.233	96640.884	107.404	283.369	4912.104	CL CO RD	280
1015	105329.329	96839.955	199.071	482.441	4909.606	CL CO RD	
1014	105329.160	96896.908	56.953	539.394	4909.675	CL CO RD	
1025	105330.625	96917.204	20.349	559.743	4909.649	CL CO RD	CL culvert
1013	105329.161	96956.015	38.839	598.581	4909.693	CL CO RD	
1011	105329.169	97070.727	114.712	713.293	4909.364	CL CO RD	
1009	105328.833	97124.724	53.998	767.291	4909.315	CL CO RD	min
1008	105328.626	97176.732	52.008	819.300	4909.399	CL CO RD	
1007	105329.328	97227.441	50.714	870.013	4909.789	CL CO RD	
1005	105329.485	97356.159	128.718	998.732	4911.756	CL CO RD	1000
1003	105328.064	97501.665	145.513	1144.245	4915.288	CL CO RD	
1001	105328.662	97618.048	116.385	1260.629	4916.811	CL CO RD	13
1027	105314.238	96920.302			4906.367	FL CMP	
1026	105351.216	96913.557	37.6		4904.821	FLcmp -3.25'channel	

4912 @ 720



TT20

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1

CURRENT DATE: 03-25-1999
CURRENT TIME: 09:34:08

FILE DATE: 03-25-1999
FILE NAME: TTWCR20

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	SITE DATA: OUTLET ELEV. (ft)	SITE DATA: CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4906.37	4904.82	38.03	1 CMPA	3.50	2.42	.025	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: TTWCR20 DATE: 03-25-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
4906.37	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4909.21	35.0	35.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4909.55	70.0	39.0	0.0	0.0	0.0	0.0	0.0	30.34	17
4909.65	105.0	40.1	0.0	0.0	0.0	0.0	0.0	64.22	12
4909.71	140.0	40.8	0.0	0.0	0.0	0.0	0.0	98.17	8
4909.76	175.0	41.3	0.0	0.0	0.0	0.0	0.0	132.12	6
09.80	200.0	41.7	0.0	0.0	0.0	0.0	0.0	156.53	5
09.85	245.0	42.2	0.0	0.0	0.0	0.0	0.0	200.60	5
09.88	280.0	42.6	0.0	0.0	0.0	0.0	0.0	235.91	5
4909.92	315.0	43.0	0.0	0.0	0.0	0.0	0.0	269.10	4
4909.95	350.0	43.3	0.0	0.0	0.0	0.0	0.0	303.65	4
4909.31	36.2	36.2	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: TTWCR20 DATE: 03-25-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4906.37	0.000	0.00	0.00	0.00
4909.21	0.000	35.00	0.00	0.00
4909.55	-0.001	70.00	0.70	1.00
4909.65	-0.001	105.00	0.68	0.65
4909.71	-0.001	140.00	1.01	0.72
4909.76	-0.002	175.00	1.53	0.87
4909.80	-0.002	200.00	1.78	0.89
4909.85	-0.003	245.00	2.17	0.89
4909.88	-0.002	280.00	1.47	0.53
4909.92	-0.004	315.00	2.94	0.93
4909.95	-0.004	350.00	3.06	0.87

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

TT20 4/6

2

CURRENT DATE: 03-25-1999
CURRENT TIME: 09:34:08

FILE DATE: 03-25-1999
FILE NAME: TTWCR20

PERFORMANCE CURVE FOR CULVERT 1 - 1(3.50 (ft) BY 2.42 (ft)) CMPA

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4906.37	0.00	-1.55	0-NF	0.00	0.00	0.00	-2.82	0.00	0.00
35.00	4909.22	2.85	1.78	1-S2n	1.16	1.55	1.18	-1.15	9.52	3.70
38.96	4909.54	3.18	2.15	1-S2n	1.25	1.65	1.27	-0.65	9.78	4.40
40.10	4909.64	3.28	2.27	1-S2n	1.28	1.67	1.30	-0.32	9.85	4.84
40.82	4909.71	3.34	2.34	1-S2n	1.29	1.69	1.32	-0.06	9.89	5.17
41.35	4909.76	3.39	2.39	1-S2n	1.31	1.70	1.33	0.16	9.92	5.44
41.69	4909.79	3.42	2.43	5-S2n	1.31	1.71	1.34	0.30	9.94	5.61
42.23	4909.84	3.48	2.48	5-S2n	1.33	1.72	1.35	0.51	9.98	5.87
42.62	4909.88	3.51	2.52	5-S2n	1.33	1.73	1.36	0.67	10.00	6.05
42.96	4909.91	3.55	2.56	5-S2n	1.34	1.74	1.37	0.81	10.02	6.21
43.29	4909.95	3.58	2.59	5-S2n	1.35	1.74	1.37	0.94	10.04	6.36

El. inlet face invert 4906.37 ft El. outlet invert 4904.82 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	138.00 ft
INLET ELEVATION	4906.37 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	4904.82 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0407
CULVERT LENGTH ALONG SLOPE	38.03 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	PIPE ARCH
BARREL SPAN	3.50 ft
BARREL RISE	2.42 ft
BARREL MATERIAL	STEEL OR ALUMINUM
BARREL MANNING'S n	0.025
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	PROJECTING
INLET DEPRESSION	NONE

TT20
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CURRENT DATE: 03-25-1999
CURRENT TIME: 09:34:08

FILE DATE: 03-25-1999
FILE NAME: TTWCR20

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION

FILE NAME: TTWCR20
FILE DATE: 03-25-1999

MAIN CHANNEL AND LT & RT OVER BANKS	
LEFT CHANNEL BOUNDARY	3
RIGHT CHANNEL BOUNDARY	6
MANNING n LEFT OVER BANK	0.035
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.035
SLOPE OF CHANNEL	0.0060 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	4920.00
2	350.00	4910.00
3	380.00	4903.00
4	380.00	4902.00
5	385.00	4902.00
6	385.00	4903.00
7	460.00	4910.00
8	1560.00	4920.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	4902.00	0.000	-2.82	0.00	0.00
35.00	4903.67	0.504	-1.15	3.70	0.45
70.00	4904.17	0.527	-0.65	4.40	0.58
105.00	4904.50	0.539	-0.32	4.84	0.67
140.00	4904.76	0.548	-0.06	5.17	0.74
175.00	4904.98	0.555	0.16	5.44	0.80
200.00	4905.12	0.560	0.30	5.61	0.83
245.00	4905.33	0.566	0.51	5.87	0.89
280.00	4905.49	0.570	0.67	6.05	0.93
315.00	4905.63	0.574	0.81	6.21	0.97
350.00	4905.76	0.578	0.94	6.36	1.01

Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	GRAVEL
EMBANKMENT TOP WIDTH	30.00 ft

***** USER DEFINED ROADWAY PROFILE

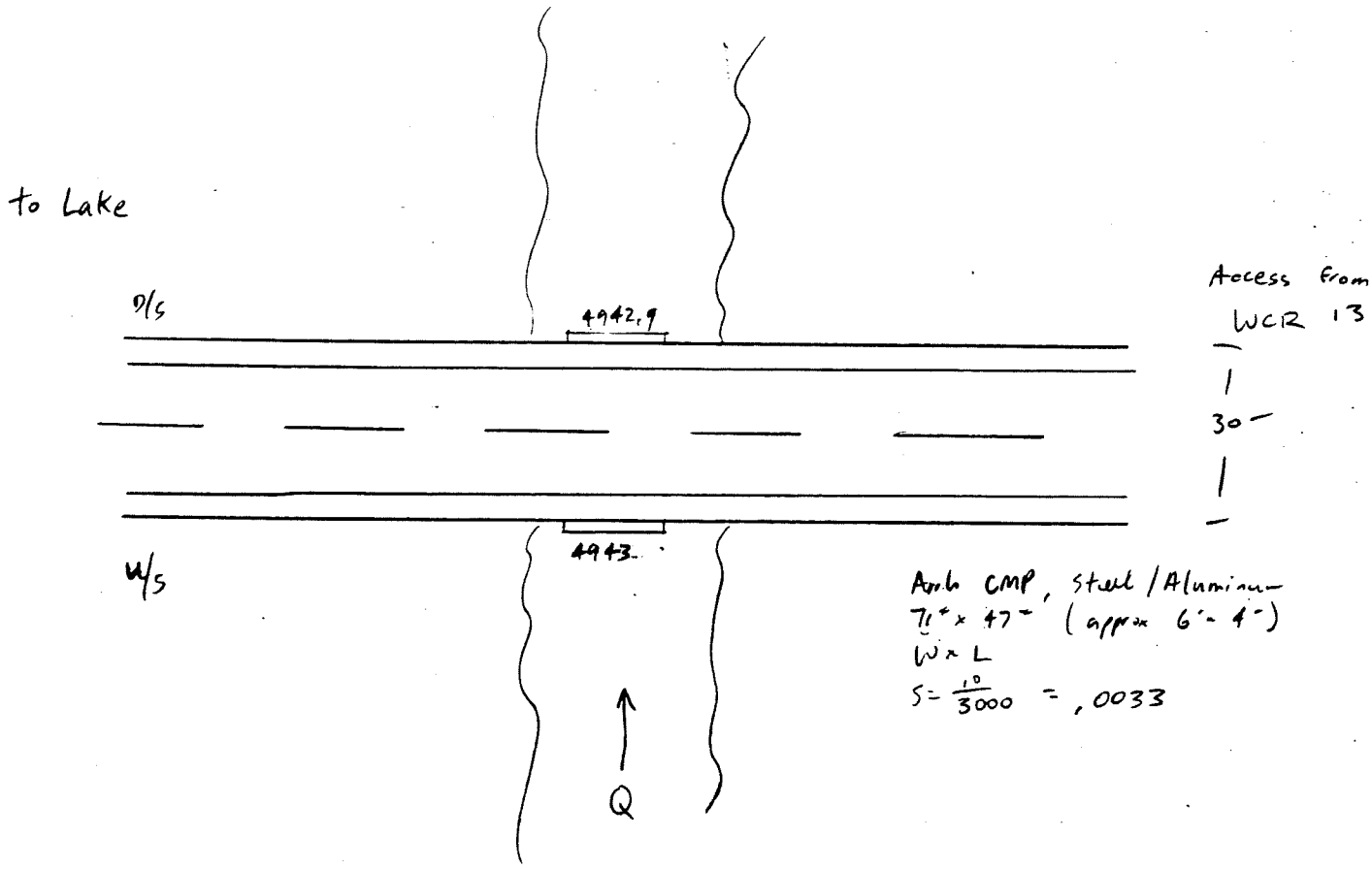
CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	4919.08
2	60.30	4917.62
3	175.97	4914.69
4	283.37	4912.10
5	482.44	4909.61
6	539.39	4909.67
7	559.74	4909.65
8	598.58	4909.69
9	713.29	4909.36
10	767.29	4909.31

TT20
6/6

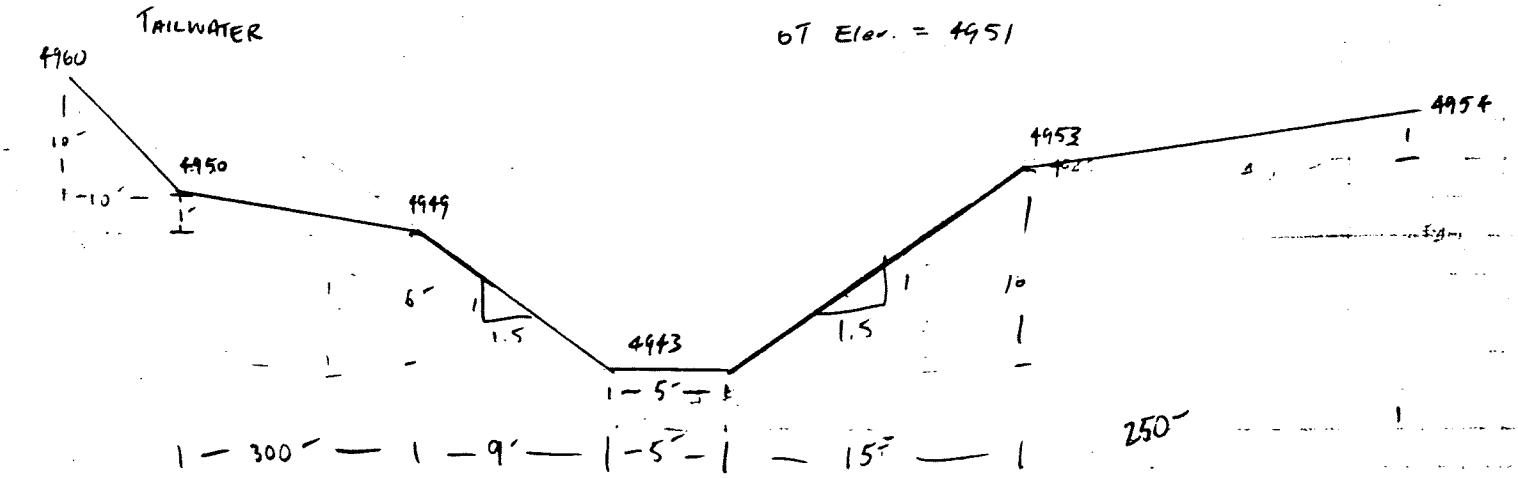
11	819.30	4909.40
12	870.01	4909.79
13	998.73	4911.76
14	1144.24	4915.29
15	1260.63	4916.81

Q_{OT} = 170 cfs TT MLAKE

ANDERSON CONSULTING ENGINEERS, INC Civil • Water Resources • Environmental	Project Number CO-WELD-01	Page 1 Of 4
Owner-Project WELD COUNTY I-25 MDP	By DCS	Date 5/26/99
TRITOWN BASIN MILAVEC LAKE PARKING	Checked By CJP	Date 05/26/99



Arch CMP, Steel / Aluminum
71" x 47" (approx 6'-4")
W x L
$S = \frac{10}{3000} = .0033$



CURRENT DATE: 05-26-1999
CURRENT TIME: 11:37:36

FILE DATE: 05-26-1999
FILE NAME: TT-LAKE

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS / SHAPE / MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4943.00	4942.90	30.00	1 CMPA	5.92	3.92	.024	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: TT-LAKE DATE: 05-26-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
4943.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4945.41	40.0	40.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4946.69	80.0	80.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4947.93	120.0	120.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4949.62	160.0	160.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4951.06	200.0	191.8	0.0	0.0	0.0	0.0	0.0	6.46	17
4951.19	240.0	194.1	0.0	0.0	0.0	0.0	0.0	44.50	6
29	280.0	195.7	0.0	0.0	0.0	0.0	0.0	82.95	5
.33	300.0	196.4	0.0	0.0	0.0	0.0	0.0	102.21	4
4951.45	360.0	198.1	0.0	0.0	0.0	0.0	0.0	159.35	4
4951.58	400.0	160.0	0.0	0.0	0.0	0.0	0.0	238.09	5
4951.00	190.9	190.9	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: TT-LAKE DATE: 05-26-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4943.00	0.000	0.00	0.00	0.00
4945.41	0.000	40.00	0.00	0.00
4946.69	0.000	80.00	0.00	0.00
4947.93	0.000	120.00	0.00	0.00
4949.62	0.000	160.00	0.00	0.00
4951.06	-0.006	200.00	1.73	0.87
4951.19	-0.005	240.00	1.40	0.58
4951.29	-0.004	280.00	1.36	0.49
4951.33	-0.004	300.00	1.41	0.47
4951.45	-0.009	360.00	2.50	0.69
4951.58	-0.006	400.00	1.91	0.48

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

CURRENT DATE: 05-26-1999 FILE DATE: 05-26-1999
CURRENT TIME: 11:37:36 FILE NAME: TT-LAKE

PERFORMANCE CURVE FOR CULVERT 1 - 1(5.92 (ft) BY 3.92 (ft)) CMPA

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4943.00	0.00	0.00	0-NF	0.00	0.00	0.00	0.10	0.00	0.00
40.00	4945.41	2.16	2.41	3-M1t	1.92	1.33	1.97	1.97	3.89	2.82
80.00	4946.69	3.36	3.69	3-M2t	3.92	1.98	2.75	2.75	5.56	3.38
120.00	4947.93	4.61	4.93	3-M2t	3.92	2.49	3.35	3.35	7.13	3.77
160.00	4949.62	6.30	6.62	3-M2t	3.92	2.92	3.85	3.85	8.85	4.06
191.80	4951.05	8.05	4.16	3-M2t	3.92	3.20	3.92	4.26	10.53	4.30
194.10	4951.19	8.19	4.54	3-M2t	3.92	3.22	3.92	4.64	10.65	4.50
195.69	4951.29	8.29	4.88	3-M2t	3.92	3.23	3.92	4.98	10.74	4.68
196.37	4951.33	8.33	5.04	3-M2t	3.92	3.23	3.92	5.14	10.78	4.76
198.15	4951.45	8.45	5.48	3-M2t	3.92	3.24	3.92	5.58	10.88	4.99
160.00	4949.30	6.30	5.75	3-M2t	3.92	2.92	3.92	5.85	8.78	5.12

El. inlet face invert 4943.00 ft El. outlet invert 4942.90 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	130.00 ft
INLET ELEVATION	4943.00 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	4942.90 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0033
CULVERT LENGTH ALONG SLOPE	30.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	PIPE ARCH
BARREL SPAN	5.92 ft
BARREL RISE	3.92 ft
BARREL MATERIAL	STEEL OR ALUMINUM
BARREL MANNING'S n	0.024
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	PROJECTING
INLET DEPRESSION	NONE

CURRENT DATE: 05-26-1999
CURRENT TIME: 11:37:36

FILE DATE: 05-26-1999
FILE NAME: TT-LAKE

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION

FILE NAME: TT-LAKE
FILE DATE: 05-26-1999

MAIN CHANNEL AND LT & RT OVER BANKS

LEFT CHANNEL BOUNDARY	3
RIGHT CHANNEL BOUNDARY	6
MANNING n LEFT OVER BANK	0.035
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.035
SLOPE OF CHANNEL	0.0033 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	4960.00
2	10.00	4950.00
3	310.00	4949.00
4	319.00	4943.00
5	324.00	4943.00
6	339.00	4953.00
7	589.00	4954.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	4943.00	0.000	0.10	0.00	0.00
40.00	4944.87	0.424	1.97	2.82	0.26
80.00	4945.65	0.440	2.75	3.38	0.34
120.00	4946.25	0.450	3.35	3.77	0.40
160.00	4946.75	0.457	3.85	4.06	0.44
200.00	4947.16	0.463	4.26	4.30	0.48
240.00	4947.54	0.468	4.64	4.50	0.52
280.00	4947.88	0.472	4.98	4.68	0.55
300.00	4948.04	0.473	5.14	4.76	0.56
360.00	4948.48	0.478	5.58	4.99	0.60
400.00	4948.75	0.481	5.85	5.12	0.63

Note: Shear stress was calculated using R.

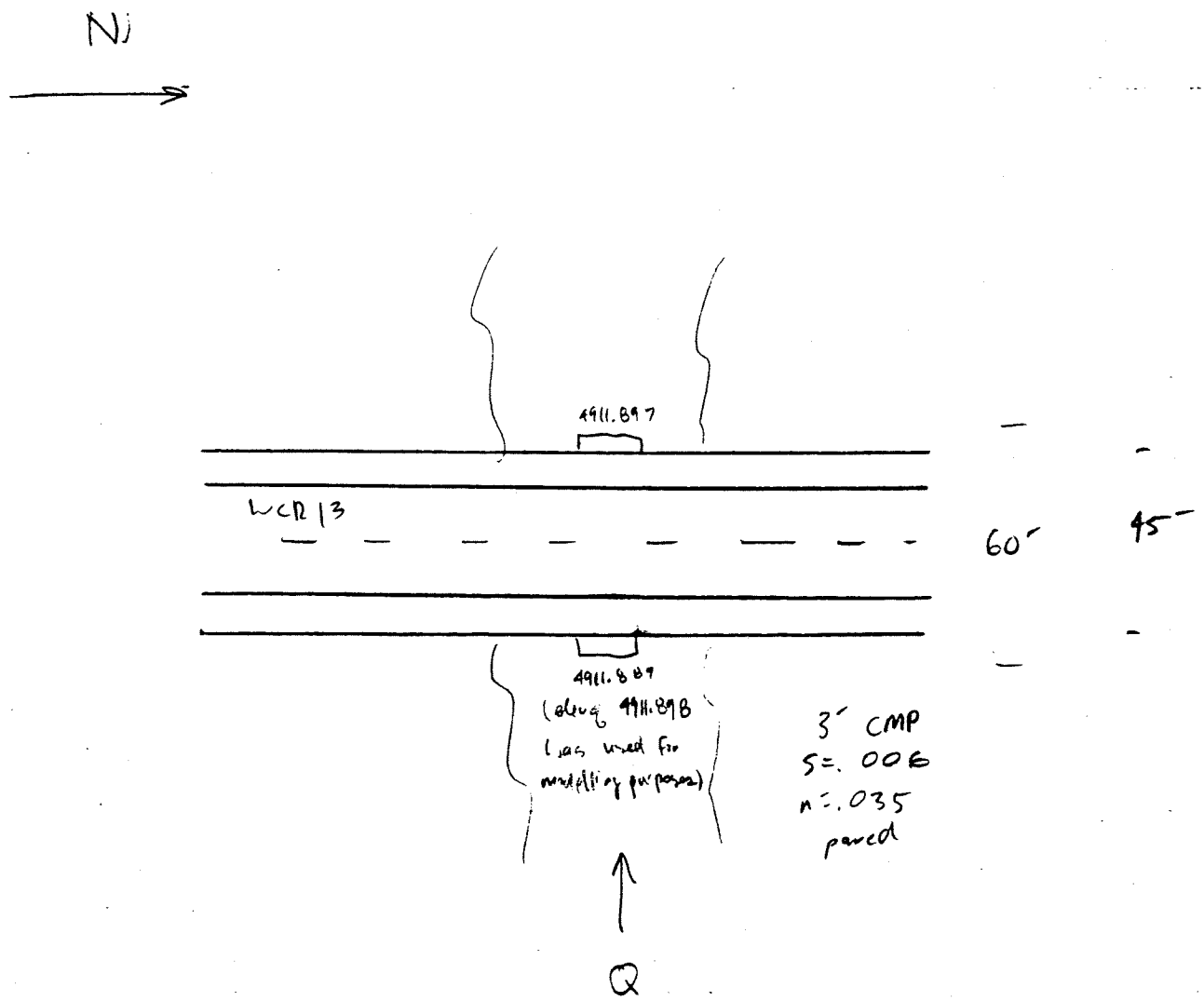
ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	GRAVEL
EMBANKMENT TOP WIDTH	25.00 ft
CREST LENGTH	200.00 ft
OVERTOPPING CREST ELEVATION	4951.00 ft

QOT = 32cfs

TT STP 13

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number COWELD01	Page 1 Of 6
Owner-Project	By DCS	Date 3/25/99
Su.. Tritown Basin WCR 13 (6)	Checked By CJP	Date 04/13/99



TT STP 13

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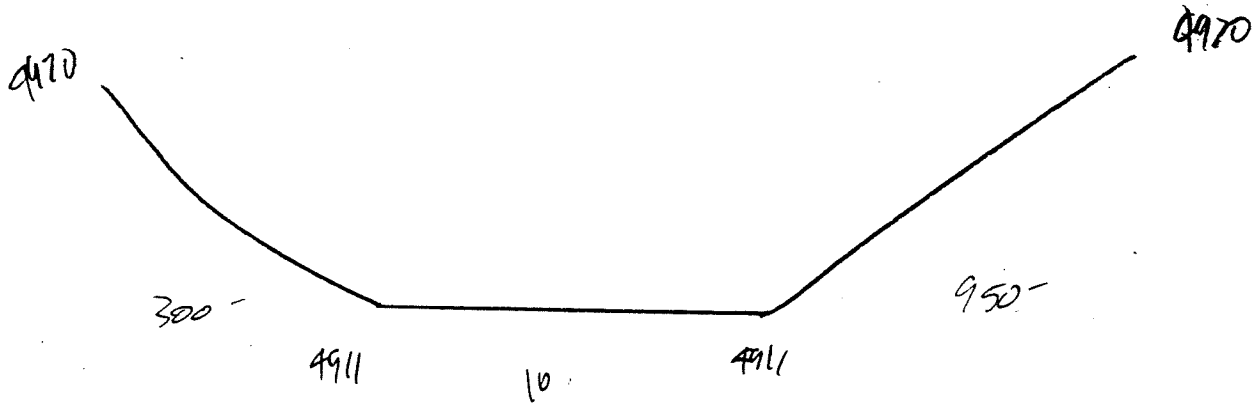
TTWCR13

	x	y	distance	station	elevation		
1029	105379.967	97554.339		0.000	4916.321	CL CO RD	
1030	105298.604	97555.256	81.368	81.368	4916.636	CL CO RD	
1067	105098.405	97557.451	200.211	281.579	4915.745	CL CO RD	
1031	105052.550	97552.739	46.096	327.676	4915.783	CL CO RD	
1071	105044.244	97552.679	8.306	335.982	4915.662	CL CO RD	
1065	104911.573	97554.767	132.687	468.669	4915.351	CL CO RD	min
1074	104814.087	97552.381	97.515	566.185	4915.482	CL CO RD	
1077	104552.545	97550.703	261.547	827.732	4916.587	CL CO RD	
1079	104366.322	97549.495	186.227	1013.959	4917.339	CL CO RD	
1081	104175.437	97548.994	190.886	1204.844	4917.256	CL CO RD	
1082	104080.489	97548.653	94.949	1299.793	4917.429	CL CO RD	near culv
1084	103889.256	97547.195	191.239	1491.032	4918.424	CL CO RD	
1060	103635.708	97548.892	253.554	1744.585	4920.596	CL CO RD	
1055	103186.877	97547.854	448.832	2193.418	4924.896	CL CO RD	
1050	102678.374	97545.238	508.510	2701.927	4927.704	CL CO RD	
1088	104109.872	97520.017	~		4911.897	FL 36IN CMP	outlet, D/S
1087	104085.145	97574.535	60'		4911.889	FL 36IN CMP	inlet, U/S



TT STP 13

CURRENT DATE: 03-25-1999
CURRENT TIME: 10:29:19

FILE DATE: 03-25-1999
FILE NAME: TTWCR13

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	SITE DATA: OUTLET ELEV. (ft)	SITE DATA: CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	4911.90	4911.90	60.00	1 CSP	3.00	3.00	.024	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: TTWCR13 DATE: 03-25-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
4911.90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4915.11	30.0	30.0	0.0	0.0	0.0	0.0	0.0	0.00	1
4915.56	60.0	35.6	0.0	0.0	0.0	0.0	0.0	24.04	19
4915.64	90.0	35.6	0.0	0.0	0.0	0.0	0.0	53.70	12
4915.70	120.0	36.1	0.0	0.0	0.0	0.0	0.0	83.12	10
4915.75	150.0	36.5	0.0	0.0	0.0	0.0	0.0	112.29	8
15.79	180.0	37.0	0.0	0.0	0.0	0.0	0.0	141.34	7
5.82	200.0	37.4	0.0	0.0	0.0	0.0	0.0	160.78	6
15.86	240.0	38.0	0.0	0.0	0.0	0.0	0.0	200.69	7
4915.89	270.0	38.0	0.0	0.0	0.0	0.0	0.0	230.07	6
4915.92	300.0	38.0	0.0	0.0	0.0	0.0	0.0	260.41	6
4915.35	32.6	32.6	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: TTWCR13 DATE: 03-25-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
4911.90	0.000	0.00	0.00	0.00
4915.11	0.000	30.00	0.00	0.00
4915.56	-0.001	60.00	0.40	0.67
4915.64	-0.001	90.00	0.74	0.82
4915.70	-0.001	120.00	0.78	0.65
4915.75	-0.001	150.00	1.24	0.83
4915.79	-0.001	180.00	1.64	0.91
4915.82	-0.001	200.00	1.79	0.89
4915.86	-0.001	240.00	1.33	0.55
4915.89	-0.001	270.00	1.93	0.71
4915.92	-0.001	300.00	1.59	0.53

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

TTSTP13
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2

CURRENT DATE: 03-25-1999 FILE DATE: 03-25-1999
CURRENT TIME: 10:29:19 FILE NAME: TTWCR13

PERFORMANCE CURVE FOR CULVERT 1 - 1(3.00 (ft) BY 3.00 (ft)) CSP

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	4911.90	0.00	0.00	0-NF	0.00	0.00	0.00	-0.90	0.00	0.00
30.00	4915.11	2.92	3.21	2-M2c	3.00	1.77	1.77	-0.40	6.90	1.40
35.56	4915.52	3.33	3.62	2-M2c	3.00	1.93	1.93	-0.24	7.40	1.67
35.56	4915.67	3.33	3.77	2-M2c	3.00	1.93	1.93	-0.13	7.40	1.84
36.10	4915.71	3.37	3.81	2-M2c	3.00	1.95	1.95	-0.03	7.45	1.98
36.47	4915.74	3.40	3.84	2-M2c	3.00	1.96	1.96	0.05	7.48	2.09
37.02	4915.78	3.45	3.88	2-M2c	3.00	1.97	1.97	0.13	7.52	2.19
37.43	4915.81	3.48	3.91	2-M2c	3.00	1.98	1.98	0.17	7.56	2.25
37.99	4915.85	3.52	3.95	2-M2c	3.00	2.00	2.00	0.25	7.60	2.36
38.00	4915.85	3.52	3.96	7-M2c	3.00	2.00	2.00	0.30	7.60	2.42
38.00	4915.94	3.52	4.04	2-M2c	3.00	2.00	2.00	0.35	7.60	2.49

El. inlet face invert 4911.90 ft El. outlet invert 4911.90 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	160.00 ft
INLET ELEVATION	4911.90 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	4911.90 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0000
CULVERT LENGTH ALONG SLOPE	60.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	3.00 ft
BARREL MATERIAL	CORRUGATED STEEL
BARREL MANNING'S n	0.024
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	THIN EDGE PROJECTING
INLET DEPRESSION	NONE

TTSTP13

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CURRENT DATE: 03-25-1999
CURRENT TIME: 10:29:19

FILE DATE: 03-25-1999
FILE NAME: TTWCR13

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION

FILE NAME: TTWCR13
FILE DATE: 03-25-1999

MAIN CHANNEL ONLY	
LEFT CHANNEL BOUNDARY	0
RIGHT CHANNEL BOUNDARY	0
MANNING n LEFT OVER BANK	0.000
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.000
SLOPE OF CHANNEL	0.0060 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	4920.00
2	300.00	4911.00
3	310.00	4911.00
4	1260.00	4920.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	4911.00	0.000	-0.90	0.00	0.00
30.00	4911.50	0.469	-0.40	1.40	0.10
60.00	4911.66	0.489	-0.24	1.67	0.14
90.00	4911.77	0.501	-0.13	1.84	0.16
120.00	4911.87	0.511	-0.03	1.98	0.17
150.00	4911.95	0.518	0.05	2.09	0.19
180.00	4912.02	0.524	0.13	2.19	0.20
200.00	4912.06	0.527	0.17	2.25	0.21
240.00	4912.15	0.533	0.25	2.36	0.23
270.00	4912.20	0.537	0.30	2.42	0.24
300.00	4912.25	0.541	0.35	2.49	0.25

Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	45.00 ft

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	0.00	4916.32
2	81.37	4916.64
3	281.58	4915.75
4	327.68	4915.78
5	335.98	4915.66
6	468.67	4915.35
7	566.19	4915.48
8	827.73	4916.59
9	1013.96	4917.34
10	1204.84	4917.26
11	1299.79	4917.43
12	1491.03	4918.42
13	1744.58	4920.60
14	2193.42	4924.90

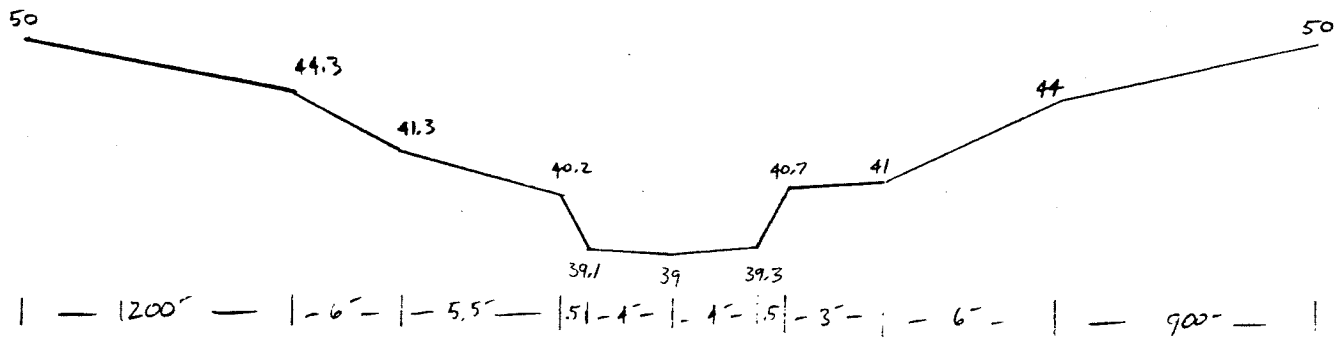
TTSTP13
6/6

15	2701.93	4927.70

Q_{OT} = 750 cfs @ WCR 18 TT 18/13

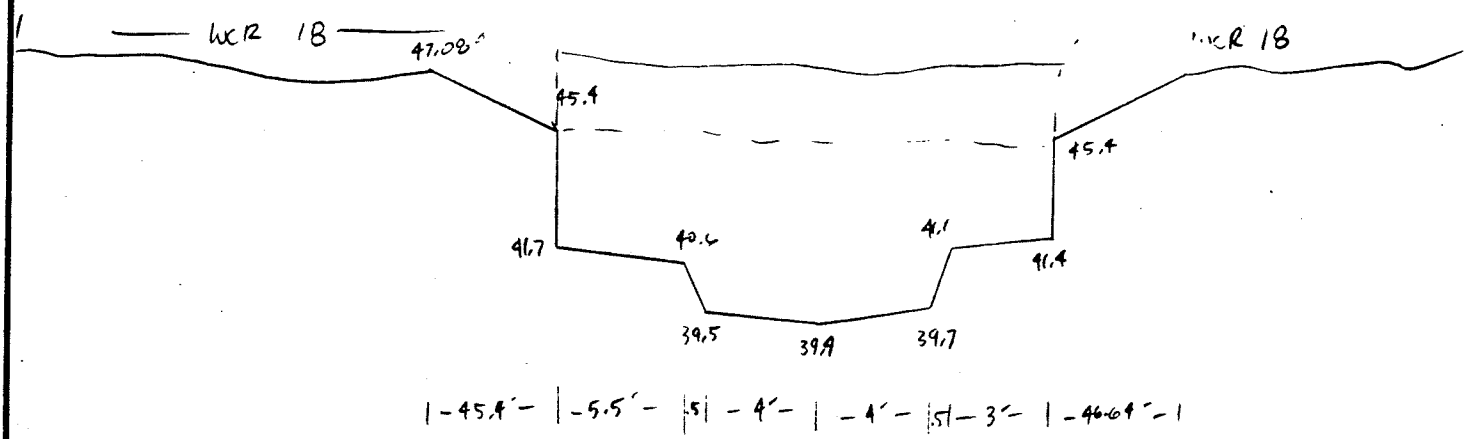
ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number COWELD01	Page 1 Of 19
Owner-Project WELD COUNTY I-25 MDP	By DCS	Date 4/13/99
TRITOWN BASIN BRIDGE @ WCR 18	Checked By CJP	Date 04/13/99

D/s X-section



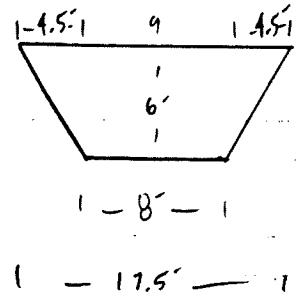
For U/s X-section, add .6' elevation to each point (124' @ .005 slope)

— U/s Face of bridge



For U/s face of bridge, add .1 ft of elevation

TRAP AREA



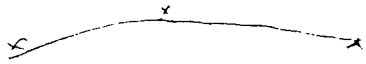
$A = \frac{1}{2}(17.5+8)(6)$
$= 76.5\ ft^2$

TT 18/13
2/19

Bridge at WCR 18

	X	Y	distance	station	elevation		
1114	100036.433	96570.712		0.000	4947.833	CL ROAD CROSS7	
1113	100036.216	96631.567	60.855	60.855	4947.476	CL ROAD CROSS7	
1112	100036.039	96686.332	54.765	115.621	4947.105	CL ROAD CROSS7	
1111	100035.608	96740.688	54.358	169.978	4946.835	CL ROAD CROSS7	
~~1110~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~CL ROAD CROSS7~~	
1109	100035.617	96805.964	66.414	237.574	4946.687	CL ROAD CROSS7	
1108	100035.620	96872.728	66.764	304.338	4946.529	CL ROAD CROSS7	
1107	100035.652	96939.634	66.906	371.244	4946.492	CL ROAD CROSS7	— min
1106	100035.626	97006.543	66.909	438.153	4946.548	CL ROAD CROSS7	
1105	100035.299	97072.443	65.901	504.054	4946.653	CL ROAD CROSS7	
1104	100034.811	97136.605	64.164	568.218	4946.651	CL ROAD CROSS7	
1103	100034.450	97198.923	62.319	630.537	4946.930	CL ROAD CROSS7	
1102	100033.842	97285.011	86.090	716.627	4947.085	CL ROAD CROSS7	
1101	100033.486	97340.380	55.370	771.997	4947.346	CL ROAD CROSS7	— near bridge
1100	100033.296	97394.521	54.141	826.138	4947.433	CL ROAD CROSS7	
1099	100033.290	97468.578	74.057	900.195	4947.998	CL ROAD CROSS7	
1098	100035.556	97528.887	60.352	960.547	4948.913	CL ROAD CROSS7	
1097	100041.996	97585.609	57.086	1017.633	4948.846	CL ROAD CROSS7	
1096	100041.996	97638.108	52.499	1070.132	4949.010	CL ROAD CROSS7	
1095	100041.404	97692.877	54.772	1124.904	4949.105	CL ROAD CROSS7	
1094	100041.178	97792.432	99.555	1224.460	4949.588	CL ROAD CROSS7	
1093	100040.448	97861.978	69.550	1294.009	4949.813	CL ROAD CROSS7	
1092	100039.270	97932.285	70.317	1364.326	4949.731	CL ROAD CROSS7	
1091	100038.035	98002.347	70.073	1434.399	4949.664	CL ROAD CROSS7	
1090	100036.774	98071.936	69.600	1504.000	4949.496	CL ROAD CROSS7	
1089	100035.835	98140.864	68.934	1572.934	4949.407	CL ROAD CROSS7	
1118	100099.819	97349.142		0.000	4938.994	CL FL STREAM	
1117	100044.698	97342.730	55.493	55.493	4946.852	N SIDE TOP BRDG	
1116	100021.359	97341.729			4946.909	S SIDE TOP BRDG	

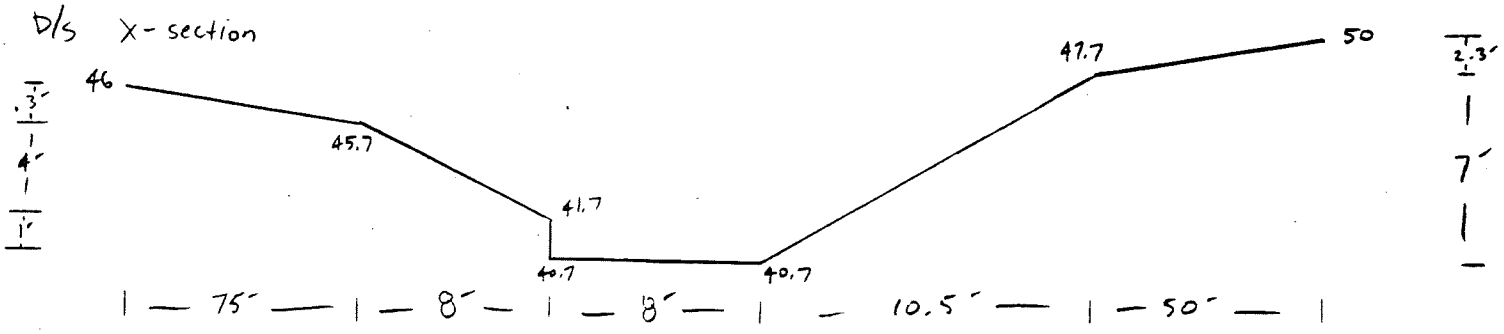
L=24'



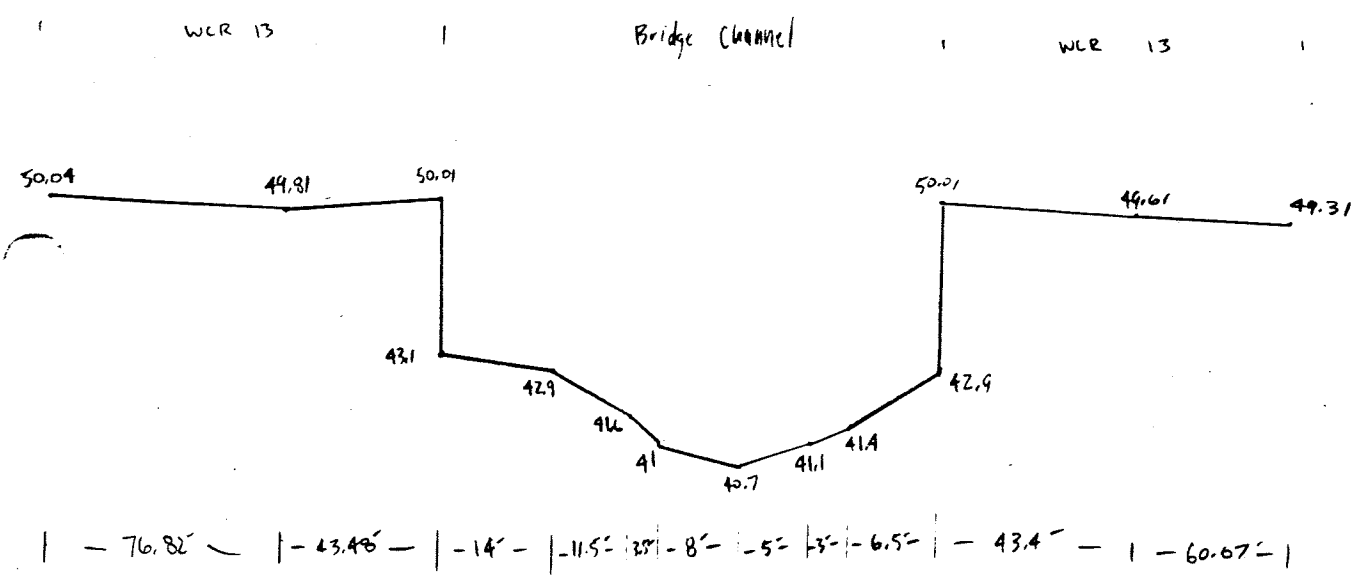
QOT — 15 Wcfs @ WCR13 TT 18/13

ANDERSON CONSULTING ENGINEERS, INC Civil • Water Resources • Environmental	Project Number COWELD01	Page Of 3/19
Owner-Project WELD COUNTY 1-25 MDP	By DCS	Date 4-13-99
TRITOWN BASIN BRIDGE @ WCR 13	Checked By CJP	Date 04/13/99

D/S X-section

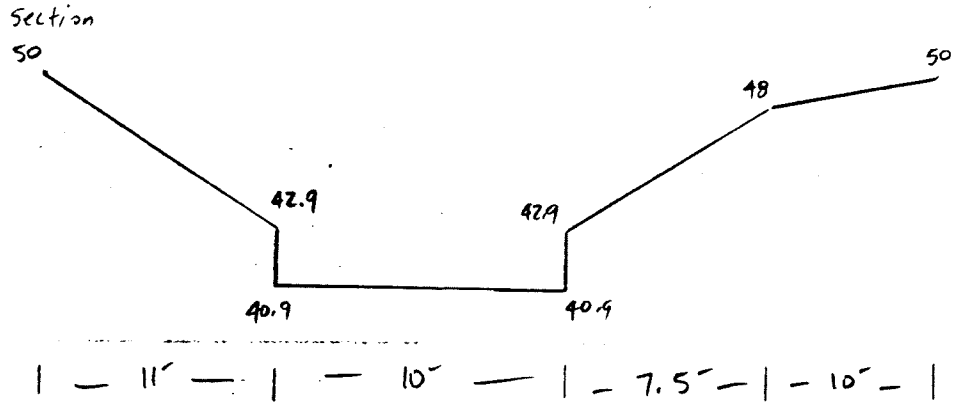


D/S Face of Bridge



For U/S face of bridge, add 0.1' to all bridge channel elevations

U/S X-section



TT 13
CO-WELD-01
04/13/99
DCS

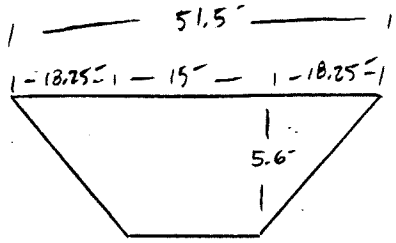
4/19

TTWCR13bridge

	x	y	distance	station	elevation			
1149	99207.579	97530.284		0.000	4951.483	CL CO RD13		
1148	99301.039	97530.035	93.460	93.460	4950.991	CL CO RD13		
1147	99391.929	97530.351	90.891	184.351	4950.796	CL CO RD13		
1146	99479.882	97530.294	87.953	272.304	4950.502	CL CO RD13		
1145	99564.635	97529.934	84.754	357.058	4950.270	CL CO RD13		
1144	99645.417	97530.045	80.782	437.840	4950.035	CL CO RD13	0	
1143	99722.242	97530.209	76.825	514.665	4949.810	CL CO RD13	76.8	
1142	99794.202	97530.287	71.960	586.625	4950.011	CL CO RD13		near brid
BT 1141	99860.715	97530.509	66.513	653.138	4949.611	CL CO RD13	→ 1253	99816.762, 97633.071
1140	99921.385	97530.551	60.670	713.808	4949.306	CL CO RD13		4949.392
1139	99975.107	97529.792	53.727	767.536	4949.206	CL CO RD13		
1138	100070.281	97527.236	95.208	862.744	4948.695	CL CO RD13		
1137	100130.007	97527.480	59.726	922.471	4948.490	CL CO RD13		
1136	100180.677	97527.733	50.671	973.141	4948.240	CL CO RD13		
1135	100247.117	97528.316	66.443	1039.584	4947.798	CL CO RD13		
1134	100321.851	97529.182	74.739	1114.323	4947.476	CL CO RD13		
1133	100401.720	97529.736	79.871	1194.194	4947.205	CL CO RD13		min
1132	100483.798	97530.286	82.080	1276.273	4947.432	CL CO RD13		
1121	99657.529	97581.028			4940.759	STREAM FL		
1120	99772.210	97551.227		0.000	4940.759	FL @ BRDG ABUTT		m = .002
1119	99812.586	97511.299	56.784	56.784	4940.641	FL @ BRDG ABUTT		

$\frac{.118}{56.8}$

TRAP AREA



$A = \frac{1}{2}(15 + 51.5)\,5.6$

$= 186.2\,ft^2$

TT 18/13 5/19

```
*****************************************
*  HEC-2 WATER SURFACE PROFILES          *
*                                        *
*  Version   4.6.2;  May 1991            *
*                                        *
*       ATE    13APR99    TIME   08:58:08 *
*       ***********************************
```

```
*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*          (916) 756-1104               *
*****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

THIS RUN EXECUTED 13APR99 08:58:08

```
*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************
```

THIS IS AN ARCHIVAL RUN ALL DATA AND RESULTS ARE SAVED ON UNIT 96

```
AC
T1   I-25 MASTER DRAINAGE PLAN  MARCH 1999   FILE:TTWR1318.DAT
T2   HEC-2 ANALYSIS OF BRIDGES
T3    RITOWN BASIN   WELD COUNTY
```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2		0	0				41	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1							

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	42	39	63	1	2	25	5	10	43
4	53	54	0	38	43	50	55	26	56
3	61	14	16	17	18	8	0	100	0

J5 LPRNT NUMSEC ********REQUESTED SECTION NUMBERS********

-10 -10

BRIDGE @ WCR 18 ↓

NC	.035	.035	.035	.1	.3					
QT	16	300	400	500	600	700	800	900	1000	1100
QT	1200	1300	1400	1500	1600	1700	1800			
X1	850	11	1206	1223.5	0	0	0		-1	
X2										
X3										
GR	50	0	44.3	1200	41.3	1206	40.2	1211.5	39.1	1212
GR	39	1216	39.3	1220	40.7	1220.5	41	1223.5	44	1229.5
GR	50	2129.5								

6/19

X1	900	0	0	0	50	50	50		.25	
X1	950	0	0	0	50	50	50		.25	
X1	1000	0	0	0	50	50	50		.25	
X	1050	11	1206	1223.5	50	50	50			
GR	50	0	44.3	1200	41.3	1206	40.2	1211.5	39.1	1212
GR	39	1216	39.3	1220	40.7	1220.5	41	1223.5	44	1229.5
GR	50	2129.5								
NC	.035	.035	.035	.3	.5					
X1	1100	33	762	779.5	50	50	50			
X3	10									
GR	47.833	0	47.476	60.855	47.105	115.621	46.835	169.978	46.687	237.574
GR	46.529	304.338	46.492	371.244	46.548	438.153	46.653	504.054	46.651	568.218
GR	46.93	630.54	47.085	716.63	45.4	762	41.7	762	40.6	767.5
GR	39.5	768	39.4	772	39.7	776	41.1	776.5	41.4	779.5
GR	45.4	779.5	47.43	826.14	48	900.19	48.91	960.55	48.85	1017.63
GR	49.01	1070.13	49.105	1124.9	49.59	1224.46	49.81	1294.01	49.73	1364.33
GR	49.66	1434.4	49.5	1504	49.41	1572.93				
SB		1.6	3	0	8	0	76.5	.8	39.5	39.4
NC	.035	.035	.035	.3	.5					
X1	1124	33	762	779.6	24	24	24			
X2	0	0	1	45.4	~~47.4~~ 48					
X3	10									
BT	-27	0	47.833	47.833	60.855	47.476	47.476	115.621	47.105	47.105
BT		169.978	46.835	46.835	237.574	46.687	46.687	304.338	46.529	46.529
BT		371.244	46.492	46.492	438.153	46.548	46.548	504.054	46.653	46.653
BT		568.218	46.651	46.651	630.54	46.93	46.93	716.63	47.085	47.085
BT		762	47.2	45.5	772	47.346	45.346	779.6	~~47.4~~	45.5
BT		826.14	47.43	47.43	900.19	48	48	960.55	48.91	48.91
BT		1017.6	48.85	48.85	1070.1	49.01	49.01	1124.9	49.1	49.1
BT		1224.5	49.59	49.59	1294.0	49.81	49.81	1364.33	49.73	49.73
B		1434.4	49.66	49.66	1504	49.5	49.5	1572.93	49.41	49.41
GR	.833	0	47.476	60.855	47.105	115.621	46.835	169.978	46.687	237.574
GR	46.529	304.338	46.492	371.244	46.548	438.153	46.653	504.054	46.651	568.218
GR	46.93	630.54	47.085	716.63	45.5	762	41.8	762.01	40.7	767.5
GR	39.6	768	39.5	772	39.8	776	41.2	776.5	41.5	779.5
GR	45.5	779.6	47.43	826.14	48	900.19	48.91	960.55	48.85	1017.6
GR	49.01	1070.1	49.1	1124.9	49.59	1224.5	49.81	1294.0	49.73	1364.33
GR	49.66	1434.4	49.5	1504	49.41	1572.93				
NC	.035	.035	.035	.3	.5					
X1	1174	11	1206	1223.5	50	50	50			
GR	50.6	0	44.9	1200	41.9	1206	40.8	1211.5	39.7	1212
GR	39.6	1216	39.9	1220	41.3	1220.5	41.6	1223.5	44.6	1229.5
GR	50.6	2129.5								

BRIDGE @ WCR 13

NC	.035	.035	.035	.1	.3					
X1	1334	7	75	101.6	180	160	140			
GR	46	0	45.7	75	41.7	83	40.7	83.1	40.7	91.1
GR	47.7	101.6	50	151.6						
NC	.035	.035	.035	.3	.5					
X1	1384	14	120.3	171.9	50	50	50			
X3	10									
GR	50.04	0	49.81	76.82	50.01	120.3	43.1	120.4	42.9	134.3
GR	1.6	145.8	41	149.3	40.7	157.3	41.1	162.3	41.4	165.3
G	2.9	171.8	50.01	171.9	49.61	215.3	49.31	275.97		
SB		1.6	3	0	15	0	186.2	3.26	40.8	40.7

```
NC     .035      .035      .035       .3        .5
X1     1424        14     120.3    171.9        40        40        40
X2        0         0         1     46.4     50.01
X3       10
BT       -6         0     50.04    50.04     76.82     49.81     49.81     120.3     50.01      46.4
               171.9     50.01     46.4     215.3     49.61     49.61    275.97     49.31     49.31
GR    50.04         0     49.81    76.82     50.01     120.3      43.2     120.4        43     134.3
GR    41.7     145.8      41.1    149.3      40.8     157.3      41.2     162.3      41.5     165.3
GR      43     171.8     50.01    171.9     49.61     215.3     49.31    275.97


NC     .035      .035      .035       .3        .5
X1     1474         7        11     21.2        50        50        50
GR       50         0      42.9       11      40.9      11.1      40.9      21.1      42.9      21.2
GR       48      28.7        50     38.7


T1      I-25 MASTER DRAINAGE PLAN  MARCH 1999   FILE:TTBRIDGE.DAT
T2      HEC-2 ANALYSIS OF BRIDGES
T3      TRITOWN BASIN   WELD COUNTY

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

              3                 0        0                          42


J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    2         0        -1


T1      I-25 MASTER DRAINAGE PLAN  MARCH 1999   FILE:TTBRIDGE.DAT
T2      HEC-2 ANALYSIS OF BRIDGES
T3      TRITOWN BASIN   WELD COUNTY

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

              4                 0        0                          42

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    3         0        -1


T1      I-25 MASTER DRAINAGE PLAN  MARCH 1999   FILE:TTBRIDGE.DAT
T2      HEC-2 ANALYSIS OF BRIDGES
T3      TRITOWN BASIN   WELD COUNTY

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

              5                 0        0                          42

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    4         0        -1


T1      I-25 MASTER DRAINAGE PLAN  MARCH 1999   FILE:TTBRIDGE.DAT
T2      HEC-2 ANALYSIS OF BRIDGES
T3      TRITOWN BASIN   WELD COUNTY

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

              6                 0        0                          42

            IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    5         0        -1
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T1      I-25 MASTER DRAINAGE PLAN  MARCH 1999   FILE:TTBRIDGE.DAT
T2      HEC-2 ANALYSIS OF BRIDGES
T3      TRITOWN BASIN   WELD COUNTY

        :K    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

                7                 0        0                                  42


J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     6        0        -1

T1      I-25 MASTER DRAINAGE PLAN  MARCH 1999   FILE:TTBRIDGE.DAT
T2      HEC-2 ANALYSIS OF BRIDGES
T3      TRITOWN BASIN   WELD COUNTY

J1  ICHECK   INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

                8                 0        0                                  42

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     7        0        -1

T1      I-25 MASTER DRAINAGE PLAN  MARCH 1999   FILE:TTBRIDGE.DAT
T2      HEC-2 ANALYSIS OF BRIDGES
T3      TRITOWN BASIN   WELD COUNTY

J1  ICHECK   INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

                9                 0        0                                  42

J2  [illegible]OF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     8        0        -1

T1      I-25 MASTER DRAINAGE PLAN  MARCH 1999   FILE:TTBRIDGE.DAT
T2      HEC-2 ANALYSIS OF BRIDGES
T3      TRITOWN BASIN   WELD COUNTY

J1  ICHECK   INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

               10                 0        0                                  42

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     9        0        -1

T1      I-25 MASTER DRAINAGE PLAN  MARCH 1999   FILE:TTBRIDGE.DAT
T2      HEC-2 ANALYSIS OF BRIDGES
T3      TRITOWN BASIN   WELD COUNTY

J1  ICHECK   INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

               11                 0        0                                  42


J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

                0        -1

T1      I-25 MASTER DRAINAGE PLAN  MARCH 1999   FILE:TTBRIDGE.DAT
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T2      HEC-2 ANALYSIS OF BRIDGES
T3      TRITOWN BASIN   WELD COUNTY

J1 ICHECK   INQ     NINV    IDIR    STRT    METRIC  HVINS   Q       WSEL    FQ
            12              0       0                               42
J2 NPROF    IPLOT   PRFVS   XSECV   XSECH   FN      ALLDC   IBW     CHNIM   ITRACE
   11       0       -1

T1      I-25 MASTER DRAINAGE PLAN  MARCH 1999   FILE:TTBRIDGE.DAT
T2      HEC-2 ANALYSIS OF BRIDGES
T3      TRITOWN BASIN   WELD COUNTY

J1 ICHECK   INQ     NINV    IDIR    STRT    METRIC  HVINS   Q       WSEL    FQ
            13              0       0                               42
J2 NPROF    IPLOT   PRFVS   XSECV   XSECH   FN      ALLDC   IBW     CHNIM   ITRACE
   12       0       -1

T1      I-25 MASTER DRAINAGE PLAN  MARCH 1999   FILE:TTBRIDGE.DAT
T2      HEC-2 ANALYSIS OF BRIDGES
T3      TRITOWN BASIN   WELD COUNTY

J1 ICHECK   INQ     NINV    IDIR    STRT    METRIC  HVINS   Q       WSEL    FQ
            14              0       0                               42
J2 NPROF    IPLOT   PRFVS   XSECV   XSECH   FN      ALLDC   IBW     CHNIM   ITRACE
   13       0       -1

T1      I-25 MASTER DRAINAGE PLAN  MARCH 1999   FILE:TTBRIDGE.DAT
T2      HEC-2 ANALYSIS OF BRIDGES
T3      TRITOWN BASIN   WELD COUNTY

J1 ICHECK   INQ     NINV    IDIR    STRT    METRIC  HVINS   Q       WSEL    FQ
            15              0       0                               42

J2 NPROF    IPLOT   PRFVS   XSECV   XSECH   FN      ALLDC   IBW     CHNIM   ITRACE
   14       0       -1

T1      I-25 MASTER DRAINAGE PLAN  MARCH 1999   FILE:TTBRIDGE.DAT
T2      HEC-2 ANALYSIS OF BRIDGES
T3      TRITOWN BASIN   WELD COUNTY

J1 ICHECK   INQ     NINV    IDIR    STRT    METRIC  HVINS   Q       WSEL    FQ
            16              0       0                               42
1221 NUMBER PROFILES TOO LARGE
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THIS RUN EXECUTED 13APR99 08:58:10

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*       ******************************
HEC     WATER SURFACE PROFILES

Version   4.6.2;  May 1991
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

ASIN WELD COU

SUMMARY PRINTOUT

	SECNO	ELMIN	XLCH	TELMX	CWSEL	CRIWS	AREA	10*KS	HV	Q	TOPWID	SSTA	ENDST
*	850.000	38.00	.00	49.00	41.07	41.07	38.61	149.91	.98	300.00	21.17	1204.47	1225.63
	850.000	38.00	.00	49.00	42.00	.00	60.09	72.56	.75	400.00	24.90	1202.60	1227.50
	850.000	38.00	.00	49.00	42.00	41.92	60.09	113.38	1.17	500.00	24.90	1202.60	1227.50
*	850.000	38.00	.00	49.00	42.27	42.27	66.85	120.25	1.37	600.00	25.96	1202.07	1228.03
*	850.000	38.00	.00	49.00	42.62	42.62	76.19	112.87	1.46	700.00	27.36	1201.37	1228.73
*	850.000	38.00	.00	49.00	43.88	43.88	206.08	33.73	.51	800.00	283.26	1078.10	1361.36
*	850.000	38.00	.00	49.00	43.97	43.97	233.01	36.34	.54	900.00	315.68	1059.16	1374.85
*	850.000	38.00	.00	49.00	44.17	44.17	303.14	30.65	.43	1000.00	387.58	1017.18	1404.76
*	850.000	38.00	.00	49.00	44.25	44.25	335.14	31.66	.43	1100.00	416.29	1000.41	1416.71
*	850.000	38.00	.00	49.00	44.32	44.32	363.85	32.91	.44	1200.00	440.45	986.31	1426.76
*	850.000	38.00	.00	49.00	44.31	44.31	362.74	38.82	.52	1300.00	439.54	986.84	1426.38
*	850.000	38.00	.00	49.00	44.40	44.40	401.65	37.83	.49	1400.00	470.38	968.83	1439.21
*	850.000	38.00	.00	49.00	44.48	44.48	440.45	36.86	.47	1500.00	499.23	951.98	1451.21
*	850.000	38.00	.00	49.00	44.55	44.55	478.35	36.04	.45	1600.00	525.89	936.42	1462.30
*	900.000	38.25	50.00	49.25	42.01	.00	54.21	54.98	.51	300.00	23.94	1203.08	1227.02
	900.000	38.25	50.00	49.25	42.43	.00	64.78	58.48	.65	400.00	25.64	1202.23	1227.87
	900.000	38.25	50.00	49.25	42.86	.00	75.97	58.05	.75	500.00	27.33	1201.38	1228.72
*	900.000	38.25	50.00	49.25	43.27	.00	87.66	55.89	.82	600.00	32.25	1200.56	1232.81
*	900.000	38.25	50.00	49.25	43.79	42.83	128.98	44.22	.70	700.00	156.98	1151.84	1308.81
*	900.000	38.25	50.00	49.25	44.12	44.12	203.95	34.18	.52	800.00	280.53	1079.69	1360.22
*	900.000	38.25	50.00	49.25	44.28	44.28	253.59	32.32	.47	900.00	338.37	1045.92	1384.28
*	900.000	38.25	50.00	49.25	44.34	44.34	273.88	35.71	.51	1000.00	359.34	1033.67	1393.01
*	900.000	38.25	50.00	49.25	44.43	44.43	307.93	36.20	.51	1100.00	392.02	1014.59	1406.61
*	900.000	38.25	50.00	49.25	44.51	44.51	341.08	36.62	.50	1200.00	421.40	997.43	1418.83
*	900.000	38.25	50.00	49.25	44.63	44.63	394.03	33.72	.44	1300.00	464.50	972.26	1436.76
*	.000	38.25	50.00	49.25	44.68	44.68	415.55	35.63	.46	1400.00	480.91	962.68	1443.59
	.000	38.25	50.00	49.25	44.71	44.71	433.15	37.99	.48	1500.00	493.93	955.08	1449.01
*	900.000	38.25	50.00	49.25	44.74	44.74	447.91	40.68	.51	1600.00	504.59	948.85	1453.44

	SECNO	ELMIN	XLCH	TELMX	CWSEL	CRIWS	AREA	10*KS	HV	Q	TOPWID	SSTA	ENDST
	950.000	38.50	50.00	49.50	42.29	.00	55.11	52.41	.50	300.00	24.09	1203.01	1227.09
	950.000	38.50	50.00	49.50	42.75	.00	66.76	53.65	.61	400.00	25.95	1202.08	1228.02
	950.000	38.50	50.00	49.50	43.18	.00	77.94	54.00	.71	500.00	27.62	1201.24	1228.86
	950.000	38.50	50.00	49.50	43.58	.00	89.77	52.90	.79	600.00	40.99	1200.44	1241.43
*	950.000	38.50	50.00	49.50	44.02	44.02	127.59	44.74	.71	700.00	153.76	1153.72	1307.48
*	950.000	38.50	50.00	49.50	44.37	44.37	204.37	34.09	.52	800.00	281.07	1079.37	1360.45
*	950.000	38.50	50.00	49.50	44.51	44.51	245.41	33.84	.50	900.00	329.54	1051.07	1380.61
*	950.000	38.50	50.00	49.50	44.64	44.64	291.66	32.52	.46	1000.00	376.75	1023.50	1400.26
*	950.000	38.50	50.00	49.50	44.73	44.73	326.77	32.97	.45	1100.00	408.97	1004.69	1413.66
*	950.000	38.50	50.00	49.50	44.80	44.80	358.22	33.78	.45	1200.00	435.82	989.01	1424.83
*	950.000	38.50	50.00	49.50	44.83	44.83	369.97	37.56	.50	1300.00	445.43	983.40	1428.83
*	950.000	38.50	50.00	49.50	44.90	44.90	404.10	37.43	.49	1400.00	472.25	967.74	1439.99
*	950.000	38.50	50.00	49.50	44.98	44.98	439.45	37.02	.47	1500.00	498.50	952.41	1450.91
*	950.000	38.50	50.00	49.50	45.05	45.05	474.92	36.53	.45	1600.00	523.53	937.79	1461.32
	1000.000	38.75	50.00	49.75	42.56	.00	55.44	51.52	.49	300.00	24.14	1202.98	1227.12
	1000.000	38.75	50.00	49.75	43.03	.00	67.35	52.33	.60	400.00	26.04	1202.03	1228.07
	1000.000	38.75	50.00	49.75	43.46	.00	78.73	52.48	.70	500.00	27.73	1201.18	1228.92
	1000.000	38.75	50.00	49.75	43.86	.00	90.73	51.77	.77	600.00	44.42	1200.40	1244.81
*	1000.000	38.75	50.00	49.75	44.25	44.25	124.99	45.74	.72	700.00	147.55	1157.34	1304.89
*	1000.000	38.75	50.00	49.75	44.62	44.62	204.29	34.11	.52	800.00	280.97	1079.43	1360.40
*	1000.000	38.75	50.00	49.75	44.77	44.77	249.12	33.14	.49	900.00	333.57	1048.72	1382.29
*	1000.000	38.75	50.00	49.75	44.86	44.86	281.76	34.25	.49	1000.00	367.16	1029.10	1396.26
*	1000.000	38.75	50.00	49.75	44.95	44.95	314.42	35.04	.49	1100.00	397.94	1011.13	1409.07
*	1000.000	38.75	50.00	49.75	45.02	45.02	345.73	35.82	.49	1200.00	425.36	995.12	1420.48
*	.000	38.75	50.00	49.75	45.12	45.12	389.22	34.44	.45	1300.00	460.75	974.45	1435.20
	.000	38.75	50.00	49.75	45.17	45.17	413.65	35.92	.46	1400.00	479.49	963.51	1443.00
*	1000.000	38.75	50.00	49.75	45.22	45.22	434.05	37.85	.48	1500.00	494.58	954.70	1449.28
*	1000.000	38.75	50.00	49.75	45.25	45.25	451.32	40.12	.51	1600.00	507.02	947.43	1454.45

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	1050.000	39.00	50.00	50.00	42.82	.00	55.62	51.05	.49	300.00	24.17	1202.96	1227.14
	1050.000	39.00	50.00	50.00	43.30	.00	67.62	51.72	.60	400.00	26.08	1202.01	1228.09
	1050.000	39.00	50.00	50.00	43.73	.00	79.21	51.59	.69	500.00	27.80	1201.15	1228.95
	1050.000	39.00	50.00	50.00	44.12	.00	91.43	51.01	.77	600.00	46.74	1200.37	1247.11
*	1050.000	39.00	50.00	50.00	44.48	44.48	121.99	46.96	.74	700.00	140.02	1161.74	1301.76
*	[illegible].000	39.00	50.00	50.00	44.87	44.87	204.30	34.10	.52	800.00	280.99	1079.42	1360.41
*	000	39.00	50.00	50.00	45.01	45.01	247.51	33.44	.49	900.00	331.83	1049.73	1381.56
*	[illegible].000	39.00	50.00	50.00	45.13	45.13	287.62	33.21	.47	1000.00	372.87	1025.77	1398.64
*	1050.000	39.00	50.00	50.00	45.22	45.22	322.88	33.60	.46	1100.00	405.53	1006.70	1412.23
*	1050.000	39.00	50.00	50.00	45.29	45.29	355.09	34.27	.46	1200.00	433.22	990.53	1423.75
*	1050.000	39.00	50.00	50.00	45.34	45.34	374.20	36.84	.49	1300.00	448.84	981.41	1430.25
*	1050.000	39.00	50.00	50.00	45.41	45.41	405.76	37.16	.48	1400.00	473.52	967.00	1440.51
*	1050.000	39.00	50.00	50.00	45.47	45.47	438.70	37.13	.47	1500.00	497.96	952.72	1450.68
*	1050.000	39.00	50.00	50.00	45.54	45.54	472.27	36.91	.46	1600.00	521.70	938.86	1460.56

	SECNO	ELMIN	XLCH	TELMX	CWSEL	CRIWS	AREA	10*KS	HV	Q	TOPWID	SSTA	ENDST
	1100.000	39.40	50.00	47.83	43.07	.00	47.49	81.16	.62	300.00	17.50	762.00	779.50
	1100.000	39.40	50.00	47.83	43.53	.00	55.42	90.96	.81	400.00	17.50	762.00	779.50
	1100.000	39.40	50.00	47.83	43.92	.00	62.39	100.15	1.00	500.00	17.50	762.00	779.50
*	1100.000	39.40	50.00	47.83	44.27	.00	68.42	110.09	1.19	600.00	17.50	762.00	779.50
*	1100.000	39.40	50.00	47.83	44.49	.00	72.30	127.62	1.46	700.00	17.50	762.00	779.50
*	1100.000	39.40	50.00	47.83	44.51	.00	72.72	163.93	1.88	800.00	17.50	762.00	779.50
*	1100.000	39.40	50.00	47.83	44.68	44.68	75.65	185.13	2.20	900.00	17.50	762.00	779.50
*	1100.000	39.40	50.00	47.83	44.98	44.98	80.84	188.89	2.38	1000.00	17.50	762.00	779.50
*	1100.000	39.40	50.00	47.83	45.26	45.26	85.72	193.34	2.56	1100.00	17.50	762.00	779.50
*	1100.000	39.40	50.00	47.83	47.16	47.16	464.47	25.26	.31	1200.00	712.91	107.09	820.00
*	1100.000	39.40	50.00	47.83	47.21	47.21	497.03	26.17	.31	1300.00	720.66	100.39	821.04
*	1100.000	39.40	50.00	47.83	47.29	47.29	553.60	24.56	.27	1400.00	733.93	88.90	822.83
*	1100.000	39.40	50.00	47.83	47.32	47.32	579.04	25.69	.28	1500.00	739.82	83.81	823.62
*	1100.000	39.40	50.00	47.83	47.35	47.35	600.46	27.06	.29	1600.00	744.74	79.55	824.29
	W/S SIDE WEIR 18												
	1124.000	39.50	24.00	47.83	43.34	.00	50.43	67.74	.55	300.00	17.54	762.01	779.55
	1124.000	39.50	24.00	47.83	43.86	.00	59.62	73.20	.70	400.00	17.55	762.00	779.56
	1124.000	39.50	24.00	47.83	44.34	.00	67.90	78.09	.84	500.00	17.57	762.00	779.57
	1124.000	39.50	24.00	47.83	44.86	.00	77.16	77.64	.94	600.00	17.58	762.00	779.58
*	[illegible].000	39.50	24.00	47.83	45.65	.00	91.74	64.71	.92	OT 700.00	FLOW 25.78	757.56	783.34
*	.000	39.50	24.00	47.83	46.91	OT WEIR .00	300.39	22.23	.32	800.00	568.81	152.49	813.89
*	.000	39.50	24.00	47.83	44.79	44.79	75.91	183.09	2.18	900.00	17.58	762.00	779.58
*	1124.000	39.50	24.00	47.83	47.08	45.10	401.93	22.97	.29	1000.00	696.30	120.11	817.77
*	1124.000	39.50	24.00	47.83	47.17	.00	934.37	4.55	.04	1100.00	861.13	9.85	870.98
	1124.000	39.50	24.00	47.83	47.19	.00	486.37	23.74	.28	1200.00	719.31	101.33	820.64
	1124.000	39.50	24.00	47.83	47.24	.00	517.63	24.71	.28	1300.00	726.73	94.95	821.68
	1124.000	39.50	24.00	47.83	47.28	.00	552.25	25.15	.27	1400.00	734.87	87.96	822.82
	1124.000	39.50	24.00	47.83	47.32	.00	578.93	26.16	.28	1500.00	741.07	82.62	823.69
	1124.000	39.50	24.00	47.83	47.35	.00	604.11	27.17	.28	1600.00	746.89	77.62	824.51
*	1174.000	39.60	50.00	50.60	43.81	.00	65.48	31.90	.36	300.00	25.75	1202.17	1227.93
*	1174.000	39.60	50.00	50.60	44.47	.00	83.32	28.64	.40	400.00	28.39	1200.86	1229.24
*	1174.000	39.60	50.00	50.60	45.19	.00	138.38	20.92	.33	500.00	177.26	1139.99	1317.26
*	1174.000	39.60	50.00	50.60	46.05	.00	425.47	6.28	.08	600.00	488.29	958.37	1446.66
*	1174.000	39.60	50.00	50.60	46.85	.00	929.42	1.76	.02	700.00	775.76	790.51	1566.26
*	1174.000	39.60	50.00	50.60	47.33	.00	1345.06	.98	.01	800.00	949.48	689.07	1638.54
*	1174.000	39.60	50.00	50.60	47.63	.00	1650.26	.76	.01	900.00	1059.04	625.09	1684.13
*	1174.000	39.60	50.00	50.60	47.46	.00	1477.63	1.22	.01	1000.00	998.55	660.41	1658.96
*	1174.000	39.60	50.00	50.60	47.82	.00	1863.09	.84	.01	1100.00	1129.17	584.13	1713.31
*	1174.000	39.60	50.00	50.60	47.55	.00	1567.77	1.53	.02	1200.00	1030.58	641.71	1672.28
*	1174.000	39.60	50.00	50.60	47.60	.00	1616.46	1.67	.02	1300.00	1047.47	631.84	1679.31
*	1174.000	39.60	50.00	50.60	47.64	.00	1661.46	1.81	.02	1400.00	1062.85	622.86	1685.71
*	1174.000	39.60	50.00	50.60	47.68	.00	1706.56	1.94	.02	1500.00	1078.04	613.99	1692.03
*	1174.000	39.60	50.00	50.60	47.72	.00	1749.95	2.08	.02	1600.00	1092.45	605.58	1698.03

	SECNO	ELMIN	XLCH	TELMX	CWSEL	CRIWS	AREA	10*KS	HV	Q	TOPWID	SSTA	ENDST
*	1334.000	40.70	140.00	46.00	44.29	.00	45.50	87.59	.68	300.00	18.68	77.81	96.49
*	1334.000	40.70	140.00	46.00	44.86	.00	56.58	86.22	.78	400.00	20.66	76.68	97.34
*	1334.000	40.70	140.00	46.00	45.35	.00	67.06	85.10	.86	500.00	22.36	75.71	98.07
*	[illegible].000	40.70	140.00	46.00	45.61	.00	73.02	97.39	1.05	600.00	23.27	75.19	98.46
*	.000	40.70	140.00	46.00	46.61	.00	155.51	37.41	.45	700.00	99.98	.00	99.98
*	[illegible].000	40.70	140.00	46.00	47.17	.00	211.35	23.36	.30	800.00	100.82	.00	100.82
*	1334.000	40.70	140.00	46.00	47.48	.00	242.58	20.46	.27	900.00	101.28	.00	101.28
*	1334.000	40.70	140.00	46.00	47.22	.00	215.43	34.73	.44	1000.00	100.88	.00	100.88

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*	1334.000	40.70	140.00	46.00	47.62	.00	256.87	26.10	.35	1100.00	101.49	.00	101.49
*	1334.000	40.70	140.00	46.00	47.16	.00	210.72	52.97	.67	1200.00	100.81	.00	100.81
*	1334.000	40.70	140.00	46.00	47.08	.00	201.79	69.50	.87	1300.00	100.68	.00	100.68
*	1334.000	40.70	140.00	46.00	47.21	47.21	214.11	69.17	.88	1400.00	100.86	.00	100.86
*	1334.000	40.70	140.00	46.00	47.29	47.29	223.01	71.32	.91	1500.00	100.99	.00	100.99
*	000	40.70	140.00	46.00	47.26	47.26	219.62	84.51	1.08	1600.00	100.94	.00	100.94
*	[illegible].000	40.70	50.00	49.31	45.16	.00	163.98	4.44	.05	300.00	51.46	120.37	171.83
*	1384.000	40.70	50.00	49.31	45.84	.00	199.28	4.25	.06	400.00	51.48	120.36	171.84
*	1384.000	40.70	50.00	49.31	46.43	.00	229.50	4.26	.07	500.00	51.50	120.35	171.85
*	1384.000	40.70	50.00	49.31	46.92	.00	254.86	4.43	.09	600.00	51.51	120.34	171.86
*	1384.000	40.70	50.00	49.31	47.12	.00	265.07	5.33	.11	700.00	51.52	120.34	171.86
*	1384.000	40.70	50.00	49.31	47.44	.00	281.67	5.77	.13	800.00	51.53	120.34	171.86
*	1384.000	40.70	50.00	49.31	47.70	.00	294.83	6.34	.14	900.00	51.53	120.33	171.87
*	1384.000	40.70	50.00	49.31	47.63	.00	291.19	8.14	.18	1000.00	51.53	120.33	171.87
*	1384.000	40.70	50.00	49.31	47.89	.00	304.56	8.57	.20	1100.00	51.54	120.33	171.87
*	1384.000	40.70	50.00	49.31	47.81	.00	301.00	10.58	.25	1200.00	51.54	120.33	171.87
*	1384.000	40.70	50.00	49.31	47.97	.00	309.20	11.43	.27	1300.00	51.54	120.33	171.87
*	1384.000	40.70	50.00	49.31	48.07	.00	314.13	12.63	.31	1400.00	51.54	120.33	171.87
*	1384.000	40.70	50.00	49.31	48.17	.00	319.36	13.78	.34	1500.00	51.55	120.33	171.87
*	1384.000	40.70	50.00	49.31	48.32	.00	327.55	14.51	.37	1600.00	51.55	120.32	171.88
				U/s face	WCR 13								
	1424.000	40.80	40.00	49.31	45.18	.00	159.78	4.82	.05	300.00	51.46	120.37	171.83
	1424.000	40.80	40.00	49.31	45.86	.00	194.97	4.56	.07	400.00	51.48	120.36	171.84
	1424.000	40.80	40.00	49.31	46.53	.00	229.73	4.25	.07	500.00	51.50	120.35	171.85
	1424.000	40.80	40.00	49.31	47.09	.00	258.55	4.23	.08	600.00	51.52	120.34	171.86
	1424.000	40.80	40.00	49.31	47.37	.00	272.70	4.88	.10	700.00	51.52	120.34	171.86
	1424.000	40.80	40.00	49.31	47.79	.00	294.23	5.04	.11	800.00	51.54	120.33	171.87
	1424.000	40.80	40.00	49.31	48.15	.00	312.98	5.28	.13	900.00	51.55	120.33	171.87
	1424.000	40.80	40.00	49.31	48.19	.00	314.86	6.40	.16	1000.00	51.55	120.33	171.87
	1424.000	40.80	40.00	49.31	48.59	.00	335.49	6.37	.17	1100.00	51.56	120.32	171.88
	1424.000	40.80	40.00	49.31	48.65	.00	338.84	7.36	.19	1200.00	51.56	120.32	171.88
	1424.000	40.80	40.00	49.31	48.97	.00	355.40	7.47	.21	1300.00	51.57	120.32	171.89
	1424.000	40.80	40.00	49.31	49.25	.00	369.73	7.68	.22	1400.00	51.58	120.31	171.89
	1424.000	40.80	40.00	49.31	49.55 OT	.00	384.98	7.80	.24	1500.00	51.59	120.31	171.89
	1424.000	40.80	40.00	49.31	49.74 ←	.00	394.76	8.22	.26	1600.00	51.59	120.30	171.90
					49.6								

	NO	ELMIN	XLCH	TELMX	CWSEL	CRIWS	AREA	10*KS	HV	Q	TOPWID	SSTA	ENDST
*	1474.000	40.90	50.00	50.00	44.91	.00	46.86	63.81	.70	300.00	16.28	7.88	24.16
*	1474.000	40.90	50.00	50.00	45.52	.00	57.44	65.43	.85	400.00	18.14	6.93	25.07
*	1474.000	40.90	50.00	50.00	46.16	.00	69.71	60.96	.92	500.00	20.08	5.93	26.01
*	1474.000	40.90	50.00	50.00	46.69	.00	80.67	59.58	1.00	600.00	21.66	5.12	26.78
*	1474.000	40.90	50.00	50.00	46.85	.00	84.15	72.52	1.25	700.00	22.14	4.87	27.02
*	1474.000	40.90	50.00	50.00	47.23	.00	92.64	73.50	1.36	800.00	23.27	4.29	27.57
*	1474.000	40.90	50.00	50.00	47.54	.00	100.08	75.88	1.48	900.00	24.22	3.81	28.03
*	1474.000	40.90	50.00	50.00	47.35	47.27	95.55	105.85	2.00	1000.00	23.65	4.10	27.75
*	1474.000	40.90	50.00	50.00	47.75	47.56	105.32	99.09	2.00	1100.00	24.86	3.48	28.34
*	1474.000	40.90	50.00	50.00	48.00	48.00	111.62	101.22	2.12	1200.00	25.63	3.09	28.72
*	1474.000	40.90	50.00	50.00	48.29	48.29	119.21	99.44	2.17	1300.00	27.51	2.65	30.15
*	1474.000	40.90	50.00	50.00	48.58	48.58	127.31	97.13	2.21	1400.00	29.37	2.21	31.58
*	1474.000	40.90	50.00	50.00	48.85	48.85	135.52	95.05	2.24	1500.00	31.15	1.79	32.93
*	1474.000	40.90	50.00	50.00	49.14	49.14	144.94	91.36	2.23	1600.00	33.07	1.33	34.40

TRITOWN BASIN WELD COU

SUMMARY PRINTOUT

	SECNO	Q	DIFWSP	VLOB	VCH	VROB	EG	DIFEG	QCH	K*XNL	K*XNCH	K*XNR	DEPTH
*	850.000	300.00	.00	2.55	8.00	3.17	42.05	.00	294.88	35.00	35.00	35.00	3.07
	850.000	400.00	.93	3.01	7.10	3.36	42.75	.70	377.86	35.00	35.00	35.00	4.00
	850.000	500.00	.00	3.77	8.88	4.20	43.17	1.12	472.33	35.00	35.00	35.00	4.00
*	850.000	600.00	.27	4.27	9.67	4.70	43.64	1.60	559.37	35.00	35.00	35.00	4.27
*	850.000	700.00	.35	4.62	10.02	5.01	44.07	2.03	640.96	35.00	35.00	35.00	4.62
*	850.000	800.00	1.26	1.77	6.67	1.95	44.39	2.35	574.56	35.00	35.00	35.00	5.88
*	[illegible].000	900.00	.09	1.83	7.01	2.06	44.51	2.46	614.63	35.00	35.00	35.00	5.97
*	[illegible].000	1000.00	.20	1.73	6.61	1.99	44.60	2.55	602.50	35.00	35.00	35.00	6.17
*	[illegible].000	1100.00	.08	1.80	6.79	2.07	44.68	2.64	627.94	35.00	35.00	35.00	6.25
*	850.000	1200.00	.07	1.87	6.98	2.15	44.76	2.71	653.83	35.00	35.00	35.00	6.32
*	850.000	1300.00	.00	2.03	7.58	2.33	44.83	2.79	709.56	35.00	35.00	35.00	6.31

*	850.000	1400.00	.09	2.06	7.56	2.36	44.89	2.85	719.19	35.00	35.00	35.00	6.40
*	850.000	1500.00	.08	2.09	7.53	2.39	44.95	2.90	727.46	35.00	35.00	35.00	6.48
*	850.000	1600.00	.07	2.12	7.52	2.41	45.00	2.95	735.46	35.00	35.00	35.00	6.55
*	[illegible]0.000	300.00	.00	2.37	5.85	2.68	42.52	.00	286.65	35.00	35.00	35.00	3.76
	000	400.00	.43	2.90	6.63	3.20	43.08	.56	374.42	35.00	35.00	35.00	4.18
	000	500.00	.42	3.30	7.17	3.58	43.61	1.09	458.01	35.00	35.00	35.00	4.61
	[illegible].000	600.00	.41	3.62	7.56	3.88	44.09	1.57	537.58	35.00	35.00	35.00	5.02
*	900.000	700.00	.51	2.70	7.27	2.28	44.48	1.97	581.66	35.00	35.00	35.00	5.54
*	900.000	800.00	.34	1.79	6.71	1.96	44.64	2.12	576.88	35.00	35.00	35.00	5.87
*	900.000	900.00	.16	1.73	6.67	1.97	44.75	2.24	591.88	35.00	35.00	35.00	6.03
*	900.000	1000.00	.06	1.84	7.06	2.10	44.85	2.34	634.10	35.00	35.00	35.00	6.09
*	900.000	1100.00	.09	1.89	7.19	2.17	44.94	2.42	657.32	35.00	35.00	35.00	6.18
*	900.000	1200.00	.08	1.94	7.31	2.23	45.01	2.49	678.36	35.00	35.00	35.00	6.26
*	900.000	1300.00	.12	1.94	7.12	2.22	45.07	2.56	675.64	35.00	35.00	35.00	6.38
*	900.000	1400.00	.05	2.02	7.36	2.31	45.14	2.62	704.29	35.00	35.00	35.00	6.43
*	900.000	1500.00	.04	2.11	7.63	2.41	45.20	2.68	735.22	35.00	35.00	35.00	6.46
*	900.000	1600.00	.03	2.21	7.93	2.52	45.26	2.74	767.66	35.00	35.00	35.00	6.49
	950.000	300.00	.00	2.35	5.76	2.66	42.79	.00	286.15	35.00	35.00	35.00	3.79
	950.000	400.00	.46	2.85	6.45	3.13	43.37	.58	372.98	35.00	35.00	35.00	4.25
	950.000	500.00	.42	3.25	7.01	3.52	43.89	1.10	456.30	35.00	35.00	35.00	4.68
	950.000	600.00	.40	3.57	7.43	3.72	44.37	1.58	535.40	35.00	35.00	35.00	5.08
*	950.000	700.00	.44	2.75	7.31	2.30	44.73	1.94	583.14	35.00	35.00	35.00	5.52
*	950.000	800.00	.35	1.78	6.70	1.96	44.89	2.10	576.42	35.00	35.00	35.00	5.87
*	950.000	900.00	.13	1.77	6.80	2.00	45.01	2.22	600.76	35.00	35.00	35.00	6.01
*	950.000	1000.00	.13	1.77	6.78	2.03	45.10	2.31	614.58	35.00	35.00	35.00	6.14
*	950.000	1100.00	.09	1.82	6.91	2.10	45.18	2.39	636.73	35.00	35.00	35.00	6.23
*	950.000	1200.00	.07	1.89	7.06	2.17	45.26	2.47	659.74	35.00	35.00	35.00	6.30
*	950.000	1300.00	.03	2.01	7.47	2.30	45.33	2.54	701.46	35.00	35.00	35.00	6.33
*	950.000	1400.00	.07	2.05	7.52	2.35	45.39	2.60	716.52	35.00	35.00	35.00	6.40
*	950.000	1500.00	.07	2.09	7.55	2.39	45.45	2.66	728.51	35.00	35.00	35.00	6.48
*	950.000	1600.00	.07	2.13	7.56	2.42	45.50	2.71	738.95	35.00	35.00	35.00	6.55

	SECNO	Q	DIFWSP	VLOB	VCH	VROB	EG	DIFEG	QCH	K*XNL	K*XNCH	K*XNR	DEPTH
	[illegible].000	300.00	.00	2.35	5.73	2.65	43.05	.00	285.97	35.00	35.00	35.00	3.81
	000	400.00	.47	2.84	6.40	3.12	43.63	.58	372.56	35.00	35.00	35.00	4.28
	[illegible].000	500.00	.43	3.23	6.95	3.49	44.16	1.11	455.62	35.00	35.00	35.00	4.71
	1000.000	600.00	.40	3.55	7.37	3.62	44.63	1.58	534.47	35.00	35.00	35.00	5.11
*	1000.000	700.00	.40	2.86	7.37	2.34	44.98	1.93	585.93	35.00	35.00	35.00	5.50
*	1000.000	800.00	.37	1.78	6.71	1.96	45.14	2.09	576.51	35.00	35.00	35.00	5.87
*	1000.000	900.00	.15	1.75	6.74	1.99	45.26	2.21	596.71	35.00	35.00	35.00	6.02
*	1000.000	1000.00	.09	1.81	6.94	2.07	45.35	2.30	625.33	35.00	35.00	35.00	6.11
*	1000.000	1100.00	.09	1.87	7.09	2.14	45.44	2.39	650.11	35.00	35.00	35.00	6.20
*	1000.000	1200.00	.08	1.93	7.24	2.21	45.51	2.46	673.22	35.00	35.00	35.00	6.27
*	1000.000	1300.00	.10	1.95	7.19	2.24	45.57	2.53	680.66	35.00	35.00	35.00	6.37
*	1000.000	1400.00	.05	2.02	7.39	2.32	45.64	2.59	706.28	35.00	35.00	35.00	6.42
*	1000.000	1500.00	.04	2.11	7.62	2.41	45.70	2.65	734.26	35.00	35.00	35.00	6.47
*	1000.000	1600.00	.03	2.20	7.88	2.51	45.76	2.71	763.92	35.00	35.00	35.00	6.50
	1050.000	300.00	.00	2.34	5.72	2.64	43.31	.00	285.87	35.00	35.00	35.00	3.82
	1050.000	400.00	.48	2.83	6.38	3.11	43.89	.59	372.35	35.00	35.00	35.00	4.30
	1050.000	500.00	.43	3.22	6.91	3.48	44.42	1.11	455.20	35.00	35.00	35.00	4.73
	1050.000	600.00	.39	3.54	7.34	3.55	44.89	1.58	533.81	35.00	35.00	35.00	5.12
*	1050.000	700.00	.36	2.99	7.45	2.40	45.22	1.92	589.15	35.00	35.00	35.00	5.48
*	1050.000	800.00	.39	1.78	6.71	1.96	45.39	2.09	576.50	35.00	35.00	35.00	5.87
*	1050.000	900.00	.14	1.76	6.77	2.00	45.51	2.20	598.46	35.00	35.00	35.00	6.01
*	1050.000	1000.00	.11	1.79	6.84	2.05	45.60	2.29	618.92	35.00	35.00	35.00	6.13
*	1050.000	1100.00	.09	1.84	6.96	2.11	45.68	2.38	640.90	35.00	35.00	35.00	6.22
*	1050.000	1200.00	.08	1.90	7.10	2.18	45.76	2.45	663.08	35.00	35.00	35.00	6.29
*	1050.000	1300.00	.04	1.99	7.40	2.29	45.83	2.52	696.79	35.00	35.00	35.00	6.34
*	1050.000	1400.00	.07	2.05	7.50	2.35	45.89	2.58	714.72	35.00	35.00	35.00	6.41
*	1050.000	1500.00	.07	2.09	7.56	2.39	45.95	2.64	729.31	35.00	35.00	35.00	6.47
*	1050.000	1600.00	.07	2.14	7.59	2.43	46.00	2.69	741.68	35.00	35.00	35.00	6.54
	1100.000	300.00	.00	.00	6.32	.00	43.69	.00	300.00	.00	35.00	.00	3.67
	1100.000	400.00	.46	.00	7.22	.00	44.34	.65	400.00	.00	35.00	.00	4.13
	1100.000	500.00	.40	.00	8.01	.00	44.92	1.23	500.00	.00	35.00	.00	4.52
*	1100.000	600.00	.34	.00	8.77	.00	45.46	1.77	600.00	.00	35.00	.00	4.87
*	[illegible].000	700.00	.22	.00	9.68	.00	45.94	2.26	700.00	.00	35.00	.00	5.09
*	[illegible]000	800.00	.03	.00	11.00	.00	46.39	2.70	800.00	.00	35.00	.00	5.11
*	[illegible].000	900.00	.17	.00	11.90	.00	46.88	3.19	900.00	.00	35.00	.00	5.28
*	1100.000	1000.00	.30	.00	12.37	.00	47.36	3.67	1000.00	.00	35.00	.00	5.58
*	1100.000	1100.00	.28	.00	12.83	.00	47.82	4.13	1100.00	.00	35.00	.00	5.86

*	1100.000	1200.00	1.90	1.44	5.73	1.96	47.47	3.78	682.55	35.00	35.00	35.00	7.76
*	1100.000	1300.00	.05	1.53	5.86	2.03	47.51	3.83	702.49	35.00	35.00	35.00	7.81
*	1100.000	1400.00	.08	1.59	5.72	2.02	47.56	3.87	693.43	35.00	35.00	35.00	7.89
*	1100.000	1500.00	.03	1.68	5.87	2.09	47.60	3.91	715.16	35.00	35.00	35.00	7.92
*	[illegible]00.000	1600.00	.03	1.76	6.04	2.17	47.64	3.95	739.11	35.00	35.00	35.00	7.95

	SECNO	Q	DIFWSP	VLOB	VCH	VROB	EG	DIFEG	QCH	K*XNL	K*XNCH	K*XNR	DEPTH
	1124.000	300.00	.00	.00	5.95	.00	43.89	.00	300.00	.00	35.00	.00	3.84
	1124.000	400.00	.53	.00	6.71	.00	44.56	.68	400.00	.00	35.00	.00	4.36
	1124.000	500.00	.47	.00	7.36	.00	45.18	1.29	500.00	.00	35.00	.00	4.84
	1124.000	600.00	.52	.00	7.78	.00	45.80	1.91	600.00	.00	35.00	.00	5.36
*	1124.000	700.00	.80	.62	7.68	.62	46.57	2.68	699.61	35.00	35.00	35.00	6.15
*	1124.000	800.00	1.26	1.05	5.21	1.59	47.23	3.34	590.59	35.00	35.00	35.00	7.41
*	1124.000	900.00	-2.12	.00	11.86	.00	46.97	3.09	900.00	.00	35.00	.00	5.29
*	1124.000	1000.00	2.29	1.26	5.38	1.74	47.37	3.49	625.53	35.00	35.00	35.00	7.58
*	1124.000	1100.00	.69	.95	2.56	.99	47.82	3.93	328.73	35.00	35.00	35.00	8.27
	1124.000	1200.00	-.58	1.44	5.54	1.86	47.47	3.58	655.21	35.00	35.00	35.00	7.69
	1124.000	1300.00	.04	1.53	5.67	1.93	47.51	3.63	675.61	35.00	35.00	35.00	7.74
	1124.000	1400.00	.05	1.61	5.75	1.98	47.56	3.67	689.59	35.00	35.00	35.00	7.78
	1124.000	1500.00	.04	1.69	5.89	2.04	47.60	3.71	709.56	35.00	35.00	35.00	7.82
	1124.000	1600.00	.03	1.77	6.02	2.11	47.64	3.75	729.05	35.00	35.00	35.00	7.85
*	1174.000	300.00	.00	2.16	4.93	2.38	44.17	.00	280.44	35.00	35.00	35.00	4.21
*	1174.000	400.00	.66	2.49	5.28	2.68	44.87	.70	361.36	35.00	35.00	35.00	4.87
*	1174.000	500.00	.72	1.71	5.04	1.54	45.52	1.35	408.29	35.00	35.00	35.00	5.59
*	1174.000	600.00	.86	.85	3.10	.98	46.13	1.96	297.42	35.00	35.00	35.00	6.45
*	1174.000	700.00	.80	.58	1.79	.64	46.86	2.69	197.28	35.00	35.00	35.00	7.25
*	1174.000	800.00	.48	.50	1.41	.54	47.34	3.17	166.63	35.00	35.00	35.00	7.73
*	1174.000	900.00	.31	.47	1.28	.51	47.64	3.47	157.84	35.00	35.00	35.00	8.03
*	1174.000	1000.00	-.17	.57	1.59	.62	47.47	3.30	192.51	35.00	35.00	35.00	7.86
*	1174.000	1100.00	.36	.52	1.37	.55	47.83	3.66	174.07	35.00	35.00	35.00	8.22
*	1174.000	1200.00	-.27	.65	1.80	.71	47.57	3.40	219.77	35.00	35.00	35.00	7.95
*	1174.000	1300.00	.05	.69	1.88	.74	47.61	3.45	232.02	35.00	35.00	35.00	8.00
*	1174.000	1400.00	.04	.73	1.97	.78	47.66	3.49	244.13	35.00	35.00	35.00	8.04
*	1174.000	1500.00	.04	.76	2.05	.82	47.70	3.53	255.71	35.00	35.00	35.00	8.08
*	[illegible].000	1600.00	.04	.79	2.13	.85	47.74	3.57	267.02	35.00	35.00	35.00	8.12
*	[illegible].000	300.00	.00	.00	6.59	.00	44.96	.00	300.00	.00	35.00	.00	3.59
*	1334.000	400.00	.57	.00	7.07	.00	45.63	.67	400.00	.00	35.00	.00	4.16
*	1334.000	500.00	.49	.00	7.46	.00	46.21	1.24	500.00	.00	35.00	.00	4.65
*	1334.000	600.00	.26	.00	8.22	.00	46.66	1.69	600.00	.00	35.00	.00	4.91
*	1334.000	700.00	1.01	2.17	5.88	.00	47.07	2.10	574.14	35.00	35.00	.00	5.91
*	1334.000	800.00	.56	2.45	4.97	.00	47.46	2.50	555.51	35.00	35.00	.00	6.47
*	1334.000	900.00	.31	2.63	4.81	.00	47.75	2.79	576.61	35.00	35.00	.00	6.78
*	1334.000	1000.00	-.27	3.05	6.09	.00	47.66	2.69	686.75	35.00	35.00	.00	6.52
*	1334.000	1100.00	.41	3.14	5.52	.00	47.97	3.01	681.42	35.00	35.00	.00	6.92
*	1334.000	1200.00	-.46	3.68	7.48	.00	47.83	2.87	834.70	35.00	35.00	.00	6.46
*	1334.000	1300.00	-.08	4.03	8.48	.00	47.95	2.99	927.01	35.00	35.00	.00	6.38
*	1334.000	1400.00	.13	4.28	8.58	.00	48.08	3.12	964.89	35.00	35.00	.00	6.51
*	1334.000	1500.00	.09	4.53	8.80	.00	48.21	3.24	1009.59	35.00	35.00	.00	6.59
*	1334.000	1600.00	-.03	4.85	9.54	.00	48.34	3.37	1086.57	35.00	35.00	.00	6.56

	SECNO	Q	DIFWSP	VLOB	VCH	VROB	EG	DIFEG	QCH	K*XNL	K*XNCH	K*XNR	DEPTH
*	1384.000	300.00	.00	.00	1.83	.00	45.21	.00	300.00	.00	35.00	.00	4.46
*	1384.000	400.00	.68	.00	2.01	.00	45.91	.70	400.00	.00	35.00	.00	5.14
*	1384.000	500.00	.59	.00	2.18	.00	46.50	1.29	500.00	.00	35.00	.00	5.73
*	1384.000	600.00	.49	.00	2.35	.00	47.01	1.80	600.00	.00	35.00	.00	6.22
*	1384.000	700.00	.20	.00	2.64	.00	47.23	2.02	700.00	.00	35.00	.00	6.42
*	1384.000	800.00	.32	.00	2.84	.00	47.57	2.36	800.00	.00	35.00	.00	6.74
*	1384.000	900.00	.26	.00	3.05	.00	47.84	2.63	900.00	.00	35.00	.00	7.00
*	1384.000	1000.00	-.07	.00	3.43	.00	47.81	2.60	1000.00	.00	35.00	.00	6.93
*	1384.000	1100.00	.26	.00	3.61	.00	48.09	2.88	1100.00	.00	35.00	.00	7.19
*	1384.000	1200.00	-.07	.00	3.99	.00	48.06	2.85	1200.00	.00	35.00	.00	7.11
*	1384.000	1300.00	.15	.00	4.20	.00	48.24	3.03	1300.00	.00	35.00	.00	7.27
*	[illegible]384.000	1400.00	.10	.00	4.46	.00	48.38	3.17	1400.00	.00	35.00	.00	7.37
*	[illegible].000	1500.00	.10	.00	4.70	.00	48.51	3.30	1500.00	.00	35.00	.00	7.47
*	[illegible]000	1600.00	.16	.00	4.88	.00	48.70	3.49	1600.00	.00	35.00	.00	7.62
	1424.000	300.00	.00	.00	1.88	.00	45.23	.00	300.00	.00	35.00	.00	4.38
	1424.000	400.00	.68	.00	2.05	.00	45.92	.69	400.00	.00	35.00	.00	5.06

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	1424.000	500.00	.68	.00	2.18	.00	46.61	1.38	500.00	.00	35.00	.00	5.73
	1424.000	600.00	.56	.00	2.32	.00	47.18	1.95	600.00	.00	35.00	.00	6.29
	1424.000	700.00	.27	.00	2.57	.00	47.47	2.24	700.00	.00	35.00	.00	6.57
	1424.000	800.00	.42	.00	2.72	.00	47.90	2.67	800.00	.00	35.00	.00	6.99
	1424.000	900.00	.36	.00	2.88	.00	48.28	3.05	900.00	.00	35.00	.00	7.35
	[illegible].000	1000.00	.04	.00	3.18	.00	48.34	3.11	1000.00	.00	35.00	.00	7.39
	[illegible].000	1100.00	.40	.00	3.28	.00	48.75	3.52	1100.00	.00	35.00	.00	7.79
	[illegible].000	1200.00	.06	.00	3.54	.00	48.85	3.62	1200.00	.00	35.00	.00	7.85
	1424.000	1300.00	.32	.00	3.66	.00	49.18	3.95	1300.00	.00	35.00	.00	8.17
	1424.000	1400.00	.28	.00	3.79	.00	49.47	4.24	1400.00	.00	35.00	.00	8.45
	1424.000	1500.00	.30	.00	3.90	.00	49.78	4.55	1500.00	.00	35.00	.00	8.75
	1424.000	1600.00	.19	.00	4.05	.00	49.99	4.76	1600.00	.00	35.00	.00	8.94
*	1474.000	300.00	.00	3.03	6.91	3.00	45.61	.00	281.53	35.00	35.00	35.00	4.01
*	1474.000	400.00	.61	3.67	7.70	3.63	46.37	.76	361.93	35.00	35.00	35.00	4.62
*	1474.000	500.00	.64	4.10	8.11	4.05	47.08	1.47	434.18	35.00	35.00	35.00	5.26
*	1474.000	600.00	.52	4.47	8.54	4.43	47.69	2.07	503.19	35.00	35.00	35.00	5.79
*	1474.000	700.00	.17	5.07	9.59	5.02	48.11	2.49	580.84	35.00	35.00	35.00	5.95
*	1474.000	800.00	.37	5.42	10.06	5.37	48.59	2.97	647.39	35.00	35.00	35.00	6.33
*	1474.000	900.00	.31	5.77	10.56	5.71	49.02	3.40	713.15	35.00	35.00	35.00	6.64
*	1474.000	1000.00	-.19	6.63	12.23	6.56	49.35	3.73	802.53	35.00	35.00	35.00	6.45
*	1474.000	1100.00	.40	6.80	12.32	6.73	49.75	4.14	859.26	35.00	35.00	35.00	6.85
*	1474.000	1200.00	.25	7.10	12.76	7.03	50.13	4.51	921.85	35.00	35.00	35.00	7.10
*	1474.000	1300.00	.29	7.30	12.98	7.42	50.46	4.85	976.00	35.00	35.00	35.00	7.39
*	1474.000	1400.00	.28	7.47	13.16	7.67	50.79	5.17	1027.47	35.00	35.00	35.00	7.68
*	1474.000	1500.00	.27	7.62	13.32	7.85	51.09	5.47	1077.17	35.00	35.00	35.00	7.95
*	1474.000	1600.00	.29	7.72	13.38	7.93	51.37	5.76	1122.03	35.00	35.00	35.00	8.24

TRITOWN BASIN WELD COU

SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
	1124.000	43.79	45.40	.00	47.40	300.00	.00	59.00	.00	3.84	43.34	5.95	43.89
	[illegible].000	44.43	45.40	.00	47.40	400.00	.00	59.00	.00	4.36	43.86	6.71	44.56
	000	45.02	45.40	.00	47.40	500.00	.00	59.00	.00	4.84	44.34	7.36	45.18
	[illegible].000	45.56	45.40	45.80	47.40	600.00	.00	10.00	.00	5.36	44.86	7.78	45.80
*	1124.000	46.04	45.40	46.57	47.40	700.00	.00	10.00	.00	6.15	45.65	7.68	46.57
*	1124.000	46.49	45.40	47.23	47.40	800.00	.00	10.00	.00	7.41	46.91	5.21	47.23
*	1124.000	46.97	45.40	48.12	47.40	719.51	181.86	30.00	.00	5.29	44.79	11.86	46.97
*	1124.000	47.45	45.40	49.22	47.40	689.19	313.31	30.00	.00	7.58	47.08	5.38	47.37
*	1124.000	47.91	45.40	50.40	47.40	657.03	448.82	30.00	.00	8.27	47.71	2.56	47.82
	1124.000	47.49	45.40	53.28	47.40	219.01	990.48	30.00	.00	7.69	47.19	5.54	47.47
	1124.000	47.53	45.40	54.38	47.40	216.05	1084.04	30.00	.00	7.74	47.24	5.67	47.51
	1124.000	47.59	45.40	55.61	47.40	201.69	1209.21	30.00	.00	7.78	47.28	5.75	47.56
	1124.000	47.70	45.40	56.87	47.40	201.64	1298.38	30.00	.00	7.82	47.32	5.89	47.60
	1124.000	47.74	45.40	58.22	47.40	205.38	1394.64	30.00	.00	7.85	47.35	6.02	47.64
	1424.000	45.31	46.40	.00	50.01	300.00	.00	59.00	.00	4.38	45.18	1.88	45.23
	1424.000	46.01	46.40	.00	50.01	400.00	.00	59.00	.00	5.06	45.86	2.05	45.92
	1424.000	46.60	46.40	46.61	50.01	500.00	.00	10.00	.00	5.73	46.53	2.18	46.61
	1424.000	47.11	46.40	47.18	50.01	600.00	.00	10.00	.00	6.29	47.09	2.32	47.18
	1424.000	47.33	46.40	47.47	50.01	700.00	.00	10.00	.00	6.57	47.37	2.57	47.47
	1424.000	47.67	46.40	47.90	50.01	800.00	.00	10.00	.00	6.99	47.79	2.72	47.90
	1424.000	47.94	46.40	48.28	50.01	900.00	.00	10.00	.00	7.35	48.15	2.88	48.28
	1424.000	47.91	46.40	48.34	50.01	1000.00	.00	10.00	.00	7.39	48.19	3.18	48.34
	1424.000	48.19	46.40	48.75	50.01	1100.00	.00	10.00	.00	7.79	48.59	3.28	48.75
	1424.000	48.16	46.40	48.85	50.01	1200.00	.00	10.00	.00	7.85	48.65	3.54	48.85
	1424.000	48.34	46.40	49.18	50.01	1300.00	.00	10.00	.00	8.17	48.97	3.66	49.18
	1424.000	48.48	46.40	49.47	50.01	1400.00	.00	10.00	.00	8.45	49.25	3.79	49.47
	1424.000	48.61	46.40	49.78	50.01	1500.00	.00	10.00	.00	8.75	49.55	3.90	49.78
	1424.000	48.80	46.40	50.16	50.01	1524.47	88.65	30.00	.00	8.94	49.74	4.05	49.99

OF FLAT

[illegible] OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 850.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 850.000 PROFILE= 4 CRITICAL DEPTH ASSUMED

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CAUTION SECNO=    850.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    850.000  PROFILE=  6  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    850.000  PROFILE=  7  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    850.000  PROFILE=  8  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    850.000  PROFILE=  9  CRITICAL DEPTH ASSUMED
CA      SECNO=    850.000  PROFILE= 10  CRITICAL DEPTH ASSUMED
C       SECNO=    850.000  PROFILE= 11  CRITICAL DEPTH ASSUMED
C       SECNO=    850.000  PROFILE= 12  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    850.000  PROFILE= 13  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    850.000  PROFILE= 14  CRITICAL DEPTH ASSUMED

WARNING SECNO=    900.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    900.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    900.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=    900.000  PROFILE=  6  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    900.000  PROFILE=  6  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    900.000  PROFILE=  7  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    900.000  PROFILE=  7  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    900.000  PROFILE=  8  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    900.000  PROFILE=  8  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    900.000  PROFILE=  8  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    900.000  PROFILE=  9  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    900.000  PROFILE=  9  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    900.000  PROFILE=  9  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    900.000  PROFILE= 10  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    900.000  PROFILE= 10  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    900.000  PROFILE= 10  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    900.000  PROFILE= 11  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    900.000  PROFILE= 11  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    900.000  PROFILE= 11  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    900.000  PROFILE= 12  CRITICAL DEPTH ASSUMED
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CAUTION SECNO=    900.000  PROFILE= 13  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    900.000  PROFILE= 13  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    900.000  PROFILE= 14  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    900.000  PROFILE= 14  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    900.000  PROFILE= 14  20 TRIALS ATTEMPTED TO BALANCE WSEL

C       SECNO=    950.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CA      SECNO=    950.000  PROFILE=  5  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    950.000  PROFILE=  6  CRITICAL DEPTH ASSUMED
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CAUTION SECNO=    950.000  PROFILE=  8  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    950.000  PROFILE=  8  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=    950.000  PROFILE=  9  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    950.000  PROFILE=  9  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    950.000  PROFILE=  9  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    950.000  PROFILE= 10  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    950.000  PROFILE= 10  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    950.000  PROFILE= 10  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    950.000  PROFILE= 11  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    950.000  PROFILE= 11  PROBABLE MINIMUM SPECIFIC ENERGY
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CAUTION SECNO=    950.000  PROFILE= 12  CRITICAL DEPTH ASSUMED
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CAUTION SECNO=    950.000  PROFILE= 13  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    950.000  PROFILE= 13  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    950.000  PROFILE= 14  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    950.000  PROFILE= 14  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    950.000  PROFILE= 14  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   1000.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1000.000  PROFILE=  5  MINIMUM SPECIFIC ENERGY
C       SECNO=   1000.000  PROFILE=  6  CRITICAL DEPTH ASSUMED
C       SECNO=   1000.000  PROFILE=  6  MINIMUM SPECIFIC ENERGY
CAU     SECNO=   1000.000  PROFILE=  7  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1000.000  PROFILE=  7  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1000.000  PROFILE=  8  CRITICAL DEPTH ASSUMED
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CAUTION SECNO=   1000.000  PROFILE=  8  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1000.000  PROFILE=  8  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1000.000  PROFILE=  9  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1000.000  PROFILE=  9  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1000.000  PROFILE=  9  20 TRIALS ATTEMPTED TO BALANCE WSEL
C       SECNO=   1000.000  PROFILE= 10  CRITICAL DEPTH ASSUMED
        SECNO=   1000.000  PROFILE= 10  PROBABLE MINIMUM SPECIFIC ENERGY
CA      SECNO=   1000.000  PROFILE= 10  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1000.000  PROFILE= 11  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1000.000  PROFILE= 11  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1000.000  PROFILE= 11  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1000.000  PROFILE= 12  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1000.000  PROFILE= 12  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1000.000  PROFILE= 12  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1000.000  PROFILE= 13  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1000.000  PROFILE= 13  PROBABLE MINIMUM SPECIFIC ENERGY
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CAUTION SECNO=   1000.000  PROFILE= 14  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1000.000  PROFILE= 14  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1000.000  PROFILE= 14  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   1050.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1050.000  PROFILE=  5  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1050.000  PROFILE=  6  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1050.000  PROFILE=  6  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1050.000  PROFILE=  7  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1050.000  PROFILE=  7  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1050.000  PROFILE=  8  CRITICAL DEPTH ASSUMED


CAUTION SECNO=   1050.000  PROFILE=  8  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1050.000  PROFILE=  8  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1050.000  PROFILE=  9  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1050.000  PROFILE=  9  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1050.000  PROFILE=  9  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1050.000  PROFILE= 10  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1050.000  PROFILE= 10  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1050.000  PROFILE= 10  20 TRIALS ATTEMPTED TO BALANCE WSEL
C       SECNO=   1050.000  PROFILE= 11  CRITICAL DEPTH ASSUMED
C       ECNO=    1050.000  PROFILE= 11  PROBABLE MINIMUM SPECIFIC ENERGY
CAU     SECNO=   1050.000  PROFILE= 11  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1050.000  PROFILE= 12  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1050.000  PROFILE= 12  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1050.000  PROFILE= 12  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1050.000  PROFILE= 13  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1050.000  PROFILE= 13  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1050.000  PROFILE= 13  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1050.000  PROFILE= 14  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1050.000  PROFILE= 14  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1050.000  PROFILE= 14  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=   1100.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   1100.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   1100.000  PROFILE=  6  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=   1100.000  PROFILE=  7  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1100.000  PROFILE=  7  MINIMUM SPECIFIC ENERGY
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CAUTION SECNO=   1100.000  PROFILE=  8  20 TRIALS ATTEMPTED TO BALANCE WSEL
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CAUTION SECNO=   1100.000  PROFILE= 11  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1100.000  PROFILE= 12  CRITICAL DEPTH ASSUMED
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C       SECNO=   1100.000  PROFILE= 13  PROBABLE MINIMUM SPECIFIC ENERGY
C       ECNO=    1100.000  PROFILE= 13  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAU     SECNO=   1100.000  PROFILE= 14  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1100.000  PROFILE= 14  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1100.000  PROFILE= 14  20 TRIALS ATTEMPTED TO BALANCE WSEL
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18/19

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CAUTION SECNO=   1124.000  PROFILE=  7  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1124.000  PROFILE=  8  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1124.000  PROFILE=  8  WSEL ASSUMED BASED ON MIN DIFF


CAUTION SECNO=   1124.000  PROFILE=  8  20 TRIALS ATTEMPTED TO BALANCE WSEL
WARNING SECNO=   1124.000  PROFILE=  9  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   1174.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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CAUTION SECNO=   1474.000  PROFILE= 13  CRITICAL DEPTH ASSUMED
CA      SECNO=   1474.000  PROFILE= 13  MINIMUM SPECIFIC ENERGY
C        ECNO=   1474.000  PROFILE= 14  CRITICAL DEPTH ASSUMED
CA      SECNO=   1474.000  PROFILE= 14  MINIMUM SPECIFIC ENERGY
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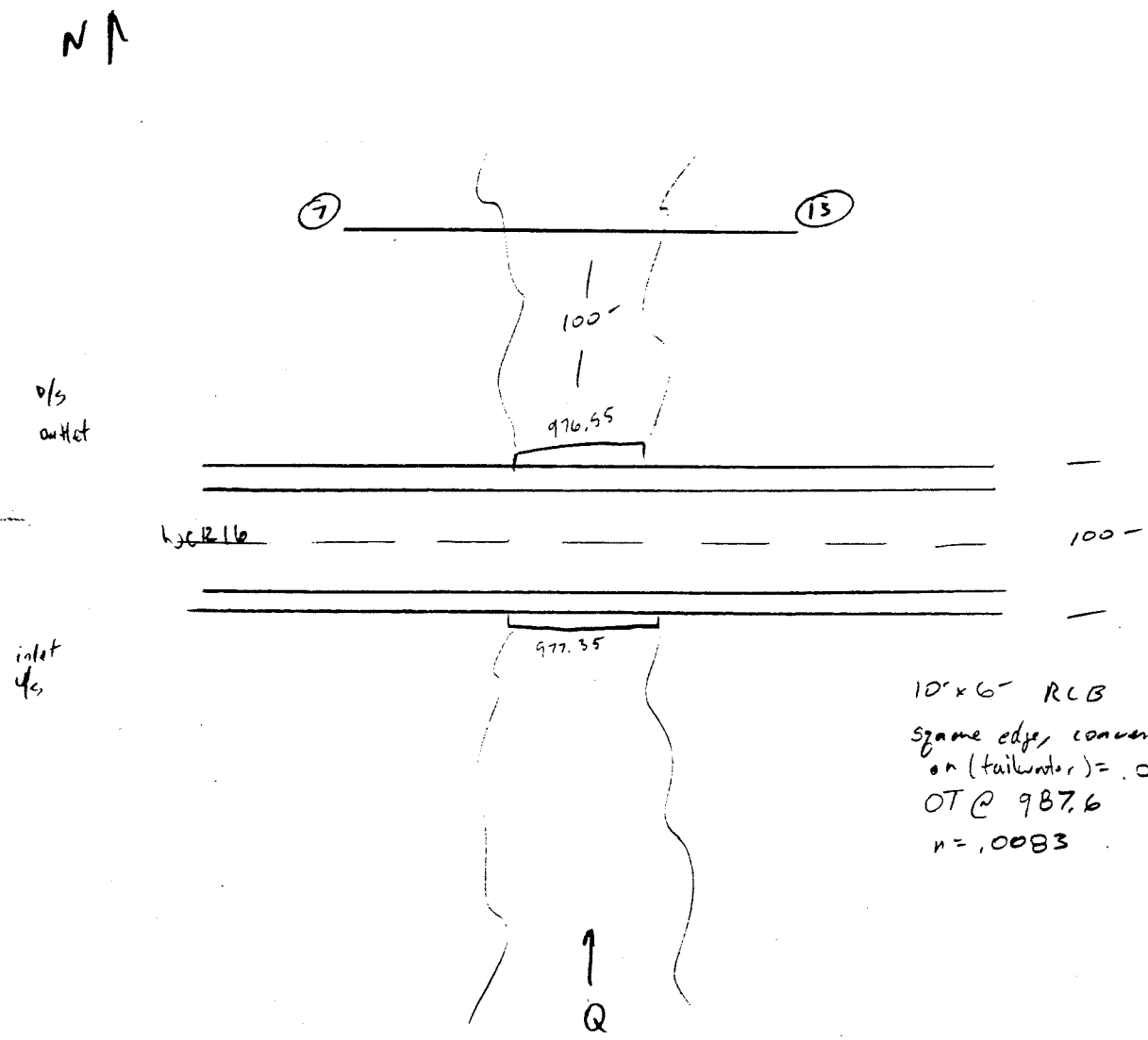
QOT = 707 cfs

TT16

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number COWELD01	Page 1 Of 5
Owner-Project WELD COUNTY I-25 MDP	By DCS	Date 4/13/99
S. TRITOWN BASIN TTWCR16	Checked By CJP	Date 04/12/99



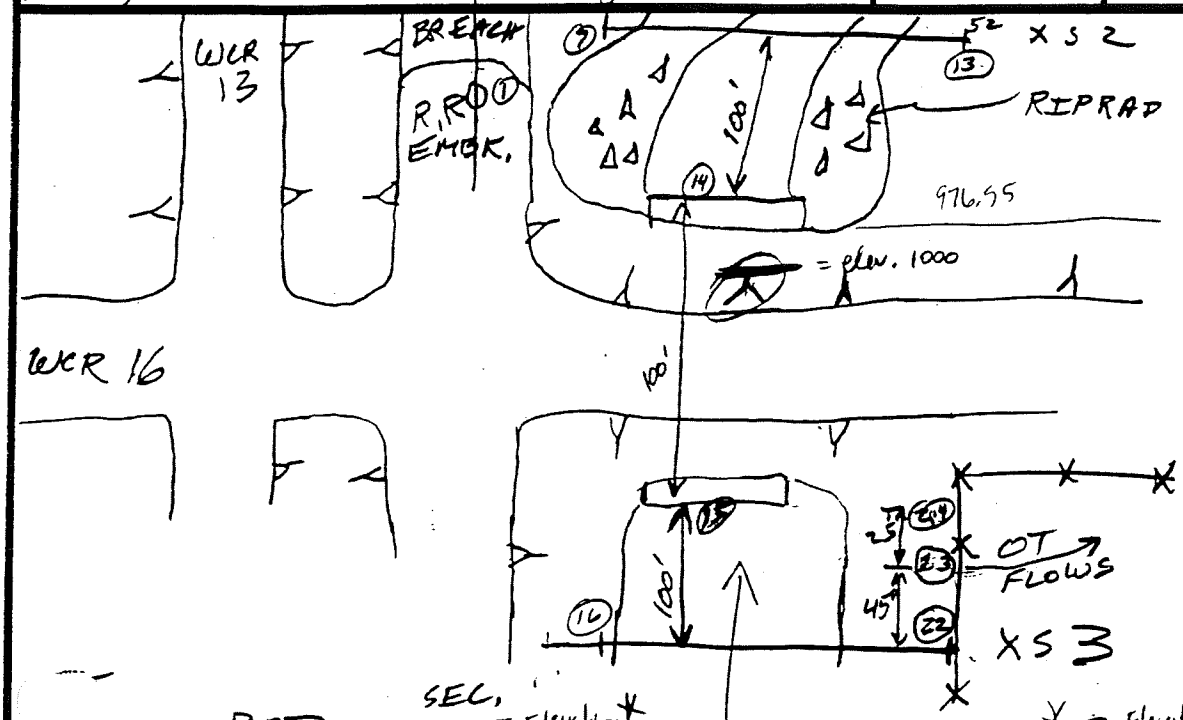
10' x 6' RCB
square edge, conventional inlet
n (tailwater) = .035
OT @ 987.6
n = .0083

TT 16

2/5

Lidstone & Anderson Inc.
Water Resources and Environmental Consultants

PROJECT	BY	DATE	PROJECT NO.
D COUNTY - I-25 MDP	CJP/BLU	03/30/99	COWELD01
FEATURE	**CHECKED BY**	**DATE**	**SHEET OF**
Survey of WCR16 RCB ⑥ XS1 AT FREDERIC	K		1 / 1



	ROD	SEC. DIST (ft.)	Elevation*		
①	6.6	0	993.4	XS1	TOP ℄ RR. EMBK.
2	4.1	3'	995.9		TOP SAFETY BERM
3	12.2	20	987.8		TOE BREACH
4	12.5	50	987.5		" "
5	3.0	70	997.0		TOP N. Safety Berm
⑥	5.6	80	994.4		TOP ℄ RR. EMBK N. END BREACH
⑦	14.5	0	985.5	XS2	TOP LB
8	16.6	10	983.4		
9	21.2	21	978.8		
10	22.6	22	977.4		TOE LB
11	23.3	31	976.7		TOE RB
12	19.0	40	981.0		MID BK.
⑬	14.0	52	986.0		TOP RB
⑭	23.45		976.55		D/S FACE INV. RCB
⑮	22.65		977.35		U/S FACE INV. RCB
⑯	3.7	22	996.3		TOP LB
17	5.4	30	994.6		
	13.8	46	986.2		MID LB
	20.8	63	979.2		TOE LB
20	20.6	69	979.4		" RB
21	14.5	84	985.5		MID RB
㉒	11.3	97	988.7		TOP RB
㉓	12.0		988.0		OT AT ON RB
㉔	12.4		987.6		" " " "

$$\frac{979.2 - 976.7}{300}$$

Slope = .0083

* = Elevation relative to a datum of 1000 (elevation of line of sight)

TT16

3/5

CURRENT DATE: 04-08-1999
CURRENT TIME: 11:33:37

FILE DATE: 04-08-1999
FILE NAME: TTWCR16

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

C U L V NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	977.35	976.55	100.00	1 RCB	10.00	6.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: TTWCR16 DATE: 04-08-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
977.35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
980.23	80.0	80.0	0.0	0.0	0.0	0.0	0.0	0.00	1
980.74	160.0	160.0	0.0	0.0	0.0	0.0	0.0	0.00	1
981.27	200.0	200.0	0.0	0.0	0.0	0.0	0.0	0.00	1
982.69	320.0	320.0	0.0	0.0	0.0	0.0	0.0	0.00	1
→ 983.58	400.0	400.0	0.0	0.0	0.0	0.0	0.0	0.00	1
[illegible]	480.0	480.0	0.0	0.0	0.0	0.0	0.0	0.00	1
[illegible]	560.0	560.0	0.0	0.0	0.0	0.0	0.0	0.00	1
[illegible]	640.0	640.0	0.0	0.0	0.0	0.0	0.0	0.00	1
☆ 987.64	720.0	709.2	0.0	0.0	0.0	0.0	0.0	4.25	5
987.84	800.0	722.4	0.0	0.0	0.0	0.0	0.0	70.82	4
987.60	706.8	706.8	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

Crown of RCB = 983.35 ft

Flows will begin to spill along RB near u/s face of culvert; elev. = 987.60 ft (4.25 ft. higher than culvert crown elev.)

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: TTWCR16 DATE: 04-08-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
977.35	0.000	0.00	0.00	0.00
980.23	0.000	80.00	0.00	0.00
980.74	0.000	160.00	0.00	0.00
981.27	0.000	200.00	0.00	0.00
982.69	0.000	320.00	0.00	0.00
983.58	0.000	400.00	0.00	0.00
984.50	0.000	480.00	0.00	0.00
985.49	0.000	560.00	0.00	0.00
986.58	0.000	640.00	0.00	0.00
987.64	-0.010	720.00	6.51	0.90
987.84	-0.009	800.00	6.80	0.85

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

☆ At this point, flows have already begun to spill along the fence line on the RB. Therefore, the culvert capacity is ≃ 710 - 720 cfs before flows will be routed to the east (Element 287).

TT16

4/5

CURRENT DATE: 04-08-1999 FILE DATE: 04-08-1999
CURRENT TIME: 11:33:37 FILE NAME: TTWCR16

PERFORMANCE CURVE FOR CULVERT 1 - 1(10.00 (ft) BY 6.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	977.35	0.00	-0.65	0-NF	0.00	0.00	0.00	0.15	0.00	0.00
80.00	980.23	2.15	2.88	1-S2n	0.85	1.26	0.91	2.05	8.79	4.43
160.00	980.74	3.39	3.39	1-S2n	1.36	2.00	1.48	2.82	10.81	5.36
200.00	981.27	3.92	3.65	1-S2n	1.58	2.32	1.75	3.13	11.42	5.68
320.00	982.69	5.34	4.53	1-S2n	2.17	3.18	2.47	3.87	12.98	6.41
400.00	983.58	6.23	5.20	1-S2n	2.54	3.68	2.90	4.27	13.77	6.78
480.00	984.50	7.15	5.95	1-S2n	2.89	4.16	3.32	4.62	14.46	7.09
560.00	985.49	8.14	6.78	5-S2n	3.22	4.61	3.71	4.95	15.09	7.37
640.00	986.58	9.23	7.69	5-S2n	3.54	5.04	4.11	5.24	15.57	7.61
709.24	987.63	10.28	8.55	5-S2n	3.82	5.40	4.44	5.52	15.98	7.84
722.38	987.84	10.49	8.75	5-S2n	3.87	5.46	4.49	5.77	16.08	8.04

El. inlet face invert 977.35 ft El. outlet invert 976.55 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	200.00 ft
INLET ELEVATION	977.35 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	976.55 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0080
CULVERT LENGTH ALONG SLOPE	100.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	10.00 ft
BARREL RISE	6.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (90-45 DEG.)
INLET DEPRESSION	NONE

TT16
5/5

CURRENT DATE: 04-08-1999
CURRENT TIME: 11:33:37

FILE DATE: 04-08-1999
FILE NAME: TTWCR16

TAILWATER

***** USER DEFINED CHANNEL CROSS-SECTION

FILE NAME: TTWCR16
FILE DATE: 04-08-1999

MAIN CHANNEL ONLY	
LEFT CHANNEL BOUNDARY	0
RIGHT CHANNEL BOUNDARY	0
MANNING n LEFT OVER BANK	0.000
MANNING n MAIN CHANNEL	0.035
MANNING n RIGHT OVER BANK	0.000
SLOPE OF CHANNEL	0.0083 ft/ft

CROSS-SECTION COORD. NO.	X (ft)	Y (ft)
1	0.00	985.50
2	10.00	983.40
3	21.00	978.80
4	22.00	977.40
5	31.00	976.70
6	40.00	981.00
7	52.00	986.00

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	976.70	0.000	0.15	0.00	0.00
80.00	978.60	0.679	2.05	4.43	0.63
160.00	979.37	0.709	2.82	5.36	0.84
200.00	979.68	0.720	3.13	5.68	0.92
320.00	980.42	0.741	3.87	6.41	1.10
400.00	980.82	0.752	4.27	6.78	1.20
480.00	981.17	0.760	4.62	7.09	1.29
560.00	981.50	0.767	4.95	7.37	1.36
640.00	981.79	0.774	5.24	7.61	1.43
720.00	982.07	0.780	5.52	7.84	1.49
800.00	982.32	0.785	5.77	8.04	1.55

Note: Shear stress was calculated using R.

ROADWAY OVERTOPPING DATA

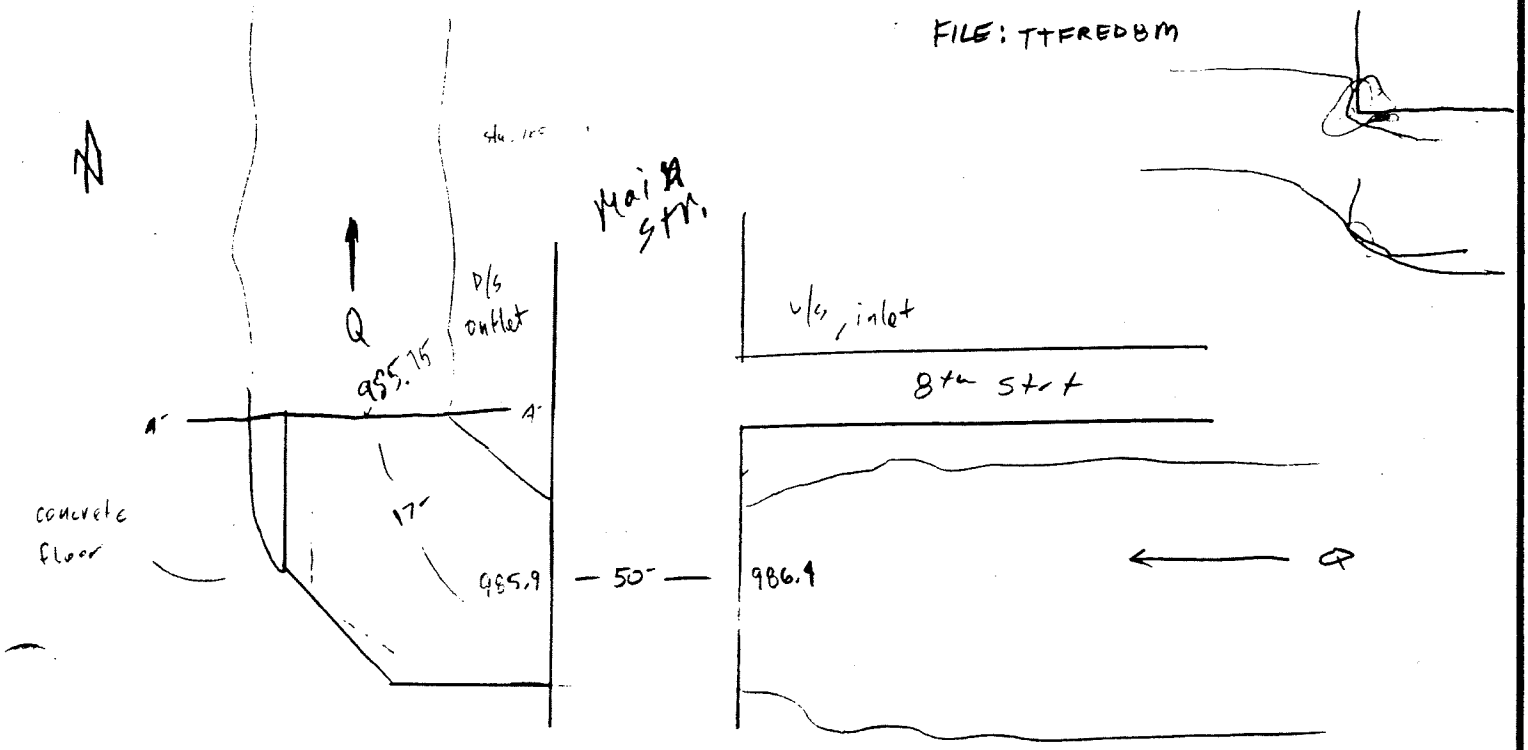
ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	50.00 ft
CREST LENGTH	200.00 ft
OVERTOPPING CREST ELEVATION	987.60 ft

$Q_{OT} = 5 \pm 4$ cfs

TT MAIN

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number COWELD01	Page 1 Of 5
Owner-Project	By DCS	Date 4/8/99
TRITOWN BASIN 8'x6' RCB @ 8th + Main St in Frederick	Checked By CJP	Date 04/13/99

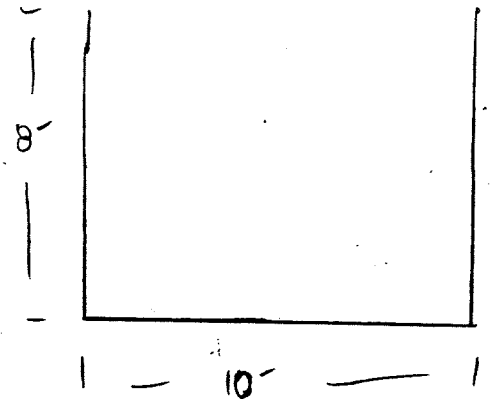
FILE: TTFREDBM



conventional inlet 1:1 Bevel

8'x6' RCB
slope = .0094
n = .016 (from Table 10, p.163 Hydraulic Design of Highway Culverts)
Overtopping @ 995' (constant)
Paved surface

D/S X Section for tailwater rating curve



n = .016

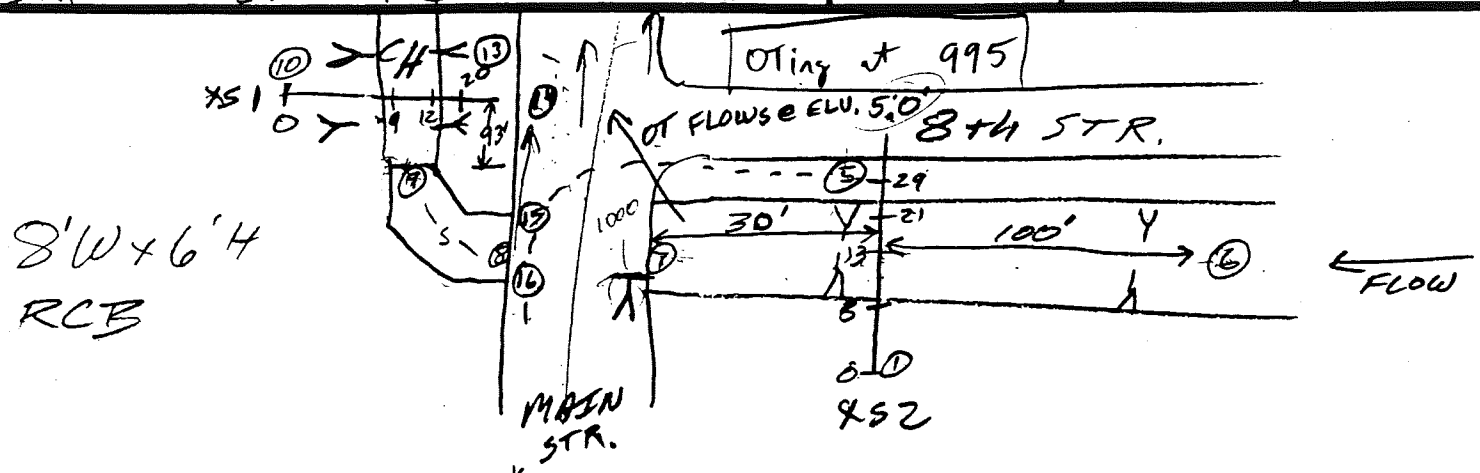
slope = $\frac{.15}{16}$ = .0094

L = 16

TT MAIN
2/5

Lee & Anderson Inc
Water Resources and Environmental Consultants

OWNER–PROJECT	BY	DATE	PROJECT NO.
DCOUNTY – I-25 MASTER DRAINAGEPLAN	CJP/BLV	03/30/99	COWELD01
TRI-AREA DRAINAGEWAY	CHECKED BY	DATE	SHEET OF
STRUCTURE SURVEY @ MAIN STR, FREDERIC	K		1 1



PT. NO	HI.	ROD	Elev*	XSEC DIST. (ft.)	
T	—				
1		6.8	993.2	0	TOP LB
		10.5	989.5	8	
		13.6	986.4	13	@ CH.
4		9.6	990.4	21	
5		4.9	995.1	29	TOP RB
6		13.9	986.1		U/S INV. HI = 14.6 LO = 13.3 ≈ 130' from T
7		13.6	986.4		U/S FACE CULV. INV.
8		14.1	985.9		D/S FACE CULV. INV.
9 – D/S X-Section		14.25	985.75		D/S Edge Floor. Slope = 15/17 = .088 8' High WALLS ON BOX.
10		9.65	990.35	0	TOP LB
11		16.9	983.1	9	
12		17.2	982.8	12	
13		6.9	993.1	20	TOP RB
14		6.5	993.5	0	TOP CURB
15		5.1	994.9	110	Edge Asphalt @ Rt Abut.
		5.0	995.0		" " " Lt Abut.

XS2

XS1

* – Elevation relative to a datum of 1000 (elevation of line of sight)

TTMAIN
3/5

CURRENT DATE: 04-13-1999
CURRENT TIME: 15:20:22

FILE DATE: 04-13-1999
FILE NAME: TTFRED8M

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	986.40	985.90	50.00	1 RCB	8.00	6.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: TTFRED8M DATE: 04-13-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
986.40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
989.54	60.0	60.0	0.0	0.0	0.0	0.0	0.0	0.00	1
989.98	120.0	120.0	0.0	0.0	0.0	0.0	0.0	0.00	1
990.44	180.0	180.0	0.0	0.0	0.0	0.0	0.0	0.00	1
990.60	200.0	200.0	0.0	0.0	0.0	0.0	0.0	0.00	1
991.85	300.0	300.0	0.0	0.0	0.0	0.0	0.0	0.00	1
[illegible]5	360.0	360.0	0.0	0.0	0.0	0.0	0.0	0.00	1
[illegible]	420.0	420.0	0.0	0.0	0.0	0.0	0.0	0.00	1
994.33	480.0	480.0	0.0	0.0	0.0	0.0	0.0	0.00	1
995.07	540.0	528.0	0.0	0.0	0.0	0.0	0.0	10.00	8
995.21	600.0	537.5	0.0	0.0	0.0	0.0	0.0	57.28	4
995.00	523.7	523.7	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: TTFRED8M DATE: 04-13-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
986.40	0.000	0.00	0.00	0.00
989.54	0.000	60.00	0.00	0.00
989.98	0.000	120.00	0.00	0.00
990.44	0.000	180.00	0.00	0.00
990.60	0.000	200.00	0.00	0.00
991.85	0.000	300.00	0.00	0.00
992.65	0.000	360.00	0.00	0.00
993.47	0.000	420.00	0.00	0.00
994.33	0.000	480.00	0.00	0.00
995.07	-0.004	540.00	1.98	0.37
995.21	-0.007	600.00	5.26	0.88

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

TT MAIN

4/5

CURRENT DATE: 04-13-1999 FILE DATE: 04-13-1999
TIME: 15:20:22 FILE NAME: TTFRED8M

PERFORMANCE CURVE FOR CULVERT 1 - 1(8.00 (ft) BY 6.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	986.40	0.00	-0.50	0-NF	0.00	0.00	0.00	-0.15	0.00	0.00
60.00	989.54	1.78	3.14	1-S2n	0.77	1.21	0.87	0.68	8.59	7.20
120.00	989.98	2.83	3.58	1-S2n	1.25	1.92	1.45	1.15	10.34	9.21
180.00	990.44	3.76	4.04	1-S2n	1.63	2.51	1.95	1.55	11.51	10.56
200.00	990.60	4.06	4.20	1-S2n	1.76	2.69	2.11	1.68	11.83	10.94
300.00	991.85	5.45	5.05	1-S2n	2.33	3.53	2.86	2.26	13.12	12.45
360.00	992.65	6.25	5.63	1-S2n	2.65	3.99	3.27	2.58	13.78	13.17
420.00	993.47	7.07	6.26	5-S2n	2.97	4.42	3.66	2.90	14.36	13.78
480.00	994.33	7.93	6.94	5-S2n	3.27	4.83	4.03	3.20	14.90	14.33
528.02	995.06	8.66	7.52	5-S2n	3.50	5.14	4.32	3.49	15.26	14.81
537.46	995.21	8.81	7.64	5-S2n	3.55	5.21	4.39	3.78	15.32	15.25

El. inlet face invert 986.40 ft El. outlet invert 985.90 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	150.00 ft
INLET ELEVATION	986.40 ft
OUTLET STATION	100.00 ft
OUTLET ELEVATION	985.90 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0100
CULVERT LENGTH ALONG SLOPE	50.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	8.00 ft
BARREL RISE	6.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	1:1 BEVEL (45 DEG. FLARE)
INLET DEPRESSION	NONE

TT MAIN
5/5

CURRENT DATE: 04-13-1999 FILE DATE: 04-13-1999
TIME: 15:20:22 FILE NAME: TTFRED8M

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

BOTTOM WIDTH	10.00 ft
SIDE SLOPE H/V (X:1)	0.0
CHANNEL SLOPE V/H (ft/ft)	0.009
MANNING'S n (.01-0.1)	0.016
CHANNEL INVERT ELEVATION	985.75 ft
CULVERT NO.1 OUTLET INVERT ELEVATION	985.90 ft

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	985.75	0.000	0.00	0.00	0.00
60.00	986.58	1.389	0.83	7.20	0.49
120.00	987.05	1.421	1.30	9.21	0.76
180.00	987.45	1.427	1.70	10.56	1.00
200.00	987.58	1.426	1.83	10.94	1.07
300.00	988.16	1.414	2.41	12.45	1.41
360.00	988.48	1.403	2.73	13.17	1.60
420.00	988.80	1.392	3.05	13.78	1.79
480.00	989.10	1.380	3.35	14.33	1.96
540.00	989.40	1.367	3.65	14.81	2.14
600.00	989.68	1.355	3.93	15.25	2.31

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	45.00 ft
CREST LENGTH	200.00 ft
OVERTOPPING CREST ELEVATION	995.00 ft

II-A

DEFINITIONS OF MODEL INPUT PARAMETERS

II

CUHP RUNOFF MODELING

USER MANUAL

COLORADO URBAN HYDROGRAPH PROCEDURE COMPUTER PROGRAM - PC VERSION

(CUHPF/PC)

July, 1995

Urban Drainage and Flood Control District
2480 West 26th Avenue
Suite 156-B
Denver, Colorado 80211

Telephone (303) 455-6277
FAX (303) 455-7880

INPUT PARAMETERS

The user needs to input the following catchment parameters to generate a unit and storm hydrograph:

A. Input Parameters

The following catchment parameters are needed for the program to generate a unit and storm hydrograph.

1. *Area* - Catchment area in square miles
2. *Catchment Length* - The length in miles from the downstream design point of the catchment or sub-catchment along the main drainageway to the high point on its respective catchment or sub-catchment. When a catchment is subdivided into a series of sub-catchments, the sub-catchment length used shall include the distance required for runoff to reach the major channel from the farthest point in the sub-catchment.
3. *Centroid Distance* - Distance in miles from the design point of the catchment or sub-catchment along the main drainageway to its respective catchment or sub-catchment centroid.
4. *Percent Impervious* - The fraction of the catchment surface which is impervious in percent.
5. *Catchment Slope* - The length weighted average slope of the catchment in feet per foot. See instructions in the USDCM to determine the weighted slope.
6. As an option for small urbanized areas, (e.g. less than 90 acres), you may enter time of concentration in minutes. Procedure for estimating time of concentration is given in the USDCM, Vol. 1. By specifying the time of concentration, hydrograph peaks will be computed and displayed using both the CUHP method and the Rational Formula. This option will be exercised only if the 1-hour rainfall option is used for Card B2*.
7. *Pervious retention* - Maximum depression storage on pervious surfaces in inches.
8. *Impervious retention* - Maximum depression storage on impervious surfaces in inches.
9. *Infiltration rate* - Initial infiltration rate for pervious surfaces in the catchment in inches per hour. If this entry is used by itself, it will be used as a constant infiltration rate

* Card B2 is equivalent to line 2 of the CUHPF/PC input file.

throughout the storm. If the next two entries are made, then this value will be used as the initial infiltration rate in Horton's equation.

10. *Decay* - Exponential decay coefficient in Horton's equation in "per second" units.
11. *Final infiltration* - Final infiltration rate in Horton's equation in inches per hour.
12. *Nullifier of Rainfall Loss Adjustment Factors Entered with Rainfall* - To be used if rainfall loss adjustment factors entered with rainfall data are to be nullified (*optional*).

B. Optional Input Parameters For Hydrograph Shaping

The unit hydrograph is developed by the computer using the algorithm used in the 1984 revision of the USDCM. As noted before, the coefficients C_t and C_p are computed by the program; however, they can be specified by the user as an option.

The shaping of the unit hydrograph also relies on proportioning the widths at 50% and 75% of the unit hydrograph peak. The proportioning is based on 0.35 of the width at 50% of peak being ahead of the "time to peak" and 0.45 of the width at 75% of peak being ahead of the "time to peak". These proportioning factors were selected after observing a number of unit hydrographs derived from the rainfall/runoff data collected by the U.S.G.S. for the District. It is possible for the user to override the unit hydrograph widths and the proportioning of these widths built into the program. For drainage and flood studies within the District, the program values shall be used. If the user has derived unit hydrographs from reliable rainfall-runoff data for a study catchment and can develop a "calibrated" unit hydrograph for this catchment, this option permits reshaping the unit hydrograph accordingly.

C. Optional Parameters For Modeling of Minimized DCIA

The following catchment parameters are optional inputs for adjusting the pervious/impervious area relationships.

1. *DCIA* - Specifies the DCIA Level of practice as defined in USDCM, Vol. 3, Structural BMPs. Input is 1, 2, or 3.
2. *D* - Defines the fraction of the total impervious area directly connected to the drainage system. Values from 0.01 to 1.0.
3. *R* - Defines the fraction of total pervious area receiving runoff from the "disconnected" impervious areas. Values from 0.01 to 1.0.

4. *WQCV* - Defines the water quality capture volume to be modeled as detained in swales and/or berms, in watershed-inches.
5. *DTIME* - Defines the duration over which the WQCV is released, in hours (up to 40 hours).

II-B

DESIGN STORM

II-B.1

DEPTHS

Lidstone & Anderson, Inc.
Water Resources and Environmental Consultants

PROJECT	BY	DATE	PROJECT NO.
ld County	BFS	1/18/99	COWELD01
FEATURE	**CHECKED BY**	**DATE**	**SHEET OF**
Precipitation Frequency Analysis Based on NOAA Atlas	CJP	02/09/99	1 20

Reference: Precipitation Frequency Atlas of the Western United States
J. F. Miller, R. H. Frederick, and R. J. Tracey
Volume III - Colorado
U.S. Department of Commerce 1973

Task: Determine 2 Hr. values for the 2, 5, 10, 25, 50, and 100-Yr. return periods

Methodology:

1- Calculate 1 Hr. values for the 2-Yr and 100-Yr return period For Frederick, Colorado located in the South Platte Drainage (Region 1) at an average basin elevation of 5000 FT.

- Using the following equations from Table 11, calculate the 2-Yr. and 100 Yr., 6 Hr. and 24 hr values (Based on Isopluvial Maps)

$$Y_2 = 0.218 + 0.709\,(X_1^2/X_2)$$

$$Y_{100} = 1.897 + 0.439\,(X_3^2/X_4) - 0.008\,Z$$

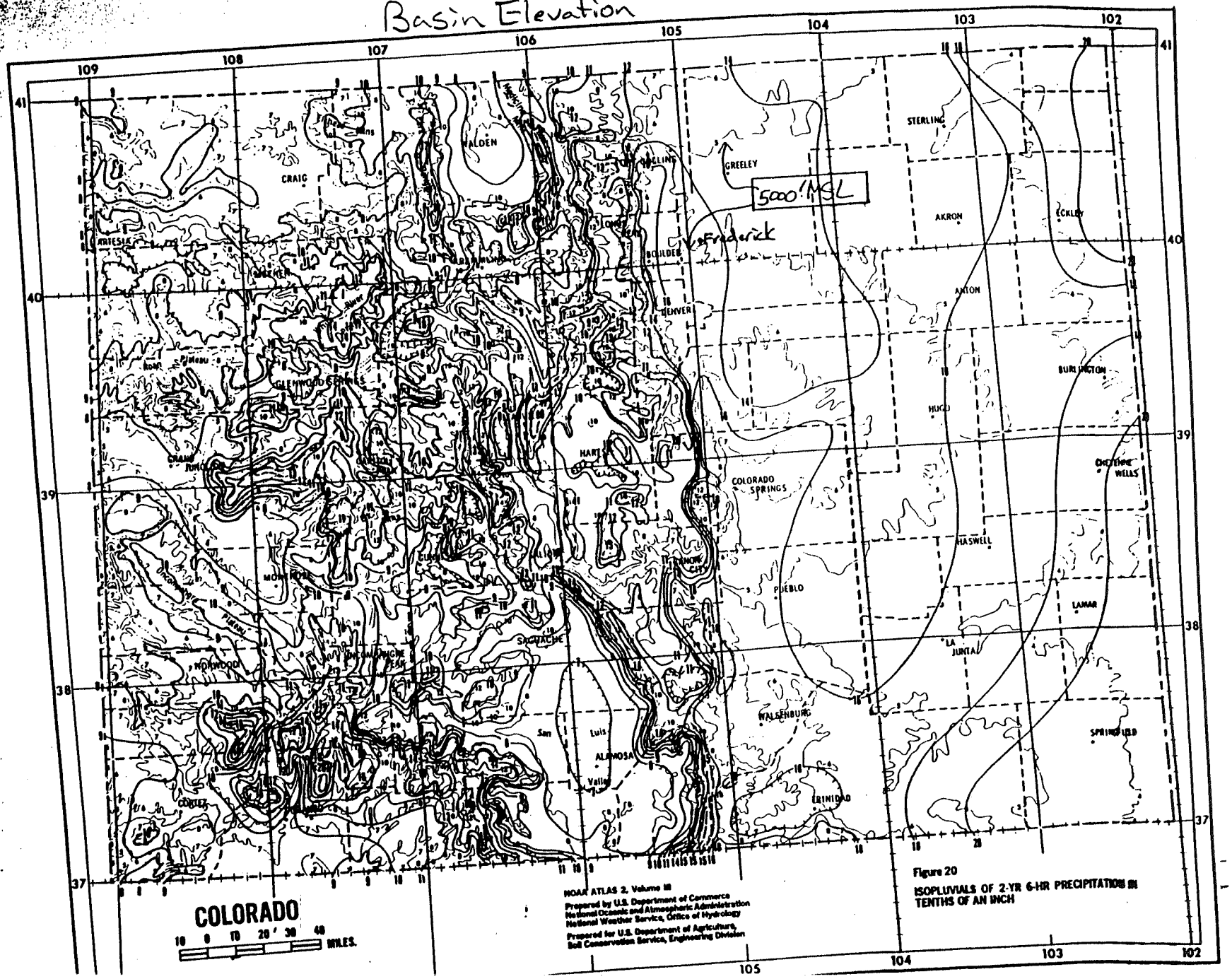
where: X_1 = 2-Yr. 6-Hr. Value
X_2 = 2-Yr. 24-Hr. Value
X_3 = 100-Yr. 6-Hr. Value
X_4 = 100-Yr. 24-Hr. Value
} From Precipitation Frequency Maps
Z = elevation in hundreds of feet

X_1 = 1.5 (Figure 20)
X_2 = 2.1 (Figure 26)
X_3 = 3.7 (Figure 25)
X_4 = 5.1 (Figure 31)

$Y_2 = 0.218 + 0.709\,(1.5^2/2.1) =$ **0.98 in = 2-Yr 1-Hr Precip**

$Y_{100} = 1.897 + 0.439\,(3.7^2/5.1) - 0.008\,(5000/100) =$ **2.68 in = 100-Yr. 1-Hr Precip**

Basin Elevation



NOAA ATLAS 2, Volume III
Prepared by U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service, Office of Hydrology
Prepared for U.S. Department of Agriculture,
Soil Conservation Service, Engineering Division

Figure 20
ISOPLUVIALS OF 2-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH

Discussion of Maps

Figures 20 through 43 present precipitation-frequency maps for Colorado for 6- and 24-hr durations. Figures 20 through 31 are for annual (or all-season) values for the 2-, 5-, 10-, 25-, 50, and 100-yr return periods. Figures 32 through 43 are for the May through October season and are for probabilities of 0.50, 0.20, 0.10, 0.04, 0.02, and 0.01. The isopluvial maps represent the 360- and 1,440-min durations for the partial-duration series. Data were tabulated for clock and observation-day intervals for the annual series and were adjusted by the empirical factors given in the ANALYSIS section.

Isoline interval. The isoline interval selected was designed to provide a reasonably complete description of the isopluvial pattern in various regions of the state. The isoline interval over most of the state on maps for the 24-hr duration is 0.2 in. for precipitation-frequency values below 3.0 in., 0.4 in. between 3.0 in. and 5.0 in., and 0.5 in. at values greater than 5.0 in. However, in southwestern Colorado along the San Juan Mountains, the annual maps use an isoline interval of 0.2 in. below precipitation-frequency values of 2.0 in., and 0.5 in. for values over 2.0 in. On the maps for the 6-hr duration, the interval is 0.1 in. for precipitation-frequency values under 1.2 in. at the 2-yr and 0.50 and 0.20 probability level (on maps for the May through October season). At longer return periods (or lower probabilities), the upper limit of the 0.1-in. isoline interval increases in order to maintain the isopluvial gradient and degree of detail. On all maps for the 6-hr duration, the isoline interval changes from 0.2 in. below 3.0 in. to 0.4 in. over 3.0-in. precipitation-frequency values. Dashed intermediate lines have been placed between widely separated isolines and in regions where a linear interpolation between the normal isopluvial interval would lead to erroneous interpolation. "Lows" that close within the boundaries of a particular map have been hatched on the low-valued side of the isoline.

Importance of snow in precipitation-frequency values. The annual maps in this Atlas represent frequency values of precipitation regardless of type. For many hydrologic purposes, precipitation falling as rain must be treated in a different manner from that falling as snow. The contribution of snow amounts to precipitation-frequency values in Colorado and the Rocky Mountain States (roughly Montana, Wyoming, Colorado, New Mexico, and Utah) was investigated. In this area, there were about 50 stations per state having 10 to 15 yrs of observation of snowfall as part of the precipitation observing program. For each such station, two data series were formed as discussed under Interpretation of Results, Importance of Snow in Estimating Frequency Values.

A ratio was formed of the 2-yr 24-hr value for the series containing maximum annual events without regard to the type of precipitation and the 2-yr 24-hr value for the series with snow occurrences eliminated. A plot of this ratio vs. latitude (fig. 15) shows that the ratio tends to be at a maximum in the latitude of Colorado and Utah. Over all of Colorado, the all-precipitation series tends to average about 10 percent higher than the series with snow eliminated. However, examination of the data shows that in the relatively flat areas east of a smoothed 6,000-ft contour the differences between the two series are minor. With data from this area eliminated, the difference between the two series averages about 15 percent, with some individual differences as large as 40 to 50 percent. About half the stations have differences greater than 10 percent. These differences indicate that frequency values computed from an annual series of rainfall amounts only would be different from those composed of all-precipitation values, and two separate sets of precipitation-frequency maps were needed.

Snowfall observations are made at only about 15 percent of the precipitation stations used in this study. For this reason, a rainfall-frequency study could not be made by direct methods. Since most snowfall occurs during the colder half of the year, a series containing only values for the May to October season was compared with the series that was based on rainfall only. The two series were in good agreement, except for a slight bias toward higher values for the May to October season. This bias results from some large amounts in late October and early May occurring as snow and thus excluded from the rainfall-only series. The average difference is only about 4 percent, with no consistent preference toward higher elevations or particular geographic regions.

Two sets of maps were prepared for Colorado. The first set consists of annual maps based on precipitation data from all months of the year without regard to the type of precipitation; rain, rain and snow mixed, all snow, hail, etc. The second series takes precipitation values from the months May to October. No attempt was made in this second series to differentiate between types of precipitation occurring within these months, but the investigations mentioned in the preceding paragraph indicate that these maps will approximate the values that would be obtained by using a data series made up of precipitation events that are exclusively rain. Since data for only part of the year were used, these maps have been labeled with the appropriate probabilities rather than with a return period in years (figs. 32–43).

Table 11. Equations for estimati[illegible] hr. values in Colorado with statistical parameters for each [illegible]tion.

Region of applicability[a]	Equation	Corr. coeff.	No. of stations	Mean of computed stn. values (inches)	Standard error of estimate (inches)
South Platte, Republican, Arkansas, and Cimarron River Basins (1)	$Y_2 = 0.218 + 0.709[(X_1)(X_1/X_2)]$	0.94	75	1.01	0.074
	$Y_{100} = 1.897 + 0.439[(X_3)(X_3/X_4)] - 0.008Z$	.84	75	2.68	.317
San Juan, Upper Rio Grande, Upper Colorado, and Gunnison River Basins and Green River Basin below confluence with the Yampa River (2)	$Y_2 = -0.011 + 0.942[(X_1)(X_1/X_2)]$	.95	86	0.72	.085
	$Y_{100} = 0.494 + 0.755[(X_3)(X_3/X_4)]$	.90	85	1.96	.290
Yampa and Green River Basins above confluence of Green and Yampa Rivers (3)	$Y_2 = 0.019 + 0.711[(X_1)(X_1/X_2)] + 0.001Z$	.82	98	0.40	.031
	$Y_{100} = 0.338 + 0.670[(X_3)(X_3/X_4)] + 0.001Z$	.80	79	1.04	.141
North Platte (4)	$Y_2 = 0.028 + 0.890[(X_1)(X_1/X_2)]$	.93	90	0.60	.062
	$Y_{100} = 0.671 + 0.757[(X_3)(X_3/X_4)] - 0.003Z$	.91	88	1.71	.236

[a] Numbers in parentheses refer to geographic regions shown in figure 19. See text for more complete description.

List of variables
- Y_2 = 2-yr 1-hr estimated value
- Y_{100} = 100-yr 1-hr estimated value
- X_1 = 2-yr 6-hr value from precipitation-frequency maps
- X_2 = 2-yr 24-hr value from precipitation-frequency maps
- X_3 = 100-yr 6-hr value from precipitation-frequency maps
- X_4 = 100-yr 24-hr value from precipitation-frequency maps
- Z = point elevation in hundreds of feet

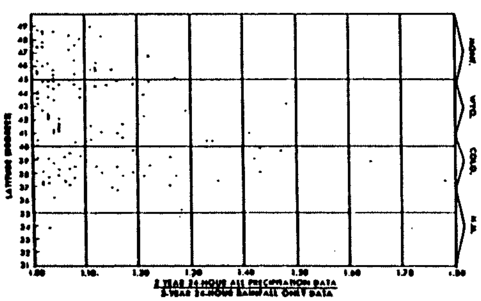


Figure 15. ***Ratio of 2-yr 24-hr value for all data to 2-yr 24-hr value for rainfall only vs. latitude.***

Duration (min)	5	10	15	30
Ratio to 1-hr	0.29	0.45	0.57	0.79

(Adopted from U.S. *Weather Bureau Technical Paper* No. 40, 1961.)

Procedures for Estimating Values for Durations Other Than 6 and 24 Hrs

The isopluvial maps in this Atlas are for 6- and 24-hr durations. For many hydrologic purposes, values for other durations are necessary. Such values can be estimated using the 6- and 24-hr maps and the empirical methods outlined in the following sections. The procedures detailed below for obtaining 1-, 2-, and 3-hr estimates were developed specifically for this Atlas. The procedures for obtaining estimates for less than 1-hr duration and for 12-hr duration were adopted from *Weather Bureau Technical Paper* 40 (U.S. Weather Bureau 1961) only after investigation demonstrated their applicability to data from the area covered by this Atlas.

Procedures for estimating 1-hr (60-min) precipitation-frequency values. Multiple-regression screening techniques were used to develop equations for estimating 1-hr duration values. Factors considered in the screening process were restricted to those that could be determined easily from the maps of this Atlas or from generally available topographic maps.

The 11 western states were separated into several geographic regions. The regions were chosen on the basis of meteorological and climatological homogeneity and are generally combinations of river basins separated by prominent divides. Four of these geographic regions are partially within Colorado. For convenience and use as an overlay on the precipitation-frequency maps, regions are outlined on figure 19. The first Colorado region is that part of the region that lies to the east of the Continental Divide and the crest of the Sangre de Cristo and Sacramento Mountains, and is south of the divide separating the drainage basins of the North and South Platte Rivers. It consists of that portion of Colorado drained by the South Platte, Republican, Arkansas, and Cimarron Rivers (Region 1, fig. 19). The second region consists of the area drained by the San Juan, Upper Rio Grande, Upper Colorado, Gunnison Rivers and by the Green River below its confluence with the Yampa River (Region 2, fig. 19). This is part of a larger region that extends from southwestern Colorado, westward to the Wasatch Mountains of Utah, and southward through Arizona and the western half of New Mexico. The third region is the mountainous portion of the area between the Continental Divide and the crest of the Cascade Range. The portion that lies within Colorado is the northwestern portion of the State that is drained by the Yampa River and the Green River above its confluence with the Yampa (Region 3, fig. 19). A small portion of Colorado drained by the North Platte is Region 4, figure 19. The larger region of which this is a part includes that portion of Wyoming and Montana east of the Continental Divide. Equations to provide estimates for the 1-hr duration for 2- and 100-yr return periods are shown in table 11. Also listed are the statistical parameters associated with each equation. In these equations, the variable $[(X_1)(X_1/X_2)]$

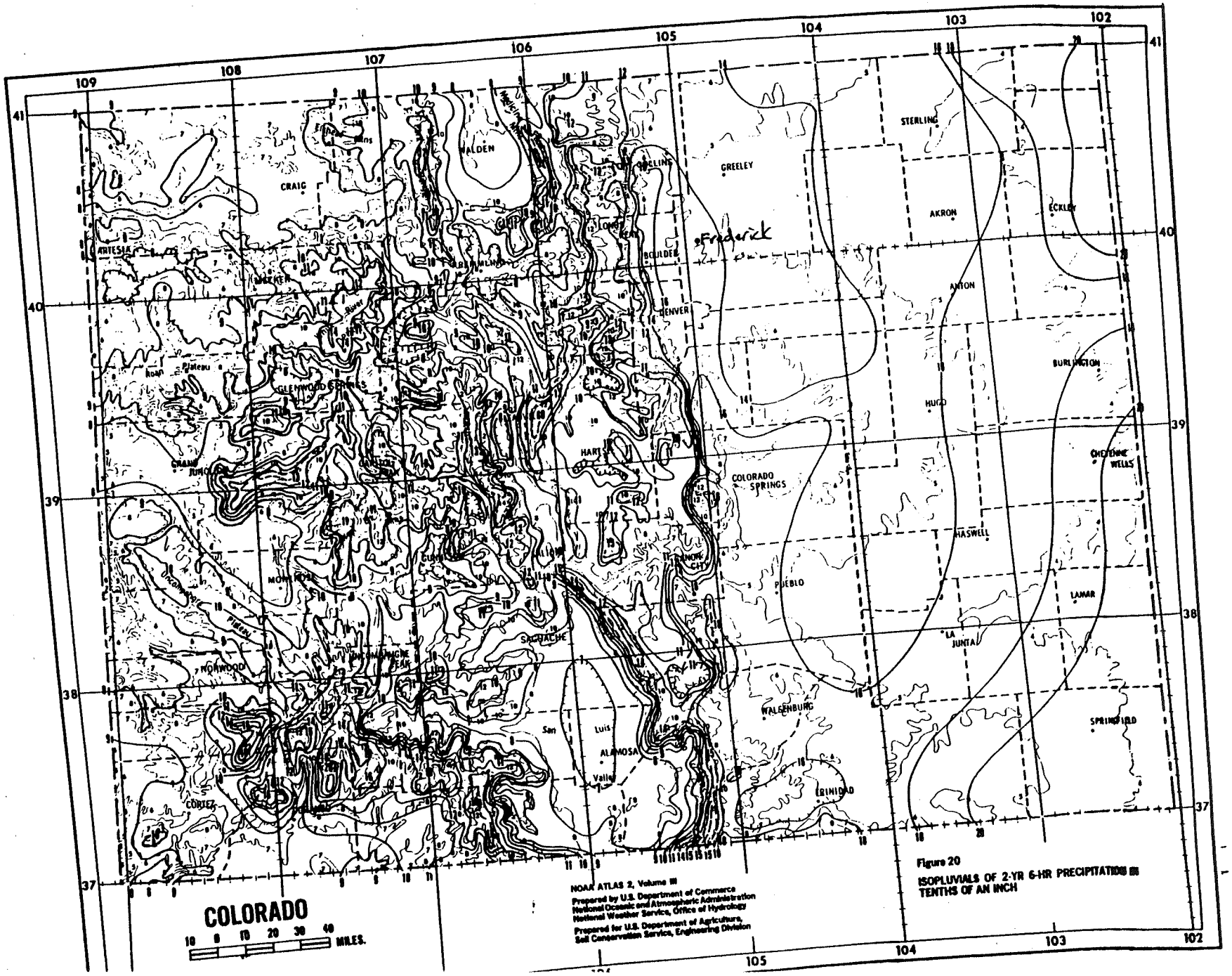
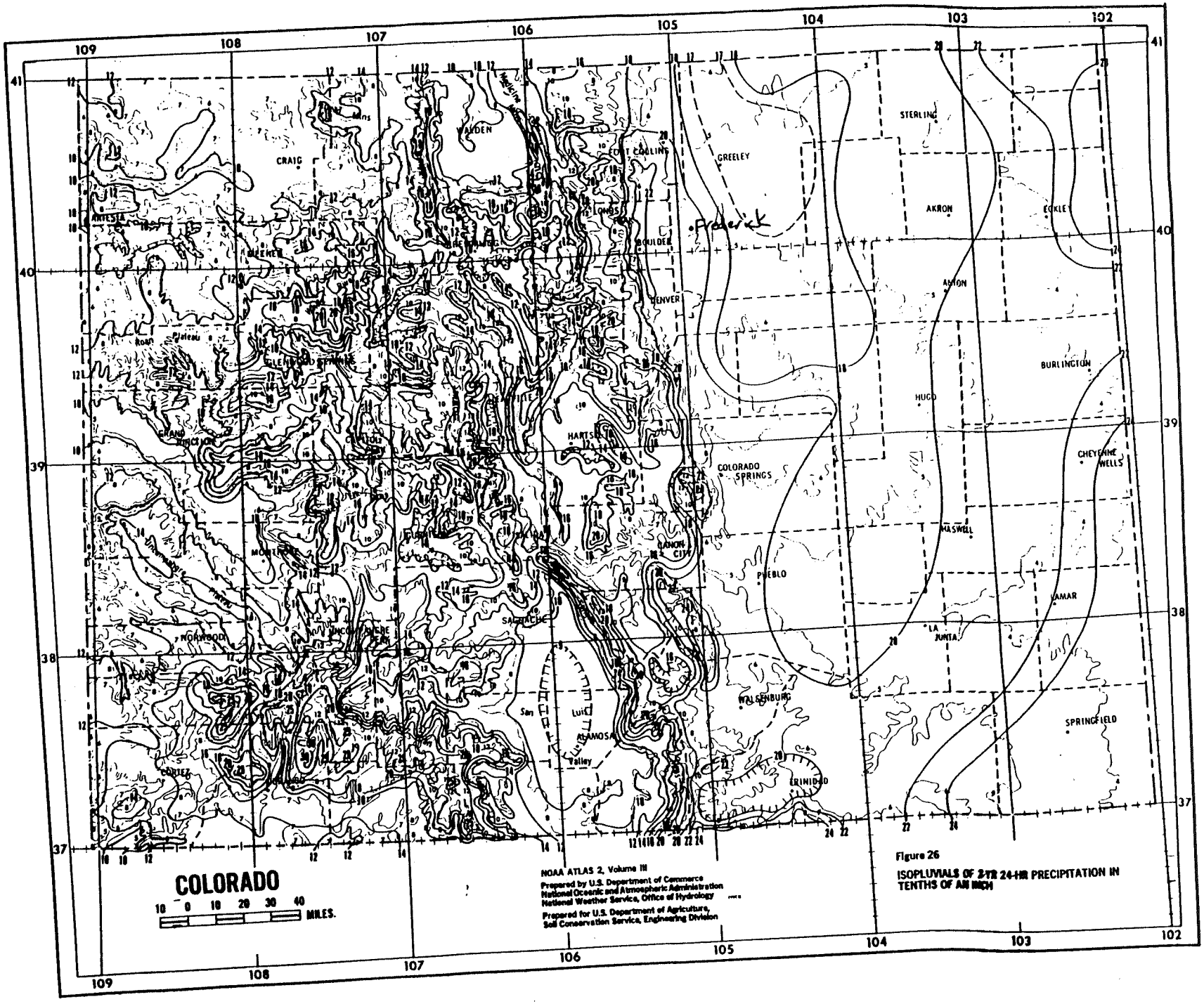


Figure 20
ISOPLUVIALS OF 2-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH

4/2


COLORADO
10 0 10 20 30 40
MILES.
NOAA ATLAS 2, Volume III
Prepared by U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service, Office of Hydrology
Prepared for U.S. Department of Agriculture,
Soil Conservation Service, Engineering Division
Figure 26
ISOPLUVIALS OF 2-YR 24-HR PRECIPITATION IN
TENTHS OF AN INCH
CRAIG
WALDEN
FORT COLLINS
GREELEY
STERLING
AKRON
ECKLE
ASTON
BURLINGTON
HUGO
CHEYENNE WELLS
BOULDER
DENVER
Frederick
COLORADO SPRINGS
PUEBLO
CANON CITY
MASWELL
LAMAR
LA JUNTA
WALSENBURG
SPRINGFIELD
TRINIDAD
ALAMOSA
SALIDA
HARTSEL
MONTROSE
NORWOOD
CORTEZ
GRAND JUNCTION
GLENWOOD SPRINGS
ASPEN
San Luis Valley
Rio Grande
Plateau
109
108
107
106
105
104
103
102
41
40
39
38
37

5/20

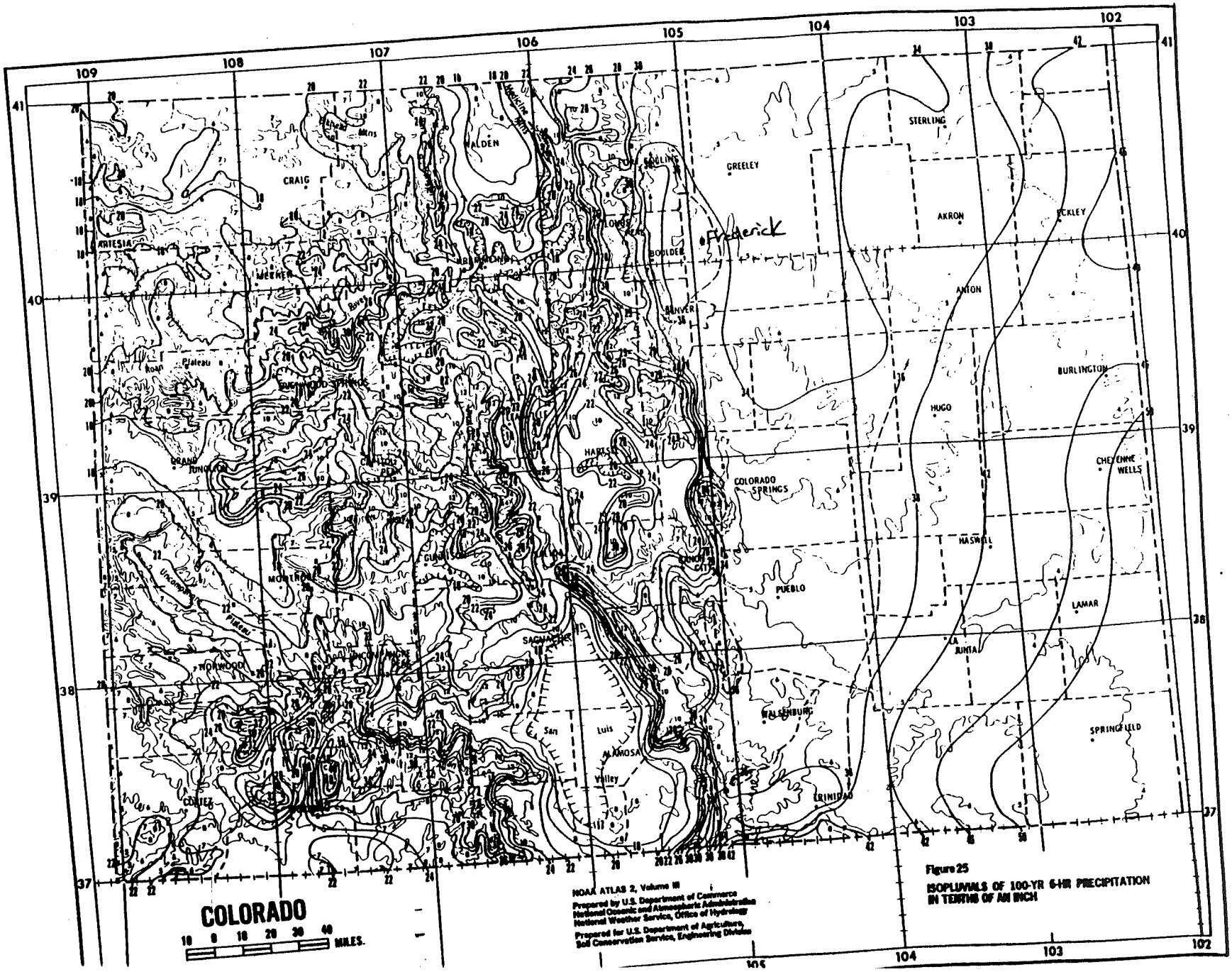
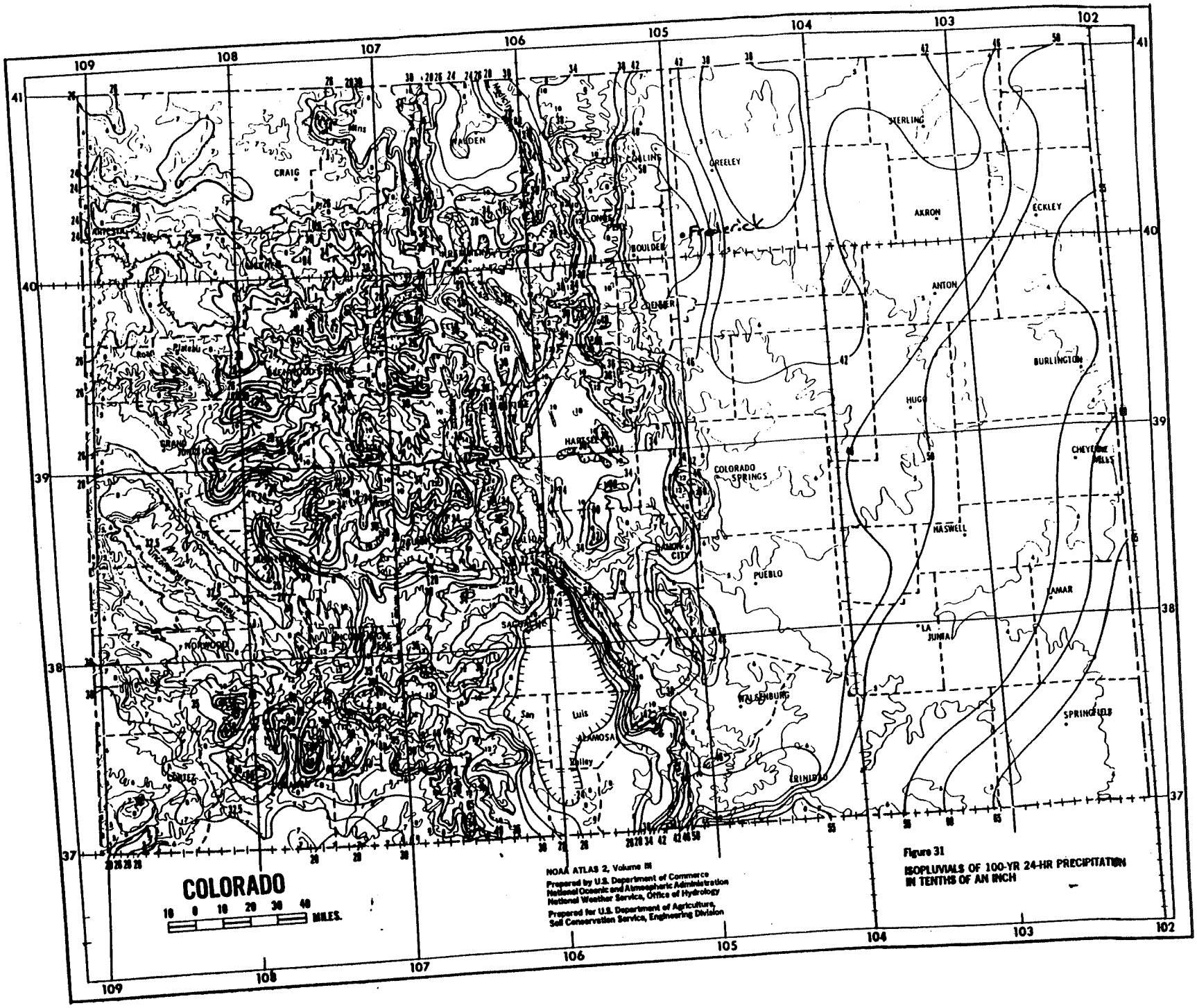


Figure 25

ISOPLUVIALS OF 100-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH



NOAA ATLAS 2, Volume III
Prepared by U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service, Office of Hydrology
Prepared for U.S. Department of Agriculture,
Soil Conservation Service, Engineering Division

Figure 31
ISOPLUVIALS OF 100-YR 24-HR PRECIPITATION
IN TENTHS OF AN INCH

7/20

(2) - Using 1-Hr. and 6-Hr., 2-Yr. and 100-Yr values estimate 2-Hr, 2-Yr and 100-Yr values

Equation 3 for 2-hr value for Region 1 (mathematical solution from the data used to develop Figure 16A)

$$2\text{-Hr.} = 0.342(6\text{-Hr.}) + 0.658(1\text{-Hr.})$$

$$2\text{-Hr}_2 = 0.342(1.5) + 0.658(0.98) = \underline{\underline{1.16 \text{ in.} = 2\text{-Yr } 2\text{-Hr. Precip}}}$$

$$2\text{-Hr}_{100} = 0.342(3.7) + 0.658(2.68) = \underline{\underline{3.03 \text{ in.} = 100\text{-Yr } 2\text{-Hr Precip}}}$$

(3) - Estimate 5, 10, 25, 50-Yr, 1-Hr values using Nomograph on Figure 6

2-YR = 0.98 in. (Calculated in Step 1)
5-YR = 1.39 in.
10-YR = 1.68 in.
25-YR = 2.04 in.
50-YR = 2.37 in.
100-YR = 2.68 in. (Calculated in Step 1)

$[(X_a)(X_a/X_b)]$ can be regarded as the 6-hr value times the slope of the line connecting the 6- and 24-hr values for the appropriate return period.

As with any separation into regions, the boundary can only be regarded as the sharpest portion of a zone of transition between regions. These equations have been tested for boundary discontinuities by computing values using equations from both sides of the boundary. Differences were found to be mostly under 15 percent. However, it is suggested that when computing estimates along or within a few miles of a regional boundary computations be made using equations applicable to each region and that the average of such computations be adopted.

Estimates of 1-hr precipitation-frequency values for return periods between 2 and 100 yrs. The 1-hr values for the 2- and 100-yr return periods can be plotted on the nomogram of figure 6 to obtain values for return periods greater than 2 yrs or less than 100 yrs. Draw a straight line connecting the 2- and 100-yr values and read the desired return-period value from the nomogram.

Estimates for 2- and 3-hr (120- and 180-min) precipitation-frequency values. To obtain estimates of precipitation-frequency values for 2 or 3 hrs, plot the 1- and 6-hr values from the Atlas on the appropriate nomogram of figure 16. Draw a straight line connecting the 1- and 6-hr values, and read the 2- and 3-hr values from the nomogram. This nomogram is independent of return period. It was developed using data from the same regions used to develop the 1-hr equations.

The mathematical solution from the data used to develop figure 16 gives the following equations for estimating the 2- and 3-hr values:

For Region 1, figure 19	2-hr = 0.342 (6-hr) + 0.658 (1-hr)	(3)
	3-hr = 0.597 (6-hr) + 0.403 (1-hr)	(4)
For Region 2, figure 19	2-hr = 0.341 (6-hr) + 0.659 (1-hr)	(5)
	3-hr = 0.569 (6-hr) + 0.431 (1-hr)	(6)
For Regions 3 and 4, figure 19	2-hr = 0.250 (6-hr) + 0.750 (1-hr)	(7)
	3-hr = 0.467 (6-hr) + 0.533 (1-hr)	(8)

Estimates for 12-hr (720-min) precipitation-frequency values. To obtain estimates for the 12-hr duration, plot values from the 6- and 24-hr maps on figure 17. Read the 12-hr estimates at the intersection of the line connecting these points with the 12-hr duration line of the nomogram.

Estimates for less than 1 hr. To obtain estimates for durations of less than 1 hr, apply the values in table 12 to the 1-hr value for the return period of interest.

	1-hr	2-hr	3-hr	6-hr	24-hr
2-yr	*0.71*	*0.83*	*0.91*	1.05	1.58
5-yr				1.38	1.99
10-yr				1.59	2.27
25-yr				1.80	2.65
50-yr				2.19	2.95
100-yr	*1.86*			2.39	3.35

Table 13. *Precipitation data for depth-frequency atlas computation point 106°00′ W., 39°00′ N.*

Illustration of Use of Precipitation-Frequency Maps, Diagrams, and Equations

To illustrate the use of these maps, values were read from figures 20 to 31 for the point at 39°00′ N. and 106°00′ W. These values are shown in boldface type in table 13. The values read from the maps should be plotted on the return-period diagram of figure 6 because (1) not all points are as easy to locate on a series of maps as are latitude-longitude intersections, (2) there may be some slight registration differences in printing, and (3) precise interpolation between isolines is difficult. This has been done for the 24-hr values in table 13 (fig. 18a) and a line of best fit has been drawn subjectively. On this nomogram, the line fits the data rather well. Had any points deviated noticeably from the line, the value would have been reread from the line and the new value substituted in table 13 and adopted in preference to the original readings.

The 2- and 100-yr 1-hr values for the point were computed from the equations applicable to Region 1, figure 19 (table 11), since the point is east of the Continental Divide. The 2-yr 1-hr value is estimated at 0.71 in. (2-yr 6- and 24-hr values from table 13); the estimated 100-yr 1-hr value is 1.86 in. (100-yr 6- and 24-hr values from table 13 and elevation of 9,500 ft). By plotting these 1-hr values on figure 6 and connecting them with a straight line, one can obtain estimates for return periods of 5, 10, 25, and 50 yrs.

The 2- and 3-hr values can be estimated by using the nomogram of figure 16 or equations (3) and (4). The 1- and 6-hr values for the desired return period are obtained as above. Plot these points on the nomogram of figure 16 and connect them with a straight line. Read the estimates for 2 or 3 hrs at the intersections of the connecting line and the 2- and 3-hr vertical lines. An example is shown in figure 18b for the 2-yr return period. The 2-yr 2-hr (0.83 in.) and 2-yr 3-hr (0.91 in.) values are in italics on table 13.

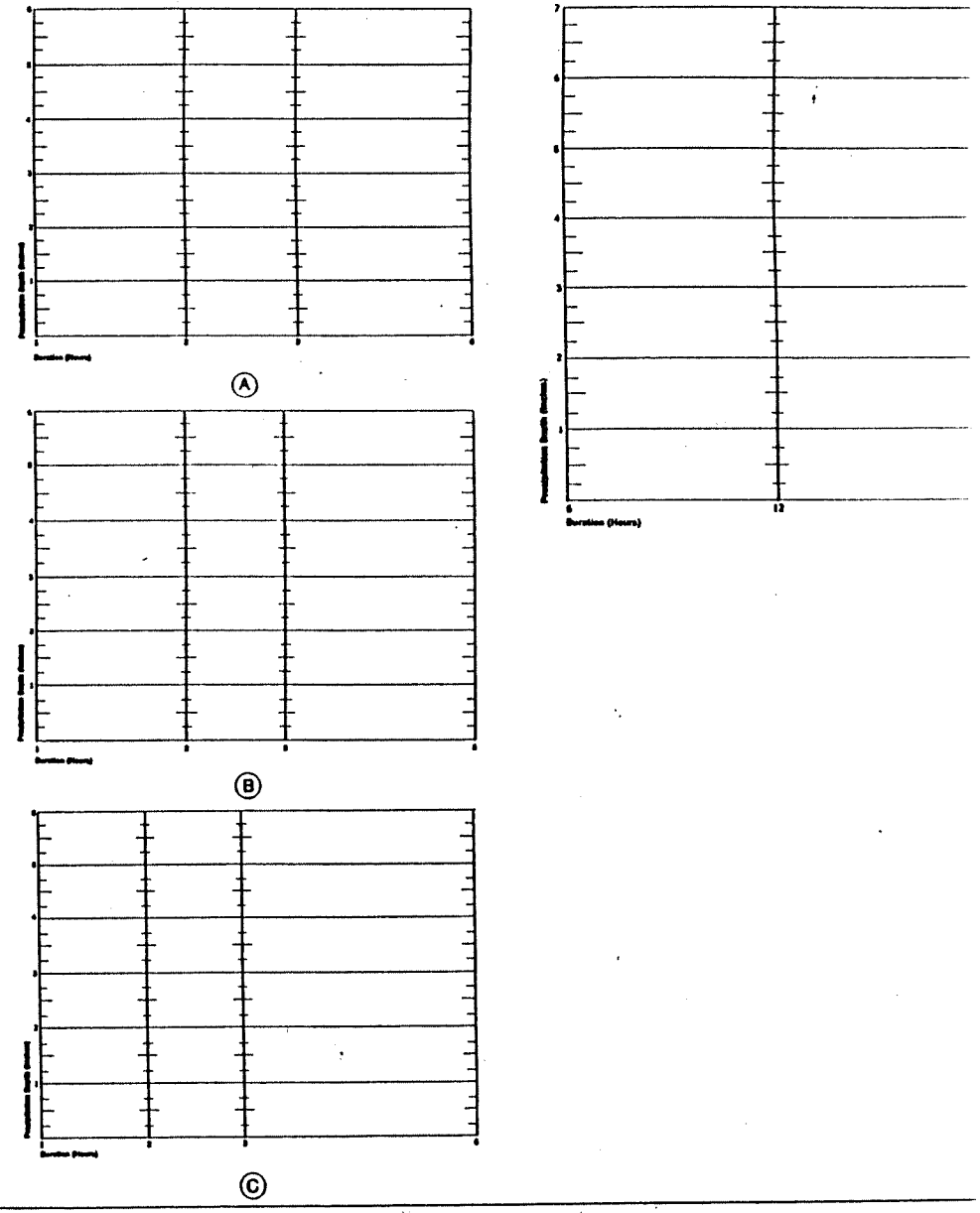


Figure 18. *Precipitation depth-duration diagram (1- to 6-hr).*
a. South Platte, Republican, Arkansas, and Cimarron River Basins (Region 1, fig. 19).
b. San Juan, Upper Rio Grande, Upper Colorado, and Gunnison River Basins and Green River Basin

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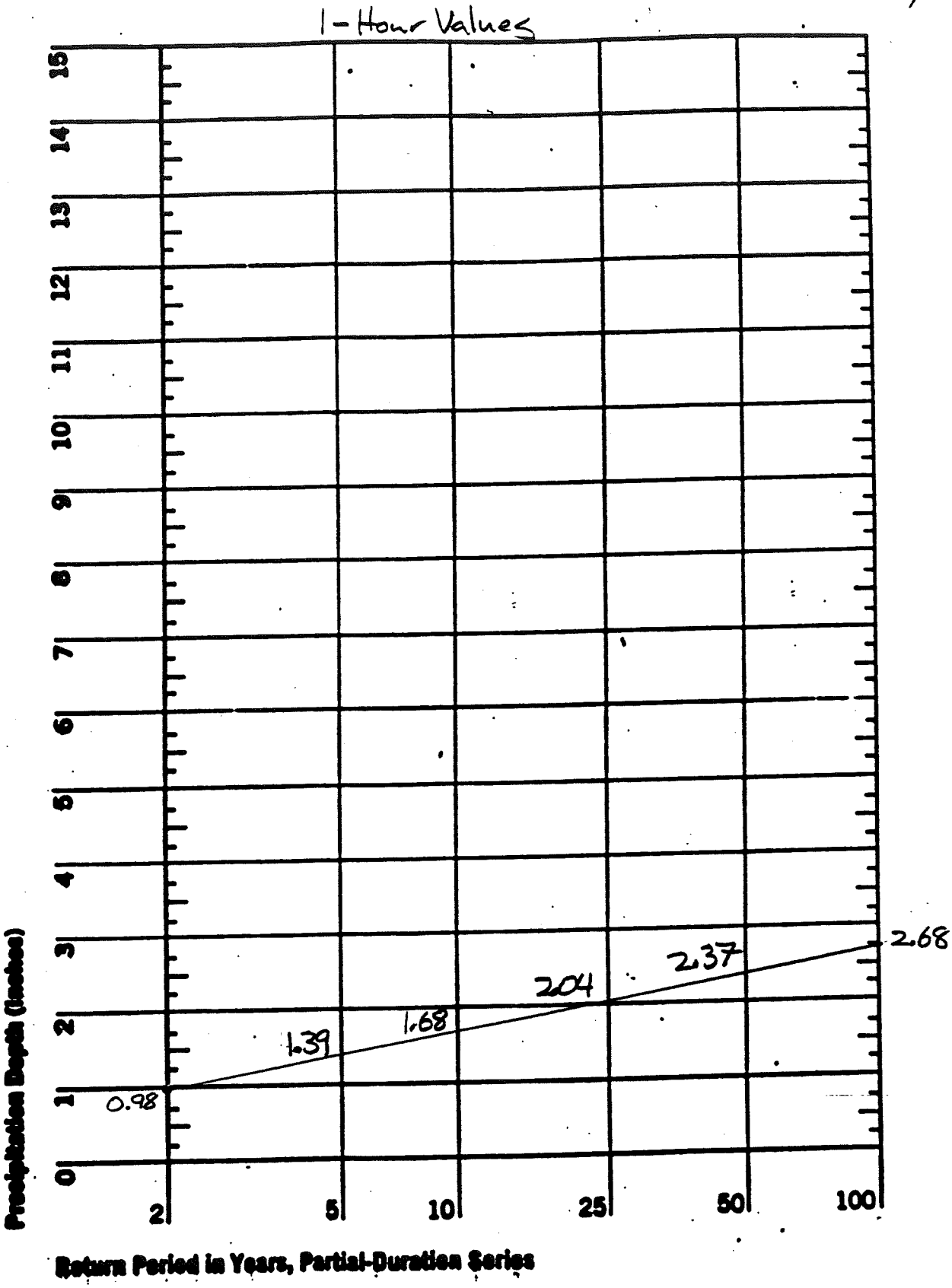

Figure 6. *Precipitation depth versus return period for partial-duration series.*

PROJECT:	WELD COUNTY - I-25 CORRIDOR MASTER DRAINAGE PLAN	BY: BFS	DATE: 02/24/99	PROJECT NO. COWELD01
FEATURE:	DURATION/FREQUENCY/INTENSITY COMPUTATIONS	CHK. BY: CJP	DATE: 03/04/99	SHEET: FREQUENCY

REGION 1 : South Platte, Republican, Arkansas, and Cimarron River Basins
LOCATION: Frederick
LAT: n/a
LONG: n/a
ELEVATION: 5000 feet

DURATION	5-MIN		10-MIN		15-MIN		30-MIN		1-HR		2-HR		3-HR		6-HR		24-HR	
DURATION FACTORS	0.29		0.45		0.57		0.79		1.00									
FREQUENCY	Depth (in)	Intensity (in/hr)	Depth (in)	Intensity (in/hr)	Depth (in)	Intensity (in/hr)	Depth (in)	Intensity (in/hr)	Depth (in)	Intensity (in/hr)	Depth (in)	Intensity (in/hr)	Depth (in)	Intensity (in/hr)	Depth (in)	Intensity (in/hr)	Depth (in)	Intensity (in/hr)
2-YR	*0.28*	*3.41*	*0.44*	*2.65*	*0.56*	*2.23*	*0.77*	1.55	*0.98*	*0.98*	*1.16*	*0.58*	*1.29*	*0.43*	**1.50**	**0.25**	**2.10**	0.09
5-YR	*0.40*	*4.84*	*0.63*	*3.75*	*0.79*	*3.17*	*1.10*	2.20	**1.39**	*1.39*	*1.60*	*0.80*	*1.75*	*0.58*	**2.00**	**0.33**	**2.80**	0.12
10-YR	*0.49*	*5.85*	*0.76*	*4.54*	*0.96*	*3.83*	*1.33*	2.65	**1.68**	*1.68*	*1.91*	*0.95*	*2.08*	*0.69*	**2.35**	**0.39**	**3.20**	0.13
25-YR	*0.59*	*7.10*	*0.92*	*5.51*	*1.16*	*4.65*	*1.61*	3.22	**2.04**	*2.04*	*2.32*	*1.16*	*2.54*	*0.85*	**2.87**	**0.48**	**4.00**	0.17
50-YR	*0.69*	*8.25*	*1.07*	*6.40*	*1.35*	*5.40*	*1.87*	3.74	**2.37**	*2.37*	*2.67*	*1.34*	*2.90*	*0.97*	**3.25**	**0.54**	**4.60**	0.19
100-YR	*0.78*	*9.33*	*1.21*	*7.24*	*1.53*	*6.11*	*2.12*	4.23	*2.68*	*2.68*	*3.03*	*1.51*	*3.29*	*1.10*	**3.70**	**0.62**	**5.10**	0.21

Notes:

1. **BOLD = Input from Atlas Isopluvials or Graphing (Figure 6.)**

2. *ITALICS = Computed Values*

3. EQUATIONS USED:

1HR, 2YR = .218 + .709(2YR6HR^2 / 2YR24HR)
1HR, 100YR = 1.897 + .439(100YR6HR^2 / 100YR24HR) - .008(ELEVATION/100)
2HR = .342(6HR) + .658(1HR)
3HR = .597(6HR) + .403(1HR)
5MIN = .290(1HR)
10MIN = .450(1HR)
15MIN = .570(1HR)
30MIN = .790(1HR)

4. SAMPLE CALCULATIONS:

1HR, 2YR=	0.218	+	0.709	*(	1.500	^2 /	2.100	) =	0.978	inches							
1HR, 100YR=	1.897	+	0.439	*(	3.700	^2 /	5.100	) -	0.008	*(	5000 / 100	)=	2.675	inches			
2HR, 10YR=	0.342	*(	2.350	) +	0.658	*(	1.680	) =	1.909	inches							
3HR, 50YR=	0.597	*(	3.250	) +	0.403	*(	2.370	) =	2.895	inches							
30MIN, 5YR=	0.790	*(	1.390	) =	1.098	inches											
5MIN, 25YR=	0.290	*(	2.040	) =	0.592	inches											

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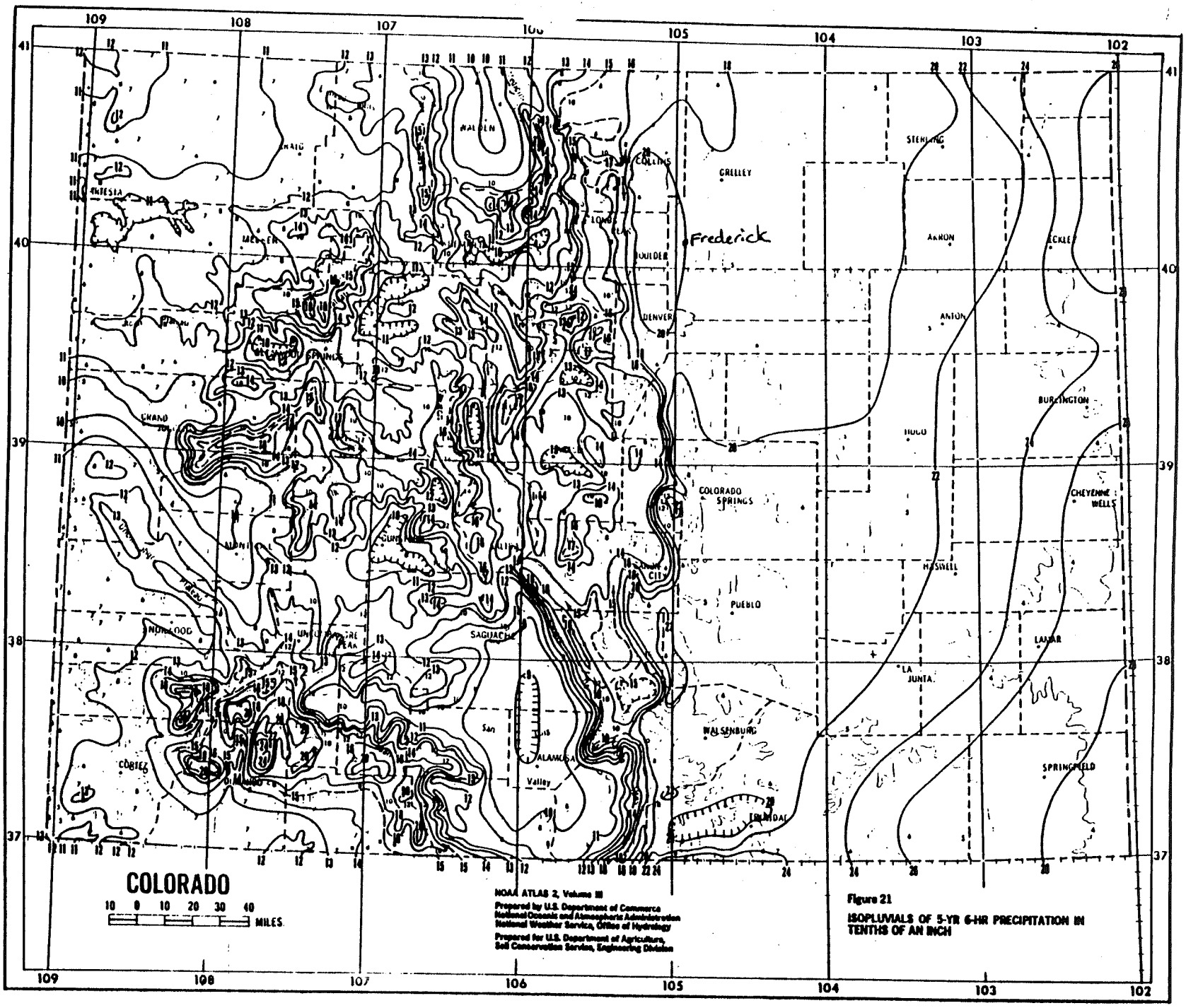

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Figure 21

ISOPLUVIALS OF 5-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH

12/20

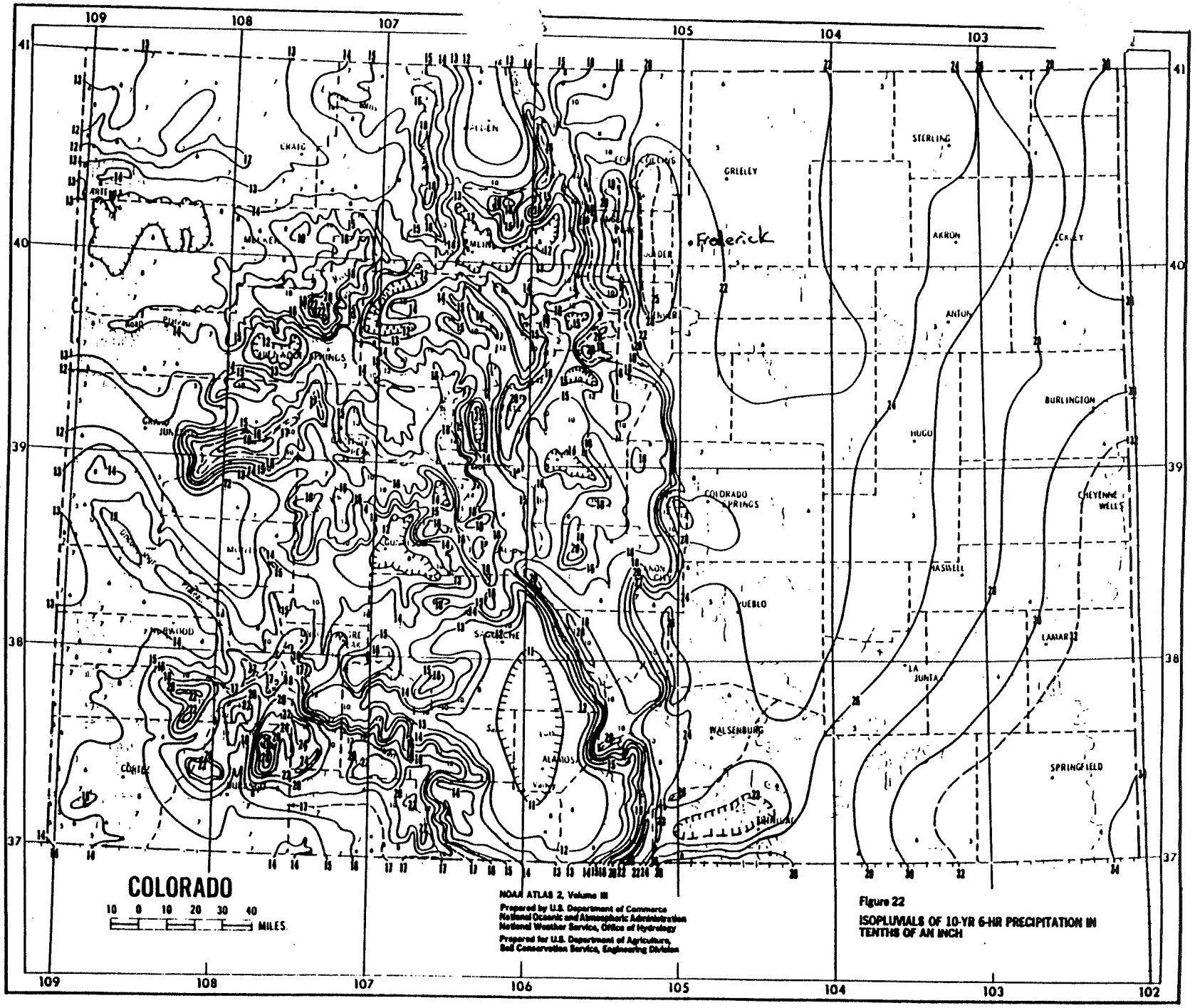

Figure 22

ISOPLUVIALS OF 10-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH

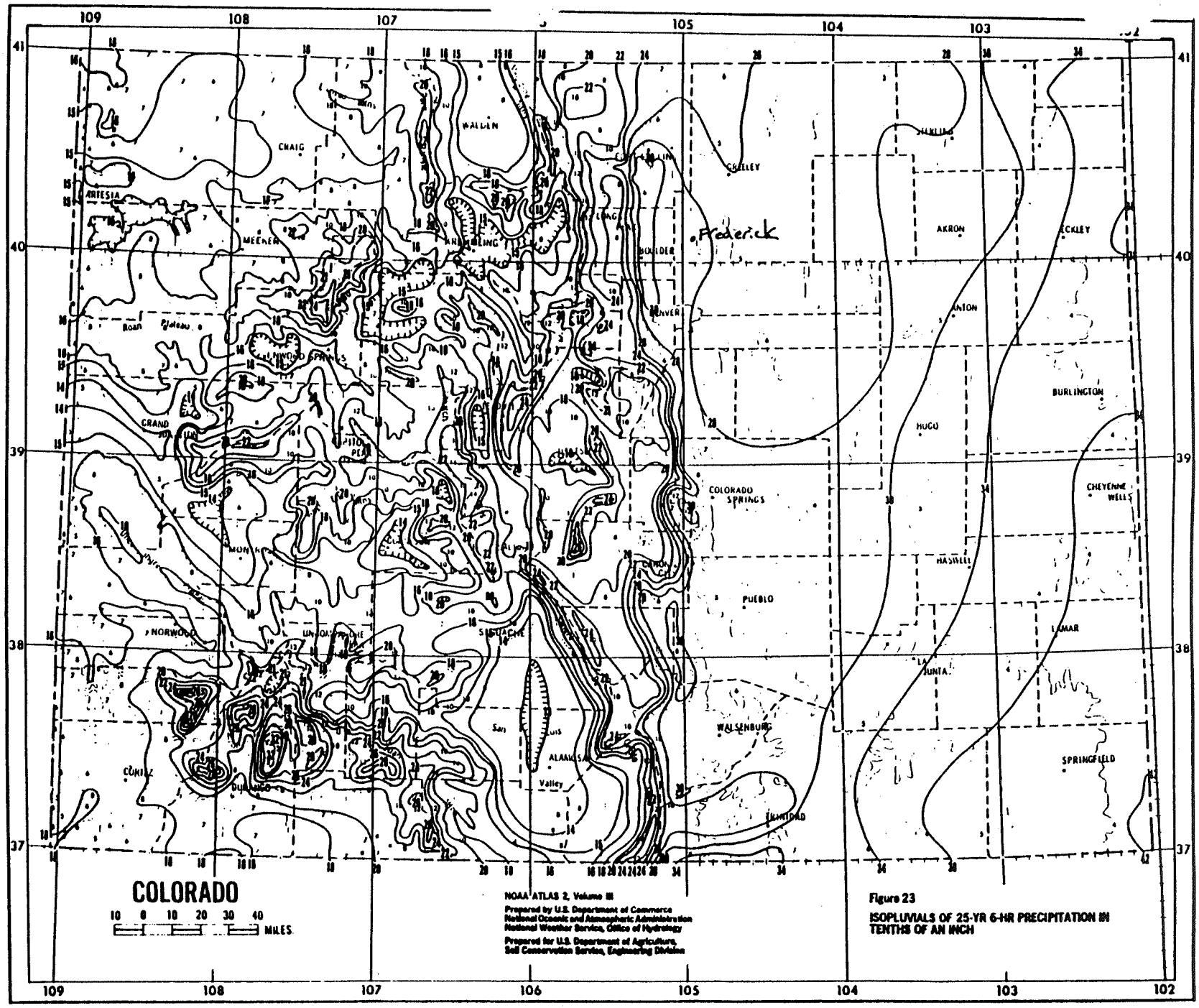

Figure 23

ISOPLUVIALS OF 25-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH

14/20

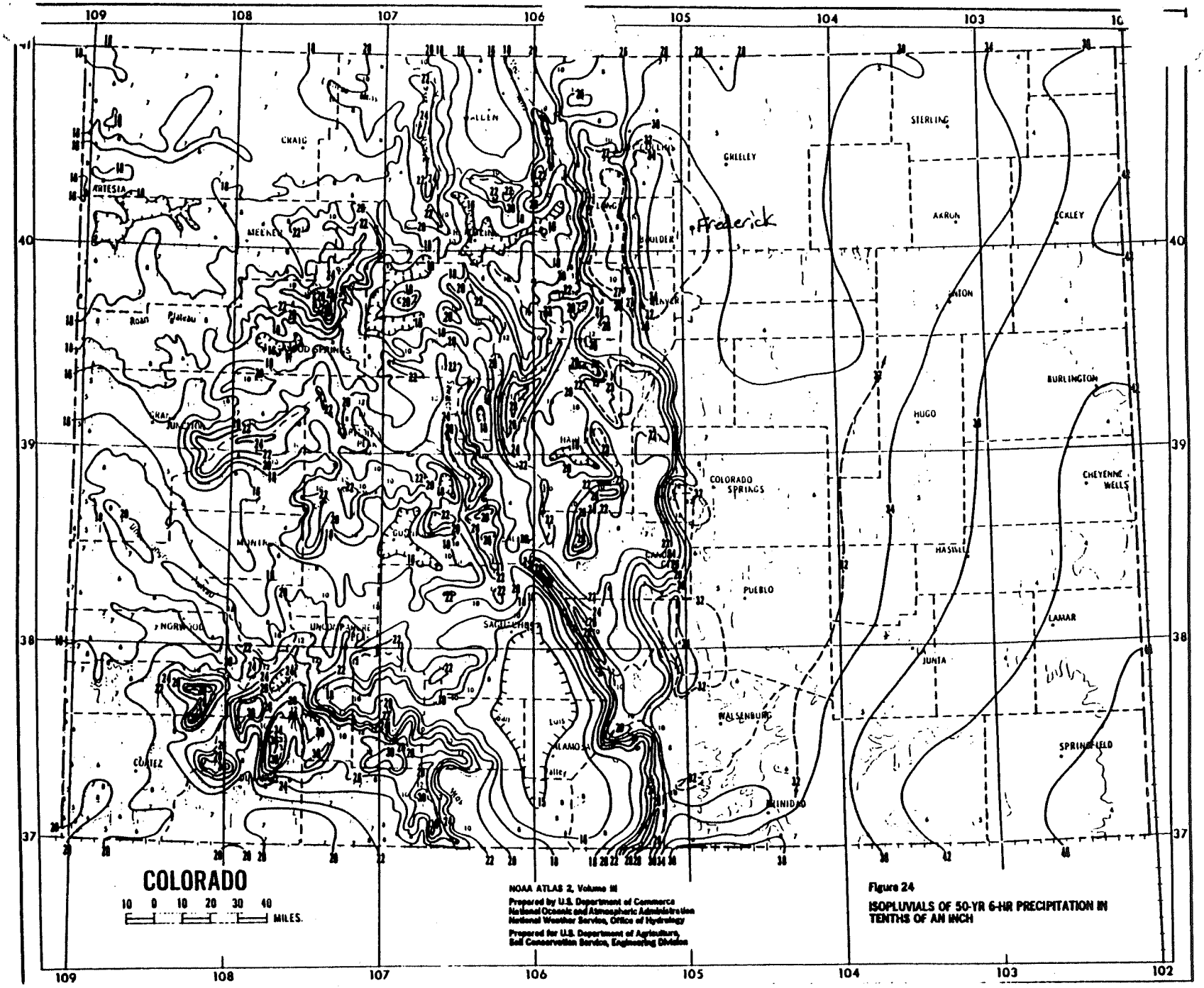

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Figure 24

ISOPLUVIALS OF 50-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH

15/20

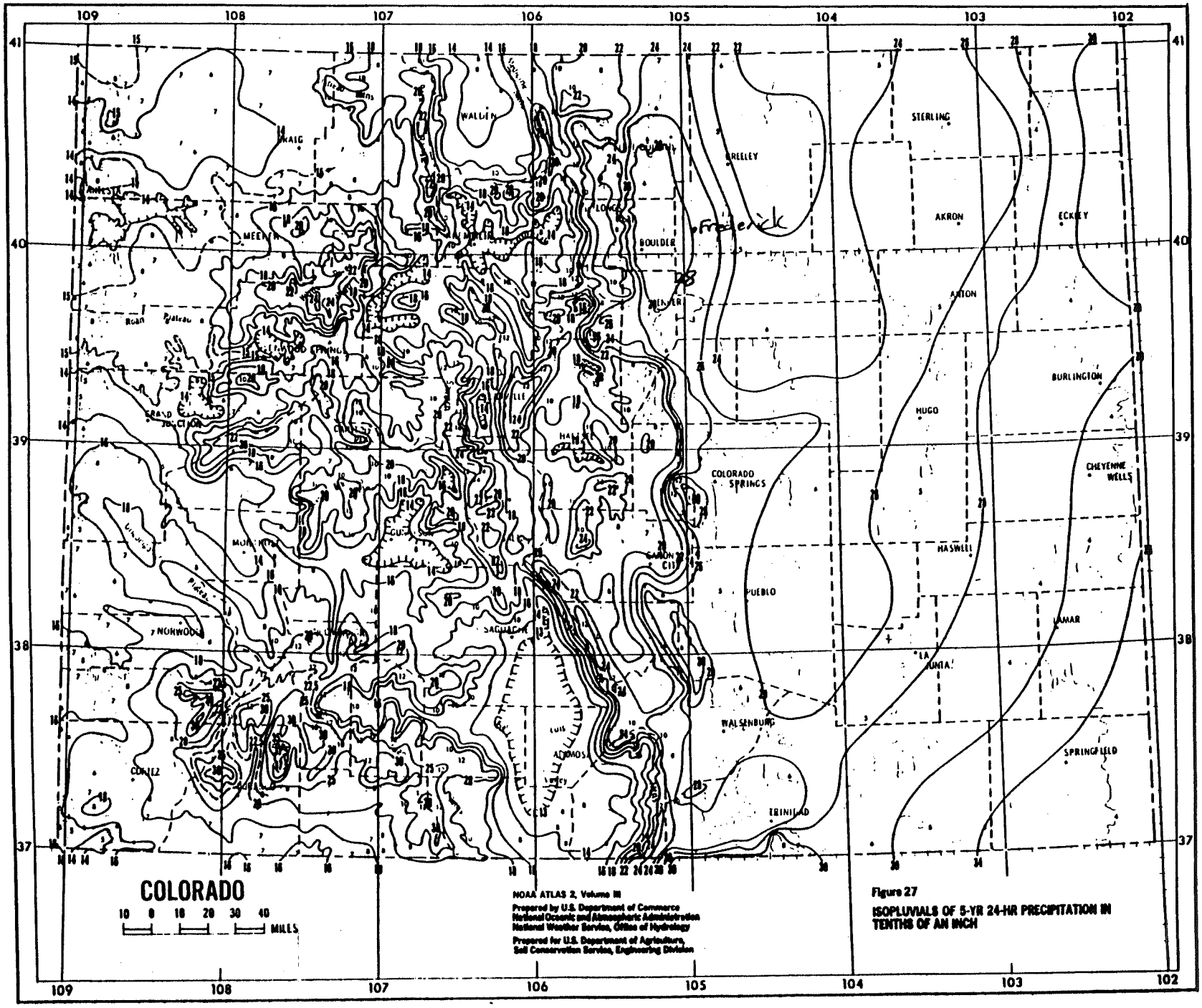

Figure 27

ISOPLUVIALS OF 5-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH

16/21

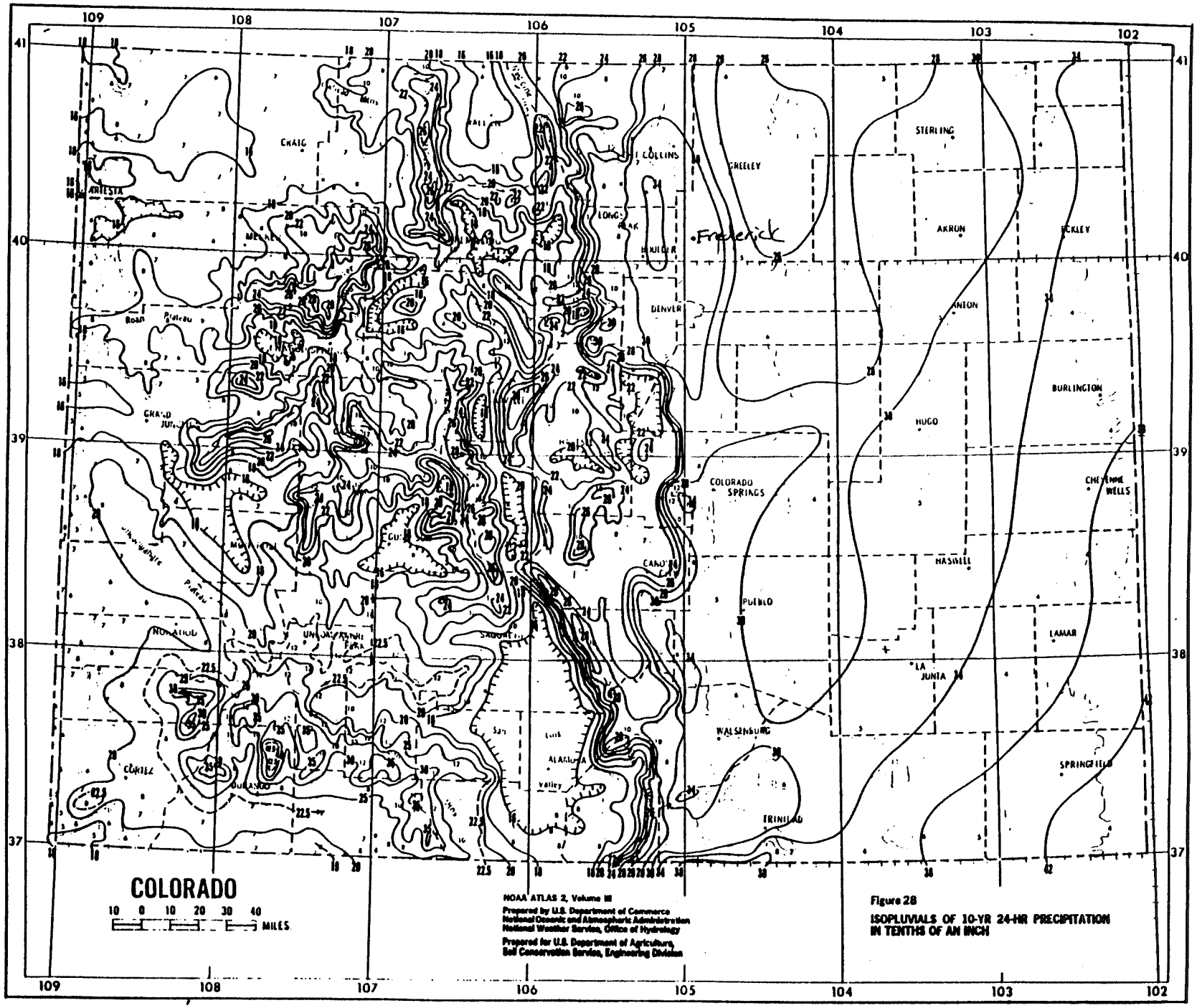

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Figure 28

ISOPLUVIALS OF 10-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH

17/20

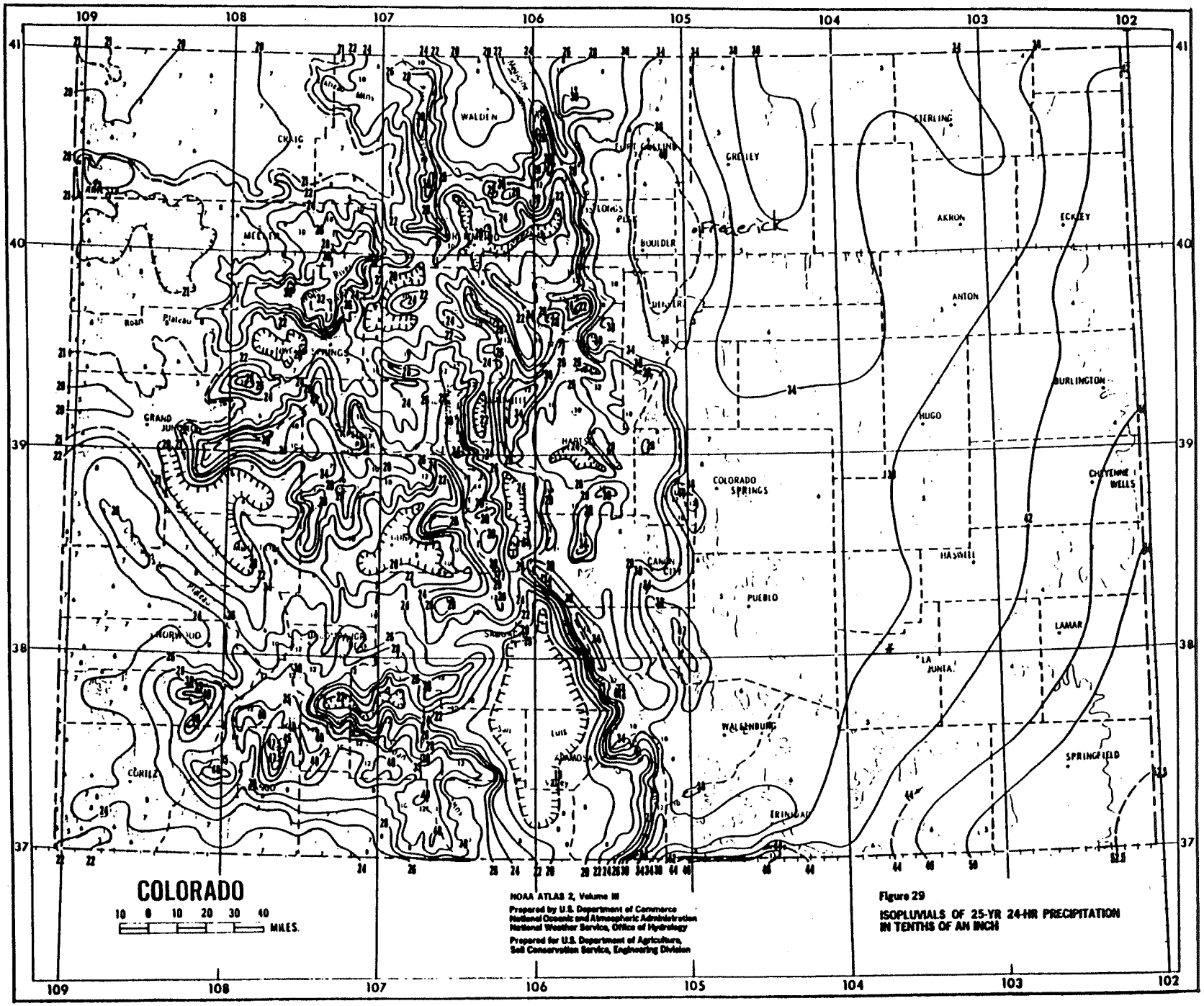

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Figure 29

ISOPLUVIALS OF 25-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH

18/20

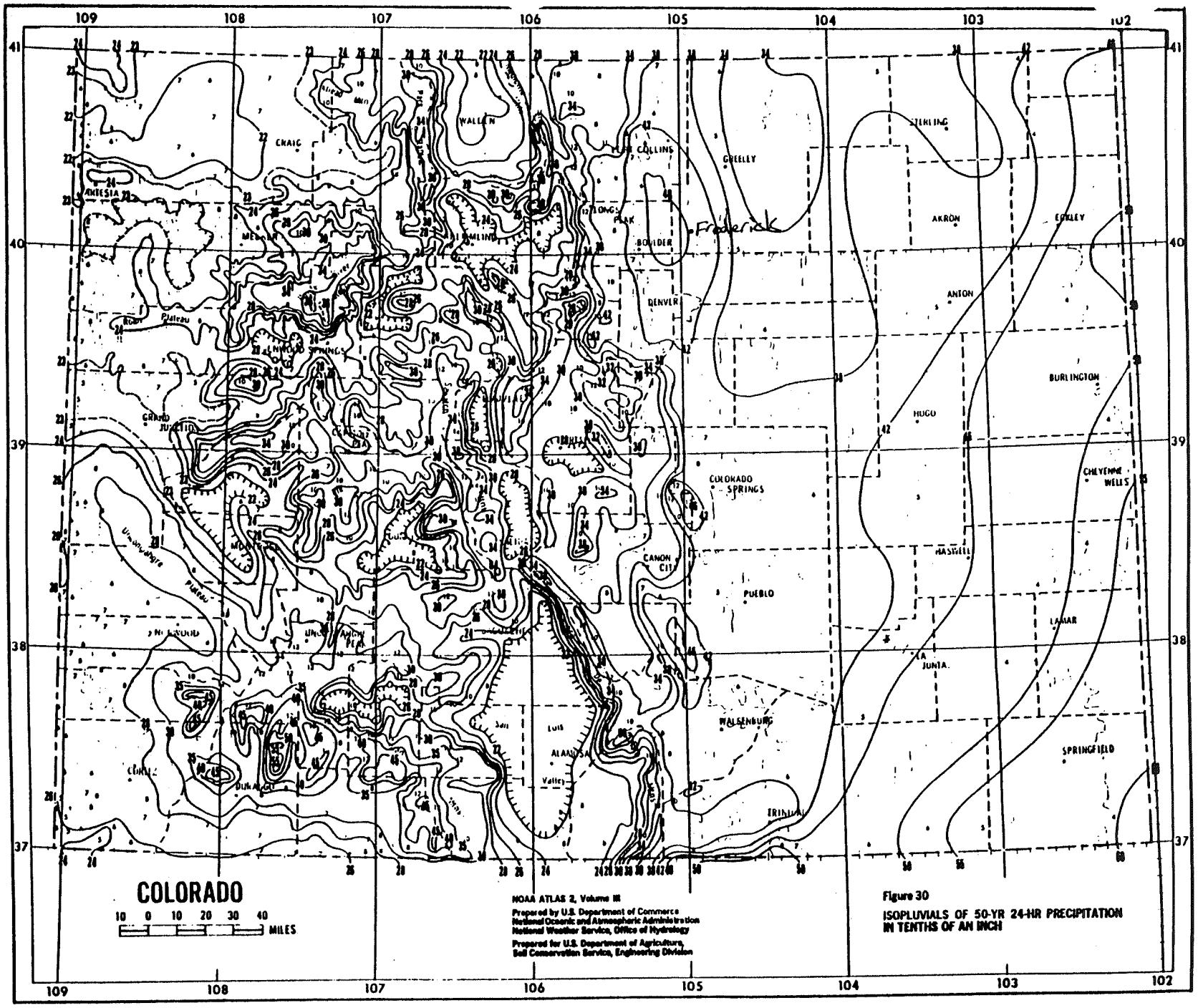


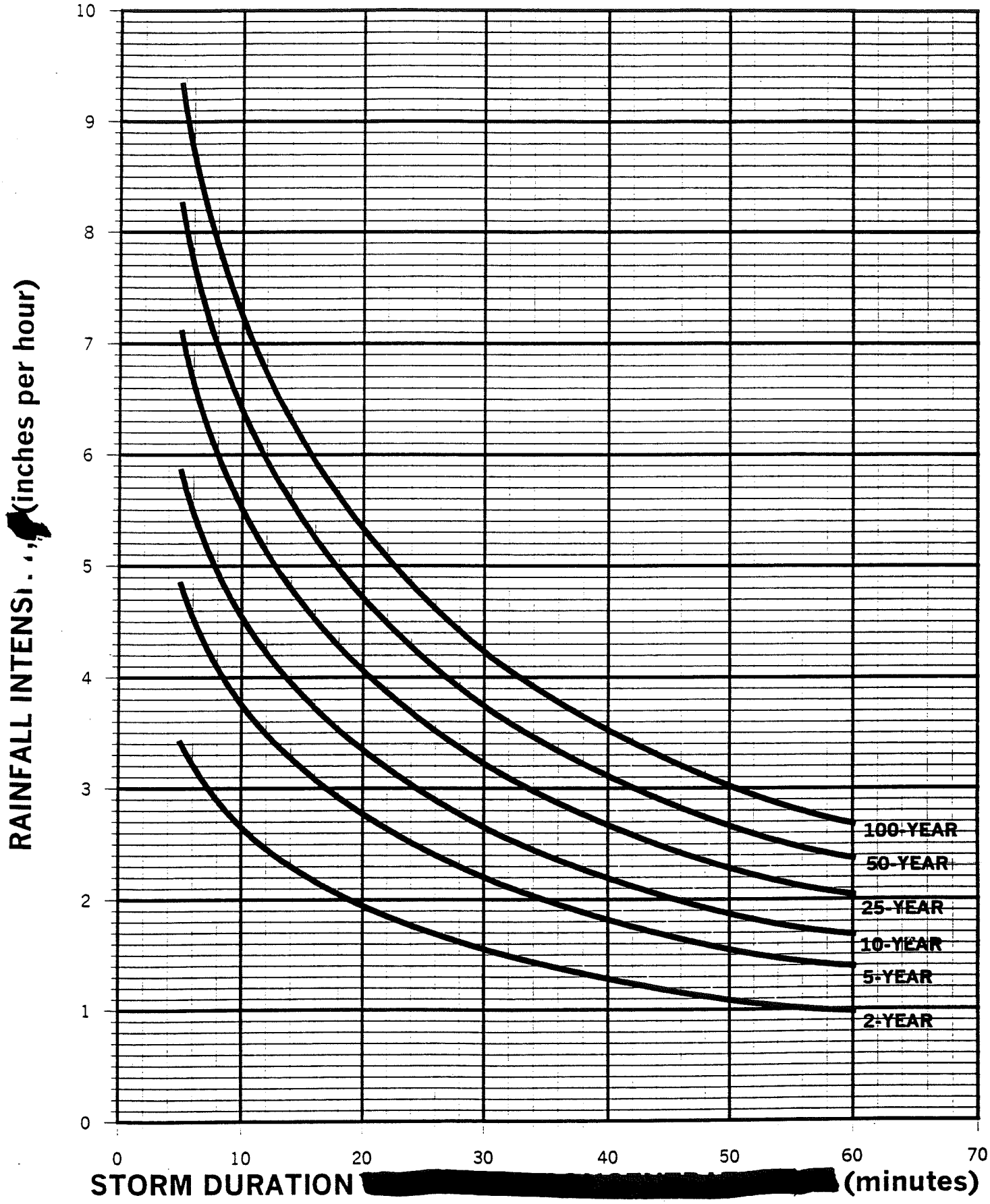
Figure 30

ISOPLUVIALS OF 50-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH

19/20

TRI-TOWN & GODDING HOLLOW BASINS

TIME - INTENSITY - FREQUENCY CURVES



REF: "Precipitation Frequency Atlas of the Western United States", NOAA 1973.

II-B.2

DISTRIBUTION

3. DESIGN STORM DISTRIBUTION FOR CUHP

3.1 Temporal Distribution

The 1982 version of the CUHP (see RUNOFF) was designed to be used with THE NOAA 1-hour rainfall depths provided under 2.1. To obtain a temoral distribution for a design storm in the Denver region, the 1-hour depth is transferred into a 2-hour design storm by multiplying the 1-hour depth(s) by the percentages for each time increment given in Table 3-1. The resultant design storm(s) may then be used with the 1982 version of the CUHP.

3.2 Example: Develop a 2-Hour Design Storm

Develop a 2-hour, 10-year design storm using the 1-hour, 10-year depth of 1.6 inches from Example in 2.3. Set up a working table (Table 3-2) with columns for "Time", "Percent of 1-hour Rainfall", and "Incremental Rainfall". Take the "Percent of 1-Hour NOAA Rainfall Atlas Depth" for the 10-year case from Table 3-1 and enter in the second column of Table 3-2. For each time increment multiply the 1.60-inch 1-hour depth by the value in the second column. After dividing the answer by 100 and rounding off to two decimal places enter the result in the third column under "Incremental Rainfall". The third column then is the 5-minute incremental tabulation of the 10-year design rainfall.

You will note that the total of all the incremental depths for the first hour does not agree with the 1-hour depth of 1.60-inches from Example in Section 3.2. Do not be alarmed. The temporal distribution was calibrated to work with the CUHP procedure and the first hour of the design storm is not intended to be the same as the 1-hour depth obtained from the NOAA Atlas. Nevertheless, the NOAA Atlas value is "imbeded" in the most intense portion of the 2-hour design storm.

Table 3-1

Design Storm Distributions of 1-Hour NOAA Atlas Depths

Time Minutes	Percent of 1-Hour NOAA Rainfall Atlas Depth 2-year	5-year	10-year	50-year	100-year
5	2.0	2.0	2.0	1.3	1.0
10	4.0	3.7	3.7	3.5	3.0
15	8.4	8.7	8.2	5.0	4.6
20	16.0	15.3	15.0	8.0	8.0
25	25.0	25.0	25.0	15.0	14.0
30	14.0	13.0	12.0	25.0	25.0
35	6.3	5.8	5.6	12.0	14.0
40	5.0	4.4	4.3	8.0	8.0
45	3.0	3.6	3.8	5.0	6.2
50	3.0	3.6	3.2	5.0	5.0
55	3.0	3.0	3.2	3.2	4.0
60	3.0	3.0	3.2	3.2	4.0
65	3.0	3.0	3.2	3.2	4.0
70	2.0	3.0	3.2	2.4	2.0
75	2.0	2.5	3.2	2.4	2.0
80	2.0	2.2	2.5	1.8	1.2
85	2.0	2.2	1.9	1.8	1.2
90	2.0	2.2	1.9	1.4	1.2
95	2.0	2.2	1.9	1.4	1.2
100	2.0	1.5	1.9	1.4	1.2
105	2.0	1.5	1.9	1.4	1.2
110	2.0	1.5	1.9	1.4	1.2
115	1.0	1.5	1.7	1.4	1.2
120	1.0	1.3	1.3	1.4	1.2
Totals	115.7	115.7	115.7	115.6	115.6

Table 3-2

Example 3.2 Design Storm Calculation 2-HOUR, 10-YR

10-Year Design Storm
1-Hour Depth = 1.60 Inches

Time (Minutes)	Percent of 1-Hour Rainfall	Incremental Rainfall - Inches
5	2.0	0.03
10	3.7	0.06
15	8.2	0.13
20	15.0	0.24
25	25.0	0.40
30	12.0	0.19
35	5.6	0.09
40	4.3	0.07
45	3.8	0.06
50	3.2	0.05
55	3.2	0.05
60	3.2	0.05
65	3.2	0.05
70	3.2	0.05
75	3.2	0.05
80	2.5	0.04
85	1.9	0.03
90	1.9	0.03
95	1.9	0.03
100	1.9	0.03
105	1.9	0.03
110	1.9	0.03
115	1.7	0.03
120	1.3	0.02
Total	115.7	1.84*

* Note that the 2-hour total is close, but not exactly the same value of the 2-hour, 10-year depth shown in example in 2.1.2. These small differances are considered to be acceptable.

4. ADJUSTMENTS FOR LARGER WATERSHEDS

1 Adjustments for Larger Watersheds

As the watershed size increases, it is necessary to also increase the duration of the design storm and to adjust for its distribution. Whenever a duration of more than 2-hours is required, it is recommended for the Denver region that the difference between the rainfall depth at 2-hour duration and the depth at greater than 2-hour duration be distributed uniformly at the end of the 2-hour storm. It is also recommended that the design storm duration and the need for area adjustment be done in accordance with Table 4-1.

Table 4-1

Recommended Area-Storm Duration Adjustments

Watershed Area Square Miles	Minimum Duration	Need for Area Adjustment
Less than 5.0	2 hours	No
5.0 to 10.0	2 hours	Yes
10.0 to 20.0	3 hours	Yes
20.0 or larger	6 hours	Yes

The NOAA Atlas (1) provides guidelines for adjusting the rainfall depths with increasing area. Area-depth adjustments are given in the Atlas for durations of ½-, 1-, 3-, 6- and 24-hours and Figure 4-1 was taken from the NOAA Atlas. The 15-minute curve was mathematically extrapolated by UDFCD from the information on Figure 4-1. The fast response times of urbanized watersheds and sharp rainstorm distribution gradients in the Denver area require adjustments of rainfall depths for durations that are less than ½-hour.

The area adjustment procedure can be tedious and time consuming; therefore Table 4-2 is provided to assist the engineer with the area-depth adjustment calculations. To adjust the design storm distribution to account for the averaging effects of larger watersheds, follow these 3 steps:

Step 1 - Begin with the unadjusted design rainstorm

Step 2 - On the basis of total watershed size select the appropriate column(s) of adjustment coefficients in Table 4-2.

Table 4-2

Area Adjustment Factors For Design Rainfall Distributions

Time Minutes	2-, 5- and 10-year Design Rainfall Area - Square Miles					50- and 100-year Design Rainfall Area - Square Miles				
	5-10	10-20	20-30	30-50	50-75	5-10	10-20	20-30	30-50	50-75
5	1.00	1.00	1.00	1.10	1.00	1.00	1.00	1.00	1.05	1.10
10	1.00	1.00	1.00	1.05	1.10	1.00	1.00	1.00	1.05	1.10
15	1.00	1.00	1.00	1.05	1.00	1.00	1.00	1.00	1.05	1.10
20	0.96	0.90	0.81	0.74	0.62	1.00	1.00	1.00	1.05	1.00
25	0.96	0.90	0.81	0.74	0.62	0.96	0.90	0.81	0.74	0.60
30	0.96	0.90	0.81	0.74	0.62	0.96	0.90	0.81	0.74	0.60
35	1.00	1.00	1.00	1.05	1.00	0.96	0.90	0.81	0.74	0.70
40	1.00	1.00	1.00	1.05	1.10	1.00	1.00	1.00	1.05	1.00
45	1.00	1.00	1.00	1.05	1.10	1.00	1.00	1.00	1.05	1.10
50	1.00	1.00	1.00	1.05	1.10	1.00	1.00	1.00	1.05	1.10
55	1.00	1.00	1.00	1.05	1.10	1.00	1.00	1.00	1.05	1.10
60	1.00	1.00	1.00	1.05	1.10	1.00	1.00	1.00	1.05	1.10
65 - 120	1.00	1.00	1.00	1.05	1.10	1.00	1.00	1.00	1.05	1.10
125 - 180	N/A	1.00	1.15	1.20	1.40	N/A	1.00	1.15	1.20	1.40
185 - 360	N/A	N/A	1.15	1.20	1.20	N/A	N/A	1.15	1.20	1.20

Step 3 - Multiply each incremental design storm depth by an adjustment factor for that time increment.

4.2 Example: Area Adjustment of Design Storm

Adjust the 2-hour, 10-year design storm developed for Example 3.2 for a watershed area of 11.0 square miles. First convert the 2-hour storm into a 3-hour storm as recommended by Table 4-1. Do this by subtracting the 2-hour rainfall total in Table 3-2 from the 3-hour depth given in Section 2.3:

1.99 - 1.84 = 0.15 inches

Divide 0.15 inches by 12 (i.e. 12 time increments of 5-minutes each in the 1-hour past the 2-hour storm):

0.15 / 12 = 0.0125-inches/5-minutes

Use 0.02-inches for each 5-minute increment between 125 and 135 minutes of the design storm and 0.01-inches for each 5-minutes for the remainder of e 3-hour storm.

Next, set up a Table 4-3 using the area adjustment factors for 10-year design rainfall and 10 to 20 square mile area. Calculate the area adjusted design storm using the steps outlined in Section 4.1.

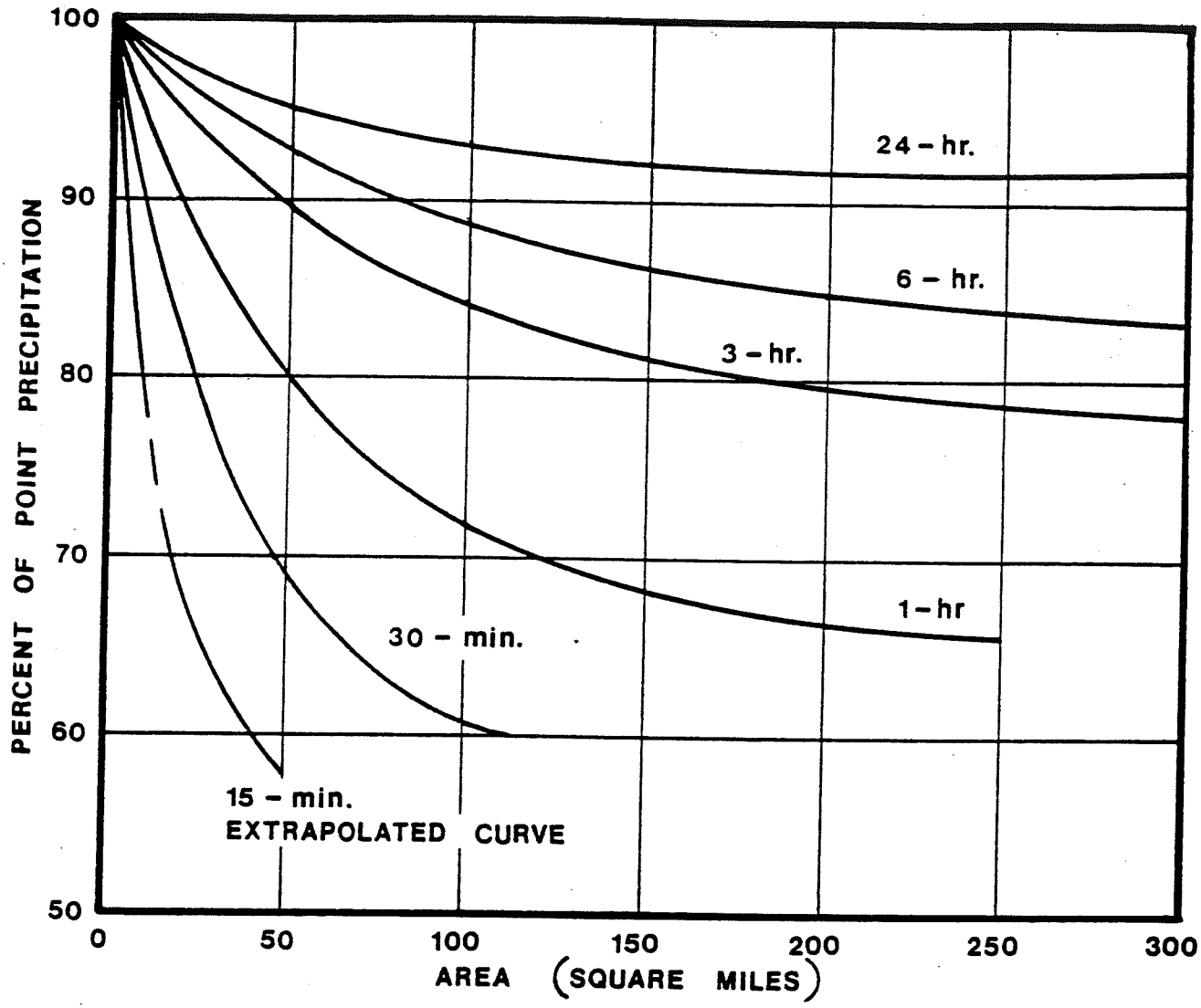


FIGURE 4-1. DEPTH - AREA ADJUSTMENT CURVES

SOURCE: NOAA ATLAS 2, VOL III COLORADO, 1973
5-1-84
URBAN DRAINAGE & FLOOD CONTROL DISTRICT

Table 4-3

Example 4.2 Area Adjusted Design Storm

10-year Design Storms

Time (minutes)	Unadjusted Depths - (Inches)	Adjustment Factor	Adjusted Depths - (Inches)
5	.03	1.0	.03
10	.06	1.0	.06
15	.13	1.0	.13
20	.24	0.90	.22
25	.40	0.90	.36
30	.19	0.90	.18
35	.09	1.0	.09
40	.07	1.0	.07
45	.06	1.0	.06
50	.05	1.0	.05
55	.05	1.0	.05
60	.05	1.0	.05
65	.05	1.0	.05
70	.05	1.0	.05
75	.05	1.0	.05
80	.04	1.0	.04
85	.03	1.0	.03
90	.03	1.0	.03
95	.03	1.0	.03
100	.03	1.0	.03
105	.03	1.0	.03
110	.03	1.0	.03
115	.03	1.0	.03
120	.02	1.0	.02
125	.02	1.0	.02
130	.02	1.0	.02
135	.02	1.0	.02
140	.01	1.0	.01
145	.01	1.0	.01
150	.01	1.0	.01
155	.01	1.0	.01
160	.01	1.0	.01
165	.01	1.0	.01
170	.01	1.0	.01
175	.01	1.0	.01
180	.01	1.0	.01
Total	1.99	N/A	1.92

PROJECT: WELD COUNTY I-25 CORRIDOR MASTER DRAINAGE PLAN
SUBJECT: CUHP STORM DISTRIBUTION

BY: CJP
DATE: 04/19/99

Table 3-1 2-Hour Design Storm Distributions of 1-Hour NOAA Atlas Depth

Time (min)	Percent of 1-Hour NOAA Rainfall Atlas Depth 2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
5	2.0	2.0	2.0	1.5	1.3	1.0
10	4.0	3.7	3.7	3.6	3.5	3.0
15	8.4	8.7	8.2	5.2	5.0	4.6
20	16.0	15.3	15.0	8.2	8.0	8.0
25	25.0	25.0	25.0	16.0	15.0	14.0
30	14.0	13.0	12.0	25.0	25.0	25.0
35	6.3	5.8	5.6	10.0	12.0	14.0
40	5.0	4.4	4.3	7.4	8.0	8.0
45	3.0	3.6	3.8	4.4	5.0	6.2
50	3.0	3.6	3.2	4.1	5.0	5.0
55	3.0	3.0	3.2	3.2	3.2	4.0
60	3.0	3.0	3.2	3.2	3.2	4.0
65	3.0	3.0	3.2	3.2	3.2	4.0
70	2.0	3.0	3.2	2.8	2.4	2.0
75	2.0	2.5	3.2	2.8	2.4	2.0
80	2.0	2.2	2.5	2.2	1.8	1.2
85	2.0	2.2	1.9	1.9	1.8	1.2
90	2.0	2.2	1.9	1.7	1.4	1.2
95	2.0	2.2	1.9	1.7	1.4	1.2
100	2.0	1.5	1.9	1.7	1.4	1.2
105	2.0	1.5	1.9	1.7	1.4	1.2
110	2.0	1.5	1.9	1.7	1.4	1.2
115	1.0	1.5	1.7	1.6	1.4	1.2
120	1.0	1.3	1.3	1.4	1.4	1.2
Totals	115.7	115.7	115.7	115.7	115.6	115.6

Table 3-2 2-Hour Design Storm Calculation

	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
1-Hour Depth = (inches)	0.98	1.39	1.68	2.04	2.37	2.68
Incremental Rainfall (inches)						
5	0.02	0.03	0.03	0.03	0.03	0.03
10	0.04	0.05	0.06	0.07	0.08	0.08
15	0.08	0.12	0.14	0.11	0.12	0.12
20	0.16	0.21	0.25	0.17	0.19	0.21
25	0.25	0.35	0.42	0.33	0.36	0.38
30	0.14	0.18	0.20	0.51	0.59	0.67
35	0.06	0.08	0.09	0.20	0.28	0.38
40	0.05	0.06	0.07	0.15	0.19	0.21
45	0.03	0.05	0.06	0.09	0.12	0.17
50	0.03	0.05	0.05	0.08	0.12	0.13
55	0.03	0.04	0.05	0.07	0.08	0.11
60	0.03	0.04	0.05	0.07	0.08	0.11
65	0.03	0.04	0.05	0.07	0.08	0.11
70	0.02	0.04	0.05	0.06	0.06	0.05
75	0.02	0.03	0.05	0.06	0.06	0.05
80	0.02	0.03	0.04	0.04	0.04	0.03
85	0.02	0.03	0.03	0.04	0.04	0.03
90	0.02	0.03	0.03	0.03	0.03	0.03
95	0.02	0.03	0.03	0.03	0.03	0.03
100	0.02	0.02	0.03	0.03	0.03	0.03
105	0.02	0.02	0.03	0.03	0.03	0.03
110	0.02	0.02	0.03	0.03	0.03	0.03
115	0.01	0.02	0.03	0.03	0.03	0.03
120	0.01	0.02	0.02	0.03	0.03	0.03
Totals	1.13	1.61	1.94	2.36	2.74	3.10

Unadjusted 3-Hour Depths (inches)

	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
3-Hour Depth =	1.29	1.75	2.08	2.54	2.90	3.29
2-Hour Depth =	1.13	1.61	1.94	2.36	2.74	3.10
Time (min)						
5	0.02	0.03	0.03	0.03	0.03	0.03
10	0.04	0.05	0.06	0.07	0.08	0.08
15	0.08	0.12	0.14	0.11	0.12	0.12
20	0.16	0.21	0.25	0.17	0.19	0.21
25	0.25	0.35	0.42	0.33	0.36	0.38
30	0.14	0.18	0.20	0.51	0.59	0.67
35	0.06	0.08	0.09	0.20	0.28	0.38
40	0.05	0.06	0.07	0.15	0.19	0.21
45	0.03	0.05	0.06	0.09	0.12	0.17
50	0.03	0.05	0.05	0.08	0.12	0.13
55	0.03	0.04	0.05	0.07	0.08	0.11
60	0.03	0.04	0.05	0.07	0.08	0.11
65	0.03	0.04	0.05	0.07	0.08	0.11
70	0.02	0.04	0.05	0.06	0.06	0.05
75	0.02	0.03	0.05	0.06	0.06	0.05
80	0.02	0.03	0.04	0.04	0.04	0.03
85	0.02	0.03	0.03	0.04	0.04	0.03
90	0.02	0.03	0.03	0.03	0.03	0.03
95	0.02	0.03	0.03	0.03	0.03	0.03
100	0.02	0.02	0.03	0.03	0.03	0.03
105	0.02	0.02	0.03	0.03	0.03	0.03
110	0.02	0.02	0.03	0.03	0.03	0.03
115	0.01	0.02	0.03	0.03	0.03	0.03
120	0.01	0.02	0.02	0.03	0.03	0.03
125	0.02	0.02	0.02	0.02	0.02	0.02
130	0.02	0.02	0.02	0.02	0.02	0.02
135	0.02	0.01	0.01	0.02	0.02	0.02
140	0.02	0.01	0.01	0.02	0.01	0.02
145	0.01	0.01	0.01	0.01	0.01	0.02
150	0.01	0.01	0.01	0.01	0.01	0.02
155	0.01	0.01	0.01	0.01	0.01	0.01
160	0.01	0.01	0.01	0.01	0.01	0.01
165	0.01	0.01	0.01	0.01	0.01	0.01
170	0.01	0.01	0.01	0.01	0.01	0.01
175	0.01	0.01	0.01	0.01	0.01	0.01
180	0.01	0.01	0.01	0.01	0.01	0.01
TotalS	1.29	1.75	2.08	2.52	2.89	3.28
Error	0.3%	-0.1%	0.2%	-0.7%	-0.4%	-0.4%

Table 4-2 Area Adjustment Factors for Design Rainfall Distributions

	2-, 5- and 10-year Design Rainfall Area - (square miles)					50- and 100-year Design Rainfall Area - (square miles)				
	5-10	10-20	20-30	30-50	50-75	5-10	10-20	20-30	30-50	50-75
5		1.00					1.00			
10		1.00					1.00			
15		1.00					1.00			
20		0.90					1.00			
25		0.90					0.90			
30		0.90					0.90			
35		1.00					0.90			
40		1.00					1.00			
45		1.00					1.00			
50		1.00					1.00			
55		1.00					1.00			
60		1.00					1.00			
65		1.00					1.00			
70		1.00					1.00			
75		1.00					1.00			
80		1.00					1.00			
85		1.00					1.00			
90		1.00					1.00			
95		1.00					1.00			
100		1.00					1.00			
105		1.00					1.00			
110		1.00					1.00			
115		1.00					1.00			
120		1.00					1.00			
125		1.00					1.00			
130		1.00					1.00			
135		1.00					1.00			
140		1.00					1.00			
145		1.00					1.00			
150		1.00					1.00			
155		1.00					1.00			
160		1.00					1.00			
165		1.00					1.00			
170		1.00					1.00			
175		1.00					1.00			
180		1.00					1.00			

Table 4-3 Adjusted 3 Hour Depths (inches)

	10-20 square mile area					
	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
5	0.02	0.03	0.03	0.03	0.03	0.03
10	0.04	0.05	0.06	0.07	0.08	0.08
15	0.08	0.12	0.14	0.11	0.12	0.12
20	0.14	0.19	0.23	0.17	0.19	0.21
25	0.22	0.31	0.38	0.29	0.32	0.34
30	0.12	0.16	0.18	0.46	0.53	0.60
35	0.06	0.08	0.09	0.18	0.26	0.34
40	0.05	0.06	0.07	0.15	0.19	0.21
45	0.03	0.05	0.06	0.09	0.12	0.17
50	0.03	0.05	0.05	0.08	0.12	0.13
55	0.03	0.04	0.05	0.07	0.08	0.11
60	0.03	0.04	0.05	0.07	0.08	0.11
65	0.03	0.04	0.05	0.07	0.08	0.11
70	0.02	0.04	0.05	0.06	0.06	0.05
75	0.02	0.03	0.05	0.06	0.06	0.05
80	0.02	0.03	0.04	0.04	0.04	0.03
85	0.02	0.03	0.03	0.04	0.04	0.03
90	0.02	0.03	0.03	0.03	0.03	0.03
95	0.02	0.03	0.03	0.03	0.03	0.03
100	0.02	0.02	0.03	0.03	0.03	0.03
105	0.02	0.02	0.03	0.03	0.03	0.03
110	0.02	0.02	0.03	0.03	0.03	0.03
115	0.01	0.02	0.03	0.03	0.03	0.03
120	0.01	0.02	0.02	0.03	0.03	0.03
125	0.02	0.02	0.02	0.02	0.02	0.02
130	0.02	0.02	0.02	0.02	0.02	0.02
135	0.02	0.01	0.01	0.02	0.02	0.02
140	0.02	0.01	0.01	0.02	0.01	0.02
145	0.01	0.01	0.01	0.01	0.01	0.02
150	0.01	0.01	0.01	0.01	0.01	0.02
155	0.01	0.01	0.01	0.01	0.01	0.01
160	0.01	0.01	0.01	0.01	0.01	0.01
165	0.01	0.01	0.01	0.01	0.01	0.01
170	0.01	0.01	0.01	0.01	0.01	0.01
175	0.01	0.01	0.01	0.01	0.01	0.01
180	0.01	0.01	0.01	0.01	0.01	0.01
TotalS	1.24	1.67	2.00	2.42	2.77	3.14

NOTES:

1. BOLD VALUES MANUALLY INPUT
2. 1-HOUR AND 3-HOUR DEPTHS FROM NOAA DEPTH ANALYSIS

9/9

II-C

CUHP MODEL INPUT PARAMETERS

Existing Conditions Land Use - Tri-Town Basin

Basin ID	Parks/Open Space	SFR (very low)	SFR (low)	SFR (medium)	SFR (high)	Commercial	Total basin area
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
51	453.9	31.2				74.9	560.0
52	489.2	57.8				63.6	610.6
53	532.3	77.9				30.2	640.4
54	330.5	16.4					346.9
55	84.4	64.9				24.6	173.9
56	13.1			14.2			27.3
57	8.0			6.2			14.2
58	9.7		7.6				17.3
59	12.2		7.2				19.4
60	2.6			51.1			53.7
61	250.8						250.8
62				108.1			108.1
63	281.8	6.2					288.0
70	507.5	37.1		87.4		51.9	683.9
71	111.1	3.2					114.3
72	236.4			156.4			392.8
73	115.3						115.3
74	252.3	22.1	49.9				324.3
75	684.4	18.8	19.1				722.3
76				49.2			49.2
77	30.3			6.9			37.2
78				36.4			36.4
79	26.9			13.2			40.1
80	7.6			34.5			42.1
81	56.6			53.4			110.0
82	81.5	7.2					88.7
83	16.4		12.6	19.4			48.4
84	54.6			14.5			69.1
85	4.6		11.5				16.1
86	38.4		4.5	14.5			57.4
87	7.0			56.8		10.3	74.1
88	10.7			14.2			24.9
89	190.0			14.7		6.7	211.4
90	241.2		200.0				441.2
91	38.6		11.0		176.0		225.6
92	107.9	9.1					117.0
93	22.5					23.3	45.8
94	32.9	2.4				3.4	38.7
95	374.3						374.3
96	203.0					66.3	269.3

SFR = single family residence; the description indicates density of homes per acre

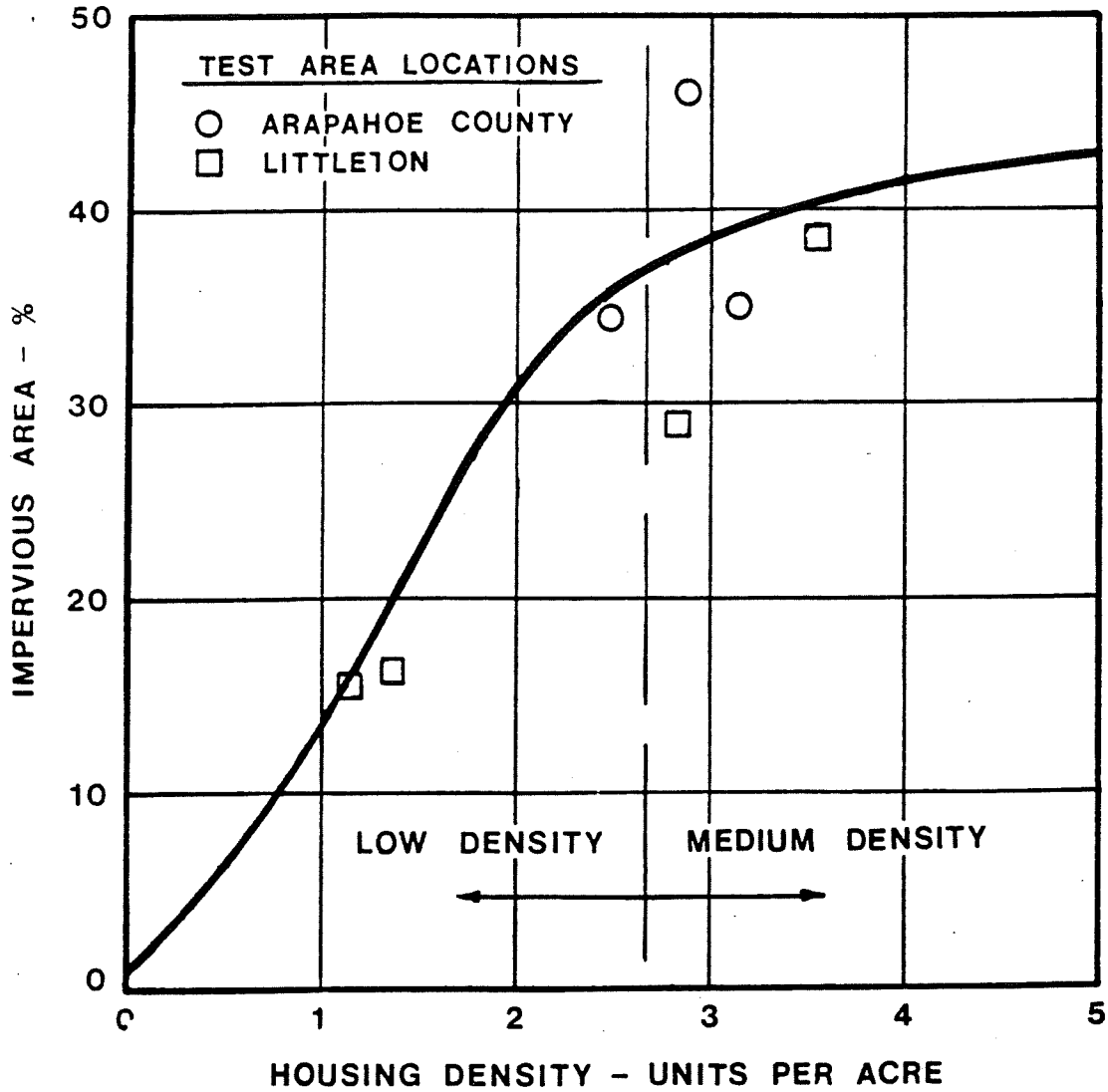


FIGURE 2-1. RESIDENTIAL HOUSING DENSITY
vs.
IMPERVIOUS AREA

$$f = f_o + (f_i - f_o)\, e^{-at} \qquad (2\text{-}1)$$

In which f = infiltration rate (inches/hour)
f_i = initial infiltration rate (inches/hour)
f_o = final infiltration rate (inches/hour)
e = natural logarithm base
a = decay coefficient (1/second)
t = time in seconds

In developing Equation 2-1 Horton observed that infiltration is high early in the storm and eventually decays to a steady state constant value as the pores in the soil become saturated. The coefficients and initial and final infiltration values are site specific and depend on the soils and vegetative cover complex. It is possible to develop these values for each site if sufficient rainfall/runoff observations are made. However, such an approach is not always practical.

The Urban Drainage and Flood Control District analyzed a considerable amount of rainfall/runoff data. On the basis of this analysis, the values in Table 2-2 are recommended for use within the District in conjunction with the 1982 version of the CUHP. The Soil Conservation Service (SCS) Hydrologic Soil Groups C and D occur most frequently within the District; however areas of SCS Group A and B soils are fairly common. Consult SCS Soil surveys for appropriate soil classifications.

TABLE 2-2

RECOMMENDED HORTON'S EQUATION PARAMETERS

SCS Hydrologic Soil Group	Infiltration (in/hr) Initial - f_i	Final - f_o	Decay Coefficient
A	5.0	1.0	0.0007
B	4.5	0.6	0.0018
C	3.0	0.5	0.0018
D	3.0	0.5	0.0018

To calculate the amount of maximum infiltration depths that may occur at each time increment, it is necessary to integrate Equation 2-1 and calculate the values for each time increment. Very little accuracy is lost if instead

TABLE 3-1 (42)

RECOMMENDED RUNOFF COEFFICIENTS AND PERCENT IMPERVIOUS

LAND USE OR SURFACE CHARACTERISTICS	PERCENT IMPERVIOUS	FREQUENCY 2	5	10	100
Business:					
Commercial Areas	95	.87	.87	.88	.89
Neighborhood Areas	70	.60	.65	.70	.80
Residential:					
Single-Family	*	.40	.45	.50	.60
Multi-Unit (detached)	50	.45	.50	.60	.70
Multi-Unit (attached)	70	.60	.65	.70	.80
1/2 Acre Lot or Larger	*	.30	.35	.40	.60
Apartments	70	.65	.70	.70	.80
Industrial:					
Light Areas	80	.71	.72	.76	.82
Heavy Acres	90	.80	.80	.85	.90
Parks, Cemetaries:	7	.10	.18	.25	.45
Playgrounds:	13	.15	.20	.30	.50
Schools:	50	.45	.50	.60	.70
Railroad Yard Areas	20	.20	.25	.35	.45
Undeveloped Areas:					
Historic Flow Analysis-	2	(See "Lawns")			
Greenbelts, Agricultural					
Offsite Flow Analysis (when land use not defined)	45	.43	.47	.55	.65
Streets:					
Paved	100	.87	.88	.90	.93
Gravel (Packed)	40	.40	.45	.50	.60
Drive and Walks:	96	.87	.87	.88	.89
Roofs:	90	.80	.85	.90	.90
Lawns, Sandy Soil	0	.00	.01	.05	.20
Lawns, Clayey Soil	0	.05	.15	.25	.50

NOTE: These Rational Formula coefficients may not be valid for large basins.

*See Figure 2-1 for percent impervious.

The CUHP model is sensitive to the "percent impervious" parameter. Since the value of this parameter depends, to a degree, on the density of the residential development, Figure 2-1 is provided to assist in estimating the percent impervious values for low to medium density residential areas. It is based on the observed trends in the urbanized portions of the Urban Drainage and Flood Control District (39), and reflects the densities found in built-up areas. Figure 2-1 does not account for parks or large open areas.

2.2 Depression Losses

Rain water that is collected and held in small depressions and does not become part of the general surface runoff is called depression storage. Most of this water eventually infiltrates or is evaporated. Depression losses also include water intercepted by trees and bushes and water that is detained on the surface and does not run off. The CUHP Method in Chapter 4, requires numerical values of retention loss as input in calculating the effective rainfall. Table 2-1 can be used as a guide in estimating the amount of depression retention storage to be used with CUHP.

TABLE 2-1

TYPICAL DEPRESSION RETENTION FOR VARIOUS LAND COVERS
(all values in inches)
(For use with CUHP Method)

Land Cover	Depression & Detention	Recommended
Impervious:		
Large Paved Areas	0.05 - 0.15	0.1
Roofs - Flat	0.1 - 0.3	0.1
Roofs - Sloped	0.05 - 0.1	0.05
Pervious		
Lawn Grass	0.2 - 0.5	0.35
Wooded Area and Open Fields	0.2 - 0.6	0.4

When an area is analyzed for depression retention storage, the pervious and impervious storage values for all parts of the basin must be considered

Weld County I-25 Master Drainage Plan
Sub-basin information used for CUHP hydrologic model
Project number: CO-WELD-01

Tri-Town Basin - Existing conditions

Sub-basin No.	Sub-basin Area (acres)	Sub-basin Area (mi^2)	Sub-basin Length (ft)	Sub-basin Length (miles)	Distance to Centroid (ft)	Distance to Centroid (miles)	Sub-basin % Impervious	Weighted Basin Slope (ft/ft)	Depression storage Perv. retention (in)	Depression storage Imp. retention (in)	Soil Type	Soil Type Area (acres)	Soil Type Area (%)	Infiltration rates Weighted Initial Rate (in/hr)	Infiltration rates Initial rate used for sub-basin (in/hr)	Infiltration rates Weighted Final Rate (in/hr)	Infiltration rates Final rate used for sub-basin (in/hr)	Decay coefficient
51	560.0	0.875	7600	1.439	4200	0.795	21.3	0.0046	0.4	0.1	B	305.9	54.63	2.5	3.8	0.3	0.6	0.0018
											C	151.6	27.07	0.8		0.1		
											D	102.5	18.30	0.5		0.1		
											Total:	560.0	100.0	3.8		0.6		
52	610.6	0.954	8000	1.515	2800	0.530	19.3	0.0081	0.4	0.1	A	19.9	3.26	0.2	4.4	0.0	0.6	0.0018
											B	559.4	91.61	4.1		0.5		
											D	31.3	5.13	0.2		0.0		
											Total:	610.6	100.0	4.4		0.6		
53	640.4	1.001	8400	1.591	3400	0.644	15.0	0.0085	0.4	0.1	B	577.2	90.13	4.1	4.4	0.5	0.6	0.0018
											D	63.2	9.87	0.3		0.0		
											Total:	640.4	100.0	4.4		0.6		
54	346.9	0.542	8900	1.686	2400	0.455	10.5	0.0077	0.4	0.1	B	264.3	76.19	3.4	4.3	0.5	0.6	0.0018
(410.0 W/ MILAVEC LAKE; AREA OF LAKE DETERMINED USING AERIAL PHOTOGRAPHY)											C	7.0	2.02	0.1		0.0		
											D	93.1	26.84	0.8		0.1		
											Total:	364.4	105.0	4.3		0.6		
55	173.9	0.272	4600	0.871	2300	0.436	25.0	0.0137	0.4	0.1	B	165.1	94.94	4.3	4.4	0.6	0.6	0.0018
											C	2.9	1.67	0.1		0.0		
											D	5.9	3.39	0.1		0.0		
											Total:	173.9	100.0	4.4		0.6		
56	27.3	0.043	1500	0.284	700	0.133	30.8	0.0033	0.4	0.1	B	26.6	97.44	4.4	4.5	0.6	0.6	0.0018
											D	0.7	2.56	0.1		0.0		
											Total:	27.3	100.0	4.5		0.6		
57	14.2	0.022	1000	0.189	600	0.114	27.5	0.0040	0.4	0.1	B	14.2	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	14.2	100.0	4.5		0.6		
58	17.3	0.027	900	0.170	400	0.076	23.2	0.0040	0.4	0.1	B	17.3	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	17.3	100.0	4.5		0.6		
59	19.4	0.030	1500	0.284	700	0.133	21.1	0.0047	0.4	0.1	B	19.4	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	19.4	100.0	4.5		0.6		
60	53.7	0.084	3100	0.587	1300	0.246	48.1	0.0060	0.4	0.1	B	13.5	25.14	1.1	3.4	0.2	0.5	0.0018
											C	40.2	74.86	2.2		0.4		
											Total:	53.7	100.0	3.4		0.5		
61	250.8	0.392	6000	1.136	1600	0.303	10.0	0.0110	0.4	0.1	B	65.4	26.08	1.2	3.4	0.2	0.5	0.0018
											C	185.4	73.92	2.2		0.4		
											Total:	250.8	100.0	3.4		0.5		
62	108.1	0.169	3500	0.663	1100	0.208	50.0	0.0140	0.4	0.1	B	2.8	2.59	0.1	3.0	0.0	0.5	0.0018
											C	105.3	97.41	2.9		0.5		
											Total:	108.1	100.0	3.0		0.5		
63	288.0	0.450	4850	0.919	2200	0.417	10.2	0.0150	0.4	0.1	B	22.9	7.95	0.4	3.1	0.0	0.5	0.0018
											C	265.1	92.05	2.8		0.5		
											Total:	288.0	100.0	3.1		0.5		
70	683.9	1.069	8500	1.610	4200	0.795	21.7	0.0070	0.4	0.1	A	19.7	2.88	0.1	3.9	0.0	0.6	0.0018
											B	369.6	54.04	2.4		0.3		
											C	142.1	20.78	0.6		0.1		
											D	152.5	22.30	0.7		0.1		
											Total:	683.9	100.0	3.9		0.6		
71	114.3	0.179	3200	0.606	1700	0.322	10.3	0.0155	0.4	0.1	A	20.6	18.02	0.9	4.6	0.2	0.7	0.0016
											B	93.7	81.98	3.7		0.5		
											Total:	114.3	100.0	4.6		0.7		
72	392.8	0.614	4800	0.909	2400	0.455	25.9	0.0150	0.4	0.1	A	2.9	0.74	0.0	4.5	0.0	0.6	0.0018
											B	389.9	99.26	4.5		0.6		
											Total:	392.8	100.0	4.5		0.6		
73	115.3	0.180	3800	0.720	1900	0.360	10.0	0.0163	0.4	0.1	B	115.3	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	115.3	100.0	4.5		0.6		
74	324.3	0.507	5600	1.061	2500	0.473	15.3	0.0111	0.4	0.1	A	6.8	2.10	0.1	4.5	0.0	0.6	0.0018
											B	309.2	95.34	4.3		0.6		
											D	8.3	2.56	0.1		0.0		
											Total:	324.3	100.0	4.5		0.6		

Weld County I-25 Master Drainage Plan
Sub-basin information used for CUHP hydrologic model
Project number: CO-WELD-01

Tri-Town Basin - Existing conditions

Sub-basin No.	Sub-basin Area (acres)	Sub-basin Area (mi^2)	Sub-basin Length (ft)	Sub-basin Length (miles)	Distance to Centroid (ft)	Distance to Centroid (miles)	Sub-basin % Impervious	Weighted Basin Slope (ft/ft)	Depression storage: Perv. retention (in)	Depression storage: Imp. retention (in)	Soil Type	Soil Type Area (acres)	Soil Type Area (%)	Infiltration rates: Weighted Initial Rate (in/hr)	Infiltration rates: Initial rate used for sub-basin (in/hr)	Infiltration rates: Weighted Final Rate (in/hr)	Infiltration rates: Final rate used for sub-basin (in/hr)	Decay coefficient
75	722.3	1.129	8200	1.553	4200	0.795	11.1	0.0145	0.4	0.1	A	7.2	1.00	0.0	4.2	0.0	0.6	0.0018
											B	555.0	76.84	3.5		0.5		
											D	160.1	22.17	0.7		0.1		
											Total:	722.3	100.0	4.2		0.6		
76	49.2	0.077	2600	0.492	900	0.170	50.0	0.0117	0.4	0.1	B	49.2	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	49.2	100.0	4.5		0.6		
77	37.2	0.058	2400	0.455	800	0.152	17.4	0.0200	0.4	0.1	B	37.2	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	37.2	100.0	4.5		0.6		
78	36.4	0.057	2400	0.455	1100	0.208	50.0	0.0109	0.4	0.1	B	36.4	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	36.4	100.0	4.5		0.6		
79	40.1	0.063	2800	0.530	1100	0.208	23.2	0.0210	0.4	0.1	B	40.1	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	40.1	100.0	4.5		0.6		
80	42.1	0.066	2400	0.455	1000	0.189	42.8	0.0070	0.4	0.1	B	42.1	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	42.1	100.0	4.5		0.6		
81	110.0	0.172	3300	0.625	1400	0.265	29.4	0.0180	0.4	0.1	B	110.0	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	110.0	100.0	4.5		0.6		
82	88.7	0.139	3500	0.663	1400	0.265	10.8	0.0120	0.4	0.1	B	88.7	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	88.7	100.0	4.5		0.6		
83	48.4	0.076	2900	0.549	900	0.170	33.8	0.0125	0.4	0.1	B	48.4	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	48.4	100.0	4.5		0.6		
84	69.1	0.108	3200	0.606	1600	0.303	18.4	0.0180	0.4	0.1	B	69.1	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	69.1	100.0	4.5		0.6		
85	16.1	0.025	1000	0.189	400	0.076	31.4	0.0063	0.4	0.1	B	16.7	103.73	4.7	4.7	0.6	0.6	0.0018
											Total:	16.7	103.7	4.7		0.6		
86	57.4	0.090	4000	0.758	1700	0.322	22.5	0.0180	0.4	0.1	B	57.4	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	57.4	100.0	4.5		0.6		
87	74.1	0.116	3900	0.739	1600	0.303	51.8	0.0050	0.4	0.1	B	29.8	40.22	1.8	4.0	0.2	0.6	0.0018
											C	53.0	71.52	2.1		0.4		
											Total:	82.8	111.7	4.0		0.6		
88	24.9	0.039	2800	0.530	1300	0.246	32.8	0.0157	0.4	0.1	B	23.1	92.77	4.2	4.2	0.6	0.6	0.0018
											Total:	23.1	92.8	4.2		0.6		
89	211.4	0.330	5000	0.947	1800	0.341	15.3	0.0119	0.4	0.1	B	106.3	50.28	2.3	3.7	0.3	0.5	0.0018
											C	78.8	37.28	1.1		0.2		
											D	19.5	9.22	0.3		0.0		
											Total:	204.6	96.8	3.7		0.5		
90	441.2	0.689	5200	0.985	2300	0.436	23.6	0.0158	0.4	0.1	B	406.3	92.09	4.1	4.4	0.6	0.6	0.0018
											C	24.0	5.44	0.2		0.0		
											D	10.9	2.47	0.1		0.0		
											Total:	441.2	100.0	4.4		0.6		
91	225.6	0.353	5400	1.023	2700	0.511	58.3	0.0120	0.4	0.1	B	38.8	17.20	0.8	3.3	0.1	0.5	0.0018
											C	186.8	82.80	2.5		0.4		
											Total:	225.6	100.0	3.3		0.5		
92	117.0	0.183	4000	0.758	1500	0.284	10.8	0.0113	0.4	0.1	B	60.7	51.88	2.3	3.8	0.3	0.6	0.0018
											C	56.3	48.12	1.4		0.2		
											Total:	117.0	100.0	3.8		0.6		
93	45.8	0.072	3500	0.663	2400	0.455	50.7	0.0110	0.4	0.1	C	45.8	100.00	3.0	3.0	0.5	0.5	0.0018
											Total:	45.8	100.0	3.0		0.5		
94	38.7	0.060	3100	0.587	1200	0.227	17.6	0.0110	0.4	0.1	B	3.1	8.01	0.4	3.1	0.0	0.5	0.0018
											C	35.6	91.99	2.8		0.5		
											Total:	38.7	100.0	3.1		0.5		
95	374.3	0.585	4900	0.928	2400	0.455	10.0	0.0102	0.4	0.1	B	84.1	22.47	1.0	3.3	0.1	0.5	0.0018
											C	290.2	77.53	2.3		0.4		
											Total:	374.3	100.0	3.3		0.5		
96	269.3	0.421	4500	0.852	1800	0.341	29.7	0.0130	0.4	0.1	B	269.3	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	269.3	100.0	4.5		0.6		
Total:	7880.5	12.313																

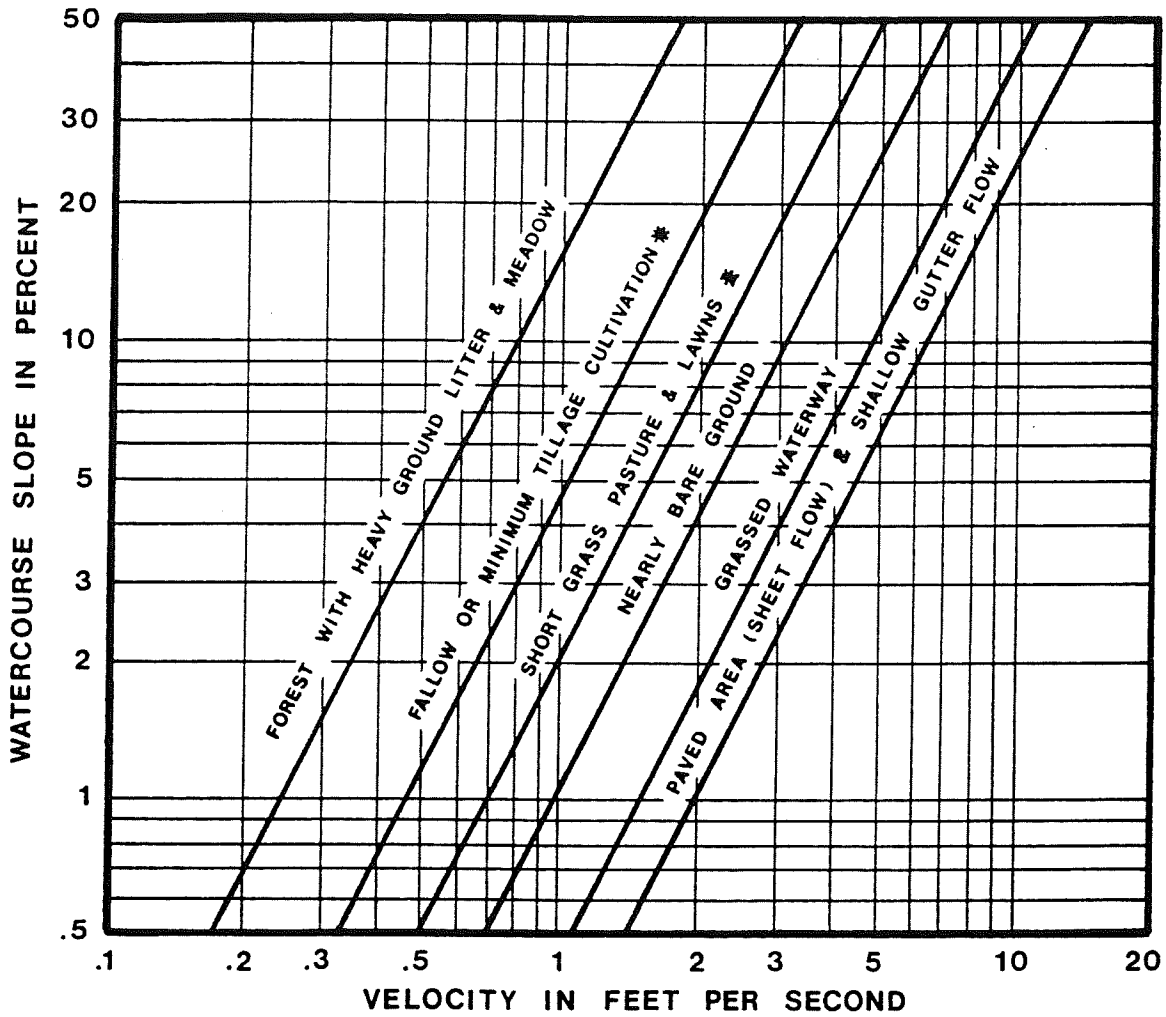


FIGURE 3-2. ESTIMATE OF AVERAGE FLOW VELOCITY FOR USE WITH THE RATIONAL FORMULA.

* MOST FREQUENTLY OCCURRING "UNDEVELOPED" LAND SURFACES IN THE DENVER REGION.

REFERENCE: "Urban Hydrology For Small Watersheds" Technical Release No. 55, USDA, SCS Jan. 1975.

Runoff coefficients (C values)

	2 year	5 year	10 year	25 year*	50 year*	100 year	% impervious
Commercial Areas	0.87	0.87	0.88	0.88	0.89	0.89	90
SFR (low, medium)	0.40	0.45	0.50	0.52	0.54	0.60	40
SFR (very low)	0.30	0.35	0.40	0.43	0.49	0.60	20
Apartments (high)	0.65	0.70	0.70	0.72	0.74	0.80	70
Parks/Open Space (sandy soil)	0.00	0.01	0.05	0.08	0.12	0.20	10
Parks/Open Space (clayey soil)	0.05	0.15	0.25	0.29	0.36	0.50	10

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Existing Conditions - Tri Town Basin
Time of concentration calculations (for basins less than 90 acres only)

Sub-basin No.	Description	Runoff coefficients (C values)						Overland flow length (ft)	Overland flow length slope (%)	Initial or overland flow time (T_i), min						Water course slope (%)	Velocity and desc. (fps)	Water course length (ft)	Travel time (T_t), min						Time of concentration (T_c), min						
		2 year	5 year	10 year	25 year*	50 year*	100 year			2 year	5 year	10 year	25 year	50 year	100 year				2 year	5 year	10 year	25 year	50 year	100 year	2 year	5 year	10 year	25 year	50 year	100 year	
56	52.0% SFR (medium), 48.0% sandy soils	0.21	0.24	0.28	0.31	0.34	0.41	300	2.00	22.07	21.31	20.19	19.58	18.84	17.12	0.50	1.1 grassed waterway	1500	22.73	22.73	22.73	22.73	22.73	22.73	44.80 18.33	44.04 18.33	42.92 18.33	42.30 18.33	41.57 18.33	39.85 18.33	non-urban procedure urban procedure
57	43.7% SFR (medium), 56.3% sandy soils	0.17	0.20	0.25	0.27	0.30	0.37	200	2.00	18.70	18.14	17.24	16.73	16.10	14.66	0.50	1.1 grassed waterway	1000	15.15	15.15	15.15	15.15	15.15	15.15	33.85 15.56	33.29 15.56	32.40 15.56	31.88 15.56	31.25 15.56	29.81 15.56	non-urban procedure urban procedure
58	43.9% SFR (low), 56.1% sandy soils	0.18	0.20	0.25	0.27	0.30	0.38	200	2.00	18.67	18.12	17.22	16.70	16.07	14.63	0.50	1.1 grassed waterway	900	13.64	13.64	13.64	13.64	13.64	13.64	32.31 15.00	31.75 15.00	30.86 15.00	30.34 15.00	29.71 15.00	28.27 15.00	non-urban procedure urban procedure
59	36.9% SFR (low), 63.1% sandy soils	0.15	0.17	0.22	0.24	0.28	0.35	200	2.00	19.23	18.72	17.84	17.31	16.65	15.18	0.50	1.1 grassed waterway	1500	22.73	22.73	22.73	22.73	22.73	22.73	41.95 18.33	41.45 18.33	40.57 18.33	40.04 18.33	39.38 18.33	37.91 18.33	non-urban procedure urban procedure
60	95.1% SFR (medium), 4.9% sandy soils	0.38	0.43	0.48	0.50	0.52	0.58	200	2.00	14.53	13.56	12.56	12.15	11.73	10.49	0.61	1.6 paved area	3100	32.29	32.29	32.29	32.29	32.29	32.29	46.83 27.22	45.85 27.22	44.85 27.22	44.44 27.22	44.02 27.22	42.79 27.22	non-urban procedure urban procedure
76	100% SFR (medium)	0.40	0.45	0.50	0.52	0.54	0.60	200	2.00	14.14	13.13	12.12	11.72	11.31	10.10	1.20	2.1 paved area	2600	20.63	20.63	20.63	20.63	20.63	20.63	34.78 24.44	33.77 24.44	32.76 24.44	32.35 24.44	31.95 24.44	30.74 24.44	non-urban procedure urban procedure
77	18.5% SFR (medium), 81.5% sandy soils	0.07	0.09	0.13	0.16	0.20	0.27	300	1.00	31.98	31.44	30.13	29.26	28.12	25.75	2.04	0.65 fallow	2400	61.54	61.54	61.54	61.54	61.54	61.54	93.52 23.33	92.98 23.33	91.67 23.33	90.79 23.33	89.66 23.33	87.28 23.33	non-urban procedure urban procedure
78	100% SFR (medium)	0.40	0.45	0.50	0.52	0.54	0.60	300	0.56	26.48	24.59	22.69	21.94	21.18	18.91	1.10	2.1 paved area	2300	18.25	18.25	18.25	18.25	18.25	18.25	44.73 23.33	42.84 23.33	40.95 23.33	40.19 23.33	39.44 23.33	37.17 23.33	non-urban procedure urban procedure
79	32.9% SFR (medium), 67.1% sandy soils	0.13	0.15	0.20	0.22	0.26	0.33	400	0.40	47.31	46.18	44.06	42.76	41.13	37.54	2.14	0.68 fallow	2800	68.63	68.63	68.63	68.63	68.63	68.63	115.94 25.56	114.81 25.56	112.69 25.56	111.39 25.56	109.75 25.56	106.17 25.56	non-urban procedure urban procedure
80	81.9% SFR (medium), 18.1% sandy soils	0.33	0.37	0.42	0.44	0.46	0.53	300	0.44	31.65	29.90	27.92	27.03	26.06	23.46	0.78	1.8 paved area	1800	16.67	16.67	16.67	16.67	16.67	16.67	48.32 23.33	46.57 23.33	44.59 23.33	43.70 23.33	42.73 23.33	40.12 23.33	non-urban procedure urban procedure
82	8.2% SFR (very low), 91.8% sandy soils	0.02	0.04	0.08	0.11	0.15	0.23	500	0.53	53.50	52.84	50.81	49.32	47.25	43.15	1.20	0.5 fallow	3500	116.67	116.67	116.67	116.67	116.67	116.67	170.16 29.44	169.51 29.44	167.48 29.44	165.98 29.44	163.91 29.44	159.81 29.44	non-urban procedure urban procedure
83	66.1% SFR (low-medium), 33.9% sandy soils	0.26	0.30	0.35	0.37	0.40	0.46	300	0.29	39.35	37.64	35.44	34.34	33.08	29.93	1.25	2.2 paved area	2400	18.18	18.18	18.18	18.18	18.18	18.18	57.54 26.11	55.82 26.11	53.62 26.11	52.52 26.11	51.26 26.11	48.12 26.11	non-urban procedure urban procedure
84	21% SFR (medium), 79.0% sandy soils	0.08	0.10	0.14	0.17	0.21	0.28	500	0.45	53.37	52.40	50.19	48.72	46.84	42.86	1.81	0.6 fallow	3200	87.43	87.43	87.43	87.43	87.43	87.43	140.80 27.78	139.83 27.78	137.62 27.78	136.16 27.78	134.28 27.78	130.29 27.78	non-urban procedure urban procedure
85	71.3% SFR (low), 28.7% sandy soils	0.29	0.32	0.37	0.39	0.42	0.49	300	0.27	39.28	37.42	35.14	34.04	32.80	29.63	0.63	1.6 paved	800	8.33	8.33	8.33	8.33	8.33	8.33	47.61 15.56	45.75 15.56	43.48 15.56	42.37 15.56	41.13 15.56	37.96 15.56	non-urban procedure urban procedure
86	33% SFR (low-medium), 67% sandy soils	0.13	0.16	0.20	0.23	0.26	0.33	300	0.45	39.37	38.42	36.66	35.57	34.21	31.23	1.75	1.40 nearly bare ground	4000	47.62	47.62	47.62	47.62	47.62	47.62	86.99 32.22	86.04 32.22	84.28 32.22	83.19 32.22	81.83 32.22	78.85 32.22	non-urban procedure urban procedure
87	76.7% SFR (medium), 13.9% COMMERCIAL, 9.4% sandy soils	0.43	0.47	0.51	0.53	0.55	0.60	300	0.76	22.97	21.63	20.15	19.53	18.82	17.00	0.57	1.6 paved	2400	25.00	25.00	25.00	25.00	25.00	25.00	47.97 31.67	46.63 31.67	45.15 31.67	44.53 31.67	43.82 31.67	42.00 31.67	non-urban procedure urban procedure
88	57% SFR (medium), 43% sandy soils	0.23	0.26	0.31	0.33	0.36	0.43	100	0.63	18.31	17.62	16.66	16.15	15.55	14.11	1.57	2.5 paved	2800	18.67	18.67	18.67	18.67	18.67	18.67	36.97 25.56	36.28 25.56	35.33 25.56	34.82 25.56	34.21 25.56	32.77 25.56	non-urban procedure urban procedure
93	50.9% COMMERCIAL, 49.1% clayey soils	0.47	0.52	0.57	0.59	0.63	0.70	300	0.42	26.35	24.30	22.04	21.23	19.58	16.72	1.15	2.1 paved	5300	42.06	42.06	42.06	42.06	42.06	42.06	68.41 29.44	66.36 29.44	64.11 29.44	63.29 29.44	61.65 29.44	58.78 29.44	non-urban procedure urban procedure
94	6.2% SFR (very low), 8.8% COMMERCIAL, 85.0% sandy soils	0.10	0.11	0.14	0.17	0.21	0.29	400	0.42	48.31	47.75	45.93	44.61	42.75	39.16	1.06	1.0 nearly bare ground	3100	51.67	51.67	51.67	51.67	51.67	51.67	99.98 27.22	99.42 27.22	97.59 27.22	96.28 27.22	94.42 27.22	90.82 27.22	non-urban procedure urban procedure

indicates these numbers were used for the CUHP modeling

* Values linearly interpolated from Table 3-1, USDCM

Future Conditions Land Use - Tri-Town Basin

Basin ID	Parks/Open Space	SFR (very low)	SFR (low)	SFR (medium)	SFR (high)	Commercial	Total basin area
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
51	104.1			189.7		266.2	560.0
52	40.1			551.2		19.3	610.6
53	191.6			396.3	26.7	25.7	640.4
54	209.3			137.6			346.9
55	67.0			79.2		27.7	173.9
56	5.7			21.6			27.3
57	3.9			10.3			14.2
58	5.8			11.5			17.3
59	7.2			12.2			19.4
60	12.1			35.0		6.5	53.7
61	169.5			55.4		25.9	250.8
62	11.4		42.8	28.0		25.9	108.1
63	75.2	7.3	66.6	61.5		77.4	288.0
70	451.7			171.4		60.8	683.9
71	67.5			44.6		2.2	114.3
72	38.3			338.6	4.9	11.0	392.8
73			0.9	59.4	37.6	17.5	115.3
74	8.7		198.7	94.1	22.9		324.3
75	176.6		45.6	498.2		1.9	722.3
76				49.2			49.2
77				37.2			37.2
78				36.4			36.4
79				40.1			40.1
80	5.2			36.9			42.1
81	7.8		3.6	98.5			110.0
82	11.9		4.5	72.3			88.7
83				48.4			48.4
84				69.1			69.1
85				16.1			16.1
86	16.8			40.6			57.4
87	7.0			56.8		10.3	74.1
88				22.9		2.1	24.9
89	7.1			193.4		10.9	211.4
90	150.2			291.0			441.2
91	22.8		26.8		155.6	20.4	225.6
92	70.2		23.6			23.3	117.0
93	22.5					23.3	45.8
94	16.3					22.4	38.7
95	89.8			244.7		39.7	374.3
96	19.3			166.1		84.0	269.3

SFR = single family residence; the description indicates density of homes per acre

Weld County I-25 Master Drainage Plan
Sub-basin information used for CUHP hydrologic model
Project number: CO-WELD-01

Tri-Town Basin - Future conditions

Sub-basin No.	Sub-basin Area (acres)	Sub-basin Area (mi^2)	Sub-basin Length (ft)	Sub-basin Length (miles)	Distance to Centroid (ft)	Distance to Centroid (miles)	Sub-basin % Impervious	Weighted Basin Slope (ft/ft)	Depression storage Perv. retention (in)	Depression storage Imp. retention (in)	Soil Type	Soil Type Area (acres)	Soil Type Area (%)	Infiltration rates Weighted Initial Rate (in/hr)	Infiltration rates Initial rate used for sub-basin (in/hr)	Infiltration rates Weighted Final Rate (in/hr)	Infiltration rates Final rate used for sub-basin (in/hr)	Decay coefficient
51	560.0	0.875	7900	1.496	4200	0.795	61.6	0.0046	0.4	0.1	B	305.9	54.63	2.5	3.8	0.3	0.6	0.0018
											C	151.6	27.07	0.8		0.1		
											D	102.5	18.30	0.5		0.1		
											Total:	560.0	100.0	3.8		0.6		
52	610.6	0.954	8300	1.572	2800	0.530	48.6	0.0081	0.4	0.1	A	19.9	3.26	0.2	4.4	0.0	0.6	0.0018
											B	559.4	91.61	4.1		0.5		
											D	31.3	5.13	0.2		0.0		
											Total:	610.6	100.0	4.4		0.6		
53	640.4	1.001	8700	1.648	3400	0.644	40.5	0.0085	0.4	0.1	B	577.2	90.13	4.1	4.4	0.5	0.6	0.0018
											D	63.2	9.87	0.3		0.0		
											Total:	640.4	100.0	4.4		0.6		
54	346.9	0.542	9200	1.742	2400	0.455	23.4	0.0077	0.4	0.1	B	264.3	76.19	3.4	4.3	0.5	0.6	0.0018
(410.0 W/ MILAVEC LAKE; AREA OF LAKE DETERMINED USING AERIAL PHOTOGRAPHY)											C	7.0	2.02	0.1		0.0		
											D	93.1	26.84	0.8		0.1		
											Total:	364.4	105.0	4.3		0.6		
55	173.9	0.272	4900	0.928	2300	0.436	41.0	0.0137	0.4	0.1	B	165.1	94.94	4.3	4.4	0.6	0.6	0.0018
											C	2.9	1.67	0.1		0.0		
											D	5.9	3.39	0.1		0.0		
											Total:	173.9	100.0	4.4		0.6		
56	27.3	0.043	1800	0.341	700	0.133	41.7	0.0086	0.4	0.1	B	26.6	97.44	4.4	4.5	0.6	0.6	0.0018
											D	0.7	2.56	0.1		0.0		
											Total:	27.3	100.0	4.5		0.6		
57	14.2	0.022	1300	0.246	600	0.114	39.0	0.0067	0.4	0.1	B	14.2	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	14.2	100.0	4.5		0.6		
58	17.3	0.027	1200	0.227	400	0.076	36.7	0.0045	0.4	0.1	B	17.3	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	17.3	100.0	4.5		0.6		
59	19.4	0.030	1800	0.341	700	0.133	35.1	0.0047	0.4	0.1	B	19.4	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	19.4	100.0	4.5		0.6		
60	53.7	0.084	3100	0.587	1300	0.246	48.1	0.0073	0.4	0.1	B	13.5	25.14	1.1	3.4	0.2	0.5	0.0018
											C	40.2	74.86	2.2		0.4		
											Total:	53.7	100.0	3.4		0.5		
61	250.8	0.392	6300	1.193	1600	0.303	27.1	0.0120	0.4	0.1	B	65.4	26.08	1.2	3.4	0.2	0.5	0.0018
											C	185.4	73.92	2.2		0.4		
											Total:	250.8	100.0	3.4		0.5		
62	108.1	0.169	3500	0.663	1100	0.208	50.0	0.0188	0.4	0.1	B	2.8	2.59	0.1	3.0	0.0	0.5	0.0018
											C	105.3	97.41	2.9		0.5		
											Total:	108.1	100.0	3.0		0.5		
63	288.0	0.450	5150	0.975	2200	0.417	47.2	0.0163	0.4	0.1	B	22.9	7.95	0.4	3.1	0.0	0.5	0.0018
											C	265.1	92.05	2.8		0.5		
											Total:	288.0	100.0	3.1		0.5		
70	683.9	1.069	8800	1.667	4200	0.795	27.1	0.0070	0.4	0.1	A	19.7	2.88	0.1	3.9	0.0	0.6	0.0018
											B	369.6	54.04	2.4		0.3		
											C	142.1	20.78	0.6		0.1		
											D	152.5	22.30	0.7		0.1		
											Total:	683.9	100.0	3.9		0.6		
71	114.3	0.179	3500	0.663	1700	0.322	27.1	0.0155	0.4	0.1	A	20.6	18.02	0.9	4.6	0.2	0.7	0.0016
											B	93.7	81.98	3.7		0.5		
											Total:	114.3	100.0	4.6		0.7		
72	392.8	0.614	5100	0.966	2400	0.455	47.5	0.0150	0.4	0.1	A	2.9	0.74	0.0	4.5	0.0	0.6	0.0018
											B	389.9	99.26	4.5		0.6		
											Total:	392.8	100.0	4.5		0.6		
73	115.3	0.180	4100	0.777	1900	0.360	62.5	0.0163	0.4	0.1	B	115.3	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	115.3	100.0	4.5		0.6		
74	324.3	0.507	5900	1.117	2500	0.473	44.2	0.0111	0.4	0.1	A	6.8	2.10	0.1	4.5	0.0	0.6	0.0018
											B	309.2	95.34	4.3		0.6		
											D	8.3	2.56	0.1		0.0		
											Total:	324.3	100.0	4.5		0.6		

Weld County I-25 Master Drainage Plan
Sub-basin information used for CUHP hydrologic model
Project number: CO-WELD-01

Tri-Town Basin - Future conditions

Sub-basin No.	Sub-basin Area (acres)	Sub-basin Area (mi^2)	Sub-basin Length (ft)	Sub-basin Length (miles)	Distance to Centroid (ft)	Distance to Centroid (miles)	Sub-basin % Impervious	Weighted Basin Slope (ft/ft)	Depression storage: Perv. retention (in)	Depression storage: Imp. retention (in)	Soil Type	Soil Type Area (acres)	Soil Type Area (%)	Infiltration rates: Weighted Initial Rate (in/hr)	Infiltration rates: Initial rate used for sub-basin (in/hr)	Infiltration rates: Weighted Final Rate (in/hr)	Infiltration rates: Final rate used for sub-basin (in/hr)	Decay coefficient
75	722.3	1.129	8500	1.610	4200	0.795	39.7	0.0145	0.4	0.1	A	7.2	1.00	0.0	4.1	0.0	0.6	0.0018
											B	555.0	76.84	3.5		0.5		
											D	151.1	20.92	0.6		0.1		
											Total:	713.3	98.8	4.1		0.6		
76	49.2	0.077	2600	0.492	900	0.170	50.0	0.0117	0.4	0.1	B	49.2	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	49.2	100.0	4.5		0.6		
77	37.2	0.058	2700	0.511	800	0.152	50.0	0.0200	0.4	0.1	B	37.2	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	37.2	100.0	4.5		0.6		
78	36.4	0.057	2400	0.455	1100	0.208	50.0	0.0109	0.4	0.1	B	36.4	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	36.4	100.0	4.5		0.6		
79	40.1	0.063	3100	0.587	1100	0.208	50.0	0.0204	0.4	0.1	B	40.1	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	40.1	100.0	4.5		0.6		
80	42.1	0.066	2400	0.455	1000	0.189	45.1	0.0078	0.4	0.1	B	42.1	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	42.1	100.0	4.5		0.6		
81	110.0	0.172	3600	0.682	1400	0.265	46.8	0.0197	0.4	0.1	B	110.0	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	110.0	100.0	4.5		0.6		
82	88.7	0.139	3800	0.720	1400	0.265	44.1	0.0114	0.4	0.1	B	88.7	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	88.7	100.0	4.5		0.6		
83	48.4	0.076	2900	0.549	900	0.170	50.0	0.0125	0.4	0.1	B	48.4	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	48.4	100.0	4.5		0.6		
84	69.1	0.108	3500	0.663	1600	0.303	50.0	0.0193	0.4	0.1	B	69.1	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	69.1	100.0	4.5		0.6		
85	16.1	0.025	1000	0.189	400	0.076	50.0	0.0063	0.4	0.1	B	16.7	103.73	4.7	4.7	0.6	0.6	0.0018
											Total:	16.7	103.7	4.7		0.6		
86	57.4	0.090	4300	0.814	1700	0.322	38.3	0.0169	0.4	0.1	B	57.4	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	57.4	100.0	4.5		0.6		
87	74.1	0.116	3900	0.739	1600	0.303	51.8	0.0058	0.4	0.1	B	29.8	40.22	1.8	4.0	0.2	0.6	0.0018
											C	53.0	71.52	2.1		0.4		
											Total:	82.8	111.7	4.0		0.6		
88	24.9	0.039	3100	0.587	1300	0.246	53.3	0.0157	0.4	0.1	B	23.1	92.77	4.2	4.2	0.6	0.6	0.0018
											Total:	23.1	92.8	4.2		0.6		
89	211.4	0.330	5300	1.004	1800	0.341	51.1	0.0119	0.4	0.1	B	106.3	50.28	2.3	3.7	0.3	0.5	0.0018
											C	78.8	37.28	1.1		0.2		
											D	19.5	9.22	0.3		0.0		
											Total:	204.6	96.8	3.7		0.5		
90	441.2	0.689	5500	1.042	2300	0.436	36.4	0.0158	0.4	0.1	B	406.3	92.09	4.1	4.4	0.6	0.6	0.0018
											C	24.0	5.44	0.2		0.0		
											D	10.9	2.47	0.1		0.0		
											Total:	441.2	100.0	4.4		0.6		
91	225.6	0.353	5700	1.080	2700	0.511	62.2	0.0139	0.4	0.1	B	38.8	17.20	0.8	3.3	0.1	0.5	0.0018
											C	186.8	82.80	2.5		0.4		
											Total:	225.6	100.0	3.3		0.5		
92	117.0	0.183	4300	0.814	1500	0.284	32.0	0.0113	0.4	0.1	B	60.7	51.88	2.3	3.8	0.3	0.6	0.0018
											C	56.3	48.12	1.4		0.2		
											Total:	117.0	100.0	3.8		0.6		
93	45.8	0.072	3800	0.720	2400	0.455	50.7	0.0125	0.4	0.1	C	45.8	100.00	3.0	3.0	0.5	0.5	0.0018
											Total:	45.8	100.0	3.0		0.5		
94	38.7	0.060	3400	0.644	1200	0.227	56.3	0.0103	0.4	0.1	B	3.1	8.01	0.4	3.1	0.0	0.5	0.0018
											C	35.6	91.99	2.8		0.5		
											Total:	38.7	100.0	3.1		0.5		
95	374.3	0.585	5200	0.985	2400	0.455	44.6	0.0102	0.4	0.1	B	84.1	22.47	1.0	3.3	0.1	0.5	0.0018
											C	290.2	77.53	2.3		0.4		
											Total:	374.3	100.0	3.3		0.5		
96	269.3	0.421	4800	0.909	1800	0.341	59.6	0.0104	0.4	0.1	B	269.3	100.00	4.5	4.5	0.6	0.6	0.0018
											Total:	269.3	100.0	4.5		0.6		
Total:	7880.5	12.313																

Future Conditions - Tri-Town Basin
Time of concentration calculations (for basins less than 90 acres only)

Sub-basin No.	Sub-basin Length (ft)	Time of concentration (T_c), min						
		2 year	5 year	10 year	25 year	50 year	100 year	
56	1800	20.00	20.00	20.00	20.00	20.00	20.00	urban procedure
57	1300	17.22	17.22	17.22	17.22	17.22	17.22	urban procedure
58	1200	16.67	16.67	16.67	16.67	16.67	16.67	urban procedure
59	1800	20.00	20.00	20.00	20.00	20.00	20.00	urban procedure
60	3100	27.22	27.22	27.22	27.22	27.22	27.22	urban procedure
76	2600	24.44	24.44	24.44	24.44	24.44	24.44	urban procedure
77	2700	25.00	25.00	25.00	25.00	25.00	25.00	urban procedure
78	2400	23.33	23.33	23.33	23.33	23.33	23.33	urban procedure
79	3100	27.22	27.22	27.22	27.22	27.22	27.22	urban procedure
80	2400	23.33	23.33	23.33	23.33	23.33	23.33	urban procedure
82	3800	31.11	31.11	31.11	31.11	31.11	31.11	urban procedure
83	2900	26.11	26.11	26.11	26.11	26.11	26.11	urban procedure
84	3500	29.44	29.44	29.44	29.44	29.44	29.44	urban procedure
85	1000	15.56	15.56	15.56	15.56	15.56	15.56	urban procedure
86	4300	33.89	33.89	33.89	33.89	33.89	33.89	urban procedure
87	3900	31.67	31.67	31.67	31.67	31.67	31.67	urban procedure
88	3100	27.22	27.22	27.22	27.22	27.22	27.22	urban procedure
93	3800	31.11	31.11	31.11	31.11	31.11	31.11	urban procedure
94	3400	28.89	28.89	28.89	28.89	28.89	28.89	urban procedure

II-D

EXISTING CONDITION INPUT FILES

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 1      Weld County I-25 Master Drainage Plan - Existing Conditions, ACE 4/99
01 2 YEAR   0.020.040.080.140.220.120.060.050.030.030.030.030.030.020.020.020.02
01 2 YEAR   0.020.020.020.020.020.010.010.000.020.020.020.010.010.010.010.010.01
01 2 YEAR   0.010.01

 701 1 05.TTSB51051                                        0
.875 1.439.795 21.300.00500.00.4   .1   3.500.00180.600          00.00 0.00
 701 1 05.TTSB52052
.954 1.515.53  19.300.00800.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB53053
1.0011.591.644 15.000.00900.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB54054
.542 1.686.455 10.500.00800.000.4  0.1  4.300.00180.600          0
 701 1 05.TTSB55055
.272 .871 .436 25.000.01400.000.4  0.1  4.400.00180.600          0
 711 1 05.TTSB56056
.043 .284 .133 30.800.00318.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB57057
.022 .189 .114 27.500.00415.56.4   0.1  4.500.00130.600          0
 711 1 05.TTSB58058
.027 .17  .076 23.200.00415.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB59059
.03  .284 .133 21.100.00518.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB60060
.084 .587 .246 48.100.00627.220.4  0.1  3.400.00180.500          0
 701 1 05.TTSB61061
.392 1.136.303 10.000.01100.000.4  0.1  3.400.00180.500          0
 701 1 05.TTSB62062
.169 .663 .208 50.000.01400.000.4  0.1  3.000.00180.500          0
 701 1 05.TTSB63063
.45  .919 .417 10.200.01500.000.4  0.1  3.100.00180.500          0
 701 1 05.TTSB70070
1.0691.61 .795 21.700.00700.000.4  0.1  3.900.00180.600          0
 701 1 05.TTSB71071
.179 .606 .322 10.300.01600.000.4  0.1  4.600.00160.700          0
 701 1 05.TTSB72072
.614 .909 .455 25.900.01500.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB73073
.18  .72  .36  10.000.01600.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB74074
.507 1.061.473 15.300.01100.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB75075
1.1291.553.795 11.100.01500.000.4  0.1  4.200.00180.600          0
 711 1 05.TTSB76076
.077 .492 .17  50.000.01224.440.4  0.1  4.500.00180.600          0
 711 1 05.TTSB77077
.058 .455 .152 17.400.02093.520.4  0.1  4.500.00180.600          0
 711 1 05.TTSB78078
.057 .455 .208 50.000.01123.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB79079
.063 .53  .208 23.200.021115.90.4  0.1  4.500.00180.600          0
 711 1 05.TTSB80080
.066 .455 .189 42.800.00723.330.4  0.1  4.500.00180.600          0
 701 1 05.TTSB81081
.172 .625 .265 29.400.01800.00.4   .1   4.500.00180.600          0
 711 1 05.TTSB82082
.139 .663 .265 10.800.012170.2.4   .1   4.500.00180.600          0
 711 1 05.TTSB83083
.076 .549 .17  33.800.01326.11.4   .1   4.500.00180.600          0
 711 1 05.TTSB84084
.108 .606 .303 18.400.018140.8.4   .1   4.500.00180.600          0
 711 1 05.TTSB85085
.025 .189 .076 31.400.00615.56.4   .1   4.700.00180.600          0
 711 1 05.TTSB86086
.09  .758 .322 22.500.01887.00.4   .1   4.500.00180.600          0
 711 1 05.TTSB87087
.116 .739 .303 51.800.00531.67.4   .1   4.000.00180.600          0
 711 1 05.TTSB88088
.039 .53  .246 32.800.01625.56.4   .1   4.200.00180.600          0
 701 1 05.TTSB89089
.33  .947 .341 15.300.01200.00.4   .1   3.700.00180.500          0
 701 1 05.TTSB90090
.689 .985 .436 23.600.016     .4   .1   4.400.00180.600          0
 701 1 05.TTSB91091
.353 1.023.511 58.300.012     .4   .1   3.300.00180.500          0
 701 1 05.TTSB92092
.183 .758 .284 10.800.01100.00.4   .1   3.800.00180.600          0
 711 1 05.TTSB93093
.072 .663 .455 50.700.01129.44.4   .1   3.000.00180.500          0
 711 1 05.TTSB94094
.06  .587 .227 17.600.011100.0.4   .1   3.100.00180.500          0
 701 1 05.TTSB95095
.585 .928 .455 10.000.01000.00.4   .1   3.300.00180.500          0
 701 1 05.TTSB96096
.421 .852 .341 29.700.013     0.4  0.1  4.500.00180.600          0
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 1      Weld County I-25 Master Drainage Plan - Existing Conditions, ACE 4/99
01 5 YEAR   0.030.050.120.190.310.160.080.060.050.050.040.040.040.040.030.030.03
01 5 YEAR   0.030.030.020.020.020.020.020.020.020.010.010.010.010.010.010.010.01
01 5 YEAR   0.010.01

 701 1 05.TTSB51051                                        0
.875 1.439.795 21.300.00500.00.4   .1   3.800.00180.600          00.00 0.00
 701 1 05.TTSB52052
.954 1.515.53  19.300.00800.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB53053
1.0011.591.644 15.000.00900.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB54054
.542 1.686.455 10.500.00800.000.4  0.1  4.300.00180.600          0
 701 1 05.TTSB55055
.272 .871 .436 25.000.01400.000.4  0.1  4.400.00180.600          0
 711 1 05.TTSB56056
.043 .284 .133 30.800.00318.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB57057
.022 .189 .114 27.500.00415.56.4   0.1  4.500.00180.600          0
 711 1 05.TTSB58058
.027 .17  .076 23.200.00415.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB59059
.03  .284 .133 21.100.00518.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB60060
.084 .587 .246 48.100.00627.220.4  0.1  3.400.00180.500          0
 701 1 05.TTSB61061
.392 1.136.303 10.000.01100.000.4  0.1  3.400.00180.500          0
 701 1 05.TTSB62062
.169 .663 .208 50.000.01400.000.4  0.1  3.000.00180.500          0
 701 1 05.TTSB63063
.45  .919 .417 10.200.01500.000.4  0.1  3.100.00180.500          0
 701 1 05.TTSB70070
1.0691.61 .795 21.700.00700.000.4  0.1  3.900.00180.600          0
 701 1 05.TTSB71071
.179 .606 .322 10.300.01600.000.4  0.1  4.600.00160.700          0
 701 1 05.TTSB72072
.614 .909 .455 25.900.01500.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB73073
.18  .72  .36  10.000.01600.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB74074
.507 1.061.473 15.300.01100.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB75075
1.1291.553.795 11.100.01500.000.4  0.1  4.200.00180.600          0
 711 1 05.TTSB76076
.077 .492 .17  50.000.01224.440.4  0.1  4.500.00180.600          0
 711 1 05.TTSB77077
.058 .455 .152 17.400.02093.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB78078
.057 .455 .208 50.000.01123.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB79079
.063 .53  .208 23.200.021114.80.4  0.1  4.500.00180.600          0
 711 1 05.TTSB80080
.066 .455 .189 42.800.00723.330.4  0.1  4.500.00180.600          0
 701 1 05.TTSB81081
.172 .625 .265 29.400.01800.00.4   .1   4.500.00180.600          0
 711 1 05.TTSB82082
.139 .663 .265 10.800.012169.5.4   .1   4.500.00180.600          0
 711 1 05.TTSB83083
.076 .549 .17  33.800.01326.11.4   .1   4.500.00180.600          0
 711 1 05.TTSB84084
.108 .606 .303 18.400.018139.8.4   .1   4.500.00180.600          0
 711 1 05.TTSB85085
.025 .189 .076 31.400.00615.56.4   .1   4.700.00180.600          0
 711 1 05.TTSB86086
.09  .758 .322 22.500.01886.00.4   .1   4.500.00180.600          0
 711 1 05.TTSB87087
.116 .739 .303 51.800.00531.67.4   .1   4.000.00180.600          0
 711 1 05.TTSB88088
.039 .53  .246 32.800.01625.56.4   .1   4.200.00180.600          0
 701 1 05.TTSB89089
.33  .947 .341 15.300.01200.00.4   .1   3.700.00180.500          0
 701 1 05.TTSB90090
.689 .985 .436 23.600.016     .4   .1   4.400.00180.600          0
 701 1 05.TTSB91091
.353 1.023.511 58.300.012     .4   .1   3.300.00180.500          0
 701 1 05.TTSB92092
.183 .758 .284 10.800.01100.00,4   .1   3.800.00180.600          0
 711 1 05.TTSB93093
.072 .663 .455 50.700.01129.44.4   .1   3.000.00180.500          0
 711 1 05.TTSB94094
.06  .587 .227 17.600.01199.40.4   .1   3.100.00180.500          0
 701 1 05.TTSB95095
.585 .928 .455 10.000.01000.00.4   .1   3.300.00180.500          0
 701 1 05.TTSB96096
.421 .852 .341 29.700.013     0.4  0.1  4.500.00180.600          0
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 1      Weld County I-25 Master Drainage Plan - Existing Conditions, ACE 4/99
01 10 YEAR  0.030.060.140.230.380.180.090.070.060.050.050.050.050.050.040.03
01 10 YEAR  0.030.030.030.030.030.030.020.020.020.010.010.010.010.010.010.01
01 10 YEAR  0.010.01

 701 1 05.TTSB51051                                        0
.875 1.439.795 21.300.00500.00.4   .1   3.800.00180.600          00.00 0.00
 701 1 05.TTSB52052
.954 1.515.53  19.300.00800.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB53053
1.0011.591.644 15.000.00900.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB54054
.542 1.686.455 10.500.00800.000.4  0.1  4.300.00180.600          0
 701 1 05.TTSB55055
.272 .871 .436 25.000.01400.000.4  0.1  4.400.00180.600          0
 711 1 05.TTSB56056
.043 .284 .133 30.800.00318.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB57057
.022 .189 .114 27.500.00415.56.4   0.1  4.500.00180.600          0
 711 1 05.TTSB58058
.027 .17  .076 23.200.00415.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB59059
.03  .284 .133 21.100.00518.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB60060
.084 .587 .246 48.100.00627.220.4  0.1  3.400.00180.500          0
 701 1 05.TTSB61061
.392 1.136.303 10.000.01100.000.4  0.1  3.400.00180.500          0
 701 1 05.TTSB62062
.169 .663 .208 50.000.01400.000.4  0.1  3.000.00180.500          0
 701 1 05.TTSB63063
.45  .919 .417 10.200.01500.000.4  0.1  3.100.00180.500          0
 701 1 05.TTSB70070
1.0691.61 .795 21.700.00700.000.4  0.1  3.900.00180.600          0
 701 1 05.TTSB71071
.179 .606 .322 10.300.01600.000.4  0.1  4.600.00160.700          0
 701 1 05.TTSB72072
.614 .909 .455 25.900.01500.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB73073
.18  .72  .36  10.000.01600.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB74074
.507 1.061.473 15.300.01100.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB75075
1.1291.553.795 11.100.01500.000.4  0.1  4.200.00180.600          0
 711 1 05.TTSB76076
.077 .492 .17  50.000.01224.440.4  0.1  4.500.00180.600          0
 711 1 05.TTSB77077
.058 .455 .152 17.400.02091.700.4  0.1  4.500.00180.600          0
 711 1 05.TTSB78078
.057 .455 .208 50.000.01123.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB79079
.063 .53  .208 23.200.021112.70.4  0.1  4.500.00180.600          0
 711 1 05.TTSB80080
.066 .455 .189 42.800.00723.330.4  0.1  4.500.00180.600          0
 701 1 05.TTSB81081
.172 .625 .265 29.400.01800.00.4   .1   4.500.00180.600          0
 711 1 05.TTSB82082
.139 .663 .265 10.800.012167.5.4   .1   4.500.00180.600          0
 711 1 05.TTSB83083
.076 .549 .17  33.800.01326.11.4   .1   4.500.00180.600          0
 711 1 05.TTSB84084
.108 .606 .303 18.400.018137.6.4   .1   4.500.00180.600          0
 711 1 05.TTSB85085
.025 .189 .076 31.400.00615.56.4   .1   4.700.00180.600          0
 711 1 05.TTSB86086
.09  .758 .322 22.500.01884.30.4   .1   4.500.00180.600          0
 711 1 05.TTSB87087
.116 .739 .303 51.800.00531.67.4   .1   4.000.00180.600          0
 711 1 05.TTSB88088
.039 .53  .246 32.800.01625.56.4   .1   4.200.00180.600          0
 701 1 05.TTSB89089
.33  .947 .341 15.300.01200.00.4   .1   3.700.00180.500          0
 701 1 05.TTSB90090
.689 .985 .436 23.600.016     .4   .1   4.400.00180.600          0
 701 1 05.TTSB91091
.353 1.023.511 58.300.012     .4   .1   3.300.00180.500          0
 701 1 05.TTSB92092
.183 .758 .284 10.800.01100.00.4   .1   3.800.00180.600          0
 711 1 05.TTSB93093
.072 .663 .455 50.700.01129.44.4   .1   3.000.00180.500          0
 711 1 05.TTSB94094
.06  .587 .227 17.600.01197.60.4   .1   3.100.00180.500          0
 701 1 05.TTSB95095
.585 .928 .455 10.000.01000.00.4   .1   3.300.00180.500          0
 701 1 05.TTSB96096
.421 .852 .341 29.700.013     0.4  0.1  4.500.00180.600          0
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 1      Weld County I-25 Master Drainage Plan - Existing Conditions, ACE 4/99
01 25 YEAR  0.030.070.110.170.290.460.180.150.090.080.070.070.070.060.060.040.04
01 25 YEAR  0.030.030.030.030.030.030.030.020.020.020.020.010.010.010.010.010.01
01 25 YEAR  0.010.01

 701 1 05.TTSB51051                                        0
.875 1.439.795 21.300.00500.00.4   .1   3.800.00180.600          00.00 0.00
 701 1 05.TTSB52052
.954 1.515.53  19.300.00800.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB53053
1.0011.591.644 15.000.00900.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB54054
.542 1.686.455 10.500.00800.000.4  0.1  4.300.00180.600          0
 701 1 05.TTSB55055
.272 .871 .436 25.000.01400.000.4  0.1  4.400.00180.600          0
 711 1 05.TTSB56056
.043 .284 .133 30.800.00318.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB57057
.022 .189 .114 27.500.00415.56.4   0.1  4.500.00180.600          0
 711 1 05.TTSB58058
.027 .17  .076 23.200.00415.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB59059
.03  .284 .133 21.100.00518.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB60060
.084 .587 .246 48.100.00627.220.4  0.1  3.400.00180.500          0
 701 1 05.TTSB61061
.392 1.136.303 10.000.01100.000.4  0.1  3.400.00180.500          0
 701 1 05.TTSB62062
.169 .663 .208 50.000.01400.000.4  0.1  3.000.00180.500          0
 701 1 05.TTSB63063
.45  .919 .417 10.200.01500.000.4  0.1  3.100.00180.500          0
 701 1 05.TTSB70070
1.0691.61 .795 21.700.00700.000.4  0.1  3.900.00180.600          0
 701 1 05.TTSB71071
.179 .606 .322 10.300.01600.000.4  0.1  4.600.00160.700          0
 701 1 05.TTSB72072
.614 .909 .455 25.900.01500.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB73073
.18  .72  .36  10.000.01600.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB74074
.507 1.061.473 15.300.01100.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB75075
1.1291.553.795 11.100.01500.000.4  0.1  4.200.00180.600          0
 711 1 05.TTSB76076
.077 .492 .17  50.000.01224.440.4  0.1  4.500.00180.600          0
 711 1 05.TTSB77077
.058 .455 .152 17.400.02090.800.4  0.1  4.500.00180.600          0
 711 1 05.TTSB78078
.057 .455 .208 50.000.01123.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB79079
.063 .53  .208 23.200.021111.40.4  0.1  4.500.00180.600          0
 711 1 05.TTSB80080
.066 .455 .189 42.800.00723.330.4  0.1  4.500.00180.600          0
 701 1 05.TTSB81081
.172 .625 .265 29.400.01800.00.4   .1   4.500.00180.600          0
 711 1 05.TTSB82082
.139 .663 .265 10.800.012166.0.4   .1   4.500.00180.600          0
 711 1 05.TTSB83083
.076 .549 .17  33.800.01326.11.4   .1   4.500.00180.600          0
 711 1 05.TTSB84084
.108 .606 .303 18.400.018136.2.4   .1   4.500.00180.600          0
 711 1 05.TTSB85085
.025 .189 .076 31.400.00615.56.4   .1   4.700.00180.600          0
 711 1 05.TTSB86086
.09  .758 .322 22.500.01883.20.4   .1   4.500.00180.600          0
 711 1 05.TTSB87087
.116 .739 .303 51.800.00531.67.4   .1   4.000.00180.600          0
 711 1 05.TTSB88088
.039 .53  .246 32.800.01625.56.4   .1   4.200.00180.600          0
 701 1 05.TTSB89089
.33  .947 .341 15.300.01200.00.4   .1   3.700.00180.500          0
 701 1 05.TTSB90090
.689 .985 .436 23.600.016     .4   .1   4.400.00180.600          0
 701 1 05.TTSB91091
.353 1.023.511 58.300.012     .4   .1   3.300.00180.500          0
 701 1 05.TTSB92092
.183 .758 .284 10.800.01100.00.4   .1   3.800.00180.600          0
 711 1 05.TTSB93093
.072 .663 .455 50.700.01129.44.4   .1   3.000.00180.500          0
 711 1 05.TTSB94094
.06  .587 .227 17.600.01196.30.4   .1   3.100.00180.500          0
 701 1 05.TTSB95095
.585 .928 .455 10.000.01000.00.4   .1   3.300.00180.500          0
 701 1 05.TTSB96096
.421 .852 .341 29.700.013     0.4  0.1  4.500.00180.600          0
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 1      Weld County I-25 Master Drainage Plan - Existing Conditions, ACE 4/99
01 50 YEAR  0.030.080.120.190.320.530.260.190.120.120.080.080.080.060.060.040.04
01 50 YEAR  0.030.030.030.030.030.030.030.020.020.020.010.010.010.010.010.010.01
01 50 YEAR  0.010.01

 701 1 05.TTSB51051                                          0
.875 1.439.795 21.300.00500.00.4   .1   3.800.00180.600          00.00 0.00
 701 1 05.TTSB52052
.954 1.515.53  19.300.00800.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB53053
1.0011.591.644 15.000.00900.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB54054
.542 1.686.455 10.500.00800.000.4  0.1  4.300.00180.600          0
 701 1 05.TTSB55055
.272 .871 .436 25.000.01400.000.4  0.1  4.400.00180.600          0
 711 1 05.TTSB56056
.043 .284 .133 30.800.00318.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB57057
.022 .189 .114 27.500.00415.56.4   0.1  4.500.00180.600          0
 711 1 05.TTSB58058
.027 .17  .076 23.200.00415.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB59059
.03  .284 .133 21.100.00518.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB60060
.084 .587 .246 48.100.00627.220.4  0.1  3.400.00180.500          0
 701 1 05.TTSB61061
.392 1.136.303 10.000.01100.000.4  0.1  3.400.00180.500          0
 701 1 05.TTSB62062
.169 .663 .208 50.000.01400.000.4  0.1  3.000.00180.500          0
 701 1 05.TTSB63063
.45  .919 .417 10.200.01500.000.4  0.1  3.100.00180.500          0
 701 1 05.TTSB70070
1.0691.61 .795 21.700.00700.000.4  0.1  3.900.00180.600          0
 701 1 05.TTSB71071
.179 .606 .322 10.300.01600.000.4  0.1  4.600.00160.700          0
 701 1 05.TTSB72072
.614 .909 .455 25.900.01500.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB73073
.18  .72  .36  10.000.01600.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB74074
.507 1.061.473 15.300.01100.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB75075
1.1291.553.795 11.100.01500.000.4  0.1  4.200.00180.600          0
 711 1 05.TTSB76076
.077 .492 .17  50.000.01224.440.4  0.1  4.500.00180.600          0
 711 1 05.TTSB77077
.058 .455 .152 17.400.02089.700.4  0.1  4.500.00180.600          0
 711 1 05.TTSB78078
.057 .455 .208 50.000.01123.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB79079
.063 .53  .208 23.200.021109.80.4  0.1  4.500.00180.600          0
 711 1 05.TTSB80080
.066 .455 .189 42.800.00723.330.4  0.1  4.500.00180.600          0
 701 1 05.TTSB81081
.172 .625 .265 29.400.01800.00.4   .1   4.500.00180.600          0
 711 1 05.TTSB82082
.139 .663 .265 10.800.012163.9.4   .1   4.500.00180.600          0
 711 1 05.TTSB83083
.076 .549 .17  33.800.01326.11.4   .1   4.500.00180.600          0
 711 1 05.TTSB84084
.108 .606 .303 18.400.018134.3.4   .1   4.500.00180.600          0
 711 1 05.TTSB85085
.025 .189 .076 31.400.00615.56.4   .1   4.700.00180.600          0
 711 1 05.TTSB86086
.09  .758 .322 22.500.01881.80.4   .1   4.500.00180.600          0
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.116 .739 .303 51.800.00531.67.4   .1   4.000.00180.600          0
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.039 .53  .246 32.800.01625.56.4   .1   4.200.00180.600          0
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.33  .947 .341 15.300.01200.00.4   .1   3.700.00180.500          0
 701 1 05.TTSB90090
.689 .985 .436 23.600.016     .4   .1   4.400.00180.600          0
 701 1 05.TTSB91091
.353 1.023.511 58.300.012     .4   .1   3.300.00180.500          0
 701 1 05.TTSB92092
.183 .758 .284 10.800.01100.00.4   .1   3.800.00180.600          0
 711 1 05.TTSB93093
.072 .663 .455 50.700.01129.44.4   .1   3.000.00180.500          0
 711 1 05.TTSB94094
.06  .587 .227 17.600.01194.40.4   .1   3.100.00180.500          0
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.585 .928 .455 10.000.01000.00.4   .1   3.300.00180.500          0
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.421 .852 .341 29.700.013     0.4  0.1  4.500.00180.600          0
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01 100 YEAR 0.030.030.030.030.030.030.030.020.020.020.020.020.020.010.010.010.01
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.875 1.439.795 21.300.00500.00.4   .1   3.800.00180.600          00.00 0.00
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.954 1.515.53  19.300.00800.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB53053
1.0011.591.644 15.000.00900.000.4  0.1  4.400.00180.600          0
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.272 .871 .436 25.000.01400.000.4  0.1  4.400.00180.600          0
 711 1 05.TTSB56056
.043 .284 .133 30.800.00318.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB57057
.022 .189 .114 27.500.00415.56.4   0.1  4.500.00180.600          0
 711 1 05.TTSB58058
.027 .17  .076 23.200.00415.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB59059
.03  .284 .133 21.100.00518.330.4  0.1  4.500.00180.600          0
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 701 1 05.TTSB61061
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.169 .663 .208 50.000.01400.000.4  0.1  3.000.00180.500          0
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.45  .919 .417 10.200.01500.000.4  0.1  3.100.00180.500          0
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1.0691.61 .795 21.700.00700.000.4  0.1  3.900.00180.600          0
 701 1 05.TTSB71071
.179 .606 .322 10.300.01600.000.4  0.1  4.600.00160.700          0
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.614 .909 .455 25.900.01500.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB73073
.18  .72  .36  10.000.01600.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB74074
.507 1.061.473 15.300.01100.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB75075
1.1291.553.795 11.100.01500.000.4  0.1  4.200.00180.600          0
 711 1 05.TTSB76076
.077 .492 .17  50.000.01224.440.4  0.1  4.500.00180.600          0
 711 1 05.TTSB77077
.058 .455 .152 17.400.02087.300.4  0.1  4.500.00180.600          0
 711 1 05.TTSB78078
.057 .455 .208 50.000.01123.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB79079
.063 .53  .208 23.200.021106.20.4  0.1  4.500.00180.600          0
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.066 .455 .189 42.800.00723.330.4  0.1  4.500.00180.600          0
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.172 .625 .265 29.400.01800.00.4   .1   4.500.00180.600          0
 711 1 05.TTSB82082
.139 .663 .265 10.800.012159.8.4   .1   4.500.00180.600          0
 711 1 05.TTSB83083
.076 .549 .17  33.800.01326.11.4   .1   4.500.00180.600          0
 711 1 05.TTSB84084
.108 .606 .303 18.400.018130.3.4   .1   4.500.00180.600          0
 711 1 05.TTSB85085
.025 .189 .076 31.400.00615.56.4   .1   4.700.00180.600          0
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.09  .758 .322 22.500.01878.90.4   .1   4.500.00180.600          0
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.116 .739 .303 51.800.00531.67.4   .1   4.000.00180.600          0
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.039 .53  .246 32.800.01625.56.4   .1   4.200.00180.600          0
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.33  .947 .341 15.300.01200.00.4   .1   3.700.00180.500          0
 701 1 05.TTSB90090
.689 .985 .436 23.600.016      .4   .1   4.400.00180.600          0
 701 1 05.TTSB91091
.353 1.023.511 58.300.012      .4   .1   3.300.00180.500          0
 701 1 05.TTSB92092
.183 .758 .284 10.800.01100.00.4   .1   3.800.00180.600          0
 711 1 05.TTSB93093
.072 .663 .455 50.700.01129.44.4   .1   3.000.00180.500          0
 711 1 05.TTSB94094
.06  .587 .227 17.600.01190.80.4   .1   3.100.00180.500          0
 701 1 05.TTSB95095
.585 .928 .455 10.000.01000.00.4   .1   3.300.00180.500          0
 701 1 05.TTSB96096
.421 .852 .341 29.700.013      0.4  0.1  4.500.00180.600          0
E
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II-E

FUTURE CONDITION INPUT FILES

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 1      Weld County I-25 Master Drainage Plan - Future Conditions, ACE 4/99
01 2 YEAR   0.020.040.080.140.220.120.060.050.030.030.030.030.030.020.020.020.02
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01 2 YEAR   0.010.01

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.875 1.496.795 61.600.00500.00.4   .1   3.800.00180.600          00.00 0.00
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.954 1.572.53  48.600.00800.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB53053
1.0011.648.644 40.500.00900.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB54054
.542 1.742.455 23.400.00800.000.4  0.1  4.300.00180.600          0
 701 1 05.TTSB55055
.272 .928 .436 41.000.01400.000.4  0.1  4.400.00180.600          0
 711 1 05.TTSB56056
.043 .341 .133 41.700.00320.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB57057
.022 .246 .114 39.000.00417.22.4   0.1  4.500.00180.600          0
 711 1 05.TTSB58058
.027 .227 .076 36.700.00416.670.4  0.1  4.500.00180.600          0
 711 1 05.TTSB59059
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 711 1 05.TTSB60060
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.45  .975 .417 47.200.01500.000.4  0.1  3.100.00180.500          0
 701 1 05.TTSB70070
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.179 0.663.322 27.100.01600.000.4  0.1  4.600.00160.700          0
 701 1 05.TTSB72072
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 701 1 05.TTSB73073
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 701 1 05.TTSB74074
.507 1.117.473 44.200.01100.000.4  0.1  4.500.00180.600          0
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1.1291.610.795 39.700.01500.000.4  0.1  4.200.00180.600          0
 711 1 05.TTSB76076
.077 .492 0.17050.000.01224.440.4  0.1  4.500.00180.600          0
 711 1 05.TTSB77077
.058 0.511.152 50.000.02025.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB78078
.057 .455 .208 50.000.01123.330.4  0.1  4.500.00180.600          0
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 711 1 05.TTSB82082
.139 .720 .265 44.100.01231.11.4   .1   4.500.00180.600          0
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.076 .549 .170 50.000.01326.11.4   .1   4.500.00180.600          0
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.108 .663 .303 50.000.01829.44.4   .1   4.500.00180.600          0
 711 1 05.TTSB85085
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 711 1 05.TTSB86086
.09  .814 .322 38.300.01833.89.4   .1   4.500.00180.600          0
 711 1 05.TTSB87087
.116 .739 .303 51.800.00531.67.4   .1   4.000.00180.600          0
 711 1 05.TTSB88088
.039 .587 .246 53.300.01627.22.4   .1   4.200.00180.600          0
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.689 1.042.436 36.400.016      .4   .1   4.400.00180.600          0
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.353 1.080.511 62.200.012      .4   .1   3.300.00180.500          0
 701 1 05.TTSB92092
.183 .814 .284 32.000.01100.00.4   .1   3.800.00180.600          0
 711 1 05.TTSB93093
.072 .720 .455 50.700.01131.11.4   .1   3.000.00180.500          0
 711 1 05.TTSB94094
.06  .644 .227 56.300.01128.89.4   .1   3.100.00180.500          0
 701 1 05.TTSB95095
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 701 1 05.TTSB96096
.421 .909 .341 59.600.013      0.4  0.1  4.500.00180.600          0
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.542 1.742.455 23.400.00800.000.4  0.1  4.300.00180.600          0
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.272 .928 .436 41.000.01400.000.4  0.1  4.400.00180.600          0
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.03  .341 .133 35.100.00520.000.4  0.1  4.500.00180.600          0
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.169 .663 .208 50.000.01400.000.4  0.1  3.000.00180.500          0
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.45  .975 .417 47.200.01500.000.4  0.1  3.100.00180.500          0
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1.0691.667.795 27.100.00700.000.4  0.1  3.900.00180.600          0
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.18  .777 .36  62.500.01600.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB74074
.507 1.117.473 44.200.01100.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB75075
1.1291.610.795 39.700.01500.000.4  0.1  4.200.00180.600          0
 711 1 05.TTSB76076
.077 .492 0.17050.000.01224.440.4  0.1  4.500.00180.600          0
 711 1 05.TTSB77077
.058 0.511.152 50.000.02025.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB78078
.057 .455 .208 50.000.01123.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB79079
.063 .587 .208 50.000.02127.220.4  0.1  4.500.00180.600          0
 711 1 05.TTSB80080
.066 .455 .189 45.100.00723.330.4  0.1  4.500.00180.600          0
 701 1 05.TTSB81081
.172 .682 .265 46.800.01800.00.4   .1   4.500.00180.600          0
 711 1 05.TTSB82082
.139 .720 .265 44.100.01231.11.4   .1   4.500.00180.600          0
 711 1 05.TTSB83083
.076 .549 .170 50.000.01326.11.4   .1   4.500.00180.600          0
 711 1 05.TTSB84084
.108 .663 .303 50.000.01829.44.4   .1   4.500.00180.600          0
 711 1 05.TTSB85085
.025 .189 .076 50.000.00615.56.4   .1   4.700.00180.600          0
 711 1 05.TTSB86086
.09  .814 .322 38.300.01833.89.4   .1   4.500.00180.600          0
 711 1 05.TTSB87087
.116 .739 .303 51.800.00531.67.4   .1   4.000.00180.600          0
 711 1 05.TTSB88088
.039 .587 .246 53.300.01627.22.4   .1   4.200.00180.600          0
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.33  1.004.341 51.100.01200.00.4   .1   3.700.00180.500          0
 701 1 05.TTSB90090
.689 1.042.436 36.400.016      .4   .1   4.400.00180.600          0
 701 1 05.TTSB91091
.353 1.080.511 62.200.012      .4   .1   3.300.00180.500          0
 701 1 05.TTSB92092
.183 .814 .284 32.000.01100.00.4   .1   3.800.00180.600          0
 711 1 05.TTSB93093
.072 .720 .455 50.700.01131.11.4   .1   3.000.00180.500          0
 711 1 05.TTSB94094
.06  .644 .227 56.300.01128.89.4   .1   3.100.00180.500          0
 701 1 05.TTSB95095
.585 .985 .455 44.600.01000.00.4   .1   3.300.00180.500          0
 701 1 05.TTSB96096
.421 .909 .341 59.600.013      0.4  0.1  4.500.00180.600          0
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 1      Weld County I-25 Master Drainage Plan - Future Conditions, ACE 4/99
01 10 YEAR  0.030.060.140.230.380.180.090.070.060.050.050.050.050.050.050.040.03
01 10 YEAR  0.030.030.030.030.030.030.020.020.020.010.010.010.010.010.010.010.01
01 10 YEAR  0.010.01

 701 1 05.TTSB51051                                          0
.875 1.496.795 61.600.00500.00.4   .1   3.800.00180.600          00.00 0.00
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.954 1.572.53  48.600.00800.000.4  0.1  4.400.00180.600          0
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1.0011.648.644 40.500.00900.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB54054
.542 1.742.455 23.400.00800.000.4  0.1  4.300.00180.600          0
 701 1 05.TTSB55055
.272 .928 .436 41.000.01400.000.4  0.1  4.400.00180.600          0
 711 1 05.TTSB56056
.043 .341 .133 41.700.00320.000.4  0.1  4.500.00180.600          0
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.022 .246 .114 39.000.00417.22.4   0.1  4.500.00180.600          0
 711 1 05.TTSB58058
.027 .227 .076 36.700.00416.670.4  0.1  4.500.00180.600          0
 711 1 05.TTSB59059
.03  .341 .133 35.100.00520.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB60060
.084 .587 .246 48.100.00627.220.4  0.1  3.400.00180.500          0
 701 1 05.TTSB61061
.392 1.1930.30327.100.01100.000.4  0.1  3.400.00180.500          0
 701 1 05.TTSB62062
.169 .663 .208 50.000.01400.000.4  0.1  3.000.00180.500          0
 701 1 05.TTSB63063
.45  .975 .417 47.200.01500.000.4  0.1  3.100.00180.500          0
 701 1 05.TTSB70070
1.0691.667.795 27.100.00700.000.4  0.1  3.900.00180.600          0
 701 1 05.TTSB71071
.179 0.663.322 27.100.01600.000.4  0.1  4.600.00160.700          0
 701 1 05.TTSB72072
.614 .966 .455 47.500.01500.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB73073
.18  .777 .36  62.500.01600.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB74074
.507 1.117.473 44.200.01100.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB75075
1.1291.610.795 39.700.01500.000.4  0.1  4.200.00180.600          0
 711 1 05.TTSB76076
.077 .492 0.17050.000.01224.440.4  0.1  4.500.00180.600          0
 711 1 05.TTSB77077
.058 0.511.152 50.000.02025.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB78078
.057 .455 .208 50.000.01123.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB79079
.063 .587 .208 50.000.02127.220.4  0.1  4.500.00180.600          0
 711 1 05.TTSB80080
.066 .455 .189 45.100.00723.330.4  0.1  4.500.00180.600          0
 701 1 05.TTSB81081
.172 .682 .265 46.800.01800.00.4   .1   4.500.00180.600          0
 711 1 05.TTSB82082
.139 .720 .265 44.100.01231.11.4   .1   4.500.00180.600          0
 711 1 05.TTSB83083
.076 .549 .170 50.000.01326.11.4   .1   4.500.00180.600          0
 711 1 05.TTSB84084
.108 .663 .303 50.000.01829.44.4   .1   4.500.00180.600          0
 711 1 05.TTSB85085
.025 .189 .076 50.000.00615.56.4   .1   4.700.00180.600          0
 711 1 05.TTSB86086
.09  .814 .322 38.300.01833.89.4   .1   4.500.00180.600          0
 711 1 05.TTSB87087
.116 .739 .303 51.800.00531.67.4   .1   4.000.00180.600          0
 711 1 05.TTSB88088
.039 .587 .246 53.300.01627.22.4   .1   4.200.00180.600          0
 701 1 05.TTSB89089
.33  1.004.341 51.100.01200.00.4   .1   3.700.00180.500          0
 701 1 05.TTSB90090
.689 1.042.436 36.400.016      .4   .1   4.400.00180.600          0
 701 1 05.TTSB91091
.353 1.080.511 62.200.012      .4   .1   3.300.00180.500          0
 701 1 05.TTSB92092
.183 .814 .284 32.000.01100.00.4   .1   3.800.00180.600          0
 711 1 05.TTSB93093
.072 .720 .455 50.700.01131.11.4   .1   3.000.00180.500          0
 711 1 05.TTSB94094
.06  .644 .227 56.300.01128.89.4   .1   3.100.00180.500          0
 701 1 05.TTSB95095
.585 .985 .455 44.600.01000.00.4   .1   3.300.00180.500          0
 701 1 05.TTSB96096
.421 .909 .341 59.600.013      0.4  0.1  4.500.00180.600          0
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 1      Weld County I-25 Master Drainage Plan - Future Conditions, ACE 4/99
01 25 YEAR  0.030.070.110.170.290.460.180.150.090.080.070.070.070.060.060.040.04
01 25 YEAR  0.030.030.030.030.030.030.030.020.020.020.020.010.010.010.010.010.01
01 25 YEAR  0.010.01

 701 1 05.TTSB51051                                        0
.875 1.496.795 61.600.00500.00.4   .1   3.800.00180.600          00.00 0.00
 701 1 05.TTSB52052
.954 1.572.53  48.600.00800.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB53053
1.0011.648.644 40.500.00900.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB54054
.542 1.742.455 23.400.00800.000.4  0.1  4.300.00180.600          0
 701 1 05.TTSB55055
.272 .928 .436 41.000.01400.000.4  0.1  4.400.00180.600          0
 711 1 05.TTSB56056
.043 .341 .133 41.700.00320.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB57057
.022 .246 .114 39.000.00417.22.4   0.1  4.500.00180.600          0
 711 1 05.TTSB58058
.027 .227 .076 36.700.00416.670.4  0.1  4.500.00180.600          0
 711 1 05.TTSB59059
.03  .341 .133 35.100.00520.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB60060
.084 .587 .246 48.100.00627.220.4  0.1  3.400.00180.500          0
 701 1 05.TTSB61061
.392 1.1930.30327.100.01100.000.4  0.1  3.400.00180.500          0
 701 1 05.TTSB62062
.169 .663 .208 50.000.01400.000.4  0.1  3.000.00180.500          0
 701 1 05.TTSB63063
.45  .975 .417 47.200.01500.000.4  0.1  3.100.00180.500          0
 701 1 05.TTSB70070
1.0691.667.795 27.100.00700.000.4  0.1  3.900.00180.600          0
 701 1 05.TTSB71071
.179 0.663.322 27.100.01600.000.4  0.1  4.600.00160.700          0
 701 1 05.TTSB72072
.614 .966 .455 47.500.01500.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB73073
.18  .777 .36  62.500.01600.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB74074
.507 1.117.473 44.200.01100.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB75075
1.1291.610.795 39.700.01500.000.4  0.1  4.200.00180.600          0
 711 1 05.TTSB76076
.077 .492 0.17050.000.01224.440.4  0.1  4.500.00180.600          0
 711 1 05.TTSB77077
.058 0.511.152 50.000.02025.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB78078
.057 .455 .208 50.000.01123.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB79079
.063 .587 .208 50.000.02127.220.4  0.1  4.500.00180.600          0
 711 1 05.TTSB80080
.066 .455 .189 45.100.00723.330.4  0.1  4.500.00180.600          0
 701 1 05.TTSB81081
.172 .682 .265 46.800.01800.00.4   .1   4.500.00180.600          0
 711 1 05.TTSB82082
.139 .720 .265 44.100.01231.11.4   .1   4.500.00180.600          0
 711 1 05.TTSB83083
.076 .549 .170 50.000.01326.11.4   .1   4.500.00180.600          0
 711 1 05.TTSB84084
.108 .663 .303 50.000.01829.44.4   .1   4.500.00180.600          0
 711 1 05.TTSB85085
.025 .189 .076 50.000.00615.56.4   .1   4.700.00180.600          0
 711 1 05.TTSB86086
.09  .814 .322 38.300.01833.89.4   .1   4.500.00180.600          0
 711 1 05.TTSB87087
.116 .739 .303 51.800.00531.67.4   .1   4.000.00180.600          0
 711 1 05.TTSB88088
.039 .587 .246 53.300.01627.22.4   .1   4.200.00180.600          0
 701 1 05.TTSB89089
.33  1.004.341 51.100.01200.00.4   .1   3.700.00180.500          0
 701 1 05.TTSB90090
.689 1.042.436 36.400.016     .4   .1   4.400.00180.600          0
 701 1 05.TTSB91091
.353 1.080.511 62.200.012     .4   .1   3.300.00180.500          0
 701 1 05.TTSB92092
.183 .814 .284 32.000.01100.00.4   .1   3.800.00180.600          0
 711 1 05.TTSB93093
.072 .720 .455 50.700.01131.11.4   .1   3.000.00180.500          0
 711 1 05.TTSB94094
.06  .644 .227 56.300.01128.89.4   .1   3.100.00180.500          0
 701 1 05.TTSB95095
.585 .985 .455 44.600.01000.00.4   .1   3.300.00180.500          0
 701 1 05.TTSB96096
.421 .909 .341 59.600.013     0.4  0.1  4.500.00180.600          0
E
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 1      Weld County I-25 Master Drainage Plan - Future Conditions, ACE 4/99
01 50 YEAR  0.030.080.120.190.320.530.260.190.120.120.080.080.080.060.060.040.04
01 50 YEAR  0.030.030.030.030.030.030.030.020.020.020.010.010.010.010.010.010.01
01 50 YEAR  0.010.01

 701 1 05.TTSB51051                                        0
.875 1.496.795 61.600.00500.00.4   .1   3.800.00180.600          00.00 0.00
 701 1 05.TTSB52052
.954 1.572.53  48.600.00800.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB53053
1.0011.648.644 40.500.00900.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB54054
.542 1.742.455 23.400.00800.000.4  0.1  4.300.00180.600          0
 701 1 05.TTSB55055
.272 .928 .436 41.000.01400.000.4  0.1  4.400.00180.600          0
 711 1 05.TTSB56056
.043 .341 .133 41.700.00320.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB57057
.022 .246 .114 39.000.00417.22.4   0.1  4.500.00180.600          0
 711 1 05.TTSB58058
.027 .227 .076 36.700.00416.670.4  0.1  4.500.00180.600          0
 711 1 05.TTSB59059
.03  .341 .133 35.100.00520.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB60060
.084 .587 .246 48.100.00627.220.4  0.1  3.400.00180.500          0
 701 1 05.TTSB61061
.392 1.1930.30327.100.01100.000.4  0.1  3.400.00180.500          0
 701 1 05.TTSB62062
.169 .663 .208 50.000.01400.000.4  0.1  3.000.00180.500          0
 701 1 05.TTSB63063
.45  .975 .417 47.200.01500.000.4  0.1  3.100.00180.500          0
 701 1 05.TTSB70070
1.0691.667.795 27.100.00700.000.4  0.1  3.900.00180.600          0
 701 1 05.TTSB71071
.179 0.663.322 27.100.01600.000.4  0.1  4.600.00160.700          0
 701 1 05.TTSB72072
.614 .966 .455 47.500.01500.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB73073
.18  .777 .36  62.500.01600.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB74074
.507 1.117.473 44.200.01100.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB75075
1.1291.610.795 39.700.01500.000.4  0.1  4.200.00180.600          0
 711 1 05.TTSB76076
.077 .492 0.17050.000.01224.440.4  0.1  4.500.00180.600          0
 711 1 05.TTSB77077
.058 0.511.152 50.000.02025.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB78078
.057 .455 .208 50.000.01123.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB79079
.063 .587 .208 50.000.02127.220.4  0.1  4.500.00180.600          0
 711 1 05.TTSB80080
.066 .455 .189 45.100.00723.330.4  0.1  4.500.00180.600          0
 701 1 05.TTSB81081
.172 .682 .265 46.800.01800.00.4   .1   4.500.00180.600          0
 711 1 05.TTSB82082
.139 .720 .265 44.100.01231.11.4   .1   4.500.00180.600          0
 711 1 05.TTSB83083
.076 .549 .170 50.000.01326.11.4   .1   4.500.00180.600          0
 711 1 05.TTSB84084
.108 .663 .303 50.000.01829.44.4   .1   4.500.00180.600          0
 711 1 05.TTSB85085
.025 .189 .076 50.000.00615.56.4   .1   4.700.00180.600          0
 711 1 05.TTSB86086
.09  .814 .322 38.300.01833.89.4   .1   4.500.00180.600          0
 711 1 05.TTSB87087
.116 .739 .303 51.800.00531.67.4   .1   4.000.00180.600          0
 711 1 05.TTSB88088
.039 .587 .246 53.300.01627.22.4   .1   4.200.00180.600          0
 701 1 05.TTSB89089
.33  1.004.341 51.100.01200.00.4   .1   3.700.00180.500          0
 701 1 05.TTSB90090
.689 1.042.436 36.400.016     .4   .1   4.400.00180.600          0
 701 1 05.TTSB91091
.353 1.080.511 62.200.012     .4   .1   3.300.00180.500          0
 701 1 05.TTSB92092
.183 .814 .284 32.000.01100.00.4   .1   3.800.00180.600          0
 711 1 05.TTSB93093
.072 .720 .455 50.700.01131.11.4   .1   3.000.00180.500          0
 711 1 05.TTSB94094
.06  .644 .227 56.300.01128.89.4   .1   3.100.00180.500          0
 701 1 05.TTSB95095
.585 .985 .455 44.600.01000.00.4   .1   3.300.00180.500          0
 701 1 05.TTSB96096
.421 .909 .341 59.600.013     0.4  0.1  4.500.00180.600          0
E
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 1       Weld County I-25 Master Drainage Plan - Future Conditions, ACE 4/99
01 100 YEAR 0.030.080.120.210.340.600.340.210.170.130.110.110.110.050.050.030.03
01 100 YEAR 0.030.030.030.030.030.030.030.020.020.020.020.020.020.010.010.010.01
01 100 YEAR 0.010.01

 701 1 05.TTSB51051                                          0
.875 1.496.795 61.600.00500.00.4   .1   3.800.00180.600          00.00 0.00
 701 1 05.TTSB52052
.954 1.572.53  48.600.00800.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB53053
1.0011.648.644 40.500.00900.000.4  0.1  4.400.00180.600          0
 701 1 05.TTSB54054
.542 1.742.455 23.400.00800.000.4  0.1  4.300.00180.600          0
 701 1 05.TTSB55055
.272 .928 .436 41.000.01400.000.4  0.1  4.400.00180.600          0
 711 1 05.TTSB56056
.043 .341 .133 41.700.00320.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB57057
.022 .246 .114 39.000.00417.22.4   0.1  4.500.00180.600          0
 711 1 05.TTSB58058
.027 .227 .076 36.700.00416.670.4  0.1  4.500.00180.600          0
 711 1 05.TTSB59059
.03  .341 .133 35.100.00520.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB60060
.084 .587 .246 48.100.00627.220.4  0.1  3.400.00180.500          0
 701 1 05.TTSB61061
.392 1.1930.30327.100.01100.000.4  0.1  3.400.00180.500          0
 701 1 05.TTSB62062
.169 .663 .208 50.000.01400.000.4  0.1  3.000.00180.500          0
 701 1 05.TTSB63063
.45  .975 .417 47.200.01500.000.4  0.1  3.100.00180.500          0
 701 1 05.TTSB70070
1.0691.667.795 27.100.00700.000.4  0.1  3.900.00180.600          0
 701 1 05.TTSB71071
.179 0.663.322 27.100.01600.000.4  0.1  4.600.00160.700          0
 701 1 05.TTSB72072
.614 .966 .455 47.500.01500.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB73073
.18  .777 .36  62.500.01600.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB74074
.507 1.117.473 44.200.01100.000.4  0.1  4.500.00180.600          0
 701 1 05.TTSB75075
1.1291.610.795 39.700.01500.000.4  0.1  4.200.00180.600          0
 711 1 05.TTSB76076
.077 .492 0.17050.000.01224.440.4  0.1  4.500.00180.600          0
 711 1 05.TTSB77077
.058 0.511.152 50.000.02025.000.4  0.1  4.500.00180.600          0
 711 1 05.TTSB78078
.057 .455 .208 50.000.01123.330.4  0.1  4.500.00180.600          0
 711 1 05.TTSB79079
.063 .587 .208 50.000.02127.220.4  0.1  4.500.00180.600          0
 711 1 05.TTSB80080
.066 .455 .189 45.100.00723.330.4  0.1  4.500.00180.600          0
 701 1 05.TTSB81081
.172 .682 .265 46.800.01800.00.4   .1   4.500.00180.600          0
 711 1 05.TTSB82082
.139 .720 .265 44.100.01231.11.4   .1   4.500.00180.600          0
 711 1 05.TTSB83083
.076 .549 .170 50.000.01326.11.4   .1   4.500.00180.600          0
 711 1 05.TTSB84084
.108 .663 .303 50.000.01829.44.4   .1   4.500.00180.600          0
 711 1 05.TTSB85085
.025 .189 .076 50.000.00615.56.4   .1   4.700.00180.600          0
 711 1 05.TTSB86086
.09  .814 .322 38.300.01833.89.4   .1   4.500.00180.600          0
 711 1 05.TTSB87087
.116 .739 .303 51.800.00531.67.4   .1   4.000.00180.600          0
 711 1 05.TTSB88088
.039 .587 .246 53.300.01627.22.4   .1   4.200.00180.600          0
 701 1 05.TTSB89089
.33  1.004.341 51.100.01200.00.4   .1   3.700.00180.500          0
 701 1 05.TTSB90090
.689 1.042.436 36.400.016      .4   .1   4.400.00180.600          0
 701 1 05.TTSB91091
.353 1.080.511 62.200.012      .4   .1   3.300.00180.500          0
 701 1 05.TTSB92092
.183 .814 .284 32.000.01100.00.4   .1   3.800.00180.600          0
 711 1 05.TTSB93093
.072 .720 .455 50.700.01131.11.4   .1   3.000.00180.500          0
 711 1 05.TTSB94094
.06  .644 .227 56.300.01128.89.4   .1   3.100.00180.500          0
 701 1 05.TTSB95095
.585 .985 .455 44.600.01000.00.4   .1   3.300.00180.500          0
 701 1 05.TTSB96096
.421 .909 .341 59.600.013      0.4  0.1  4.500.00180.600          0
E
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II-F

CUHP OUTPUT SUMMARY PROGRAM

```
update$ = "06/08/99"      'Date Last Updated
title$ = "CUHPSUM.BAS - CUHP INPUT & OUTPUT DATA STRIPPER"
CONST maxevents = 6
CONST maxbasins = 50
DIM id(maxbasins) AS STRING
DIM area(maxbasins)
DIM basinlength(maxbasins)
DIM distance(maxbasins)
DIM imperv(maxbasins)
DIM slope(maxbasins)
DIM duration(maxbasins)
DIM runoff(maxevents, maxbasins)
DIM totalvol(maxevents)
DIM peakq(maxevents, maxbasins)
DIM peaktime(maxevents, maxbasins)
DIM outname(maxevents) AS STRING
DIM sumname(maxevents) AS STRING
DIM search$(4)
search$(1) = "BASIN ID:"
search$(2) = "VOLUME OF EXCESS PRECIP ="
search$(3) = "(MIN)"

CLS
PRINT title$
PRINT "PROGRAM LAST UPDATED ON: "; update$
PRINT
err1:
INPUT "Enter 1 for Godding or 2 for Tri-Town or 3 for Other"; mainbasin
INPUT "Enter 1 for Historic, 2 for Existing or 3 for Future"; condition
SELECT CASE mainbasin
  CASE 1
        SELECT CASE condition
        CASE 1
        PRINT "No Historic Condition Available"
        GOTO err1:
        CASE 2
        outname(1) = "P:\coweld01\existi~1\Goddin~1\2_Year\cuhp\ghxc2yr.cho"
        sumname(1) = "P:\coweld01\existi~1\Goddin~1\2_Year\cuhp\ghxc2yr.txt"
        outname(2) = "P:\coweld01\existi~1\Goddin~1\5_Year\cuhp\ghxc5yr.cho"
        sumname(2) = "P:\coweld01\existi~1\Goddin~1\5_Year\cuhp\ghxc5yr.txt"
        outname(3) = "P:\coweld01\existi~1\Goddin~1\10_Year\cuhp\ghxc10yr.cho"
        sumname(3) = "P:\coweld01\existi~1\Goddin~1\10_Year\cuhp\ghxc10yr.txt"
        outname(4) = "P:\coweld01\existi~1\Goddin~1\25_Year\cuhp\ghxc25yr.cho"
        sumname(4) = "P:\coweld01\existi~1\Goddin~1\25_Year\cuhp\ghxc25yr.txt"
        outname(5) = "P:\coweld01\existi~1\Goddin~1\50_Year\cuhp\ghxc50yr.cho"
        sumname(5) = "P:\coweld01\existi~1\Goddin~1\50_Year\cuhp\ghxc50yr.txt"
        outname(6) = "P:\coweld01\existi~1\Goddin~1\100_Year\cuhp\ghxc100y.cho"
        sumname(6) = "P:\coweld01\existi~1\Goddin~1\100_Year\cuhp\ghxc100y.txt"
        numevents = 6
        CASE 3
        outname(1) = "P:\coweld01\future~1\Goddin~1\2_Year\cuhp\ghfc2yr.cho"
        sumname(1) = "P:\coweld01\future~1\Goddin~1\2_Year\cuhp\ghfc2yr.txt"
        outname(2) = "P:\coweld01\future~1\Goddin~1\5_Year\cuhp\ghfc5yr.cho"
        sumname(2) = "P:\coweld01\future~1\Goddin~1\5_Year\cuhp\ghfc5yr.txt"
        outname(3) = "P:\coweld01\future~1\Goddin~1\10_Year\cuhp\ghfc10yr.cho"
        sumname(3) = "P:\coweld01\future~1\Goddin~1\10_Year\cuhp\ghfc10yr.txt"
        outname(4) = "P:\coweld01\future~1\Goddin~1\25_Year\cuhp\ghfc25yr.cho"
        sumname(4) = "P:\coweld01\future~1\Goddin~1\25_Year\cuhp\ghfc25yr.txt"
        outname(5) = "P:\coweld01\future~1\Goddin~1\50_Year\cuhp\ghfc50yr.cho"
        sumname(5) = "P:\coweld01\future~1\Goddin~1\50_Year\cuhp\ghfc50yr.txt"
        outname(6) = "P:\coweld01\future~1\Goddin~1\100_Year\cuhp\ghfc100y.cho"
        sumname(6) = "P:\coweld01\future~1\Goddin~1\100_Year\cuhp\ghfc100y.txt"
        numevents = 6
        END SELECT     'condition
  CASE 2
        SELECT CASE condition
        CASE 1
        outname(1) = "P:\coweld01\histor~1\TriTow~1\2_Year\cuhp\tthc2yr.cho"
        sumname(1) = "P:\coweld01\histor~1\TriTow~1\2_Year\cuhp\tthc2yr.txt"
        numevents = 1
        CASE 2
        outname(1) = "P:\coweld01\existi~1\TriTow~1\2_Year\cuhp\ttxc2yr.cho"
        sumname(1) = "P:\coweld01\existi~1\TriTow~1\2_Year\cuhp\ttxc2yr.txt"
        outname(2) = "P:\coweld01\existi~1\TriTow~1\5_Year\cuhp\ttxc5yr.cho"
        sumname(2) = "P:\coweld01\existi~1\TriTow~1\5_Year\cuhp\ttxc5yr.txt"
        outname(3) = "P:\coweld01\existi~1\TriTow~1\10_Year\cuhp\ttxc10yr.cho"
        sumname(3) = "P:\coweld01\existi~1\TriTow~1\10_Year\cuhp\ttxc10yr.txt"
        outname(4) = "P:\coweld01\existi~1\TriTow~1\25_Year\cuhp\ttxc25yr.cho"
        sumname(4) = "P:\coweld01\existi~1\TriTow~1\25_Year\cuhp\ttxc25yr.txt"
        outname(5) = "P:\coweld01\existi~1\TriTow~1\50_Year\cuhp\ttxc50yr.cho"
        sumname(5) = "P:\coweld01\existi~1\TriTow~1\50_Year\cuhp\ttxc50yr.txt"
        outname(6) = "P:\coweld01\existi~1\TriTow~1\100_Year\cuhp\ttxc100y.cho"
        sumname(6) = "P:\coweld01\existi~1\TriTow~1\100_Year\cuhp\ttxc100y.txt"
        numevents = 6
        CASE 3
        outname(1) = "P:\coweld01\future~1\TriTow~1\2_Year\cuhp\ttfc2yr.cho"
        sumname(1) = "P:\coweld01\future~1\TriTow~1\2_Year\cuhp\ttfc2yr.txt"
        outname(2) = "P:\coweld01\future~1\TriTow~1\5_Year\cuhp\ttfc5yr.cho"
        sumname(2) = "P:\coweld01\future~1\TriTow~1\5_Year\cuhp\ttfc5yr.txt"
        outname(3) = "P:\coweld01\future~1\TriTow~1\10_Year\cuhp\ttfc10yr.cho"
        sumname(3) = "P:\coweld01\future~1\TriTow~1\10_Year\cuhp\ttfc10yr.txt"
        outname(4) = "P:\coweld01\future~1\TriTow~1\25_Year\cuhp\ttfc25yr.cho"
        sumname(4) = "P:\coweld01\future~1\TriTow~1\25_Year\cuhp\ttfc25yr.txt"
        outname(5) = "P:\coweld01\future~1\TriTow~1\50_Year\cuhp\ttfc50yr.cho"
        sumname(5) = "P:\coweld01\future~1\TriTow~1\50_Year\cuhp\ttfc50yr.txt"
        outname(6) = "P:\coweld01\future~1\TriTow~1\100_Year\cuhp\ttfc100y.cho"
        sumname(6) = "P:\coweld01\future~1\TriTow~1\100_Year\cuhp\ttfc100y.txt"
        numevents = 6
        END SELECT     'condition
  CASE 3
```

```
'        outname(1) = "a:\cuhp\ghxcl0yr.cho"
'        sumname(1) = "a:\cuhp\ghxcl0yr.txt"
        numevents = 1
END SELECT      'mainbasin

FOR eventnum = 1 TO numevents

PRINT "Now Working On:"
PRINT outname(eventnum); eventnum
OPEN outname(eventnum) FOR INPUT AS #1
OPEN sumname(eventnum) FOR OUTPUT AS #2

numbasins = 0: basinnum = 0

WHILE NOT EOF(1)

WHILE INSTR(sent$, search$(1)) = 0 AND NOT EOF(1)
  LINE INPUT #1, sent$
WEND
basinnum = basinnum + 1

'PRINT sent$
id(basinnum) = LTRIM$(MID$(sent$, INSTR(sent$, search$(1)) + LEN(search$(1)), 8))
'PRINT basinnum
'PRINT id(basinnum)

WHILE INSTR(sent$, search$(3)) = 0 AND NOT EOF(1)
  LINE INPUT #1, sent$
WEND
IF NOT EOF(1) THEN LINE INPUT #1, sent$
IF NOT EOF(1) THEN INPUT #1, area(basinnum), basinlength(basinnum), distance(basinnum), imperv(basinnum), slope(basinnum),
duration(basinnum)
'PRINT area(basinnum), basinlength(basinnum), distance(basinnum), imperv(basinnum), slope(basinnum), area(basinnum), basinlength(basinnum),
distance(basinnum), imperv(basinnum), slope(basinnum), duration(basinnum)
'WHILE INKEY$ = "": WEND
'PRINT

WHILE INSTR(sent$, search$(2)) = 0 AND NOT EOF(1)
'WHILE NOT EOF(1) AND LEFT$(sent$, 16) <> "          VOLUME" AND NOT EOF(1)
  LINE INPUT #1, sent$
WEND
runoff(eventnum, basinnum) = VAL(MID$(sent$, INSTR(sent$, search$(2)) + LEN(search$(2)), 8))
IF NOT EOF(1) THEN LINE INPUT #1, sent$
peakq(eventnum, basinnum) = VAL(MID$(sent$, INSTR(sent$, "PEAK Q =") + LEN("PEAK Q ="), 6))
peaktime(eventnum, basinnum) = VAL(MID$(sent$, INSTR(sent$, "TIME OF PEAK =") + LEN("TIME OF PEAK ="), 5))
PRINT runoff(eventnum, basinnum), peakq(eventnum, basinnum), peaktime(eventnum, basinnum)
IF NOT EOF(1) THEN LINE INPUT #1, sent$

WEND 'not eof(1)
numbasins = basinnum - 1
totalarea = 0: totalbasinlength = 0: totaldistance = 0: totalimperv = 0
totalslope = 0:  totalduration = 0:   totalrunoff = 0: totalpeakq = 0
totalpeaktime = 0: totalqa = 0
'FOR x = 1 TO numbasins: totalarea = totalarea + area(x): NEXT
'PRINT totalarea
CLOSE #1

PRINT #2, DATE$; "  "; TIME$
PRINT #2, "Summary File: "; sumname(eventnum)
PRINT #2, "BASIN "; " AREA"; " LENGTH"; " DIST. "; "IMPERV."; " SLOPE "; "DURATION"; " VOLUME "; " PEAKQ "; " PEAKT "; "  Q/AREA "
PRINT #2, "ID   "; " (SQMI)"; " (MI) "; " (MI)  "; "  (%)  "; "(FT/FT)"; "  (MIN) "; " (ACFT) "; " (CFS) "; " (MIN) "; " (CFS/AC)"
FOR x = 1 TO numbasins
 PRINT #2, id(x); area(x); basinlength(x); distance(x); imperv(x); slope(x); duration(x); runoff(eventnum, x); peakq(eventnum, x);
peaktime(eventnum, x); INT(peakq(eventnum, x) / area(x) / 640 * 100) / 100
 totalarea = totalarea + area(x)
 totalbasinlength = totalbasinlength + basinlength(x)
 totaldistance = totaldistance + distance(x)
 totalimperv = totalimperv + imperv(x)
 totalslope = totalslope + slope(x)
 totalduration = totalduration + duration(x)
 totalrunoff = totalrunoff + runoff(eventnum, x)
 totalpeakq = totalpeakq + peakq(eventnum, x)
 totalpeaktime = totalpeaktime + peaktime(eventnum, x)
 totalqa = totalqa + INT(peakq(eventnum, x) / area(x) / 640 * 100) / 100
NEXT x
PRINT #2,
PRINT #2, USING "Total ###.# ###.# ##.## & & & ####.# ###### & &"; totalarea; totalbasinlength; totaldistance; "_"; "_"; "_"; totalrunoff;
totalpeakq; "_"; "_"
PRINT #2, USING "Average ###.# ###.# ##.## ###.# #.### "; totalarea / numbasins; totalbasinlength / numbasins; totaldistance / numbasins;
totalimperv / numbasins; totalslope / numbasins;
PRINT #2, USING "##.# ####.# ###### ### ##.#"; totalduration / numbasins; totalrunoff / numbasins; totalpeakq / numbasins; totalpeaktime /
numbasins; totalqa / numbasins
PRINT #2,

CLOSE #2

NEXT eventnum
SELECT CASE mainbasin
  CASE 1
        SELECT CASE condition
          CASE 1
          CASE 2
                filename$ = "P:\coweld01\existi~1\Goddin~1\ghexcuhp.txt"
          CASE 3
                filename$ = "P:\coweld01\future~1\Goddin~1\ghfucuhp.txt"
        END SELECT
  CASE 2
        SELECT CASE condition
          CASE 1
          CASE 2
```

```
            filename$ = "P:\coweld01\existi-1\TriTow-1\ttexcuhp.txt"
        CASE 3
            filename$ = "P:\coweld01\future-1\TriTow-1\ttfucuhp.txt"
      END SELECT

  CASE 3
      SELECT CASE condition
        CASE 1
            filename$ = "P:\coweld01\histor-1\TriTow-1\tthccuhp.txt"
        CASE 2
            filename$ = "A:\ghexcuhp.txt"
        CASE 3
      END SELECT

END SELECT
'PRINT mainbasin, condition, "fn =", filename$
'WHILE INKEY$ = "": WEND
OPEN filename$ FOR OUTPUT AS #2
FOR eventnum = 1 TO numevents: totalvol(eventnum) = 0:  NEXT eventnum
PRINT #2, DATE$; "  "; TIME$
PRINT #2, "Summary File: "; filename$
PRINT #2, "_ "; "2-YrVol "; "5-YrVol "; "10-YrVol "; "25-YrVol "; "50-YrVol "; "100-YrVol "
PRINT #2, "BASIN "; "2-YEAR "; "5-YEAR "; "10-YEAR "; "25-YEAR "; "50-YEAR "; "100-YEAR "
PRINT #2, "ID "; "VOLUME "; "VOLUME "; "VOLUME "; "VOLUME "; "VOLUME "; "VOLUME "
PRINT #2, "_ "; "(ac.ft.) "; "(ac.ft.) "; "(ac.ft.) "; "(ac.ft.) "; "(ac.ft.) "; "(ac.ft.) "
FOR basinnum = 1 TO numbasins
  PRINT #2, id(basinnum);
  FOR eventnum = 1 TO numevents
   PRINT #2, USING "####.# "; runoff(eventnum, basinnum);
   totalvol(eventnum) = totalvol(eventnum) + runoff(eventnum, basinnum)
  NEXT eventnum
  PRINT #2,
NEXT basinnum
PRINT #2, "Total ";
FOR eventnum = 1 TO numevents: PRINT #2, USING " #####.# "; totalvol(eventnum); : NEXT eventnum
PRINT #2,
PRINT #2, "Average ";
FOR eventnum = 1 TO numevents: PRINT #2, USING " ####.# "; totalvol(eventnum) / numbasins; : NEXT eventnum

FOR eventnum = 1 TO numevents: totalpeakq(eventnum) = 0: totalpeaktime(eventnum) = 0: NEXT eventnum
PRINT #2,
PRINT #2, "_ "
PRINT #2, DATE$; "  "; TIME$
PRINT #2, "Summary File: "; filename$
PRINT #2, "_ "; "2-YrPkQ "; "2-YrPkT "; "5-YrPkQ "; "5-YrPkT "; "10-YrPkQ "; "10-YrPkT "; "25-YrPkQ "; "25-YrPkT "; "50-YrPkQ "; "50-YrPkT
"; "100-YrPkQ "; "100-YrPkT "
PRINT #2, "BASIN "; "2-YEAR "; "_ "; "5-YEAR "; "_ "; "10-YEAR "; "_ "; "25-YEAR "; "_ "; "50-YEAR "; "_ "; "100-YEAR "
PRINT #2, "ID "; "PEAK_Q "; "TIME_Pk "; "PEAK_Q "; "TIME_Pk "; "PEAK_Q "; "TIME_Pk "; "PEAK_Q "; "TIME_Pk "; "PEAK_Q "; "TIME_Pk "; "PEAK_Q
"; "TIME_Pk "
PRINT #2, "_ "; "(cfs) "; "(min) "; "(cfs) "; "(min) "; "(cfs) "; "(min) "; "(cfs) "; "(min) "; "(cfs) "; "(min) "; "(cfs) "; "(min) "
FOR basinnum = 1 TO numbasins
  PRINT #2, id(basinnum);
  FOR eventnum = 1 TO numevents
   PRINT #2, peakq(eventnum, basinnum), peaktime(eventnum, basinnum);
   totalpeakq(eventnum) = totalpeakq(eventnum) + peakq(eventnum, basinnum)
   totalpeaktime(eventnum) = totalpeaktime(eventnum) + peaktime(eventnum, basinnum)
  NEXT eventnum
  PRINT #2,
NEXT basinnum
PRINT #2, "Total ";
FOR eventnum = 1 TO numevents: PRINT #2, totalpeakq(eventnum); " _ "; : NEXT eventnum
PRINT #2,
PRINT #2, "Average ";
FOR eventnum = 1 TO numevents
  PRINT #2, USING " ####  #### "; totalpeakq(eventnum) / numbasins; totalpeaktime(eventnum) / numbasins;
NEXT eventnum

CLOSE #2

END
```

II-G

CUHP SUMMARY OUTPUT

6/8/99 14:05:24
Summary File: P:\coweld01\existi~1\TriTow~1\2_Year\cuhp\ttxc2yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
TTSB51	0.88	1.44	0.80	21.3	0.005	5	7.46	47	55	0.08
TTSB52	0.95	1.51	0.53	19.3	0.008	5	7.02	54	50	0.08
TTSB53	1.00	1.59	0.64	15.0	0.009	5	5.27	36	50	0.05
TTSB54	0.54	1.69	0.46	10.5	0.008	5	1.77	12	50	0.03
TTSB55	0.27	0.87	0.44	25.0	0.014	5	2.83	29	40	0.16
TTSB56	0.04	0.28	0.13	30.8	0.003	5	0.59	9	30	0.35
TTSB57	0.02	0.19	0.11	27.5	0.004	5	0.26	3	35	0.23
TTSB58	0.03	0.17	0.08	23.2	0.004	5	0.25	3	35	0.15
TTSB59	0.03	0.28	0.13	21.1	0.005	5	0.25	3	35	0.15
TTSB60	0.08	0.59	0.25	48.1	0.006	5	2.12	27	35	0.52
TTSB61	0.39	1.14	0.30	10.0	0.011	5	1.39	13	45	0.05
TTSB62	0.17	0.66	0.21	50.0	0.014	5	4.48	80	30	0.73
TTSB63	0.45	0.92	0.42	10.2	0.015	5	1.67	16	45	0.05
TTSB70	1.07	1.61	0.80	21.7	0.007	5	9.31	62	55	0.09
TTSB71	0.18	0.61	0.32	10.3	0.016	5	0.48	5	40	0.04
TTSB72	0.61	0.91	0.46	25.9	0.015	5	6.69	76	40	0.19
TTSB73	0.18	0.72	0.36	10.0	0.016	5	0.54	5	40	0.04
TTSB74	0.51	1.06	0.47	15.3	0.011	5	2.73	23	45	0.07
TTSB75	1.13	1.55	0.80	11.1	0.015	5	3.99	28	50	0.03
TTSB76	0.08	0.49	0.17	50.0	0.012	5	1.98	26	35	0.50
TTSB77	0.06	0.46	0.15	17.4	0.020	5	0.37	2	45	0.05
TTSB78	0.06	0.46	0.21	50.0	0.011	5	1.47	19	35	0.49
TTSB79	0.06	0.53	0.21	23.2	0.021	5	0.59	3	50	0.07
TTSB80	0.07	0.46	0.19	42.8	0.007	5	1.42	19	35	0.42
TTSB81	0.17	0.63	0.26	29.4	0.018	5	2.22	31	35	0.28
TTSB82	0.14	0.66	0.26	10.8	0.012	5	0.47	2	60	0.02
TTSB83	0.08	0.55	0.17	33.8	0.013	5	1.19	15	35	0.29
TTSB84	0.11	0.61	0.30	18.4	0.018	5	0.74	3	55	0.04
TTSB85	0.03	0.19	0.08	31.4	0.006	5	0.35	5	30	0.26
TTSB86	0.09	0.76	0.32	22.5	0.018	5	0.81	5	45	0.08
TTSB87	0.12	0.74	0.30	51.8	0.005	5	3.13	36	40	0.46
TTSB88	0.04	0.53	0.25	32.8	0.016	5	0.59	7	35	0.27
TTSB89	0.33	0.95	0.34	15.3	0.012	5	1.99	19	40	0.08
TTSB90	0.69	0.99	0.44	23.6	0.016	5	6.63	74	40	0.16
TTSB91	0.35	1.02	0.51	58.3	0.012	5	11.11	163	35	0.72
TTSB92	0.18	0.76	0.28	10.8	0.011	5	0.63	6	40	0.05
TTSB93	0.07	0.66	0.46	50.7	0.011	5	1.94	23	35	0.51
TTSB94	0.06	0.59	0.23	17.6	0.011	5	0.44	2	45	0.05
TTSB95	0.58	0.93	0.46	10.0	0.010	5	2.09	18	45	0.04
TTSB96	0.42	0.85	0.34	29.7	0.013	5	5.52	70	35	0.26
Total	12.30	31.60	13.64	_	_	_	104.80	1079	_	_
Average	0.30	0.80	0.34	25.9	0.011	5	2.60	27	41	0.20

6/8/99 14:05:25
Summary File: P:\coweld01\existi~1\TriTow~1\5_Year\cuhp\ttxc5yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
TTSB51	0.88	1.44	0.80	21.3	0.005	5	14.90	100	55	0.17
TTSB52	0.95	1.51	0.53	19.3	0.008	5	14.08	113	50	0.18
TTSB53	1.00	1.59	0.64	15.0	0.009	5	11.72	83	55	0.12
TTSB54	0.54	1.69	0.46	10.5	0.008	5	4.76	33	50	0.09
TTSB55	0.27	0.87	0.44	25.0	0.014	5	5.16	57	40	0.32
TTSB56	0.04	0.28	0.13	30.8	0.003	5	1.00	16	30	0.62
TTSB57	0.02	0.19	0.11	27.5	0.004	5	0.46	7	35	0.54
TTSB58	0.03	0.17	0.08	23.2	0.004	5	0.47	7	35	0.36
TTSB59	0.03	0.28	0.13	21.1	0.005	5	0.48	7	35	0.36
TTSB60	0.08	0.59	0.25	48.1	0.006	5	3.38	47	35	0.91
TTSB61	0.39	1.14	0.30	10.0	0.011	5	5.20	51	45	0.20
TTSB62	0.17	0.66	0.21	50.0	0.014	5	7.13	139	30	1.27
TTSB63	0.45	0.92	0.42	10.2	0.015	5	6.35	66	45	0.22
TTSB70	1.07	1.61	0.80	21.7	0.007	5	18.34	130	55	0.18
TTSB71	0.18	0.61	0.32	10.3	0.016	5	1.04	11	35	0.09
TTSB72	0.61	0.91	0.46	25.9	0.015	5	11.98	144	40	0.36
TTSB73	0.18	0.72	0.36	10.0	0.016	5	1.47	15	40	0.13
TTSB74	0.51	1.06	0.47	15.3	0.011	5	5.97	53	45	0.16
TTSB75	1.13	1.55	0.80	11.1	0.015	5	10.52	77	55	0.10
TTSB76	0.08	0.49	0.17	50.0	0.012	5	2.96	42	35	0.82
TTSB77	0.06	0.46	0.15	17.4	0.020	5	0.77	5	45	0.13
TTSB78	0.06	0.46	0.21	50.0	0.011	5	2.19	31	35	0.80
TTSB79	0.06	0.53	0.21	23.2	0.021	5	1.10	5	50	0.13
TTSB80	0.07	0.46	0.19	42.8	0.007	5	2.17	31	35	0.69
TTSB81	0.17	0.63	0.26	29.4	0.018	5	3.82	58	35	0.53
TTSB82	0.14	0.66	0.26	10.8	0.012	5	1.21	5	60	0.05
TTSB83	0.08	0.55	0.17	33.8	0.013	5	1.95	27	35	0.52
TTSB84	0.11	0.61	0.30	18.4	0.018	5	1.51	7	55	0.09
TTSB85	0.03	0.19	0.08	31.4	0.006	5	0.59	9	35	0.46
TTSB86	0.09	0.76	0.32	22.5	0.018	5	1.53	10	45	0.17
TTSB87	0.12	0.74	0.30	51.8	0.005	5	4.68	58	40	0.75
TTSB88	0.04	0.53	0.25	32.8	0.016	5	0.98	13	35	0.50
TTSB89	0.33	0.95	0.34	15.3	0.012	5	5.29	53	40	0.25
TTSB90	0.69	0.99	0.44	23.6	0.016	5	12.34	146	40	0.33
TTSB91	0.35	1.02	0.51	58.3	0.012	5	16.88	269	35	1.20
TTSB92	0.18	0.76	0.28	10.8	0.011	5	1.78	19	40	0.16
TTSB93	0.07	0.66	0.46	50.7	0.011	5	3.07	39	35	0.87
TTSB94	0.06	0.59	0.23	17.6	0.011	5	1.14	7	45	0.18
TTSB95	0.58	0.93	0.46	10.0	0.010	5	7.90	76	45	0.20
TTSB96	0.42	0.85	0.34	29.7	0.013	5	9.44	129	35	0.47
Total	12.30	31.60	13.64	_	_	_	207.70	2195	_	_
Average	0.30	0.80	0.34	25.9	0.011	5	5.20	55	42	0.40

Tri Town, Existing Conditions, 10 Year Storm

6/8/99 14:05:27
Summary File: P:\coweld01\existi~1\TriTow~1\10_Year\cuhp\ttxc10yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
TTSB51	0.88	1.44	0.80	21.3	0.005	5	24.64	173	55	0.30
TTSB52	0.95	1.51	0.53	19.3	0.008	5	24.13	206	50	0.33
TTSB53	1.00	1.59	0.64	15.0	0.009	5	21.93	165	50	0.25
TTSB54	0.54	1.69	0.46	10.5	0.008	5	10.13	74	50	0.21
TTSB55	0.27	0.87	0.44	25.0	0.014	5	8.13	96	40	0.55
TTSB56	0.04	0.28	0.13	30.8	0.003	5	1.48	26	30	1.01
TTSB57	0.02	0.19	0.11	27.5	0.004	5	0.70	11	35	0.85
TTSB58	0.03	0.17	0.08	23.2	0.004	5	0.76	12	35	0.62
TTSB59	0.03	0.28	0.13	21.1	0.005	5	0.80	12	35	0.62
TTSB60	0.08	0.59	0.25	48.1	0.006	5	4.53	65	35	1.26
TTSB61	0.39	1.14	0.30	10.0	0.011	5	10.03	93	45	0.37
TTSB62	0.17	0.66	0.21	50.0	0.014	5	9.44	198	30	1.81
TTSB63	0.45	0.92	0.42	10.2	0.015	5	11.91	116	40	0.40
TTSB70	1.07	1.61	0.80	21.7	0.007	5	30.22	224	55	0.32
TTSB71	0.18	0.61	0.32	10.3	0.016	5	2.37	29	40	0.25
TTSB72	0.61	0.91	0.46	25.9	0.015	5	18.68	241	40	0.61
TTSB73	0.18	0.72	0.36	10.0	0.016	5	3.21	35	40	0.30
TTSB74	0.51	1.06	0.47	15.3	0.011	5	11.11	105	45	0.32
TTSB75	1.13	1.55	0.80	11.1	0.015	5	21.88	167	50	0.23
TTSB76	0.08	0.49	0.17	50.0	0.012	5	3.91	59	35	1.15
TTSB77	0.06	0.46	0.15	17.4	0.020	5	1.37	9	45	0.23
TTSB78	0.06	0.46	0.21	50.0	0.011	5	2.89	44	35	1.14
TTSB79	0.06	0.53	0.21	23.2	0.021	5	1.78	9	50	0.23
TTSB80	0.07	0.46	0.19	42.8	0.007	5	2.95	45	35	1.00
TTSB81	0.17	0.63	0.26	29.4	0.018	5	5.73	94	35	0.86
TTSB82	0.14	0.66	0.26	10.8	0.012	5	2.56	12	60	0.13
TTSB83	0.08	0.55	0.17	33.8	0.013	5	2.81	42	35	0.82
TTSB84	0.11	0.61	0.30	18.4	0.018	5	2.63	13	55	0.18
TTSB85	0.03	0.19	0.08	31.4	0.006	5	0.87	14	30	0.72
TTSB86	0.09	0.76	0.32	22.5	0.018	5	2.49	18	45	0.31
TTSB87	0.12	0.74	0.30	51.8	0.005	5	6.14	81	35	1.05
TTSB88	0.04	0.53	0.25	32.8	0.016	5	1.43	21	35	0.82
TTSB89	0.33	0.95	0.34	15.3	0.012	5	9.44	94	40	0.44
TTSB90	0.69	0.99	0.44	23.6	0.016	5	19.80	252	40	0.57
TTSB91	0.35	1.02	0.51	58.3	0.012	5	21.80	363	35	1.62
TTSB92	0.18	0.76	0.28	10.8	0.011	5	3.68	41	40	0.35
TTSB93	0.07	0.66	0.46	50.7	0.011	5	4.06	54	35	1.20
TTSB94	0.06	0.59	0.23	17.6	0.011	5	1.90	11	45	0.28
TTSB95	0.58	0.93	0.46	10.0	0.010	5	15.11	137	45	0.36
TTSB96	0.42	0.85	0.34	29.7	0.013	5	14.13	208	35	0.77
Total	12.30	31.60	13.64	_	_	_	343.60	3669	_	_
Average	0.30	0.80	0.34	25.9	0.011	5	8.60	92	41	0.60

6/8/99 14:05:28
Summary File: P:\coweld01\existi~1\TriTow~1\25_Year\cuhp\ttxc25yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
TTSB51	0.88	1.44	0.80	21.3	0.005	5	44.18	314	60	0.55
TTSB52	0.95	1.51	0.53	19.3	0.008	5	45.85	393	55	0.64
TTSB53	1.00	1.59	0.64	15.0	0.009	5	44.71	332	55	0.51
TTSB54	0.54	1.69	0.46	10.5	0.008	5	22.41	157	55	0.45
TTSB55	0.27	0.87	0.44	25.0	0.014	5	14.32	169	45	0.97
TTSB56	0.04	0.28	0.13	30.8	0.003	5	2.47	43	35	1.67
TTSB57	0.02	0.19	0.11	27.5	0.004	5	1.20	19	40	1.48
TTSB58	0.03	0.17	0.08	23.2	0.004	5	1.38	21	40	1.09
TTSB59	0.03	0.28	0.13	21.1	0.005	5	1.48	22	40	1.14
TTSB60	0.08	0.59	0.25	48.1	0.006	5	6.42	94	40	1.83
TTSB61	0.39	1.14	0.30	10.0	0.011	5	18.65	171	45	0.68
TTSB62	0.17	0.66	0.21	50.0	0.014	5	13.26	283	35	2.60
TTSB63	0.45	0.92	0.42	10.2	0.015	5	21.81	209	45	0.72
TTSB70	1.07	1.61	0.80	21.7	0.007	5	54.16	408	60	0.59
TTSB71	0.18	0.61	0.32	10.3	0.016	5	6.04	72	45	0.62
TTSB72	0.61	0.91	0.46	25.9	0.015	5	32.71	424	45	1.08
TTSB73	0.18	0.72	0.36	10.0	0.016	5	7.32	74	45	0.64
TTSB74	0.51	1.06	0.47	15.3	0.011	5	22.69	209	50	0.64
TTSB75	1.13	1.55	0.80	11.1	0.015	5	47.37	350	60	0.48
TTSB76	0.08	0.49	0.17	50.0	0.012	5	5.68	87	40	1.69
TTSB77	0.06	0.46	0.15	17.4	0.020	5	2.69	17	50	0.44
TTSB78	0.06	0.46	0.21	50.0	0.011	5	4.20	64	40	1.66
TTSB79	0.06	0.53	0.21	23.2	0.021	5	3.22	17	55	0.44
TTSB80	0.07	0.46	0.19	42.8	0.007	5	4.46	69	40	1.54
TTSB81	0.17	0.63	0.26	29.4	0.018	5	9.66	157	35	1.44
TTSB82	0.14	0.66	0.26	10.8	0.012	5	5.74	26	65	0.29
TTSB83	0.08	0.55	0.17	33.8	0.013	5	4.55	69	40	1.34
TTSB84	0.11	0.61	0.30	18.4	0.018	5	5.10	26	60	0.36
TTSB85	0.03	0.19	0.08	31.4	0.006	5	1.44	23	35	1.19
TTSB86	0.09	0.76	0.32	22.5	0.018	5	4.54	33	50	0.57
TTSB87	0.12	0.74	0.30	51.8	0.005	5	8.78	119	40	1.54
TTSB88	0.04	0.53	0.25	32.8	0.016	5	2.32	33	40	1.28
TTSB89	0.33	0.95	0.34	15.3	0.012	5	16.73	167	45	0.79
TTSB90	0.69	0.99	0.44	23.6	0.016	5	35.50	450	45	1.01
TTSB91	0.35	1.02	0.51	58.3	0.012	5	29.81	503	40	2.24
TTSB92	0.18	0.76	0.28	10.8	0.011	5	7.75	79	45	0.68
TTSB93	0.07	0.66	0.46	50.7	0.011	5	5.69	78	40	1.74
TTSB94	0.06	0.59	0.23	17.6	0.011	5	3.22	19	50	0.49
TTSB95	0.58	0.93	0.46	10.0	0.010	5	27.98	250	50	0.67
TTSB96	0.42	0.85	0.34	29.7	0.013	5	23.76	353	40	1.31
Total	12.30	31.60	13.64	_	_	_	621.30	6403	_	_
Average	0.30	0.80	0.34	25.9	0.011	5	15.50	160	46	1.00

Tri Town, Existing Conditions, 50 Year Storm

6/8/99 14:05:29
Summary File: P:\coweld01\existi~1\TriTow~1\50_Year\cuhp\ttxc50yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
TTSB51	0.88	1.44	0.80	21.3	0.005	5	60.04	441	60	0.78
TTSB52	0.95	1.51	0.53	19.3	0.008	5	63.12	558	55	0.91
TTSB53	1.00	1.59	0.64	15.0	0.009	5	62.85	480	60	0.75
TTSB54	0.54	1.69	0.46	10.5	0.008	5	32.24	230	55	0.66
TTSB55	0.27	0.87	0.44	25.0	0.014	5	19.24	232	45	1.34
TTSB56	0.04	0.28	0.13	30.8	0.003	5	3.24	57	35	2.22
TTSB57	0.02	0.19	0.11	27.5	0.004	5	1.60	25	40	1.95
TTSB58	0.03	0.17	0.08	23.2	0.004	5	1.87	29	40	1.51
TTSB59	0.03	0.28	0.13	21.1	0.005	5	2.02	31	40	1.61
TTSB60	0.08	0.59	0.25	48.1	0.006	5	7.95	120	40	2.34
TTSB61	0.39	1.14	0.30	10.0	0.011	5	25.94	243	50	0.97
TTSB62	0.17	0.66	0.21	50.0	0.014	5	16.33	355	35	3.26
TTSB63	0.45	0.92	0.42	10.2	0.015	5	30.17	295	50	1.02
TTSB70	1.07	1.61	0.80	21.7	0.007	5	73.51	573	60	0.83
TTSB71	0.18	0.61	0.32	10.3	0.016	5	9.29	109	50	0.94
TTSB72	0.61	0.91	0.46	25.9	0.015	5	43.81	583	45	1.49
TTSB73	0.18	0.72	0.36	10.0	0.016	5	10.58	107	45	0.92
TTSB74	0.51	1.06	0.47	15.3	0.011	5	31.88	299	50	0.91
TTSB75	1.13	1.55	0.80	11.1	0.015	5	67.84	513	60	0.70
TTSB76	0.08	0.49	0.17	50.0	0.012	5	7.06	113	40	2.20
TTSB77	0.06	0.46	0.15	17.4	0.020	5	3.74	25	50	0.65
TTSB78	0.06	0.46	0.21	50.0	0.011	5	5.23	83	40	2.16
TTSB79	0.06	0.53	0.21	23.2	0.021	5	4.36	25	55	0.65
TTSB80	0.07	0.46	0.19	42.8	0.007	5	5.65	91	40	2.03
TTSB81	0.17	0.63	0.26	29.4	0.018	5	12.77	213	40	1.95
TTSB82	0.14	0.66	0.26	10.8	0.012	5	8.26	39	65	0.43
TTSB83	0.08	0.55	0.17	33.8	0.013	5	5.93	92	40	1.79
TTSB84	0.11	0.61	0.30	18.4	0.018	5	7.05	38	60	0.53
TTSB85	0.03	0.19	0.08	31.4	0.006	5	1.89	32	40	1.66
TTSB86	0.09	0.76	0.32	22.5	0.018	5	6.17	46	50	0.79
TTSB87	0.12	0.74	0.30	51.8	0.005	5	10.87	152	45	1.97
TTSB88	0.04	0.53	0.25	32.8	0.016	5	3.02	45	40	1.75
TTSB89	0.33	0.95	0.34	15.3	0.012	5	22.84	232	50	1.09
TTSB90	0.69	0.99	0.44	23.6	0.016	5	47.96	620	45	1.40
TTSB91	0.35	1.02	0.51	58.3	0.012	5	36.21	630	40	2.81
TTSB92	0.18	0.76	0.28	10.8	0.011	5	11.07	113	45	0.98
TTSB93	0.07	0.66	0.46	50.7	0.011	5	7.00	98	40	2.18
TTSB94	0.06	0.59	0.23	17.6	0.011	5	4.33	27	50	0.70
TTSB95	0.58	0.93	0.46	10.0	0.010	5	38.85	354	50	0.95
TTSB96	0.42	0.85	0.34	29.7	0.013	5	31.37	475	40	1.76
Total	12.30	31.60	13.64				845.20	8823		
Average	0.30	0.80	0.34	25.9	0.011	5	21.10	221	47	1.40

Tri Town, Existing Conditions, 100 Year Storm

6/8/99 14:05:30
Summary File: P:\coweld01\existi~1\TriTow~1\100_Year\cuhp\ttxc100y.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
TTSB51	0.88	1.44	0.80	21.3	0.005	5	75.59	561	65	0.99
TTSB52	0.95	1.51	0.53	19.3	0.008	5	80.09	707	55	1.16
TTSB53	1.00	1.59	0.64	15.0	0.009	5	80.70	618	60	0.96
TTSB54	0.54	1.69	0.46	10.5	0.008	5	41.94	298	60	0.86
TTSB55	0.27	0.87	0.44	25.0	0.014	5	24.07	290	45	1.67
TTSB56	0.04	0.28	0.13	30.8	0.003	5	4.01	70	35	2.73
TTSB57	0.02	0.19	0.11	27.5	0.004	5	1.99	31	40	2.42
TTSB58	0.03	0.17	0.08	23.2	0.004	5	2.35	36	40	1.87
TTSB59	0.03	0.28	0.13	21.1	0.005	5	2.56	39	40	2.03
TTSB60	0.08	0.59	0.25	48.1	0.006	5	9.44	143	40	2.79
TTSB61	0.39	1.14	0.30	10.0	0.011	5	32.95	307	55	1.22
TTSB62	0.17	0.66	0.21	50.0	0.014	5	19.32	418	35	3.84
TTSB63	0.45	0.92	0.42	10.2	0.015	5	38.22	372	55	1.29
TTSB70	1.07	1.61	0.80	21.7	0.007	5	92.50	725	60	1.05
TTSB71	0.18	0.61	0.32	10.3	0.016	5	12.63	144	50	1.24
TTSB72	0.61	0.91	0.46	25.9	0.015	5	54.71	727	45	1.86
TTSB73	0.18	0.72	0.36	10.0	0.016	5	13.81	138	55	1.19
TTSB74	0.51	1.06	0.47	15.3	0.011	5	40.92	380	50	1.16
TTSB75	1.13	1.55	0.80	11.1	0.015	5	88.04	665	60	0.91
TTSB76	0.08	0.49	0.17	50.0	0.012	5	8.43	136	40	2.65
TTSB77	0.06	0.46	0.15	17.4	0.020	5	4.78	32	70	0.83
TTSB78	0.06	0.46	0.21	50.0	0.011	5	6.24	100	40	2.60
TTSB79	0.06	0.53	0.21	23.2	0.021	5	5.48	32	60	0.83
TTSB80	0.07	0.46	0.19	42.8	0.007	5	6.82	110	40	2.45
TTSB81	0.17	0.63	0.26	29.4	0.018	5	15.82	263	40	2.41
TTSB82	0.14	0.66	0.26	10.8	0.012	5	10.74	51	65	0.56
TTSB83	0.08	0.55	0.17	33.8	0.013	5	7.27	113	40	2.20
TTSB84	0.11	0.61	0.30	18.4	0.018	5	8.98	49	60	0.69
TTSB85	0.03	0.19	0.08	31.4	0.006	5	2.34	39	40	2.03
TTSB86	0.09	0.76	0.32	22.5	0.018	5	7.77	60	65	1.04
TTSB87	0.12	0.74	0.30	51.8	0.005	5	12.92	183	45	2.38
TTSB88	0.04	0.53	0.25	32.8	0.016	5	3.71	55	40	2.14
TTSB89	0.33	0.95	0.34	15.3	0.012	5	28.72	291	50	1.37
TTSB90	0.69	0.99	0.44	23.6	0.016	5	60.20	776	45	1.75
TTSB91	0.35	1.02	0.51	58.3	0.012	5	42.45	741	40	3.30
TTSB92	0.18	0.76	0.28	10.8	0.011	5	14.35	145	55	1.25
TTSB93	0.07	0.66	0.46	50.7	0.011	5	8.27	116	40	2.58
TTSB94	0.06	0.59	0.23	17.6	0.011	5	5.40	35	70	0.91
TTSB95	0.58	0.93	0.46	10.0	0.010	5	49.32	445	50	1.19
TTSB96	0.42	0.85	0.34	29.7	0.013	5	38.83	584	40	2.17
Total	12.30	31.60	13.64	–	–	–	1064.70	11025	–	–
Average	0.30	0.80	0.34	25.9	0.011	5	26.60	276	50	1.70

6/17/99 12:49:35
Summary File: P:\coweld01\future~1\TriTow~1\2_Year\cuhp\ttfc2yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
TTSB51	0.88	1.50	0.80	61.6	0.005	5	29.04	327	45	0.58
TTSB52	0.95	1.57	0.53	48.6	0.008	5	23.79	287	40	0.47
TTSB53	1.00	1.65	0.64	40.5	0.009	5	20.17	206	45	0.32
TTSB54	0.54	1.74	0.46	23.4	0.008	5	5.17	39	45	0.11
TTSB55	0.27	0.93	0.44	41.0	0.014	5	5.56	72	35	0.41
TTSB56	0.04	0.34	0.13	41.7	0.003	5	0.90	12	30	0.46
TTSB57	0.02	0.25	0.11	39.0	0.004	5	0.42	6	30	0.46
TTSB58	0.03	0.23	0.08	36.7	0.004	5	0.47	7	30	0.36
TTSB59	0.03	0.34	0.13	35.1	0.005	5	0.49	7	30	0.36
TTSB60	0.08	0.59	0.25	48.1	0.006	5	2.12	27	35	0.52
TTSB61	0.39	1.19	0.30	27.1	0.011	5	4.85	53	40	0.21
TTSB62	0.17	0.66	0.21	50.0	0.014	5	4.48	80	30	0.73
TTSB63	0.45	0.98	0.42	47.2	0.015	5	11.16	168	35	0.58
TTSB70	1.07	1.67	0.80	27.1	0.007	5	12.50	91	50	0.13
TTSB71	0.18	0.66	0.32	27.1	0.016	5	1.95	25	35	0.21
TTSB72	0.61	0.97	0.46	47.5	0.015	5	14.89	225	35	0.57
TTSB73	0.18	0.78	0.36	62.5	0.016	5	6.06	102	30	0.88
TTSB74	0.51	1.12	0.47	44.2	0.011	5	11.30	141	40	0.43
TTSB75	1.13	1.61	0.80	39.7	0.015	5	22.21	231	45	0.31
TTSB76	0.08	0.49	0.17	50.0	0.012	5	1.98	26	35	0.50
TTSB77	0.06	0.51	0.15	50.0	0.020	5	1.49	19	35	0.49
TTSB78	0.06	0.46	0.21	50.0	0.011	5	1.47	19	35	0.49
TTSB79	0.06	0.59	0.21	50.0	0.021	5	1.62	20	35	0.52
TTSB80	0.07	0.46	0.19	45.1	0.007	5	1.51	20	35	0.44
TTSB81	0.17	0.68	0.26	46.8	0.018	5	4.10	69	30	0.63
TTSB82	0.14	0.72	0.26	44.1	0.012	5	3.09	37	35	0.41
TTSB83	0.08	0.55	0.17	50.0	0.013	5	1.96	25	35	0.48
TTSB84	0.11	0.66	0.30	50.0	0.018	5	2.78	33	35	0.46
TTSB85	0.03	0.19	0.08	50.0	0.006	5	0.64	10	30	0.52
TTSB86	0.09	0.81	0.32	38.3	0.018	5	1.68	18	35	0.31
TTSB87	0.12	0.74	0.30	51.8	0.005	5	3.13	36	40	0.46
TTSB88	0.04	0.59	0.25	53.3	0.016	5	1.09	13	35	0.50
TTSB89	0.33	1.00	0.34	51.1	0.012	5	8.91	135	35	0.63
TTSB90	0.69	1.04	0.44	36.4	0.016	5	11.97	157	35	0.35
TTSB91	0.35	1.08	0.51	62.2	0.012	5	11.98	177	35	0.79
TTSB92	0.18	0.81	0.28	32.0	0.011	5	2.68	34	35	0.29
TTSB93	0.07	0.72	0.46	50.7	0.011	5	1.94	22	40	0.49
TTSB94	0.06	0.64	0.23	56.3	0.011	5	1.82	21	35	0.54
TTSB95	0.58	0.99	0.46	44.6	0.010	5	13.58	184	35	0.49
TTSB96	0.42	0.91	0.34	59.6	0.013	5	13.38	222	35	0.82
Total	12.30	33.40	13.64	–	–	–	270.30	3403	–	–
Average	0.30	0.80	0.34	45.3	0.011	5	6.80	85	36	0.50

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Summary File: P:\coweld01\future~1\TriTow~1\5_Year\cuhp\ttfc5yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
TTSB51	0.88	1.50	0.80	61.6	0.005	5	42.22	515	45	0.91
TTSB52	0.95	1.57	0.53	48.6	0.008	5	35.76	468	40	0.76
TTSB53	1.00	1.65	0.64	40.5	0.009	5	31.26	348	45	0.54
TTSB54	0.54	1.74	0.46	23.4	0.008	5	9.70	78	45	0.22
TTSB55	0.27	0.93	0.44	41.0	0.014	5	8.60	122	35	0.70
TTSB56	0.04	0.34	0.13	41.7	0.003	5	1.38	21	30	0.82
TTSB57	0.02	0.25	0.11	39.0	0.004	5	0.66	10	30	0.78
TTSB58	0.03	0.23	0.08	36.7	0.004	5	0.76	12	30	0.62
TTSB59	0.03	0.34	0.13	35.1	0.005	5	0.80	12	35	0.62
TTSB60	0.08	0.59	0.25	48.1	0.006	5	3.38	47	35	0.91
TTSB61	0.39	1.19	0.30	27.1	0.011	5	9.72	118	40	0.47
TTSB62	0.17	0.66	0.21	50.0	0.014	5	7.13	139	30	1.27
TTSB63	0.45	0.98	0.42	47.2	0.015	5	18.02	302	35	1.04
TTSB70	1.07	1.67	0.80	27.1	0.007	5	22.62	176	50	0.25
TTSB71	0.18	0.66	0.32	27.1	0.016	5	3.22	43	35	0.37
TTSB72	0.61	0.97	0.46	47.5	0.015	5	22.43	367	35	0.94
TTSB73	0.18	0.78	0.36	62.5	0.016	5	8.73	160	30	1.38
TTSB74	0.51	1.12	0.47	44.2	0.011	5	17.22	235	35	0.71
TTSB75	1.13	1.61	0.80	39.7	0.015	5	34.78	396	45	0.54
TTSB76	0.08	0.49	0.17	50.0	0.012	5	2.96	42	35	0.82
TTSB77	0.06	0.51	0.15	50.0	0.020	5	2.23	31	35	0.80
TTSB78	0.06	0.46	0.21	50.0	0.011	5	2.19	31	35	0.80
TTSB79	0.06	0.59	0.21	50.0	0.021	5	2.42	32	35	0.83
TTSB80	0.07	0.46	0.19	45.1	0.007	5	2.29	33	35	0.73
TTSB81	0.17	0.68	0.26	46.8	0.018	5	6.19	114	30	1.04
TTSB82	0.14	0.72	0.26	44.1	0.012	5	4.71	61	35	0.68
TTSB83	0.08	0.55	0.17	50.0	0.013	5	2.92	40	35	0.78
TTSB84	0.11	0.66	0.30	50.0	0.018	5	4.16	54	35	0.76
TTSB85	0.03	0.19	0.08	50.0	0.006	5	0.96	16	30	0.83
TTSB86	0.09	0.81	0.32	38.3	0.018	5	2.64	31	35	0.53
TTSB87	0.12	0.74	0.30	51.8	0.005	5	4.68	58	40	0.75
TTSB88	0.04	0.59	0.25	53.3	0.016	5	1.61	20	35	0.78
TTSB89	0.33	1.00	0.34	51.1	0.012	5	13.87	230	35	1.08
TTSB90	0.69	1.04	0.44	36.4	0.016	5	19.21	275	35	0.62
TTSB91	0.35	1.08	0.51	62.2	0.012	5	17.90	287	35	1.28
TTSB92	0.18	0.81	0.28	32.0	0.011	5	4.59	64	35	0.55
TTSB93	0.07	0.72	0.46	50.7	0.011	5	3.07	38	40	0.84
TTSB94	0.06	0.64	0.23	56.3	0.011	5	2.80	35	35	0.91
TTSB95	0.58	0.99	0.46	44.6	0.010	5	22.17	330	35	0.88
TTSB96	0.42	0.91	0.34	59.6	0.013	5	19.42	348	30	1.29
Total	12.30	33.40	13.64	_	_	_	421.40	5739	_	_
Average	0.30	0.80	0.34	45.3	0.011	5	10.50	143	36	0.80

Tri Town, Future Conditions, 10 Year Storm

6/17/99 12:49:37
Summary File: P:\coweld01\future~1\TriTow~1\10_Year\cuhp\ttfc10yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
TTSB51	0.88	1.50	0.80	61.6	0.005	5	53.79	682	45	1.21
TTSB52	0.95	1.57	0.53	48.6	0.008	5	47.44	659	40	1.08
TTSB53	1.00	1.65	0.64	40.5	0.009	5	43.01	512	45	0.80
TTSB54	0.54	1.74	0.46	23.4	0.008	5	15.60	134	45	0.38
TTSB55	0.27	0.93	0.44	41.0	0.014	5	11.80	182	35	1.05
TTSB56	0.04	0.34	0.13	41.7	0.003	5	1.88	30	30	1.17
TTSB57	0.02	0.25	0.11	39.0	0.004	5	0.91	16	30	1.25
TTSB58	0.03	0.23	0.08	36.7	0.004	5	1.07	19	30	0.98
TTSB59	0.03	0.34	0.13	35.1	0.005	5	1.14	18	30	0.93
TTSB60	0.08	0.59	0.25	48.1	0.006	5	4.53	65	35	1.26
TTSB61	0.39	1.19	0.30	27.1	0.011	5	14.84	179	40	0.71
TTSB62	0.17	0.66	0.21	50.0	0.014	5	9.44	198	30	1.81
TTSB63	0.45	0.98	0.42	47.2	0.015	5	24.14	419	35	1.45
TTSB70	1.07	1.67	0.80	27.1	0.007	5	34.84	286	50	0.41
TTSB71	0.18	0.66	0.32	27.1	0.016	5	4.86	71	35	0.61
TTSB72	0.61	0.97	0.46	47.5	0.015	5	29.88	525	35	1.34
TTSB73	0.18	0.78	0.36	62.5	0.016	5	11.08	212	30	1.84
TTSB74	0.51	1.12	0.47	44.2	0.011	5	23.27	339	35	1.03
TTSB75	1.13	1.61	0.80	39.7	0.015	5	48.12	585	45	0.80
TTSB76	0.08	0.49	0.17	50.0	0.012	5	3.91	59	35	1.15
TTSB77	0.06	0.51	0.15	50.0	0.020	5	2.95	43	35	1.11
TTSB78	0.06	0.46	0.21	50.0	0.011	5	2.89	44	35	1.14
TTSB79	0.06	0.59	0.21	50.0	0.021	5	3.20	45	35	1.17
TTSB80	0.07	0.46	0.19	45.1	0.007	5	3.08	47	35	1.04
TTSB81	0.17	0.68	0.26	46.8	0.018	5	8.27	163	30	1.49
TTSB82	0.14	0.72	0.26	44.1	0.012	5	6.37	88	35	0.98
TTSB83	0.08	0.55	0.17	50.0	0.013	5	3.86	56	35	1.09
TTSB84	0.11	0.66	0.30	50.0	0.018	5	5.48	76	35	1.07
TTSB85	0.03	0.19	0.08	50.0	0.006	5	1.26	22	30	1.14
TTSB86	0.09	0.81	0.32	38.3	0.018	5	3.68	46	35	0.79
TTSB87	0.12	0.74	0.30	51.8	0.005	5	6.14	81	35	1.05
TTSB88	0.04	0.59	0.25	53.3	0.016	5	2.10	28	35	1.09
TTSB89	0.33	1.00	0.34	51.1	0.012	5	18.39	317	35	1.50
TTSB90	0.69	1.04	0.44	36.4	0.016	5	27.17	420	35	0.95
TTSB91	0.35	1.08	0.51	62.2	0.012	5	22.85	382	35	1.70
TTSB92	0.18	0.81	0.28	32.0	0.011	5	6.73	100	35	0.86
TTSB93	0.07	0.72	0.46	50.7	0.011	5	4.06	51	35	1.13
TTSB94	0.06	0.64	0.23	56.3	0.011	5	3.63	48	35	1.25
TTSB95	0.58	0.99	0.46	44.6	0.010	5	30.07	472	35	1.27
TTSB96	0.42	0.91	0.34	59.6	0.013	5	24.84	465	30	1.72
Total	12.30	33.40	13.64	_	_	_	572.60	8184	_	_
Average	0.30	0.80	0.34	45.3	0.011	5	14.30	205	36	1.10

Tri Town, Future Conditions, 25 Year Storm

6/17/99 12:49:38
Summary File: P:\coweld01\future~1\TriTow~1\25_Year\cuhp\ttfc25yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
TTSB51	0.88	1.50	0.80	61.6	0.005	5	73.73	957	50	1.69
TTSB52	0.95	1.57	0.53	48.6	0.008	5	69.28	989	45	1.62
TTSB53	1.00	1.65	0.64	40.5	0.009	5	65.88	808	50	1.26
TTSB54	0.54	1.74	0.46	23.4	0.008	5	27.91	242	50	0.70
TTSB55	0.27	0.93	0.44	41.0	0.014	5	18.01	282	40	1.63
TTSB56	0.04	0.34	0.13	41.7	0.003	5	2.87	48	35	1.87
TTSB57	0.02	0.25	0.11	39.0	0.004	5	1.42	24	35	1.87
TTSB58	0.03	0.23	0.08	36.7	0.004	5	1.68	30	35	1.56
TTSB59	0.03	0.34	0.13	35.1	0.005	5	1.83	30	35	1.56
TTSB60	0.08	0.59	0.25	48.1	0.006	5	6.42	94	40	1.83
TTSB61	0.39	1.19	0.30	27.1	0.011	5	23.57	289	45	1.15
TTSB62	0.17	0.66	0.21	50.0	0.014	5	13.26	283	35	2.60
TTSB63	0.45	0.98	0.42	47.2	0.015	5	34.28	595	40	2.06
TTSB70	1.07	1.67	0.80	27.1	0.007	5	58.84	495	55	0.72
TTSB71	0.18	0.66	0.32	27.1	0.016	5	8.63	129	40	1.11
TTSB72	0.61	0.97	0.46	47.5	0.015	5	43.96	779	40	1.99
TTSB73	0.18	0.78	0.36	62.5	0.016	5	15.22	306	35	2.65
TTSB74	0.51	1.12	0.47	44.2	0.011	5	34.88	529	40	1.62
TTSB75	1.13	1.61	0.80	39.7	0.015	5	73.78	921	50	1.27
TTSB76	0.08	0.49	0.17	50.0	0.012	5	5.68	87	40	1.69
TTSB77	0.06	0.51	0.15	50.0	0.020	5	4.28	64	40	1.66
TTSB78	0.06	0.46	0.21	50.0	0.011	5	4.20	64	40	1.66
TTSB79	0.06	0.59	0.21	50.0	0.021	5	4.64	66	40	1.71
TTSB80	0.07	0.46	0.19	45.1	0.007	5	4.59	71	40	1.58
TTSB81	0.17	0.68	0.26	46.8	0.018	5	12.21	251	35	2.30
TTSB82	0.14	0.72	0.26	44.1	0.012	5	9.55	136	40	1.51
TTSB83	0.08	0.55	0.17	50.0	0.013	5	5.60	84	40	1.64
TTSB84	0.11	0.66	0.30	50.0	0.018	5	7.96	114	40	1.61
TTSB85	0.03	0.19	0.08	50.0	0.006	5	1.84	34	35	1.77
TTSB86	0.09	0.81	0.32	38.3	0.018	5	5.74	74	40	1.28
TTSB87	0.12	0.74	0.30	51.8	0.005	5	8.78	119	40	1.54
TTSB88	0.04	0.59	0.25	53.3	0.016	5	3.00	41	40	1.60
TTSB89	0.33	1.00	0.34	51.1	0.012	5	25.86	443	40	2.09
TTSB90	0.69	1.04	0.44	36.4	0.016	5	42.90	675	40	1.52
TTSB91	0.35	1.08	0.51	62.2	0.012	5	30.88	523	40	2.33
TTSB92	0.18	0.81	0.28	32.0	0.011	5	10.84	161	40	1.39
TTSB93	0.07	0.72	0.46	50.7	0.011	5	5.69	74	40	1.65
TTSB94	0.06	0.64	0.23	56.3	0.011	5	4.99	67	40	1.74
TTSB95	0.58	0.99	0.46	44.6	0.010	5	43.23	696	40	1.87
TTSB96	0.42	0.91	0.34	59.6	0.013	5	34.52	687	35	2.55
Total	12.30	33.40	13.64	–	–	–	852.40	12361	–	–
Average	0.30	0.80	0.34	45.3	0.011	5	21.30	309	41	1.70

6/17/99 12:49:39
Summary File: P:\coweld01\future~1\TriTow~1\50_Year\cuhp\ttfc50yr.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
TTSB51	0.88	1.50	0.80	61.6	0.005	5	89.44	1210	50	2.14
TTSB52	0.95	1.57	0.53	48.6	0.008	5	86.45	1272	45	2.09
TTSB53	1.00	1.65	0.64	40.5	0.009	5	83.93	1073	50	1.67
TTSB54	0.54	1.74	0.46	23.4	0.008	5	37.72	338	55	0.97
TTSB55	0.27	0.93	0.44	41.0	0.014	5	22.92	369	40	2.13
TTSB56	0.04	0.34	0.13	41.7	0.003	5	3.64	61	35	2.38
TTSB57	0.02	0.25	0.11	39.0	0.004	5	1.81	32	35	2.50
TTSB58	0.03	0.23	0.08	36.7	0.004	5	2.17	40	35	2.08
TTSB59	0.03	0.34	0.13	35.1	0.005	5	2.37	39	40	2.03
TTSB60	0.08	0.59	0.25	48.1	0.006	5	7.95	120	40	2.34
TTSB61	0.39	1.19	0.30	27.1	0.011	5	30.78	389	45	1.55
TTSB62	0.17	0.66	0.21	50.0	0.014	5	16.33	355	35	3.26
TTSB63	0.45	0.98	0.42	47.2	0.015	5	42.48	766	40	2.65
TTSB70	1.07	1.67	0.80	27.1	0.007	5	78.17	679	60	0.99
TTSB71	0.18	0.66	0.32	27.1	0.016	5	11.87	180	40	1.56
TTSB72	0.61	0.97	0.46	47.5	0.015	5	55.01	1008	40	2.58
TTSB73	0.18	0.78	0.36	62.5	0.016	5	18.45	372	35	3.22
TTSB74	0.51	1.12	0.47	44.2	0.011	5	44.02	679	40	2.08
TTSB75	1.13	1.61	0.80	39.7	0.015	5	94.15	1225	50	1.69
TTSB76	0.08	0.49	0.17	50.0	0.012	5	7.06	113	40	2.20
TTSB77	0.06	0.51	0.15	50.0	0.020	5	5.32	82	40	2.13
TTSB78	0.06	0.46	0.21	50.0	0.011	5	5.23	83	40	2.16
TTSB79	0.06	0.59	0.21	50.0	0.021	5	5.78	85	40	2.21
TTSB80	0.07	0.46	0.19	45.1	0.007	5	5.78	93	40	2.07
TTSB81	0.17	0.68	0.26	46.8	0.018	5	15.31	319	35	2.93
TTSB82	0.14	0.72	0.26	44.1	0.012	5	12.06	177	40	1.97
TTSB83	0.08	0.55	0.17	50.0	0.013	5	6.97	107	40	2.08
TTSB84	0.11	0.66	0.30	50.0	0.018	5	9.90	145	40	2.05
TTSB85	0.03	0.19	0.08	50.0	0.006	5	2.29	43	35	2.23
TTSB86	0.09	0.81	0.32	38.3	0.018	5	7.37	98	40	1.70
TTSB87	0.12	0.74	0.30	51.8	0.005	5	10.87	152	45	1.97
TTSB88	0.04	0.59	0.25	53.3	0.016	5	3.70	52	40	2.03
TTSB89	0.33	1.00	0.34	51.1	0.012	5	31.85	571	40	2.70
TTSB90	0.69	1.04	0.44	36.4	0.016	5	55.33	890	40	2.01
TTSB91	0.35	1.08	0.51	62.2	0.012	5	37.27	650	40	2.90
TTSB92	0.18	0.81	0.28	32.0	0.011	5	14.15	215	40	1.86
TTSB93	0.07	0.72	0.46	50.7	0.011	5	7.00	94	45	2.09
TTSB94	0.06	0.64	0.23	56.3	0.011	5	6.08	84	40	2.18
TTSB95	0.58	0.99	0.46	44.6	0.010	5	53.91	890	40	2.39
TTSB96	0.42	0.91	0.34	59.6	0.013	5	42.08	834	35	3.10
Total	12.30	33.40	13.64	–	–	–	1075.00	15984	–	–
Average	0.30	0.80	0.34	45.3	0.011	5	26.90	400	41	2.20

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Summary File: P:\coweld01\future~1\TriTow~1\100_Year\cuhp\ttfc100y.txt

BASIN ID	AREA (SQMI)	LENGTH (MI)	DIST. (MI)	IMPERV. (%)	SLOPE (FT/FT)	DURATION (MIN)	VOLUME (ACFT)	PEAKQ (CFS)	PEAKT (MIN)	Q/AREA (CFS/AC)
TTSB51	0.88	1.50	0.80	61.6	0.005	5	104.96	1438	50	2.55
TTSB52	0.95	1.57	0.53	48.6	0.008	5	103.35	1530	45	2.51
TTSB53	1.00	1.65	0.64	40.5	0.009	5	101.68	1310	50	2.04
TTSB54	0.54	1.74	0.46	23.4	0.008	5	47.34	426	55	1.23
TTSB55	0.27	0.93	0.44	41.0	0.014	5	27.74	448	40	2.59
TTSB56	0.04	0.34	0.13	41.7	0.003	5	4.41	74	40	2.89
TTSB57	0.02	0.25	0.11	39.0	0.004	5	2.20	39	35	3.04
TTSB58	0.03	0.23	0.08	36.7	0.004	5	2.65	49	35	2.55
TTSB59	0.03	0.34	0.13	35.1	0.005	5	2.90	48	40	2.50
TTSB60	0.08	0.59	0.25	48.1	0.006	5	9.44	143	40	2.79
TTSB61	0.39	1.19	0.30	27.1	0.011	5	37.74	478	45	1.91
TTSB62	0.17	0.66	0.21	50.0	0.014	5	19.32	418	35	3.84
TTSB63	0.45	0.98	0.42	47.2	0.015	5	50.45	915	40	3.17
TTSB70	1.07	1.67	0.80	27.1	0.007	5	97.12	854	60	1.24
TTSB71	0.18	0.66	0.32	27.1	0.016	5	15.15	225	40	1.95
TTSB72	0.61	0.97	0.46	47.5	0.015	5	65.89	1218	40	3.11
TTSB73	0.18	0.78	0.36	62.5	0.016	5	21.64	434	35	3.76
TTSB74	0.51	1.12	0.47	44.2	0.011	5	53.00	824	45	2.52
TTSB75	1.13	1.61	0.80	39.7	0.015	5	114.17	1498	50	2.07
TTSB76	0.08	0.49	0.17	50.0	0.012	5	8.43	136	40	2.65
TTSB77	0.06	0.51	0.15	50.0	0.020	5	6.35	99	40	2.57
TTSB78	0.06	0.46	0.21	50.0	0.011	5	6.24	100	40	2.60
TTSB79	0.06	0.59	0.21	50.0	0.021	5	6.89	102	40	2.65
TTSB80	0.07	0.46	0.19	45.1	0.007	5	6.95	113	40	2.52
TTSB81	0.17	0.68	0.26	46.8	0.018	5	18.36	382	35	3.51
TTSB82	0.14	0.72	0.26	44.1	0.012	5	14.52	213	40	2.37
TTSB83	0.08	0.55	0.17	50.0	0.013	5	8.32	129	40	2.51
TTSB84	0.11	0.66	0.30	50.0	0.018	5	11.82	173	40	2.45
TTSB85	0.03	0.19	0.08	50.0	0.006	5	2.73	51	35	2.65
TTSB86	0.09	0.81	0.32	38.3	0.018	5	8.96	119	45	2.06
TTSB87	0.12	0.74	0.30	51.8	0.005	5	12.92	183	45	2.38
TTSB88	0.04	0.59	0.25	53.3	0.016	5	4.39	62	40	2.42
TTSB89	0.33	1.00	0.34	51.1	0.012	5	37.69	686	40	3.24
TTSB90	0.69	1.04	0.44	36.4	0.016	5	67.55	1084	40	2.45
TTSB91	0.35	1.08	0.51	62.2	0.012	5	43.51	763	40	3.40
TTSB92	0.18	0.81	0.28	32.0	0.011	5	17.39	263	40	2.28
TTSB93	0.07	0.72	0.46	50.7	0.011	5	8.27	112	45	2.49
TTSB94	0.06	0.64	0.23	56.3	0.011	5	7.14	99	40	2.57
TTSB95	0.58	0.99	0.46	44.6	0.010	5	64.27	1058	40	2.85
TTSB96	0.42	0.91	0.34	59.6	0.013	5	49.54	983	40	3.65
Total	12.30	33.40	13.64	–	–	–	1293.40	19279	–	–
Average	0.30	0.80	0.34	45.3	0.011	5	32.30	482	42	2.60

III-A

UDSWMM MODEL DESCRIPTION
(Pages from Manual)

III

UDSWMM ROUTING MODELING

URBAN DRAINAGE AND STORM WATER MANAGEMENT

Using
the Personal Computer Model

UDSWMM

Developed by

the Environmental Protect Agency

Revised by

the Urban Drainage and Flood Control District
Denver, Colorado

Supported by

the Urban Drainage and Flood Control District
and Metro Denver Cities and Counties, Colorado

January 1995

URBAN DRAINAGE AND FLOOD CONTROL DISTRICT-69

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December 17, 1985

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MEMORANDUM

TO : All Owners of the UDSWM2 Computer Program

FROM : Ben Urbonas

SUBJECT: UDSWM-PC Program Use - WARNING

It has been brought to my attention that two problems are being experienced by users of the UDSWM2-PC Program. Both of the problems are the result of not fully understanding the user manual or how the system works. The first one is as follows:

WHENEVER YOU USE ROUTING ELEMENT OPTION 3 (DIRECT FLOW), BE SURE TO INCLUDE A POSITIVE LENGTH, (i.e. ONE-FOOT) IN THE LENGTH FIELD OF YOUR INPUT. (If you do not include a positive number in the length field for routing option 3, the program will not link the routing elements together properly.)

The second problem arises whenever a user generates more storm hydrographs using CUHPE/PC than you will use for routing in a single run using the UDSWM2-PC program. As an example, if you generate 22 storm hydrographs to be used later by UDSWM2-PC, you have to call up <u>all</u> the 22 hydrographs when you run UDSWM2-PC.

THUS, BE SURE THAT THE FILE CONTAINING CUHP STORM HYDROGRAPHS THAT YOU CALL USING UDSWM2-PC CONTAINS THE EXACT NUMBER OF HYDROGRAPHS THAT YOU SPECIFY IN THE UDSWM2-PC RUN. (If you do not follow this restriction, you will find that some of your routing elements will be registering zero flow instead of the specified hydrograph.)

BRU/gb

Storm Water Computer Software Library, Inc.
P.O. Box 27517, Denver, Colorado 80227, USA
Telephone: 303-947-3413, Fax: 303-985-8882

To: Users of the UDSWM386 Computer Program
From: James C.Y. Guo, PhD, P.E.
Date: January 31, 1996

The computer program, UDSWM386, is the revised version of the UDSWM2-pc program. The major revisions were completed in January 1996. They include:

(A) Improvements on the Program Capacity
(1) Increase of the number of sub-basins from 399 to 1500,
(2) Increase of the number of gutters from 399 to 1500, and
(3) Increase of the total number of nodes for detention, inflow, and diversion from 25 to 100.

(B) Corrections on Modeling Algorithms
(1) The averaging algorithm used with the inflow option in the older version often resulted in 5% to 15% more runoff than the user-defined inflow hydrograph. This problem has been corrected. The new version of UDSWM386 transfer hydrograph without numerical mistake.
(2) The direct step method for channel hydrograph routing was found to occasionally produce fluctuations on the computed hydrograph. The numerical method associated with the continuity principle was revised to produce stable and smooth computed hydrograph.

(C) Input and Output Management
(1) The older version had problem to accept the stored hydrographs from a watershed with seven sub-basins. This problem was caused by an incorrect printing format.
(2) The older version saved and printed gutter storm hydrographs in computer machine language. The new version allows the user to print out hydrographs at all nodes and links in a spread sheet format which is ready for hydrograph plottings. This revision is very helpful for visual presentations of inflow and outflow hydrographs at detention facilities, basin diversions, and confluence points.

(D) Additional notes for storm water modeling using UDSWM386 was attached in the back of this user operation manual.

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INTRODUCTION

UDSWM2 is the name assigned by the Urban Drainage and Flood Control District (UDFCD) to the Runoff Block of the EPA's SWMM (Storm Water Management Model, Version 2) as modified by the Missouri River Division (MRD) of the U.S. Corps of Engineers. This model is being used by UDFCD in its master planning studies only after it has been calibrated against the Colorado Urban Hydrograph Procedure (CUHP). The UDSWM2 offers channel, pipe and reservoir routing and the ability to analyze sub-basins having areas less than 90 acres which is the lower limit of the CUHP described in the 1984 version of the Urban Storm Drainage Criteria Manual (USDCM).

UDSWM2-PC is a personal computer version of the UDSWM2. It includes additional modifications made by Boyle Engineering Corporation under the direction of Ben Urbonas of Urban Drainage and Flood Control District. Major modifications incorporated into this version are as follows:

1. Subroutines of UDSWM2 were reconstructed in such a way that the model can be conjunctively used with the Colorado Urban Hydrograph Computer Program-Personal Computer Version (CUHPE/PC). The UDSWM2-PC has an option to take hydrographs developed by the CUHPE/PC, and to combine and route them through conveyance facilities as specified by a user. The CUHPE/PC is a personal computer version of the CUHPE (Colorado Urban Hydrograph Procedure Computer

Program) orginally developed by the UDFCD and modified by Boyle Engineering Corporation.

2. Dimensional and common statements and some of the logic in the earlier version were modified to be adoptable on a personal computer (IBM PC-XT, PC-AT or compatible equipment).

3. Plotting routines which were included in the earlier version were eliminated.

4. Some program "bugs" found during the conversion process were corrected. These included a divergence problem experienced with the Newton-Raphson Procedure used in the model, incorrect initialization of some variables, and incorrect procedure to account for diversions.

PROGRAM DESCRIPTION

The Runoff Block was developed as part of the EPA Storm Water Management Model (SWMM). It simulates both the quantity and quality runoff from an urban drainage basin and the routing of flow and contaminant to the major sewer lines. The model was later modified by the Missouri River Division (MRD) of the U.S. Corps of Engineers to improve deficiencies experienced with the original model. The Runoff Block for this personal computer version permits simulation of quantity runoff only, and can be conjunctively used with the Colorado Urban Hydrograph Computer Program-Personal Computer Version (CUHPE/PC).

The Runoff Block represents the basin by an aggregate of idealized subcatchments, channels, gutters and pipes. The program accepts rainfall hyetographs and makes a step by step accounting of rainfall infiltration losses in pervious areas, surface retention, overland flow, and gutter flow, leading to the calculation of hydrographs.

With the UDSWM2-PC, the drainage basin may be subdivided into a maximum of 399 subcatchment areas. The resulting hydrographs from all subcatchments can be routed through a maximum of 399 gutters or pipes to compute hydrographs at the inlet points. Overbank floodway sections may be used in conjunction with gutters and pipes. Up to 25 detention basins with a specified storage-outflow relationship may be used. Also, the program allows the user to specify a flow diversion table for up to 25 routing elements. All pipes, gutters, diversion and detentions are sometimes referred to as "conveyance elements" in this manual.

The user can also specify hydrographs developed by other models and utilize only the hydrograph routing routines built in the model. The input format for hydrographs is consistent with that used in the CUHPE/PC for outputs.

Surface Flows and Flow Routing

The core of the Runoff Block is the routing of hydrographs through the drainageway system. This is accomplished by a combination of overland flow and channel, gutter, reservoir and pipe routing.

Two types of elements are available to the user:

1. Subcatchment elements (overland flow)

2. Conveyance elements (channel flow, pipe flow, sotrage, etc.)

The subcatchment elements receive rainfall, account for infiltration loss using Horton's equation, permit surface storage such as ponding or retention on grass or shrubbery, and route excess rainfall to develop overland flows. The overland flows are then routed through the conveyance elements of the study watershed. Pipes and initial channel sections are permitted to surcharge when full or, if desired, overflow sections may be provided to convey the flow exceeding the pipe or the initial channel capacity. The routing is based on a kinematic wave approach utilizing Manning's equation both for subcatchment and conveyance elements.

There are five standard types of conveyance elements and three special flow routing conveyance elements. The five standard conveyance elements are as follows:

1. Channel. A trapezoidal channel to represent or approximate an open channel/gutter condition.

2. Pipe. A circular pipe of any diameter.

3. Direct flow. This element provides only instantaneous direct translation of the flows from the upstream to the downstream conveyance element and does not modify the hydrograph.

4. Channel with overflow channel. Same as the channel element above except that a larger trapezoidal channel is also specified to accept the flows exceeding the capacity of the initial channel cross-section.

5. Pipe with overflow channel. Same as the pipe element above except that a trapezoidal channel is also specified to accept the flows exceeding the capacity of the pipe.

The three special flow routing conveyance elements are as follows:

1. Diversion. A table of flows in a conveyance element versus the flow divereted to another conveyance element may be specified using this option. This option may be used with any routing elements but is limited to 25 diversion tables.

2. Storage reservoir. A table of reservoir storage in acre-feet versus outflow in cubic feet per second may be specified using this option. This option may be used in conjunction with the "pipe" routing element. The pipe capacity has to be exceeded before the storage-outflow function is utilized. The user may specify up to 25 reservoir routing elements.

3. Inflow hydrograph. This option may be used to specify an input hydrograph table of time in hours versus the flow in cfs for any routing element, but the user is limited to use 25 such tables.

Note that the total number of the three special conveyance elements has to be less than or equal to 25.

Subroutine Descriptions

The Runoff Block for this personal computer version has six core subroutines. Their functions and relationships are described below.

Subroutine RUNOFF This is the subroutine called by the main program. This subroutine prints "entry made to the Runoff Model" and then computes or reads in the hydrograph ordinates with the assistance of five subroutines, RHYDRW, WSHED, INPUTW, RHYDRG, and GUTTER. The subroutines, RHYDRW, WSHED, INPUTW and GUTTER, are called if the option index IOPT = 0. This option calls for estimation of the hydrographs from subcatchments for given rainfall and watershed parmeters. The subcatchment hydrographs are then routed through conveyance elements. If IOPT = 1, the subroutines, INPUTW, RHYDRG and GUTTER, are called instead, and hydrographs specified by the user will be read in and routed through conveyance elements.

Subroutine RHYDRW This subroutine is called by RUNOFF to read in the rainfall hyetograph and information related to the subcatchment areas and to perform some initial preparatory work, such as unit conversion and error detection.

There are three basis categories of input data read in by this subroutine. The general information includes a number representing the subcatchment area, period of simulation, and a key indicating if the rainfall hyetograph is different from that of the previous basin. A new rainfall hyetograph will be read if it is so indicated. Otherwise, this part of the "read" operation will be skipped and the rainfall of the previous drainage basin will be used. The first basin must have a rainfall input.

The program proceeds to read subcatchment data, e.g., the size, width, ground slope.

It must be noted that the program can detect only logical errors such as indexing numbers. However, the input data are printed so the user can check the data for correctness.

Subroutine WSHED This subroutine is called by RUNOFF to compute the depth and the rate of overland flow. A DO loop is formed to compute the hydrograph coordinate for each incremental time-step. In each step, the rainfall intensity is first interpolated from the designated rainfall hyetograph for each subcatchment. This rainfall intensity is assumed uniform over each subcatchment.

A DO loop is set up to treat the subcatchments, one at a time. For a subcatchment, the amount of infiltration loss is calculated using Horton's equation,

$$\text{Infiltration loss} = f_0+(f_i-f_o)e^{-at} \qquad (1)$$

in which f_o, f_i and a are coefficients and t is the time from the start of rainfall. The loss is compared with the amount of water existing on the subcatchment plus the rainfall. If the loss is larger, it is set equal to the amount available and the ramainder of the computation is skipped.

The water depth will increase without inducing an outflow until it reaches the specified surface detention requirement. Beyond that, the surface flow rate is calculated by Manning's equation using depth as the hydraulic radius. An iterative procedure termed Newton-

Raphson's technique is used to determine the excess water depth and the outflow rate so that the continuity of water mass is satisfied.

During the process of computation, an accounting is made of the rainfall accumulation which is compared against runoff, detention, and infiltration loss. A mass continuity is therefore be checked and printed for reference.

Upon completion, the subroutine will return or, as an option, create a data file containing hydrograph values of all subcatchments, for the subsequent routing through the conveyance elements.

Subroutine INPUTW This subroutine is called by RUNOFF to read in subcatchment hydrographs and the realtionship between subcatchments and conveyance elements when the option , IOPT = 1, is specified. If IOPT = 1 is specified, the subroutines RHYDRW and WSHED are skipped.

The data file containing subcatchment hydrographs may be created either by the CUHPE/PC model using print option NSW=7,8 or 9 or by the UDSWM2-PC with IOPT=0 and NSAVE in Card Group 1.7 being specified. This data file is an ASCII file and the output format used in both models has been set to be consistent with the input format used in the subroutine INPUTW.

Subroutine RHYDRC This subroutine is called by RUNOFF to read in the information regarding the routing elements (gutters, pipes, channels, etc.). The subroutine also sequences the computational order for

all the routing elements according to the upstream and downstream relationships.

Subroutine GUTTER The function of subroutine GUTTER is very similar to that of WSHED. It calculates a complete set of water depths and flows for all channels, gutters, pipes and other types of routing elements for each time step within a DO loop.

The computation also proceeds one routing element at a time. First, the inflow into the routing element from tributary subcatchments and other routing elements is computed. The Newton-Raphson's iterative procedure is then used to determine the depth and outflow of the routing elements so that the mass (volume) of water is conserved. The flow is computed by Manning's equation.

The hydraulic radius of trapezoidal channels and circular pipes is calculated separately in different paths of the subroutine. The storage reservoir elements are computed using a modified Puls routing procedure and the diversion and inflow hydrograph values are calculated using table interpolation routines.

A pipe or channel may surcharge when it is full and the inflow is larger than the capacity of the conveyance element. In this case, the surcharged volume is computed and stored at the upstream end of the element unless an overflow conveyance element is specified. A message will be printed to indicate the time, location, and total volume of the surcharge. The pipe or initial channel will remain full

until the stored water is completely drained. If an overflow element is provided, the flow exceeding the pipe or initial channel capacity will be routed through the overflow section.

III-B

UDSWMM INPUT FILES

```
   2   1   1   2
   3   4
WATERSHED   1
TRI TOWN EXISTING CONDITIONS SWMM MODEL; ALL EVENTS
ANDERSON CONSULTING ENGINEERS, JUNE 1999
        72  0 0  5.0                                                    1
        51  751
        52  252
        53  253
        54  254
        55  455
        56  256
        57  457
        58  258
        59  259
        60  260
        61  261
        62  462
        63  263
        70  470
        71  271
        72  372
        73  273
        74  474
        75  275
        76  276
        77  477
        78  278
        79  479
        80  280
        81  481
        82  282
        83  283
        84  484
        85  285
        86  286
        87  287
        88  488
        89  289
        90  490
        91  291
        92  292
        93  293
        94  293
        95  295
        96  496

    0  751   51  0 3              1.
    0  152  751  0 4     4.0   2500.  0.0056     1.0     1.0   0.035     3.0
                         20.0   2500.  0.0056   200.0   300.0   0.035   100.0
    0  252  152  0 3              1.
    0  153  252  0 4     4.0   5800.  0.0048     1.0     1.0   0.035     3.0
                         20.0   5800.  0.0048    70.0    90.0   0.035   100.0
    0  253  153  0 3              1.
    0  154  253  0 4     4.0   6700.  0.0049     3.0     3.0   0.035     6.0
                         40.0   6700.  0.0049    60.0   300.0   0.035   100.0
    0  254  154  0 3              1.
    0  175  254  0 4     4.0   1400.  0.0036     1.0     1.0   0.035     3.0
                         20.0   1400.  0.0036    70.0   120.0   0.035   100.0
    0  754  175  0 3              1.
    0  155  754  0 4     6.0   4200.  0.0088     3.0     3.0   0.035     6.0
                         30.0   4200.  0.0088   400.0   100.0   0.035   100.0
    0  255  155  0 3              1.
```

```
0  156  255  0 4    6.0    300.  0.0017    3.0    3.0  0.035    6.0
                   30.0    300.  0.0017  240.0  350.0  0.035  100.0
0  755  156  0 3            1.
0  256  755  0 3            1.
0  157  256  0 4    6.0   1450.  0.0052    3.0    3.0  0.035    8.0
                   60.0   1450.  0.0052    1.0  300.0  0.035  100.0
0  257  157  0 3            1.
0  158  257  0 4    6.0   1000.  0.0040    3.0    3.0  0.035    8.0
                   60.0   1000.  0.0040    1.0  150.0  0.035  100.0
0  258  158  0 3            1.
0  159  258  0 4   10.0   1100.  0.0027    3.0    3.0  0.035   10.0
                   60.0   1100.  0.0027    1.0  200.0  0.035  100.0
0  259  159  0 3            1.
0   59  259  0 4   10.0   1500.  0.0040    3.0    3.0  0.035   10.0
                   60.0   1500.  0.0040    1.0  200.0  0.035  100.0
0  760   59  0 3            1.
0  161  760  0 4    6.0   1300.  0.0092    2.0    3.0  0.035   10.0
                   60.0   1300.  0.0092    1.0  200.0  0.035  100.0
0  761  161  0 3            1.
0   61  761  0 4    4.0   2000.  0.0025    2.0    2.0  0.035    8.0
                   30.0   2000.  0.0025  100.0  300.0  0.035  100.0
0  261   61  0 3            1.
0  162  261  0 4    3.0   2500.  0.0020    5.0    5.0  0.035    2.0
                   20.0   2500.  0.0020  170.0  160.0  0.035  100.0
0  262  162  0 3            1.
0  163  262  0 4   0.01   2100.  0.0124   50.0   50.0  0.016    0.5
                   50.0   2100.  0.0124   20.0   20.0  0.040  100.0
0  263  163  0 3            1.
0  171  998  0 1    4.0   7600.  0.0035   50.0   50.0  0.035  100.0
0  470  998  2 2    0.1      1.                                  0.1
   0.0       0.0     36.6     623.0
0  271  171  0 3            1.
0  372  271  2.2    0.1      1.                                  0.1
   0.0       0.0     67.3     190.0
0  173  253  0 1   0.01   2400.  0.0121   20.0   20.0  0.035  100.0
0  273  173  0 3            1.
0  174  253  0 1   0.01   3700.  0.0103   20.0   20.0  0.035  100.0
0  274  174  0 3            1.
0  474  274  2 2    0.1      1.                                  0.1
   0.0       0.0      7.4     328.0
0  275  754  0 3            1.
0  455  255  2 2    0.1      1.                                  0.1
   0.0       0.0      3.9     250.0
0  176  256  0 4   0.01    800.  0.0030   10.0   10.0  0.016    1.0
                   20.0    800.  0.0030   50.0  200.0  0.040  100.0
0  276  176  0 3            1.
0  177  276  0 4   0.01   1650.  0.0152   50.0   50.0  0.016    0.5
                   50.0   1650.  0.0152   20.0   20.0  0.040  100.0
0  277  177  0 3            1.
0  477  277  2 2    0.1      1.                                  0.1
   0.0       0.0      0.7      29.0
0  457  257  2 2    0.1      1.                                  0.1
   0.0       0.0      4.1      80.0
0  178  457  0 4   0.01    250.  0.0040   10.0   10.0  0.016  100.0
                   20.0    250.  0.0040  200.0   80.0  0.040  100.0
0  278  178  0 3            1.
0  179  278  0 4   0.01   2100.  0.0100   50.0   50.0  0.016    0.5
                   50.0   2100.  0.0100   20.0   20.0  0.040  100.0
0  279  179  0 3            1.
0  479  279  2 2    0.1      1.                                  0.1
   0.0       0.0      0.4      31.0
0  180  258  0 5    3.0    600.  0.0020   0.01   0.01  0.013    3.0
                    3.0    600.  0.0020    1.0    1.0  0.016  100.0
```

```
  0  280  180  0 3              1.
  0  181  280  0 5     2.4   1700.  0.0097    0.01    0.01   0.013     2.4
                       50.0   1700.  0.0097    20.0    20.0   0.016   100.0
  0  281  181  0 3              1.
  0  481  281  2 2     0.1      1.                                      0.1
     0.0       0.0       4.1     188.0
  0  182  281  0 1    0.01   2700.  0.0156    90.0   110.0   0.035   100.0
  0  282  182  0 3              1.
  0  183  259  0 1    0.01    500.  0.0020   170.0   100.0   0.035   100.0
  0  283  183  0 3              1.
  0  184  283  0 1    0.01   2000.  0.0085   160.0   130.0   0.035   100.0
  0  284  184  0 3              1.
  0  484  284  2 2     0.1      1.                                      0.1
     0.0       0.0       1.7      39.0
  0  185  259  0 1    0.01    600.  0.0017    60.0   290.0   0.035   100.0
  0  285  185  0 3              1.
  0  186  285  0 4    0.01    550.  0.0073    50.0    50.0   0.016     0.5
                       50.0    550.  0.0073    20.0    20.0   0.040   100.0
  0  286  186  0 3              1.
  0  160  285  0 1    0.01   1250.  0.0080   140.0   100.0   0.035   100.0
  0  260  160  0 3              1.
  0  287  260  0 3              1.
  0  188  287  0 4    0.01   1800.  0.0133    50.0    50.0   0.016     0.5
                       50.0   1800.  0.0133    20.0    20.0   0.016   100.0
  0  288  188  0 3              1.
  0  488  288  2 2     0.1      1.                                      0.1
     0.0       0.0       0.7      45.0
  0  189  261  0 4     4.0   1500.  0.0047     2.0     2.0   0.035     8.0
                       30.0   1500.  0.0047   100.0   300.0   0.035   100.0
  0  289  189  0 3              1.
  0  190  289  0 1    0.01   2600.  0.0115    50.0    60.0   0.035   100.0
  0  290  190  0 3              1.
  0  490  290  2 2     0.1      1.                                      0.1
     0.0       0.0      17.4     539.0
  0  462  262  2 2     0.1      1.                                      0.1
     0.0       0.0       4.4     292.0
  0  191  262  0 4    0.01   1500.  0.0060    50.0    50.0   0.016     0.5
                       50.0   1500.  0.0060    20.0    20.0   0.040   100.0
  0  291  191  0 3              1.
  0  192  291  0 4    0.01   2600.  0.0085    50.0    50.0   0.016     0.5
                       50.0   2600.  0.0085    20.0    20.0   0.040   100.0
  0  292  192  0 3              1.
  0  193  262  0 4    0.01   1000.  0.0020    50.0    50.0   0.016     0.5
                       50.0   1000.  0.0020    20.0    20.0   0.040   100.0
  0  293  193  0 3              1.
  0  196  755  0 4     2.0   1500.  0.0038     5.0     5.0   0.035     3.0
                       30.0   1500.  0.0038    45.0     2.0   0.035   100.0
  0  296  196  0 3              1.
  0  195  296  0 4     2.0   3650.  0.0064     5.0     5.0   0.035     3.0
                       30.0   3650.  0.0064   100.0     2.0   0.035   100.0
  0  295  195  0 3              1.
  0  496  296  2 2     0.1      1.                                      0.1
     0.0       0.0       7.3     474.0

  0
 33
751  152  252  153  253  154  254  175  754  155  255  156  755  256  157  257
158  258  159  259   59  760  161  761   61  261  162  262  163  263  271  372
275
ENDPROGRAM
```

```
   2   1   1   2
   3   4
WATERSHED   1
TRI TOWN FUTURE CONDITIONS WITH ON-SITE DETENTION UDSWMM MODEL; ALL EVENTS
ANDERSON CONSULTING ENGINEERS, JUNE 1999
        72  0 0  5.0                                                          1
        51  451
        52  452
        53  453
        54  454
        55  455
        56  456
        57  457
        58  458
        59  459
        60  460
        61  461
        62  462
        63  463
        70  470
        71  471
        72  472
        73  473
        74  474
        75  475
        76  276
        77  477
        78  278
        79  479
        80  480
        81  481
        82  482
        83  483
        84  484
        85  485
        86  486
        87  487
        88  488
        89  489
        90  490
        91  491
        92  492
        93  493
        94  494
        95  495
        96  496

    0  751   51  0 3              1.
    0  152  751  0 4     4.0   2500.  0.0056     1.0     1.0   0.035     3.0
                         20.0   2500.  0.0056   200.0   300.0   0.035   100.0
    0  252  152  0 3              1.
    0  153  252  0 4     4.0   5800.  0.0048     1.0     1.0   0.035     3.0
                         20.0   5800.  0.0048    70.0    90.0   0.035   100.0
    0  253  153  0 3              1.
    0  154  253  0 4     4.0   6700.  0.0049     3.0     3.0   0.035     6.0
                         40.0   6700.  0.0049    60.0   300.0   0.035   100.0
    0  254  154  0 3              1.
    0  175  254  0 4     4.0   1400.  0.0036     1.0     1.0   0.035     3.0
                         20.0   1400.  0.0036    70.0   120.0   0.035   100.0
    0  754  175  0 3              1.
    0  155  754  0 4     6.0   4200.  0.0088     3.0     3.0   0.035     6.0
                         30.0   4200.  0.0088   400.0   100.0   0.035   100.0
    0  255  155  0 3              1.
```

```
0  156  255  0 4    6.0    300.  0.0017     3.0     3.0   0.035     6.0
                   30.0    300.  0.0017   240.0   350.0   0.035   100.0
0  755  156  0 3              1.
0  256  755  0 3              1.
0  157  256  0 4    6.0   1450.  0.0052     3.0     3.0   0.035     8.0
                   60.0   1450.  0.0052     1.0   300.0   0.035   100.0
0  257  157  0 3              1.
0  158  257  0 4    6.0   1000.  0.0040     3.0     3.0   0.035     8.0
                   60.0   1000.  0.0040     1.0   150.0   0.035   100.0
0  258  158  0 3              1.
0  159  258  0 4   10.0   1100.  0.0027     3.0     3.0   0.035    10.0
                   60.0   1100.  0.0027     1.0   200.0   0.035   100.0
0  259  159  0 3              1.
0   59  259  0 4   10.0   1500.  0.0040     3.0     3.0   0.035    10.0
                   60.0   1500.  0.0040     1.0   200.0   0.035   100.0
0  760   59  0 3              1.
0  161  760  0 4    6.0   1300.  0.0092     2.0     3.0   0.035    10.0
                   60.0   1300.  0.0092     1.0   200.0   0.035   100.0
0  761  161  0 3              1.
0   61  761  0 4    4.0   2000.  0.0025     2.0     2.0   0.035     8.0
                   30.0   2000.  0.0025   100.0   300.0   0.035   100.0
0  261   61  0 3              1.
0  162  261  0 4    3.0   2500.  0.0020     5.0     5.0   0.035     2.0
                   20.0   2500.  0.0020   170.0   160.0   0.035   100.0
0  262  162  0 3              1.
0  163  262  0 4   0.01   2100.  0.0124    50.0    50.0   0.016     0.5
                   50.0   2100.  0.0124    20.0    20.0   0.040   100.0
0  263  163  0 3              1.
0  171  998  0 1    4.0   7600.  0.0035    50.0    50.0   0.035   100.0
0  470  998  3 2    0.1      1.                                     0.1
   0.0       0.0      5.7     228.0      22.3     631.0
0  271  171  0 3              1.
0  372  271  2 2    0.1      1.                                     0.1
   0.0       0.0     67.3     190.0
0  173  253  0 1   0.01   2400.  0.0121    20.0    20.0   0.035   100.0
0  273  173  0 3              1.
0  174  253  0 1   0.01   3700.  0.0103    20.0    20.0   0.035   100.0
0  274  174  0 3              1.
0  474  274  3 2    0.1      1.                                     0.1
   0.0       0.0     10.9     111.0      26.2     358.0
0  275  754  0 3              1.
0  455  255  2 2    0.1      1.                                     0.1
   0.0       0.0     14.5     172.0
0  176  256  0 4   0.01    800.  0.0030    10.0    10.0   0.016     1.0
                   20.0    800.  0.0030    50.0   200.0   0.040   100.0
0  276  176  0 3              1.
0  177  276  0 4   0.01   1650.  0.0152    50.0    50.0   0.016     0.5
                   50.0   1650.  0.0152    20.0    20.0   0.040   100.0
0  277  177  0 3              1.
0  477  277  2 2    0.1      1.                                     0.1
   0.0       0.0      5.7       4.0
0  457  257  2 2    0.1      1.                                     0.1
   0.0       0.0      5.0      64.0
0  178  457  0 4   0.01    250.  0.0040    10.0    10.0   0.016   100.0
                   20.0    250.  0.0040   200.0    80.0   0.040   100.0
0  278  178  0 3              1.
0  179  278  0 4   0.01   2100.  0.0100    50.0    50.0   0.016     0.5
                   50.0   2100.  0.0100    20.0    20.0   0.040   100.0
0  279  179  0 3              1.
0  479  279  2 2    0.1      1.                                     0.1
   0.0       0.0      4.4      27.0
0  180  258  0 5    3.0    600.  0.0020    0.01    0.01   0.013     3.0
                    3.0    600.  0.0020     1.0     1.0   0.016   100.0
```

```
0  280  180  0 3              1.
0  181  280  0 5     2.4   1700.  0.0097    0.01    0.01   0.013     2.4
                    50.0   1700.  0.0097    20.0    20.0   0.016   100.0
0  281  181  0 3              1.
0  481  281  2 2     0.1      1.                                     0.1
   0.0       0.0      12.4      72.0
0  182  281  0 1    0.01   2700.  0.0156    90.0   110.0   0.035   100.0
0  282  182  0 3              1.
0  183  259  0 1    0.01    500.  0.0020   170.0   100.0   0.035   100.0
0  283  183  0 3              1.
0  184  283  0 1    0.01   2000.  0.0085   160.0   130.0   0.035   100.0
0  284  184  0 3              1.
0  484  284  2 2     0.1      1.                                     0.1
   0.0       0.0      11.6       1.0
0  185  259  0 1    0.01    600.  0.0017    60.0   290.0   0.035   100.0
0  285  185  0 3              1.
0  186  285  0 4    0.01    550.  0.0073    50.0    50.0   0.016     0.5
                    50.0    550.  0.0073    20.0    20.0   0.040   100.0
0  286  186  0 3              1.
0  160  285  0 1    0.01   1250.  0.0080   140.0   100.0   0.035   100.0
0  260  160  0 3              1.
0  287  260  0 3              1.
0  188  287  0 4    0.01   1800.  0.0133    50.0    50.0   0.016     0.5
                    50.0   1800.  0.0133    20.0    20.0   0.016   100.0
0  288  188  0 3              1.
0  488  288  2 2     0.1      1.                                     0.1
   0.0       0.0       2.4      25.0
0  189  261  0 4     4.0   1500.  0.0047     2.0     2.0   0.035     8.0
                    30.0   1500.  0.0047   100.0   300.0   0.035   100.0
0  289  189  0 3              1.
0  190  289  0 1    0.01   2600.  0.0115    50.0    60.0   0.035   100.0
0  290  190  0 3              1.
0  490  290  2 2     0.1      1.                                     0.1
   0.0       0.0      53.4     126.0
0  462  262  2 2     0.1      1.                                     0.1
   0.0       0.0       4.4     292.0
0  191  262  0 4    0.01   1500.  0.0060    50.0    50.0   0.016     0.5
                    50.0   1500.  0.0060    20.0    20.0   0.040   100.0
0  291  191  0 3              1.
0  192  291  0 4    0.01   2600.  0.0085    50.0    50.0   0.016     0.5
                    50.0   2600.  0.0085    20.0    20.0   0.040   100.0
0  292  192  0 3              1.
0  193  262  0 4    0.01   1000.  0.0020    50.0    50.0   0.016     0.5
                    50.0   1000.  0.0020    20.0    20.0   0.040   100.0
0  293  193  0 3              1.
0  196  755  0 4     2.0   1500.  0.0038     5.0     5.0   0.035     3.0
                    30.0   1500.  0.0038    45.0     2.0   0.035   100.0
0  296  196  0 3              1.
0  195  296  0 4     2.0   3650.  0.0064     5.0     5.0   0.035     3.0
                    30.0   3650.  0.0064   100.0     2.0   0.035   100.0
0  295  195  0 3              1.
0  496  296  2 2     0.1      1.                                     0.1
   0.0       0.0      40.6      65.0
0  451  751  3 2     0.1      1.                                     0.1
   0.0       0.0      29.8     173.0      56.4     561.0
0  452  252  3 2     0.1      1.                                     0.1
   0.0       0.0      23.0     206.0      49.7     707.0
0  453  253  3 2     0.1      1.                                     0.1
   0.0       0.0      21.7     165.0      49.0     618.0
0  454  254  3 2     0.1      1.                                     0.1
   0.0       0.0       5.3      74.0      14.3     298.0
0  456  256  2 2     0.1      1.                                     0.1
   0.0       0.0       1.8      39.0
```

```
    0  458  258  2 2     0.1      1.                                    0.1
       0.0       0.0       1.3      22.0
    0  459  259  2 2     0.1      1.                                    0.1
       0.0       0.0       1.8      18.0
    0  460  260  2 2     0.1      1.                                    0.1
       0.0       0.0       0.8     134.0
    0  461  261  2 2     0.1      1.                                    0.1
       0.0       0.0      35.5      13.0
    0  463  263  2 2     0.1      1.                                    0.1
       0.0       0.0      45.0      34.0
    0  471  271  3 2     0.1      1.                                    0.1
       0.0       0.0       2.0      29.0       5.4     144.0
    0  472  372  3 2     0.1      1.                                    0.1
       0.0       0.0      10.5     241.0      22.7     727.0
    0  473  273  3 2     0.1      1.                                    0.1
       0.0       0.0       6.5      35.0      12.3     138.0
    0  475  275  3 2     0.1      1.                                    0.1
       0.0       0.0      27.3     154.0      61.5     605.0
    0  480  280  2 2     0.1      1.                                    0.1
       0.0       0.0       1.2      93.0
    0  482  282  2 2     0.1      1.                                    0.1
       0.0       0.0      12.0      19.0
    0  483  283  2 2     0.1      1.                                    0.1
       0.0       0.0       2.4      86.0
    0  485  285  2 2     0.1      1.                                    0.1
       0.0       0.0       1.7      15.0
    0  486  286  2 2     0.1      1.                                    0.1
       0.0       0.0       5.2      41.0
    0  487  287  2 2     0.1      1.                                    0.1
       0.0       0.0       1.5     166.0
    0  489  289  2 2     0.1      1.                                    0.1
       0.0       0.0      29.1      78.0
    0  491  291  2 2     0.1      1.                                    0.1
       0.0       0.0       6.9     635.0
    0  492  292  2 2     0.1      1.                                    0.1
       0.0       0.0      14.3      26.0
    0  493  293  2 2     0.1      1.                                    0.1
       0.0       0.0       3.6      57.0
    0  494  293  2 2     0.1      1.                                    0.1
       0.0       0.0       5.3      16.0
    0  495  295  2 2     0.1      1.                                    0.1
       0.0       0.0      60.8      18.0

    0
   33
  751  152  252  153  253  154  254  175  754  155  255  156  755  256  157  257
  158  258  159  259   59  760  161  761   61  261  162  262  163  263  271  372
  275
ENDPROGRAM
```

```
   2   1   1   2
   3   4
WATERSHED   1
TRI TOWN FUTURE CONDITIONS WITH ON-SITE DET. AND REG. DET. UDSWMM MODEL; 100 YR
ANDERSON CONSULTING ENGINEERS, JUNE 1999
       108  0 0  5.0                                                          1
        51  451
        52  452
        53  453
        54  454
        55  455
        56  456
        57  457
        58  458
        59  459
        60  460
        61  461
        62  462
        63  463
        70  470
        71  471
        72  472
        73  473
        74  474
        75  475
        76  276
        77  477
        78  278
        79  479
        80  480
        81  481
        82  482
        83  483
        84  484
        85  485
        86  486
        87  487
        88  488
        89  489
        90  490
        91  491
        92  492
        93  493
        94  494
        95  495
        96  496

    0  751   51  0 3              1.
    0  152  751  0 4     4.0   2500.  0.0056     1.0     1.0   0.035     3.0
                         20.0   2500.  0.0056   200.0   300.0   0.035   100.0
    0  252  152  0 3              1.
    0   52  252  0 4     4.0   3600.  0.0047     1.0     1.0   0.035     3.0
                         20.0   3600.  0.0047    50.0    20.0   0.035   100.0
    0  352   52  3 2     0.1      1.                                      0.1
       0.0       0.0      19.5     490.0     130.0     760.0
    0  153  352  0 4     4.0   2200.  0.0048     1.0     1.0   0.035     3.0
                         20.0   2200.  0.0048    70.0    90.0   0.035   100.0
    0  253  153  0 3              1.
    0   53  253  0 4     4.0   2800.  0.0064     3.0     3.0   0.035     6.0
                         40.0   2800.  0.0064    15.0   170.0   0.035   100.0
    0  353   53  3 2     0.1      1.                                      0.1
       0.0       0.0      51.0     530.0     150.5     680.0
    0  753  353  0 3              1.
```

```
0  154  753  0 4     4.0   3900.  0.0038     3.0     3.0   0.035     6.0
                    40.0   3900.  0.0038    25.0    20.0   0.035   100.0
0  254  154  0 3             1.
0  175  254  0 4     4.0   1400.  0.0036     1.0     1.0   0.035     3.0
                    20.0   1400.  0.0036    70.0   120.0   0.035   100.0
0  754  175  0 3             1.
0  155  754  0 4     6.0   4200.  0.0088     3.0     3.0   0.035     6.0
                    30.0   4200.  0.0088   400.0   100.0   0.035   100.0
0  255  155  0 3             1.
0  156  255  0 4     6.0    300.  0.0017     3.0     3.0   0.035     6.0
                    30.0    300.  0.0017   240.0   350.0   0.035   100.0
0  755  156  0 3             1.
0  256  755  0 3             1.
0  157  256  0 4     6.0   1450.  0.0052     3.0     3.0   0.035     8.0
                    60.0   1450.  0.0052     1.0   300.0   0.035   100.0
0  257  157  0 3             1.
0  158  257  0 4     6.0   1000.  0.0040     3.0     3.0   0.035     8.0
                    60.0   1000.  0.0040     1.0   150.0   0.035   100.0
0  258  158  0 3             1.
0  159  258  0 4    10.0   1100.  0.0027     3.0     3.0   0.035    10.0
                    60.0   1100.  0.0027     1.0   200.0   0.035   100.0
0  259  159  0 3             1.
0   59  259  0 4    10.0   1500.  0.0040     3.0     3.0   0.035    10.0
                    60.0   1500.  0.0040     1.0   200.0   0.035   100.0
0  760   59  0 3             1.
0  161  760  0 4     6.0   1300.  0.0092     2.0     3.0   0.035    10.0
                    60.0   1300.  0.0092     1.0   200.0   0.035   100.0
0  761  161  0 3             1.
0  361  761  3 2     0.1      1.                                     0.1
   0.0       0.0      30.6      80.0     136.4     108.0
0  261  361  0 3             1.
0  162  261  0 4     3.0   2500.  0.0020     5.0     5.0   0.035     2.0
                    20.0   2500.  0.0020   170.0   160.0   0.035   100.0
0  262  162  0 3             1.
0  163  262  0 4    0.01   2100.  0.0124    50.0    50.0   0.016     0.5
                    50.0   2100.  0.0124    20.0    20.0   0.040   100.0
0  263  163  0 3             1.
0  171  998  0 1     4.0   7600.  0.0035    50.0    50.0   0.035   100.0
0  470  998  3 2     0.1      1.                                     0.1
   0.0       0.0       5.7     228.0      22.3     631.0
0  271  171  0 3             1.
0  372  271  2 2     0.1      1.                                     0.1
   0.0       0.0      67.3     190.0
0  173  253  0 1    0.01   2400.  0.0121    20.0    20.0   0.035   100.0
0  273  173  0 3             1.
0  174  753  0 1    0.01   2000.  0.0100    20.0    20.0   0.035   100.0
0  274  174  0 3             1.
0  474  274  3 2     0.1      1.                                     0.1
   0.0       0.0      10.9     111.0      26.2     358.0
0  275  754  0 3             1.
0  455  255  2 2     0.1      1.                                     0.1
   0.0       0.0      14.5     172.0
0  375  275  3 2     0.1      1.                                     0.1
   0.0       0.0      11.2     170.0      47.2     270.0
0  176  256  0 4    0.01    800.  0.0030    10.0    10.0   0.016     1.0
                    20.0    800.  0.0030    50.0   200.0   0.040   100.0
0  276  176  0 3             1.
0  177  276  0 4    0.01   1650.  0.0152    50.0    50.0   0.016     0.5
                    50.0   1650.  0.0152    20.0    20.0   0.040   100.0
0  277  177  0 3             1.
0  477  277  2 2     0.1      1.                                     0.1
   0.0       0.0       5.7       4.0
0  457  257  2 2     0.1      1.                                     0.1
```

```
   0.0        0.0        5.0       64.0
0  178  457  0 4    0.01    250.  0.0040    10.0    10.0   0.016   100.0
                    20.0    250.  0.0040   200.0    80.0   0.040   100.0
0  278  178  0 3              1.
0  179  278  0 4    0.01   2100.  0.0100    50.0    50.0   0.016     0.5
                    50.0   2100.  0.0100    20.0    20.0   0.040   100.0
0  279  179  0 3              1.
0  479  279  2 2     0.1      1.                                     0.1
   0.0        0.0        4.4       27.0
0  180  258  0 5     3.0    600.  0.0020    0.01    0.01   0.013     3.0
                     3.0    600.  0.0020     1.0     1.0   0.016   100.0
0  280  180  0 3              1.
0  181  280  0 5     2.4   1700.  0.0097    0.01    0.01   0.013     2.4
                    50.0   1700.  0.0097    20.0    20.0   0.016   100.0
0  281  181  0 3              1.
0  481  281  2 2     0.1      1.                                     0.1
   0.0        0.0       12.4       72.0
0  182  281  0 1    0.01   2700.  0.0156    90.0   110.0   0.035   100.0
0  282  182  0 3              1.
0  183  259  0 1    0.01    500.  0.0020   170.0   100.0   0.035   100.0
0  283  183  0 3              1.
0  184  283  0 1    0.01   2000.  0.0085   160.0   130.0   0.035   100.0
0  284  184  0 3              1.
0  484  284  2 2     0.1      1.                                     0.1
   0.0        0.0       11.6        1.0
0  185  259  0 1    0.01    600.  0.0017    60.0   290.0   0.035   100.0
0  285  185  0 3              1.
0  186  285  0 4    0.01    550.  0.0073    50.0    50.0   0.016     0.5
                    50.0    550.  0.0073    20.0    20.0   0.040   100.0
0  286  186  0 3              1.
0  160  285  0 1    0.01   1250.  0.0080   140.0   100.0   0.035   100.0
0  260  160  0 3              1.
0  287  260  0 3              1.
0  188  287  0 4    0.01   1800.  0.0133    50.0    50.0   0.016     0.5
                    50.0   1800.  0.0133    20.0    20.0   0.016   100.0
0  288  188  0 3              1.
0  488  288  2 2     0.1      1.                                     0.1
   0.0        0.0        2.4       25.0
0  289  261  0 3              1.
0  190  289  0 1    0.01   2600.  0.0115    50.0    60.0   0.035   100.0
0  290  190  0 3              1.
0  490  290  2 2     0.1      1.                                     0.1
   0.0        0.0       53.4      126.0
0  462  262  2 2     0.1      1.                                     0.1
   0.0        0.0        4.4      292.0
0  191  262  0 4    0.01   1500.  0.0060    50.0    50.0   0.016     0.5
                    50.0   1500.  0.0060    20.0    20.0   0.040   100.0
0  291  191  0 3              1.
0  192  291  0 4    0.01   2600.  0.0085    50.0    50.0   0.016     0.5
                    50.0   2600.  0.0085    20.0    20.0   0.040   100.0
0  292  192  0 3              1.
0  193  262  0 4    0.01   1000.  0.0020    50.0    50.0   0.016     0.5
                    50.0   1000.  0.0020    20.0    20.0   0.040   100.0
0  293  193  0 3              1.
0  196  755  0 4     2.0   1500.  0.0038     5.0     5.0   0.035     3.0
                    30.0   1500.  0.0038    45.0     2.0   0.035   100.0
0  296  196  0 3              1.
0  195  296  0 4     2.0   3650.  0.0064     5.0     5.0   0.035     3.0
                    30.0   3650.  0.0064   100.0     2.0   0.035   100.0
0  295  195  0 3              1.
0  496  296  2 2     0.1      1.                                     0.1
   0.0        0.0       40.6       65.0
0  451  751  3 2     0.1      1.                                     0.1
```

```
      0.0        0.0       29.8      173.0       56.4      561.0
    0  452  252  3 2      0.1       1.                                    0.1
      0.0        0.0       23.0      206.0       49.7      707.0
    0  453  253  3 2      0.1       1.                                    0.1
      0.0        0.0       21.7      165.0       49.0      618.0
    0  454  254  3 2      0.1       1.                                    0.1
      0.0        0.0        5.3       74.0       14.3      298.0
    0  456  256  2 2      0.1       1.                                    0.1
      0.0        0.0        1.8       39.0
    0  458  258  2 2      0.1       1.                                    0.1
      0.0        0.0        1.3       22.0
    0  459  259  2 2      0.1       1.                                    0.1
      0.0        0.0        1.8       18.0
    0  460  260  2 2      0.1       1.                                    0.1
      0.0        0.0        0.8      134.0
    0  461  261  2 2      0.1       1.                                    0.1
      0.0        0.0       35.5       13.0
    0  463  263  2 2      0.1       1.                                    0.1
      0.0        0.0       45.0       34.0
    0  471  271  3 2      0.1       1.                                    0.1
      0.0        0.0        2.0       29.0        5.4      144.0
    0  472  372  3 2      0.1       1.                                    0.1
      0.0        0.0       10.5      241.0       22.7      727.0
    0  473  273  3 2      0.1       1.                                    0.1
      0.0        0.0        6.5       35.0       12.3      138.0
    0  475  375  3 2      0.1       1.                                    0.1
      0.0        0.0       27.3      154.0       61.5      605.0
    0  480  280  2 2      0.1       1.                                    0.1
      0.0        0.0        1.2       93.0
    0  482  282  2 2      0.1       1.                                    0.1
      0.0        0.0       12.0       19.0
    0  483  283  2 2      0.1       1.                                    0.1
      0.0        0.0        2.4       86.0
    0  485  285  2 2      0.1       1.                                    0.1
      0.0        0.0        1.7       15.0
    0  486  286  2 2      0.1       1.                                    0.1
      0.0        0.0        5.2       41.0
    0  487  287  2 2      0.1       1.                                    0.1
      0.0        0.0        1.5      166.0
    0  489  289  2 2      0.1       1.                                    0.1
      0.0        0.0       29.1       78.0
    0  491  291  2 2      0.1       1.                                    0.1
      0.0        0.0        6.9      635.0
    0  492  292  2 2      0.1       1.                                    0.1
      0.0        0.0       14.3       26.0
    0  493  293  2 2      0.1       1.                                    0.1
      0.0        0.0        3.6       57.0
    0  494  293  2 2      0.1       1.                                    0.1
      0.0        0.0        5.3       16.0
    0  495  295  2 2      0.1       1.                                    0.1
      0.0        0.0       60.8       18.0

    0
   38
  751  152  252   52  352  153  253   53  353  753  154  254  175  754  155  255
  156  755  256  157  257  158  258  159  259   59  760  161  761  361  261  162
  262  163  263  271  372  275
ENDPROGRAM
```

III-C

UDSWMM MODEL NETWORK SCHEMATICS

III-D

EXISTING AND FUTURE CONDITION WITH ON-SITE DETENTION POND ANALYSES

'/6

PARK ENGINEERING CONSULTANTS

Sub-basin 55
Part of detention pond 455 analysis

Final Drainage Report
Meadowlark Business Park, Filing No. 2
Town of Frederick, Colorado

Prepared for:

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March 18, 1998
Revised September 8, 1998

PEC Job#21010012.doc

Basin E9 contains 11.31 acres and presently drains north to the offsite irrigation ditch. Initially this portion of the site will remain undeveloped. It will however be developed at a later date during which time the retention pond design will be determined for site specific information. When developed, it will drain north to be collected and retained in a retention pond as shown on the plan. It will eventually contribute a developed Q_{10} and Q_{100} of approximately 36 cfs and 60 cfs, respectively.

Basin O10 includes 1.14 undeveloped acres which presently discharges to the west. When developed, it will contribute a developed Q_{10} and Q_{100} of approximately 4 cfs and 7 cfs, respectively. These flows will be redirected to the previously discussed retention pond in Basin E9.

Detention Ponds

There are two proposed detention ponds on the site. The South Pond will have a maximum release rate of 3.5 cfs and the North Pond will have a maximum release rate of 1.2 cfs. Flows from the north portion of the site will generally flow toward the North Pond while flows from the south portion of the site will flow into the South Pond.

Outflow will be controlled by concrete release structures. Each will have an orifice to discharge small flows, along with a triangular notch weir to release the larger flows. The boxes will be constructed with an open top which is at 1 foot below the rim elevation of the pond. This will reduce the risk of large flows overtopping the banks of the ponds and causing damage to the embankments.

Discharge from each outlet structure will be carried to the roadside swale via 18" rcp.

Hydrograph Summary Report (100-YEAR)

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	Rational	27.4	1	10	0.50	100	—	—	—	D5 (DP 6)
2	Rational	1 .0	1	14	0.46	100	—	—	—	D6
3	Reach	23.6	1	16	0.51	100	1	—	—	DP 6 TO DP 7
4	Combine	40.5	1	15	0.97	100	3 + 2	—	—	DP 7
5	Rational	23.6	1	10	0.43	100	—	—	—	D7
6	Reach	39.6	1	17	0.98	100	4	—	—	DP 7 TO DP 8
7	Combine	54.0	1	16	1.40	100	6 + 5	—	—	DP 8
8	Reach	52.4	1	19	1.43	100	7	—	—	DP 8 TO POND
9	Rational	20.5	1	15	0.56	100	—	—	—	D8
10	Combine	69.7	1	18	1.99	100	8 + 9	—	—	TO POND
11	Rational	9.5	1	13	0.23	100	—	—	—	C3E
12	Rational	10.0	1	16	0.30	100	—	—	—	C3N(DP15)
13	Rational	6.9	1	10	0.13	100	—	—	—	C4(DP17)
14	Reach	9.0	1	22	0.29	100	12	—	—	DP15 TO DP16
15	Combine	14.9	1	20	0.52	100	11 + 14	—	—	DP16
16	Reach	14.8	1	21	0.52	100	15	—	—	DP16 TO DP5
[illegible]	Combine	18.2	1	15	0.64	100	13 + 16	—	—	DP5
18	Reach	17.2	1	25	0.66	100	17	—	—	TO N. POND
19	Combine	84.6	1	19	2.66	100	10 + 18	—	—	POND INFLOW
20	Reservoir	1.2	1	55	1.53	100	19	4953.28	2.60	NORTH POND
21	Rational	107.1	1	18	3.54	100	—	—	—	A1(DP1)
22	Rational	30.0	1	26	1.43	100	—	—	—	B2
23	Rational	31.3	1	17	0.98	100	—	—	—	B11
24	Reach	93.4	1	31	3.64	100	21	—	—	DP1 TO DP14
25	Combine	119.9	1	31	5.07	100	22 + 24	—	—	A1+B2
26	Combine	136.6	1	30	6.04	100	23 + 25	—	—	DP14
27	Rational	10.2	1	14	0.26	100	—	—	—	C3S(DP4)
28	Rational	11.2	1	14	0.29	100	—	—	—	C12
29	Reach	9.7	1	16	0.26	100	27	—	—	DP4 TO DP2
30	Combine	20.4	1	15	0.55	100	28 + 29	—	—	DP2
31	Combine	144.7	1	29	6.58	100	26 + 30	—	—	POND INFLOW

j. file: 2101D2.GPW | IDF file: ZONE1.IDF | Run date: 08-31-1998

Reservoir Report

Reservoir No. 2

NORTH POND

Culvert / Orifice Structures

		[A]	[B]	[C]
Rise (in)	=	4.0	0.0	0.0
Span (in)	=	4.0	0.0	0.0
No. Barrels	=	1	0	0
Invert El. (ft)	=	4949.05	0.00	0.00
Length (ft)	=	0.0	0.0	0.0
Slope (%)	=	0.00	0.00	0.00
N-Value	=	.013	.013	.013
Orif. Coeff.	=	0.60	0.60	0.60
Multi-Stage	=	——	No	No

Weir Structures

		[A]	[B]	[C]
Crest Len (ft)	=	1.0	0.0	0.0
Crest El. (ft)	=	4952.50	0.00	0.00
Weir Coeff.	=	0.67	3.00	3.00
Eqn. Exp.	=	2.50	1.50	1.50
Multi-Stage	=	No	No	No

Tailwater Elevation = 0.00 ft

Note: All outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

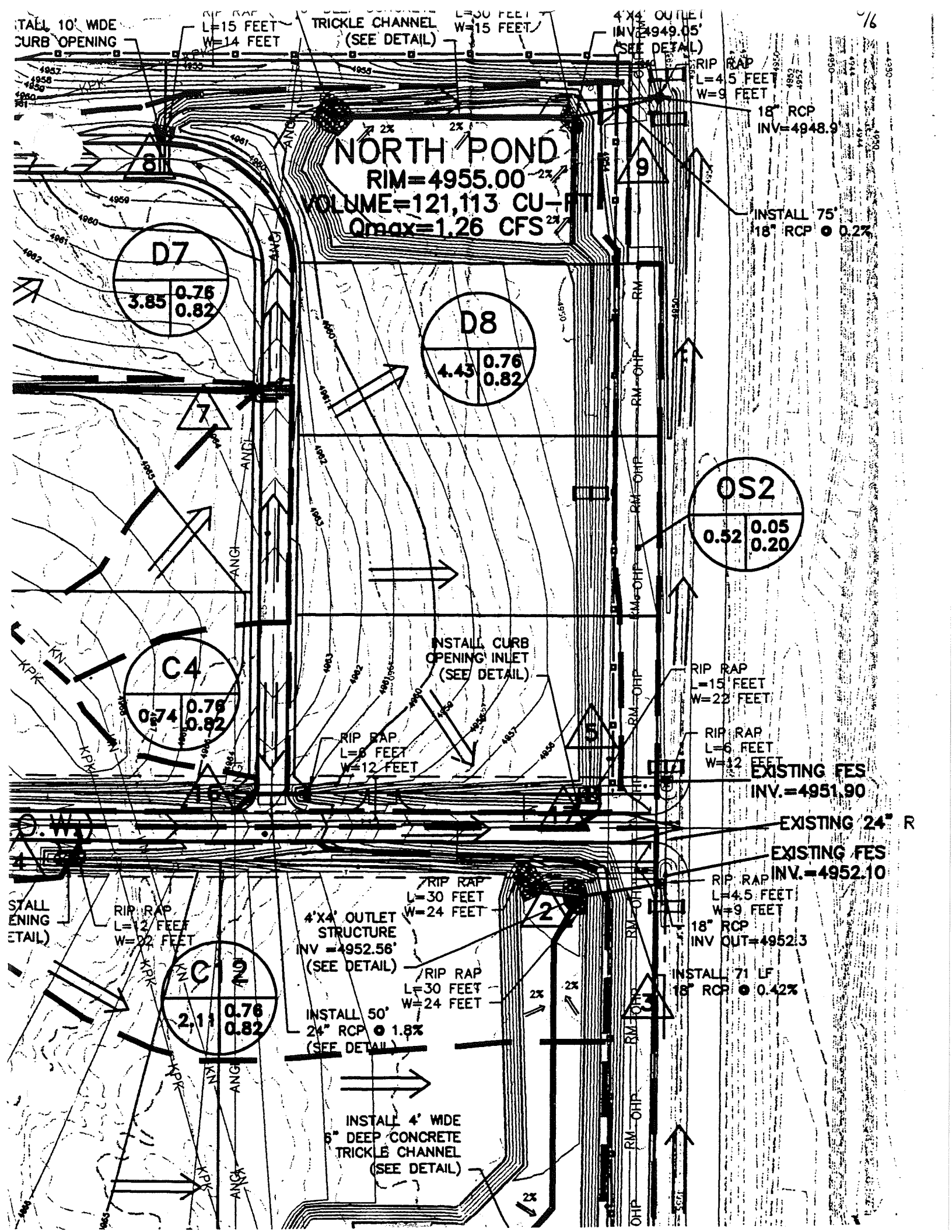
Stage (ft)	Storage (acft)	Elevation (ft)	Culv. A (cfs)	Culv. B (cfs)	Culv. C (cfs)	Weir A (cfs)	Weir B (cfs)	Weir C (cfs)	Discharge (cfs)
0.0	0.000	4949.00	0.00	—	—	0.00	—	—	0.00
0.1	0.027	4949.10	0.01	—	—	0.00	—	—	0.01
0.2	0.054	4949.20	0.05	—	—	0.00	—	—	0.05
0.3	0.081	4949.30	0.12	—	—	0.00	—	—	0.12
0.4	0.108	4949.40	0.18	—	—	0.00	—	—	0.18
0.5	0.135	4949.50	0.20	—	—	0.00	—	—	0.20
0.6	0.162	4949.60	0.26	—	—	0.00	—	—	0.26
0.7	0.189	4949.70	0.29	—	—	0.00	—	—	0.29
0.8	0.216	4949.80	0.32	—	—	0.00	—	—	0.32
0.9	0.243	4949.90	0.35	—	—	0.00	—	—	0.35
1.0	0.270	4950.00	0.37	—	—	0.00	—	—	0.37
1.1	0.329	4950.10	0.39	—	—	0.00	—	—	0.39
1.2	0.388	4950.20	0.42	—	—	0.00	—	—	0.42
1.3	0.447	4950.30	0.44	—	—	0.00	—	—	0.44
1.4	0.506	4950.40	0.46	—	—	0.00	—	—	0.46
1.5	0.565	4950.50	0.48	—	—	0.00	—	—	0.48
1.6	0.624	4950.60	0.49	—	—	0.00	—	—	0.49
1.7	0.683	4950.70	0.51	—	—	0.00	—	—	0.51
1.8	0.742	4950.80	0.53	—	—	0.00	—	—	0.53
1.9	0.801	4950.90	0.55	—	—	0.00	—	—	0.55
2.0	0.860	4951.00	0.56	—	—	0.00	—	—	0.56
2.1	0.929	4951.10	0.58	—	—	0.00	—	—	0.58
2.2	0.998	4951.20	0.59	—	—	0.00	—	—	0.59
2.3	1.067	4951.30	0.61	—	—	0.00	—	—	0.61

Continues on next page...

NORTH POND

Stage / Storage / Discharge Table

Stage (ft)	Storage (acft)	Elevation (ft)	Culv. A (cfs)	Culv. B (cfs)	Culv. C (cfs)	Weir A (cfs)	Weir B (cfs)	Weir C (cfs)	Discharge (cfs)
2.4	1.136	4951.40	0.62	—	—	0.00	—	—	0.62
2.5	1.205	4951.50	0.63	—	—	0.00	—	—	0.63
2.6	1.274	4951.60	0.65	—	—	0.00	—	—	0.65
2.7	1.343	4951.70	0.66	—	—	0.00	—	—	0.66
2.8	1.412	4951.80	0.68	—	—	0.00	—	—	0.68
2.9	1.481	4951.90	0.69	—	—	0.00	—	—	0.69
3.0	1.550	4952.00	0.70	—	—	0.00	—	—	0.70
3.1	1.629	4952.10	0.71	—	—	0.00	—	—	0.71
3.2	1.708	4952.20	0.73	—	—	0.00	—	—	0.73
3.3	1.787	4952.30	0.74	—	—	0.00	—	—	0.74
3.4	1.866	4952.40	0.75	—	—	0.00	—	—	0.75
3.5	1.945	4952.50	0.76	—	—	0.00	—	—	0.76
3.6	2.024	4952.60	0.77	—	—	0.00	—	—	0.78
3.7	2.103	4952.70	0.78	—	—	0.01	—	—	0.80
3.8	2.182	4952.80	0.80	—	—	0.03	—	—	0.83
3.9	2.261	4952.90	0.81	—	—	0.07	—	—	0.87
4.0	2.340	4953.00	0.82	—	—	0.12	—	—	0.94
4.1	2.431	4953.10	0.83	—	—	0.19	—	—	1.01
4.2	2.522	4953.20	0.84	—	—	0.27	—	—	1.11
4.3	2.613	4953.30	0.85	—	—	0.38	—	—	1.23
4.4	2.704	4953.40	0.86	—	—	0.52	—	—	1.37
4.5	2.795	4953.50	0.87	—	—	0.67	—	—	1.54
4.6	2.886	4953.60	0.88	—	—	0.85	—	—	1.73
4.7	2.977	4953.70	0.89	—	—	1.06	—	—	1.95
4.8	3.068	4953.80	0.90	—	—	1.29	—	—	2.19
4.9	3.159	4953.90	0.91	—	—	1.56	—	—	2.47
5.0	3.250	4954.00	0.92	—	—	1.85	—	—	2.77
5.1	3.353	4954.10	0.93	—	—	2.17	—	—	3.10
5.2	3.456	4954.20	0.94	—	—	2.53	—	—	3.46
5.3	3.559	4954.30	0.95	—	—	2.91	—	—	3.86
5.4	3.662	4954.40	0.96	—	—	3.34	—	—	4.29
5.5	3.765	4954.50	0.97	—	—	3.79	—	—	4.76
5.6	3.868	4954.60	0.97	—	—	4.28	—	—	5.26
5.7	3.971	4954.70	0.98	—	—	4.81	—	—	5.80
5.8	4.074	4954.80	0.99	—	—	5.38	—	—	6.37
5.9	4.177	4954.90	1.00	—	—	5.98	—	—	6.99
6.0	4.280	4955.00	1.01	—	—	6.62	—	—	7.63



NORTH POND
RIM=4955.00
VOLUME=121,113 CU-FT
Qmax=1.26 CFS
D7
3.85
0.76
0.82
D8
4.43
0.76
0.82
OS2
0.52
0.05
0.20
C4
0.74
0.76
0.82
C12
2.11
0.76
0.82
TRICKLE CHANNEL
(SEE DETAIL)
L=15 FEET
W=14 FEET
L=30 FEET
W=15 FEET
4'X4' OUTLET
INV=4949.05'
(SEE DETAIL)
RIP RAP
L=4.5 FEET
W=9 FEET
18" RCP
INV=4948.9'
INSTALL 75'
18" RCP @ 0.2%
INSTALL CURB
OPENING INLET
(SEE DETAIL)
RIP RAP
L=15 FEET
W=22 FEET
RIP RAP
L=6 FEET
W=12 FEET
EXISTING FES
INV.=4951.90
EXISTING 24" R
EXISTING FES
INV.=4952.10
RIP RAP
L=4.5 FEET
W=9 FEET
18" RCP
INV OUT=4952.3
INSTALL 71 LF
18" RCP @ 0.42%
RIP RAP
L=30 FEET
W=24 FEET
4'X4' OUTLET
STRUCTURE
INV =4952.56'
(SEE DETAIL)
RIP RAP
L=30 FEET
W=24 FEET
INSTALL 50'
24" RCP @ 1.8%
(SEE DETAIL)
INSTALL 4' WIDE
6" DEEP CONCRETE
TRICKLE CHANNEL
(SEE DETAIL)
RIP RAP
L=12 FEET
W=22 FEET

1/7

Sub-basin 57
Part of detention
pond 457 analysis

FIRESTONE VILLAS SUBDIVISION

FINAL STORM DRAINAGE REPORT

March 31, 1998

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southeastern corner of the Site will exit the site undetained into First Street and flow southward in First Street.

The runoff will be conveyed via strom sewer, overland/roadway conveyance and channelization. Storm sewer and roadway conveyance will generally run towards the center of the site and then westward into the detention area (refer to exhibits for storm sewer layout).
Storm sewer pipe sizes and slopes were calculated as part of this study based upon both free-flowing non-pressurized conditions and upon conditions with tailwater. Runoff calculation can be found in the appendix under "Rational Method Calculations" which includes all sub-basin and basin runoff peaks for the 2- and 100-year storms. Street capacity calculations are also included in the appendix as well as inlet capacity calculations.

III. STORMWATER DETENTION

The stormwater detention for the Site will be accomplished by a detention pond to be located at the west side of the Site in an area of approximately five acres. The pond is specified with four-to-one side slopes and a one percent bottom slope (a one percent bottom slope is requested to provide additional low level storage as well as to increase the conveyance capacity with respect to the Tri-area Drainageway) with a 3' wide concrete trickle ditch at a minimum 0.2 percent slope for low flows. The pond site connects to the main channel fo the Tri-County Drainageway via a dual 24 inch concrete pipe culvert.

In order to "route" the detention pond, a hydrograph was produced using the Soil Conservation Service Technical Release 20 (TR-20). The peak 100-year storm discharge to the pond was determined by applying the rational formula with the associated post-development runoff coefficients (manning's "c" values) and the associated time of concentration and drainage area (0.6, 50.5 minutes, and 51.4 acres, respectively). The rational formula produced a peak 100-year post-development discharge to the pond of approximately 95.0 cfs to the pond. With the rational formula peak, the TR-20 model was then "calibrated" by varying the runoff curve number to produce a hydrograph with a corresponding peak (94.56 cfs).

According to Tri-Area Sanitation District requirements, the allowable post-development release is equal to the pre-development 2-year storm peak discharge for the site. The peak detention pond release was determined by applying the rational formula (with a "c", "i", and "a" of 0.05, Tc equal to 60.0 minutes with intensity of 1.0 inches/hour, and 15.8 onsite acres, respectively) with a resulting pre-development peak of 0.8 cfs. Adding in pass-through flows from offsite areas and subtracting undetained flows leaving the site at the northwest and southeast corners of the site results in an allowable post-development pond release of 68.5 cfs. The detention pond provides for approximately 3 acre-feet of storage with this corresponding peak release rate of 61 cfs for the 100-year storm. Related calculations are contained in the Appendix.

STORMWATER DETENTION POND ROUTING

HEC1 INPUT/OUTPUT

***

COMPUTED OUTFLOW-ELEVATION DATA

(EXCLUDING FLOW OVER DAM)

```
          OUTFLOW       .00     58.98     60.25     61.57     62.95     64.39     65.90     67.48     69.14
  70.88
        ELEVATION     48.75     50.31     50.38     50.45     50.52     50.61     50.69     50.79     50.89
  51.00

                OUTFLOW                 6754.57      52620.25    176471.80    417140.60
813461.801404271.002228404.003324696.004731984.006489103.00
        ELEVATION     55.96     70.68     95.17    129.43    173.44    227.23    290.77    364.08    447.16
  540.00
```

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

(INCLUDING FLOW OVER DAM)

```
          STORAGE       .00       .01       .39      1.11      1.27      1.43      1.61      1.80      2.01
   2.23
          OUTFLOW       .00     23.63     52.83     58.98     60.25     61.57     62.95     64.39     65.90
  67.48
        ELEVATION     48.75     49.00     50.00     50.31     50.38     50.45     50.52     50.61     50.69
  50.79

          STORAGE      2.47      2.72      5.50      7.00      7.02      7.11      7.26      7.47      7.74
   8.07
          OUTFLOW         69.14         70.88       685.19      2394.47    11482.59  101077.30  346673.90
825911.901616457.002795980.00
        ELEVATION     50.89     51.00     52.00     53.00     55.96     70.68     95.17    129.43    173.44
  227.23

          STORAGE      8.46      8.92      9.43     10.00
          OUTFLOW 4442150.006632640.009445122.00**********
        ELEVATION    290.77    364.08    447.16    540.00
```

****
****

HYDROGRAPH AT STATION 100

****
****

```
                                                *                                                *
  DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE * DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE * DA MON HRMN ORD
OUTFLOW  STORAGE   STAGE
                                                *                                                *
   1     0000   1      0.       .0    48.8 *  1     0230  31      5.       .0    48.8 *  1     0500  61
 14.       .0    48.8
   1     0005   2      3.       .0    48.8 *  1     0235  32     11.       .0    48.8 *  1     0505  62
 12.       .0    48.8
   1     0010   3      0.       .0    48.8 *  1     0240  33      6.       .0    48.8 *  1     0510  63
 12.       .0    48.8
   1     0015   4      3.       .0    48.8 *  1     0245  34     14.       .0    48.8 *  1     0515  64
 10.       .0    48.8
   1     0020   5      0.       .0    48.8 *  1     0250  35     12.       .0    48.8 *  1     0520  65
 10.       .0    48.8
   1     0025   6      3.       .0    48.8 *  1     0255  36     19.       .0    48.9 *  1     0525  66
  9.       .0    48.8
   1     0030   7      0.       .0    48.8 *  1     0300  37     28.       .0    49.1 *  1     0530  67
  9.       .0    48.8
   1     0035   8      3.       .0    48.8 *  1     0305  38     37.       .1    49.4 *  1     0535  68
  8.       .0    48.8
   1     0040   9      0.       .0    48.8 *  1     0310  39     46.       .3    49.7 *  1     0540  69
  8.       .0    48.8
   1     0045  10      4.       .0    48.8 *  1     0315  40     53.       .5    50.0 *  1     0545  70
  8.       .0    48.8
   1     0050  11      0.       .0    48.8 *  1     0320  41     55.       .7    50.1 *  1     0550  71
  8.       .0    48.8
   1     0055  12      4.       .0    48.8 *  1     0325  42     58.       .9    50.2 *  1     0555  72
```

```
 7.      .0    48.8
  1    0100  13       0.      .0    48.8 *  1    0330  43    60.     1.2    50.3 *  1    0600  73
 7.      .0    48.8
  1    0105  14       5.      .0    48.8 *  1    0335  44    61.     1.4    50.4 *  1    0605  74
 6.      .0    48.8
  1    0110  15       0.      .0    48.8 *  1    0340  45    62.     1.5    50.5 *  1    0610  75
 8.      .0    48.8
  1    0115  16       5.      .0    48.8 *  1    0345  46    63.     1.6    50.5 *  1    0615  76
 6.      .0    48.8
  1    0120  17       0.      .0    48.8 *  1    0350  47    62.     1.5    50.5 *  1    0620  77
 8.      .0    48.8
  1    0125  18       6.      .0    48.8 *  1    0355  48    61.     1.4    50.4 *  1    0625  78
 6.      .0    48.8
  1    0130  19       0.      .0    48.8 *  1    0400  49    60.     1.3    50.4 *  1    0630  79
 7.      .0    48.8
  1    0135  20       6.      .0    48.8 *  1    0405  50    59.     1.1    50.3 *  1    0635  80
 6.      .0    48.8
  1    0140  21       0.      .0    48.8 *  1    0410  51    58.     1.0    50.2 *  1    0640  81
 7.      .0    48.8
  1    0145  22       7.      .0    48.8 *  1    0415  52    56.      .8    50.2 *  1    0645  82
 5.      .0    48.8
  1    0150  23       0.      .0    48.8 *  1    0420  53    54.      .6    50.1 *  1    0650  83
 7.      .0    48.8
  1    0155  24       8.      .0    48.8 *  1    0425  54    52.      .4    50.0 *  1    0655  84
 5.      .0    48.8
  1    0200  25       0.      .0    48.8 *  1    0430  55    41.      .2    49.5 *  1    0700  85
 7.      .0    48.8
  1    0205  26       9.      .0    48.8 *  1    0435  56    31.      .1    49.2 *  1    0705  86
 5.      .0    48.8
  1    0210  27       0.      .0    48.8 *  1    0440  57    23.      .0    49.0 *  1    0710  87
 6.      .0    48.8
  1    0215  28      11.      .0    48.8 *  1    0445  58    12.      .0    48.8 *  1    0715  88
 5.      .0    48.8
  1    0220  29       3.      .0    48.8 *  1    0450  59    17.      .0    48.9 *  1    0720  89
 6.      .0    48.8
  1    0225  30      11.      .0    48.8 *  1    0455  60    12.      .0    48.8 *  1    0725  90
 5.      .0    48.8
                                            *                                          *
*****************************************************************************************************
************************

 PEAK OUTFLOW IS       63. AT TIME   3.75 HOURS

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR       7.42-HR
+   (CFS)        (HR)
                                  (CFS)
+      63.       3.75               20.          17.          17.          17.
                                (INCHES)        2.371        2.424        2.424        2.424
                                 (AC-FT)         10.          10.          10.          10.

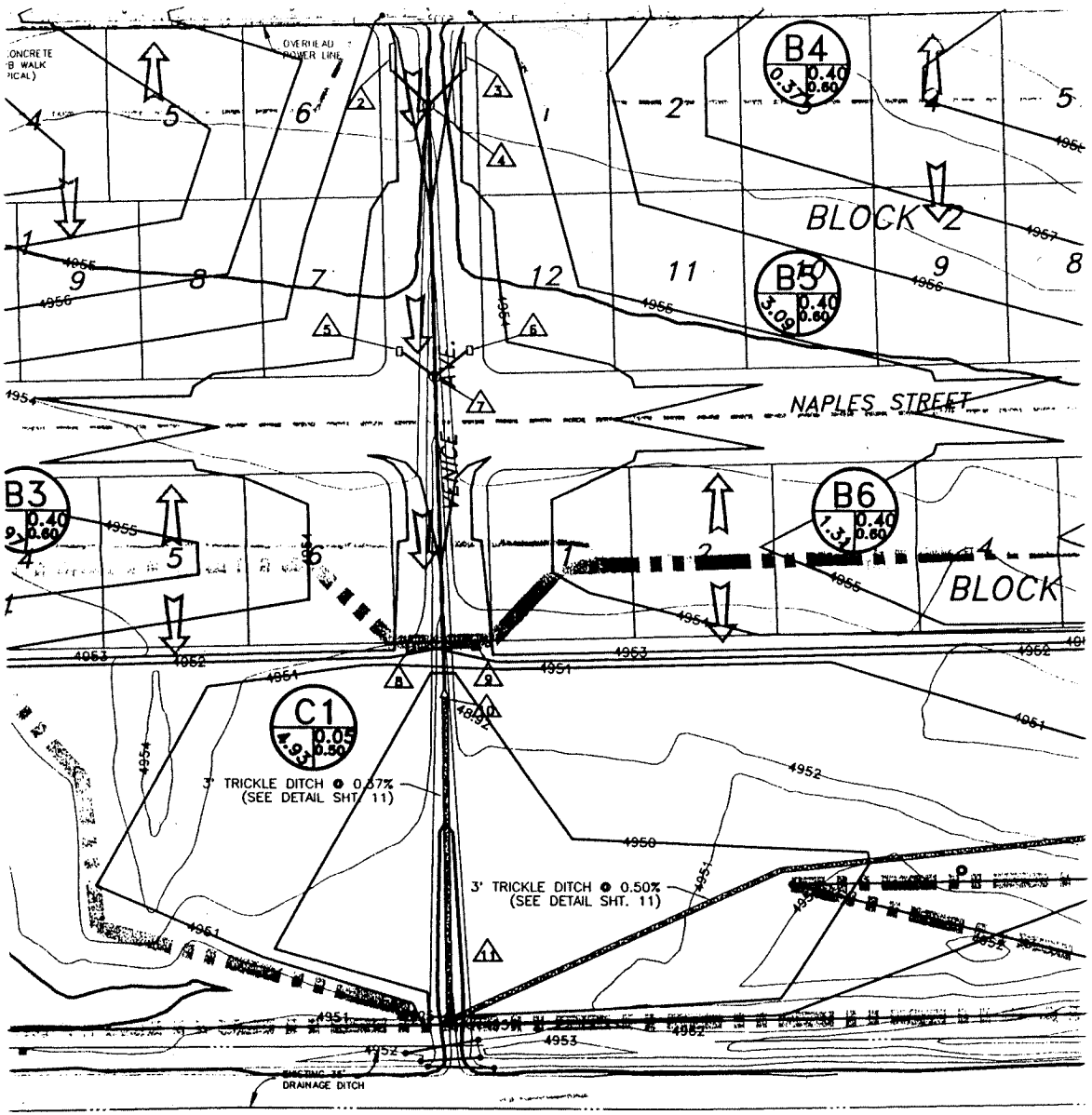
 PEAK STORAGE    TIME                          MAXIMUM AVERAGE STORAGE
                                      6-HR        24-HR        72-HR       7.42-HR
+  (AC-FT)       (HR)
       2.        3.75                0.           0.           0.           0.

  PEAK STAGE     TIME                          MAXIMUM AVERAGE STAGE
                                      6-HR        24-HR        72-HR       7.42-HR
+   (FEET)       (HR)
    50.50       3.75               49.14        49.06        49.06        49.06

                          CUMULATIVE AREA =      .08 SQ MI

1
                                                    RUNOFF SUMMARY
                                              FLOW IN CUBIC FEET PER SECOND
                                            TIME IN HOURS,  AREA IN SQUARE MILES

                                      PEAK   TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD      BASIN     MAXIMUM
   TIME OF
        OPERATION        STATION      FLOW     PEAK                                          AREA      STAGE
   MAX STAGE
+                                                        6-HOUR      24-HOUR      72-HOUR
```



LE

GRAPHIC SCALE

(IN FEET)
1 inch = 50 ft.

7/7

1/6

ACKLAM ASSOCIATES, INC.
SURVEYING · ENGINEERING

Sub-basin 62
Part of detention
pond 462 analysis

PHASE III
FINAL
DRAINAGE REPORT

FOR

SUNDANCE SUBDIVISION
DACONO, COLORADO

SEPTEMBER 11, 1995

Prepared For:

Dacono Development, LLC.

1001 E. BRIDGE ST • P.O. BOX 795 • BRIGHTON, COLORADO 80601
TELEPHONE (303) 659-3546

DETENTION POND CALCULATIONS:

There are two detention pond being proposed in the final design for Sundance Subdivision. Although, only the single family detached home areas are being considered in the report, the north basin has been sized to accommodate the future areas west of Sundance Parkway and north of Patriot Way. This area is initially proposed for townhouse development. This may not happen, yet it has been provide for.

SUMMARY FOR BASIN "A"

Basin $A_{(North)}$:

Area in $A_{(North)}$ = 15.27 acres (includes the townhome area of 6.6 acres)

V=KA

I=.4 Soil Group B

$K_{100}=(1.78I - 0.002I^2 - 3.56)/1000$

therefore:
$K^{100}= (71.2 - 3.20 - 3.56)/1000 = 0.0644$

$V_{100}= K_{100} x A = 0.98$ ac-ft = 42,862 ft^3

$V_{10}= K_{10}A$

therefore:
$K_{10}= (0.95I - 1.90)/1000 = 0.0361$

$V_{10}= 0.55$ ac-ft = 23,958 ft^3

Release rate from Basin "A":

$R_{100}= 0.55 \times A = .50 \times 15.25 = 7.63$ cfs

$R_{10}= 0.23 \times A = .23 \times 15.25 = 3.51$ cfs

SUMMARY BASIN "B":

Basin $B_{(South)}$:

Area in $B_{(South)}$ = 21.3 acres

V=KA

I=.4 Soil Group B

$K_{100}=(1.78I - 0.002I^2 - 3.56)/1000$

therefore:
$K^{100} = (71.2 - 3.20 - 3.56)/1000 = 0.0644$

$V_{100} = K_{100} x\ A = 1.37$ ac-ft $= 59{,}752\ ft^3$

$V_{10} = K_{10} A$

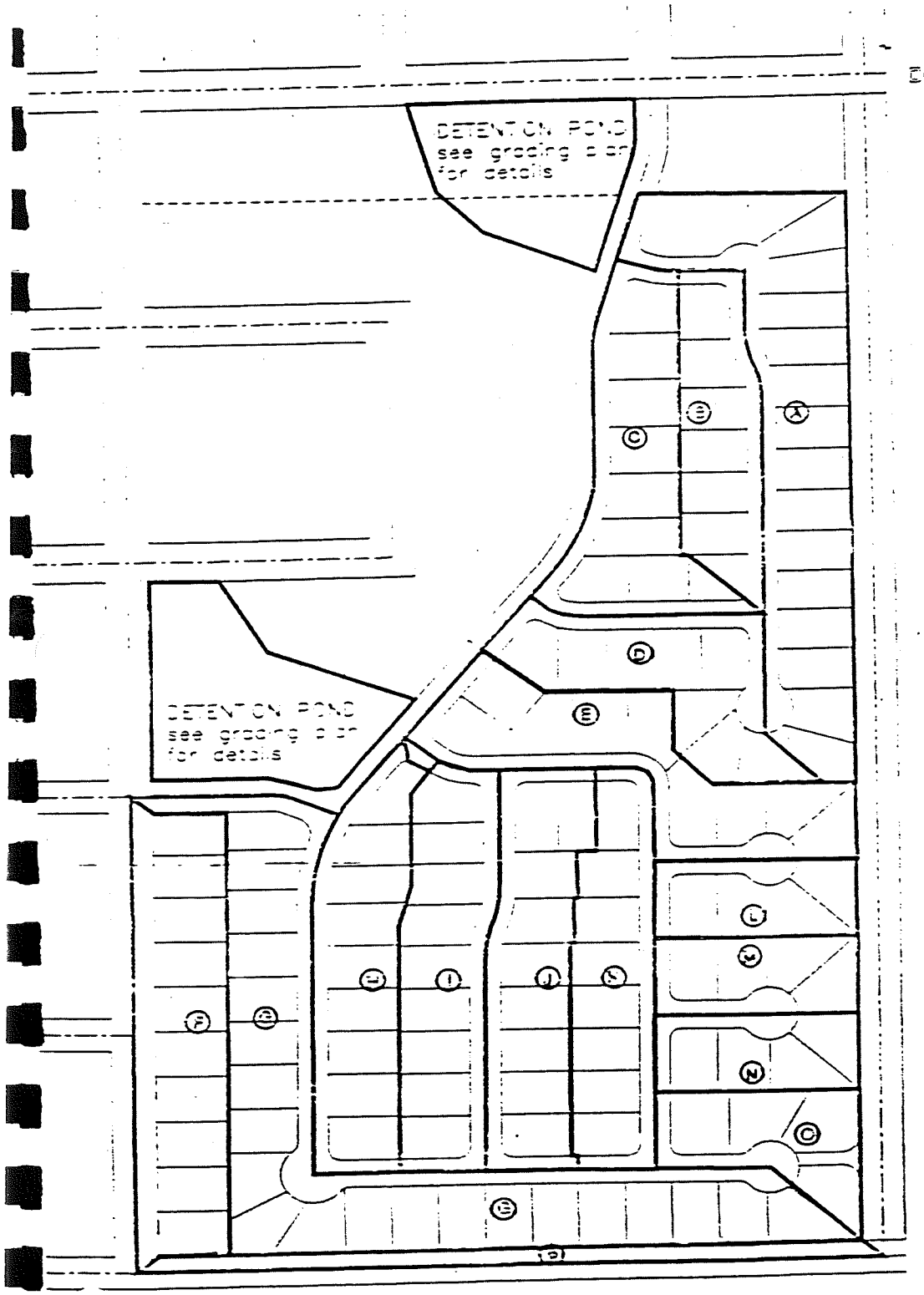
therefore:
$K_{10} = (0.95I - 1.90)/1000 = 0.0361$

$V_{10} = 0.77$ ac-ft $= 33{,}494\ ft^3$

Release rate from Basin "B":

$R_{100} = 0.55 \times A = .50 \times 21.3 = 10.65$ cfs

$R_{10} = 0.23 \times A = .23 \times 21.3 = 4.90$ cfs

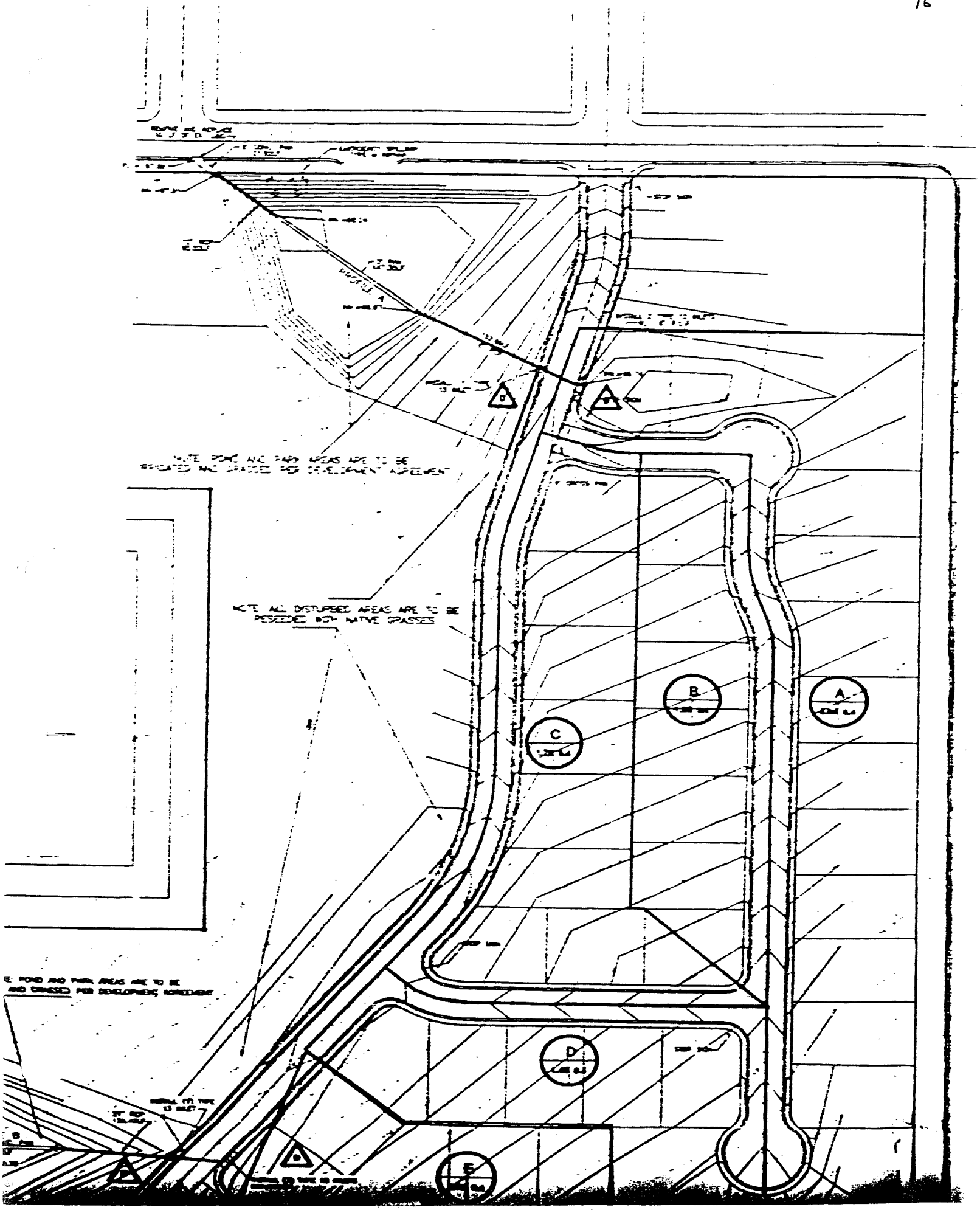


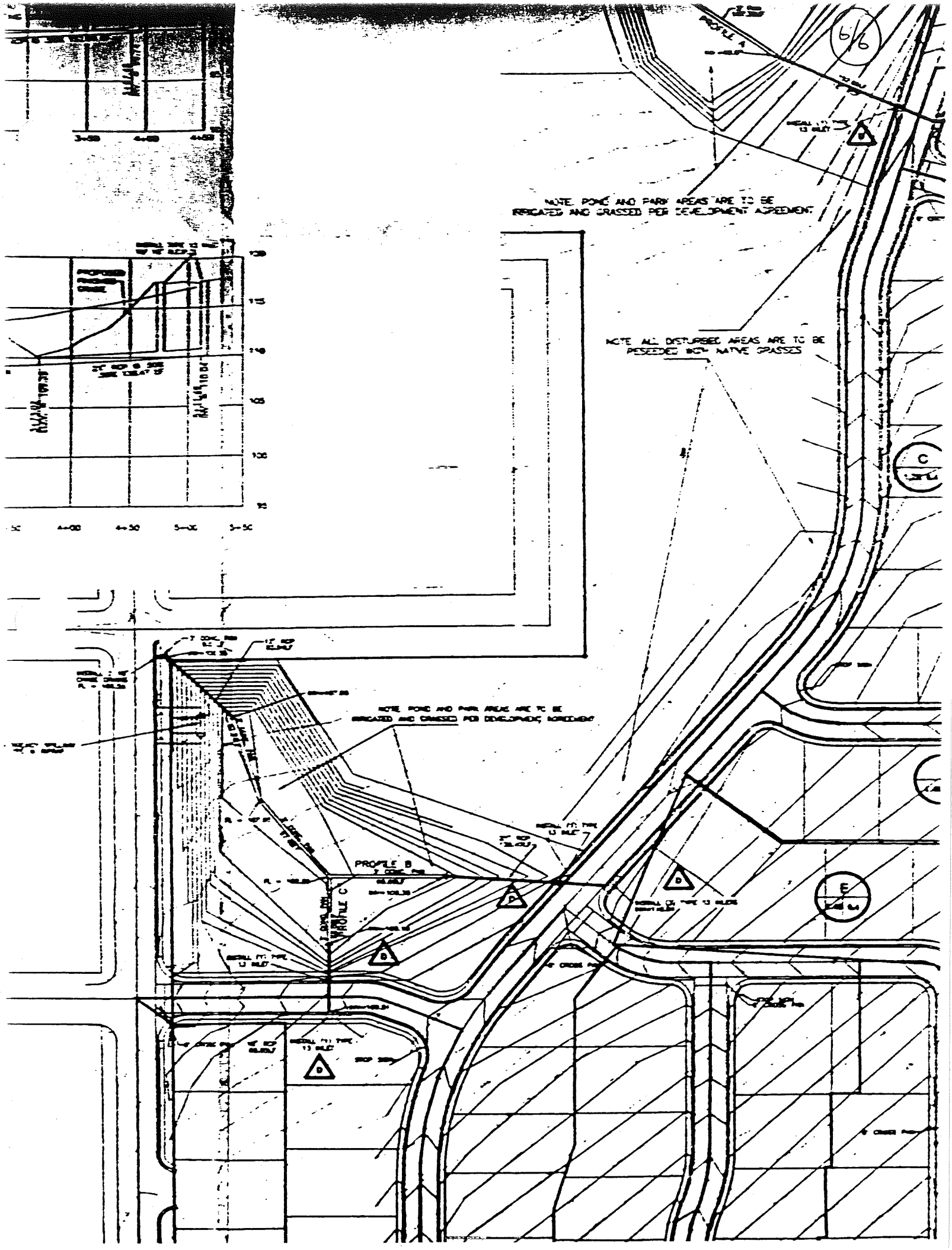
DRAINAGE STUDY SUNDANCE SUB.

BASING, COLO.

SUB-BASIN NOTATION

(A)


NOTE: POND AND PARK AREAS ARE TO BE IRRIGATED AND GRASSED PER DEVELOPMENT AGREEMENT
NOTE: ALL DISTURBED AREAS ARE TO BE RESEEDED WITH NATIVE GRASSES
A
B
C
D
E



6/6
PROFILE A
NOTE: POND AND PARK AREAS ARE TO BE IRRIGATED AND GRASSED PER DEVELOPMENT AGREEMENT
NOTE: ALL DISTURBED AREAS ARE TO BE RESEEDED WITH NATIVE GRASSES
NOTE: POND AND PARK AREAS ARE TO BE IRRIGATED AND GRASSED PER DEVELOPMENT AGREEMENT
PROFILE B
PROFILE C
C
E

Sub-basin 70
Part of detention pond
470 analysis

1ST COPY
REV: 1-19
BY: JAL
APPROVED

1/9

FINAL DRAINAGE REPORT

TO

TOWN OF FIRESTONE

FOR

OAK MEADOWS P.U.D.

ST-FIRESTONE, LLC.
4190 North Garfield Avenue
Loveland, Colorado 80538
(970) 669-8600

Prepared By:

TuttleApplegate**Inc.**
Consultants for Land, Mineral, and Water
11990 Grant Street, Suite 304
Denver, Colorado 80233
(303) 452-6611 FAX:(303) 452-2759

December, 1998
TA #97-111F

Offsite historic Basin A1 is a sub basin of offsite Basin A. Sub-basin A1 contains approximately 43 acres and has a calculated 100 year peak runoff value of 20 cfs. This sub-basin is the only area that contributes existing runoff to the development site. Approximately 2.45 acre-feet of runoff is generated in the 100 year event. This runoff is collected at an existing lowpoint on the Southeast corner of Weld County Road 13 and Weld County Road 24. Presently 1.8 acre-feet is retained at this location. The remaining 0.65 acre-feet of runoff will overtop the road way at the intersection and sheet flow to the designed Detention Pond A.

Existing topography for this site indicates that flows would likely split to the North along County Road 13 and to the West along County Road 24. The runoff that is conveyed to the North will collect east and adjacent to an existing low point in the County Road 13 R.O.W. located approximately 150 feet south of the west entry of the project where the top of asphalt is at an elevation of 4843.94. Overtopping for offsite flows and flows in excess of the 100 year storm can occur at this location and also the west entry to the site. The area adjacent to the east side of County Road 13 in this vicinity is designed for the drainage to enter detention Pond A.

The portion of the runoff that follows the County Road 24 R.O.W. will continue to head West. *It is likely that any additional development in this area will result in improvements to Weld County Road 13 and County Road 24. Any drainage improvements for regional conveyance structures will likely be constructed at this time.* (See APPENDIX "A" – Offsite Historic Basins for more detailed information regarding basin location and basin hydrology.)

A Detention Pond system has been proposed for this site. In keeping with historic and existing drainage patterns, there will be two Detention Ponds. The majority of the drainage from the site will be detained in Detention Pond B, which is located in the northern part of the project. Detention Pond A will be located in the Southwestern corner of the development and will intercept flows primarily from the commercial portion and the off-site spillway from the south side of County Road 24.

The location of both Detention Ponds is shown on Sheet 3 and 4 of the attached maps. The 100 year historic runoff or allowable release rate is calculated at 29 cfs and 53 cfs for Ponds A and B respectively. Because of downstream limitations it is not practical to convey these peak flows directly to the Saint Vrain Creek. *The release rate has been set at 10.6 cfs and 43.9 cfs from Pond A and B, respectively.* Both Ponds will also incorporate storm water quality and sedimentation ponds in the bottom. These water quality ponds will also intercept the majority of the nuisance flows that typically would otherwise not be subject to a controlled release rate from the ponds.

The storm water release from Pond A and Pond B will be collected in a storm sewer system (see construction plans) and routed north and east until it can be daylighted and discharged into a drainage channel and culvert crossing system ½ mile east of County 13. The discharge from the detention ponds will then be conveyed to the Saint Vrain Creek through a series of culverts, channels and a wetlands area just south of the creek. Pursuant to a discussion with the County Engineer and Town Engineer, a possible regional drainage system could be built ½ mile east of this proposed outfall. Therefore, additional capacity for the outfall system proposed for this development, from other basins should not be necessary.

All proposed residential lots have been graded to drain into the streets, with the exception of isolated locations where drainage will be conveyed between lots directly to the storm sewer and Detention Pond systems. Onsite storm sewer along with the proposed streets will be used to convey runoff into the Detention Ponds. A storm sewer layout has been included in the construction plan set included with this submittal.

B. SPECIFIC DETAILS

Detention Pond B will have a storage volume of 11.23 acre-feet and will be able to release flows at 43.9 cfs. This volume was determined by routing all contributing basins to the pond and determining a combined inflow hydrograph. The storage indication method was then used to determine the size of the pond for the allowable release rate.

A 31 inch diameter orifice plate will be used with the outlet control structure to control the release from Pond B. This orifice plate will be set with an invert 4829.4 which is the water surface elevation for the water quality pond. The storm-water quality pond has been designed using Urban Drainage standards. A water quality catchment volume of 2.43 acre-feet was determined with a corresponding release rate of 0.74 cfs (40 hour drain time). A 4" diameter orifice plate will be attached to the outlet control structure at an invert of 4827.0. (See the Detention Pond B section in APPENDIX "A" for design calculations).

Detention Pond A will have a storage volume of 3.72 acre-feet and will be able to release flows at 10.60 cfs. This volume was determined by routing all contributing basins to the pond and determining a combined inflow hydrograph. The storage indication method was then used to determine the size of the pond for the allowable release rate. (see the Detention Pond Section of APPENDIX "A" for design information).

A 16.3 inch diameter orifice plate will be used with the outlet control structure to control the release from Pond A. The orifice plate will be set with an invert 4838.50 which is the water surface elevation for the water quality pond. The storm-water quality pond has been designed using Urban Drainage standards. A water quality catchment volume of 0.75 acre-feet was determined with a corresponding release rate of 0.23 cfs (40 hour drain time).

Pond A

97-111F 5/9
TPY
7/14/98

POND A ROUTING DATA

Storage Indication Method

Given Input Data:
File ..... D:\DRAWINGS\sdp8tpy\97111pdp\hd\aat1 both orifices.sdc.sim
Description .... POND AAT1 WITH BOTH ORIFICES
Time increment . 0.1000 hrs

Input Files:
Pre-Dev Hydrograph curve .. D:\DRAWINGS\sdp8tpy\97111pdp\hd\hisa-100yr.hdc
Post-Dev Hydrograph curve . D:\DRAWINGS\sdp8tpy\97111pdp\hd\devb-100yr.hdc
Stage-Storage curve ..... D:\DRAWINGS\sdp8tpy\97111pdp\hd\aat1.ssc
Stage-Discharge curve ..... D:\DRAWINGS\sdp8tpy\97111pdp\hd\aat1 both orifices.sdc

Output Data:
Routed Peak Flow ..... 10.6578 cfs
Routed Peak Time ..... 13.6000 hrs
Pre-Developed Peak Flow .. 29.3880 cfs
Pre-Developed Peak Time .. 13.2000 hrs
Post-Developed Peak Flow . 58.4011 cfs
Post-Developed Peak Time . 12.2000 hrs

Support Calculations:

Time hrs	Inflow cfs	(I1+I2)/2 acft	H1 ft	S1-(O1/2)T acft	S2-(O2/2)T acft	H2 ft	Outflow cfs
11.0000	2.2716	0.0094	0.0000	0.0000	0.0094	4836.1769	0.0000
11.1000	2.5338	0.0198	4836.1769	0.0094	0.0292	4836.4072	0.0000
11.2000	2.7960	0.0220	4836.4072	0.0292	0.0512	4836.5697	0.0529
11.3000	3.0582	0.0242	4836.5697	0.0508	0.0750	4836.7039	0.1084
11.4000	3.5099	0.0271	4836.7039	0.0741	0.1012	4836.8211	0.1359
11.5000	3.9616	0.0309	4836.8211	0.1001	0.1310	4836.9323	0.1577
11.6000	4.4133	0.0346	4836.9323	0.1297	0.1642	4837.0397	0.1763
11.7000	8.1312	0.0518	4837.0397	0.1628	0.2146	4837.1847	0.1987
11.8000	11.8492	0.0825	4837.1847	0.2130	0.2955	4837.3899	0.2266
11.9000	15.5672	0.1132	4837.3899	0.2936	0.4069	4837.6340	0.2557
12.0000	30.6361	0.1908	4837.6340	0.4047	0.5956	4837.9845	0.2926
12.1000	54.2759	0.3507	4837.9845	0.5932	0.9439	4838.5068	0.3403
12.2000	58.4011	0.4654	4838.5068	0.9411	1.4065	4839.0610	0.3844
12.3000	44.4410	0.4248	4839.0610	1.4033	1.8281	4839.4849	0.4150
12.4000	37.4257	0.3381	4839.4849	1.8246	2.1628	4839.7566	0.4211
12.5000	37.1741	0.3081	4839.7566	2.0957	2.4038	4839.9562	0.4441
12.6000	36.6676	0.3050	4839.9562	2.3324	2.6374	4840.1391	0.4970
12.7000	34.3391	0.2933	4840.1391	2.5623	2.8555	4840.3023	0.4828
12.8000	31.5460	0.2721	4840.3023	2.7772	3.0493	4840.4408	0.7975
12.9000	27.8108	0.2452	4840.4408	2.9684	3.2136	4840.5547	10.0489
13.0000	24.0755	0.2143	4840.5547	3.1305	3.3449	4840.6433	10.2404
13.1000	20.9549	0.1860	4840.6433	3.2603	3.4462	4840.7106	10.3837
13.2000	17.8343	0.1602	4840.7106	3.3605	3.5207	4840.7589	10.4850
13.3000	15.6904	0.1385	4840.7589	3.4341	3.5725	4840.7926	10.5555
13.4000	13.5464	0.1208	4840.7926	3.4853	3.6061	4840.8196	10.6111
13.5000	12.1871	0.1063	4840.8196	3.5184	3.6247	4840.8360	10.6449
13.6000	**10.8277**	**0.0951**	**4840.8360**	**3.5368**	**3.6319**	**4840.8423**	**10.6578**
13.7000	9.8868	0.0856	4840.8423	3.5438	3.6294	4840.8401	10.6533
13.8000	8.9460	0.0778	4840.8401	3.5414	3.6192	4840.8311	10.6348
13.9000	8.3006	0.0712	4840.8311	3.5313	3.6025	4840.8165	10.6047
14.0000	7.6553	0.0659	4840.8165	3.5149	3.5808	4840.7980	10.5668
14.1000	7.1946	0.0614	4840.7980	3.4936	3.5549	4840.7812	10.5315
14.2000	6.7439	0.0576	4840.7812	3.4679	3.5255	4840.7621	10.4915
14.3000	6.2881	0.0538	4840.7621	3.4388	3.4927	4840.7407	10.4469
14.4000	6.0089	0.0508	4840.7407	3.4064	3.4572	4840.7177	10.3986
14.5000	5.7297	0.0485	4840.7177	3.3713	3.4197	4840.6932	10.3470
14.6000	5.4505	0.0462	4840.6932	3.3343	3.3804	4840.6670	10.2911
14.7000	5.2904	0.0443	4840.6670	3.2954	3.3398	4840.6399	10.2332
14.8000	5.1104	0.0429	4840.6399	3.2552	3.2981	4840.6122	10.1739
14.9000	4.9483	0.0415	4840.6122	3.2141	3.2556	4840.5834	10.1117
15.0000	4.7782	0.0401	4840.5834	3.1721	3.2122	4840.5537	10.0469

USE FOR STORM SEWER SIZING

Pond B

97-111F
TPT
5/21/98
POND B

Storage Indication Method

Given Input Data:
File ..... D:\DRAWINGS\sdp8tpy\97111pdp\hd\bat1 with both orifices.sdc.sim
Description .... POND BAT1 WITH BOTH ORIFICES
Time increment . 0.1000 hrs

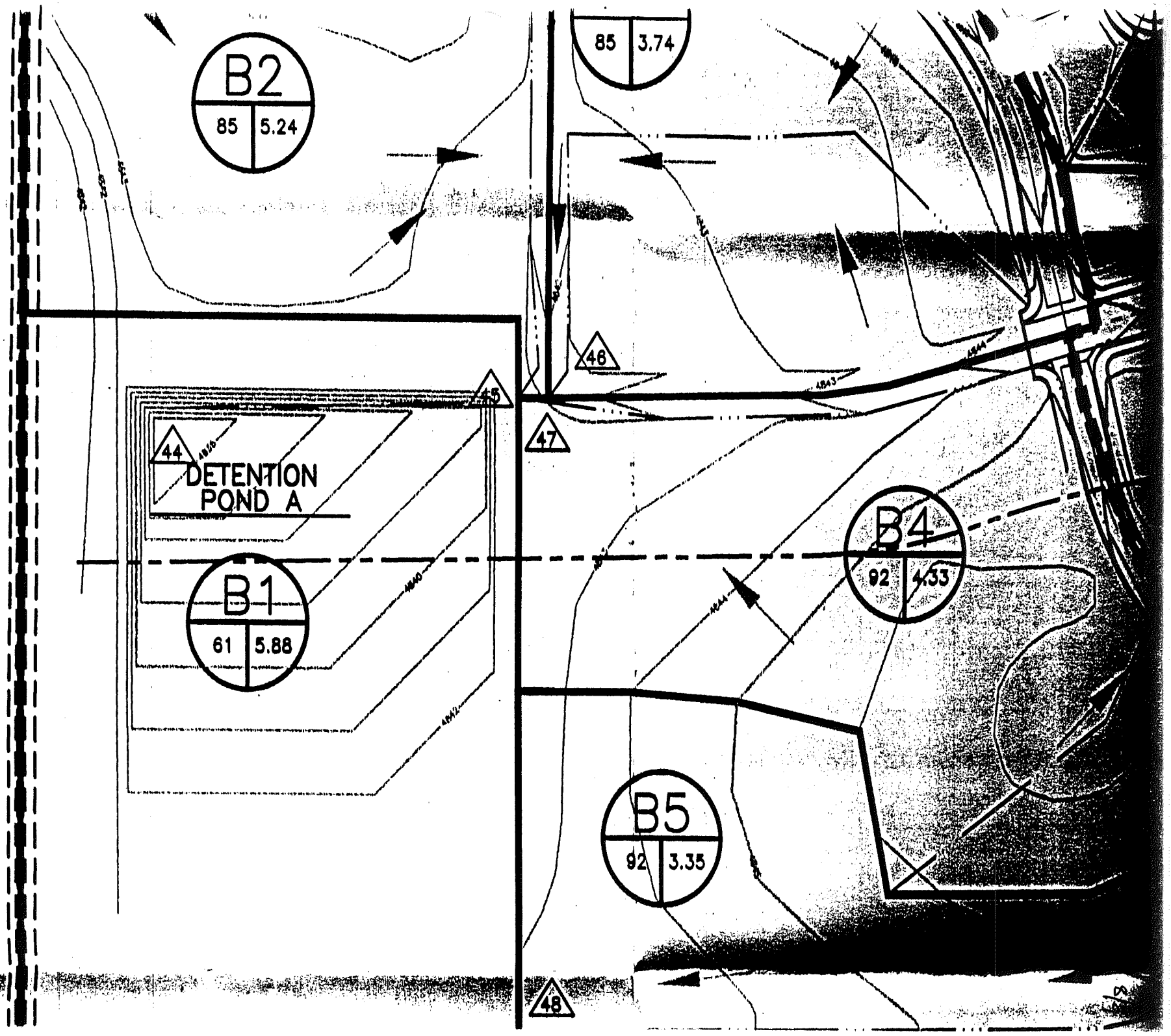
Input Files:
Pre-Dev Hydrograph curve .. D:\DRAWINGS\sdp8tpy\97111pdp\hd\hisc-100yr.hdc
Post-Dev Hydrograph curve . D:\DRAWINGS\sdp8tpy\97111pdp\hd\A-C-D-E100.hdc
Stage-Storage curve ..... D:\DRAWINGS\sdp8tpy\97111pdp\hd\bat1.ssc
Stage-Discharge curve ..... D:\DRAWINGS\sdp8tpy\97111pdp\hd\bat1 with both orifices.sdc

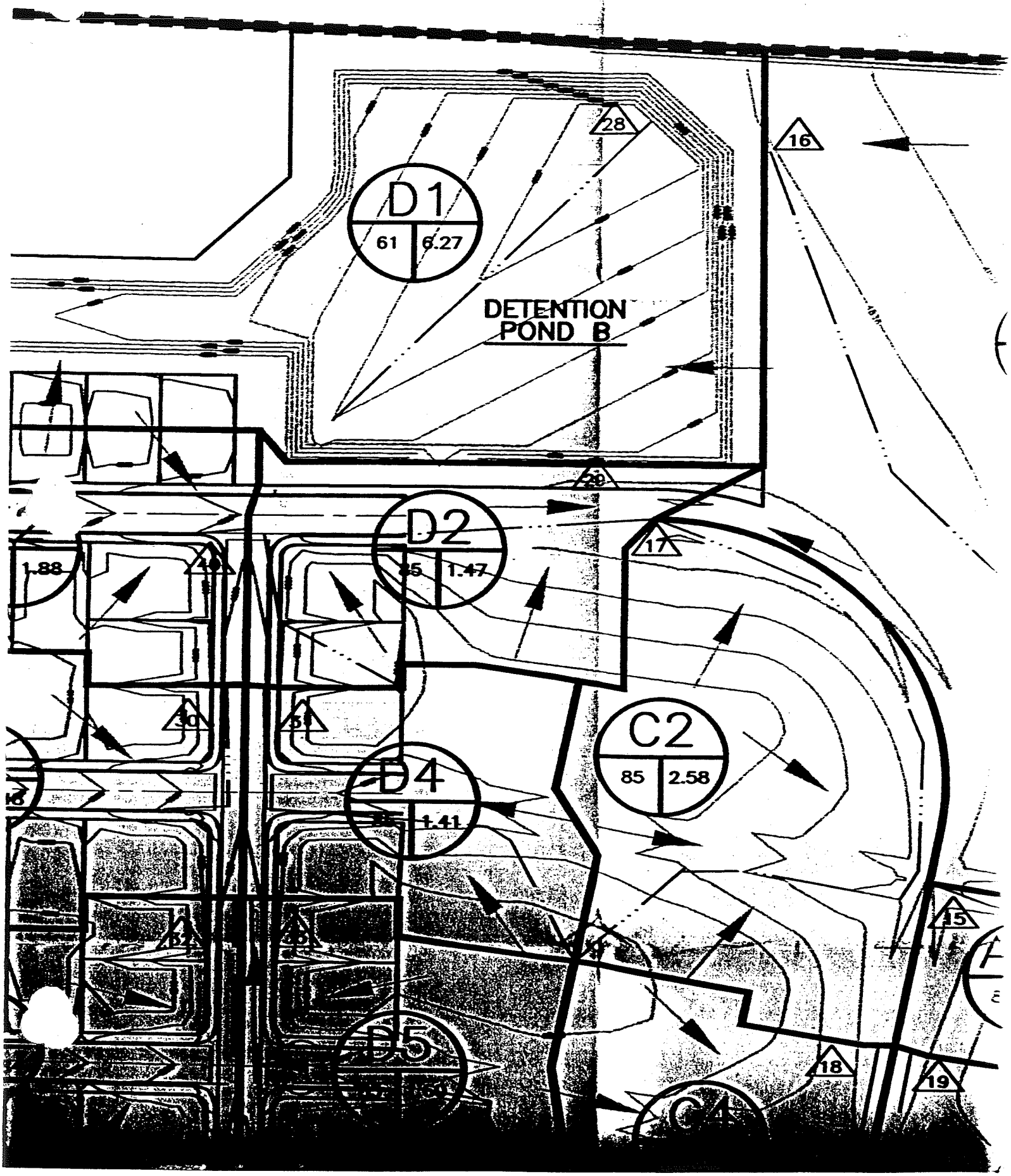
Output Data:
Routed Peak Flow ..... 43.9748 cfs
Routed Peak Time ..... 14.0000 hrs
Pre-Developed Peak Flow .. 53.5360 cfs
Pre-Developed Peak Time .. 13.4000 hrs
Post-Developed Peak Flow . 150.7123 cfs
Post-Developed Peak Time . 12.4000 hrs

Support Calculations:

Time hrs	Inflow cfs	(I1+I2)/2 acft	H1 ft	S1-(O1/2)T acft	S2+(O2/2)T acft	H2 ft	Outflow cfs
11.0000	5.6640	0.0234	0.0000	0.0000	0.0234	4827.0787	0.0000
11.1000	6.3335	0.0496	4827.0787	0.0234	0.0729	4827.2216	0.0000
11.2000	7.0030	0.0551	4827.2216	0.0729	0.1280	4827.3515	0.1204
11.3000	7.6724	0.0606	4827.3515	0.1270	0.1877	4827.4721	0.2600
11.4000	8.6354	0.0674	4827.4721	0.1855	0.2529	4827.5881	0.2381
11.5000	9.5983	0.0753	4827.5881	0.2504	0.3257	4827.7023	0.3314
11.6000	10.5613	0.0833	4827.7023	0.3230	0.4062	4827.8138	0.3607
11.7000	13.1385	0.0979	4827.8138	0.4033	0.5011	4827.9314	0.3892
11.8000	15.7158	0.1192	4827.9314	0.4979	0.6171	4828.0604	0.4183
11.9000	18.2930	0.1405	4828.0604	0.6137	0.7541	4828.1979	0.4474
12.0000	28.6348	0.1938	4828.1979	0.7504	0.9443	4828.3668	0.4805
12.1000	50.9822	0.3288	4828.3668	0.9403	1.2691	4828.6207	0.5265
12.2000	89.0745	0.5785	4828.6207	1.2648	1.8433	4829.0006	0.5887
12.3000	128.8619	0.9002	4829.0006	1.8384	2.7386	4829.5110	0.6630
12.4000	150.7123	1.1547	4829.5110	2.7331	3.8878	4830.0693	0.7358
12.5000	146.1377	1.2261	4830.0693	3.8817	5.1078	4830.5940	0.7982
12.6000	127.7683	1.1313	4830.5940	5.1012	6.2326	4831.0394	0.8475
12.7000	108.8372	0.9773	4831.0394	6.2256	7.2028	4831.4017	0.8857
12.8000	94.1720	0.8385	4831.4017	7.1955	8.0340	4831.7008	0.9159
12.9000	86.5636	0.7465	4831.7008	8.0264	8.7729	4831.9385	15.2638
13.0000	78.9553	0.6837	4831.9385	8.6469	9.3305	4832.0966	38.9663
13.1000	76.6177	0.6426	4832.0966	9.0086	9.6512	4832.2045	39.8992
13.2000	74.2801	0.6233	4832.2045	9.3216	9.9449	4832.3028	40.7300
13.3000	72.2619	0.6053	4832.3028	9.6084	10.2137	4832.3922	41.4712
13.4000	70.2437	0.5886	4832.3922	9.8711	10.4597	4832.4737	42.1341
13.5000	66.4154	0.5644	4832.4737	10.1116	10.6761	4832.5450	42.7068
13.6000	62.5871	0.5328	4832.5450	10.3233	10.8561	4832.6042	43.1781
13.7000	57.8089	0.4973	4832.6042	10.4994	10.9967	4832.6502	43.5380
13.8000	53.0308	0.4578	4832.6502	10.6371	11.0949	4832.6824	43.7893
13.9000	48.2736	0.4184	4832.6824	10.7331	11.1516	4832.7009	43.9343
14.0000	43.5164	0.3791	4832.7009	10.7886	11.1678	4832.7062	43.9748
14.1000	39.7337	0.3439	4832.7062	10.8045	11.1483	4832.6999	43.9262
14.2000	35.9510	0.3126	4832.6999	10.7855	11.0981	4832.6834	43.7975
14.3000	32.1683	0.2814	4832.6834	10.7363	11.0176	4832.6571	43.5916
14.4000	29.7052	0.2556	4832.6571	10.6575	10.9131	4832.6229	43.3240
14.5000	27.2420	0.2352	4832.6229	10.5552	10.7904	4832.5827	43.0066
14.6000	24.7789	0.2149	4832.5827	10.4352	10.6500	4832.5365	42.6385
14.7000	23.4328	0.1991	4832.5365	10.2978	10.4969	4832.4860	42.2343
14.8000	22.0867	0.1880	4832.4860	10.1481	10.3361	4832.4328	41.8018
14.9000	20.7406	0.1769	4832.4328	9.9908	10.1676	4832.3769	41.3443
15.0000	19.3945	0.1658	4832.3769	9.8261	9.9919	4832.3184	40.8597
15.1000	18.6695	0.1572	4832.3184	9.6544	9.8116	4832.2582	40.3533
15.2000	17.9445	0.1512	4832.2582	9.4782	9.6295	4832.1972	39.8370
15.3000	17.2195	0.1452	4832.1972	9.3004	9.4456	4832.1353	39.3021

USE THIS OUTFLOW FOR OUTLET PIPE SIZE


B2
85
5.24
85
3.74
46
45
44
47
DETENTION
POND A
B1
61
5.88
B4
92
4.33
B5
92
3.35
48


D1
61
6.27
DETENTION
POND B
28
16
D2
1.47
17
1.88
C2
85
2.58
D4
1.41
15
D5
18
19
C4

Sub-basin 72 1/8
Part of detention
pond 372 analysis

ST. VRAIN RANCH SUBDIVISION

FILING I

STORM DRAINAGE REPORT

August 18, 1998

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III. STORMWATER DETENTION

The stormwater detention for the Site will be accomplished by a detention pond to be located at the northwest corner of the parcel in an area of approximately five acres. The pond is specified with four to one side slopes and a two percent bottom slope with a 3' wide concrete trickle ditch at 0.2 percent slope for low flows. The pond site connects to a major drainage channel. This major drainage channel conveys runoff from the site to the detention pond. For ultimate planning purposes the ultimate proposed discharges of approximately 75 and 317 cfs for the 2- and 100-year storm events, respectively (with inputs of n of 0.035, allowable depth of 8', slope of 0.002 ft/ft, bottom width of 3 feet and side slope of 4 ft/ft) were analyzed for the design of the drainage way. Using manning's formula the following results were obtained: for the 2-year storm event a depth of 2.48 feet, velocity of 2.34 fps and a froude number of 0.35 For the 100-year storm event a depth of 4.50 feet, velocity of 3.36 fps and a froude number of 0.38 (sub-critical and hence none erosive) were obtained. A future box culvert crossing of this drainage was not considered as part of this study but preliminary reviews indicate that an acceptable headwater condition can be achieved with a 5' x 7' single box culvert.

The pre-development peak discharge for the westerly watershed (P2) associated with the peak detention pond release was determined by applying the rational formula (with a c, i and a of 0.30, tc equal to 44 min. with I equal to 3.4 in/hr and 151.6 acres) with a resulting pre-development peak of 154.6 cfs. Times of concentration for the basin, both pre- and post were obtained via TR-55 (refer to appendix).

In order to "route" the detention pond a hydrograph was produced using the Soil Conservation Service Technical Release 20. The peak discharge to the pond was determined by applying the rational formula with the associated developed and undeveloped runoff coefficients (mannings "c" values) and the associated time of concentration and drainage area. The developed and undeveloped drainage area to the pond was 103.5 acres with 26.1 acres developed and 77.4 as undeveloped. This resulted in a weighted C factor of 0.38 (using undeveloped and developed C factors of 0.30 and 0.60, respectively). Time of concentration of the contributing basin was 31 minutes (or .517 hours, as obtained from the rational formula time of concentration calculations as related to basin B1, storm sewer flow times and the travel time through the major drainage channel) with a resulting rainfall intensity of 4.3 in. hr. The rational formula produced a peak discharge of approximately 169.2 cfs. With the rational formula peak the TR-20 model was then "calibrated" by varying the runoff curve number to produce a hydrograph with a corresponding peak (173.4 cfs). This hydrograph was used in the HEC-1 evaluation.

The Army Corp of Engineers HEC-1 program was utilized for the routing of the detention pond. HEC-1 provides for simultaneous analysis of storage-stage-volume-outflow comparisons. The 33 inch RCP outfall pipe is modeled as an orifice (HEC-1 utilizes the orifice equation for low level outlets). The spillway is modeled as a second stage outfall with the weir equation. The low and second stage modeling (stage vs. outflow) is integrated into the HEC-1 program and no further discussion is given (refer to HEC-1 documentation).

The uncontrolled area of basin (post Filing 1) P2 results in a peak discharge of 69.9 cfs (with an area of 45.7 acres, a "c" of 0.30, Tc of 22 minutes, I of 5.1 in/hr). Thus the allowable outflow from the pond is the P2 pre-developed peak (154.6 cfs) minus the uncontrolled peak runoff from P2 (69.9) which equals 84.7 cfs.

The results of the HEC-1 analysis indicates that the detention pond will provide for approximately 6 acre-feet of storage at elevation 88.14 (the maximum elevation in pond, without spillway overtopping, is 90.3 with 10 acre-feet of storage) with the corresponding peak release rate of 44 cfs for the 100-year storm without spillway flow. This actual computed outflow as compared to the allowable of 84.7 cfs will provide some interim over-detention and should relieve some potential downstream flooding problems. The release of stormwater from the detention pond will be accomplished via a 33 inch RCP culvert (although 3-33" RCP's will be installed for future considerations).

Outflow from the detention pond is to the natural drainway along the easterly side of the old Union Pacific Railroad right-of-way. Since the release rate from the site is less than historical no further study of the conveyance capacity of the downstream channel was made. However, field observation of the channel reveals some low depressions within the reach just north of the detention pond site, which may provide some flooding potential to future developments to the north.

The drainage plan is to allow for direct, uncontrolled runoff from the easterly and westerly portions of the site (basins P3 and P1, respectively). This drainage enters historical drainageways and therefore not further analysis is presented in this report.

Erosion control has been specified at all permanent and temporary culvert outfalls. Permanent riprap is to be installed at the detention pond outlet only and has been designed for the ultimate maximum discharge. Riprap will be installed at all temporary culvert outfalls until future pipe extensions are made. Riprap has been specified for the major drainage channel (at the outlet of the 54 inch pipe outfall, the 60 inch pipe does not discharge storm water for Filing 1 construction) for the Filing 1 temporary condition. This riprap will need to be upgraded and re-evaluated as additional filings, and hence, additional discharge is added to the major drainage channel.

HEC-1 INPUT/OUTPUT
(DETENTION POND ROUTING)

COMPUTED OUTFLOW-ELEVATION DATA

(EXCLUDING FLOW OVER DAM)

	OUTFLOW	.00	.00	32.82	35.10	37.72	40.76	44.33	48.59	53.76
60.16										
	ELEVATION	84.39	85.77	87.09	87.28	87.51	87.80	88.18	88.66	89.31
90.20										
	OUTFLOW	60.90	63.45	68.99	78.70	93.70	115.17	144.26	182.10	229.86
288.69										
	ELEVATION	90.23	90.30	90.39	90.52	90.68	90.88	91.11	91.37	91.67
92.00										

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

(INCLUDING FLOW OVER DAM)

	STORAGE	.00	.84	.98	3.57	4.02	4.58	5.27	5.74	6.46
8.45										
	OUTFLOW	.00	.00	13.71	32.82	35.10	37.72	40.76	42.68	44.33
48.59										
	ELEVATION	84.39	85.77	86.00	87.09	87.28	87.51	87.80	88.00	88.18
88.66										
	STORAGE	11.11	13.95	14.42	14.50	14.65	14.88	15.19	15.57	16.04
16.58										
	OUTFLOW	53.76	58.79	60.16	60.90	63.45	68.99	78.70	93.70	115.17
144.26										
	ELEVATION	89.31	90.00	90.20	90.23	90.30	90.39	90.52	90.68	90.88
91.11										
	STORAGE	17.21	17.91	18.69						
	OUTFLOW	182.10	229.86	288.69						
	ELEVATION	91.37	91.67	92.00						

****
****

HYDROGRAPH AT STATION 100

****
****

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD
1	0000	1	0.	.0	84.4	*	1	0230	31	41.	5.2	87.8	*	1	0500	61			
18.	1.4	86.2																	
1	0005	2	0.	.0	84.4	*	1	0235	32	40.	5.1	87.7	*	1	0505	62			
18.	1.3	86.2																	
1	0010	3	0.	.1	84.5	*	1	0240	33	39.	5.0	87.7	*	1	0510	63			
17.	1.3	86.1																	
1	0015	4	0.	.1	84.6	*	1	0245	34	39.	4.8	87.6	*	1	0515	64			
16.	1.2	86.1																	
1	0020	5	0.	.2	84.6	*	1	0250	35	38.	4.7	87.6	*	1	0520	65			
16.	1.2	86.1																	
1	0025	6	0.	.2	84.7	*	1	0255	36	37.	4.5	87.5	*	1	0525	66			
15.	1.1	86.1																	
1	0030	7	0.	.3	84.8	*	1	0300	37	37.	4.4	87.4	*	1	0530	67			
15.	1.1	86.0																	
1	0035	8	0.	.4	85.0	*	1	0305	38	36.	4.2	87.4	*	1	0535	68			
14.	1.0	86.0																	
1	0040	9	0.	.6	85.3	*	1	0310	39	35.	4.1	87.3	*	1	0540	69			
13.	1.0	86.0																	
1	0045	10	0.	.7	85.5	*	1	0315	40	35.	3.9	87.2	*	1	0545	70			
10.	.9	85.9																	
1	0050	11	14.	1.0	86.0	*	1	0320	41	34.	3.7	87.2	*	1	0550	71			
7.	.9	85.8																	
1	0055	12	21.	1.7	86.3	*	1	0325	42	33.	3.6	87.1	*	1	0555	72			
7.	.9	85.8																	
1	0100	13	28.	2.6	86.7	*	1	0330	43	32.	3.5	87.0	*	1	0600	73			

```
 7.      .9    85.8
  1    0105   14      33.      3.6     87.1 *  1     0335  44      31.      3.3     87.0 *  1     0605  74
 7.      .9    85.8
  1    0110   15      37.      4.5     87.5 *  1     0340  45      31.      3.2     86.9 *  1     0610  75
 7.      .9    85.8
  1    0115   16      40.      5.2     87.8 *  1     0345  46      30.      3.1     86.9 *  1     0615  76
 6.      .9    85.8
  1    0120   17      43.      5.7     88.0 *  1     0350  47      29.      2.9     86.8 *  1     0620  77
 6.      .9    85.8
  1    0125   18      43.      6.1     88.1 *  1     0355  48      29.      2.8     86.8 *  1     0625  78
 6.      .9    85.8
  1    0130   19      44.      6.3     88.1 *  1     0400  49      28.      2.7     86.7 *  1     0630  79
 6.      .9    85.8
  1    0135   20      44.      6.3     88.1 *  1     0405  50      27.      2.5     86.7 *  1     0635  80
 4.      .9    85.8
  1    0140   21      44.      6.1     88.1 *  1     0410  51      26.      2.4     86.6 *  1     0640  81
 3.      .8    85.8
  1    0145   22      44.      6.2     88.1 *  1     0415  52      25.      2.3     86.5 *  1     0645  82
 5.      .9    85.8
  1    0150   23      44.      6.2     88.1 *  1     0420  53      24.      2.2     86.5 *  1     0650  83
 5.      .9    85.8
  1    0155   24      44.      6.1     88.1 *  1     0425  54      24.      2.1     86.5 *  1     0655  84
 5.      .9    85.8
  1    0200   25      43.      6.1     88.1 *  1     0430  55      23.      2.0     86.4 *  1     0700  85
 5.      .9    85.8
  1    0205   26      43.      6.0     88.1 *  1     0435  56      22.      1.9     86.4 *  1     0705  86
 5.      .9    85.8
  1    0210   27      43.      5.9     88.0 *  1     0440  57      22.      1.8     86.3 *  1     0710  87
 5.      .9    85.8
  1    0215   28      43.      5.8     88.0 *  1     0445  58      21.      1.7     86.3 *  1     0715  88
 5.      .9    85.8
  1    0220   29      42.      5.6     88.0 *  1     0450  59      20.      1.6     86.3 *  1     0720  89
 5.      .9    85.8
  1    0225   30      41.      5.4     87.9 *  1     0455  60      19.      1.5     86.2 *  1     0725  90
 5.      .9    85.8                                  *                                             *

*************************************************************************************************************
************************

 PEAK OUTFLOW IS      44. AT TIME   1.50 HOURS

                                                    MAXIMUM AVERAGE FLOW
  PEAK FLOW      TIME                        6-HR       24-HR       72-HR       7.42-HR
+   (CFS)        (HR)
                                   (CFS)
+      44.       1.50                26.         22.         22.         22.
                                (INCHES)          .852        .870        .870        .870
                                 (AC-FT)           13.         13.         13.         13.

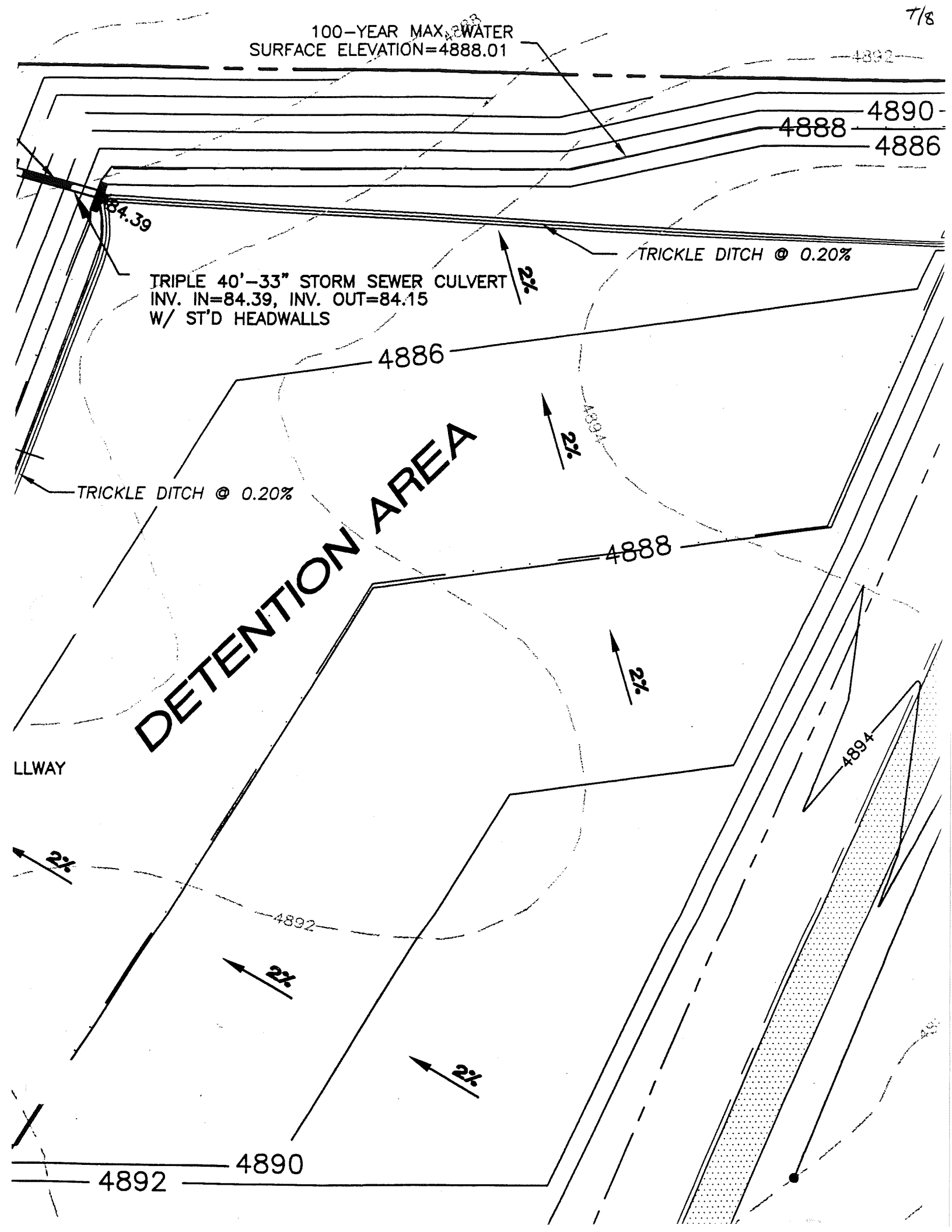
                                                    MAXIMUM AVERAGE STORAGE
  PEAK STORAGE   TIME                        6-HR       24-HR       72-HR       7.42-HR
+  (AC-FT)       (HR)
       6.        1.50                 3.          3.          3.          3.

                                                    MAXIMUM AVERAGE STAGE
  PEAK STAGE     TIME                        6-HR       24-HR       72-HR       7.42-HR
+   (FEET)       (HR)
    88.14        1.50               86.84       86.54       86.54       86.54

                                CUMULATIVE AREA =      .29 SQ MI

1
                                                    RUNOFF SUMMARY
                                              FLOW IN CUBIC FEET PER SECOND
                                            TIME IN HOURS,  AREA IN SQUARE MILES

                                          PEAK   TIME OF    AVERAGE FLOW FOR MAXIMUM PERIOD     BASIN     MAXIMUM
  TIME OF
        OPERATION          STATION        FLOW   PEAK                                          AREA      STAGE
  MAX STAGE
+                                                          6-HOUR     24-HOUR     72-HOUR
        HYDROGRAPH AT
+                            100          169.   1.08        28.         23.         23.         .29
```


100-YEAR MAX. WATER
SURFACE ELEVATION=4888.01
4892
4890
4888
4886
84.39
TRICKLE DITCH @ 0.20%
TRIPLE 40'-33" STORM SEWER CULVERT
INV. IN=84.39, INV. OUT=84.15
W/ ST'D HEADWALLS
2%
4886
4894
TRICKLE DITCH @ 0.20%
DETENTION AREA
4888
LLWAY
4894
4892
4890
4892

Two areas were analyzed for existing detention:

1) WCR24 and the RR embankment

The embankment creates a detention area, with a 36" steel pipe at the embankment toe.

Elev. (ft)	Area (ac)	Depth (ft)	Vol. (ac-ft)	Q (cfs)
4855.0 (assumed from USGS quad)	0.0	0.0	0.0	0.0
4865.0 (assumed over-topping elev. for RR embankment)	9.3	10.0	31.0	100*

2) RR embankment @ Harney

The embankment also contains a 36" steel pipe @ the toe.

4877.0 (assumed from USGS quad)	0.0	0.0	0.0	0.0
4885.0 (assumed over-topping elev. for RR embankment)	11.1	8.0	30.0	90*

Therefore, the existing detention along the two RR embankment locations is:

Vol. (ac-ft)	Q (cfs)
0.0	0.0
61.0	190.0

Adding the St. Vrain Ranch P.U.D. storage, the rating curve becomes

0.0	0.0
67.3	190.0

* Flows determined by using the orifice equation: $Q = CA\sqrt{2g\Delta h}$

$C = 0.6$ $\quad g = 32.2$

$A = \pi/4\,(3)^2$ $\quad \Delta h$ = head to centerline of pipe

Sub-basin 74
Part of detention
pond 474 analysis

DRAINAGE STUDY
FOR
OWL LAKE ESTATES SUBDIVISION

Prepared For:

Mr. John Zadel
9031 Weld County Road 13
Longmont, CO 80501

Date: February, 1995
Project No. ZADJ-4H2G-06
Revised July, 1996
REV. AUG, 1996

CONSULTING ENGINEER

Landmark Engineering Ltd.
3521 West Eisenhower Boulevard
Loveland, Colorado 80537

peak flow rates. This will reduce downstream peak flow rates during major storms. Therefore, based on the above information, downstream improvements are not needed.

2) *Detention Facilities*

The Weld County Subdivision Ordinance specifies that detention facilities shall be designed to detain the difference in the runoff flows from a 100-Year storm on the fully developed subdivision and runoff flow from a 2-Year storm on the undeveloped site.

This subdivision is comprised of rural type lots with a relatively small increase in the amount of impervious surface proposed with the development. Although the increased impervious is relatively small, two detention areas are proposed to detain the difference between the 100-Year developed runoff and the 2-Year historic runoff. One of the detention areas utilizes the existing irrigation equalization pond located in the South central part of the subdivision as shown on the Drainage Exhibit. The other proposed detention area is the back side of Lots 1, 2 & 3, Block 1 as shown on the Drainage Exhibit. The release rate from the detention ponds during the 100-Year storm will be less than or equal to the predeveloped 2-Year peak flow rate. Therefore, the downstream drainage facilities will be less impacted with this development.

3) *Onsite Storm Drainage System*

The onsite storm drainage system as shown on the Drainage Exhibit consists of surface drainage to roadside swales which drain to detention ponds and established discharge points for the site. Culverts and drainage crossings have been sized for tributary areas as defined on the Drainage Exhibit provided in the back pocket of this report.

3/11

DRAINAGE CALCULATIONS FOR OWL LAKE ESTATES SUBDIVISION

1. EVALUATE DRAINAGE FOR THAT TOTAL AREA TRIBUTARY TO THE EXISTING IRRIGATION POND LOCATED ON TRACT A.

OFFSITE AREAS TRIBUTARY TO THE EXISTING IRRIGATION POND ARE AREAS A AND B WITH AN APPROXIMATE AREA OF 4 AC. IT IS PROPOSED THAT WHEN THIS OFFSITE AREA DEVELOPS, ONSITE DETENTION WILL BE REQUIRED TO LIMIT THE RELEASE TO THE 2 YEAR HISTORICAL FLOW RATE. FOR THE INTERIM, UNTIL THIS OFFSITE AREA DEVELOPS, THE OWL LAKE ESTATES MUST PROVIDE DRAINAGE FACILITIES TO HANDLE THE HISTORICAL 100 YEAR FLOWS. OWL LAKE ESTATES SHOULD NOT BE REQUIRED TO PROVIDE STORM WATER DETENTION FOR THIS OFFSITE AREA BUT ALLOW SUCH STORM FLOWS TO PASS THROUGH AND FOLLOW EXISTING DOWN STREAM DRAINAGE PATTERNS.

b) DETERMINE DESIGN FLOWS FOR TRIBUTARY OFFSITE AREAS A AND B

AREA A = 0.5 AC

L = 100 FT

$S = \frac{1}{100} \times 100 = 1\%$

C = .20

$T_c = \frac{1.87(1.1 - .20)\sqrt{100}}{(1)^{1/3}} = 16.8$ SAY 17 MINUTES

$I_2 = 2.15$ in/hr

$I_{10} = 4.37$ in/hr

$I_{100} = 6.8$ in/hr

$Q_2 = (2.15)(.20)(.5) = 0.22$ CFS ←

$Q_{10} = (4.37)(.20)(.5) = 0.44$ CFS ←

$Q_{100} = (6.8)(.20)(.5)(1.25) = 0.85$ CFS ←

AREA B = 3.50 AC

L = 430

$S = \frac{2}{430} \times 100 = 0.5$

C = .20

$T_c = \frac{1.87(1.1 - .20)\sqrt{930}}{(.5)^{1/3}} = 44$ MIN

$I_2 = 1.25$ in/Hr

$I_{10} = 2.10$ in/Hr

$I_{100} = 3.40$ in/Hr

$Q_2 = (.20)(1.25)(3.5) = 0.88$ CFS ←

$Q_{10} = (.20)(2.10)(3.5) = 1.47$ CFS ←

$Q_{100} = (.20)(3.40)(3.5)(1.25) = 2.98$ CFS ←

FOR THE ONSITE AREA THE TRIBUTARY AREAS ARE A-1, A-2, AND A-4

THE TOTAL ONSITE TRIBUTARY AREA IS 8.35 + 6.00 + 10.80 OR 25.15 AC.

DETERMINE HISTORICAL RELEASE RATE FOR PROPOSED DETENTION POND.

$L = 1200'$

$S = \frac{102 - 88}{1200} = 1.16\%$

$T_c = \frac{1.87(1.1 - .20)\sqrt{1200}}{(1.16)^{1/3}} = 55$ min

$I_2 = 1.08$ in/hr

$Q_2 = (.20)(1.08)(25.15) = \underline{\underline{5.43 \text{ CFS}}}$

DETERMINE COMPOSITE C FOR DEVELOPED CONDITIONS

BASED ON A TYPICAL LOT, WITH AREA OF 1.0 AC = 43560.

HOUSE 50 X 50 = 2500 SF C = .95

GARAGE 24 X 30 = 720 SF C = .95

DRIVE & WALKS 900 SF C = .95

1/2 PAVED STREET = 14 X 150 = 2100 SF C = .95

6220 SF

SAY 6500 SF @ C = .95

37060 SF @ C = .20

$$\bar{C} = \frac{(6500)(.95) + (37060)(.20)}{43560} = 0.31$$

$$Q_{IN} = CC_f IA = (.31)(1.25)(I)(25.15) = 9.75I$$

DETERMINE DETENTION VOLUME REQUIREMENTS

T MIN	I IN/HR	(9.75)(I) Q_{IN} CFS	VOL IN FT³	Q_{OUT} CFS	VOL OUT FT³	STORAGE VOLUME
10	7.20	70.2	42120	5.43	3258	38862
20	5.40	52.7	63180	5.43	6516	56664
30	4.25	41.4	74520	5.43	9774	64746
40	3.62	35.3	84720	5.43	13032	71688
50	3.12	30.4	91260	5.43	16290	74970
60	2.68	26.1	94068	5.43	19548	74520
70				5.43	22806	
80				5.43	26064	
90				5.43	29322	
100				5.43	32580	

DETENTION VOLUME REQ'D = 74970 FT³
1.72 AC-FT

DETERMINE THE VOLUME OF EXISTING POND.

TOP OF BERM AT ELEVATION 90

MAXIMUM WATER SURFACE = ELEVATION 89 TO ALLOW 1' FREE BOARD. BOTTOM OF EXISTING POND IS AT ELEVATION 87

CONTOUR	AREA	AB_m	VOLUME FT^3
87	69890		
		74045	74045
88	78200		
		83055	83055
89	87910		
			157100 FT^3

VOLUME => $V = \frac{d}{6}(A + 4AB_m + B)$

IF THE POND IS TO CONTINUE TO BE USED FOR IRRIGATION, THE DETENTION VOLUME MUST BE MAINTAINED FROM ELEVATION 89 DOWN.

THE DETENTION VOLUME REQUIRED IS 74970 FT^3

BASED ON THE ABOVE INFORMATION, THE MAXIMUM NORMAL WATER SURFACE IN THE POND IS

$$89 - \frac{74970}{83055} = 88.09$$

SET CONTROL AT ELEVATION 88.0 ←

THIS PROVIDES 1.7 AC-FT OF NORMAL STORAGE FOR IRRIGATION PURPOSES. IF MORE STORAGE IS REQUIRED, THE POND MAY BE EXCAVATED TO A LOWER ELEVATION AS REQUIRED.

2. EVALUATE DRAINAGE FOR THAT TOTAL AREA TRIBUTARY TO THE DETENTION POND LOCATED ON LOTS 1,2 & 3 BLOCK 1

FOR THE ONSITE AREA, THE TRIBUTARY AREAS ARE A-5 AND A-6 OR 22.32 AC.

DETERMINE HISTORICAL RELEASE RATE FOR THE PROPOSED DETENTION POND.

$L = 1200'$

$S = \frac{92 - 76}{1200} = 1.33\%$

$T_c = \frac{1.87(1.1 - .20)\sqrt{1200}}{(1.33)^{1/3}} = 53 \text{ min}$ SAY 55 min

$I_2 = 1.08 \text{ in/hr}$

$Q_2 = (.20)(1.08)(22.32) = 4.82 \text{ CFS}$ ←

FROM PREVIOUS CALCULATIONS $C = 0.31$

$Q_{IN} = C C_f I A = (.31)(1.25)(I)(22.32) = 8.65 I$

DETERMINE DETENTION VOLUME REQUIREMENTS.

Tc min	I IN/HR	8.65I Q_{IN} CFS	VOL IN FT3	Q_{OUT} CFS	VOL_{OUT} FT3	STORAGE VOLUME
10	7.20	62.3	37380	4.82	2892	34488
20	5.40	46.7	56052	4.82	5784	50268
30	4.25	36.8	66240	4.82	8676	57564
40	3.62	31.3	75151	4.82	11568	63583
50	3.12	27.0	81000	4.82	14460	66540 ←
60	2.68	23.2	83520	4.82	17352	66168

DETENTION VOLUME REQUIRED = 66540 FT3 ←

1.53 AC-FT

EVALUATE DETENTION PROVIDED BASED ON THE CONTOURS SHOWN ON THE DRAINAGE PLAN.

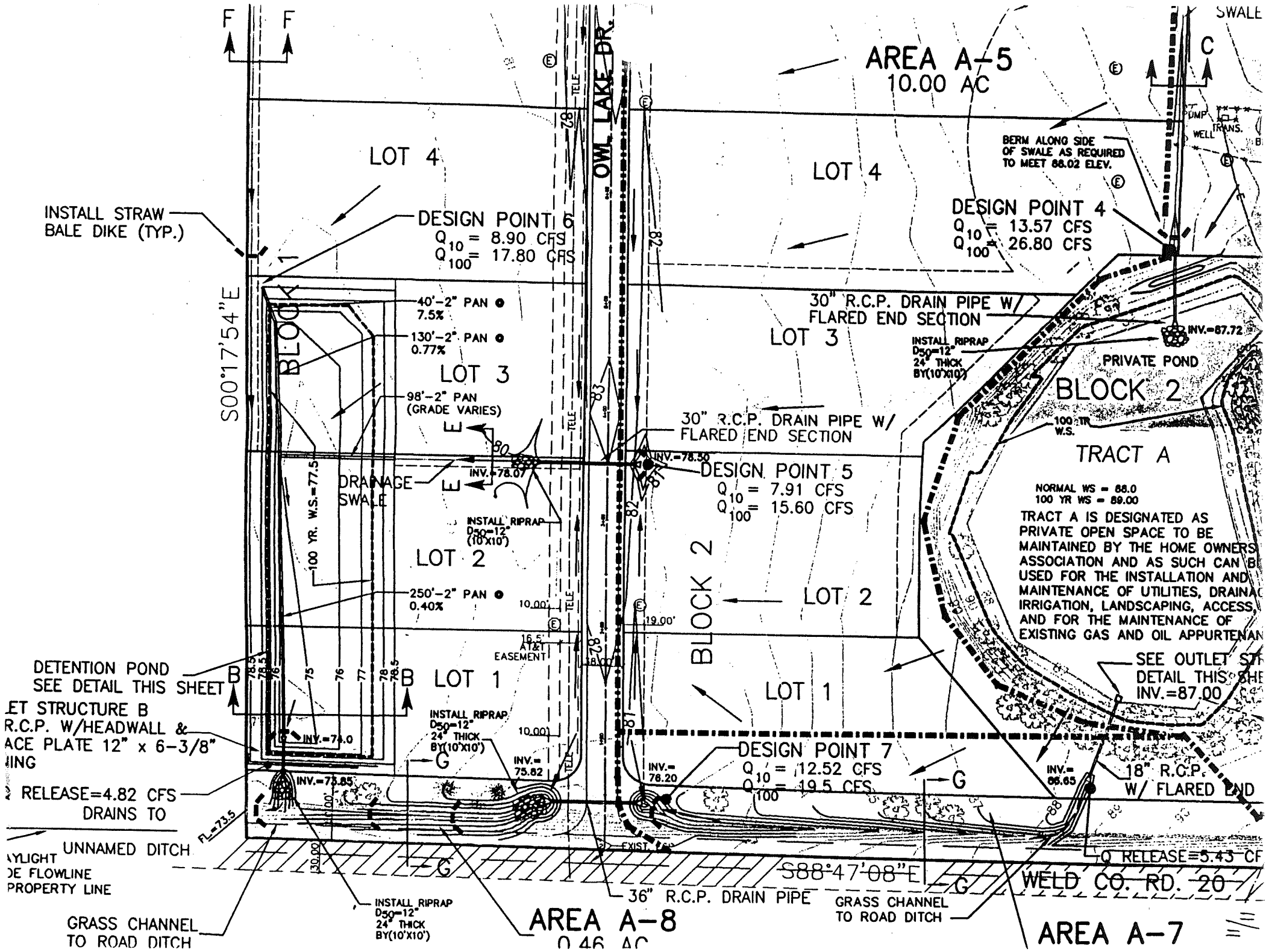
$$V = \frac{d}{3}\left(A + B + \sqrt{AB}\right)$$

CONTOUR	AREA	VOLUME
74	0	
		1,250
75	3,750	
		11,168
76	20,900	
		26,441
77	32,400	
		37,336
78	42,500	
		76,195 FT^3

$$100\text{ YR WS} = \frac{76{,}195 - 66{,}540}{37{,}336} + 77 = 77.26$$

SAY 77.5

SET TOP of BERM @ 78.5


AREA A-5
10.00 AC
LOT 4
LOT 4
OWL LAKE DR.
BERM ALONG SIDE OF SWALE AS REQUIRED TO MEET 88.02 ELEV.
INSTALL STRAW BALE DIKE (TYP.)
DESIGN POINT 6
Q10 = 8.90 CFS
Q100 = 17.80 CFS
DESIGN POINT 4
Q10 = 13.57 CFS
Q100 = 26.80 CFS
S00°17'54"E
BLOCK 1
40'-2" PAN
7.5%
130'-2" PAN
0.77%
LOT 3
98'-2" PAN (GRADE VARIES)
30" R.C.P. DRAIN PIPE W/ FLARED END SECTION
LOT 3
INV.=87.72
INSTALL RIPRAP D50=12" 24" THICK BY(10'X10')
PRIVATE POND
BLOCK 2
30" R.C.P. DRAIN PIPE W/ FLARED END SECTION
INV.=78.50
DESIGN POINT 5
Q10 = 7.91 CFS
Q100 = 15.60 CFS
DRAINAGE SWALE
INV.=78.07
INSTALL RIPRAP D50=12" (10'X10')
100 YR. W.S.=77.5
LOT 2
250'-2" PAN
0.40%
BLOCK 2
LOT 2
TRACT A
NORMAL WS = 88.0
100 YR WS = 89.00
TRACT A IS DESIGNATED AS PRIVATE OPEN SPACE TO BE MAINTAINED BY THE HOME OWNERS ASSOCIATION AND AS SUCH CAN BE USED FOR THE INSTALLATION AND MAINTENANCE OF UTILITIES, DRAINAGE, IRRIGATION, LANDSCAPING, ACCESS, AND FOR THE MAINTENANCE OF EXISTING GAS AND OIL APPURTENANCES
AT&T EASEMENT
LOT 1
LOT 1
DETENTION POND SEE DETAIL THIS SHEET
SEE OUTLET STRUCTURE DETAIL THIS SHEET INV.=87.00
ET STRUCTURE B
R.C.P. W/HEADWALL &
ACE PLATE 12" x 6-3/8"
ING
INV.=74.0
INSTALL RIPRAP D50=12" 24" THICK BY(10'X10')
INV.=75.82
INV.=76.20
DESIGN POINT 7
Q10 = 12.52 CFS
Q100 = 19.5 CFS
INV.=86.65
18" R.C.P. W/ FLARED END
RELEASE=4.82 CFS DRAINS TO
INV.=73.85
FL=73.5
UNNAMED DITCH
YLIGHT
DE FLOWLINE
PROPERTY LINE
RELEASE=5.43 CFS
S88°47'08"E
WELD CO. RD. 20
36" R.C.P. DRAIN PIPE
GRASS CHANNEL TO ROAD DITCH
INSTALL RIPRAP D50=12" 24" THICK BY(10'X10')
GRASS CHANNEL TO ROAD DITCH
AREA A-8
0.46 AC
AREA A-7
SWALE
PUMP WELL
TRANS.

1/7

ACKLAM ASSOCIATES, INC.
SURVEYING - ENGINEERING

Sub-basin 77
Part of detention
pond 477 analysis

FINAL DRAINAGE REPORT

FOR

TIMBERLAND SUBDIVISION
FIRESTONE, COLORADO

MAY 23, 1997

Prepared For:

Timberland Construction
c/o Jim Orr

1001 E. BRIDGE ST • P.O. BOX 795 • BRIGHTON, COLORADO 80601
TELEPHONE (303) 659-8546

convey the runoff to the north gutter of Fifth Street. These flows will then be conveyed to Detention Pond No. 1. The offsite drainage area is owned by the City of Firestone (Hart Park) and will remain in native gasses.

IV. PROPOSED DRAINAGE FACILITIES

The proposed drainage facilities consist of curb and gutter flow to collect the stormwater runoff from the developed lots. The gutter flow will be intercepted by type "R" inlets and conveyed to the detention ponds with storm sewers. The type "R" inlets and storm sewer are designed to intercept and convey the runoff from a 100 year recurrence interval storm from the developed site. The site consists of two drainage basins of approximately 2.87 and 6.82 acres. The 2.87 acre basin drains to a detention pond at the northeast corner of Buchanan Avenue and 4th Street. The 6.82 acre basin plus the 1.5 acre offsite area drains to a detention pond between Jackson Avenue and Wooster Avenue on the East side of Fourth Street.

The detention ponds were designed to store the volumetric difference between the historic 2-year recurrence interval storm and the major 100-year recurrence interval storm. The historic flow release rates will be controlled by orifice openings in the outlet pipe headwall structure. The 18 inch reinforced concrete pipe from detention pond No. 2 will outlot in a concrete channel to a sidewalk chase to the 4th Street gutter. The gutter flows south to Granville Avenue. The 18 inch reinforced concrete pipe outlet pipe from detention Pond No. 1 will outlet in a concrete channel to 4th Street and cross 4th Street in an 8 foot wide concrete pan to the gutter on the North side of Wooster Avenue. The flow will then be conveyed West in the Wooster Avenue gutter. Overflow from the ponds will be by a grouted overflow weir at the top of the outlet pipe headwall. The top of the grading pads for houses adjacent to the detention basins will be a minimum of 1 foot above the top of berm elevation.

The detention basins will be constructed early in the development cycle so that they can be utilized to trap sediment from construction activities within the drainage basin. The detention pond areas will be top soiled with grass seeding and mulch for erosion control. Seeding, fertilizing and mulching will be in accordance with the Weld County Tri-Area Sanitation District's Standards.

V. CONCLUSIONS:

Developed runoff drainage from this site will have no adverse effects on downstream drainage facilities or property. The detention pond's release flows are controlled at the 2-year historic runoff rates. The discharge flows are 1.03 cfs to Fourth Street and 3.00 cfs to Wooster Avenue These flows will be within the curb and gutter sections of the streets. Future offsite flows for the small offsite drainage area east of the project site will remain at historic levels with no increase in runoff flows being routed through the development.

The development detention ponds will benefit the Town's drainage by reducing the 100-year runoff from the site and offsite area. Without the detention ponds the 100-year runoff to Wooster Avenue is approximately 26 cfs. The detention ponds reduces this flow to 3.00 cfs. and the 100-year runoff to Fourth Street is reduced from approximately 8.9 cfs to 1 cfs.

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PROJECT TIMBERLAND SUBDIVISION
JOB NUMBER _____ SHEET ____ OF ____
CALCULATED BY BFE DATE _____
CHECKED BY _____ DATE _____

DETENTION STORAGE BASIN A - 8.32

T_c HISTORIC = 13.6 MIN

Q 2-YEAR HISTORIC = CIA = 0.15 (2.42) (8.32) = 3.02 CFS

Q 100-YEAR DEVELOPED = CCfIA = 0.70 (1.25)(6.82) I
= 5.97 I

TIME (MIN)	INTENSITY (IN/HR.)	Q (CFS)	VOLUME (IN) (FT³)	RELEASE (FT³)	DETENTION (FT³)
10	7.35	43.88	26,328	1488	24,840
15	6.18	36.90	33,205	2232	30,973
20	5.45	32.54	39,044	2976	36,068
25	4.75	28.36	42,536	3720	38,816
30	4.25	25.37	45,670	4464	41,206
35	3.88	23.16	48,644	5208	43,435
40	3.58	21.37	51,294	5952	45,342
45	3.45	20.60	55,610	6696	48,914
50	3.12	18.63	55,879	7440	48,439
55	2.85	17.01	56,148	8184	47,964
60	2.65	15.82	56,954	8928	48,026
90	1.85	11.04	59,640	13392	46,248
120	1.45	8.66	62,327	17,856	44,471
150	1.20	7.16	64,476	22,320	42,156
180	1.05	6.27	67,700	26,784	40,916

DETENTION VOLUME REQ'D = 48,914 FT³

RELEASE ORIFICE PLATE:

Pond 1

$Q = C_d A (2gh)^{1/2}$

$3.00 = 0.65 A [2 \times 32.2 (4.0)]^{1/2}$

$3.00 = 10.43 A$

$A = 0.288 \text{ ft}^2$

$DIA = [4(0.288)/\pi]^{1/2}$

$= 0.605'$

$= 7.25''$

LENGTH OF OVERFLOW WEIR REQ'D.

$Q_{WEIR} = 40.7 - 3.00 = 37.7$ CFS

$L = Q/(CH)^{3/2}$

$L = \frac{37.7}{(3.4 \times 1.0)^{3/2}} = 6.01'$ USE 6.0'

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PROJECT TIMBERLAND SUBDIVISION
JOB NUMBER _____ SHEET ____ OF ____
CALCULATED BY B.FE DATE _____
CHECKED BY _____ DATE _____

VOLUME DETENTION POND NO. 2

$VOL = \frac{H}{3}[A + B + \sqrt{AB}]$

CONTOUR	AREA (SQ FT)	VOLUME (CU. FT.)	CUMULATIVE VOLUME CU. FT.
4975.5	1620		
		1374	
4976.0	4060		6444
		5070	
4977.0	6150		11514
		7407	
4978.0	8740		13,851
		6541	
4978.7	9962		26,392
4979.0	10,485		

VOLUME DETENTION POND NO 1

4971	11,360		
		11,636	
4972	11,900		11,636
		12,256	
4973	12,615		23,892
		13,080	
4974	13,550		36,972
		13,826	
4975	14,104		50,798

100-YEAR WATER SURFACE ELEV. = 4974.90

==========

DETENTION POND SIZING BY FAA METHOD
Developed by
Civil Eng. Dept., U. of Colorado
Supported by Denver Metro Cities/Counties Pool Fund Study
Denver Urban Drainage and Flood Control District, Colorado

==========

USER=Acklam Associates Inc.....
EXECUTED ON 05-26-1997 AT TIME 11:06:59

PROJECT TITLE: 100 YEAR DETTENTION

**** DRAINAGE BASIN DESCRIPTION

BASIN ID NUMBER = 1.00
BASIN AREA (acre) = 8.32
RUNOFF COEF = 0.67

***** DESIGN RAINFALL STATISTICS
DESIGN RETURN PERIOD (YEARS) = 100.00

INTENSITY(IN/HR)-DURATION(MIN) TABLE IS GIVEN

DURATION	5	10	20	30	40	50	60	80	100	120	150	180
INTENSITY	9.4	7.3	5.4	4.3	3.6	3.1	2.6	2.2	1.8	1.6	1.4	1.2

***** POND OUTFLOW CHARACTERISTICS:
MAXIMUM ALLOWABLE RELEASE RATE = 3 CFS
OUTFLOW ADJUSTMENT FACTOR = .95
AVERAGE RELEASE RATE = 2.85 CFS

AVERAGE RELEASE RATE = MAXIMUM RELEASE RATE * ADJUSTMENT FACTOR.

***** COMPUTATION OF POND SIZE

RAINFALL DURATION MINUTE	RAINFALL INTENSITY INCH/HR	INFLOW VOLUME ACRE-FT	OUTFLOW VOLUME ACRE-FT	REQUIRED STORAGE ACRE-FT
0.00	0.00	0.00	0.00	0.00
5.00	9.40	0.36	0.02	0.34
10.00	7.35	0.57	0.04	0.53
15.00	6.40	0.74	0.06	0.68
20.00	5.45	0.84	0.08	0.77
25.00	4.85	0.94	0.10	0.84
30.00	4.25	0.99	0.12	0.87
35.00	3.92	1.06	0.14	0.92
40.00	3.58	1.11	0.16	0.95
45.00	3.35	1.17	0.18	0.99
50.00	3.12	1.21	0.20	1.01
55.00	2.87	1.22	0.22	1.01
60.00	2.63	1.22	0.24	0.99
65.00	2.51	1.26	0.26	1.01
70.00	2.39	1.30	0.27	1.02
75.00	2.27	1.32	0.29	1.03
80.00	2.16	1.34	0.31	1.02
85.00	2.08	1.37	0.33	1.03

150.00

ACKLAM
ASSOCIATES, INC.
SURVEYING - ENGINEERING

1/7

Sub-basin 79
Part of detention
pond 479 analysis

FINAL
DRAINAGE REPORT

FOR

TIMBERLAND SUBDIVISION
FIRESTONE, COLORADO

MAY 23, 1997

Prepared For:

Timberland Construction
c/o Jim Orr

1001 E. BRIDGE ST • P.O. BOX 795 • BRIGHTON, COLORADO 80601
TELEPHONE (303) 659-8546

AM
)CIATES, INC.
NG - ENGINEERING

Sub-basin 79
Part of detention
pond 479 analysis

:er of Fifth Street. These
ıntion Pond No. 1. The offsite
of Firestone (Hart Park) and

FINAL DRAINAGE REPORT

FOR

TIMBERLAND SUBDIVISION
FIRESTONE, COLORADO

MAY 23, 1997

Prepared For:

Timberland Construction
c/o Jim Orr

s consist of curb and gutter
f from the developed lots.
ɔy type "R" inlets and
storm sewers. The type "R"
o intercept and convey the
erval storm from the
two drainage basins of
ıe 2.87 acre basin drains to
ıer of Buchanan Avenue and
the 1.5 acre offsite area
kson Avenue and Wooster
ɜt.
to store the volumetric
recurrence interval storm
val storm. The historic
y orifice openings in the
inch reinforced concrete
lot in a concrete channel
ıtter. The gutter flows
reinforced concrete pipe
ll outlet in a concrete
ɜt in an 8 foot wide
ɜide of Wooster Avenue.
ıe Wooster Avenue gutter.
ted overflow weir at the
of the grading pads for
ill be a minimum of 1

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The detention basins will be constructed early in the development cycle so that they can be utilized to trap sediment from construction activities within the drainage basin. The detention pond areas will be top soiled with grass seeding and mulch for erosion control. Seeding, fertilizing and mulching will be in accordance with the Weld County Tri-Area Sanitation District's Standards.

V. CONCLUSIONS:

Developed runoff drainage from this site will have no adverse effects on downstream drainage facilities or property. The detention pond's release flows are controlled at the 2-year historic runoff rates. The discharge flows are 1.03 cfs to Fourth Street and 3.00 cfs to Wooster Avenue These flows will be within the curb and gutter sections of the streets. Future offsite flows for the small offsite drainage area east of the project site will remain at historic levels with no increase in runoff flows being routed through the development.

The development detention ponds will benefit the Town's drainage by reducing the 100-year runoff from the site and offsite area. Without the detention ponds the 100-year runoff to Wooster Avenue is approximately 26 cfs. The detention ponds reduces this flow to 3.00 cfs. and the 100-year runoff to Fourth Street is reduced from approximately 8.9 cfs to 1 cfs.

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PROJECT TIVERTON SUBDIVISION
JOB NUMBER _____ SHEET ____ OF ____
CALCULATED BY RFE DATE _____
CHECKED BY _____ DATE _____

DETENTION STORAGE BASIN B-1 → 2.87 AC.

T_c HISTORIC = 14.4 MIN.

Q 2-YEAR HISTORIC = CIA = 0.15 (2.4)(2.87) = 1.03 CFS

Q 100-YEAR DEVELOPED = CC_fIA = 0.69(1.25) I 2.87 = 2.47 I CFS

TIME (MIN)	INTENSITY (IN/HR)	Q (CFS)	VOLUME (IN) (FT³)	RELEASE (FT³)	DETENTION (FT³)
10	7.35	18.15	10,890	618	10,272
15	6.18	15.26	13,734	927	12,807
20	5.45	13.46	16,152	1236	14,916
25	4.75	11.73	17,595	1545	16,050
30	4.25	10.50	18,900	1854	17,046
35	3.88	9.58	20,118	2163	17,955
40	3.58	8.84	21,222	2,472	18,750
45	3.35	8.27	23,130	2,781	20,349
50	3.12	7.71	23,119	3090	20,029
55	2.85	7.04	23,232	3399	19,831
60	2.65	6.54	23,564	3708	19,856
90	1.85	4.57	24,675	5562	19,113
120	1.45	3.58	25,776	7416	18,360
150	1.20	2.96	26,676	9270	17,406
180	1.05	2.59	28,010	11,124	16,886

DETENTION VOLUME REQ'D = 20,349 FT³

RELEASE ORIFICE PLATE:

$Q = C_d A (2gh)^{1/2}$

$1.03 = 0.65A(2 \times 32.2 \times 3.4)^{1/2}$

$1.03 = 9.33A$

$A = 0.110$

$DIA = [4(0.110)/\pi]^{1/2}$

$= 0.37'$

$= 4.5''$

Pond 2

LENGTH OF OVERFLOW WEIR REQ'D

Q WEIR = 14.9 - 1.0 = 13.9

$L = Q/(CH)^{3/2}$

$L = \frac{13.9}{(3.4 \times 1)^{3/2}} = 2.5'$ USE 3'

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PROJECT TIMBERLAND SUBDIVISION
JOB NUMBER _____ SHEET ____ OF ____
CALCULATED BY B.FE DATE _____
CHECKED BY _____ DATE _____

VOLUME DETENTION POND NO. 2

$$VOL = \frac{H}{3}\left[A + B + \sqrt{AB}\right]$$

CONTOUR	AREA (SQ FT)	VOLUME (CU. FT.)	CUMULATIVE VOLUME CU. FT.
4975.5	1620		
		1374	
4976.0	4060		6444
		5070	
4977.0	6150		11514
		7407	
4978.0	8740		13,851
		6541	
4978.7	9962		26,392
4979.0	10,485		

VOLUME DETENTION POND NO 1

4971	11,360		
		11,636	
4972	11,900		11,636
		12,256	
4973	12,615		23,892
		13,080	
4974	13,550		36,972
		13,826	
4975	14,104		50,798

100-YEAR WATER SURFACE ELEV. = 4974.90

==========

DETENTION POND SIZING BY FAA METHOD
Developed by
Civil Eng. Dept., U. of Colorado
Supported by Denver Metro Cities/Counties Pool Fund Study
Denver Urban Drainage and Flood Control District, Colorado

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USER=Acklam Associates Inc.....
EXECUTED ON 05-26-1997 AT TIME 11:20:43

PROJECT TITLE: 100 YEAR DETENTION

**** DRAINAGE BASIN DESCRIPTION

BASIN ID NUMBER = 2.00
BASIN AREA (acre) = 2.87
RUNOFF COEF = 0.69

***** DESIGN RAINFALL STATISTICS
DESIGN RETURN PERIOD (YEARS) = 100.00

INTENSITY(IN/HR)-DURATION(MIN) TABLE IS GIVEN

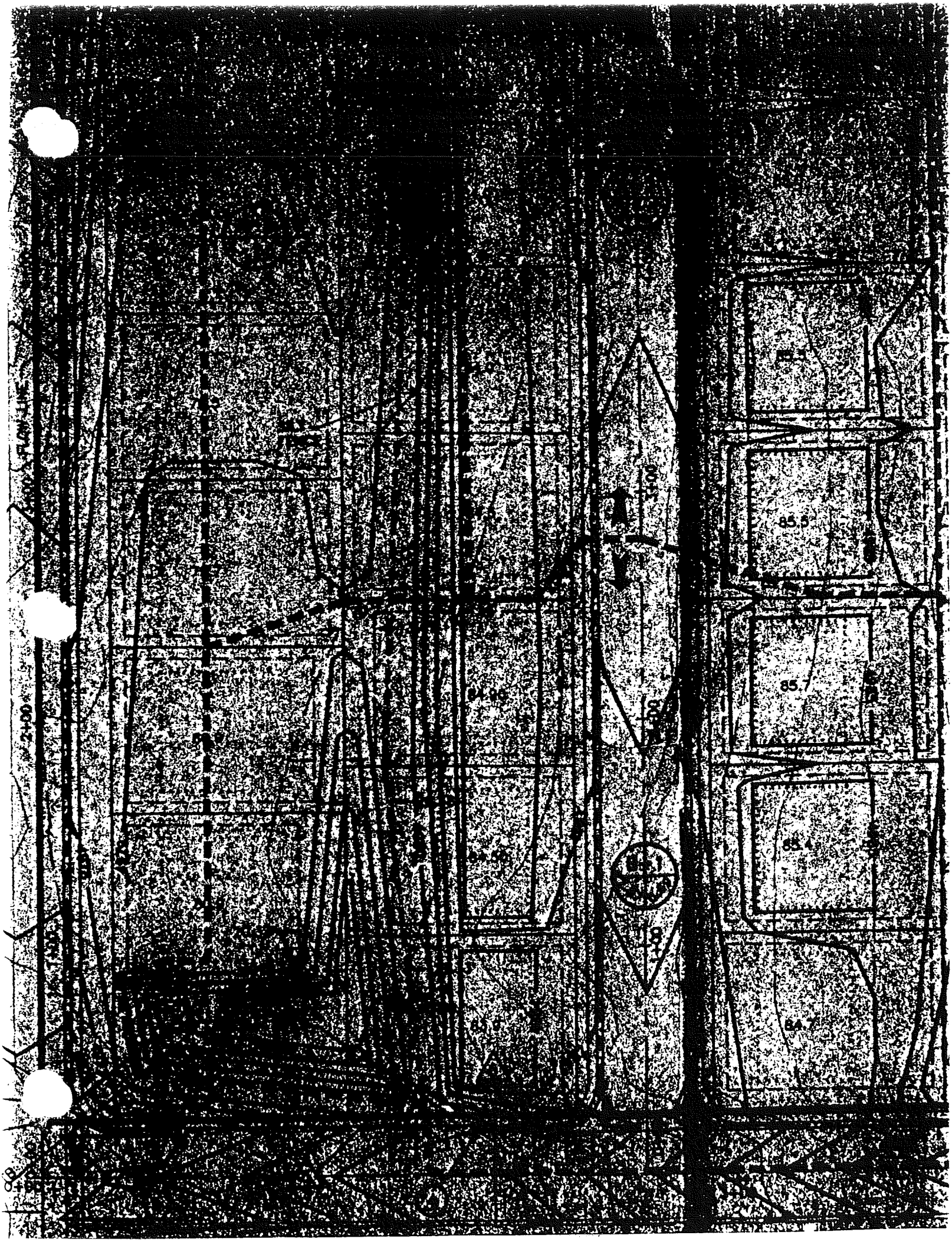
DURATION	5	10	20	30	40	50	60	80	100	120	150	180
INTENSITY	9.4	7.3	5.4	4.3	3.6	3.1	2.7	2.2	1.8	1.6	1.4	1.2

***** POND OUTFLOW CHARACTERISTICS:
MAXIMUM ALLOWABLE RELEASE RATE = 1.03 CFS
OUTFLOW ADJUSTMENT FACTOR = .95
AVERAGE RELEASE RATE = .9785 CFS

AVERAGE RELEASE RATE = MAXIMUM RELEASE RATE * ADJUSTMENT FACTOR.

***** COMPUTATION OF POND SIZE

RAINFALL DURATION MINUTE	RAINFALL INTENSITY INCH/HR	INFLOW VOLUME ACRE-FT	OUTFLOW VOLUME ACRE-FT	REQUIRED STORAGE ACRE-FT
0.00	0.00	0.00	0.00	0.00
5.00	9.40	0.13	0.01	0.12
10.00	7.35	0.20	0.01	0.19
15.00	6.40	0.26	0.02	0.24
20.00	5.45	0.30	0.03	0.27
25.00	4.85	0.33	0.03	0.30
30.00	4.25	0.35	0.04	0.31
35.00	3.92	0.38	0.05	0.33
40.00	3.58	0.39	0.05	0.34
45.00	3.35	0.41	0.06	0.35
50.00	3.12	0.43	0.07	0.36
55.00	2.89	0.44	0.07	0.36
60.00	2.65	0.44	0.08	0.36
65.00	2.53	0.45	0.09	0.36
70.00	2.40	0.46	0.09	0.37
75.00	2.28	0.47	0.10	0.37
80.00	2.16	0.47	0.11	0.37
85.00	2.08	0.49	0.11	0.37


FLOW LINE
85.5
85.7
84.7

1/6

Sub-basin 81
Part of detention
pond 481 analysis

FINAL DRAINAGE REPORT
COALRIDGE ESTATES
FREDERICK, COLORADO

Prepared For:

Aksel Property
4620 Weld County Road No.5
Erie, Colorado

Prepared By:

Hurst & Associates, Inc.
3055 47th St., Suite A-2
Boulder, Colorado 80301

Job No. 2184-03
March 17, 1997
Revised June 8, 1998

DETENTION POND DESIGN

The proposed detention pond facilities have been designed to provide detention for this development in accordance with the Tri-Area Drainage District Criteria. Due to existing site topography, runoff from rear yards lying adjacent to the existing drainage channels along the north and west property lines will not be intercepted by onsite facilities for conveyance to the detention ponds (basins B15 and B16). These drainage channels are to remain in their existing conditions with minor regrading in the channel adjacent to McClure Street (refer to Master Drainage Plan in back pocket). Consistent with historic patterns, both drainage channels are conveyed around Detention Pond "B" to the existing grated inlet located in the northwest corner of the project. Detention Pond B has been oversized to account for undetained sub-basins B15 and B16, as well as the Water Quality Capture Volume as described in Urban Drainage guidelines.

Per agreement with the Tri-Area Drainage District, the peak site discharge for the 100 year storm event has been limited to 15 cfs. Please refer to Appendix E for detention pond design computations, along with the storage-discharge relationships.

APPENDIX E

DETENTION POND DESIGN & S.W.M.M. MODELING

Summary of S.W.M.M. Analysis
Coalridge Estates Pond Results
Job No. 2184-03

08-Jun-98

Pond ID	Element Number	Pond Volumes (Ac-Ft)			Peak Pond Discharges (cfs)		
		2 Year	* 100 Year	** 100 Year	2 Year	* 100 Year	** 100 Year
A	231	0.1	1.78	2.4	0.1	0.2	57.0
B	232	0.9	4.47	5.7	0.2	13.7	222.0

The Onsite Detention Pond Facilities are designed to detain the 100 year flood control volume plus the water quality capture volume for developed Coalridge Estates. A spillway will be constructed at the 100 year pond design high water elevation so that offsite basin flows are conveyed along historic drainage paths without detention.

** A S.W.M.M. routing was performed with the historic basins bypassing the detention ponds to determine the required 100 year flood control volume for developed Coalridge Estates. These 100 year tabulated volumes include the water quality capture volumes.*

*** The historic flows were then routed through the detention ponds to model actual conditions which may occur until the property to the east and south develops.*

Coalridge Estates
Pond B Storage-Discharge Relationship
S.W.M.M. Element No. 232

08-Jun-98

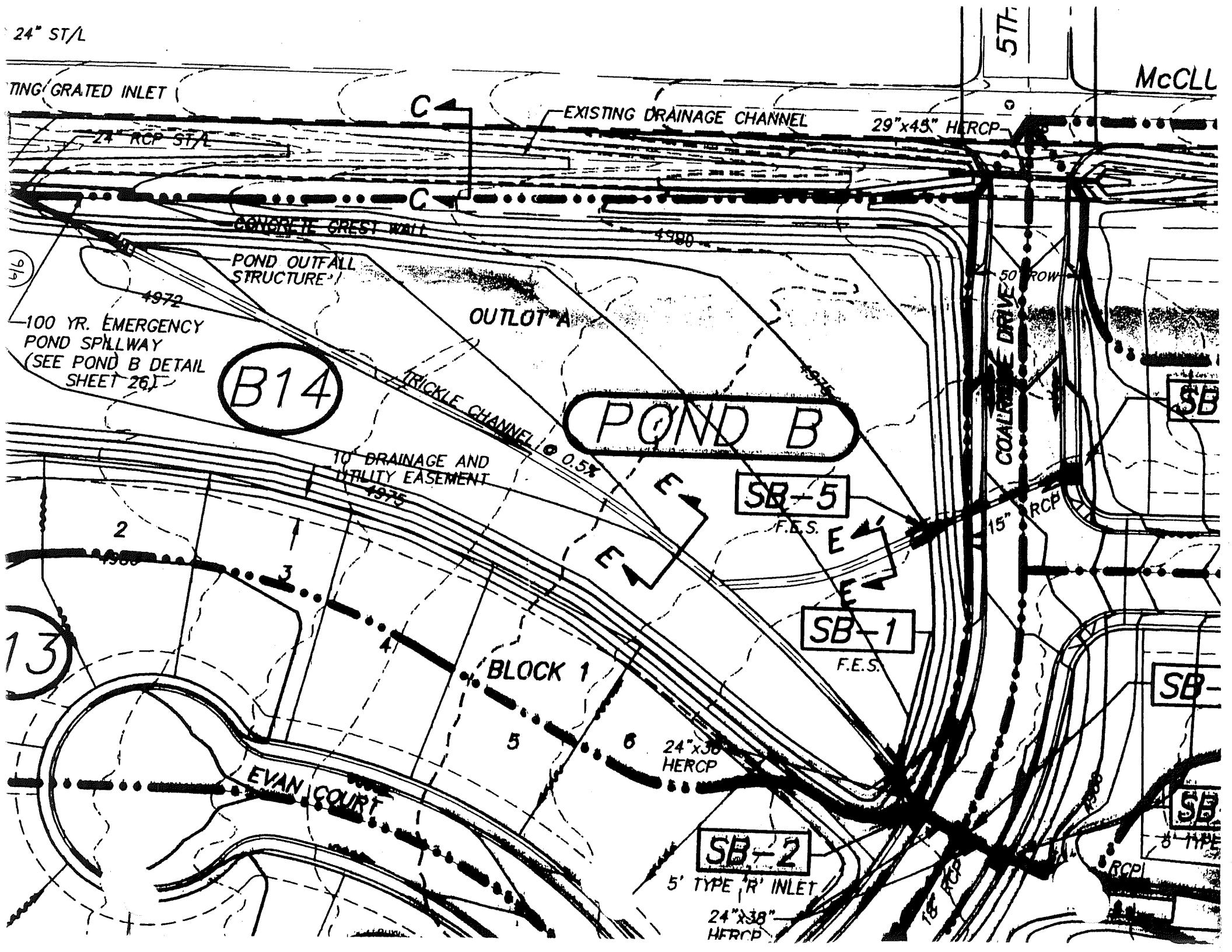
Job 2184-03

Stage (ft)	Surface Area (ac)	Cummulative Volume (ac-ft)	Orifice Outflow (cfs)	Pipe Outflow (cfs)	Weir Spillway Outflow (cfs)	Total Pond Discharge (cfs)
4971.00	0.00	0.00	0.00	0.00	0.00	0.00
4972.00	0.04	0.02	0.10	0.10	0.00	0.10
4973.00	0.45	0.27	0.15	0.15	0.00	0.15
4973.20	0.56	0.37	0.15	0.15	0.00	0.15
4973.40	0.67	0.49	0.16	0.16	0.00	0.16
4973.60	0.77	0.64	0.17	0.17	0.00	0.17
4973.80	0.88	0.80	0.17	0.17	0.00	0.17
4974.00	0.99	0.99	0.18	9.82	0.00	9.82
4974.20	1.05	1.19	0.19	10.17	0.00	10.17
4974.40	1.12	1.41	0.19	10.50	0.00	10.50
4974.60	1.18	1.64	0.20	10.83	0.00	10.83
4974.80	1.25	1.88	0.20	11.15	0.00	11.15
4975.00	1.31	2.14	0.21	11.46	0.00	11.46
4975.20	1.35	2.41	0.21	11.76	0.00	11.76
4975.40	1.40	2.68	0.22	12.05	0.00	12.05
4975.60	1.44	2.97	0.22	12.34	0.00	12.34
4975.80	1.49	3.26	0.23	12.62	0.00	12.62
4976.00	1.53	3.56	0.23	12.89	0.00	12.89
4976.20	1.56	3.87	0.24	13.16	0.00	13.16
4976.40	1.59	4.19	0.24	13.42	0.00	13.42
4976.60	1.62	4.51	0.25	13.68	0.00	13.68
4976.80	1.65	4.83	0.25	13.93	25.94	39.87
4977.00	1.68	5.17	0.26	14.18	73.36	87.55
4977.25	1.71	5.59	0.26	14.49	151.97	166.46
4977.50	1.74	6.02	0.27	14.78	247.61	262.39
4977.75	1.77	6.46	0.27	15.08	357.64	372.72
4978.00	1.80	6.91	0.28	15.36	480.39	495.75

Orifice:	*Orifice Diameter (in.)*	*2*
	Discharge Coefficient	*0.6*
	Orifice Invert Elevation	*4971.00*
Pipe:	*Top of Pond Structure Elevation*	*4973.90*
	Outflow Pipe Diameter (in.)	*24*
	Area of Pipe - Not Restricted (Sq. In.)	*180.0*
	Discharge Coefficient	*0.6*
	Outflow Pipe Invert Elevation	*4970.80*
Weir:	*Weir Length*	*100.0*
	Weir Coefficient	*2.9*
	Weir Elevation	*4976.6*
	Top of Freeboard Elevation	*4977.6*

2 Year Design High Water Elevation = 4973.90; Volume = 0.9 Ac-Ft; Actual Release Q = 0.2 cfs

100 Year Design High Water Elevation = 4976.60; Volume = 4.47 Ac-Ft; Actual Release Q = 13.7 cfs


24" ST/L
TING GRATED INLET
C
EXISTING DRAINAGE CHANNEL
29"x45" HERCP
McCLL
24" RCP ST/L
C
CONCRETE CREST WALL
4980
POND OUTFALL STRUCTURE
50' ROW
4972
100 YR. EMERGENCY POND SPILLWAY (SEE POND B DETAIL SHEET 26)
OUTLOT A
B14
TRICKLE CHANNEL @ 0.5%
POND B
COALFIELD DRIVE
10' DRAINAGE AND UTILITY EASEMENT
4975
E
E
SB-5
F.E.S.
E
E
15" RCP
SB-1
F.E.S.
2
1
3
4
BLOCK 1
5
6
24"x38" HERCP
EVAN COURT
SB-2
5' TYPE 'R' INLET
24"x38" HERCP
18" RCP
RCP
13

14

Sub-basin 81
Part of detention
pond 481 analysis

THE OVERLOOK AT FIRESTONE

FILING I

STORM DRAINAGE REPORT

September 10, 1998

Prepared by:

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Prepared for:

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Longmont, Colorado 80501

III. STORMWATER DETENTION

The stormwater detention for the Site will be accomplished by a detention pond to be located at the southwest corner of the parcel in an area of approximately two acres. The pond is specified with four to one maximum side slopes and a two percent bottom slope with a 4' wide concrete trickle ditch at a one-half percent minimum slope for low flows. For ultimate planning purposes the ultimate developed contributing watershed was analyzed with respect to the maximum proposed 100-year discharge to the pond. This is in anticipation of future contributing filing to be constructed to the east.

The pre-development peak discharge for the westerly watershed associated with the peak detention pond release was determined by applying the rational formula (with a c, i and a of 0.30, tc equal to 34 min. with I equal to 1.6 in/hr and 29.23 acres) with a resulting pre-development peak of approximately 14 cfs. Times of concentration for the basin, pre-development was obtained via TR-55 (refer to appendix).

In order to "route" the detention pond a hydrograph was produced using the Soil Conservation Service Technical Release 20. The peak discharge to the pond was determined by applying the rational formula with the associated developed and undeveloped runoff coefficients (mannings "c" values) and the associated time of concentration and drainage area. The developed drainage area to the pond is 29.23 acres. The resulting "C" factor of 0.60. Time of concentration of the contributing basin was 22 minutes (as obtained from the rational formula time of concentration calculation/travel time as related to basin A3) with a resulting rainfall intensity of 5.1 in. hr. The rational formula produced a peak discharge of approximately 89.4 cfs. With the rational formula peak the TR-20 model was then "calibrated" by varying the runoff curve number to produce a hydrograph with a corresponding peak (88.9 cfs). This hydrograph was used in the HEC-1 evaluation.

The Army Corp of Engineers HEC-1 program was utilized for the routing of the detention pond. HEC-1 provides for simultaneous analysis of storage-stage-volume-outflow comparisons. An eight inch orifice is to utilized as the main low level outlet (HEC-1 utilizes the orifice equation for low level outlets). To anticipate potential blockage or the low-level outlet a modified D-5 inlet is to be placed at the storm sewer outlet from the detention pond. The D-5 has a grate top so in the event the low level outlet become clogged most runoff will still discharge from the pond via the storm sewer pipe, no the secondary spillway (and into McClure Avenue). The secondary spillway is modeled as a second stage outfall with the weir equation. The low and second stage modeling (stage vs. outflow) is integrated into the HEC-1 program and no further discussion is given (refer to HEC-1 documentation).

The results of the HEC-1 analysis indicates that the detention pond will provide for approximately 5 acre-feet of storage at elevation 92.45 (the maximum elevation in pond, without spillway overtopping, is 93.0 with approximately 6 acre-feet of storage) with the corresponding peak release rate of 4 cfs for the 100-year storm without grate or secondary spillway flow. In the event the low-level orifice becomes clogged the inlet structure and secondary spillway will pass 3 cfs with a maximum elevation of 93.11 and approximately. The actual computed outflow, 3 cfs, as compared to the allowable of discharge of 14 cfs. This will provide some interim over-detention and should relieve some potential downstream flooding problems. The release of stormwater from the detention pond will be accomplished via a 24 inch RCP culvert.

Outflow from the detention pond is to the natural drainway along the southerly side of McClure Avenue. Since the release rate from the site is significantly less than historical no further study of the conveyance capacity of the downstream channel was made.

The drainage plan is to allow for direct, uncontrolled runoff from the westerly portions of the site. This is due to the existing development constraints related to the Globe Subdivision. This drainage enters historical drainageways (Buchannon and Berwick Avenues) and due to the rather insignificant increases in imperviousness (less than 1% in both basins), situation within the respective drainage sheds (near the top of the shed)

IV. FLOODPLAIN

There is no designated 100-year floodplain which impacts this property according to the Federal Emergency Management Agency's flood insurance rate map.

V. CONCLUSIONS AND RECOMMENDATIONS

Due to the relatively moderate, uniform slopes across the site, the central (southerly) point of outfall and the absence of offsite (excluding future filings) drainage impacts this site possesses good characteristics with respect to drainage design for the proposed residential use. The street layout, situated in a predominantly east-west & north-south orientation, will provide for the conveyance of stormwater runoff which closely follows pre-development drainage patterns. Street conveyance, swales, storm sewer will be used to convey the storm runoff to the southwesterly detention pond and associated westerly outfall. The 100-floodplain (zone c) does not prohibit or limit development on the site.

HEC-1 POND ROUTINGS

COMPUTED OUTFLOW-ELEVATION DATA

(EXCLUDING FLOW OVER DAM)

OUTFLOW	.00	.00	.99	1.10	1.25	1.44	1.71	2.09	2.70	3.80
ELEVATION	87.54	87.87	88.21	88.30	88.42	88.61	88.91	89.42	90.46	93.00
OUTFLOW	3.90	4.56	6.31	9.69	15.24	23.48	34.96	50.21	69.76	94.16
ELEVATION	93.01	93.04	93.09	93.16	93.25	93.36	93.49	93.64	93.81	94.00

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

(INCLUDING FLOW OVER DAM)

STORAGE	.00	.01	.02	.11	.15	.21	.29	.42	.46	.88
OUTFLOW	.00	.00	.61	.99	1.10	1.25	1.44	1.71	1.79	2.09
ELEVATION	87.54	87.87	88.00	88.21	88.30	88.42	88.61	88.91	89.00	89.42
STORAGE	1.45	2.05	2.77	4.25	5.84	5.86	5.91	6.00	6.12	6.27
OUTFLOW	2.45	2.70	2.97	3.41	3.80	3.90	4.56	6.31	9.69	15.24
ELEVATION	90.00	90.46	91.00	92.00	93.00	93.01	93.04	93.09	93.16	93.25
STORAGE	6.46	6.68	6.94	7.23	7.56					
OUTFLOW	23.48	34.96	50.21	69.76	94.16					
ELEVATION	93.36	93.49	93.64	93.81	94.00					

****

HYDROGRAPH AT STATION 100

****

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	87.5	*	1		0700	85	3.	3.5	91.5	*	1		1400	169	4.	4.7	92.3
1		0005	2	0.	.0	87.5	*	1		0705	86	3.	3.7	91.7	*	1		1405	170	4.	4.7	92.3
1		0010	3	0.	.0	87.5	*	1		0710	87	3.	3.9	91.8	*	1		1410	171	4.	4.7	92.3
1		0015	4	0.	.0	87.5	*	1		0715	88	3.	4.1	91.9	*	1		1415	172	4.	4.7	92.3
1		0020	5	0.	.0	87.5	*	1		0720	89	3.	4.2	92.0	*	1		1420	173	4.	4.6	92.2
1		0025	6	0.	.0	87.5	*	1		0725	90	3.	4.3	92.0	*	1		1425	174	4.	4.6	92.2
1		0030	7	0.	.0	87.5	*	1		0730	91	3.	4.4	92.1	*	1		1430	175	4.	4.6	92.2
1		0035	8	0.	.0	87.5	*	1		0735	92	3.	4.5	92.1	*	1		1435	176	4.	4.6	92.2
1		0040	9	0.	.0	87.5	*	1		0740	93	3.	4.5	92.2	*	1		1440	177	4.	4.6	92.2
1		0045	10	0.	.0	87.5	*	1		0745	94	3.	4.6	92.2	*	1		1445	178	4.	4.6	92.2
1		0050	11	0.	.0	87.5	*	1		0750	95	4.	4.6	92.2	*	1		1450	179	3.	4.6	92.2
1		0055	12	0.	.0	87.5	*	1		0755	96	4.	4.7	92.3	*	1		1455	180	3.	4.6	92.2
1		0100	13	0.	.0	87.5	*	1		0800	97	4.	4.7	92.3	*	1		1500	181	3.	4.6	92.2
1		0105	14	0.	.0	87.6	*	1		0805	98	4.	4.7	92.3	*	1		1505	182	3.	4.6	92.2
1		0110	15	0.	.0	87.6	*	1		0810	99	4.	4.8	92.3	*	1		1510	183	3.	4.5	92.2
1		0115	16	0.	.0	87.6	*	1		0815	100	4.	4.8	92.3	*	1		1515	184	3.	4.5	92.2
1		0120	17	0.	.0	87.6	*	1		0820	101	4.	4.8	92.4	*	1		1520	185	3.	4.5	92.2
1		0125	18	0.	.0	87.6	*	1		0825	102	4.	4.8	92.4	*	1		1525	186	3.	4.5	92.2
1		0130	19	0.	.0	87.6	*	1		0830	103	4.	4.9	92.4	*	1		1530	187	3.	4.5	92.1
1		0135	20	0.	.0	87.6	*	1		0835	104	4.	4.9	92.4	*	1		1535	188	3.	4.5	92.1
1		0140	21	0.	.0	87.6	*	1		0840	105	4.	4.9	92.4	*	1		1540	189	3.	4.5	92.1
1		0145	22	0.	.0	87.6	*	1		0845	106	4.	4.9	92.4	*	1		1545	190	3.	4.4	92.1
1		0150	23	0.	.0	87.6	*	1		0850	107	4.	4.9	92.4	*	1		1550	191	3.	4.4	92.1
1		0155	24	0.	.0	87.6	*	1		0855	108	4.	4.9	92.4	*	1		1555	192	3.	4.4	92.1
1		0200	25	0.	.0	87.7	*	1		0900	109	4.	4.9	92.4	*	1		1600	193	3.	4.4	92.1
1		0205	26	0.	.0	87.7	*	1		0905	110	4.	4.9	92.4	*	1		1605	194	3.	4.4	92.1
1		0210	27	0.	.0	87.7	*	1		0910	111	4.	4.9	92.4	*	1		1610	195	3.	4.4	92.1
1		0215	28	0.	.0	87.7	*	1		0915	112	4.	5.0	92.4	*	1		1615	196	3.	4.4	92.1
1		0220	29	0.	.0	87.7	*	1		0920	113	4.	5.0	92.4	*	1		1620	197	3.	4.4	92.1
1		0225	30	0.	.0	87.7	*	1		0925	114	4.	5.0	92.4	*	1		1625	198	3.	4.3	92.1
1		0230	31	0.	.0	87.7	*	1		0930	115	4.	5.0	92.5	*	1		1630	199	3.	4.3	92.1
1		0235	32	0.	.0	87.7	*	1		0935	116	4.	5.0	92.5	*	1		1635	200	3.	4.3	92.0
1		0240	33	0.	.0	87.8	*	1		0940	117	4.	5.0	92.5	*	1		1640	201	3.	4.3	92.0
1		0245	34	0.	.0	87.8	*	1		0945	118	4.	5.0	92.5	*	1		1645	202	3.	4.3	92.0
1		0250	35	0.	.0	87.8	*	1		0950	119	4.	5.0	92.5	*	1		1650	203	3.	4.3	92.0
1		0255	36	0.	.0	87.8	*	1		0955	120	4.	5.0	92.5	*	1		1655	204	3.	4.3	92.0
1		0300	37	0.	.0	87.8	*	1		1000	121	4.	5.0	92.5	*	1		1700	205	3.	4.3	92.0
1		0305	38	0.	.0	87.9	*	1		1005	122	4.	5.0	92.5	*	1		1705	206	3.	4.2	92.0
1		0310	39	0.	.0	87.9	*	1		1010	123	4.	5.0	92.5	*	1		1710	207	3.	4.2	92.0
1		0315	40	0.	.0	87.9	*	1		1015	124	4.	5.0	92.5	*	1		1715	208	3.	4.2	92.0
1		0320	41	0.	.0	87.9	*	1		1020	125	4.	5.0	92.5	*	1		1720	209	3.	4.2	92.0
1		0325	42	0.	.0	87.9	*	1		1025	126	4.	5.0	92.4	*	1		1725	210	3.	4.2	92.0
1		0330	43	0.	.0	87.9	*	1		1030	127	4.	5.0	92.4	*	1		1730	211	3.	4.2	91.9
1		0335	44	0.	.0	87.9	*	1		1035	128	4.	5.0	92.4	*	1		1735	212	3.	4.2	91.9
1		0340	45	0.	.0	87.9	*	1		1040	129	4.	5.0	92.4	*	1		1740	213	3.	4.1	91.9
1		0345	46	0.	.0	88.0	*	1		1045	130	4.	5.0	92.4	*	1		1745	214	3.		

1	0350	47	1.	.0	88.0 *	1	1050	131	4.	4.9	92.4 *	1	1750	215	3.	4.1	91.9
1	0355	48	1.	.0	88.0 *	1	1055	132	4.	4.9	92.4 *	1	1755	216	3.	4.1	91.9
1	0400	49	1.	.0	88.0 *	1	1100	133	4.	4.9	92.4 *	1	1800	217	3.	4.1	91.9
1	0405	50	1.	.0	88.0 *	1	1105	134	4.	4.9	92.4 *	1	1805	218	3.	4.1	91.9
1	0410	51	1.	.0	88.0 *	1	1110	135	4.	4.9	92.4 *	1	1810	219	3.	4.1	91.9
1	0415	52	1.	.0	88.0 *	1	1115	136	4.	4.9	92.4 *	1	1815	220	3.	4.1	91.9
1	0420	53	1.	.0	88.0 *	1	1120	137	4.	4.9	92.4 *	1	1820	221	3.	4.1	91.9
1	0425	54	1.	.0	88.1 *	1	1125	138	4.	4.9	92.4 *	1	1825	222	3.	4.1	91.9
1	0430	55	1.	.1	88.1 *	1	1130	139	4.	4.9	92.4 *	1	1830	223	3.	4.0	91.9
1	0435	56	1.	.1	88.1 *	1	1135	140	4.	4.9	92.4 *	1	1835	224	3.	4.0	91.9
1	0440	57	1.	.1	88.1 *	1	1140	141	4.	4.9	92.4 *	1	1840	225	3.	4.0	91.8
1	0445	58	1.	.1	88.1 *	1	1145	142	4.	4.9	92.4 *	1	1845	226	3.	4.0	91.8
1	0450	59	1.	.1	88.1 *	1	1150	143	4.	4.9	92.4 *	1	1850	227	3.	4.0	91.8
1	0455	60	1.	.1	88.1 *	1	1155	144	4.	4.9	92.4 *	1	1855	228	3.	4.0	91.8
1	0500	61	1.	.1	88.2 *	1	1200	145	4.	4.9	92.4 *	1	1900	229	3.	4.0	91.8
1	0505	62	1.	.1	88.2 *	1	1205	146	4.	4.9	92.4 *	1	1905	230	3.	4.0	91.8
1	0510	63	1.	.1	88.2 *	1	1210	147	4.	4.9	92.4 *	1	1910	231	3.	3.9	91.8
1	0515	64	1.	.1	88.2 *	1	1215	148	4.	4.9	92.4 *	1	1915	232	3.	3.9	91.8
1	0520	65	1.	.1	88.3 *	1	1220	149	4.	4.9	92.4 *	1	1920	233	3.	3.9	91.8
1	0525	66	1.	.1	88.3 *	1	1225	150	4.	4.9	92.4 *	1	1925	234	3.	3.9	91.8
1	0530	67	1.	.2	88.3 *	1	1230	151	4.	4.8	92.4 *	1	1930	235	3.	3.9	91.8
1	0535	68	1.	.2	88.4 *	1	1235	152	4.	4.8	92.4 *	1	1935	236	3.	3.9	91.8
1	0540	69	1.	.2	88.4 *	1	1240	153	4.	4.8	92.4 *	1	1940	237	3.	3.9	91.7
1	0545	70	1.	.2	88.5 *	1	1245	154	4.	4.8	92.4 *	1	1945	238	3.	3.9	91.7
1	0550	71	1.	.2	88.5 *	1	1250	155	4.	4.8	92.4 *	1	1950	239	3.	3.9	91.7
1	0555	72	1.	.3	88.6 *	1	1255	156	4.	4.8	92.4 *	1	1955	240	3.	3.8	91.7
1	0600	73	1.	.3	88.6 *	1	1300	157	4.	4.8	92.3 *	1	2000	241	3.	3.8	91.7
1	0605	74	2.	.3	88.7 *	1	1305	158	4.	4.8	92.3 *	1	2005	242	3.	3.8	91.7
1	0610	75	2.	.4	88.8 *	1	1310	159	4.	4.8	92.3 *	1	2010	243	3.	3.8	91.7
1	0615	76	2.	.4	88.9 *	1	1315	160	4.	4.8	92.3 *	1	2015	244	3.	3.8	91.7
1	0620	77	2.	.5	89.0 *	1	1320	161	4.	4.8	92.3 *	1	2020	245	3.	3.8	91.7
1	0625	78	2.	.6	89.1 *	1	1325	162	4.	4.8	92.3 *	1	2025	246	3.	3.8	91.7
1	0630	79	2.	.8	89.3 *	1	1330	163	4.	4.7	92.3 *	1	2030	247	3.	3.8	91.7
1	0635	80	2.	1.0	89.6 *	1	1335	164	4.	4.7	92.3 *	1	2035	248	3.	3.7	91.7
1	0640	81	2.	1.4	90.0 *	1	1340	165	4.	4.7	92.3 *	1	2040	249	3.	3.7	91.6
1	0645	82	3.	2.0	90.4 *	1	1345	166	4.	4.7	92.3 *	1	2045	250	3.	3.7	91.6
1	0650	83	3.	2.5	90.8 *	1	1350	167	4.	4.7	92.3 *						
1	0655	84	3.	3.1	91.2 *	1	1355	168	4.	4.7	92.3 *						
					*						*						

****

PEAK OUTFLOW IS 4. AT TIME 9.92 HOURS

PEAK FLOW	TIME
+ (CFS)	(HR)
+ 4.	9.58

	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	20.75-HR
(CFS)	4.	3.	3.	3.
(INCHES)	.106	.259	.259	.259
(AC-FT)	2.	4.	4.	4.

PEAK STORAGE	TIME
+ (AC-FT)	(HR)
5.	9.67

MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	20.75-HR
5.	3.	3.	3.

PEAK STAGE	TIME
+ (FEET)	(HR)
92.45	9.92

MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	20.75-HR
92.39	90.80	90.80	90.80

CUMULATIVE AREA = .31 SQ MI

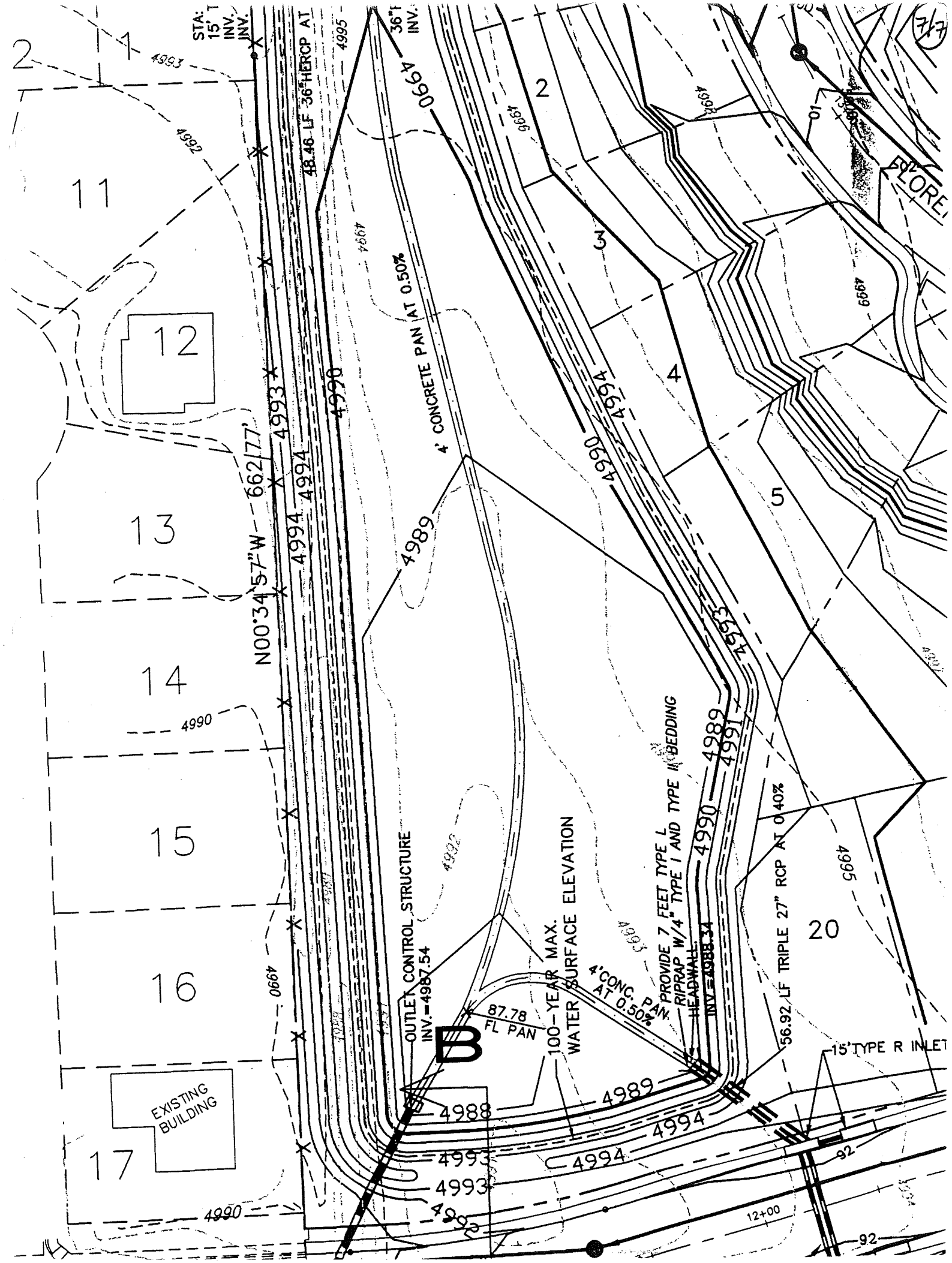
1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	100	89.	6.75	13.	5.	5.	.31		
+	ROUTED TO	100	4.	9.58	4.	3.	3.	.31	92.45	9.92

+
+ SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION 100
1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
PLAN 1			



STA: 15' T INV. INV.
36" INV.
48.46 LF 36" HERCP AT
4' CONCRETE PAN AT 0.50%
N00°34'57"W 662.77'
OUTLET CONTROL STRUCTURE INV.=4987.54
100-YEAR MAX. WATER SURFACE ELEVATION
87.78 FL PAN
4' CONC. PAN AT 0.50%
PROVIDE 7 FEET TYPE L RIPRAP W/4" TYPE I AND TYPE II BEDDING
HEADWALL INV.=4988.34
56.92 LF TRIPLE 27" RCP AT 0.40%
15' TYPE R INLET
EXISTING BUILDING
B
FLORE
12+00
1
2
3
4
5
11
12
13
14
15
16
17
20
4990
4994
4993
4989
4991
4988
4992
4995
4996
4999
92

1/6

Sub-basin 84
Part of detention
pond 484 analysis

FINAL DRAINAGE REPORT
COALRIDGE ESTATES
FREDERICK, COLORADO

Prepared For:

Aksel Property
4620 Weld County Road No.5
Erie, Colorado

Prepared By:

Hurst & Associates, Inc.
3055 47th St., Suite A-2
Boulder, Colorado 80301

Job No. 2184-03
March 17, 1997
Revised June 8, 1998

DETENTION POND DESIGN

The proposed detention pond facilities have been designed to provide detention for this development in accordance with the Tri-Area Drainage District Criteria. Due to existing site topography, runoff from rear yards lying adjacent to the existing drainage channels along the north and west property lines will not be intercepted by onsite facilities for conveyance to the detention ponds (basins B15 and B16). These drainage channels are to remain in their existing conditions with minor regrading in the channel adjacent to McClure Street (refer to Master Drainage Plan in back pocket). Consistent with historic patterns, both drainage channels are conveyed around Detention Pond "B" to the existing grated inlet located in the northwest corner of the project. Detention Pond B has been oversized to account for undetained sub-basins B15 and B16, as well as the Water Quality Capture Volume as described in Urban Drainage guidelines.

Per agreement with the Tri-Area Drainage District, the peak site discharge for the 100 year storm event has been limited to 15 cfs. Please refer to Appendix E for detention pond design computations, along with the storage-discharge relationships.

APPENDIX E

DETENTION POND DESIGN & S.W.M.M. MODELING

Summary of S.W.M.M. Analysis
Coalridge Estates Pond Results
Job No. 2184-03

08-Jun-98

Pond ID	Element Number	Pond Volumes (Ac-Ft)			Peak Pond Discharges (cfs)		
		2 Year	* 100 Year	** 100 Year	2 Year	* 100 Year	** 100 Year
A	231	0.1	1.78	2.4	0.1	0.2	57.0
B	232	0.9	4.47	5.7	0.2	13.7	222.0

The Onsite Detention Pond Facilities are designed to detain the 100 year flood control volume plus the water quality capture volume for developed Coalridge Estates. A spillway will be constructed at the 100 year pond design high water elevation so that offsite basin flows are conveyed along historic drainage paths without detention.

** A S.W.M.M. routing was performed with the historic basins bypassing the detention ponds to determine the required 100 year flood control volume for developed Coalridge Estates. These 100 year tabulated volumes include the water quality capture volumes.*

*** The historic flows were then routed through the detention ponds to model actual conditions which may occur until the property to the east and south develops.*

Coalridge Estates
Pond A Storage-Discharge Relationship
S.W.M.M. Element No. 231

08-Jun-98

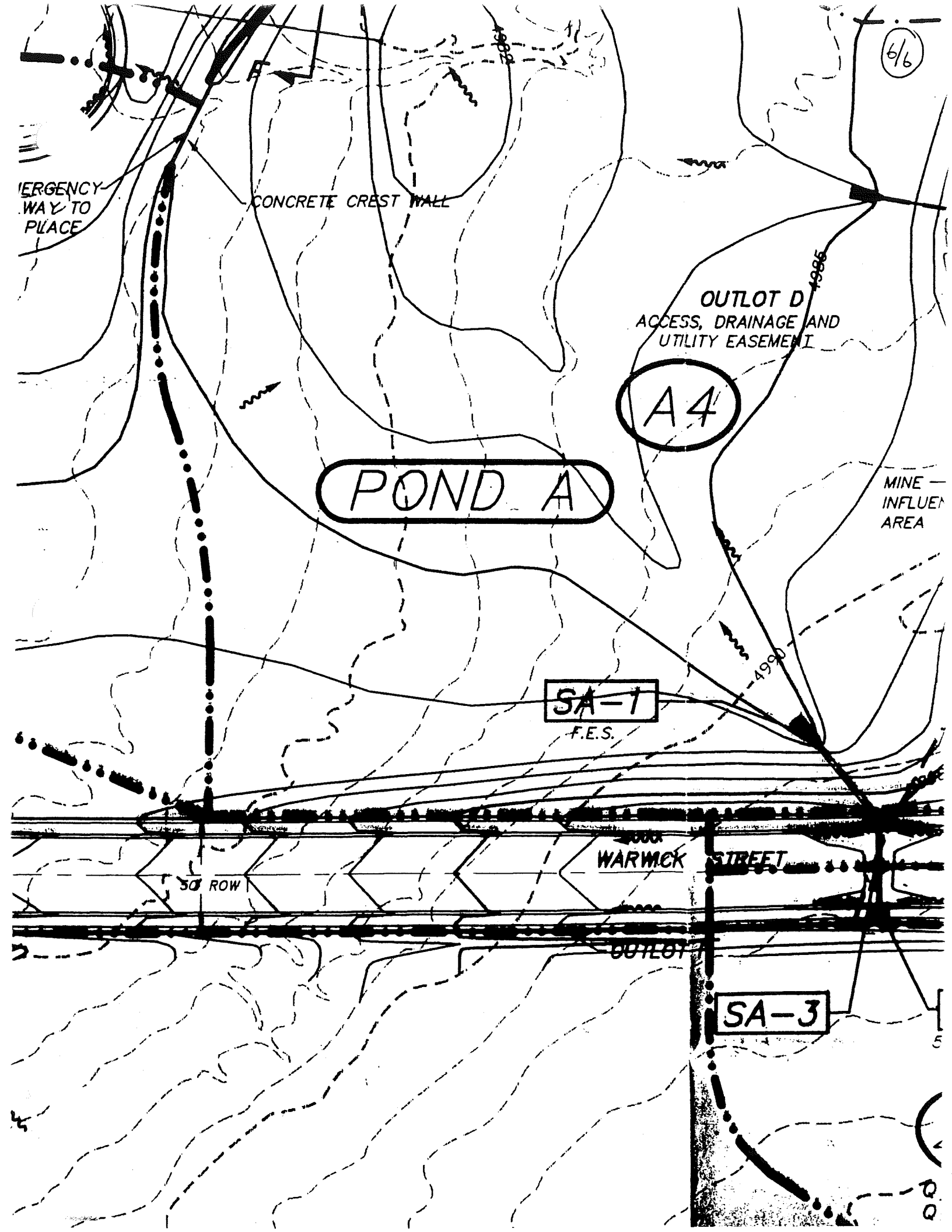
Job 2184-03

Stage (ft)	Surface Area (ac)	Cummulative Volume (ac-ft)	Orifice Outflow (cfs)	Weir Spillway Outflow (cfs)	Total Pond Discharge (cfs)
4981.00	0.00	0.00	0.00	0.00	0.00
4982.00	0.10	0.05	0.10	0.00	0.10
4982.20	0.16	0.08	0.11	0.00	0.11
4982.40	0.23	0.12	0.12	0.00	0.12
4982.60	0.29	0.17	0.13	0.00	0.13
4983.00	0.41	0.31	0.15	0.00	0.15
4983.20	0.52	0.40	0.15	0.00	0.15
4983.40	0.63	0.51	0.16	0.00	0.16
4983.60	0.74	0.65	0.17	0.00	0.17
4983.80	0.85	0.81	0.17	0.00	0.17
4984.00	0.96	0.99	0.18	0.00	0.18
4984.20	1.10	1.20	0.19	0.00	0.19
4984.40	1.24	1.43	0.19	0.00	0.19
4984.60	1.38	1.69	0.20	0.00	0.20
4984.66	1.42	1.78	0.20	0.00	0.20
4984.80	1.52	1.98	0.20	9.17	9.37
4985.00	1.66	2.30	0.21	47.65	47.86
4985.20	1.83	2.65	0.21	102.53	102.74
4985.40	2.00	3.03	0.22	169.84	170.06
4985.60	2.16	3.45	0.22	247.61	247.83
4985.80	2.33	3.90	0.23	334.57	334.80
4986.00	2.50	4.38	0.23	429.85	430.08

Orifice Equation..... $Q=CA\ (2gh)^{0.5}$
Orifice Diameter (in.)..... *2*
Discharge Coefficient..... *0.6*
Orifice Invert Elevation..... *4981.00*

Weir Equation..... *Q=2.9 LH 3/2*
Weir Length..... *100.0*
Weir Coefficient..... *2.9*
Weir Elevation..... *4984.7*
Top of Freeboard Elevation..... *4985.7*

2 Year Design High Water Elevation = 4982.3; Volume = .1 Ac-Ft; Actual Release Q = 0.1 cfs
100 Year Design High Water Elevation = 4984.66; Volume = 1.78 Ac-Ft; Actual Release Q = 0.2 cf


6/6
ERGENCY
WAY TO
PLACE
CONCRETE CREST WALL
OUTLOT D
ACCESS, DRAINAGE AND
UTILITY EASEMENT
A4
POND A
MINE
INFLUE
AREA
4990
SA-1
F.E.S.
WARWICK STREET
50' ROW
OUTLOT
SA-3

1/6

Sub-basin 88
Part of detention
pond 488 analysis

Neil
6-5-96
@

FINAL DRAINAGE REPORT
MAPLEWOOD III SUBDIVISION
Frederick, Colorado

Prepared by: Swift and Associates
421 21st Avenue
Longmont, Co.
80501
(303) 772-7052

April 17, 1996

DRAINAGE NARRATIVE

I. GENERAL LOCATION AND DESCRIPTION

The proposed Maplewood III Subdivision (herafter referred to as the site) is located within the Northeast 1/4, Section 31, Township 2 North, Range 67 West of the 6th Principal Meridian, Town of Frederick, Weld County, Colorado. The site is situated south of Weld County Road 16, east of COunty Road 15 and west of Maplewood II Subdivision.

Maplewood III Subdivision has a potential total area of approximately 21 acres for a total of 103 residential lots. The current proposal includes 33 residential lots only.

The site is currently vacant farm land with a scrub cover (not being cultivated anymore). A drainage channel (hereafter referred to at "the cut-off ditch) traverses the property on the west side in a north to south direction. This drainage channel was designed to intercept runoff prior to reaching Maplewood II Subdivision. This runoff is conveyed south to Eight Street. No existing structures exist on-site. However, two oil wells exist in close proximity to the site; one to the west at park no. 2 (which will be utilized for storm water detention) and one to the southeast.

II. DRAINAGE BASINS AND SUB-BASINS

The site is comprised of mild slopes (less than 5 percent, greater than 2 percent). The site naturally drains east to west and slightly north to south. Off-site runoff associated with the site an area extending from the easterly limits of the site to Co. Rd 15. The cut-off ditch intercepts on-site and off-site runoff from the east and conveys it south. This cut-off ditch is to be filled for its entire run on-site. The cut-off ditch will continue to convey on-site runoff from the southerly portion of the site.

In order to determine the need for curb inlets and associated storm sewer an evaluation of street capacity was performed for key sections. The evaluation criteria for street capacity is based upon the ability of the 100-year flood discharge to be contained within the street. This study is based on a stand-alone approach. Future development must revise this plan and study to accomodate their individual needs. For critical sections evaluated all street flows were contained with the curb(s) and therefore were deemed acceptable. Therefore, no storm sewer inlets or associated storm sewer is proposed for this development (refer to "on-site drainage divides" exhibit and related calculations in the appendix_

III. STORM WATER DETENTION-OVERVIEW

The Maplewood III Subdivision is part of a master planned community. The overall plan was developed by Mr. Jim Mountain for the Grant Brothers. This planned community is divided into single family residential, modular homes, commercial and industrial uses. The entire community has been planned with a regional storm water detention pond system. The site naturally outfalls to two of the planned regional ponds situated at parks no. 2 & 5.

On-site runoff will be conveyed in grass swales between the proposed residential units and via curb and gutter and pans along the roadways. The primary storm water detention pond is located east of the site (an outlot owned by the Grant Brothers) in an area off approximatley 1.8 acres which surrounds an existing oil well. Approximatley 2 acre-feet of total storage volume will be provided for detention at park pond #2.

The area draining to the park no.2 detention pond includes 11.35 acres of the site. Additional off-site area to the east of the site will also drain to this detention pond. Areas of 5.14 and 13.63 acres, contributing to the pond and direct flow to the west (see Basin Delineation map) have been identified as the contributing off-site flow areas. The 5.14 acre area at the north portion of the site is to be released undetained. This is due to topographic as well as existing development constraints which do not allow for this area to be "captured" and conveyed to the park pond no.2. In addition there is an area of the south/southeast portion of the site, approximatley 7.8 acres in size, which will be detained in the Park No. 5 regional storm water detention pond. Park No. 5 is the natural outfall for this portion of the site. (refer to the appendix for a drainage area map). Development of the Park No.5 detention pond is not proposed at this time.

IV. SITE SPECIFIC STORM WATER MANAGEMENT

The Maplewood III Subdivision construction will involve the construction of a regional pond in the area surrounding the well head at the westerly portion of the site(park no. 2). This detention pond will eventually control a developed area of approximatley twenty eight acres. Park No. 5, the site of the other regional detention pond associated with the site, is to be constructed at the time of further build-out in the drainage shed. Justification for not constructing the Park No. 5 detention pond with this development is as follows:

Existing conditions drainage patterns show that the area west of Weld County Road 15 flows to the "cut off" ditch which is located just south of Weld County Road 16 and flows south to Eight street (and then west to Main Street). The park no. 2 detention pond outfalls south to fifth street, thus relieving the "cut off" ditch of 46 and 67 CFS (proposed and ultimate pre-developed peak runoff) It is calculated that the 7.8 acres of Maplewood 3rd filing will generate an additional peak runoff of 16.7 CFS during the hundred year event (post-pre=30.1-13.4 = 16.7 CFS, where post= 8.2 in/hr,

c=.55 and pre=6.1 in/hr, c=.30). Therefore, development of the site will reduce the peak runoff rate to the "cut off" ditch without construction of the detention pond at Park No.5

V. FLOODPLAIN

There is no designated a 100-year floodplain which impacts this property

VI. FINAL FINDINGS AND RECOMMENDATIONS

The Maplewood III subdivision is part of the master planned Maplewood Villages community. The Maplewood III development willinclude the construction of one of the planned regional storm water detention facilities (park no. 2 pond). The other detention pond related to this development, park no. 5 pond, will be constructed at a later date as it has been determined that this development will reduce the post development discharge to the main outfall, the cut-off ditch to 8th street. Curb inlets and any associated storm sewer is not required for this development since the 100-year runoff will be contained with the street right of way in all cases.

MAPLEWOOD ===== ==========
OUTLET SIZING POND 1
==========

Invert	2.7
Hw 100	4.6

----------CULVERT----------

100 yr orifice sizing ing

			feet	inches	
Qmax =	1.51	r	0.268	3.216	<---- = I
1/2 Q =	0.755	h	1.632	19.584	
		Diam	0.536	6.432	
		Hw	1.9	22.8	<----
		C	0.65		<----
		A	0.225642		
		Q/C	2.313255		
		Q =	1.50		

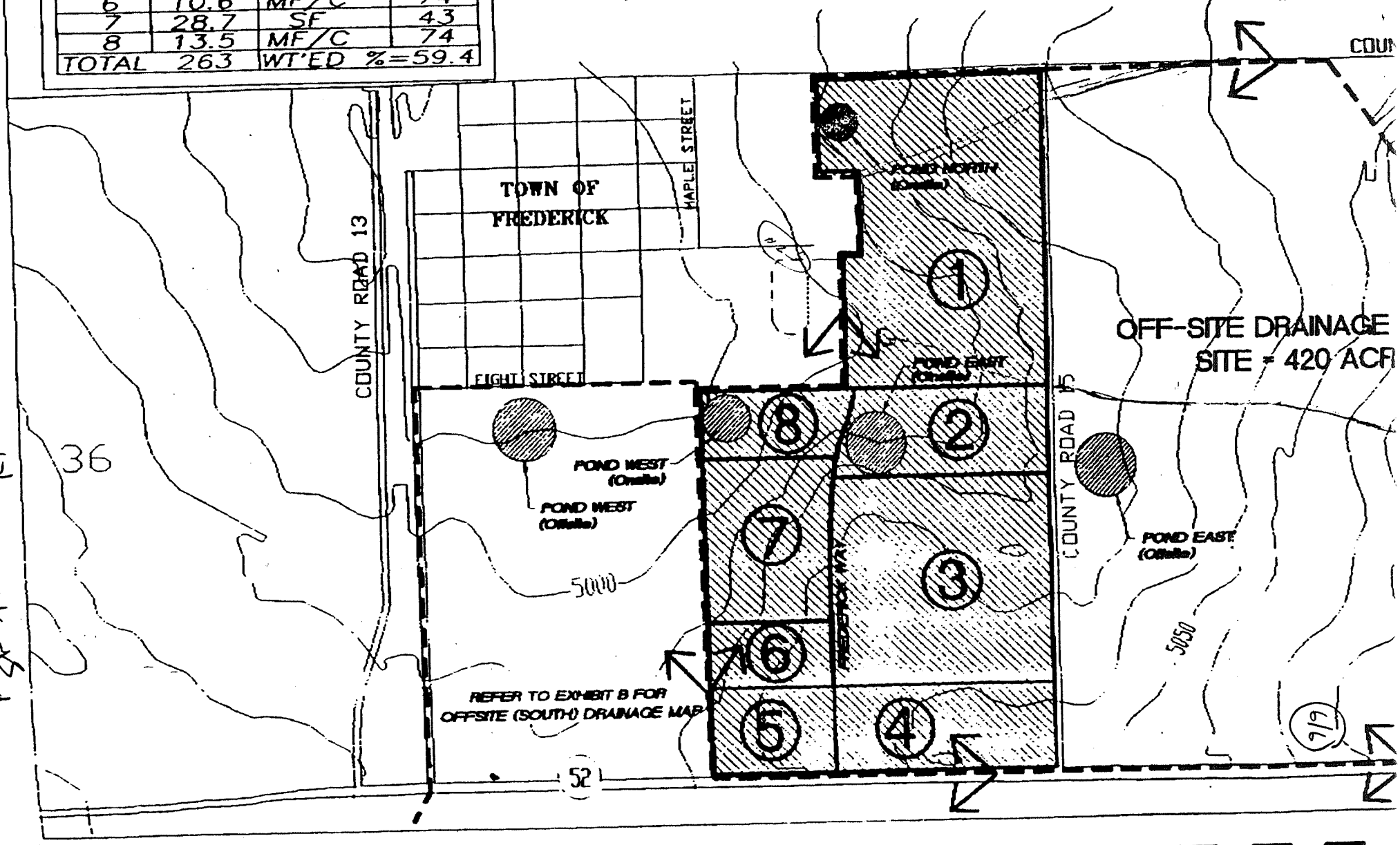
DRAINAGE AREA MAP

SC : 1" = 1000' ; CONTOUR INTERVAL 1

LA USE/AREA/IMPERVIOUSNESS			
AREA #	ACERAGE	PROP. USE	% IMP.
1	84.1	SF	46
2	26.5	MF/C	75
3	60.5	SFM	50
4	25.4	C	95
5	13.8	C	95
6	10.6	MF/C	74
7	28.7	SF	43
8	13.5	MF/C	74
TOTAL	263	WT'ED	%=59.4

LEGEND:
SF – SINGLE FAMILY RESIDENTIAL (5 U/AC)
MF – MULTI-FAMILY (APT.'S)
SFM – SINGLE FAMILY/MANUFACTORED HOME
C – COMMERCIAL

NOTE: LAND USES FROM CONCEPTUAL COMMUNITY MASTER PLAN, MAPLEWOOD VILLAGES DATED 9-24-95.



1/6

Sub-basin 90
Part of detention
pond 490 analysis

ANGEL VIEW ESTATES SUBDIVISION

PRELIMINARY

DRAINAGE STUDY

September 2, 1998

Prepared by:

QCI Development Services Group, Inc.
11184 Huron Street, Suite 13
Denver, Colorado 80234
(303) 280-9200

Prepared for:

Eagle Mountain LLC
c/o Mr. Greg Hepp
P.O. Box 179
Frederick, Colorado 80530

final grading plan and, subsequently, allow for sizing of the cross culverts.

Sub-basin runoff will be conveyed via overland/roadway conveyance, channelization and roadway cross culverts. Storm sewer and roadway conveyance will be in a north-south direction to the proposed detention pond area. Temporary conveyance channels will be constructed from the platted residential area to the detention pond located to the south (these channels will be removed once the area to the south is developed with roadways).

There exists an off-site drainage area to the east which has some impact the on the site. This drainage area flows predominantly toward Road 15 and converges at a low point at the quarter section line (and Road 15). Based upon field inspection it does not appear that any functional drainage culverts exist at Road 15.

III. STORMWATER DETENTION

The stormwater detention for the Site will be accomplished by a detention pond to be located to the south of the platted residential portion of the parcel in an area of approximately eight and one-half acres. The pond is specified with four to one side slopes and a minimum two percent bottom slope with a 3' wide concrete trickle ditch at 0.5 percent minimum slope for low flows. The pond site connects to temporary drainage channels, which will link the platted residential area with the pond. For ultimate planning purposes the ultimate proposed discharge associated with an one hundred and sixty-acre area (the NW ¼ of Section 7) was evaluated with respect to the detention pond volume. The design criterion associated with the detention pond sizing is to detain the 100-year post development peak discharge to the 2-year pre-development peak discharge.

The pre-development peak discharge for the watershed associated with the peak detention pond release was determined by applying the rational formula with a resulting peak of 108 cfs (refer to appendix). Times of concentration for the basin, both pre- and post were obtained via TR-55 (refer to appendix).

In order to "route" the detention pond a hydrograph was produced using the Soil Conservation Service Technical Release 20. The peak discharge to the pond was determined by applying the rational formula with the associated developed and undeveloped runoff coefficients (mannings "c" values) and the associated time of concentration and drainage area. Time of concentration of the contributing basin was 28 minutes (or .47 hours, with a resulting rainfall intensity of 4.8 in./hr), a weighted c of 0.54, area of 200 acres and a resulting peak discharge of approximately 486 cfs. With the rational formula peak discharge the TR-20 model was then "calibrated" by varying the runoff curve number to produce a hydrograph with a corresponding peak (480-cfs). This hydrograph was used in the HEC-1 evaluation.

SEE COMMENT IN LETT

The Army Corp of Engineers HEC-1 program was utilized for the routing of the

detention pond. HEC-1 provides for simultaneous analysis of storage-stage-volume-outflow comparisons. Preliminary results indicate that a dual-30 inch RCP culvert is to be utilized for the outlet control from the pond.

The results of the HEC-1 analysis indicates that the detention pond will provide for approximately 18 acre-feet of storage at elevation 5027.2 with a corresponding peak release rate of approximately 115 cfs for the 100-year storm without spillway flow (rational formula results indicate an allowable release rate of 108 cfs, see appendix for calculations). While this is based upon the fully developed, ultimate watershed (N ¼ of section 7), the detention pond is to be built in its entirety with this filing and will function to provide the required detention as the basin develops. This statement can be made due to the "over detention" required by the Weld County Tri-Area Sanitation District (WCTASD).

Outflow from the detention pond is to a natural swale to the west of Road 15 and, eventually, to the Tri-area drainage way along Eighth street. Since the release rate from the site is to be significantly less than historical no further study of the conveyance capacity of the downstream channel was made.

BUT, THIS IS A POINT DISCHARGE INSTEAD OF A NON-POINT DISCHARGE. PLEASE ANALYZE THE IMPACTS.

IV. FLOODPLAIN

There is no designated 100-year floodplain, which impacts this property according to the Federal Emergency Management Agency's flood insurance rate map.

V. CONCLUSIONS AND RECOMMENDATIONS

Due to the relatively mild, uniform slopes across the site, the central (southerly) point of outfall and relatively slight offsite drainage impacts this site possesses good characteristics with respect to drainage design for the proposed residential use. The street layout, situated in a predominantly south-north orientation utilizing open drainage conveyance, will provide for the conveyance of stormwater runoff which will follow pre-development drainage patterns. Street conveyance, swales, roadway cross culverts and temporary drainage channels will be used to convey the storm runoff to the regional detention pond. WCTASD criteria, which specifies "over detention" will significantly reduce the peak discharge and therefore provide some relief to the property to the west (Grant Property) and associated westerly outfall, including the Tri-area Drainageway. The 100-floodplain (zone c) does not prohibit or limit development on the site.

ELEVATION	20.00	21.25	22.00	22.96	23.00	23.23	23.56	23.99	24.00	24.54
STORAGE	9.27	10.35	13.00	14.23	16.86	20.11	20.15	20.24	20.30	20.38
OUTFLOW	91.51	94.98	102.99	106.40	113.31	120.94	121.15	121.79	122.34	123.09
ELEVATION	25.00	25.29	26.00	26.32	27.00	27.80	27.81	27.83	27.85	27.87
STORAGE	20.46	20.56	20.67	20.79	20.92					
OUTFLOW	124.07	125.30	126.82	128.65	130.82					
ELEVATION	27.89	27.91	27.94	27.97	28.00					

****

HYDROGRAPH AT STATION 100

PEAK

****

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	20.0	1		0215	28	113.	16.9	27.0	1		0430	55	88.	8.4	24.7
1		0005	2	0.	.1	20.2	1		0220	29	114.	17.3	27.1	1		0435	56	87.	7.9	24.6
1		0010	3	0.	.1	20.4	1		0225	30	115.	17.5	27.2	1		0440	57	85.	7.5	24.5
1		0015	4	0.	.2	20.6	1		0230	31	115.	17.5	27.2	1		0445	58	84.	7.0	24.4
1		0020	5	0.	.3	20.8	1		0235	32	115.	17.5	27.1	1		0450	59	82.	6.6	24.3
1		0025	6	0.	.4	21.0	1		0240	33	114.	17.3	27.1	1		0455	60	80.	6.2	24.1
1		0030	7	6.	.5	21.3	1		0245	34	114.	17.1	27.1	1		0500	61	79.	5.8	24.0
1		0035	8	17.	.5	21.4	1		0250	35	113.	16.8	27.0	1		0505	62	77.	5.4	23.9
1		0040	9	18.	.5	21.4	1		0255	36	112.	16.5	26.9	1		0510	63	75.	5.0	23.8
1		0045	10	20.	.6	21.4	1		0300	37	112.	16.2	26.8	1		0515	64	73.	4.6	23.6
1		0050	11	22.	.6	21.5	1		0305	38	111.	15.8	26.7	1		0520	65	71.	4.3	23.5
1		0055	12	24.	.6	21.5	1		0310	39	110.	15.5	26.6	1		0525	66	70.	3.9	23.4
1		0100	13	26.	.6	21.5	1		0315	40	109.	15.1	26.5	1		0530	67	68.	3.6	23.3
1		0105	14	28.	.6	21.6	1		0320	41	108.	14.6	26.4	1		0535	68	66.	3.3	23.2
1		0110	15	30.	.6	21.7	1		0325	42	106.	14.2	26.3	1		0540	69	64.	3.0	23.1
1		0115	16	34.	.7	21.8	1		0330	43	105.	13.8	26.2	1		0545	70	62.	2.7	23.0
1		0120	17	41.	.8	22.0	1		0335	44	104.	13.4	26.1	1		0550	71	60.	2.4	22.8
1		0125	18	45.	1.0	22.1	1		0340	45	103.	12.9	26.0	1		0555	72	57.	2.1	22.7
1		0130	19	51.	1.5	22.4	1		0345	46	101.	12.5	25.9	1		0600	73	54.	1.9	22.6
1		0135	20	60.	2.4	22.9	1		0350	47	100.	12.0	25.7	1		0605	74	51.	1.6	22.4
1		0140	21	69.	3.9	23.4	1		0355	48	99.	11.6	25.6	1		0610	75	49.	1.4	22.3
1		0145	22	79.	6.0	24.1	1		0400	49	97.	11.2	25.5	1		0615	76	46.	1.2	22.2
1		0150	23	89.	8.5	24.8	1		0405	50	96.	10.7	25.4	1		0620	77	44.	1.0	22.1
1		0155	24	97.	11.1	25.5	1		0410	51	95.	10.2	25.3	1		0625	78	41.	.8	22.0
1		0200	25	104.	13.4	26.1	1		0415	52	93.	9.8	25.1	1		0630	79	33.	.7	21.7
1		0205	26	109.	15.0	26.5	1		0420	53	92.	9.3	25.0	1		0635	80	25.	.6	21.5
1		0210	27	112.	16.2	26.8	1		0425	54	90.	8.8	24.9							

****

PEAK OUTFLOW IS 115. AT TIME 2.50 HOURS

PEAK FLOW + (CFS)	TIME (HR)
+ 115.	2.50

MAXIMUM AVERAGE FLOW

	6-HR	24-HR	72-HR	6.58-HR
(CFS)	77.	71.	71.	71.
(INCHES)	2.302	2.308	2.308	2.308
(AC-FT)	38.	39.	39.	39.

PEAK STORAGE + (AC-FT)	TIME (HR)
18.	2.50

MAXIMUM AVERAGE STORAGE

6-HR	24-HR	72-HR	6.58-HR
8.	7.	7.	7.

PEAK STAGE + (FEET)	TIME (HR)
27.17	2.50

MAXIMUM AVERAGE STAGE

6-HR	24-HR	72-HR	6.58-HR
24.34	24.02	24.02	24.02

CUMULATIVE AREA = .31 SQ MI

1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

+	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	100	486.	1.83	78.	72.	72.	.31		
+	ROUTED TO	100	115.	2.50	77.	71.	71.	.31	27.17	2.50
+										

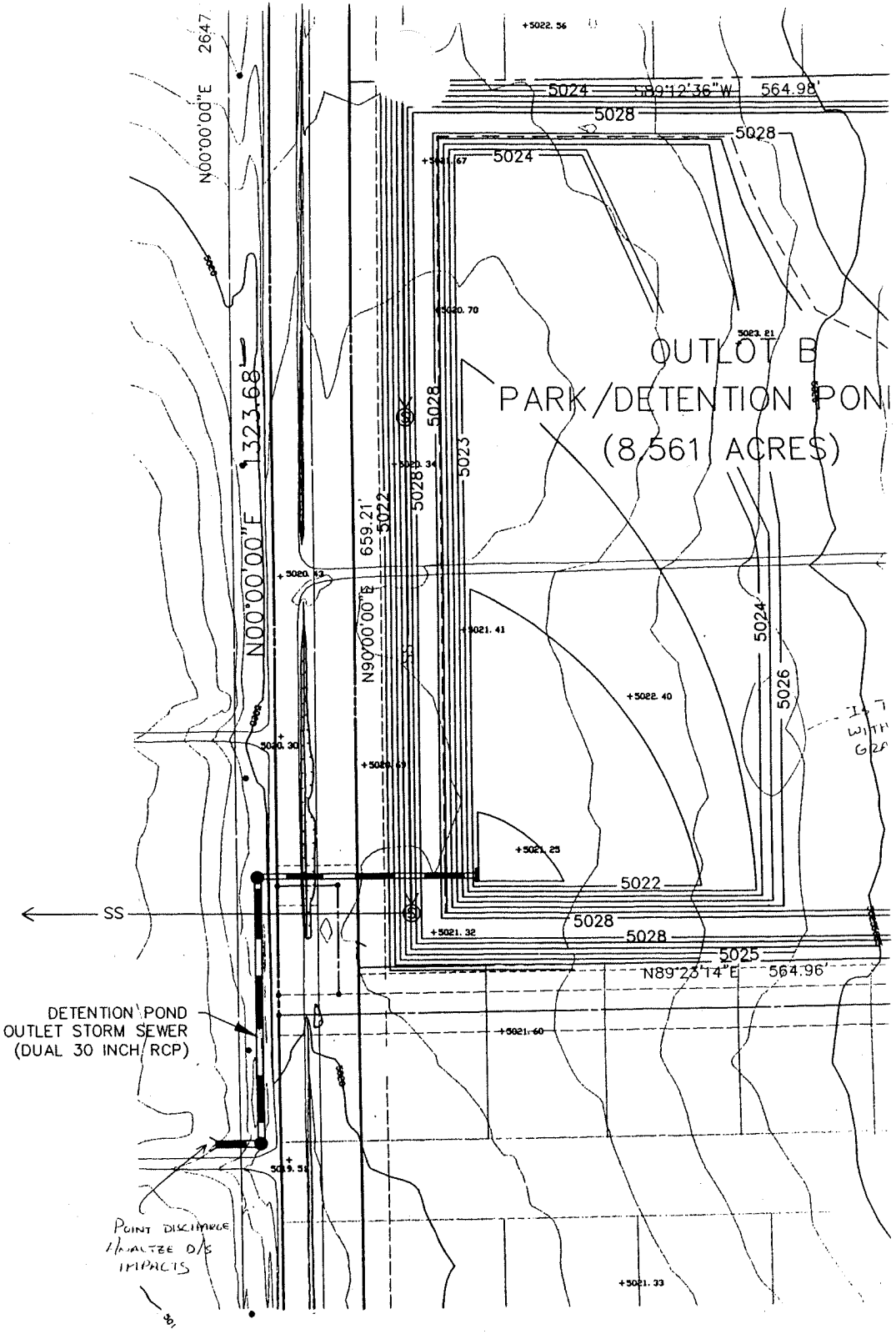
1

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION 100

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	20.00	27.80	28.00
STORAGE	0.	20.	21.
OUTFLOW	0.	121.	131.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	27.17	.00	18.	115.	.00	2.50	.00


N00°00'00"E 2647
N00°00'00"E 1323.68
N90°00'00"E 659.21'
S89°12'36"W 564.98'
N89°23'14"E 564.96'
OUTLOT B
PARK/DETENTION POND
(8.561 ACRES)
5024
5028
5023
5022
5026
5025
SS
DETENTION POND
OUTLET STORM SEWER
(DUAL 30 INCH RCP)
POINT DISCHARGE
ANALYZE D/S
IMPACTS

PARK ENGINEERING CONSULTANTS

'17

Sub-basin 96
Part of detention
pond 496 analysis

Final Drainage Report
Meadowlark Business Park, Filing No. 2
Town of Frederick, Colorado

Prepared for:

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Park Engineering Consultants
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Longmont, Colorado 80501
(303) 651-6626

March 18, 1998
Revised September 8, 1998

PEC Job#21010012.doc

Basin E9 contains 11.31 acres and presently drains north to the offsite irrigation ditch. Initially this portion of the site will remain undeveloped. It will however be developed at a later date during which time the retention pond design will be determined for site specific information. When developed, it will drain north to be collected and retained in a retention pond as shown on the plan. It will eventually contribute a developed Q_{10} and Q_{100} of approximately 36 cfs and 60 cfs, respectively.

Basin O10 includes 1.14 undeveloped acres which presently discharges to the west. When developed, it will contribute a developed Q_{10} and Q_{100} of approximately 4 cfs and 7 cfs, respectively. These flows will be redirected to the previously discussed retention pond in Basin E9.

Detention Ponds

There are two proposed detention ponds on the site. The South Pond will have a maximum release rate of 3.5 cfs and the North Pond will have a maximum release rate of 1.2 cfs. Flows from the north portion of the site will generally flow toward the North Pond while flows from the south portion of the site will flow into the South Pond.

Outflow will be controlled by concrete release structures. Each will have an orifice to discharge small flows, along with a triangular notch weir to release the larger flows. The boxes will be constructed with an open top which is at 1 foot below the rim elevation of the pond. This will reduce the risk of large flows overtopping the banks of the ponds and causing damage to the embankments.

Discharge from each outlet structure will be carried to the roadside swale via 18" rcp.

Hydrograph Summary Report (100-YEAR)

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
	Reservoir	3.5	1	65	2.82	100	31	4958.77	6.44	SOUTH POND
33	Rational	1.6	1	42	0.12	100	—	—	—	OS1
34	Combine	4.6	1	61	2.94	100	32 + 33	—	—	DP3
35	Reach	4.5	1	72	2.93	100	34	—	—	RS DITCH TO NP
36	Rational	0.3	1	44	0.03	100	—	—	—	OS2
37	Combine	4.7	1	71	2.96	100	35 + 36	—	—	DITCH TOTAL
38	Combine	5.9	1	70	4.49	100	20 + 37	—	—	DP9

file: 2101D2.GPW | IDF file: ZONE1.IDF | Run date: 08-31-1998

Reservoir Report

Reservoir No. 3

SOUTH POND

Culvert / Orifice Structures

		[A]	[B]	[C]
Rise (in)	=	4.0	0.0	0.0
Span (in)	=	4.0	0.0	0.0
No. Barrels	=	1	0	0
Invert El. (ft)	=	4952.70	0.00	0.00
Length (ft)	=	0.0	0.0	0.0
Slope (%)	=	0.00	0.00	0.00
N-Value	=	.013	.013	.013
Orif. Coeff.	=	0.60	0.60	0.60
Multi-Stage	=	——	No	No

Weir Structures

		[A]	[B]	[C]
Crest Len (ft)	=	1.0	0.0	0.0
Crest El. (ft)	=	4957.10	0.00	0.00
Weir Coeff.	=	0.67	3.00	3.00
Eqn. Exp.	=	2.50	1.50	1.50
Multi-Stage	=	No	No	No

Tailwater Elevation = 0.00 ft

Note: All outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

Stage (ft)	Storage (acft)	Elevation (ft)	Culv. A (cfs)	Culv. B (cfs)	Culv. C (cfs)	Weir A (cfs)	Weir B (cfs)	Weir C (cfs)	Discharge (cfs)
0.0	0.000	4952.00	0.00	—	—	0.00	—	—	0.00
0.1	0.002	4952.10	0.00	—	—	0.00	—	—	0.00
0.2	0.004	4952.20	0.00	—	—	0.00	—	—	0.00
0.3	0.006	4952.30	0.00	—	—	0.00	—	—	0.00
0.4	0.008	4952.40	0.00	—	—	0.00	—	—	0.00
0.5	0.010	4952.50	0.00	—	—	0.00	—	—	0.00
0.6	0.012	4952.60	0.00	—	—	0.00	—	—	0.00
0.7	0.014	4952.70	0.00	—	—	0.00	—	—	0.00
0.8	0.016	4952.80	0.02	—	—	0.00	—	—	0.02
0.9	0.018	4952.90	0.09	—	—	0.00	—	—	0.09
1.0	0.020	4953.00	0.15	—	—	0.00	—	—	0.15
1.1	0.037	4953.10	0.20	—	—	0.00	—	—	0.20
1.2	0.054	4953.20	0.23	—	—	0.00	—	—	0.23
1.3	0.071	4953.30	0.28	—	—	0.00	—	—	0.28
1.4	0.088	4953.40	0.31	—	—	0.00	—	—	0.31
1.5	0.105	4953.50	0.33	—	—	0.00	—	—	0.33
1.6	0.122	4953.60	0.36	—	—	0.00	—	—	0.36
1.7	0.139	4953.70	0.38	—	—	0.00	—	—	0.38
1.8	0.156	4953.80	0.41	—	—	0.00	—	—	0.41
1.9	0.173	4953.90	0.43	—	—	0.00	—	—	0.43
2.0	0.190	4954.00	0.45	—	—	0.00	—	—	0.45
2.1	0.250	4954.10	0.47	—	—	0.00	—	—	0.47
2.2	0.310	4954.20	0.49	—	—	0.00	—	—	0.49
2.3	0.370	4954.30	0.50	—	—	0.00	—	—	0.50

Continues on next page...

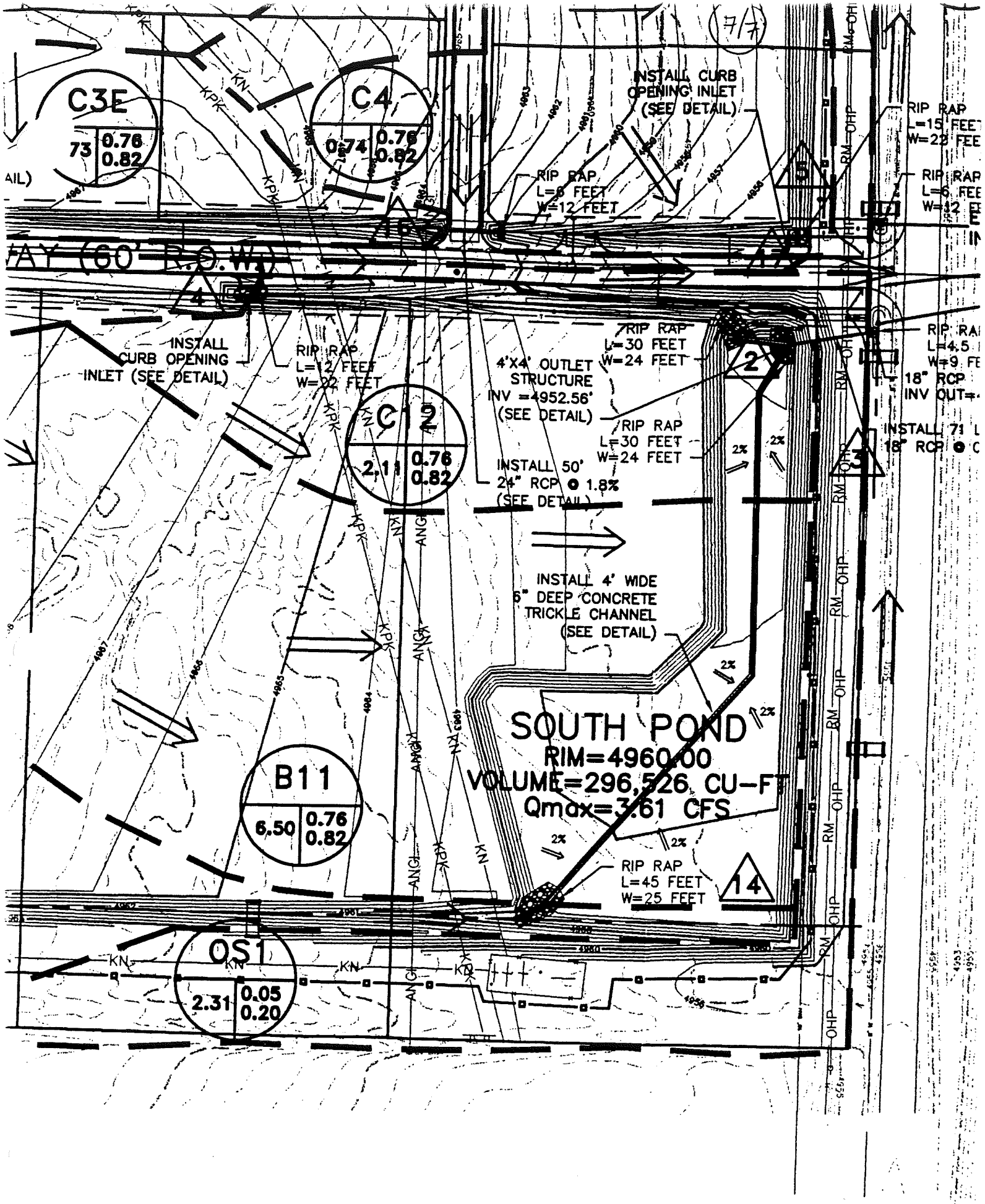
Stage / Storage / Discharge Table

Stage (ft)	Storage (acft)	Elevation (ft)	Culv. A (cfs)	Culv. B (cfs)	Culv. C (cfs)	Weir A (cfs)	Weir B (cfs)	Weir C (cfs)	Discharge (cfs)
2.4	0.430	4954.40	0.52	—	—	0.00	—	—	0.52
2.5	0.490	4954.50	0.54	—	—	0.00	—	—	0.54
2.6	0.550	4954.60	0.55	—	—	0.00	—	—	0.55
2.7	0.610	4954.70	0.57	—	—	0.00	—	—	0.57
2.8	0.670	4954.80	0.58	—	—	0.00	—	—	0.58
2.9	0.730	4954.90	0.60	—	—	0.00	—	—	0.60
3.0	0.790	4955.00	0.61	—	—	0.00	—	—	0.61
3.1	0.908	4955.10	0.63	—	—	0.00	—	—	0.63
3.2	1.026	4955.20	0.64	—	—	0.00	—	—	0.64
3.3	1.144	4955.30	0.66	—	—	0.00	—	—	0.66
3.4	1.262	4955.40	0.67	—	—	0.00	—	—	0.67
3.5	1.380	4955.50	0.68	—	—	0.00	—	—	0.68
3.6	1.498	4955.60	0.69	—	—	0.00	—	—	0.69
3.7	1.616	4955.70	0.71	—	—	0.00	—	—	0.71
3.8	1.734	4955.80	0.72	—	—	0.00	—	—	0.72
3.9	1.852	4955.90	0.73	—	—	0.00	—	—	0.73
4.0	1.970	4956.00	0.74	—	—	0.00	—	—	0.74
4.1	2.121	4956.10	0.76	—	—	0.00	—	—	0.76
4.2	2.272	4956.20	0.77	—	—	0.00	—	—	0.77
4.3	2.423	4956.30	0.78	—	—	0.00	—	—	0.78
4.4	2.574	4956.40	0.79	—	—	0.00	—	—	0.79
4.5	2.725	4956.50	0.80	—	—	0.00	—	—	0.80
4.6	2.876	4956.60	0.81	—	—	0.00	—	—	0.81
4.7	3.027	4956.70	0.82	—	—	0.00	—	—	0.82
4.8	3.178	4956.80	0.83	—	—	0.00	—	—	0.83
4.9	3.329	4956.90	0.84	—	—	0.00	—	—	0.84
5.0	3.480	4957.00	0.85	—	—	0.00	—	—	0.85
5.1	3.642	4957.10	0.86	—	—	0.00	—	—	0.86
5.2	3.804	4957.20	0.87	—	—	0.00	—	—	0.88
5.3	3.966	4957.30	0.88	—	—	0.01	—	—	0.90
5.4	4.128	4957.40	0.89	—	—	0.03	—	—	0.93
5.5	4.290	4957.50	0.90	—	—	0.07	—	—	0.97
5.6	4.452	4957.60	0.91	—	—	0.12	—	—	1.03
5.7	4.614	4957.70	0.92	—	—	0.19	—	—	1.11
5.8	4.776	4957.80	0.93	—	—	0.28	—	—	1.21
5.9	4.938	4957.90	0.94	—	—	0.38	—	—	1.33
6.0	5.100	4958.00	0.95	—	—	0.51	—	—	1.47
6.1	5.273	4958.10	0.96	—	—	0.67	—	—	1.63
6.2	5.446	4958.20	0.97	—	—	0.85	—	—	1.82
6.3	5.619	4958.30	0.98	—	—	1.06	—	—	2.04
6.4	5.792	4958.40	0.99	—	—	1.29	—	—	2.28
6.5	5.965	4958.50	1.00	—	—	1.55	—	—	2.55
6.6	6.138	4958.60	1.01	—	—	1.85	—	—	2.85
6.7	6.311	4958.70	1.01	—	—	2.17	—	—	3.19
6.8	6.484	4958.80	1.02	—	—	2.53	—	—	3.55
6.9	6.657	4958.90	1.03	—	—	2.92	—	—	3.95
7.0	6.830	4959.00	1.04	—	—	3.33	—	—	4.37
7.1	7.016	4959.10	1.05	—	—	3.79	—	—	4.84
7.2	7.202	4959.20	1.06	—	—	4.28	—	—	5.34

Continues on next page...

Stage / Storage / Discharge Table

Stage (ft)	Storage (acft)	Elevation (ft)	Culv. A (cfs)	Culv. B (cfs)	Culv. C (cfs)	Weir A (cfs)	Weir B (cfs)	Weir C (cfs)	Discharge (cfs)
7.3	7.388	4959.30	1.07	—	—	4.81	—	—	5.88
7.4	7.574	4959.40	1.07	—	—	5.38	—	—	6.45
7.5	7.760	4959.50	1.08	—	—	5.98	—	—	7.06
7.6	7.946	4959.60	1.09	—	—	6.62	—	—	7.71
7.7	8.132	4959.70	1.10	—	—	7.31	—	—	8.41
7.8	8.318	4959.80	1.11	—	—	8.03	—	—	9.14
7.9	8.504	4959.90	1.11	—	—	8.80	—	—	9.91
8.0	8.690	4960.00	1.12	—	—	9.59	—	—	10.72



LEGEND

	EXISTING	PROPOSED
DESIGNATION		

WELD COUNTY I-25 MDP (COWELD01)
Tri-Town Basin (Subbasins South of WCR18)

Procedures to determine allowable release rate for subbasins with the following characteristics.

Scenario 1
- **Basin Partially Urbanized**
- **No Detention Ponds**

Existing Condition: Use Existing Land Use → Obtain Q_{100} (allowable)

Future Condition: Use planned Land Use → Obtain Q_{100} (fully developed)

Detained Condition:

1. Run Q_2 with undeveloped land use (existing)
2. Determine allowable release

$$Q_{100}\text{ (allowable)} = Q_{100}\text{ (fully developed)} \times \frac{\%\text{ (fully developed w/o detention)}}{\text{Total Area}} + Q_2\text{ (existing)} \times \frac{\%\text{ (undeveloped)}}{\text{Total Area}}$$

3. Iterate volume to obtain Q_{100} (allowable)

Basins where this scenario applies: 56, 58, 59, 60, 61, 63, 76, 78, 80, 82, 83, 85, 86, 87, 89, 91, 92, 93, 94, 95

Weld County I-25 Master Drainage Plan
CO-WELD-01

Tri-Town Basin
Basins south of WCR 18 (20 total)
Determination of sub-basin release rates for 100 year, future condition flows with on-site detention
Scenario 1 (basins with no urbanization or partially urbanized, and no detention ponds)

Sub-basin	No. of developed acres	Acres of undeveloped area	Sub-basin area (ac)	2 Year Historic Q (cfs)	100 Year, Future Q (cfs)	100 Year, Allowable Q (cfs)	100 Year on-site storage (ac-ft)
56	14.2	13.1	27.3	1	74	39	1.8
58	7.6	9.7	17.3	1	49	22	1.3
59	7.2	12.2	19.4	1	48	18	1.8
60	51.1	2.6	53.7	2	141	134	0.8
61	0	250.8	250.8	13	478	13	35.5
63	6.2	281.8	288	15	915	34	45.0
76	49.2	0	49.2	2	136	136	*
78	36.4	0	36.4	1	100	100	*
80	34.5	7.6	42.1	1	113	93	1.2
82	7.2	81.5	88.7	2	213	19	12.0
83	32	16.4	48.4	1	129	86	2.4
85	4.6	11.5	16.1	1	51	15	1.7
86	19	38.4	57.4	2	119	41	5.2
87	67.1	7	74.1	2	183	166	1.5
89	21.4	190	211.4	10	686	78	29.1
91	187	38.6	225.6	12	763	635	6.9
92	9.1	107.9	117	6	263	26	14.3
93	23.3	22.5	45.8	1	112	57	3.6
94	5.8	32.9	38.7	1	99	16	5.3
95	0	374.3	374.3	18	1058	18	60.8
						Total:	230.2 ac-ft

* Sub-basin does not have any on-site detention due to complete build out in the existing conditions.

WELD COUNTY I-25 MDP (COWELD01)
Tri-Town Basin (Subbasins South of WCR18)

Procedures to determine allowable release rate for subbasins with the following characteristics.

Scenario 2
- **Basin Partially Developed**
- **Existing Detention Ponds (planned and approved)**

Existing Condition

1. Run Q_{100} (existing land use) w/o detention
2. Obtain Q_{100} release from detention ponds
3. Determine Q_{100} (allowable)

$$Q_{100}\text{ (allowable)} = Q_{100}\text{ (existing)} \times \frac{\%\text{ (undetained)}}{\text{Total Area}} + Q_{release}$$

4. Iterate volume to obtain Q_{100} (allowable)

Future Condition

1. Run Q_{100} (future land use) w/o detention
2. Determine Q_{100} (allowable)

$$Q_{100}\text{ (allowable)} = Q_{100}\text{ (future)} \times \frac{\%\text{ (undetained)}}{\text{Total Area}} + Q_{release}$$

3. Iterate volume to obtain Q_{100} (future)

Detained Condition

1. Run Q_2 over entire basin (existing land use)
2. Determine Q_{100} (allowable)

$$Q_{100}\text{ (allowable)} = Q_{100}\text{ (future)} \times \frac{\%\text{ (undetained)}}{\text{Total Area}} + Q_{release} + Q_2\text{ (existing)} \times \frac{\%\text{ (detained)}}{\text{Total Area}}$$

3. Iterate volume to obtain Q_{100} (allowable)

Basins where this scenario applies: 55, 57, 62, 77, 79, 81, 84, 88, 90, 96

Weld County I-25 Master Drainage Plan
CO-WELD-01

I-Town Basin
Basins south of WCR 18 (12 total)
Determination of sub-basin release rates for 100 year, existing, future, and future condition flows with on-site detention
Scenario 2 (basins that are partially urbanized with existing or approved detention ponds)

Sub-basin	No. of developed acres (un-detained area)	No. of un-developed acres (to be detained in future)	No. of detained acres	Sub-basin area (ac)	2 Year Historic Q (cfs)	10 Year, Existing Q (cfs)	10 Year, Future Q (cfs)	100 Year, Existing Q (cfs)	100 Year, Future Q (cfs)	Existing pond release rate (cfs)	100 Yr Existing Allowable Q (cfs)	100 Yr Existing allowable storage (ac-ft)	100 Yr Future Allowable Q (cfs)	100 Yr Future allowable storage (ac-ft)	100 Yr Future with on-site det. Allowable Q (cfs)	100 Yr Future w/ on-site storage (ac-ft)	10 Yr. Future to 10 Yr. Exist. (cfs)	10 Yr. Future to 10 Yr. Exist. on-site storage (ac-ft)	100 Yr. Future to 100 Yr. Exist. (cfs)	100 Yr. Future to 100 Yr. Exist. on-site storage (ac-ft)
55	64.9	84.4	24.6	173.9	7			290	448	1.2	250	3.9	386	4.1	172	14.5				
57		8.0	6.2	14.2	1			31	39	63.0	80	4.1	85	8.1	64	5.0				
62	70.7		37.4	108.1	7			418	418	18.3	292	4.4	292	4.4	292	4.4				
*70	46.8	489.1	148.0	683.9	57	224	286	725	854	54.5	623	36.6	724	42.9			228	5.7	631	22.3
*74	22.1	252.3	49.9	324.3	23	105	339	380	824	10.3	332	7.4	708	8.4			115	10.9	362	26.2
77		30.3	6.9	37.2	1			32	99	3.0	29	0.7	84	1.0	4	5.7				
79	10.1	26.9	3.1	40.1	1			32	102	1.0	31	0.4	95	0.6	27	4.4				
81	14.8	56.6	38.6	110.0	6			263	382	17.7	188	4.1	266	4.4	72	12.4				
84		54.6	14.5	69.1	1			49	173	0.2	39	1.7	137	2.4	1	11.6				
88	9.1	10.7	5.1	24.9	1			55	62	1.5	45	0.7	51	0.8	25	2.4				
90		241.2	200.0	441.2	21			776	1084	115.0	539	17.5	708	20.2	126	53.4				
96	14.1	203.0	52.2	269.3	13			584	983	3.5	474	7.3	796	9.1	65	40.6				
											Total:	88.8	ac-ft	106.4	ac-ft	264.4	ac-ft			

* Sub-basins are north of WCR 18.

*75	37.9	684.4		722.3	24	167	585	665	1498		665		1498				154	27.3	605	61.5

617 acres will detain to the 10-10, 100-100 criteria (north of WCR 18)
67.4 acres will detain from the 100 yr, future conditions flow to the 2 yr, historic flow (south of WCR 18)
654.9 67.4

III-E

FUTURE CONDITION REGIONAL DETENTION POND ANALYSIS

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number CO-WELD-01	Page 1 Of 2
Owner-Project Weld County I-25 Master Drainage Plan	By BLV	Date 5/7/99
Subject Regional on-line detention pond in Sub-basin 52	Checked By	Date

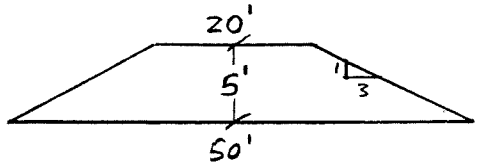
A natural valley exists just downstream of the Godding Ditch, and upstream of the Greggerson property. Propose a regional detention facility on-line with the main flow path.

The peak, 100-yr future condition w/ regional detention discharge coming to the pond = 1100 cfs. Try and reduce the peak flow by half.

Build the detention pond @ a min. elev. = 4860.0 ft (USGS quad), and assume the downstream embankment will have an avg. fill depth = 5 ft. Buy 38 ac. of land.

Elev. (ft)	Area (ac)	ΔD (ft)	Total D (ft)	ΔS (ac-ft)	Total S (ac-ft)	Q (cfs)
4860.0	0.0	0.0	0.0	0.0	0.0	0.0
4865.0	11.7	5.0	5.0	19.5	19.5	490.0
4870.0	34.5	5.0	10.0	110.5	130.0	760.0

The fill for the downstream embankment will require the following volume of material:

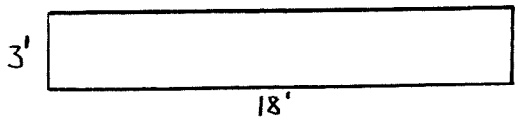


Longitudinal cross section of downstream embankment

$A = \frac{1}{2}(5')(20' + 50') = 175\ ft^2$ (cross-sectional area of embankment)

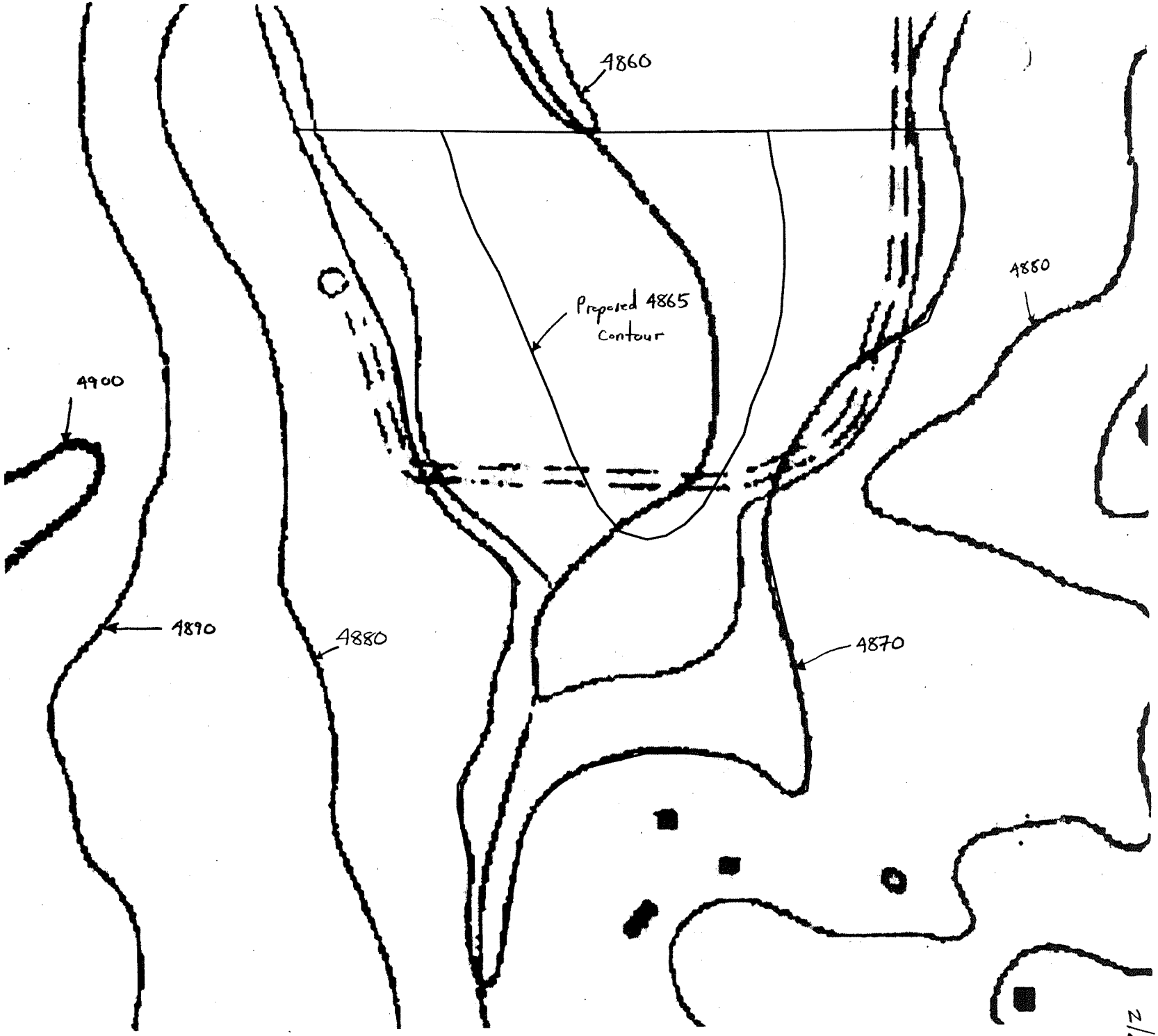
Fill volume: $\frac{(175\ ft^2)\ 1500 \text{ linear feet}}{27\ ft^3/yd^3} = 9{,}700\ yd^3$

The discharges were determined as follows:



Use one 3'H x 18'W RCB as the outlet structure; use orifice equation to determine Q's @ each elev:

1) At elev. = 4865 ft $Q = 0.6\,(54\ ft^2)\sqrt{2(32.2)(3.5)} = 490$ cfs
2) At elev. = 4870 ft, $Q = 0.6\,(54\ ft^2)\sqrt{2(32.2)\,8.5} = 760$ cfs


4860
Proposed 4865
Contour
4850
4900
4890
4880
4870

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number CO-WELD-01	Page 1 Of 3
Owner-Project Weld County I-25 Master Drainage Plan	By BLV	Date 5/17/99
S Regional on-line detention pond in Sub-basin 53	Checked By	Date

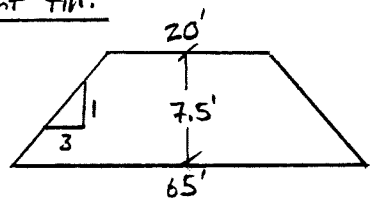
Two water ski lakes exist in Sub-basin 53; upstream of this location exists a large natural storage area. Propose a regional detention facility on-line with the main flow path.

The peak, 100-yr future condition w/ regional detention discharge coming to the pond ≈ 1650 cfs. Try and reduce this flow by half.

Build the detention pond @ a min. elev. = 4880.0 ft. (USGS quad). Assume the downstream embankment will have approx. 10' of fill, and approx. 5' of cut throughout the detention pond. Buy 28 ac. of land.

Elev. (ft)	Area (ac)	ΔD (ft)	Total D (ft)	ΔS (ac-ft)	Total S (ac-ft)	Q (cfs)
4880.0	0.0	0.0	0.0	0.0	0.0	0.0
4890.0	15.3	10.0	10.0	51.0	51.0	530.0
4895.0	24.9	5.0	15.0	99.5	150.5	680.0

Downstream embankment fill:

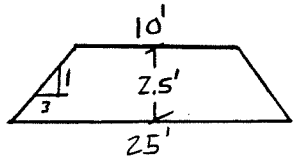


Longitudinal cross section of downstream embankment

$A = \frac{1}{2}(7.5')(20' + 65') = 319\ ft^2$

Fill volume: $\frac{(319\ ft^2)\ 600 \text{ linear feet}}{27\ ft^3/yd^3} = 7{,}100\ yd^3$

East embankment of pond fill:



Longitudinal cross section of east embankment

$A = \frac{1}{2}(2.5')(10' + 25') = 44\ ft^2$

Fill volume: $\frac{(44\ ft^2)\ 1100\ \text{linear feet}}{27\ ft^3/yd^3} = 1{,}800\ yd^3$

Determine the avg. cut volume to excavate down to elev. 4890.0 ft through out the pond:

Existing 4890.0 area

$$\frac{(15.3\ ac - 3.9\ ac)\ 43560\ \frac{ft^2}{ac}\ (2.5\ ft\ \text{avg. cut depth})}{27\ ft^3/yd^3} = 46{,}000\ yd^3$$

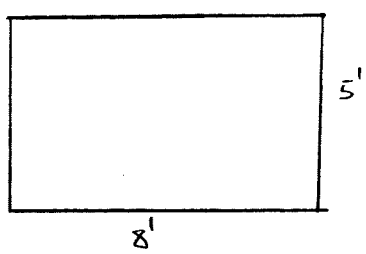
Area @ elev. 4890.0

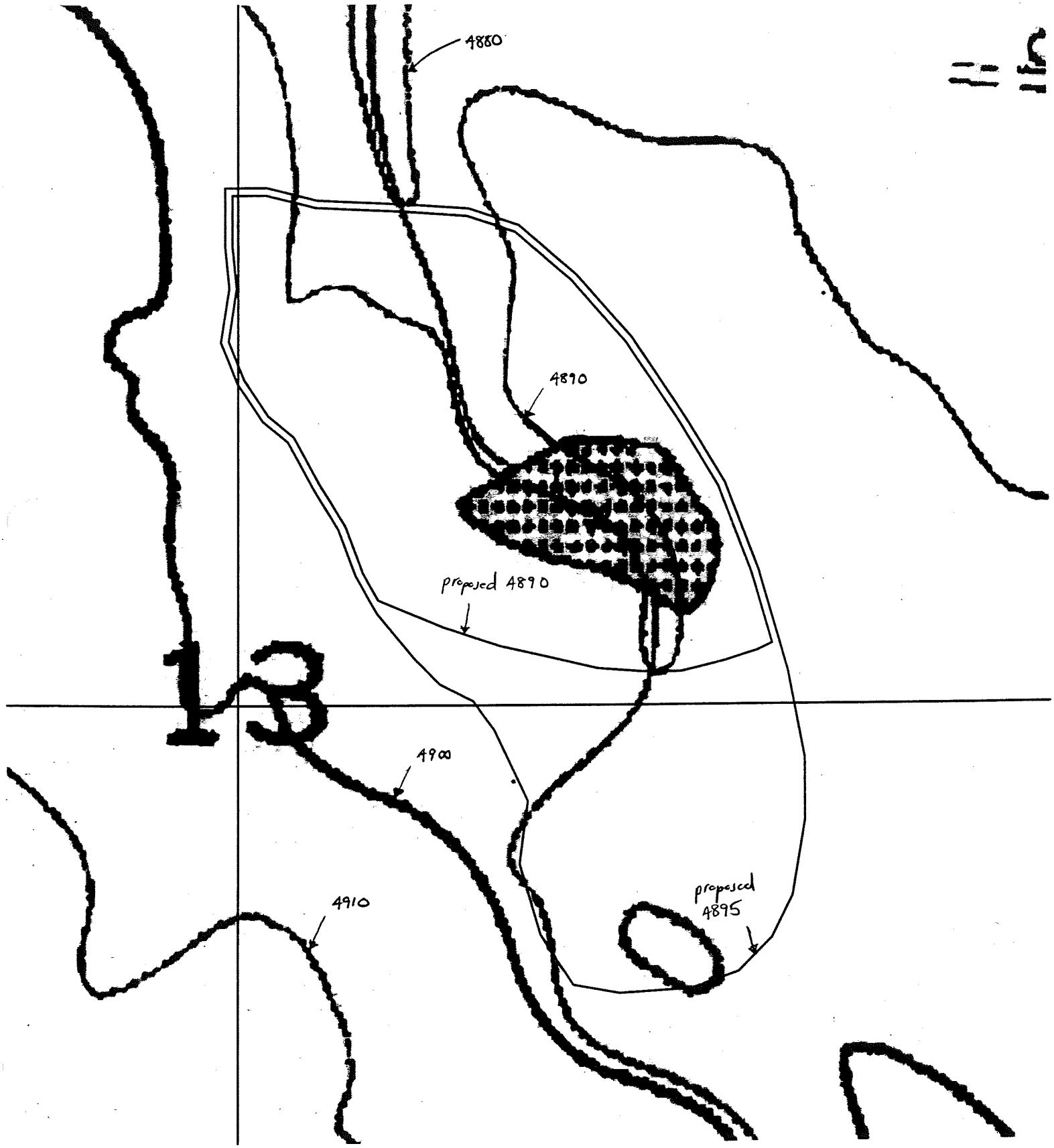
Discharges were determined as follows:

Use a 5' H x 8' W RCB as the outlet structure; use orifice equation to determine Q's @ each elev:

1) Elev. 4890: $Q = 0.6\ (40\ ft^2)\sqrt{2(32.2)\ 7.5\ ft} = 530\ cfs$

2) Elev. 4895: $Q = 0.6\ (40\ ft^2)\sqrt{2(32.2)\ 12.5\ ft} = 680\ cfs$




4880
4890
proposed 4890
13
4900
4910
proposed
4895

ANDERSON CONSULTING ENGINEERS, INC *Civil • Water Resources • Environmental*	Project Number CO-WELD-01	Page 1 Of 3
Owner-Project Weld County I-25 MDP	By BLV	Date 5/6/99
Su Regional detention pond @ SE corner of WCR13 and WCR20	Checked By	Date

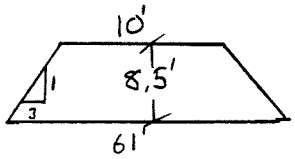
A wastewater treatment plant exists just south and east of the intersection. Propose a regional detention pond north of the plant to capture flows from sub basin 75 prior to reaching the main flow path.

The peak, 100yr future condition w/ regional detention discharge coming to the pond ≃ 1600 cfs. Try and reduce this discharge by half.

Build the detention pond @ a min. elev. = 4918.0 ft (USGS quad), assume a 1.5' of cut over entire pond area, and 6.0-8.5' of fill for embankment surrounding pond. Buy 9 ac of land.

Elev. (ft)	Area (ac)	ΔD (ft)	Total D (ft)	ΔS (ac-ft)	Total S (ac-ft)	Q (cfs)
4918.0	0.0	0.0	0.0	0.0	0.0	0.0
4923.0	6.7	5.0	5.0	11.2	11.2	170.0
4928.0	7.7	5.0	10.0	36.0	47.2	270.0

Determine fill for downstream embankment:

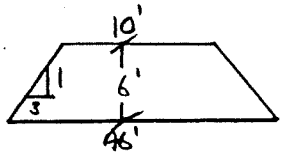


Longitudinal cross section of downstream embankment

$A = \frac{1}{2}(8.5')(10' + 61') = 302\ ft^2$

Fill volume: $\frac{(302\ ft^2)\ 1100\ \text{linear feet}}{27\ ft^3/yd^3} = 12{,}300\ yd^3$

Determine fill for embankment on north and south ends of pond:



Longitudinal cross section of embankment side

$A = \frac{1}{2}(6')(10' + 46') = 168\ ft^2$

Fill volume: $\frac{(168\ ft^2)\ 750 \text{ linear feet}}{27\ ft^3/yd^3} = 4{,}700\ yd^3$

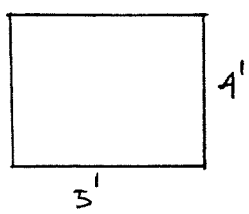
Avg. cut through pond: $\frac{(7.7\ ac)\ 43560\ ft^2/ac\ (1.5')}{27\ ft^3/yd^3} = 18{,}600\ yd^3$

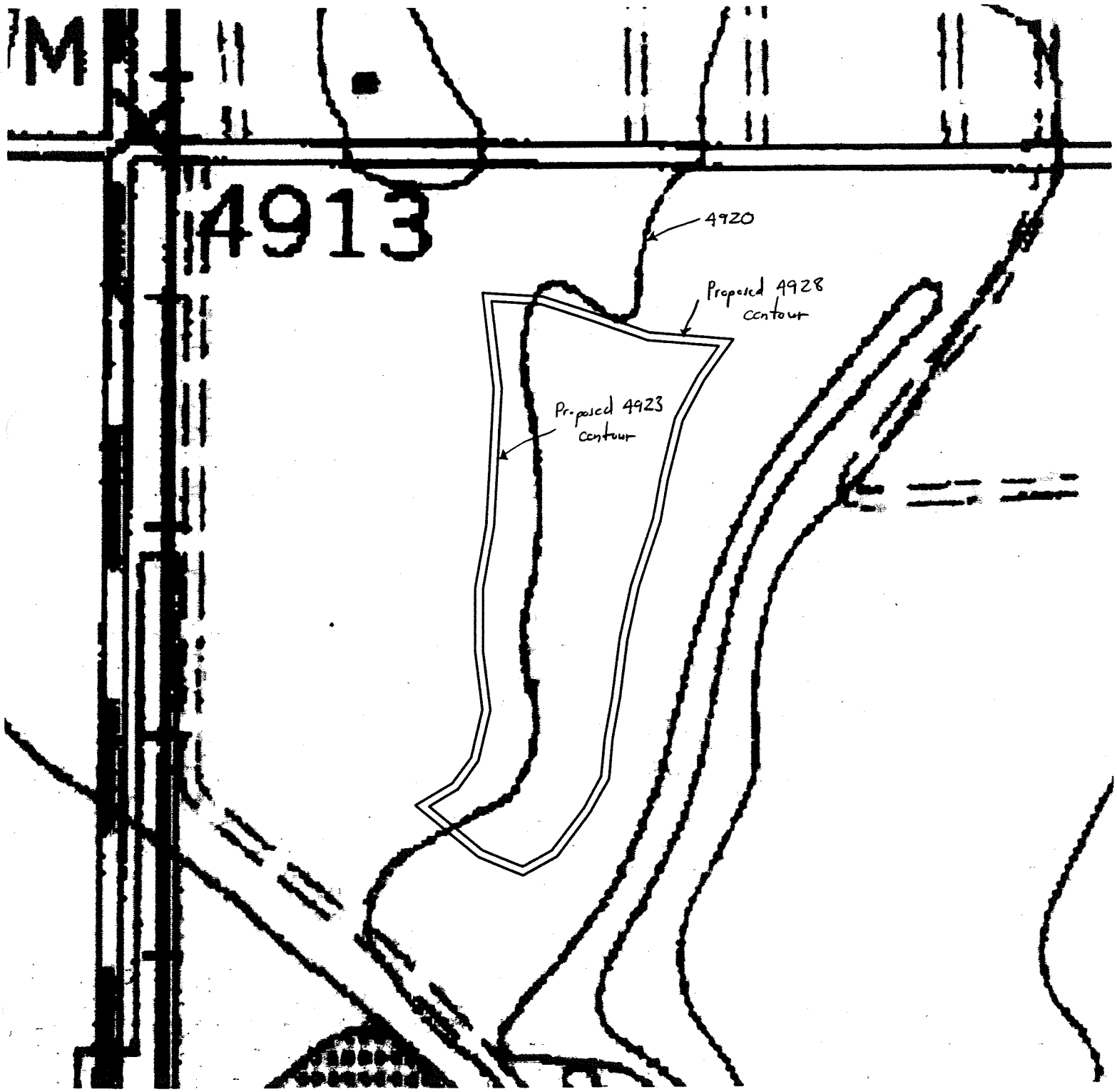
Discharges were determined as follows:

Use a 4'H x 5'W RCB as the outlet structure, and orifice equation to determine discharges:

1) El 4923.0: $Q = 0.6\,(20\ ft^2)\sqrt{2\,(32.2)\,3} = 170\ cfs$

2) EL. 4928: $Q = 0.6\,(20\ ft^2)\sqrt{2\,(32.2)\,8} = 270\ cfs$




4913
4920
Proposed 4928 contour
Proposed 4923 contour

1/8 ACE COP

TOWN OF FREDERICK

Weld County Tri-Area
Sanitation District
P.O. Box 213
Frederick, Colorado 80530

SOUTH SIDE DRAINAGE IMPROVEMENTS

APRIL 1996

ROCKY MOUNTAIN CONSULTANTS, INC.

2/8

CONCEPTUAL DESIGN REPORT
FOR
SIDE DRAINAGE IMPROVEMENTS

TOWN OF FREDERICK, COLORADO

Prepared for:

TOWN OF FREDERICK
P.O. Box 435
Frederick, Colorado 80530

Prepared by:

ROCKY MOUNTAIN CONSULTANTS, INC.
8301 E. Prentice Avenue
Suite 101
Englewood, Colorado 80111

April 1996
RMC Reference No. 0092.026.00

RMC RMC RMC RMC RMC RMC

Detention Requirements and Runoff Analysis

In order to maintain a release rate from the proposed detention facility of approximately 650 cfs it will be necessary to provide a total detention volume of 145 acre-feet. This could be constructed in the form of a large pond (pond 'A') of 135 acre-feet south of Eighth Street and east of Main Street and a 10 acre-foot pond (pond 'B') south of the large pond. Peak inflow from the Dacono basin and sub-basin 204, south of the detention ponds, is 1380 cfs and that from the east, sub-basins 201,202 and 203, is 670 cfs. This 670 cfs flow would enter the pond through a wide channel section. This channel section would be designed in cooperation with the Maplewood Subdivision development located south and east of the high school. The extent of this development is delineated on the drainage plan. More frequent flows, up to and including the 2-year runoff (65 cfs), would be conveyed from the east into the pond via a culvert to allow access along the east side of the detention pond. Prior to construction of the Maplewood Subdivision improvements the existing berm on the east and south side of the high school property would have to be enlarged to prevent overtopping.

The configuration of the detention ponds is shown on the drainage plan. In order to develop the required detention it would be necessary to construct concrete trickle channels parallel to Eighth Street and Main Street. These would be at approximately a 0.8% grade. The bottom grade of the pond sloping towards the trickle channel would be approximately 1%. In addition, a berm would have to be constructed parallel to Eighth and Main. As part of these improvements Eighth Street could be widened to the south. The berm would be a maximum of ten feet above the street. The top of the berm would be located approximately 50 to 60 feet south of the proposed south edge of Eighth Street so as to "soften" the appearance of the berm as viewed from the north. The existing box culvert under Main Street would have to be extended on the upstream end to accommodate the widening of Eighth Street and construction of the berm. Landscape improvements along the berm would be an integral part of the project's overall appearance.

The smaller 10 acre-foot detention pond would have a weir outlet with a concrete cutoff wall for erosion protection. It is anticipated that the large pond would be landscaped for both passive recreation use and for active uses such as soccer.

SOUTH SIDE DRAINAGE IMPROVEMENTS

DETENTION POND A

STAGE VS.STORAGE

Elev.	Area sq.ft	Height ft.	Volume cu-ft	Cum. Volume cu-ft	Volume acre-feet	Description
4979.0	0					
		1.0	833			
4980.0	2,500			833	0.02	
		2.0	68,052			
4982.0	85,000			68885	1.58	
		2.0	377,852			
4984.0	317,500			446737	10.26	
		2.0	886,701			
4986.0	582,500			1333438	30.61	
		2.0	1,487,371			
4988.0	917,500			2820809	**64.76**	**10-Year Storage**
		2.0	2,284,168			
4990.0	1,382,500			5104977	117.19	
		0.6	834,744			
4990.6	1,400,000			5939722	**136.36**	**100-Year Storage**

DETENTION POND B

STAGE VS.STORAGE

Elev.	Area sq.ft	Height ft.	Volume cu-ft	Volume cu-ft	Volume acre-feet	Description
4991.0	0					
		1.0	3,750			
4992.0	11,250			3750	0.09	
		2.0	46,193			
4994.0	37,500			49943	1.15	
		2.0	256,216			
4996.0	250,000			306159	**7.03**	**100-Year Storage**

TOWN OF FREDERICK
South Side Drainage Improvements
Engineer's Design & Construction Cost Opinion
epared by Rocky Mountain Consultants, Inc.
l 12, 1996

Item No.	Description	Estimated Quantity	Unit	Unit Price	Total Price
	Phase 1 - Storm Water Detention Improvements				
1	Detention pond earthwork, cut to fill	170,000	CY	$1	$170,000
2	Concrete trickle channel	2,400	LF	$15	$36,000
3	Outlet structure and box culvert extension	1	LS	$50,000	$50,000
4	Culvert from sub-basins 201, 202, 203	150	LF	$40	$6,000
5	Revegetation	50	ACRE	$500	$25,000

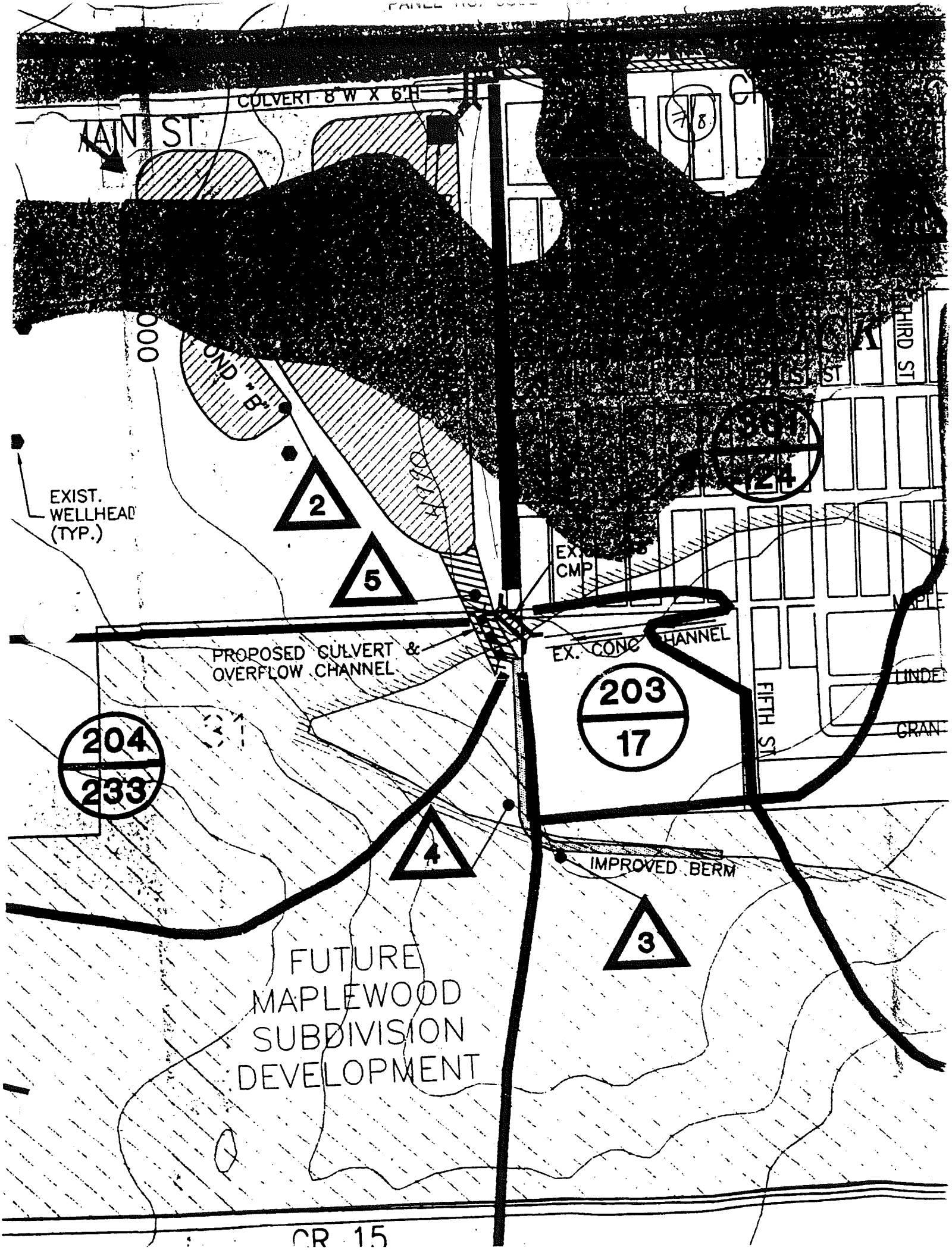
Sub-Total	$287,000
Construction Contingency (20%)	$57,400
CONSTRUCTION TOTAL	$344,400
Design, Surveying & Construction Engineering Contingency (15%)	$51,660
TOTAL ESTIMATED COST	**$396,000**

TOWN OF FREDERICK
DEVELOPED CONDITIONS alternative 2

6/8

TER BER	GUTTER CONNECTION	NDP	NP		WIDTH OR DIAM (FT)	LENGTH (FT)	INVERT SLOPE (FT/FT)	SIDE SLOPES HORIZ TO VERT L	R	MANNING N	OVERBANK/SURCHARGE DEPTH (FT)	JK
1	101	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
2	201	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
201	202	0	1	CHANNEL	10.0	850.	.0070	4.0	4.0	.045	10.00	0
51	50	8	2	PIPE	.1	1.	.0100	.0	.0	.016	.10	0
		RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW										
		.0	.0	1.0 150.0	3.0	400.0	6.0	800.0	7.0	100.0	10.0 1200.0	
		20.0	140.0	25.0 2000.0								
202	50	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
50	203	9	2	PIPE	.1	1.	.0100	.0	.0	.016	.10	0
		RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW										
		.0	.0	.1 20.0	1.6	50.0	11.0	100.0	31.0	160.0	65.0 190.0	
		118.0	600.0	149.0 700.0	150.0	2000.0						
203	204	0	5	PIPE	8.0	20.	.0100	.0	.0	.016	8.00	0
				OVERFLOW	20.0	20.	.0100	20.0	20.0	.030	10.00	
3	202	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
4	202	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
5	50	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
101	51	0	1	CHANNEL	100.0	700.	.0090	50.0	50.0	.045	10.00	0
204	301	0	1	CHANNEL	20.0	2850.	.0020	4.0	4.0	.045	10.00	0
6	301	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
301	0	0	1	CHANNEL	25.0	50.	.0020	4.0	4.0	.045	10.00	0

NUMBER OF GUTTERS/PIPES, 14


CULVERT 8'W X 6'H
MAIN ST
THIRD ST
EXIST. WELLHEAD (TYP.)
2
5
EX. CMP
PROPOSED CULVERT & OVERFLOW CHANNEL
EX. CONC CHANNEL
203
17
204
233
FIFTH ST
4
IMPROVED BERM
3
FUTURE MAPLEWOOD SUBDIVISION DEVELOPMENT
CR 15

The data used for the rating curve information was obtained from the RMC study, dated April 1996. The only change made was to the outlet structure, where one 3' RCP was used instead.

Elev. (ft)	Volume (ac-ft)	Q (cfs)	Area (ac)
4979.0	0.0	0.0	0.0
4986.0	30.6	80.0	13.4
4990.6	136.4	108.0	32.1

data from RMC report

Discharges out of the pond were determined using the orifice equation:

1) El. 4986.0: $Q = 0.6\left(\pi/4\,(3)^2\right)\sqrt{2(32.2)\,5.5\text{ ft}} = 80\text{ cfs}$

2) El. 4990.6: $Q = 0.6\left(\pi/4\,(3')^2\right)\sqrt{2(32.2)\,10.1\text{ ft}} = 108\text{ cfs}$

III-F

UDSWMM OUTPUT SUMMARY PROGRAM

```
update$ = "11/23/99"       'Date Last Updated
title$ = "SWMMSUM.BAS - SWMM INPUT & OUTPUT DATA STRIPPER"

CONST maxevents = 6
CONST maxelements = 150       '85 max with out getting out of string space
CONST maxtimesteps = 90
DIM outname(10) AS STRING
DIM sumname(10) AS STRING
DIM search$(6)
DIM storcase AS STRING * 4
DIM elementid(maxelements) AS STRING
DIM area(maxelements) AS SINGLE
DIM hydrographid(maxelements) AS STRING
DIM swmmcase AS STRING * 4
DIM hr AS INTEGER
DIM min AS INTEGER
DIM peakq(maxevents, maxelements) AS INTEGER
DIM peakhr(maxevents, maxelements) AS INTEGER
DIM peakmin(maxevents, maxelements) AS INTEGER
DIM storatpk(maxevents, maxelements) AS INTEGER
DIM caseatpk(maxevents, maxelements) AS STRING
'*********************************************************************
CLS
PRINT DATE$; "  "; TIME$
PRINT title$

INPUT "Enter 1 for Godding or 2 for Tri-Town or 3 for Other"; mainbasin
PRINT "1. Existing"
PRINT "2. Future"
PRINT "3. Future w/ Onsite Detention"
PRINT "4. Future w/ Regional Detention"
INPUT "Select Condition:"; condition
SELECT CASE mainbasin
  CASE 1
       SELECT CASE condition
       CASE 1
       outname(1) = "P:\coweld01\existi~1\Goddin~1\2_Year\udswmm\ghxc2yr.swo"
       sumname(1) = "P:\coweld01\existi~1\Goddin~1\2_Year\udswmm\ghxc2yr.txt"
       outname(2) = "P:\coweld01\existi~1\Goddin~1\5_Year\udswmm\ghxc5yr.swo"
       sumname(2) = "P:\coweld01\existi~1\Goddin~1\5_Year\udswmm\ghxc5yr.txt"
       outname(3) = "P:\coweld01\existi~1\Goddin~1\10_Year\udswmm\ghxc10yr.swo"
       sumname(3) = "P:\coweld01\existi~1\Goddin~1\10_Year\udswmm\ghxc10yr.txt"
       outname(4) = "P:\coweld01\existi~1\Goddin~1\25_Year\udswmm\ghxc25yr.swo"
       sumname(4) = "P:\coweld01\existi~1\Goddin~1\25_Year\udswmm\ghxc25yr.txt"
       outname(5) = "P:\coweld01\existi~1\Goddin~1\50_Year\udswmm\ghxc50yr.swo"
       sumname(5) = "P:\coweld01\existi~1\Goddin~1\50_Year\udswmm\ghxc50yr.txt"
       outname(6) = "P:\coweld01\existi~1\Goddin~1\100_Year\udswmm\ghxc100y.swo"
       sumname(6) = "P:\coweld01\existi~1\Goddin~1\100_Year\udswmm\ghxc100y.txt"
       numevents = 6
       CASE 2
       outname(1) = "P:\coweld01\future~3\Goddin~1\2_Year\udswmm\ghfc2yr.swo"
       sumname(1) = "P:\coweld01\future~3\Goddin~1\2_Year\udswmm\ghfc2yr.txt"
       outname(2) = "P:\coweld01\future~3\Goddin~1\5_Year\udswmm\ghfc5yr.swo"
       sumname(2) = "P:\coweld01\future~3\Goddin~1\5_Year\udswmm\ghfc5yr.txt"
       outname(3) = "P:\coweld01\future~3\Goddin~1\10_Year\udswmm\ghfc10yr.swo"
       sumname(3) = "P:\coweld01\future~3\Goddin~1\10_Year\udswmm\ghfc10yr.txt"
       outname(4) = "P:\coweld01\future~3\Goddin~1\25_Year\udswmm\ghfc25yr.swo"
       sumname(4) = "P:\coweld01\future~3\Goddin~1\25_Year\udswmm\ghfc25yr.txt"
       outname(5) = "P:\coweld01\future~3\Goddin~1\50_Year\udswmm\ghfc50yr.swo"
       sumname(5) = "P:\coweld01\future~3\Goddin~1\50_Year\udswmm\ghfc50yr.txt"
       outname(6) = "P:\coweld01\future~3\Goddin~1\100_Year\udswmm\ghfc100y.swo"
       sumname(6) = "P:\coweld01\future~3\Goddin~1\100_Year\udswmm\ghfc100y.txt"
       numevents = 6
       CASE 3
       outname(1) = "P:\coweld01\future~2\Goddin~1\2_Year\udswmm\ghod2yr.swo"
       sumname(1) = "P:\coweld01\future~2\Goddin~1\2_Year\udswmm\ghod2yr.txt"
       outname(2) = "P:\coweld01\future~2\Goddin~1\5_Year\udswmm\ghod5yr.swo"
       sumname(2) = "P:\coweld01\future~2\Goddin~1\5_Year\udswmm\ghod5yr.txt"
       outname(3) = "P:\coweld01\future~2\Goddin~1\10_Year\udswmm\ghod10yr.swo"
       sumname(3) = "P:\coweld01\future~2\Goddin~1\10_Year\udswmm\ghod10yr.txt"
       outname(4) = "P:\coweld01\future~2\Goddin~1\25_Year\udswmm\ghod25yr.swo"
       sumname(4) = "P:\coweld01\future~2\Goddin~1\25_Year\udswmm\ghod25yr.txt"
       outname(5) = "P:\coweld01\future~2\Goddin~1\50_Year\udswmm\ghod50yr.swo"
       sumname(5) = "P:\coweld01\future~2\Goddin~1\50_Year\udswmm\ghod50yr.txt"
       outname(6) = "P:\coweld01\future~2\Goddin~1\100_Year\udswmm\ghod100y.swo"
       sumname(6) = "P:\coweld01\future~2\Goddin~1\100_Year\udswmm\ghod100y.txt"
       numevents = 6
       CASE 4
       outname(1) = "P:\coweld01\future~1\Goddin~1\2_Year\udswmm\ghrd2yr.swo"
       sumname(1) = "P:\coweld01\future~1\Goddin~1\2_Year\udswmm\ghrd2yr.txt"
       outname(2) = "P:\coweld01\future~1\Goddin~1\5_Year\udswmm\ghrd5yr.swo"
       sumname(2) = "P:\coweld01\future~1\Goddin~1\5_Year\udswmm\ghrd5yr.txt"
       outname(3) = "P:\coweld01\future~1\Goddin~1\10_Year\udswmm\ghrd10yr.swo"
       sumname(3) = "P:\coweld01\future~1\Goddin~1\10_Year\udswmm\ghrd10yr.txt"
       outname(4) = "P:\coweld01\future~1\Goddin~1\25_Year\udswmm\ghrd25yr.swo"
       sumname(4) = "P:\coweld01\future~1\Goddin~1\25_Year\udswmm\ghrd25yr.txt"
       outname(5) = "P:\coweld01\future~1\Goddin~1\50_Year\udswmm\ghrd50yr.swo"
       sumname(5) = "P:\coweld01\future~1\Goddin~1\50_Year\udswmm\ghrd50yr.txt"
       outname(6) = "P:\coweld01\future~1\Goddin~1\100_Year\alt 8\ghrd100y.swo"
       sumname(6) = "P:\coweld01\future~1\Goddin~1\100_Year\alt 8\ghrd100y.txt"
       numevents = 6
      END SELECT     'condition
 CASE 2
       SELECT CASE condition
       CASE 1
       outname(1) = "P:\coweld01\existi~1\TriTow~1\2_Year\udswmm\ttxc2yr.swo"
       sumname(1) = "P:\coweld01\existi~1\TriTow~1\2_Year\udswmm\ttxc2yr.txt"
       outname(2) = "P:\coweld01\existi~1\TriTow~1\5_Year\udswmm\ttxc5yr.swo"
       sumname(2) = "P:\coweld01\existi~1\TriTow~1\5_Year\udswmm\ttxc5yr.txt"
       outname(3) = "P:\coweld01\existi~1\TriTow~1\10_Year\udswmm\ttxc10yr.swo"
```

```
        sumname(3) = "P:\coweld01\existi~1\TriTow~1\10_Year\udswmm\ttxc10yr.txt"
        outname(4) = "P:\coweld01\existi~1\TriTow~1\25_Year\udswmm\ttxc25yr.swo"
        sumname(4) = "P:\coweld01\existi~1\TriTow~1\25_Year\udswmm\ttxc25yr.txt"
        outname(5) = "P:\coweld01\existi~1\TriTow~1\50_Year\udswmm\ttxc50yr.swo"
        sumname(5) = "P:\coweld01\existi~1\TriTow~1\50_Year\udswmm\ttxc50yr.txt"
        outname(6) = "P:\coweld01\existi~1\TriTow~1\100_Year\udswmm\ttxc100y.swo"
        sumname(6) = "P:\coweld01\existi~1\TriTow~1\100_Year\udswmm\ttxc100y.txt"
        numevents = 6
        CASE 2
        outname(1) = "P:\coweld01\future~3\TriTow~1\2_Year\udswmm\ttfc2yr.swo"
        sumname(1) = "P:\coweld01\future~3\TriTow~1\2_Year\udswmm\ttfc2yr.txt"
        outname(2) = "P:\coweld01\future~3\TriTow~1\5_Year\udswmm\ttfc5yr.swo"
        sumname(2) = "P:\coweld01\future~3\TriTow~1\5_Year\udswmm\ttfc5yr.txt"
        outname(3) = "P:\coweld01\future~3\TriTow~1\10_Year\udswmm\ttfc10yr.swo"
        sumname(3) = "P:\coweld01\future~3\TriTow~1\10_Year\udswmm\ttfc10yr.txt"
        outname(4) = "P:\coweld01\future~3\TriTow~1\25_Year\udswmm\ttfc25yr.swo"
        sumname(4) = "P:\coweld01\future~3\TriTow~1\25_Year\udswmm\ttfc25yr.txt"
        outname(5) = "P:\coweld01\future~3\TriTow~1\50_Year\udswmm\ttfc50yr.swo"
        sumname(5) = "P:\coweld01\future~3\TriTow~1\50_Year\udswmm\ttfc50yr.txt"
        outname(6) = "P:\coweld01\future~3\TriTow~1\100_Year\udswmm\ttfc100y.swo"
        sumname(6) = "P:\coweld01\future~3\TriTow~1\100_Year\udswmm\ttfc100y.txt"
        numevents = 6
        CASE 3
        outname(1) = "P:\coweld01\future~2\TriTow~1\2_Year\udswmm\ttod2yr.swo"
        sumname(1) = "P:\coweld01\future~2\TriTow~1\2_Year\udswmm\ttod2yr.txt"
        outname(2) = "P:\coweld01\future~2\TriTow~1\5_Year\udswmm\ttod5yr.swo"
        sumname(2) = "P:\coweld01\future~2\TriTow~1\5_Year\udswmm\ttod5yr.txt"
        outname(3) = "P:\coweld01\future~2\TriTow~1\10_Year\udswmm\ttod10yr.swo"
        sumname(3) = "P:\coweld01\future~2\TriTow~1\10_Year\udswmm\ttod10yr.txt"
        outname(4) = "P:\coweld01\future~2\TriTow~1\25_Year\udswmm\ttod25yr.swo"
        sumname(4) = "P:\coweld01\future~2\TriTow~1\25_Year\udswmm\ttod25yr.txt"
        outname(5) = "P:\coweld01\future~2\TriTow~1\50_Year\udswmm\ttod50yr.swo"
        sumname(5) = "P:\coweld01\future~2\TriTow~1\50_Year\udswmm\ttod50yr.txt"
        outname(6) = "P:\coweld01\future~2\TriTow~1\100_Year\udswmm\ttod100y.swo"
        sumname(6) = "P:\coweld01\future~2\TriTow~1\100_Year\udswmm\ttod100y.txt"
        numevents = 6
        CASE 4
        outname(1) = "P:\coweld01\future~1\TriTow~1\2_Year\udswmm\ttrd2yr.swo"
        sumname(1) = "P:\coweld01\future~1\TriTow~1\2_Year\udswmm\ttrd2yr.txt"
        outname(2) = "P:\coweld01\future~1\TriTow~1\5_Year\udswmm\ttrd5yr.swo"
        sumname(2) = "P:\coweld01\future~1\TriTow~1\5_Year\udswmm\ttrd5yr.txt"
        outname(3) = "P:\coweld01\future~1\TriTow~1\10_Year\udswmm\ttrd10yr.swo"
        sumname(3) = "P:\coweld01\future~1\TriTow~1\10_Year\udswmm\ttrd10yr.txt"
        outname(4) = "P:\coweld01\future~1\TriTow~1\25_Year\udswmm\ttrd25yr.swo"
        sumname(4) = "P:\coweld01\future~1\TriTow~1\25_Year\udswmm\ttrd25yr.txt"
        outname(5) = "P:\coweld01\future~1\TriTow~1\50_Year\udswmm\ttrd50yr.swo"
        sumname(5) = "P:\coweld01\future~1\TriTow~1\50_Year\udswmm\ttrd50yr.txt"
        outname(6) = "P:\coweld01\future~1\TriTow~1\100_Year\fredst~2\ttrd100y.swo"
        sumname(6) = "P:\coweld01\future~1\TriTow~1\100_Year\fredst~2\ttrd100y.txt"

        numevents = 6
        END SELECT  'condition
  CASE 3
        outname(1) = "C:\CJPSTUFF\ghrd100y.swo"
        sumname(1) = "C:\CJPSTUFF\ghrdtest.txt"
'        outname(1) = "A:\udswmm\ghxc10yr.swo"
'        sumname(1) = "A:\udswmm\ghxc10yr.txt"
        numevents = 1
END SELECT  'mainbasin

FOR eventnum = 1 TO numevents

PRINT "Now Working On:"
PRINT outname(eventnum); "  Event: "; eventnum
OPEN outname(eventnum) FOR INPUT AS #1

numhydrographs = 0: hydrographnum = 0
FOR x = 1 TO maxelements: hydrographid(x) = "": NEXT x
'try eliminating this loop

WHILE NOT EOF(1)

search$(3) = "NUMBER OF TIME STEPS"
WHILE INSTR(sent$, search$(3)) = 0 AND NOT EOF(1): LINE INPUT #1, sent$: WEND
numtimesteps = VAL(MID$(sent$, INSTR(sent$, search$(3)) + LEN(search$(3)), 6))
PRINT "Numtimesteps = "; numtimesteps
'***
'***SEARCH AND LOAD GUTTERS/PIPES INFORMATION***
'***
search$(4) = "TOTAL NUMBER OF GUTTERS/PIPES,"
WHILE INSTR(sent$, search$(4)) = 0 AND NOT EOF(1): LINE INPUT #1, sent$: WEND
modelements = VAL(MID$(sent$, INSTR(sent$, search$(4)) + LEN(search$(4)), 5))
PRINT "Model Elements = "; modelements
search$(5) = "TRIBUTARY GUTTER/PIPE"
WHILE INSTR(sent$, search$(5)) = 0 AND NOT EOF(1): LINE INPUT #1, sent$: WEND
LINE INPUT #1, sent$
 numelements = 0
 FOR elementx = 1 TO modelements
  INPUT #1, junk
  numelements = numelements + 1
  elementid(numelements) = RTRIM$(LTRIM$(STR$(junk)))
  FOR x = 1 TO 21: INPUT #1, area(numelements): NEXT x
  INPUT #1, sent$
 NEXT elementx
PRINT "Number Elements Saved ="; numelements

'***
'***SEARCH AND LOAD LISTED CONVEYANCE ELEMENT HYDROGRAPHS***
'***
search$(1) = "HYDROGRAPHS ARE LISTED FOR THE FOLLOWING"
```

```
WHILE INSTR(sent$, search$(1)) = 0 AND NOT EOF(1): LINE INPUT #1, sent$: WEND
numhydrographs = VAL(MID$(sent$, INSTR(sent$, search$(1)) + LEN(search$(1)), 4))
PRINT "Numhydrographs = "; numhydrographs

'***READ IN THE REQUESTED HYDROGRAPH IDs
search$(2) = "TIME(HR/MIN)"
WHILE INSTR(sent$, search$(2)) = 0 AND NOT EOF(1): LINE INPUT #1, sent$: WEND
hydrographnum = 1
WHILE hydrographnum <= numhydrographs
        IF hydrographnum = 1 THEN hydrographid(hydrographnum) = RTRIM$(LTRIM$(MID$(sent$, INSTR(sent$, search$(2)) + LEN(search$(2)), 6)))
        IF hydrographnum > 1 AND hydrographnum < 11 THEN
          hydrographid(hydrographnum) = RTRIM$(LTRIM$(MID$(sent$, INSTR(sent$, search$(2)) + LEN(search$(2)) + 6 + ((hydrographnum - 2) *
10), 10)))
        END IF
        IF hydrographnum > 10 THEN
                INPUT #1, junk
                hydrographid(hydrographnum) = RTRIM$(LTRIM$(STR$(junk)))
        END IF 'numhydrographs >10
'PRINT hydrographnum, hydrographid(hydrographnum)
'WHILE INKEY$ = "": WEND
        hydrographnum = hydrographnum + 1
 WEND  'hydrographnum <= numhydrographs

'***
'***READ IN THE DISCHARGE VALUES
'***
IF eventnum = 1 THEN
        OPEN "P:\coweld01\qbasic\hgtemp.txt" FOR OUTPUT AS #3
        OPEN "P:\coweld01\qbasic\stortemp.txt" FOR OUTPUT AS #4
       OPEN "P:\coweld01\qbasic\casetemp.txt" FOR OUTPUT AS #5
ELSE
        OPEN "P:\coweld01\qbasic\hgtemp.txt" FOR APPEND AS #3
        OPEN "P:\coweld01\qbasic\stortemp.txt" FOR APPEND AS #4
        OPEN "P:\coweld01\qbasic\casetemp.txt" FOR APPEND AS #5
END IF
IF eventnum = 1 THEN
'       OPEN "c:\cjpstuff\hgtemp.txt" FOR OUTPUT AS #3
'       OPEN "c:\cjpstuff\stortemp.txt" FOR OUTPUT AS #4
'       OPEN "c:\cjpstuff\casetemp.txt" FOR OUTPUT AS #5
ELSE
'       OPEN "c:\cjpstuff\hgtemp.txt" FOR APPEND AS #3
'       OPEN "c:\cjpstuff\stortemp.txt" FOR APPEND AS #4
'       OPEN "c:\cjpstuff\casetemp.txt" FOR APPEND AS #5
END IF
PRINT #3, "EVENTNUM"
PRINT #3, eventnum
LINE INPUT #1, sent$
'pRINT "sent$", sent$
FOR timestep = 1 TO numtimesteps
  INPUT #1, hr, min
'PRINT "hr= ", hr, "min= ", min
'WHILE INKEY$ = "": WEND
  PRINT #3, timestep
  PRINT #3, hr
  PRINT #3, min
  FOR hydrographnum = 1 TO numhydrographs
    INPUT #1, hg
    PRINT #3, hg;
'PRINT "timestep="; timestep, "hydrographnum="; hydrographnum, "id ="; hydrographid(hydrographnum), "Q= "; hg
'WHILE INKEY$ = "": WEND

'READ, LOCATE, AND STRIP STORAGE VALUES FOR PREVIOUS LINE OF ELEMENTS
    IF hydrographnum MOD 10 = 0 THEN
             x = hydrographnum - 9
             prevperiod = -4
             INPUT #1, junk$
             FOR letter = 1 TO LEN(junk$)
                 IF MID$(junk$, letter, 1) = "." THEN
                    stor = VAL(MID$(junk$, prevperiod + 5, letter + 1 - prevperiod + 5))
                    PRINT #4, stor;
                    IF MID$(junk$, letter + 3, 1) = " " THEN
'PRINT "x="; x, "let="; letter, "stor="; stor, "time="; timestep
                     swmmcase = "(_) "
                     PRINT #5, "(_) "
                    ELSE
                     swmmcase = MID$(junk$, letter + 2, 4)
                     PRINT #5, MID$(junk$, letter + 2, 5)
                    END IF
'PRINT "x="; x, "let="; letter, "stor="; stor
                    prevperiod = letter
'PRINT "hydrographnum="; x; "id="; hydrographid(x), "stor ="; stor, "case="; swmmcase
                    x = x + 1
                 END IF
             NEXT letter
             LINE INPUT #1, sent$
'PRINT "sent$="; sent$
    END IF  'hydrographnum MOD 10 = 0
  NEXT hydrographnum

'***AFTER LAST DISCHARGE READ; INPUT NEXT SENT., LOCATE, AND STRIP REMAINING
'***STORAGE VALUES
       IF (hydrographnum - 1) MOD 10 <> 0 THEN
                INPUT #1, junk$
'PRINT "hydrographnum=", hydrographnum - 1, "mod=", (hydrographnum - 1) MOD 10
'PRINT junk$
'WHILE INKEY$ = "": WEND
                x = hydrographnum - ((hydrographnum - 1) MOD 10)
                prevperiod = -4
                FOR letter = 1 TO LEN(junk$)
                  IF MID$(junk$, letter, 1) = "." THEN
```

```
                    stor = VAL(MID$(junk$, prevperiod + 5, letter + 1))
                    PRINT #4, VAL(MID$(junk$, prevperiod + 5, letter + 1));
                    IF MID$(junk$, letter + 3, 1) = " " THEN
                      swmmcase = "(_) "
                      PRINT #5, "(_) "
                    ELSE
                      swmmcase = MID$(junk$, letter + 2, 4)
                      PRINT #5, MID$(junk$, letter + 2, 5)
                    END IF
 PRINT "x="; x, "let="; letter, "stor="; stor
                    prevperiod = letter
'PRINT "hydrographnum="; x; "id="; hydrographid(x), "stor ="; stor, "case="; swmmcase
                    x = x + 1
                  END IF
                NEXT letter
              LINE INPUT #1, sent$
'PRINT "sent$="; sent$
        END IF  'hydrographnum mod 10 <> 0
  PRINT #3,
  PRINT #4,
NEXT timestep

WHILE NOT EOF(1): LINE INPUT #1, sent$: WEND
WEND 'not eof(1)
CLOSE #1
CLOSE #3
CLOSE #4
CLOSE #5

NEXT eventnum  '***
'*****************************************************************************
'*****************************************************************************
'***
'***CLEAR PEAK ARRAYS
'***
FOR eventnum = 1 TO numevents
  FOR hydrographnum = 1 TO numhydrographs
       peakq(eventnum, hydrographnum) = 0
       peakhr(eventnum, hydrographnum) = 0
       peakmin(eventnum, hydrographnum) = 0
       storatpk(eventnum, hydrographnum) = 0
       caseatpk(eventnum, hydrographnum) = " "
  NEXT hydrographnum
NEXT eventnum
'***
'***LOAD PEAK ARRAYS
'***
OPEN "P:\coweld01\qbasic\hgtemp.txt" FOR INPUT AS #3
OPEN "P:\coweld01\qbasic\stortemp.txt" FOR INPUT AS #4
OPEN "P:\coweld01\qbasic\casetemp.txt" FOR INPUT AS #5
'        OPEN "c:\cjpstuff\hgtemp.txt" FOR INPUT AS #3
'        OPEN "c:\cjpstuff\stortemp.txt" FOR INPUT AS #4
'        OPEN "c:\cjpstuff\casetemp.txt" FOR INPUT AS #5

FOR eventnum = 1 TO numevents
  INPUT #3, junk$
  INPUT #3, txteventnum
'PRINT junk$, "txteventnum=", txteventnum
'WHILE INKEY$ = "": WEND
  FOR j = 1 TO numtimesteps
   INPUT #3, timestep
   INPUT #3, hr, min
'PRINT "en="; eventnum; " ts="; timestep, hr, min
   hydrographnum = 1
   WHILE hydrographnum <= numhydrographs AND NOT EOF(3)
     INPUT #3, hg
     INPUT #4, stor
     INPUT #5, storcase
'PRINT "en="; eventnum; " ts="; timestep, hr, min, hydrographid(hydrographnum), hg, stor, storcase
     IF hg > peakq(eventnum, hydrographnum) THEN
'pRINT "en="; eventnum; "  "; hydrographid(hydrographnum); "hg=", hg, "peakq=", peakq(eventnum, hydrographnum)
       peakq(eventnum, hydrographnum) = hg
       peakhr(eventnum, hydrographnum) = hr
       peakmin(eventnum, hydrographnum) = min
       storatpk(eventnum, hydrographnum) = stor
       caseatpk(eventnum, hydrographnum) = storcase
     END IF
     hydrographnum = hydrographnum + 1
   WEND 'hydrographnum
  NEXT j
NEXT eventnum
CLOSE #3
CLOSE #4
CLOSE #5

'***
'*** EVENT SUMMARY OF ELEMENTS AND HYDROGRAPHS
'***
FOR eventnum = 1 TO numevents
OPEN sumname(eventnum) FOR OUTPUT AS #2
PRINT #2, "Time(Hrs) "; " Time(Min) ";
FOR hydrographnum = 1 TO numhydrographs
 PRINT #2, " Elem" + hydrographid(hydrographnum);
NEXT hydrographnum

PRINT #2, " TotalTime(Hrs) "
'OPEN "c:\cjpstuff\hgtemp.txt" FOR INPUT AS #3
OPEN "P:\coweld01\qbasic\hgtemp.txt" FOR INPUT AS #3
timestep = 0
  FOR x = 1 TO eventnum
```

```
    search$(5) = "EVENTNUM"
    WHILE INSTR(sent$, search$(5)) = 0 AND NOT EOF(3): LINE INPUT #3, sent$:  WEND
    sent$ = "???"
   NEXT x
   INPUT #3, txteventnum

'FOR x = 1 TO (eventnum - 1) * (5 + numhydrographs): INPUT #3, junk: NEXT x
'INPUT #3, junk, txteventnum
 RINT "eventnum="; txteventnum
 WHILE INKEY$ = "": WEND
WHILE timestep <= numtimesteps
  INPUT #3, timestep
  INPUT #3, hr, min
'PRINT timestep, hr, min
  PRINT #2, LTRIM$(STR$(hr)); min;
'PRINT LTRIM$(STR$(hr)); min
  hydrographnum = 1
  WHILE hydrographnum <= numhydrographs AND NOT EOF(3)
'  FOR hydrographnum = 1 TO numhydrographs
    INPUT #3, hg
    PRINT #2, hg;
    hydrographnum = hydrographnum + 1
  WEND
'  NEXT hydrographnum
  PRINT #2, USING " ###.## "; hr + min / 60
  timestep = timestep + 1
WEND 'timestep
CLOSE #3

PRINT #2, "Peak (cfs)";
FOR hydrographnum = 1 TO numhydrographs: PRINT #2, peakq(eventnum, hydrographnum); : NEXT hydrographnum
PRINT #2,
PRINT #2, "Peak (hrs)";
FOR hydrographnum = 1 TO numhydrographs: PRINT #2, peakhr(eventnum, hydrographnum); : NEXT hydrographnum
PRINT #2,
PRINT #2, "Peak (min)";
FOR hydrographnum = 1 TO numhydrographs: PRINT #2, peakmin(eventnum, hydrographnum); : NEXT hydrographnum
PRINT #2,
PRINT #2, "Peak (cfs_or_ac.ft.)";
FOR hydrographnum = 1 TO numhydrographs: PRINT #2, storatpk(eventnum, hydrographnum); : NEXT hydrographnum
PRINT #2,
PRINT #2, "Case (().S,I,D,O) ";
FOR hydrographnum = 1 TO numhydrographs: PRINT #2, " "; caseatpk(eventnum, hydrographnum); : NEXT hydrographnum
PRINT #2,
PRINT #2, "Area (ac)";

FOR hydrographnum = 1 TO numhydrographs
  elementnum = 0
  WHILE hydrographid(hydrographnum) <> elementid(elementnum) AND elementnum <= numelements
'PRINT hydrographnum, hydrographid(hydrographnum), elementnum, elementid(elementnum)
    elementnum = elementnum + 1
  WEND
  IF elementnum <= numelements THEN
        PRINT #2, USING " ######.# "; area(elementnum);
  ELSE
        PRINT #2, " n/a ";
        PRINT "WARNING: REQUESTED HYDROGRAPH, "; hydrographid(hydrographnum); " IS NOT A DEFINED ELEMENT"
'        PRINT "PRESS ANY KEY TO CONTINUE"
'        WHILE INKEY$ = "": WEND
  END IF
NEXT hydrographnum
PRINT #2,
PRINT #2, "Peak/Area (cfs/ac)";

FOR hydrographnum = 1 TO numhydrographs
  elementnum = 0
  WHILE hydrographid(hydrographnum) <> elementid(elementnum) AND elementnum <= numelements
'PRINT hydrographnum, hydrographid(hydrographnum), elementnum, elementid(elementnum)
    elementnum = elementnum + 1
  WEND
  IF elementnum <= numelements THEN
'PRINT hydrographnum; "hydroid="; hydrographid(hydrographnum), peakq(eventnum, hydrographnum), elementnum; "elemid="; elementid(elementnum),
area(elementnum)
'WHILE INKEY$ = "": WEND
        PRINT #2, USING " ####.## "; peakq(eventnum, hydrographnum) / area(elementnum);
  ELSE
        PRINT #2, " n/a ";
  END IF
NEXT hydrographnum
PRINT #2,
PRINT #2, DATE$; "  "; TIME$
PRINT #2, "Summary File: "; sumname(eventnum)

CLOSE #2
NEXT eventnum

'***
'***MODEL SUMMARY FILE
'***
SELECT CASE mainbasin
  CASE 1
        filename2$ = "P:\coweld01\qbasic\ghexsta.txt"
        SELECT CASE condition
          CASE 1
                filename$ = "P:\coweld01\existi~1\Goddin~1\ghexswmm.txt"
                filename3$ = "P:\coweld01\existi~1\Goddin~1\ghexprof.txt"
          CASE 2
                filename$ = "P:\coweld01\future~1\Goddin~1\ghfuswmm.txt"
                filename3$ = "P:\coweld01\future~1\Goddin~1\ghfuprof.txt"
          CASE 3
```

```
            filename$ = "P:\coweld01\future~2\Goddin~1\ghodswmm.txt"
            filename3$ = "P:\coweld01\future~2\Goddin~1\ghodprof.txt"
        CASE 4
            filename$ = "P:\coweld01\future~3\Goddin~1\ghrdswmm.txt"
            filename2$ = "P:\coweld01\qbasic\ghrdsta.txt"
            filename3$ = "P:\coweld01\future~3\Goddin~1\ghrdprof.txt"
        END SELECT
  CASE 2
      filename2$ = "P:\coweld01\qbasic\ttexsta.txt"
      SELECT CASE condition
        CASE 1
            filename$ = "P:\coweld01\existi~1\TriTow~1\ttexswmm.txt"
            filename3$ = "P:\coweld01\existi~1\TriTow~1\ttexprof.txt"
        CASE 2
            filename$ = "P:\coweld01\future~1\TriTow~1\ttfuswmm.txt"
            filename3$ = "P:\coweld01\future~1\TriTow~1\ttfuprof.txt"
        CASE 3
            filename$ = "P:\coweld01\future~2\TriTow~1\ttodswmm.txt"
            filename3$ = "P:\coweld01\future~2\TriTow~1\ttodprof.txt"
        CASE 4
            filename$ = "P:\coweld01\future~3\TriTow~1\ttrdswmm.txt"
            filename2$ = "P:\coweld01\qbasic\ttrdsta.txt"
            filename3$ = "P:\coweld01\future~3\TriTow~1\ttrdprof.txt"
        END SELECT
  CASE 3
      SELECT CASE condition
        CASE 1
            filename$ = "c:\cjpstuff\ghexswts.txt"
            filename2$ = "c:\cjpstuff\ghexsta.txt"
            filename3$ = "c:\cjpstuff\ghexprts.txt"
'            filename$ = "A:\ghexswmm.txt"
'            filename3$ = "A:\ghexprof.txt"
        CASE 2
'           filename$= "P:\coweld01\hogan'~1\junk.sum"
        CASE 3
      END SELECT
END SELECT
'***
'*** PRINT OUT PEAK AND TIME TO PEAK SUMMARY
'***
OPEN filename$ FOR OUTPUT AS #2
SELECT CASE numevents
      CASE 1
        PRINT #2, "Element "; "100-YrPkQ "; "100-YrPkT "
      CASE 6
        PRINT #2, "Element "; "2-YrPkQ "; "2-YrPkT "; "5-YrPkQ "; "5-YrPkT "; "10-YrPkQ "; "10-YrPkT "; "25-YrPkQ "; "25-YrPkT ";
"50-YrPkQ "; "50-YrPkT "; "100-YrPkQ "; "100-YrPkT "
END SELECT
FOR hydrographnum = 1 TO numhydrographs
  PRINT #2, hydrographid(hydrographnum);
 PRINT hydrographid(hydrographnum);
  FOR eventnum = 1 TO numevents
    PRINT #2, peakq(eventnum, hydrographnum), peakhr(eventnum, hydrographnum) * 60 + peakmin(eventnum, hydrographnum);
'PRINT hydrographid(hydrographnum), eventnum; peakhr(eventnum, hydrographnum), peakmin(eventnum, hydrographnum), peakq(eventnum,
hydrographnum), peakhr(eventnum, hydrographnum) * 60 + peakmin(eventnum, hydrographnum)
  NEXT eventnum
  PRINT #2,
PRINT
'WHILE INKEY$ = "": WEND
NEXT hydrographnum
PRINT #2,
PRINT #2, DATE$; "  "; TIME$
PRINT #2, "Summary File: "; filename$
CLOSE #2
'***
'*** PRINT OUT PEAK AND TIME TO PEAK PROFILE TABLE
'***
'PRINT filename2$
OPEN filename2$ FOR INPUT AS #1
OPEN filename3$ FOR OUTPUT AS #2

IF condition = 4 THEN
  PRINT #2, "Element "; "100-YrPkQ "; "100-YrPkT "; "Station "; "Description "
ELSE
  PRINT #2, "Element "; "2-YrPkQ "; "2-YrPkT "; "5-YrPkQ "; "5-YrPkT "; "10-YrPkQ "; "10-YrPkT "; "25-YrPkQ "; "25-YrPkT "; "50-YrPkQ ";
"50-YrPkT "; "100-YrPkQ "; "100-YrPkT "; "Station "; "Description "
END IF
LINE INPUT #1, junk$
'PRINT junk$
WHILE NOT EOF(1)
  INPUT #1, sta, profelement, descrip$
'PRINT "***"
'PRINT sta, profelement, descrip$
  hydrographnum = 0
  WHILE hydrographid(hydrographnum) <> RTRIM$(LTRIM$(STR$(profelement))) AND hydrographnum <= numhydrographs
'PRINT hydrographnum, hydrographid(hydrographnum), RTRIM$(LTRIM$(STR$(profelement)))
    hydrographnum = hydrographnum + 1
  WEND
'PRINT "GOT MATCH"
'WHILE INKEY$ = "": WEND
  IF hydrographid <= numhydrographs THEN
      PRINT #2, hydrographid(hydrographnum);
      FOR eventnum = 1 TO numevents: PRINT #2, peakq(eventnum, hydrographnum); peakhr(eventnum, hydrographnum) * 60 + peakmin(eventnum,
hydrographnum); : NEXT eventnum
      PRINT #2, sta, descrip$
      PRINT #2,
  ELSE
      PRINT "WARNING: REQUESTED PROFILE ELEMENT "; RTRIM$(LTRIM$(STR$(profelement))); " WAS NOT IN THE OUTPUT HYDROGRAPH LISTING"
      WHILE INKEY$ = "": WEND
  END IF  'hydrographid <= numhydrographs
```

```
WEND 'NOT EOF(1)
PRINT #2,
PRINT #2, DATE$; "  "; TIME$
PRINT #2, "Summary File: "; filename3$

CLOSE #2
CLOSE #1
END
```

III-G

UDSWMM SUMMARY OUTPUT

TRI-TOWN BASIN, EXISTING CONDITION

2-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem153	Elem253	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156	Elem755
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0	1
0	20	2	0	2	0	1	0	0	0	1	0	2	1	4
0	25	7	1	10	0	5	0	2	0	4	0	11	8	15
0	30	20	5	24	1	13	0	6	2	12	3	33	25	34
0	35	40	14	40	2	23	1	17	10	28	12	63	49	58
0	40	62	27	53	5	34	2	35	26	51	30	97	78	87
0	45	83	41	63	10	45	7	61	50	81	55	130	107	116
0	50	99	53	71	17	58	15	90	79	113	85	160	135	143
0	55	110	63	78	26	71	27	106	95	145	118	188	164	172
1	0	119	73	86	37	87	41	127	116	177	151	219	196	204
1	5	127	82	97	50	104	58	153	142	211	185	253	231	240
1	10	137	93	110	65	125	78	183	172	245	221	286	265	272
1	15	141	99	125	82	149	102	215	205	278	255	312	292	297
1	20	144	104	133	94	175	129	248	239	306	284	328	310	313
1	25	148	110	140	104	204	158	279	270	326	305	334	318	318
1	30	152	116	150	116	232	189	304	295	337	318	331	316	315
1	35	156	123	161	130	260	218	321	313	341	322	323	310	308
1	40	162	130	174	145	285	244	332	324	338	320	314	301	299
1	45	170	139	189	162	305	266	336	328	331	315	302	291	288
1	50	179	150	205	179	321	284	334	327	321	306	289	279	276
1	55	189	162	221	197	331	296	329	322	310	295	276	266	263
2	0	201	175	236	213	337	303	320	314	297	284	262	254	251
2	5	213	188	250	229	338	306	310	304	284	271	249	241	237
2	10	225	202	262	243	335	306	298	293	270	258	235	228	225
2	15	238	216	273	254	330	302	286	281	257	246	223	216	213
2	20	250	229	281	264	323	297	273	269	244	233	212	205	203
2	25	261	241	288	271	314	289	261	256	232	222	202	195	193
2	30	271	252	292	276	304	280	249	245	221	211	192	186	183
2	35	280	261	294	279	293	271	237	233	210	201	182	176	174
2	40	286	268	294	280	282	261	226	222	199	191	172	167	165
2	45	291	274	293	280	271	251	215	211	189	181	163	159	157
2	50	294	278	290	278	260	241	205	201	180	172	155	151	148
2	55	296	280	286	275	249	231	195	192	171	163	147	143	141
3	0	296	281	281	270	238	221	185	182	162	155	139	135	133
3	5	294	281	276	265	227	211	176	173	154	147	132	128	126
3	10	292	279	269	260	217	202	168	165	146	140	124	121	119
3	15	288	276	262	253	207	193	159	157	137	132	116	113	110
3	20	283	272	255	247	197	184	151	148	129	124	107	104	102
3	25	277	267	247	240	187	176	143	140	121	116	99	96	94
3	30	271	262	239	233	178	167	134	132	112	108	91	89	87
3	35	265	256	231	225	169	159	126	124	104	100	83	82	80
3	40	257	249	223	218	160	151	118	116	97	93	76	76	73
3	45	250	243	215	210	151	143	111	109	89	86	69	69	67
3	50	242	236	206	202	143	135	103	101	82	79	63	63	61
3	55	235	228	198	195	135	127	96	94	75	73	57	57	55
4	0	227	221	190	187	126	120	87	87	69	66	52	52	50
4	5	219	214	182	179	118	112	81	81	63	61	47	47	45
4	10	211	206	174	172	110	105	72	72	58	56	43	43	41
4	15	203	199	166	164	102	97	61	61	53	51	39	39	37
4	20	196	191	158	157	94	89	54	54	49	47	35	35	34
4	25	188	184	151	149	86	82	49	49	44	43	32	32	31
4	30	180	177	142	142	79	75	45	45	41	39	29	29	28
4	35	172	169	135	135	73	69	41	41	37	36	27	27	26
4	40	165	162	128	128	67	64	37	37	33	33	24	24	23
4	45	158	155	121	121	61	59	34	34	30	30	22	22	21
4	50	150	148	115	115	57	54	31	31	28	28	20	20	20
4	55	143	141	108	108	51	50	28	28	25	25	19	19	18
5	0	137	135	102	102	47	46	26	26	23	23	17	17	17
5	5	130	129	96	96	43	42	24	24	22	22	16	16	15
5	10	121	122	90	90	40	39	22	22	20	20	15	15	14
5	15	118	116	81	81	37	36	21	21	18	18	13	13	13
5	20	108	109	70	70	34	34	19	19	17	17	12	12	12
5	25	103	102	61	61	32	31	18	18	16	16	11	11	11
5	30	89	90	54	54	30	29	16	16	15	15	10	10	10
5	35	71	70	48	48	28	27	15	15	13	13	10	10	9
5	40	56	58	43	43	26	25	14	14	12	12	9	9	8
5	45	51	50	39	39	24	24	13	13	12	12	8	8	8
5	50	43	44	36	36	22	22	12	12	11	11	8	8	7
5	55	41	40	33	33	21	20	11	11	10	10	7	7	7
6	0	35	36	30	30	19	19	10	10	9	9	6	6	6
Peak	(cfs)	296	281	294	280	338	306	336	328	341	322	334	318	318
Peak	(hrs)	2	3	2	2	2	2	1	1	1	1	1	1	1
Peak	(min)	55	0	35	40	5	5	45	45	35	35	25	25	25
Peak	(cfs_or_ac.ft.)	0	4	0	4	0	4	0	4	0	3	0	5	0
Case	(( ),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4	3197.4
Peak/Area	(cfs/ac)	0.04	0.05	0.05	0.05	0.06	0.07	0.08	0.08	0.08	0.10	0.10	0.10	0.10
11-23-1999	15:54:10													
Summary	File:	P:\coweld01\existi~1\TriTow~1\2_Year\udswmm\ttxc2yr.txt												

TRI-TOWN BASIN, EXISTING CONDITION

2-YEAR

Time(Hrs)	Time(Min)	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761	Elem61	Elem261
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	1	0	0	0	0	0	0	0	0	0	0	0	0
0	20	4	0	1	0	3	0	1	0	0	0	0	0	1
0	25	13	0	4	3	12	0	5	0	0	0	0	0	7
0	30	27	3	14	11	26	2	12	0	0	0	4	4	28
0	35	42	10	30	24	40	8	22	0	4	4	17	17	68
0	40	57	25	47	40	54	18	38	2	19	19	42	42	102
0	45	72	43	66	57	72	36	61	13	47	47	74	74	130
0	50	90	64	89	79	99	62	95	38	82	82	106	106	154
0	55	113	91	120	109	134	98	135	72	115	115	134	134	172
1	0	144	125	158	147	173	138	172	107	142	142	157	157	184
1	5	180	163	196	184	206	175	201	137	163	163	173	173	191
1	10	215	200	227	215	231	204	222	159	177	177	183	183	193
1	15	243	230	249	238	248	223	233	174	185	185	188	188	192
1	20	262	250	262	250	255	233	238	183	188	188	189	189	188
1	25	271	261	265	255	254	236	236	186	188	188	186	186	181
1	30	272	264	263	253	251	234	232	186	184	184	182	182	174
1	35	269	261	258	248	244	229	225	183	179	179	176	176	166
1	40	262	255	250	241	236	222	216	178	172	172	168	168	158
1	45	254	247	241	232	227	214	207	172	165	165	161	161	149
1	50	245	238	231	222	216	204	197	164	157	157	152	152	141
1	55	235	228	220	212	206	195	187	157	149	149	144	144	133
2	0	224	218	209	202	195	185	177	149	141	141	137	137	125
2	5	213	207	199	191	185	175	168	141	134	134	129	129	118
2	10	202	197	188	181	175	166	159	134	126	126	122	122	111
2	15	192	187	179	172	166	157	150	126	119	119	115	115	104
2	20	183	177	170	163	158	149	142	119	112	112	108	108	98
2	25	174	168	161	155	149	141	135	113	106	106	102	102	93
2	30	166	160	153	147	142	134	128	107	100	100	97	97	88
2	35	157	152	145	139	134	127	121	101	95	95	92	92	84
2	40	149	144	138	132	127	121	115	96	90	90	87	87	79
2	45	142	137	131	125	121	115	109	91	85	85	81	81	72
2	50	134	130	125	119	115	109	103	85	80	80	76	76	66
2	55	128	124	118	113	108	103	97	80	74	74	70	70	61
3	0	121	118	112	107	102	97	91	75	69	69	65	65	57
3	5	114	111	105	100	96	91	86	70	64	64	61	61	53
3	10	108	105	99	94	89	85	80	65	60	60	56	56	48
3	15	100	98	92	87	82	80	74	61	55	55	52	52	44
3	20	93	92	85	81	77	74	69	56	51	51	48	48	39
3	25	86	85	79	75	71	69	63	52	47	47	43	43	35
3	30	80	79	73	69	65	63	58	48	42	42	39	39	31
3	35	74	73	67	64	59	58	53	44	38	38	35	35	27
3	40	68	68	62	58	54	53	48	40	35	35	31	31	24
3	45	62	62	56	53	49	48	43	36	31	31	28	28	21
3	50	57	57	51	48	44	44	39	33	28	28	25	25	18
3	55	52	52	47	44	40	39	35	29	25	25	22	22	16
4	0	47	47	42	40	36	36	31	26	22	22	19	19	14
4	5	43	43	38	36	33	32	28	23	19	19	17	17	12
4	10	39	39	35	32	29	29	25	21	17	17	15	15	10
4	15	36	36	32	29	26	26	23	19	15	15	13	13	9
4	20	33	33	29	27	24	24	20	17	14	14	12	12	8
4	25	30	30	26	24	22	21	18	15	12	12	11	11	7
4	30	27	27	24	22	20	19	17	14	11	11	9	9	6
4	35	25	25	22	20	18	18	15	12	10	10	8	8	6
4	40	23	23	20	18	16	16	14	11	9	9	7	7	5
4	45	21	21	18	16	15	14	12	10	8	8	7	7	4
4	50	19	19	17	15	13	13	11	9	7	7	6	6	4
4	55	17	17	15	14	12	12	10	8	6	6	5	5	3
5	0	16	16	14	12	11	11	9	7	6	6	5	5	3
5	5	15	15	13	11	10	10	8	7	5	5	4	4	3
5	10	13	13	12	10	9	9	8	6	5	5	4	4	2
5	15	12	12	11	9	8	8	7	5	4	4	4	4	2
5	20	11	11	10	9	8	8	6	5	4	4	3	3	2
5	25	10	10	9	8	7	7	6	5	3	3	3	3	2
5	30	10	10	8	7	7	6	5	4	3	3	3	3	2
5	35	9	9	8	7	6	6	5	4	3	3	2	2	1
5	40	8	8	7	6	6	5	5	3	3	3	2	2	1
5	45	8	8	6	6	5	5	4	3	2	2	2	2	1
5	50	7	7	6	5	5	5	4	3	2	2	2	2	1
5	55	6	6	5	5	4	4	4	3	2	2	2	2	1
6	0	6	6	5	5	4	4	3	3	2	2	2	2	1
Peak	(cfs)	272	264	265	255	255	236	238	186	188	188	189	189	193
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	30	30	25	25	20	25	20	25	20	20	20	20	10
Peak	(cfs_or_ac.ft.)	0	3	0	4	0	3	0	3	0	3	0	4	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7	1726.7	1726.7
Peak/Area	(cfs/ac)	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
11-23-1999	15:54:10													
Summary	File:													

TRI-TOWN BASIN, EXISTING CONDITION

2-YEAR

Time(Hrs)	Time(Min)	Elem162	Elem262	Elem163	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0.17
0	15	0	1	0	0	0	0	0	0.25
0	20	0	10	0	1	1	0	1	0.33
0	25	4	43	0	4	2	1	3	0.42
0	30	17	105	2	9	5	1	9	0.50
0	35	48	177	5	14	8	3	16	0.58
0	40	74	221	9	16	9	4	22	0.67
0	45	96	226	12	16	10	5	26	0.75
0	50	114	207	13	15	11	7	28	0.83
0	55	126	181	14	14	12	8	28	0.92
1	0	133	157	14	14	12	8	27	1.00
1	5	135	137	14	13	13	9	26	1.08
1	10	134	122	13	12	13	10	25	1.17
1	15	131	109	12	11	13	10	24	1.25
1	20	127	97	12	10	13	11	23	1.33
1	25	121	87	11	9	13	11	21	1.42
1	30	115	78	10	8	14	11	20	1.50
1	35	109	71	9	7	14	12	18	1.58
1	40	103	66	8	7	14	12	17	1.67
1	45	97	62	7	6	14	12	16	1.75
1	50	92	58	7	6	14	12	15	1.83
1	55	87	55	6	5	12	12	14	1.92
2	0	82	52	6	5	12	12	13	2.00
2	5	77	47	5	4	12	12	13	2.08
2	10	73	45	5	4	12	12	12	2.17
2	15	69	44	4	4	12	12	11	2.25
2	20	65	44	4	3	12	12	11	2.33
2	25	62	45	4	3	12	12	10	2.42
2	30	59	43	3	3	12	12	10	2.50
2	35	56	40	3	3	12	12	9	2.58
2	40	53	37	3	2	12	12	8	2.67
2	45	48	34	3	2	12	12	8	2.75
2	50	44	31	3	2	12	12	8	2.83
2	55	40	30	2	2	12	12	7	2.92
3	0	37	28	2	2	12	12	7	3.00
3	5	35	27	2	2	12	12	6	3.08
3	10	32	24	2	1	12	12	6	3.17
3	15	30	20	2	0	12	12	5	3.25
3	20	27	15	1	0	12	12	5	3.33
3	25	23	11	1	0	11	11	5	3.42
3	30	20	8	1	0	11	11	4	3.50
3	35	17	6	0	0	11	11	4	3.58
3	40	14	4	0	0	11	11	4	3.67
3	45	12	3	0	0	11	11	3	3.75
3	50	10	2	0	0	10	10	3	3.83
3	55	9	2	0	0	10	10	3	3.92
4	0	7	1	0	0	10	10	3	4.00
4	5	6	1	0	0	10	10	2	4.08
4	10	5	1	0	0	10	10	2	4.17
4	15	4	1	0	0	9	9	2	4.25
4	20	4	0	0	0	9	9	2	4.33
4	25	3	0	0	0	9	9	2	4.42
4	30	3	0	0	0	9	9	2	4.50
4	35	3	0	0	0	9	9	1	4.58
4	40	2	0	0	0	9	9	0	4.67
4	45	2	0	0	0	8	8	0	4.75
4	50	2	0	0	0	8	8	0	4.83
4	55	2	0	0	0	8	8	0	4.92
5	0	1	0	0	0	8	8	0	5.00
5	5	1	0	0	0	8	8	0	5.08
5	10	1	0	0	0	8	8	0	5.17
5	15	1	0	0	0	8	8	0	5.25
5	20	1	0	0	0	7	7	0	5.33
5	25	1	0	0	0	7	7	0	5.42
5	30	1	0	0	0	7	7	0	5.50
5	35	1	0	0	0	7	7	0	5.58
5	40	1	0	0	0	7	7	0	5.67
5	45	1	0	0	0	7	7	0	5.75
5	50	0	0	0	0	7	7	0	5.83
5	55	0	0	0	0	6	6	0	5.92
6	0	0	0	0	0	6	6	0	6.00
Peak	(cfs)	135	226	14	16	14	12	28	
Peak	(hrs)	1	0	0	0	1	1	0	
Peak	(min)	5	45	55	40	30	35	50	
Peak	(cfs_or_ac.ft.)	2	0	0	0	0	4	0	
Case	(( ),S,I,D,O)	( )	( )	( )	( )	( )	(S)	( )	
Area	(ac)	823.7	823.7	288.0	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	0.16	0.27	0.05	0.06	0.03	0.03	0.04	
11-23-1999	15:54:10								
Summary	File:	P:\coweld01\existi~1\TriTow~1\2_Year\udswmm\ttxc2yr.txt							

TRI-TOWN BASIN, EXISTING CONDITION

5-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem153	Elem253	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156	Elem755
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	1	0	1	0	0	0	0	0	0	0	1	0	2
0	20	3	0	5	0	2	0	1	0	1	0	5	3	8
0	25	15	3	20	0	11	0	4	1	9	1	24	18	29
0	30	44	13	49	2	29	0	18	8	31	9	66	50	65
0	35	88	35	84	7	55	3	50	31	71	31	125	98	114
0	40	141	66	117	17	85	11	102	76	130	71	195	158	176
0	45	186	97	145	33	118	25	135	104	201	130	272	228	246
0	50	205	108	168	55	150	46	182	149	280	204	351	304	322
0	55	220	120	192	82	186	77	245	212	362	286	433	386	404
1	0	232	133	204	99	230	118	320	288	448	374	521	476	494
1	5	242	147	215	115	286	171	405	375	537	466	606	563	580
1	10	253	161	232	137	353	237	495	465	617	549	657	617	646
1	15	266	177	255	165	428	312	580	551	682	616	701	663	685
1	20	281	196	285	201	507	393	653	625	730	667	725	690	699
1	25	299	218	322	244	584	473	709	683	758	699	729	696	695
1	30	322	245	367	293	654	547	747	723	767	711	717	687	678
1	35	351	278	416	347	712	609	767	743	761	708	694	667	654
1	40	385	316	467	403	755	657	769	747	742	693	665	641	624
1	45	424	359	518	458	783	690	759	738	715	669	631	609	591
1	50	465	404	564	509	796	708	738	718	682	639	592	572	557
1	55	508	450	605	555	796	712	709	691	643	603	548	529	524
2	0	550	496	639	593	785	706	674	657	603	566	514	497	490
2	5	589	538	665	622	764	690	637	622	565	531	480	465	459
2	10	623	576	683	644	738	669	601	586	529	497	449	435	429
2	15	652	607	694	657	707	642	565	551	496	466	419	407	401
2	20	674	632	696	662	674	614	530	518	464	436	391	380	375
2	25	689	650	693	662	640	584	498	486	434	408	365	355	350
2	30	697	661	684	655	606	554	467	455	405	381	340	331	326
2	35	700	665	670	644	573	524	437	427	378	356	316	309	304
2	40	696	664	654	630	540	495	410	400	353	333	295	288	284
2	45	689	659	635	612	509	467	383	374	330	311	275	269	265
2	50	677	649	614	593	479	440	359	350	308	290	257	252	248
2	55	662	636	591	572	450	414	336	328	288	271	240	235	231
3	0	644	620	568	550	423	390	315	307	269	254	224	220	216
3	5	625	602	544	528	398	367	295	288	252	238	209	205	202
3	10	604	583	521	506	374	345	277	270	236	222	195	192	188
3	15	582	562	497	483	351	325	259	253	220	208	181	178	174
3	20	560	541	474	461	330	306	243	237	205	194	167	164	161
3	25	537	520	451	440	310	288	227	222	190	180	154	152	149
3	30	514	498	429	419	291	270	212	207	176	167	142	140	137
3	35	491	477	408	399	273	254	198	193	163	155	130	129	126
3	40	469	456	387	379	256	238	184	180	151	143	119	118	115
3	45	448	436	367	360	239	224	171	167	139	131	108	107	104
3	50	427	416	348	342	224	210	159	155	127	120	98	97	94
3	55	407	396	330	324	209	196	147	144	116	110	88	88	85
4	0	387	377	313	307	195	183	136	133	106	100	79	79	77
4	5	368	359	296	291	182	171	125	122	97	91	71	71	69
4	10	350	342	280	276	169	160	115	112	88	83	64	64	62
4	15	333	325	264	261	158	149	106	103	80	75	58	58	56
4	20	316	309	249	247	146	139	97	95	73	69	53	53	51
4	25	300	293	235	233	136	129	89	87	66	62	48	48	46
4	30	284	279	222	220	126	120	81	79	61	57	44	44	42
4	35	270	264	210	208	116	110	70	68	55	52	40	40	38
4	40	256	251	196	196	107	101	60	58	51	48	36	36	35
4	45	242	238	185	185	97	92	52	52	47	44	34	34	32
4	50	229	225	174	174	88	84	47	47	43	40	31	31	30
4	55	217	213	164	164	80	76	43	43	39	37	28	28	28
5	0	205	202	154	154	73	70	40	40	36	34	26	26	25
5	5	193	191	145	145	65	64	37	37	34	32	24	24	24
5	10	183	181	136	136	60	59	34	34	31	29	23	23	22
5	15	173	171	127	127	55	54	31	31	27	27	21	21	20
5	20	162	162	120	120	51	50	28	28	25	25	19	19	19
5	25	153	153	112	112	47	46	26	26	23	23	18	18	17
5	30	145	145	105	105	43	43	24	24	22	22	17	17	16
5	35	137	137	99	99	40	39	22	22	20	20	16	16	15
5	40	130	130	92	92	37	37	21	21	19	19	14	14	14
5	45	123	123	84	84	34	34	20	20	18	18	13	13	13
5	50	115	115	72	72	32	32	18	18	17	17	13	13	12
5	55	107	107	62	62	30	29	17	17	15	15	12	12	11
6	0	98	98	54	54	28	27	16	16	14	14	11	11	10
Peak	(cfs)	700	665	696	662	796	712	769	747	767	711	729	696	699
Peak	(hrs)	2	2	2	2	1	1	1	1	1	1	1	1	1
Peak	(min)	35	35	20	20	50	55	40	40	30	30	25	25	20
Peak	(cfs_or_ac.ft.)	0	4	0	4	0	6	0	4	0	5	0	6	0
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4	3197.4
Peak/Area	(cfs/ac)	0.10	0.11	0.11	0.12	0.14	0.16	0.17	0.18	0.19	0.21	0.22	0.22	0.22
11-23-1999	15:54:11													
Summary	File:	P:\coweld01\existi~1\TriTow~1\5_Year\udswmm\ttxc5yr.txt												

TRI-TOWN BASIN, EXISTING CONDITION

5-YEAR

Time(Hrs)	Time(Min)	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761	Elem61	Elem261
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	2	0	0	0	1	0	0	0	0	0	0	0	0
0	20	7	0	2	1	7	0	2	0	0	0	0	0	2
0	25	26	1	9	7	23	1	10	0	0	0	1	1	18
0	30	51	8	29	23	46	7	25	0	2	2	13	13	70
0	35	78	25	59	50	76	21	49	2	18	18	48	48	145
0	40	109	56	97	84	114	49	88	16	63	63	109	109	219
0	45	148	99	145	129	164	97	154	59	134	134	182	182	286
0	50	199	155	209	192	237	171	241	130	212	212	255	255	340
0	55	266	228	292	274	325	263	331	211	283	283	316	316	380
1	0	350	317	383	364	410	351	404	285	339	339	362	362	405
1	5	435	406	462	443	477	420	457	341	377	377	391	391	416
1	10	505	479	518	499	519	466	488	378	399	399	406	406	416
1	15	551	528	550	530	539	492	502	399	409	409	410	410	409
1	20	573	552	561	542	543	501	502	406	408	408	406	406	397
1	25	577	559	558	539	535	498	492	405	401	401	396	396	381
1	30	569	552	545	527	520	486	477	397	388	388	381	381	363
1	35	553	538	527	510	501	469	457	384	372	372	364	364	344
1	40	532	518	503	487	474	448	434	368	355	355	346	346	324
1	45	507	493	477	461	449	425	410	350	336	336	327	327	304
1	50	480	467	451	436	423	402	386	332	317	317	307	307	284
1	55	453	442	425	410	398	378	363	313	297	297	288	288	264
2	0	426	416	399	386	373	355	340	294	278	278	269	269	245
2	5	400	391	375	362	349	333	318	275	260	260	250	250	228
2	10	376	367	351	339	327	311	297	257	242	242	233	233	212
2	15	353	344	329	317	306	291	277	240	226	226	217	217	196
2	20	331	323	308	296	285	272	259	224	210	210	202	202	182
2	25	310	302	288	277	267	254	242	209	196	196	188	188	169
2	30	290	283	269	259	249	237	225	194	182	182	174	174	156
2	35	271	265	252	242	232	222	210	181	169	169	162	162	145
2	40	254	248	235	226	217	207	196	168	157	157	150	150	133
2	45	237	232	220	211	202	193	182	157	145	145	139	139	123
2	50	222	217	205	197	188	180	170	145	135	135	128	128	114
2	55	208	202	192	184	176	167	158	135	125	125	119	119	105
3	0	195	189	179	171	164	156	146	125	115	115	110	110	96
3	5	182	177	167	159	152	145	136	116	107	107	101	101	88
3	10	170	165	155	148	141	134	126	107	98	98	93	93	80
3	15	158	154	144	137	130	125	117	99	90	90	85	85	71
3	20	146	143	133	127	120	115	107	91	82	82	76	76	61
3	25	135	132	123	117	111	106	98	83	74	74	67	67	52
3	30	125	122	113	108	101	97	88	75	65	65	59	59	44
3	35	115	112	103	98	91	88	79	67	57	57	51	51	38
3	40	105	103	94	89	82	78	70	59	50	50	45	45	33
3	45	96	93	85	80	73	70	62	52	44	44	39	39	29
3	50	87	85	76	71	65	62	55	46	39	39	34	34	25
3	55	79	76	69	64	58	55	49	41	34	34	30	30	22
4	0	71	69	62	57	52	49	43	36	30	30	27	27	19
4	5	64	62	56	52	47	44	39	32	26	26	24	24	17
4	10	58	56	50	46	42	40	35	28	23	23	21	21	15
4	15	53	51	46	42	38	36	31	25	21	21	18	18	13
4	20	48	47	42	38	35	32	28	23	19	19	16	16	11
4	25	44	43	38	35	31	29	25	20	16	16	14	14	10
4	30	40	39	35	31	29	26	23	18	15	15	13	13	9
4	35	36	36	32	29	26	24	21	16	13	13	11	11	8
4	40	34	33	30	26	24	22	19	14	12	12	10	10	7
4	45	31	30	27	24	22	20	17	13	10	10	9	9	6
4	50	28	28	25	22	20	18	16	12	9	9	8	8	5
4	55	26	26	23	20	19	17	14	10	8	8	7	7	5
5	0	24	24	22	19	17	15	13	9	7	7	6	6	4
5	5	23	22	20	17	16	14	12	8	7	7	6	6	4
5	10	21	21	19	16	15	13	11	8	6	6	5	5	3
5	15	19	19	17	15	14	12	10	7	5	5	5	5	3
5	20	18	18	16	14	13	11	10	6	5	5	4	4	3
5	25	17	17	15	13	12	10	9	6	4	4	4	4	2
5	30	16	15	14	12	11	9	8	5	4	4	3	3	2
5	35	14	14	13	11	10	9	7	5	4	4	3	3	2
5	40	13	13	12	11	10	8	7	4	3	3	3	3	2
5	45	13	13	11	10	9	7	6	4	3	3	3	3	2
5	50	12	12	10	9	8	7	6	4	3	3	2	2	1
5	55	11	11	10	9	8	6	5	3	2	2	2	2	1
6	0	10	10	9	8	7	6	5	3	2	2	2	2	1
Peak	(cfs)	577	559	561	542	543	501	502	406	409	409	410	410	416
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	25	25	20	20	20	20	15	20	15	15	15	15	5
Peak	(cfs_or_ac.ft.)	0	5	0	5	0	5	0	4	0	4	0	6	0
Case	(()S,I,D,O)	()	()	()	()	()	()	()	()	()	()	()	()	()
Area	(ac)	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7	1726.7	1726.7
Peak/Area	(cfs/ac)	0.23	0.23	0.23	0.23	0.23	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
11-23-1999	15:54:11													
Summary	File:													

TRI-TOWN BASIN, EXISTING CONDITION

5-YEAR

Time(Hrs)	Time(Min)	Elem162	Elem262	Elem163	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0.17
0	15	0	3	0	0	0	0	0	0.25
0	20	1	21	0	1	1	0	1	0.33
0	25	9	80	1	9	6	1	7	0.42
0	30	38	189	7	29	12	3	22	0.50
0	35	79	328	22	52	16	5	41	0.58
0	40	122	415	40	64	19	8	58	0.67
0	45	170	424	53	66	21	10	70	0.75
0	50	211	391	58	64	23	12	76	0.83
0	55	239	349	60	61	24	14	77	0.92
1	0	255	308	60	57	25	16	74	1.00
1	5	262	272	57	52	25	17	71	1.08
1	10	261	241	54	47	26	19	68	1.17
1	15	255	216	50	43	26	20	66	1.25
1	20	246	193	45	39	27	21	63	1.33
1	25	234	173	41	36	27	21	59	1.42
1	30	222	156	37	32	27	22	56	1.50
1	35	209	142	34	30	27	23	52	1.58
1	40	196	129	31	27	27	23	49	1.67
1	45	184	118	28	24	27	23	46	1.75
1	50	172	107	26	22	27	23	43	1.83
1	55	160	97	23	19	26	24	40	1.92
2	0	149	89	21	17	26	24	37	2.00
2	5	139	83	19	15	26	24	34	2.08
2	10	130	77	17	14	26	24	32	2.17
2	15	121	73	15	12	25	24	30	2.25
2	20	113	67	14	11	25	23	28	2.33
2	25	106	60	12	10	25	23	26	2.42
2	30	99	54	11	9	23	23	24	2.50
2	35	92	49	10	8	23	23	22	2.58
2	40	85	45	9	7	23	23	21	2.67
2	45	79	41	8	6	22	22	19	2.75
2	50	73	38	7	6	22	22	18	2.83
2	55	68	36	7	5	22	22	17	2.92
3	0	63	34	6	5	22	22	15	3.00
3	5	58	32	5	4	21	21	14	3.08
3	10	54	29	5	4	21	21	13	3.17
3	15	47	25	4	3	21	21	12	3.25
3	20	40	20	4	3	20	20	11	3.33
3	25	34	16	3	2	20	20	10	3.42
3	30	29	13	3	0	20	20	10	3.50
3	35	25	10	2	0	19	19	9	3.58
3	40	21	8	1	0	19	19	8	3.67
3	45	18	6	1	0	19	19	7	3.75
3	50	15	5	1	0	18	18	7	3.83
3	55	13	5	1	0	18	18	6	3.92
4	0	11	4	0	0	18	18	6	4.00
4	5	10	3	0	0	17	17	5	4.08
4	10	9	2	0	0	17	17	5	4.17
4	15	7	2	0	0	17	17	5	4.25
4	20	6	1	0	0	16	16	4	4.33
4	25	5	1	0	0	16	16	4	4.42
4	30	5	1	0	0	16	16	4	4.50
4	35	4	1	0	0	15	15	3	4.58
4	40	4	1	0	0	15	15	3	4.67
4	45	3	0	0	0	15	15	3	4.75
4	50	3	0	0	0	15	15	3	4.83
4	55	2	0	0	0	14	14	2	4.92
5	0	2	0	0	0	14	14	2	5.00
5	5	2	0	0	0	14	14	2	5.08
5	10	2	0	0	0	13	13	2	5.17
5	15	1	0	0	0	13	13	0	5.25
5	20	1	0	0	0	13	13	0	5.33
5	25	1	0	0	0	13	13	0	5.42
5	30	1	0	0	0	12	12	0	5.50
5	35	1	0	0	0	12	12	0	5.58
5	40	1	0	0	0	12	12	0	5.67
5	45	1	0	0	0	12	12	0	5.75
5	50	1	0	0	0	11	11	0	5.83
5	55	1	0	0	0	11	11	0	5.92
6	0	1	0	0	0	11	11	0	6.00
Peak	(cfs)	262	424	60	66	27	24	77	
Peak	(hrs)	1	0	0	0	1	1	0	
Peak	(min)	5	45	55	45	20	55	55	
Peak	(cfs_or_ac.ft.)	3	0	0	0	0	8	0	
Case	(),S,I,D,O)	(_)	(_)	(_)	(_)	(_)	(S)	(_)	
Area	(ac)	823.7	823.7	288.0	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	0.32	0.51	0.21	0.23	0.05	0.06	0.11	
11-23-1999	15:54:11								
Summary	File:	P:\coweld01\existi~1\TriTow~1\5_Year\udswmm\ttxc5yr.txt							

TRI-TOWN BASIN, EXISTING CONDITION

10-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem153	Elem253	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156	Elem755
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	1	0	1	0	1	0	0	0	0	0	1	0	2
0	20	5	0	8	0	4	0	1	0	3	0	7	5	11
0	25	27	5	34	1	20	0	11	3	19	3	36	27	42
0	30	81	26	90	5	59	2	46	22	66	17	103	78	100
0	35	168	73	161	18	119	10	120	76	150	56	204	159	184
0	40	241	109	229	45	186	29	179	118	264	132	333	270	301
0	45	293	135	291	87	255	61	264	193	402	244	477	403	431
0	50	337	166	314	109	328	112	379	305	549	382	614	536	562
0	55	370	198	333	136	413	185	514	441	689	523	727	649	716
1	0	397	229	358	173	513	282	656	587	820	662	858	783	874
1	5	422	261	396	221	632	400	800	735	954	804	995	925	1001
1	10	451	298	447	283	764	533	943	879	1082	939	1099	1034	1081
1	15	489	341	513	359	903	675	1074	1013	1183	1046	1158	1097	1119
1	20	535	393	594	449	1040	816	1181	1122	1246	1116	1178	1122	1126
1	25	591	456	682	547	1118	901	1253	1197	1272	1149	1169	1118	1109
1	30	656	528	770	644	1166	959	1290	1237	1267	1152	1140	1093	1075
1	35	726	606	852	736	1204	1008	1295	1246	1239	1132	1096	1054	1029
1	40	800	687	927	820	1233	1047	1276	1230	1196	1097	1044	1006	977
1	45	873	767	994	895	1252	1076	1240	1197	1143	1050	988	954	924
1	50	944	844	1053	961	1261	1096	1192	1152	1085	999	931	900	868
1	55	1010	915	1101	1016	1261	1105	1137	1099	1025	944	873	845	812
2	0	1068	979	1140	1061	1251	1106	1078	1043	964	888	815	789	757
2	5	1118	1034	1168	1095	1234	1098	1017	984	903	833	759	736	705
2	10	1158	1080	1186	1119	1209	1082	957	926	844	778	706	685	656
2	15	1189	1116	1195	1133	1179	1061	897	868	786	726	655	636	609
2	20	1209	1141	1195	1138	1143	1034	838	811	731	675	604	587	566
2	25	1221	1157	1187	1135	1103	1002	781	756	675	623	549	534	525
2	30	1223	1164	1172	1125	1059	966	726	702	622	574	507	494	487
2	35	1218	1163	1151	1108	1012	925	673	651	575	530	470	459	452
2	40	1206	1155	1124	1085	959	879	624	603	532	491	435	426	419
2	45	1187	1139	1090	1054	887	813	579	560	493	455	403	395	389
2	50	1160	1116	1048	1015	801	733	538	520	457	422	373	366	360
2	55	1127	1086	999	969	729	667	500	483	425	392	346	340	334
3	0	1088	1050	947	920	668	611	465	450	394	364	321	316	310
3	5	1045	1009	895	870	615	563	433	418	366	339	298	293	288
3	10	998	965	843	820	569	521	403	390	340	315	276	272	267
3	15	950	919	793	773	527	483	375	363	316	292	255	251	246
3	20	901	873	746	727	489	449	349	338	293	271	234	231	227
3	25	854	827	700	684	454	418	325	314	271	251	216	213	209
3	30	807	783	658	643	423	389	302	292	250	232	199	197	193
3	35	762	740	617	604	393	362	280	271	231	214	182	181	177
3	40	719	699	580	568	366	338	260	251	213	198	167	167	163
3	45	678	659	544	533	341	315	241	233	197	182	153	153	149
3	50	639	622	511	501	317	294	223	216	181	167	139	139	135
3	55	602	586	480	471	295	274	207	200	166	154	126	126	123
4	0	568	553	451	443	274	255	191	185	152	140	114	114	111
4	5	535	521	423	416	255	237	176	170	138	128	103	103	99
4	10	504	492	397	391	237	221	162	157	126	116	92	92	89
4	15	475	463	372	367	220	205	149	144	115	106	83	83	80
4	20	447	436	348	345	204	191	137	132	104	96	75	75	72
4	25	421	411	327	324	189	177	126	121	95	87	68	68	65
4	30	396	387	307	305	175	164	115	111	86	79	61	61	59
4	35	373	365	288	286	162	152	106	102	78	72	56	56	54
4	40	352	344	270	269	150	141	97	94	72	66	51	51	50
4	45	331	324	254	252	138	131	88	86	66	60	47	47	46
4	50	312	306	237	237	128	121	78	78	60	55	43	43	42
4	55	294	288	223	223	117	111	67	67	56	51	40	40	39
5	0	276	272	209	209	106	101	58	58	51	47	37	37	36
5	5	259	256	196	196	95	92	52	52	47	43	34	34	33
5	10	244	241	183	183	86	84	48	48	44	40	31	31	31
5	15	229	227	171	171	78	76	44	44	40	37	29	29	28
5	20	216	214	160	160	71	70	40	40	36	35	27	27	26
5	25	203	202	150	150	65	64	36	36	32	32	25	25	24
5	30	190	190	140	140	60	59	33	33	30	30	23	23	23
5	35	179	179	131	131	55	54	31	31	28	28	22	22	21
5	40	169	169	123	123	51	50	28	28	26	26	20	20	20
5	45	160	160	115	115	47	46	26	26	24	24	19	19	18
5	50	151	151	108	108	43	43	25	25	23	23	18	18	17
5	55	142	142	101	101	40	39	23	23	21	21	16	16	16
6	0	134	134	95	95	37	37	22	22	20	20	15	15	15
Peak	(cfs)	1223	1164	1195	1138	1261	1106	1295	1246	1272	1152	1178	1122	1126
Peak	(hrs)	2	2	2	2	1	2	1	1	1	1	1	1	1
Peak	(min)	30	30	15	20	50	0	35	35	25	30	20	20	20
Peak	(cfs_or_ac.ft.)	0	4	0	5	0	6	0	5	0	6	0	7	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4	3197.4
Peak/Area	(cfs/ac)	0.18	0.19	0.19	0.21	0.23	0.25	0.29	0.30	0.31	0.34	0.35	0.35	0.35
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Summary	File:	P:\coweld01\existi~1\TriTow~1\10_Year\udswmm\ttxc10yr.txt												

TRI-TOWN BASIN, EXISTING CONDITION

10-YEAR

Time(Hrs)	Time(Min)	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761	Elem61	Elem261
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	2	0	0	0	1	0	1	0	0	0	0	0	0
0	20	10	0	2	1	9	0	3	0	0	0	0	0	4
0	25	36	2	14	11	34	3	16	0	0	0	4	4	38
0	30	76	13	45	38	71	14	42	0	8	8	31	31	134
0	35	119	46	98	85	130	42	87	8	47	47	100	100	244
0	40	177	102	166	148	191	98	167	49	136	136	205	205	362
0	45	250	180	251	230	287	196	292	140	257	257	324	324	466
0	50	348	285	375	351	427	335	439	267	380	380	435	435	548
0	55	480	425	528	502	576	484	573	394	485	485	526	526	608
1	0	628	579	671	644	701	611	674	499	564	564	591	591	644
1	5	755	712	778	750	787	701	741	574	615	615	631	631	659
1	10	843	805	845	817	837	755	777	620	642	642	649	649	658
1	15	892	858	878	850	857	781	789	643	651	651	652	652	648
1	20	911	880	885	857	856	786	784	648	647	647	643	643	630
1	25	907	879	873	846	838	775	766	642	634	634	626	626	605
1	30	886	862	849	822	810	754	739	626	613	613	603	603	576
1	35	856	834	817	791	777	725	707	604	586	586	574	574	543
1	40	821	801	780	756	740	691	671	576	556	556	543	543	509
1	45	782	763	741	717	699	654	632	546	524	524	510	510	474
1	50	740	722	697	674	654	615	592	514	491	491	477	477	441
1	55	694	677	650	629	609	576	553	482	459	459	444	444	410
2	0	649	633	608	587	569	538	516	450	427	427	413	413	380
2	5	607	592	567	548	529	502	481	420	398	398	384	384	351
2	10	567	552	529	510	493	468	448	391	369	369	356	356	325
2	15	528	516	493	476	459	436	417	363	343	343	330	330	300
2	20	492	481	460	443	427	406	387	338	317	317	305	305	277
2	25	459	449	428	412	397	378	359	313	294	294	282	282	255
2	30	428	418	398	383	368	351	333	290	272	272	260	260	234
2	35	398	389	370	356	342	325	309	268	251	251	240	240	214
2	40	371	362	344	330	317	302	286	248	231	231	221	221	196
2	45	345	336	319	306	294	279	264	229	212	212	203	203	180
2	50	321	313	296	284	272	258	244	211	195	195	186	186	164
2	55	298	290	275	263	252	239	225	194	179	179	171	171	150
3	0	277	270	255	244	233	221	208	178	165	165	156	156	137
3	5	258	250	237	226	215	204	191	164	151	151	143	143	125
3	10	239	232	219	208	198	188	176	151	138	138	131	131	114
3	15	221	215	202	192	182	173	162	138	127	127	120	120	104
3	20	204	199	186	177	168	160	149	127	116	116	109	109	93
3	25	188	184	172	163	155	147	137	116	106	106	99	99	83
3	30	174	170	158	150	142	135	124	106	95	95	88	88	71
3	35	161	156	146	138	130	123	113	96	85	85	78	78	59
3	40	148	144	133	126	118	111	101	86	74	74	67	67	50
3	45	136	132	121	114	106	100	90	76	65	65	58	58	41
3	50	124	120	110	103	95	89	79	67	56	56	49	49	35
3	55	113	109	99	92	85	79	69	58	48	48	43	43	30
4	0	102	99	89	82	75	70	61	51	42	42	37	37	27
4	5	92	89	80	74	67	62	54	44	36	36	32	32	23
4	10	83	80	72	66	60	55	48	39	32	32	28	28	20
4	15	75	73	65	59	54	49	43	34	28	28	25	25	18
4	20	68	66	59	53	49	44	38	30	25	25	22	22	15
4	25	61	60	54	48	44	39	35	27	22	22	19	19	13
4	30	56	55	49	44	40	36	31	24	19	19	17	17	11
4	35	51	50	45	40	37	32	28	21	17	17	15	15	10
4	40	47	46	42	37	34	29	26	19	15	15	13	13	9
4	45	43	43	39	34	31	27	23	17	13	13	11	11	8
4	50	40	39	36	31	29	24	21	15	12	12	10	10	7
4	55	37	36	33	29	26	22	19	13	10	10	9	9	6
5	0	34	34	31	26	24	20	18	12	9	9	8	8	5
5	5	32	31	28	25	23	19	16	11	8	8	7	7	5
5	10	29	29	26	23	21	17	15	10	7	7	6	6	4
5	15	27	27	24	21	20	16	14	9	7	7	6	6	4
5	20	25	25	23	20	18	15	13	8	6	6	5	5	3
5	25	23	23	21	19	17	13	12	7	5	5	5	5	3
5	30	22	22	20	17	16	12	11	6	5	5	4	4	3
5	35	20	20	18	16	15	11	10	6	4	4	4	4	2
5	40	19	19	17	15	14	10	9	5	4	4	3	3	2
5	45	18	18	16	14	13	10	8	5	4	4	3	3	2
5	50	16	16	15	13	12	9	8	4	3	3	3	3	2
5	55	15	15	14	12	11	8	7	4	3	3	2	2	2
6	0	14	14	13	12	11	8	6	4	3	3	2	2	1
Peak	(cfs)	911	880	885	857	857	786	789	648	651	651	652	652	659
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	20	20	20	20	15	20	15	20	15	15	15	15	5
Peak	(cfs_or_ac.ft.)	0	6	0	6	0	6	0	5	0	5	0	7	0
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7	1726.7	1726.7
Peak/Area	(cfs/ac)	0.36	0.36	0.36	0.36	0.36	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
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Summary	File:													

TRI-TOWN BASIN, EXISTING CONDITION

10-YEAR

Time(Hrs)	Time(Min)	Elem162	Elem262	Elem163	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0.17
0	15	0	4	0	0	0	0	0	0.25
0	20	2	28	0	3	2	0	2	0.33
0	25	13	109	4	25	9	1	16	0.42
0	30	57	280	22	67	24	4	50	0.50
0	35	105	488	54	102	37	8	94	0.58
0	40	175	599	79	116	42	12	132	0.67
0	45	250	602	97	115	43	17	157	0.75
0	50	311	554	106	111	45	20	167	0.83
0	55	353	493	107	106	46	23	166	0.92
1	0	375	436	105	99	46	26	159	1.00
1	5	382	387	100	92	47	28	150	1.08
1	10	380	349	95	87	47	30	144	1.17
1	15	370	320	89	81	47	32	137	1.25
1	20	358	296	84	76	47	33	130	1.33
1	25	343	273	78	70	47	34	123	1.42
1	30	327	248	73	63	46	35	115	1.50
1	35	309	221	67	57	46	36	107	1.58
1	40	290	197	61	51	45	37	100	1.67
1	45	271	178	56	46	45	37	93	1.75
1	50	252	163	51	42	44	37	87	1.83
1	55	235	149	45	38	44	37	81	1.92
2	0	219	138	40	34	43	37	76	2.00
2	5	203	127	36	31	42	37	70	2.08
2	10	189	117	32	27	42	37	65	2.17
2	15	176	106	29	24	41	37	61	2.25
2	20	164	96	26	22	40	37	56	2.33
2	25	152	86	23	19	40	37	52	2.42
2	30	140	77	21	17	39	36	48	2.50
2	35	130	67	19	15	36	36	44	2.58
2	40	119	60	17	14	36	36	41	2.67
2	45	110	55	15	12	35	35	38	2.75
2	50	101	51	14	11	35	35	35	2.83
2	55	94	47	12	10	34	34	32	2.92
3	0	87	44	11	9	34	34	30	3.00
3	5	80	41	10	8	33	33	28	3.08
3	10	74	37	9	7	33	33	26	3.17
3	15	68	32	8	6	32	32	24	3.25
3	20	63	26	7	4	32	32	22	3.33
3	25	56	21	6	3	31	31	20	3.42
3	30	48	17	5	2	30	30	19	3.50
3	35	39	14	4	2	30	30	17	3.58
3	40	32	12	3	1	29	29	16	3.67
3	45	27	10	2	0	29	29	14	3.75
3	50	23	8	2	0	28	28	13	3.83
3	55	19	7	1	0	28	28	12	3.92
4	0	17	6	1	0	27	27	11	4.00
4	5	14	5	1	0	27	27	10	4.08
4	10	12	4	1	0	26	26	10	4.17
4	15	11	3	0	0	26	26	9	4.25
4	20	9	2	0	0	25	25	8	4.33
4	25	8	2	0	0	25	25	7	4.42
4	30	7	1	0	0	24	24	7	4.50
4	35	6	1	0	0	24	24	6	4.58
4	40	5	1	0	0	23	23	6	4.67
4	45	4	1	0	0	23	23	5	4.75
4	50	4	1	0	0	22	22	5	4.83
4	55	3	0	0	0	22	22	5	4.92
5	0	3	0	0	0	22	22	4	5.00
5	5	2	0	0	0	21	21	4	5.08
5	10	2	0	0	0	21	21	3	5.17
5	15	2	0	0	0	20	20	2	5.25
5	20	2	0	0	0	20	20	1	5.33
5	25	1	0	0	0	20	20	0	5.42
5	30	1	0	0	0	19	19	0	5.50
5	35	1	0	0	0	19	19	0	5.58
5	40	1	0	0	0	18	18	0	5.67
5	45	1	0	0	0	18	18	0	5.75
5	50	1	0	0	0	18	18	0	5.83
5	55	1	0	0	0	17	17	0	5.92
6	0	1	0	0	0	17	17	0	6.00
Peak	(cfs)	382	602	107	116	47	37	167	
Peak	(hrs)	1	0	0	0	1	1	0	
Peak	(min)	5	45	55	40	5	40	50	
Peak	(cfs_or_ac.ft.)	3	0	1	0	0	13	0	
Case	(),S,I,D,O)	()	()	()	()	()	(S)	()	
Area	(ac)	823.7	823.7	288.0	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	0.46	0.73	0.37	0.40	0.09	0.09	0.23	
11-23-1999	15:54:12								
Summary	File:	P:\coweld01\existi~1\TriTow~1\10_Year\udswmm\ttxc10yr.txt							

TRI-TOWN BASIN, EXISTING CONDITION

25-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem153	Elem253	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156	Elem755
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	1	0	1	0	0	0	0	0	0	0	1	0	2
0	20	3	0	4	0	2	0	1	0	1	0	5	4	8
0	25	14	2	18	0	10	0	4	1	8	1	23	17	27
0	30	65	18	82	3	54	1	37	15	57	11	86	66	92
0	35	183	75	200	18	148	9	136	76	172	49	215	165	196
0	40	302	123	342	58	277	34	236	136	353	144	413	328	374
0	45	415	174	461	106	423	83	394	262	594	312	663	548	592
0	50	526	241	537	148	585	172	612	461	856	527	854	721	850
0	55	624	316	603	210	771	311	870	713	1118	769	1123	982	1157
1	0	710	395	677	297	989	503	1151	996	1406	1056	1445	1304	1474
1	5	791	481	780	413	1241	741	1444	1294	1675	1334	1742	1604	1732
1	10	881	580	908	557	1442	932	1699	1551	1816	1483	1948	1816	1888
1	15	985	693	1048	713	1568	1057	1888	1742	1940	1617	2049	1925	1953
1	20	1100	818	1187	873	1686	1182	2032	1890	2041	1730	2075	1960	1964
1	25	1222	952	1323	1032	1797	1307	2138	2002	2111	1815	2060	1954	1945
1	30	1345	1090	1454	1186	1897	1428	2208	2080	2149	1872	2018	1922	1902
1	35	1467	1229	1579	1333	1986	1541	2244	2125	2158	1901	1955	1869	1840
1	40	1587	1366	1696	1472	2062	1644	2251	2141	2143	1905	1875	1799	1764
1	45	1703	1497	1803	1599	2124	1732	2234	2131	2106	1886	1786	1718	1678
1	50	1812	1620	1899	1713	2170	1804	2195	2099	2052	1848	1690	1630	1587
1	55	1912	1733	1982	1812	2199	1858	2139	2050	1984	1795	1590	1538	1491
2	0	2002	1835	2052	1896	2212	1895	2070	1986	1905	1730	1487	1440	1390
2	5	2079	1923	2107	1964	2210	1916	1989	1911	1817	1655	1376	1334	1278
2	10	2142	1997	2145	2015	2192	1920	1897	1825	1718	1568	1256	1219	1156
2	15	2191	2056	2169	2050	2160	1909	1797	1729	1609	1470	1136	1103	1043
2	20	2225	2099	2177	2069	2115	1883	1685	1623	1487	1359	1029	1000	947
2	25	2243	2127	2171	2073	2057	1843	1552	1493	1312	1193	937	912	866
2	30	2247	2140	2150	2062	1984	1788	1393	1339	1132	1023	858	836	794
2	35	2237	2137	2116	2035	1898	1718	1240	1190	1010	909	786	768	729
2	40	2213	2120	2068	1995	1804	1638	1113	1066	916	823	720	706	670
2	45	2176	2090	2009	1943	1707	1555	1008	965	837	751	660	648	616
2	50	2127	2048	1942	1882	1609	1470	919	879	766	687	603	593	568
2	55	2069	1995	1868	1814	1514	1387	841	804	700	627	543	534	524
3	0	2003	1935	1790	1741	1422	1306	771	736	639	572	498	490	484
3	5	1931	1868	1710	1665	1334	1227	707	675	587	525	461	454	447
3	10	1855	1796	1628	1587	1249	1152	651	621	541	484	424	419	412
3	15	1776	1722	1547	1510	1168	1079	600	572	499	446	391	386	379
3	20	1695	1645	1466	1433	1089	1009	554	528	460	411	359	355	348
3	25	1614	1569	1386	1356	1012	939	512	488	424	379	330	327	321
3	30	1534	1492	1307	1280	931	864	474	451	391	350	303	301	295
3	35	1453	1414	1225	1200	808	747	438	417	360	322	278	277	271
3	40	1371	1335	1137	1115	703	647	405	386	332	297	255	254	249
3	45	1287	1254	1050	1030	621	570	375	357	306	274	234	233	228
3	50	1204	1173	966	949	555	509	346	330	281	252	214	214	209
3	55	1121	1093	888	873	501	459	320	305	259	231	196	196	191
4	0	1042	1017	817	803	455	417	296	281	238	213	179	179	174
4	5	967	944	752	739	415	381	273	260	218	195	163	163	158
4	10	897	875	692	681	380	349	252	240	200	179	148	147	144
4	15	831	811	638	628	349	321	232	221	183	163	133	133	130
4	20	771	752	587	580	321	296	214	203	167	149	121	121	117
4	25	714	697	542	537	295	273	197	187	152	135	109	109	106
4	30	662	646	501	497	272	252	181	172	139	123	99	99	96
4	35	614	600	464	461	251	233	166	158	127	112	90	90	87
4	40	571	558	430	427	232	215	153	145	116	103	82	82	80
4	45	531	519	399	397	214	199	140	133	106	94	75	75	73
4	50	494	483	371	369	197	184	127	123	97	86	69	69	67
4	55	460	450	344	344	182	169	116	113	89	79	64	64	62
5	0	428	419	320	320	167	156	107	104	82	73	59	59	57
5	5	397	391	298	298	152	144	98	97	76	67	55	55	53
5	10	370	366	277	277	139	133	89	89	70	63	51	51	49
5	15	345	342	259	259	128	123	82	82	65	58	47	47	46
5	20	323	320	241	241	118	114	75	75	58	54	44	44	43
5	25	302	299	225	225	108	105	62	62	53	50	41	41	40
5	30	282	280	210	210	97	95	55	55	49	47	38	38	37
5	35	264	263	195	195	88	87	50	50	45	44	36	36	35
5	40	246	246	182	182	80	79	46	46	41	41	33	33	32
5	45	231	231	170	170	74	73	42	42	38	38	31	31	30
5	50	217	217	159	159	68	67	39	39	36	36	29	29	28
5	55	204	204	148	148	62	61	36	36	34	34	27	27	26
6	0	191	191	138	138	57	57	34	34	31	31	25	25	25
Peak	(cfs)	2247	2140	2177	2073	2212	1920	2251	2141	2158	1905	2075	1960	1964
Peak	(hrs)	2	2	2	2	2	2	1	1	1	1	1	1	1
Peak	(min)	30	30	20	25	0	10	40	40	35	40	20	20	20
Peak	(cfs_or_ac.ft.)	0	5	0	5	0	7	0	6	0	7	0	8	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4	3197.4
Peak/Area	(cfs/ac)	0.34	0.35	0.36	0.38	0.40	0.43	0.51	0.52	0.53	0.57	0.62	0.61	0.61
11-23-1999	15:54:13													
Summary	File:	P:\coweld01\existi~1\TriTow~1\25_Year\udswmm\ttxc25yr.txt												

TRI-TOWN BASIN, EXISTING CONDITION

25-YEAR

Time(Hrs)	Time(Min)	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761	Elem61	Elem261
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	2	0	0	0	1	0	0	0	0	0	0	0	0
0	20	7	0	2	1	7	0	2	0	0	0	0	0	2
0	25	24	1	9	7	22	1	9	0	0	0	1	1	16
0	30	76	9	36	29	66	10	41	0	3	3	18	18	103
0	35	136	41	103	89	152	41	95	4	34	34	86	86	262
0	40	228	116	206	185	249	111	198	41	136	136	227	227	458
0	45	350	235	341	312	394	248	379	157	318	318	424	424	662
0	50	517	408	545	510	629	466	628	357	539	539	635	635	841
0	55	752	652	818	779	903	733	884	589	748	748	825	825	987
1	0	1028	936	1091	1048	1147	976	1086	787	892	892	927	927	1090
1	5	1270	1187	1295	1250	1310	1144	1204	914	969	969	991	991	1151
1	10	1428	1353	1412	1365	1393	1235	1264	988	1025	1025	1044	1044	1176
1	15	1506	1440	1467	1419	1432	1283	1301	1042	1070	1070	1084	1084	1172
1	20	1539	1480	1491	1443	1449	1311	1321	1081	1099	1099	1106	1106	1147
1	25	1545	1493	1494	1447	1445	1322	1323	1103	1111	1111	1112	1112	1103
1	30	1531	1486	1478	1432	1423	1314	1306	1108	1106	1106	1101	1101	1046
1	35	1500	1461	1444	1401	1387	1290	1274	1096	1085	1085	1075	1075	982
1	40	1455	1421	1399	1357	1338	1251	1229	1070	1051	1051	1036	1036	913
1	45	1400	1370	1342	1302	1279	1201	1174	1032	1006	1006	987	987	843
1	50	1337	1309	1277	1239	1213	1143	1111	983	951	951	928	928	775
1	55	1266	1240	1204	1168	1138	1074	1037	922	879	879	846	846	711
2	0	1187	1163	1120	1085	1050	991	944	839	778	778	732	732	651
2	5	1096	1072	1022	989	947	894	840	745	686	686	658	658	595
2	10	996	974	920	889	850	801	754	667	623	623	599	599	544
2	15	901	881	833	803	771	725	688	607	569	569	548	548	497
2	20	822	802	762	734	707	663	630	555	521	521	501	501	454
2	25	753	736	701	674	649	609	579	509	477	477	458	458	414
2	30	694	677	644	619	594	560	532	466	437	437	419	419	377
2	35	639	623	593	569	547	515	489	428	400	400	383	383	343
2	40	589	574	546	523	501	474	450	392	365	365	350	350	312
2	45	543	529	502	481	462	436	413	359	334	334	319	319	284
2	50	502	488	464	443	425	401	379	328	305	305	291	291	258
2	55	464	451	428	409	392	369	348	300	278	278	265	265	234
3	0	430	417	396	377	361	339	320	274	254	254	241	241	212
3	5	398	386	365	347	333	312	293	250	231	231	219	219	191
3	10	368	356	337	320	305	286	269	228	210	210	199	199	173
3	15	339	329	310	294	280	262	246	208	190	190	180	180	156
3	20	312	303	285	270	257	240	225	189	173	173	163	163	141
3	25	288	279	263	248	235	220	205	172	157	157	147	147	124
3	30	266	257	241	227	215	200	186	156	141	141	132	132	110
3	35	245	237	221	208	197	182	168	141	127	127	118	118	98
3	40	226	217	203	190	179	165	152	127	113	113	105	105	86
3	45	207	199	186	173	163	150	137	114	101	101	94	94	75
3	50	191	183	170	158	148	135	124	102	90	90	82	82	61
3	55	175	167	155	143	134	122	110	91	78	78	70	70	50
4	0	160	153	141	130	121	109	98	79	67	67	60	60	42
4	5	146	140	128	117	109	97	86	69	58	58	51	51	36
4	10	133	127	116	106	98	86	76	60	49	49	44	44	31
4	15	120	116	105	95	88	76	67	52	43	43	38	38	26
4	20	109	105	96	86	79	68	60	45	37	37	32	32	23
4	25	99	96	87	77	71	61	53	39	32	32	28	28	19
4	30	90	87	80	70	65	54	48	34	28	28	24	24	17
4	35	82	80	73	64	59	49	43	30	24	24	21	21	14
4	40	75	74	67	58	54	44	39	27	21	21	18	18	12
4	45	69	68	62	53	50	40	35	23	19	19	16	16	11
4	50	64	63	58	49	46	36	32	21	16	16	14	14	9
4	55	59	58	53	45	42	33	29	18	14	14	12	12	8
5	0	55	54	50	42	39	30	27	16	13	13	11	11	7
5	5	51	50	46	39	37	28	25	14	11	11	10	10	6
5	10	47	47	43	37	34	25	23	13	10	10	8	8	5
5	15	44	44	40	34	32	23	21	11	9	9	7	7	5
5	20	41	41	38	32	30	22	19	10	8	8	7	7	4
5	25	38	38	35	30	28	20	18	9	7	7	6	6	4
5	30	36	36	33	28	26	18	16	8	6	6	5	5	3
5	35	34	33	31	27	25	17	15	7	6	6	5	5	3
5	40	31	31	29	25	23	16	14	7	5	5	4	4	3
5	45	29	29	27	23	22	14	13	6	5	5	4	4	2
5	50	27	27	25	22	21	13	12	5	4	4	3	3	2
5	55	26	26	23	21	19	12	11	5	4	4	3	3	2
6	0	24	24	22	20	18	11	10	4	3	3	3	3	2
Peak	(cfs)	1545	1493	1494	1447	1449	1322	1323	1108	1111	1111	1112	1112	1176
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	25	25	25	25	20	25	25	30	25	25	25	25	10
Peak	(cfs_or_ac.ft.)	0	7	0	8	0	7	0	6	0	6	0	8	0
Case	((),S,I,D,O)	()	()	()	()	()	()	()	()	()	()	()	()	()
Area	(ac)	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7	1726.7	1726.7
Peak/Area	(cfs/ac)	0.61	0.61	0.61	0.62	0.62	0.63	0.63	0.64	0.64	0.64	0.64	0.64	0.68
11-23-1999	15:54:13													
Summary	File:													

TRI-TOWN BASIN, EXISTING CONDITION

25-YEAR

Time(Hrs)	Time(Min)	Elem162	Elem262	Elem163	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0.17
0	15	0	3	0	0	0	0	0	0.25
0	20	1	22	0	1	1	0	1	0.33
0	25	9	78	1	7	5	1	7	0.42
0	30	41	213	13	59	33	3	46	0.50
0	35	93	488	55	135	66	8	122	0.58
0	40	178	778	106	189	86	15	209	0.67
0	45	300	928	159	209	95	23	282	0.75
0	50	425	930	189	208	101	31	329	0.83
0	55	525	862	200	205	103	37	349	0.92
1	0	590	778	201	197	103	43	350	1.00
1	5	624	701	196	189	103	48	341	1.08
1	10	634	636	188	178	103	52	333	1.17
1	15	628	580	179	168	101	56	323	1.25
1	20	612	529	168	155	99	59	311	1.33
1	25	587	477	156	141	97	62	296	1.42
1	30	557	423	143	127	95	64	277	1.50
1	35	522	372	130	113	93	65	257	1.58
1	40	485	326	117	102	90	66	238	1.67
1	45	447	287	106	91	88	67	220	1.75
1	50	411	256	95	81	86	67	204	1.83
1	55	376	230	86	73	84	68	189	1.92
2	0	345	210	78	65	82	68	175	2.00
2	5	317	192	70	59	80	67	162	2.08
2	10	292	176	64	52	78	67	150	2.17
2	15	268	161	57	47	77	67	139	2.25
2	20	247	147	52	41	75	66	128	2.33
2	25	228	132	45	37	73	66	118	2.42
2	30	210	119	40	33	71	65	109	2.50
2	35	193	107	35	29	68	64	101	2.58
2	40	177	96	31	26	66	63	93	2.67
2	45	163	86	28	23	64	62	86	2.75
2	50	150	77	25	21	61	61	79	2.83
2	55	137	69	22	18	60	60	73	2.92
3	0	126	63	20	16	59	59	67	3.00
3	5	116	58	18	15	58	58	62	3.08
3	10	107	52	16	13	58	58	57	3.17
3	15	98	45	14	11	57	57	53	3.25
3	20	90	38	13	10	56	56	49	3.33
3	25	82	32	11	6	55	55	45	3.42
3	30	74	26	9	5	54	54	41	3.50
3	35	67	22	7	3	53	53	38	3.58
3	40	60	18	5	3	52	52	35	3.67
3	45	52	16	4	2	51	51	32	3.75
3	50	42	14	3	2	50	50	30	3.83
3	55	34	12	3	0	49	49	27	3.92
4	0	29	10	2	0	48	48	25	4.00
4	5	24	8	1	0	47	47	23	4.08
4	10	20	7	1	0	46	46	21	4.17
4	15	17	5	1	0	45	45	20	4.25
4	20	14	4	1	0	44	44	18	4.33
4	25	12	3	0	0	43	43	17	4.42
4	30	10	2	0	0	43	43	15	4.50
4	35	9	2	0	0	42	42	14	4.58
4	40	7	1	0	0	41	41	13	4.67
4	45	6	1	0	0	40	40	12	4.75
4	50	5	1	0	0	39	39	11	4.83
4	55	5	1	0	0	39	39	10	4.92
5	0	4	1	0	0	38	38	9	5.00
5	5	3	1	0	0	37	37	9	5.08
5	10	3	0	0	0	36	36	8	5.17
5	15	3	0	0	0	36	36	7	5.25
5	20	2	0	0	0	35	35	4	5.33
5	25	2	0	0	0	34	34	3	5.42
5	30	2	0	0	0	34	34	2	5.50
5	35	2	0	0	0	33	33	2	5.58
5	40	1	0	0	0	32	32	0	5.67
5	45	1	0	0	0	32	32	0	5.75
5	50	1	0	0	0	31	31	0	5.83
5	55	1	0	0	0	31	31	0	5.92
6	0	1	0	0	0	30	30	0	6.00
Peak	(cfs)	634	930	201	209	103	68	350	
Peak	(hrs)	1	0	1	0	0	1	1	
Peak	(min)	10	50	0	45	55	55	0	
Peak	(cfs_or_ac.ft.)	3	0	1	0	0	24	0	
Case	(( ),S,I,D,O)	( )	( )	( )	( )	( )	(S)	( )	
Area	(ac)	823.7	823.7	288.0	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	0.77	1.13	0.70	0.73	0.20	0.17	0.48	
11-23-1999	15:54:13								
Summary	File:	P:\coweld01\existi~1\TriTow~1\25_Year\udswmm\ttxc25yr.txt							

TRI-TOWN BASIN, EXISTING CONDITION

50-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem153	Elem253	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156	Elem755
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	1	0	1	0	1	0	0	0	0	0	1	1	2
0	20	4	0	6	0	3	0	1	0	2	0	7	5	9
0	25	17	3	23	0	12	0	5	1	10	2	28	21	33
0	30	83	25	105	4	70	2	50	21	76	15	107	81	113
0	35	239	98	266	26	201	13	172	91	234	67	277	213	253
0	40	383	145	469	87	385	48	321	182	489	199	551	439	499
0	45	550	224	618	130	603	124	560	373	823	426	844	691	811
0	50	718	328	742	198	853	263	886	669	1192	722	1168	987	1212
0	55	874	446	860	302	1149	482	1275	1045	1604	1097	1624	1429	1671
1	0	1016	575	995	449	1493	781	1677	1447	1937	1424	2092	1894	2096
1	5	1156	718	1161	633	1722	987	2019	1795	2151	1647	2456	2262	2387
1	10	1304	877	1339	834	1898	1150	2295	2075	2369	1878	2658	2472	2527
1	15	1462	1050	1520	1044	2071	1325	2532	2316	2564	2089	2738	2564	2587
1	20	1626	1232	1699	1256	2241	1508	2727	2519	2717	2263	2765	2604	2615
1	25	1793	1418	1875	1468	2403	1696	2876	2679	2825	2396	2757	2612	2607
1	30	1957	1606	2048	1675	2553	1880	2977	2793	2889	2488	2719	2589	2574
1	35	2119	1792	2214	1875	2686	2052	3034	2862	2912	2542	2654	2537	2509
1	40	2277	1973	2371	2063	2801	2207	3050	2891	2902	2560	2559	2456	2416
1	45	2428	2147	2516	2236	2894	2339	3032	2884	2858	2542	2432	2341	2283
1	50	2571	2310	2646	2392	2963	2447	2981	2843	2783	2492	2280	2201	2138
1	55	2701	2459	2758	2526	3006	2527	2901	2772	2682	2413	2121	2051	1983
2	0	2817	2592	2849	2639	3023	2580	2796	2676	2563	2313	1962	1902	1835
2	5	2915	2705	2919	2727	3015	2606	2674	2563	2431	2201	1817	1763	1702
2	10	2992	2798	2965	2790	2983	2606	2541	2437	2295	2083	1680	1633	1572
2	15	3049	2868	2988	2830	2931	2584	2402	2306	2158	1962	1548	1506	1445
2	20	3083	2916	2989	2845	2862	2542	2261	2172	2020	1839	1414	1378	1312
2	25	3096	2941	2969	2839	2778	2485	2120	2037	1881	1714	1275	1244	1173
2	30	3088	2945	2931	2814	2683	2414	1977	1900	1739	1585	1138	1111	1042
2	35	3061	2929	2877	2771	2578	2332	1832	1760	1593	1451	1014	993	931
2	40	3017	2895	2809	2713	2466	2240	1681	1614	1431	1300	911	894	842
2	45	2958	2845	2729	2642	2345	2138	1499	1437	1183	1062	826	812	768
2	50	2885	2781	2637	2558	2213	2024	1305	1248	1019	908	754	742	703
2	55	2801	2704	2534	2463	2074	1901	1145	1092	908	805	689	679	644
3	0	2706	2617	2424	2359	1935	1778	1020	970	821	726	629	622	592
3	5	2603	2520	2308	2249	1802	1659	918	872	747	659	572	565	545
3	10	2492	2416	2189	2136	1676	1545	833	790	678	598	511	506	501
3	15	2378	2307	2070	2022	1557	1438	758	719	618	544	474	470	460
3	20	2261	2196	1953	1909	1446	1338	693	656	567	499	433	429	422
3	25	2144	2084	1838	1800	1343	1245	636	602	520	457	398	395	388
3	30	2029	1973	1728	1693	1247	1158	584	553	478	420	365	362	356
3	35	1916	1865	1623	1591	1157	1075	538	509	440	387	335	333	327
3	40	1807	1760	1522	1494	1071	997	496	469	405	355	307	305	299
3	45	1701	1658	1425	1400	986	919	458	432	372	327	281	280	274
3	50	1600	1560	1331	1308	886	825	422	399	342	300	257	256	251
3	55	1501	1464	1233	1212	749	694	390	368	314	276	235	235	230
4	0	1402	1368	1132	1114	647	597	360	339	289	253	215	214	210
4	5	1304	1273	1035	1019	569	523	332	313	265	232	196	196	191
4	10	1208	1180	945	930	506	465	306	288	243	213	178	178	174
4	15	1116	1090	862	849	454	417	282	266	223	195	162	162	158
4	20	1029	1005	785	776	411	377	260	245	204	178	147	147	143
4	25	948	925	716	710	373	343	239	225	186	163	134	134	130
4	30	872	852	655	651	341	313	220	207	170	149	121	121	118
4	35	803	784	601	597	312	287	203	191	156	136	110	110	108
4	40	740	723	552	549	286	264	187	176	143	124	101	101	98
4	45	683	667	508	506	263	243	172	162	131	114	92	92	90
4	50	631	616	468	466	242	224	155	149	120	105	85	85	83
4	55	583	570	431	431	222	206	142	137	110	96	78	78	76
5	0	539	527	398	398	203	189	130	127	102	89	72	72	70
5	5	496	489	369	369	184	174	120	117	94	82	67	67	65
5	10	459	453	341	341	169	161	110	109	87	76	62	62	61
5	15	425	421	316	316	154	149	101	101	80	70	58	58	56
5	20	395	392	293	293	142	137	93	93	72	65	54	54	52
5	25	367	365	272	272	131	127	85	85	65	61	50	50	49
5	30	342	340	253	253	121	117	78	78	60	57	47	47	45
5	35	319	317	235	235	109	108	66	66	55	53	43	43	42
5	40	296	296	219	219	100	99	58	58	51	50	41	41	40
5	45	276	276	204	204	91	90	52	52	46	46	38	38	37
5	50	258	258	190	190	83	82	47	47	43	43	35	35	34
5	55	242	242	177	177	76	75	44	44	41	41	33	33	32
6	0	226	226	165	165	70	69	41	41	38	38	31	31	30
Peak	(cfs)	3096	2945	2989	2845	3023	2606	3050	2891	2912	2560	2765	2612	2615
Peak	(hrs)	2	2	2	2	2	2	1	1	1	1	1	1	1
Peak	(min)	25	30	20	20	0	5	40	40	35	40	20	25	20
Peak	(cfs_or_ac.ft.)	0	5	0	6	0	7	0	6	0	7	0	8	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4	3197.4
Peak/Area	(cfs/ac)	0.46	0.48	0.49	0.52	0.55	0.59	0.69	0.71	0.71	0.76	0.82	0.82	0.82
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Summary	File:	P:\coweld01\existi~1\TriTow~1\50_Year\udswmm\ttxc50yr.txt												

TRI-TOWN BASIN, EXISTING CONDITION

50-YEAR

Time(Hrs)	Time(Min)	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761	Elem61	Elem261
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	2	0	0	0	2	0	1	0	0	0	0	0	0
0	20	9	0	2	1	8	0	3	0	0	0	0	0	3
0	25	28	2	11	9	26	2	12	0	0	0	2	2	21
0	30	92	12	45	38	83	14	52	0	5	5	25	25	134
0	35	175	56	134	117	196	58	128	8	51	51	119	119	339
0	40	304	160	278	251	337	161	278	67	196	196	314	314	612
0	45	487	335	483	446	565	364	542	240	454	454	591	591	900
0	50	750	602	797	751	913	685	897	527	760	760	880	880	1160
0	55	1105	967	1185	1133	1286	1046	1220	816	972	972	1014	1014	1375
1	0	1473	1347	1520	1463	1561	1321	1419	1011	1096	1096	1146	1146	1528
1	5	1744	1629	1729	1669	1720	1487	1546	1150	1229	1229	1274	1274	1615
1	10	1886	1784	1829	1767	1825	1604	1652	1278	1346	1346	1383	1383	1644
1	15	1966	1877	1917	1853	1903	1697	1733	1385	1437	1437	1462	1462	1629
1	20	2023	1945	1981	1917	1949	1760	1781	1461	1494	1494	1507	1507	1581
1	25	2052	1984	2011	1948	1957	1788	1793	1503	1517	1517	1519	1519	1506
1	30	2060	2001	2004	1943	1927	1781	1770	1512	1508	1508	1501	1501	1416
1	35	2039	1988	1964	1906	1873	1743	1721	1492	1474	1474	1458	1458	1316
1	40	1990	1945	1900	1844	1797	1683	1651	1449	1419	1419	1398	1398	1213
1	45	1899	1860	1816	1763	1708	1606	1568	1388	1351	1351	1325	1325	1111
1	50	1796	1760	1713	1663	1610	1519	1476	1317	1273	1273	1245	1245	1014
1	55	1680	1647	1589	1542	1508	1426	1381	1238	1192	1192	1162	1162	922
2	0	1566	1536	1489	1443	1405	1331	1286	1156	1108	1108	1078	1078	839
2	5	1463	1434	1384	1341	1302	1236	1190	1073	1024	1024	993	993	762
2	10	1358	1331	1281	1240	1203	1142	1095	989	937	937	902	902	692
2	15	1255	1229	1177	1139	1098	1041	987	888	817	817	759	759	629
2	20	1144	1121	1063	1027	979	926	862	771	692	692	651	651	570
2	25	1027	1005	943	908	860	811	752	667	608	608	580	580	517
2	30	914	893	835	802	762	716	671	591	547	547	524	524	469
2	35	817	798	750	719	688	644	608	533	496	496	475	475	425
2	40	741	722	683	654	627	586	554	484	450	450	431	431	384
2	45	677	659	625	597	572	535	506	440	409	409	391	391	348
2	50	621	604	572	545	522	489	462	400	371	371	355	355	315
2	55	571	554	525	500	479	448	423	364	337	337	322	322	284
3	0	525	509	483	458	439	410	387	331	306	306	291	291	256
3	5	484	469	444	421	403	375	354	301	277	277	263	263	229
3	10	447	431	408	386	369	343	323	273	251	251	237	237	206
3	15	411	397	375	353	337	314	294	248	227	227	214	214	185
3	20	377	365	344	323	308	286	267	224	205	205	193	193	166
3	25	347	335	315	296	281	260	242	203	185	185	173	173	146
3	30	320	308	289	270	257	236	219	183	166	166	155	155	129
3	35	294	282	265	247	234	214	198	165	148	148	138	138	115
3	40	270	259	242	225	213	194	178	148	132	132	123	123	101
3	45	248	237	222	205	194	175	161	133	118	118	109	109	89
3	50	228	218	203	187	176	158	145	119	105	105	97	97	78
3	55	209	200	186	170	160	143	131	106	93	93	85	85	65
4	0	192	183	170	155	146	129	117	94	81	81	73	73	53
4	5	176	168	156	141	132	116	105	83	70	70	62	62	44
4	10	161	154	143	128	120	104	93	72	60	60	53	53	37
4	15	146	141	130	116	108	92	82	62	51	51	45	45	31
4	20	133	129	119	105	98	82	73	54	44	44	38	38	26
4	25	122	118	108	95	88	73	65	47	38	38	33	33	22
4	30	111	108	99	86	80	65	58	40	32	32	28	28	19
4	35	101	99	91	78	73	59	52	35	28	28	24	24	16
4	40	93	91	84	72	67	53	47	30	24	24	21	21	14
4	45	86	84	77	66	61	48	42	27	21	21	18	18	12
4	50	79	78	72	61	57	43	38	23	18	18	16	16	10
4	55	73	72	66	56	52	39	35	20	16	16	14	14	9
5	0	68	67	62	52	49	36	32	18	14	14	12	12	8
5	5	63	62	57	48	45	33	29	16	12	12	10	10	7
5	10	58	58	53	45	43	30	27	14	11	11	9	9	6
5	15	54	54	50	42	40	28	25	12	10	10	8	8	5
5	20	51	50	46	40	37	26	23	11	8	8	7	7	5
5	25	47	47	43	37	35	24	21	10	8	8	6	6	4
5	30	44	44	40	35	33	22	19	9	7	7	6	6	4
5	35	41	41	38	33	31	20	18	8	6	6	5	5	3
5	40	39	38	35	31	29	18	16	7	5	5	5	5	3
5	45	36	36	33	29	27	17	15	6	5	5	4	4	3
5	50	34	34	31	27	26	15	13	6	4	4	4	4	2
5	55	31	31	29	26	24	14	12	5	4	4	3	3	2
6	0	29	29	27	24	23	13	11	5	4	4	3	3	2
Peak	(cfs)	2060	2001	2011	1948	1957	1788	1793	1512	1517	1517	1519	1519	1644
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	30	30	25	25	25	25	25	30	25	25	25	25	10
Peak	(cfs_or_ac.ft.)	0	8	0	8	0	8	0	7	0	7	0	9	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7	1726.7	1726.7
Peak/Area	(cfs/ac)	0.81	0.82	0.82	0.83	0.83	0.86	0.86	0.88	0.88	0.88	0.88	0.88	0.95
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Summary	File:													

TRI-TOWN BASIN, EXISTING CONDITION

50-YEAR

Time(Hrs)	Time(Min)	Elem162	Elem262	Elem163	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0.17
0	15	0	5	0	0	0	0	0	0.25
0	20	2	28	0	2	1	0	1	0.33
0	25	12	91	1	9	6	1	8	0.42
0	30	51	255	18	77	45	4	61	0.50
0	35	109	598	72	182	94	10	166	0.58
0	40	222	995	151	259	126	20	290	0.67
0	45	391	1218	228	292	139	31	397	0.75
0	50	569	1240	271	295	150	41	470	0.83
0	55	714	1170	287	294	155	50	506	0.92
1	0	810	1069	288	284	155	59	513	1.00
1	5	860	963	281	271	154	66	504	1.08
1	10	873	865	268	253	152	72	491	1.17
1	15	860	777	252	235	148	77	475	1.25
1	20	830	694	234	215	144	82	454	1.33
1	25	788	614	215	194	140	85	429	1.42
1	30	738	537	195	174	136	88	400	1.50
1	35	683	468	176	155	132	89	370	1.58
1	40	627	407	159	139	128	91	342	1.67
1	45	572	356	142	124	124	91	316	1.75
1	50	520	315	128	110	120	92	292	1.83
1	55	472	283	115	99	117	92	270	1.92
2	0	430	257	103	88	114	92	249	2.00
2	5	392	235	93	79	111	91	230	2.08
2	10	358	214	84	70	108	91	213	2.17
2	15	328	194	75	63	105	90	196	2.25
2	20	300	176	68	56	102	89	181	2.33
2	25	275	159	61	49	100	88	167	2.42
2	30	252	142	55	44	97	87	154	2.50
2	35	231	127	49	39	92	86	142	2.58
2	40	211	113	42	35	89	85	131	2.67
2	45	193	102	37	31	86	84	121	2.75
2	50	177	92	33	27	84	82	111	2.83
2	55	162	83	29	24	81	81	103	2.92
3	0	148	75	26	22	79	79	95	3.00
3	5	136	69	23	19	78	78	87	3.08
3	10	125	62	21	17	77	77	81	3.17
3	15	115	54	19	15	75	75	74	3.25
3	20	105	46	17	13	74	74	68	3.33
3	25	96	39	14	8	73	73	63	3.42
3	30	87	32	11	6	71	71	58	3.50
3	35	79	27	9	4	70	70	53	3.58
3	40	71	23	7	3	69	69	49	3.67
3	45	63	20	5	2	67	67	45	3.75
3	50	56	18	4	2	66	66	42	3.83
3	55	47	15	3	0	65	65	38	3.92
4	0	38	11	2	0	64	64	35	4.00
4	5	31	9	1	0	62	62	33	4.08
4	10	25	7	1	0	61	61	30	4.17
4	15	21	6	1	0	60	60	28	4.25
4	20	17	4	1	0	59	59	25	4.33
4	25	14	3	0	0	58	58	23	4.42
4	30	12	3	0	0	57	57	22	4.50
4	35	10	2	0	0	56	56	20	4.58
4	40	8	1	0	0	54	54	18	4.67
4	45	7	1	0	0	53	53	17	4.75
4	50	6	1	0	0	52	52	15	4.83
4	55	5	1	0	0	51	51	14	4.92
5	0	4	1	0	0	50	50	13	5.00
5	5	4	1	0	0	49	49	12	5.08
5	10	3	0	0	0	48	48	11	5.17
5	15	3	0	0	0	48	48	10	5.25
5	20	3	0	0	0	47	47	6	5.33
5	25	2	0	0	0	46	46	4	5.42
5	30	2	0	0	0	45	45	3	5.50
5	35	2	0	0	0	44	44	2	5.58
5	40	2	0	0	0	43	43	2	5.67
5	45	1	0	0	0	42	42	0	5.75
5	50	1	0	0	0	41	41	0	5.83
5	55	1	0	0	0	41	41	0	5.92
6	0	1	0	0	0	40	40	0	6.00
Peak	(cfs)	873	1240	288	295	155	92	513	
Peak	(hrs)	1	0	1	0	0	1	1	
Peak	(min)	10	50	0	50	55	50	0	
Peak	(cfs_or_ac.ft.)	4	0	1	0	0	32	0	
Case	(()S,I,D,O)	(_)	(_)	(_)	(_)	(_)	(S)	(_)	
Area	(ac)	823.7	823.7	288.0	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	1.06	1.51	1.00	1.02	0.31	0.23	0.71	
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Summary	File:	P:\coweld01\existi~1\TriTow~1\50_Year\udswmm\ttxc50yr.txt							

TRI-TOWN BASIN, EXISTING CONDITION

100-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem153	Elem253	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156	Elem755
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	1	0	1	0	1	0	0	0	0	0	1	1	2
0	20	5	0	7	0	3	0	1	0	2	0	7	5	10
0	25	19	4	25	0	14	0	6	2	12	2	30	23	36
0	30	98	30	125	5	85	2	62	26	91	18	122	93	130
0	35	275	107	326	34	249	17	204	103	289	82	332	256	305
0	40	457	168	570	99	485	63	401	226	613	250	673	537	608
0	45	674	273	763	155	771	165	717	480	1029	528	999	811	1024
0'	50	896	412	933	250	1107	354	1144	867	1507	909	1488	1264	1552
0	55	1109	573	1104	396	1508	652	1646	1350	2010	1361	2091	1848	2129
1	0	1311	753	1297	597	1871	949	2115	1817	2299	1634	2654	2404	2616
1	5	1513	952	1521	834	2103	1141	2497	2201	2605	1943	3043	2795	2909
1	10	1722	1171	1752	1087	2339	1352	2841	2547	2907	2254	3233	2993	3039
1	15	1938	1403	1980	1352	2573	1585	3147	2859	3165	2530	3334	3107	3153
1	20	2153	1641	2202	1623	2801	1834	3399	3123	3367	2763	3412	3203	3234
1	25	2363	1880	2421	1894	3016	2088	3593	3333	3517	2950	3445	3257	3268
1	30	2568	2118	2638	2160	3215	2336	3729	3487	3614	3089	3426	3259	3249
1	35	2769	2353	2848	2416	3394	2569	3811	3587	3659	3176	3354	3207	3177
1	40	2965	2581	3049	2658	3548	2778	3842	3634	3656	3211	3239	3110	3063
1	45	3155	2800	3235	2881	3673	2957	3826	3633	3608	3197	3089	2977	2918
1	50	3334	3005	3401	3080	3765	3101	3767	3587	3520	3141	2917	2819	2750
1	55	3497	3193	3543	3252	3822	3208	3669	3502	3400	3050	2730	2644	2569
2	0	3641	3358	3658	3394	3844	3277	3541	3385	3253	2930	2531	2457	2375
2	5	3760	3499	3743	3503	3833	3310	3387	3242	3084	2786	2305	2240	2136
2	10	3853	3611	3797	3579	3789	3308	3211	3077	2895	2620	2071	2015	1919
2	15	3917	3693	3819	3622	3716	3274	3019	2895	2697	2444	1875	1826	1750
2	20	3952	3744	3812	3633	3618	3212	2822	2706	2504	2270	1717	1674	1608
2	25	3957	3765	3777	3615	3500	3128	2628	2520	2322	2106	1573	1536	1470
2	30	3935	3757	3716	3570	3367	3026	2442	2342	2149	1950	1430	1398	1328
2	35	3888	3723	3635	3502	3223	2911	2264	2171	1982	1799	1284	1258	1185
2	40	3818	3666	3535	3415	3073	2787	2093	2006	1820	1650	1142	1121	1049
2	45	3729	3588	3422	3313	2919	2657	1926	1846	1659	1503	1015	998	935
2	50	3624	3494	3297	3198	2762	2523	1761	1686	1493	1349	910	896	844
2	55	3506	3386	3164	3074	2602	2384	1572	1503	1247	1115	825	814	770
3	0	3378	3266	3023	2942	2436	2238	1367	1302	1052	930	755	746	708
3	5	3241	3138	2876	2803	2268	2087	1190	1130	929	816	693	686	652
3	10	3098	3003	2725	2659	2103	1939	1053	997	838	734	636	630	600
3	15	2950	2862	2572	2513	1946	1797	945	893	762	666	578	573	550
3	20	2799	2719	2421	2368	1800	1664	855	808	692	604	514	509	504
3	25	2649	2574	2273	2225	1665	1541	777	733	629	547	474	471	461
3	30	2500	2431	2131	2088	1540	1428	709	668	575	500	433	430	423
3	35	2355	2291	1995	1956	1425	1323	649	611	527	458	397	395	387
3	40	2214	2156	1866	1831	1319	1226	596	560	483	420	363	361	355
3	45	2080	2026	1744	1712	1221	1136	547	514	443	385	332	331	324
3	50	1951	1902	1629	1600	1128	1051	504	473	407	353	303	302	296
3	55	1829	1784	1520	1495	1040	970	464	435	373	324	276	276	270
4	0	1714	1672	1417	1394	951	888	427	401	342	296	252	252	246
4	5	1603	1564	1314	1294	823	766	393	369	314	272	230	230	225
4	10	1495	1460	1208	1190	697	646	362	339	287	249	210	209	205
4	15	1389	1356	1103	1087	603	557	333	312	263	228	191	191	187
4	20	1284	1254	1001	990	530	489	307	288	241	209	174	174	170
4	25	1184	1156	909	901	471	434	283	265	221	191	158	158	154
4	30	1088	1063	826	820	423	389	260	244	202	175	144	144	140
4	35	999	976	752	747	382	352	240	224	185	160	131	131	128
4	40	918	896	685	682	347	320	221	206	170	146	119	119	116
4	45	843	823	626	624	317	292	203	190	155	134	109	109	106
4	50	774	756	573	572	289	267	183	175	142	122	100	100	97
4	55	712	696	525	525	264	244	167	161	131	112	92	92	89
5	0	655	640	482	482	241	224	153	149	120	103	84	84	82
5	5	600	590	444	444	218	205	140	137	111	95	78	78	76
5	10	552	545	408	408	198	189	129	127	102	88	72	72	70
5	15	509	504	376	376	181	174	119	118	94	81	66	66	65
5	20	470	466	347	347	166	160	108	108	84	75	62	62	60
5	25	435	432	321	321	152	148	99	99	75	70	57	57	56
5	30	403	400	297	297	140	136	91	91	69	65	53	53	52
5	35	373	372	275	275	127	126	83	83	63	60	49	49	48
5	40	346	346	255	255	117	116	75	75	58	56	46	46	45
5	45	322	322	237	237	108	106	62	62	54	52	43	43	42
5	50	300	300	220	220	98	97	55	55	49	49	40	40	39
5	55	279	279	204	204	89	88	50	50	46	46	37	37	36
6	0	261	261	190	190	81	80	46	46	43	43	34	34	33
Peak	(cfs)	3957	3765	3819	3633	3844	3310	3842	3634	3659	3211	3445	3259	3268
Peak	(hrs)	2	2	2	2	2	2	1	1	1	1	1	1	1
Peak	(min)	25	25	15	20	0	5	40	40	35	40	25	30	25
Peak	(cfs_or_ac.ft.)	0	5	0	6	0	8	0	6	0	7	0	8	0
Case	((),S,I,D,O)	()	()	()	()	()	()	()	()	()	()	()	()	()
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4	3197.4
Peak/Area	(cfs/ac)	0.59	0.61	0.62	0.66	0.70	0.75	0.87	0.89	0.89	0.95	1.02	1.02	1.02
11-23-1999	15:54:15													
Summary	File:	P:\coweld01\existi~1\TriTow~1\100_Year\udswmm\ttxc100y.txt												

TRI-TOWN BASIN, EXISTING CONDITION

100-YEAR

Time(Hrs)	Time(Min)	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761	Elem61	Elem261
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	2	0	0	0	2	0	1	0	0	0	0	0	0
0	20	9	0	2	1	9	0	3	0	0	0	0	0	4
0	25	31	2	12	10	28	2	13	0	0	0	3	3	26
0	30	105	14	52	44	97	17	61	0	7	7	32	32	160
0	35	209	68	161	143	236	73	159	12	67	67	148	148	409
0	40	373	202	346	314	421	208	353	92	253	253	394	394	750
0	45	618	434	621	576	730	476	696	321	580	580	745	745	1116
0	50	972	790	1032	977	1170	882	1123	663	902	902	996	996	1451
0	55	1424	1252	1499	1436	1598	1294	1469	966	1113	1113	1176	1176	1730
1	0	1838	1679	1844	1775	1899	1593	1699	1187	1303	1303	1375	1375	1934
1	5	2098	1950	2049	1975	2107	1806	1891	1390	1505	1505	1571	1571	2058
1	10	2224	2091	2238	2160	2276	1987	2061	1585	1684	1684	1737	1737	2108
1	15	2355	2240	2392	2312	2404	2137	2191	1747	1821	1821	1857	1857	2091
1	20	2471	2373	2501	2421	2478	2236	2265	1861	1906	1906	1924	1924	2021
1	25	2555	2471	2554	2475	2492	2278	2283	1920	1937	1937	1939	1939	1914
1	30	2593	2521	2548	2471	2449	2264	2248	1929	1921	1921	1909	1909	1786
1	35	2582	2520	2492	2418	2368	2206	2174	1894	1867	1867	1844	1844	1647
1	40	2527	2473	2400	2330	2259	2116	2072	1827	1785	1785	1755	1755	1506
1	45	2437	2390	2282	2216	2131	2005	1953	1738	1686	1686	1652	1652	1370
1	50	2320	2278	2148	2085	1993	1881	1825	1635	1577	1577	1540	1540	1241
1	55	2185	2146	2005	1946	1853	1753	1695	1526	1465	1465	1428	1428	1123
2	0	2033	1996	1860	1804	1715	1625	1568	1416	1355	1355	1317	1317	1016
2	5	1835	1800	1708	1656	1581	1501	1444	1308	1248	1248	1211	1211	918
2	10	1653	1621	1546	1496	1456	1383	1329	1204	1146	1146	1110	1110	831
2	15	1516	1485	1430	1383	1340	1273	1220	1105	1048	1048	1013	1013	751
2	20	1400	1371	1315	1271	1230	1167	1116	1009	952	952	915	915	679
2	25	1285	1259	1203	1161	1117	1059	1000	900	825	825	764	764	614
2	30	1169	1143	1081	1041	991	936	868	774	690	690	643	643	556
2	35	1045	1020	954	916	864	813	750	662	598	598	568	568	504
2	40	925	901	840	804	761	713	665	581	535	535	511	511	457
2	45	824	801	751	717	684	638	601	522	484	484	463	463	414
2	50	745	723	683	650	623	579	548	473	439	439	420	420	375
2	55	681	660	626	595	572	529	501	429	399	399	381	381	339
3	0	627	607	577	547	526	485	458	391	362	362	345	345	305
3	5	579	559	532	503	482	444	419	355	328	328	312	312	273
3	10	534	515	488	460	440	406	382	322	296	296	281	281	245
3	15	490	473	447	421	402	370	347	292	267	267	253	253	220
3	20	450	434	409	384	366	336	314	264	241	241	228	228	197
3	25	413	397	374	350	333	305	285	238	217	217	204	204	172
3	30	379	364	342	319	303	277	257	214	194	194	181	181	152
3	35	348	333	313	291	276	250	232	192	172	172	161	161	134
3	40	319	305	286	265	251	226	208	172	153	153	143	143	118
3	45	293	280	261	241	228	204	188	153	137	137	127	127	104
3	50	268	256	239	219	207	184	169	137	122	122	113	113	92
3	55	245	234	219	200	188	166	152	122	108	108	100	100	79
4	0	225	215	201	182	172	150	137	109	95	95	87	87	68
4	5	206	198	184	166	156	135	123	97	83	83	75	75	55
4	10	189	182	169	151	142	122	110	85	72	72	64	64	45
4	15	173	167	155	138	129	109	98	74	61	61	54	54	37
4	20	158	153	142	125	117	97	87	64	52	52	46	46	31
4	25	145	141	130	114	106	87	77	55	44	44	39	39	26
4	30	132	129	119	103	96	77	69	47	38	38	33	33	22
4	35	121	118	109	94	87	69	61	41	32	32	28	28	18
4	40	110	108	100	85	80	62	55	35	28	28	24	24	15
4	45	101	99	92	78	73	56	49	30	24	24	20	20	13
4	50	93	92	84	72	67	50	45	26	21	21	18	18	11
4	55	86	84	78	66	62	46	41	23	18	18	15	15	10
5	0	79	78	72	61	58	41	37	20	15	15	13	13	8
5	5	73	72	67	57	54	38	34	17	14	14	12	12	7
5	10	68	67	62	53	50	34	31	15	12	12	10	10	6
5	15	63	62	57	50	47	31	28	14	10	10	9	9	6
5	20	58	58	53	46	43	29	25	12	9	9	8	8	5
5	25	54	54	49	43	41	26	23	11	8	8	7	7	4
5	30	50	50	46	40	38	24	21	10	7	7	6	6	4
5	35	47	47	43	38	36	22	19	8	6	6	5	5	3
5	40	44	43	40	35	33	20	17	8	6	6	5	5	3
5	45	41	40	37	33	31	18	16	7	5	5	4	4	3
5	50	38	38	35	31	29	16	14	6	5	5	4	4	2
5	55	35	35	32	29	27	15	13	6	4	4	4	4	2
6	0	33	33	29	27	24	14	12	5	4	4	3	3	2
Peak	(cfs)	2593	2521	2554	2475	2492	2278	2283	1929	1937	1937	1939	1939	2108
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	30	30	25	25	25	25	25	30	25	25	25	25	10
Peak	(cfs_or_ac.ft.)	0	9	0	9	0	9	0	8	0	8	0	9	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7	1726.7	1726.7
Peak/Area	(cfs/ac)	1.02	1.03	1.05	1.05	1.06	1.09	1.09	1.12	1.12	1.12	1.12	1.12	1.22
11-23-1999	15:54:15													
Summary	File:													

TRI-TOWN BASIN, EXISTING CONDITION

100-YEAR

Time(Hrs)	Time(Min)	Elem162	Elem262	Elem163	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0.17
0	15	0	5	0	0	0	0	0	0.25
0	20	2	29	0	2	1	0	2	0.33
0	25	13	98	2	15	7	1	10	0.42
0	30	56	291	25	97	56	4	74	0.50
0	35	122	700	91	224	121	12	207	0.58
0	40	262	1192	195	320	161	24	363	0.67
0	45	477	1478	292	363	179	37	501	0.75
0	50	704	1519	344	371	194	50	598	0.83
0	55	890	1445	363	372	202	62	649	0.92
1	0	1014	1334	367	364	205	73	665	1.00
1	5	1081	1223	361	353	207	82	662	1.08
1	10	1104	1119	349	334	205	91	653	1.17
1	15	1093	1005	329	307	199	98	634	1.25
1	20	1055	878	303	276	192	103	604	1.33
1	25	994	753	274	247	185	108	566	1.42
1	30	920	643	247	220	178	111	525	1.50
1	35	841	551	222	196	172	113	483	1.58
1	40	763	476	198	175	166	114	445	1.67
1	45	689	415	178	155	160	115	411	1.75
1	50	621	367	159	139	155	116	379	1.83
1	55	560	329	143	124	150	116	350	1.92
2	0	506	298	128	110	146	115	323	2.00
2	5	459	272	115	99	141	115	298	2.08
2	10	418	248	103	88	137	114	275	2.17
2	15	381	226	93	78	133	113	254	2.25
2	20	348	205	83	69	129	112	234	2.33
2	25	318	186	75	62	126	110	216	2.42
2	30	291	171	67	55	122	109	199	2.50
2	35	267	157	60	49	116	108	184	2.58
2	40	246	144	54	43	112	106	169	2.67
2	45	226	130	48	39	108	104	156	2.75
2	50	208	116	42	34	105	103	144	2.83
2	55	191	104	37	31	103	101	133	2.92
3	0	175	94	33	27	101	99	122	3.00
3	5	161	84	29	24	97	97	113	3.08
3	10	148	74	26	21	96	96	104	3.17
3	15	135	64	23	19	94	94	96	3.25
3	20	123	55	20	16	92	92	88	3.33
3	25	112	46	17	11	91	91	81	3.42
3	30	102	38	14	7	89	89	75	3.50
3	35	92	32	10	5	87	87	69	3.58
3	40	83	27	8	4	86	86	63	3.67
3	45	74	23	6	3	84	84	58	3.75
3	50	67	19	5	2	82	82	54	3.83
3	55	59	15	4	0	81	81	50	3.92
4	0	50	12	2	0	79	79	46	4.00
4	5	39	9	2	0	78	78	42	4.08
4	10	31	7	1	0	76	76	39	4.17
4	15	25	6	1	0	75	75	36	4.25
4	20	20	4	1	0	73	73	33	4.33
4	25	17	3	1	0	72	72	30	4.42
4	30	14	2	0	0	71	71	28	4.50
4	35	11	2	0	0	69	69	26	4.58
4	40	9	1	0	0	68	68	24	4.67
4	45	8	1	0	0	67	67	22	4.75
4	50	7	1	0	0	65	65	20	4.83
4	55	6	1	0	0	64	64	18	4.92
5	0	5	1	0	0	63	63	17	5.00
5	5	4	1	0	0	62	62	16	5.08
5	10	4	0	0	0	60	60	14	5.17
5	15	3	0	0	0	59	59	13	5.25
5	20	3	0	0	0	58	58	8	5.33
5	25	2	0	0	0	57	57	6	5.42
5	30	2	0	0	0	56	56	4	5.50
5	35	2	0	0	0	55	55	3	5.58
5	40	2	0	0	0	54	54	2	5.67
5	45	1	0	0	0	53	53	1	5.75
5	50	1	0	0	0	52	52	0	5.83
5	55	1	0	0	0	51	51	0	5.92
6	0	1	0	0	0	50	50	0	6.00
Peak	(cfs)	1104	1519	367	372	207	116	665	
Peak	(hrs)	1	0	1	0	1	1	1	
Peak	(min)	10	50	0	55	5	50	0	
Peak	(cfs_or_ac.ft.)	4	0	1	0	0	41	0	
Case	(),S,I,D,O)	(_)	(_)	(_)	(_)	(_)	(S)	(_)	
Area	(ac)	823.7	823.7	288.0	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	1.34	1.84	1.27	1.29	0.41	0.30	0.92	
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Summary	File:	P:\coweld01\existi~1\TriTow~1\100_Year\udswmm\ttxc100y.txt							

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

2-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem153	Elem253	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156
0	5	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0
0	20	0	0	1	0	0	0	0	0	0	0	1	0
0	25	2	0	3	0	2	0	1	0	2	0	6	4
0	30	6	1	10	0	7	0	3	1	6	1	19	13
0	35	16	5	22	1	15	0	8	4	16	6	37	26
0	40	34	13	38	3	29	1	20	13	32	14	53	37
0	45	59	27	58	7	46	3	38	29	51	26	67	48
0	50	88	45	78	15	66	8	61	49	73	40	81	59
0	55	119	66	99	27	89	16	87	72	95	55	98	74
1	0	150	89	122	42	113	27	102	85	118	73	119	94
1	5	168	101	146	61	137	40	118	99	143	94	145	120
1	10	183	111	171	82	161	55	137	118	171	118	177	150
1	15	198	122	186	95	186	72	162	141	203	147	208	182
1	20	213	135	198	106	212	92	190	168	235	177	235	209
1	25	228	147	211	118	239	115	220	198	265	205	255	230
1	30	243	160	225	133	268	141	251	229	290	229	268	243
1	35	258	174	241	149	297	168	279	257	310	247	274	250
1	40	273	189	258	167	326	196	303	281	322	260	276	253
1	45	290	205	277	187	354	224	322	299	330	267	275	252
1	50	307	222	297	209	379	249	335	313	333	270	272	249
1	55	326	241	318	232	401	272	343	321	333	270	267	245
2	0	345	260	340	254	418	290	347	326	331	267	261	240
2	5	365	281	360	277	431	305	348	327	326	263	254	234
2	10	385	301	380	298	440	316	346	325	320	258	248	228
2	15	405	322	398	318	446	323	342	322	314	252	241	222
2	20	424	342	414	336	448	327	337	317	308	246	235	217
2	25	443	361	428	352	448	329	331	312	302	240	230	212
2	30	460	379	440	365	446	329	325	307	296	235	225	207
2	35	476	396	450	377	442	327	318	301	290	229	219	203
2	40	490	410	457	386	437	324	312	295	284	224	214	198
2	45	501	423	462	393	430	320	306	289	278	219	209	193
2	50	511	434	466	398	423	315	299	283	272	213	204	189
2	55	518	442	467	401	416	310	293	277	266	209	199	185
3	0	523	448	466	403	408	305	286	272	260	204	195	181
3	5	526	453	465	403	400	299	280	266	255	199	191	177
3	10	528	456	462	402	392	293	274	260	249	195	186	174
3	15	527	457	458	400	383	288	268	255	244	190	181	169
3	20	525	456	452	397	374	282	261	249	237	185	175	164
3	25	522	454	446	393	365	276	255	243	231	180	170	159
3	30	517	451	438	388	356	270	248	237	224	175	164	154
3	35	510	447	431	382	346	263	241	231	217	169	158	149
3	40	503	441	422	376	336	257	234	224	210	164	152	144
3	45	494	435	413	370	326	250	227	217	203	158	147	139
3	50	485	428	404	363	316	244	219	210	196	152	141	134
3	55	476	421	394	355	306	237	212	204	189	147	135	128
4	0	465	413	384	348	295	230	204	197	181	141	129	123
4	5	455	404	374	339	285	223	197	190	175	135	124	119
4	10	444	395	363	331	275	215	189	183	168	130	119	114
4	15	433	386	353	323	265	208	182	176	161	125	114	110
4	20	421	376	342	314	255	201	175	170	155	120	110	105
4	25	410	367	332	305	245	194	168	163	149	115	106	102
4	30	399	357	322	296	236	188	162	157	143	111	102	98
4	35	387	347	311	288	227	181	156	152	138	107	98	95
4	40	376	337	301	279	218	174	150	146	133	103	95	92
4	45	364	327	291	270	210	168	144	141	129	100	92	89
4	50	353	317	281	262	202	162	139	136	124	97	90	87
4	55	342	308	272	253	194	156	134	131	120	94	87	85
5	0	331	298	263	245	187	151	129	127	116	91	85	82
5	5	321	289	254	237	180	146	125	123	113	88	83	80
5	10	310	280	245	230	173	141	121	119	110	86	81	79
5	15	300	271	236	222	167	136	117	115	106	84	79	77
5	20	290	262	228	215	161	132	114	112	103	82	77	75
5	25	281	254	220	208	155	128	110	109	101	80	75	74
5	30	271	246	213	201	150	124	107	106	98	78	74	72
5	35	263	238	206	195	145	120	104	103	96	76	72	71
5	40	254	230	199	188	140	116	102	100	93	75	71	70
5	45	246	223	192	182	135	113	99	98	91	73	69	68
5	50	238	216	186	177	131	110	96	95	89	72	68	67
5	55	230	209	180	171	127	107	94	93	87	70	67	66
6	0	222	202	174	166	123	104	92	91	85	69	66	65
Peak	(cfs)	528	457	467	403	448	329	348	327	333	270	276	253
Peak	(hrs)	3	3	2	3	2	2	2	2	1	1	1	1
Peak	(min)	10	15	55	0	20	25	5	5	50	50	40	40
Peak	(cfs_or_ac.ft.)	0	4	0	4	0	4	0	4	0	3	0	4
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4
Peak/Area	(cfs/ac)	0.08	0.07	0.08	0.07	0.08	0.07	0.08	0.08	0.08	0.08	0.08	0.08
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Summary	File:	P:\coweld01\future~2\TriTow~1\2_Year\udswmm\ttod2yr.txt											

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

2-YEAR

Time(Hrs)	Time(Min)	Elem755	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761
0	5	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0
0	20	2	2	0	0	0	1	0	0	0	0	0	0
0	25	8	8	0	1	0	3	0	1	0	0	0	0
0	30	19	19	1	5	3	10	0	3	0	0	0	1
0	35	31	30	3	12	8	18	1	7	0	1	1	4
0	40	41	38	9	23	17	28	4	16	0	4	4	15
0	45	51	47	18	35	28	40	12	30	2	16	16	34
0	50	64	57	31	50	42	56	27	51	10	36	36	56
0	55	79	71	48	70	60	79	50	80	27	59	59	77
1	0	101	91	70	96	86	108	80	111	50	82	82	97
1	5	128	117	98	127	117	139	112	140	75	102	102	114
1	10	159	147	130	158	148	167	141	163	96	118	118	126
1	15	190	177	161	186	175	190	164	180	114	129	129	135
1	20	215	202	187	206	195	205	181	191	126	136	136	140
1	25	234	219	206	219	208	214	191	196	134	140	140	142
1	30	245	230	219	226	215	218	196	198	139	142	142	142
1	35	251	236	225	228	217	218	197	196	141	142	142	141
1	40	253	237	227	227	217	215	195	193	141	140	140	139
1	45	252	235	226	224	214	211	191	188	139	137	137	136
1	50	248	232	222	219	209	206	187	183	137	134	134	132
1	55	244	227	218	214	204	201	182	177	134	131	131	129
2	0	238	221	213	208	199	195	176	172	131	128	128	126
2	5	233	215	207	202	193	189	171	166	128	125	125	123
2	10	227	209	201	196	187	184	165	161	125	122	122	120
2	15	221	203	195	191	182	178	160	156	122	118	118	116
2	20	216	197	190	186	176	173	155	151	119	115	115	114
2	25	211	192	185	181	172	169	151	147	116	113	113	111
2	30	206	187	180	176	167	164	147	143	113	110	110	108
2	35	201	182	175	172	163	160	143	140	110	108	108	106
2	40	197	177	171	168	159	156	139	136	108	105	105	104
2	45	192	173	167	164	155	153	136	133	106	103	103	102
2	50	188	168	163	160	152	149	133	130	104	101	101	100
2	55	184	164	159	156	148	146	130	127	102	99	99	98
3	0	180	160	156	153	145	142	127	124	99	97	97	96
3	5	177	157	152	149	141	139	123	121	97	95	95	93
3	10	172	153	149	145	138	135	120	118	95	93	93	91
3	15	168	148	145	141	134	131	117	114	93	90	90	88
3	20	163	143	141	137	130	127	113	110	90	87	87	85
3	25	158	138	136	132	125	122	110	106	87	84	84	81
3	30	153	133	131	127	121	118	105	101	84	80	80	78
3	35	148	128	127	122	116	113	101	97	81	77	77	75
3	40	143	123	122	117	111	108	96	92	78	74	74	72
3	45	137	118	117	112	106	103	92	87	74	71	71	68
3	50	132	113	112	107	101	98	87	83	71	68	68	65
3	55	127	108	107	102	97	93	83	79	68	65	65	62
4	0	122	103	102	97	92	89	79	75	65	62	62	60
4	5	117	98	97	93	88	85	75	71	63	59	59	58
4	10	113	94	93	89	84	81	71	68	60	57	57	55
4	15	108	90	89	85	80	78	68	65	58	55	55	53
4	20	104	86	85	81	77	74	65	62	56	53	53	52
4	25	101	82	81	78	74	72	63	60	54	51	51	50
4	30	97	79	78	75	71	69	60	58	52	50	50	49
4	35	94	76	75	72	68	66	58	56	50	49	49	48
4	40	91	74	73	70	66	64	56	54	49	47	47	46
4	45	89	71	70	68	64	62	54	53	48	46	46	45
4	50	86	69	68	66	62	61	53	51	47	45	45	44
4	55	84	67	66	64	60	59	51	50	46	44	44	44
5	0	82	65	64	62	59	57	50	49	45	43	43	43
5	5	80	63	62	60	57	56	49	47	44	43	43	42
5	10	78	61	60	59	56	55	48	46	43	42	42	41
5	15	76	60	59	57	54	53	47	45	42	41	41	40
5	20	75	58	57	56	53	52	46	44	41	40	40	40
5	25	73	57	56	55	52	51	45	44	41	40	40	39
5	30	72	56	55	53	51	50	44	43	40	39	39	38
5	35	70	54	54	52	50	49	43	42	39	38	38	38
5	40	69	53	52	51	49	48	42	41	39	38	38	37
5	45	68	52	51	50	48	47	41	40	38	37	37	37
5	50	67	51	50	49	47	46	41	40	37	37	37	36
5	55	66	50	49	48	46	45	40	39	37	36	36	36
6	0	65	49	48	47	45	45	39	38	36	36	36	35
Peak	(cfs)	253	237	227	228	217	218	197	198	141	142	142	142
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	40	40	40	35	35	30	35	30	35	30	30	25
Peak	(cfs_or_ac.ft.)	0	0	3	0	3	0	3	0	2	0	2	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	3197.4	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7
Peak/Area	(cfs/ac)	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08
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Summary	File:												

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

2-YEAR

Time(Hrs)	Time(Min)	Elem61	Elem261	Elem162	Elem262	Elem163	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0.17
0	15	0	0	0	1	0	0	0	0	0	0.25
0	20	0	0	0	7	0	0	0	0	0	0.33
0	25	0	2	2	25	0	0	1	0	2	0.42
0	30	1	9	9	63	0	1	3	1	5	0.50
0	35	4	27	25	108	0	2	6	2	10	0.58
0	40	15	56	53	151	1	3	9	3	18	0.67
0	45	34	77	71	180	1	3	12	4	26	0.75
0	50	56	96	87	187	2	4	15	6	33	0.83
0	55	77	114	101	179	3	4	18	8	40	0.92
1	0	97	127	112	163	3	5	20	10	45	1.00
1	5	114	136	118	146	4	5	22	12	49	1.08
1	10	126	142	121	130	4	5	24	14	53	1.17
1	15	135	144	121	116	5	5	26	15	56	1.25
1	20	140	145	120	105	5	6	27	17	58	1.33
1	25	142	143	117	95	5	6	28	18	60	1.42
1	30	142	141	113	87	5	6	29	19	61	1.50
1	35	141	138	108	80	6	6	30	20	62	1.58
1	40	139	135	104	75	6	6	30	21	63	1.67
1	45	136	131	99	71	6	6	31	22	63	1.75
1	50	132	128	95	68	6	6	31	23	63	1.83
1	55	129	124	91	66	6	7	31	23	64	1.92
2	0	126	121	87	63	6	7	31	24	64	2.00
2	5	123	118	83	60	6	7	32	24	63	2.08
2	10	120	115	80	57	7	7	32	25	63	2.17
2	15	116	112	76	56	7	7	32	25	62	2.25
2	20	114	109	73	55	7	7	32	25	62	2.33
2	25	111	107	71	55	7	7	32	26	62	2.42
2	30	108	105	69	55	7	7	32	26	61	2.50
2	35	106	103	66	54	7	7	32	26	61	2.58
2	40	104	101	64	52	7	7	32	26	60	2.67
2	45	102	99	62	49	7	7	32	27	59	2.75
2	50	100	97	60	47	7	7	31	27	58	2.83
2	55	98	95	58	45	7	7	31	27	57	2.92
3	0	96	92	55	43	7	7	31	27	57	3.00
3	5	93	90	53	42	7	7	31	27	56	3.08
3	10	91	86	50	40	7	7	31	27	55	3.17
3	15	88	83	46	37	7	7	30	27	53	3.25
3	20	85	79	43	33	7	7	30	27	52	3.33
3	25	81	76	40	30	7	7	29	27	51	3.42
3	30	78	73	37	27	7	7	29	26	49	3.50
3	35	75	69	34	24	7	7	29	26	48	3.58
3	40	72	66	31	22	7	7	28	26	46	3.67
3	45	68	63	29	20	7	7	28	26	45	3.75
3	50	65	60	26	18	7	7	27	25	43	3.83
3	55	62	58	24	17	7	7	27	25	42	3.92
4	0	60	55	23	16	7	7	26	25	40	4.00
4	5	58	53	21	16	7	7	26	24	39	4.08
4	10	55	52	20	15	7	7	25	24	38	4.17
4	15	53	50	19	15	7	7	25	24	36	4.25
4	20	52	49	18	14	7	7	24	23	35	4.33
4	25	50	47	17	14	7	7	24	23	34	4.42
4	30	49	46	16	14	7	7	23	22	32	4.50
4	35	48	45	16	14	7	7	23	22	31	4.58
4	40	46	44	15	13	7	7	22	22	30	4.67
4	45	45	43	15	13	7	7	22	21	29	4.75
4	50	44	43	14	13	7	7	21	21	28	4.83
4	55	44	42	14	13	7	7	21	20	27	4.92
5	0	43	41	14	13	7	7	20	20	26	5.00
5	5	42	40	14	12	7	7	20	20	25	5.08
5	10	41	40	13	12	7	7	20	19	24	5.17
5	15	40	39	13	12	7	7	19	19	23	5.25
5	20	40	38	13	12	7	7	19	19	22	5.33
5	25	39	38	13	12	7	7	19	18	21	5.42
5	30	38	37	12	12	7	6	18	18	20	5.50
5	35	38	37	12	11	7	6	18	18	19	5.58
5	40	37	36	12	11	7	6	17	17	19	5.67
5	45	37	36	12	11	6	6	17	17	18	5.75
5	50	36	35	12	11	6	6	17	17	17	5.83
5	55	36	35	12	11	6	6	16	16	17	5.92
6	0	35	34	11	11	6	6	16	16	16	6.00
Peak	(cfs)	142	145	121	187	7	7	32	27	64	
Peak	(hrs)	1	1	1	0	2	1	2	2	1	
Peak	(min)	25	20	10	50	10	55	5	45	55	
Peak	(cfs_or_ac.ft.)	4	0	2	0	0	0	0	9	0	
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	(S)	( )	
Area	(ac)	1726.7	1726.7	823.7	823.7	288.0	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	0.08	0.08	0.15	0.23	0.02	0.02	0.06	0.07	0.09	
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Summary	File:							P:\coweld01\future~2\TriTow~1\2_Year\udswmm\ttod2yr.txt			

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

5-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem153	Elem253	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156
0	5	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0
0	20	1	0	2	0	1	0	0	0	1	0	3	1
0	25	3	0	6	0	4	0	2	0	4	1	13	8
0	30	11	3	17	0	12	0	6	3	12	4	36	25
0	35	29	10	38	2	28	1	18	11	31	13	65	46
0	40	60	26	66	7	52	3	43	30	61	30	92	66
0	45	104	52	100	17	84	9	79	61	97	53	119	87
0	50	154	85	136	33	122	20	111	87	137	80	149	112
0	55	189	105	176	57	163	35	138	109	180	112	185	145
1	0	216	120	218	88	205	56	173	140	226	149	231	189
1	5	245	139	241	103	249	81	216	180	278	193	286	243
1	10	274	160	265	120	296	113	267	228	336	245	344	300
1	15	302	183	290	142	347	152	324	283	396	301	395	351
1	20	332	208	318	168	402	199	385	342	453	353	433	390
1	25	362	235	350	199	461	251	444	400	500	397	458	415
1	30	394	264	386	235	521	306	497	453	534	429	470	428
1	35	428	297	426	276	579	362	540	495	557	450	474	432
1	40	465	332	469	321	632	415	572	527	568	461	470	431
1	45	504	371	514	368	678	461	592	547	572	464	463	424
1	50	545	413	559	416	715	500	602	558	569	460	452	415
1	55	588	456	603	463	743	530	605	561	561	453	438	403
2	0	632	500	644	508	761	551	601	558	549	442	425	391
2	5	674	544	681	549	771	564	592	551	537	430	411	378
2	10	715	586	713	585	773	571	581	541	523	418	397	366
2	15	753	626	740	615	770	572	568	529	508	405	384	354
2	20	787	661	761	640	762	569	554	516	494	392	371	343
2	25	816	692	776	659	750	562	539	502	480	379	358	331
2	30	840	718	786	673	736	553	523	488	465	366	346	320
2	35	858	739	792	682	720	542	508	475	451	354	334	310
2	40	871	755	792	687	702	530	493	461	437	342	323	300
2	45	879	765	789	688	684	517	478	447	424	331	313	291
2	50	883	771	783	686	665	503	463	434	411	320	302	282
2	55	882	773	774	681	645	490	448	421	398	310	293	273
3	0	878	772	763	673	626	476	434	408	386	300	284	265
3	5	871	767	750	664	608	462	421	396	375	291	275	257
3	10	861	760	735	653	589	449	408	384	364	281	266	249
3	15	849	750	720	641	571	436	395	373	353	273	257	241
3	20	834	739	703	628	553	423	383	362	341	264	248	233
3	25	819	726	686	614	535	410	371	350	330	255	239	225
3	30	801	711	668	599	517	398	358	339	319	246	231	218
3	35	783	696	649	585	500	385	346	329	309	238	223	211
3	40	763	680	630	569	482	373	335	318	298	230	216	205
3	45	744	663	612	554	465	361	323	308	288	222	208	198
3	50	723	646	593	539	449	350	312	298	278	215	200	191
3	55	703	628	574	523	433	338	301	288	268	207	193	184
4	0	682	610	556	508	417	327	290	278	259	199	185	177
4	5	662	593	538	492	401	316	280	268	249	192	178	171
4	10	641	575	520	477	386	305	269	258	240	185	171	164
4	15	621	557	502	462	372	295	259	249	230	178	164	158
4	20	601	540	485	447	357	284	249	240	222	171	158	152
4	25	582	523	468	433	344	274	239	231	213	165	152	147
4	30	563	506	452	418	330	264	230	223	206	159	147	142
4	35	544	489	436	404	317	255	222	215	198	153	143	138
4	40	525	473	420	391	305	246	213	207	192	148	138	134
4	45	507	457	405	377	293	237	206	200	185	143	134	131
4	50	490	442	390	364	282	228	199	194	179	139	131	127
4	55	473	427	376	352	271	220	192	187	174	135	127	124
5	0	457	412	363	340	261	213	186	181	169	132	124	121
5	5	441	398	350	328	251	206	180	176	164	128	122	119
5	10	425	384	337	317	242	199	174	171	160	125	119	116
5	15	411	371	325	306	234	193	169	166	155	122	116	114
5	20	396	358	314	296	226	187	164	162	152	120	114	112
5	25	383	346	303	286	218	181	160	157	148	117	112	110
5	30	369	334	292	276	211	176	156	153	144	115	110	108
5	35	357	323	282	267	204	171	152	150	141	112	108	106
5	40	345	312	272	258	198	166	148	146	138	110	106	104
5	45	333	302	263	250	192	161	144	143	134	108	104	102
5	50	322	292	255	242	186	157	141	139	132	106	102	101
5	55	311	282	246	235	181	153	138	136	129	104	100	99
6	0	301	273	239	228	176	149	134	133	126	103	99	98
Peak	(cfs)	883	773	792	688	773	572	605	561	572	464	474	432
Peak	(hrs)	2	2	2	2	2	2	1	1	1	1	1	1
Peak	(min)	50	55	35	45	10	15	55	55	45	45	35	35
Peak	(cfs_or_ac.ft.)	0	4	0	4	0	5	0	4	0	4	0	5
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4
Peak/Area	(cfs/ac)	0.13	0.13	0.13	0.12	0.14	0.13	0.14	0.14	0.14	0.14	0.14	0.14
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Summary	File:	P:\coweld01\future~2\TriTow~1\5_Year\udswmm\ttod5yr.txt											

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

5-YEAR

Time(Hrs)	Time(Min)	Elem755	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761
0	5	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0
0	15	1	1	0	0	0	0	0	0	0	0	0	0
0	20	4	4	0	1	0	2	0	0	0	0	0	0
0	25	15	15	0	3	1	7	0	2	0	0	0	0
0	30	35	34	2	10	6	18	1	5	0	0	0	2
0	35	53	51	7	24	17	33	3	15	0	2	2	12
0	40	72	67	20	43	33	49	12	34	1	13	13	33
0	45	94	86	39	66	54	75	31	64	9	37	37	62
0	50	120	109	66	99	85	113	65	108	29	71	71	99
0	55	155	141	103	143	128	161	113	161	63	111	111	137
1	0	201	185	151	197	180	215	169	214	104	150	150	172
1	5	256	238	207	253	236	268	223	261	145	184	184	201
1	10	312	292	264	304	287	312	268	297	181	210	210	222
1	15	361	339	313	344	326	344	302	321	208	227	227	234
1	20	396	374	350	371	353	364	323	334	225	237	237	241
1	25	419	395	374	386	368	373	334	339	236	242	242	242
1	30	430	405	387	392	374	375	337	337	240	242	242	241
1	35	433	407	390	390	373	371	334	331	240	239	239	237
1	40	430	404	388	385	367	363	328	322	238	234	234	232
1	45	422	396	381	376	358	353	319	312	233	229	229	225
1	50	412	385	372	364	347	341	308	301	228	222	222	219
1	55	400	373	360	352	335	329	298	290	221	216	216	212
2	0	388	360	348	340	324	317	286	279	215	209	209	206
2	5	376	347	336	328	312	305	275	268	208	203	203	199
2	10	363	335	324	316	300	294	265	257	202	196	196	192
2	15	352	323	312	304	289	283	255	247	196	190	190	186
2	20	340	311	301	294	279	273	245	238	189	184	184	180
2	25	329	299	291	283	269	263	236	230	183	178	178	175
2	30	318	288	281	273	259	254	228	221	178	173	173	170
2	35	308	278	271	264	250	245	219	213	172	167	167	164
2	40	298	268	261	255	241	237	212	206	167	162	162	159
2	45	288	259	253	246	233	228	204	199	162	157	157	154
2	50	280	250	244	238	225	221	197	191	157	153	153	150
2	55	271	241	236	230	217	213	190	185	152	148	148	145
3	0	263	233	228	222	210	206	183	178	148	143	143	141
3	5	255	225	220	215	203	199	177	172	143	139	139	136
3	10	247	218	213	208	196	192	171	166	139	135	135	133
3	15	239	210	206	200	190	186	165	161	135	131	131	129
3	20	231	202	199	193	183	179	160	156	131	127	127	125
3	25	224	194	192	187	177	173	155	150	127	124	124	121
3	30	217	187	185	180	171	167	149	145	124	120	120	117
3	35	210	181	179	174	165	161	144	139	120	116	116	113
3	40	203	174	173	167	158	155	138	133	116	111	111	108
3	45	196	168	166	161	152	148	132	127	111	106	106	103
3	50	189	161	160	154	146	142	126	121	106	101	101	98
3	55	183	154	153	147	139	135	120	115	102	96	96	94
4	0	176	148	146	141	133	129	114	109	97	92	92	90
4	5	169	141	140	134	127	123	109	104	93	89	89	86
4	10	162	135	134	128	121	118	104	99	89	85	85	83
4	15	156	129	128	123	116	113	99	95	86	82	82	81
4	20	151	124	122	118	112	109	95	92	83	80	80	78
4	25	146	119	118	114	107	105	92	89	80	78	78	76
4	30	141	115	113	110	104	101	89	86	78	76	76	74
4	35	137	111	109	106	100	98	86	83	76	74	74	73
4	40	133	107	106	103	97	95	83	81	74	72	72	71
4	45	130	104	103	100	94	92	81	79	73	71	71	70
4	50	126	101	100	97	92	90	79	77	71	69	69	68
4	55	123	98	97	94	90	88	77	75	70	68	68	67
5	0	121	96	94	92	87	86	75	74	68	67	67	66
5	5	118	93	92	90	85	84	74	72	67	66	66	65
5	10	116	91	90	88	83	82	72	71	66	64	64	64
5	15	113	89	88	86	82	80	71	69	65	63	63	63
5	20	111	87	86	84	80	79	69	68	64	62	62	62
5	25	109	85	84	82	78	77	68	67	63	61	61	61
5	30	107	84	82	81	77	76	67	66	62	60	60	60
5	35	105	82	81	79	76	74	66	64	61	60	60	59
5	40	104	80	79	77	74	73	64	63	60	59	59	58
5	45	102	79	77	76	73	72	63	62	59	58	58	57
5	50	100	77	76	75	71	71	62	61	58	57	57	56
5	55	99	76	75	73	70	69	61	60	57	56	56	56
6	0	97	74	73	72	69	68	60	59	56	55	55	55
Peak	(cfs)	433	407	390	392	374	375	337	339	240	242	242	242
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	35	35	35	30	30	30	30	25	30	25	25	25
Peak	(cfs_or_ac.ft.)	0	0	4	0	4	0	4	0	3	0	3	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	3197.4	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7
Peak/Area	(cfs/ac)	0.14	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.14	0.14	0.14	0.14
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Summary	File:												

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

5-YEAR

Time(Hrs)	Time(Min)	Elem61	Elem261	Elem162	Elem262	Elem163	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0.17
0	15	0	0	0	2	0	0	0	0	0	0.25
0	20	0	1	1	13	0	0	1	0	1	0.33
0	25	0	5	5	45	0	1	2	0	3	0.42
0	30	2	20	19	109	0	2	6	1	8	0.50
0	35	12	55	52	188	1	3	11	3	18	0.58
0	40	33	87	79	266	2	5	16	5	30	0.67
0	45	62	123	110	312	3	6	21	7	44	0.75
0	50	99	160	142	318	4	7	26	10	57	0.83
0	55	137	193	169	300	5	8	31	14	68	0.92
1	0	172	218	189	271	6	8	35	17	77	1.00
1	5	201	234	200	240	7	9	38	20	85	1.08
1	10	222	243	205	212	8	9	41	22	91	1.17
1	15	234	246	204	189	9	10	43	25	96	1.25
1	20	241	245	200	170	9	10	46	27	100	1.33
1	25	242	242	193	155	10	10	47	29	103	1.42
1	30	241	237	186	142	10	11	49	31	105	1.50
1	35	237	231	177	131	10	11	50	33	107	1.58
1	40	232	224	169	122	10	11	51	34	108	1.67
1	45	225	217	160	114	11	11	51	36	108	1.75
1	50	219	210	152	107	11	11	52	37	108	1.83
1	55	212	203	144	100	11	11	52	38	108	1.92
2	0	206	197	137	95	11	11	52	39	107	2.00
2	5	199	190	130	89	11	12	52	39	106	2.08
2	10	192	184	123	85	11	12	52	40	105	2.17
2	15	186	178	117	82	12	12	52	41	104	2.25
2	20	180	173	112	78	12	12	51	41	102	2.33
2	25	175	167	106	75	12	12	51	41	101	2.42
2	30	170	162	101	71	12	12	51	41	99	2.50
2	35	164	157	96	66	12	12	50	42	97	2.58
2	40	159	152	92	62	12	12	50	42	95	2.67
2	45	154	147	87	59	12	12	49	42	93	2.75
2	50	150	143	83	56	12	12	48	42	91	2.83
2	55	145	138	79	54	12	12	48	41	89	2.92
3	0	141	134	75	53	12	12	47	41	86	3.00
3	5	136	131	72	51	12	12	47	41	84	3.08
3	10	133	127	69	49	12	12	46	41	82	3.17
3	15	129	123	65	46	12	12	45	41	80	3.25
3	20	125	119	62	43	12	12	45	40	78	3.33
3	25	121	115	59	39	12	12	44	40	75	3.42
3	30	117	111	55	36	12	12	43	39	73	3.50
3	35	113	106	50	33	12	12	42	39	71	3.58
3	40	108	100	45	31	12	12	41	38	68	3.67
3	45	103	95	41	29	12	12	41	38	66	3.75
3	50	98	91	38	27	12	12	40	37	64	3.83
3	55	94	87	35	26	12	11	39	37	61	3.92
4	0	90	84	32	25	12	11	38	36	59	4.00
4	5	86	81	30	24	11	11	38	36	57	4.08
4	10	83	78	29	23	11	11	37	35	55	4.17
4	15	81	76	27	23	11	11	36	35	53	4.25
4	20	78	74	26	22	11	11	35	34	51	4.33
4	25	76	73	25	22	11	11	35	33	49	4.42
4	30	74	71	24	22	11	11	34	33	47	4.50
4	35	73	70	24	21	11	11	33	32	45	4.58
4	40	71	68	23	21	11	11	33	32	44	4.67
4	45	70	67	23	21	11	11	32	31	42	4.75
4	50	68	66	22	20	11	11	31	30	40	4.83
4	55	67	65	22	20	11	11	31	30	39	4.92
5	0	66	64	21	20	11	11	30	29	37	5.00
5	5	65	63	21	20	11	11	29	29	36	5.08
5	10	64	62	21	19	11	11	29	28	34	5.17
5	15	63	61	20	19	11	11	28	28	33	5.25
5	20	62	60	20	19	11	11	28	27	32	5.33
5	25	61	59	20	19	11	10	27	27	31	5.42
5	30	60	58	19	18	11	10	27	26	29	5.50
5	35	59	57	19	18	10	10	26	26	28	5.58
5	40	58	56	19	18	10	10	25	25	27	5.67
5	45	57	56	19	18	10	10	25	25	26	5.75
5	50	56	55	19	18	10	10	24	24	25	5.83
5	55	56	54	18	17	10	10	24	24	24	5.92
6	0	55	53	18	17	10	10	24	23	23	6.00
Peak	(cfs)	242	246	205	318	12	12	52	42	108	
Peak	(hrs)	1	1	1	0	2	2	1	2	1	
Peak	(min)	25	15	10	50	15	5	50	35	40	
Peak	(cfs_or_ac.ft.)	5	0	3	0	0	0	0	15	0	
Case	(),S,I,D,O)	()	()	()	()	()	()	()	(S)	()	
Area	(ac)	1726.7	1726.7	823.7	823.7	288.0	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	0.14	0.14	0.25	0.39	0.04	0.04	0.10	0.11	0.15	
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Summary	File:							P:\coweld01\future~2\TriTow~1\5_Year\udswmm\ttod5yr.txt			

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

10-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem153	Elem253	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156
0	5	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0
0	20	1	0	2	0	1	0	0	0	1	0	4	2
0	25	4	1	8	0	5	0	2	1	5	1	18	12
0	30	14	4	23	1	16	0	10	4	17	6	49	35
0	35	39	15	51	3	39	1	30	17	45	21	90	64
0	40	83	39	92	11	75	5	68	47	90	46	131	93
0	45	145	77	141	27	124	16	116	85	145	82	175	127
0	50	197	106	196	54	181	33	154	113	207	125	224	170
0	55	236	126	253	89	242	58	205	156	274	175	283	225
1	0	278	152	288	109	306	91	268	213	347	236	354	293
1	5	319	181	323	133	376	136	343	282	428	306	432	370
1	10	362	214	362	164	452	192	427	361	513	382	508	446
1	15	406	251	405	203	535	259	515	447	596	459	572	509
1	20	452	291	455	251	624	336	604	532	669	526	616	554
1	25	502	337	513	306	715	419	683	611	724	577	637	576
1	30	557	388	576	370	805	503	749	675	761	611	647	587
1	35	616	445	645	440	886	582	797	723	782	630	647	589
1	40	679	507	716	514	956	651	829	755	791	637	640	583
1	45	746	574	787	589	1011	708	846	772	789	635	626	572
1	50	816	643	856	662	1051	752	851	778	779	626	609	557
1	55	885	714	919	730	1078	782	846	775	765	612	588	539
2	0	953	782	975	791	1091	800	834	765	747	595	570	523
2	5	1017	848	1023	844	1093	809	818	751	727	577	551	505
2	10	1075	907	1062	888	1087	809	799	734	707	559	532	488
2	15	1125	960	1091	923	1074	802	779	715	686	540	513	472
2	20	1167	1004	1111	949	1056	791	757	696	665	522	494	455
2	25	1200	1040	1123	966	1034	777	734	676	645	504	477	440
2	30	1224	1067	1127	977	1009	760	711	655	624	486	460	425
2	35	1239	1086	1125	980	982	741	689	635	604	469	443	410
2	40	1247	1097	1117	978	954	721	666	615	584	452	427	396
2	45	1247	1101	1104	971	925	701	644	596	565	436	412	383
2	50	1241	1099	1087	960	896	680	623	576	546	421	398	370
2	55	1230	1092	1067	946	867	659	602	558	528	406	384	358
3	0	1215	1081	1045	929	839	639	581	540	511	392	370	345
3	5	1196	1065	1021	910	811	619	562	522	494	379	357	334
3	10	1175	1047	996	890	784	599	542	505	478	366	345	323
3	15	1150	1027	970	868	757	579	524	489	462	353	333	312
3	20	1124	1004	942	846	730	560	506	473	446	341	320	301
3	25	1097	981	915	823	705	542	488	457	431	329	309	291
3	30	1068	956	887	800	679	524	471	442	416	317	298	282
3	35	1038	930	859	777	654	506	454	427	401	306	288	273
3	40	1008	904	831	754	630	489	438	412	388	295	278	264
3	45	978	877	803	730	607	472	422	398	374	285	268	255
3	50	948	850	776	707	584	456	407	385	361	276	259	247
3	55	917	824	750	685	562	440	392	372	349	266	250	239
4	0	887	798	723	662	541	425	378	359	337	257	241	231
4	5	858	772	698	640	520	410	364	347	325	248	233	224
4	10	829	746	673	619	500	396	351	335	314	240	225	216
4	15	801	721	649	598	481	382	339	324	303	232	217	209
4	20	773	697	625	577	463	369	326	313	292	224	209	202
4	25	746	673	602	558	445	356	314	302	282	216	202	195
4	30	720	649	580	538	428	343	303	291	272	208	195	189
4	35	695	627	559	520	412	331	292	281	262	201	189	183
4	40	670	605	539	501	396	319	281	272	253	195	183	178
4	45	646	584	519	484	381	308	271	263	245	189	178	173
4	50	623	563	500	467	366	297	262	254	237	183	173	169
4	55	601	543	481	450	353	287	253	246	230	178	169	165
5	0	580	524	464	435	340	278	245	239	224	174	165	161
5	5	559	505	447	420	327	268	237	231	217	169	161	158
5	10	539	488	431	405	316	260	230	225	211	165	158	154
5	15	520	471	415	391	305	252	223	219	206	161	154	151
5	20	502	454	400	378	294	244	217	213	201	158	151	148
5	25	484	438	386	365	284	237	211	207	196	155	148	146
5	30	467	423	373	353	275	230	206	202	191	152	146	143
5	35	451	409	360	341	266	223	200	197	187	149	143	141
5	40	435	395	348	330	258	217	195	193	183	146	140	138
5	45	421	382	336	320	250	211	191	188	179	143	138	136
5	50	406	369	325	310	243	206	186	184	175	141	136	134
5	55	393	357	315	300	236	201	182	180	171	138	133	132
6	0	380	345	305	291	229	196	178	176	167	136	131	130
Peak	(cfs)	1247	1101	1127	980	1093	809	851	778	791	637	647	589
Peak	(hrs)	2	2	2	2	2	2	1	1	1	1	1	1
Peak	(min)	40	45	30	35	5	5	50	50	40	40	30	35
Peak	(cfs_or_ac.ft.)	0	4	0	5	0	6	0	5	0	4	0	6
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4
Peak/Area	(cfs/ac)	0.19	0.18	0.18	0.18	0.20	0.18	0.19	0.19	0.19	0.19	0.19	0.18
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Summary	File:	P:\coweld01\future~2\TriTow~1\10_Year\udswmm\ttod10yr.txt											

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

10-YEAR

Time(Hrs)	Time(Min)	Elem755	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761
0	5	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0
0	15	1	1	0	0	0	0	0	0	0	0	0	0
0	20	5	5	0	1	0	2	0	0	0	0	0	0
0	25	20	20	0	4	2	9	0	2	0	0	0	0
0	30	47	45	3	15	9	25	1	8	0	0	0	4
0	35	73	69	12	34	24	44	6	23	0	5	5	18
0	40	103	96	31	63	49	75	21	52	3	21	21	46
0	45	138	127	62	102	85	117	53	100	16	55	55	87
0	50	182	167	107	155	136	174	107	165	48	103	103	139
0	55	240	221	166	222	201	245	178	240	97	159	159	193
1	0	310	289	240	300	277	322	256	312	156	213	213	241
1	5	387	363	320	377	353	391	328	373	212	258	258	278
1	10	460	434	395	442	418	446	386	417	258	291	291	304
1	15	520	491	456	489	465	483	425	444	290	311	311	318
1	20	560	531	498	518	494	503	447	457	310	322	322	325
1	25	583	551	522	532	507	511	457	459	320	326	326	326
1	30	590	558	532	534	510	509	457	455	324	325	325	323
1	35	588	555	532	529	505	501	451	446	323	321	321	318
1	40	580	545	525	518	494	489	441	433	319	315	315	311
1	45	567	532	513	505	481	474	428	419	313	307	307	303
1	50	553	517	499	489	466	458	413	403	305	298	298	294
1	55	536	500	483	472	449	441	398	387	296	289	289	284
2	0	519	482	466	455	433	425	382	372	287	280	280	275
2	5	502	464	449	439	417	409	367	357	278	270	270	266
2	10	485	447	433	422	401	393	352	343	269	262	262	257
2	15	468	430	417	407	386	378	339	330	260	253	253	249
2	20	452	413	402	392	371	364	326	317	252	245	245	241
2	25	436	398	387	377	358	350	313	305	244	238	238	234
2	30	422	383	373	363	344	338	302	294	237	230	230	226
2	35	407	368	359	350	332	325	290	282	229	223	223	219
2	40	393	354	346	337	320	313	279	272	222	216	216	212
2	45	380	341	334	325	308	302	269	261	215	208	208	205
2	50	367	329	322	313	296	290	258	251	208	201	201	198
2	55	355	316	310	301	285	279	248	241	201	195	195	191
3	0	343	304	298	290	274	269	239	232	194	188	188	185
3	5	332	293	287	280	264	259	230	224	188	182	182	179
3	10	321	282	277	270	255	250	222	216	182	177	177	173
3	15	310	271	267	260	246	240	214	208	176	171	171	168
3	20	299	261	257	250	237	232	206	201	171	166	166	163
3	25	289	251	248	241	228	223	199	193	166	161	161	158
3	30	280	242	239	233	220	215	192	186	161	156	156	154
3	35	271	233	231	224	212	208	185	179	156	152	152	149
3	40	262	225	222	216	205	200	178	173	151	147	147	144
3	45	253	217	214	208	197	193	171	166	147	142	142	139
3	50	245	209	206	200	190	185	165	160	142	137	137	134
3	55	237	201	199	193	183	178	158	153	137	132	132	129
4	0	229	194	191	186	176	172	152	147	132	127	127	124
4	5	222	186	184	179	169	165	146	141	127	122	122	118
4	10	214	179	177	171	162	158	140	135	122	117	117	114
4	15	207	172	170	165	156	152	134	129	117	112	112	110
4	20	200	165	164	158	150	146	129	124	113	109	109	106
4	25	194	159	157	152	144	141	124	120	109	105	105	103
4	30	187	153	151	147	139	136	119	116	106	103	103	101
4	35	182	148	146	142	134	131	115	112	103	100	100	98
4	40	176	143	141	137	130	128	112	109	100	98	98	96
4	45	172	139	137	133	126	124	109	106	98	96	96	94
4	50	168	135	133	130	123	121	106	104	96	94	94	93
4	55	164	131	129	126	120	118	104	101	94	92	92	91
5	0	160	128	126	123	117	115	101	99	92	90	90	89
5	5	157	125	123	120	114	113	99	97	91	89	89	88
5	10	153	122	120	118	112	110	97	95	89	87	87	87
5	15	151	119	117	115	110	108	95	94	88	86	86	85
5	20	148	116	115	113	108	106	93	92	86	85	85	84
5	25	145	114	112	110	105	104	92	90	85	83	83	83
5	30	143	112	110	108	103	102	90	89	84	82	82	81
5	35	140	110	108	106	102	100	89	87	82	81	81	80
5	40	138	108	106	104	100	98	87	86	81	80	80	79
5	45	136	106	104	102	98	97	86	84	80	79	79	78
5	50	133	104	102	100	96	95	84	83	79	78	78	77
5	55	131	102	100	98	95	93	83	82	78	76	76	76
6	0	129	100	98	97	93	92	82	80	77	75	75	75
Peak	(cfs)	590	558	532	534	510	511	457	459	324	326	326	326
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	30	30	30	30	30	25	25	25	30	25	25	25
Peak	(cfs_or_ac.ft.)	0	0	5	0	5	0	4	0	4	0	3	0
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	3197.4	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7
Peak/Area	(cfs/ac)	0.18	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.19	0.19	0.19	0.19
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Summary	File:												

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

10-YEAR

Time(Hrs)	Time(Min)	Elem61	Elem261	Elem162	Elem262	Elem163	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0.17
0	15	0	0	0	3	0	0	0	0	0	0.25
0	20	0	1	1	17	0	0	1	0	1	0.33
0	25	0	7	7	62	0	1	3	0	4	0.42
0	30	4	30	28	148	0	2	9	1	11	0.50
0	35	18	71	66	261	1	4	16	3	25	0.58
0	40	46	113	102	364	2	6	25	6	43	0.67
0	45	87	165	147	418	4	8	32	10	64	0.75
0	50	139	219	192	419	6	9	40	14	83	0.83
0	55	193	264	229	388	7	10	46	19	99	0.92
1	0	241	297	254	346	9	11	51	23	112	1.00
1	5	278	317	268	306	10	12	56	27	122	1.08
1	10	304	327	271	271	11	13	60	31	131	1.17
1	15	318	330	269	245	12	13	63	34	138	1.25
1	20	325	329	263	225	12	14	66	37	143	1.33
1	25	326	325	254	209	13	14	68	40	147	1.42
1	30	323	319	244	193	14	14	70	43	150	1.50
1	35	318	311	234	177	14	15	72	45	153	1.58
1	40	311	302	222	163	14	15	72	47	154	1.67
1	45	303	292	211	150	15	15	73	49	154	1.75
1	50	294	282	199	140	15	15	73	51	154	1.83
1	55	284	273	188	132	15	15	73	52	153	1.92
2	0	275	263	178	126	15	16	73	53	152	2.00
2	5	266	255	169	120	15	16	73	54	150	2.08
2	10	257	247	160	114	16	16	72	55	148	2.17
2	15	249	239	152	109	16	16	72	55	146	2.25
2	20	241	231	145	102	16	16	71	56	144	2.33
2	25	234	224	138	96	16	16	71	56	141	2.42
2	30	226	217	130	90	16	16	70	56	138	2.50
2	35	219	209	124	84	16	16	69	56	135	2.58
2	40	212	202	117	78	16	16	68	56	132	2.67
2	45	205	195	111	73	16	16	67	56	129	2.75
2	50	198	189	105	69	16	16	66	56	125	2.83
2	55	191	182	99	66	16	16	65	56	122	2.92
3	0	185	177	94	64	16	16	64	55	119	3.00
3	5	179	171	90	62	16	16	63	55	115	3.08
3	10	173	166	85	59	16	16	62	55	112	3.17
3	15	168	161	81	56	16	16	61	54	109	3.25
3	20	163	156	77	52	16	16	60	54	105	3.33
3	25	158	151	73	48	16	16	59	53	102	3.42
3	30	154	147	70	45	16	16	57	52	99	3.50
3	35	149	142	66	42	16	16	56	52	95	3.58
3	40	144	137	62	39	16	16	55	51	92	3.67
3	45	139	132	58	37	16	15	54	50	89	3.75
3	50	134	127	54	35	16	15	53	50	86	3.83
3	55	129	121	49	34	15	15	52	49	83	3.92
4	0	124	115	45	33	15	15	51	48	80	4.00
4	5	118	111	42	32	15	15	50	47	77	4.08
4	10	114	107	39	31	15	15	49	46	74	4.17
4	15	110	104	37	31	15	15	48	46	71	4.25
4	20	106	101	35	30	15	15	47	45	68	4.33
4	25	103	99	34	30	15	15	46	44	66	4.42
4	30	101	97	33	29	15	15	45	43	63	4.50
4	35	98	95	32	29	15	15	44	42	61	4.58
4	40	96	93	31	28	15	15	43	42	58	4.67
4	45	94	91	30	28	15	15	42	41	56	4.75
4	50	93	90	30	28	15	14	41	40	54	4.83
4	55	91	88	29	27	15	14	40	39	52	4.92
5	0	89	87	29	27	14	14	40	39	50	5.00
5	5	88	86	28	26	14	14	39	38	48	5.08
5	10	87	84	28	26	14	14	38	37	46	5.17
5	15	85	83	27	26	14	14	37	37	45	5.25
5	20	84	82	27	26	14	14	36	36	43	5.33
5	25	83	81	27	25	14	14	36	35	41	5.42
5	30	81	79	26	25	14	14	35	35	40	5.50
5	35	80	78	26	25	14	14	34	34	38	5.58
5	40	79	77	26	24	14	14	34	33	37	5.67
5	45	78	76	25	24	14	14	33	33	35	5.75
5	50	77	75	25	24	14	14	32	32	34	5.83
5	55	76	74	25	24	14	14	32	31	33	5.92
6	0	75	73	24	23	14	13	31	31	31	6.00
Peak	(cfs)	326	330	271	419	16	16	73	56	154	
Peak	(hrs)	1	1	1	0	2	2	1	2	1	
Peak	(min)	25	15	10	50	10	0	45	20	40	
Peak	(cfs_or_ac.ft.)	5	0	3	0	0	0	0	20	0	
Case	(),S,I,D,O)	()	()	()	()	()	()	()	(S)	()	
Area	(ac)	1726.7	1726.7	823.7	823.7	288.0	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	0.19	0.19	0.33	0.51	0.06	0.06	0.14	0.14	0.21	
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Summary	File:							P:\coweld01\future~2\TriTow~1\10_Year\udswmm\ttod10yr.txt			

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

25-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem153	Elem253	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156
0	5	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0
0	20	1	0	2	0	1	0	0	0	1	0	3	1
0	25	3	0	6	0	4	0	2	0	4	1	13	8
0	30	11	3	18	0	13	0	7	3	13	4	40	28
0	35	32	12	45	2	34	1	25	13	39	17	88	62
0	40	76	35	92	9	75	5	68	43	91	46	152	107
0	45	149	79	160	27	140	16	129	88	168	94	226	163
0	50	216	111	243	61	227	37	189	129	266	160	308	231
0	55	279	143	342	99	333	71	275	198	378	242	404	317
1	0	354	190	437	131	473	124	398	295	512	341	518	423
1	5	457	252	528	178	635	202	546	424	675	456	644	545
1	10	573	327	622	245	805	308	714	576	831	574	739	637
1	15	689	412	724	332	985	440	884	735	970	685	836	733
1	20	807	509	839	441	1167	591	1043	887	1095	790	923	819
1	25	930	617	965	568	1345	751	1184	1024	1198	879	982	880
1	30	1057	736	1097	708	1483	881	1299	1138	1271	944	1011	911
1	35	1187	864	1225	849	1553	955	1383	1222	1312	983	1014	918
1	40	1314	994	1341	981	1607	1021	1433	1275	1324	997	1001	909
1	45	1435	1121	1442	1102	1647	1080	1452	1299	1313	993	978	889
1	50	1545	1240	1528	1209	1676	1131	1447	1300	1288	976	947	862
1	55	1642	1348	1600	1301	1693	1173	1424	1283	1252	950	912	832
2	0	1726	1444	1658	1380	1699	1205	1388	1254	1209	918	875	799
2	5	1796	1525	1703	1443	1694	1227	1343	1216	1162	883	837	765
2	10	1851	1592	1734	1492	1680	1240	1293	1173	1114	847	800	732
2	15	1892	1645	1752	1528	1658	1243	1240	1127	1065	811	764	700
2	20	1918	1684	1759	1552	1629	1239	1187	1081	1018	776	730	669
2	25	1934	1712	1763	1564	1595	1228	1133	1034	971	742	697	640
2	30	1939	1729	1758	1566	1556	1212	1081	989	927	710	667	613
2	35	1935	1737	1744	1560	1515	1190	1031	945	884	680	638	588
2	40	1922	1735	1722	1546	1470	1165	982	902	843	650	610	563
2	45	1901	1726	1695	1526	1428	1137	935	861	803	622	582	538
2	50	1878	1709	1663	1502	1386	1106	892	821	765	596	561	519
2	55	1851	1686	1627	1474	1342	1073	851	784	731	572	540	501
3	0	1819	1659	1589	1443	1297	1040	814	750	702	551	520	484
3	5	1783	1627	1549	1409	1252	1005	781	720	678	531	502	468
3	10	1744	1592	1506	1373	1207	971	751	693	655	512	485	453
3	15	1702	1555	1463	1336	1162	936	723	669	632	494	467	438
3	20	1657	1515	1417	1297	1116	899	697	646	611	477	451	423
3	25	1611	1473	1371	1257	1068	861	672	624	590	460	435	410
3	30	1563	1430	1322	1214	1005	807	648	602	570	444	420	396
3	35	1513	1384	1269	1168	941	753	625	582	550	429	405	383
3	40	1460	1336	1216	1119	889	710	602	562	530	414	390	370
3	45	1406	1287	1162	1072	843	673	580	543	512	399	377	358
3	50	1352	1237	1111	1025	803	642	559	524	494	386	365	347
3	55	1298	1187	1061	981	767	614	539	506	477	373	352	337
4	0	1245	1139	1015	939	734	589	519	489	461	360	341	326
4	5	1193	1091	970	899	704	565	500	473	445	348	329	316
4	10	1144	1046	928	861	675	543	482	457	431	337	319	307
4	15	1097	1002	889	826	648	523	465	442	416	327	309	298
4	20	1051	961	852	792	622	504	449	427	403	316	300	290
4	25	1008	921	816	761	598	486	433	414	390	307	291	282
4	30	968	884	783	731	575	469	418	400	378	298	283	274
4	35	929	848	752	702	553	453	404	388	367	290	275	267
4	40	892	815	722	675	533	437	391	376	356	282	268	260
4	45	857	783	693	650	513	423	379	365	345	274	261	254
4	50	823	752	667	626	495	409	367	354	335	267	254	248
4	55	792	723	641	603	477	396	355	344	326	260	248	242
5	0	762	696	617	581	461	383	344	334	316	253	242	236
5	5	733	670	594	560	445	371	334	325	308	247	236	231
5	10	706	645	573	541	430	360	324	316	299	241	230	226
5	15	680	622	552	522	415	349	315	307	292	235	225	221
5	20	656	599	532	504	402	339	306	299	284	230	221	217
5	25	632	578	514	487	389	329	298	292	277	225	216	212
5	30	610	558	496	471	377	320	290	284	270	220	212	209
5	35	589	539	479	456	365	311	282	277	264	216	208	205
5	40	568	520	463	441	354	303	275	271	258	212	204	201
5	45	549	503	448	427	343	295	269	265	252	208	201	198
5	50	531	486	434	414	334	287	262	259	247	204	197	195
5	55	513	471	420	401	324	280	256	253	242	201	194	192
6	0	496	456	407	389	315	274	251	248	237	197	191	189
Peak	(cfs)	1939	1737	1763	1566	1699	1243	1452	1300	1324	997	1014	918
Peak	(hrs)	2	2	2	2	2	2	1	1	1	1	1	1
Peak	(min)	30	35	25	30	0	15	45	50	40	40	35	35
Peak	(cfs_or_ac.ft.)	0	4	0	5	0	7	0	5	0	5	0	7
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4
Peak/Area	(cfs/ac)	0.29	0.28	0.29	0.28	0.31	0.28	0.33	0.32	0.32	0.30	0.30	0.29
11-23-1999	15:55:08												
Summary	File:	P:\coweld01\future~2\TriTow~1\25_Year\udswmm\ttod25yr.txt											

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

25-YEAR

Time(Hrs)	Time(Min)	Elem755	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761
0	5	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0
0	15	1	1	0	0	0	0	0	0	0	0	0	0
0	20	4	4	0	1	0	2	0	0	0	0	0	0
0	25	15	14	0	3	1	7	0	1	0	0	0	0
0	30	40	39	2	11	6	20	1	6	0	0	0	2
0	35	75	72	9	31	21	43	4	19	0	3	3	14
0	40	122	115	30	67	51	84	18	50	2	17	17	41
0	45	179	167	70	123	101	144	54	108	13	50	50	86
0	50	250	231	133	200	172	224	122	197	45	108	108	153
0	55	338	314	221	298	267	328	222	308	106	187	187	236
1	0	447	417	332	417	383	445	341	425	190	274	274	319
1	5	569	535	457	540	504	561	461	532	281	355	355	391
1	10	689	652	580	652	614	659	563	616	362	419	419	443
1	15	791	750	685	739	700	732	638	673	424	462	462	477
1	20	864	821	762	797	757	776	685	704	465	487	487	495
1	25	906	861	809	827	787	795	708	714	487	498	498	501
1	30	920	872	830	835	795	795	712	710	497	499	499	498
1	35	916	867	831	826	788	782	703	695	496	493	493	489
1	40	900	849	818	807	769	760	684	672	489	482	482	476
1	45	875	823	796	781	744	732	660	645	477	467	467	460
1	50	845	793	768	751	714	701	632	614	462	450	450	442
1	55	813	759	736	718	683	668	601	584	445	432	432	423
2	0	779	725	704	685	650	636	571	553	427	413	413	405
2	5	745	691	671	652	619	604	542	525	409	396	396	388
2	10	712	658	639	621	589	575	514	498	392	379	379	371
2	15	681	626	609	592	560	548	489	474	376	363	363	356
2	20	652	597	581	565	534	523	465	451	361	349	349	343
2	25	625	570	555	540	511	500	444	431	347	336	336	330
2	30	600	545	531	517	489	478	424	412	334	324	324	318
2	35	577	521	509	496	468	459	406	395	322	312	312	307
2	40	555	500	489	476	449	440	389	379	311	302	302	297
2	45	534	479	469	457	432	423	374	364	300	292	292	287
2	50	515	460	451	440	415	407	359	350	290	282	282	277
2	55	497	443	434	423	399	392	345	336	280	273	273	268
3	0	481	426	418	408	385	378	332	324	271	264	264	260
3	5	465	410	403	393	371	364	320	312	263	256	256	252
3	10	450	396	389	379	358	351	308	301	255	248	248	244
3	15	435	381	375	366	346	339	297	290	247	241	241	237
3	20	420	367	362	354	334	328	287	280	240	234	234	230
3	25	407	354	350	341	322	316	277	270	233	227	227	223
3	30	393	341	337	328	310	303	267	261	226	220	220	217
3	35	380	328	324	316	298	292	258	251	219	214	214	210
3	40	368	316	312	304	288	282	249	242	213	207	207	204
3	45	356	305	301	294	278	272	240	233	207	201	201	198
3	50	345	294	291	283	268	262	231	225	200	195	195	192
3	55	334	284	280	273	258	253	223	217	194	189	189	186
4	0	324	273	270	263	249	244	215	210	189	184	184	181
4	5	314	264	261	254	241	236	208	203	183	178	178	176
4	10	305	255	252	246	233	229	201	196	178	174	174	171
4	15	296	247	244	238	226	222	195	190	173	169	169	166
4	20	288	239	236	231	219	215	189	185	169	164	164	162
4	25	280	232	229	224	212	208	184	179	164	160	160	158
4	30	273	225	222	217	206	202	178	174	160	156	156	154
4	35	266	218	216	211	200	197	173	169	156	152	152	150
4	40	259	212	209	205	195	191	168	164	152	148	148	146
4	45	252	206	203	199	189	186	164	160	148	144	144	142
4	50	246	200	198	193	184	181	159	155	144	141	141	139
4	55	240	195	192	188	179	176	155	151	141	138	138	136
5	0	235	189	187	183	174	172	151	148	138	135	135	133
5	5	229	185	182	178	170	167	147	145	135	133	133	131
5	10	224	180	178	174	166	164	144	142	133	130	130	129
5	15	220	176	173	170	162	160	141	139	130	128	128	127
5	20	216	172	169	166	159	157	138	136	128	126	126	125
5	25	211	168	166	163	156	154	136	134	126	124	124	123
5	30	208	165	162	160	153	151	133	131	124	122	122	121
5	35	204	161	159.	156	150	148	131	129	122	120	120	119
5	40	201	158	156	153	147	146	129	127	120	119	119	117
5	45	197	155	153	151	145	143	127	125	119	117	117	116
5	50	194	153	150	148	142	140	125	123	117	115	115	114
5	55	191	150	147	145	140	138	123	121	115	114	114	112
6	0	188	147	145	143	137	136	121	119	114	112	112	111
Peak	(cfs)	920	872	831	835	795	795	712	714	497	499	499	501
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	30	30	35	30	30	25	30	25	30	30	30	25
Peak	(cfs_or_ac.ft.)	0	0	6	0	6	0	6	0	4	0	4	0
Case	(()),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	3197.4	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7
Peak/Area	(cfs/ac)	0.29	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.29	0.29	0.29	0.29
11-23-1999	15:55:08												
Summary	File:												

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

25-YEAR

Time(Hrs)	Time(Min)	Elem61	Elem261	Elem162	Elem262	Elem163	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0.17
0	15	0	0	0	2	0	0	0	0	0	0.25
0	20	0	1	1	14	0	0	1	0	1	0.33
0	25	0	5	5	44	0	1	2	0	3	0.42
0	30	2	21	20	120	0	2	8	1	9	0.50
0	35	14	64	59	251	1	4	18	3	22	0.58
0	40	41	110	100	414	2	7	32	6	45	0.67
0	45	86	180	159	548	4	10	54	11	74	0.75
0	50	153	264	231	610	7	12	76	18	106	0.83
0	55	236	347	301	601	9	14	92	26	136	0.92
1	0	319	414	355	555	12	16	105	34	172	1.00
1	5	391	461	390	499	14	17	113	41	220	1.08
1	10	443	490	406	445	16	18	119	48	257	1.17
1	15	477	503	410	399	17	19	123	54	285	1.25
1	20	495	506	403	360	18	20	124	59	305	1.33
1	25	501	502	391	325	19	21	125	64	319	1.42
1	30	498	491	374	292	20	21	124	68	327	1.50
1	35	489	477	355	261	21	22	122	71	329	1.58
1	40	476	460	334	233	21	22	120	74	327	1.67
1	45	460	441	312	209	22	22	117	76	321	1.75
1	50	442	422	290	190	22	22	114	78	312	1.83
1	55	423	403	270	174	22	22	112	80	302	1.92
2	0	405	385	251	163	22	23	110	81	291	2.00
2	5	388	368	234	153	23	23	109	83	279	2.08
2	10	371	353	219	146	23	23	108	83	266	2.17
2	15	356	340	206	138	23	23	107	84	254	2.25
2	20	343	327	193	131	23	23	106	84	241	2.33
2	25	330	315	182	125	23	23	105	85	229	2.42
2	30	318	304	172	118	23	23	103	85	217	2.50
2	35	307	294	162	112	23	23	102	84	205	2.58
2	40	297	284	154	106	23	23	100	84	193	2.67
2	45	287	275	145	100	23	23	99	84	181	2.75
2	50	277	266	138	95	23	23	97	83	170	2.83
2	55	268	257	131	90	23	23	95	83	159	2.92
3	0	260	249	124	87	23	23	94	82	152	3.00
3	5	252	242	118	83	23	23	92	81	147	3.08
3	10	244	235	112	79	23	23	90	81	143	3.17
3	15	237	228	107	74	23	23	89	80	138	3.25
3	20	230	221	102	70	23	23	87	79	134	3.33
3	25	223	214	97	65	23	22	85	78	130	3.42
3	30	217	208	92	61	22	22	83	77	125	3.50
3	35	210	202	87	58	22	22	82	76	121	3.58
3	40	204	195	83	55	22	22	80	75	117	3.67
3	45	198	189	78	52	22	22	78	73	113	3.75
3	50	192	184	74	50	22	22	77	72	108	3.83
3	55	186	179	71	49	22	22	75	71	105	3.92
4	0	181	174	67	47	22	22	74	70	101	4.00
4	5	176	169	64	46	22	22	72	69	97	4.08
4	10	171	164	61	45	22	21	71	68	93	4.17
4	15	166	160	59	44	22	21	69	66	90	4.25
4	20	162	156	56	44	21	21	68	65	86	4.33
4	25	158	152	54	43	21	21	66	64	83	4.42
4	30	154	148	51	42	21	21	65	63	80	4.50
4	35	150	144	49	42	21	21	64	62	77	4.58
4	40	146	140	47	41	21	21	62	61	74	4.67
4	45	142	137	45	41	21	21	61	59	71	4.75
4	50	139	135	44	40	21	21	60	58	68	4.83
4	55	136	132	43	40	21	20	58	57	66	4.92
5	0	133	130	42	39	21	20	57	56	63	5.00
5	5	131	128	41	39	20	20	56	55	61	5.08
5	10	129	126	40	38	20	20	55	54	59	5.17
5	15	127	124	40	38	20	20	54	53	56	5.25
5	20	125	122	39	37	20	20	53	52	54	5.33
5	25	123	120	39	37	20	20	52	51	52	5.42
5	30	121	118	38	36	20	20	51	50	50	5.50
5	35	119	116	38	36	20	20	50	49	48	5.58
5	40	117	115	37	36	20	20	49	48	46	5.67
5	45	116	113	37	35	20	19	48	47	45	5.75
5	50	114	112	36	35	19	19	47	46	43	5.83
5	55	112	110	36	35	19	19	46	45	41	5.92
6	0	111	109	35	34	19	19	45	45	40	6.00
Peak	(cfs)	501	506	410	610	23	23	125	85	329	
Peak	(hrs)	1	1	1	0	2	2	1	2	1	
Peak	(min)	25	20	15	50	5	0	25	25	35	
Peak	(cfs_or_ac.ft.)	6	0	3	0	0	0	0	30	0	
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	(S)	( )	
Area	(ac)	1726.7	1726.7	823.7	823.7	288.0	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	0.29	0.29	0.50	0.74	0.08	0.08	0.25	0.22	0.46	
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Summary	File:							P:\coweld01\future~2\TriTow~1\25_Year\udswmm\ttod25yr.txt			

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

50-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem153	Elem253	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156
0	5	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0
0	20	1	0	2	0	1	0	0	0	1	0	4	2
0	25	4	1	7	0	5	0	2	1	4	1	15	10
0	30	14	4	22	1	16	0	9	4	16	5	47	33
0	35	39	15	53	3	42	1	33	17	49	22	106	75
0	40	92	44	112	13	94	7	89	56	114	59	190	134
0	45	181	97	200	36	182	21	156	101	217	124	292	213
0	50	253	127	336	85	305	50	246	162	351	216	409	309
0	55	346	179	482	120	497	100	392	269	534	332	544	430
1	0	504	257	618	173	719	185	585	429	751	470	698	573
1	5	674	358	756	255	958	311	812	629	961	617	821	689
1	10	846	478	903	369	1210	479	1047	845	1158	767	979	843
1	15	1020	617	1066	516	1471	681	1278	1061	1352	926	1133	996
1	20	1199	773	1244	690	1704	880	1494	1268	1525	1077	1250	1113
1	25	1383	944	1424	878	1830	990	1681	1451	1659	1197	1319	1184
1	30	1566	1123	1592	1062	1936	1097	1825	1595	1741	1274	1343	1212
1	35	1742	1302	1744	1238	2027	1204	1914	1687	1765	1300	1334	1207
1	40	1906	1475	1880	1401	2103	1305	1954	1733	1764	1307	1302	1181
1	45	2054	1636	1998	1549	2162	1396	1958	1745	1742	1297	1258	1143
1	50	2184	1782	2098	1680	2203	1474	1935	1731	1700	1270	1207	1098
1	55	2294	1911	2180	1792	2226	1536	1887	1692	1631	1218	1152	1049
2	0	2386	2021	2243	1885	2231	1582	1820	1635	1558	1163	1096	999
2	5	2458	2111	2289	1959	2220	1611	1743	1568	1484	1108	1041	950
2	10	2510	2183	2317	2013	2194	1624	1663	1499	1411	1055	989	903
2	15	2545	2235	2328	2048	2156	1624	1582	1428	1341	1003	939	858
2	20	2561	2269	2323	2066	2108	1612	1503	1359	1273	954	893	817
2	25	2561	2286	2304	2069	2052	1591	1426	1293	1208	908	851	780
2	30	2545	2287	2274	2059	1989	1562	1353	1229	1148	865	812	745
2	35	2516	2275	2237	2036	1924	1527	1283	1168	1090	826	775	713
2	40	2478	2253	2196	2004	1856	1487	1217	1111	1037	789	742	683
2	45	2432	2223	2148	1965	1787	1444	1155	1057	986	755	710	656
2	50	2379	2185	2094	1919	1718	1399	1097	1006	938	723	681	630
2	55	2321	2140	2035	1869	1651	1353	1041	958	894	693	653	606
3	0	2261	2090	1974	1816	1591	1306	990	913	852	665	627	583
3	5	2202	2036	1913	1762	1531	1259	943	871	812	638	602	560
3	10	2140	1979	1851	1707	1472	1212	899	831	774	613	577	538
3	15	2077	1921	1789	1652	1415	1166	858	793	741	589	557	521
3	20	2013	1862	1727	1597	1359	1121	821	760	715	567	537	503
3	25	1948	1802	1665	1543	1304	1078	789	731	689	547	518	488
3	30	1884	1742	1605	1489	1251	1035	759	704	666	528	501	473
3	35	1819	1683	1545	1435	1199	994	731	679	643	510	485	458
3	40	1755	1624	1486	1383	1148	953	704	656	621	494	469	445
3	45	1692	1566	1429	1331	1098	913	679	634	601	478	454	432
3	50	1630	1508	1372	1280	1046	870	655	613	581	462	440	419
3	55	1569	1452	1315	1228	982	815	632	593	562	448	426	407
4	0	1507	1395	1255	1174	912	754	610	574	544	434	413	396
4	5	1446	1338	1195	1119	856	706	589	556	527	421	401	385
4	10	1384	1280	1137	1065	810	667	569	538	511	408	389	374
4	15	1323	1223	1081	1013	769	634	549	522	494	396	377	363
4	20	1264	1168	1029	965	734	606	531	505	479	384	365	353
4	25	1207	1115	980	920	703	581	513	490	464	373	355	344
4	30	1153	1064	935	878	674	558	496	475	450	362	346	335
4	35	1101	1016	892	840	647	538	480	460	437	353	337	327
4	40	1053	971	853	803	622	519	464	447	424	343	329	319
4	45	1007	929	817	770	599	501	450	434	413	335	321	312
4	50	964	889	782	739	578	484	436	422	401	326	313	305
4	55	924	851	751	709	557	469	424	410	391	319	306	299
5	0	886	816	721	682	538	454	411	399	381	311	299	293
5	5	851	784	693	656	520	441	400	389	371	304	293	287
5	10	817	753	667	632	503	428	389	379	362	298	287	281
5	15	786	724	642	610	487	416	379	370	353	292	281	276
5	20	756	697	619	589	472	404	369	361	345	286	275	271
5	25	728	671	597	569	458	393	360	352	337	280	270	266
5	30	702	647	577	550	444	383	351	344	329	274	265	261
5	35	677	624	557	532	431	373	342	336	322	269	259	256
5	40	653	603	539	515	419	364	334	328	314	264	255	251
5	45	631	583	521	499	407	355	326	321	307	259	250	247
5	50	610	563	505	484	396	346	318	314	301	254	245	242
5	55	590	545	489	470	385	338	311	307	294	249	241	238
6	0	571	528	474	456	375	330	304	300	288	245	237	234
Peak	(cfs)	2561	2287	2328	2069	2231	1624	1958	1745	1765	1307	1343	1212
Peak	(hrs)	2	2	2	2	2	2	1	1	1	1	1	1
Peak	(min)	20	30	15	25	0	10	45	45	35	40	30	30
Peak	(cfs_or_ac.ft.)	0	5	0	5	0	7	0	5	0	6	0	7
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4
Peak/Area	(cfs/ac)	0.38	0.37	0.38	0.37	0.40	0.37	0.44	0.43	0.43	0.39	0.40	0.38
11-23-1999	15:55:09												
Summary	File:	P:\coweld01\future~2\TriTow~1\50_Year\udswmm\ttod50yr.txt											

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

50-YEAR

Time(Hrs)	Time(Min)	Elem755	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761
0	5	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0
0	15	1	1	0	0	0	0	0	0	0	0	0	0
0	20	5	5	0	1	0	2	0	0	0	0	0	0
0	25	17	17	0	4	2	8	0	2	0	0	0	0
0	30	47	45	3	14	8	24	1	7	0	0	0	3
0	35	90	87	13	39	26	52	6	24	0	4	4	17
0	40	154	146	40	87	66	110	25	65	3	22	22	49
0	45	234	218	95	163	135	190	73	143	18	64	64	107
0	50	333	310	182	267	232	296	166	261	62	139	139	196
0	55	457	426	302	400	360	436	303	410	144	245	245	307
1	0	607	569	454	561	517	597	465	569	258	363	363	420
1	5	776	732	626	732	684	757	625	714	380	473	473	517
1	10	940	891	795	884	834	891	761	826	489	558	558	588
1	15	1074	1021	934	999	947	985	858	898	569	614	614	632
1	20	1164	1107	1031	1069	1017	1036	914	934	620	645	645	653
1	25	1209	1150	1083	1100	1048	1053	937	941	646	656	656	656
1	30	1217	1156	1099	1100	1048	1043	934	927	652	652	652	648
1	35	1197	1134	1089	1078	1028	1016	914	899	646	638	638	630
1	40	1163	1099	1061	1042	994	978	881	861	630	617	617	608
1	45	1120	1055	1022	999	951	933	841	818	609	593	593	582
1	50	1072	1006	976	951	904	884	797	773	584	566	566	554
1	55	1021	955	928	901	856	836	752	728	557	539	539	527
2	0	971	904	879	853	809	789	709	685	531	512	512	501
2	5	922	854	832	806	764	745	667	645	505	487	487	477
2	10	876	808	787	763	722	705	629	608	481	464	464	454
2	15	833	765	746	724	684	668	595	575	459	443	443	434
2	20	794	726	708	687	649	634	564	546	439	424	424	416
2	25	758	690	674	654	618	604	535	519	420	407	407	399
2	30	725	657	642	624	589	576	510	495	403	391	391	384
2	35	695	626	613	597	562	551	487	473	388	376	376	370
2	40	667	599	587	571	538	527	465	452	374	363	363	356
2	45	641	573	562	547	516	505	445	433	360	350	350	344
2	50	617	549	539	525	495	485	427	416	347	338	338	332
2	55	594	527	518	505	475	466	410	399	336	326	326	321
3	0	573	506	498	485	457	449	394	384	324	316	316	311
3	5	554	487	479	468	440	432	379	370	314	306	306	301
3	10	535	469	462	451	425	417	365	357	304	297	297	292
3	15	517	452	445	435	410	402	353	344	295	288	288	284
3	20	500	435	430	420	396	389	341	333	287	280	280	276
3	25	484	420	415	405	382	376	329	322	279	272	272	268
3	30	470	405	401	392	370	363	318	311	271	265	265	261
3	35	456	392	387	379	357	351	307	300	264	257	257	254
3	40	442	379	375	366	346	340	297	290	256	250	250	247
3	45	429	366	362	354	334	329	287	280	249	243	243	240
3	50	417	354	350	342	324	318	278	271	242	237	237	233
3	55	405	343	339	332	314	308	269	262	236	230	230	227
4	0	394	332	329	321	304	299	260	254	229	224	224	221
4	5	383	322	318	311	294	289	252	246	223	218	218	215
4	10	371	311	308	300	284	279	244	239	218	213	213	210
4	15	361	301	298	290	275	271	237	232	212	208	208	205
4	20	351	292	288	282	267	263	231	226	207	203	203	200
4	25	342	283	280	274	260	257	225	220	202	198	198	196
4	30	334	276	272	267	253	249	219	215	198	194	194	192
4	35	326	268	265	259	246	243	213	209	194	190	190	188
4	40	318	261	257	252	240	237	208	204	190	186	186	184
4	45	311	254	251	246	234	231	203	200	186	182	182	180
4	50	304	248	245	240	229	226	199	195	182	179	179	177
4	55	298	242	239	234	224	221	194	191	178	175	175	173
5	0	291	236	233	229	219	216	190	187	175	172	172	170
5	5	286	231	228	224	214	211	186	183	172	169	169	167
5	10	280	226	223	219	209	207	182	179	169	166	166	164
5	15	275	221	218	214	205	202	179	176	166	163	163	161
5	20	269	216	213	209	201	198	175	172	163	160	160	158
5	25	264	212	209	205	197	194	172	169	160	157	157	155
5	30	259	207	204	201	193	190	168	166	157	154	154	153
5	35	255	203	200	196	189	186	165	162	154	152	152	150
5	40	250	199	196	192	185	183	162	159	152	149	149	148
5	45	246	195	192	189	181	179	159	157	149	147	147	145
5	50	241	191	188	185	178	176	156	154	147	145	145	143
5	55	237	187	184	181	175	173	154	151	145	142	142	141
6	0	234	184	181	178	172	170	151	149	142	140	140	139
Peak	(cfs)	1217	1156	1099	1100	1048	1053	937	941	652	656	656	656
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	30	30	30	25	25	25	25	25	30	25	25	25
Peak	(cfs_or_ac.ft.)	0	0	6	0	6	0	6	0	5	0	5	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	3197.4	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7
Peak/Area	(cfs/ac)	0.38	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.38	0.38	0.38	0.38
11-23-1999	15:55:09												
Summary	File:												

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

50-YEAR

Time(Hrs)	Time(Min)	Elem61	Elem261	Elem162	Elem262	Elem163	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0.17
0	15	0	0	0	4	0	0	0	0	0	0.25
0	20	0	1	1	17	0	0	1	0	1	0.33
0	25	0	6	6	53	0	1	3	0	4	0.42
0	30	3	27	25	140	0	2	9	1	11	0.50
0	35	17	73	67	302	1	5	23	4	27	0.58
0	40	49	131	117	510	3	8	47	8	55	0.67
0	45	107	222	196	687	5	12	83	15	93	0.75
0	50	196	336	293	774	9	15	112	24	135	0.83
0	55	307	448	387	774	12	18	136	34	203	0.92
1	0	420	541	462	724	15	20	152	45	281	1.00
1	5	517	607	511	654	18	22	164	55	343	1.08
1	10	588	646	534	582	20	24	171	64	391	1.17
1	15	632	663	537	515	22	25	175	73	425	1.25
1	20	653	664	526	456	24	26	176	80	449	1.33
1	25	656	653	505	403	25	27	175	86	462	1.42
1	30	648	634	478	356	26	27	172	91	467	1.50
1	35	630	610	448	313	27	28	168	95	465	1.58
1	40	608	582	416	276	27	28	163	98	457	1.67
1	45	582	554	384	245	28	28	158	101	445	1.75
1	50	554	525	354	220	28	28	153	103	430	1.83
1	55	527	499	326	201	28	28	148	104	413	1.92
2	0	501	474	300	187	28	28	143	106	394	2.00
2	5	477	451	278	175	28	29	139	107	375	2.08
2	10	454	431	258	166	29	29	135	107	356	2.17
2	15	434	413	240	157	29	29	134	108	337	2.25
2	20	416	397	225	149	29	29	132	108	319	2.33
2	25	399	381	211	141	29	29	130	108	300	2.42
2	30	384	367	198	133	29	29	128	107	282	2.50
2	35	370	354	186	125	29	29	126	107	265	2.58
2	40	356	341	175	118	29	29	124	106	248	2.67
2	45	344	330	165	112	29	29	122	106	231	2.75
2	50	332	319	156	107	29	28	120	105	216	2.83
2	55	321	308	148	103	28	28	117	104	201	2.92
3	0	311	299	140	99	28	28	115	103	187	3.00
3	5	301	290	133	96	28	28	113	102	174	3.08
3	10	292	282	127	92	28	28	111	100	161	3.17
3	15	284	274	121	88	28	28	109	99	152	3.25
3	20	276	267	116	83	28	28	107	98	147	3.33
3	25	268	259	111	78	28	28	105	97	142	3.42
3	30	261	252	105	73	28	28	102	95	137	3.50
3	35	254	245	100	70	28	27	100	94	133	3.58
3	40	247	238	95	66	28	27	98	92	128	3.67
3	45	240	231	91	64	27	27	96	91	123	3.75
3	50	233	225	87	61	27	27	94	89	119	3.83
3	55	227	219	83	60	27	27	92	88	114	3.92
4	0	221	213	80	58	27	27	90	86	110	4.00
4	5	215	208	76	57	27	27	88	85	106	4.08
4	10	210	203	74	56	27	27	87	83	102	4.17
4	15	205	198	71	55	27	26	85	82	98	4.25
4	20	200	194	69	54	26	26	83	80	95	4.33
4	25	196	190	66	53	26	26	81	79	91	4.42
4	30	192	186	64	53	26	26	80	77	88	4.50
4	35	188	182	63	52	26	26	78	76	84	4.58
4	40	184	179	61	51	26	26	76	75	81	4.67
4	45	180	175	59	51	26	26	75	73	78	4.75
4	50	177	172	58	50	26	25	73	72	75	4.83
4	55	173	169	56	49	25	25	72	71	72	4.92
5	0	170	166	55	49	25	25	70	69	69	5.00
5	5	167	163	54	48	25	25	69	68	67	5.08
5	10	164	160	52	48	25	25	68	67	64	5.17
5	15	161	157	51	47	25	25	66	65	62	5.25
5	20	158	154	50	46	25	25	65	64	59	5.33
5	25	155	151	49	46	25	25	64	63	57	5.42
5	30	153	149	48	45	25	24	62	62	55	5.50
5	35	150	147	47	45	24	24	61	60	53	5.58
5	40	148	144	47	44	24	24	60	59	51	5.67
5	45	145	142	46	44	24	24	59	58	49	5.75
5	50	143	140	45	44	24	24	58	57	47	5.83
5	55	141	138	45	43	24	24	56	56	45	5.92
6	0	139	136	44	43	24	24	55	55	43	6.00
Peak	(cfs)	656	664	537	774	29	29	176	108	467	
Peak	(hrs)	1	1	1	0	2	2	1	2	1	
Peak	(min)	25	20	15	50	10	5	20	15	30	
Peak	(cfs_or_ac.ft.)	7	0	3	0	0	0	0	38	0	
Case	(()S,I,D,O)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(S)	(_)	
Area	(ac)	1726.7	1726.7	823.7	823.7	288.0	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	0.38	0.38	0.65	0.94	0.10	0.10	0.35	0.27	0.65	
11-23-1999	15:55:09										
Summary	File:							P:\coweld01\future~2\TriTow~1\50_Year\udswmm\ttod50yr.txt			

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

100-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem153	Elem253	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156
0	5	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0
0	20	1	0	2	0	1	0	0	0	1	0	4	2
0	25	4	1	8	0	5	0	2	1	5	1	16	11
0	30	15	4	23	1	17	0	10	4	18	6	52	36
0	35	42	17	59	4	47	2	38	20	55	25	120	85
0	40	103	50	127	15	109	8	105	65	133	70	223	158
0	45	197	103	234	45	219	26	179	112	259	150	351	256
0	50	287	142	429	96	395	62	308	194	434	265	497	378
0	55	440	216	607	142	657	131	505	342	693	412	668	530
1	0	652	324	784	219	944	247	763	560	954	578	822	669
1	5	873	463	970	336	1258	420	1054	817	1208	756	1010	848
1	10	1101	629	1176	497	1592	648	1355	1092	1469	957	1231	1063
1	15	1338	823	1403	701	1906	887	1655	1373	1727	1171	1429	1258
1	20	1583	1039	1636	929	2088	1024	1925	1631	1917	1331	1570	1399
1	25	1828	1269	1854	1160	2242	1163	2128	1829	2017	1416	1645	1478
1	30	2062	1501	2053	1384	2376	1305	2260	1963	2086	1482	1666	1503
1	35	2278	1725	2231	1597	2489	1445	2342	2049	2125	1527	1644	1488
1	40	2472	1936	2388	1793	2581	1576	2383	2099	2135	1551	1594	1446
1	45	2642	2127	2522	1970	2652	1694	2390	2116	2119	1554	1530	1388
1	50	2788	2296	2635	2124	2701	1796	2368	2106	2081	1538	1457	1324
1	55	2908	2442	2725	2255	2729	1878	2322	2074	2025	1507	1380	1255
2	0	3005	2564	2794	2362	2738	1941	2258	2023	1956	1463	1304	1186
2	5	3078	2663	2842	2446	2727	1983	2179	1958	1876	1409	1231	1120
2	10	3129	2738	2870	2507	2698	2006	2089	1882	1786	1344	1162	1059
2	15	3159	2791	2877	2546	2654	2011	1986	1793	1678	1262	1099	1002
2	20	3167	2823	2866	2564	2594	1998	1865	1685	1541	1149	1041	951
2	25	3157	2834	2838	2562	2520	1968	1739	1572	1440	1072	989	904
2	30	3128	2827	2794	2543	2435	1924	1627	1472	1356	1011	942	863
2	35	3084	2802	2736	2507	2343	1872	1529	1385	1283	960	900	826
2	40	3026	2763	2668	2459	2249	1814	1442	1309	1218	916	861	792
2	45	2957	2712	2599	2401	2155	1752	1364	1242	1158	876	826	761
2	50	2882	2654	2524	2335	2063	1690	1292	1180	1102	839	793	733
2	55	2800	2588	2445	2264	1973	1627	1227	1123	1050	806	763	706
3	0	2714	2517	2362	2189	1885	1564	1166	1071	1002	775	735	682
3	5	2624	2441	2277	2113	1802	1503	1109	1022	957	746	709	659
3	10	2534	2363	2193	2037	1728	1443	1056	976	916	719	684	638
3	15	2450	2283	2111	1962	1658	1385	1007	934	876	694	660	617
3	20	2365	2203	2030	1889	1589	1329	963	893	838	670	636	596
3	25	2280	2124	1952	1818	1523	1276	921	855	801	646	613	577
3	30	2197	2046	1875	1749	1460	1224	882	820	772	623	591	557
3	35	2115	1970	1801	1682	1399	1175	847	789	745	601	570	538
3	40	2036	1895	1730	1617	1340	1127	815	760	719	580	552	524
3	45	1958	1823	1660	1554	1285	1082	786	734	695	562	535	508
3	50	1883	1753	1594	1494	1231	1039	757	709	673	544	518	494
3	55	1810	1685	1530	1435	1179	997	730	685	651	527	502	479
4	0	1740	1619	1468	1379	1129	956	705	663	630	510	487	466
4	5	1672	1556	1408	1325	1079	915	681	642	610	495	472	453
4	10	1606	1495	1350	1271	1029	873	657	622	591	480	459	441
4	15	1542	1435	1292	1218	967	820	635	603	573	467	446	430
4	20	1479	1376	1233	1163	898	758	614	585	556	454	434	419
4	25	1416	1318	1173	1108	843	710	594	567	540	441	423	409
4	30	1354	1260	1115	1053	797	672	575	551	525	430	412	400
4	35	1294	1203	1060	1002	759	640	557	535	510	419	402	391
4	40	1235	1148	1009	954	725	612	541	520	497	409	392	382
4	45	1179	1095	961	910	696	589	525	506	483	398	383	373
4	50	1126	1045	917	869	669	567	509	492	470	389	373	364
4	55	1076	998	876	831	644	548	494	479	457	379	365	356
5	0	1029	954	839	797	622	530	480	467	446	370	357	349
5	5	985	913	804	764	601	514	467	455	435	362	349	342
5	10	943	874	772	734	581	499	455	443	424	354	342	335
5	15	905	839	742	707	562	484	443	432	414	347	335	329
5	20	869	805	714	681	545	471	431	422	404	340	328	323
5	25	835	774	688	657	528	458	421	412	395	333	322	317
5	30	804	745	663	634	513	446	410	403	386	327	316	311
5	35	774	718	640	613	498	435	401	394	378	321	310	306
5	40	746	692	619	593	484	424	391	385	370	315	305	301
5	45	720	668	599	574	471	414	382	377	362	309	300	296
5	50	695	645	579	557	458	404	374	369	355	303	294	291
5	55	672	624	561	540	446	395	366	361	347	298	289	286
6	0	650	604	544	524	435	386	358	354	340	293	285	282
Peak	(cfs)	3167	2834	2877	2564	2738	2011	2390	2116	2135	1554	1666	1503
Peak	(hrs)	2	2	2	2	2	2	1	1	1	1	1	1
Peak	(min)	20	25	15	20	0	15	45	45	40	45	30	30
Peak	(cfs_or_ac.ft.)	0	5	0	6	0	7	0	5	0	6	0	7
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4
Peak/Area	(cfs/ac)	0.47	0.46	0.47	0.46	0.50	0.45	0.54	0.52	0.52	0.46	0.49	0.47
11-23-1999	15:55:10												
Summary	File:	P:\coweld01\future~2\TriTow~1\100_Year\udswmm\ttod100y.txt											

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

100-YEAR

Time(Hrs)	Time(Min)	Elem755	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761
0	5	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0
0	15	1	1	0	0	0	0	0	0	0	0	0	0
0	20	6	5	0	1	0	2	0	0	0	0	0	0
0	25	19	18	0	4	2	8	0	2	0	0	0	0
0	30	51	50	3	15	9	26	1	8	0	0	0	4
0	35	103	99	15	45	30	60	7	28	0	5	5	19
0	40	181	172	48	103	79	131	30	77	3	25	25	56
0	45	282	264	116	197	164	228	90	172	22	75	75	125
0	50	407	379	225	324	282	358	206	318	76	167	167	233
0	55	563	526	375	491	443	534	376	503	178	297	297	371
1	0	755	710	567	697	643	741	577	701	320	445	445	512
1	5	972	920	787	914	856	943	777	881	473	581	581	633
1	10	1181	1122	1000	1105	1044	1111	945	1021	606	687	687	722
1	15	1347	1283	1172	1246	1183	1226	1065	1112	705	757	757	778
1	20	1453	1385	1288	1331	1267	1288	1134	1157	767	796	796	805
1	25	1502	1430	1348	1364	1301	1305	1160	1164	798	809	809	810
1	30	1504	1430	1361	1358	1296	1287	1153	1142	805	802	802	796
1	35	1472	1396	1341	1324	1263	1246	1122	1101	793	781	781	770
1	40	1420	1342	1298	1272	1213	1191	1074	1047	769	750	750	736
1	45	1357	1279	1241	1210	1152	1127	1017	986	737	714	714	699
1	50	1289	1210	1176	1142	1086	1060	956	923	701	676	676	660
1	55	1219	1139	1109	1074	1020	994	894	862	663	638	638	623
2	0	1151	1070	1043	1009	957	932	836	806	627	603	603	589
2	5	1086	1005	981	948	898	874	782	754	593	570	570	557
2	10	1026	945	923	893	844	822	733	708	562	541	541	529
2	15	972	891	870	843	796	776	690	667	534	515	515	504
2	20	923	842	823	798	753	735	651	631	509	492	492	482
2	25	879	798	780	758	714	698	617	599	486	471	471	462
2	30	840	759	742	722	680	665	587	570	466	452	452	444
2	35	805	724	708	690	649	636	560	545	448	435	435	428
2	40	773	692	678	660	621	609	535	522	431	420	420	413
2	45	743	663	650	634	596	585	514	501	416	406	406	399
2	50	716	637	624	609	573	563	494	482	403	393	393	387
2	55	691	612	601	587	552	542	475	464	390	381	381	375
3	0	668	589	579	566	532	523	458	448	378	369	369	364
3	5	647	568	558	546	514	506	442	433	367	359	359	354
3	10	626	548	539	528	497	489	427	418	357	349	349	344
3	15	606	529	521	510	480	472	413	405	347	339	339	335
3	20	587	510	504	493	464	457	400	391	337	330	330	326
3	25	569	493	487	476	449	442	387	379	328	321	321	317
3	30	552	476	471	461	434	427	374	366	320	313	313	308
3	35	536	461	455	446	420	414	362	354	311	304	304	300
3	40	520	446	441	431	407	400	350	343	303	296	296	292
3	45	505	431	426	417	394	387	339	331	295	288	288	284
3	50	491	417	413	404	381	375	328	321	287	280	280	276
3	55	477	404	399	391	369	363	318	311	279	273	273	269
4	0	463	391	387	379	358	352	308	301	272	266	266	262
4	5	451	379	375	367	347	342	298	292	265	259	259	256
4	10	439	368	364	356	337	332	290	284	258	253	253	250
4	15	427	357	353	346	328	323	282	276	252	247	247	244
4	20	417	347	343	336	319	315	274	269	246	241	241	239
4	25	407	338	334	328	311	307	267	262	241	236	236	233
4	30	398	329	325	319	303	300	260	256	236	231	231	229
4	35	389	321	317	311	296	292	254	249	231	227	227	224
4	40	380	312	309	302	288	283	248	244	226	222	222	220
4	45	371	304	300	294	280	276	242	238	222	218	218	216
4	50	362	296	292	287	273	270	237	233	218	214	214	212
4	55	354	289	285	280	267	264	232	229	214	210	210	208
5	0	347	282	279	274	262	259	227	224	210	206	206	204
5	5	341	276	272	268	256	253	223	220	206	203	203	201
5	10	334	270	266	262	250	247	219	215	203	199	199	198
5	15	327	264	260	256	245	243	214	211	199	196	196	194
5	20	321	259	255	251	241	238	210	207	196	193	193	191
5	25	316	253	250	246	236	233	207	204	193	190	190	188
5	30	310	248	245	241	232	229	203	200	190	187	187	185
5	35	305	244	240	236	227	225	199	197	187	184	184	182
5	40	300	239	235	232	223	221	196	193	184	181	181	180
5	45	295	234	231	228	219	217	192	190	181	178	178	177
5	50	290	230	227	223	215	213	189	187	178	176	176	174
5	55	285	226	222	219	211	209	186	184	176	173	173	172
6	0	281	222	218	215	208	206	183	181	173	171	171	169
Peak	(cfs)	1504	1430	1361	1364	1301	1305	1160	1164	805	809	809	810
Peak	(hrs)	1	1	1	1	1	1	1	1	1	1	1	1
Peak	(min)	30	25	30	25	25	25	25	25	30	25	25	25
Peak	(cfs_or_ac.ft.)	0	0	7	0	7	0	7	0	5	0	5	0
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	3197.4	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7
Peak/Area	(cfs/ac)	0.47	0.56	0.56	0.56	0.55	0.56	0.55	0.56	0.47	0.47	0.47	0.47
11-23-1999	15:55:10												
Summary	File:												

TRI-TOWN BASIN, FUTURE WITH ON SITE DETENTION CONDITION

100-YEAR

Time(Hrs)	Time(Min)	Elem61	Elem261	Elem162	Elem262	Elem163	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0	0	0	0	0	0.08
0	10	0	0	0	0	0	0	0	0	0	0.17
0	15	0	0	0	4	0	0	0	0	0	0.25
0	20	0	1	1	17	0	0	1	0	1	0.33
0	25	0	7	6	56	0	1	3	0	4	0.42
0	30	4	29	28	155	0	2	11	1	12	0.50
0	35	19	79	73	343	1	5	27	4	30	0.58
0	40	56	148	132	592	3	10	65	9	63	0.67
0	45	125	259	227	808	6	14	108	17	109	0.75
0	50	233	399	347	919	10	18	145	29	168	0.83
0	55	371	539	465	928	14	22	174	42	281	0.92
1	0	512	656	560	876	18	24	195	55	376	1.00
1	5	633	740	622	802	22	27	211	68	452	1.08
1	10	722	792	654	723	25	29	222	79	512	1.17
1	15	778	816	661	644	27	30	228	90	556	1.25
1	20	805	819	648	566	29	31	228	99	586	1.33
1	25	810	804	621	489	30	32	226	107	602	1.42
1	30	796	776	583	419	31	33	221	113	605	1.50
1	35	770	740	541	359	32	33	214	118	598	1.58
1	40	736	701	496	310	33	33	207	122	584	1.67
1	45	699	661	452	272	33	34	199	125	565	1.75
1	50	660	622	412	243	33	34	191	127	543	1.83
1	55	623	587	375	221	34	34	184	128	519	1.92
2	0	589	555	343	205	34	34	177	129	493	2.00
2	5	557	526	315	193	34	34	170	130	468	2.08
2	10	529	501	291	183	34	34	164	130	442	2.17
2	15	504	479	270	174	34	34	159	130	417	2.25
2	20	482	459	251	165	34	34	157	130	392	2.33
2	25	462	441	235	158	34	34	154	130	368	2.42
2	30	444	425	221	151	34	34	152	129	345	2.50
2	35	428	410	208	146	34	34	149	128	323	2.58
2	40	413	397	197	140	34	34	147	127	302	2.67
2	45	399	385	186	134	34	34	144	126	282	2.75
2	50	387	373	177	129	34	34	142	125	263	2.83
2	55	375	362	168	123	34	34	139	124	245	2.92
3	0	364	352	161	118	34	34	137	123	227	3.00
3	5	354	342	153	113	34	33	134	121	211	3.08
3	10	344	333	146	109	34	33	132	120	196	3.17
3	15	335	324	140	103	33	33	129	118	182	3.25
3	20	326	315	134	98	33	33	127	117	168	3.33
3	25	317	307	128	93	33	33	124	115	155	3.42
3	30	308	298	122	87	33	33	121	113	149	3.50
3	35	300	290	116	83	33	33	119	112	144	3.58
3	40	292	282	111	79	33	32	116	110	139	3.67
3	45	284	274	106	76	33	32	114	108	134	3.75
3	50	276	267	101	73	32	32	112	106	129	3.83
3	55	269	260	97	71	32	32	109	105	124	3.92
4	0	262	254	93	69	32	32	107	103	120	4.00
4	5	256	248	89	68	32	32	105	101	115	4.08
4	10	250	242	86	67	32	31	103	99	111	4.17
4	15	244	237	83	66	32	31	101	97	107	4.25
4	20	239	232	81	65	31	31	99	96	103	4.33
4	25	233	227	78	64	31	31	97	94	99	4.42
4	30	229	223	76	63	31	31	95	92	95	4.50
4	35	224	218	74	62	31	31	93	90	91	4.58
4	40	220	214	72	61	31	30	91	89	88	4.67
4	45	216	210	71	60	31	30	89	87	85	4.75
4	50	212	207	69	60	30	30	87	85	81	4.83
4	55	208	203	68	59	30	30	85	84	78	4.92
5	0	204	200	66	58	30	30	84	82	75	5.00
5	5	201	196	65	57	30	30	82	81	72	5.08
5	10	198	193	64	57	30	30	80	79	70	5.17
5	15	194	190	63	56	30	29	79	78	67	5.25
5	20	191	187	62	56	29	29	77	76	64	5.33
5	25	188	184	61	55	29	29	76	75	62	5.42
5	30	185	181	60	54	29	29	74	73	60	5.50
5	35	182	179	59	54	29	29	73	72	57	5.58
5	40	180	176	58	53	29	29	71	71	55	5.67
5	45	177	173	57	53	29	28	70	69	53	5.75
5	50	174	171	56	52	29	28	68	68	51	5.83
5	55	172	168	55	52	28	28	67	67	49	5.92
6	0	169	166	55	51	28	28	66	65	47	6.00
Peak	(cfs)	810	819	661	928	34	34	228	130	605	
Peak	(hrs)	1	1	1	0	1	1	1	2	1	
Peak	(min)	25	20	15	55	55	45	15	5	30	
Peak	(cfs_or_ac.ft.)	8	0	3	0	0	0	0	46	0	
Case	(),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	(S)	( )	
Area	(ac)	1726.7	1726.7	823.7	823.7	288.0	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	0.47	0.47	0.80	1.13	0.12	0.12	0.45	0.33	0.84	
11-23-1999	15:55:10										
Summary	File:							P:\coweld01\future~2\TriTow~1\100_Year\udswmm\ttod100y.txt			

2-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem52	Elem352	Elem153	Elem253	Elem53	Elem353	Elem753	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
0	25	2	0	3	0	0	0	2	0	0	0	0	1	0	0	0	6	4
0	30	6	1	10	0	0	1	6	0	0	1	0	2	0	2	1	19	13
0	35	15	5	21	0	0	3	13	0	0	4	0	5	1	7	6	37	26
0	40	33	12	36	0	1	7	23	0	1	9	1	11	5	16	14	53	37
0	45	56	24	50	0	3	16	35	0	2	17	3	23	13	30	26	67	48
0	50	82	38	63	0	6	26	46	0	3	28	7	39	27	46	40	81	59
0	55	105	52	74	1	10	37	56	1	5	42	14	59	44	64	55	96	72
1	0	126	65	83	3	15	49	65	2	8	60	26	80	64	84	71	112	87
1	5	143	76	91	6	21	59	73	4	13	79	41	98	80	104	88	127	101
1	10	157	86	98	10	28	68	81	6	18	99	57	110	91	124	104	140	114
1	15	170	94	106	16	35	77	89	10	24	118	73	125	104	142	119	149	123
1	20	177	98	114	22	42	86	97	16	31	136	90	140	119	158	132	155	129
1	25	183	102	122	29	50	91	105	22	39	154	108	156	134	171	141	157	132
1	30	188	106	129	36	57	96	114	29	48	172	125	171	148	181	148	158	133
1	35	194	110	136	44	63	101	123	38	57	188	141	183	161	187	151	157	132
1	40	199	115	142	52	70	108	133	47	66	203	156	193	171	192	153	155	132
1	45	205	120	149	59	77	115	142	57	76	216	170	201	179	195	154	154	130
1	50	210	126	155	66	83	124	152	67	86	226	181	207	185	196	153	152	129
1	55	216	131	161	74	90	132	163	77	96	235	191	211	189	197	152	150	128
2	0	221	137	167	81	98	142	172	88	106	241	198	214	192	198	151	148	127
2	5	227	143	171	88	106	151	182	98	116	246	204	215	194	198	149	146	125
2	10	232	148	173	92	114	161	191	108	125	249	208	216	196	197	147	144	124
2	15	236	153	176	97	122	170	200	118	133	251	211	216	196	197	146	142	123
2	20	240	158	180	102	130	180	208	127	141	251	212	216	196	197	144	141	123
2	25	244	162	185	109	139	189	216	136	149	251	213	215	196	196	143	140	123
2	30	248	167	190	116	148	197	223	144	156	251	214	214	196	196	142	140	122
2	35	253	172	196	123	156	206	229	152	163	250	214	214	196	196	141	139	122
2	40	257	178	202	131	165	213	235	159	169	249	214	213	196	195	140	138	121
2	45	261	183	208	139	173	221	240	165	174	247	213	212	195	194	139	136	121
2	50	266	189	214	147	181	227	244	171	179	246	212	211	195	194	138	135	120
2	55	271	195	221	155	189	233	248	176	184	244	212	209	194	193	136	134	120
3	0	275	201	227	163	196	238	251	181	188	242	211	208	193	192	135	133	119
3	5	280	207	233	171	203	242	254	185	191	240	209	207	193	190	134	132	119
3	10	285	213	239	179	210	246	256	189	195	237	208	205	192	189	133	130	118
3	15	290	219	245	187	216	250	258	193	198	235	207	203	190	188	132	128	116
3	20	294	225	250	194	222	253	259	196	200	232	205	201	189	185	130	126	114
3	25	298	231	254	201	227	255	260	199	202	229	203	199	187	183	128	123	113
3	30	302	236	258	207	231	256	260	201	204	226	201	196	185	180	126	121	111
3	35	305	241	261	213	235	258	260	203	205	223	199	193	183	177	123	118	109
3	40	307	246	265	219	239	258	259	204	206	219	197	190	180	174	121	116	108
3	45	310	250	267	224	242	258	258	206	207	215	194	187	178	171	119	114	106
3	50	311	254	269	229	245	258	257	207	208	211	191	183	175	168	116	111	104
3	55	313	258	271	233	247	257	255	207	208	206	188	180	172	165	114	109	102
4	0	314	261	272	236	248	256	253	207	207	202	184	176	169	162	112	107	101
4	5	315	264	273	239	250	255	251	207	207	198	181	173	166	159	110	105	99
4	10	315	266	274	242	250	254	249	207	206	193	178	169	163	155	107	103	98
4	15	315	268	274	244	251	252	246	206	205	189	174	165	159	152	105	101	96
4	20	314	269	274	246	251	250	243	205	204	184	171	162	156	149	103	99	95
4	25	314	270	273	247	250	247	241	204	202	180	167	158	153	146	102	98	93
4	30	313	271	273	248	250	245	237	203	200	175	164	155	150	143	100	96	92
4	35	311	271	271	248	249	242	234	201	199	171	160	151	147	140	98	95	91
4	40	310	271	270	248	247	239	231	199	197	167	157	148	144	138	97	93	90
4	45	308	271	268	248	246	236	227	197	194	163	153	145	142	135	95	92	89
4	50	306	270	266	247	244	233	224	195	192	159	150	142	139	132	94	91	88
4	55	303	269	264	246	242	230	220	193	190	156	147	139	136	130	92	89	87
5	0	300	268	262	245	240	226	217	191	187	152	144	136	134	127	91	88	86
5	5	298	266	259	243	237	223	213	188	185	149	141	134	131	125	90	87	85
5	10	295	264	257	241	235	219	209	186	182	145	138	131	129	123	89	86	84
5	15	291	262	254	240	232	216	206	183	179	142	136	128	126	121	87	85	83
5	20	288	260	251	237	229	212	202	181	177	139	133	126	124	118	86	84	82
5	25	285	258	248	235	226	209	198	178	174	136	130	123	122	116	85	83	81
5	30	281	255	245	233	223	205	195	175	171	133	128	121	120	114	84	82	81
5	35	277	252	241	230	220	202	191	173	169	130	125	119	118	112	83	81	80
5	40	273	250	238	227	217	198	188	170	166	128	123	117	116	110	82	80	79
5	45	269	247	234	224	214	195	184	167	163	125	121	115	114	109	81	79	78
5	50	266	243	231	221	210	191	181	164	160	123	119	113	112	107	81	79	77
5	55	261	240	227	218	207	188	177	162	158	120	116	111	110	105	80	78	77
6	0	257	237	224	215	204	184	174	159	155	118	114	109	108	103	79	77	76
6	5	253	234	220	212	200	181	170	156	152	116	112	107	106	102	78	76	75
6	10	249	230	216	209	197	177	167	154	150	114	110	105	104	100	77	75	75
6	15	245	227	213	206	193	174	164	151	147	112	109	103	103	98	76	75	74
6	20	241	223	209	203	190	171	161	149	145	109	107	102	101	97	76	74	73
6	25	237	220	205	199	187	168	158	146	142	108	105	100	100	95	75	73	73
6	30	233	217	202	196	183	164	155	144	140	106	103	98	98	94	74	72	72
6	35	228	213	198	193	180	161	152	141	137	104	102	97	96	92	73	72	71
6	40	224	210	195	190	177	158	149	139	135	102	100	95	95	91	73	71	71
6	45	220	206	191	186	174	155	146	136	133	100	98	94	93	90	72	70	70
6	50	216	203	188	183	171	152	143	134	130	99	97	92	92	88	71	70	69
6	55	212	199	184	180	167	150	140	132	128	97	95	91	91	87	71	69	69
7	0	208	196	181	177	164	147	138	129	126	95	94	90	89	86	70	68	68
7	5	204	192	177	174	161	144	135	127	124	94	92	88	88	84	69	68	67
7	10	201	189	174	171	158	141	133	125	122	92	91	87	87	83	69	67	67
7	15	197	186	171	168	155	139	130	123	120	91	90	86	85	82	68	66	66
7	20	193	182	168	165	153	136	128	121	117	90	88	84	84	81	67	66	66
7	25	190	179	165	162	150	134	125	119	116	88	87	83	83	80	67	65	65
7	30	186	176	162	159	147	131	123	117	114	87	86	82	82	79	66	65	64
7	35	182	173	159	156	144	129	121	115	112	85	84	81	81	78	66	64	64
7	40	179	170	156	153	142	127	119	113	110	84	83	80	79	77	65	64	63
7	45	176	167	153	150	139	124	117	111	108	83	82	78	78	76	64	63	63
7	50	172	164	150	148	137	122	115	109	106	82	81	77	77	75	64	62	62
7	55	169	161	147	145	134	120	112	107	104	80	80	76	76	74	63	62	62
8	0	166	158	144	143	132	118	111	106	103	79	78	75	74	73	63	61	61
8	5	163	155	142	140	129	116	109	104	101	78	77	73	73	72	62	61	61
8	10	160	152	139	137	127	114	107	102	99	76	76	72	72	71	62	60	60
8	15	157	150	137	135	125	112	105	101	98	75	75	71	71	70	61	60	60
8	20	154	147	134	133	122	110	103	99	96	74	73	70	70	69	60	59	59
8	25	151	145	132	130	120	108	101	97	95	73	72	69	69	68	60	59	58
8	30	148	142	129	128	118	106	99	96	93	72	71	68	68	67	59	58	58
8	35	145	139	127	126	116	104	98	94	92	71	70	67	67	66	59	58	57
8	40	143	137	125	124	114	102	96	93	90	70	69	67	66	66	58	57	57
8	45	140	135	123	121	112	101	94	91	89	69	68	66	66	65	58	57	56
8	50	138	132	120	119	110	99	93	90	87	68	68	65	65	64	57	56	56
8	55	135	130	118	117	108	97	91	88	86	67	67	64	64	63	57	56	55
9	0	133	128	116	115	106	95	90	87	85	66	66	63	63	63	56	55	55
Peak	(cfs)	315	271	274	248	251	258	260	207	208	251	214	216	196	198	154	158	133
Peak	(hrs)	4	4	4	4	4	3	3	3	3	2	2	2	2	2	1	1	1
Peak	(min)	5	30	10	30	15	35	25	50	50	15	30	10	10	0	45	30	30
Peak	(cfs_or_ac.ft.)	0	4	0	4	10	4	0	3	20	0	4	0	4	0	2	0	3
Case	((),S,I,D,O)	(_)	(_)	(_)	(_)	(S)	(_)	(_)	(_)	(S)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	5521.3	5521.3	4765.4	4765.4	4765.4	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4
Peak/Area	(cfs/ac)	0.05	0.04	0.04	0.04	0.05	0.05	0.05	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04

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Summary File: P:\coweld01\future~1\TriTow~1\2_Year\udswmm\ttrd2yr.txt

TRI-TOWN BASIN, FUTURE WITH REGIONAL DETENTION CONDITION

2-YEAR

Time(Hrs)	Time(Min)	Elem755	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761	Elem361	Elem261	Elem162	Elem262	Elem163
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
0	20	2	2	0	0	0	1	0	0	0	0	0	0	0	1	0	7	0
0	25	8	8	0	1	0	3	0	1	0	0	0	0	0	3	2	25	0
0	30	19	19	1	5	3	10	0	3	0	0	0	0	0	12	9	63	0
0	35	31	30	3	12	8	18	1	7	0	0	0	1	1	31	25	108	0
0	40	41	38	9	23	17	28	4	16	0	0	0	1	1	61	53	151	1
0	45	51	47	18	35	27	39	12	28	0	1	1	3	3	82	71	180	1
0	50	63	57	31	48	40	52	23	41	0	2	2	4	4	102	87	187	2
0	55	77	69	45	63	54	65	37	53	0	3	3	6	6	118	101	179	3
1	0	91	82	61	77	67	77	49	62	1	5	5	8	8	131	112	163	3
1	5	105	94	75	89	79	86	59	68	2	7	7	11	11	140	118	146	4
1	10	117	105	87	98	87	92	66	71	4	10	10	13	13	145	121	130	4
1	15	125	112	96	103	92	95	70	73	6	12	12	15	15	147	121	116	5
1	20	130	116	102	106	95	96	72	74	9	15	15	18	18	147	120	105	5
1	25	132	118	105	107	96	96	73	74	12	17	17	20	20	146	117	95	5
1	30	133	118	106	107	96	96	74	74	15	20	20	22	22	143	113	87	5
1	35	132	117	106	106	95	94	74	73	17	22	22	24	24	140	108	80	6
1	40	131	115	105	104	94	93	73	72	20	24	24	26	26	136	104	75	6
1	45	130	114	104	103	93	92	72	71	22	26	26	28	28	132	99	71	6
1	50	129	112	103	102	92	91	71	71	25	28	28	30	30	129	95	68	6
1	55	128	111	102	101	91	90	71	70	27	30	30	32	32	125	91	66	6
2	0	126	109	101	100	90	89	70	69	29	32	32	33	33	122	87	63	6
2	5	125	107	99	98	89	88	70	69	31	34	34	35	35	118	83	60	6
2	10	124	106	98	97	88	87	69	69	33	35	35	36	36	115	80	57	7
2	15	123	105	98	97	87	87	69	69	34	37	37	38	38	112	76	56	7
2	20	123	104	97	96	87	87	69	69	36	38	38	39	39	109	73	55	7
2	25	123	104	96	96	87	87	69	69	37	39	39	40	40	107	71	55	7
2	30	122	103	96	96	87	87	69	69	39	40	40	41	41	105	69	55	7
2	35	122	103	96	96	87	87	69	69	40	42	42	43	43	103	66	54	7
2	40	121	102	96	95	87	87	69	70	41	43	43	44	44	101	64	52	7
2	45	121	101	95	95	87	87	70	70	42	44	44	45	45	99	62	49	7
2	50	120	100	95	95	86	86	70	70	43	45	45	46	46	97	60	47	7
2	55	120	100	95	94	86	86	70	70	44	46	46	47	47	94	58	45	7
3	0	119	99	94	94	86	86	70	70	45	47	47	47	47	92	55	43	7
3	5	118	98	94	94	86	85	70	70	46	47	47	48	48	90	53	42	7
3	10	117	97	93	93	85	85	70	70	47	48	48	49	49	86	50	40	7
3	15	116	96	93	92	84	84	70	69	48	49	49	49	49	83	46	37	7
3	20	114	94	92	91	83	83	69	69	49	50	50	50	50	79	43	33	7
3	25	112	92	90	89	82	82	69	68	49	50	50	51	51	76	40	30	7
3	30	110	91	89	88	81	80	68	67	50	51	51	51	51	72	37	27	7
3	35	109	89	88	86	80	79	67	66	50	51	51	51	51	69	34	24	7
3	40	107	88	86	85	79	78	66	65	51	51	51	52	52	65	31	22	7
3	45	105	86	85	83	77	76	65	64	51	52	52	52	52	62	29	20	7
3	50	104	84	83	82	76	75	64	63	51	52	52	52	52	60	26	18	7
3	55	102	83	82	80	75	74	63	62	52	52	52	52	52	57	24	17	7
4	0	100	81	80	79	74	73	62	62	52	52	52	52	52	55	23	16	7
4	5	99	80	79	77	72	72	62	61	52	52	52	52	52	53	21	16	7
4	10	97	79	78	76	71	71	61	60	52	52	52	52	52	51	20	15	7
4	15	96	77	76	75	70	70	60	60	52	52	52	52	52	50	19	15	7
4	20	94	76	75	74	69	69	60	59	52	52	52	52	52	48	18	14	7
4	25	93	75	74	73	69	68	59	58	52	52	52	52	52	47	17	14	7
4	30	92	74	73	72	68	67	58	58	52	52	52	52	52	46	16	14	7
4	35	91	73	72	71	67	66	58	57	52	52	52	52	52	45	16	14	7
4	40	90	72	71	70	66	66	57	57	52	52	52	52	52	44	15	13	7
4	45	89	71	70	69	65	65	57	57	52	52	52	51	51	43	15	13	7
4	50	87	70	69	68	65	64	57	56	52	51	51	51	51	42	14	13	7
4	55	86	69	68	68	64	64	56	56	51	51	51	51	51	41	14	13	7
5	0	86	68	68	67	64	63	56	55	51	51	51	51	51	41	14	13	7
5	5	85	68	67	66	63	62	55	55	51	51	51	51	51	40	14	12	7
5	10	84	67	66	65	62	62	55	54	51	51	51	51	51	39	13	12	7
5	15	83	66	65	65	62	61	55	54	51	51	51	50	50	38	13	12	7
5	20	82	66	65	64	61	61	54	54	51	50	50	50	50	38	13	12	7
5	25	81	65	64	63	61	60	54	53	50	50	50	50	50	37	13	12	7
5	30	80	64	63	63	60	60	53	53	50	50	50	50	50	37	12	12	7
5	35	80	64	63	62	60	59	53	53	50	50	50	49	49	36	12	11	7
5	40	79	63	62	61	59	59	53	52	50	49	49	49	49	36	12	11	7
5	45	78	62	61	61	58	58	52	52	49	49	49	49	49	35	12	11	6
5	50	77	62	61	60	58	58	52	52	49	49	49	49	49	35	12	11	6
5	55	77	61	60	60	57	57	52	51	49	49	49	48	48	34	12	11	6
6	0	76	60	60	59	57	57	51	51	49	48	48	48	48	34	11	11	6
6	5	75	60	59	58	57	56	51	50	48	48	48	48	48	33	11	11	6
6	10	74	59	59	58	56	56	50	50	48	48	48	48	48	33	11	11	6
6	15	74	59	58	57	56	55	50	50	48	48	48	47	47	32	11	11	6
6	20	73	58	57	57	55	55	50	49	48	47	47	47	47	32	11	10	6
6	25	72	58	57	56	55	54	49	49	47	47	47	47	47	31	11	10	6
6	30	72	57	56	56	54	54	49	49	47	47	47	47	47	31	11	10	6
6	35	71	57	56	55	54	53	49	48	47	46	46	46	46	30	11	10	6
6	40	70	56	55	55	53	53	48	48	47	46	46	46	46	30	11	10	6
6	45	70	56	55	54	53	52	48	48	46	46	46	46	46	29	10	10	6
6	50	69	55	54	54	52	52	48	47	46	46	46	45	45	29	10	10	6
6	55	68	55	54	53	52	52	47	47	46	45	45	45	45	29	10	10	6
7	0	68	54	53	53	51	51	47	47	45	45	45	45	45	28	10	10	6
7	5	67	54	53	52	51	51	47	46	45	45	45	44	44	28	10	10	6
7	10	67	53	52	52	51	50	46	46	45	44	44	44	44	28	10	9	6
7	15	66	53	52	51	50	50	46	46	45	44	44	44	44	27	10	9	6
7	20	65	52	51	51	50	49	46	45	44	44	44	44	44	27	10	9	6
7	25	65	52	51	50	49	49	45	45	44	44	44	43	43	26	10	9	6
7	30	64	51	50	50	49	49	45	45	44	43	43	43	43	26	10	9	6
7	35	64	51	50	49	49	48	45	44	43	43	43	43	43	26	9	9	6
7	40	63	50	50	49	48	48	44	44	43	43	43	42	42	25	9	9	6
7	45	63	50	49	49	48	47	44	44	43	42	42	42	42	25	9	9	6
7	50	62	49	49	48	47	47	44	43	42	42	42	42	42	25	9	9	6
7	55	62	49	48	48	47	47	43	43	42	42	42	41	41	24	9	9	6
8	0	61	49	48	47	47	46	43	43	42	41	41	41	41	24	9	9	6
8	5	60	48	47	47	46	46	43	42	42	41	41	41	41	24	9	9	6
8	10	60	48	47	46	46	45	42	42	41	41	41	41	41	23	9	8	6
8	15	59	47	46	46	45	45	42	42	41	40	40	40	40	23	9	8	6
8	20	59	47	46	46	45	45	42	41	41	40	40	40	40	23	9	8	6
8	25	58	46	46	45	45	44	41	41	40	40	40	40	40	23	9	8	5
8	30	58	46	45	45	44	44	41	41	40	40	40	39	39	22	9	8	5
8	35	57	46	45	44	44	43	41	40	40	39	39	39	39	22	8	8	5
8	40	57	45	44	44	43	43	40	40	39	39	39	39	39	22	8	8	5
8	45	56	45	44	44	43	43	40	40	39	39	39	38	38	21	8	8	5
8	50	56	44	44	43	43	42	40	39	39	38	38	38	38	21	8	8	5
8	55	55	44	43	43	42	42	39	39	38	38	38	38	38	21	8	8	5
9	0	55	44	43	42	42	42	39	39	38	38	38	37	37	21	8	8	5
Peak	(cfs)	133	118	106	107	96	96	74	74	52	52	52	52	52	147	121	187	7
Peak	(hrs)	1	1	1	1	1	1	1	1	3	3	3	3	3	1	1	0	2
Peak	(min)	30	25	30	25	25	20	30	20	55	45	45	40	40	15	10	50	10
Peak	(cfs_or_ac.ft.)	0	0	2	0	2	0	2	0	1	0	1	0	20	0	2	0	0
Case	((),S,I,D,O)	()	()	()	()	()	()	()	()	()	()	()	()	(S)	()	()	()	()
Area	(ac)	3197.4	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7	1726.7	1726.7	823.7	823.7	288.0
Peak/Area	(cfs/ac)	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.09	0.15	0.23	0.02
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Summary	File:																	

TRI-TOWN BASIN, FUTURE WITH REGIONAL DETENTION CONDITION

2-YEAR

Time(Hrs)	Time(Min)	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0.08
0	10	0	0	0	0	0.17
0	15	0	0	0	0	0.25
0	20	0	0	0	0	0.33
0	25	0	1	0	0	0.42
0	30	1	3	1	0	0.50
0	35	2	6	2	1	0.58
0	40	3	9	3	2	0.67
0	45	3	12	4	4	0.75
0	50	4	15	6	7	0.83
0	55	4	18	8	10	0.92
1	0	5	20	10	13	1.00
1	5	5	22	12	16	1.08
1	10	5	24	14	20	1.17
1	15	5	26	15	23	1.25
1	20	6	27	17	27	1.33
1	25	6	28	18	30	1.42
1	30	6	29	19	33	1.50
1	35	6	30	20	36	1.58
1	40	6	30	21	38	1.67
1	45	6	31	22	41	1.75
1	50	6	31	23	43	1.83
1	55	7	31	23	45	1.92
2	0	7	31	24	47	2.00
2	5	7	32	24	49	2.08
2	10	7	32	25	50	2.17
2	15	7	32	25	51	2.25
2	20	7	32	25	52	2.33
2	25	7	32	26	53	2.42
2	30	7	32	26	54	2.50
2	35	7	32	26	55	2.58
2	40	7	32	26	55	2.67
2	45	7	32	27	56	2.75
2	50	7	31	27	56	2.83
2	55	7	31	27	56	2.92
3	0	7	31	27	56	3.00
3	5	7	31	27	56	3.08
3	10	7	31	27	56	3.17
3	15	7	30	27	56	3.25
3	20	7	30	27	56	3.33
3	25	7	29	27	55	3.42
3	30	7	29	26	55	3.50
3	35	7	29	26	54	3.58
3	40	7	28	26	53	3.67
3	45	7	28	26	53	3.75
3	50	7	27	25	52	3.83
3	55	7	27	25	51	3.92
4	0	7	26	25	50	4.00
4	5	7	26	24	49	4.08
4	10	7	25	24	48	4.17
4	15	7	25	24	47	4.25
4	20	7	24	23	46	4.33
4	25	7	24	23	45	4.42
4	30	7	23	22	43	4.50
4	35	7	23	22	42	4.58
4	40	7	22	22	41	4.67
4	45	7	22	21	40	4.75
4	50	7	21	21	39	4.83
4	55	7	21	20	38	4.92
5	0	7	20	20	36	5.00
5	5	7	20	20	35	5.08
5	10	7	20	19	34	5.17
5	15	7	19	19	33	5.25
5	20	7	19	19	32	5.33
5	25	7	19	18	31	5.42
5	30	6	18	18	30	5.50
5	35	6	18	18	29	5.58
5	40	6	17	17	28	5.67
5	45	6	17	17	27	5.75
5	50	6	17	17	26	5.83
5	55	6	16	16	25	5.92
6	0	6	16	16	24	6.00
6	5	6	16	16	23	6.08
6	10	6	15	15	23	6.17
6	15	6	15	15	22	6.25
6	20	6	15	15	21	6.33
6	25	6	15	15	20	6.42
6	30	6	14	14	20	6.50
6	35	6	14	14	19	6.58
6	40	6	14	14	18	6.67
6	45	6	13	13	18	6.75
6	50	6	13	13	17	6.83
6	55	6	13	13	16	6.92
7	0	6	13	13	16	7.00
7	5	6	12	12	15	7.08
7	10	6	12	12	15	7.17
7	15	6	12	12	14	7.25
7	20	6	12	12	13	7.33
7	25	6	11	11	13	7.42
7	30	6	11	11	13	7.50
7	35	6	11	11	12	7.58
7	40	6	11	11	12	7.67
7	45	6	11	11	11	7.75
7	50	6	10	10	11	7.83
7	55	6	10	10	10	7.92
8	0	6	10	10	10	8.00
8	5	6	10	10	10	8.08
8	10	6	10	10	9	8.17
8	15	5	9	9	9	8.25
8	20	5	9	9	9	8.33
8	25	5	9	9	8	8.42
8	30	5	9	9	8	8.50
8	35	5	9	9	8	8.58
8	40	5	9	9	7	8.67
8	45	5	8	8	7	8.75
8	50	5	8	8	7	8.83
8	55	5	8	8	7	8.92
9	0	5	8	8	6	9.00
Peak	(cfs)	7	32	27	56	
Peak	(hrs)	1	2	2	2	
Peak	(min)	55	5	45	45	
Peak	(cfs_or_ac.ft.)	0	0	9	0	
Case	((),S,I,D,O)	(_)	(_)	(S)	(_)	
Area	(ac)	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	0.02	0.06	0.07	0.08	
11-23-1999	15:55:37					
Summary	File:	P:\coweld01\future~1\TriTow~1\2_Year\udswmm\ttrd2yr.txt				

TRI-TOWN BASIN, FUTURE WITH REGIONAL DETENTION CONDITION

5-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem52	Elem352	Elem153	Elem253	Elem53	Elem353	Elem753	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	3	1
0	25	3	0	6	0	0	0	4	0	0	1	0	1	0	1	1	13	8
0	30	11	3	17	0	0	2	11	0	0	3	0	4	0	5	4	36	25
0	35	28	10	36	0	1	6	23	0	1	8	1	11	3	15	13	65	46
0	40	58	24	59	0	2	15	41	0	1	18	3	26	13	35	30	92	66
0	45	97	45	83	0	6	30	60	0	3	35	8	51	32	61	53	119	86
0	50	138	69	104	1	11	49	79	1	6	58	19	84	60	92	80	147	110
0	55	176	92	122	3	19	69	96	2	11	87	37	113	84	126	109	177	136
1	0	197	101	138	7	28	87	111	5	17	119	59	136	103	163	141	206	164
1	5	215	109	152	14	38	96	126	9	25	151	85	165	129	200	172	233	189
1	10	231	117	166	22	48	105	140	15	35	185	113	198	159	235	201	252	208
1	15	246	127	179	31	58	116	155	24	47	221	146	233	192	265	225	265	220
1	20	261	137	192	41	68	128	170	34	60	257	180	267	224	289	244	270	226
1	25	275	148	203	52	79	141	186	47	75	293	215	297	253	307	255	271	228
1	30	289	159	214	63	90	155	203	62	91	327	249	322	277	318	262	268	226
1	35	302	171	225	75	101	171	220	78	108	357	279	340	295	325	264	265	224
1	40	315	182	235	87	114	187	238	95	126	381	304	354	309	329	263	261	221
1	45	326	193	239	93	127	205	257	114	145	400	324	362	318	331	261	256	218
1	50	336	203	244	101	141	223	275	133	163	414	340	368	324	332	258	251	214
1	55	345	212	250	110	155	241	292	152	181	423	351	370	327	331	254	246	211
2	0	352	221	257	121	170	259	309	170	198	429	359	371	328	330	249	241	207
2	5	360	229	265	132	186	277	325	188	214	431	363	370	328	327	245	236	204
2	10	367	238	274	145	202	295	339	205	229	431	365	368	328	325	240	232	200
2	15	374	247	284	159	218	311	353	221	243	429	366	365	326	322	235	228	198
2	20	382	256	295	174	234	327	365	236	255	426	365	362	324	320	231	224	195
2	25	390	266	306	189	250	341	376	250	267	422	363	358	322	317	227	220	193
2	30	398	277	318	205	266	354	385	262	278	417	360	354	319	314	223	216	190
2	35	407	288	330	221	281	366	393	273	287	412	357	350	316	311	219	212	187
2	40	415	299	342	237	295	376	400	283	295	406	353	345	313	307	215	208	185
2	45	424	310	354	253	309	385	405	292	303	400	349	341	310	304	212	205	183
2	50	433	322	365	268	322	393	410	300	309	393	345	336	307	300	208	202	181
2	55	442	333	376	283	333	399	413	307	315	387	341	331	303	297	205	199	179
3	0	451	345	387	297	344	405	416	313	320	380	336	326	300	293	202	196	177
3	5	460	356	396	310	354	409	418	318	324	373	331	321	296	289	199	193	175
3	10	468	367	405	323	363	412	419	322	327	367	327	316	293	286	196	190	173
3	15	476	378	413	334	371	414	419	325	329	360	322	312	289	282	193	187	171
3	20	483	388	420	345	378	416	418	328	331	354	317	307	285	278	190	183	168
3	25	489	397	426	355	384	417	417	330	333	347	312	301	281	273	186	180	166
3	30	494	405	431	363	389	416	415	332	333	340	307	296	277	269	183	176	164
3	35	499	412	435	371	394	416	413	333	334	333	302	290	273	264	180	173	161
3	40	502	418	438	377	397	414	410	333	333	326	297	285	268	259	176	170	159
3	45	504	424	441	383	400	412	406	333	333	319	291	279	264	254	173	166	156
3	50	506	428	442	388	401	409	403	332	331	312	286	273	259	249	170	163	154
3	55	507	432	443	392	402	406	398	331	330	304	280	267	254	244	166	160	151
4	0	507	435	443	395	403	403	394	330	328	297	274	262	249	239	163	157	149
4	5	506	437	442	397	402	399	389	328	325	290	269	256	244	234	160	154	146
4	10	505	438	441	398	402	395	384	326	323	283	263	250	239	229	157	151	144
4	15	502	438	439	399	400	390	379	323	320	276	257	244	235	225	154	148	142
4	20	500	438	437	399	398	385	373	320	316	269	252	239	230	220	151	146	140
4	25	497	437	434	398	396	380	368	317	313	262	246	233	225	216	149	144	139
4	30	493	436	431	397	393	375	362	314	309	256	241	228	221	212	147	142	137
4	35	489	434	427	396	389	369	356	310	305	250	235	223	216	207	144	140	136
4	40	484	432	423	393	386	364	350	306	301	244	230	218	212	204	142	138	134
4	45	479	429	419	391	382	358	344	302	297	238	225	214	208	200	140	137	133
4	50	474	426	414	388	378	352	338	298	293	232	220	209	204	196	139	135	131
4	55	468	422	409	384	373	346	332	294	288	227	216	205	201	193	137	133	130
5	0	463	418	404	381	368	341	326	290	284	222	211	201	197	189	135	132	129
5	5	457	414	398	377	363	335	320	285	279	217	207	197	194	186	134	131	128
5	10	450	409	393	373	358	329	314	281	275	212	203	194	190	183	132	129	127
5	15	444	404	387	368	353	323	308	276	270	208	199	190	187	180	131	128	126
5	20	437	399	381	363	348	317	302	272	266	203	195	187	184	177	130	127	125
5	25	431	394	375	359	342	311	296	267	262	199	192	183	181	174	128	126	124
5	30	424	389	369	354	337	305	290	263	257	195	188	180	178	171	127	125	123
5	35	417	383	363	348	331	299	284	259	253	192	185	177	175	169	126	124	122
5	40	410	377	357	343	326	294	279	254	248	188	182	174	172	166	125	122	121
5	45	403	372	351	338	320	288	273	250	244	185	179	171	170	163	124	121	120
5	50	396	366	345	333	315	282	268	246	240	181	176	169	167	161	123	120	119
5	55	389	360	339	327	309	277	263	241	236	178	173	166	164	158	121	119	118
6	0	382	354	333	322	304	272	258	237	232	175	170	163	162	156	120	118	117
6	5	375	348	327	316	298	266	252	233	228	172	167	160	159	154	119	117	116
6	10	368	342	321	311	293	261	248	229	224	169	165	158	157	151	118	115	115
6	15	361	336	315	306	287	256	243	225	220	166	162	155	154	149	117	114	114
6	20	354	330	309	300	282	251	238	221	216	163	159	153	152	147	116	113	112
6	25	347	324	303	295	277	247	233	217	212	160	157	151	150	144	115	112	111
6	30	340	319	297	290	271	242	229	214	208	158	154	148	148	142	114	111	110
6	35	334	313	292	284	266	237	225	210	205	155	152	146	145	140	112	110	110
6	40	327	307	286	279	261	233	220	206	201	152	150	144	143	138	111	109	109
6	45	321	302	281	274	256	228	216	203	198	150	147	142	141	136	110	108	108
6	50	315	296	275	269	252	224	212	199	194	148	145	139	139	134	109	107	107
6	55	308	291	270	264	247	220	208	196	191	145	143	137	137	132	108	106	106
7	0	302	285	265	259	242	216	204	193	188	143	141	135	135	130	107	105	105
7	5	296	280	260	255	238	212	200	189	185	141	139	133	133	128	106	104	104
7	10	291	275	255	250	233	208	197	186	182	139	137	132	131	127	105	103	103
7	15	285	270	250	245	229	204	193	183	179	137	135	130	129	125	104	102	102
7	20	279	265	245	241	225	200	190	180	176	135	133	128	128	123	104	101	101
7	25	274	260	240	237	221	197	186	177	173	133	131	126	126	122	103	101	100
7	30	268	255	236	232	216	193	183	174	170	131	129	124	124	120	102	100	99
7	35	263	250	231	228	213	190	180	171	167	129	127	123	123	118	101	99	99
7	40	258	246	227	224	209	186	176	168	164	127	126	121	121	117	100	98	98
7	45	253	241	223	220	205	183	173	166	162	125	124	119	119	115	99	97	97
7	50	248	237	219	216	201	180	170	163	159	123	122	118	118	114	98	96	96
7	55	243	232	215	212	198	177	167	160	157	122	121	116	116	112	97	95	95
8	0	239	228	211	208	194	174	165	158	154	120	119	115	115	111	96	94	94
8	5	234	224	207	205	191	171	162	155	152	119	118	113	113	110	96	94	94
8	10	230	220	203	201	187	168	159	153	149	117	116	112	112	108	95	93	93
8	15	225	216	199	197	184	165	156	151	147	115	115	111	110	107	94	92	92
8	20	221	212	196	194	181	162	154	148	145	114	113	109	109	106	93	91	91
8	25	217	208	192	191	178	160	151	146	143	112	112	108	108	104	92	90	90
8	30	213	205	189	187	175	157	149	144	141	111	110	107	106	103	91	90	90
8	35	209	201	186	184	172	155	147	142	138	110	109	105	105	102	91	89	89
8	40	205	198	182	181	169	152	144	140	136	108	108	104	104	101	90	88	88
8	45	202	194	179	178	166	150	142	138	134	107	106	103	103	99	89	87	87
8	50	198	191	176	175	163	147	140	136	132	106	105	102	101	98	88	87	87
8	55	194	188	173	172	160	145	138	134	131	104	104	100	100	97	88	86	86
9	0	191	184	170	169	158	143	136	132	129	103	103	99	99	96	87	85	85
Peak	(cfs)	507	438	443	399	403	417	419	333	334	431	366	371	328	332	264	271	228
Peak	(hrs)	3	4	3	4	4	3	3	3	3	2	2	2	2	1	1	1	1
Peak	(min)	55	10	55	15	0	25	10	35	35	5	15	0	0	50	35	25	25
Peak	(cfs_or_ac.ft.)	0	4	0	4	16	4	0	4	32	0	4	0	4	0	3	0	4
Case	((),S,I,D,O)	()	()	()	()	(S)	()	()	()	(S)	()	()	()	()	()	()	()	()
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	5521.3	5521.3	4765.4	4765.4	4765.4	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4
Peak/Area	(cfs/ac)	0.08	0.07	0.07	0.07	0.07	0.08	0.08	0.07	0.07	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.07
11-23-1999	15:55:38																	
Summary	File:	P:\coweld01\future~1\TriTow~1\5_Year\udswmm\ttrd5yr.txt																

TRI-TOWN BASIN, FUTURE WITH REGIONAL DETENTION CONDITION

5-YEAR

Time(Hrs)	Time(Min)	Elem755	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761	Elem361	Elem261	Elem162	Elem262	Elem163
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
0	20	4	4	0	1	0	2	0	0	0	0	0	0	0	1	1	13	0
0	25	15	15	0	3	1	7	0	2	0	0	0	0	0	7	5	45	0
0	30	35	34	2	10	6	18	1	5	0	0	0	0	0	24	19	109	0
0	35	53	51	7	24	17	33	3	15	0	0	0	1	1	62	52	188	1
0	40	72	67	20	42	32	49	12	32	0	1	1	3	3	95	79	266	2
0	45	93	85	39	65	53	72	28	56	0	1	1	5	5	131	110	312	3
0	50	117	106	63	92	78	99	52	80	0	3	3	7	7	168	142	318	4
0	55	144	130	92	121	105	124	76	99	1	6	6	10	10	200	169	300	5
1	0	171	155	121	146	129	144	97	113	3	9	9	14	14	224	189	271	6
1	5	195	177	146	164	147	156	111	121	5	13	13	18	18	240	200	240	7
1	10	212	192	164	176	158	163	119	125	9	17	17	22	22	248	205	212	8
1	15	222	201	175	182	164	166	124	126	13	22	22	26	26	250	204	189	9
1	20	227	205	181	184	166	166	126	126	18	26	26	30	30	249	200	170	9
1	25	227	204	183	184	166	165	126	125	22	30	30	34	34	245	193	155	10
1	30	226	201	183	182	164	162	125	124	27	34	34	37	37	239	186	142	10
1	35	223	198	181	179	161	160	124	122	32	38	38	41	41	233	177	131	10
1	40	220	194	179	177	159	158	122	120	36	41	41	44	44	226	169	122	10
1	45	217	191	176	173	156	154	120	118	40	45	45	48	48	219	160	114	11
1	50	213	186	173	170	153	151	118	117	43	48	48	50	50	211	152	107	11
1	55	210	182	169	167	150	148	117	115	47	51	51	53	53	204	144	100	11
2	0	206	178	166	164	147	146	115	113	50	54	54	56	56	197	137	95	11
2	5	203	174	163	161	145	143	113	112	53	56	56	58	58	191	130	89	11
2	10	200	171	160	158	143	141	112	111	56	59	59	61	61	184	123	85	11
2	15	197	168	158	156	141	140	111	110	58	61	61	63	63	178	117	82	12
2	20	194	165	156	154	139	138	110	109	61	63	63	65	65	173	112	78	12
2	25	192	162	154	152	138	137	109	109	63	65	65	67	67	167	106	75	12
2	30	189	160	152	150	136	135	109	108	65	67	67	68	68	162	101	71	12
2	35	187	157	150	148	135	134	108	108	67	69	69	70	70	157	96	66	12
2	40	185	155	148	147	133	133	108	107	68	71	71	72	72	152	92	62	12
2	45	182	153	146	145	132	131	107	106	70	72	72	73	73	147	87	59	12
2	50	180	151	145	143	131	130	106	106	72	73	73	74	74	142	83	56	12
2	55	178	149	143	142	130	129	106	105	73	75	75	75	75	138	79	54	12
3	0	177	147	142	140	129	128	105	105	74	76	76	77	77	134	75	53	12
3	5	175	145	140	139	128	127	105	104	76	77	77	78	78	130	72	51	12
3	10	173	143	139	138	126	126	104	104	77	78	78	78	78	126	69	49	12
3	15	170	141	137	136	125	124	104	104	78	79	79	79	79	123	65	46	12
3	20	168	138	136	134	124	123	103	103	78	79	79	80	80	119	62	43	12
3	25	165	136	134	132	122	121	103	102	79	80	80	80	80	115	59	39	12
3	30	163	134	132	130	121	119	102	101	80	80	80	80	80	110	55	36	12
3	35	161	132	130	128	119	118	100	99	80	80	80	80	80	105	50	33	12
3	40	158	129	128	126	117	116	99	97	80	80	80	80	80	99	45	31	12
3	45	156	127	125	123	115	114	97	96	80	80	80	80	80	94	41	29	12
3	50	153	125	123	121	113	112	96	95	80	80	80	80	80	90	38	27	12
3	55	151	122	121	119	111	110	95	93	80	80	80	80	80	86	35	26	12
4	0	148	120	119	117	109	108	93	92	80	80	80	80	80	83	32	25	12
4	5	146	118	117	115	108	107	92	91	80	80	80	80	80	80	30	24	11
4	10	144	116	115	113	106	105	91	91	80	80	80	80	80	78	29	23	11
4	15	142	115	113	112	105	104	91	90	80	80	80	80	80	76	27	23	11
4	20	140	113	112	110	104	103	90	89	80	80	80	80	80	74	26	22	11
4	25	138	112	110	109	103	102	89	89	80	80	80	80	80	72	25	22	11
4	30	137	110	109	108	102	101	89	88	80	80	80	80	80	70	24	22	11
4	35	135	109	108	106	101	100	88	88	80	80	80	80	80	69	24	21	11
4	40	134	108	106	105	100	99	88	87	80	80	80	80	80	68	23	21	11
4	45	132	107	105	104	99	99	87	87	80	80	80	80	80	66	23	21	11
4	50	131	106	104	103	98	98	87	86	80	80	80	80	80	65	22	20	11
4	55	130	105	103	102	98	97	86	86	80	80	80	80	80	64	22	20	11
5	0	129	104	102	102	97	96	86	86	80	80	80	80	80	63	21	20	11
5	5	128	103	102	101	96	96	86	85	80	80	80	80	80	62	21	20	11
5	10	127	102	101	100	96	95	85	85	80	80	80	80	80	61	21	19	11
5	15	126	101	100	99	95	95	85	85	80	80	80	80	80	60	20	19	11
5	20	125	100	99	98	94	94	85	84	80	80	80	80	80	59	20	19	11
5	25	124	100	98	98	94	93	84	84	80	79	79	79	79	58	20	19	11
5	30	123	99	98	97	93	93	84	83	79	79	79	79	79	57	19	18	11
5	35	122	98	97	96	93	92	83	83	79	79	79	78	78	57	19	18	10
5	40	121	97	96	95	92	91	83	82	79	78	78	78	78	56	19	18	10
5	45	120	96	95	94	91	91	82	82	78	78	78	78	78	55	19	18	10
5	50	118	96	94	93	90	90	82	81	78	77	77	77	77	54	19	18	10
5	55	117	95	93	93	90	89	81	81	78	77	77	77	77	53	18	17	10
6	0	116	94	93	92	89	88	81	80	77	77	77	76	76	53	18	17	10
6	5	115	93	92	91	88	88	80	79	77	76	76	76	76	52	18	17	10
6	10	114	92	91	90	87	87	79	79	76	76	76	75	75	51	18	17	10
6	15	113	91	90	89	87	86	79	78	76	75	75	75	75	51	18	17	10
6	20	112	90	89	88	86	85	78	78	75	75	75	75	75	50	17	17	10
6	25	111	90	88	88	85	85	78	77	75	74	74	74	74	49	17	16	10
6	30	110	89	88	87	85	84	77	77	75	74	74	74	74	48	17	16	10
6	35	109	88	87	86	84	83	77	76	74	74	74	73	73	48	17	16	10
6	40	108	87	86	85	83	83	76	76	74	73	73	73	73	47	17	16	10
6	45	107	86	85	84	82	82	76	75	73	73	73	72	72	47	16	16	10
6	50	106	86	84	84	82	81	75	75	73	72	72	72	72	46	16	16	10
6	55	105	85	84	83	81	81	75	74	72	72	72	71	71	45	16	16	10
7	0	104	84	83	82	80	80	74	73	72	71	71	71	71	45	16	15	10
7	5	104	83	82	81	80	79	73	73	71	71	71	70	70	44	16	15	10
7	10	103	83	81	81	79	79	73	72	71	70	70	70	70	44	16	15	9
7	15	102	82	81	80	79	78	72	72	70	70	70	69	69	43	16	15	9
7	20	101	81	80	79	78	77	72	71	70	69	69	69	69	42	15	15	9
7	25	100	80	79	79	77	77	71	71	69	69	69	69	69	42	15	15	9
7	30	99	80	79	78	77	76	71	70	69	68	68	68	68	41	15	15	9
7	35	98	79	78	77	76	75	70	70	68	68	68	68	68	41	15	14	9
7	40	97	78	77	77	75	75	70	69	68	67	67	67	67	40	15	14	9
7	45	97	78	77	76	75	74	69	69	68	67	67	67	67	40	15	14	9
7	50	96	77	76	75	74	74	69	68	67	66	66	66	66	39	15	14	9
7	55	95	76	75	75	73	73	68	68	67	66	66	66	66	39	14	14	9
8	0	94	76	75	74	73	72	68	67	66	65	65	65	65	38	14	14	9
8	5	93	75	74	73	72	72	67	67	66	65	65	65	65	38	14	14	9
8	10	92	74	73	73	72	71	67	66	65	65	65	64	64	37	14	14	9
8	15	92	74	73	72	71	71	66	66	65	64	64	64	64	37	14	13	9
8	20	91	73	72	71	70	70	66	65	64	64	64	63	63	36	14	13	9
8	25	90	72	71	71	70	69	65	65	64	63	63	63	63	36	14	13	9
8	30	89	72	71	70	69	69	65	64	63	63	63	62	62	35	14	13	9
8	35	89	71	70	69	69	68	64	64	63	62	62	62	62	35	13	13	9
8	40	88	71	69	69	68	68	64	63	62	62	62	61	61	35	13	13	9
8	45	87	70	69	68	67	67	63	63	62	61	61	61	61	34	13	13	9
8	50	86	69	68	68	67	66	63	62	61	61	61	60	60	34	13	13	9
8	55	86	69	68	67	66	66	62	62	61	60	60	60	60	33	13	13	8
9	0	85	68	67	66	66	65	62	61	60	60	60	59	59	33	13	12	8
Peak	(cfs)	227	205	183	184	166	166	126	126	80	80	80	80	80	250	205	318	12
Peak	(hrs)	1	1	1	1	1	1	1	1	3	3	3	3	3	1	1	0	2
Peak	(min)	20	20	25	20	20	15	20	15	30	25	25	20	20	15	10	50	15
Peak	(cfs_or_ac.ft.)	0	0	3	0	3	0	2	0	2	0	2	0	31	0	3	0	0
Case	((),S,I,D,O)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(S)	(_)	(_)	(_)	(_)
Area	(ac)	3197.4	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7	1726.7	1726.7	823.7	823.7	288.0
Peak/Area	(cfs/ac)	0.07	0.08	0.08	0.08	0.07	0.07	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.14	0.25	0.39	0.04
11-23-1999	15:55:38																	
Summary	File:																	

TRI-TOWN BASIN, FUTURE WITH REGIONAL DETENTION CONDITION

5-YEAR

Time(Hrs)	Time(Min)	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0.08
0	10	0	0	0	0	0.17
0	15	0	0	0	0	0.25
0	20	0	1	0	0	0.33
0	25	1	2	0	0	0.42
0	30	2	6	1	1	0.50
0	35	3	11	3	2	0.58
0	40	5	16	5	4	0.67
0	45	6	21	7	7	0.75
0	50	7	26	10	12	0.83
0	55	8	31	14	17	0.92
1	0	8	35	17	22	1.00
1	5	9	38	20	28	1.08
1	10	9	41	22	34	1.17
1	15	10	43	25	40	1.25
1	20	10	46	27	46	1.33
1	25	10	47	29	51	1.42
1	30	11	49	31	57	1.50
1	35	11	50	33	61	1.58
1	40	11	51	34	66	1.67
1	45	11	51	36	70	1.75
1	50	11	52	37	74	1.83
1	55	11	52	38	77	1.92
2	0	11	52	39	80	2.00
2	5	12	52	39	83	2.08
2	10	12	52	40	85	2.17
2	15	12	52	41	87	2.25
2	20	12	51	41	89	2.33
2	25	12	51	41	90	2.42
2	30	12	51	41	91	2.50
2	35	12	50	42	92	2.58
2	40	12	50	42	92	2.67
2	45	12	49	42	92	2.75
2	50	12	48	42	92	2.83
2	55	12	48	41	92	2.92
3	0	12	47	41	91	3.00
3	5	12	47	41	91	3.08
3	10	12	46	41	90	3.17
3	15	12	45	41	89	3.25
3	20	12	45	40	88	3.33
3	25	12	44	40	87	3.42
3	30	12	43	39	86	3.50
3	35	12	42	39	84	3.58
3	40	12	41	38	83	3.67
3	45	12	41	38	81	3.75
3	50	12	40	37	80	3.83
3	55	11	39	37	78	3.92
4	0	11	38	36	76	4.00
4	5	11	38	36	74	4.08
4	10	11	37	35	73	4.17
4	15	11	36	35	71	4.25
4	20	11	35	34	69	4.33
4	25	11	35	33	67	4.42
4	30	11	34	33	65	4.50
4	35	11	33	32	63	4.58
4	40	11	33	32	61	4.67
4	45	11	32	31	59	4.75
4	50	11	31	30	58	4.83
4	55	11	31	30	56	4.92
5	0	11	30	29	54	5.00
5	5	11	29	29	52	5.08
5	10	11	29	28	51	5.17
5	15	11	28	28	49	5.25
5	20	11	28	27	47	5.33
5	25	10	27	27	46	5.42
5	30	10	27	26	44	5.50
5	35	10	26	26	43	5.58
5	40	10	25	25	41	5.67
5	45	10	25	25	40	5.75
5	50	10	24	24	38	5.83
5	55	10	24	24	37	5.92
6	0	10	24	23	36	6.00
6	5	10	23	23	34	6.08
6	10	10	23	22	33	6.17
6	15	10	22	22	32	6.25
6	20	10	22	22	31	6.33
6	25	10	21	21	30	6.42
6	30	10	21	21	29	6.50
6	35	10	20	20	28	6.58
6	40	10	20	20	27	6.67
6	45	10	20	20	26	6.75
6	50	10	19	19	25	6.83
6	55	10	19	19	24	6.92
7	0	9	19	18	23	7.00
7	5	9	18	18	22	7.08
7	10	9	18	18	21	7.17
7	15	9	17	17	20	7.25
7	20	9	17	17	20	7.33
7	25	9	17	17	19	7.42
7	30	9	16	16	18	7.50
7	35	9	16	16	18	7.58
7	40	9	16	16	17	7.67
7	45	9	16	16	16	7.75
7	50	9	15	15	16	7.83
7	55	9	15	15	15	7.92
8	0	9	15	15	15	8.00
8	5	9	14	14	14	8.08
8	10	9	14	14	13	8.17
8	15	9	14	14	13	8.25
8	20	9	14	14	12	8.33
8	25	9	13	13	12	8.42
8	30	9	13	13	12	8.50
8	35	9	13	13	11	8.58
8	40	9	13	13	11	8.67
8	45	8	12	12	10	8.75
8	50	8	12	12	10	8.83
8	55	8	12	12	10	8.92
9	0	8	12	12	9	9.00
Peak	(cfs)	12	52	42	92	
Peak	(hrs)	2	1	2	2	
Peak	(min)	5	50	35	35	
Peak	(cfs_or_ac.ft.)	0	0	15	0	
Case	(I(),S,I,D,O)	(_)	(_)	(S)	(_)	
Area	(ac)	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	0.04	0.10	0.11	0.13	
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Summary	File:	P:\coweld01\future-1\TriTow-1\5_Year\udswmm\ttrd5yr.txt				

TRI-TOWN BASIN, FUTURE WITH REGIONAL DETENTION CONDITION

10-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem52	Elem352	Elem153	Elem253	Elem53	Elem353	Elem753	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	1	0	2	0	0	0	1	0	0	0	0	0	0	0	0	4	2
0	25	4	1	8	0	0	0	5	0	0	1	0	2	0	1	1	18	12
0	30	14	4	22	0	0	2	14	0	0	4	0	7	1	7	6	49	35
0	35	38	14	48	0	1	9	32	0	1	12	1	19	6	23	21	90	64
0	40	79	35	81	0	3	23	57	0	2	28	5	44	22	52	46	131	93
0	45	133	65	115	1	8	46	85	0	5	56	16	84	52	92	81	174	127
0	50	187	96	145	2	16	73	113	2	10	93	35	126	85	140	123	219	165
0	55	218	107	170	6	27	94	137	4	17	136	63	160	111	194	170	265	207
1	0	246	120	191	12	39	108	160	8	27	183	96	204	148	251	219	307	247
1	5	272	134	211	21	51	124	181	16	39	233	137	256	195	305	264	340	278
1	10	297	149	229	32	64	141	202	26	54	288	186	312	246	352	303	362	299
1	15	321	166	246	44	78	161	224	40	73	345	239	365	297	390	333	373	311
1	20	344	183	263	58	93	182	247	57	93	402	294	413	342	418	352	377	315
1	25	367	201	280	73	109	204	272	77	117	456	346	452	379	437	364	376	314
1	30	388	219	294	88	126	228	298	100	142	503	393	481	407	449	368	370	310
1	35	407	236	301	97	144	254	326	126	168	541	432	502	427	456	367	363	305
1	40	424	251	310	108	164	281	353	153	195	570	463	515	441	458	364	356	300
1	45	438	265	319	121	185	308	379	181	221	591	486	522	449	459	358	348	294
1	50	451	279	330	137	206	336	405	208	247	604	501	525	453	458	352	341	289
1	55	464	292	343	154	229	363	430	236	272	611	511	525	455	456	345	334	284
2	0	476	305	357	173	253	390	454	262	296	613	517	524	454	453	338	327	279
2	5	488	319	373	193	277	416	475	287	318	612	519	520	453	449	331	320	275
2	10	501	334	389	216	301	440	495	310	338	609	519	516	451	446	324	313	270
2	15	515	350	407	239	325	463	512	331	356	603	516	511	447	442	318	307	266
2	20	528	366	425	262	348	483	528	350	373	596	513	505	444	437	311	301	261
2	25	543	383	444	287	371	502	541	368	388	588	508	498	440	432	305	294	257
2	30	557	400	462	311	393	518	552	384	402	580	503	491	435	427	298	287	252
2	35	571	418	480	335	414	532	561	398	414	570	496	484	430	421	291	279	246
2	40	586	436	497	359	434	544	568	410	424	560	490	476	425	414	284	272	241
2	45	600	454	514	381	452	554	574	421	433	549	482	467	418	407	277	264	235
2	50	614	472	530	403	469	563	578	431	441	538	474	458	412	399	270	257	230
2	55	628	489	545	423	485	569	581	439	447	526	465	448	405	392	263	250	224
3	0	640	506	557	441	491	574	583	445	452	514	457	439	397	384	256	244	219
3	5	652	521	566	455	492	578	584	451	456	502	447	429	390	376	249	238	215
3	10	661	534	572	466	494	580	583	455	459	490	438	419	382	369	243	232	210
3	15	669	545	575	474	495	581	581	458	461	478	429	410	375	361	237	226	206
3	20	673	553	577	480	497	580	579	460	461	466	419	400	367	353	231	220	201
3	25	676	560	577	485	498	579	575	461	461	454	410	391	360	346	225	214	196
3	30	677	564	576	489	499	577	570	461	460	442	400	381	352	338	219	209	192
3	35	676	567	574	492	501	573	565	460	459	430	391	372	344	330	214	204	189
3	40	673	569	572	495	502	569	559	459	456	419	381	362	337	323	208	199	185
3	45	670	569	570	497	503	564	552	456	453	407	372	353	329	315	203	194	181
3	50	666	569	568	499	504	558	545	453	450	396	363	344	322	308	199	190	178
3	55	662	568	565	500	505	552	537	450	446	385	354	335	314	301	194	185	175
4	0	657	567	563	502	505	545	529	446	441	374	345	326	307	294	190	182	172
4	5	652	566	560	503	506	538	521	442	436	363	336	318	300	287	186	178	169
4	10	647	564	558	504	506	530	513	437	431	353	328	310	294	281	182	175	166
4	15	642	562	555	505	507	522	504	431	425	343	319	302	287	275	178	172	164
4	20	636	560	553	505	507	514	495	426	419	333	311	294	281	269	175	169	161
4	25	631	558	551	506	507	505	485	420	413	324	304	287	275	263	172	166	159
4	30	626	555	548	506	507	496	476	414	406	315	296	280	269	257	169	163	157
4	35	621	553	546	506	507	487	467	407	400	307	289	273	263	252	166	161	155
4	40	616	551	544	506	506	478	458	401	393	299	282	267	258	247	164	159	154
4	45	611	549	541	506	506	469	448	394	386	291	275	261	252	242	161	157	152
4	50	607	546	539	506	505	460	439	388	379	284	269	255	247	237	159	155	150
4	55	602	544	537	506	504	451	430	381	373	277	263	249	242	233	157	153	149
5	0	597	542	534	505	503	442	421	374	366	270	257	244	238	228	155	151	147
5	5	593	539	532	504	502	433	412	367	359	264	251	239	233	224	153	149	146
5	10	588	537	529	504	501	424	403	360	352	257	246	234	229	220	151	148	145
5	15	584	534	527	503	500	415	394	354	345	252	241	229	225	216	150	146	143
5	20	580	532	524	502	498	406	386	347	339	246	236	225	220	212	148	145	142
5	25	575	530	522	500	496	398	377	340	332	241	231	220	217	208	147	144	141
5	30	571	527	519	499	495	389	369	334	326	235	227	216	213	205	145	142	140
5	35	567	525	516	497	493	381	361	327	319	230	222	212	209	201	144	141	139
5	40	562	522	514	496	491	373	353	321	313	226	218	208	205	198	142	140	138
5	45	558	519	510	493	480	364	345	315	307	221	214	205	202	195	141	139	137
5	50	553	516	502	486	461	357	337	308	301	217	210	201	199	192	140	137	136
5	55	546	510	491	477	443	349	330	302	295	213	206	198	196	189	139	136	135
6	0	538	504	479	465	428	341	323	296	289	209	203	194	192	186	138	135	134
6	5	528	495	466	452	413	334	316	291	283	205	199	191	189	183	137	134	133
6	10	517	486	452	440	400	327	309	285	278	201	196	188	187	180	136	133	132
6	15	505	475	439	427	388	320	302	279	272	198	193	185	184	178	135	132	131
6	20	493	464	426	415	377	313	296	274	267	194	190	182	181	175	134	132	131
6	25	480	452	413	403	366	306	290	269	262	191	187	180	178	173	133	131	130
6	30	467	440	401	391	356	300	283	264	257	188	184	177	176	170	132	130	129
6	35	455	429	390	381	347	294	277	259	252	185	181	174	173	168	131	129	128
6	40	442	417	379	370	338	288	272	254	247	182	179	172	171	166	130	128	128
6	45	430	406	368	360	329	282	266	249	243	179	176	170	169	164	129	128	127
6	50	418	395	359	351	321	276	261	244	238	176	173	167	167	162	128	127	126
6	55	407	385	349	342	313	270	255	240	234	174	171	165	164	160	128	126	126
7	0	396	375	340	334	306	265	250	235	230	171	169	163	162	158	127	125	125
7	5	386	365	332	326	299	260	245	231	225	169	167	161	160	156	126	125	124
7	10	376	356	324	318	292	254	241	227	222	167	164	159	159	154	126	124	124
7	15	366	347	316	311	286	249	236	223	218	164	162	157	157	152	125	123	123
7	20	357	339	309	303	280	245	232	219	214	162	160	155	155	151	124	123	122
7	25	348	331	302	297	274	240	227	215	210	160	158	153	153	149	124	122	122
7	30	340	323	295	290	268	235	223	212	207	158	156	152	151	147	123	122	121
7	35	332	315	288	284	263	231	219	208	203	156	155	150	150	146	122	121	121
7	40	324	308	282	278	257	227	215	205	200	154	153	148	148	144	122	120	120
7	45	316	301	276	272	252	223	211	201	197	153	151	147	147	143	121	120	120
7	50	309	295	270	267	247	219	208	198	194	151	150	145	145	142	121	119	119
7	55	302	288	264	261	242	215	204	195	191	149	148	144	144	140	120	119	119
8	0	296	282	259	256	238	211	201	192	188	148	146	143	142	139	119	118	118
8	5	289	276	254	251	233	208	197	189	185	146	145	141	141	138	119	118	118
8	10	283	271	249	246	229	204	194	186	182	145	144	140	140	137	118	117	117
8	15	277	265	244	241	225	201	191	184	180	143	142	139	138	135	118	117	117
8	20	271	260	239	237	221	197	188	181	177	142	141	137	137	134	117	116	116
8	25	266	255	235	232	217	194	185	178	175	140	139	136	136	133	117	116	116
8	30	260	250	230	228	213	191	182	176	172	139	138	135	135	132	116	115	115
8	35	255	245	226	224	209	188	180	173	170	138	137	134	134	131	116	115	115
8	40	250	241	222	220	206	185	177	171	168	137	136	133	133	130	116	115	114
8	45	245	236	218	216	202	183	174	169	165	135	135	132	132	129	115	114	114
8	50	241	232	214	213	199	180	172	166	163	134	134	131	130	128	115	114	114
8	55	236	228	211	209	196	177	169	164	161	133	132	130	129	127	114	113	113
9	0	232	224	207	206	192	175	167	162	159	132	131	129	129	126	114	113	113
Peak	(cfs)	677	569	577	506	507	581	584	461	461	613	519	525	455	459	368	377	315
Peak	(hrs)	3	3	3	4	4	3	3	3	3	2	2	1	1	1	1	1	1
Peak	(min)	30	40	20	25	15	15	5	25	15	0	5	50	55	45	30	20	20
Peak	(cfs_or_ac.ft.)	0	4	0	4	26	4	0	4	44	0	5	0	4	0	4	0	5
Case	((),S,I,D,O)	( )	( )	( )	( )	(S)	( )	( )	( )	(S)	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	5521.3	5521.3	4765.4	4765.4	4765.4	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4
Peak/Area	(cfs/ac)	0.10	0.09	0.09	0.09	0.09	0.11	0.11	0.10	0.10	0.13	0.12	0.12	0.11	0.11	0.11	0.11	0.10

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Summary File: P:\coweld01\future~1\TriTow~1\10_Year\udswmm\ttrd10yr.txt

TRI-TOWN BASIN, FUTURE WITH REGIONAL DETENTION CONDITION

10-YEAR

Time(Hrs)	Time(Min)	Elem755	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761	Elem361	Elem261	Elem162	Elem262	Elem163
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
0	20	5	5	0	1	0	2	0	0	0	0	0	0	0	2	1	17	0
0	25	20	20	0	4	2	9	0	2	0	0	0	0	0	10	7	62	0
0	30	47	45	3	15	9	25	1	8	0	0	0	1	1	35	28	148	0
0	35	73	69	12	34	24	44	6	23	0	0	0	2	2	81	66	261	1
0	40	103	96	31	63	49	74	20	49	0	1	1	3	3	124	102	364	2
0	45	137	126	61	99	82	111	47	84	0	2	2	6	6	176	147	418	4
0	50	176	161	101	141	122	150	82	118	1	5	5	10	10	229	192	419	6
0	55	217	199	144	182	161	184	117	145	2	8	8	14	14	273	229	388	7
1	0	255	234	185	215	192	209	143	161	4	13	13	19	19	305	254	346	9
1	5	284	260	217	237	214	223	160	170	8	18	18	24	24	324	268	306	10
1	10	302	276	238	249	225	229	169	173	13	24	24	29	29	333	271	271	11
1	15	312	284	249	254	229	230	172	173	19	30	30	35	35	336	269	245	12
1	20	315	286	253	254	229	229	173	172	26	35	35	40	40	334	263	225	12
1	25	314	282	253	252	227	226	172	171	32	41	41	45	45	329	254	209	13
1	30	309	277	251	249	224	222	170	169	38	46	46	50	50	322	244	193	14
1	35	304	270	248	245	220	218	168	167	44	51	51	55	55	313	234	177	14
1	40	299	264	243	240	216	213	166	164	49	56	56	60	60	304	222	163	14
1	45	293	258	239	235	212	209	163	160	54	61	61	64	64	294	211	150	15
1	50	288	252	234	231	207	205	160	157	59	65	65	68	68	284	199	140	15
1	55	283	246	229	226	203	201	157	155	64	69	69	72	72	274	188	132	15
2	0	278	241	225	222	199	197	154	152	68	73	73	75	75	264	178	126	15
2	5	274	236	221	218	196	194	152	151	72	76	76	79	79	255	169	120	15
2	10	269	231	217	214	193	191	150	149	75	79	79	80	80	247	160	114	16
2	15	265	227	214	211	190	188	149	147	78	80	80	80	80	239	152	109	16
2	20	260	222	210	207	187	185	146	144	79	81	81	81	81	231	145	102	16
2	25	256	217	206	203	183	181	144	141	80	81	81	81	81	224	138	96	16
2	30	250	212	202	198	179	176	140	138	81	81	81	81	81	216	130	90	16
2	35	245	206	197	193	175	172	137	134	81	81	81	82	82	209	124	84	16
2	40	239	200	192	188	170	168	134	131	81	82	82	82	82	202	117	78	16
2	45	234	195	187	184	166	164	131	128	82	82	82	82	82	195	111	73	16
2	50	228	190	183	179	162	159	128	125	82	82	82	82	82	188	105	69	16
2	55	223	184	178	174	158	155	125	123	82	82	82	82	82	182	99	66	16
3	0	218	179	173	170	154	152	122	120	82	82	82	83	83	176	94	64	16
3	5	214	175	169	166	151	149	120	118	82	83	83	83	83	170	90	62	16
3	10	209	171	166	163	148	146	118	116	83	83	83	83	83	165	85	59	16
3	15	204	166	162	159	145	143	116	114	83	83	83	83	83	160	81	56	16
3	20	200	162	158	155	142	140	114	113	83	83	83	83	83	155	77	52	16
3	25	195	157	155	152	139	137	112	111	83	83	83	83	83	150	73	48	16
3	30	191	154	151	148	136	134	110	108	83	83	83	83	83	145	70	45	16
3	35	188	150	148	145	133	131	108	106	83	83	83	83	83	141	66	42	16
3	40	184	147	144	142	130	128	106	105	83	84	84	84	84	136	62	39	16
3	45	180	144	141	139	128	126	104	103	83	84	84	84	84	131	58	37	16
3	50	177	140	138	136	125	124	103	101	84	84	84	84	84	126	54	35	16
3	55	174	138	135	133	123	121	101	100	84	84	84	84	84	120	49	34	15
4	0	171	135	133	131	121	119	100	99	84	84	84	84	84	114	45	33	15
4	5	168	132	130	128	119	118	99	98	84	84	84	84	84	110	42	32	15
4	10	165	130	128	126	117	116	98	97	84	84	84	84	84	106	39	31	15
4	15	163	128	126	124	116	115	97	96	84	84	84	84	84	103	37	31	15
4	20	161	126	124	123	114	113	96	95	84	84	84	84	84	100	35	30	15
4	25	159	124	122	121	113	112	95	94	84	84	84	84	84	98	34	30	15
4	30	157	123	121	119	112	111	94	94	84	84	84	84	84	96	33	29	15
4	35	155	121	119	118	111	110	94	93	84	84	84	84	84	94	32	29	15
4	40	153	120	118	117	110	109	93	93	84	84	84	84	84	92	31	28	15
4	45	152	118	117	115	109	108	93	92	84	84	84	84	84	90	30	28	15
4	50	150	117	115	114	108	107	92	92	84	84	84	84	84	89	30	28	15
4	55	148	116	114	113	107	106	92	91	84	84	84	84	84	87	29	27	15
5	0	147	115	113	112	106	105	91	91	84	84	84	84	84	86	29	27	14
5	5	146	114	112	111	105	105	91	91	84	84	84	84	84	85	28	26	14
5	10	144	113	111	110	104	104	91	90	84	84	84	84	84	83	28	26	14
5	15	143	112	110	109	104	103	90	90	84	84	84	84	84	82	27	26	14
5	20	142	111	109	108	103	103	90	90	84	84	84	84	84	81	27	26	14
5	25	141	110	108	107	102	102	90	89	84	84	84	84	84	80	27	25	14
5	30	140	109	107	106	102	101	89	89	84	84	84	84	84	78	26	25	14
5	35	139	108	106	106	101	101	89	89	84	84	84	84	84	77	26	25	14
5	40	137	107	106	105	101	100	89	89	84	84	84	84	84	76	26	24	14
5	45	136	107	105	104	100	100	89	88	84	84	84	84	84	75	25	24	14
5	50	136	106	104	104	100	99	88	88	84	84	84	84	84	74	25	24	14
5	55	135	105	104	103	99	99	88	88	84	84	84	84	84	73	25	24	14
6	0	134	105	103	102	99	98	88	88	84	84	84	84	84	72	24	23	14
6	5	133	104	102	102	98	98	88	88	84	84	84	84	84	71	24	23	14
6	10	132	103	102	101	98	97	88	87	84	84	84	84	84	70	24	23	13
6	15	131	103	101	101	97	97	87	87	84	84	84	84	84	69	24	23	13
6	20	130	102	101	100	97	97	87	87	84	84	84	84	84	68	23	23	13
6	25	130	102	100	100	97	96	87	87	84	84	84	84	84	67	23	22	13
6	30	129	101	100	99	96	96	87	87	84	84	84	84	84	66	23	22	13
6	35	128	101	99	99	96	96	87	87	84	84	84	84	84	65	23	22	13
6	40	127	100	99	98	95	95	87	86	84	84	84	84	84	65	22	22	13
6	45	127	100	98	98	95	95	86	86	84	84	84	84	84	64	22	21	13
6	50	126	99	98	97	95	95	86	86	84	84	84	84	84	63	22	21	13
6	55	125	99	97	97	94	94	86	86	84	84	84	84	84	62	22	21	13
7	0	125	98	97	96	94	94	86	86	84	84	84	84	84	61	22	21	13
7	5	124	98	96	96	94	94	86	86	84	84	84	84	84	60	21	21	13
7	10	123	97	96	96	94	93	86	86	84	84	84	84	84	60	21	20	13
7	15	123	97	96	95	93	93	86	86	84	84	84	84	84	59	21	20	13
7	20	122	97	95	95	93	93	86	85	84	84	84	83	83	58	21	20	13
7	25	122	96	95	95	93	93	85	85	84	83	83	83	83	57	21	20	12
7	30	121	96	95	94	92	92	85	85	83	83	83	83	83	57	20	20	12
7	35	121	96	94	94	92	92	85	85	83	83	83	83	83	56	20	20	12
7	40	120	95	94	94	92	92	85	85	83	83	83	83	83	55	20	19	12
7	45	120	95	94	93	92	92	85	85	83	83	83	83	83	54	20	19	12
7	50	119	95	93	93	91	91	85	85	83	83	83	83	83	54	20	19	12
7	55	119	94	93	93	91	91	85	85	83	83	83	83	83	53	20	19	12
8	0	118	94	93	92	91	91	85	85	83	83	83	83	83	52	19	19	12
8	5	118	94	92	92	91	91	85	84	83	83	83	83	83	52	19	19	12
8	10	117	94	92	92	91	90	84	84	83	83	83	83	83	51	19	18	12
8	15	117	93	92	92	90	90	84	84	83	83	83	83	83	50	19	18	12
8	20	116	93	92	91	90	90	84	84	83	83	83	83	83	50	19	18	12
8	25	116	93	91	91	90	90	84	84	83	83	83	83	83	49	19	18	12
8	30	115	92	91	91	90	90	84	84	83	83	83	83	83	49	18	18	12
8	35	115	92	91	91	90	89	84	84	83	83	83	83	83	48	18	18	12
8	40	114	92	91	90	89	89	84	84	83	83	83	83	83	47	18	17	12
8	45	114	92	90	90	89	89	84	84	83	83	83	83	83	47	18	17	11
8	50	114	91	90	90	89	89	84	84	83	83	83	82	82	46	18	17	11
8	55	113	91	90	90	89	89	84	84	83	82	82	82	82	46	18	17	11
9	0	113	91	90	89	89	89	84	83	82	82	82	82	82	45	17	17	11
Peak	(cfs)	315	286	253	254	229	230	173	173	84	84	84	84	84	336	271	419	16
Peak	(hrs)	1	1	1	1	1	1	1	1	3	3	3	3	3	1	1	0	2
Peak	(min)	20	20	20	15	15	15	20	10	50	40	40	40	40	15	10	50	10
Peak	(cfs_or_ac.ft.)	0	0	3	0	3	0	3	0	2	0	2	0	44	0	3	0	0
Case	((),S,I,D,O)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(_)	(S)	(_)	(_)	(_)	(_)
Area	(ac)	3197.4	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7	1726.7	1726.7	823.7	823.7	288.0
Peak/Area	(cfs/ac)	0.10	0.11	0.10	0.10	0.10	0.10	0.08	0.08	0.05	0.05	0.05	0.05	0.05	0.19	0.33	0.51	0.06
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Summary	File:																	

TRI-TOWN BASIN, FUTURE WITH REGIONAL DETENTION CONDITION

10-YEAR

Time(Hrs)	Time(Min)	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0.08
0	10	0	0	0	0	0.17
0	15	0	0	0	0	0.25
0	20	0	1	0	0	0.33
0	25	1	3	0	0	0.42
0	30	2	9	1	1	0.50
0	35	4	16	3	3	0.58
0	40	6	25	6	6	0.67
0	45	8	32	10	11	0.75
0	50	9	40	14	17	0.83
0	55	10	46	19	24	0.92
1	0	11	51	23	32	1.00
1	5	12	56	27	41	1.08
1	10	13	60	31	49	1.17
1	15	13	63	34	58	1.25
1	20	14	66	37	66	1.33
1	25	14	68	40	74	1.42
1	30	14	70	43	81	1.50
1	35	15	72	45	88	1.58
1	40	15	72	47	95	1.67
1	45	15	73	49	100	1.75
1	50	15	73	51	106	1.83
1	55	15	73	52	110	1.92
2	0	16	73	53	115	2.00
2	5	16	73	54	118	2.08
2	10	16	72	55	121	2.17
2	15	16	72	55	124	2.25
2	20	16	71	56	126	2.33
2	25	16	71	56	128	2.42
2	30	16	70	56	129	2.50
2	35	16	69	56	130	2.58
2	40	16	68	56	130	2.67
2	45	16	67	56	130	2.75
2	50	16	66	56	130	2.83
2	55	16	65	56	129	2.92
3	0	16	64	55	128	3.00
3	5	16	63	55	127	3.08
3	10	16	62	55	126	3.17
3	15	16	61	54	124	3.25
3	20	16	60	54	123	3.33
3	25	16	59	53	121	3.42
3	30	16	57	52	119	3.50
3	35	16	56	52	117	3.58
3	40	16	55	51	114	3.67
3	45	15	54	50	112	3.75
3	50	15	53	50	109	3.83
3	55	15	52	49	107	3.92
4	0	15	51	48	104	4.00
4	5	15	50	47	102	4.08
4	10	15	49	46	99	4.17
4	15	15	48	46	96	4.25
4	20	15	47	45	94	4.33
4	25	15	46	44	91	4.42
4	30	15	45	43	88	4.50
4	35	15	44	42	86	4.58
4	40	15	43	42	83	4.67
4	45	15	42	41	81	4.75
4	50	14	41	40	78	4.83
4	55	14	40	39	76	4.92
5	0	14	40	39	73	5.00
5	5	14	39	38	71	5.08
5	10	14	38	37	68	5.17
5	15	14	37	37	66	5.25
5	20	14	36	36	64	5.33
5	25	14	36	35	62	5.42
5	30	14	35	35	60	5.50
5	35	14	34	34	58	5.58
5	40	14	34	33	56	5.67
5	45	14	33	33	54	5.75
5	50	14	32	32	52	5.83
5	55	14	32	31	50	5.92
6	0	13	31	31	48	6.00
6	5	13	30	30	46	6.08
6	10	13	30	30	45	6.17
6	15	13	29	29	43	6.25
6	20	13	29	28	42	6.33
6	25	13	28	28	40	6.42
6	30	13	28	27	39	6.50
6	35	13	27	27	37	6.58
6	40	13	26	26	36	6.67
6	45	13	26	26	34	6.75
6	50	13	25	25	33	6.83
6	55	13	25	25	32	6.92
7	0	13	24	24	31	7.00
7	5	13	24	24	30	7.08
7	10	13	23	23	29	7.17
7	15	12	23	23	28	7.25
7	20	12	23	23	26	7.33
7	25	12	22	22	25	7.42
7	30	12	22	22	25	7.50
7	35	12	21	21	24	7.58
7	40	12	21	21	23	7.67
7	45	12	20	20	22	7.75
7	50	12	20	20	21	7.83
7	55	12	20	20	20	7.92
8	0	12	19	19	20	8.00
8	5	12	19	19	19	8.08
8	10	12	19	19	18	8.17
8	15	12	18	18	17	8.25
8	20	12	18	18	17	8.33
8	25	12	18	18	16	8.42
8	30	12	17	17	15	8.50
8	35	11	17	17	15	8.58
8	40	11	17	17	14	8.67
8	45	11	16	16	14	8.75
8	50	11	16	16	13	8.83
8	55	11	16	16	13	8.92
9	0	11	15	15	12	9.00
Peak	(cfs)	16	73	56	130	
Peak	(hrs)	2	1	2	2	
Peak	(min)	0	45	20	35	
Peak	(cfs_or_ac.ft.)	0	0	20	0	
Case	((),S,I,D,O)	(_)	(_)	(S)	(_)	
Area	(ac)	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	0.06	0.14	0.14	0.18	

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25-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem52	Elem352	Elem153	Elem253	Elem53	Elem353	Elem753	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	1	0	2	0	0	0	1	0	0	0	0	0	0	0	0	3	1
0	25	3	0	6	0	0	0	4	0	0	1	0	1	0	1	1	13	8
0	30	11	3	18	0	0	2	12	0	0	3	0	5	0	5	4	40	28
0	35	32	11	42	0	1	7	29	0	1	10	1	17	4	19	17	88	62
0	40	72	32	82	0	3	21	58	0	2	27	5	45	19	51	46	152	107
0	45	138	68	133	1	8	48	99	0	5	61	17	97	55	105	94	225	163
0	50	206	102	184	2	18	87	146	2	11	115	41	153	93	178	159	304	227
0	55	258	122	249	6	30	109	194	4	20	185	79	212	135	266	237	386	299
1	0	314	151	320	14	45	139	260	10	35	270	132	301	199	362	321	464	369
1	5	393	189	374	25	64	181	328	21	54	369	205	404	282	459	403	527	428
1	10	478	232	417	40	86	233	387	37	80	478	297	513	376	549	474	571	469
1	15	554	277	452	61	114	289	439	60	111	593	400	618	470	623	529	595	492
1	20	620	321	484	86	147	346	488	90	148	707	508	710	554	679	565	604	501
1	25	675	362	498	101	183	403	535	127	191	810	609	784	623	718	585	602	500
1	30	719	398	511	121	222	457	581	170	236	897	697	837	676	743	591	591	492
1	35	751	428	523	147	264	510	623	217	284	955	760	873	713	757	587	576	480
1	40	775	454	536	177	307	559	663	266	332	988	799	891	733	751	578	561	468
1	45	792	478	552	212	351	605	699	315	378	1010	829	892	740	740	565	544	455
1	50	805	500	570	250	395	647	732	364	422	1020	849	884	737	728	549	526	441
1	55	816	521	590	291	438	686	761	410	463	1020	858	870	729	713	532	507	426
2	0	826	543	613	334	480	720	786	453	501	1011	859	851	717	698	514	487	411
2	5	836	565	634	375	493	750	806	491	531	996	853	831	703	681	496	468	396
2	10	845	586	649	407	498	774	814	517	536	976	842	808	688	664	477	449	381
2	15	851	605	657	433	502	789	810	530	540	952	827	785	672	647	459	431	367
2	20	854	620	660	453	507	796	800	537	544	927	809	762	656	631	441	415	355
2	25	855	633	668	469	512	795	789	543	548	901	790	739	640	615	425	400	343
2	30	853	643	673	482	517	791	778	547	551	875	770	717	624	600	410	386	333
2	35	850	652	676	493	521	783	767	551	555	850	750	695	609	586	395	373	323
2	40	846	659	677	501	526	775	757	554	558	819	724	675	595	573	382	361	313
2	45	840	664	677	509	530	766	751	557	560	788	698	655	581	560	369	349	305
2	50	837	668	676	516	534	760	747	560	562	761	676	639	568	548	357	338	297
2	55	835	670	675	521	537	754	743	562	564	737	656	623	556	536	346	328	289
3	0	831	671	673	526	541	748	738	564	566	716	638	608	544	525	335	319	282
3	5	827	671	671	531	544	743	733	566	567	695	622	593	533	515	326	310	276
3	10	822	671	669	535	548	738	729	567	569	676	607	579	522	504	316	301	269
3	15	817	670	666	539	551	733	724	568	570	658	592	566	511	495	308	293	263
3	20	811	668	664	543	554	729	718	569	570	640	578	553	501	485	299	284	257
3	25	804	667	661	547	557	723	713	570	571	623	565	540	492	476	291	277	251
3	30	798	665	658	550	559	718	708	571	572	607	552	528	482	467	283	269	245
3	35	791	662	655	553	562	713	702	571	572	591	539	516	473	458	275	261	239
3	40	784	660	652	556	564	708	697	572	572	576	527	504	464	449	267	254	233
3	45	776	657	650	559	567	702	691	572	572	561	515	493	455	440	260	247	228
3	50	769	655	647	562	569	697	686	572	572	546	503	481	446	432	253	241	224
3	55	763	652	645	564	571	691	680	572	571	532	492	470	438	424	246	235	219
4	0	756	650	642	566	573	686	675	571	571	519	481	460	430	416	240	229	215
4	5	749	647	640	569	575	681	670	571	570	505	470	450	422	409	234	224	211
4	10	743	645	638	571	577	675	665	570	570	493	460	440	415	402	229	219	207
4	15	737	643	636	573	578	670	659	570	569	481	450	431	408	396	224	215	204
4	20	731	640	634	575	580	665	654	569	568	469	441	422	401	389	219	211	201
4	25	725	638	632	576	581	660	649	568	567	458	431	413	393	378	215	207	198
4	30	720	636	630	578	582	655	644	567	566	447	422	402	384	366	211	204	195
4	35	715	634	629	579	584	650	639	566	564	435	411	390	373	354	207	201	192
4	40	710	632	627	581	585	645	635	564	563	422	400	378	363	344	204	198	190
4	45	705	631	626	582	586	640	630	563	561	410	389	366	352	334	201	195	188
4	50	700	629	624	583	586	635	625	561	560	397	378	355	342	324	198	192	185
4	55	696	627	623	584	587	630	621	560	558	385	367	344	333	316	195	189	183
5	0	692	626	621	585	588	626	616	558	556	373	356	334	324	307	192	187	181
5	5	688	624	620	586	588	621	611	556	554	361	346	324	315	299	189	185	179
5	10	684	623	619	587	589	617	607	554	552	350	336	315	307	292	187	182	178
5	15	680	622	618	588	589	612	602	552	550	340	326	307	299	285	185	180	176
5	20	677	620	616	588	590	607	598	550	548	330	317	299	292	278	182	178	174
5	25	673	619	615	589	590	603	593	548	545	321	309	291	285	272	180	176	173
5	30	670	618	614	589	590	598	589	546	543	312	301	284	278	266	178	174	171
5	35	666	617	613	589	590	594	585	543	541	304	293	277	272	260	176	173	170
5	40	663	615	612	590	590	590	580	541	538	296	286	271	266	255	175	171	168
5	45	660	614	611	590	590	585	576	538	536	289	279	265	261	249	173	169	167
5	50	657	613	609	590	590	581	572	536	533	282	273	259	255	245	171	168	165
5	55	654	612	608	590	590	577	567	533	530	275	267	254	250	240	169	166	164
6	0	651	611	607	590	590	572	559	527	515	269	261	248	245	235	168	165	163
6	5	649	610	606	590	589	564	545	514	497	263	256	243	240	231	166	164	162
6	10	646	608	605	590	589	554	528	499	481	257	250	239	236	227	165	162	161
6	15	643	607	604	589	588	541	511	483	465	251	245	234	232	223	164	161	159
6	20	641	606	602	589	587	527	494	468	450	246	240	230	228	219	162	160	158
6	25	638	605	601	588	586	512	478	453	436	241	236	226	224	216	161	159	157
6	30	635	603	599	587	585	497	463	439	422	237	232	222	220	212	160	157	156
6	35	633	602	598	586	583	482	448	425	409	232	227	218	216	209	159	156	155
6	40	630	601	596	585	581	467	434	412	397	228	223	214	213	206	158	155	154
6	45	627	599	594	584	579	453	421	400	385	224	220	211	210	203	156	154	153
6	50	624	597	591	582	577	439	408	388	374	220	216	208	206	200	155	153	152
6	55	621	595	589	580	575	426	396	377	363	216	212	204	203	197	154	152	151
7	0	618	593	586	578	572	413	384	366	353	213	209	201	200	194	153	151	151
7	5	615	591	584	576	569	401	373	355	343	209	206	199	198	192	152	150	150
7	10	612	588	581	574	566	390	362	346	334	206	203	196	195	189	151	150	149
7	15	608	586	578	571	563	379	352	336	325	203	200	193	192	187	151	149	148
7	20	605	583	575	568	560	368	342	327	316	200	197	190	190	184	150	148	147
7	25	601	580	571	565	557	358	333	319	308	197	194	188	187	182	149	147	147
7	30	597	577	568	562	554	348	324	310	300	194	192	186	185	180	148	146	146
7	35	593	574	565	559	550	339	316	303	293	192	189	183	183	178	147	146	145
7	40	590	571	561	556	546	330	308	295	286	189	187	181	181	176	146	145	144
7	45	585	568	557	553	543	321	300	288	279	187	185	179	179	174	146	144	144
7	50	581	564	554	549	539	313	293	281	273	184	182	177	177	172	145	143	143
7	55	577	561	550	546	535	305	286	275	266	182	180	175	175	170	144	143	142
8	0	573	557	546	542	531	298	279	268	260	180	178	173	173	169	143	142	142
8	5	569	554	542	538	527	291	272	263	255	178	176	171	171	167	143	141	141
8	10	564	550	538	534	523	284	266	257	249	176	174	170	169	165	142	141	140
8	15	560	546	534	531	519	277	260	251	244	174	172	168	168	164	141	140	140
8	20	555	542	530	527	515	271	255	246	239	172	171	166	166	162	141	139	139
8	25	551	538	526	523	511	265	249	241	235	170	169	165	164	161	140	139	139
8	30	547	534	521	519	507	259	244	236	230	168	167	163	163	159	140	138	138
8	35	542	530	517	515	503	254	239	232	226	167	166	162	161	158	139	138	138
8	40	537	526	513	511	499	249	235	227	222	165	164	160	160	157	138	137	137
8	45	533	522	509	507	494	244	230	223	218	163	163	159	159	155	138	137	136
8	50	528	518	505	502	490	239	226	219	214	162	161	157	157	154	137	136	136
8	55	523	513	495	493	450	234	222	215	210	160	160	156	156	153	137	135	135
9	0	516	506	478	476	415	230	218	212	207	159	158	155	155	152	136	135	135
Peak	(cfs)	855	671	677	590	590	796	814	572	572	1020	859	892	740	757	591	604	501
Peak	(hrs)	2	3	2	5	5	2	2	3	3	1	2	1	1	1	1	1	1
Peak	(min)	25	0	40	40	20	20	10	40	30	50	0	45	45	35	30	20	20
Peak	(cfs_or_ac.ft.)	0	4	0	5	60	4	0	5	78	0	6	0	4	0	4	0	6
Case	((),S,I,D,O)	( )	( )	( )	( )	(S)	( )	( )	( )	(S)	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	5521.3	5521.3	4765.4	4765.4	4765.4	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4
Peak/Area	(cfs/ac)	0.13	0.11	0.11	0.11	0.11	0.14	0.15	0.12	0.12	0.21	0.19	0.20	0.18	0.18	0.18	0.18	0.16
11-23-1999	15:55:40																	
Summary	File:	P:\coweld01\future~1\TriTow~1\25_Year\udswmm\ttrd25yr.txt																

TRI-TOWN BASIN, FUTURE WITH REGIONAL DETENTION CONDITION

25-YEAR

Time(Hrs)	Time(Min)	Elem755	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761	Elem361	Elem261	Elem162	Elem262	Elem163
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
0	20	4	4	0	1	0	2	0	0	0	0	0	0	0	1	1	14	0
0	25	15	14	0	3	1	7	0	1	0	0	0	0	0	7	5	44	0
0	30	40	39	2	11	6	20	1	6	0	0	0	0	0	26	20	120	0
0	35	75	72	9	31	21	43	4	19	0	0	0	1	1	73	59	251	1
0	40	122	115	30	67	51	84	17	48	0	1	1	3	3	124	100	414	2
0	45	178	166	69	121	98	140	49	96	0	2	2	6	6	195	159	548	4
0	50	244	225	128	187	160	201	99	152	0	5	5	10	10	280	231	610	7
0	55	315	291	198	256	225	263	157	203	2	9	9	15	15	362	301	601	9
1	0	383	354	268	317	283	311	207	239	5	15	15	22	22	428	355	555	12
1	5	438	404	326	361	324	341	241	261	10	22	22	30	30	473	390	499	14
1	10	475	438	366	387	349	358	261	271	17	30	30	38	38	500	406	445	16
1	15	495	454	389	400	361	364	270	274	25	39	39	46	46	512	410	399	17
1	20	502	458	400	403	364	364	273	274	34	48	48	55	55	514	403	360	18
1	25	499	454	402	401	362	359	272	271	44	56	56	63	63	508	391	325	19
1	30	489	441	399	395	356	352	269	266	53	65	65	71	71	496	374	292	20
1	35	478	428	392	387	348	343	264	260	62	73	73	78	78	481	355	261	21
1	40	465	415	383	376	338	333	258	253	70	78	78	81	81	463	334	233	21
1	45	452	400	372	365	328	322	250	243	76	80	80	81	81	443	312	209	22
1	50	438	386	360	352	315	308	239	231	79	81	81	82	82	423	290	190	22
1	55	423	370	347	337	302	295	228	219	81	82	82	82	82	404	270	174	22
2	0	408	354	333	323	288	281	217	208	82	83	83	83	83	385	251	163	22
2	5	393	338	319	309	275	268	206	198	82	83	83	84	84	369	234	153	23
2	10	378	323	305	296	263	257	196	189	83	84	84	84	84	353	219	146	23
2	15	364	310	293	284	253	247	188	182	84	84	84	85	85	339	206	138	23
2	20	352	297	281	274	243	238	180	175	84	85	85	85	85	327	193	131	23
2	25	341	286	271	264	234	230	174	169	85	85	85	85	85	315	182	125	23
2	30	330	275	262	255	227	222	168	164	85	86	86	86	86	304	172	118	23
2	35	321	265	253	247	219	215	163	159	86	86	86	86	86	293	162	112	23
2	40	311	256	245	239	213	209	158	154	86	86	86	87	87	283	154	106	23
2	45	303	248	238	232	207	203	154	150	86	87	87	87	87	274	145	100	23
2	50	295	240	231	226	201	197	150	146	87	87	87	87	87	265	138	95	23
2	55	287	233	224	219	195	192	146	143	87	87	87	88	88	256	131	90	23
3	0	281	226	218	214	191	188	142	139	87	88	88	88	88	248	124	87	23
3	5	274	220	212	208	186	183	139	136	88	88	88	88	88	241	118	83	23
3	10	268	214	207	203	182	179	136	134	88	88	88	88	88	234	112	79	23
3	15	262	208	202	198	178	175	133	131	88	89	89	89	89	227	107	74	23
3	20	255	202	197	194	174	172	131	129	89	89	89	89	89	220	102	70	23
3	25	250	197	193	189	170	167	128	126	89	89	89	89	89	213	97	65	23
3	30	244	191	187	183	165	161	126	123	89	89	89	89	89	206	92	61	22
3	35	238	185	182	177	160	157	123	121	89	89	89	90	90	200	87	58	22
3	40	232	180	177	173	156	154	121	119	89	90	90	90	90	194	83	55	22
3	45	227	176	172	169	153	151	118	116	90	90	90	90	90	188	78	52	22
3	50	222	171	168	165	150	147	116	115	90	90	90	90	90	182	74	50	22
3	55	218	167	164	161	146	144	114	113	90	90	90	90	90	177	71	49	22
4	0	214	163	160	157	143	142	113	111	90	90	90	90	90	172	67	47	22
4	5	210	160	157	154	141	139	111	110	90	91	91	91	91	167	64	46	22
4	10	206	157	154	151	138	137	110	109	91	91	91	91	91	163	61	45	22
4	15	203	154	151	149	136	135	109	108	91	91	91	91	91	159	59	44	22
4	20	200	151	149	146	134	133	108	107	91	91	91	91	91	155	56	44	21
4	25	197	149	146	144	133	132	107	106	91	91	91	91	91	151	54	43	21
4	30	194	147	144	142	131	130	106	105	91	91	91	91	91	146	51	42	21
4	35	192	145	142	140	130	129	105	104	91	91	91	91	91	142	49	42	21
4	40	189	143	140	138	128	127	104	104	91	91	91	91	91	139	47	41	21
4	45	187	141	138	137	127	126	104	103	91	91	91	92	92	136	45	41	21
4	50	185	139	136	135	126	125	103	102	91	92	92	92	92	133	44	40	21
4	55	183	137	135	133	124	124	102	102	92	92	92	92	92	131	43	40	21
5	0	181	136	133	132	123	123	102	101	92	92	92	92	92	128	42	39	21
5	5	179	134	132	130	122	121	101	101	92	92	92	92	92	126	41	39	20
5	10	177	133	130	129	121	121	101	101	92	92	92	92	92	124	40	38	20
5	15	175	131	129	128	120	120	101	100	92	92	92	92	92	122	40	38	20
5	20	174	130	128	127	119	119	100	100	92	92	92	92	92	120	39	37	20
5	25	172	129	126	125	118	118	100	99	92	92	92	92	92	119	39	37	20
5	30	171	128	125	124	118	117	99	99	92	92	92	92	92	117	38	36	20
5	35	169	127	124	123	117	116	99	99	92	92	92	92	92	115	38	36	20
5	40	168	126	123	122	116	116	99	99	92	92	92	92	92	114	37	36	20
5	45	166	125	122	121	115	115	99	98	92	92	92	92	92	112	37	35	20
5	50	165	124	121	120	115	114	98	98	92	92	92	92	92	110	36	35	19
5	55	164	123	120	119	114	114	98	98	92	92	92	92	92	109	36	35	19
6	0	163	122	119	119	113	113	98	98	92	92	92	92	92	107	35	34	19
6	5	161	121	119	118	113	112	98	97	92	92	92	92	92	106	35	34	19
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6	15	159	119	117	116	112	111	97	97	92	92	92	92	92	103	34	33	19
6	20	158	119	116	116	111	111	97	97	92	92	92	92	92	102	34	33	19
6	25	157	118	116	115	111	110	97	97	92	92	92	92	92	100	34	33	19
6	30	156	117	115	114	110	110	97	96	92	92	92	92	92	99	33	32	19
6	35	155	116	114	114	110	109	96	96	92	92	92	92	92	98	33	32	19
6	40	154	116	114	113	109	109	96	96	92	92	92	92	92	96	33	32	18
6	45	153	115	113	112	109	109	96	96	92	92	92	92	92	95	32	31	18
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6	55	151	114	112	111	108	108	96	96	92	92	92	92	92	93	32	31	18
7	0	150	113	111	111	108	107	96	96	92	92	92	92	92	91	31	30	18
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7	10	149	112	110	110	107	107	95	95	92	92	92	92	92	89	31	30	18
7	15	148	112	110	109	106	106	95	95	92	92	92	92	92	88	31	30	18
7	20	147	111	109	109	106	106	95	95	92	92	92	92	92	87	30	29	18
7	25	146	111	109	108	106	106	95	95	92	92	92	92	92	86	30	29	18
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7	35	145	110	108	108	105	105	95	95	92	92	92	92	92	83	29	29	17
7	40	144	110	108	107	105	105	95	95	92	92	92	92	92	82	29	28	17
7	45	144	109	107	107	105	104	95	95	92	92	92	92	92	81	29	28	17
7	50	143	109	107	106	104	104	95	94	92	92	92	92	92	80	29	28	17
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8	0	142	108	106	106	104	104	94	94	92	92	92	92	92	78	28	27	17
8	5	141	108	106	105	103	103	94	94	92	92	92	92	92	77	28	27	17
8	10	140	107	105	105	103	103	94	94	92	92	92	92	92	76	28	27	17
8	15	140	107	105	105	103	103	94	94	92	92	92	92	92	75	27	27	17
8	20	139	107	105	104	103	103	94	94	92	92	92	92	92	74	27	26	17
8	25	139	106	104	104	102	102	94	94	92	92	92	92	92	73	27	26	17
8	30	138	106	104	104	102	102	94	94	92	92	92	92	92	72	27	26	17
8	35	137	106	104	103	102	102	94	94	92	92	92	92	92	72	27	26	16
8	40	137	105	103	103	102	102	94	94	92	92	92	92	92	71	26	25	16
8	45	136	105	103	103	102	101	94	93	92	92	92	92	92	70	26	25	16
8	50	136	105	103	103	101	101	93	93	92	92	92	92	92	69	26	25	16
8	55	135	105	103	102	101	101	93	93	92	92	92	92	92	68	26	25	16
9	0	135	104	102	102	101	101	93	93	92	92	92	92	92	67	25	25	16
Peak	(cfs)	502	458	402	403	364	364	273	274	92	92	92	92	92	514	410	610	23
Peak	(hrs)	1	1	1	1	1	1	1	1	4	4	4	4	4	1	1	0	2
Peak	(min)	20	20	25	20	20	15	20	15	55	50	50	45	45	20	15	50	5
Peak	(cfs_or_ac.ft.)	0	0	4	0	4	0	4	0	2	0	2	0	74	0	3	0	0
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	(S)	( )	( )	( )	( )
Area	(ac)	3197.4	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7	1726.7	1726.7	823.7	823.7	288.0
Peak/Area	(cfs/ac)	0.16	0.18	0.16	0.17	0.15	0.15	0.13	0.13	0.05	0.05	0.05	0.05	0.05	0.30	0.50	0.74	0.08
11-23-1999	15:55:40																	
Summary	File:																	

TRI-TOWN BASIN, FUTURE WITH REGIONAL DETENTION CONDITION

25-YEAR

Time(Hrs)	Time(Min)	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0.08
0	10	0	0	0	0	0.17
0	15	0	0	0	0	0.25
0	20	0	1	0	0	0.33
0	25	1	2	0	0	0.42
0	30	2	8	1	1	0.50
0	35	4	18	3	2	0.58
0	40	7	32	6	5	0.67
0	45	10	54	11	11	0.75
0	50	12	76	18	19	0.83
0	55	14	92	26	29	0.92
1	0	16	105	34	41	1.00
1	5	17	113	41	57	1.08
1	10	18	119	48	75	1.17
1	15	19	123	54	94	1.25
1	20	20	124	59	114	1.33
1	25	21	125	64	134	1.42
1	30	21	124	68	153	1.50
1	35	22	122	71	170	1.58
1	40	22	120	74	173	1.67
1	45	22	117	76	176	1.75
1	50	22	114	78	179	1.83
1	55	22	112	80	181	1.92
2	0	23	110	81	183	2.00
2	5	23	109	83	185	2.08
2	10	23	108	83	187	2.17
2	15	23	107	84	188	2.25
2	20	23	106	84	189	2.33
2	25	23	105	85	190	2.42
2	30	23	103	85	191	2.50
2	35	23	102	84	191	2.58
2	40	23	100	84	191	2.67
2	45	23	99	84	191	2.75
2	50	23	97	83	191	2.83
2	55	23	95	83	190	2.92
3	0	23	94	82	190	3.00
3	5	23	92	81	189	3.08
3	10	23	90	81	188	3.17
3	15	23	89	80	187	3.25
3	20	23	87	79	186	3.33
3	25	22	85	78	185	3.42
3	30	22	83	77	184	3.50
3	35	22	82	76	183	3.58
3	40	22	80	75	182	3.67
3	45	22	78	73	180	3.75
3	50	22	77	72	179	3.83
3	55	22	75	71	178	3.92
4	0	22	74	70	176	4.00
4	5	22	72	69	175	4.08
4	10	21	71	68	173	4.17
4	15	21	69	66	172	4.25
4	20	21	68	65	170	4.33
4	25	21	66	64	163	4.42
4	30	21	65	63	155	4.50
4	35	21	64	62	147	4.58
4	40	21	62	61	140	4.67
4	45	21	61	59	133	4.75
4	50	21	60	58	127	4.83
4	55	20	58	57	121	4.92
5	0	20	57	56	115	5.00
5	5	20	56	55	110	5.08
5	10	20	55	54	105	5.17
5	15	20	54	53	100	5.25
5	20	20	53	52	96	5.33
5	25	20	52	51	92	5.42
5	30	20	51	50	88	5.50
5	35	20	50	49	84	5.58
5	40	20	49	48	80	5.67
5	45	19	48	47	77	5.75
5	50	19	47	46	73	5.83
5	55	19	46	45	70	5.92
6	0	19	45	45	67	6.00
6	5	19	44	44	65	6.08
6	10	19	43	43	62	6.17
6	15	19	42	42	59	6.25
6	20	19	42	41	57	6.33
6	25	19	41	41	55	6.42
6	30	19	40	40	52	6.50
6	35	18	39	39	50	6.58
6	40	18	38	38	48	6.67
6	45	18	38	37	46	6.75
6	50	18	37	37	44	6.83
6	55	18	36	36	43	6.92
7	0	18	35	35	41	7.00
7	5	18	35	35	39	7.08
7	10	18	34	34	38	7.17
7	15	18	33	33	36	7.25
7	20	18	33	33	35	7.33
7	25	17	32	32	33	7.42
7	30	17	32	31	32	7.50
7	35	17	31	31	31	7.58
7	40	17	30	30	30	7.67
7	45	17	30	30	28	7.75
7	50	17	29	29	27	7.83
7	55	17	29	29	26	7.92
8	0	17	28	28	25	8.00
8	5	17	27	27	24	8.08
8	10	17	27	27	23	8.17
8	15	17	26	26	22	8.25
8	20	17	26	26	22	8.33
8	25	16	25	25	21	8.42
8	30	16	25	25	20	8.50
8	35	16	24	24	19	8.58
8	40	16	24	24	18	8.67
8	45	16	24	24	18	8.75
8	50	16	23	23	17	8.83
8	55	16	23	23	16	8.92
9	0	16	22	22	16	9.00
Peak	(cfs)	23	125	85	191	
Peak	(hrs)	2	1	2	2	
Peak	(min)	0	25	25	30	
Peak	(cfs_or_ac.ft.)	0	0	30	0	
Case	((),S,I,D,O)	(_)	(_)	(S)	(_)	
Area	(ac)	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	0.08	0.25	0.22	0.26	
11-23-1999	15:55:40					
Summary	File:	P:\coweld01\future~1\TriTow~1\25_Year\udswmm\ttrd25yr.txt				

TRI-TOWN BASIN, FUTURE WITH REGIONAL DETENTION CONDITION

50-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem52	Elem352	Elem153	Elem253	Elem53	Elem353	Elem753	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	1	0	2	0	0	0	1	0	0	0	0	0	0	0	0	4	2
0	25	4	1	7	0	0	0	5	0	0	1	0	1	0	1	1	15	10
0	30	14	4	21	0	0	2	14	0	0	3	0	6	1	6	5	47	33
0	35	38	14	50	0	1	9	35	0	1	12	1	22	6	25	22	106	75
0	40	88	39	99	0	4	27	72	0	2	35	7	59	26	66	59	190	134
0	45	169	85	164	1	10	62	126	1	6	82	24	129	74	137	124	291	212
0	50	240	114	255	3	22	101	194	2	14	159	57	194	111	237	214	402	302
0	55	316	149	371	8	37	138	300	7	28	263	111	298	175	360	322	515	401
1	0	448	201	463	18	58	198	407	16	48	390	193	429	273	497	439	620	495
1	5	582	265	535	34	86	275	497	32	77	537	305	579	396	633	550	703	571
1	10	702	335	592	58	123	360	575	57	114	698	442	734	532	753	641	750	614
1	15	807	404	639	88	168	447	644	91	160	864	594	878	661	849	708	785	647
1	20	894	468	662	108	219	530	709	136	215	1020	744	999	773	923	753	800	663
1	25	961	522	682	136	275	608	770	190	274	1117	841	1088	858	954	778	798	663
1	30	1012	569	702	172	334	681	826	251	335	1203	932	1141	911	966	785	783	652
1	35	1049	609	722	216	394	749	878	315	397	1270	1007	1166	939	963	777	758	632
1	40	1075	644	745	267	456	810	924	380	459	1314	1062	1170	948	950	759	728	607
1	45	1094	676	768	319	493	865	965	445	519	1336	1097	1158	944	930	733	695	580
1	50	1106	705	783	366	499	911	990	495	537	1339	1114	1135	930	904	703	659	549
1	55	1112	729	790	403	507	944	991	523	545	1327	1116	1104	909	876	670	623	520
2	0	1112	747	790	432	514	961	979	539	553	1303	1106	1069	884	847	638	594	496
2	5	1105	759	786	456	521	965	963	550	561	1270	1087	1032	858	820	607	565	473
2	10	1094	766	780	476	529	961	945	559	568	1232	1062	995	831	794	579	539	452
2	15	1079	769	772	492	536	950	927	566	574	1191	1033	960	806	770	552	514	433
2	20	1060	768	762	505	543	937	910	573	580	1148	1002	925	782	747	527	493	417
2	25	1040	765	752	517	549	922	892	580	586	1106	970	893	759	726	505	473	401
2	30	1017	760	742	527	555	906	875	585	591	1064	939	862	738	707	484	454	387
2	35	995	754	737	536	561	890	859	591	596	1024	908	833	718	689	465	437	375
2	40	973	749	736	544	566	874	844	595	600	988	878	805	699	672	447	421	363
2	45	954	745	735	552	571	859	829	600	604	953	850	780	682	656	431	406	352
2	50	936	742	733	558	576	844	816	603	607	920	823	755	665	640	416	392	342
2	55	919	739	730	564	580	830	804	607	611	889	797	732	649	626	401	380	332
3	0	907	736	728	569	585	819	800	610	613	859	773	711	634	612	388	368	324
3	5	899	733	725	574	588	810	795	613	616	832	750	692	620	599	376	357	316
3	10	892	731	723	579	592	803	791	615	618	802	724	675	607	587	365	347	308
3	15	884	728	720	583	595	797	786	617	619	772	699	659	594	575	354	337	301
3	20	876	725	717	588	599	792	781	619	621	747	678	643	582	563	343	326	293
3	25	869	722	714	591	602	786	775	621	622	724	659	628	570	551	333	317	286
3	30	861	720	711	595	605	781	770	622	623	704	642	613	559	540	324	308	280
3	35	853	717	708	598	608	775	764	623	624	684	626	599	547	530	315	300	274
3	40	845	714	705	602	611	770	759	624	624	666	611	585	537	520	306	292	268
3	45	837	711	702	605	613	764	753	624	625	648	597	572	526	510	298	285	263
3	50	829	708	699	608	616	759	748	625	625	631	583	559	517	501	291	278	258
3	55	822	705	697	610	618	753	742	625	625	615	570	546	507	492	284	272	253
4	0	815	702	694	613	620	748	737	625	625	599	557	534	498	483	277	266	249
4	5	808	700	692	616	622	742	731	624	624	584	545	523	489	475	271	260	244
4	10	801	697	690	618	624	737	726	624	624	570	533	512	481	467	265	255	240
4	15	795	695	688	620	626	731	721	624	623	556	522	501	473	460	259	249	235
4	20	788	692	686	622	628	726	715	623	622	543	511	491	465	452	253	243	231
4	25	782	690	684	624	629	721	710	622	621	530	501	481	457	445	248	239	227
4	30	777	688	682	626	631	716	705	621	620	518	490	471	450	438	243	235	224
4	35	771	686	680	628	632	710	700	620	619	507	481	462	443	431	238	231	221
4	40	766	684	679	629	634	705	695	619	618	496	471	454	436	425	234	227	218
4	45	761	682	677	631	635	700	690	618	617	485	462	446	430	419	230	223	215
4	50	756	681	676	632	636	696	686	617	615	475	454	438	423	413	226	220	212
4	55	752	679	675	633	637	691	681	615	614	466	446	430	417	407	223	217	210
5	0	747	678	673	634	638	686	676	614	612	457	438	423	411	402	220	214	207
5	5	743	676	672	636	638	681	672	612	611	448	431	417	406	396	217	211	205
5	10	739	675	671	636	639	677	667	611	609	440	424	410	401	391	214	208	203
5	15	735	674	670	637	640	672	663	609	607	433	417	404	395	386	211	206	201
5	20	732	672	668	638	640	668	659	607	605	425	411	398	390	382	208	203	199
5	25	728	671	667	639	641	663	654	605	603	418	405	393	385	377	206	201	197
5	30	725	670	666	639	641	659	650	604	601	411	399	386	380	368	203	199	195
5	35	721	669	665	640	641	655	646	602	599	404	392	378	372	354	201	197	193
5	40	718	667	664	640	641	651	642	600	597	395	384	367	361	342	199	195	191
5	45	715	666	663	641	641	646	638	598	595	385	375	356	351	331	197	193	190
5	50	712	665	662	641	642	642	634	595	593	375	365	344	340	320	195	191	188
5	55	709	664	661	641	642	638	630	593	591	364	355	334	329	310	193	189	187
6	0	706	663	660	641	641	634	626	591	588	353	345	323	320	301	191	188	185
6	5	703	662	659	641	641	630	622	589	586	343	335	314	310	293	189	186	184
6	10	701	661	658	641	641	626	618	586	583	332	325	304	301	285	188	184	182
6	15	698	660	657	641	641	622	614	583	581	322	316	296	293	278	186	183	181
6	20	695	659	655	641	640	618	610	581	578	313	307	288	285	271	184	182	180
6	25	693	658	654	641	640	614	606	578	575	304	298	280	278	264	183	180	178
6	30	690	656	653	640	640	610	602	575	572	296	290	273	271	258	182	179	177
6	35	688	655	652	640	639	606	597	573	569	288	283	267	265	253	180	177	176
6	40	686	654	651	640	638	602	593	570	566	281	276	261	259	247	179	176	175
6	45	683	653	650	639	638	598	589	567	563	274	269	255	253	242	177	175	174
6	50	681	652	649	639	637	594	585	564	560	267	263	249	248	238	176	174	173
6	55	679	651	647	638	636	590	581	561	557	261	257	244	243	233	175	173	172
7	0	676	650	646	637	636	586	577	558	554	255	252	239	238	229	174	172	171
7	5	674	649	645	637	635	582	573	555	551	250	246	235	234	225	173	170	170
7	10	672	647	644	636	634	578	569	551	548	245	242	231	230	221	172	169	169
7	15	670	646	643	635	633	574	565	548	545	240	237	227	226	218	171	168	168
7	20	668	645	641	634	632	570	561	545	542	235	233	223	222	214	169	167	167
7	25	666	644	640	633	631	566	558	542	539	231	228	219	218	211	168	167	166
7	30	663	642	639	632	630	562	554	539	535	227	225	216	215	208	167	166	165
7	35	661	641	637	631	628	558	550	536	532	223	221	212	212	205	167	165	164
7	40	659	640	636	630	627	554	544	531	523	220	217	209	209	202	166	164	163
7	45	657	638	634	629	626	548	532	519	502	216	214	206	206	200	165	163	163
7	50	655	637	633	628	625	539	515	502	482	213	211	204	203	197	164	162	162
7	55	653	636	631	627	623	526	496	484	463	210	208	201	201	195	163	161	161
8	0	651	634	630	625	621	512	477	466	445	207	205	198	198	193	162	161	160
8	5	648	633	628	624	619	496	459	449	429	204	202	196	196	191	161	160	159
8	10	646	631	626	622	617	479	442	432	413	201	200	194	193	188	161	159	159
8	15	644	629	624	620	615	463	426	416	399	199	197	191	191	186	160	158	158
8	20	641	627	622	618	612	447	411	402	385	196	195	189	189	185	159	158	157
8	25	639	625	619	616	609	432	397	388	372	194	193	187	187	183	158	157	157
8	30	636	623	616	613	606	417	383	375	359	192	190	185	185	181	158	156	156
8	35	633	621	613	611	603	403	370	362	348	190	188	183	183	179	157	155	155
8	40	630	618	610	608	599	390	358	351	337	187	186	182	181	178	156	155	155
8	45	627	616	607	605	596	377	347	340	326	185	185	180	180	176	156	154	154
8	50	624	613	604	602	592	365	336	329	316	184	183	178	178	174	155	154	153
8	55	620	610	600	598	588	353	326	319	307	182	181	177	177	173	154	153	153
9	0	617	607	597	595	584	343	316	310	298	180	179	175	175	172	154	152	152
Peak	(cfs)	1112	769	790	641	642	965	991	625	625	1339	1116	1170	948	966	785	800	663
Peak	(hrs)	1	2	1	5	5	2	1	3	3	1	1	1	1	1	1	1	1
Peak	(min)	55	15	55	45	50	5	55	50	45	50	55	40	40	30	30	20	20
Peak	(cfs_or_ac.ft.)	0	4	0	5	82	5	0	5	114	0	7	0	5	0	5	0	6
Case	((),S,I,D,O)	( )	( )	( )	( )	(S)	( )	( )	( )	(S)	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	5521.3	5521.3	4765.4	4765.4	4765.4	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4
Peak/Area	(cfs/ac)	0.17	0.13	0.13	0.12	0.12	0.17	0.18	0.13	0.13	0.28	0.25	0.26	0.23	0.24	0.23	0.24	0.21
11-23-1999	15:55:41																	
Summary	File:	P:\coweld01\future~1\TriTow~1\50_Year\udswmm\ttrd50yr.txt																

50-YEAR

Time(Hrs)	Time(Min)	Elem755	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761	Elem361	Elem261	Elem162	Elem262	Elem163
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
0	20	5	5	0	1	0	2	0	0	0	0	0	0	0	2	1	17	0
0	25	17	17	0	4	2	8	0	2	0	0	0	0	0	9	6	53	0
0	30	47	45	3	14	8	24	1	7	0	0	0	1	1	32	25	140	0
0	35	90	87	13	39	26	52	6	24	0	0	0	2	2	83	67	302	1
0	40	154	146	40	87	66	109	24	62	0	1	1	4	4	147	117	510	3
0	45	232	217	93	160	131	183	66	125	0	2	2	7	7	241	196	687	5
0	50	324	301	173	248	213	264	134	200	1	6	6	12	12	355	293	774	9
0	55	422	391	267	338	298	344	211	269	3	11	11	19	19	467	387	774	12
1	0	513	475	359	419	375	411	278	318	7	19	19	28	28	558	462	724	15
1	5	587	543	437	480	433	456	323	347	13	29	29	38	38	622	511	654	18
1	10	636	587	491	517	468	479	349	360	23	39	39	49	49	659	534	582	20
1	15	661	608	522	534	483	486	360	363	34	51	51	60	60	674	537	515	22
1	20	667	611	534	537	485	483	361	360	46	62	62	71	71	673	526	456	24
1	25	659	600	534	530	478	474	358	354	58	73	73	80	80	660	505	403	25
1	30	643	581	525	517	466	459	350	343	69	79	79	81	81	640	478	356	26
1	35	619	556	510	500	450	441	338	329	76	81	81	82	82	614	448	313	27
1	40	594	530	492	479	430	419	322	310	79	82	82	83	83	585	416	276	27
1	45	569	503	470	455	407	396	304	291	82	83	83	84	84	556	384	245	28
1	50	542	476	446	430	384	372	285	272	83	84	84	85	85	527	354	220	28
1	55	516	449	422	407	362	351	267	254	84	85	85	86	86	499	326	201	28
2	0	491	424	399	385	341	331	250	239	85	86	86	86	86	474	300	187	28
2	5	469	401	378	365	323	313	235	225	86	87	87	87	87	451	278	175	28
2	10	448	380	360	347	306	298	223	214	86	87	87	88	88	431	258	166	29
2	15	430	362	343	332	292	285	211	204	87	88	88	88	88	412	240	157	29
2	20	413	345	328	318	279	273	202	195	88	88	88	89	89	396	225	149	29
2	25	398	330	314	305	268	262	194	188	88	89	89	89	89	380	211	141	29
2	30	385	316	302	293	258	252	186	181	89	90	90	90	90	366	198	133	29
2	35	372	304	291	283	249	244	180	175	90	90	90	90	90	353	186	125	29
2	40	360	292	280	273	240	235	174	169	90	91	91	91	91	340	175	118	29
2	45	350	282	271	264	232	228	168	164	91	91	91	91	91	328	165	112	29
2	50	340	272	262	256	225	221	163	159	91	91	91	92	92	317	156	107	29
2	55	330	263	254	248	219	215	159	155	91	92	92	92	92	307	148	103	28
3	0	322	255	246	241	213	209	154	151	92	92	92	93	93	297	140	99	28
3	5	314	248	239	234	207	204	151	148	92	93	93	93	93	288	133	96	28
3	10	307	241	233	228	202	199	148	145	93	93	93	93	93	280	127	92	28
3	15	299	233	227	222	197	194	144	142	93	93	93	94	94	272	121	88	28
3	20	292	226	221	216	192	189	142	139	93	94	94	94	94	265	116	83	28
3	25	285	220	215	211	188	185	139	136	94	94	94	94	94	257	111	78	28
3	30	279	214	210	206	183	181	136	133	94	94	94	95	95	250	105	73	28
3	35	273	209	205	200	179	177	133	131	94	95	95	95	95	243	100	70	28
3	40	267	204	200	196	175	173	130	128	95	95	95	95	95	236	95	66	28
3	45	262	199	195	191	172	169	128	126	95	95	95	95	95	229	91	64	27
3	50	257	194	190	187	168	166	126	124	95	95	95	96	96	223	87	61	27
3	55	252	190	186	183	165	164	124	122	95	96	96	96	96	217	83	60	27
4	0	248	186	183	180	163	161	122	120	96	96	96	96	96	211	80	58	27
4	5	243	183	179	176	159	157	120	119	96	96	96	96	96	206	76	57	27
4	10	239	178	175	171	156	153	119	118	96	96	96	96	96	201	74	56	27
4	15	234	174	171	168	152	151	117	116	96	96	96	97	97	197	71	55	27
4	20	230	171	167	165	150	149	116	115	96	97	97	97	97	192	69	54	26
4	25	226	168	164	162	148	147	115	114	97	97	97	97	97	188	66	53	26
4	30	223	165	162	159	146	144	114	114	97	97	97	97	97	184	64	53	26
4	35	220	162	159	157	144	143	113	113	97	97	97	97	97	181	63	52	26
4	40	217	160	156	154	142	141	113	112	97	97	97	97	97	177	61	51	26
4	45	214	157	154	152	141	140	112	111	97	97	97	98	98	174	59	51	26
4	50	211	155	152	150	139	138	111	111	97	98	98	98	98	170	58	50	26
4	55	209	153	150	149	138	137	111	110	98	98	98	98	98	167	56	49	25
5	0	207	151	148	147	136	136	110	110	98	98	98	98	98	164	55	49	25
5	5	204	150	147	145	135	134	110	109	98	98	98	98	98	161	54	48	25
5	10	202	148	145	144	134	133	109	109	98	98	98	98	98	158	52	48	25
5	15	200	146	143	142	133	132	109	108	98	98	98	98	98	155	51	47	25
5	20	198	145	142	141	132	131	108	108	98	98	98	98	98	152	50	46	25
5	25	196	144	141	139	131	130	108	107	98	98	98	98	98	150	49	46	25
5	30	195	142	139	138	130	129	107	107	98	98	98	99	99	147	48	45	25
5	35	193	141	138	137	129	128	107	107	98	99	99	99	99	145	47	45	24
5	40	191	140	137	136	128	128	107	106	99	99	99	99	99	143	47	44	24
5	45	189	138	135	134	127	127	106	106	99	99	99	99	99	141	46	44	24
5	50	188	137	134	133	126	126	106	106	99	99	99	99	99	139	45	44	24
5	55	186	136	133	132	126	125	106	106	99	99	99	99	99	137	45	43	24
6	0	185	135	132	131	125	124	106	105	99	99	99	99	99	135	44	43	24
6	5	183	134	131	130	124	124	105	105	99	99	99	99	99	133	44	42	24
6	10	182	133	130	129	124	123	105	105	99	99	99	99	99	131	43	42	24
6	15	181	132	129	129	123	122	105	105	99	99	99	99	99	129	43	41	23
6	20	179	131	128	128	122	122	105	105	99	99	99	99	99	128	42	41	23
6	25	178	130	128	127	122	121	104	104	99	99	99	99	99	126	42	41	23
6	30	177	130	127	126	121	121	104	104	99	99	99	99	99	124	42	40	23
6	35	176	129	126	125	121	120	104	104	99	99	99	99	99	123	41	40	23
6	40	175	128	125	125	120	120	104	104	99	99	99	99	99	121	41	39	23
6	45	174	127	125	124	120	119	104	104	99	99	99	99	99	119	40	39	23
6	50	172	127	124	123	119	119	104	104	99	99	99	99	99	118	40	39	23
6	55	171	126	123	123	119	118	104	103	99	100	100	100	100	116	40	38	23
7	0	170	125	123	122	118	118	103	103	100	100	100	100	100	115	39	38	22
7	5	169	125	122	121	118	117	103	103	100	100	100	100	100	113	39	38	22
7	10	168	124	121	121	117	117	103	103	100	100	100	100	100	112	38	37	22
7	15	167	123	121	120	117	117	103	103	100	100	100	100	100	110	38	37	22
7	20	167	123	120	120	117	116	103	103	100	100	100	100	100	109	38	37	22
7	25	166	122	120	119	116	116	103	103	100	100	100	100	100	108	37	36	22
7	30	165	122	119	119	116	116	103	103	100	100	100	100	100	106	37	36	22
7	35	164	121	119	118	115	115	103	103	100	100	100	100	100	105	37	36	22
7	40	163	121	118	118	115	115	103	102	100	100	100	100	100	103	36	35	21
7	45	162	120	118	117	115	114	102	102	100	100	100	100	100	102	36	35	21
7	50	162	120	117	117	114	114	102	102	100	100	100	100	100	101	36	35	21
7	55	161	120	117	117	114	114	102	102	100	100	100	100	100	100	35	34	21
8	0	160	119	117	116	114	114	102	102	100	100	100	100	100	98	35	34	21
8	5	159	119	116	116	113	113	102	102	100	100	100	100	100	97	35	34	21
8	10	159	118	116	115	113	113	102	102	100	100	100	100	100	96	35	33	21
8	15	158	118	115	115	113	113	102	102	100	100	100	100	100	95	34	33	21
8	20	157	117	115	115	113	112	102	102	100	100	100	100	100	93	34	33	21
8	25	156	117	115	114	112	112	102	102	100	100	100	100	100	92	34	33	20
8	30	156	117	114	114	112	112	102	102	100	100	100	100	100	91	33	32	20
8	35	155	116	114	114	112	112	102	102	100	100	100	100	100	90	33	32	20
8	40	154	116	114	113	112	111	102	102	100	100	100	100	100	89	33	32	20
8	45	154	116	113	113	111	111	102	101	100	100	100	100	100	88	32	32	20
8	50	153	115	113	113	111	111	101	101	100	100	100	100	100	87	32	31	20
8	55	153	115	113	112	111	111	101	101	100	100	100	100	100	86	32	31	20
9	0	152	115	112	112	111	110	101	101	100	100	100	100	100	85	32	31	20
Peak	(cfs)	667	611	534	537	485	486	361	363	100	100	100	100	100	674	537	774	29
Peak	(hrs)	1	1	1	1	1	1	1	1	7	6	6	6	6	1	1	0	2
Peak	(min)	20	20	20	20	20	15	20	15	0	55	55	55	55	15	15	50	10
Peak	(cfs_or_ac.ft.)	0	0	5	0	5	0	4	0	2	0	2	0	104	0	3	0	0
Case	((),S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	(S)	( )	( )	( )	( )
Area	(ac)	3197.4	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7	1726.7	1726.7	823.7	823.7	288.0
Peak/Area	(cfs/ac)	0.21	0.24	0.22	0.22	0.21	0.21	0.17	0.17	0.06	0.06	0.06	0.06	0.06	0.39	0.65	0.94	0.10
11-23-1999	15:55:41																	
Summary	File:																	

TRI-TOWN BASIN, FUTURE WITH REGIONAL DETENTION CONDITION

50-YEAR

Time(Hrs)	Time(Min)	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0.08
0	10	0	0	0	0	0.17
0	15	0	0	0	0	0.25
0	20	0	1	0	0	0.33
0	25	1	3	0	0	0.42
0	30	2	9	1	1	0.50
0	35	5	23	4	3	0.58
0	40	8	47	8	7	0.67
0	45	12	83	15	13	0.75
0	50	15	112	24	23	0.83
0	55	18	136	34	38	0.92
1	0	20	152	45	58	1.00
1	5	22	164	55	83	1.08
1	10	24	171	64	112	1.17
1	15	25	175	73	141	1.25
1	20	26	176	80	170	1.33
1	25	27	175	86	176	1.42
1	30	27	172	91	181	1.50
1	35	28	168	95	186	1.58
1	40	28	163	98	192	1.67
1	45	28	158	101	197	1.75
1	50	28	153	103	201	1.83
1	55	28	148	104	205	1.92
2	0	28	143	106	209	2.00
2	5	29	139	107	212	2.08
2	10	29	135	107	215	2.17
2	15	29	134	108	218	2.25
2	20	29	132	108	220	2.33
2	25	29	130	108	222	2.42
2	30	29	128	107	223	2.50
2	35	29	126	107	224	2.58
2	40	29	124	106	224	2.67
2	45	29	122	106	225	2.75
2	50	28	120	105	225	2.83
2	55	28	117	104	224	2.92
3	0	28	115	103	224	3.00
3	5	28	113	102	223	3.08
3	10	28	111	100	222	3.17
3	15	28	109	99	221	3.25
3	20	28	107	98	219	3.33
3	25	28	105	97	218	3.42
3	30	28	102	95	216	3.50
3	35	27	100	94	215	3.58
3	40	27	98	92	213	3.67
3	45	27	96	91	212	3.75
3	50	27	94	89	210	3.83
3	55	27	92	88	208	3.92
4	0	27	90	86	206	4.00
4	5	27	88	85	204	4.08
4	10	27	87	83	203	4.17
4	15	26	85	82	201	4.25
4	20	26	83	80	199	4.33
4	25	26	81	79	197	4.42
4	30	26	80	77	195	4.50
4	35	26	78	76	193	4.58
4	40	26	76	75	190	4.67
4	45	26	75	73	188	4.75
4	50	25	73	72	186	4.83
4	55	25	72	71	184	4.92
5	0	25	70	69	182	5.00
5	5	25	69	68	180	5.08
5	10	25	68	67	178	5.17
5	15	25	66	65	175	5.25
5	20	25	65	64	173	5.33
5	25	25	64	63	171	5.42
5	30	24	62	62	164	5.50
5	35	24	61	60	153	5.58
5	40	24	60	59	143	5.67
5	45	24	59	58	134	5.75
5	50	24	58	57	125	5.83
5	55	24	56	56	118	5.92
6	0	24	55	55	110	6.00
6	5	24	54	54	104	6.08
6	10	23	53	53	97	6.17
6	15	23	52	52	92	6.25
6	20	23	51	51	86	6.33
6	25	23	50	50	81	6.42
6	30	23	49	49	77	6.50
6	35	23	48	48	72	6.58
6	40	23	47	47	68	6.67
6	45	23	46	46	65	6.75
6	50	22	45	45	61	6.83
6	55	22	44	44	58	6.92
7	0	22	44	44	55	7.00
7	5	22	43	43	52	7.08
7	10	22	42	42	50	7.17
7	15	22	41	41	47	7.25
7	20	22	40	40	45	7.33
7	25	22	40	39	43	7.42
7	30	22	39	39	41	7.50
7	35	21	38	38	39	7.58
7	40	21	37	37	37	7.67
7	45	21	37	37	35	7.75
7	50	21	36	36	34	7.83
7	55	21	35	35	32	7.92
8	0	21	34	34	31	8.00
8	5	21	34	34	29	8.08
8	10	21	33	33	28	8.17
8	15	21	32	32	27	8.25
8	20	20	32	32	26	8.33
8	25	20	31	31	24	8.42
8	30	20	31	31	23	8.50
8	35	20	30	30	22	8.58
8	40	20	29	29	21	8.67
8	45	20	29	29	21	8.75
8	50	20	28	28	20	8.83
8	55	20	28	28	19	8.92
9	0	20	27	27	18	9.00
Peak	(cfs)	29	176	108	225	
Peak	(hrs)	2	1	2	2	
Peak	(min)	5	20	15	45	
Peak	(cfs_or_ac.ft.)	0	0	38	0	
Case	(()S,I,D,O)	(_)	(_)	(S)	(_)	
Area	(ac)	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	0.10	0.35	0.27	0.31	
11-23-1999	15:55:41					
Summary	File:	P:\coweld01\future~1\TriTow~1\50_Year\udswmm\ttrd50yr.txt				

TRI-TOWN BASIN, FUTURE WITH REGIONAL DETENTION CONDITION

100-YEAR

Time(Hrs)	Time(Min)	Elem751	Elem152	Elem252	Elem52	Elem352	Elem153	Elem253	Elem53	Elem353	Elem753	Elem154	Elem254	Elem175	Elem754	Elem155	Elem255	Elem156
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	20	1	0	2	0	0	0	1	0	0	0	0	0	0	0	0	4	2
0	25	4	1	8	0	0	0	5	0	0	1	0	2	0	1	1	16	11
0	30	14	4	23	0	0	2	15	0	0	4	0	7	1	7	6	52	36
0	35	41	16	55	0	1	10	39	0	1	14	2	25	7	28	25	120	85
0	40	98	45	113	0	4	31	83	0	3	41	9	71	31	77	70	223	158
0	45	191	96	190	1	12	75	152	1	7	101	29	150	83	165	150	349	255
0	50	270	125	336	4	25	114	254	3	17	201	72	243	129	290	263	488	369
0	55	401	177	476	10	44	171	403	9	35	337	144	377	215	446	399	630	492
1	0	580	252	588	23	71	259	534	21	61	503	253	547	344	618	543	751	599
1	5	750	340	678	44	110	367	647	42	98	695	401	740	503	782	674	839	677
1	10	906	434	754	76	160	483	747	75	147	905	581	935	672	930	784	922	753
1	15	1041	525	805	103	220	597	838	121	206	1108	766	1113	832	1047	874	975	804
1	20	1152	607	840	133	289	706	921	180	274	1254	903	1256	962	1117	936	996	825
1	25	1237	678	869	175	364	807	995	249	346	1390	1039	1354	1055	1157	968	991	823
1	30	1298	737	896	227	441	897	1060	324	422	1501	1158	1411	1114	1170	974	967	805
1	35	1340	788	920	286	493	977	1118	403	499	1581	1251	1435	1143	1164	960	930	774
1	40	1366	830	935	340	502	1045	1158	472	537	1629	1316	1432	1148	1142	931	885	736
1	45	1377	862	937	385	511	1096	1167	515	548	1649	1353	1409	1136	1110	892	837	696
1	50	1376	884	931	421	521	1124	1155	539	560	1643	1367	1373	1112	1073	849	790	657
1	55	1363	897	920	450	531	1133	1134	555	571	1619	1361	1328	1080	1034	804	744	619
2	0	1343	902	906	474	541	1128	1109	568	581	1580	1341	1279	1045	995	760	700	582
2	5	1317	901	891	495	551	1114	1085	580	591	1531	1310	1228	1008	955	716	655	545
2	10	1287	895	875	512	560	1096	1060	590	601	1476	1272	1177	970	918	674	620	516
2	15	1254	887	859	528	569	1076	1036	600	610	1418	1229	1127	934	886	638	591	494
2	20	1220	876	843	541	577	1054	1014	608	618	1359	1185	1081	901	857	607	564	473
2	25	1186	864	828	553	585	1032	992	617	625	1302	1142	1039	872	832	579	540	455
2	30	1152	851	814	563	592	1010	971	624	632	1247	1099	1000	845	808	554	519	439
2	35	1119	838	802	573	599	990	951	631	638	1195	1059	964	821	787	531	500	425
2	40	1088	825	791	582	606	970	933	637	643	1146	1021	931	799	768	511	482	412
2	45	1059	814	788	590	612	951	916	643	648	1102	985	901	779	750	492	465	400
2	50	1035	806	787	597	617	933	899	648	653	1061	952	872	760	733	475	450	389
2	55	1013	800	785	604	622	916	884	652	657	1023	921	846	743	717	459	435	379
3	0	993	795	782	610	627	900	871	656	660	988	891	821	726	702	444	422	369
3	5	974	791	780	616	631	885	858	660	664	956	864	797	710	687	430	409	360
3	10	959	787	778	621	635	873	853	663	666	925	838	775	695	673	417	397	351
3	15	951	784	775	626	639	864	849	666	669	896	814	755	681	660	405	385	343
3	20	942	781	772	631	643	857	844	669	671	869	792	737	667	646	393	373	334
3	25	934	778	769	635	647	850	839	671	673	844	771	719	653	632	381	362	326
3	30	925	775	765	639	650	844	833	673	675	821	752	702	640	619	370	352	318
3	35	917	771	762	643	653	839	828	674	676	795	731	686	627	607	359	342	311
3	40	908	768	759	646	656	833	822	676	677	768	707	670	614	595	349	333	304
3	45	900	765	756	650	659	828	817	677	678	744	687	654	602	583	340	324	298
3	50	892	762	753	653	662	822	811	678	679	722	669	639	590	572	331	316	292
3	55	884	759	750	656	664	816	806	678	679	702	653	624	579	562	322	308	286
4	0	876	756	748	659	667	811	800	679	679	684	637	610	568	551	314	301	280
4	5	869	753	745	662	669	805	794	679	679	666	622	596	558	542	307	294	275
4	10	862	750	743	664	672	800	789	679	679	649	608	583	548	532	300	288	271
4	15	855	748	741	667	674	794	784	679	678	633	595	571	539	523	293	282	266
4	20	848	745	739	669	676	789	778	678	678	618	582	559	529	515	287	277	262
4	25	842	743	737	672	677	784	773	678	677	603	570	548	521	507	282	272	258
4	30	836	741	735	674	679	778	768	677	676	589	558	537	513	499	276	268	255
4	35	830	739	733	676	681	773	762	676	675	576	547	527	505	492	271	263	252
4	40	825	737	732	677	682	768	757	675	674	564	537	518	497	485	267	259	248
4	45	819	735	730	679	684	763	752	674	673	552	527	508	490	478	262	254	244
4	50	814	733	729	681	685	758	747	673	672	541	517	500	483	471	258	249	240
4	55	809	732	727	682	686	753	743	672	670	530	508	491	476	464	253	245	237
5	0	805	730	726	684	687	748	738	670	669	520	499	482	469	457	249	242	234
5	5	800	729	725	685	688	743	733	669	667	510	491	474	462	451	245	239	231
5	10	796	727	723	686	689	738	728	667	666	500	482	467	455	444	242	235	229
5	15	792	726	722	687	690	733	724	666	664	491	474	459	449	438	238	232	226
5	20	788	725	721	688	690	729	719	664	662	483	467	452	443	433	235	229	223
5	25	785	724	720	689	691	724	715	662	660	474	460	446	437	427	232	226	221
5	30	781	722	719	690	692	720	711	660	658	466	453	439	431	422	229	224	219
5	35	778	721	718	690	692	715	706	658	656	459	446	433	426	416	226	221	217
5	40	774	720	717	691	692	711	702	656	654	451	439	427	420	411	224	219	215
5	45	771	719	716	691	693	706	698	654	652	444	433	421	415	406	221	217	213
5	50	768	718	715	692	693	702	694	652	650	438	427	415	410	401	219	215	211
5	55	765	717	714	692	693	698	689	650	647	431	421	410	405	397	217	213	209
6	0	762	716	713	692	693	694	685	648	645	425	416	405	400	392	214	211	208
6	5	759	715	712	693	693	690	681	645	643	419	410	400	396	387	212	209	206
6	10	756	714	711	693	693	686	677	643	641	413	405	395	391	383	210	207	204
6	15	753	713	710	693	693	682	673	641	638	408	400	390	387	379	208	205	203
6	20	751	712	708	693	693	678	669	638	636	402	395	383	380	365	207	203	201
6	25	748	710	707	693	692	674	666	636	633	395	388	373	370	351	205	202	200
6	30	746	709	706	692	692	670	662	633	631	386	380	362	359	339	203	200	198
6	35	743	708	705	692	692	666	658	631	628	376	371	350	348	327	202	199	197
6	40	741	707	704	692	691	662	654	628	626	366	361	339	337	317	200	197	196
6	45	738	706	703	692	691	658	650	626	623	355	350	328	326	307	199	196	194
6	50	736	705	702	691	690	654	646	623	620	345	340	318	316	298	197	194	193
6	55	734	704	701	691	689	651	642	620	617	334	330	308	307	290	196	193	192
7	0	732	703	700	690	689	647	639	617	614	324	320	300	298	282	194	192	191
7	5	729	702	699	690	688	643	635	614	611	315	311	291	290	275	193	190	189
7	10	727	701	697	689	687	639	631	611	608	306	302	284	282	268	192	189	188
7	15	725	700	696	688	686	635	627	608	605	297	294	276	275	262	190	188	187
7	20	723	698	695	688	685	631	623	605	602	289	286	270	269	256	189	187	186
7	25	721	697	694	687	684	627	619	602	598	282	279	264	263	251	188	186	185
7	30	719	696	693	686	683	623	615	599	595	275	272	258	257	246	187	185	184
7	35	716	695	691	685	682	619	611	595	592	269	266	252	252	241	186	184	183
7	40	714	694	690	684	681	615	607	592	588	263	260	247	247	237	185	183	182
7	45	712	692	689	683	680	611	602	589	585	257	255	243	242	233	184	182	181
7	50	710	691	687	682	679	607	598	585	582	252	249	238	238	229	183	181	180
7	55	708	690	686	681	678	603	594	582	578	247	245	234	234	225	182	180	179
8	0	706	688	684	680	676	599	590	578	575	242	240	230	230	222	181	179	179
8	5	704	687	683	679	675	595	586	575	571	238	236	226	226	219	180	178	178
8	10	702	686	681	677	674	591	582	571	568	234	232	223	223	216	179	177	177
8	15	700	684	680	676	672	587	579	568	564	230	228	220	219	213	178	176	176
8	20	698	683	678	675	671	583	575	565	561	226	225	217	216	210	177	175	175
8	25	696	681	677	673	669	579	571	561	557	223	221	214	213	208	176	175	174
8	30	694	680	675	672	668	575	567	558	554	219	218	211	211	205	175	174	174
8	35	691	678	673	670	666	571	563	554	550	216	215	208	208	203	175	173	173
8	40	689	676	672	669	665	567	559	551	547	214	212	206	206	201	174	172	172
8	45	687	675	670	667	663	564	555	547	543	211	210	204	203	198	173	172	171
8	50	685	673	668	666	661	560	551	544	540	208	207	201	201	196	172	171	171
8	55	683	672	666	664	660	556	548	540	537	206	205	199	199	195	172	170	170
9	0	681	670	665	662	658	552	544	537	533	203	203	197	197	193	171	169	169
Peak	(cfs)	1377	902	937	693	693	1133	1167	679	679	1649	1367	1435	1148	1170	974	996	825
Peak	(hrs)	1	2	1	6	5	1	1	4	3	1	1	1	1	1	1	1	1
Peak	(min)	45	0	45	5	45	55	45	0	50	45	50	35	40	30	30	20	20
Peak	(cfs_or_ac.ft.)	0	4	0	5	102	5	0	5	150	0	7	0	5	0	5	0	7
Case	((),S,I,D,O)	( )	( )	( )	( )	(S)	( )	( )	( )	(S)	( )	( )	( )	( )	( )	( )	( )	( )
Area	(ac)	6691.8	6131.8	6131.8	5521.3	5521.3	5521.3	5521.3	4765.4	4765.4	4765.4	4441.0	4441.0	4094.1	4094.1	3371.5	3371.5	3197.4
Peak/Area	(cfs/ac)	0.21	0.15	0.15	0.13	0.13	0.21	0.21	0.14	0.14	0.35	0.31	0.32	0.28	0.29	0.29	0.30	0.26

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Summary File: P:\coweld01\future~1\TriTow~1\100_Year\fredst~2\ttrd100y.txt

TRI-TOWN BASIN, FUTURE WITH REGIONAL DETENTION CONDITION

100-YEAR Time(Hrs)	Time(Min)	Elem755	Elem256	Elem157	Elem257	Elem158	Elem258	Elem159	Elem259	Elem59	Elem760	Elem161	Elem761	Elem361	Elem261	Elem162	Elem262	Elem163
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
0	20	6	5	0	1	0	2	0	0	0	0	0	0	0	2	1	17	0
0	25	19	18	0	4	2	8	0	2	0	0	0	0	0	9	6	56	0
0	30	51	50	3	15	9	26	1	8	0	0	0	1	1	35	28	155	0
0	35	103	99	15	45	30	60	7	28	0	0	0	2	2	91	73	343	1
0	40	181	172	48	103	78	130	29	73	0	1	1	4	4	166	132	592	3
0	45	280	262	114	193	159	218	81	150	0	3	3	8	8	281	227	808	6
0	50	395	367	213	300	258	317	165	243	1	7	7	14	14	422	347	919	10
0	55	517	479	328	412	364	419	260	328	3	13	13	22	22	561	465	928	14
1	0	632	586	444	516	462	506	342	389	8	23	23	33	33	676	560	876	18
1	5	728	675	542	594	536	564	398	425	17	34	34	45	45	758	622	802	22
1	10	793	734	611	642	581	595	430	443	28	48	48	58	58	808	654	723	25
1	15	824	760	649	664	601	605	444	449	42	62	62	72	72	830	661	644	27
1	20	829	761	664	667	603	601	447	446	56	74	74	81	81	830	648	566	29
1	25	816	745	662	657	593	585	441	434	68	80	80	82	82	812	621	489	30
1	30	790	716	647	635	572	560	426	414	76	82	82	83	83	783	583	419	31
1	35	753	677	622	605	544	529	404	388	80	84	84	84	84	745	541	359	32
1	40	712	635	591	570	511	495	378	360	83	85	85	86	86	704	496	310	33
1	45	673	595	557	535	477	461	351	333	84	86	86	87	87	663	452	272	33
1	50	635	556	522	501	445	430	325	308	86	87	87	88	88	623	412	243	33
1	55	599	519	490	470	415	401	302	286	87	88	88	89	89	587	375	221	34
2	0	567	487	460	441	389	376	280	266	88	89	89	90	90	555	343	205	34
2	5	538	457	433	416	365	354	262	250	89	90	90	90	90	526	315	193	34
2	10	512	431	409	394	345	335	246	236	90	91	91	91	91	501	291	183	34
2	15	490	409	388	375	328	319	233	224	91	91	91	92	92	478	270	174	34
2	20	470	389	370	358	312	305	221	213	91	92	92	93	93	458	251	165	34
2	25	452	371	353	343	299	292	211	204	92	93	93	93	93	440	235	158	34
2	30	436	356	339	329	287	281	203	197	93	93	93	94	94	424	221	151	34
2	35	422	342	326	318	277	271	195	190	93	94	94	94	94	409	208	146	34
2	40	410	329	315	307	268	263	189	184	94	95	95	95	95	395	197	140	34
2	45	398	318	304	297	259	255	183	179	95	95	95	96	96	383	186	134	34
2	50	387	307	295	288	252	248	178	174	95	96	96	96	96	371	177	129	34
2	55	377	297	286	280	245	241	174	170	96	96	96	97	97	360	168	123	34
3	0	367	288	278	272	238	234	169	166	96	97	97	97	97	350	161	118	34
3	5	358	280	270	264	232	228	165	162	97	97	97	97	97	340	153	113	34
3	10	350	271	263	257	226	223	162	159	97	98	98	98	98	331	146	109	34
3	15	341	263	255	250	220	217	158	155	98	98	98	98	98	322	140	103	33
3	20	332	255	248	243	215	211	155	152	98	98	98	99	99	313	134	98	33
3	25	324	247	242	237	209	206	151	149	98	99	99	99	99	305	128	93	33
3	30	317	241	235	230	204	201	148	145	99	99	99	99	99	296	122	87	33
3	35	310	234	229	224	199	196	145	142	99	100	100	100	100	288	116	83	33
3	40	303	228	223	219	195	192	142	139	100	100	100	100	100	280	111	79	33
3	45	296	222	218	213	190	188	139	137	100	100	100	100	100	272	106	76	33
3	50	290	217	212	208	186	184	136	134	100	101	101	101	101	265	101	73	32
3	55	285	212	207	203	182	180	134	132	101	101	101	101	101	258	97	71	32
4	0	279	207	203	199	179	177	132	130	101	101	101	101	101	252	93	69	32
4	5	274	203	198	195	175	174	130	128	101	101	101	102	102	246	89	68	32
4	10	269	199	194	191	173	171	128	127	101	102	102	102	102	240	86	67	32
4	15	265	195	191	188	170	168	127	126	102	102	102	102	102	235	83	66	32
4	20	261	191	187	185	168	166	126	124	102	102	102	102	102	230	81	65	31
4	25	257	188	184	182	165	164	124	123	102	102	102	103	103	225	78	64	31
4	30	254	186	182	180	164	163	123	122	102	103	103	103	103	221	76	63	31
4	35	251	183	179	177	162	160	122	121	103	103	103	103	103	216	74	62	31
4	40	247	180	176	173	159	156	121	121	103	103	103	103	103	212	72	61	31
4	45	243	176	173	170	156	154	120	120	103	103	103	103	103	209	71	60	31
4	50	239	173	169	167	154	152	120	119	103	103	103	104	104	205	69	60	30
4	55	236	171	167	165	152	151	119	118	103	104	104	104	104	201	68	59	30
5	0	233	168	165	163	151	149	118	118	104	104	104	104	104	198	66	58	30
5	5	231	166	162	161	149	148	118	117	104	104	104	104	104	195	65	57	30
5	10	228	164	160	158	147	146	117	117	104	104	104	104	104	191	64	57	30
5	15	225	162	158	157	146	145	117	116	104	104	104	104	104	188	63	56	30
5	20	223	160	156	155	145	144	116	116	104	104	104	105	105	185	62	56	29
5	25	221	158	155	153	143	143	116	115	104	105	105	105	105	182	61	55	29
5	30	218	157	153	152	142	141	115	115	105	105	105	105	105	180	60	54	29
5	35	216	155	152	150	141	140	115	115	105	105	105	105	105	177	59	54	29
5	40	214	154	150	149	140	139	115	114	105	105	105	105	105	174	58	53	29
5	45	213	152	149	148	139	139	114	114	105	105	105	105	105	172	57	53	29
5	50	211	151	147	146	138	138	114	114	105	105	105	105	105	169	56	52	29
5	55	209	150	146	145	137	137	114	113	105	105	105	105	105	166	55	52	28
6	0	207	148	145	144	136	136	113	113	105	106	106	106	106	164	55	51	28
6	5	206	147	144	143	136	135	113	113	106	106	106	106	106	162	54	51	28
6	10	204	146	143	142	135	134	113	113	106	106	106	106	106	159	53	50	28
6	15	202	145	142	141	134	134	113	112	106	106	106	106	106	157	52	50	28
6	20	201	144	141	140	133	133	112	112	106	106	106	106	106	154	52	49	28
6	25	199	143	140	139	133	132	112	112	106	106	106	106	106	152	51	49	28
6	30	198	142	139	138	132	132	112	112	106	106	106	106	106	150	50	48	27
6	35	197	141	138	137	131	131	112	112	106	106	106	106	106	148	49	48	27
6	40	195	140	137	136	131	130	112	111	106	106	106	106	106	146	49	47	27
6	45	194	139	136	135	130	130	111	111	106	106	106	106	106	144	48	47	27
6	50	193	139	135	135	130	129	111	111	106	106	106	106	106	142	48	46	27
6	55	192	138	135	134	129	129	111	111	106	106	106	107	107	140	47	46	27
7	0	190	137	134	133	129	128	111	111	106	107	107	107	107	138	47	45	27
7	5	189	136	133	133	128	128	111	111	107	107	107	107	107	136	46	45	26
7	10	188	136	133	132	128	127	111	111	107	107	107	107	107	134	46	45	26
7	15	187	135	132	131	127	127	111	111	107	107	107	107	107	133	46	44	26
7	20	186	134	131	131	127	127	111	110	107	107	107	107	107	131	45	44	26
7	25	185	134	131	130	126	126	110	110	107	107	107	107	107	129	45	43	26
7	30	184	133	130	130	126	126	110	110	107	107	107	107	107	128	44	43	26
7	35	183	133	129	129	126	125	110	110	107	107	107	107	107	126	44	43	26
7	40	182	132	129	128	125	125	110	110	107	107	107	107	107	124	43	42	25
7	45	181	132	128	128	125	125	110	110	107	107	107	107	107	123	43	42	25
7	50	180	131	128	127	124	124	110	110	107	107	107	107	107	121	43	41	25
7	55	179	131	127	127	124	124	110	110	107	107	107	107	107	120	42	41	25
8	0	178	130	127	127	124	124	110	110	107	107	107	107	107	118	42	41	25
8	5	177	130	127	126	123	123	110	110	107	107	107	107	107	117	42	40	25
8	10	177	129	126	126	123	123	110	110	107	107	107	107	107	115	41	40	25
8	15	176	129	126	125	123	123	110	110	107	107	107	107	107	114	41	40	25
8	20	175	128	125	125	122	122	110	110	107	107	107	107	107	112	40	39	24
8	25	174	128	125	124	122	122	110	109	107	107	107	107	107	111	40	39	24
8	30	173	127	124	124	122	122	109	109	107	107	107	107	107	110	40	39	24
8	35	173	127	124	124	122	121	109	109	107	107	107	107	107	108	39	38	24
8	40	172	127	124	123	121	121	109	109	107	107	107	107	107	107	39	38	24
8	45	171	126	123	123	121	121	109	109	107	107	107	107	107	106	39	38	24
8	50	171	126	123	123	121	121	109	109	107	107	107	107	107	104	38	37	24
8	55	170	126	123	122	121	120	109	109	107	107	107	107	107	103	38	37	24
9	0	169	125	122	122	120	120	109	109	107	107	107	107	107	102	38	37	23
Peak	(cfs)	829	761	664	667	603	605	447	449	107	107	107	107	107	830	661	928	34
Peak	(hrs)	1	1	1	1	1	1	1	1	7	7	7	6	6	1	1	0	1
Peak	(min)	20	20	20	20	20	15	20	15	5	0	0	55	55	15	15	55	55
Peak	(cfs_or_ac.ft.)	0	0	5	0	5	0	4	0	2	0	2	0	131	0	3	0	0
Case	(()S,I,D,O)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	(S)	( )	( )	( )	( )
Area	(ac)	3197.4	2553.6	2439.7	2439.7	2348.8	2348.8	2090.2	2090.2	1726.7	1726.7	1726.7	1726.7	1726.7	1726.7	823.7	823.7	288.0
Peak/Area	(cfs/ac)	0.26	0.30	0.27	0.27	0.26	0.26	0.21	0.21	0.06	0.06	0.06	0.06	0.06	0.48	0.80	1.13	0.12
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Summary	File:																	

TRI-TOWN BASIN, FUTURE WITH REGIONAL DETENTION CONDITION

100-YEAR

Time(Hrs)	Time(Min)	Elem263	Elem271	Elem372	Elem275	TotalTime(Hrs)
0	5	0	0	0	0	0.08
0	10	0	0	0	0	0.17
0	15	0	0	0	0	0.25
0	20	0	1	0	0	0.33
0	25	1	3	0	0	0.42
0	30	2	11	1	1	0.50
0	35	5	27	4	3	0.58
0	40	10	65	9	7	0.67
0	45	14	108	17	15	0.75
0	50	18	145	29	27	0.83
0	55	22	174	42	47	0.92
1	0	24	195	55	75	1.00
1	5	27	211	68	109	1.08
1	10	29	222	79	146	1.17
1	15	30	228	90	173	1.25
1	20	31	228	99	180	1.33
1	25	32	226	107	188	1.42
1	30	33	221	113	196	1.50
1	35	33	214	118	204	1.58
1	40	33	207	122	211	1.67
1	45	34	199	125	218	1.75
1	50	34	191	127	224	1.83
1	55	34	184	128	230	1.92
2	0	34	177	129	235	2.00
2	5	34	170	130	240	2.08
2	10	34	164	130	244	2.17
2	15	34	159	130	248	2.25
2	20	34	157	130	251	2.33
2	25	34	154	130	253	2.42
2	30	34	152	129	255	2.50
2	35	34	149	128	256	2.58
2	40	34	147	127	257	2.67
2	45	34	144	126	258	2.75
2	50	34	142	125	258	2.83
2	55	34	139	124	258	2.92
3	0	34	137	123	258	3.00
3	5	33	134	121	257	3.08
3	10	33	132	120	256	3.17
3	15	33	129	118	255	3.25
3	20	33	127	117	253	3.33
3	25	33	124	115	252	3.42
3	30	33	121	113	250	3.50
3	35	33	119	112	248	3.58
3	40	32	116	110	246	3.67
3	45	32	114	108	244	3.75
3	50	32	112	106	242	3.83
3	55	32	109	105	239	3.92
4	0	32	107	103	237	4.00
4	5	32	105	101	235	4.08
4	10	31	103	99	233	4.17
4	15	31	101	97	230	4.25
4	20	31	99	96	228	4.33
4	25	31	97	94	225	4.42
4	30	31	95	92	223	4.50
4	35	31	93	90	221	4.58
4	40	30	91	89	218	4.67
4	45	30	89	87	216	4.75
4	50	30	87	85	213	4.83
4	55	30	85	84	211	4.92
5	0	30	84	82	208	5.00
5	5	30	82	81	206	5.08
5	10	30	80	79	203	5.17
5	15	29	79	78	200	5.25
5	20	29	77	76	198	5.33
5	25	29	76	75	195	5.42
5	30	29	74	73	193	5.50
5	35	29	73	72	190	5.58
5	40	29	71	71	188	5.67
5	45	28	70	69	185	5.75
5	50	28	68	68	183	5.83
5	55	28	67	67	180	5.92
6	0	28	66	65	178	6.00
6	5	28	64	64	175	6.08
6	10	28	63	63	173	6.17
6	15	28	62	62	170	6.25
6	20	27	61	60	158	6.33
6	25	27	59	59	146	6.42
6	30	27	58	58	136	6.50
6	35	27	57	57	126	6.58
6	40	27	56	56	117	6.67
6	45	27	55	55	109	6.75
6	50	27	54	54	101	6.83
6	55	26	53	53	94	6.92
7	0	26	52	52	88	7.00
7	5	26	51	51	82	7.08
7	10	26	50	50	77	7.17
7	15	26	49	49	72	7.25
7	20	26	48	48	67	7.33
7	25	26	47	47	63	7.42
7	30	26	46	46	59	7.50
7	35	25	45	45	55	7.58
7	40	25	44	44	52	7.67
7	45	25	43	43	49	7.75
7	50	25	43	43	46	7.83
7	55	25	42	42	44	7.92
8	0	25	41	41	41	8.00
8	5	25	40	40	39	8.08
8	10	24	39	39	37	8.17
8	15	24	39	39	35	8.25
8	20	24	38	38	33	8.33
8	25	24	37	37	31	8.42
8	30	24	36	36	30	8.50
8	35	24	36	36	28	8.58
8	40	24	35	35	27	8.67
8	45	24	34	34	25	8.75
8	50	24	34	34	24	8.83
8	55	23	33	33	23	8.92
9	0	23	32	32	22	9.00
Peak	(cfs)	34	228	130	258	
Peak	(hrs)	1	1	2	2	
Peak	(min)	45	15	5	45	
Peak	(cfs_or_ac.ft.)	0	0	46	0	
Case	((),S,I,D,O)	()	()	(S)	()	
Area	(ac)	288.0	507.5	393.0	722.6	
Peak/Area	(cfs/ac)	0.12	0.45	0.33	0.36	

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IV

COST ESTIMATES

DETENTION POND COST ESTIMATES

COSTS:
Earthwork = 5 $/cy
Property Acquisition:
Residential Unimproved = 10000 $/ac
Residential Structures = 80000 $/unit

Reach Number and Pond Description		Earthwork Cut cy	Earthwork Fill cy	Jurisdictional V in ac ft A in ac	Outlet Structure	Property Acquisition Unimproved ac	Structures units	Construction Costs Earthwork	Construction Costs Spillway or Canal Repl. ea.	Construction Costs Outlet Structure ea.	Cost	35% Contigency	Total	20% Engineering	Property Acquistion	Total Project Costs
GODDING HOLLOW BASIN																
TRI-TOWN BASIN																
5	Frederick	170000	0	V=136, A=32	Pipe	35	0	$850,000	$100,000	$6,400	$956,400	$334,740	$1,291,140	$258,228	$350,000	$1,899,368
3	Basin 75 (WWTP)	18600	17000	No	RCB	9	0	$178,000	$0	$17,800	$195,800	$68,530	$264,330	$52,866	$90,000	$407,196
2	Basin 53 (Ski Lakes)	46000	8900	V=150, A=25	RCB	28	0	$274,500	$100,000	$26,000	$400,500	$140,175	$540,675	$108,135	$280,000	$928,810
2	Basin 52 (Dairy)	0	9700	V=110, A=35	RCB	38	0	$48,500	$100,000	$38,000	$186,500	$65,275	$251,775	$50,355	$380,000	$682,130
6	Basin 72 N. @ WCR 24	0	0	H>10'	Pipe	10	0	$0	$0	$0	$0	$0	$0	$0	$100,000	$100,000
6	Basin 72 S. @ R.R. Embk	0	0	No	Pipe	12	0	$0	$0	$0	$0	$0	$0	$0	$120,000	$120,000
							TOTALS	$1,351,000	$300,000	$88,200	$1,739,200	$608,720	$2,347,920	$469,584	$1,320,000	$4,137,504

BRIDGE IMPROV... COST ESTIMATES

Assumptions:

1. Future channel invert and slope are same as in existing condition, unless channel and/or road improvements are specified
2. Under design conditions, structures are not under pressure flow

ROAD/BRIDGE CONSTANTS:

Deck & Pavement Thickness = 2 ft

COSTS:

Bridges = 80 $/sq.ft.
Road Demolition and Repair = 30 $/sq.yd.
Road Base Fill = 8 $/cy

	Reach Number and Road Crossing	Existing			Required				Existing	Height	Span	Road	Change	Road	Road	Construction Costs								Total
		Channel Invert ft, msl	Top Road ft, msl	Channel Slope ft/ft	Top Road ft, msl	Road Length ft	Low Chord ft, msl	100-Yr Regional Q cfs	Capacity cfs	Opening ft	Length ft	Width ft	Elevation ft	Fill cy	Surfacing sqyd	Bridges	Road Fill	Road Surfacing	Cost	35% Contigency	Total	20% Engineering	Property Acquistion	Project Costs
	TRI-TOWN DRAINAGEWAY																							
5	SHW52/Forest St.	0.0	0.0	0.0000	0.0	0	-2.0	640	n/a	4.0	**20**	75	0	0	0	$120,000	$0	$0	$120,000	$42,000	$162,000	$32,400	$0	$194,400
5	SHW52/Cherry St.	0.0	0.0	0.0000	0.0	0	-2.0	100	n/a	4.0	**4**	150	0	0	0	$48,000	$0	$0	$48,000	$16,800	$64,800	$12,960	$0	$77,760
5	SHW52/Birch St.	0.0	0.0	0.0000	0.0	0	-2.0	300	n/a	4.0	**8**	150	0	0	0	$96,000	$0	$0	$96,000	$33,600	$129,600	$25,920	$0	$155,520
	MAIN STR.	986.4	995	0.0094	995.0	0	993.0	150	524	6.6	**0**	75	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	WCR16	977.4	987.6	0.0083	987.6	0	985.6	150	710	8.2	**0**	75	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	WCR13	4940.7	4949.3	0.005	4949.3	0	4947.3	800	1500	6.6	**0**	75	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	WCR18	4939.4	4946.5	0.003	4947.0	0	4945.0	1000	750	5.6	**30**	75	0.5	0	0	$180,000	$0	$0	$180,000	$63,000	$243,000	$48,600	$0	$291,600
3	WCR20	4905	4909.3	0.003	4912.0	720	4910.0	1400	36	5.0	**50**	75	2.7	5400	6000	$300,000	$43,200	$180,000	$523,200	$183,120	$706,320	$141,264	$0	$847,584
2	WCR22	4871.5	4876.2	0.0045	4880.0	500	4878.0	1300	84	6.5	**30**	75	3.8	5278	4167	$180,000	$42,222	$125,000	$347,222	$121,528	$468,750	$93,750	$0	$562,500
1	WCR24	4841	4847	0.0028	4847.0	0	4845.0	1000	61	4.0	**50**	75	0	0	0	$300,000	$0	$0	$300,000	$105,000	$405,000	$81,000	$0	$486,000
															Totals	$1,224,000	$85,422	$305,000	$1,614,422	$565,048	$2,179,470	$435,894	$0	$2,615,364

CHANNEL IMPROVEMENT COST ESTIMATES

COSTS:

Riprap =	85 $/cy	D50 =	1 ft
Earthwork =	5 $/cy	Manning's n =	0.035
Property Acquisition:		Channel Side Slopes =	4 H:1V
Residential Unimproved =	10000 $/ac	Access Road Width =	10 ft

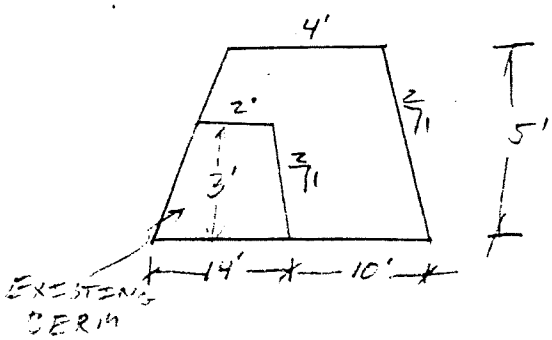
Reach	Descrip.	Station	Length ft	Existing Ground ft, msl	Proposed Channel Invert ft, msl	Channel Slope ft/ft	100-Yr Discharge cfs	Depth Cut ft	Ave. Ch. Depth Cut ft	Bottom Width Cut ft	Top Width Cut ft	Area Of Cut ft^2	Earthwork Cut cy	Riprap cy	R.O.W. ac	Construction Costs: Earthwork Cut	Construction Costs: Riprap	Construction Costs: Cost	35% Contigency	Total	20% Engineering	Property Acquistion	Total Project Costs	Total Reach Costs
TRI-TOWN DRAINAGEWAY																								
		100		**4833**	**4828**			5																
T1	Transition		100			0.0030	1400		5	**60**	100	400	1481	741	0.3	$7,407	$62,963	$70,370	$24,630	$95,000	$19,000	$2,525	$116,525	
		200		**4833.3**	**4828.3**			5																
T1	Channel		4300			0.0028	1400		5.8	**54**	100.4	448	71310	0	10.9	$356,550	$0	$356,550	$124,792	$481,342	$96,268	$108,981	$686,591	
		4500		**4846.8**	**4840.2**			6.6																
T1	Transition		100		0.3	0.0030	1000		6.6	**52**	104.8	517	1916	0	0.3	$9,582	$0	$9,582	$3,354	$12,936	$2,587	$2,635	$18,159	
		4600		**4847.1**	**4840.5**			6.6																
T1	Channel		75			0.0027	1000		6.6	**50**	102.8	504	1401	0	0.2	$7,003	$0	$7,003	$2,451	$9,455	$1,891	$1,942	$13,288	
		4675		**4847.3**	**4840.7**			6.6																
T1	Transition		25		0.1	0.0040	1000		6.6	**70**	122.8	636	589	0	0.1	$2,946	$0	$2,946	$1,031	$3,976	$795	$762	$5,534	
		4700		**4847.4**	**4840.8**			6.6																
T1	Drop		50		2.7		1000		5.45	**92**	135.6	620	1149	940	0.2	$5,743	$79,900	$85,643	$29,975	$115,618	$23,124	$1,671	$140,412	
		4750		**4847.8**	**4843.5**			4.3																
T1	Channel		3050			0.0053	1000		4.25	**92**	126	463	52330	0	9.5	$261,650	$0	$261,650	$91,578	$353,228	$70,646	$95,225	$519,099	
		7800		**4864**	**4859.8**			4.2																
T1	Transition		100			0.0020	1000		6.1	**55**	103.8	484	1794	769	0.3	$8,969	$65,356	$74,325	$26,014	$100,338	$20,068	$2,612	$123,019	
		7900		**4868**	**4860**			8																
	Sub-Totals =		7800										131970	2450	21.6	$659,851	$208,219	$868,069	$303,824	$1,171,893	$234,379	$216,354		$1,622,626
T2	NONE																							
		20500		**0**	**0**			0																
T3	Transition		75			0.0000	1000		3	**50**	74	186	517	411	0.1	$2,583	$34,944	$37,528	$13,135	$50,663	$10,133	$1,446	$62,241	
		20575		**0**	**0**			0																
T3	Channel		2850			0.0000	1000		4	**34**	66	200	21111	0	5.0	$105,556	$0	$105,556	$36,944	$142,500	$28,500	$49,725	$220,725	
		23425		**0**	**0**			0																
			2925										21628	411	5	$108,139	$34,944	$143,083	$50,079	$193,163	$38,633	$51,171		$282,966
		23425		**0**	**0**			0																
T4	Transition		0			ERR	1000		3	**50**	74	186	0	0	0.0	$0	$0	$0	$0	$0	$0	$0	$0	
		23425		**0**	**0**			0																
T4	Channel		6875			0.0000	1000		4	**34**	66	200	50926	0	12.0	$254,630	$0	$254,630	$89,120	$343,750	$68,750	$119,949	$532,449	
		30300		**0**	**0**			0																
			6875										50926	0	12	$254,630	$0	$254,630	$89,120	$343,750	$68,750	$119,949		$532,449
		31900		**4997.5**	**4994.5**			3																
T5	Transition		50			0.0020	1000		3	**92**	116	312	578	430	0.1	$2,889	$36,519	$39,407	$13,793	$53,200	$10,640	$1,446	$65,286	
		31950		**4997.6**	**4994.6**			3																
T5	Channel		150			0.0027	1000		3.5	**92**	120	371	2061	0	0.4	$10,306	$0	$10,306	$3,607	$13,913	$2,783	$4,477	$21,172	
		32100		**4999**	**4995**			4																
T5	Drop		20		2		1000		3	**92**	116	312	231	172	0.1	$1,156	$14,607	$15,763	$5,517	$21,280	$4,256	$579	$26,115	
		32120		**4999**	**4997**			2																
T5	Channel		980			0.0061	1000		2.5	**92**	112	255	9256	0	2.7	$46,278	$0	$46,278	$16,197	$62,475	$12,495	$27,447	$102,417	
		33100		**5006**	**5003**			3																
T5	Drop		20		3		1000		1.5	**92**	104	147	109	154	0.1	$544	$13,096	$13,641	$4,774	$18,415	$3,683	$523	$22,621	
		33120		**5006**	**5006**			0																
T5	Channel		380			0.0079	1000		2.5	**92**	112	255	3589	0	1.1	$17,944	$0	$17,944	$6,281	$24,225	$4,845	$10,643	$39,713	
		33500		**5014**	**5009**			5																
T5	Channel		1250			0.0056	640		6.5	**41**	93	436	20162	0	3.0	$100,810	$0	$100,810	$35,284	$136,094	$27,219	$29,557	$192,869	
		34750		**5024**	**5016**			8																
T5	Transition		0			ERR	640		5.5	**41**	85	347	0	0	0.0	$0	$0	$0	$0	$0	$0	$0	$0	
		34750		**5014**	**5011**			3																
	Sub-Totals =		2850										35985	756	7.5	$179,927	$64,222	$244,149	$85,452	$329,601	$65,920	$74,672		$470,193
T6	NONE																							

ANDERSON CONSULTING ENGINEERS, INC
Civil • Water Resources • Environmental

Project Number	Page	Of
COWELD01	1	1

Owner-Project	By	Date
	BAA/CJP	06/23/99

	Checked By	Date
TT - FREDERICK H.S. BERM IMPROVEMENTS		



$$\left(\frac{2+14}{2}\right) \times 3 = 24\ sf$$

$$\left(\frac{4+24}{2}\right) \times 5 = 70\ sf$$

$70 - 24 = 46^{\square} \times 3300' = \frac{151800\ cf}{27\ cf/cy} = 5622 \times \$5/cy = \$28,[illegible]$

35% CONTIG. = $9,8[illegible]

$37,950

20% ENGR. $ 7,5[illegible]

$25' \times 3300 = 82,500/43560 = 1.89 \times \$10,000/ac$ = Property = $18,939

PROJ. TOTAL = $64,479

V

REFERENCES

REFERENCES

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VI

PROJECT COMPUTER FILES

Weld County I-25 MDP

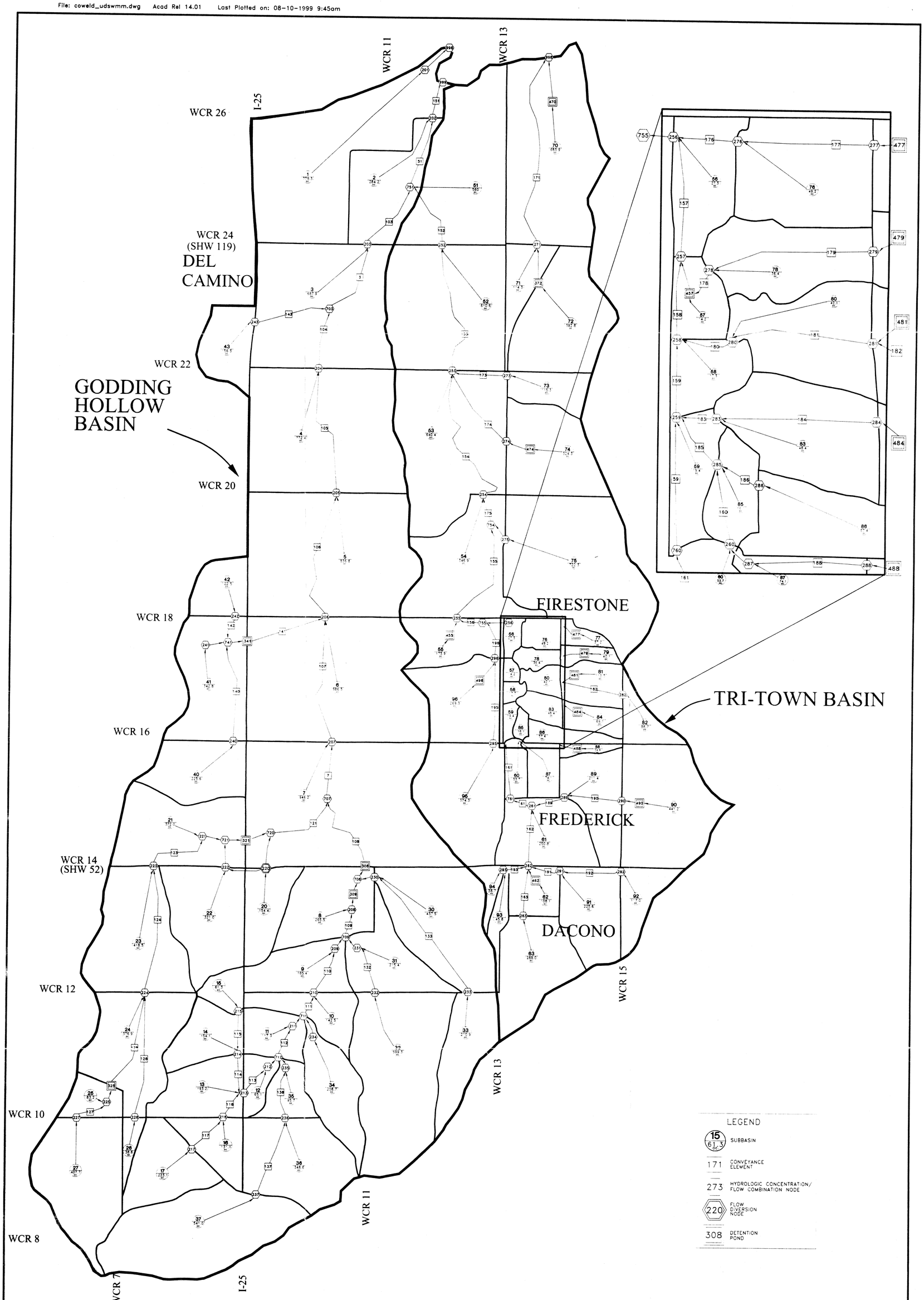
Abbreviations

1) TT – Tri-Town
2) XC - Existing conditions
3) FC - Future conditions
4) OD – on-site detention
5) RD – regional detention

File naming convention

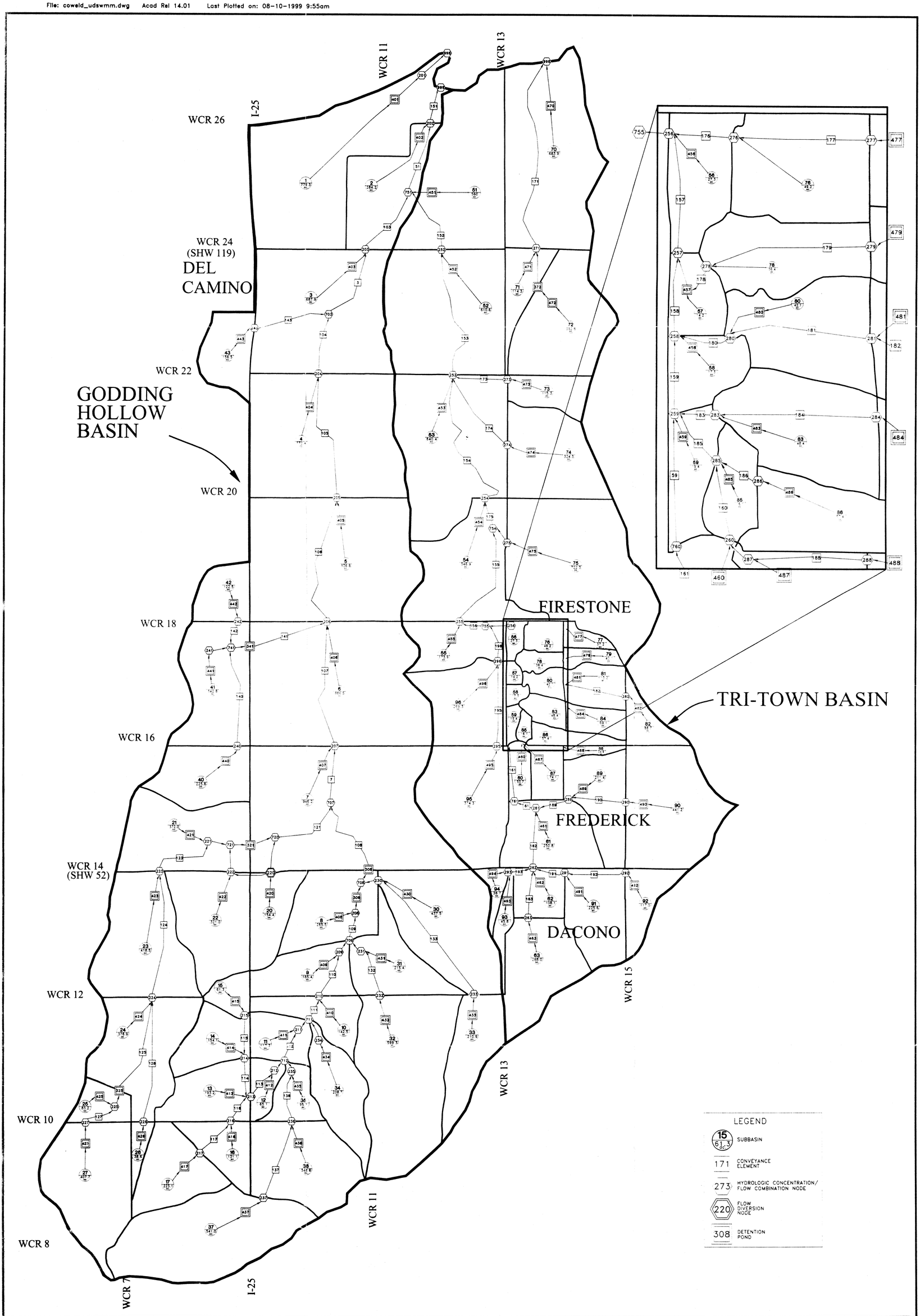
1) *.CHI – CUHP input file
2) *.CHO – CUHP output file
3) *.INP – sub-basin inflow hydrographs
4) *.SWI – UDSWMM input file
5) *.SWO – UDSWMM output file

File: coweld_udswmm.dwg Acad Rel 14.01 Last Plotted on: 08-10-1999 9:45am



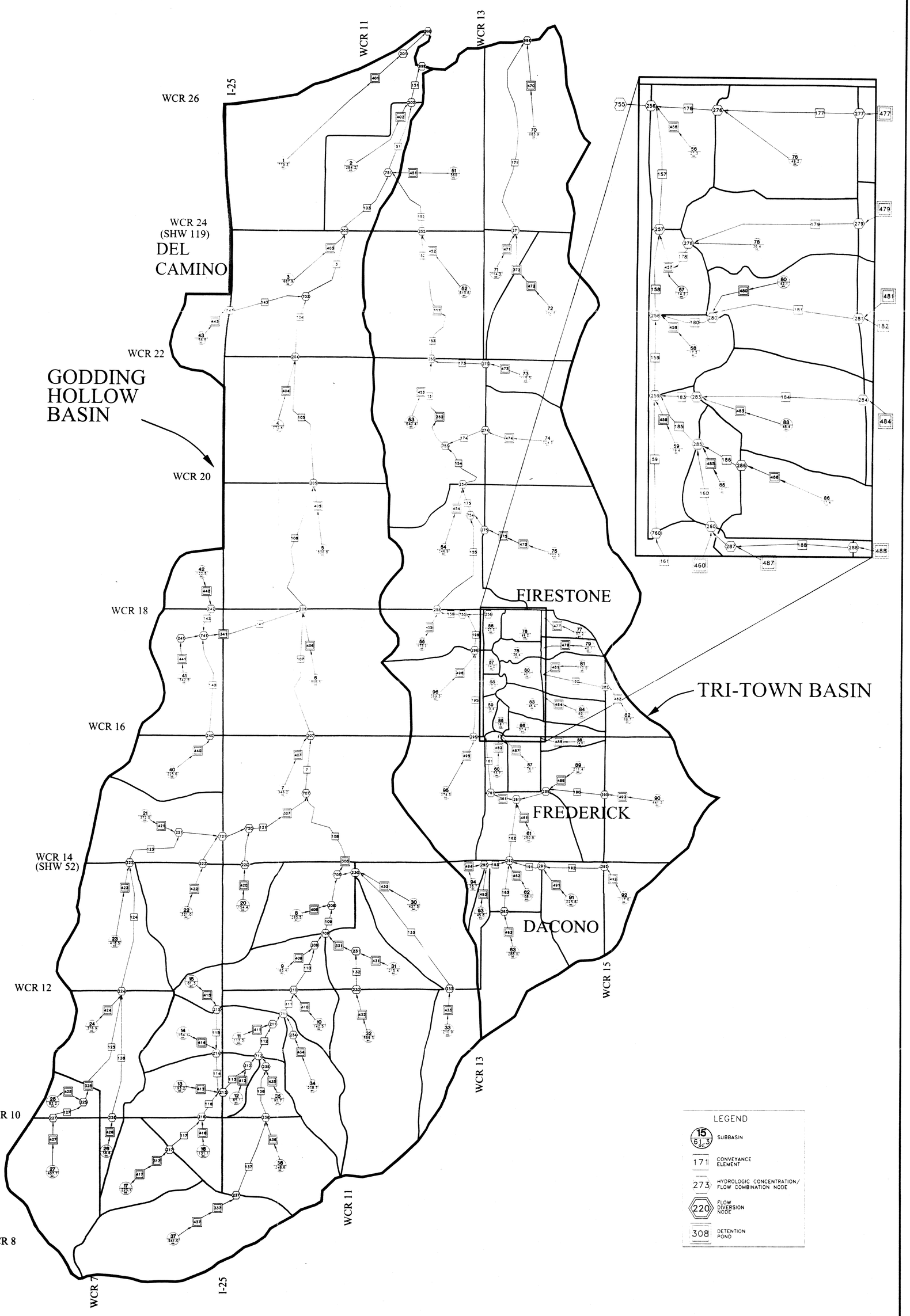
N NOT TO SCALE	PROJECT NUMBER: COWELDO1	DRAWN BY: MRC	Anderson Consulting Engineers, Inc Civil · Water Resources · Environmental 2900 S. College Avenue, Suite 3B, Fort Collins, CO 80525 Phone (970) 226-0120 · Fax (970) 226-0121	SOUTH WELD COUNTY I-25 CORRIDOR MASTER DRAINAGE PLAN	UDSWMM MODEL NETWORK SCHEMATIC EXISTING CONDITIONS	SHEET A1
	ACAD FILE: COWELD_UDSWMM	DESIGNED BY: BLV				
	DATE: 5/21/99 REVISED: 8/10/99	CHECKED BY: CJP				

File: coweld_udswmm.dwg Acad Rel 14.01 Last Plotted on: 08-10-1999 9:55am



NOT TO SCALE	PROJECT NUMBER: COWELD01	DRAWN BY: MRC	Anderson Consulting Engineers, Inc Civil · Water Resources · Environmental 2900 S. College Avenue, Suite 3B, Fort Collins, CO 80525 Phone (970) 226-0120 / Fax (970) 226-0121	SOUTH WELD COUNTY I-25 CORRIDOR MASTER DRAINAGE PLAN	UDSWMM MODEL NETWORK SCHEMATIC FUTURE CONDITIONS	SHEET A.2
	ACAD FILE: COWELD_UDSWMM	DESIGNED BY: BLV				
	DATE: 5/21/99 REVISED: 8/10/99	CHECKED BY: CJP				

File: coweld_udswmm.dwg Acad Rel 14.01 Last Plotted on: 08-10-1999 10:15am



NOT TO SCALE	PROJECT NUMBER: COWELD01 ACAD FILE: COWELD_UDSWMM DATE: 6/21/99 REVISED: 8/10/99	DRAWN BY: MRC DESIGNED BY: BLV CHECKED BY: CJP	Anderson Consulting Engineers, Inc Civil • Water Resources • Environmental 2900 S. College Avenue, Suite 3B, Fort Collins, CO 80525 Phone (970) 226-0120 / Fax (970) 226-0121	SOUTH WELD COUNTY I-25 CORRIDOR MASTER DRAINAGE PLAN	UDSWMM MODEL NETWORK SCHEMATIC FUTURE CONDITIONS WITH PROPOSED IMPROVEMENTS	SHEET A.3