Due to the high groundwater the surface acreage of the pond(s) may need to be larger- Please verify with borings

MASTER DEVELOPMENT DRAINAGE PLAN and PRELIMINARY DRAINAGE REPORT FOR Grandview Reserve Preliminary Plan

Prepared For:
4 Site Investments, LLC.
1271 Kelly Johnson Blvd., Suite 100
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January 23, 2019
Project No. 2931.26

Prepared By:
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El Paso County PCD File No. SP-19-004

ENGINEER'S STATEMENT:
The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by El Paso County for drainage reports and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors, or omissions on my part in preparing this report.

Mike Bramlett, Colorado P.E. # 32314 Date
For and On Behalf of JR Engineering, LLC

DEVELOPER'S STATEMENT:
I, the developer, have read and will comply with all of the requirements specified in this drainage report and plan.

Business Name: 4 Site Investments, LLC

By:

Title:
Address: 1271 Kelly Johnson Blvd., Suite 100
Colorado Springs, CO 80920

El Paso County:
Filed in accordance with the requirements of the El Paso County Land Development Code, Drainage Criteria Manual, Volumes 1 and 2 and Engineering Criteria Manual, as amended.

Jennifer Irvine, P.E. Date
County Engineer/ ECM Administrator

Conditions:

CONTENTS

PURPOSE

This document is the Master Development Drainage Plan (MDDP)/Preliminary Drainage Report (PDR) for the proposed Grandview Reserve Subdivision. The purpose of this report is to:

1. Identify on-site and off-site drainage patterns.
2. Recommend preliminary storm water facilities to collect and convey storm runoff from the proposed development to appropriate discharge and/or detention locations.
3. Recommend preliminary water quality and detention facilities to control discharge release rates to below historic values.
4. Demonstrate compliance with drainage basin planning studies, master plans and flood insurance studies.

The drainage improvements proposed in this report are preliminary in nature and future final drainage reports will be required as development and platting progresses.

GENERAL LOCATION AND DESCRIPTION

Location

Grandview Reserve is a 768 acre site located in the south half of section 21 and 22 and the north half of section 27 and 28, Township 12 South, and Range 66 West of the Sixth Principal Meridian in El Paso County, Colorado. Please reference the attached Vicinity Map presented in Appendix A.

Currently, there are four major drainageways that run through the site: Gieck Ranch Tributary 1 (GRT1), Gieck Ranch Tributary 2 (GRT2), East Fork Tributary 1(EFT1) and East Fork (EF) as shown in the Gieck Ranch DBPS. These drainageways were analyzed, both hydrologically and hydraulically, in the following reports:

- Geick Ranch Drainage Basin Planning Study (DBPS), Drexel Barrell, October 2010 (not approved)
- Haegler and Gieck Drainage Basins Letter of Map Revision, Four Way Ranch Subdivision, Kiowa, March 2004
- Unnamed Tributary Black Squirrel Creek Drainage Basin, Letter of Map Revision, Elbert Road Site, Kiowa Engineering, February 2006
- Unnamed Tributary Black Squirrel Creek, Four Way Ranch Letter of Map Revision, Kiowa Engineering, March 2004

The impact of these drainageways on the proposed development will be discussed later in the report.

Description of Property

The 768 acre site is bounded on the east by Highway 24, to the north by unplatted land, to the west by Eastonville Road and to the south by the proposed Waterbury residential development and unplatted land. A 184 lot rural (+2.5 acre lot) residential neighborhood is proposed on this parcel per the corresponding Preliminary Plan that this MDDP / Preliminary Drainage Report supports. The existing site is undeveloped and is comprised of relatively flat grasslands sloping generally southeast at approximately 1-10%.

Mention Falcon Regional Park and Meridian Ranch to west.

Per a NRCS web soil survey of the area, the site is made up of Type A and B soils. Columbine Gravelly sandy loam (A) soils cover approximately 56% of the site, Stapleton sandy loam (TypeB) cover approximately 41% of the site and Blakeland loamy sand (Type A) soils cover the remaining 3% of the site. Type A soils have a high infiltration rate when thoroughly wet. Type B soils have a moderate infiltration when thoroughly wet. A NRCS soil survey map has been presented in Appendix A.

show on drainage plans

There are no existing irrigation facilities on site. A Diamond Shamrock petroleum products pipeline traverses the western portion of the site and crosses Gieck Ranch Tributary 1, Gieck Ranch Tributary 2 and East Fork Tributary 1. Adequate protection for the line will be provided in any proposed culverts or channel improvements.

There are four major drainageways that traverse through the site: Gieck Ranch Tributary 1 (GRT1), Gieck Ranch Tributary 2 (GRT2), East Fork Tributary 1(EFT1) and East Fork (EF) as shown in the Gieck Ranch DBPS. All four of the drainageways are natural channels that follow the site topography with channel slopes ranging from less than 1.0% to 7.0%. Each channel can be described as meandering, irregular, and jagged. More in depth discussion of the existing drainageways is included in the subsequent text.

Floodplain Statement

Portions of this site are located within a Zone A floodplain as determined by the FEMA FIRM Map numbers 08041C0556G and 08041C0552G dated December, 2018. Zone A floodplains have not been studied and show approximate flood prone areas with no Base Flood Elevations listed.

See below sections of this report for further discussion on results of the channel analysis that has occurred. The analysis will be used to support a CLOMR / LOMR application to establish Base Flood Elevations and perform various culvert crossings and channel improvements. The preliminary plan indicates all floodplains will be in Tracts and not encroach onto any proposed lot. A copy of the current FIRM Map has been presented in Appendix A.

DRAINAGE BASINS AND SUBBASINS

Major Basin Descriptions

The site lies within the Gieck Ranch Drainage Basin per the "Gieck Ranch Drainage Basin Planning Study" prepared by Drexel, Barrell in October, 2007 and updated in February 2010. While this study provides valuable reference, the DBPS has not been approved by El Paso County as of the date of this report. The Gieck Ranch Drainage Basin covers approximately 22 square miles and begins approximately five miles northeast of the Town of Falcon and extends approximately 15 miles to the southeast. The Gieck Ranch Drainage Basin is tributary to Black Squirrel Creek which drains south to its confluence with the Arkansas river near the city of Pueblo, Colorado. The majority of the the basin is undeveloped and is characterized as rolling range land typically associated with Colorado's semi-arid climates.

The Grandview Reserve site is north of Four Way Ranch Phase 1 (Waterbury) and east of the Meridian Ranch Development. As part of its drainage research, JR also reviewed the following MDDP's and Drainage Reports;

- Master Development Drainage Plan and preliminary Drainage Report for Four Way Ranch completed by JR Engineering, revised March 2005.
- Conceptual Drainage Report for Waterbury (project is included within Four Way Ranch Phase 1 and adjacent to this site) completed by Classic Consulting, revised November 2012.
- Revision to: Master Development Drainage Plan for Meridian Ranch, completed by Tech Contractors, January 2018.
- Final Drainage report for Falcon Regional Park (project is located west of Grandview across Eastonville Road) completed by JPS Engineering, October 2015.
- Unnamed Tributary Black Squirrel Creek, Fourway Ranch Letter of Map Revision, Kiowa Engineering, March 2004.
-

The Fourway Ranch Letter of Map Revision (Fourway LOMR) analyzed both the hydrology and hydraulics of the Gieck Ranch GRT1, and GRT2 drainageways in order to establish 100 year peak flow rates and 100 year flood boundaries. However, as shown on the attached FEMA Firm Panel in Appendix A, the Fourway Ranch Letter of Map Revision only analyzed a small portion of GRT1 and GRT2 near the southern boundary of the Grandview Reserve site. Therefore, it is JR Engineering's intention to analyze and establish base flood elevations for the portions of GRT1 and GRT2 along with EFT1 and EF that traverse the project site and are affected by the development through a future CLOMR and/or LOMR process.

Due to the anticipation of a future CLOMR and/or LOMR process for the sections of GRT1 and GRT2 affected by the development, JR Engineering has selected the published flowrates from the "Fourway Ranch Letter of Map Revision" to be used in our analysis of the site in this report. GRT1 shows a 100 year peak flow rate from the "Fourway Ranch Letter of Map Revision" of 413 cfs at the southern boundary of the Grandview Reserve development, while GRT2 shows a 100 year peak flow

rate of 280 cfs. These two reaches combine approximately 1000 feet south of the project site with a 100 year peak flow rate of 690 cfs.

JR Engineering has held these flowrates at the project site's southern boundary, but performed our own on-site analysis of the tributary sub basins to each drainageway within the project site to establish flowrates upstream of the published flow rates from the Fourway LOMR.

In order to establish 5 year flow rates for GRT1 and GRT2, JR Engineering reviewed multiple other studies that included a 5 year storm analysis. In general, an average of the 5 year results was taken from the various studies and adjusted to the selected 100 year rate to maintain the relationship between the 5 year and 100 year runoff rates for the GRT1 and GRT2 basins.

The Geick Ranch Drainage Basin Planning Study (DBPS) analyzed the hydrology and hydraulics of the EFT1 and EF drainageways upstream, within and downstream of the proposed project site. However, this study did not publish 5 year flow rates for the reaches within our project site. Therefore, JR Engineering interpolated from the closest adjacent reach for which a 5 year flow rate was published and adjusted it to the selected 100 year flow rate of the on-site reaches maintaining the relationship between the 5 year and 100 year storms for the applicable basin and drainageway. A summary table showing the studies considered, the flow rates selected and math used to establish them is included below.

Describe source calculation method (are all of these SCS method?)

Table 1 – Drainage Way Design Flow Comparison

Drainage Way Design Flow Comparison Table						
Drainageway	**Source**	**Design Point from Source**	**Design Storm**		**Selected Flows**	
			$Q_{5\ (cfs)}$	$Q_{100\ (cfs)}$	$Q_{5\ (cfs)}$	$Q_{100\ (cfs)}$
Gieck Ranch Tributary 1 (GRT1)	4 Way Ranch LOMR, Kiowa Engineering, Mar. 2004, Case No. 04-08-0012P	Sect. 19, 20, 21	67.3	413	67.3*	413
	Gieck Ranch DBPS Volume 1 Final Report, Oct. 2010, Drexel, Barrell & Co.	MS-R5	119	573		
	Rev. to MDDP Meridian Ranch, Tech Contractors, Jan. 2018	G06	44.1	663		
	MDDP 4 Way Ranch Phase 1, ADP, Inc., Dec. 2011	DP-19	121.6	511.3		
Gieck Ranch Tributary 2 (GRT2)	Final Drianage Report for Falcon Regional Park, JPS Engineering, Oct. 2015	G09	52	277	58.5**	280
	4 Way Ranch LOMR, Kiowa Engineering, Mar. 2004, Case No. 04-08-0012P	Sect. 23	N/A	280		
	Gieck Ranch DBPS Volume 1 Final Report, Oct. 2007, Drexel, Barrell & Co.	MSt2-R2	65	271		
	Rev. to MDDP Meridian Ranch, Tech Contractors, Jan. 2018	G08	10.7	129		
	MDDP 4 Way Ranch Phase 1, ADP, Inc., Dec. 2011	DP-21	126.2	394		
East Fork Tributary 1 (EFT1)	Gieck Ranch DBPS Volume 1 Final Report, Oct. 2010, Drexel, Barrell & Co.	EFT1-R2b	N/A	217	61*	217
		EFT1-R2a	61	217		
		EFT1-B1	46	134		
		EFT1-J2	95	337		
East Fork (EF)	Gieck Ranch DBPS Volume 1 Final Report, Oct. 2010, Drexel, Barrell & Co.	EF-R3	180	595	180*	595
		EF-R2	N/A	285		
		EF-J4	334	1102		
*This study/reach did not provide a 5 Year storm flow rate, therefore an average of the 5 year flows from the other published studies was taken and adjusted to the selected 100 year flow to maintain the relationship between 5 year and 100 year design flows.						
*GRT1 ex: 413(*Average(119,44.1,121.6)/Average(573,663,511.3)) = 67.3						
EFT1 ex: 217(Average(46,95)/Average(134,337) = 61						
EF ex: 595(334/1102) = 180						
**An avaerage of 5 year design flows was taken from two more recent studies that agrreed with the selected 100 year LOMR flow rate						

These notes are hard to track to the table; consider using superscripts or additional asterisks.

Provide off-site sub-basins and design points.

Existing Sub-basin Drainage

Within the site, existing drainage patterns are generally from northwest to southeast by way of existing, natural drainageways (GRT1, GRT2, EFT1, EF). On-site areas flow directly into these drainageways which also pass the off-site flows through the site. Off-site flows conveyed in the major drainageways conveyed through the site will influence the on-site culvert designs and any channel improvements.

On-site, existing drainage basins were established based upon existing topography and the limits of 100-year floodplain. The site was divided into 13 existing sub-basins. See Table 1 below for summary of existing drainage sub-basins and corresponding peak flows. An existing/proposed drainage map is provided in Appendix F.

Table 2: Historic Drainage Basin Summary

HISTORIC BASIN SUMMARY TABLE				
IDENTIFIER	**BASIN**		**Peak Flow**	
Basin	Area [ac]	Composite % Impervious	Q_5 [cfs]	Q_{100} [cfs]
A	136.48	2.0%	0.47	44.27
B	50.20	2.0%	0.16	14.97
C	110.73	2.0%	0.44	41.08
D	40.28	2.0%	0.82	48.97
E	60.44	2.0%	0.97	59.38
F	105.74	2.0%	1.33	84.26
G	21.93	2.0%	0.30	18.38
H	52.37	2.0%	0.99	59.60
V	61.68	2.0%	0.34	26.63
W	14.49	2.0%	0.05	4.40
X	66.04	2.0%	0.46	32.75
Y	23.96	2.0%	0.16	15.04
Z	22.10	2.0%	0.28	17.55

The four major drainageways are discussed below.

The first of which GRT1 is in the southwest corner of Grandview Reserve within Tract A. Offsite flows cross Eastonville Road in a 24" corrugated metal pipe culvert. Flow from the culvert outfalls in a natural channel to an existing stock pond, where some ponding occurs before discharging over the pond spillway to continue southeast to the south property line. GRT1 merges with GRT2 approximately 1,000 feet south of the Grandview Reserve Development. This natural channel has jurisdictional wetlands and the southern portion is within a Zone A floodplain. The section of GRT1 that is in the Waterbury Development was studied as part of the Fourway Ranch Phase 1 development and a Letter of Map Revisions (LOMR) was prepared by Kiowa Engineering and approved by FEMA in 2004. The intent for this corridor is to not add developed flows and limit channel improvements. If, in the future Tract A is proposed for development, future drainage reports

which tract?

Provide calculations verifying flows for all sub-basins.

will better define any necessary channel improvements. For this report a 100 year peak flow of 413 cfs is used at the downstream boundary. The chosen downstream boundary flow of 413 cfs is consistent with the Fourway Ranch LOMR hydrology analysis and was chosen to better align with FEMA applications. See Table 1 above for a comparison of the flow estimated in the various reports that were reviewed.

What happens to overflows across Eastonville Road?

The second drainageway, GRT2 crosses Eastonville Road near the northwest corner of Grandview Reserve. Per the DBPS, offsite flows cross Eastonville Road in a 19" x 28" culver and are conveyed in a shallow wide drainageway which becomes more defined as the flows traverse the site and continue southeast to the south property line. GRT2 merges with GRT1 approximately 1,000 feet south in the proposed Waterbury Development. This natural channel has no jurisdictional wetlands and is within a Zone A floodplain. The section of GRT2 that is in the Waterbury Development was studied as part of the Fourway Ranch Phase 1 development and a Letter of Map Revisions (LOMR) was prepared by Kiowa Engineering and approved by FEMA in 2004. The intent for this corridor is to better define the drainageway with a wide shallow channel that contains the flows within the proposed Tract. Three roadway culvert crossings are also proposed within this reach. Each culvert crossing will require grading both upstream and downstream to accommodate the culvert. For this report a 100 year peak flow of 280 cfs is used at the downstream boundary. The chosen downstream boundary flow of 280 cfs is consistent with the Waterbury LOMR hydrology analysis and was chosen to better align with FEMA applications. See Table 1 above for a comparison of the flow estimated in the various reports that were reviewed.

Should this be in "proposed" section of the report?

The third drainageway, EFT1, crosses the north property line approximately 1,500 east of the northwest corner of site. Flows are conveyed in natural channel to an existing stock pond, where some ponding occurs before discharging over the pond spillway. The drainageway between the existing stock pond and Highway 24 becomes very wide and undefined. Per the FIRM panel, flows in this drainageway cross the Rock Island trail and Highway 24 and continue southeast where they merge with EF approximately a half mile southeast of the site. This natural channel has no jurisdictional wetlands and the is within a Zone A floodplain. The reach below the confluence of EFT1 and EF was studied as part of the Elbert Road Site Letter of Map Revisions (LOMR) was prepared by Kiowa Engineering and approved by FEMA in 2006. The intent for this corridor is to better define the south half of the drainageway with a wide shallow channel that contains the flows within the Tract and redirect the flows along the Rock Island trail to merge with the EF at the Grandview Reserve east property line. Three roadway culvert crossings are also proposed within this reach. Each culvert crossing will require grading both upstream and downstream to accommodate the culvert. For this report a 100 year peak flow of 217 cfs is used at the downstream boundary. The chosen downstream boundary flow of 217 cfs is consistent with the Gieck Ranch DBPS hydrology analysis. EFT1 and EF have merged into one channel in the Elbert Road Site LOMR. See Table 1 above for a comparison of the flow estimate in the various reports that were reviewed.

The fourth drainageway, EF, crosses the north property line approximately 2,500 west of the northeast corner of site. Flows are contained in a natural channel and the flows travel south east to the property line and then to Highway 24 where a 60' wide bridge carries the flow under the highway. Flows continue southeast where they merge with EFT1 approximately a half mile southeast of the site. This natural channel has jurisdictional wetlands and is within a Zone A floodplain. The reach below the confluence of EFT1 and EF was studied as part of the Elbert Road Site improvements and a Letter of Map Revisions (LOMR) was prepared by Kiowa Engineering and approved by FEMA in 2006. The intent for this corridor is to limit channel improvements.. Two roadway culvert crossings are also proposed within this reach. Each culvert crossing will require

grading both upstream and downstream to accommodate the culvert. For this report a 100 year peak flow of 595 cfs was chosen at the downstream boundary. The chosen downstream boundary flow of 595 cfs is consistent with the Gieck Ranch DBPS hydrology analysis. EFT1 and EF have merged into one channel in the Elbert Road Site LOMR. See Table 1 above for a comparison of the flow estimate in the various reports that were reviewed.

Proposed Sub-basin Drainage

Basin A is approximately 136.5 acres and in its existing condition is rolling rangeland. Runoff generally follows the natural topography of the site towards GRT2. In the proposed condition, Basin A will consist of rural 2.5 acre+ lots and paved private rural residential roadways. The basins southern boundary follows the centerline of a proposed public rural major collector roadway. The basins northern boundary follows the southern tract line of GRT2 and the basins western boundary follows the eastern right of way line of Eastonville Road. Runoff from this basin will be collected in road side swales and "back of lot" swales that will convey the collected runoff to the proposed full-spectrum extended detention basin, Pond A. The peak flow rate for Basin A in the 5 and 100-year storm are 37.9 cfs and 90.5 cfs, respectively. However, Pond A will discharge at less than historic rates.

Basin B is approximately 50.2 acres and in its existing condition is rolling rangeland. Runoff generally flows southeast across the basin along and towards Drainageway GRT2. In the proposed condition, Basin B will be rural 2.5 acre+ lots, paved private rural residential roadways and will include proposed full-spectrum extended detention basin, Pond B. The basins southern limit follows the northern tract line that contains GRT2. Runoff from this basin will be collected in road side swales and "back of lot" swales that will convey runoff to Pond B. The peak flow rate for Basin B in the 5 and 100-year storm are 15.9 cfs and 38.9 cfs, respectively. However, Pond B will discharge at less than historic rates.

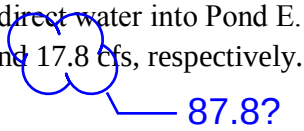
Not found on plan

Basin C is approximately 110.73 acres and in its existing condition is rolling rangeland. Runoff generally flows southeast across the basin towards Highway 24 and the Rock Island Trail where it is intercepted in an almost flat drainage swale that directs water towards two existing 24 inch corrugated metal pipe culverts that cross to the southeastern side of Highway 24 and spills into Drainageway EFT1. In the proposed condition, Basin C will be rural 2.5 acre+ lots, paved private rural residential roadways, and a proposed public rural major collector roadway. This basin will also include proposed full-spectrum extended detention basin, Pond C. The basins southern limit follows the Southern limits of the proposed Major Collector Roadway. The basins northern limits follow the southern tract line that contains drainageway EFT1 and the basins eastern limits coincide with the property boundary that borders the rock island trail. Runoff from this basin will be collected in road side swales and "back of lot" swales that will convey runoff to Pond C which is located at the back of three lots that border the Rock Island Trail. A proposed trapezoidal channel will carry water from the roadside swales to Pond C. The peak flow rate for Basin C in the 5 and 100-year storm are 29.7 cfs and 71.2 cfs, respectively. However, Pond C will discharge at less than historic rates.

show on plan (not found)

Basin D is approximately 40.28 acres and in its existing condition is rolling rangeland. Runoff generally flows south across the basin towards Drainageway EFT1. In the proposed condition, Basin D will be rural 2.5 acre+ lots, paved private rural residential roadways, and will include proposed full-spectrum extended detention basin Pond D. The basins northern limit coincides with the northern boundary of the development and the basins southern limit is approximately the northern tract line of the EFT1 Drainageway. Runoff from this basin will be collected in road side swales and conveyed south along two down draining cul-de-sacs to proposed trapezoidal swale "Basin D Swale" to Pond D. The peak flow rate for Basin D in the 5 and 100-year storm are 10.2 cfs and 66.2 cfs, respectively. However, Pond D will discharge at less than historic rates.

Basin E is approximately 60.44 acres and in its existing condition is rolling rangeland. Runoff generally flows east across the basin towards Drainageway EF. In the proposed condition, Basin E will be rural 2.5 acre+ lots, paved private rural residential roadways, and will include proposed full-spectrum extended detention basin Pond E. The basins northern limit coincides with the northern boundary of the development and the basins eastern limit is approximately the western tract line of the EF Drainageway. Runoff from this basin will be collected in road side swales and conveyed east towards a proposed "Back of Lot" swale that will direct water into Pond E. The peak flow rate for Basin E in the 5 and 100-year storm are 17.8 cfs and 17.8 cfs, respectively. However, Pond E will discharge at less than historic rates.



Basin F is approximately 105.74 acres and in its existing condition is rolling rangeland. Runoff generally flows south and east across the basin towards Drainageway EF and the existing Rock Island Trail swale at the project's southeastern boundary. Runoff that reaches the Rock Island Trail swale is conveyed northeast along the trail until it discharges into the EF Drainageway and heads south under the existing 60' wide Highway 24 Bridge. In the proposed condition, Basin F will be rural 2.5 acre+ lots, paved private rural residential roadways, and will include proposed full-spectrum extended detention basin Pond F. The basins northeastern limit is the southwestern tract line of the EF Drainageway and partially the border of basin E. The basins southeastern limit is the northwestern tract line that contains the proposed East Fork Tributary 1 trapezoidal channel that carries water from the Pond C outfall and the flows in EFT1 to its proposed confluence with the EF Drainageway. Runoff from this basin will be collected in road side swales and conveyed south and east to Pond F. The peak flow rate for Basin F in the 5 and 100-year storm are 27.5 cfs and 136.1 cfs, respectively. However, Pond F will discharge at less than historic rates.

Basin G is approximately 21.93 acres and in its existing condition is rolling rangeland. Runoff generally flows south across the basin towards Drainageway EF. In the proposed condition, Basin G will be rural 2.5 acre+ lots, paved private rural residential roadways, and will include proposed full-spectrum extended detention basin Pond G. The basins northern limit coincides with the northern boundary of the development and the basins southern limit is approximately the northern tract line that contains the EF Drainageway. Runoff from this basin will be collected in road side swales and conveyed south along a down draining cul-de-sac and into a proposed "Back of Lot" swale that

directs the collected runoff to Pond G. The peak flow rate for Basin G in the 5 and 100-year storm are 6.0 cfs and 24.6 cfs, respectively. However, Pond G will discharge at less than historic rates.

Basin H is approximately 52.37 acres and in its existing condition is rolling rangeland. Runoff generally flows south across the basin towards Drainageway EF. In the proposed condition, Basin H will be rural 2.5 acre+ lots, paved private rural residential roadways, and will include proposed full-spectrum extended detention basin Pond H. The basins northern limit coincides with the northern boundary of the development and the basins eastern limit coincides with the eastern boundary of the development. The basins southwestern boundary is approximately the northeastern boundary of the tract that contains the EF Drainageway. Runoff from this basin will be collected in road side swales and conveyed south along the proposed private rural local roadways to Pond H. The peak flow rate for Basin H in the 5 and 100-year storm are 11.4 cfs and 83.2 cfs, respectively. However, Pond H will discharge at less than historic rates.

Basin V is approximately 61.68 acres and in its existing condition is rolling rangeland. Runoff generally flows east towards the GRT1 Drainageway. The GRT1 Drainageway has an existing Zone A floodplain that begins approximately 900 feet southeast of the existing stock pond. This drainageway also contains jurisdictional wetlands along most of its path through basin V. In the proposed condition, Basin V will be almost entirely an undeveloped open space tract. However, the basins northern boundary follows the centerline of the proposed public major collector roadway (Rex Road). Runoff from the southern half of the proposed road will flow undetained into the GRT1 Drainageway. The basins western boundary follows the eastern right of way line of Eastonville Road. The basins southern limits follow the southern boundary line of the development. The drainageway was studied in the Geick Ranch Drainage Basin Planning Study (DBPS) and channelization, vegetation augmentation, and grade control structures were recommended along the channel portion that traverses the project site. JR Engineering has run a preliminary model of the channel using HEC-RAS to identify areas that will need improvements which are discussed further in the "Drainage Facility Design" section.

Basin W is approximately 14.49 acres and in its existing condition is rolling range land but is almost entirely comprised of the existing GRT2 drainageway. The basin and drainageway traverse the site from the northwest corner to the southern site boundary. The existing drainageway is poorly defined in the upper reach within the project site, but is more defined through the lower reaches within the site. The channel is part of the existing Zone A FEMA floodplain throughout the project site and contains non-jurisdictional wetlands for most of its limits within the project site. In the proposed condition, Basin W will be almost entirely comprised of the GRT2 drainageway. However, the drainageway will cross three of the proposed private rural residential roadways and the proposed public major collector roadway at the site's southern boundary. Each road crossing will be achieved with a culvert and headwall/wingwall design. Pond A and B are planned to outfall to this drainageway below historic rates and maintain the historic drainage patterns. This drainageway was also studied in the Geick Ranch Drainage Basin Planning Study (DBPS) and was identified as a candidate for vegetation augmentation in the proposed condition. However, due to the proposed

with low-flow channel?

culvert crossings, and the poorly defined sections of the channel, JR Engineering has proposed grading of a 60' wide bottom trapezoidal channel grass lined channel through the entire development that approximately follows the existing channel alignment and grade. JR Engineering has run a preliminary model of the existing channel using HEC-RAS to identify the existing conditions and areas that will need improvements. Our findings are discussed further in the "Drainage Facility Design" section.

Basin X is approximately 66.04 acres and in its existing condition is rolling range land but is almost entirely comprised of the existing EFT1 Drainageway. The basin and Drainageway traverse the site from the northern boundary to the southeastern boundary along the Rock Island Trail and Highway 24. The existing drainageway is well defined in its upper reaches, and contains a stock pond around the middle of its path through the project site. Below the stock pond, the drainageway is poorly defined except for a section of narrow meandering channel that appears to spread out as it approaches the Rock Island Trail until its path becomes undiscernible. However, the existing topography indicates that the flow from this channel is collected in the almost flat Rock Island Trail swale and is directed to two 24 inch corrugated metal pipe culverts that transport flows to the southeastern side of Highway 24. The channel is part of the existing Zone A FEMA floodplain throughout the project site and contains non-jurisdictional wetlands for most of its limits within the project site. However, the current floodplain shows a gap between the channels intersection with the Rock Island Trail and its path southeast of Highway 24.

In the proposed condition, Basin X will be almost entirely comprised of the EFT1 drainageway, however, the basin will also contain six(6) 2.5+ acre lots that border the drainageway. Runoff from these lots cannot be completely captured without significant amounts of grading that would change the natural topography which is not consistent with the development concept of large natural lots. The drainageway will cross three of the proposed private rural residential roadways. Each road crossing will be achieved with a culvert and headwall/wingwall design. Pond C and D are planned to outfall to this drainageway below historic rates and maintain the historic drainage patterns.

This drainageway was also studied in the Geick Ranch Drainage Basin Planning Study (DBPS) and suggested improvements were limited to "as needed". This study also shows a different path across Highway 24 than the FEMA flood plain map which indicated a need for further analysis. JR Engineering sent survey crews out in the last quarter of 2018 to investigate the channels path in the undefined sections. Survey investigations confirmed that the channel is not defined, and is not contained within a channel section near the projects southeastern limits along Highway 24 and the Rock Island Trail. Due to our findings, JR Engineering has recommended channelization in the undefined regions of the Drainageway and has proposed to combine the channel with the EF Drainageway on the northwest side of Highway 24. JR Engineering has run a preliminary model of the existing channel using HEC-RAS to identify the existing conditions and areas that will need improvements. Our findings are discussed further in the "Drainage Facility Design" section.

The peak flow rate for Basin X in the 5 and 100-year storm are 3.6 cfs and 13.2 cfs, respectively. The 5 year flow rate is higher than the calculated historic flow but the 100 year flow rate is well below the calculated historic rate.

Basin Y is approximately 23.96 acres and in its existing condition is rolling range land. Runoff generally flows southeast across the basin towards the Rock Island Trail and is captured by an existing swale that outfalls to the Gieck Ranch Drainageway (GRT1 and GRT2 are combined at the crossing). Flows then travel south underneath an existing bridge below Highway 24. In the proposed condition, Basin Y will contain four (4) rural 2.5 acre+ lots and approximately 320 feet of the proposed major collector roadway. The basins western and southeastern limits coincide with the western and southeastern project boundary. The basins northern boundary follows the southern right of way line of the adjacent proposed local roadways. Runoff from this basin will follow the existing topography and drainage paths. Flows will be intercepted by the existing Rock Island Trail swale. Areas within the basins that are east of the proposed collector roadway will outfall un-detained to the Gieck Ranch Drainageway and basin areas west of the proposed collector will outfall to the existing 24 inch corrugated metal pipe culvert that crosses under the Rock Island Trail and Highway 24 to the South and enters the existing EFT1 drainageway. Proposed drainage patterns are consistent with the historic drainage patterns. The peak flow rate for Basin Y in the 5 and 100-year storm are 1.5 cfs and 6.6 cfs, respectively. The 5 year flow rate is higher than the calculated historic flow rate by approximately 1 cfs but the 100 year flow rate is well below the calculated historic rate.

Address sediment control

Basin Z is approximately 22.10 acres and in its existing condition is rolling range land but is almost entirely comprised of the existing EF Drainageway. The basin and Drainageway traverse the site from the northern boundary to the southeastern site corner. The existing drainageway is well defined throughout its limits within the entire project site. The channel is part of the existing Zone A FEMA floodplain throughout the project site and contains jurisdictional wetlands for most of its limits within the project site.

In the proposed condition, Basin Z will be almost entirely comprised of the EF drainageway but also contains two rural 2.5+ acre lots and two road crossings. Each road crossing will be achieved with a culvert and headwall/wingwall design. Runoff from these lots cannot be completely captured without significant amounts of grading that would change the natural topography which is not consistent with the development concept of large natural lots. Pond E, F, G, and H will outfall to the EF Drainageway within Basin Z, below historic rates, and preserve the historic drainage patterns. This drainageway was also studied in the Geick Ranch Drainage Basin Planning Study (DBPS) and the reaches within the project site were identified for "As Needed" improvements only. JR Engineering has run a preliminary model of the existing channel using HEC-RAS to identify the existing conditions and areas that will need improvements. We anticipate grading upstream and downstream of the proposed culverts at a minimum. Our findings are discussed further in the "Drainage Facility Design" section. See Table 3 on the next page for proposed Basin and Pond parameters.

Table 3: Proposed Basin & Pond Summary Table

	BASIN AND POND SUMMARY TABLE							
	IDENTIFIER	**BASIN**		**RUNOFF/INFLOW**		**ALLOWABLE RELEASE RATE**		**POND VOLUME**
	Basin/Pond	Area [ac]	Composite % Impervious	Q_5 [cfs]	Q_{100} [cfs]	Q_5 [cfs]	Q_{100} [cfs]	[Ac-ft]
Basin/Pond	A	136.48	7.1%	37.9	90.5	0.4	44.2	2.62
	B	50.20	7.8%	15.9	38.9	0.1	14.9	1.01
	C	110.73	7.6%	29.7	71.2	0.4	41.0	2.20
	D	40.28	5.9%	10.2	66.2	0.8	48.9	1.17
	E	60.44	7.0%	17.8	87.8	0.9	59.3	1.90
	F	105.74	6.2%	27.5	136.1	1.3	84.2	2.93
	G	21.93	6.7%	6.0	24.6	0.2	18.3	0.79
	H	52.37	5.1%	11.4	83.2	0.9	59.5	1.43
Basin	V	61.68	2.6%	6.9	18.9	NA	NA	NA
	W	14.49	2.0%	1.2	3.4	NA	NA	NA
	X	66.04	1.3%	3.6	13.2	NA	NA	NA
	Y	23.96	1.4%	1.5	6.6	NA	NA	NA
	Z	22.10	1.9%	1.8	17.6	NA	NA	NA

Each full spectrum pond will release treated flows at less than historic rates to minimize adverse impacts downstream. Ponds A and B will discharge to the GRT1 Drainageway, Ponds C and D will discharge to EFT1, and Ponds E, F, G and H will discharge to the EF Drainageway.

DRAINAGE DESIGN CRITERIA

Development Criteria Reference

Storm drainage analysis and design criteria for the project were taken from the "*City of Colorado Springs / El Paso County – Drainage Criteria Manual*" Volumes 1 and 2 (CCSDCM) revised in November 1991 and October 1994 with County adopted Chapter 6 and Section 3.2.1 of Chapter 13 of the "*City of Colorado Springs / El Paso County – Drainage Criteria Manual*" revised in May 2014 and the "*Urban Storm Drainage Criteria Manual"* Volumes 1 - 3 (USDCM).

Hydrologic Criteria

All hydrologic data was obtained from the "El Paso County Drainage Criteria Manual" Volumes 1 and 2, and the "Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual" Volumes 1, 2, and 3 and the NOAA Atlas 14, Volume 8, Version 2. Onsite drainage improvements were designed based on the 5 year (minor) storm event and the 100-year (major) storm event. Runoff was calculated using EPA SWMM Version 5.1, with Horton Infiltration and Kinematic Wave analysis. The model utilizes the "2-Hour Design Storm Distribution" (Table 6-3) and "1 Hour Rainfall Depths" obtained from the above mentioned NOAA Atlas for the project location. Table 4 below shows the depths obtained from the Atlas.

Table 4: NOAA Atlas 14 Rainfall Depth Table

NOAA Atlas Depths			
Return Period	*6-Hour Depth**	*24-Hour Depth**	1-Hour Depth*
(Year)	*(Inches)*	*(Inches)*	(Inches)
2	*1.40*	*1.86*	0.934
5	*1.79*	*2.36*	1.22
10	*2.17*	*2.84*	1.47
25	*2.77*	*3.57*	1.85
50	*3.29*	*4.21*	2.16
100	*3.87*	*4.90*	2.50

*All depths from NOAA Atlas 14, Volume 8, Version 2, Peyton CO, Lat:38.983 Long:-104.5532

The SWMM model is presented in Appendix B. Provide existing and proposed conditions models.

Urban Drainage and Flood Control District's UD-Detention, Version 3.07 workbook was used for preliminary pond sizing. Required detention volumes and allowable release rates were designed per USDCM and CCSDCM. Pond sizing spreadsheets are presented in Appendix D. Outlet structures were not designed with this PDR but an outlet structure and basin sheet was included for each basin to present the basin parameters used and allowable release rates considered.

Hydraulic Criteria

Address hydrology for culvert sizing (see plan redlines).

The Federal Highway Administration's HY-8 program (Volume 7.50) was used to analyze the proposed box culverts within Major Drainageways GRT2, EFT1, and EF. Per Section 14.3.2 of the CCSDCM, a maximum headwater to rise ratio of 1.5 was used for the sizing of box culverts. Furthermore, box culverts will be designed in conjunction with channel improvements to address channel stabilization where required. Culvert sizing and corresponding channel improvements will be revised as roadway geometry becomes better defined. Preliminary culvert design sheets are presented in Appendix C and a culvert design summary table is included below.

Table 5: Culvert Design Summary Table

PRELIMINARY CULVERT DESIGN SUMMARY TABLE											
Culvert Parameters					**Major Storm Condition**				**Frequent Storm Condition**		
Culvert	Road	Span [ft]	Rise [ft]	Slope	Q_{100} [cfs]	HW/D	Inlet Control?	Outlet Vel. [fps]	Q_5 [cfs]	25% of Q_5 [cfs]	Outlet Vel. [fps]
GRT2-1	Lakeside	6	4	0.5%	219	1.47	Y	11.29	56.8	14.2	4.86
GRT2-2	Grandview Lake	6	4	0.5%	219	1.47	Y	11.29	56.8	14.2	4.86
GRT2-3	Lakeside	7	4	0.5%	233	1.35	Y	11.17	58.1	14.5	4.67
GRT2-4	Rex	8	4	0.5%	280	1.41	Y	11.45	58.5	14.6	4.49
EFT1-1	Grandview Lake	6	3	0.5%	116	1.33	Y	9.42	56.4	14.1	4.85
EFT1-2	Vista Point	5	4	0.5%	164	1.33	Y	10.69	60.7	15.2	5.24
EFT1-3	Grandview Lake	5	4	0.5%	164	1.33	Y	10.69	60.7	15.2	5.24
EF-1	Grandview Lake	7	5	0.5%	357	1.47	Y	12.61	175	43.7	6.78
EF-2	Grandview Lake	9	5	0.5%	432	1.39	Y	12.64	178	44.4	6.35

Autodesk Inc.'s Hydraflow Express Extension (Volume 10.5) was used for preliminary roadside swale design and preliminary proposed channel section design. Hydraflow reports are included in Appendix C and a roadside swale summary table is included below. For the purposes of this PDR/MDDP, the maximum roadside ditch size was determined based on peak 100-year flows and minimum roadway slopes within each basin. Swales were checked for velocity and capacity per the CCSDCM Section 12.3.2.2. Any swale cross sections with a 100-year velocity greater than 5 ft/s will include periodic drop structures to limit velocities below 5 ft/s. Drop structure design and locations will be provided with the FDR.

Table 6: Roadside Swale Design Summary Table

ROADSIDE SWALE MIN/MAX CONDITIONS				
Condition	Slope	Depth [ft]	Velocity [fps]	Q [cfs]
Max Velocity	5%	0.68	5.19	9.6
Max Flow	1%	2.5	4.18	104.6
Min Flow/Velocity	1%	0.66	1.72	3.0

Preliminary channel analysis was completed using Geo-HEC-RAS, and the U.S. Army Corps of Engineers HEC-RAS Version 5.0.6, release date November 2018. The Final Drainage Report will provide final sizing of all swales and local street culverts and driveway culverts. Hydraflow swale and culvert design sheets are presented in Appendix C.

DRAINAGE FACILITY DESIGN

General Concept

The proposed stormwater conveyance system was designed to convey the developed Grandview Reserve Subdivision flows to full spectrum water quality and detention ponds. Water quality and detention ponds will be designed to release at less than historic rates to minimize adverse impacts downstream. Undeveloped basins are allowed to follow existing drainage patterns and discharge directly into major drainageways or off-site.

Channel improvements will be proposed immediately up and downstream of culvert improvements. Further channel improvements will be proposed within the major drainageways where 100-year flow velocities become erosive and sheer stresses and Froude numbers are too high according to County criteria, and where undefined drainageways create the need for channelization to limit the flood plain to the proposed tracts.

For this MDDP/PDR, a preliminary HEC RAS model was created for the four Major Drainageways (GRT1, GRT2, EFT1, and EF) and preliminary improvements are shown on the drainage map included in Appendix F. During final design a CLOMR/LOMR process will be completed as needed for each drainageway, and the model will be fine-tuned and updated to include the proposed conditions. At that time, details of specific improvements will be modeled, analyzed, and proposed.

Specific Details

Four Step Process to Minimize Adverse Impacts of Urbanization

In accordance with the El Paso County Drainage Criteria Manual, Volume 2 this site has implemented the four step process to minimize adverse impacts of urbanization. The four step process includes reducing runoff volumes, stabilizing drainageways, treating the water quality capture volume (WQCV), and consider the need for Industrial Commercial BMP's.

Step 1, Reducing Runoff Volumes: The development of the project site is proposed lot single family residential (2.5 ac. min.) with open spaces and lawn areas interspersed within the development which helps disconnect impervious areas and reduce runoff volumes. Roadways will utilize roadside ditches further disconnecting impervious areas. These practices will also allow for increased infiltration and reduce runoff volume.

Step 2, Stabilize Drainageways: This site will utilize roadside swales and "Back of Lot" swales with culvert crossings throughout the site. These roadside ditches will then direct the on-site development flows to the multiple full spectrum extended detention basins within the project that will be designed to release at or below historic rates in the natural channels. The natural channels will be stabilized in reaches with velocity, sheer stress, or Froude number values that indicate the channel is unstable given soil and bank conditions or fall outside of County criteria and recommendations. Improvements to be considered include but are not necessarily limited to, drop structures, channel armoring, vegetation augmentation, and channelization.

Based upon the proposed reduction in released flows compared to the pre-developed flows, no impact to downstream drainageways is anticipated.

Step 3, Provide WQCV: Runoff from this development will be treated through capture and slow release of the WQCV in multiple permanent full spectrum extended detention basins that will be designed per current El Paso County drainage criteria. Further water quality will be provided by use of low impact development techniques such as grass buffers, vegetated swales, and the preservation of native vegetation in areas subject to runoff.

Step 4 Consider the need for Industrial and Commercial BMP's: No industrial or commercial uses are proposed within this development. However, a site specific storm water quality and erosion control plan and narrative will be prepared for each future Filing. Site specific temporary source control BMPs as well as permanent BMP's will be detailed in this plan and narrative to protect receiving waters.

Water Quality

In accordance with Section 13.3.2.1 of the CCSDCM, full spectrum water quality and detention will be provided for all developed basins. Outlet structure release rates will be limited to less than historic rates to minimize adverse impacts to downstream stormwater facilities. Complete pond and outlet

structure designs will be provided with the Final Drainage Report. Preliminary pond design parameters are presented in Appendix D.

Erosion Control Plan

The El Paso County Drainage Criteria Manual specifies an Erosion Control Plan and associated cost estimate must be submitted with each Final Drainage Report. We respectfully request that the Erosion Control Plan and Cost Estimate be submitted in conjunction with the grading and erosion control plans and construction assurances posted prior to obtaining a grading permit.

Operation & Maintenance

In order to ensure the function and effectiveness of the stormwater infrastructure, maintenance activities such as inspection, routine maintenance, restorative maintenance, rehabilitation and repair, are required. All proposed drainage structures within the any platted County ROW will be owned and maintained by El Paso County. All proposed drainage structures within easements or tracts will be owned and maintained by the 4 Way Ranch Metropolitan District No. 2.

Drainage and Bridge Fees

Drainage and Bridge Fees are due at time of final platting. An estimate of basin fees at this time is provided in below. The Grandview Reserve Subdivision is not within an approved drainage basin, therefore; no drainage or bridge fees will be required for this area.

Construction Cost Opinion

(For Information Only / Non-Reimbursable)
Cost opinion to be provided with Final Drainage Report Submittal

SUMMARY

The proposed development remains consistent with pre-development drainage conditions with the construction of the recommended drainage improvements, including ditches, culverts, detention ponds and drainage channel improvements. The proposed development will not adversely affect the offsite major drainageways or surrounding development. This report meets the latest El Paso County Drainage Criteria requirements for this site.

REFERENCES:

1. El Paso County Drainage Criteria Manual (Volumes I & II), El Paso County, Colorado, current edition.

2. Urban Storm Drainage Criteria Manual, Urban Drainage and Flood Control District, Latest Revision.

3. Hydrologic Group Rating for El Paso County Area, Colorado", USDA-Natural Resources Conservation Service, National Cooperative Soil Survey. Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov. [June 21, 2017]

4. Gieck Ranch Drainage Basin Planning Study (Not approved) prepared by Drexel Barrell, revised February 2010

5. Master Development Drainage Plan and preliminary Drainage Report for Four Way Ranch completed by JR Engineering, revised March 2005.

6. Conceptual Drainage Report for Waterbury completed by Classic Consulting, revised November 2012.

7.

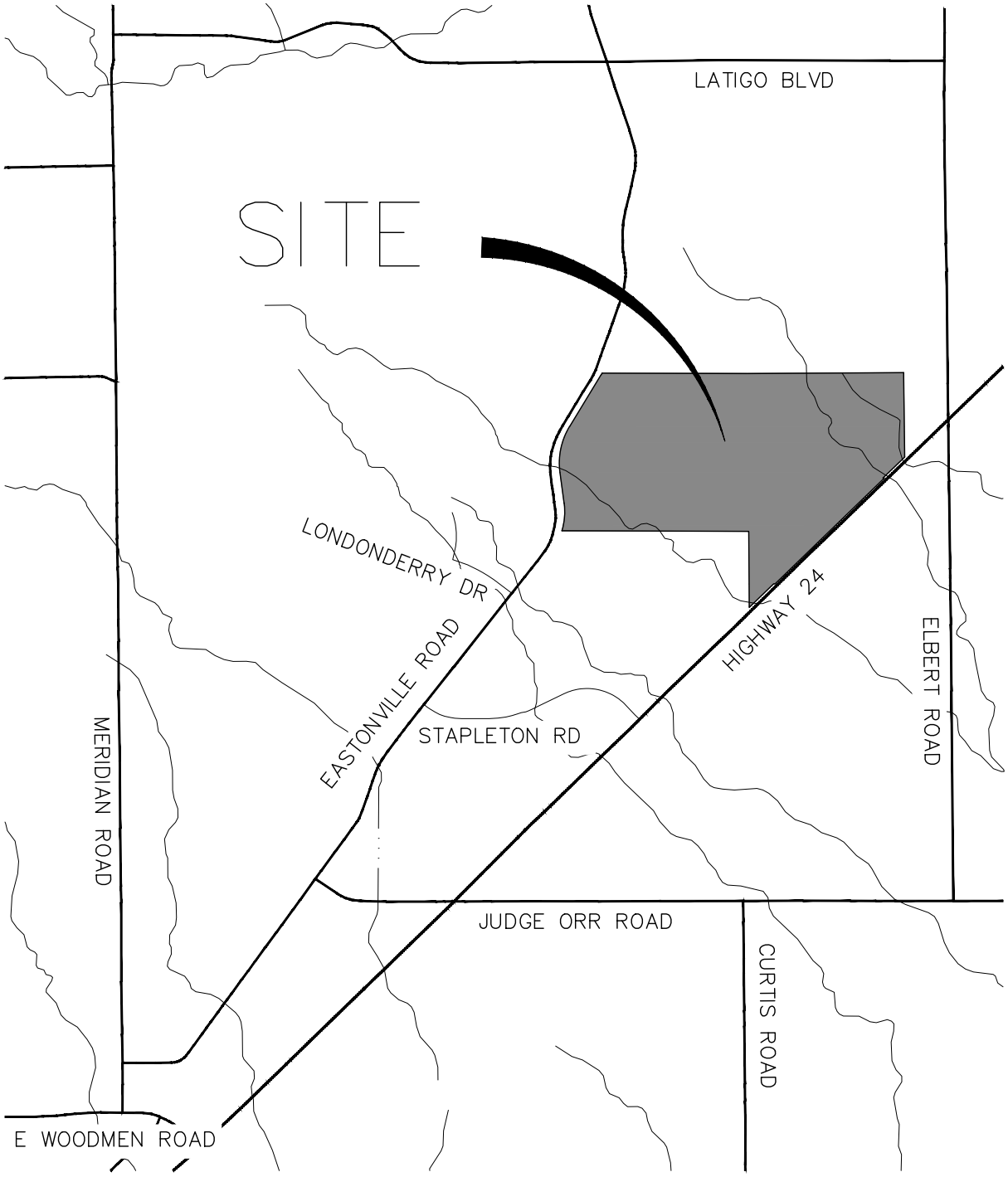
8. Final Drainage report for Falcon Regional Park completed by JPS Engineering, October 2015

9. Hagler and Gieck Drainage Basins Letter of Map Revision, Four Way Ranch Subdivision, Kiowa, March 2004

10. Unnamed Tributary Black Squirrel Creek, Fourway Ranch Letter of Map Revision, Kiowa Engineering, March 2004

APPENDIX A

VICINITY MAP, SOIL DESCRIPTIONS, FEMA FLOODPLAIN MAP



4000 2000 0 4000

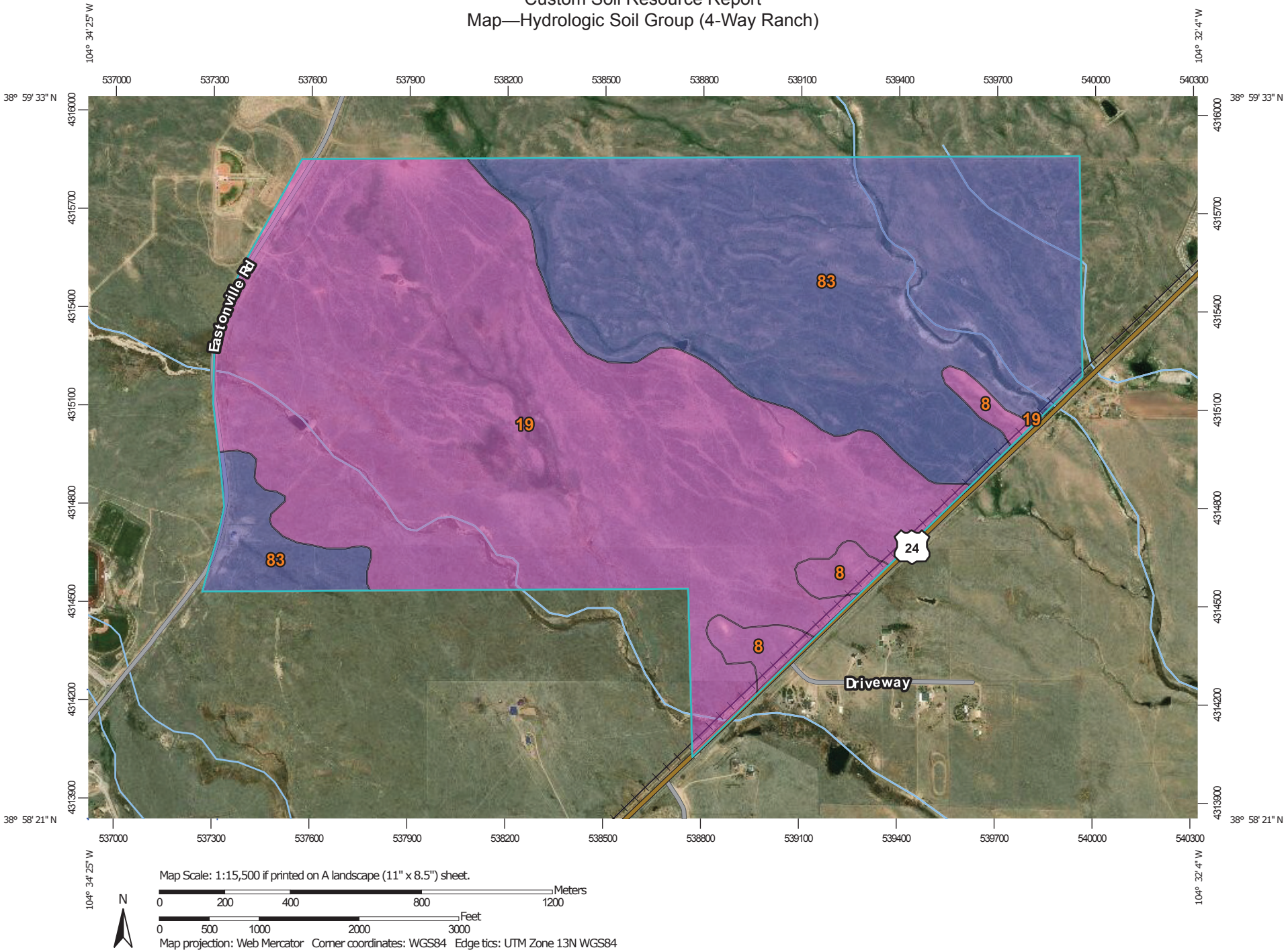
ORIGINAL SCALE: 1" = 4000'

VICINITY MAP
GRANDVIEW RESERVE
JOB NO. 29931.26
01/22/19
SHEET 1 OF 1

J·R ENGINEERING
A Westrian Company

Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

Custom Soil Resource Report
Map—Hydrologic Soil Group (4-Way Ranch)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 16, Sep 10, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 7, 2016—Aug 17, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group (4-Way Ranch)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	A	22.1	2.7%
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	A	470.5	56.5%
83	Stapleton sandy loam, 3 to 8 percent slopes	B	339.9	40.8%
Totals for Area of Interest			**832.5**	**100.0%**

Rating Options—Hydrologic Soil Group (4-Way Ranch)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

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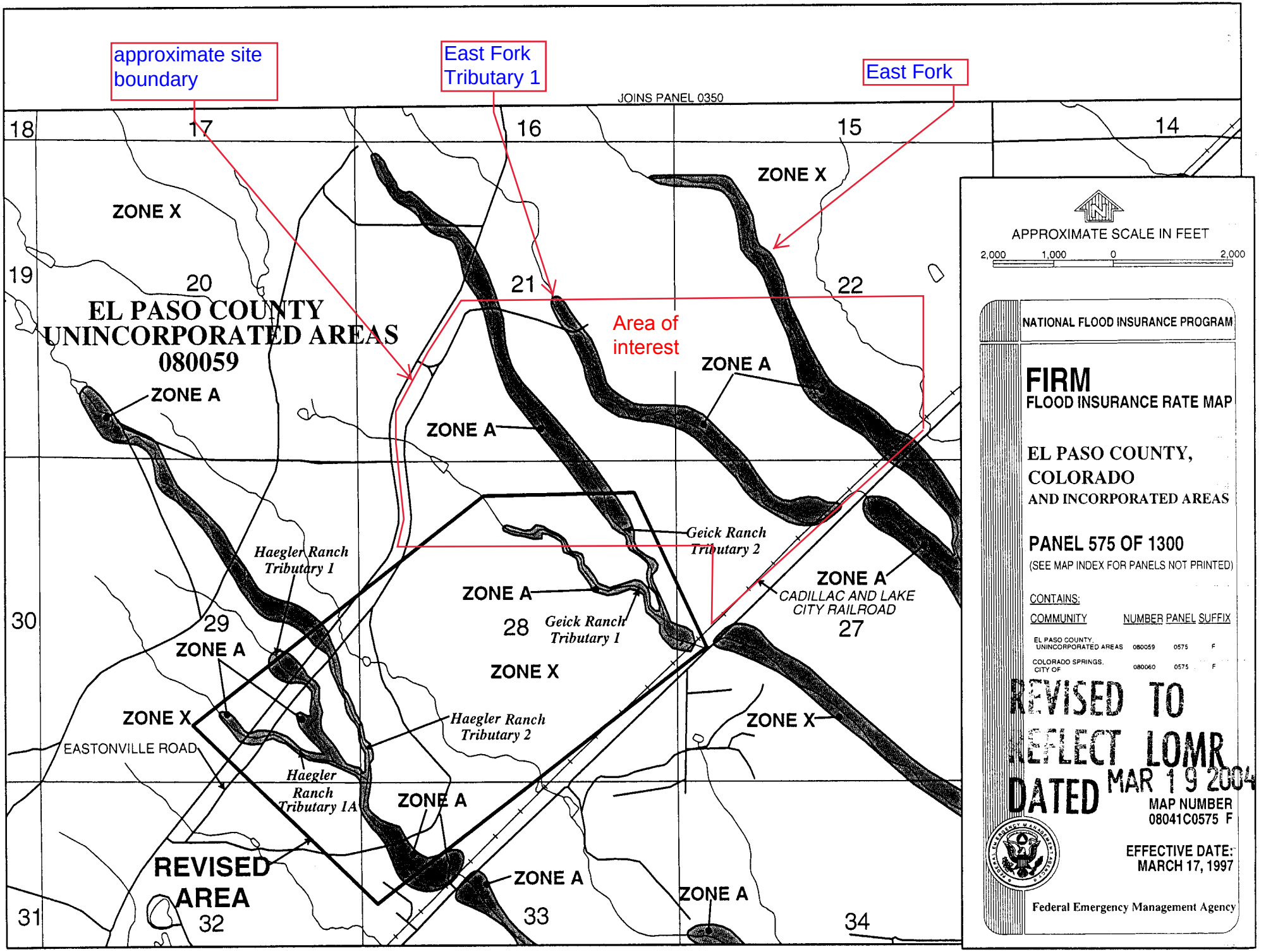

approximate site boundary
East Fork Tributary 1
East Fork
JOINS PANEL 0350
18
17
16
15
14
ZONE X
ZONE X
19
20
21
22
EL PASO COUNTY
UNINCORPORATED AREAS
080059
Area of interest
ZONE A
ZONE A
ZONE A
ZONE A
Haegler Ranch Tributary 1
Geick Ranch Tributary 2
ZONE A
CADILLAC AND LAKE CITY RAILROAD
30
29
28
27
Geick Ranch Tributary 1
ZONE A
ZONE X
ZONE X
ZONE X
Haegler Ranch Tributary 2
EASTONVILLE ROAD
Haegler Ranch Tributary 1A
ZONE A
REVISED AREA
ZONE A
ZONE A
31
32
33
34
APPROXIMATE SCALE IN FEET
2,000 1,000 0 2,000
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY, COLORADO
AND INCORPORATED AREAS
PANEL 575 OF 1300
(SEE MAP INDEX FOR PANELS NOT PRINTED)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
EL PASO COUNTY, UNINCORPORATED AREAS 080059 0575 F
COLORADO SPRINGS, CITY OF 080060 0575 F
REVISED TO REFLECT LOMR DATED MAR 19 2004
MAP NUMBER
08041C0575 F
EFFECTIVE DATE:
MARCH 17, 1997
Federal Emergency Management Agency

APPENDIX B

HYDROLOGIC CALCULATIONS

GRANDVIEW RESERVE

RAINFALL DEPTHS AND DESIGN STORMS

NOAA Atlas Depths			
Return Period	*6-Hour Depth**	*24-Hour Depth**	1-Hour Depth*
(Year)	*(Inches)*	*(Inches)*	(Inches)
2	*1.40*	*1.86*	0.934
5	*1.79*	*2.36*	1.22
10	*2.17*	*2.84*	1.47
25	*2.77*	*3.57*	1.85
50	*3.29*	*4.21*	2.16
100	*3.87*	*4.90*	2.50

*All depths from NOAA Atlas 14, Volume 8, Version 2, Peyton CO, Lat:38.983 Long:-104.5532

2-Hour Design Storm Distribution (Table 6-3)	
Time	Fraction of 1-Hour Rainfall Depth
0:00	0.000
0:05	0.014
0:10	0.046
0:15	0.079
0:20	0.120
0:25	0.179
0:30	0.258
0:35	0.421
0:40	0.712
0:45	0.824
0:50	0.892
0:55	0.935
1:00	0.972
1:05	1.004
1:10	1.018
1:15	1.030
1:20	1.041
1:25	1.052
1:30	1.063
1:35	1.072
1:40	1.082
1:45	1.091
1:50	1.100
1:55	1.109
2:00	1.119

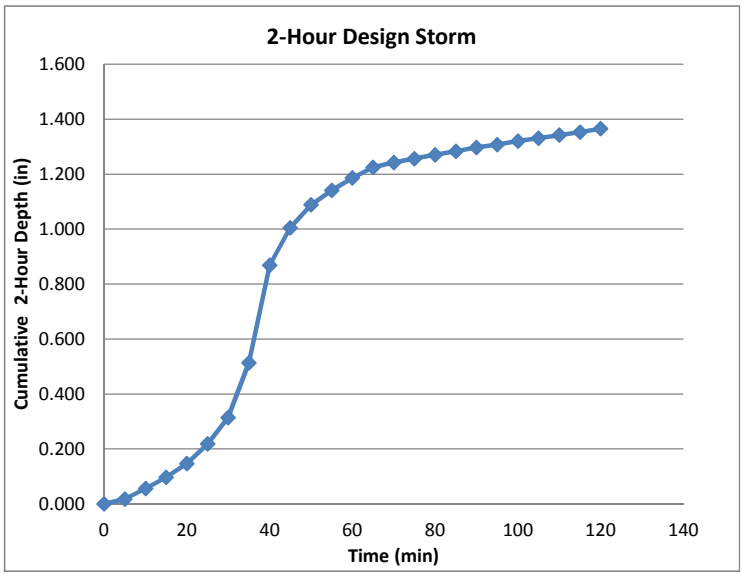
GRANDVIEW RESERVE

2 HOUR DESIGN STORM CUMULATIVE DEPTHS

	Thunderstrom Analysis
	z=6860'
Return Period	1-Hour Depth
(Year)	(Inches)
5	1.22

Cumulative Rainfall Depth	
2-Hour Design Storm	
Time	Cumulative
(5 min)	2-Hour Depth (in)
0:00	0.000
0:05	0.017
0:10	0.056
0:15	0.096
0:20	0.146
0:25	0.218
0:30	0.315
0:35	0.514
0:40	0.869
0:45	1.005
0:50	1.088
0:55	1.141
1:00	1.186
1:05	1.225
1:10	1.242
1:15	1.257
1:20	1.270
1:25	1.283
1:30	1.297
1:35	1.308
1:40	1.320
1:45	1.331
1:50	1.342
1:55	1.353
2:00	1.365

*DARFs not used for sub-basins (<1 sq mi).



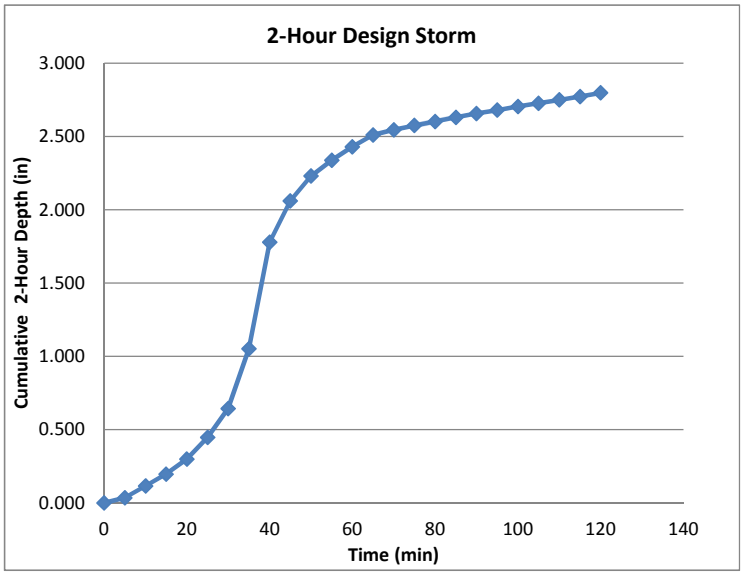
GRANDVIEW RESERVE

2 HOUR DESIGN STORM CUMULATIVE DEPTHS

	Thunderstrom Analysis
	z=6860'
Return Period	1-Hour Depth
(Year)	(Inches)
100	2.50

Cumulative Rainfall Depth	
2-Hour Design Storm	
Time	Cumulative
(5 min)	2-Hour Depth (in)
0:00	0.000
0:05	0.035
0:10	0.115
0:15	0.198
0:20	0.300
0:25	0.448
0:30	0.645
0:35	1.053
0:40	1.780
0:45	2.060
0:50	2.230
0:55	2.338
1:00	2.430
1:05	2.510
1:10	2.545
1:15	2.575
1:20	2.603
1:25	2.630
1:30	2.658
1:35	2.680
1:40	2.705
1:45	2.728
1:50	2.750
1:55	2.773
2:00	2.798

*DARFs not used for sub-basins (<1 sq mi).



GRANDVIEW RESERVE

Proposed Basin Parameters

Basin			Streets (100% impervious)						Roofs (90% Imp.)		Lawns (0% Imp.) (AC)	Composite % Imp.	Hornton Infil. Parameters			HSG Type	
Name	Acreage	# Lots	Type	Length	Width*	Area (SF)	Drive Area (SF)**	Total Area (Ac)	Area (SF)	Area (Ac)			$f_{i\ (Max)}$	$f_{o\ (Min)}$	Decay Coeff.	%A	%B
A	136.48	38	Local	6,384	32	204,288	28,500	7.25	3,000	2.62	126.61	**7.13%**	5.0	1.0	2.52	100.0%	0.0%
			Collector	4,150	20	83,000											
B	50.20	17	Local	3,402	32	108,864	12,750	2.79	3,000	1.17	46.24	**7.75%**	5.0	1.0	2.52	100.0%	0.0%
			Collector	-		-											
C	110.73	31	Local	7,997	32	255,904	23,250	6.41	3,000	2.13	102.19	**7.61%**	5.0	1.0	2.52	100.0%	0.0%
			Collector	2,107	40	84,280											
D	40.28	15	Local	1,583	32	50,656	11,250	1.42	3,000	1.03	37.83	**5.93%**	4.5	0.6	6.48	0.0%	100.0%
			Collector	-		-											
E	60.44	21	Local	3,438	32	110,016	15,750	2.89	3,000	1.45	56.11	**7.02%**	4.5	0.6	6.48	0%	100%
F	105.74	30	Local	5,581	32	178,592	22,500	4.62	3,000	2.07	99.06	**6.22%**	4.6	0.7	5.81	16.9%	83.1%
G	21.93	7	Local	1,228	32	39,296	5,250	1.02	3,000	0.48	20.43	**6.73%**	4.5	0.6	6.48	0.0%	100%
H	52.37	13	Local	2,175	32	69,600	9,750	1.82	3,000	0.90	49.65	**5.11%**	4.5	0.6	6.48	0.0%	100%
V	61.68	0	Local	4,148	16	66,368	-	1.52	3,000	0.00	60.16	**2.57%**	4.9	0.9	3.19	83.1%	16.9%
W	14.49	0	Local	-		-	-	-	3,000	0.00	14.49	**2.00%**	5.0	1.0	2.52	100.0%	0.0%
X	66.04	6	Local	430	32	13,760	4,500	0.42	3,000	0.41	65.21	**1.30%**	4.8	0.8	4.11	59.7%	40.3%
Y	23.96	4	Local	-		-	3,000	0.07	3,000	0.28	23.62	**1.42%**	5.0	1.0	2.52	100.0%	0.0%
Z	22.10	2	Local	325	32	10,400	1,500	0.27	3,000	0.14	21.69	**1.90%**	4.5	0.6	6.48	0.0%	100.0%

*Street widths include gravel shoulders

**Drives assumed to be 15'x50' for each lot

Horton's Equation Parameters				
NRCS HSG	Infil. (in/hr)		Decay Coeff.	
	f_i	f_o	in/s	in/hr
A	5	1	0.0007	2.52
B	4.5	0.6	0.0018	6.48
C	3	0.5	0.0018	6.48
D	3	0.5	0.0018	6.48

Typical Depression Losses for Various Land Covers (All Values in Inches)		
Land Cover	Range in Depression (Retention) Losses	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 areas and open fields	0.2 - 0.6	0.4

Table 3-5 Estimates of Manning's roughness coefficient for overland flow

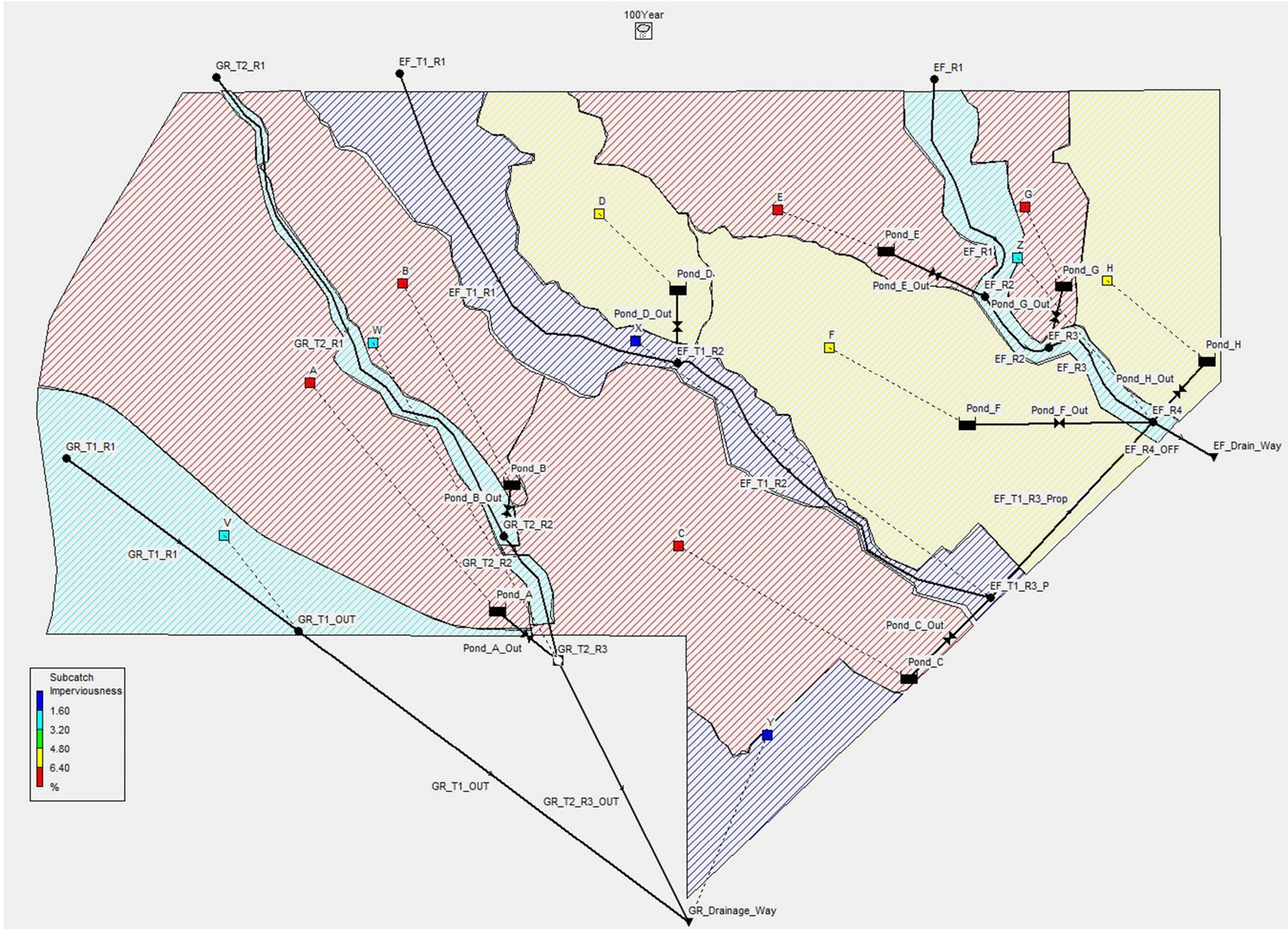
Source	Ground Cover	n	Range
Crawford and Linsley (1966)[a]	Smooth asphalt	0.01	
	Asphalt of concrete paving	0.014	
	Packed clay	0.03	
	Light turf	0.20	
	Dense turf	0.35	
	Dense shrubbery and forest litter	0.4	
Engman (1986)[b]	Concrete or asphalt	0.011	0.010-0.013
	Bare sand	0.010	0.01-0.016
	Graveled surface	0.02	0.012-0.03
	Bare clay-loam (eroded)	0.02	0.012-0.033
	Range (natural)	0.13	0.01-0.32
	Bluegrass sod	0.45	0.39-0.63
	Short grass prairie	0.15	0.10-0.20
	Bermuda grass	0.41	0.30-0.48
Yen (2001)[c]	Smooth asphalt pavement	0.012	0.010-0.015
	Smooth impervious surface	0.013	0.011-0.015
	Tar and sand pavement	0.014	0.012-0.016
	Concrete pavement	0.017	0.014-0.020
	Rough impervious surface	0.019	0.015-0.023
	Smooth bare packed soil	0.021	0.017-0.025
	Moderate bare packed soil	0.030	0.025-0.035
	Rough bare packed soil	0.038	0.032-0.045
	Gravel soil	0.032	0.025-0.045
	Mowed poor grass	0.038	0.030-0.045
	Average grass, closely clipped sod	0.050	0.040-0.060
	Pasture	0.055	0.040-0.070
	Timberland	0.090	0.060-0.120
	Dense grass	0.090	0.060-0.120
	Shrubs and bushes	0.120	0.080-0.180
	Business land use	0.022	0.014-0.035
	Semi-business land use	0.035	0.022-0.050
	Industrial land use	0.035	0.020-0.050
	Dense residential land use	0.040	0.025-0.060
	Suburban residential land use	0.055	0.030-0.080
	Parks and lawns	0.075	0.040-0.120

[a]Obtained by calibration of Stanford Watershed Model.
[b]Computed by Engman (1986) by kinematic wave and storage analysis of measured rainfall-runoff data.
[c]Computed on basis of kinematic wave analysis.

Selected impervious value ranges

Selected pervious value ranges

GRANDVIEW RESERVE SWMM MODEL



EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)

WARNING 04: minimum elevation drop used for Conduit EF_R2
WARNING 04: minimum elevation drop used for Conduit EF_R3
WARNING 04: minimum elevation drop used for Conduit GR_T1_OUT

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... KINWAVE
Starting Date 01/10/2019 00:00:00
Ending Date 01/10/2019 06:00:00
Antecedent Dry Days 0.0
Report Time Step 00:15:00
Wet Time Step 00:05:00
Dry Time Step 01:00:00
Routing Time Step ..... 30.00 sec

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Total Precipitation	85.748	1.365
Evaporation Loss	0.000	0.000
Infiltration Loss	80.958	1.289
Surface Runoff	4.692	0.075
Final Storage	0.140	0.002
Continuity Error (%)	-0.049	

Flow Routing Continuity	Volume acre-feet	Volume 10^6 gal
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	4.692	1.529
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	172.218	56.120
External Outflow	174.711	56.932
Flooding Loss	0.137	0.045
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	2.197	0.716
Continuity Error (%)	-0.077	

****
Highest Flow Instability Indexes
****
Link EF_R4_OFF (42)
Link EF_R3 (39)
Link Pond_G_Out (39)
Link Pond_E_Out (3)
Link EF_R2 (3)

****
Routing Time Step Summary
****
Minimum Time Step : 30.00 sec
Average Time Step : 30.00 sec
Maximum Time Step : 30.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 1.00
Percent Not Converging : 0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
A	1.37	0.00	0.00	1.27	0.10	0.35	37.94	0.070
B	1.36	0.00	0.00	1.26	0.10	0.14	15.90	0.076
C	1.37	0.00	0.00	1.26	0.10	0.27	29.68	0.075
D	1.37	0.00	0.00	1.28	0.08	0.09	10.18	0.057
E	1.37	0.00	0.00	1.27	0.09	0.15	17.79	0.069
F	1.37	0.00	0.00	1.28	0.09	0.25	27.53	0.063
G	1.36	0.00	0.00	1.27	0.09	0.05	6.01	0.065
H	1.37	0.00	0.00	1.30	0.07	0.10	11.43	0.050
V	1.37	0.00	0.00	1.33	0.03	0.06	6.92	0.025
W	1.36	0.00	0.00	1.34	0.03	0.01	1.23	0.020
X	1.36	0.00	0.00	1.35	0.02	0.03	3.62	0.013
Y	1.37	0.00	0.00	1.35	0.02	0.01	1.46	0.014

Z 1.37 0.00 0.00 1.34 0.03 0.02 1.79 0.019

****
Node Depth Summary
****

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
GR_T1_R1	JUNCTION	0.00	0.00	0.00	0 00:00	0.00
GR_T1_OUT	JUNCTION	4.00	4.00	4.00	0 00:00	4.00
GR_T2_R1	JUNCTION	0.00	0.00	0.00	0 00:00	0.00
GR_T2_R2	JUNCTION	4.00	4.00	4.00	0 00:00	4.00
GR_T2_R3	JUNCTION	4.00	4.00	4.00	0 00:00	4.00
EF_T1_R1	JUNCTION	0.00	0.00	0.00	0 00:00	0.00
EF_T1_R2	JUNCTION	4.00	4.00	4.00	0 00:00	4.00
EF_T1_R3_P	JUNCTION	4.00	4.00	4.00	0 00:00	4.00
EF_R1	JUNCTION	0.00	0.00	0.00	0 00:00	0.00
EF_R2	JUNCTION	4.00	4.00	4.00	0 00:00	4.00
EF_R3	JUNCTION	0.00	0.00	0.00	0 00:00	0.00
EF_R4	JUNCTION	4.00	4.00	4.00	0 00:00	4.00
EF_Drain_Way	OUTFALL	4.00	4.00	4.00	0 00:00	4.00
GR_Drainage_Way	OUTFALL	4.00	4.00	4.00	0 00:00	4.00
Pond_A	STORAGE	2.21	2.52	2.52	0 02:22	2.52
Pond_B	STORAGE	2.55	2.86	2.86	0 02:25	2.86
Pond_C	STORAGE	2.64	3.00	18.00	0 02:21	3.00
Pond_D	STORAGE	1.40	2.48	2.48	0 01:15	2.48
Pond_E	STORAGE	2.01	2.54	2.54	0 01:22	2.54
Pond_F	STORAGE	2.30	2.79	2.79	0 01:30	2.79
Pond_G	STORAGE	0.01	0.29	0.29	0 00:46	0.26
Pond_H	STORAGE	1.26	2.43	2.43	0 01:14	2.43

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
GR_T1_R1	JUNCTION	60.38	60.38	0 00:00	9.76	9.75	-0.456
GR_T1_OUT	JUNCTION	6.92	67.30	0 00:45	0.0583	9.85	0.000
GR_T2_R1	JUNCTION	56.77	56.77	0 00:00	9.17	9.17	0.000
GR_T2_R2	JUNCTION	0.00	56.87	0 00:12	0	9.18	-0.275

GR_T2_R3	JUNCTION	1.23	58.50	0	00:45	0.0105	9.28	0.000
EF_T1_R1	JUNCTION	56.40	56.40	0	00:00	9.11	9.11	0.000
EF_T1_R2	JUNCTION	0.00	57.10	0	00:20	0	9.19	0.000
EF_T1_R3_P	JUNCTION	3.62	61.02	0	00:45	0.0312	9.27	0.000
EF_R1	JUNCTION	174.01	174.01	0	00:00	28.1	28.1	0.000
EF_R2	JUNCTION	0.00	174.91	0	00:18	0	28.2	0.000
EF_R3	JUNCTION	0.00	180.33	0	00:46	0	28.3	0.000
EF_R4	JUNCTION	1.79	245.08	0	00:45	0.0152	37.9	0.000
EF_Drain_Way	OUTFALL	0.00	245.08	0	00:45	0	37.9	0.000
GR_Drainage_Way	OUTFALL	1.46	127.27	0	00:45	0.0123	19.1	0.000
Pond_A	STORAGE	37.94	37.94	0	00:45	0.353	0.353	0.008
Pond_B	STORAGE	15.90	15.90	0	00:45	0.141	0.141	0.000
Pond_C	STORAGE	29.68	29.68	0	00:45	0.271	0.271	0.009
Pond_D	STORAGE	10.18	10.18	0	00:45	0.0858	0.0858	-0.073
Pond_E	STORAGE	17.79	17.79	0	00:45	0.154	0.154	0.023
Pond_F	STORAGE	27.53	27.53	0	00:45	0.246	0.246	0.015
Pond_G	STORAGE	6.01	6.01	0	00:45	0.0531	0.0531	0.626
Pond_H	STORAGE	11.43	11.43	0	00:45	0.0961	0.0961	-0.085

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CFS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 gal	Maximum Ponded Volume 1000 ft3
GR_T1_OUT	0.01	199.08	0 00:00	0.045	0.000

****
Storage Volume Summary
****

	Average Volume	Avg Pcnt	Evap Pcnt	Exfil Pcnt	Maximum Volume	Max Pcnt	Time of Max Occurrence	Maximum Outflow

Storage Unit	1000 ft3	Full	Loss	Loss	1000 ft3	Full	days	hr:min	CFS
Pond_A	35.883	30	0	0	43.510	36	0	02:21	0.40
Pond_B	15.042	32	0	0	17.941	38	0	02:24	0.10
Pond_C	27.677	29	0	0	33.506	35	0	02:20	0.30
Pond_D	3.243	6	0	0	7.720	15	0	01:15	0.70
Pond_E	8.640	10	0	0	14.899	17	0	01:21	0.90
Pond_F	16.087	13	0	0	24.698	19	0	01:29	1.20
Pond_G	0.003	0	0	0	0.178	1	0	00:46	5.42
Pond_H	3.018	3	0	0	8.281	9	0	01:14	0.90

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
EF_Drain_Way	100.00	234.45	245.08	37.854
GR_Drainage_Way	100.00	118.14	127.27	19.099
System	100.00	352.59	372.35	56.953

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days	hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
GR_T1_R1	DUMMY	60.38	0	00:00			
GR_T2_R1	DUMMY	56.77	0	00:00			
GR_T2_R2	DUMMY	56.87	0	00:12			
GR_T2_R3_OUT	DUMMY	58.50	0	00:45			
EF_T1_R1	DUMMY	56.40	0	00:00			
EF_T1_R2	DUMMY	57.10	0	00:20			
EF_T1_R3_P	DUMMY	61.02	0	00:45			
EF_R1	DUMMY	174.01	0	00:00			
EF_R2	DUMMY	174.91	0	00:18			
EF_R3	DUMMY	180.33	0	00:46			
EF_R4_OFF	DUMMY	245.08	0	00:45			
GR_T1_OUT	DUMMY	67.30	0	00:45			
Pond_A_Out	DUMMY	0.40	0	00:13			
Pond_B_Out	DUMMY	0.10	0	00:12			
Pond_C_Out	DUMMY	0.30	0	00:13			
Pond_D_Out	DUMMY	0.70	0	00:20			

Pond_F_Out	DUMMY	1.20	0	00:19
Pond_H_Out	DUMMY	0.90	0	00:20
Pond_E_Out	DUMMY	0.90	0	00:18
Pond_G_Out	DUMMY	5.42	0	00:46

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Jan 24 17:23:13 2019
Analysis ended on: Thu Jan 24 17:23:13 2019
Total elapsed time: < 1 sec

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

WARNING 04: minimum elevation drop used for Conduit GR_T1_OUT
WARNING 04: minimum elevation drop used for Conduit EF_R2
WARNING 04: minimum elevation drop used for Conduit EF_R3

***********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
***********************************************************

****************
Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... HORTON
Flow Routing Method ...... KINWAVE
Starting Date ............ 01/10/2019 00:00:00
Ending Date .............. 01/10/2019 06:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:15:00
Wet Time Step ............ 00:05:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 30.00 sec


*************************        Volume         Depth
Runoff Quantity Continuity     acre-feet        inches
*************************     ---------       -------
Total Precipitation ......       175.768         2.798
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........       147.583         2.349
Surface Runoff ...........        28.489         0.454
Final Storage ............         0.140         0.002
Continuity Error (%) .....        -0.253


*************************        Volume        Volume
Flow Routing Continuity        acre-feet      10^6 gal
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......        28.489         9.284
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........       538.039       175.328
External Outflow .........       566.405       184.572
Flooding Loss ............         0.137         0.045
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....        -0.002
```

****
Highest Flow Instability Indexes
****
Link EF_R4_OFF (61)
Link EF_T1_R3_Prop (55)
Link GR_T2_R3_OUT (52)
Link EF_R3 (49)
Link Pond_C_Out (44)

****
Routing Time Step Summary
****
Minimum Time Step : 30.00 sec
Average Time Step : 30.00 sec
Maximum Time Step : 30.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 1.00
Percent Not Converging : 0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
A	2.80	0.00	0.00	2.58	0.22	0.82	90.50	0.080
B	2.80	0.00	0.00	2.55	0.25	0.34	38.85	0.090
C	2.80	0.00	0.00	2.56	0.24	0.64	71.19	0.086
D	2.80	0.00	0.00	1.91	0.90	0.99	66.24	0.323
E	2.80	0.00	0.00	1.93	0.88	1.44	87.84	0.314
F	2.80	0.00	0.00	1.97	0.84	2.40	136.08	0.299
G	2.80	0.00	0.00	2.02	0.78	0.47	24.56	0.279
H	2.80	0.00	0.00	1.93	0.88	1.25	83.17	0.314
V	2.80	0.00	0.00	2.67	0.13	0.21	18.91	0.045
W	2.80	0.00	0.00	2.72	0.08	0.03	3.39	0.028
X	2.80	0.00	0.00	2.66	0.14	0.25	13.19	0.050
Y	2.80	0.00	0.00	2.71	0.09	0.06	6.57	0.032

Z	2.80	0.00	0.00	2.18	0.63	0.38	17.63	0.224

Node Depth Summary

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
GR_T1_R1	JUNCTION	0.00	0.00	0.00	0 00:00	0.00
GR_T1_OUT	JUNCTION	4.00	4.00	4.00	0 00:00	4.00
GR_T2_R1	JUNCTION	0.00	0.00	0.00	0 00:00	0.00
GR_T2_R2	JUNCTION	4.00	4.00	4.00	0 00:00	4.00
GR_T2_R3	JUNCTION	4.00	4.00	4.00	0 00:00	4.00
EF_T1_R1	JUNCTION	0.00	0.00	0.00	0 00:00	0.00
EF_T1_R2	JUNCTION	4.00	4.00	4.00	0 00:00	4.00
EF_T1_R3_P	JUNCTION	4.00	4.00	4.00	0 00:00	4.00
EF_R1	JUNCTION	0.00	0.00	0.00	0 00:00	0.00
EF_R2	JUNCTION	4.00	4.00	4.00	0 00:00	4.00
EF_R4	JUNCTION	4.00	4.00	4.00	0 00:00	4.00
EF_R3	JUNCTION	0.00	0.00	0.00	0 00:00	0.00
GR_Drainage_Way	OUTFALL	4.00	4.00	4.00	0 00:00	4.00
EF_Drain_Way	OUTFALL	4.00	4.00	4.00	0 00:00	4.00
Pond_A	STORAGE	0.11	1.75	1.75	0 00:53	1.55
Pond_B	STORAGE	0.22	2.43	2.43	0 00:56	2.39
Pond_C	STORAGE	0.09	1.82	16.82	0 00:51	1.26
Pond_D	STORAGE	0.25	3.02	3.02	0 01:02	3.00
Pond_E	STORAGE	0.33	3.01	3.01	0 01:07	2.92
Pond_F	STORAGE	0.43	3.39	3.39	0 01:11	3.35
Pond_G	STORAGE	0.35	2.12	2.12	0 01:14	2.12
Pond_H	STORAGE	0.28	2.99	2.99	0 01:04	2.96

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
GR_T1_R1	JUNCTION	394.09	394.09	0 00:00	63.7	63.6	-0.070
GR_T1_OUT	JUNCTION	18.91	413.00	0 00:45	0.213	63.9	0.000
GR_T2_R1	JUNCTION	216.31	216.31	0 00:00	34.9	34.9	0.000
GR_T2_R2	JUNCTION	0.00	230.31	0 00:37	0	35.3	-0.072

GR_T2_R3	JUNCTION	3.39	277.00	0	00:45	0.0307	36.1	0.000
EF_T1_R1	JUNCTION	115.77	115.77	0	00:00	18.7	18.7	0.000
EF_T1_R2	JUNCTION	0.00	163.77	0	00:44	0	19.7	0.000
EF_T1_R3_P	JUNCTION	13.19	217.06	0	00:45	0.25	20.6	0.000
EF_R1	JUNCTION	359.67	359.67	0	00:00	58.1	58.1	0.000
EF_R2	JUNCTION	0.00	418.07	0	00:43	0	59.5	0.000
EF_R4	JUNCTION	17.63	807.56	0	00:55	0.376	84.5	0.000
EF_R3	JUNCTION	0.00	432.64	0	01:14	0	60	0.000
GR_Drainage_Way	OUTFALL	6.57	696.57	0	00:45	0.0586	100	0.000
EF_Drain_Way	OUTFALL	0.00	807.56	0	00:55	0	84.5	0.000
Pond_A	STORAGE	90.50	90.50	0	00:45	0.825	0.825	1.104
Pond_B	STORAGE	38.85	38.85	0	00:45	0.345	0.345	0.594
Pond_C	STORAGE	71.19	71.19	0	00:45	0.642	0.642	1.200
Pond_D	STORAGE	66.24	66.24	0	00:50	0.987	0.987	0.330
Pond_E	STORAGE	87.84	87.84	0	00:45	1.44	1.44	0.638
Pond_F	STORAGE	136.08	136.08	0	00:45	2.4	2.4	0.237
Pond_G	STORAGE	24.56	24.56	0	00:45	0.465	0.465	0.019
Pond_H	STORAGE	83.17	83.17	0	00:50	1.25	1.25	0.269

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CFS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 gal	Maximum Ponded Volume 1000 ft3
GR_T1_OUT	0.01	199.08	0 00:00	0.045	0.000

****
Storage Volume Summary
****

	Average Volume	Avg Pcnt	Evap Pcnt	Exfil Pcnt	Maximum Volume	Max Pcnt	Time of Max Occurrence	Maximum Outflow

Storage Unit	1000 ft3	Full	Loss	Loss	1000 ft3	Full	days	hr:min	CFS
Pond_A	0.762	1	0	0	16.705	14	0	00:53	43.30
Pond_B	0.721	2	0	0	11.026	23	0	00:56	14.00
Pond_C	0.288	0	0	0	8.641	9	0	00:50	40.10
Pond_D	0.811	2	0	0	13.192	25	0	01:02	48.00
Pond_E	2.004	2	0	0	25.297	29	0	01:06	58.40
Pond_F	4.338	3	0	0	46.610	36	0	01:11	83.30
Pond_G	1.730	5	0	0	13.979	41	0	01:14	14.57
Pond_H	1.223	1	0	0	18.574	20	0	01:03	58.60

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
GR_Drainage_Way	100.00	619.44	696.57	100.038
EF_Drain_Way	100.00	523.61	807.56	84.545
System	100.00	1143.05	1497.86	184.583

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days	hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
GR_T1_R1	DUMMY	394.09	0	00:00			
GR_T1_OUT	DUMMY	413.00	0	00:45			
GR_T2_R1	DUMMY	216.31	0	00:00			
GR_T2_R2	DUMMY	230.31	0	00:37			
GR_T2_R3_OUT	DUMMY	277.00	0	00:45			
EF_T1_R1	DUMMY	115.77	0	00:00			
EF_T1_R2	DUMMY	163.77	0	00:44			
EF_T1_R3_Prop	DUMMY	217.06	0	00:45			
EF_R1	DUMMY	359.67	0	00:00			
EF_R2	DUMMY	418.07	0	00:43			
EF_R3	DUMMY	432.64	0	01:14			
EF_R4_OFF	DUMMY	807.56	0	00:55			
Pond_A_Out	DUMMY	43.30	0	00:40			
Pond_B_Out	DUMMY	14.00	0	00:37			
Pond_C_Out	DUMMY	40.10	0	00:40			
Pond_D_Out	DUMMY	48.00	0	00:44			

Pond_F_Out	DUMMY	83.30	0	00:43
Pond_H_Out	DUMMY	58.60	0	00:44
Pond_E_Out	DUMMY	58.40	0	00:43
Pond_G_Out	DUMMY	14.57	0	01:14

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Jan 24 15:41:06 2019
Analysis ended on: Thu Jan 24 15:41:06 2019
Total elapsed time: < 1 sec

APPENDIX C

HYDRAULIC CALCULATIONS

Drainage Way Design Flow Comparison Table						
Drainageway	Source	Design Point from Source	Design Storm		Selected Flows	
			$Q_{5\ (cfs)}$	$Q_{100\ (cfs)}$	$Q_{5\ (cfs)}$	$Q_{100\ (cfs)}$
Gieck Ranch Tributary 1 (GRT1)	4 Way Ranch LOMR, Kiowa Engineering, Mar. 2004, Case No. 04-08-0012P	Sect. 19, 20, 21	67.3	413	67.3*	413
	Gieck Ranch DBPS Volume 1 Final Report, Oct. 2010, Drexel, Barrell & Co.	MS-R5	119	573		
	Rev. to MDDP Meridian Ranch, Tech Contractors, Jan. 2018	G06	44.1	663		
	MDDP 4 Way Ranch Phase 1, ADP, Inc., Dec. 2011	DP-19	121.6	511.3		
Gieck Ranch Tributary 2 (GRT2)	Final Drianage Report for Falcon Regional Park, JPS Engineering, Oct. 2015	G09	52	277	58.5**	280
	4 Way Ranch LOMR, Kiowa Engineering, Mar. 2004, Case No. 04-08-0012P	Sect. 23	N/A	280		
	Gieck Ranch DBPS Volume 1 Final Report, Oct. 2007, Drexel, Barrell & Co.	MSt2-R2	65	271		
	Rev. to MDDP Meridian Ranch, Tech Contractors, Jan. 2018	G08	10.7	129		
	MDDP 4 Way Ranch Phase 1, ADP, Inc., Dec. 2011	DP-21	126.2	394		
East Fork Tributary 1 (EFT1)	Gieck Ranch DBPS Volume 1 Final Report, Oct. 2010, Drexel, Barrell & Co.	EFT1-R2b	N/A	217	61*	217
		EFT1-R2a	61	217		
		EFT1-B1	46	134		
		EFT1-J2	95	337		
East Fork (EF)	Gieck Ranch DBPS Volume 1 Final Report, Oct. 2010, Drexel, Barrell & Co.	EF-R3	180	595	180*	595
		EF-R2	N/A	285		
		EF-J4	334	1102		

*This study/reach did not provide a 5 Year storm flow rate, therefore an average of the 5 year flows from the other published studies was taken and adjusted to the selected 100 year flow to maintain the relationship between 5 year and 100 year design flows.

*GRT1 ex: 413(*Average(119,44.1,121.6)/Average(573,663,511.3)) = 67.3

EFT1 ex: 217(Average(46,95)/Average(134,337) = 61

EF ex: 595(334/1102) = 180

**An avaerage of 5 year design flows was taken from two more recent studies that agrreed with the selected 100 year LOMR flow rate

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Jan 10 2019

BASIN C SWALE - CAPACITY

Trapezoidal

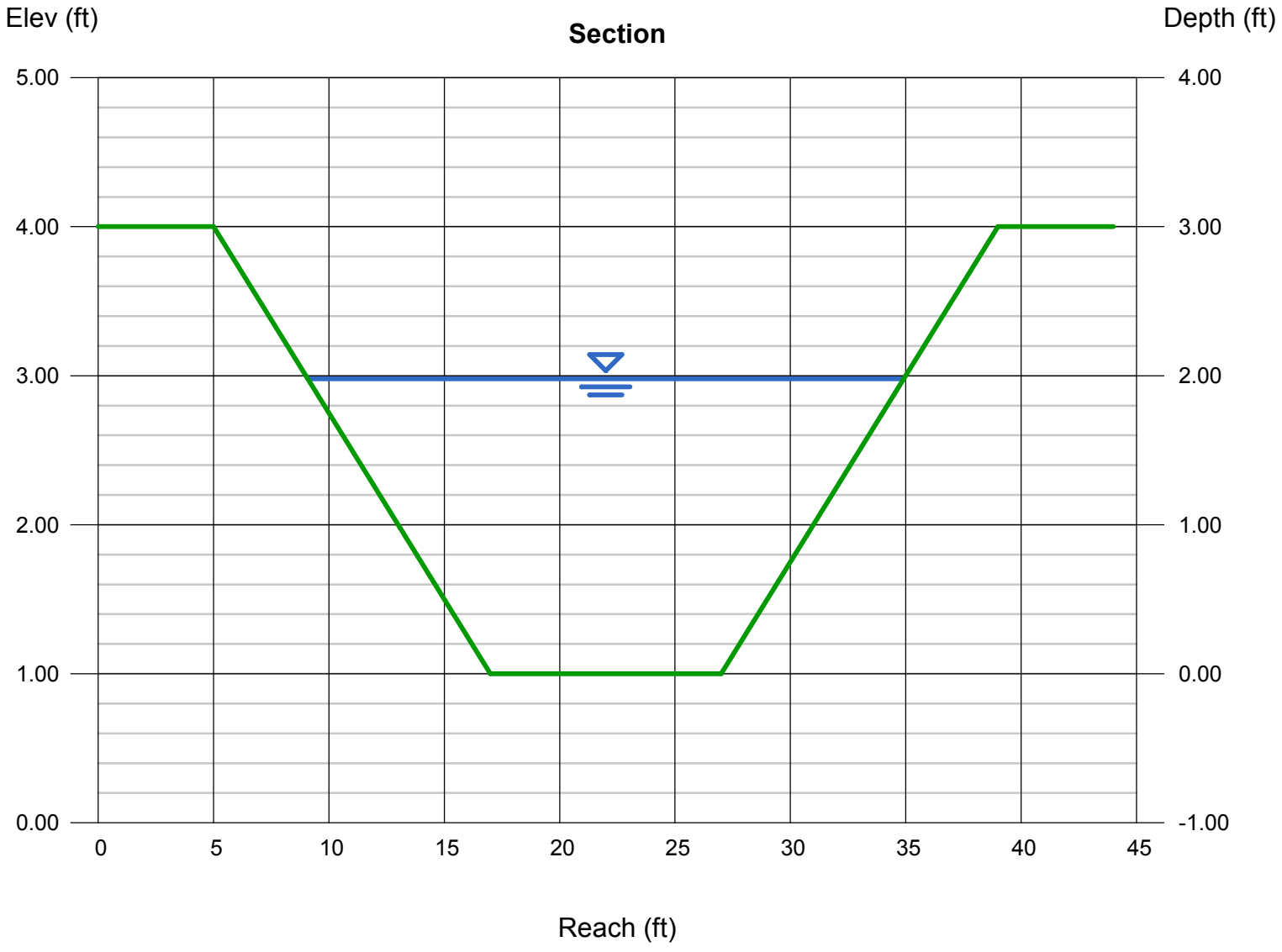
Bottom Width (ft)	= 10.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 3.00
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.040

Calculations

Compute by:	Q vs Depth
No. Increments	= 50

Highlighted

Depth (ft)	= 1.98
Q (cfs)	= 113.73
Area (sqft)	= 35.48
Velocity (ft/s)	= 3.21
Wetted Perim (ft)	= 26.33
Crit Depth, Yc (ft)	= 1.33
Top Width (ft)	= 25.84
EGL (ft)	= 2.14



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Jan 10 2019

BASIN C SWALE - VELOCITY

Trapezoidal

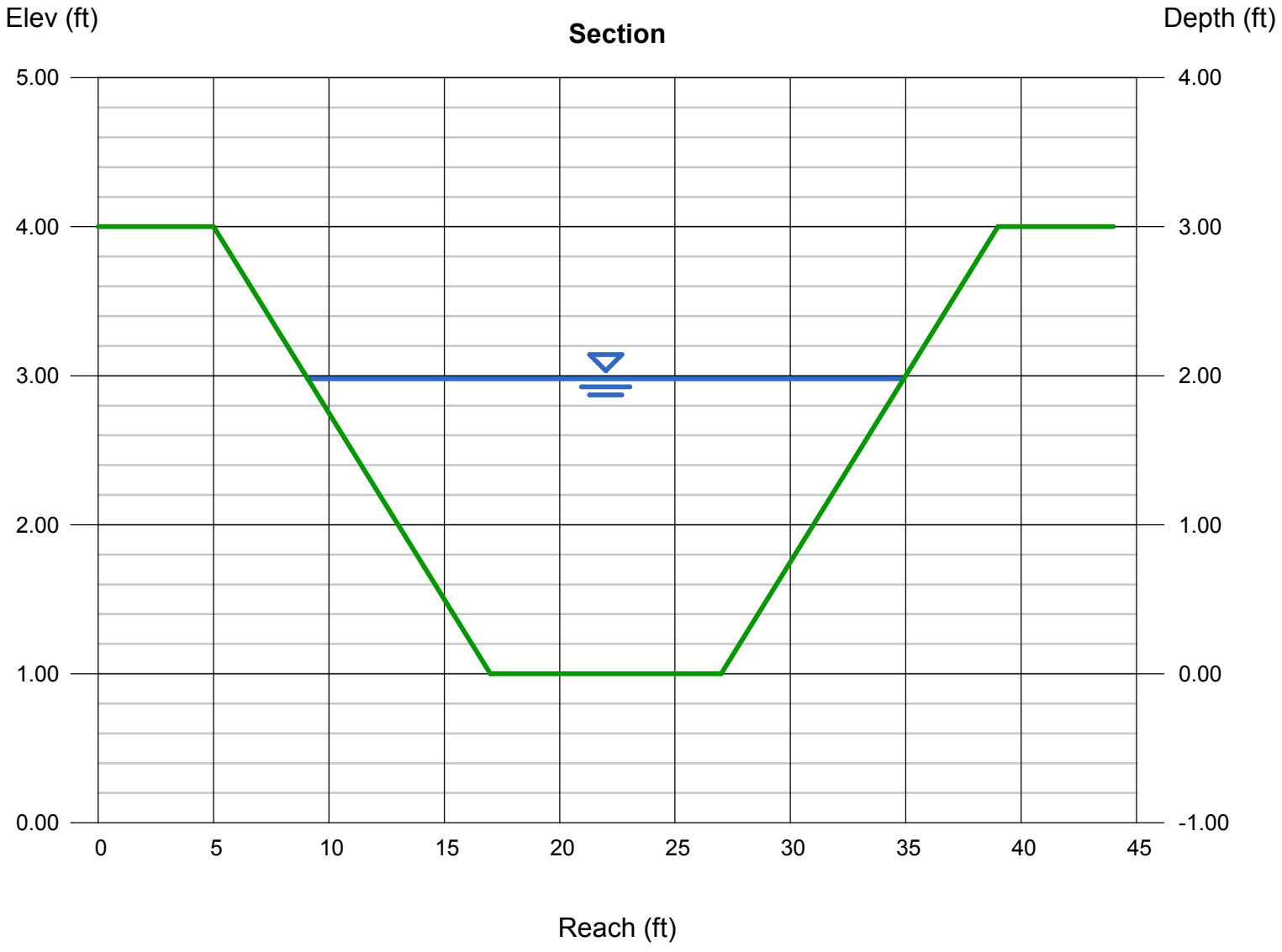
Bottom Width (ft)	= 10.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 3.00
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.030

Calculations

Compute by:	Q vs Depth
No. Increments	= 50

Highlighted

Depth (ft)	= 1.98
Q (cfs)	= 151.64
Area (sqft)	= 35.48
Velocity (ft/s)	= 4.27
Wetted Perim (ft)	= 26.33
Crit Depth, Yc (ft)	= 1.56
Top Width (ft)	= 25.84
EGL (ft)	= 2.26



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Friday, Jan 25 2019

Basin D Swale - Capacity

Trapezoidal

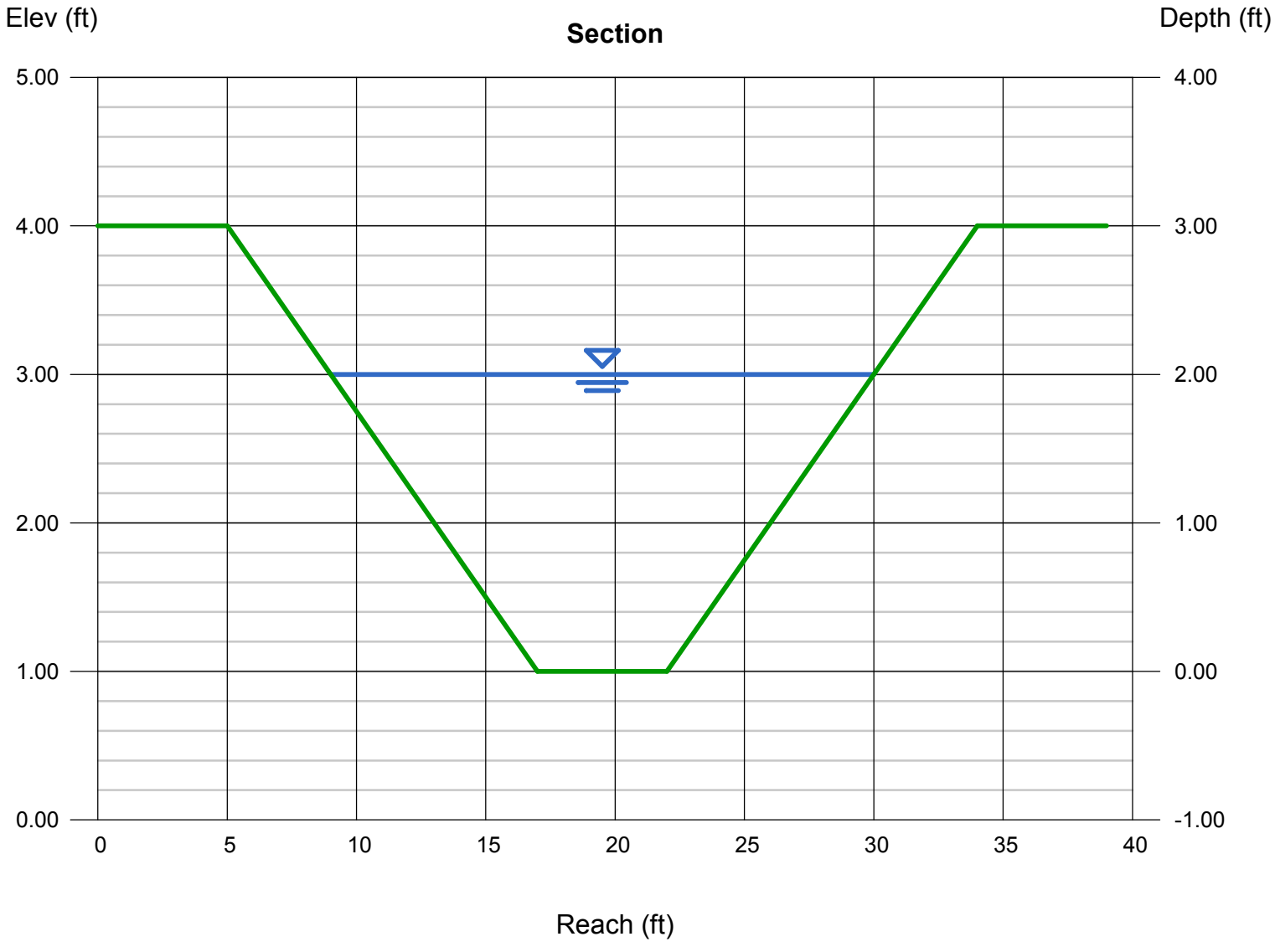
Bottom Width (ft)	= 5.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 3.00
Invert Elev (ft)	= 1.00
Slope (%)	= 1.30
N-Value	= 0.040

Calculations

Compute by:	Q vs Depth
No. Increments	= 3

Highlighted

Depth (ft)	= 2.00
Q (cfs)	= 125.04
Area (sqft)	= 26.00
Velocity (ft/s)	= 4.81
Wetted Perim (ft)	= 21.49
Crit Depth, Yc (ft)	= 1.75
Top Width (ft)	= 21.00
EGL (ft)	= 2.36



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Friday, Jan 25 2019

Basin D Swale - Velocity

Trapezoidal

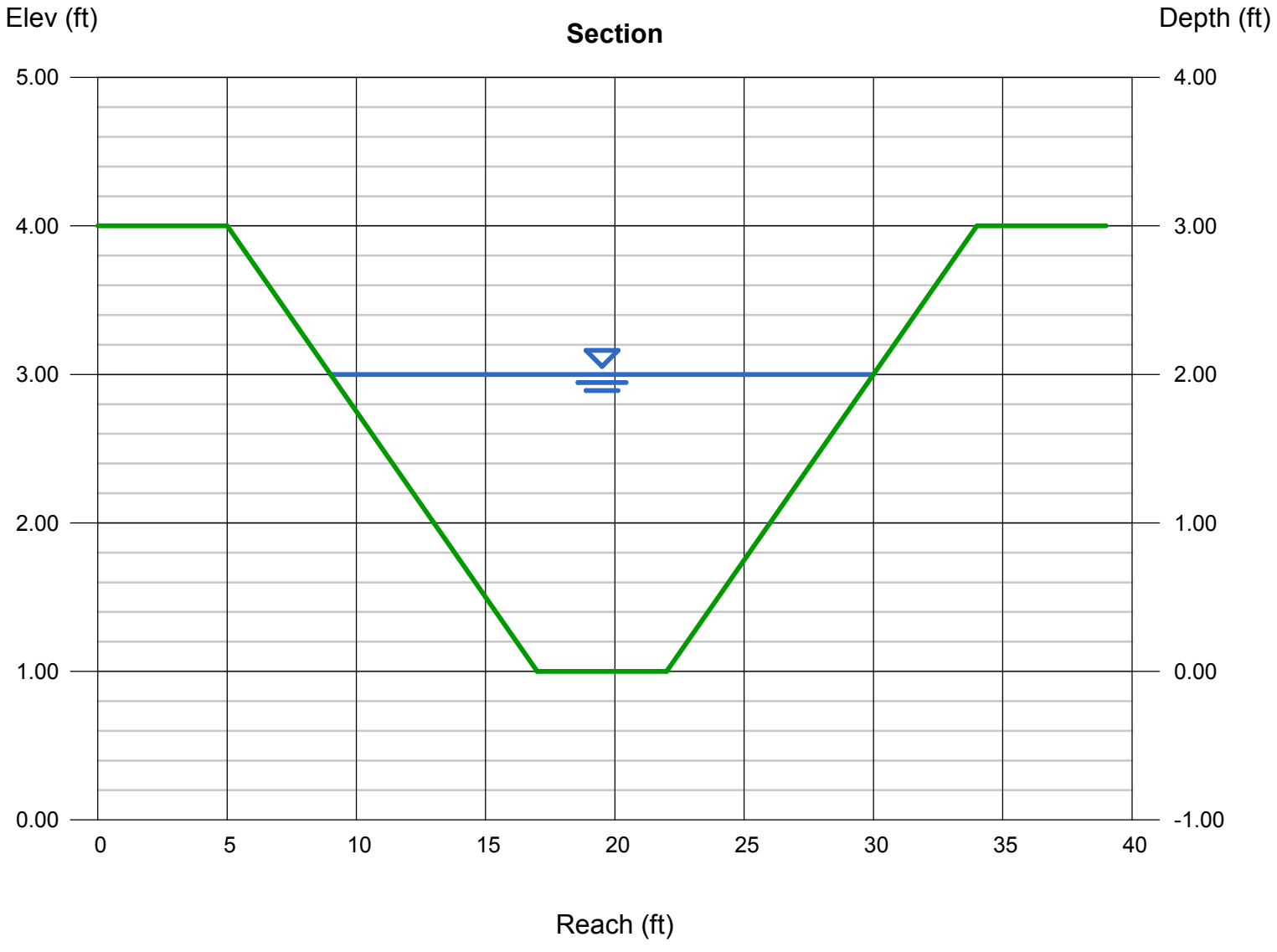
Bottom Width (ft)	= 5.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 3.00
Invert Elev (ft)	= 1.00
Slope (%)	= 1.30
N-Value	= 0.030

Calculations

Compute by:	Q vs Depth
No. Increments	= 3

Highlighted

Depth (ft)	= 2.00
Q (cfs)	= 166.72
Area (sqft)	= 26.00
Velocity (ft/s)	= 6.41
Wetted Perim (ft)	= 21.49
Crit Depth, Yc (ft)	= 2.02
Top Width (ft)	= 21.00
EGL (ft)	= 2.64



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Friday, Jan 25 2019

East Fork Tributary 1 Reach 3 - Proposed Channel_Capacity

Trapezoidal

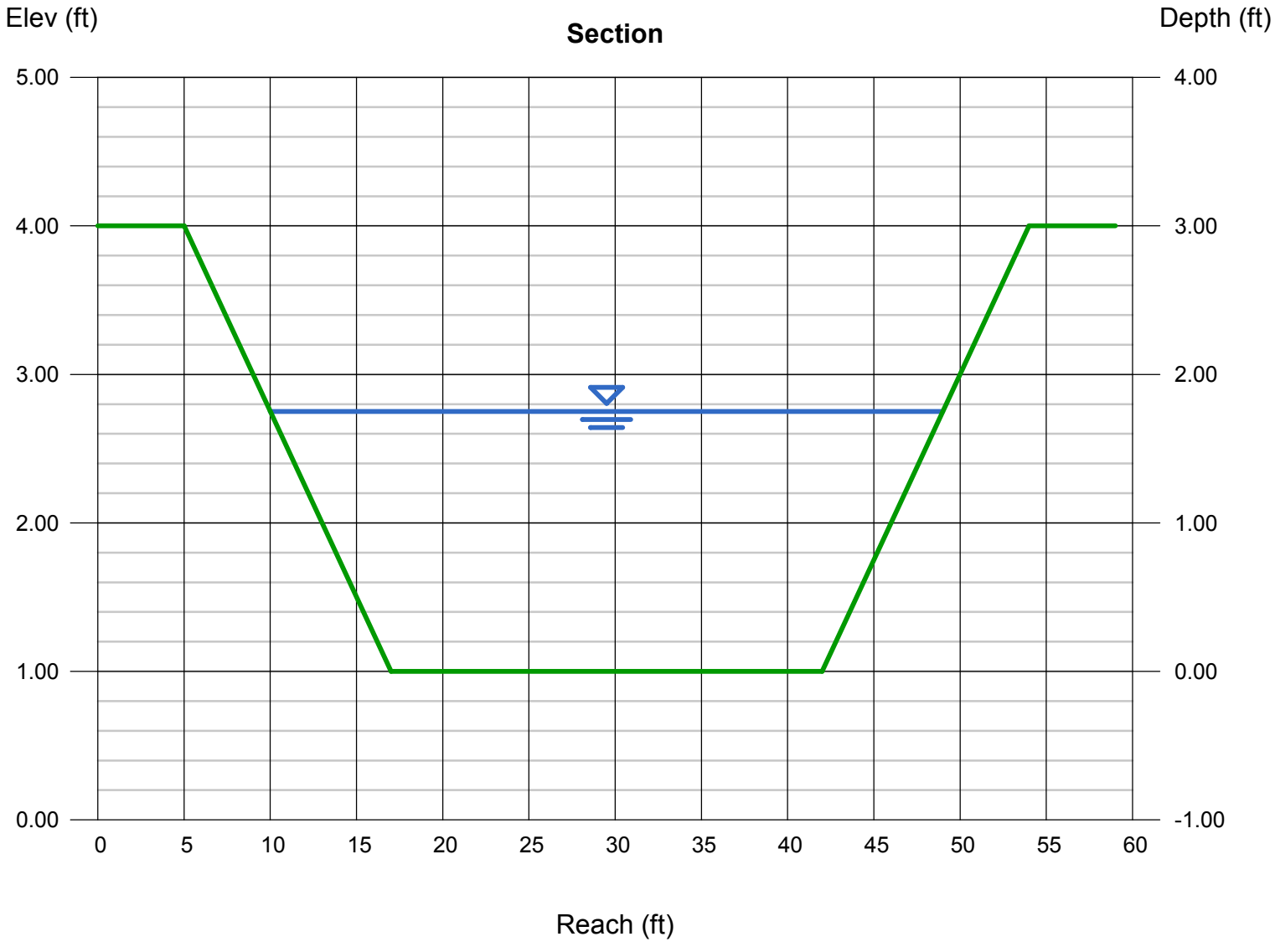
Bottom Width (ft)	= 25.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 3.00
Invert Elev (ft)	= 1.00
Slope (%)	= 0.69
N-Value	= 0.040

Calculations

Compute by:	Known Q
Known Q (cfs)	= 217.00

Highlighted

Depth (ft)	= 1.75
Q (cfs)	= 217.00
Area (sqft)	= 56.00
Velocity (ft/s)	= 3.88
Wetted Perim (ft)	= 39.43
Crit Depth, Yc (ft)	= 1.24
Top Width (ft)	= 39.00
EGL (ft)	= 1.98



Channel Report

East Fork Tributary 1 Reach 3 - Proposed Channel_Velocity

Trapezoidal

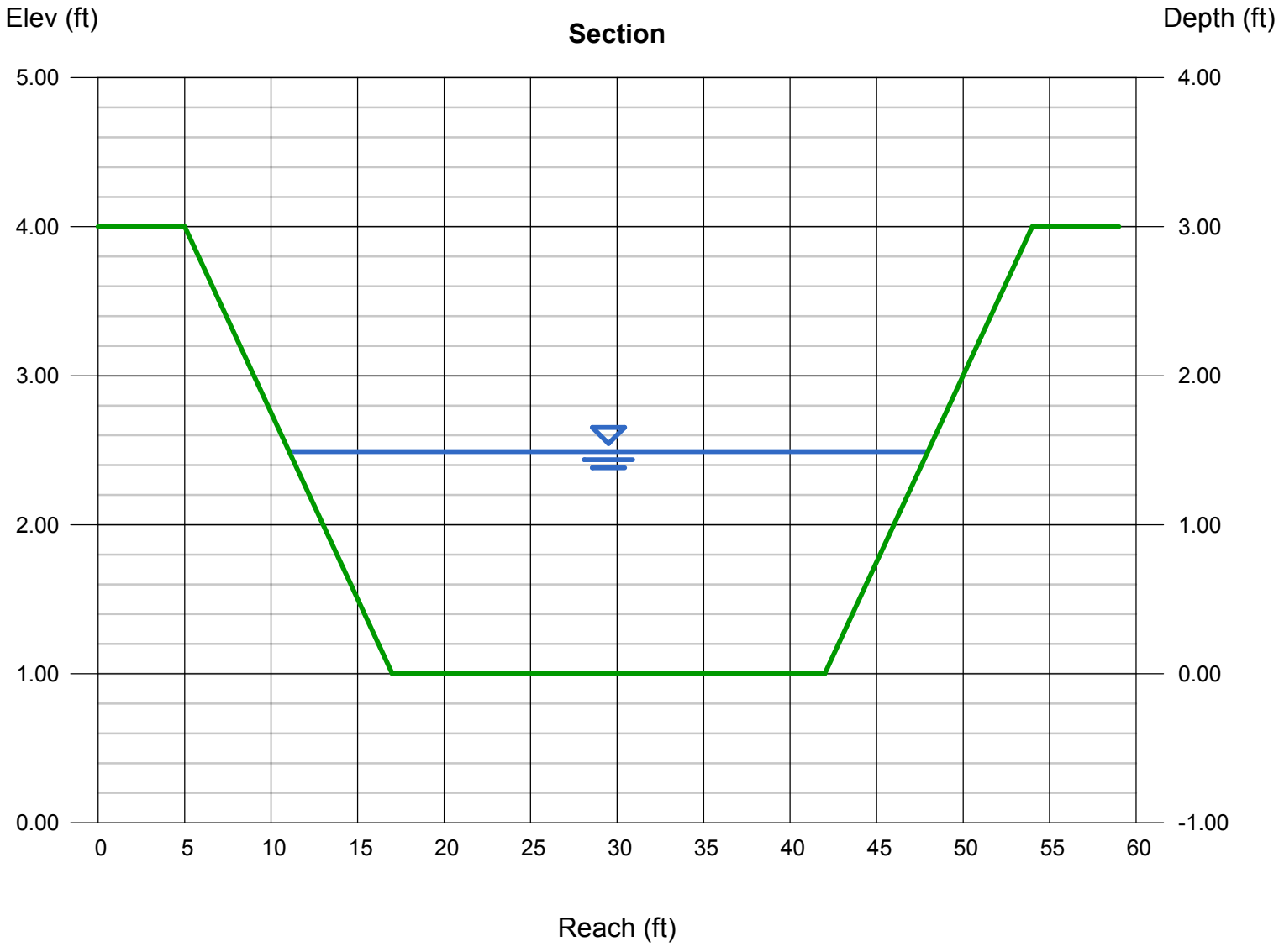
Bottom Width (ft)	= 25.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 3.00
Invert Elev (ft)	= 1.00
Slope (%)	= 0.69
N-Value	= 0.030

Calculations

Compute by:	Known Q
Known Q (cfs)	= 217.00

Highlighted

Depth (ft)	= 1.49
Q (cfs)	= 217.00
Area (sqft)	= 46.13
Velocity (ft/s)	= 4.70
Wetted Perim (ft)	= 37.29
Crit Depth, Yc (ft)	= 1.24
Top Width (ft)	= 36.92
EGL (ft)	= 1.83



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Friday, Jan 18 2019

East Fork Tributary 1 Reach 2 - Proposed Channel_Capacity

Trapezoidal

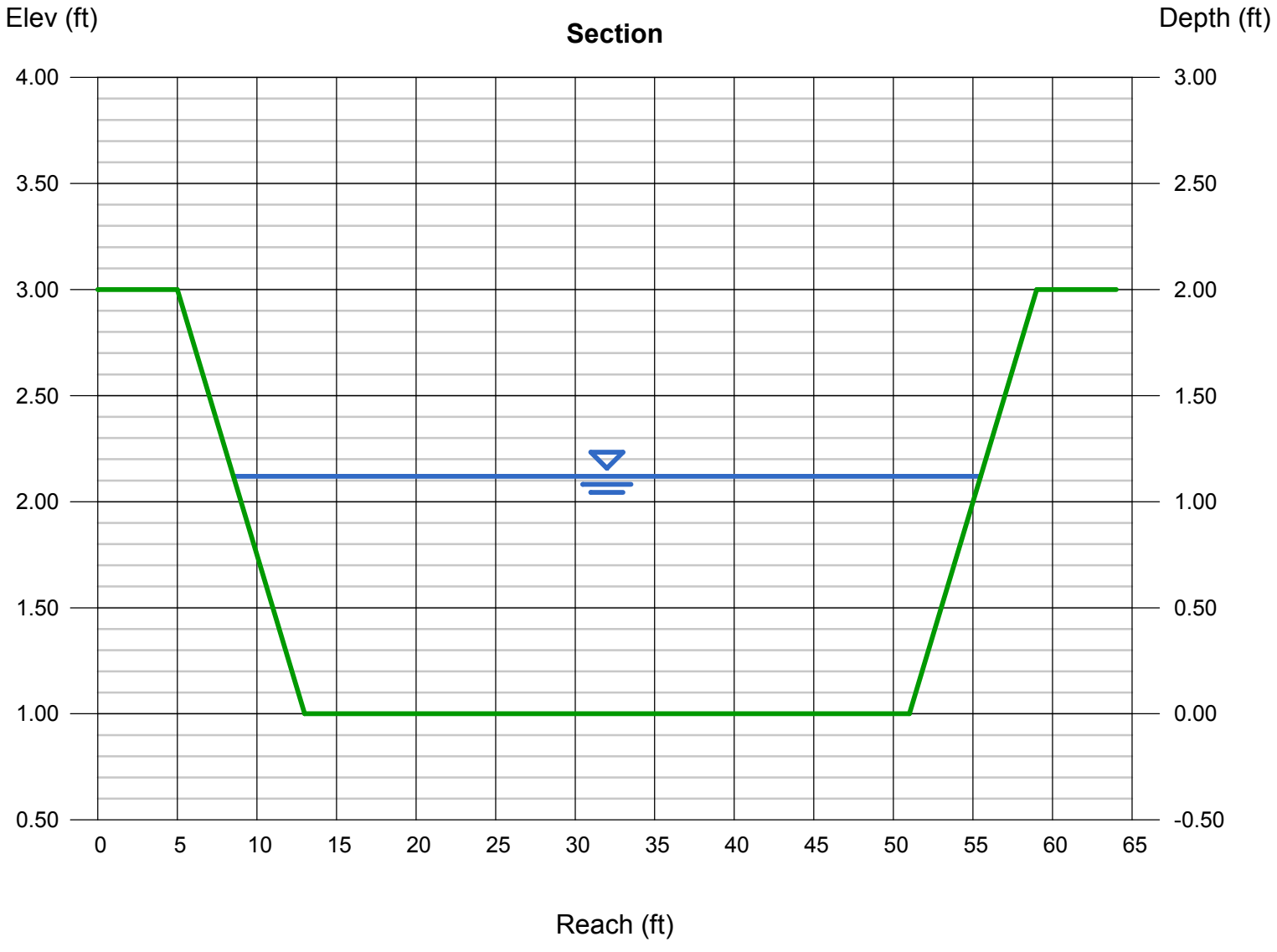
Bottom Width (ft)	= 38.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 1.58
N-Value	= 0.050

Calculations

Compute by:	Known Q
Known Q (cfs)	= 177.00

Highlighted

Depth (ft)	= 1.12
Q (cfs)	= 177.00
Area (sqft)	= 47.58
Velocity (ft/s)	= 3.72
Wetted Perim (ft)	= 47.24
Crit Depth, Yc (ft)	= 0.86
Top Width (ft)	= 46.96
EGL (ft)	= 1.34



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Friday, Jan 18 2019

East Fork Tributary 1 Reach 2 - Proposed Channel_Velocity

Trapezoidal

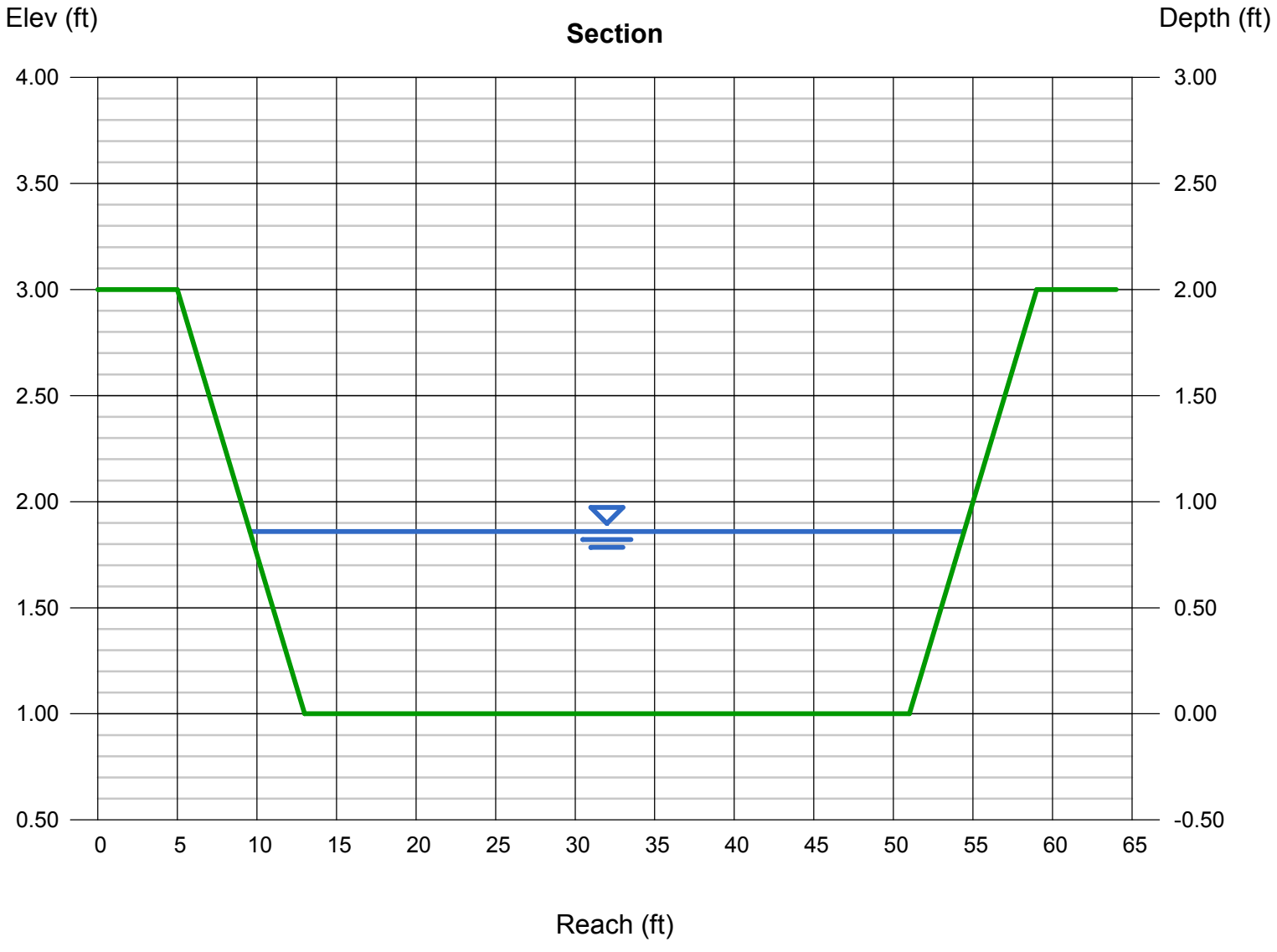
Bottom Width (ft)	= 38.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 1.58
N-Value	= 0.032

Calculations

Compute by:	Known Q
Known Q (cfs)	= 177.00

Highlighted

Depth (ft)	= 0.86
Q (cfs)	= 177.00
Area (sqft)	= 35.64
Velocity (ft/s)	= 4.97
Wetted Perim (ft)	= 45.09
Crit Depth, Yc (ft)	= 0.86
Top Width (ft)	= 44.88
EGL (ft)	= 1.24



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Jan 17 2019

Gieck Ranch Tributary 2 - Proposed Channel Section Capacity Check

Trapezoidal

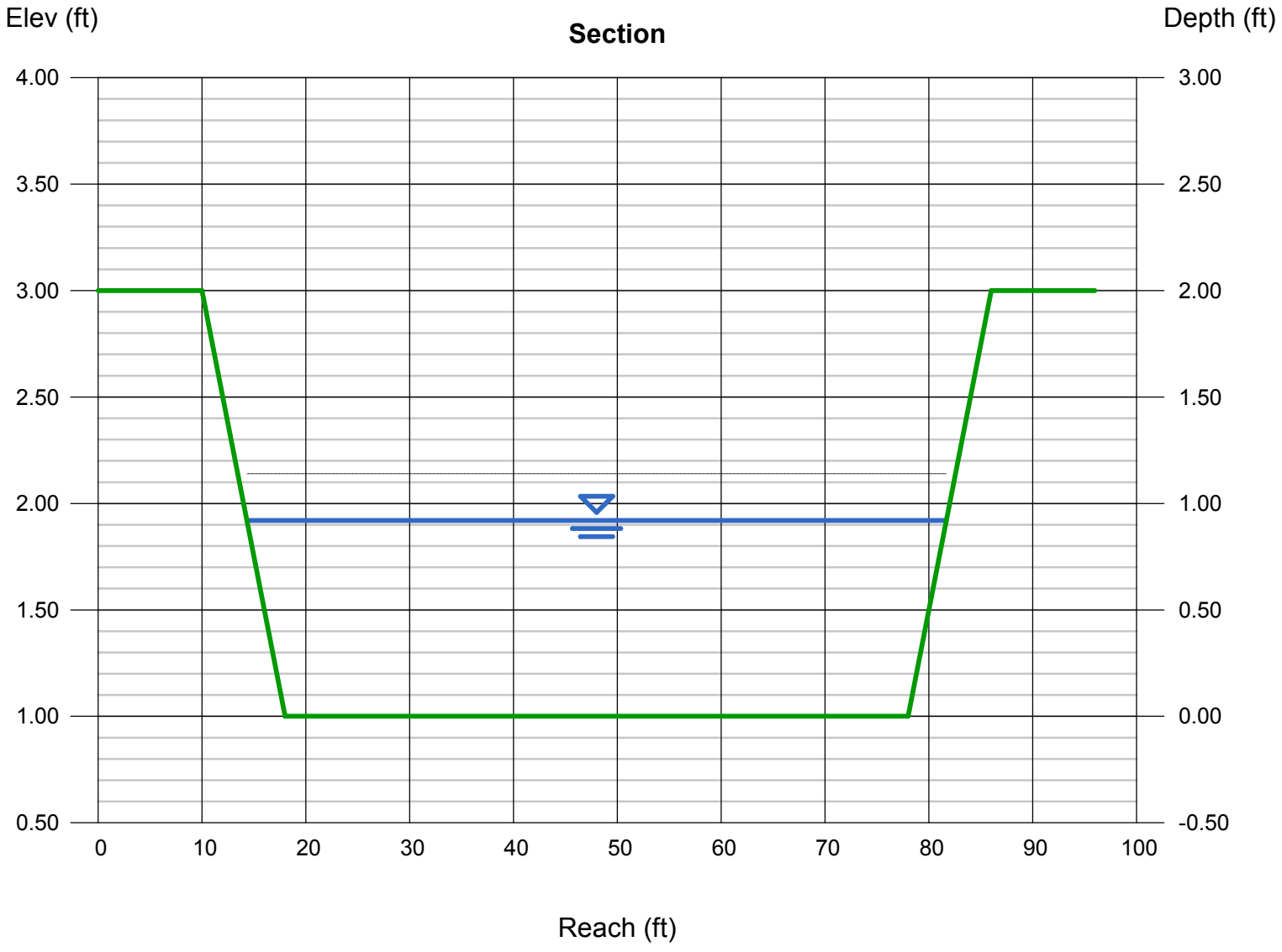
Bottom Width (ft)	= 60.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 2.00
N-Value	= 0.050

Calculations

Compute by:	Known Q
Known Q (cfs)	= 220.00

Highlighted

Depth (ft)	= 0.92
Q (cfs)	= 220.00
Area (sqft)	= 58.59
Velocity (ft/s)	= 3.76
Wetted Perim (ft)	= 67.59
Crit Depth, Yc (ft)	= 0.74
Top Width (ft)	= 67.36
EGL (ft)	= 1.14



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Jan 17 2019

Gieck Ranch Tributary 2 - Proposed Channel Section Velocity Check

Trapezoidal

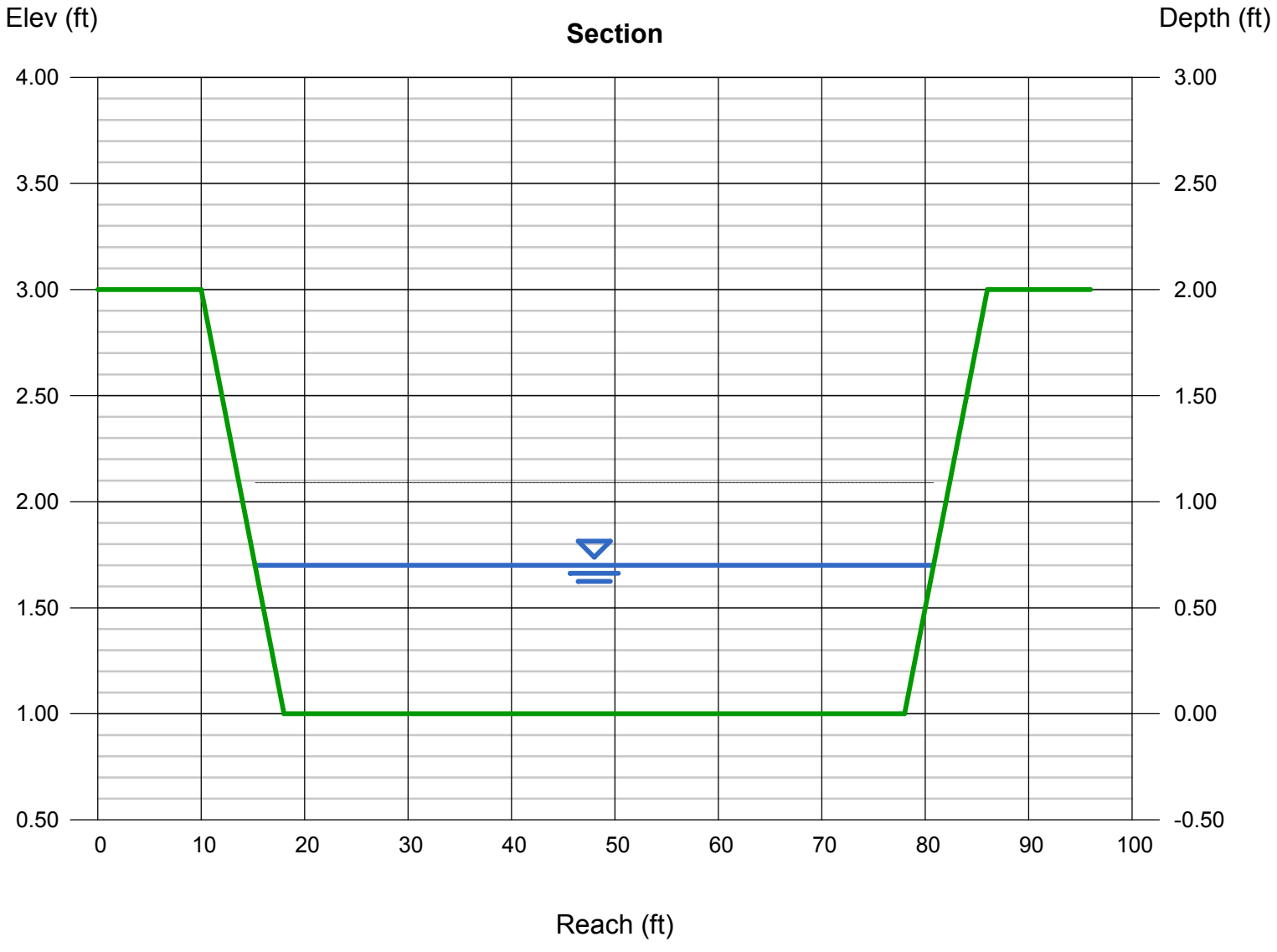
Bottom Width (ft)	= 60.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 2.00
N-Value	= 0.032

Calculations

Compute by:	Known Q
Known Q (cfs)	= 220.00

Highlighted

Depth (ft)	= 0.70
Q (cfs)	= 220.00
Area (sqft)	= 43.96
Velocity (ft/s)	= 5.00
Wetted Perim (ft)	= 65.77
Crit Depth, Yc (ft)	= 0.74
Top Width (ft)	= 65.60
EGL (ft)	= 1.09



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Jan 17 2019

Gieck Ranch Tributary 2_Reach 1 - Proposed Channel Section Capacity Check

Trapezoidal

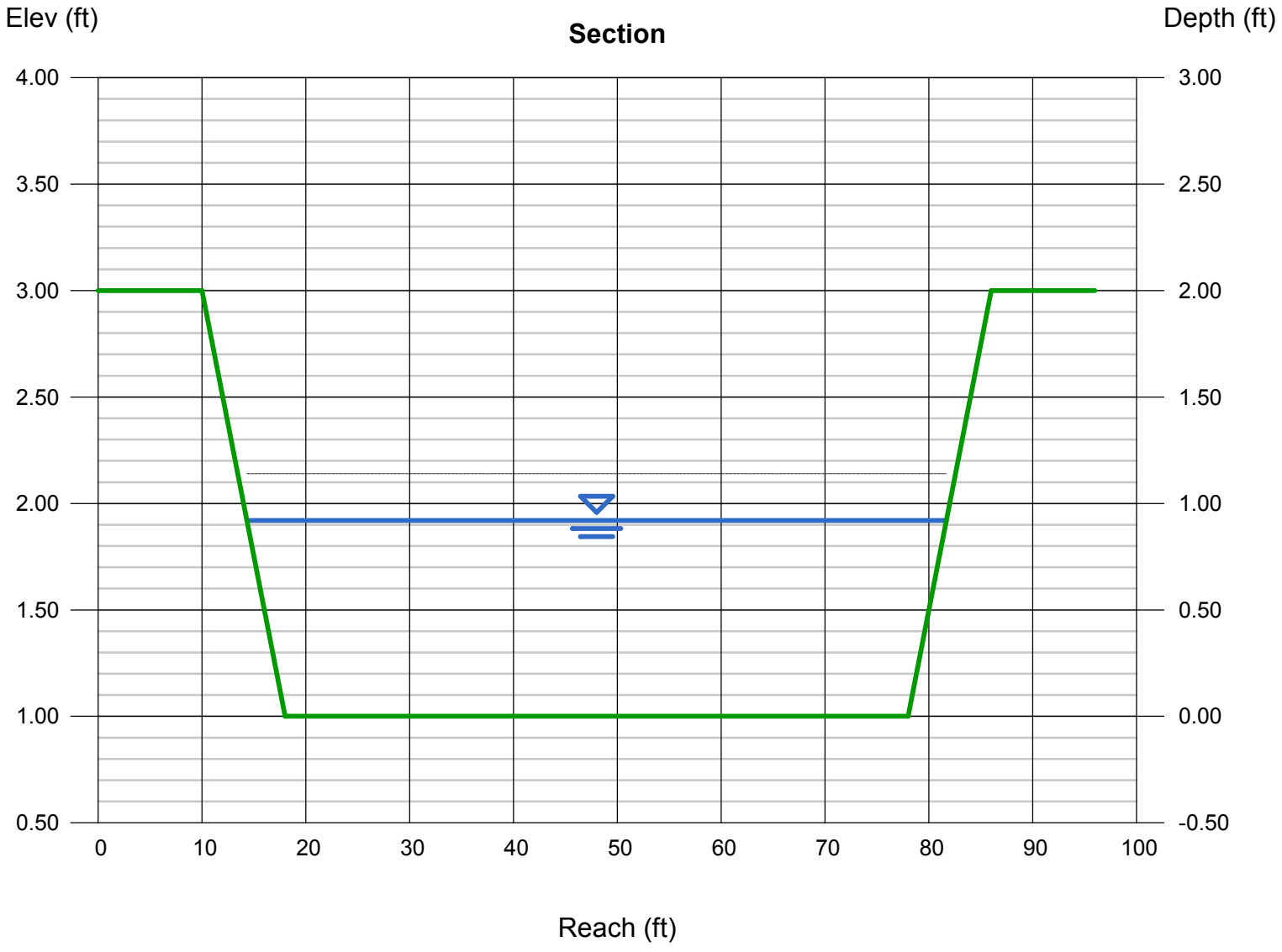
Bottom Width (ft)	= 60.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 2.00
N-Value	= 0.050

Calculations

Compute by:	Known Q
Known Q (cfs)	= 220.00

Highlighted

Depth (ft)	= 0.92
Q (cfs)	= 220.00
Area (sqft)	= 58.59
Velocity (ft/s)	= 3.76
Wetted Perim (ft)	= 67.59
Crit Depth, Yc (ft)	= 0.74
Top Width (ft)	= 67.36
EGL (ft)	= 1.14



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Jan 17 2019

Gieck Ranch Tributary 2_Reach 1 - Proposed Channel Section Velocity Check

Trapezoidal

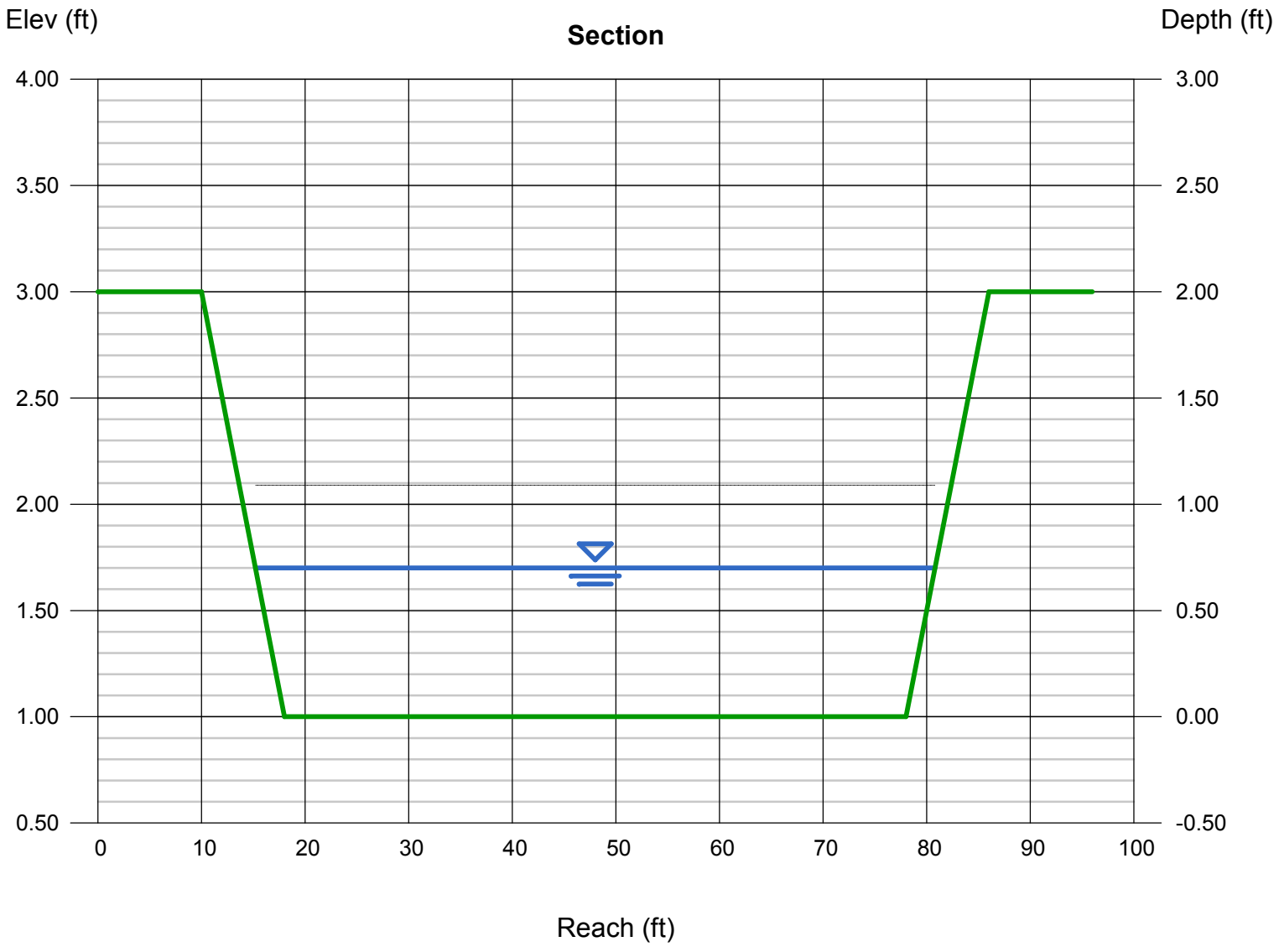
Bottom Width (ft)	= 60.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 2.00
N-Value	= 0.032

Calculations

Compute by:	Known Q
Known Q (cfs)	= 220.00

Highlighted

Depth (ft)	= 0.70
Q (cfs)	= 220.00
Area (sqft)	= 43.96
Velocity (ft/s)	= 5.00
Wetted Perim (ft)	= 65.77
Crit Depth, Yc (ft)	= 0.74
Top Width (ft)	= 65.60
EGL (ft)	= 1.09



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Jan 17 2019

Gieck Ranch Tributary 2_Reach 2 - Proposed Channel Section Capacity Check

Trapezoidal

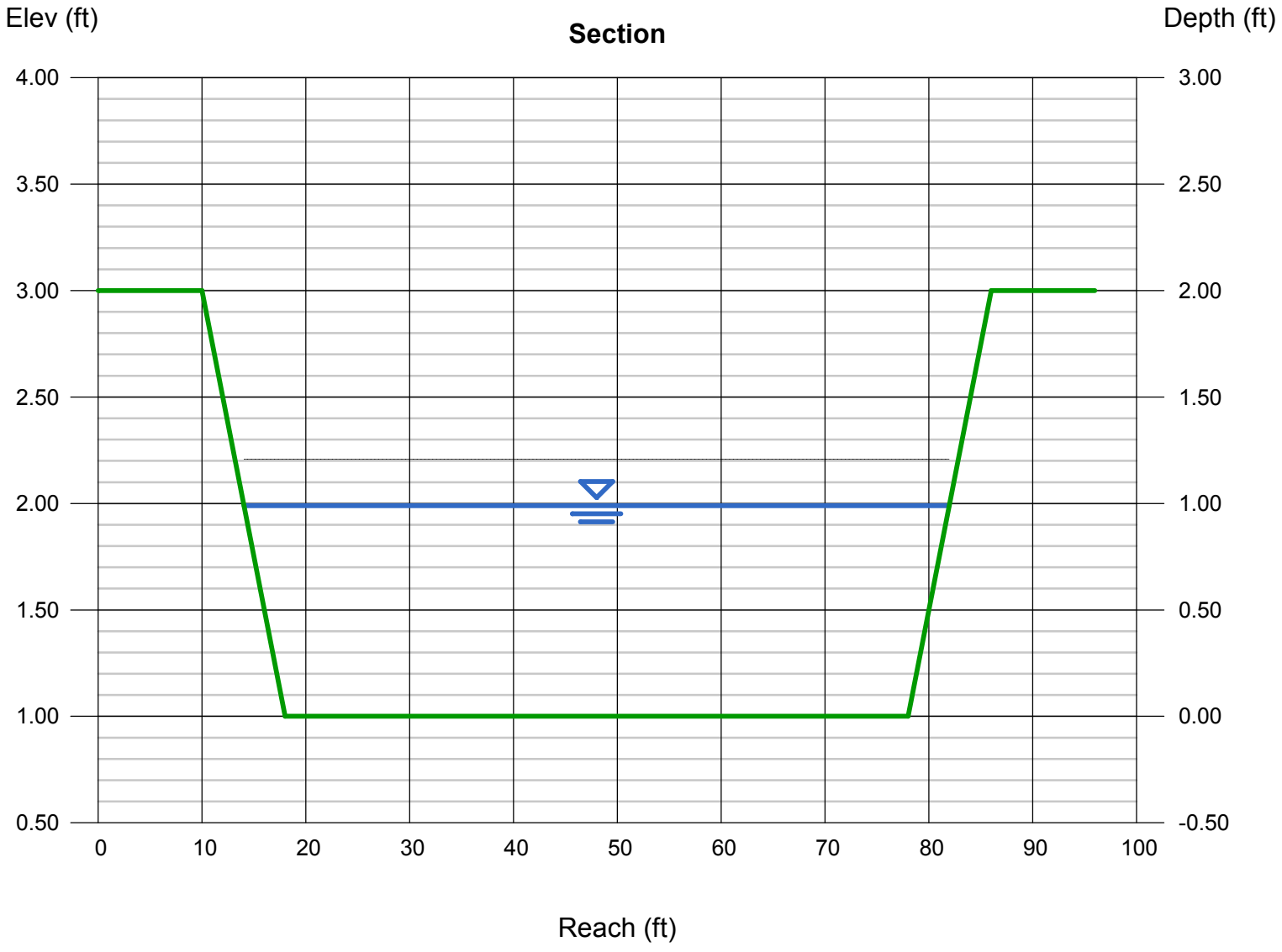
Bottom Width (ft)	= 60.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 1.80
N-Value	= 0.050

Calculations

Compute by:	Known Q
Known Q (cfs)	= 237.00

Highlighted

Depth (ft)	= 0.99
Q (cfs)	= 237.00
Area (sqft)	= 63.32
Velocity (ft/s)	= 3.74
Wetted Perim (ft)	= 68.16
Crit Depth, Yc (ft)	= 0.78
Top Width (ft)	= 67.92
EGL (ft)	= 1.21



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Jan 17 2019

Gieck Ranch Tributary 2_Reach 2 - Proposed Channel Section Velocity Check

Trapezoidal

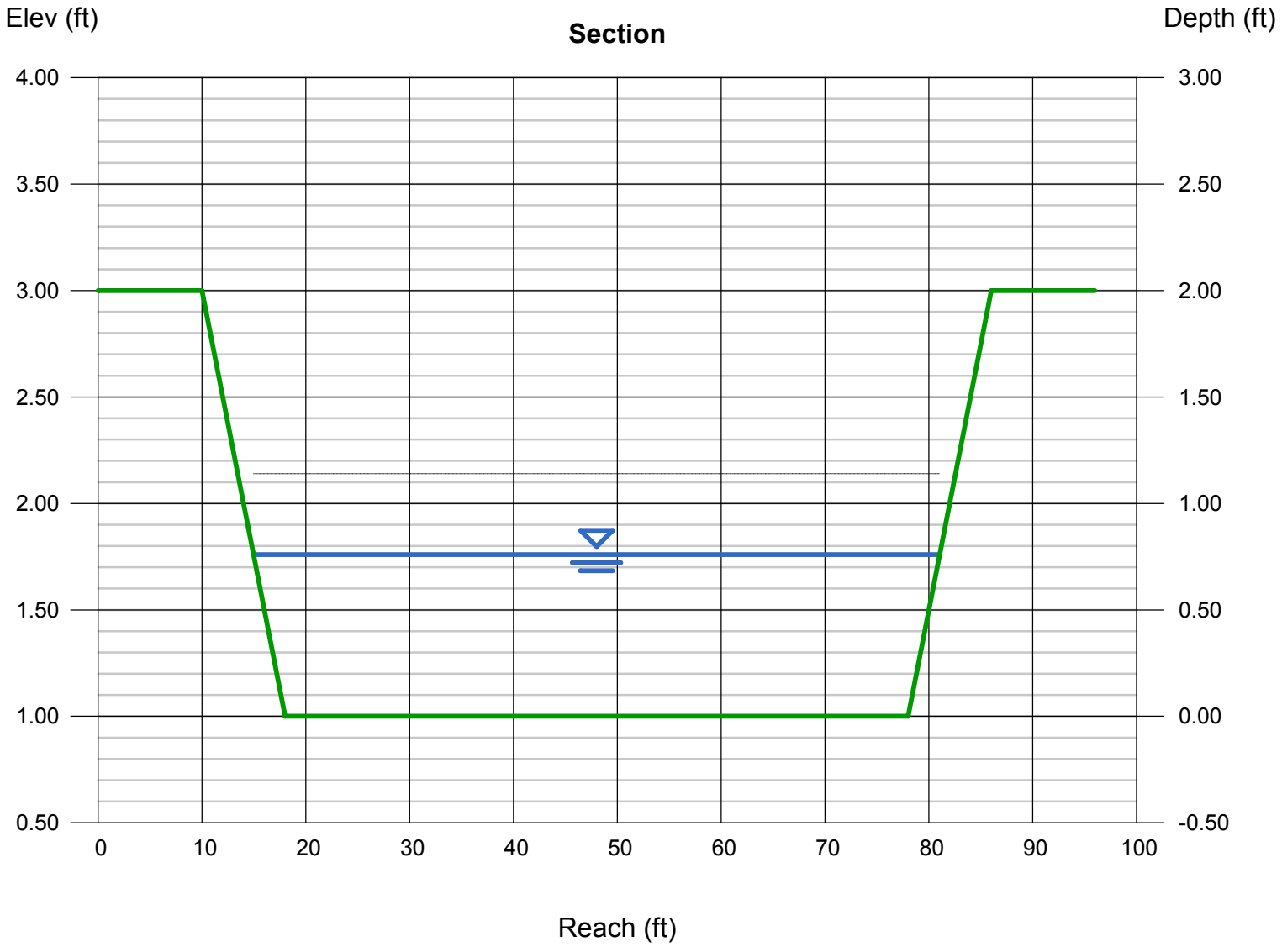
Bottom Width (ft)	= 60.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 1.80
N-Value	= 0.032

Calculations

Compute by:	Known Q
Known Q (cfs)	= 237.00

Highlighted

Depth (ft)	= 0.76
Q (cfs)	= 237.00
Area (sqft)	= 47.91
Velocity (ft/s)	= 4.95
Wetted Perim (ft)	= 66.27
Crit Depth, Yc (ft)	= 0.78
Top Width (ft)	= 66.08
EGL (ft)	= 1.14



HEC-RAS HEC-RAS 5.0.6 November 2018
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: HEC-RAS Model
Project File : 2019_4 Way Ranch.prj
Run Date and Time: 1/23/2019 4:16:07 PM

Project in English units

Project Description:
4 Way Ranch

PLAN DATA

Plan Title: Default Scenario
Plan File : C:\hecras\2019_4 Way Ranch\2019_4 Way Ranch.p01

Geometry Title: Default Geometry
Geometry File : C:\hecras\2019_4 Way Ranch\2019_4 Way Ranch.g01

Flow Title : Default Steady Flow
Flow File : C:\hecras\2019_4 Way Ranch\2019_4 Way Ranch.f01

Plan Description:
Default Scenario

Plan Summary Information:

Number of:	Cross Sections	= 105	Multiple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	0

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculation tolerance	= 0.01
Maximum number of iterations	= 20
Maximum difference tolerance	= 0.33
Flow tolerance factor	= 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance

Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Default Steady Flow
Flow File : C:\hecras\2019_4 Way Ranch\2019_4 Way Ranch.f01

Flow Data (cfs)

River	Reach	RS	100 Year
EAST FORK T1	EAST FORK T1R2a	-994	176.9
EAST FORK T1	EF_T1_R1	8248.03	115.8
EAST FORK T1	EF_T1_R1	7213.09	115.8
EAST FORK T1	EF_T1_R1	4893.61	176.9
EAST FORK	EF_R1	4747.49	359.67
EAST FORK	EF_R1	2951.88	418.07
EAST FORK	EF_R1	2261.03	435.47
EAST FORK	EF_R1	928	595
Geick Ranch T2	Geick Ranch T2	-D989.6	236.7
Geick Ranch T2	Geick Ranch T2	-D1069	280
Geick Ranch T2	GR_T2_R1	5786.62	219.31
Geick Ranch T2	GR_T2_R1	1492.43	236.7
Geick Ranch T2	GR_T2_R1	1183.47	280
Gieck Ranch T1	Gieck Ranch T1	-D1086	413
Gieck Ranch T1	GR_T1_R	4586.31	394.09
Gieck Ranch T1	GR_T1_R	1277.21	413

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
EAST FORK	EF_R1	100 Year	Normal S = 0.016456	Normal S = 0.018519
EAST FORK T1	EF_T1_R1	100 Year	Known WS = 0.5	Known WS = 1
Geick Ranch T2	GR_T2_R1	100 Year	Normal S = 0.024879	Normal S = 0.014888
Gieck Ranch T1	GR_T1_R	100 Year	Normal S = 0.036597	Normal S = 0.01753

GEOMETRY DATA

Geometry Title: Default Geometry
Geometry File : C:\hecras\2019_4 Way Ranch\2019_4 Way Ranch.g01

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 4747.49

INPUT

Description:
Station Elevation Data num= 209

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6912.9	1.24	6912.9	5.01	6912.8	8.87	6912.7	12.69	6912.6
16.51	6912.5	29.41	6912.5	37.2	6912.6	44.44	6912.7	52.06	6912.8
59.47	6912.89	59.89	6912.9	61.52	6912.9	72.08	6912.8	81.33	6912.7
89.17	6912.6	97.17	6912.5	105.05	6912.4	112.93	6912.3	120.81	6912.2
128.69	6912.1	135.05	6912	136.13	6911.9	137.09	6911.8	138.05	6911.7
139.02	6911.6	139.98	6911.5	140.94	6911.4	141.9	6911.3	142.87	6911.2
143.84	6911.1	144.8	6911	145.73	6910.9	146.64	6910.8	147.57	6910.7
148.49	6910.6	149.4	6910.5	150.33	6910.4	151.25	6910.3	152.16	6910.2
153.08	6910.1	154.01	6910	154.92	6909.9	155.84	6909.8	156.77	6909.7
157.69	6909.6	158.6	6909.5	159.52	6909.4	160.45	6909.3	161.36	6909.2
162.28	6909.1	163.21	6909	164.12	6908.9	165.04	6908.8	165.97	6908.7
166.89	6908.6	167.8	6908.5	168.72	6908.4	169.65	6908.3	170.56	6908.2
171.48	6908.1	172.41	6908	173.32	6907.9	174.24	6907.8	175.16	6907.7
176.08	6907.6	177	6907.5	177.92	6907.4	178.85	6907.3	179.76	6907.2
180.68	6907.1	181.52	6907	182.25	6906.9	182.91	6906.8	183.56	6906.7
184.2	6906.6	184.85	6906.5	185.5	6906.4	186.15	6906.3	186.8	6906.2
187.45	6906.1	211.4	6906.1	212.48	6906.2	213.57	6906.3	214.66	6906.4
215.75	6906.5	216.84	6906.6	217.93	6906.7	219.02	6906.8	220.12	6906.9
221.16	6907	221.87	6907.1	222.52	6907.2	223.17	6907.3	223.81	6907.4
224.46	6907.5	225.1	6907.6	225.75	6907.7	226.39	6907.8	227.03	6907.9
227.69	6908	228.37	6908.1	229.08	6908.2	229.79	6908.3	230.5	6908.4
231.21	6908.5	231.92	6908.6	232.63	6908.7	233.34	6908.8	234.06	6908.9
234.77	6909	235.48	6909.1	236.19	6909.2	236.9	6909.3	237.61	6909.4
238.32	6909.5	239.03	6909.6	239.74	6909.7	240.46	6909.8	241.17	6909.9
241.88	6910	242.59	6910.1	243.3	6910.2	244.01	6910.3	244.72	6910.4
245.43	6910.5	246.15	6910.6	246.86	6910.7	247.57	6910.8	248.28	6910.9
249.01	6911	250.09	6911.1	251.19	6911.2	252.29	6911.3	253.41	6911.4
254.61	6911.5	255.81	6911.6	257.02	6911.7	258.25	6911.8	259.47	6911.9
260.74	6912	262.19	6912.1	263.67	6912.2	265.15	6912.3	266.63	6912.4
268.11	6912.5	269.59	6912.6	271.07	6912.7	272.55	6912.8	274.02	6912.9
275.59	6913	277.68	6913.1	279.83	6913.2	281.96	6913.3	284.05	6913.4
286.12	6913.5	288.2	6913.6	290.21	6913.7	292.2	6913.8	294.21	6913.9
296.18	6914	298.44	6914.1	300.71	6914.2	302.98	6914.3	305.22	6914.4
307.48	6914.5	309.75	6914.6	311.99	6914.7	314.24	6914.8	316.47	6914.9
318.71	6915	320.89	6915.1	323.08	6915.2	325.25	6915.3	327.43	6915.4
329.61	6915.5	331.79	6915.6	333.96	6915.7	336.13	6915.8	338.3	6915.9
340.47	6916	342.66	6916.1	344.84	6916.2	347.02	6916.3	349.2	6916.4
351.38	6916.5	353.55	6916.6	355.71	6916.7	357.87	6916.8	359.47	6916.87
360.02	6916.9	362.16	6917	364.02	6917.1	365.88	6917.2	367.73	6917.3
369.59	6917.4	371.44	6917.5	373.29	6917.6	375.16	6917.7	377.01	6917.8
378.86	6917.9	380.72	6918	382.6	6918.1	384.49	6918.2	386.38	6918.3
388.29	6918.4	390.19	6918.5	392.1	6918.6	392.55	6918.6		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	177	.05	225.1	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
177	225.1	480.02	500.39	508.14	.1	.3

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 4247.11

INPUT
Description:
Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

0	6904.2	.25	6904.2	4.54	6904.1	22.42	6904	26.39	6903.9
29.86	6903.8	33.32	6903.7	36.77	6903.6	40.22	6903.5	43.67	6903.4
47.12	6903.3	50.56	6903.2	54	6903.1	57.43	6903	60.78	6902.9
64.13	6902.8	67.48	6902.7	70.83	6902.6	74.17	6902.5	77.51	6902.4
80.86	6902.3	84.2	6902.2	87.55	6902.1	90.67	6902	91.36	6901.9
91.84	6901.8	92.32	6901.7	92.79	6901.6	93.26	6901.5	93.74	6901.4
94.21	6901.3	94.68	6901.2	95.15	6901.1	95.63	6901	96.08	6900.9
96.53	6900.8	96.99	6900.7	97.37	6900.6	97.71	6900.5	98.05	6900.4
98.33	6900.3	98.57	6900.2	98.81	6900.1	99.09	6900	99.39	6899.9
99.97	6899.8	100.58	6899.7	101.18	6899.6	101.79	6899.5	102.39	6899.4
103	6899.3	103.61	6899.2	104.21	6899.1	120.91	6899.1	122.14	6899.2
123.36	6899.3	124.59	6899.4	125.82	6899.5	127.03	6899.6	128.27	6899.7
129.47	6899.8	130.68	6899.9	131.94	6900	133.52	6900.1	135.24	6900.2
136.96	6900.3	138.89	6900.4	140.84	6900.5	142.76	6900.6	144.66	6900.7
146.51	6900.8	148.38	6900.9	150.23	6901	151.91	6901.1	153.62	6901.2
155.43	6901.3	157.25	6901.4	159.05	6901.5	160.89	6901.6	162.78	6901.7
164.64	6901.8	166.51	6901.9	168.38	6902	170.17	6902.1	171.96	6902.2
173.8	6902.3	175.63	6902.4	177.42	6902.5	179.38	6902.6	181.35	6902.7
183.29	6902.8	185.35	6902.9	187.39	6903	189.42	6903.1	191.37	6903.2
193.19	6903.3	194.97	6903.4	196.92	6903.5	197.49	6903.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	100.58	.05	128.27	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100.58	128.27	422.47	415.35	387.57	.1 .3

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 3831.76

INPUT
Description:
Station Elevation Data num= 77

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6896.8	4.1	6896.8	8.72	6896.7	14.03	6896.6	19.32	6896.5
24.6	6896.4	31.15	6896.3	40.31	6896.2	50.78	6896.1	61.47	6896
68.01	6895.9	70.91	6895.8	74.32	6895.7	77.19	6895.6	78.47	6895.5
79.65	6895.4	80.72	6895.3	81.75	6895.2	82.72	6895.1	83.36	6895
84.01	6894.9	84.65	6894.8	85.3	6894.7	85.94	6894.6	86.58	6894.5
87.23	6894.4	87.88	6894.3	88.52	6894.2	89.16	6894.1	150.07	6894.1
151.72	6894.2	153.29	6894.3	154.72	6894.4	156.16	6894.5	157.49	6894.6
158.88	6894.7	160.22	6894.8	161.5	6894.9	162.78	6895	164.22	6895.1
165.55	6895.2	166.9	6895.3	168.28	6895.4	169.75	6895.5	171.32	6895.6
172.9	6895.7	174.47	6895.8	176.04	6895.9	177.62	6896	178.7	6896.1
179.78	6896.2	180.86	6896.3	181.93	6896.4	183.01	6896.5	184.05	6896.6
184.98	6896.7	185.82	6896.8	186.61	6896.9	187.68	6897	188.52	6897.1
189.28	6897.2	190.01	6897.3	190.75	6897.4	191.49	6897.5	192.23	6897.6
192.96	6897.7	193.7	6897.8	194.44	6897.9	195.15	6898	195.85	6898.1
196.53	6898.2	197.21	6898.3	197.9	6898.4	198.58	6898.5	199.26	6898.6
199.94	6898.7	200.18	6898.73						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	86.58	.05	154.72	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
86.58	154.72	110.7	152.01	178.81	.1 .3

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 3679.75

INPUT
Description:
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6895.6	.88	6895.6	4.14	6895.5	8.22	6895.4	11.91	6895.3
15.82	6895.2	19.72	6895.1	27.49	6895	31.62	6894.9	36.29	6894.8
40.69	6894.7	45.46	6894.6	49.55	6894.5	54.84	6894.4	59.66	6894.3
64.49	6894.2	69.2	6894.1	72.81	6894	74.91	6893.9	76.94	6893.8
79.01	6893.7	81.28	6893.6	83.25	6893.5	85.64	6893.4	88.83	6893.3
93.31	6893.2	96.13	6893.1	100.81	6893	133.47	6893	140.92	6893.1
143.35	6893.2	144.96	6893.3	146.53	6893.4	148.1	6893.5	149.68	6893.6
151.25	6893.7	152.83	6893.8	154.41	6893.9	155.94	6894	156.59	6894.1
157.2	6894.2	157.81	6894.3	158.42	6894.4	159.03	6894.5	159.64	6894.6
160.25	6894.7	160.86	6894.8	161.47	6894.9	162.08	6895	162.7	6895.1
163.32	6895.2	163.95	6895.3	164.57	6895.4	165.2	6895.5	165.83	6895.6
166.46	6895.7	167.08	6895.8	167.39	6895.85				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	83.25	.05	148.1	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
83.25	148.1	200.98	208.39	210.66	.1	.3

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 3471.36

INPUT
Description:
Station Elevation Data num= 114

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6890.4	.22	6890.4	3.24	6890.3	6.1	6890.2	8.94	6890.1
11.44	6890	12.53	6889.9	13.23	6889.8	13.91	6889.7	14.56	6889.6
15.2	6889.5	15.85	6889.4	16.49	6889.3	17.13	6889.2	17.78	6889.1
18.43	6889	19.14	6888.9	19.86	6888.8	20.61	6888.7	21.36	6888.6
22.11	6888.5	22.86	6888.4	23.63	6888.3	24.42	6888.2	25.22	6888.1
26	6888	26.83	6887.9	27.65	6887.8	28.48	6887.7	29.31	6887.6
30.14	6887.5	30.96	6887.4	31.79	6887.3	32.62	6887.2	33.45	6887.1
34.27	6887	35.1	6886.9	35.93	6886.8	36.77	6886.7	37.6	6886.6
38.43	6886.5	39.27	6886.4	40.11	6886.3	40.94	6886.2	41.76	6886.1
42.47	6886	43.1	6885.9	43.66	6885.8	44.2	6885.7	44.81	6885.6
45.45	6885.5	46.18	6885.4	46.93	6885.3	47.69	6885.2	48.49	6885.1
51.54	6885.1	52.51	6885.2	53.2	6885.3	54.02	6885.4	54.48	6885.5
55.08	6885.6	55.74	6885.7	56.23	6885.8	56.72	6885.9	57.37	6886
58.29	6886.1	59.34	6886.2	60.37	6886.3	61.42	6886.4	62.47	6886.5
63.43	6886.6	63.92	6886.7	64.41	6886.8	65.3	6886.9	66.35	6887
67.25	6887.1	68.11	6887.2	68.98	6887.3	69.85	6887.4	70.72	6887.5
71.59	6887.6	72.45	6887.7	73.32	6887.8	74.19	6887.9	75.04	6888
75.55	6888.1	76.05	6888.2	76.54	6888.3	77.03	6888.4	77.52	6888.5
78.01	6888.6	78.51	6888.7	79	6888.8	79.49	6888.9	79.98	6889
80.46	6889.1	80.93	6889.2	81.4	6889.3	81.87	6889.4	82.36	6889.5
82.85	6889.6	83.32	6889.7	83.8	6889.8	84.3	6889.9	84.92	6890
86.16	6890.1	87.91	6890.2	89.84	6890.3	91.77	6890.4	94.82	6890.5
99.32	6890.6	108.38	6890.7	118.18	6890.8	128.32	6890.8		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	43.66	.05	56.23	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
43.66	56.23	196.19	196.2	179.3	.1	.3

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 3275.15

INPUT
Description:
Station Elevation Data num= 162

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6891.1	.48	6891.1	2.98	6891	5.16	6890.9	7.31	6890.8
9.44	6890.7	11.37	6890.6	13.42	6890.5	15.49	6890.4	17.57	6890.3
19.6	6890.2	21.68	6890.1	23.79	6890	25.69	6889.9	27.16	6889.8
28.52	6889.7	29.96	6889.6	31.24	6889.5	32.64	6889.4	34.05	6889.3
35.21	6889.2	36.48	6889.1	37.6	6889	38.31	6888.9	38.98	6888.8
39.65	6888.7	40.31	6888.6	40.97	6888.5	41.63	6888.4	42.3	6888.3
42.96	6888.2	43.62	6888.1	44.1	6888	44.4	6887.9	44.69	6887.8
44.96	6887.7	45.19	6887.6	45.42	6887.5	45.64	6887.4	45.87	6887.3
46.09	6887.2	46.33	6887.1	46.57	6887	46.81	6886.9	47.05	6886.8
47.29	6886.7	47.54	6886.6	47.79	6886.5	48.03	6886.4	48.28	6886.3
48.52	6886.2	48.76	6886.1	49	6886	49.23	6885.9	49.46	6885.8
49.68	6885.7	49.9	6885.6	50.12	6885.5	50.34	6885.4	50.56	6885.3
50.78	6885.2	51	6885.1	51.22	6885	51.45	6884.9	51.67	6884.8
51.9	6884.7	52.12	6884.6	52.35	6884.5	52.57	6884.4	52.79	6884.3
53.01	6884.2	53.23	6884.1	53.45	6884	53.68	6883.9	53.91	6883.8
54.14	6883.7	54.37	6883.6	54.61	6883.5	54.84	6883.4	55.07	6883.3
55.31	6883.2	55.54	6883.1	55.78	6883	56.04	6882.9	56.3	6882.8
56.57	6882.7	56.83	6882.6	57.11	6882.5	57.37	6882.4	57.63	6882.3
57.87	6882.2	58.19	6882.1	58.55	6882	59.65	6881.9	60.88	6881.8
62.11	6881.7	63.38	6881.6	64.7	6881.5	65.65	6881.42	65.89	6881.4
66.98	6881.3	68.03	6881.2	69.28	6881.1	76.41	6881.1	77.26	6881.2
78.1	6881.3	78.91	6881.4	79.63	6881.5	80.3	6881.6	80.97	6881.7
81.64	6881.8	82.33	6881.9	82.96	6882	83.52	6882.1	84.06	6882.2
84.6	6882.3	85.14	6882.4	85.67	6882.5	86.21	6882.6	86.73	6882.7
87.27	6882.8	87.8	6882.9	88.32	6883	88.8	6883.1	89.27	6883.2
89.74	6883.3	90.22	6883.4	90.69	6883.5	91.16	6883.6	91.63	6883.7
92.1	6883.8	92.59	6883.9	93.14	6884	93.79	6884.1	94.54	6884.2
95.29	6884.3	96.04	6884.4	96.79	6884.5	97.54	6884.6	98.28	6884.7
99.03	6884.8	99.78	6884.9	100.53	6885	101.28	6885.1	102.04	6885.2
102.8	6885.3	103.54	6885.4	104.3	6885.5	105.09	6885.6	105.87	6885.7
106.62	6885.8	107.4	6885.9	108.33	6886	109.72	6886.1	111.32	6886.2
113.1	6886.3	115.03	6886.4	117.51	6886.5	119.56	6886.6	122.36	6886.7
136.08	6886.8	136.09	6886.8						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	62.11	.05	80.97	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
62.11	80.97	183.43	172.58	146.69	.1	.3

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 3102.57

INPUT
Description:
Station Elevation Data num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6885.13	.94	6884.62	2.17	6883.96	2.67	6883.71	3.4	6883.34
4.39	6882.8	4.62	6882.67	5.19	6882.36	5.85	6882	6.12	6881.9
7.08	6881.6	7.84	6881.35	8.3	6881.21	9.44	6880.81	9.57	6880.76
10.76	6880.32	11.29	6880.15	11.99	6880	32.84	6880	33.72	6880.03
34.07	6880.06	34.94	6880.3	35.3	6880.39	35.44	6880.43	36.53	6880.72
37.17	6880.9	37.75	6881.06	38.9	6881.37	38.98	6881.39	39.19	6881.45
40.21	6881.72	40.62	6881.84	41.43	6882.06	42.35	6882.31	42.66	6882.4
43.44	6882.61	43.89	6882.73	44.07	6882.78	45.11	6883.06	45.8	6883.23
46.34	6883.37	47.52	6883.66	47.57	6883.67	47.69	6883.7	48.8	6883.97
49.25	6884.03	50.02	6884.09	50.97	6884.17	51.25	6884.19	51.94	6884.25
52.48	6884.29	52.7	6884.31	53.7	6884.39	54.42	6884.45	54.93	6884.49
56.15	6884.59	56.18	6884.59	57.39	6884.69	57.87	6884.73	58.61	6884.79
59.6	6884.87	59.84	6884.89	60.43	6884.94	61.07	6884.98	61.32	6885
61.67	6885.02								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	9.57	.05	36.53	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9.57	36.53	107.61	125.01	130.97	.1	.3

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 2977.57

INPUT
Description:
Station Elevation Data num= 168

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6885.56	.39	6885.48	.92	6885.38	1.4	6885.28	1.88	6885.19
2.4	6885.09	2.84	6885	3.4	6884.89	3.79	6884.81	4.4	6884.68
4.75	6884.61	5.4	6884.47	5.7	6884.42	6.4	6884.27	6.66	6884.22
7.4	6884.08	7.61	6884.01	8.4	6883.8	8.57	6883.73	9.4	6883.42
9.52	6883.37	10.41	6883.04	10.48	6883.01	11.41	6882.66	11.43	6882.65
12.02	6882.43	12.39	6882.29	13.35	6881.93	14.3	6881.57	14.41	6881.53
15.26	6881.22	15.41	6881.17	16.21	6880.87	16.41	6880.8	17.17	6880.53
17.41	6880.44	18.12	6880.18	18.41	6880.07	19.08	6880.03	19.42	6879.94
20.03	6879.9	20.42	6879.87	20.99	6879.83	21.42	6879.8	21.94	6879.76
22.42	6879.72	22.9	6879.69	23.42	6879.65	23.85	6879.62	24.42	6879.58
24.81	6879.55	25.42	6879.51	25.77	6879.48	26.42	6879.43	26.72	6879.4
27.42	6879.34	27.68	6879.32	28.43	6879.26	28.63	6879.24	29.43	6879.17
29.59	6879.16	30.43	6879.1	30.54	6879.09	31.43	6879.03	31.5	6879.03
32.43	6878.98	32.45	6878.98	32.96	6878.94	33.41	6878.9	34.36	6878.81
35.32	6878.74	35.43	6878.73	36.28	6878.65	36.43	6878.64	37.23	6878.57
37.43	6878.55	38.19	6878.5	38.44	6878.48	39.14	6878.43	39.44	6878.4
40.1	6878.35	40.44	6878.32	41.05	6878.28	41.44	6878.25	42.01	6878.2
42.44	6878.17	42.96	6878.13	43.44	6878.1	43.92	6878.06	44.44	6878.02
44.87	6878.02	45.44	6878	59.46	6878	60.16	6878.03	60.46	6878.04
61.12	6878.11	61.46	6878.15	62.07	6878.21	62.46	6878.25	63.03	6878.31
63.46	6878.36	63.98	6878.41	64.46	6878.46	64.94	6878.51	65.47	6878.57
65.89	6878.61	66.47	6878.67	66.85	6878.71	67.47	6878.77	67.8	6878.81
68.47	6878.88	68.76	6878.91	69.47	6878.99	69.72	6879.01	70.47	6879.06
70.67	6879.08	71.47	6879.14	71.63	6879.15	72.47	6879.21	72.58	6879.22
73.47	6879.28	73.54	6879.28	74.48	6879.35	74.49	6879.35	74.85	6879.38
75.45	6879.42	76.4	6879.49	77.36	6879.56	77.48	6879.57	78.31	6879.63

78.48	6879.64	79.27	6879.7	79.48	6879.71	80.22	6879.77	80.48	6879.78
81.18	6879.83	81.48	6879.86	82.14	6879.9	82.48	6879.93	83.09	6879.97
83.48	6880.03	84.05	6880.25	84.49	6880.46	85	6880.67	85.49	6880.87
85.96	6881.06	86.49	6881.27	86.91	6881.42	87.49	6881.65	87.87	6881.78
88.49	6882.01	88.82	6882.13	89.49	6882.4	89.78	6882.5	90.49	6882.78
90.73	6882.87	91.49	6883.14	91.69	6883.21	92.49	6883.49	92.65	6883.54
93.5	6883.84	93.6	6883.87	94.5	6884.09	94.56	6884.1	95.5	6884.26
95.51	6884.27	95.8	6884.31	96.37	6884.41				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	37.23	.05	64.94	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.23	64.94	25.03	25.69	30.84	.1	.3

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 2951.88

INPUT
Description:
Station Elevation Data num= 163

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6885	.63	6885	1.95	6884.9	3.27	6884.8	4.59	6884.7
5.9	6884.6	7.22	6884.5	8.54	6884.4	9.86	6884.3	11.17	6884.2
12.49	6884.1	13.81	6884	15.12	6883.9	16.43	6883.8	17.74	6883.7
19.05	6883.6	20.37	6883.5	21.68	6883.4	22.98	6883.3	24.29	6883.2
25.6	6883.1	26.93	6883	28.25	6882.9	29.53	6882.8	30.82	6882.7
32.12	6882.6	33.41	6882.5	34.72	6882.4	36.03	6882.3	37.34	6882.2
38.65	6882.1	39.81	6882	40.47	6881.9	40.99	6881.8	41.5	6881.7
42.01	6881.6	42.52	6881.5	43.04	6881.4	43.55	6881.3	44.06	6881.2
44.57	6881.1	45.06	6881	45.55	6880.9	46.02	6880.8	46.47	6880.7
46.92	6880.6	47.37	6880.5	47.79	6880.4	48.22	6880.3	48.66	6880.2
49.09	6880.1	49.53	6880	49.93	6879.9	50.33	6879.8	50.72	6879.7
51.12	6879.6	51.52	6879.5	51.92	6879.4	52.33	6879.3	52.74	6879.2
53.14	6879.1	53.54	6879	53.89	6878.9	54.23	6878.8	54.56	6878.7
54.9	6878.6	55.24	6878.5	55.57	6878.4	55.91	6878.3	56.24	6878.2
56.58	6878.1	83.61	6878.1	84.33	6878.2	85.04	6878.3	85.78	6878.4
86.52	6878.5	87.25	6878.6	87.97	6878.7	88.71	6878.8	89.45	6878.9
90.18	6879	90.89	6879.1	91.59	6879.2	92.28	6879.3	92.98	6879.4
93.68	6879.5	94.38	6879.6	95.07	6879.7	95.77	6879.8	96.47	6879.9
97.11	6880	97.59	6880.1	98.04	6880.2	98.48	6880.3	98.92	6880.4
99.36	6880.5	99.8	6880.6	100.24	6880.7	100.68	6880.8	101.13	6880.9
101.6	6881	102.06	6881.1	102.58	6881.2	103.05	6881.3	103.58	6881.4
104.2	6881.5	104.82	6881.6	105.49	6881.7	106.04	6881.8	106.77	6881.9
107.38	6882	107.8	6882.1	108.23	6882.2	108.61	6882.3	108.99	6882.4
109.4	6882.5	109.83	6882.6	110.24	6882.7	110.66	6882.8	111.08	6882.9
111.48	6883	111.88	6883.1	112.28	6883.2	112.68	6883.3	113.08	6883.4
113.48	6883.5	113.88	6883.6	114.29	6883.7	114.69	6883.8	115.09	6883.9
115.52	6884	115.98	6884.1	116.44	6884.2	116.92	6884.3	117.4	6884.4
117.87	6884.5	118.5	6884.6	119.26	6884.7	120.13	6884.8	120.84	6884.9
121.57	6885	122.32	6885.1	124.24	6885.2	125.81	6885.3	128.35	6885.4
132.29	6885.4	133.29	6885.5	134.08	6885.6	134.7	6885.7	135.39	6885.8
135.98	6885.9	136.54	6886	137.05	6886.1	137.54	6886.2	138.03	6886.3
138.52	6886.4	139.01	6886.5	139.5	6886.6	139.98	6886.7	140.47	6886.8
140.96	6886.9	141.45	6887	141.8	6887.07				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	53.54	.05	90.18	.05

Bank Sta: Left	Right	Lengths: Left Channel		Right	Coeff Contr.	Expan.
53.54	90.18	372.54	322.35	396.33	.1	.3

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 2569.34

INPUT
Description:
Station Elevation Data num= 200

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6881	.62	6881	2.4	6880.9	3.46	6880.8	4.52	6880.7
5.58	6880.6	6.64	6880.5	7.7	6880.4	8.76	6880.3	9.82	6880.2
10.88	6880.1	11.78	6880	12.29	6879.9	12.64	6879.8	12.99	6879.7
13.34	6879.6	13.69	6879.5	14.04	6879.4	14.39	6879.3	14.73	6879.2
15.08	6879.1	15.44	6879	15.79	6878.9	16.15	6878.8	16.51	6878.7
16.86	6878.6	17.22	6878.5	17.58	6878.4	17.94	6878.3	18.3	6878.2
18.65	6878.1	19	6878	19.33	6877.9	19.66	6877.8	19.98	6877.7
20.3	6877.6	20.62	6877.5	20.95	6877.4	21.27	6877.3	21.59	6877.2
21.91	6877.1	22.23	6877	22.55	6876.9	22.87	6876.8	23.19	6876.7
23.51	6876.6	23.83	6876.5	24.15	6876.4	24.47	6876.3	24.79	6876.2
25.11	6876.1	25.46	6876	25.81	6875.9	26.21	6875.8	26.6	6875.7
26.99	6875.6	27.38	6875.5	27.77	6875.4	28.16	6875.3	28.55	6875.2
28.94	6875.1	29.32	6875	29.68	6874.9	30.03	6874.8	30.38	6874.7
30.73	6874.6	31.07	6874.5	31.41	6874.4	31.76	6874.3	32.11	6874.2
32.5	6874.1	32.89	6874	33.74	6873.9	34.7	6873.8	35.67	6873.7
36.63	6873.6	37.63	6873.5	38.58	6873.4	39.6	6873.3	40.57	6873.2
41.58	6873.1	59.8	6873.1	62.39	6873.2	65	6873.3	67.19	6873.4
69.19	6873.5	71.46	6873.6	73.66	6873.7	75.76	6873.8	77.88	6873.9
79.79	6874	80.26	6874.1	80.67	6874.2	81.02	6874.3	81.37	6874.4
81.71	6874.5	82.06	6874.6	82.42	6874.7	82.77	6874.8	83.12	6874.9
83.48	6875	83.88	6875.1	84.26	6875.2	84.65	6875.3	85.04	6875.4
85.42	6875.5	85.79	6875.6	86.17	6875.7	86.54	6875.8	86.91	6875.9
87.2	6876	87.48	6876.1	87.74	6876.2	87.97	6876.3	88.2	6876.4
88.43	6876.5	88.66	6876.6	88.89	6876.7	89.11	6876.8	89.34	6876.9
89.57	6877	89.8	6877.1	90.03	6877.2	90.25	6877.3	90.47	6877.4
90.7	6877.5	90.92	6877.6	91.15	6877.7	91.36	6877.8	91.56	6877.9
91.77	6878	91.97	6878.1	92.15	6878.2	92.33	6878.3	92.5	6878.4
92.67	6878.5	92.84	6878.6	93.02	6878.7	93.19	6878.8	93.36	6878.9
93.53	6879	93.69	6879.1	93.85	6879.2	94	6879.3	94.15	6879.4
94.3	6879.5	94.45	6879.6	94.6	6879.7	94.75	6879.8	94.93	6879.9
95.26	6880	95.6	6880.1	96.11	6880.2	96.67	6880.3	97.22	6880.4
97.74	6880.5	98.34	6880.6	98.88	6880.7	99.45	6880.8	100.05	6880.9
101.33	6881	102.06	6881	104.25	6880.9	105.14	6880.8	105.91	6880.7
106.61	6880.6	107.27	6880.5	107.89	6880.4	108.54	6880.3	109.24	6880.2
109.98	6880.1	112.19	6880.1	112.57	6880.2	112.86	6880.3	113.21	6880.4
113.51	6880.5	113.88	6880.6	114.29	6880.7	114.62	6880.8	115.01	6880.9
115.51	6881	118.31	6881.1	118.96	6881.2	119.99	6881.3	120.66	6881.4
121.29	6881.5	121.72	6881.6	122.05	6881.7	122.45	6881.8	123.02	6881.9
124.35	6882	125.54	6882.1	127.55	6882.2	129.66	6882.3	131.31	6882.4
132.32	6882.5	132.98	6882.6	133.68	6882.7	134.65	6882.8	134.71	6882.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	37.63	.05	71.46	.05

Bank Sta: Left	Right	Lengths: Left Channel		Right	Coeff Contr.	Expan.
37.63	71.46	263.52	279.81	292.62	.1	.3

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 2289.53

INPUT
Description:
Station Elevation Data num= 146

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6872.18	2.39	6872.1	4.94	6872	5.93	6871.9	6.59	6871.8
7.25	6871.7	7.91	6871.6	8.57	6871.5	9.23	6871.4	9.89	6871.3
10.55	6871.2	11.21	6871.1	11.89	6871	12.59	6870.9	13.31	6870.8
14.04	6870.7	14.77	6870.6	15.51	6870.5	16.24	6870.4	16.98	6870.3
17.73	6870.2	18.47	6870.1	45.76	6870.1	46.68	6870.2	47.59	6870.3
48.5	6870.4	49.41	6870.5	50.32	6870.6	51.23	6870.7	52.14	6870.8
53.05	6870.9	53.96	6871	54.88	6871.1	55.81	6871.2	56.76	6871.3
57.79	6871.4	58.85	6871.5	59.91	6871.6	60.97	6871.7	62.04	6871.8
63.11	6871.9	64.1	6872	64.85	6872.1	65.51	6872.2	66.12	6872.3
66.73	6872.4	67.34	6872.5	67.94	6872.6	68.52	6872.7	68.81	6872.8
69.1	6872.9	69.39	6873	69.84	6873.1	70.36	6873.2	70.89	6873.3
71.41	6873.4	71.94	6873.5	72.47	6873.6	72.99	6873.7	73.52	6873.8
74.04	6873.9	74.53	6874	74.77	6874.1	75.01	6874.2	75.25	6874.3
75.49	6874.4	75.72	6874.5	75.96	6874.6	76.19	6874.7	76.42	6874.8
76.72	6874.9	77.02	6875	77.29	6875.1	77.59	6875.2	78	6875.3
78.36	6875.4	78.77	6875.5	79.17	6875.6	79.58	6875.7	80.03	6875.8
80.5	6875.9	80.98	6876	81.72	6876.1	82.55	6876.2	83.48	6876.3
84.3	6876.4	84.95	6876.5	85.55	6876.6	86.15	6876.7	86.87	6876.8
87.75	6876.9	88.67	6877	89.58	6877.1	90.54	6877.2	91.46	6877.3
92.1	6877.4	92.91	6877.5	93.63	6877.6	94.58	6877.7	95.52	6877.8
96.33	6877.9	97.06	6878	97.68	6878.1	98.16	6878.2	98.64	6878.3
99.12	6878.4	99.6	6878.5	100.04	6878.6	100.49	6878.7	100.94	6878.8
101.38	6878.9	101.84	6879	102.31	6879.1	102.77	6879.2	103.23	6879.3
103.69	6879.4	104.15	6879.5	104.6	6879.6	105.05	6879.7	105.5	6879.8
105.94	6879.9	106.39	6880	106.81	6880.1	107.23	6880.2	107.65	6880.3
108.08	6880.4	108.5	6880.5	108.95	6880.6	109.39	6880.7	109.84	6880.8
110.29	6880.9	110.72	6881	111.15	6881.1	111.58	6881.2	112	6881.3
112.42	6881.4	112.84	6881.5	113.26	6881.6	113.68	6881.7	114.1	6881.8
114.54	6881.9	115.49	6882	120.64	6882	125.95	6881.9	133.83	6881.8
139.83	6881.71								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	13.31	.05	53.05	.05

Bank Sta: Left	Right	Lengths: Left Channel		Right	Coeff Contr.	Expan.
13.31	53.05	29.46	28.49	28.67	.1	.3

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 2261.03

INPUT
Description:
Station Elevation Data num= 96

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6873.2	2.26	6873.2	8.53	6873.1	23.5	6873	25.88	6872.9
28.37	6872.8	31.15	6872.7	33.92	6872.6	36.7	6872.5	39.47	6872.4
42.25	6872.3	45.01	6872.2	47.79	6872.1	56.67	6872	58.27	6871.9
59.07	6871.8	59.87	6871.7	60.67	6871.6	61.47	6871.5	62.27	6871.4
63.07	6871.3	63.88	6871.2	64.7	6871.1	65.53	6871	66.42	6870.9
67.3	6870.8	68.19	6870.7	68.78	6870.6	69.23	6870.5	69.85	6870.4

70.74	6870.3	71.62	6870.2	72.51	6870.1	94.99	6870.1	96.12	6870.2
97.26	6870.3	98.38	6870.4	99.51	6870.5	100.64	6870.6	101.76	6870.7
102.88	6870.8	104	6870.9	105.13	6871	106.27	6871.1	107.41	6871.2
108.55	6871.3	109.69	6871.4	110.83	6871.5	111.97	6871.6	113.11	6871.7
114.23	6871.8	115.36	6871.9	116.47	6872	117.12	6872.1	117.75	6872.2
118.39	6872.3	119.03	6872.4	119.66	6872.5	120.3	6872.6	120.94	6872.7
121.58	6872.8	122.21	6872.9	122.85	6873	123.49	6873.1	124.14	6873.2
124.79	6873.3	125.44	6873.4	126.09	6873.5	126.74	6873.6	127.39	6873.7
128.04	6873.8	128.68	6873.9	129.29	6874	129.82	6874.1	130.31	6874.2
130.8	6874.3	131.29	6874.4	131.77	6874.5	132.26	6874.6	132.75	6874.7
133.24	6874.8	133.72	6874.9	134.2	6875	134.67	6875.1	135.12	6875.2
135.58	6875.3	136.03	6875.4	136.48	6875.5	136.95	6875.6	137.41	6875.7
137.88	6875.8	138.35	6875.9	138.83	6876	139.31	6876.1	139.79	6876.2
139.83	6876.21								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	66.42	.05	102.88	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

66.42	102.88		52.1	67.46	80.58	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	67.1	6870.79	F

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 2193.57

INPUT
Description:
Station Elevation Data num= 125

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6872.5	.34	6872.5	1.45	6872.4	2.54	6872.3	3.66	6872.2
4.77	6872.1	7.26	6872	10.27	6871.9	12.91	6871.8	15.7	6871.7
18.81	6871.6	22.04	6871.5	25.28	6871.4	28.51	6871.3	31.74	6871.2
34.97	6871.1	38.19	6871	40.69	6870.9	43.14	6870.8	45.65	6870.7
48.16	6870.6	50.57	6870.5	53.13	6870.4	55.63	6870.3	58.13	6870.2
60.73	6870.1	99.98	6870.1	100.58	6870.2	101.18	6870.3	101.77	6870.4
102.37	6870.5	102.97	6870.6	103.56	6870.7	104.16	6870.8	104.76	6870.9
105.34	6871	105.78	6871.1	106.22	6871.2	106.72	6871.3	107.15	6871.4
107.57	6871.5	108.12	6871.6	108.59	6871.7	109.06	6871.8	109.59	6871.9
109.81	6872	109.96	6872.1	110.11	6872.2	110.26	6872.3	110.4	6872.4
110.5	6872.5	110.58	6872.6	110.66	6872.7	110.73	6872.8	110.81	6872.9
110.89	6873	110.97	6873.1	111.05	6873.2	111.13	6873.3	111.22	6873.4
111.31	6873.5	111.4	6873.6	111.48	6873.7	111.57	6873.8	111.66	6873.9
111.75	6874	111.83	6874.1	111.91	6874.2	112	6874.3	112.08	6874.4
112.16	6874.5	112.23	6874.6	112.31	6874.7	112.38	6874.8	112.45	6874.9
112.52	6875	112.59	6875.1	112.68	6875.2	112.77	6875.3	112.86	6875.4
112.95	6875.5	113.04	6875.6	113.13	6875.7	113.22	6875.8	113.3	6875.9
113.4	6876	113.54	6876.1	113.67	6876.2	113.81	6876.3	113.96	6876.4
114.11	6876.5	114.27	6876.6	114.44	6876.7	114.61	6876.8	114.79	6876.9
114.98	6877	115.18	6877.1	115.37	6877.2	115.56	6877.3	115.76	6877.4
115.95	6877.5	116.15	6877.6	116.36	6877.7	116.57	6877.8	116.79	6877.9
117.03	6878	117.48	6878.1	117.87	6878.2	118.22	6878.3	118.59	6878.4
118.94	6878.5	119.31	6878.6	119.68	6878.7	120.04	6878.8	120.39	6878.9
120.78	6879	121.54	6879.1	121.98	6879.2	122.42	6879.3	122.86	6879.4
123.31	6879.5	123.83	6879.6	124.37	6879.7	125.41	6879.8	127.02	6879.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

0 .05 50.57 .05 104.16 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
50.57 104.16 229.13 223.32 194.69 .1 .3
Ineffective Flow num= 1
Sta L Sta R Elev Permanent
104.04 127.02 6870.84 F

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 1970.26

INPUT
Description:
Station Elevation Data num= 222

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6878.78	1.23	6878.7	2.69	6878.6	4.13	6878.5	5.57	6878.4
7.01	6878.3	8.43	6878.2	9.83	6878.1	11.02	6878	11.59	6877.9
12.07	6877.8	12.48	6877.7	12.9	6877.6	13.32	6877.5	13.74	6877.4
14.16	6877.3	14.59	6877.2	15.01	6877.1	15.49	6877	15.98	6876.9
16.56	6876.8	17.19	6876.7	17.87	6876.6	18.58	6876.5	19.29	6876.4
19.99	6876.3	20.7	6876.2	21.37	6876.1	21.97	6876	22.44	6875.9
22.79	6875.8	23.15	6875.7	23.5	6875.6	23.84	6875.5	24.19	6875.4
24.53	6875.3	24.88	6875.2	25.22	6875.1	25.57	6875	25.91	6874.9
26.25	6874.8	26.6	6874.7	26.94	6874.6	27.29	6874.5	27.63	6874.4
27.97	6874.3	28.32	6874.2	28.75	6874.1	29.24	6874	29.87	6873.9
30.74	6873.8	31.59	6873.7	32.4	6873.6	33.18	6873.5	33.93	6873.4
34.68	6873.3	35.42	6873.2	36.17	6873.1	36.96	6873	37.75	6872.9
38.46	6872.8	39.14	6872.7	39.84	6872.6	40.54	6872.5	41.25	6872.4
41.94	6872.3	42.65	6872.2	43.35	6872.1	44.06	6872	44.94	6871.9
45.81	6871.8	46.67	6871.7	47.56	6871.6	48.48	6871.5	49.36	6871.4
50.23	6871.3	51.13	6871.2	52.04	6871.1	52.92	6871	53.76	6870.9
54.62	6870.8	55.51	6870.7	56.36	6870.6	57.2	6870.5	58.09	6870.4
58.97	6870.3	59.83	6870.2	60.71	6870.1	61.59	6870	62.45	6869.9
63.32	6869.8	64.18	6869.7	65.07	6869.6	65.96	6869.5	66.85	6869.4
67.75	6869.3	68.64	6869.2	69.53	6869.1	70.42	6869	71.32	6868.9
72.21	6868.8	73.11	6868.7	74	6868.6	74.9	6868.5	75.79	6868.4
76.69	6868.3	77.58	6868.2	78.48	6868.1	79.56	6868	82.4	6867.9
85.44	6867.8	86.69	6867.76	88.47	6867.7	91.5	6867.6	94.54	6867.5
97.57	6867.4	100.61	6867.3	103.64	6867.2	106.85	6867.1	116.43	6867.1
121.19	6867.2	126.33	6867.3	134.76	6867.4	142.02	6867.5	145.17	6867.6
148.58	6867.7	151.74	6867.8	154.73	6867.9	157.67	6868	158.21	6868.1
158.71	6868.2	159.15	6868.29	159.19	6868.3	159.58	6868.4	159.97	6868.5
160.36	6868.6	160.75	6868.7	161.14	6868.8	161.54	6868.9	161.93	6869
162.32	6869.1	162.71	6869.2	163.11	6869.3	163.5	6869.4	163.89	6869.5
164.29	6869.6	164.68	6869.7	165.07	6869.8	165.46	6869.9	165.99	6870
166.76	6870.1	167.67	6870.2	168.58	6870.3	169.51	6870.4	170.42	6870.5
171.38	6870.6	172.3	6870.7	173.25	6870.8	174.19	6870.9	175.16	6871
176.25	6871.1	177.36	6871.2	178.47	6871.3	179.59	6871.4	180.7	6871.5
181.81	6871.6	182.92	6871.7	184.03	6871.8	185.15	6871.9	186.26	6872
187.34	6872.1	188.43	6872.2	189.51	6872.3	190.59	6872.4	191.68	6872.5
192.74	6872.6	193.83	6872.7	194.92	6872.8	196	6872.9	197.11	6873
198.18	6873.1	199.24	6873.2	200.31	6873.3	201.38	6873.4	202.45	6873.5
203.53	6873.6	204.6	6873.7	205.68	6873.8	206.75	6873.9	207.84	6874
208.94	6874.1	210.05	6874.2	211.13	6874.3	212.23	6874.4	213.33	6874.5
214.42	6874.6	215.52	6874.7	216.62	6874.8	217.79	6874.9	219.15	6875
220.33	6875.1	221.49	6875.2	222.66	6875.3	223.82	6875.4	224.98	6875.5
226.21	6875.6	227.41	6875.7	228.63	6875.8	229.86	6875.9	231.11	6876
232.46	6876.1	233.83	6876.2	235.2	6876.3	236.57	6876.4	237.94	6876.5
239.31	6876.6	240.68	6876.7	242.05	6876.8	243.42	6876.9	244.77	6877
246.14	6877.1	246.61	6877.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	79.56	.05	157.67	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
79.56	157.67	221.03	219.8	178.05	.1	.3

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 1750.46

INPUT
Description:
Station Elevation Data num= 162

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6870.9	.53	6870.9	1.88	6870.8	3.22	6870.7	4.57	6870.6
5.92	6870.5	7.26	6870.4	8.62	6870.3	9.97	6870.2	11.32	6870.1
12.48	6870	12.91	6869.9	13.28	6869.8	13.59	6869.7	13.91	6869.6
14.21	6869.5	14.51	6869.4	14.82	6869.3	15.14	6869.2	15.45	6869.1
15.75	6869	16.05	6868.9	16.33	6868.8	16.62	6868.7	16.9	6868.6
17.19	6868.5	17.47	6868.4	17.76	6868.3	18.05	6868.2	18.36	6868.1
18.67	6868	19.14	6867.9	19.67	6867.8	20.19	6867.7	20.72	6867.6
21.24	6867.5	21.77	6867.4	22.3	6867.3	22.82	6867.2	23.35	6867.1
23.85	6867	24.32	6866.9	24.76	6866.8	25.2	6866.7	25.65	6866.6
26.09	6866.5	26.52	6866.4	26.97	6866.3	27.42	6866.2	27.86	6866.1
28.44	6866	29.31	6865.9	30.28	6865.8	31.28	6865.7	32.33	6865.6
33.33	6865.5	34.42	6865.4	35.47	6865.3	36.5	6865.2	37.58	6865.1
38.69	6865	39.97	6864.9	41.27	6864.8	42.57	6864.7	43.87	6864.6
45.17	6864.5	46.47	6864.4	47.78	6864.3	49.08	6864.2	50.38	6864.1
88.66	6864.1	89.65	6864.2	90.62	6864.3	91.54	6864.4	92.55	6864.5
93.49	6864.6	94.39	6864.7	95.38	6864.8	96.31	6864.9	97.24	6865
97.92	6865.1	98.58	6865.2	99.24	6865.3	99.9	6865.4	100.56	6865.5
101.23	6865.6	101.89	6865.7	102.55	6865.8	103.21	6865.9	103.86	6866
104.49	6866.1	105.11	6866.2	105.73	6866.3	106.35	6866.4	106.97	6866.5
107.58	6866.6	108.2	6866.7	108.82	6866.8	109.42	6866.9	110.04	6867
110.69	6867.1	111.35	6867.2	111.99	6867.3	112.66	6867.4	113.3	6867.5
113.96	6867.6	114.6	6867.7	115.26	6867.8	115.91	6867.9	116.57	6868
117.33	6868.1	118.04	6868.2	118.84	6868.3	119.62	6868.4	120.43	6868.5
121.28	6868.6	122.06	6868.7	123.1	6868.8	124.16	6868.9	125.27	6869
126.39	6869.1	127.32	6869.2	128.25	6869.3	129.15	6869.4	130.05	6869.5
130.95	6869.6	131.86	6869.7	132.76	6869.8	133.66	6869.9	134.42	6870
134.94	6870.1	135.33	6870.2	135.71	6870.3	136.1	6870.4	136.48	6870.5
136.86	6870.6	137.25	6870.7	137.63	6870.8	138.02	6870.9	138.4	6871
138.79	6871.1	139.16	6871.2	139.51	6871.3	139.85	6871.4	140.18	6871.5
140.51	6871.6	140.87	6871.7	141.21	6871.8	141.53	6871.9	141.9	6872
143.26	6872.1	144.68	6872.2	146.08	6872.3	147.49	6872.4	148.82	6872.5
150.12	6872.6	151.5	6872.7	152.88	6872.8	154.26	6872.9	155.69	6873
157.08	6873.1	158.39	6873.19						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	39.97	.05	97.24	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
39.97	97.24	193.8	181	159.02	.1	.3

CROSS SECTION

RIVER: EAST FORK

REACH: EF_R1 RS: 1569.45

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6867.75	.34	6867.7	1.02	6867.6	1.71	6867.5	2.4	6867.4
3.1	6867.3	3.8	6867.2	4.51	6867.1	5.21	6867	5.98	6866.9
6.77	6866.8	7.57	6866.7	8.38	6866.6	9.16	6866.5	9.91	6866.4
10.67	6866.3	11.41	6866.2	12.16	6866.1	12.96	6866	13.95	6865.9
14.99	6865.8	16.02	6865.7	17.03	6865.6	18.03	6865.5	19.02	6865.4
20.02	6865.3	21.01	6865.2	22	6865.1	23	6865	23.99	6864.9
24.98	6864.8	25.97	6864.7	26.96	6864.6	27.96	6864.5	28.95	6864.4
29.94	6864.3	30.94	6864.2	31.93	6864.1	119.63	6864.1	120.07	6864.2
120.5	6864.3	120.94	6864.4	121.38	6864.5	121.82	6864.6	122.26	6864.7
122.69	6864.8	123.13	6864.9	123.56	6865	123.99	6865.1	124.4	6865.2
124.82	6865.3	125.23	6865.4	125.64	6865.5	126.05	6865.6	126.46	6865.7
126.88	6865.8	127.32	6865.9	127.78	6866	128.53	6866.1	129.36	6866.2
130.2	6866.3	131.03	6866.4	131.86	6866.5	132.66	6866.6	133.47	6866.7
134.28	6866.8	135.1	6866.9	135.9	6867	136.63	6867.1	137.35	6867.2
138.06	6867.3	138.78	6867.4	139.5	6867.5	140.21	6867.6	140.93	6867.7
141.64	6867.8	142.36	6867.9	143.13	6868	144.02	6868.1	144.97	6868.2
145.91	6868.3	146.85	6868.4	147.8	6868.5	148.75	6868.6	149.69	6868.7
150.63	6868.8	151.58	6868.9	152.52	6869	153.46	6869.1	154.39	6869.2
155.32	6869.3	156.26	6869.4	157.19	6869.5	158.12	6869.6	159.05	6869.7
159.99	6869.8	160.92	6869.9	161.86	6870	162.8	6870.1	163.75	6870.2
164.69	6870.3	164.73	6870.3						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	28.95	.05	120.94	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
28.95 120.94 113.19 118.51 131.86 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	26.84	6864.59	F

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 1451

INPUT
Description:
Station Elevation Data num= 327

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6864.94	.08	6864.93	.44	6864.92	1.03	6864.88	1.17	6864.88
1.26	6864.87	1.9	6864.84	2.43	6864.81	2.62	6864.8	2.95	6864.78
3.35	6864.76	3.6	6864.75	4.08	6864.73	4.77	6864.7	4.87	6864.7
5.53	6864.67	5.94	6864.65	6.26	6864.64	6.79	6864.62	6.99	6864.61
7.11	6864.61	7.72	6864.59	8.28	6864.57	8.44	6864.56	8.71	6864.56
9.17	6864.54	9.45	6864.53	9.9	6864.51	10.63	6864.49	11.35	6864.46
11.8	6864.44	12.08	6864.43	12.55	6864.42	12.81	6864.41	12.97	6864.4
13.54	6864.38	14.14	6864.35	14.26	6864.35	14.47	6864.34	14.99	6864.32
15.31	6864.31	15.72	6864.29	16.39	6864.27	16.45	6864.26	17.17	6864.23
17.65	6864.21	17.9	6864.2	18.31	6864.19	18.63	6864.17	18.82	6864.17
19.36	6864.14	19.99	6864.12	20.09	6864.11	20.23	6864.11	20.81	6864.08
21.17	6864.07	21.54	6864.05	22.15	6864.03	22.27	6864.02	22.34	6864.01
23	6863.96	23.51	6863.9	23.72	6863.88	24.07	6863.83	24.45	6863.77
24.68	6863.74	25.18	6863.67	25.85	6863.58	25.99	6863.56	26.63	6863.47
27.02	6863.42	27.36	6863.37	27.91	6863.3	28.09	6863.27	28.19	6863.26

28.82	6863.17	29.36	6863.09	29.54	6863.07	29.83	6863.02	30.27	6862.95
30.54	6862.91	31	6862.83	31.71	6862.72	32.45	6862.6	32.88	6862.53
33.18	6862.48	33.68	6862.4	33.91	6862.37	34.05	6862.34	34.64	6862.25
35.22	6862.16	35.36	6862.13	35.6	6862.1	36.09	6862.02	36.39	6861.97
36.82	6861.9	37.52	6861.79	38.27	6861.67	38.73	6861.59	39	6861.55
39.44	6861.48	39.73	6861.43	39.91	6861.41	40.46	6861.31	41.08	6861.21
41.18	6861.2	41.36	6861.17	41.91	6861.07	42.25	6861.02	42.64	6860.95
43.28	6860.85	43.42	6860.83	44.09	6860.73	44.59	6860.64	44.82	6860.61
45.2	6860.55	45.55	6860.51	45.76	6860.47	46.28	6860.4	46.93	6860.32
47	6860.32	47.12	6860.31	47.73	6860.29	48.1	6860.27	48.46	6860.26
49.04	6860.24	49.19	6860.23	49.28	6860.23	49.91	6860.2	50.45	6860.18
50.64	6860.17	50.96	6860.16	51.37	6860.15	51.62	6860.13	52.1	6860.11
52.79	6860.08	52.88	6860.08	53.55	6860.09	53.96	6860.06	54.28	6860.04
54.8	6860.01	55.01	6860.02	55.13	6860.02	55.73	6860.03	56.3	6860.03
56.46	6860.04	56.72	6860.04	57.19	6860.06	57.47	6860.07	57.92	6860.08
58.64	6860.11	59.37	6860.13	59.82	6860.15	60.1	6860.16	60.56	6860.17
60.83	6860.18	60.99	6860.19	61.55	6860.21	62.16	6860.23	62.28	6860.23
62.48	6860.24	63.01	6860.26	63.33	6860.27	63.74	6860.29	64.4	6860.31
64.46	6860.31	65.19	6860.34	65.67	6860.35	65.92	6860.36	66.32	6860.38
66.65	6860.39	66.84	6860.4	67.37	6860.41	68.02	6860.44	68.24	6860.44
68.83	6860.47	69.19	6860.48	69.56	6860.49	70.16	6860.51	70.28	6860.52
70.36	6860.52	71.01	6860.54	71.53	6860.56	71.74	6860.57	72.08	6860.58
72.47	6860.59	72.7	6860.6	73.19	6860.62	73.87	6860.64	74	6860.65
74.65	6860.67	75.04	6860.68	75.38	6860.7	75.93	6860.72	76.1	6860.72
76.21	6860.73	76.83	6860.75	77.38	6860.77	77.56	6860.77	77.85	6860.78
78.29	6860.8	78.56	6860.81	79.01	6860.82	79.73	6860.85	80.47	6860.88
80.9	6860.89	81.2	6860.9	81.69	6860.92	81.92	6860.93	82.07	6860.93
82.65	6860.95	83.24	6860.97	83.38	6860.98	83.61	6860.99	84.11	6861
84.41	6861.01	84.83	6861.03	85.53	6861.05	85.56	6861.05	86.29	6861.08
86.75	6861.1	87.02	6861.11	87.45	6861.12	87.74	6861.13	87.93	6861.14
88.47	6861.16	89.1	6861.18	89.2	6861.18	89.37	6861.19	89.93	6861.21
90.27	6861.22	90.65	6861.23	91.29	6861.26	91.44	6861.26	92.11	6861.28
92.61	6861.3	92.84	6861.31	93.21	6861.32	93.56	6861.34	93.78	6861.34
94.29	6861.36	94.95	6861.38	95.13	6861.39	95.75	6861.41	96.12	6861.43
96.48	6861.44	97.05	6861.46	97.2	6861.46	97.3	6861.47	97.93	6861.49
98.47	6861.53	98.66	6861.54	98.97	6861.56	99.39	6861.58	99.64	6861.6
100.11	6861.63	100.81	6861.67	100.89	6861.67	101.57	6861.71	101.98	6861.74
102.3	6861.76	102.81	6861.79	103.02	6861.8	103.15	6861.81	103.75	6861.86
104.32	6861.9	104.48	6861.91	104.73	6861.93	105.21	6861.96	105.49	6861.99
105.93	6862.03	106.65	6862.1	107.39	6862.18	107.84	6862.22	108.12	6862.25
108.57	6862.3	108.84	6862.33	109.01	6862.35	109.57	6862.4	110.18	6862.47
110.3	6862.48	110.49	6862.5	111.03	6862.56	111.35	6862.59	111.75	6862.63
112.41	6862.7	112.48	6862.71	113.21	6862.78	113.69	6862.83	113.94	6862.86
114.33	6862.9	114.66	6862.93	114.86	6862.95	115.39	6863.01	116.04	6863.08
116.12	6863.09	116.25	6863.11	116.85	6863.18	117.21	6863.22	117.57	6863.27
118.17	6863.34	118.3	6863.35	118.38	6863.36	119.03	6863.45	119.55	6863.51
119.76	6863.53	120.1	6863.57	120.48	6863.62	120.72	6863.65	121.21	6863.71
121.89	6863.8	122.02	6863.81	122.67	6863.89	123.06	6863.94	123.39	6863.99
123.94	6864.12	124.12	6864.16	124.23	6864.19	124.85	6864.36	125.41	6864.51
125.58	6864.56	125.86	6864.64	126.3	6864.76	126.58	6864.83	127.03	6864.95
127.75	6865.15	128.14	6865.25						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	43.28	.05	77.38	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
43.28	77.38	209.32	216.45	227.99	.1	.3

CROSS SECTION

RIVER: EAST FORK

REACH: EF_R1 RS: 1234.49

INPUT
Description:
Station Elevation Data num= 206

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6861.2	.21	6861.2	1.98	6861.1	3.75	6861	5.53	6860.9
7.31	6860.8	9.1	6860.7	10.88	6860.6	12.67	6860.5	14.47	6860.4
16.26	6860.3	18.06	6860.2	19.86	6860.1	21.49	6860	22.2	6859.9
22.84	6859.8	23.42	6859.7	23.94	6859.6	24.5	6859.5	25.12	6859.4
25.69	6859.3	26.26	6859.2	26.83	6859.1	27.47	6859	28.19	6858.9
28.96	6858.8	29.7	6858.7	30.44	6858.6	31.16	6858.5	31.86	6858.4
32.58	6858.3	33.28	6858.2	33.97	6858.1	34.65	6858	35.15	6857.9
35.6	6857.8	36.04	6857.7	36.55	6857.6	37.04	6857.5	37.51	6857.4
37.97	6857.3	38.42	6857.2	38.91	6857.1	39.36	6857	39.81	6856.9
40.28	6856.8	40.74	6856.7	41.15	6856.6	41.58	6856.5	42.05	6856.4
42.53	6856.3	43	6856.2	43.43	6856.1	43.89	6856	44.36	6855.9
44.84	6855.8	45.3	6855.7	45.7	6855.6	46.11	6855.5	46.58	6855.4
47	6855.3	47.41	6855.2	47.82	6855.1	48.23	6855	48.66	6854.9
49.07	6854.8	49.49	6854.7	49.9	6854.6	50.31	6854.5	50.72	6854.4
51.13	6854.3	51.55	6854.2	51.96	6854.1	76.07	6854.1	76.7	6854.2
77.33	6854.3	77.98	6854.4	78.47	6854.5	78.87	6854.6	79.27	6854.7
79.91	6854.8	80.6	6854.9	81.33	6855	81.93	6855.1	82.46	6855.2
83.02	6855.3	83.65	6855.4	84.22	6855.5	84.76	6855.6	85.43	6855.7
86	6855.8	86.64	6855.9	87.3	6856	87.99	6856.1	88.71	6856.2
89.44	6856.3	90.16	6856.4	90.88	6856.5	91.6	6856.6	92.32	6856.7
93.03	6856.8	93.75	6856.9	94.46	6857	95.21	6857.1	95.97	6857.2
96.72	6857.3	97.47	6857.4	98.22	6857.5	98.91	6857.6	99.58	6857.7
100.25	6857.8	100.89	6857.9	101.87	6858	102.48	6858.1	103.02	6858.2
103.55	6858.3	104.07	6858.4	104.58	6858.5	105.06	6858.6	105.57	6858.7
106.02	6858.8	106.48	6858.9	106.99	6859	107.48	6859.1	107.94	6859.2
108.36	6859.3	108.77	6859.4	109.22	6859.5	109.67	6859.6	110.09	6859.7
110.54	6859.8	110.98	6859.9	111.31	6860	111.57	6860.1	111.84	6860.2
112.07	6860.3	112.28	6860.4	112.49	6860.5	112.71	6860.6	112.92	6860.7
113.13	6860.8	113.34	6860.9	113.56	6861	113.77	6861.1	113.99	6861.2
114.2	6861.3	114.41	6861.4	114.61	6861.5	114.81	6861.6	115.02	6861.7
115.24	6861.8	115.46	6861.9	115.69	6862	115.9	6862.1	116.11	6862.2
116.32	6862.3	116.53	6862.4	116.75	6862.5	116.97	6862.6	117.2	6862.7
117.42	6862.8	117.64	6862.9	117.86	6863	118.09	6863.1	118.31	6863.2
118.53	6863.3	118.76	6863.4	118.98	6863.5	119.2	6863.6	119.43	6863.7
119.65	6863.8	119.89	6863.9	120.12	6864	120.37	6864.1	120.64	6864.2
120.92	6864.3	121.2	6864.4	121.48	6864.5	121.77	6864.6	122.02	6864.7
122.3	6864.8	122.61	6864.9	123.05	6865	123.36	6865.1	123.66	6865.2
123.98	6865.3	124.3	6865.4	124.62	6865.5	124.95	6865.6	125.29	6865.7
125.63	6865.8	126.01	6865.9	126.63	6866	127.85	6866.1	128.59	6866.2
129.25	6866.3	130.07	6866.4	130.89	6866.5	131.51	6866.6	132.23	6866.7
133	6866.8	133.77	6866.9	134.63	6867	145.16	6867.1	146.9	6867.2
159.46	6867.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	48.23	.05	81.33	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
48.23	81.33	73.95	77.1	81	.1	.3

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 1157.39

INPUT

Description:

Station Elevation Data num= 283

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6866.13	.16	6866.1	5.88	6866	6.24	6865.9	6.57	6865.8
6.9	6865.7	7.23	6865.6	7.55	6865.5	7.87	6865.4	8.3	6865.3
8.89	6865.2	9.4	6865.1	14.68	6865	15.57	6864.9	16.04	6864.8
16.39	6864.7	16.69	6864.6	17.22	6864.5	18.13	6864.4	18.77	6864.3
19.63	6864.2	21.85	6864.1	27.2	6864	27.79	6863.9	28.53	6863.8
29.33	6863.7	30.08	6863.6	31.74	6863.5	33.44	6863.4	35.16	6863.3
36.85	6863.2	38.77	6863.1	40.36	6863	41.95	6862.9	43.31	6862.82
43.65	6862.8	45.35	6862.7	47.05	6862.6	48.76	6862.5	50.46	6862.4
52.16	6862.3	53.78	6862.2	55.35	6862.1	56.67	6862	57.42	6861.9
58.69	6861.8	59.94	6861.7	60.86	6861.6	62.05	6861.5	63.27	6861.4
64.5	6861.3	65.73	6861.2	66.97	6861.1	68.2	6861	69.39	6860.9
70.6	6860.8	71.81	6860.7	73.04	6860.6	74.77	6860.5	77.06	6860.4
82.06	6860.3	88.47	6860.2	95.01	6860.1	101.32	6860	105.48	6859.9
107.42	6859.8	108.85	6859.7	110.72	6859.6	111.77	6859.5	112.72	6859.4
113.6	6859.3	114.59	6859.2	116.1	6859.1	120.06	6859	122.39	6858.9
123.88	6858.8	125.14	6858.7	126.41	6858.6	127.81	6858.5	129.15	6858.4
130.63	6858.3	132.34	6858.2	134.05	6858.1	136.15	6858	138.91	6857.9
142.2	6857.8	145.19	6857.7	147.76	6857.6	150.06	6857.5	152.32	6857.4
154.57	6857.3	156.82	6857.2	159.08	6857.1	161.33	6857	163.49	6856.9
165.64	6856.8	167.75	6856.7	169.82	6856.6	171.82	6856.5	173.82	6856.4
175.81	6856.3	177.81	6856.2	179.82	6856.1	181.46	6856	182.59	6855.9
182.88	6855.86	183.22	6855.8	183.7	6855.7	184.18	6855.6	184.66	6855.5
185.14	6855.4	185.61	6855.3	186.09	6855.2	186.57	6855.1	187.06	6855
187.6	6854.9	188.14	6854.8	188.69	6854.7	189.25	6854.6	189.81	6854.5
190.37	6854.4	190.93	6854.3	191.49	6854.2	192.05	6854.1	192.52	6854
192.96	6853.9	193.35	6853.8	193.72	6853.7	194.09	6853.6	194.46	6853.5
194.84	6853.4	195.21	6853.3	195.79	6853.2	196.47	6853.1	198.23	6853
200.46	6852.9	202.85	6852.8	205.03	6852.7	207.21	6852.6	209.11	6852.5
210.61	6852.4	212.24	6852.3	214.39	6852.2	219.07	6852.2	220.3	6852.3
221.52	6852.4	222.96	6852.5	223.77	6852.6	224.35	6852.7	224.93	6852.8
225.5	6852.9	226.08	6853	226.66	6853.1	227.23	6853.2	227.81	6853.3
228.39	6853.4	228.96	6853.5	229.54	6853.6	230.11	6853.7	230.69	6853.8
231.25	6853.9	231.77	6854	232.16	6854.1	232.48	6854.2	232.81	6854.3
233.13	6854.4	233.45	6854.5	233.77	6854.6	234.1	6854.7	234.42	6854.8
234.75	6854.9	235.07	6855	235.37	6855.1	235.68	6855.2	235.99	6855.3
236.29	6855.4	236.6	6855.5	236.9	6855.6	237.21	6855.7	237.52	6855.8
237.82	6855.9	238.09	6856	238.24	6856.1	238.38	6856.2	238.53	6856.3
238.68	6856.4	238.82	6856.5	238.97	6856.6	239.11	6856.7	239.25	6856.8
239.39	6856.9	239.53	6857	239.67	6857.1	239.81	6857.2	239.95	6857.3
240.09	6857.4	240.23	6857.5	240.37	6857.6	240.5	6857.7	240.64	6857.8
240.78	6857.9	240.92	6858	241.06	6858.1	241.2	6858.2	241.35	6858.3
241.49	6858.4	241.63	6858.5	241.78	6858.6	241.92	6858.7	242.05	6858.8
242.2	6858.9	242.38	6859	242.56	6859.1	242.74	6859.2	242.93	6859.3
243.11	6859.4	243.31	6859.5	243.52	6859.6	243.73	6859.7	243.95	6859.8
244.17	6859.9	244.53	6860	244.98	6860.1	245.66	6860.2	246.29	6860.3
246.94	6860.4	247.61	6860.5	248.29	6860.6	248.98	6860.7	249.65	6860.8
250.33	6860.9	251	6861	251.67	6861.1	252.34	6861.2	252.99	6861.3
253.65	6861.4	254.3	6861.5	254.94	6861.6	255.58	6861.7	256.24	6861.8
256.89	6861.9	257.54	6862	258.14	6862.1	258.77	6862.2	259.4	6862.3
260.03	6862.4	260.63	6862.5	261.24	6862.6	261.86	6862.7	262.47	6862.8
263.17	6862.9	263.91	6863	264.62	6863.1	265.31	6863.2	265.99	6863.3
266.7	6863.4	267.42	6863.5	268.14	6863.6	268.86	6863.7	269.58	6863.8
270.31	6863.9	271.05	6864	272.03	6864.1	273.02	6864.2	274.02	6864.3
275.03	6864.4	276.04	6864.5	277.07	6864.6	278.12	6864.7	279.17	6864.8
280.23	6864.9	281.28	6865	282.34	6865.1	283.42	6865.2	284.5	6865.3
285.65	6865.4	286.81	6865.5	288.01	6865.6	289.23	6865.7	290.53	6865.8
291.84	6865.9	293.81	6866	343.31	6866				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

0	.05	194.46	.05	229.54	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
194.46	229.54	242.16	229.39	219.75	.1	.3

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 928

INPUT
Description:
Station Elevation Data num= 175

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6855.8	.06	6855.8	1.62	6855.7	3.19	6855.6	4.85	6855.5
6.58	6855.4	8.33	6855.3	10.14	6855.2	12.02	6855.1	13.98	6855
16.08	6854.9	18.21	6854.8	20.34	6854.7	22.47	6854.6	24.6	6854.5
26.73	6854.4	28.35	6854.3	29.47	6854.2	30.6	6854.1	31.73	6854
32.86	6853.9	33.98	6853.8	35.11	6853.7	36.24	6853.6	37.19	6853.5
38.19	6853.4	39.18	6853.3	40.29	6853.2	41.18	6853.1	42.06	6853
42.96	6852.9	43.86	6852.8	44.77	6852.7	45.69	6852.6	46.66	6852.5
47.66	6852.4	48.61	6852.3	49.53	6852.2	50.37	6852.1	51.16	6852
52.15	6851.9	53.21	6851.8	54.23	6851.7	55.42	6851.6	56.4	6851.5
57.34	6851.4	61.72	6851.4	62.73	6851.5	63.18	6851.6	63.92	6851.7
64.58	6851.8	65.48	6851.9	68.02	6851.9	71.75	6851.8	75.55	6851.7
98.51	6851.7	100.65	6851.8	101.62	6851.9	102.08	6852	102.44	6852.1
102.76	6852.2	103.17	6852.3	103.59	6852.4	103.97	6852.5	104.35	6852.6
104.76	6852.7	105.16	6852.8	105.54	6852.9	105.91	6853	106.27	6853.1
106.63	6853.2	107	6853.3	107.36	6853.4	107.72	6853.5	108.08	6853.6
108.44	6853.7	108.81	6853.8	109.17	6853.9	109.76	6854	110.91	6854.1
112.3	6854.2	113.68	6854.3	115.05	6854.4	116.41	6854.5	117.76	6854.6
119.12	6854.7	120.47	6854.8	121.83	6854.9	123.16	6855	124.48	6855.1
125.79	6855.2	127.1	6855.3	128.41	6855.4	129.72	6855.5	131.03	6855.6
132.34	6855.7	133.65	6855.8	134.96	6855.9	136.21	6856	136.9	6856.1
137.52	6856.2	138.16	6856.3	138.8	6856.4	139.42	6856.5	140.07	6856.6
140.7	6856.7	141.34	6856.8	141.99	6856.9	142.63	6857	143.26	6857.1
143.88	6857.2	144.5	6857.3	145.12	6857.4	145.74	6857.5	146.36	6857.6
146.98	6857.7	147.6	6857.8	148.22	6857.9	148.84	6858	149.5	6858.1
150.15	6858.2	150.8	6858.3	151.45	6858.4	152.11	6858.5	152.76	6858.6
153.41	6858.7	154.06	6858.8	154.72	6858.9	155.37	6859	156.03	6859.1
156.69	6859.2	157.38	6859.3	158.03	6859.4	158.73	6859.5	159.38	6859.6
160.07	6859.7	160.76	6859.8	161.44	6859.9	162.15	6860	162.91	6860.1
163.69	6860.2	164.46	6860.3	165.24	6860.4	166.01	6860.5	166.79	6860.6
167.57	6860.7	168.34	6860.8	169.12	6860.9	169.9	6861	170.67	6861.1
171.45	6861.2	172.22	6861.3	173	6861.4	173.78	6861.5	174.55	6861.6
175.33	6861.7	176.11	6861.8	176.88	6861.9	177.66	6862	178.46	6862.1
179.25	6862.2	180.06	6862.3	180.85	6862.4	181.67	6862.5	182.47	6862.6
183.28	6862.7	184.09	6862.8	184.9	6862.9	186.18	6863	191.02	6863.1
194.61	6863.2	198.19	6863.3	201.78	6863.4	205.37	6863.5	206.69	6863.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	47.66	.05	103.17	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
47.66	103.17	78.97	74.71	77.43	.1	.3

CROSS SECTION

RIVER: EAST FORK
REACH: EF_R1 RS: 698.4

INPUT
Description:
Station Elevation Data num= 318

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6864.66	.56	6864.6	1.31	6864.5	2.16	6864.4	2.31	6864.3
2.46	6864.2	2.61	6864.1	2.75	6864	3.17	6863.9	3.61	6863.9
3.67	6864	3.73	6864.1	3.8	6864.2	3.98	6864.2	4.01	6864.1
4.04	6864	4.08	6863.9	4.11	6863.8	4.14	6863.7	4.18	6863.6
4.21	6863.5	4.27	6863.4	4.38	6863.3	4.5	6863.2	4.64	6863.1
4.77	6863	4.9	6862.9	5.08	6862.9	5.15	6863	5.41	6863
5.44	6862.9	5.47	6862.8	5.5	6862.7	5.53	6862.6	5.56	6862.5
5.59	6862.4	5.62	6862.3	5.65	6862.2	5.67	6862.1	5.7	6862
5.72	6861.9	5.75	6861.8	5.77	6861.7	5.8	6861.6	5.82	6861.5
5.84	6861.4	5.87	6861.3	5.89	6861.2	6.31	6861.2	6.36	6861.3
6.41	6861.4	6.46	6861.5	6.59	6861.6	6.73	6861.7	6.75	6861.7
6.78	6861.6	6.82	6861.5	6.85	6861.4	6.88	6861.3	6.92	6861.2
6.95	6861.1	6.99	6861	7.02	6860.9	7.07	6860.8	7.11	6860.7
7.15	6860.6	7.2	6860.5	7.24	6860.4	7.29	6860.3	7.34	6860.2
7.39	6860.1	7.44	6860	7.49	6859.9	7.54	6859.8	7.6	6859.7
7.66	6859.6	7.72	6859.5	7.79	6859.4	7.86	6859.3	7.95	6859.2
8.07	6859.1	8.18	6859	8.26	6858.9	8.32	6858.8	8.39	6858.7
8.47	6858.6	8.55	6858.5	8.63	6858.4	8.7	6858.3	8.78	6858.2
8.86	6858.1	8.88	6858	8.89	6857.9	8.91	6857.8	8.92	6857.7
8.93	6857.6	8.95	6857.5	8.96	6857.4	8.98	6857.3	8.99	6857.2
9	6857.1	9.02	6857	9.03	6856.9	9.04	6856.8	9.06	6856.7
9.07	6856.6	9.09	6856.5	9.1	6856.4	9.11	6856.3	9.13	6856.2
9.14	6856.1	9.16	6856	9.17	6855.9	9.18	6855.8	9.2	6855.7
9.21	6855.6	9.23	6855.5	9.24	6855.4	9.25	6855.3	9.27	6855.2
9.28	6855.1	9.3	6855	9.31	6854.9	9.32	6854.8	9.34	6854.7
9.35	6854.6	9.37	6854.5	9.38	6854.4	9.39	6854.3	9.41	6854.2
9.42	6854.1	9.44	6854	9.45	6853.9	9.47	6853.8	9.48	6853.7
9.49	6853.6	9.51	6853.5	9.52	6853.4	9.54	6853.3	9.56	6853.2
9.58	6853.1	9.6	6853	9.66	6852.9	9.72	6852.8	9.77	6852.7
9.84	6852.6	9.96	6852.5	10.11	6852.4	10.29	6852.3	10.53	6852.2
10.73	6852.1	11.24	6852	11.38	6851.9	11.52	6851.8	11.66	6851.7
11.74	6851.7	11.94	6851.8	12.14	6851.9	12.62	6851.9	12.78	6851.8
12.93	6851.7	13.11	6851.6	13.42	6851.5	13.73	6851.4	14.45	6851.3
15.23	6851.2	16.05	6851.1	57.23	6851.1	57.56	6851.2	57.87	6851.3
58.18	6851.4	58.49	6851.5	58.8	6851.6	59.11	6851.7	59.42	6851.8
59.73	6851.9	60.03	6852	60.33	6852.1	60.64	6852.2	60.96	6852.3
61.26	6852.4	61.56	6852.5	61.86	6852.6	62.17	6852.7	62.49	6852.8
62.77	6852.9	63.05	6853	63.32	6853.1	63.58	6853.2	63.84	6853.3
64.09	6853.4	64.33	6853.5	64.57	6853.6	64.82	6853.7	65.07	6853.8
65.32	6853.9	65.57	6854	65.81	6854.1	66.06	6854.2	66.31	6854.3
66.56	6854.4	66.8	6854.5	67.05	6854.6	67.3	6854.7	67.49	6854.8
67.64	6854.9	67.72	6855	67.81	6855.1	67.89	6855.2	67.98	6855.3
68.06	6855.4	68.14	6855.5	68.23	6855.6	68.28	6855.7	68.31	6855.8
68.35	6855.9	68.38	6856	68.41	6856.1	68.44	6856.2	68.47	6856.3
68.5	6856.4	68.53	6856.5	68.56	6856.6	68.59	6856.7	68.62	6856.8
68.66	6856.9	68.69	6857	68.72	6857.1	68.75	6857.2	68.78	6857.3
68.81	6857.4	68.84	6857.5	68.87	6857.6	68.9	6857.7	68.94	6857.8
69.25	6857.8	69.5	6857.7	69.65	6857.7	69.7	6857.8	69.74	6857.9
69.77	6858	69.8	6858.1	69.83	6858.2	69.86	6858.3	69.89	6858.4
69.92	6858.5	69.95	6858.6	69.98	6858.7	70.01	6858.8	70.04	6858.9
70.07	6859	70.89	6859	70.93	6858.9	70.98	6858.8	71.03	6858.7
71.09	6858.7	71.13	6858.8	71.14	6858.9	71.16	6859	71.18	6859.1
71.2	6859.2	71.21	6859.3	71.23	6859.4	71.25	6859.5	71.27	6859.6
71.28	6859.7	71.3	6859.8	71.32	6859.9	71.34	6860	71.35	6860.1
71.37	6860.2	71.39	6860.3	71.41	6860.4	71.42	6860.5	71.44	6860.6
71.46	6860.7	71.48	6860.8	71.49	6860.9	71.51	6861	71.54	6861.1
71.56	6861.2	71.58	6861.3	71.61	6861.4	71.63	6861.5	71.66	6861.6
71.69	6861.7	71.71	6861.8	71.74	6861.9	71.77	6862	71.8	6862.1

71.83	6862.2	71.86	6862.3	71.89	6862.4	71.93	6862.5	71.96	6862.6
72	6862.7	72.03	6862.8	72.07	6862.9	72.11	6863	72.15	6863.1
72.19	6863.2	72.23	6863.3	72.28	6863.4	72.32	6863.5	72.37	6863.6
72.42	6863.7	72.47	6863.8	73.06	6863.9	73.56	6864	73.82	6864.1
74.14	6864.2	75	6864.3	75.96	6864.4	76.85	6864.5	77.74	6864.6
78.62	6864.7	79.51	6864.8	80.17	6864.87				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	13.11	.05	59.11	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
13.11	59.11	0	0	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 8248.03

INPUT
Description:
Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6988.89	2.19	6988.8	4.6	6988.7	7.01	6988.6	9.41	6988.5
11.78	6988.4	14.09	6988.3	16.41	6988.2	18.72	6988.1	26.41	6988
28.87	6987.9	30.65	6987.8	33.97	6987.7	37.01	6987.6	38.71	6987.5
40.35	6987.4	41.99	6987.3	43.62	6987.2	45.23	6987.1	46.88	6987
48.44	6986.9	49.97	6986.8	51.5	6986.7	53.04	6986.6	54.6	6986.5
56.16	6986.4	57.7	6986.3	59.23	6986.2	60.74	6986.1	62.24	6986
64.24	6985.9	65.92	6985.8	67.58	6985.7	69.48	6985.6	71.23	6985.5
72.77	6985.4	74.49	6985.3	76.67	6985.2	78.84	6985.1	81.35	6985
83.46	6984.9	85.65	6984.8	90.58	6984.73	92.48	6984.7	104.7	6984.7
107.1	6984.8	109.42	6984.9	111.69	6985	113.85	6985.1	115.92	6985.2
117.96	6985.3	119.85	6985.4	121.62	6985.5	123.34	6985.6	125.07	6985.7
126.74	6985.8	128.35	6985.9	130.06	6986	131.09	6986.1	131.97	6986.2
132.89	6986.3	133.79	6986.4	134.73	6986.5	135.66	6986.6	136.57	6986.7
137.45	6986.8	138.33	6986.9	139.37	6987	140.63	6987.1	141.55	6987.2
142.47	6987.3	143.47	6987.4	144.5	6987.5	144.71	6987.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	74.49	.07	117.96	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
74.49	117.96	107.48	112.64	116.77	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 8135.58

INPUT
Description:
Station Elevation Data num= 167

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6987.6	22.8	6987.6	27.22	6987.6	35.44	6987.7	41.2	6987.8
46.31	6987.9	51.16	6988	60.7	6988	63.77	6987.9	67.28	6987.8
71.24	6987.7	74.71	6987.6	77.89	6987.5	80.86	6987.4	83.79	6987.3
86.58	6987.2	89.31	6987.1	91.77	6987	93.15	6986.9	94.35	6986.8
95.59	6986.7	96.81	6986.6	98.03	6986.5	99.25	6986.4	100.49	6986.3
101.72	6986.2	102.95	6986.1	104.15	6986	105.23	6985.9	106.28	6985.8

107.33	6985.7	108.38	6985.6	109.43	6985.5	110.48	6985.4	111.53	6985.3
112.58	6985.2	113.62	6985.1	114.67	6985	115.73	6984.9	116.77	6984.8
117.82	6984.7	118.87	6984.6	119.92	6984.5	120.97	6984.4	122.02	6984.3
123.07	6984.2	124.12	6984.1	125.17	6984	126.22	6983.9	127.27	6983.8
128.32	6983.7	129.37	6983.6	130.42	6983.5	131.47	6983.4	132.52	6983.3
133.57	6983.2	134.62	6983.1	135.72	6983	137.16	6982.9	138.78	6982.8
140.49	6982.7	142.33	6982.6	144.27	6982.5	146.6	6982.4	149.06	6982.3
151.82	6982.2	154.84	6982.1	158.19	6982	161.91	6981.9	181.49	6981.9
184.16	6982	186.57	6982.1	188.98	6982.2	191.55	6982.3	194.35	6982.4
197.15	6982.5	199.95	6982.6	201.8	6982.7	204.32	6982.8	207.12	6982.9
209.92	6983	212.72	6983.1	215.52	6983.2	218.32	6983.3	221.11	6983.4
223.92	6983.5	226.72	6983.6	229.52	6983.7	232.14	6983.8	234.16	6983.9
236.55	6984	240.72	6984.1	243.51	6984.2	246.31	6984.3	249.11	6984.4
251.91	6984.5	254.25	6984.6	256.18	6984.7	258.09	6984.8	260.01	6984.9
262.38	6985	268.71	6985.1	271.51	6985.2	274	6985.3	276.1	6985.4
278.02	6985.5	279.94	6985.6	281.85	6985.7	283.77	6985.8	285.69	6985.9
288.34	6986	296.09	6986.1	298	6986.2	299.91	6986.3	301.82	6986.4
303.73	6986.5	305.64	6986.6	307.55	6986.7	309.46	6986.8	311.38	6986.9
313.74	6987	321.08	6987.1	322.8	6987.17	323.5	6987.2	325.75	6987.3
327.95	6987.4	329.97	6987.5	332.04	6987.6	334.06	6987.7	336.07	6987.8
338.09	6987.9	340.16	6988	342.76	6988.1	344.43	6988.2	346.13	6988.3
347.83	6988.4	349.49	6988.5	351.17	6988.6	352.9	6988.7	354.57	6988.8
356.24	6988.9	357.93	6989	359.59	6989.1	361.25	6989.2	362.9	6989.3
364.56	6989.4	366.21	6989.5	367.87	6989.6	369.54	6989.7	371.2	6989.8
372.85	6989.9	374.5	6990	376.25	6990.1	378.01	6990.2	379.77	6990.3
381.54	6990.4	383.3	6990.5	385.09	6990.6	386.97	6990.7	388.85	6990.8
390.74	6990.9	392.71	6991	394.84	6991.1	396.98	6991.2	399.13	6991.3
401.31	6991.4	402.61	6991.4						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	154.84	.07	186.57	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
154.84	186.57	222.01	228.4	232.45	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 7906.99

INPUT
Description:
Station Elevation Data num= 114

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6980.8	.09	6980.8	1.52	6980.7	2.94	6980.6	4.37	6980.5
5.8	6980.4	7.22	6980.3	8.65	6980.2	10.07	6980.1	11.67	6980
14.27	6979.9	17.27	6979.8	20.37	6979.7	23.31	6979.6	26.31	6979.5
29.12	6979.4	31.84	6979.3	34.45	6979.2	36.96	6979.1	39.4	6979
43.31	6978.9	47	6978.8	50.8	6978.7	54.58	6978.6	58.08	6978.5
61.81	6978.4	64.93	6978.3	67.79	6978.2	70.44	6978.1	72.81	6978
73.73	6977.9	74.55	6977.8	75.37	6977.7	76.19	6977.6	77.02	6977.5
77.84	6977.4	78.66	6977.3	79.48	6977.2	80.3	6977.1	81.14	6977
82.06	6976.9	82.97	6976.8	83.9	6976.7	84.76	6976.6	85.68	6976.5
86.48	6976.4	87.36	6976.3	88.17	6976.2	89.01	6976.1	117.93	6976.1
119.34	6976.2	120.73	6976.3	122.15	6976.4	123.57	6976.5	125.01	6976.6
126.52	6976.7	128.04	6976.8	129.56	6976.9	131.07	6977	132.55	6977.1
134.02	6977.2	135.51	6977.3	137	6977.4	138.48	6977.5	139.95	6977.6
141.43	6977.7	142.9	6977.8	144.37	6977.9	145.67	6978	146.44	6978.1
147.05	6978.2	147.68	6978.3	148.26	6978.4	148.89	6978.5	149.53	6978.6
150.15	6978.7	150.78	6978.8	151.44	6978.9	152.07	6979	152.67	6979.1
153.26	6979.2	153.85	6979.3	154.44	6979.4	155.02	6979.5	155.6	6979.6

156.17	6979.7	156.78	6979.8	157.36	6979.9	157.95	6980	158.55	6980.1
159.15	6980.2	159.74	6980.3	160.34	6980.4	160.93	6980.5	161.52	6980.6
162.12	6980.7	162.72	6980.8	163.3	6980.9	164.09	6981	164.88	6981.1
165.64	6981.2	166.39	6981.3	167.18	6981.4	167.98	6981.5	168.81	6981.6
169.66	6981.7	170.51	6981.8	171.36	6981.9	172.44	6982	175.25	6982.1
178.28	6982.2	181.32	6982.3	184.3	6982.4	185.44	6982.4		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	82.06	.07	128.04	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
82.06	128.04	113.09	117.22	124.18	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 7789.77

INPUT
Description:
Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6979.39	1.47	6979.3	3.17	6979.2	4.86	6979.1	6.72	6979
8.75	6978.9	10.58	6978.8	12.41	6978.7	14.25	6978.6	16.09	6978.5
17.94	6978.4	19.76	6978.3	21.44	6978.2	22.98	6978.1	25.43	6978
27.63	6977.9	29.57	6977.8	31.51	6977.7	33.45	6977.6	35.4	6977.5
37.34	6977.4	39.31	6977.3	41.58	6977.2	43.92	6977.1	46.57	6977
49.01	6976.9	51.56	6976.8	54.05	6976.7	56.48	6976.6	59.01	6976.5
61.58	6976.4	64.28	6976.3	68.92	6976.2	72.43	6976.1	102.28	6976
103.92	6975.9	105	6975.8	105.91	6975.7	107.1	6975.6	107.95	6975.5
109.15	6975.4	109.94	6975.3	110.92	6975.2	111.85	6975.1	137.32	6975.1
138.98	6975.2	140.58	6975.3	142.09	6975.4	143.51	6975.5	144.91	6975.6
146.25	6975.7	147.56	6975.8	148.78	6975.9	149.94	6976	150.72	6976.1
151.43	6976.2	152.16	6976.3	152.9	6976.4	153.62	6976.5	154.35	6976.6
155.08	6976.7	155.81	6976.8	156.54	6976.9	157.27	6977	158	6977.1
158.73	6977.2	159.46	6977.3	160.19	6977.4	160.92	6977.5	161.66	6977.6
162.38	6977.7	163.12	6977.8	163.84	6977.9	164.56	6978	165.23	6978.1
165.87	6978.2	166.56	6978.3	167.2	6978.4	167.9	6978.5	168.56	6978.6
169.26	6978.7	169.97	6978.8	170.69	6978.9	172.63	6979	174.88	6979.1
177.47	6979.19								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	107.1	.07	144.91	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
107.1	144.91	82.91	83.89	83.27	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 7705.88

INPUT
Description:
Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6978	1.14	6978	2.25	6977.9	3.07	6977.8	3.89	6977.7
4.73	6977.6	5.55	6977.5	6.36	6977.4	7.18	6977.3	8.01	6977.2
8.82	6977.1	9.63	6977	10.41	6976.9	11.15	6976.8	11.92	6976.7

12.72	6976.6	13.45	6976.5	14.21	6976.4	15	6976.3	15.77	6976.2
16.52	6976.1	17.26	6976	17.94	6975.9	18.58	6975.8	19.23	6975.7
19.89	6975.6	20.54	6975.5	21.18	6975.4	21.83	6975.3	22.48	6975.2
23.13	6975.1	23.77	6975	24.41	6974.9	25.05	6974.8	25.68	6974.7
26.32	6974.6	26.95	6974.5	27.59	6974.4	28.22	6974.3	28.86	6974.2
29.49	6974.1	30.31	6974	31.89	6973.9	33.83	6973.8	35.88	6973.7
38.85	6973.6	39.53	6973.6	47.82	6973.65	56.92	6973.7	59.07	6973.8
61.01	6973.9	63.08	6974	68.95	6974.1	73.37	6974.2	76.58	6974.3
81.27	6974.4	96.5	6974.5	102.9	6974.6	106.37	6974.7	108.92	6974.8
110.92	6974.9	112.82	6975	116.46	6975.1	117.56	6975.2	118.79	6975.3
119.88	6975.4	121.08	6975.5	122.26	6975.6	123.38	6975.7	124.62	6975.8
125.76	6975.9	126.95	6976	128.1	6976.1	129.21	6976.2	130.37	6976.3
131.45	6976.4	132.52	6976.5	133.63	6976.6	134.69	6976.7	135.76	6976.8
136.85	6976.9	137.99	6977	139.09	6977.1	140.16	6977.2	141.24	6977.3
142.31	6977.4	143.38	6977.5	144.46	6977.6	145.53	6977.7	146.6	6977.8
147.68	6977.9	148.79	6978	150	6978				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	29.49	.07	68.95	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
29.49	68.95	183.01	182.46	179.23	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 7523.37

INPUT
Description:
Station Elevation Data num= 132

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6976.87	.7	6976.8	1.69	6976.7	2.69	6976.6	3.66	6976.5
4.63	6976.4	5.61	6976.3	6.57	6976.2	7.52	6976.1	8.46	6976
9.41	6975.9	10.35	6975.8	11.31	6975.7	12.28	6975.6	13.23	6975.5
14.18	6975.4	15.12	6975.3	16.06	6975.2	17	6975.1	17.93	6975
18.87	6974.9	19.81	6974.8	20.76	6974.7	21.71	6974.6	22.69	6974.5
23.65	6974.4	24.61	6974.3	25.58	6974.2	26.54	6974.1	27.45	6974
28.3	6973.9	29.11	6973.8	29.92	6973.7	30.74	6973.6	31.55	6973.5
32.36	6973.4	33.17	6973.3	33.98	6973.2	34.79	6973.1	35.6	6973
36.4	6972.9	37.21	6972.8	38.01	6972.7	38.82	6972.6	39.62	6972.5
40.43	6972.4	41.23	6972.3	42.04	6972.2	42.84	6972.1	43.79	6972
45.62	6971.9	47.58	6971.8	49.55	6971.7	51.52	6971.6	53.49	6971.5
55.46	6971.4	57.42	6971.3	59.39	6971.2	61.36	6971.1	63.33	6971
65.3	6970.9	67.26	6970.8	69.28	6970.7	71.36	6970.6	73.45	6970.5
75.64	6970.4	78.26	6970.3	80.43	6970.2	82.51	6970.1	113.35	6970.1
114.12	6970.2	114.84	6970.3	115.54	6970.4	116.2	6970.5	116.85	6970.6
117.51	6970.7	118.17	6970.8	118.82	6970.9	119.53	6971	120.36	6971.1
121.19	6971.2	121.96	6971.3	122.7	6971.4	123.46	6971.5	124.21	6971.6
124.91	6971.7	125.57	6971.8	126.24	6971.9	126.96	6972	127.96	6972.1
129.02	6972.2	130.06	6972.3	131.12	6972.4	132.13	6972.5	133.18	6972.6
134.17	6972.7	135.14	6972.8	136.11	6972.9	137.35	6973	138.33	6973.1
139.26	6973.2	140.3	6973.3	141.13	6973.4	142.21	6973.5	143.31	6973.6
144.3	6973.7	145.41	6973.8	146.49	6973.9	147.69	6974	149.94	6974.1
152.31	6974.2	154.62	6974.3	156.95	6974.4	159.01	6974.5	161.19	6974.6
163.24	6974.7	165.21	6974.8	167.13	6974.9	169.15	6975	171.25	6975.1
173.34	6975.2	175.45	6975.3	177.56	6975.4	179.67	6975.5	181.79	6975.6
183.91	6975.7	186.03	6975.8	188.16	6975.9	190.94	6976	197.37	6976.1
201.95	6976.2	202.65	6976.2						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	69.28	.07	116.85	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
69.28	116.85	58.07	58.27	57.35	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 7465.15

INPUT
Description:
Station Elevation Data num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6973.06	.58	6973	1.57	6972.9	2.56	6972.8	3.55	6972.7
4.55	6972.6	5.54	6972.5	6.54	6972.4	7.54	6972.3	8.54	6972.2
9.54	6972.1	10.73	6972	13.11	6971.9	15.69	6971.8	18.28	6971.7
20.82	6971.6	23.28	6971.5	25.67	6971.4	28.03	6971.3	30.37	6971.2
32.71	6971.1	35.03	6971	37.46	6970.9	39.89	6970.8	42.32	6970.7
44.76	6970.6	47.19	6970.5	49.63	6970.4	52.05	6970.3	54.49	6970.2
56.92	6970.1	59.33	6970	61.22	6969.9	63.08	6969.8	64.95	6969.7
66.81	6969.6	68.67	6969.5	70.54	6969.4	72.45	6969.3	74.4	6969.2
76.37	6969.1	99.16	6969.1	100.72	6969.2	102.28	6969.3	103.84	6969.4
105.42	6969.5	107.03	6969.6	108.62	6969.7	110.27	6969.8	112.04	6969.9
113.73	6970	115.08	6970.1	116.34	6970.2	117.6	6970.3	118.85	6970.4
120.12	6970.5	121.37	6970.6	122.63	6970.7	123.89	6970.8	125.15	6970.9
126.39	6971	127.52	6971.1	128.61	6971.2	129.68	6971.3	130.68	6971.4
131.71	6971.5	132.72	6971.6	133.67	6971.7	134.64	6971.8	135.55	6971.9
136.56	6972	138.31	6972.1	140.16	6972.2	142.01	6972.3	143.85	6972.4
145.7	6972.5	147.55	6972.6	149.56	6972.7	152.16	6972.8	154.61	6972.9
157.14	6973	159.47	6973.1	162.23	6973.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	68.67	.07	103.84	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
68.67	103.84	114.76	98.5	85.2	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 7366.65

INPUT
Description:
Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6970.37	.6	6970.3	1.46	6970.2	2.31	6970.1	3.19	6970
4.45	6969.9	5.73	6969.8	7.01	6969.7	8.29	6969.6	9.57	6969.5
10.85	6969.4	12.13	6969.3	13.41	6969.2	14.69	6969.1	15.97	6969
17.49	6968.9	19.27	6968.8	21.27	6968.7	23.38	6968.6	25.57	6968.5
32.68	6968.4	38.39	6968.3	41.8	6968.3	63.98	6968.4	65.6	6968.4
76.65	6968.3	84.91	6968.2	98.3	6968.1	115.44	6968	126.8	6967.9
133.83	6967.8	136.09	6967.7	138.59	6967.6	140.38	6967.5	141.61	6967.4
142.7	6967.3	143.79	6967.2	144.88	6967.1	145.98	6967	147.07	6966.9
148.16	6966.8	149.25	6966.7	150.35	6966.6	151.44	6966.5	152.53	6966.4
153.62	6966.3	154.72	6966.2	155.81	6966.1	161.54	6966.1	162.54	6966.2
163.54	6966.3	164.54	6966.4	165.54	6966.5	166.54	6966.6	167.54	6966.7
168.54	6966.8	169.54	6966.9	170.54	6967	171.54	6967.1	172.55	6967.2

173.55	6967.3	174.55	6967.4	175.56	6967.5	176.56	6967.6	177.56	6967.7
178.56	6967.8	179.56	6967.9	180.47	6968	181.22	6968.1	181.87	6968.2
182.53	6968.3	183.18	6968.4	183.84	6968.5	184.49	6968.6	185.14	6968.7
185.8	6968.8	186.45	6968.9	187.11	6969	187.76	6969.1	188.42	6969.2
189.07	6969.3	189.72	6969.4	190.38	6969.5	191.03	6969.6	191.69	6969.7
192.34	6969.8	192.99	6969.9	193.71	6970	194.8	6970.1	195.97	6970.2
197.13	6970.3	198.28	6970.4	199.44	6970.5	200.61	6970.6	201.77	6970.7
202.93	6970.8	204.1	6970.9	205.26	6971	205.38	6971		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	147.07	.07	169.54	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
147.07	169.54	123.65	138.56	147.67	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 7228.09

INPUT
Description:
Station Elevation Data num= 105

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6969.35	.62	6969.3	1.73	6969.2	2.84	6969.1	3.94	6969
5.05	6968.9	6.22	6968.8	7.4	6968.7	8.59	6968.6	9.71	6968.5
10.85	6968.4	11.96	6968.3	13.04	6968.2	14.2	6968.1	15.36	6968
16.55	6967.9	17.72	6967.8	18.86	6967.7	19.99	6967.6	21.14	6967.5
22.29	6967.4	23.45	6967.3	24.61	6967.2	25.76	6967.1	26.93	6967
28.12	6966.9	29.38	6966.8	30.71	6966.7	31.89	6966.6	32.99	6966.5
34.05	6966.4	35.09	6966.3	36.13	6966.2	37.16	6966.1	40.13	6966
43.21	6965.9	46.03	6965.8	48.85	6965.7	51.67	6965.6	54.48	6965.5
57.3	6965.4	60.11	6965.3	62.93	6965.2	72.53	6965.1	83.55	6965
88.39	6965	100	6965.03	124.62	6965.1	127.03	6965.2	129.44	6965.3
131.58	6965.4	132.46	6965.5	133.16	6965.6	133.86	6965.7	134.56	6965.8
135.26	6965.9	135.94	6966	136.58	6966.1	137.18	6966.2	137.79	6966.3
138.4	6966.4	139.01	6966.5	139.62	6966.6	140.23	6966.7	140.83	6966.8
141.44	6966.9	142.05	6967	142.66	6967.1	143.27	6967.2	143.91	6967.3
144.56	6967.4	145.27	6967.5	146.01	6967.6	146.69	6967.7	147.41	6967.8
148.23	6967.9	149.27	6968	150.67	6968.1	152.27	6968.2	154	6968.3
155.88	6968.4	157.7	6968.5	159.51	6968.6	161.37	6968.7	163.79	6968.8
165.56	6968.9	167.85	6969	169.36	6969.1	170.65	6969.2	171.94	6969.3
173.23	6969.4	174.52	6969.5	175.81	6969.6	177.1	6969.7	178.39	6969.8
179.69	6969.9	181.2	6970	184	6970.1	187.3	6970.2	190.59	6970.3
193.89	6970.4	197.28	6970.5	200.86	6970.6	207.21	6970.7	207.57	6970.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	60.11	.07	127.03	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
60.11	127.03	25.66	15	17.72	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 7213.09

INPUT
Description:

Station Elevation Data num= 133

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6970.5	.36	6970.5	1.52	6970.4	2.68	6970.3	3.84	6970.2
5	6970.1	6.16	6970	7.32	6969.9	8.5	6969.8	9.78	6969.7
11.06	6969.6	12.36	6969.5	13.67	6969.4	14.97	6969.3	16.28	6969.2
17.58	6969.1	18.9	6969	20.25	6968.9	21.47	6968.8	22.59	6968.7
23.7	6968.6	24.76	6968.5	25.83	6968.4	26.89	6968.3	27.96	6968.2
28.92	6968.1	29.84	6968	30.7	6967.9	31.56	6967.8	32.41	6967.7
33.24	6967.6	34.09	6967.5	34.89	6967.4	35.68	6967.3	36.46	6967.2
37.25	6967.1	38	6967	38.74	6966.9	39.48	6966.8	40.22	6966.7
40.96	6966.6	41.7	6966.5	42.43	6966.4	43.17	6966.3	43.91	6966.2
44.66	6966.1	45.57	6966	47.76	6965.9	50.21	6965.8	52.77	6965.7
55.4	6965.6	58.27	6965.5	61.12	6965.4	63.93	6965.3	66.72	6965.2
69.53	6965.1	82.11	6965	85.11	6964.9	87.91	6964.8	90.72	6964.7
93.52	6964.6	103.06	6964.6	108.24	6964.7	116.17	6964.8	117.77	6964.8
119.69	6964.7	123.02	6964.6	124.44	6964.5	125.85	6964.4	127.28	6964.3
128.74	6964.2	130.97	6964.2	132.07	6964.3	132.94	6964.4	133.8	6964.5
134.61	6964.6	135.39	6964.7	136.09	6964.8	136.82	6964.9	137.53	6965
138.22	6965.1	138.94	6965.2	139.71	6965.3	140.63	6965.4	141.65	6965.5
142.63	6965.6	143.6	6965.7	144.54	6965.8	145.47	6965.9	146.4	6966
147.31	6966.1	148.23	6966.2	149.19	6966.3	150.11	6966.4	151.03	6966.5
151.96	6966.6	152.86	6966.7	153.77	6966.8	154.63	6966.9	155.48	6967
156.33	6967.1	157.19	6967.2	158.04	6967.3	158.9	6967.4	159.82	6967.5
160.66	6967.6	161.56	6967.7	162.53	6967.8	163.47	6967.9	164.5	6968
165.81	6968.1	167.17	6968.2	168.54	6968.3	169.9	6968.4	171.27	6968.5
172.64	6968.6	174.01	6968.7	175.38	6968.8	176.74	6968.9	178.11	6969
179.46	6969.1	180.81	6969.2	182.17	6969.3	183.53	6969.4	184.9	6969.5
186.26	6969.6	187.63	6969.7	189.01	6969.8	190.38	6969.9	192.26	6970
199.4	6970.1	206.9	6970.2	207.57	6970.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	82.11	.07	136.82	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
82.11	136.82	133.2	123.26	108.37	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 7089.83

INPUT
Description:
Station Elevation Data num= 138

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6969.9	.07	6969.9	.76	6969.8	1.44	6969.7	2.13	6969.6
2.81	6969.5	3.5	6969.4	4.18	6969.3	4.87	6969.2	5.55	6969.1
6.24	6969	6.93	6968.9	7.63	6968.8	8.33	6968.7	9.03	6968.6
9.73	6968.5	10.42	6968.4	11.12	6968.3	11.82	6968.2	12.51	6968.1
13.21	6968	13.88	6967.9	14.55	6967.8	15.21	6967.7	15.88	6967.6
16.54	6967.5	17.21	6967.4	17.87	6967.3	18.54	6967.2	19.21	6967.1
19.87	6967	20.53	6966.9	21.2	6966.8	21.86	6966.7	22.53	6966.6
23.19	6966.5	23.85	6966.4	24.52	6966.3	25.18	6966.2	25.84	6966.1
26.51	6966	27.17	6965.9	27.84	6965.8	28.5	6965.7	29.16	6965.6
29.83	6965.5	30.49	6965.4	31.16	6965.3	31.82	6965.2	32.48	6965.1
33.15	6965	33.81	6964.9	34.48	6964.8	35.14	6964.7	35.81	6964.6
36.48	6964.5	37.14	6964.4	37.81	6964.3	38.47	6964.2	39.14	6964.1
39.77	6964	40.37	6963.9	40.95	6963.8	41.52	6963.7	42.1	6963.6
42.67	6963.5	43.25	6963.4	43.83	6963.3	44.4	6963.2	44.98	6963.1
45.56	6963	46.15	6962.9	46.75	6962.8	47.34	6962.7	47.94	6962.6
48.54	6962.5	49.13	6962.4	49.73	6962.3	50.33	6962.2	50.96	6962.1

85.21	6962.1	86.37	6962.2	87.52	6962.3	88.68	6962.4	89.84	6962.5
91	6962.6	92.16	6962.7	93.32	6962.8	94.48	6962.9	95.63	6963
96.79	6963.1	97.98	6963.2	99.15	6963.3	100.28	6963.4	101.43	6963.5
102.58	6963.6	103.78	6963.7	104.89	6963.8	105.98	6963.9	107.6	6964
109.15	6964.1	110.23	6964.2	111.31	6964.3	112.39	6964.4	113.47	6964.5
114.55	6964.6	115.63	6964.7	116.71	6964.8	117.79	6964.9	118.98	6965
120.62	6965.1	121.6	6965.2	122.6	6965.3	123.61	6965.4	124.58	6965.5
125.55	6965.6	126.53	6965.7	127.53	6965.8	128.54	6965.9	129.6	6966
130.71	6966.1	131.83	6966.2	132.96	6966.3	134.07	6966.4	135.18	6966.5
136.28	6966.6	137.39	6966.7	138.49	6966.8	139.58	6966.9	140.67	6967
141.74	6967.1	142.82	6967.2	143.9	6967.3	144.98	6967.4	146.06	6967.5
147.14	6967.6	148.22	6967.7	148.77	6967.7				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	47.94	.07	91	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
47.94	91	178.18	181.27	181.33	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 6908.56

INPUT
Description:
Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6963.3	.22	6963.3	1.08	6963.2	1.93	6963.1	2.79	6963
3.65	6962.9	4.51	6962.8	5.36	6962.7	6.23	6962.6	7.09	6962.5
7.96	6962.4	8.84	6962.3	9.73	6962.2	10.63	6962.1	11.52	6962
12.35	6961.9	13.17	6961.8	13.97	6961.7	14.77	6961.6	15.57	6961.5
16.36	6961.4	17.16	6961.3	17.97	6961.2	18.77	6961.1	19.58	6961
20.39	6960.9	21.21	6960.8	22.03	6960.7	22.84	6960.6	23.65	6960.5
24.45	6960.4	25.24	6960.3	26.03	6960.2	26.82	6960.1	27.69	6960
28.86	6959.9	30.09	6959.8	31.39	6959.7	32.58	6959.6	33.81	6959.5
35.09	6959.4	36.3	6959.3	37.53	6959.2	38.77	6959.1	64.04	6959.1
66.16	6959.2	67.6	6959.3	69.36	6959.4	71.49	6959.5	73.66	6959.6
75.78	6959.7	77.86	6959.8	79.99	6959.9	81.99	6960	83.42	6960.1
84.74	6960.2	86.05	6960.3	87.35	6960.4	88.63	6960.5	89.91	6960.6
91.19	6960.7	92.44	6960.8	93.68	6960.9	94.92	6961	96.21	6961.1
97.49	6961.2	98.78	6961.3	100.07	6961.4	101.36	6961.5	102.67	6961.6
103.97	6961.7	105.25	6961.8	106.52	6961.9	107.82	6962	109.23	6962.1
110.67	6962.2	112.11	6962.3	113.55	6962.4	114.98	6962.5	116.42	6962.6
117.86	6962.7	119.3	6962.8	120.75	6962.9	122.17	6963	123.53	6963.1
124.9	6963.2	126.34	6963.3	127.85	6963.4	129.33	6963.5	130.91	6963.6
132.45	6963.7	132.95	6963.7						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	36.3	.07	67.6	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
36.3	67.6	169.26	166.94	160.01	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 6741.62

INPUT
Description:
Station Elevation Data num= 124

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6961.9	.61	6961.9	1.69	6961.8	2.77	6961.7	3.85	6961.6
4.93	6961.5	6.01	6961.4	7.09	6961.3	8.17	6961.2	9.25	6961.1
10.34	6961	11.42	6960.9	12.51	6960.8	13.6	6960.7	14.71	6960.6
15.8	6960.5	16.91	6960.4	18.02	6960.3	19.13	6960.2	20.25	6960.1
21.36	6960	22.44	6959.9	23.51	6959.8	24.58	6959.7	25.64	6959.6
26.71	6959.5	27.78	6959.4	28.85	6959.3	29.92	6959.2	30.98	6959.1
32.05	6959	33.12	6958.9	34.2	6958.8	35.27	6958.7	36.33	6958.6
37.4	6958.5	38.45	6958.4	39.49	6958.3	40.51	6958.2	41.51	6958.1
42.49	6958	43.39	6957.9	44.26	6957.8	45.14	6957.7	46.01	6957.6
46.89	6957.5	47.76	6957.4	48.64	6957.3	49.51	6957.2	50.38	6957.1
51.25	6957	52.13	6956.9	53	6956.8	53.88	6956.7	54.75	6956.6
55.63	6956.5	56.5	6956.4	57.38	6956.3	58.25	6956.2	59.13	6956.1
59.99	6956	60.81	6955.9	61.61	6955.8	62.4	6955.7	63.18	6955.6
63.96	6955.5	64.74	6955.4	65.51	6955.3	66.27	6955.2	67.03	6955.1
67.79	6955	68.49	6954.9	69.19	6954.8	69.89	6954.7	70.59	6954.6
71.28	6954.5	71.98	6954.4	72.68	6954.3	73.38	6954.2	74.07	6954.1
79.97	6954.1	81.17	6954.2	82.41	6954.3	83.67	6954.4	84.94	6954.5
86.17	6954.6	87.4	6954.7	88.63	6954.8	89.86	6954.9	91.08	6955
92.3	6955.1	93.52	6955.2	94.77	6955.3	96	6955.4	97.23	6955.5
98.47	6955.6	99.78	6955.7	101.35	6955.8	103.11	6955.9	105.26	6956
108.83	6956.1	111.85	6956.2	115.21	6956.3	118.58	6956.4	121.94	6956.5
124.26	6956.6	126.12	6956.7	127.98	6956.8	129.84	6956.9	132.22	6957
134.8	6957.1	136.27	6957.2	137.73	6957.3	139.21	6957.4	140.7	6957.5
142.2	6957.6	143.7	6957.7	145.11	6957.8	146.38	6957.9	147.49	6958
148.39	6958.1	149.24	6958.2	150.09	6958.3	150.2	6958.3		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	71.28	.07	84.94	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
71.28	84.94	172.83	177.26	179.79	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 6564.36

INPUT
Description:
Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6954.7	1.02	6954.7	2.35	6954.6	3.57	6954.5	4.68	6954.4
5.79	6954.3	6.83	6954.2	7.79	6954.1	8.69	6954	9.49	6953.9
10.23	6953.8	10.98	6953.7	11.72	6953.6	12.47	6953.5	13.22	6953.4
13.97	6953.3	14.73	6953.2	15.48	6953.1	16.22	6953	16.97	6952.9
17.72	6952.8	18.46	6952.7	19.22	6952.6	19.98	6952.5	20.72	6952.4
21.47	6952.3	22.24	6952.2	22.97	6952.1	23.84	6952	25.93	6951.9
28.12	6951.8	30.32	6951.7	32.52	6951.6	34.71	6951.5	36.91	6951.4
39.12	6951.3	40	6951.26	41.44	6951.2	46.54	6951.2	48.24	6951.3
50.27	6951.4	52.09	6951.5	53.82	6951.6	55.26	6951.7	56.65	6951.8
58	6951.9	59.33	6952	61.78	6952.1	64.35	6952.2	66.3	6952.3
68.68	6952.4	71.28	6952.5	73.89	6952.6	76.5	6952.7	79.11	6952.8
81.72	6952.9	84.4	6953	88.42	6953.1	92.89	6953.2	97.37	6953.3
102.32	6953.4	106.89	6953.5	109.88	6953.6	112.56	6953.7	115.15	6953.8
117.66	6953.9	119.87	6954	120.98	6954.1	122.03	6954.2	123.08	6954.3
124.13	6954.4	125.18	6954.5	126.22	6954.6	127.27	6954.7	128.32	6954.8
129.37	6954.9	130.41	6955	131.42	6955.1	131.57	6955.1		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	32.52	.07	53.82	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
32.52	53.82	194.03	194.89	197.6	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 6369.47

INPUT
Description:
Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6950	45.47	6950	47.87	6949.9	49.93	6949.8	51.86	6949.7
53.83	6949.6	55.79	6949.5	57.74	6949.4	59.7	6949.3	61.65	6949.2
63.61	6949.1	65.59	6949	67.55	6948.9	69.5	6948.8	71.44	6948.7
73.39	6948.6	75.33	6948.5	77.11	6948.4	78.09	6948.3	79.82	6948.2
81.78	6948.1	83.61	6948	84.34	6947.9	84.87	6947.8	85.45	6947.7
85.99	6947.6	86.55	6947.5	87.12	6947.4	87.66	6947.3	88.22	6947.2
88.79	6947.1	89.33	6947	89.85	6946.9	90.36	6946.8	90.86	6946.7
91.37	6946.6	91.88	6946.5	92.39	6946.4	92.9	6946.3	93.41	6946.2
93.93	6946.1	109.83	6946.1	110.21	6946.2	110.64	6946.3	111.02	6946.4
111.37	6946.5	111.78	6946.6	112.24	6946.7	112.63	6946.8	113.01	6946.9
113.44	6947	113.84	6947.1	114.25	6947.2	114.65	6947.3	115.05	6947.4
115.46	6947.5	115.86	6947.6	116.27	6947.7	116.67	6947.8	117.07	6947.9
117.46	6948	117.8	6948.1	118.14	6948.2	118.47	6948.3	118.8	6948.4
119.13	6948.5	119.46	6948.6	119.8	6948.7	120.12	6948.8	120.45	6948.9
120.77	6949	121.09	6949.1	121.41	6949.2	121.73	6949.3	122.04	6949.4
122.36	6949.5	122.68	6949.6	122.99	6949.7	123.31	6949.8	123.65	6949.9
124.02	6950	124.48	6950.1	125.01	6950.2	125.55	6950.3	126.09	6950.4
126.65	6950.5	127.19	6950.6	127.73	6950.7	128.3	6950.8	128.86	6950.9
129.42	6951	130.03	6951.1	130.63	6951.2	131.24	6951.3	131.85	6951.4
132.46	6951.5	133.06	6951.6	133.67	6951.7	134.28	6951.8	134.88	6951.9
135.58	6952	136.44	6952.1	137.4	6952.2	138.35	6952.3	139.31	6952.4
140.26	6952.5	141.22	6952.6	142.17	6952.7	143.13	6952.8	144.08	6952.9
145.04	6953	146.01	6953.1	146.97	6953.2	147.94	6953.3	148.9	6953.4
149.87	6953.5	150.81	6953.6	151.77	6953.7	152.71	6953.8	153.65	6953.9
154.78	6954	155.87	6954						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	91.37	.07	111.78	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
91.37	111.78	322.64	326.5	327.4	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 6042.97

INPUT
Description:
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6947.1	1.29	6947	2.61	6946.9	3.79	6946.8	4.98	6946.7
6.25	6946.6	7.53	6946.5	8.6	6946.4	9.73	6946.3	11.08	6946.2

12.44	6946.1	13.85	6946	15.12	6945.9	16.37	6945.8	17.56	6945.7
18.71	6945.6	19.83	6945.5	20.92	6945.4	21.95	6945.3	22.92	6945.2
23.9	6945.1	24.9	6945	25.89	6944.9	26.89	6944.8	27.9	6944.7
28.88	6944.6	29.78	6944.5	30.68	6944.4	31.61	6944.3	32.53	6944.2
33.41	6944.1	34.49	6944	36.76	6943.9	39.22	6943.8	41.68	6943.7
44.14	6943.6	46.6	6943.5	49.06	6943.4	51.52	6943.3	53.98	6943.2
56.44	6943.1	81.48	6943.1	82.74	6943.2	83.98	6943.3	85.24	6943.4
86.51	6943.5	87.83	6943.6	89.18	6943.7	90.56	6943.8	91.93	6943.9
93.39	6944	95.13	6944.1	96.92	6944.2	98.71	6944.3	100.67	6944.4
103.26	6944.5	107.41	6944.6	121.91	6944.7	127.43	6944.8	131.02	6944.9
134.59	6945	137.19	6945.1	139.21	6945.2	141.09	6945.3	141.67	6945.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	46.6	.07	85.24	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
46.6	85.24	435.01	435.57	424.51	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 5607.4

INPUT
Description:
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6937	25.79	6937	31.34	6936.9	36.14	6936.8	41.41	6936.7
48.01	6936.6	51.71	6936.5	54.04	6936.4	56.37	6936.3	58.71	6936.2
61.03	6936.1	69.8	6936	70.73	6935.9	71.14	6935.8	71.55	6935.7
71.94	6935.6	72.29	6935.5	72.62	6935.4	72.97	6935.3	73.36	6935.2
73.72	6935.1	74.08	6935	74.45	6934.9	74.81	6934.8	75.18	6934.7
75.58	6934.6	75.95	6934.5	76.32	6934.4	76.69	6934.3	77.05	6934.2
77.42	6934.1	91.38	6934.1	91.89	6934.2	92.44	6934.3	93.03	6934.4
93.62	6934.5	94.21	6934.6	94.82	6934.7	95.37	6934.8	95.97	6934.9
97.01	6935	126.96	6935.1	127.92	6935.2	128.89	6935.3	129.89	6935.4
130.85	6935.5	131.84	6935.6	132.87	6935.7	133.87	6935.8	134.89	6935.9
135.93	6936	137.01	6936.1	138.12	6936.2	139.22	6936.3	140.28	6936.4
141.37	6936.5	142.44	6936.6	143.52	6936.7	144.6	6936.8	145.67	6936.9
146.78	6937	147.78	6937.1	148.72	6937.2	149.67	6937.3	150.62	6937.4
151.56	6937.5	152.52	6937.6	153.46	6937.7	154.42	6937.8	155.37	6937.9
156.42	6938	158.25	6938.1	160.2	6938.2	162.17	6938.3	164.15	6938.4
166.15	6938.5	168.13	6938.6	170.11	6938.7	172.07	6938.8	174.02	6938.9
175.99	6939	177.89	6939.1	179.87	6939.2	181.2	6939.2		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	76.32	.07	93.03	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
76.32	93.03	181.46	200.26	206.07	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 5407.14

INPUT
Description:
Station Elevation Data num= 67

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6934.38	1.15	6934.3	2.61	6934.2	4.08	6934.1	16.08	6934
21.1	6933.9	37.14	6933.8	50.57	6933.7	55.42	6933.6	58.02	6933.5
60.63	6933.4	63.24	6933.3	65.77	6933.2	67.89	6933.1	69.88	6933
72.05	6932.9	73.92	6932.8	75.78	6932.7	77.49	6932.6	79.1	6932.5
80.92	6932.4	82.78	6932.3	84.65	6932.2	86.5	6932.1	88.14	6932
88.94	6931.9	89.52	6931.8	90.1	6931.7	90.67	6931.6	91.26	6931.5
91.84	6931.4	92.42	6931.3	92.99	6931.2	93.6	6931.1	111.42	6931.1
113.04	6931.2	114.64	6931.3	116.23	6931.4	117.89	6931.5	119.58	6931.6
121.31	6931.7	123.06	6931.8	124.82	6931.9	126.54	6932	127.89	6932.1
129.17	6932.2	130.47	6932.3	131.78	6932.4	133.01	6932.5	134.2	6932.6
135.38	6932.7	136.55	6932.8	137.73	6932.9	139.09	6933	140.77	6933.1
141.95	6933.2	143.12	6933.3	144.32	6933.4	145.49	6933.5	146.7	6933.6
147.87	6933.7	149.09	6933.8	150.26	6933.9	151.63	6934	153.88	6934.1
156.19	6934.2	158.31	6934.29						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	90.67	.07	119.58	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
90.67	119.58	126.84	124.48	126.08	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 5282.66

INPUT
Description:
Station Elevation Data num= 256

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6933.75	.42	6933.71	1.4	6933.62	1.5	6933.62	1.65	6933.6
2.57	6933.52	3.17	6933.47	3.65	6933.43	4.39	6933.36	4.72	6933.33
4.93	6933.31	5.79	6933.24	6.7	6933.16	6.87	6933.14	7.13	6933.12
7.94	6933.05	8.47	6933	9.02	6932.95	9.87	6932.87	10.09	6932.86
10.23	6932.84	11.16	6932.76	12	6932.69	12.24	6932.67	12.61	6932.63
13.31	6932.57	13.77	6932.53	14.39	6932.48	15.35	6932.39	15.46	6932.38
15.53	6932.37	16.53	6932.29	17.3	6932.22	17.61	6932.19	18.09	6932.15
18.68	6932.1	19.06	6932.07	19.76	6932.01	20.83	6932	21.9	6931.96
22.6	6931.92	22.98	6931.91	23.57	6931.88	24.05	6931.86	24.36	6931.84
25.13	6931.81	26.13	6931.76	26.2	6931.76	26.31	6931.75	27.27	6931.71
27.9	6931.68	28.35	6931.66	29.05	6931.63	29.42	6931.61	29.66	6931.6
30.5	6931.57	31.43	6931.54	31.57	6931.53	31.79	6931.53	32.64	6931.5
33.2	6931.48	33.72	6931.46	34.53	6931.43	34.79	6931.42	34.96	6931.42
35.87	6931.4	36.73	6931.38	36.94	6931.37	37.27	6931.36	38.01	6931.33
38.49	6931.31	39.09	6931.29	40.01	6931.28	40.26	6931.28	41.24	6931.26
42.03	6931.25	42.31	6931.24	42.75	6931.23	43.38	6931.22	43.79	6931.21
44.46	6931.2	45.49	6931.17	46.61	6931.15	47.33	6931.13	47.68	6931.13
48.23	6931.12	48.75	6931.1	49.09	6931.1	49.83	6931.08	50.86	6931.06
50.97	6931.06	51.98	6931.04	52.63	6931.02	53.05	6931.01	53.71	6931
54.12	6931	54.39	6930.99	55.2	6930.97	56.16	6930.95	56.27	6930.94
56.45	6930.94	57.35	6930.92	57.92	6930.9	58.42	6930.89	59.19	6930.87
59.49	6930.86	59.69	6930.85	60.57	6930.83	61.46	6930.8	61.64	6930.8
61.93	6930.79	62.72	6930.77	63.22	6930.75	63.79	6930.74	64.67	6930.71
64.86	6930.71	64.99	6930.7	65.94	6930.68	66.76	6930.66	67.01	6930.65
67.41	6930.64	68.09	6930.61	68.52	6930.6	69.16	6930.58	70.15	6930.55
70.29	6930.55	71.31	6930.51	72.06	6930.49	72.38	6930.48	72.89	6930.47
73.46	6930.45	73.82	6930.44	74.53	6930.42	75.59	6930.39	76.68	6930.35
77.35	6930.33	77.75	6930.32	78.37	6930.3	78.83	6930.29	79.12	6930.28
79.9	6930.25	80.89	6930.22	81.11	6930.22	82.05	6930.19	82.65	6930.17
83.12	6930.16	83.85	6930.13	84.2	6930.12	84.42	6930.12	85.27	6930.09

86.19	6930.06	86.34	6930.06	86.59	6930.05	87.42	6930.02	87.95	6930
88.49	6929.98	89.33	6929.91	89.56	6929.9	89.72	6929.88	90.64	6929.81
91.49	6929.77	91.71	6929.76	92.07	6929.75	92.79	6929.73	93.25	6929.74
93.86	6929.76	94.81	6929.78	95.02	6929.78	96.01	6929.81	96.78	6929.83
97.08	6929.83	97.55	6929.85	98.16	6929.86	98.55	6929.87	99.23	6929.89
100.29	6929.91	101.38	6929.94	102.08	6929.96	102.45	6929.96	103.03	6929.98
103.53	6929.99	103.85	6930	116.72	6930	117.49	6930.04	117.98	6930.11
118.56	6930.19	119.46	6930.31	119.64	6930.33	119.75	6930.35	120.71	6930.48
121.51	6930.59	121.78	6930.63	122.2	6930.69	122.86	6930.78	123.28	6930.84
123.93	6930.93	124.94	6931.07	125.01	6931.08	126.08	6931.23	126.81	6931.33
127.15	6931.37	127.68	6931.45	128.23	6931.52	128.58	6931.57	129.3	6931.67
130.35	6931.82	131.45	6931.97	132.11	6932.04	132.52	6932.09	133.16	6932.15
133.6	6932.19	133.88	6932.22	134.67	6932.3	135.64	6932.39	135.75	6932.4
135.9	6932.42	136.82	6932.51	137.41	6932.57	137.89	6932.62	138.64	6932.69
138.97	6932.72	139.18	6932.74	140.04	6932.83	140.94	6932.92	141.12	6932.94
141.38	6932.96	142.19	6933.04	142.71	6933.09	143.26	6933.15	144.12	6933.23
144.34	6933.25	144.48	6933.27	145.41	6933.36	146.24	6933.44	146.49	6933.47
146.86	6933.51	147.56	6933.58	148.01	6933.63	148.63	6933.69	149.6	6933.79
149.71	6933.81	149.78	6933.81	150.78	6933.92	151.54	6933.98	151.86	6934.01
152.34	6934.03	152.93	6934.05	153.31	6934.06	154	6934.08	155.07	6934.1
156.15	6934.14	156.84	6934.15	157.23	6934.17	157.82	6934.18	158.3	6934.19
158.37	6934.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	78.37	.07	119.64	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
78.37	119.64	110.79	113.59	117.88	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 5169.07

INPUT
Description:
Station Elevation Data num= 158

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6932	.15	6932	.92	6931.9	1.63	6931.8	2.35	6931.7
3.09	6931.6	3.81	6931.5	4.53	6931.4	5.26	6931.3	6	6931.2
6.73	6931.1	7.47	6931	8.2	6930.9	8.94	6930.8	9.68	6930.7
10.42	6930.6	11.15	6930.5	11.89	6930.4	12.62	6930.3	13.36	6930.2
14.1	6930.1	14.73	6930	15.25	6929.9	15.66	6929.8	16.07	6929.7
16.49	6929.6	16.9	6929.5	17.31	6929.4	17.72	6929.3	18.14	6929.2
18.55	6929.1	18.97	6929	19.39	6928.9	19.81	6928.8	20.23	6928.7
20.65	6928.6	21.07	6928.5	21.49	6928.4	21.91	6928.3	22.34	6928.2
22.75	6928.1	23.14	6928	23.51	6927.9	23.84	6927.8	24.17	6927.7
24.5	6927.6	24.83	6927.5	25.16	6927.4	25.48	6927.3	25.81	6927.2
26.15	6927.1	26.48	6927	26.8	6926.9	27.13	6926.8	27.46	6926.7
27.79	6926.6	28.12	6926.5	28.45	6926.4	28.78	6926.3	29.1	6926.2
29.44	6926.1	29.78	6926	30.12	6925.9	30.47	6925.8	30.82	6925.7
31.15	6925.6	31.46	6925.5	31.78	6925.4	32.09	6925.3	32.43	6925.2
32.77	6925.1	33.16	6925	33.57	6924.9	33.99	6924.8	34.37	6924.7
34.77	6924.6	35.17	6924.5	35.57	6924.4	35.98	6924.3	38.7	6924.3
39.63	6924.4	40.43	6924.5	41.14	6924.6	41.68	6924.7	42.3	6924.8
42.82	6924.9	43.36	6925	44.27	6925.1	44.79	6925.2	45.24	6925.3
45.7	6925.4	46.17	6925.5	46.64	6925.6	47.11	6925.7	47.58	6925.8
48.04	6925.9	48.51	6926	49.09	6926.1	49.7	6926.2	50.31	6926.3
50.91	6926.4	51.51	6926.5	52.11	6926.6	52.71	6926.7	53.31	6926.8
53.91	6926.9	54.51	6927	55.12	6927.1	55.71	6927.2	56.31	6927.3
56.91	6927.4	57.5	6927.5	58.1	6927.6	58.7	6927.7	59.29	6927.8

59.89	6927.9	60.6	6928	61.42	6928.1	62.37	6928.2	63.32	6928.3
64.3	6928.4	65.32	6928.5	66.44	6928.6	67.8	6928.7	69.36	6928.8
70.8	6928.9	71.99	6929	73.11	6929.1	74.19	6929.2	75.25	6929.3
76.3	6929.4	77.35	6929.5	78.37	6929.6	79.38	6929.7	80.39	6929.8
81.39	6929.9	82.47	6930	83.79	6930.1	85.19	6930.2	86.59	6930.3
87.99	6930.4	89.4	6930.5	90.8	6930.6	92.2	6930.7	93.61	6930.8
95.01	6930.9	96.66	6931	99.86	6931.1	102.33	6931.2	105.14	6931.3
108.33	6931.4	112.44	6931.5	118.39	6931.6	124.35	6931.7	130.31	6931.8
136.17	6931.9	142.16	6932	142.88	6932				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	32.09	.07	44.79	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
32.09	44.79	128.22	124.14	123.79	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 5044.93

INPUT
Description:
Station Elevation Data num= 100

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6929.9	1.05	6929.9	4.6	6929.8	7.99	6929.7	10.49	6929.6
12.79	6929.5	15.08	6929.4	17.36	6929.3	19.53	6929.2	21.49	6929.1
25.61	6929	27.61	6928.9	29.05	6928.8	30.48	6928.7	31.91	6928.6
33.35	6928.5	34.79	6928.4	36.21	6928.3	37.63	6928.2	39.05	6928.1
40.37	6928	41.25	6927.9	42.02	6927.8	42.8	6927.7	43.57	6927.6
44.33	6927.5	45.1	6927.4	45.86	6927.3	46.63	6927.2	47.39	6927.1
48.16	6927	48.92	6926.9	49.67	6926.8	50.43	6926.7	51.19	6926.6
51.94	6926.5	52.7	6926.4	53.46	6926.3	54.21	6926.2	54.97	6926.1
55.73	6926	56.9	6925.9	58.08	6925.8	59.26	6925.7	60.44	6925.6
61.62	6925.5	62.8	6925.4	63.98	6925.3	65.17	6925.2	66.37	6925.1
81.75	6925.1	83.18	6925.2	84.64	6925.3	86.14	6925.4	87.66	6925.5
89.34	6925.6	91.09	6925.7	92.94	6925.8	94.83	6925.9	97.51	6926
117.75	6926.1	118.94	6926.2	120.14	6926.3	121.33	6926.4	122.53	6926.5
123.72	6926.6	124.91	6926.7	126.11	6926.8	127.31	6926.9	129.04	6927
132	6927.1	133.51	6927.2	135.3	6927.3	137.06	6927.4	139.11	6927.5
141.19	6927.6	144.03	6927.7	146.7	6927.8	148.78	6927.9	151.22	6928
153.97	6928.1	156.33	6928.2	158.68	6928.3	161.24	6928.4	163.87	6928.5
166.39	6928.6	169.39	6928.7	172.36	6928.8	175.44	6928.9	178.32	6929
180.74	6929.1	183.12	6929.2	185.72	6929.3	188.4	6929.4	191.27	6929.5
194.4	6929.6	197.4	6929.7	200.31	6929.8	203.48	6929.9	206.07	6929.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	59.26	.07	89.34	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
59.26	89.34	120.08	111.48	103.58	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 4933.45

INPUT
Description:

Station Elevation Data num= 308

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6926.03	.37	6926.02	.47	6926.02	.77	6926.01	1.26	6925.98
1.42	6925.97	2.05	6925.93	2.48	6925.89	2.85	6925.85	3.53	6925.73
3.64	6925.72	3.98	6925.67	4.43	6925.61	4.58	6925.59	5.22	6925.48
5.63	6925.41	6.02	6925.35	6.69	6925.23	6.81	6925.21	7.18	6925.15
7.6	6925.08	7.74	6925.08	8.39	6925.01	8.79	6925.01	9.19	6925
28.2	6925	28.79	6925.02	28.99	6925.02	29.62	6925.04	29.78	6925.05
30.58	6925.09	30.89	6925.11	31.37	6925.12	31.94	6925.14	32.16	6925.14
32.83	6925.15	36.12	6925.15	36.92	6925.12	37.21	6925.12	37.71	6925.1
38.26	6925.08	38.5	6925.08	39.24	6925.05	39.29	6925.04	40.08	6925.03
40.36	6925.02	40.88	6925.03	41.42	6925	41.67	6924.99	42.44	6925
43.25	6924.98	43.52	6924.97	44.05	6924.96	44.84	6924.96	45.63	6924.94
46.42	6924.93	48.01	6924.93	48.78	6924.94	49.59	6924.94	49.83	6924.95
50.38	6924.95	50.89	6924.96	52.06	6924.96	52.76	6924.95	52.99	6924.95
53.55	6924.94	54.04	6924.93	54.35	6924.92	55.1	6924.91	55.26	6924.91
55.93	6924.9	56.15	6924.89	56.72	6924.88	57.2	6924.88	57.51	6924.87
58.25	6924.86	63.06	6924.86	63.52	6924.87	63.85	6924.87	64.57	6924.86
64.65	6924.87	65.62	6924.87	66.23	6924.85	66.67	6924.85	67.02	6924.84
67.73	6924.82	67.81	6924.82	68.08	6924.81	68.61	6924.78	68.78	6924.78
69.4	6924.75	69.83	6924.73	70.19	6924.71	70.88	6924.68	70.98	6924.68
71.29	6924.67	71.78	6924.65	71.94	6924.64	72.57	6924.61	72.99	6924.59
73.36	6924.58	74.04	6924.55	74.15	6924.54	74.49	6924.53	74.95	6924.5
75.09	6924.49	75.74	6924.46	76.15	6924.44	76.53	6924.42	77.2	6924.38
77.32	6924.38	77.7	6924.36	78.11	6924.34	78.25	6924.33	78.91	6924.29
79.3	6924.27	79.7	6924.25	80.36	6924.22	80.49	6924.21	80.9	6924.18
81.28	6924.16	81.41	6924.15	82.08	6924.11	82.46	6924.09	82.87	6924.07
83.51	6924.03	83.66	6924.02	84.11	6923.97	84.45	6923.93	84.56	6923.92
85.24	6923.82	85.62	6923.77	86.04	6923.71	86.67	6923.62	86.83	6923.6
87.32	6923.53	87.62	6923.49	87.72	6923.47	88.41	6923.38	88.77	6923.33
89.21	6923.26	89.83	6923.18	90	6923.15	90.52	6923.08	90.79	6923.04
90.88	6923.03	91.58	6922.93	91.93	6922.88	92.38	6922.82	92.98	6922.73
93.17	6922.71	93.73	6922.63	93.96	6922.6	94.04	6922.58	94.75	6922.49
95.09	6922.44	95.54	6922.38	96.14	6922.29	96.34	6922.27	96.93	6922.18
97.13	6922.15	97.19	6922.15	97.92	6922.05	98.25	6922.01	98.71	6922
106.64	6922	107.43	6922.01	107.72	6922.06	108.22	6922.15	108.77	6922.27
109.01	6922.32	109.75	6922.46	109.81	6922.47	110.6	6922.64	110.88	6922.69
111.39	6922.8	111.93	6922.91	112.18	6922.97	112.96	6923.12	113.77	6923.3
114.03	6923.35	114.56	6923.47	115.09	6923.59	115.35	6923.64	116.14	6923.82
116.94	6923.99	117.19	6924.02	117.73	6924.09	118.24	6924.15	118.52	6924.18
119.29	6924.27	119.37	6924.28	120.11	6924.37	120.35	6924.4	120.9	6924.46
121.4	6924.52	121.69	6924.56	122.45	6924.65	122.57	6924.67	123.27	6924.75
123.5	6924.78	124.07	6924.85	124.56	6924.91	124.86	6924.95	125.61	6925.02
125.78	6925.04	126.44	6925.12	126.66	6925.15	127.24	6925.21	127.71	6925.27
128.03	6925.31	128.77	6925.4	128.82	6925.4	128.98	6925.42	129.61	6925.5
129.82	6925.53	130.41	6925.6	130.87	6925.66	131.2	6925.69	131.92	6925.79
131.99	6925.8	132.19	6925.83	132.78	6925.9	132.98	6925.92	133.57	6925.99
134.03	6926.03	134.37	6926.05	135.08	6926.09	135.16	6926.1	135.39	6926.11
135.95	6926.15	136.13	6926.16	136.74	6926.19	137.19	6926.22	137.54	6926.24
138.24	6926.29	138.33	6926.29	138.6	6926.31	139.12	6926.34	139.29	6926.35
139.91	6926.39	140.34	6926.42	140.7	6926.44	141.4	6926.48	141.5	6926.49
141.8	6926.51	142.29	6926.54	142.45	6926.55	143.08	6926.58	143.5	6926.61
143.87	6926.63	144.55	6926.68	144.67	6926.69	145.01	6926.71	145.46	6926.73
145.61	6926.74	146.25	6926.78	146.66	6926.81	147.04	6926.83	147.71	6926.87
147.84	6926.88	148.22	6926.9	148.63	6926.93	148.76	6926.94	149.42	6926.98
149.82	6927	150.21	6927.02	150.87	6927.06	151	6927.07	151.42	6927.1
151.8	6927.12	151.92	6927.13	152.59	6927.17	152.97	6927.19	153.38	6927.22
154.03	6927.26	154.17	6927.27	154.63	6927.3	154.97	6927.32	155.08	6927.32
155.76	6927.37	156.13	6927.39	156.55	6927.42	157.18	6927.45	157.34	6927.46
157.83	6927.49	158.13	6927.51	158.23	6927.52	158.93	6927.56	159.29	6927.58
159.72	6927.61	160.34	6927.65	160.51	6927.66	161.04	6927.69	161.3	6927.71
161.39	6927.71	162.1	6927.75	162.44	6927.78	162.89	6927.8	163.5	6927.84
163.68	6927.85	164.24	6927.88	164.47	6927.9	164.55	6927.9	165.27	6927.95

165.6	6927.97	166.06	6927.99	166.37	6928

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	92.38	.07	111.39	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
92.38	111.39	40.85	39.84	42.39	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 4893.61

INPUT
Description:
Station Elevation Data num= 95

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6926	6.49	6926	12.92	6925.9	16.16	6925.8	18.87	6925.7
20.48	6925.6	21.86	6925.5	23.24	6925.4	24.62	6925.3	26	6925.2
27.38	6925.1	35.26	6925	37.48	6924.9	39.65	6924.8	41.78	6924.7
43.91	6924.6	46.04	6924.5	48.17	6924.4	50.3	6924.3	52.43	6924.2
54.56	6924.1	57.67	6924	58.99	6923.9	59.82	6923.8	60.67	6923.7
61.52	6923.6	62.35	6923.5	63.2	6923.4	64.05	6923.3	64.89	6923.2
65.74	6923.1	66.68	6923	67.59	6922.9	68.52	6922.8	69.54	6922.7
72.32	6922.6	75.11	6922.51	75.45	6922.5	78.9	6922.5	81.23	6922.6
83.36	6922.7	85.31	6922.8	86.93	6922.9	88.75	6923	90.58	6923.1
91.63	6923.2	92.66	6923.3	93.69	6923.4	94.7	6923.5	95.72	6923.6
96.74	6923.7	97.76	6923.8	98.78	6923.9	99.65	6924	100.12	6924.1
100.53	6924.2	100.89	6924.3	101.25	6924.4	101.62	6924.5	101.98	6924.6
102.34	6924.7	102.73	6924.8	103.08	6924.9	103.44	6925	103.92	6925.1
104.4	6925.2	104.83	6925.3	105.34	6925.4	105.85	6925.5	106.35	6925.6
106.86	6925.7	107.37	6925.8	107.87	6925.9	108.58	6926	109.99	6926.1
111.59	6926.2	113.18	6926.3	114.78	6926.4	116.38	6926.5	117.98	6926.6
119.58	6926.7	121.18	6926.8	122.78	6926.9	124.39	6927	125.99	6927.1
127.6	6927.2	129.27	6927.3	130.98	6927.4	132.86	6927.5	134.86	6927.6
136.82	6927.7	139.46	6927.8	145.03	6927.9	151.69	6928	153.41	6928

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	64.89	.07	91.63	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
64.89	91.63	133.86	129.25	140.26	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 4764.36

INPUT
Description:
Station Elevation Data num= 106

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
93.1	6924	107.53	6924	109.72	6923.9	110.92	6923.8	112.07	6923.7
113.18	6923.6	114.33	6923.5	115.5	6923.4	116.6	6923.3	117.68	6923.2
118.77	6923.1	119.9	6923	121.2	6922.9	122.57	6922.8	123.93	6922.7
125.29	6922.6	126.66	6922.5	128.02	6922.4	129.38	6922.3	130.75	6922.2
132.11	6922.1	133.47	6922	134.81	6921.9	136.19	6921.8	137.51	6921.7
138.85	6921.6	140.2	6921.5	141.53	6921.4	142.87	6921.3	144.2	6921.2
145.54	6921.1	147.05	6921	148	6920.9	148.91	6920.8	149.84	6920.7

150.73	6920.6	151.65	6920.5	152.61	6920.4	153.47	6920.3	154.44	6920.2
155.38	6920.1	207.77	6920.1	208.69	6920.2	209.6	6920.3	210.51	6920.4
211.43	6920.5	212.34	6920.6	213.25	6920.7	214.17	6920.8	215.08	6920.9
215.97	6921	216.79	6921.1	217.58	6921.2	218.37	6921.3	219.16	6921.4
219.95	6921.5	220.74	6921.6	221.52	6921.7	222.32	6921.8	223.1	6921.9
223.88	6922	224.6	6922.1	225.29	6922.2	225.97	6922.3	226.71	6922.4
227.46	6922.5	228.13	6922.6	228.89	6922.7	229.67	6922.8	230.37	6922.9
231.2	6923	232.29	6923.1	233.41	6923.2	234.53	6923.3	235.65	6923.4
236.77	6923.5	237.89	6923.6	239.02	6923.7	240.14	6923.8	241.26	6923.9
242.38	6924	243.5	6924.1	244.62	6924.2	245.74	6924.3	246.86	6924.4
247.98	6924.5	249.1	6924.6	250.23	6924.7	251.35	6924.8	252.47	6924.9
253.59	6925	254.7	6925.1	255.81	6925.2	256.92	6925.3	258.03	6925.4
259.14	6925.5	260.25	6925.6	261.37	6925.7	262.48	6925.8	263.59	6925.9
264.77	6926	266.39	6926.1	267.97	6926.2	269.64	6926.3	271.29	6926.4
271.45	6926.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
93.1	.07	149.84	.07	212.34	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
149.84	212.34	82.05	62.26	76.8	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 4702.1

INPUT
Description:
Station Elevation Data num= 124

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
24.32	6926.44	24.8	6926.5	25.63	6926.6	26.47	6926.7	27.31	6926.8
28.14	6926.9	29.22	6927	92.74	6927	93.85	6926.9	94.36	6926.8
94.82	6926.7	95.19	6926.6	95.55	6926.5	95.92	6926.4	96.28	6926.3
96.63	6926.2	96.95	6926.1	97.23	6926	97.49	6925.9	97.74	6925.8
97.99	6925.7	98.23	6925.6	98.46	6925.5	98.7	6925.4	98.93	6925.3
99.13	6925.2	99.24	6925.1	99.34	6925	99.44	6924.9	99.53	6924.8
99.63	6924.7	99.72	6924.6	99.81	6924.5	99.9	6924.4	99.97	6924.3
100.04	6924.2	100.11	6924.1	100.18	6924	100.24	6923.9	100.29	6923.8
100.35	6923.7	100.41	6923.6	100.46	6923.5	100.52	6923.4	100.57	6923.3
100.63	6923.2	100.68	6923.1	100.74	6923	100.8	6922.9	100.85	6922.8
100.91	6922.7	100.96	6922.6	101.02	6922.5	101.07	6922.4	101.13	6922.3
101.18	6922.2	101.25	6922.1	109.77	6922.1	109.84	6922.2	109.9	6922.3
109.96	6922.4	110.03	6922.5	110.08	6922.6	110.14	6922.7	110.2	6922.8
110.25	6922.9	110.3	6923	110.36	6923.1	110.41	6923.2	110.46	6923.3
110.51	6923.4	110.56	6923.5	110.6	6923.6	110.65	6923.7	110.7	6923.8
110.75	6923.9	110.81	6924	110.88	6924.1	110.94	6924.2	111.01	6924.3
111.07	6924.4	111.14	6924.5	111.21	6924.6	111.27	6924.7	111.35	6924.8
111.44	6924.9	111.53	6925	111.63	6925.1	111.74	6925.2	111.91	6925.3
112.13	6925.4	112.35	6925.5	112.57	6925.6	112.79	6925.7	113.01	6925.8
113.26	6925.9	113.51	6926	113.75	6926.1	114.02	6926.2	114.26	6926.3
114.51	6926.4	114.77	6926.5	115.05	6926.6	115.3	6926.7	115.57	6926.8
115.84	6926.9	116.17	6927	151.59	6927.1	152.29	6927.2	152.98	6927.3
153.68	6927.4	154.37	6927.5	155.07	6927.6	155.76	6927.7	156.53	6927.8
166.96	6927.8	167.92	6927.7	168.76	6927.6	169.6	6927.5	170.44	6927.4
171.28	6927.3	172.12	6927.2	172.96	6927.1	180.81	6927.1		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
24.32	.07	92.74	.07	115.84	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
92.74	115.84	37.66	32.93	34.45	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 4669.17

INPUT
Description:
Station Elevation Data num= 113

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
12.18	6922.3	13.61	6922.3	16.12	6922.2	17.7	6922.1	18.99	6922
20.83	6921.9	22.77	6921.8	24.76	6921.7	26.78	6921.6	28.81	6921.5
30.65	6921.4	32.06	6921.3	33.36	6921.2	34.34	6921.1	36.91	6921
39.4	6920.9	41.01	6920.8	42.62	6920.7	44.14	6920.6	45.41	6920.5
46.95	6920.4	48	6920.3	49.01	6920.2	49.9	6920.1	50.58	6920
51.13	6919.9	51.67	6919.8	52.19	6919.7	52.72	6919.6	53.24	6919.5
53.82	6919.4	54.4	6919.3	54.97	6919.2	55.53	6919.1	56.09	6919
56.66	6918.9	57.28	6918.8	57.9	6918.7	58.5	6918.6	59.09	6918.5
59.67	6918.4	60.28	6918.3	60.91	6918.2	61.5	6918.1	66.2	6918
73.05	6918	73.54	6918.01	77.99	6918.1	78.47	6918.2	78.93	6918.3
79.38	6918.4	79.82	6918.5	80.26	6918.6	80.7	6918.7	81.17	6918.8
81.62	6918.9	82	6919	82.24	6919.1	82.48	6919.2	82.72	6919.3
82.97	6919.4	83.42	6919.5	83.88	6919.6	84.32	6919.7	84.75	6919.8
85.18	6919.9	85.71	6920	86.36	6920.1	87.13	6920.2	88.17	6920.3
89.17	6920.4	90.25	6920.5	91.48	6920.6	92.75	6920.7	94.02	6920.8
95.28	6920.9	96.74	6921	98.09	6921.1	98.82	6921.2	99.82	6921.3
100.72	6921.4	101.79	6921.5	103.25	6921.6	104.53	6921.7	105.94	6921.8
107.61	6921.9	109.15	6922	110.14	6922.1	111.08	6922.2	112.03	6922.3
113.01	6922.4	114.09	6922.5	115.51	6922.6	117.05	6922.7	118.82	6922.8
120.8	6922.9	123.06	6923	125.21	6923.1	127.3	6923.2	129.38	6923.3
131.47	6923.4	133.4	6923.5	134.7	6923.6	136.52	6923.7	138.38	6923.8
141.06	6923.9	143.85	6924	146.34	6924.1	148.09	6924.2	149.59	6924.3
151.11	6924.4	152.62	6924.5	154.19	6924.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
12.18	.07	57.28	.07	81.17	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
57.28	81.17	186.65	181.24	179.49	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 4488

INPUT
Description:
Station Elevation Data num= 265

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6918.95	.41	6918.94	1.02	6918.92	1.14	6918.92	1.32	6918.91
1.86	6918.89	2.21	6918.88	2.58	6918.87	3.17	6918.85	3.4	6918.85
4.03	6918.83	4.58	6918.81	4.76	6918.81	5.02	6918.8	5.48	6918.79
5.77	6918.78	6.2	6918.77	6.88	6918.75	6.93	6918.74	7.65	6918.72
8.15	6918.71	8.37	6918.7	8.73	6918.69	9.1	6918.68	9.34	6918.67
9.82	6918.66	10.52	6918.64	11.27	6918.62	11.71	6918.6	11.99	6918.59
12.43	6918.58	12.72	6918.57	12.9	6918.57	13.44	6918.55	14.09	6918.54
14.16	6918.53	14.28	6918.53	14.89	6918.52	15.28	6918.51	15.61	6918.5
16.13	6918.48	16.33	6918.48	16.47	6918.47	17.06	6918.46	17.65	6918.44

17.98	6918.44	18.51	6918.42	18.84	6918.41	19.23	6918.4	19.83	6918.39
19.95	6918.38	20.03	6918.38	20.68	6918.36	21.22	6918.35	21.4	6918.34
21.68	6918.34	22.12	6918.32	22.41	6918.32	22.85	6918.3	23.54	6918.28
23.57	6918.28	24.3	6918.26	24.78	6918.25	25.02	6918.24	25.39	6918.23
25.74	6918.22	25.97	6918.21	26.47	6918.2	27.16	6918.18	27.24	6918.18
27.91	6918.16	28.35	6918.14	28.64	6918.14	29.09	6918.12	29.36	6918.11
29.53	6918.11	30.08	6918.09	30.72	6918.07	30.94	6918.07	31.53	6918.05
31.91	6918.04	32.26	6918.03	32.79	6918.01	32.98	6918.01	33.1	6918
33.7	6917.95	34.29	6917.91	34.43	6917.89	34.64	6917.88	35.15	6917.83
35.48	6917.8	35.87	6917.76	36.49	6917.7	36.6	6917.69	36.66	6917.69
37.32	6917.63	37.85	6917.58	38.04	6917.57	38.35	6917.54	38.77	6917.5
39.04	6917.47	39.49	6917.44	40.2	6917.37	40.94	6917.29	41.42	6917.24
41.66	6917.22	42.05	6917.18	42.39	6917.14	42.6	6917.12	43.11	6917.06
43.79	6916.99	43.9	6916.98	44.56	6916.92	44.98	6916.88	45.28	6916.85
45.75	6916.8	46.01	6916.78	46.17	6916.76	46.73	6916.7	47.36	6916.64
47.45	6916.63	47.6	6916.62	48.18	6916.56	48.55	6916.52	48.9	6916.49
49.45	6916.43	49.62	6916.42	49.73	6916.4	50.35	6916.34	50.92	6916.28
51.07	6916.26	51.3	6916.23	51.79	6916.18	52.11	6916.15	52.52	6916.11
53.16	6916.04	53.24	6916.03	53.3	6916.02	53.97	6915.99	54.69	6915.99
55.01	6915.98	55.41	6915.96	55.67	6915.96	56.14	6915.95	56.86	6915.93
57.58	6915.9	58.05	6915.89	58.31	6915.88	58.71	6915.87	59.03	6915.86
59.24	6915.86	59.76	6915.84	60.43	6915.82	60.56	6915.82	61.2	6915.8
61.61	6915.79	61.93	6915.78	62.41	6915.77	62.65	6915.76	62.8	6915.76
63.37	6915.74	63.99	6915.72	64.1	6915.72	64.26	6915.71	64.82	6915.7
65.18	6915.69	65.54	6915.68	66.11	6915.66	66.27	6915.66	66.37	6915.65
66.99	6915.64	67.56	6915.65	73.5	6915.65	74.23	6915.66	74.68	6915.68
74.95	6915.69	75.37	6915.7	75.68	6915.71	75.87	6915.71	76.4	6915.73
77.06	6915.75	77.22	6915.75	77.85	6915.77	78.25	6915.78	78.57	6915.79
79.07	6915.81	79.29	6915.82	79.44	6915.82	80.02	6915.84	80.63	6915.86
80.92	6915.86	81.47	6915.88	81.81	6915.89	82.19	6915.9	82.77	6915.92
82.91	6915.92	83	6915.93	83.64	6915.94	84.19	6915.96	84.36	6915.97
84.63	6915.97	85.08	6915.98	85.38	6915.99	85.81	6915.99	86.48	6916
87.98	6916	88.33	6916.06	88.7	6916.12	88.94	6916.16	89.43	6916.25
90.13	6916.38	90.87	6916.51	91.32	6916.59	91.6	6916.64	92.03	6916.72
92.32	6916.77	92.51	6916.81	93.04	6916.9	93.69	6917.02	93.77	6917.03
93.88	6917.06	94.49	6917.16	94.88	6917.23	95.22	6917.29	95.73	6917.39
95.94	6917.42	96.07	6917.45	96.66	6917.55	97.26	6917.66	97.39	6917.68
97.58	6917.72	98.11	6917.81	98.45	6917.87	98.83	6917.93	99.43	6918.01
99.56	6918.03	99.64	6918.03	100.28	6918.08	100.82	6918.12	101	6918.14
101.29	6918.16	101.73	6918.19	102.01	6918.21	102.45	6918.25	103.14	6918.3
103.18	6918.3	103.9	6918.36	104.39	6918.39	104.62	6918.41	104.99	6918.44
105.35	6918.47	105.58	6918.48	106.07	6918.52	106.76	6918.57	107.52	6918.63
107.95	6918.66	108.24	6918.68	108.69	6918.72	108.96	6918.74	109.14	6918.75
109.69	6918.79	110.33	6918.84	110.41	6918.85	110.54	6918.86	110.97	6918.89

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	49.73	.07	90.13	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
49.73	90.13	335.24	328.33	325.59	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 4159.6

INPUT
Description:
Station Elevation Data num= 105

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6913.3	2.23	6913.3	5.32	6913.2	8.08	6913.1	11.05	6913

13.63	6912.9	16.13	6912.8	18.62	6912.7	21.11	6912.6	23.55	6912.5
25.95	6912.4	28.25	6912.3	30.53	6912.2	32.79	6912.1	34.96	6912
36.21	6911.9	37.35	6911.8	38.52	6911.7	39.66	6911.6	40.81	6911.5
42	6911.4	43.14	6911.3	44.31	6911.2	45.49	6911.1	46.67	6911
47.93	6910.9	49.19	6910.8	50.45	6910.7	51.71	6910.6	52.94	6910.5
54.15	6910.4	55.04	6910.3	55.76	6910.2	56.5	6910.1	57.64	6910
58.13	6909.9	58.6	6909.8	59.08	6909.7	59.55	6909.6	60.03	6909.5
60.5	6909.4	60.98	6909.3	61.45	6909.2	61.92	6909.1	62.4	6909
62.89	6908.9	63.38	6908.8	63.88	6908.7	64.38	6908.6	64.87	6908.5
65.36	6908.4	65.86	6908.3	66.36	6908.2	66.85	6908.1	68.78	6908.1
69.2	6908.2	69.33	6908.23	69.58	6908.3	69.97	6908.4	70.35	6908.5
70.73	6908.6	71.12	6908.7	71.5	6908.8	71.89	6908.9	72.29	6909
72.69	6909.1	73.09	6909.2	73.5	6909.3	73.95	6909.4	74.35	6909.5
74.73	6909.6	75.18	6909.7	75.6	6909.8	76.01	6909.9	76.53	6910
77.55	6910.1	78.69	6910.2	79.82	6910.3	80.95	6910.4	82.06	6910.5
83.2	6910.6	84.31	6910.7	85.43	6910.8	86.57	6910.9	87.7	6911
88.82	6911.1	89.99	6911.2	91.13	6911.3	92.26	6911.4	93.42	6911.5
94.55	6911.6	95.69	6911.7	96.82	6911.8	97.94	6911.9	99.06	6912
100.44	6912.1	101.83	6912.2	103.21	6912.3	104.62	6912.4	106.02	6912.5
107.42	6912.6	108.84	6912.7	110.26	6912.8	111.68	6912.9	112.27	6912.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	60.03	.07	74.35	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
60.03	74.35	381.23	380.12	383.37	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 3779.48

INPUT
Description:
Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6906.9	3.89	6906.9	10.66	6906.8	17.23	6906.7	23.62	6906.6
29.84	6906.5	35.94	6906.4	41.99	6906.3	47.99	6906.2	53.98	6906.1
59.54	6906	60.5	6905.9	61.1	6905.8	61.71	6905.7	62.19	6905.6
62.61	6905.5	63.03	6905.4	63.54	6905.3	64.17	6905.2	64.78	6905.1
65.36	6905	65.94	6904.9	66.47	6904.8	67.02	6904.7	67.57	6904.6
68.11	6904.5	68.65	6904.4	69.21	6904.3	69.75	6904.2	70.29	6904.1
77.59	6904.1	77.96	6904.2	78.3	6904.3	78.65	6904.4	78.99	6904.5
79.34	6904.6	79.69	6904.7	80.03	6904.8	80.37	6904.9	80.72	6905
81.03	6905.1	81.33	6905.2	81.64	6905.3	81.95	6905.4	82.26	6905.5
82.56	6905.6	82.86	6905.7	83.16	6905.8	83.47	6905.9	84.18	6906
87.71	6906.1	91.64	6906.2	95.58	6906.3	99.51	6906.4	103.45	6906.5
107.38	6906.6	111.32	6906.7	115.24	6906.8	119.17	6906.9	123.2	6907
124.65	6907								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	65.36	.07	80.72	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
65.36	80.72	232.25	233.03	234.42	.1	.3

CROSS SECTION

RIVER: EAST FORK T1

REACH: EF_T1_R1 RS: 3546.45

INPUT
Description:
Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6904	2.1	6904	3.14	6903.9	3.94	6903.8	4.73	6903.7
5.51	6903.6	6.3	6903.5	7.08	6903.4	7.84	6903.3	8.68	6903.2
9.52	6903.1	10.33	6903	11.1	6902.9	11.86	6902.8	12.62	6902.7
13.24	6902.6	13.8	6902.5	14.38	6902.4	14.99	6902.3	15.54	6902.2
16.05	6902.1	16.56	6902	17.08	6901.9	17.6	6901.8	18.12	6901.7
18.64	6901.6	19.17	6901.5	19.69	6901.4	20.21	6901.3	20.74	6901.2
21.26	6901.1	21.78	6901	22.3	6900.9	22.81	6900.8	23.33	6900.7
23.84	6900.6	24.35	6900.5	24.86	6900.4	25.38	6900.3	25.89	6900.2
26.43	6900.1	39.1	6900.1	39.58	6900.2	40.04	6900.3	40.5	6900.4
40.97	6900.5	41.44	6900.6	41.91	6900.7	42.37	6900.8	42.84	6900.9
43.33	6901	43.82	6901.1	44.32	6901.2	44.82	6901.3	45.3	6901.4
45.79	6901.5	46.28	6901.6	46.76	6901.7	47.23	6901.8	47.71	6901.9
48.21	6902	48.74	6902.1	49.34	6902.2	49.92	6902.3	50.51	6902.4
51.14	6902.5	51.81	6902.6	52.39	6902.7	53.06	6902.8	53.77	6902.9
54.47	6903	55.2	6903.1	55.87	6903.2	56.57	6903.3	57.26	6903.4
57.93	6903.5	58.63	6903.6	59.38	6903.7	72.28	6903.7		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	22.81	.07	42.37	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
22.81	42.37	254.27	249.1	242.55	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 3297.35

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6900	14.52	6900	15.17	6899.9	15.67	6899.8	16.12	6899.7
16.57	6899.6	17.03	6899.5	17.48	6899.4	17.93	6899.3	18.38	6899.2
18.84	6899.1	19.29	6899	19.75	6898.9	20.21	6898.8	20.67	6898.7
21.12	6898.6	21.58	6898.5	22.04	6898.4	22.49	6898.3	22.95	6898.2
23.49	6898.1	36.97	6898.1	37.46	6898.2	37.95	6898.3	38.44	6898.4
38.93	6898.5	39.42	6898.6	39.91	6898.7	40.4	6898.8	40.89	6898.9
41.38	6899	41.88	6899.1	42.38	6899.2	42.89	6899.3	43.39	6899.4
43.89	6899.5	44.4	6899.6	44.9	6899.7	45.4	6899.8	45.91	6899.9
46.75	6900	52.29	6900.1	58.17	6900.2	60.55	6900.2		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	20.67	.07	39.91	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
20.67	39.91	231.53	235.39	241.08	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 3061.96

INPUT
Description:
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6896.4	4.59	6896.3	8.77	6896.2	12.96	6896.1	16.81	6896
17.59	6895.9	18.01	6895.8	18.44	6895.7	18.86	6895.6	19.28	6895.5
19.7	6895.4	20.12	6895.3	20.54	6895.2	20.96	6895.1	21.39	6895
21.81	6894.9	22.23	6894.8	22.65	6894.7	23.07	6894.6	23.49	6894.5
23.91	6894.4	24.34	6894.3	24.76	6894.2	25.18	6894.1	34.31	6894.02
36.09	6894	39.12	6893.9	43.19	6893.9	44.98	6894	46.86	6894.1
48.77	6894.2	50.68	6894.3	52.58	6894.4	54.49	6894.5	56.4	6894.6
58.31	6894.7	60.21	6894.8	62.12	6894.9	64.03	6895	65.93	6895.1
67.84	6895.2	69.74	6895.3	71.65	6895.4	73.56	6895.5	75.47	6895.6
75.61	6895.6								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	22.65	.07	58.31	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
22.65	58.31	231.2	228.64	224.54	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 2833.32

INPUT
Description:
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6892.2	2.05	6892.2	6.79	6892.1	14.89	6892	15.57	6891.9
16.02	6891.8	16.45	6891.7	16.89	6891.6	17.32	6891.5	17.75	6891.4
18.19	6891.3	18.62	6891.2	19.06	6891.1	19.49	6891	19.92	6890.9
20.35	6890.8	20.78	6890.7	21.21	6890.6	21.64	6890.5	22.07	6890.4
22.5	6890.3	22.94	6890.2	23.94	6890.1	23.99	6890.1	24.29	6890.15
24.57	6890.2	24.97	6890.3	25.36	6890.4	25.75	6890.5	26.14	6890.6
26.53	6890.7	26.92	6890.8	27.32	6890.9	27.71	6891	28.1	6891.1
28.49	6891.2	28.88	6891.3	29.27	6891.4	29.66	6891.5	30.06	6891.6
30.45	6891.7	30.84	6891.8	31.25	6891.9	32.02	6892	50.08	6892

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	19.49	.07	27.71	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19.49	27.71	360.53	334.46	346.03	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 2498.86

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6885.1	3.49	6885.1	12.22	6885.2	21.99	6885.3	31.09	6885.4
37.26	6885.5	43.16	6885.6	49.07	6885.7	54.98	6885.8	60.88	6885.9
67.4	6886	92.96	6886.1	97.77	6886.2	102.58	6886.3	107.39	6886.4
112.2	6886.5	119.11	6886.5	131.83	6886.4	141	6886.3	144.37	6886.28

157.11	6886.2	199.19	6886.1	210.32	6886	213.33	6886	236.45	6886.1
238.72	6886.2	241.08	6886.3	243.94	6886.4	246.88	6886.5	250.35	6886.6
254.39	6886.7	259.21	6886.8	264.69	6886.9	270.6	6887	272.16	6887

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	0	.07	141	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	141	517.19	522.63	548.72	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 1976.23

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6875.8	81.03	6875.8	104.42	6875.9	105.31	6875.9	122.41	6876
134.26	6876.1	147.39	6876.2	157.87	6876.3	167.33	6876.4	175.46	6876.5
182.62	6876.6	189.09	6876.7	194.57	6876.8	199.67	6876.9	204.78	6877
209.96	6877.1	242.27	6877.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	0	.07	242.27	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	242.27	244.72	264.49	317.22	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 1711.74

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6871.5	5.07	6871.5	11.1	6871.4	24.32	6871.3	38.07	6871.2
47.58	6871.1	57.11	6871	66.8	6870.9	76.63	6870.8	86.39	6870.7
96.06	6870.6	105.82	6870.5	115.47	6870.4	121.56	6870.3	127.67	6870.2
133.43	6870.1	138.99	6870	144.6	6869.9	150.07	6869.8	155.63	6869.7
161.45	6869.6	175.93	6869.6	179.61	6869.7	183.29	6869.8	186.98	6869.9
190.66	6870	194.34	6870.1	198.03	6870.2	201.71	6870.3	205.4	6870.4
209.08	6870.5	212.72	6870.6	215.58	6870.7	218.32	6870.8	221.05	6870.9
224.34	6871	226.35	6871.1	227.59	6871.2	228.82	6871.3	230.06	6871.4
231.29	6871.5	232.54	6871.6	233.79	6871.7	235.05	6871.8	236.29	6871.9
237.71	6872	239.17	6872						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	127.67	.07	198.03	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
127.67	198.03	452.92	489.55	528.67	.1	.3

CROSS SECTION

RIVER: EAST FORK T1
REACH: EF_T1_R1 RS: 883

INPUT
Description:
Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6865.8	.97	6865.8	4.42	6865.7	7.87	6865.6	11.36	6865.5
14.88	6865.4	18.34	6865.3	21.87	6865.2	25.42	6865.1	28.97	6865
32.56	6864.9	36.16	6864.8	39.73	6864.7	43.33	6864.6	46.92	6864.5
50.5	6864.4	54.09	6864.3	57.68	6864.2	60.92	6864.1	64.3	6864
68.18	6863.9	72.07	6863.8	75.96	6863.7	79.85	6863.6	83.75	6863.5
87.64	6863.4	91.53	6863.3	95.43	6863.2	99.33	6863.1	107.6	6863.1
108.04	6863.2	108.48	6863.3	108.92	6863.4	109.36	6863.5	109.8	6863.6
110.24	6863.7	110.68	6863.8	111.11	6863.9	111.53	6864	111.94	6864.1
112.32	6864.2	112.7	6864.3	113.07	6864.4	113.45	6864.5	113.83	6864.6
114.2	6864.7	114.57	6864.8	114.94	6864.9	115.31	6865	115.63	6865.1
115.96	6865.2	116.29	6865.3	116.61	6865.4	116.94	6865.5	117.27	6865.6
117.59	6865.7	117.92	6865.8	118.24	6865.9	118.57	6866	118.9	6866.1
119.22	6866.2	119.55	6866.3	119.88	6866.4	120.2	6866.5	120.53	6866.6
120.85	6866.7	121.18	6866.8	121.51	6866.9	121.86	6866.94		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	72.07	.07	110.24	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
72.07	110.24	0	0	.1	.3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 5786.62

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-43.26	7014.9	-37.67	7014.9	-27.46	7014.8	-12.59	7014.7	-5.4	7014.6
3.31	7014.5	13.34	7014.41	14.04	7014.4	24.07	7014.3	33.9	7014.2
45.17	7014.1	56.74	7014.01	57.73	7014	86.53	7014	132.81	7014.1
162.97	7014.2	188.75	7014.3	201.32	7014.4	213.87	7014.5	231.35	7014.6
237.37	7014.7	242.64	7014.8	247.27	7014.9	251.27	7015	251.71	7015

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-43.26	.04	13.34	.04	201.32	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
13.34	201.32	367.32	411.64	383.99	.1	.3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 5374.98

INPUT
Description:
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

0	7005.1	1.24	7005.1	6.35	7005	12.05	7004.9	17.79	7004.8
23.56	7004.7	29.32	7004.6	35.12	7004.5	40.89	7004.4	46.69	7004.3
47.54	7004.29	53.27	7004.2	60.25	7004.1	67	7004	73.98	7003.9
81.05	7003.8	88.16	7003.7	95.36	7003.6	103	7003.5	116.05	7003.4
147.57	7003.3	152.78	7003.2	161.26	7003.2	168.12	7003.3	211.8	7003.3
217.59	7003.2	221.99	7003.1	240.01	7003.1	252.18	7003.2	281.22	7003.2
300.99	7003.3	310.87	7003.4	320.99	7003.5	331.11	7003.6	346.74	7003.7
347.54	7003.71	356.87	7003.8	365.95	7003.9	375.03	7004	384.88	7004.1
395.65	7004.2	400	7004.2						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	116.05	.04	310.87	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
116.05	310.87	406.5	393.81	362.37	.1	.3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 4981.16

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6993	3.15	6993	6.88	6992.9	10.65	6992.8	14.25	6992.7
17.02	6992.6	19.92	6992.5	22.93	6992.4	26.8	6992.3	31.49	6992.2
36.12	6992.1	41.07	6992	48.18	6991.9	56.44	6991.8	67.29	6991.7
97.65	6991.7	109.27	6991.8	119.79	6991.9	133.12	6992	148.28	6992.1
162.76	6992.2	170.79	6992.3	177.17	6992.4	182.29	6992.5	188.38	6992.6
194.46	6992.7	200.53	6992.8	206.41	6992.9	211.87	6993	215.81	6993

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	41.07	.04	133.12	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
41.07	133.12	598.36	621.93	648.88	.1	.3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 4359.24

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-19.74	6978.29	-17.17	6978.2	9.72	6978.1	15.67	6978	19.92	6977.9
22.41	6977.8	24.65	6977.7	26.85	6977.6	29.09	6977.5	31.52	6977.4
33.92	6977.3	37.12	6977.2	41.29	6977.1	53.72	6977	73.13	6977
82.8	6977.1	84.57	6977.13	89.85	6977.2	94.91	6977.3	102.77	6977.4
111.13	6977.5	135.66	6977.5	140.49	6977.6	146.14	6977.7	155.25	6977.8
159.43	6977.9	164.56	6978	169.8	6978.1	171.39	6978.2	172.98	6978.3
174.56	6978.4	174.76	6978.4						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-19.74	.04	29.09	.04	111.13	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
29.09 111.13 223.33 216.55 209.68 .1 .3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 4142.7

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6974.4	5.68	6974.4	12.06	6974.3	18.16	6974.2	24.33	6974.1
30.62	6974	36.36	6973.9	42.06	6973.8	47.76	6973.7	53.48	6973.6
59.18	6973.5	64.89	6973.4	72.34	6973.3	79.6	6973.2	84.86	6973.1
138.53	6973.1	145.65	6973.2	153.75	6973.3	160.75	6973.4	163.86	6973.5
167.09	6973.6	170.67	6973.7	174.34	6973.8	179.43	6973.9	193.45	6974
198.54	6974.1	202.52	6974.2	207.19	6974.3	211.51	6974.4	216.15	6974.5
216.36	6974.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	59.18	.04	163.86	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
59.18 163.86 251.18 233.79 222.28 .1 .3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 3908.91

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6967.6	.65	6967.6	4.89	6967.5	8.61	6967.4	13.19	6967.3
20.4	6967.2	35.05	6967.2	49.31	6967.1	65.66	6967.1	73.23	6967.2
82.15	6967.2	95.98	6967.1	101.93	6967	105.41	6966.9	109.49	6966.8
117	6966.7	122.18	6966.6	128.89	6966.5	136.6	6966.4	160.79	6966.4
167.06	6966.5	173.26	6966.6	176.8	6966.7	179.7	6966.8	182.6	6966.9
185.71	6967	189.85	6967.1	192.82	6967.2	195.99	6967.3	199.15	6967.4
202.32	6967.5	205.1	6967.6	207.56	6967.69				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	109.49	.04	179.7	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
109.49 179.7 165.45 174.62 190.03 .1 .3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 3734.29

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

0	6963.8	4.76	6963.8	11.48	6963.7	24.21	6963.6	35.33	6963.5
47.98	6963.4	53.03	6963.3	57.2	6963.2	60.14	6963.1	63.74	6963
66.85	6962.9	69.53	6962.8	72.33	6962.7	75.08	6962.6	77.92	6962.5
80.83	6962.4	84.33	6962.3	88.5	6962.2	92.2	6962.1	97.61	6962
106.71	6962	112.55	6962.1	117.88	6962.2	122.01	6962.3	126.41	6962.4
130.73	6962.5	134.54	6962.6	138.88	6962.7	142.82	6962.8	146.72	6962.9
150.5	6963	154.62	6963.1	157.91	6963.2	161.68	6963.3	165.4	6963.4
169.13	6963.5	174.12	6963.6	179.4	6963.7	186.02	6963.8	204.84	6963.9
205.72	6963.9								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	77.92	.04	130.73	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
77.92	130.73	232.78	223.71	219.85	.1	.3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 3510.58

INPUT
Description:
Station Elevation Data num= 131

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6957.9	2.67	6957.9	4.53	6957.8	5.94	6957.7	7.3	6957.6
8.54	6957.5	9.73	6957.4	10.87	6957.3	12.02	6957.2	13.16	6957.1
14.16	6957	15.15	6956.9	16.1	6956.8	17.05	6956.7	18	6956.6
18.95	6956.5	19.9	6956.4	20.85	6956.3	21.8	6956.2	22.75	6956.1
23.75	6956	24.96	6955.9	26.22	6955.8	27.48	6955.7	28.74	6955.6
30	6955.5	31.28	6955.4	32.55	6955.3	33.85	6955.2	35.24	6955.1
36.67	6955	38.22	6954.9	39.78	6954.8	41.39	6954.7	43.37	6954.6
46.3	6954.5	54.01	6954.4	57.76	6954.4	62.41	6954.47	64.25	6954.5
66.99	6954.6	70.43	6954.7	72.13	6954.8	73.33	6954.9	74.47	6955
76.53	6955.1	77.61	6955.2	78.69	6955.3	79.77	6955.4	80.85	6955.5
81.88	6955.6	82.85	6955.7	83.83	6955.8	84.86	6955.9	85.91	6956
87.04	6956.1	88.22	6956.2	89.4	6956.3	90.59	6956.4	91.77	6956.5
93.07	6956.6	94.56	6956.7	95.96	6956.8	97.31	6956.9	98.74	6957
100.13	6957.1	101.62	6957.2	103.11	6957.3	104.65	6957.4	106.82	6957.5
110.06	6957.6	112.57	6957.7	115.22	6957.8	117.8	6957.9	120.55	6958
124.21	6958.1	130.07	6958.2	142.12	6958.2	146.91	6958.1	151.14	6958
153.65	6957.9	155.51	6957.8	157.31	6957.7	159.46	6957.6	161.51	6957.5
164.28	6957.4	168.54	6957.3	170.88	6957.2	173.43	6957.1	186.45	6957.1
187.73	6957.2	189.09	6957.3	190.5	6957.4	192	6957.5	193.51	6957.6
195.16	6957.7	196.9	6957.8	198.71	6957.9	200.5	6958	202.2	6958.1
203.81	6958.2	205.38	6958.3	206.86	6958.4	208.32	6958.5	209.76	6958.6
211.17	6958.7	212.58	6958.8	213.98	6958.9	215.38	6959	216.78	6959.1
218.21	6959.2	219.66	6959.3	221.07	6959.4	222.47	6959.5	223.88	6959.6
225.28	6959.7	226.72	6959.8	228.18	6959.9	229.68	6960	231.42	6960.1
233.21	6960.2	234.94	6960.3	236.66	6960.4	238.36	6960.5	240.07	6960.6
241.77	6960.7	243.5	6960.8	245.23	6960.9	246.97	6961	248.66	6961.1
248.82	6961.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	35.24	.04	74.47	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.24	74.47	177.66	191.95	207.12	.1	.3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 3318.63

INPUT
Description:
Station Elevation Data num= 101

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6953.9	1.45	6953.9	2.67	6953.8	3.77	6953.7	4.93	6953.6
6.01	6953.5	7.13	6953.4	8.22	6953.3	9.35	6953.2	10.44	6953.1
11.59	6953	12.75	6952.9	13.93	6952.8	15.11	6952.7	16.29	6952.6
17.47	6952.5	18.65	6952.4	19.83	6952.3	21.01	6952.2	22.19	6952.1
23.4	6952	24.93	6951.9	26.51	6951.8	28.07	6951.7	29.63	6951.6
31.2	6951.5	32.77	6951.4	34.33	6951.3	35.9	6951.2	37.47	6951.1
39.03	6951	40.63	6950.9	42.22	6950.8	43.81	6950.7	45.38	6950.6
46.95	6950.5	48.55	6950.4	50.09	6950.3	51.64	6950.2	53.18	6950.1
70.07	6950.1	70.96	6950.2	71.83	6950.3	72.71	6950.4	73.56	6950.5
74.46	6950.6	75.28	6950.7	76.16	6950.8	77	6950.9	77.82	6951
78.57	6951.1	79.28	6951.2	79.79	6951.3	80.22	6951.4	80.66	6951.5
81.38	6951.6	82.1	6951.7	82.82	6951.8	83.53	6951.9	84.26	6952
85.01	6952.1	85.76	6952.2	86.52	6952.3	87.27	6952.4	88.03	6952.5
88.79	6952.6	89.54	6952.7	90.3	6952.8	91.05	6952.9	91.83	6953
93.04	6953.1	94.28	6953.2	95.55	6953.3	96.82	6953.4	98.14	6953.5
99.49	6953.6	100.87	6953.7	102.25	6953.8	103.66	6953.9	105.05	6954
106.35	6954.1	107.63	6954.2	108.91	6954.3	110.2	6954.4	111.48	6954.5
112.76	6954.6	114.04	6954.7	115.32	6954.8	116.65	6954.9	119.79	6955
129.99	6955.1	131.73	6955.2	133.25	6955.3	134.73	6955.4	136.2	6955.5
137.66	6955.6	139.12	6955.7	140.57	6955.8	142.04	6955.9	143.8	6956
160.88	6956								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	43.81	.04	74.46	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
43.81	74.46	334.51	336.07	345.44	.1	.3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 2982.55

INPUT
Description:
Station Elevation Data num= 88

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6944	.53	6944	3.6	6943.9	6.72	6943.8	9.85	6943.7
12.98	6943.6	16.11	6943.5	19.23	6943.4	22.36	6943.3	26.5	6943.2
36.2	6943.1	42.79	6943	44.53	6942.9	45.73	6942.8	46.93	6942.7
48.13	6942.6	49.3	6942.5	50.45	6942.4	51.64	6942.3	52.86	6942.2
54.02	6942.1	63.96	6942.1	65.06	6942.2	66.19	6942.3	67.29	6942.4
68.41	6942.5	69.52	6942.6	70.64	6942.7	71.75	6942.8	72.86	6942.9
74.3	6943	83.17	6943.1	84.63	6943.2	88.06	6943.2	93.97	6943.1
101.17	6943	108.39	6943	114.88	6943.1	117.4	6943.2	119.86	6943.3
122.14	6943.4	124.4	6943.5	126.54	6943.6	128.27	6943.7	129.98	6943.8
131.68	6943.9	133.37	6944	134.28	6944.1	134.93	6944.2	135.59	6944.3
136.24	6944.4	136.89	6944.5	137.54	6944.6	138.19	6944.7	138.84	6944.8
139.49	6944.9	140.14	6945	140.78	6945.1	141.43	6945.2	142.08	6945.3
142.72	6945.4	143.37	6945.5	144.01	6945.6	144.66	6945.7	145.31	6945.8
145.95	6945.9	146.64	6946	147.44	6946.1	148.28	6946.2	149.12	6946.3
149.96	6946.4	150.79	6946.5	151.64	6946.6	152.47	6946.7	153.3	6946.8

154.14	6946.9	155.26	6947	156.23	6947.1	157.18	6947.2	158.13	6947.3
159.13	6947.4	160.09	6947.5	161.16	6947.6	162.22	6947.7	163.28	6947.8
164.35	6947.9	165.52	6948	166.85	6948				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	46.93	.04	70.64	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
46.93	70.64	262.04	259.99	258.3	.1	.3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 2722.57

INPUT
Description:
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6939.6	7.93	6939.6	14.34	6939.5	20.72	6939.4	27.1	6939.3
33.49	6939.2	41.94	6939.1	58.96	6939	64.23	6938.9	68.73	6938.8
73.1	6938.7	75.18	6938.6	76.7	6938.5	78.17	6938.4	79.64	6938.3
81.12	6938.2	82.6	6938.1	116.11	6938.1	117.09	6938.2	118.06	6938.3
119.03	6938.4	120.01	6938.5	120.97	6938.6	121.95	6938.7	122.91	6938.8
123.87	6938.9	124.8	6939	125.77	6939.1	126.71	6939.2	127.68	6939.3
128.56	6939.4	129.53	6939.5	130.42	6939.6	131.39	6939.7	132.29	6939.8
133.23	6939.9	134.07	6940	134.78	6940.1	135.4	6940.2	136.03	6940.3
136.65	6940.4	137.28	6940.5	137.91	6940.6	138.53	6940.7	139.16	6940.8
139.79	6940.9	140.64	6941	141.74	6941.1	142.42	6941.2	143.1	6941.3
143.79	6941.4	144.48	6941.5	145.17	6941.6	145.87	6941.7	146.63	6941.8
147.47	6941.9	149.39	6942	154.27	6942.1	156.34	6942.2	158.38	6942.3
159.96	6942.4	161.73	6942.5	163.39	6942.6	165.05	6942.7	166.72	6942.8
168.38	6942.9	170.63	6943	171.67	6943				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	75.18	.04	120.97	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
75.18	120.97	220.21	122	135.83	.1	.3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 2600.57

INPUT
Description:
Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6939.97	.99	6939.9	2.43	6939.8	3.86	6939.7	5.3	6939.6
6.7	6939.5	8.08	6939.4	9.46	6939.3	10.8	6939.2	12.16	6939.1
13.66	6939	15.17	6938.9	16.51	6938.8	17.87	6938.7	19.18	6938.6
20.51	6938.5	21.92	6938.4	23.36	6938.3	24.82	6938.2	26.35	6938.1
27.91	6938	29.85	6937.9	32.7	6937.8	35.27	6937.7	37.81	6937.6
40.55	6937.5	43.29	6937.4	46.03	6937.3	48.56	6937.2	50.97	6937.1
58.73	6937	62.43	6936.9	66.44	6936.8	79.66	6936.7	84.32	6936.6
96.37	6936.5	114.47	6936.5	120.55	6936.6	126.8	6936.7	135.54	6936.8
143.11	6936.9	151.31	6937	184.3	6937.07	196.95	6937.1	197.92	6937.2
198.86	6937.3	199.79	6937.4	200.73	6937.5	201.62	6937.6	202.56	6937.7

203.43	6937.8	204.33	6937.9	205.27	6938	206.63	6938.1	208.05	6938.2
209.54	6938.3	211.01	6938.4	212.44	6938.5	213.92	6938.6	215.4	6938.7
216.86	6938.8	218.28	6938.9	219.7	6939	221.21	6939.1	222.6	6939.2
224.01	6939.3	225.49	6939.4	227	6939.5	228.51	6939.6	230.02	6939.7
231.53	6939.8	233.04	6939.9	234.6	6940	235.81	6940		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	58.73	.04	151.31	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
58.73	151.31	179.59	189.06	203.12	.1 .3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 2411.51

INPUT
Description:
Station Elevation Data num= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6935.4	.75	6935.4	2.63	6935.3	4.51	6935.2	6.4	6935.1
8.28	6935	10.13	6934.9	11.99	6934.8	13.85	6934.7	15.71	6934.6
17.57	6934.5	19.43	6934.4	21.3	6934.3	23.17	6934.2	25.04	6934.1
27.04	6934	31.19	6933.9	35.99	6933.8	40.81	6933.7	45.62	6933.6
50.44	6933.5	55.67	6933.4	61.91	6933.3	68.1	6933.2	74.32	6933.1
91.95	6933.1	102.93	6933.2	117.39	6933.3	123.43	6933.4	129.28	6933.5
135.15	6933.6	140.89	6933.7	145.3	6933.8	149.04	6933.9	152.28	6934
153.23	6934.1	154.03	6934.2	154.84	6934.3	155.64	6934.4	156.45	6934.5
157.25	6934.6	158.06	6934.7	158.86	6934.8	159.67	6934.9	160.47	6935
161.3	6935.1	162.12	6935.2	162.95	6935.3	163.77	6935.4	164.59	6935.5
165.43	6935.6	166.25	6935.7	167.08	6935.8	167.9	6935.9	168.76	6936
169.84	6936.1	170.95	6936.2	172.07	6936.3	173.18	6936.4	174.29	6936.5
175.4	6936.6	176.51	6936.7	177.62	6936.8	178.74	6936.9	179.86	6937
181.21	6937.1	182.52	6937.2	183.86	6937.3	185.24	6937.4	186.7	6937.5
188.29	6937.6	189.87	6937.7	191.45	6937.8	193.02	6937.9	194.85	6938
196.25	6938								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	50.44	.04	129.28	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
50.44	129.28	401.61	387.28	378.31	.1 .3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 2024.23

INPUT
Description:
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6928.89	2.82	6928.8	5.12	6928.7	6.48	6928.6	7.71	6928.5
8.94	6928.4	10.16	6928.3	11.39	6928.2	12.62	6928.1	72.89	6928.03
101.96	6928	104.67	6927.9	107.02	6927.8	109.26	6927.7	111.43	6927.6
113.5	6927.5	115.51	6927.4	117.63	6927.3	119.9	6927.2	121.76	6927.2
124.13	6927.3	125.45	6927.4	126.84	6927.5	128.27	6927.6	129.85	6927.7
131.32	6927.8	132.92	6927.9	134.87	6928	139.41	6928.1	144.26	6928.2

148.96	6928.3	153.19	6928.4	155.86	6928.5	158.52	6928.6	161.18	6928.7
163.63	6928.8	165.77	6928.9	168.19	6929	170.3	6929.1	172.28	6929.2
174.33	6929.3	176.31	6929.4	178.36	6929.5	180.45	6929.6	182.56	6929.7
184.7	6929.8	186.82	6929.9	188.98	6930	191.09	6930.1	193.11	6930.2
195.15	6930.3	196.95	6930.39						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	101.96	.04	134.87	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
101.96	134.87	313.39	315.87	335.79	.1 .3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 1708.36

INPUT
Description:
Station Elevation Data num= 491

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6926	.15	6926	.41	6925.99	.86	6925.99	1.36	6925.98
1.75	6925.98	2.85	6925.96	2.98	6925.95	3.1	6925.95	4.34	6925.93
4.45	6925.92	5.8	6925.9	6.52	6925.89	7.15	6925.87	7.32	6925.87
7.94	6925.86	8.5	6925.84	8.81	6925.84	9.35	6925.82	9.84	6925.81
10.31	6925.79	10.77	6925.78	11.19	6925.76	11.48	6925.76	11.8	6925.75
12.19	6925.73	12.89	6925.71	13.29	6925.7	13.6	6925.69	13.89	6925.69
14.31	6925.67	14.78	6925.66	15.02	6925.65	15.24	6925.65	15.73	6925.63
16.27	6925.62	16.43	6925.62	16.58	6925.61	17.14	6925.59	17.76	6925.58
17.85	6925.57	17.93	6925.57	18.56	6925.55	19.25	6925.52	19.28	6925.52
19.97	6925.49	20.63	6925.46	20.74	6925.46	21.39	6925.43	21.98	6925.41
22.1	6925.4	22.23	6925.4	22.81	6925.38	23.32	6925.36	23.72	6925.34
24.22	6925.32	24.67	6925.3	25.21	6925.28	25.64	6925.26	26.02	6925.24
26.35	6925.23	26.7	6925.21	27.05	6925.2	27.37	6925.18	27.76	6925.17
28.19	6925.15	28.47	6925.14	28.72	6925.12	29.18	6925.11	29.69	6925.09
30.07	6925.07	30.59	6925.05	30.91	6925.04	31.18	6925.03	31.3	6925.03
31.41	6925.02	32.67	6925	32.76	6925	33.42	6924.97	34.11	6924.94
34.84	6924.91	35.46	6924.88	35.65	6924.88	36.26	6924.85	36.81	6924.83
37.14	6924.81	37.67	6924.79	38.63	6924.75	39.09	6924.73	39.5	6924.72
39.8	6924.71	40.12	6924.69	40.5	6924.68	40.85	6924.66	41.61	6924.64
42.2	6924.62	42.63	6924.61	43.1	6924.59	43.34	6924.59	44.04	6924.56
44.59	6924.55	44.75	6924.54	44.9	6924.54	45.46	6924.52	46.08	6924.5
46.24	6924.5	46.88	6924.48	47.57	6924.45	48.29	6924.43	48.94	6924.41
49.07	6924.41	49.71	6924.39	50.29	6924.36	50.56	6924.36	51.12	6924.34
51.64	6924.32	51.83	6924.32	52.05	6924.31	52.98	6924.29	53.54	6924.27
53.96	6924.26	55.37	6924.22	55.68	6924.21	56.52	6924.19	56.79	6924.18
60.33	6924.18	60.99	6924.17	61.74	6924.17	63.16	6924.15	63.77	6924.15
63.87	6924.14	63.97	6924.14	64.57	6924.13	65.12	6924.13	65.28	6924.12
65.46	6924.12	65.99	6924.11	66.47	6924.11	66.7	6924.1	66.96	6924.1
67.81	6924.08	68.11	6924.08	68.82	6924.06	69.16	6924.06	69.94	6924.04
70.24	6924.04	70.51	6924.03	71.43	6924.01	71.86	6924.01	72.92	6923.99
73.21	6923.99	74.41	6923.97	74.55	6923.97	75.19	6923.96	76.61	6923.94
77.25	6923.94	77.39	6923.93	78.03	6923.93	78.6	6923.92	78.88	6923.92
79.95	6923.9	80.37	6923.9	81.3	6923.88	81.86	6923.88	82.27	6923.87
82.64	6923.87	83.35	6923.85	83.99	6923.85	84.84	6923.83	85.1	6923.83
85.34	6923.82	85.81	6923.82	86.34	6923.81	86.52	6923.8	86.69	6923.8
87.83	6923.78	88.04	6923.78	88.64	6923.77	89.38	6923.76	90.06	6923.74
90.73	6923.73	91.48	6923.72	92.08	6923.71	92.18	6923.71	92.3	6923.7
93.43	6923.68	93.79	6923.68	94.78	6923.66	95.02	6923.65	95.28	6923.65
96.13	6923.63	96.43	6923.62	96.77	6923.62	97.47	6923.6	97.85	6923.6
98.26	6923.59	98.56	6923.59	98.82	6923.58	99.75	6923.56	100.17	6923.56

101.24	6923.54	101.52	6923.54	102.73	6923.52	102.87	6923.52	103.51	6923.51
104.93	6923.49	105.56	6923.48	105.72	6923.48	106.34	6923.47	106.91	6923.47
107.05	6923.46	107.21	6923.46	107.76	6923.45	108.26	6923.45	108.47	6923.44
108.7	6923.44	109.17	6923.43	109.61	6923.43	109.88	6923.42	110.19	6923.42
110.59	6923.41	110.95	6923.41	111.3	6923.4	111.68	6923.4	112.01	6923.39
112.3	6923.39	112.71	6923.38	113.17	6923.38	113.42	6923.37	113.65	6923.37
114.13	6923.36	114.66	6923.36	114.84	6923.35	115	6923.35	116.15	6923.33
116.35	6923.33	116.96	6923.32	118.38	6923.3	119.04	6923.3	119.13	6923.29
120.62	6923.29	121.21	6923.28	122.63	6923.28	123.09	6923.27	124.44	6923.27
124.75	6923.26	126.17	6923.26	126.59	6923.25	128.48	6923.25	129	6923.24
130.41	6923.24	131.06	6923.23	132.53	6923.23	133.25	6923.22	134.66	6923.22
135.22	6923.21	140.32	6923.21	140.61	6923.22	146.7	6923.22	147.36	6923.21
148.11	6923.21	148.7	6923.22	149.53	6923.22	150.05	6923.23	150.44	6923.23
150.94	6923.24	152.75	6923.24	153.07	6923.25	156.79	6923.25	157.32	6923.26
158.14	6923.26	158.73	6923.27	159.49	6923.27	160.84	6923.29	162.37	6923.29
162.98	6923.3	164.39	6923.3	164.88	6923.31	165.81	6923.31	166.23	6923.32
170.06	6923.32	170.27	6923.33	173.6	6923.33	174.29	6923.34	175.01	6923.34
175.67	6923.33	180.26	6923.33	180.68	6923.32	186.34	6923.32	186.45	6923.33
189.17	6923.33	189.88	6923.34	192.71	6923.34	193.19	6923.35	196.25	6923.35
196.65	6923.36	199.64	6923.36	199.79	6923.37	202.62	6923.37	203.33	6923.38
206.16	6923.38	206.67	6923.39	208.58	6923.39	209	6923.4	211.12	6923.4
211.56	6923.41	213.95	6923.41	214.54	6923.42	214.76	6923.42	215.37	6923.41
216.03	6923.41	216.78	6923.4	217.53	6923.4	218.2	6923.39	219.02	6923.39
219.61	6923.38	220.51	6923.38	221.03	6923.37	222	6923.37	222.45	6923.36
223.49	6923.36	223.86	6923.35	224.98	6923.35	225.28	6923.34	226.47	6923.34
226.69	6923.33	227.96	6923.33	228.11	6923.32	228.82	6923.32	229.45	6923.31
230.23	6923.31	231.65	6923.29	232.29	6923.27	232.43	6923.27	233.07	6923.26
233.64	6923.24	233.92	6923.24	234.48	6923.22	234.99	6923.21	235.19	6923.21
235.41	6923.2	236.33	6923.18	236.91	6923.18	237.68	6923.16	238.02	6923.16
238.4	6923.15	239.03	6923.15	239.44	6923.14	239.89	6923.14	240.14	6923.13
240.38	6923.13	240.85	6923.12	241.56	6923.12	241.73	6923.11	242.27	6923.11
242.87	6923.1	243.07	6923.1	244.36	6923.08	245.1	6923.08	245.77	6923.07
245.85	6923.07	247.12	6923.05	247.93	6923.05	248.47	6923.04	248.83	6923.04
249.35	6923.03	249.82	6923.03	250.06	6923.02	250.76	6923.02	251.16	6923.01
252.89	6923.01	253.3	6923	274.18	6923	274.83	6923.01	275.43	6923.03
275.67	6923.03	276.25	6923.05	276.78	6923.06	276.96	6923.07	277.16	6923.07
278.13	6923.09	278.65	6923.11	279.47	6923.13	279.79	6923.14	280.14	6923.14
280.82	6923.16	281.63	6923.18	281.91	6923.19	282.17	6923.19	282.62	6923.21
283.12	6923.22	283.33	6923.22	283.52	6923.23	284.04	6923.24	284.61	6923.26
284.75	6923.26	285.45	6923.28	286.1	6923.29	286.87	6923.31	288.29	6923.35
288.91	6923.36	288.99	6923.37	289.08	6923.37	289.7	6923.38	290.26	6923.4
290.41	6923.4	290.57	6923.41	291.12	6923.42	291.61	6923.44	291.82	6923.44
292.06	6923.45	292.96	6923.47	293.24	6923.48	293.56	6923.48	295.05	6923.52
295.36	6923.53	295.65	6923.53	296.54	6923.55	297	6923.57	298.03	6923.59
298.2	6923.6	298.35	6923.6	298.9	6923.61	299.52	6923.63	299.7	6923.63
300.32	6923.65	301.01	6923.66	301.74	6923.68	302.39	6923.7	302.5	6923.7
303.15	6923.72	303.74	6923.73	303.86	6923.73	303.99	6923.74	305.09	6923.76
305.28	6923.77	305.48	6923.77	305.98	6923.79	306.44	6923.8	306.69	6923.8
306.97	6923.81	307.79	6923.83	308.11	6923.84	308.46	6923.84	309.13	6923.86
309.95	6923.88	310.23	6923.88	310.48	6923.89	311.45	6923.91	311.65	6923.92
311.83	6923.92	312.94	6923.94	313.06	6923.95	313.18	6923.95	313.77	6923.96
314.43	6923.98	315.19	6924.01	315.87	6924.04	315.92	6924.04	316.6	6924.1
317.22	6924.16	317.41	6924.18	318.02	6924.23	318.57	6924.28	318.9	6924.3
319.43	6924.35	319.92	6924.39	320.85	6924.47	321.27	6924.51	321.56	6924.53
321.88	6924.56	322.27	6924.59	322.97	6924.65	323.37	6924.68	323.68	6924.71
323.96	6924.73	324.39	6924.77	324.86	6924.81	325.1	6924.82	325.31	6924.84
325.81	6924.87	326.35	6924.9	326.66	6924.92	327.22	6924.96	327.84	6925
328.01	6925.02	328.64	6925.06	329.33	6925.11	330.05	6925.16	330.7	6925.2
330.91	6925.22								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	109.17	.04	288.91	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
109.17	288.91	87.01	91 103.05	.1	.3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 1617.36

INPUT
Description:
Station Elevation Data num= 491

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6926	.15	6926	.41	6925.99	.86	6925.99	1.36	6925.98
1.75	6925.98	2.85	6925.96	2.98	6925.95	3.1	6925.95	4.34	6925.93
4.45	6925.92	5.8	6925.9	6.52	6925.89	7.15	6925.87	7.32	6925.87
7.94	6925.86	8.5	6925.84	8.81	6925.84	9.35	6925.82	9.84	6925.81
10.31	6925.79	10.77	6925.78	11.19	6925.76	11.48	6925.76	11.8	6925.75
12.19	6925.73	12.89	6925.71	13.29	6925.7	13.6	6925.69	13.89	6925.69
14.31	6925.67	14.78	6925.66	15.02	6925.65	15.24	6925.65	15.73	6925.63
16.27	6925.62	16.43	6925.62	16.58	6925.61	17.14	6925.59	17.76	6925.58
17.85	6925.57	17.93	6925.57	18.56	6925.55	19.25	6925.52	19.28	6925.52
19.97	6925.49	20.63	6925.46	20.74	6925.46	21.39	6925.43	21.98	6925.41
22.1	6925.4	22.23	6925.4	22.81	6925.38	23.32	6925.36	23.72	6925.34
24.22	6925.32	24.67	6925.3	25.21	6925.28	25.64	6925.26	26.02	6925.24
26.35	6925.23	26.7	6925.21	27.05	6925.2	27.37	6925.18	27.76	6925.17
28.19	6925.15	28.47	6925.14	28.72	6925.12	29.18	6925.11	29.69	6925.09
30.07	6925.07	30.59	6925.05	30.91	6925.04	31.18	6925.03	31.3	6925.03
31.41	6925.02	32.67	6925	32.76	6925	33.42	6924.97	34.11	6924.94
34.84	6924.91	35.46	6924.88	35.65	6924.88	36.26	6924.85	36.81	6924.83
37.14	6924.81	37.67	6924.79	38.63	6924.75	39.09	6924.73	39.5	6924.72
39.8	6924.71	40.12	6924.69	40.5	6924.68	40.85	6924.66	41.61	6924.64
42.2	6924.62	42.63	6924.61	43.1	6924.59	43.34	6924.59	44.04	6924.56
44.59	6924.55	44.75	6924.54	44.9	6924.54	45.46	6924.52	46.08	6924.5
46.24	6924.5	46.88	6924.48	47.57	6924.45	48.29	6924.43	48.94	6924.41
49.07	6924.41	49.71	6924.39	50.29	6924.36	50.56	6924.36	51.12	6924.34
51.64	6924.32	51.83	6924.32	52.05	6924.31	52.98	6924.29	53.54	6924.27
53.96	6924.26	55.37	6924.22	55.68	6924.21	56.52	6924.19	56.79	6924.18
60.33	6924.18	60.99	6924.17	61.74	6924.17	63.16	6924.15	63.77	6924.15
63.87	6924.14	63.97	6924.14	64.57	6924.13	65.12	6924.13	65.28	6924.12
65.46	6924.12	65.99	6924.11	66.47	6924.11	66.7	6924.1	66.96	6924.1
67.81	6924.08	68.11	6924.08	68.82	6924.06	69.16	6924.06	69.94	6924.04
70.24	6924.04	70.51	6924.03	71.43	6924.01	71.86	6924.01	72.92	6923.99
73.21	6923.99	74.41	6923.97	74.55	6923.97	75.19	6923.96	76.61	6923.94
77.25	6923.94	77.39	6923.93	78.03	6923.93	78.6	6923.92	78.88	6923.92
79.95	6923.9	80.37	6923.9	81.3	6923.88	81.86	6923.88	82.27	6923.87
82.64	6923.87	83.35	6923.85	83.99	6923.85	84.84	6923.83	85.1	6923.83
85.34	6923.82	85.81	6923.82	86.34	6923.81	86.52	6923.8	86.69	6923.8
87.83	6923.78	88.04	6923.78	88.64	6923.77	89.38	6923.76	90.06	6923.74
90.73	6923.73	91.48	6923.72	92.08	6923.71	92.18	6923.71	92.3	6923.7
93.43	6923.68	93.79	6923.68	94.78	6923.66	95.02	6923.65	95.28	6923.65
96.13	6923.63	96.43	6923.62	96.77	6923.62	97.47	6923.6	97.85	6923.6
98.26	6923.59	98.56	6923.59	98.82	6923.58	99.75	6923.56	100.17	6923.56
101.24	6923.54	101.52	6923.54	102.73	6923.52	102.87	6923.52	103.51	6923.51
104.93	6923.49	105.56	6923.48	105.72	6923.48	106.34	6923.47	106.91	6923.47
107.05	6923.46	107.21	6923.46	107.76	6923.45	108.26	6923.45	108.47	6923.44
108.7	6923.44	109.17	6923.43	109.61	6923.43	109.88	6923.42	110.19	6923.42
110.59	6923.41	110.95	6923.41	111.3	6923.4	111.68	6923.4	112.01	6923.39
112.3	6923.39	112.71	6923.38	113.17	6923.38	113.42	6923.37	113.65	6923.37
114.13	6923.36	114.66	6923.36	114.84	6923.35	115	6923.35	116.15	6923.33
116.35	6923.33	116.96	6923.32	118.38	6923.3	119.04	6923.3	119.13	6923.29
120.62	6923.29	121.21	6923.28	122.63	6923.28	123.09	6923.27	124.44	6923.27

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  124.75 6923.26  126.17 6923.26  126.59 6923.25  128.48 6923.25     129 6923.24
  130.41 6923.24  131.06 6923.23  132.53 6923.23  133.25 6923.22  134.66 6923.22
  135.22 6923.21  140.32 6923.21  140.61 6923.22   146.7 6923.22  147.36 6923.21
  148.11 6923.21   148.7 6923.22  149.53 6923.22  150.05 6923.23  150.44 6923.23
  150.94 6923.24  152.75 6923.24  153.07 6923.25  156.79 6923.25  157.32 6923.26
  158.14 6923.26  158.73 6923.27  159.49 6923.27  160.84 6923.29  162.37 6923.29
  162.98  6923.3  164.39  6923.3  164.88 6923.31  165.81 6923.31  166.23 6923.32
  170.06 6923.32  170.27 6923.33   173.6 6923.33  174.29 6923.34  175.01 6923.34
  175.67 6923.33  180.26 6923.33  180.68 6923.32  186.34 6923.32  186.45 6923.33
  189.17 6923.33  189.88 6923.34  192.71 6923.34  193.19 6923.35  196.25 6923.35
  196.65 6923.36  199.64 6923.36  199.79 6923.37  202.62 6923.37  203.33 6923.38
  206.16 6923.38  206.67 6923.39  208.58 6923.39     209  6923.4  211.12  6923.4
  211.56 6923.41  213.95 6923.41  214.54 6923.42  214.76 6923.42  215.37 6923.41
  216.03 6923.41  216.78  6923.4  217.53  6923.4   218.2 6923.39  219.02 6923.39
  219.61 6923.38  220.51 6923.38  221.03 6923.37     222 6923.37  222.45 6923.36
  223.49 6923.36  223.86 6923.35  224.98 6923.35  225.28 6923.34  226.47 6923.34
  226.69 6923.33  227.96 6923.33  228.11 6923.32  228.82 6923.32  229.45 6923.31
  230.23 6923.31  231.65 6923.29  232.29 6923.27  232.43 6923.27  233.07 6923.26
  233.64 6923.24  233.92 6923.24  234.48 6923.22  234.99 6923.21  235.19 6923.21
  235.41  6923.2  236.33 6923.18  236.91 6923.18  237.68 6923.16  238.02 6923.16
   238.4 6923.15  239.03 6923.15  239.44 6923.14  239.89 6923.14  240.14 6923.13
  240.38 6923.13  240.85 6923.12  241.56 6923.12  241.73 6923.11  242.27 6923.11
  242.87  6923.1  243.07  6923.1  244.36 6923.08   245.1 6923.08  245.77 6923.07
  245.85 6923.07  247.12 6923.05  247.93 6923.05  248.47 6923.04  248.83 6923.04
  249.35 6923.03  249.82 6923.03  250.06 6923.02  250.76 6923.02  251.16 6923.01
  252.89 6923.01   253.3    6923  274.18    6923  274.83 6923.01  275.43 6923.03
  275.67 6923.03  276.25 6923.05  276.78 6923.06  276.96 6923.07  277.16 6923.07
  278.13 6923.09  278.65 6923.11  279.47 6923.13  279.79 6923.14  280.14 6923.14
  280.82 6923.16  281.63 6923.18  281.91 6923.19  282.17 6923.19  282.62 6923.21
  283.12 6923.22  283.33 6923.22  283.52 6923.23  284.04 6923.24  284.61 6923.26
  284.75 6923.26  285.45 6923.28   286.1 6923.29  286.87 6923.31  288.29 6923.35
  288.91 6923.36  288.99 6923.37  289.08 6923.37   289.7 6923.38  290.26  6923.4
  290.41  6923.4  290.57 6923.41  291.12 6923.42  291.61 6923.44  291.82 6923.44
  292.06 6923.45  292.96 6923.47  293.24 6923.48  293.56 6923.48  295.05 6923.52
  295.36 6923.53  295.65 6923.53  296.54 6923.55     297 6923.57  298.03 6923.59
   298.2  6923.6  298.35  6923.6   298.9 6923.61  299.52 6923.63   299.7 6923.63
  300.32 6923.65  301.01 6923.66  301.74 6923.68  302.39  6923.7   302.5  6923.7
  303.15 6923.72  303.74 6923.73  303.86 6923.73  303.99 6923.74  305.09 6923.76
  305.28 6923.77  305.48 6923.77  305.98 6923.79  306.44  6923.8  306.69  6923.8
  306.97 6923.81  307.79 6923.83  308.11 6923.84  308.46 6923.84  309.13 6923.86
  309.95 6923.88  310.23 6923.88  310.48 6923.89  311.45 6923.91  311.65 6923.92
  311.83 6923.92  312.94 6923.94  313.06 6923.95  313.18 6923.95  313.77 6923.96
  314.43 6923.98  315.19 6924.01  315.87 6924.04  315.92 6924.04   316.6  6924.1
  317.22 6924.16  317.41 6924.18  318.02 6924.23  318.57 6924.28   318.9  6924.3
  319.43 6924.35  319.92 6924.39  320.85 6924.47  321.27 6924.51  321.56 6924.53
  321.88 6924.56  322.27 6924.59  322.97 6924.65  323.37 6924.68  323.68 6924.71
  323.96 6924.73  324.39 6924.77  324.86 6924.81   325.1 6924.82  325.31 6924.84
  325.81 6924.87  326.35  6924.9  326.66 6924.92  327.22 6924.96  327.84    6925
  328.01 6925.02  328.64 6925.06  329.33 6925.11  330.05 6925.16   330.7  6925.2
  330.91 6925.22

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  109.17     .04  288.91     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        109.17  288.91           140.88  124.94  128.22             .1       .3

CROSS SECTION


RIVER: Geick Ranch T2
REACH: GR_T2_R1           RS: 1492.43
```

INPUT
Description:
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
47.41	6921	69.35	6921	74.64	6920.9	79.37	6920.8	84.11	6920.7
88.85	6920.6	93.58	6920.5	98.31	6920.4	102.95	6920.3	107.66	6920.2
112.3	6920.1	150.14	6920	158.03	6919.9	165.16	6919.8	172.3	6919.7
195.94	6919.7	202.25	6919.75	209.29	6919.8	222.7	6919.9	236.87	6920
243.49	6920.1	245.84	6920.2	248.2	6920.3	250.56	6920.4	252.9	6920.5
255.26	6920.6	257.61	6920.7	259.98	6920.8	262.34	6920.9	264.84	6921
268.2	6921.1	270.58	6921.2	272.97	6921.3	275.36	6921.4	277.75	6921.5
280.16	6921.6	282.61	6921.7	285.02	6921.8	287.46	6921.9	290.81	6921.9
292.24	6921.8	293.6	6921.7	294.95	6921.6	296.32	6921.5	297.68	6921.4
299.03	6921.3	300.36	6921.2	301.67	6921.1	303.04	6921.1		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
47.41	.04	112.3	.04	243.49	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
112.3	243.49	157.12	162.67	158.4	.1 .3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 1329.76

INPUT
Description:
Station Elevation Data num= 455

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
88.46	6919.01	88.47	6919.01	88.63	6919	89.18	6919	89.84	6918.99
89.94	6918.98	90.6	6918.98	91.24	6918.97	91.4	6918.96	92.02	6918.96
92.54	6918.95	92.73	6918.95	92.96	6918.94	93.44	6918.94	93.85	6918.93
94.15	6918.93	94.52	6918.92	94.86	6918.92	95.15	6918.91	95.57	6918.91
96.08	6918.9	96.45	6918.9	96.99	6918.89	97.76	6918.89	98.41	6918.88
99.06	6918.87	99.2	6918.87	99.83	6918.86	100.36	6918.86	100.54	6918.85
100.76	6918.85	101.25	6918.84	101.66	6918.84	101.96	6918.83	102.32	6918.83
102.67	6918.82	102.97	6918.82	103.38	6918.81	103.88	6918.81	104.09	6918.8
104.27	6918.8	104.8	6918.79	105.44	6918.78	105.57	6918.78	106.22	6918.77
106.88	6918.76	107	6918.76	107.64	6918.75	108.18	6918.74	108.56	6918.74
109.06	6918.73	109.48	6918.73	109.77	6918.72	110.12	6918.72	110.48	6918.71
110.78	6918.71	111.19	6918.7	111.68	6918.7	111.9	6918.69	112.61	6918.69
113.24	6918.68	113.39	6918.68	114.03	6918.67	114.69	6918.66	114.79	6918.66
115.45	6918.65	116	6918.64	116.87	6918.64	117.3	6918.63	117.58	6918.63
117.91	6918.62	118.6	6918.62	119	6918.61	119.47	6918.61	119.71	6918.6
119.91	6918.6	120.42	6918.59	121.21	6918.59	121.84	6918.58	122.51	6918.57
123.26	6918.57	123.81	6918.56	124.15	6918.56	124.68	6918.55	125.12	6918.55
125.39	6918.54	126.42	6918.54	126.81	6918.53	127.72	6918.53	128.23	6918.52
129.65	6918.52	130.33	6918.51	131.07	6918.51	131.63	6918.5	132.94	6918.5
133.2	6918.49	134.62	6918.49	135.07	6918.48	136.75	6918.48	136.84	6918.47
138.19	6918.47	138.88	6918.46	140.3	6918.46	140.75	6918.45	142.06	6918.45
142.43	6918.44	143.85	6918.44	144.43	6918.43	144.66	6918.43	145.27	6918.42
145.97	6918.41	147.55	6918.41	148.1	6918.4	159	6918.4	159.46	6918.39
162.3	6918.39	162.9	6918.38	165.85	6918.38	166.26	6918.37	175.08	6918.37
175.62	6918.38	182.89	6918.38	183.42	6918.39	185.05	6918.39	185.73	6918.4
187.15	6918.4	187.66	6918.41	188.57	6918.41	188.96	6918.42	190.27	6918.42
190.7	6918.43	191.57	6918.43	192.12	6918.44	192.87	6918.44	193.54	6918.45
197.09	6918.45	197.45	6918.44	199.01	6918.44	199.22	6918.43	200.69	6918.43
201.35	6918.42	202.13	6918.42	202.77	6918.41	204.19	6918.41	204.6	6918.4
206.32	6918.4	206.81	6918.39	207.21	6918.39	207.74	6918.38	215.02	6918.38

215.54	6918.39	216.17	6918.38	216.25	6918.38	216.33	6918.39	220.24	6918.39
220.51	6918.4	221.93	6918.4	222.41	6918.41	223.35	6918.41	223.97	6918.42
224.77	6918.42	225.45	6918.43	227.61	6918.43	228.05	6918.44	230.2	6918.44
230.45	6918.45	231.96	6918.45	232.58	6918.46	233.26	6918.47	234	6918.47
234.57	6918.48	235.87	6918.48	236.13	6918.49	236.84	6918.49	237.17	6918.5
238	6918.5	238.26	6918.51	238.97	6918.51	239.56	6918.52	240.39	6918.52
241.08	6918.53	241.81	6918.54	242.68	6918.54	243.23	6918.55	244.65	6918.55
244.99	6918.56	245.36	6918.56	245.8	6918.55	246.78	6918.55	247.36	6918.54
247.6	6918.54	248.2	6918.53	248.9	6918.52	249.62	6918.52	250.2	6918.51
250.48	6918.51	251.04	6918.5	251.51	6918.5	251.75	6918.49	252.46	6918.49
252.81	6918.48	253.17	6918.48	253.6	6918.47	254.11	6918.47	254.59	6918.46
255.16	6918.46	255.3	6918.45	256.01	6918.45	256.72	6918.44	257.43	6918.43
258.02	6918.43	258.14	6918.42	258.85	6918.42	259.32	6918.41	259.84	6918.41
260.27	6918.4	260.63	6918.4	260.98	6918.39	261.69	6918.39	261.93	6918.38
262.4	6918.38	262.96	6918.37	263.23	6918.37	263.82	6918.36	264.53	6918.36
265.24	6918.35	265.84	6918.34	266.07	6918.34	266.66	6918.33	267.14	6918.33
267.37	6918.32	268.08	6918.32	268.45	6918.31	269.19	6918.31	269.5	6918.3
269.75	6918.3	270.21	6918.29	271.05	6918.29	271.63	6918.28	272.31	6918.27
272.35	6918.27	273.05	6918.26	273.76	6918.26	273.87	6918.25	274.47	6918.25
274.96	6918.24	275.43	6918.24	275.88	6918.23	276.26	6918.23	276.59	6918.22
276.99	6918.22	277.3	6918.21	277.57	6918.21	278.01	6918.2	278.55	6918.19
278.72	6918.18	278.87	6918.18	279.43	6918.17	280.11	6918.16	280.17	6918.16
280.85	6918.14	281.48	6918.13	281.67	6918.13	282.27	6918.12	282.78	6918.11
282.98	6918.1	283.23	6918.1	283.69	6918.09	284.08	6918.08	284.4	6918.08
284.79	6918.07	285.11	6918.06	285.38	6918.06	285.82	6918.05	286.35	6918.04
286.69	6918.04	287.24	6918.03	287.91	6918.01	287.99	6918.01	288.66	6918
291.9	6918	292.21	6918.01	292.92	6918.01	293.2	6918.02	293.63	6918.03
294.15	6918.04	294.5	6918.04	295.05	6918.06	295.71	6918.07	295.76	6918.07
295.81	6918.08	296.47	6918.09	297.11	6918.11	297.27	6918.11	297.89	6918.13
298.41	6918.14	298.6	6918.14	298.83	6918.15	299.31	6918.17	299.72	6918.18
300.02	6918.19	300.39	6918.2	300.73	6918.21	301.02	6918.21	301.44	6918.22
301.95	6918.23	302.32	6918.23	302.86	6918.24	303.63	6918.24	304.28	6918.25
305.06	6918.25	305.7	6918.26	306.23	6918.26	306.41	6918.27	307.12	6918.27
307.53	6918.28	308.54	6918.28	308.84	6918.29	309.74	6918.29	309.96	6918.3
310.67	6918.3	311.3	6918.31	312.09	6918.31	312.75	6918.32	312.86	6918.32
313.51	6918.33	314.42	6918.33	314.93	6918.34	315.35	6918.34	315.64	6918.35
316.66	6918.35	317.06	6918.36	317.77	6918.36	317.96	6918.37	319.1	6918.37
319.19	6918.38	319.9	6918.38	320.56	6918.39	321.32	6918.39	321.87	6918.4
322.22	6918.4	322.74	6918.41	323.58	6918.41	323.78	6918.42	324.87	6918.42
325.34	6918.43	326.29	6918.43	326.9	6918.42	327	6918.42	327.08	6918.41
327.71	6918.41	328.38	6918.39	329.13	6918.39	329.69	6918.37	330.02	6918.37
330.55	6918.38	330.99	6918.37	331.26	6918.36	331.58	6918.36	331.97	6918.35
332.29	6918.34	332.68	6918.34	333.14	6918.33	334.1	6918.33	334.7	6918.32
335.52	6918.32	336.2	6918.31	337.82	6918.31	338.36	6918.3	344.02	6918.3
344.74	6918.31	346.16	6918.31	346.62	6918.32	346.87	6918.32	347.17	6918.33
347.58	6918.34	347.93	6918.35	348.29	6918.36	348.73	6918.37	349	6918.38
349.23	6918.38	349.71	6918.4	350.29	6918.41	350.42	6918.42	350.53	6918.42
351.13	6918.44	351.84	6918.46	352.55	6918.47	353.14	6918.49	353.41	6918.49
353.97	6918.51	354.44	6918.52	354.68	6918.52	354.97	6918.53	355.39	6918.53
355.74	6918.54	356.1	6918.55	356.53	6918.56	356.81	6918.56	357.05	6918.57
357.52	6918.58	358.09	6918.59	358.23	6918.59	358.35	6918.6	358.94	6918.61
359.65	6918.62	360.36	6918.64	360.96	6918.66	361.07	6918.66	361.21	6918.67
362.26	6918.67	362.49	6918.68	363.56	6918.68	363.91	6918.69	364.87	6918.69
365.33	6918.7	366.17	6918.7	366.75	6918.71	367.45	6918.72	368.17	6918.72
368.77	6918.73	369.59	6918.73	370.08	6918.74	370.57	6918.74	371.01	6918.75
371.38	6918.76	371.72	6918.77	372.13	6918.78	372.43	6918.79	372.68	6918.79
373.14	6918.8	373.69	6918.82	373.99	6918.82	374.56	6918.84	375.25	6918.85
375.29	6918.85	375.98	6918.87	376.59	6918.89	376.81	6918.89	377.4	6918.91
377.9	6918.92	378.11	6918.92	378.36	6918.93	378.82	6918.94	379.2	6918.95
379.53	6918.96	379.92	6918.95	380.24	6918.94	380.95	6918.94	381.48	6918.95
383.11	6918.95	383.79	6918.96	385.21	6918.96	385.71	6918.97	385.87	6918.97

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
88.46	.04	244.65	.04	353.14	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
244.65	353.14	195.24	146.29	148.95	.1	.3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 1183.47

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6917	9.47	6917	13.64	6916.9	17.91	6916.8	23.68	6916.7
30.28	6916.6	75.62	6916.6	78.11	6916.5	80.58	6916.4	83.06	6916.3
85.54	6916.2	88.03	6916.1	109.82	6916.03	120.73	6916	121.32	6916
125.54	6916.1	129.67	6916.2	142.75	6916.3	149.18	6916.4	155.43	6916.5
161.83	6916.6	168.35	6916.7	175.13	6916.8	181.75	6916.9	188.87	6917
199.96	6917	199.97	6917						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	80.58	.04	149.18	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
80.58	149.18	80.25	79.84	69.49	.1	.3

CROSS SECTION

RIVER: Geick Ranch T2
REACH: GR_T2_R1 RS: 675

INPUT
Description:
Station Elevation Data num= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
159.96	6916	167.64	6916	172.91	6915.9	177.68	6915.8	182.6	6915.7
187.71	6915.6	192.82	6915.5	198.27	6915.4	204.59	6915.3	239.72	6915.2
249.99	6915.1	258.69	6915	264.4	6914.9	270.02	6914.8	275.39	6914.7
280.58	6914.6	285.53	6914.5	290.27	6914.4	294.89	6914.3	299.38	6914.2
303.77	6914.1	312.08	6914.1	313.28	6914.2	314.46	6914.3	315.64	6914.4
316.81	6914.5	317.96	6914.6	319.18	6914.7	320.83	6914.8	322.54	6914.9
323.86	6915	325.04	6915.1	326.41	6915.2	327.69	6915.3	336.36	6915.4
340.72	6915.5	345.14	6915.6	350.54	6915.7	355.99	6915.8	360.58	6915.9
365.72	6916	365.8	6916	369.17	6915.9	372.19	6915.8	375.23	6915.7
378.26	6915.6	381.31	6915.5	384.33	6915.4	387.41	6915.3	390.36	6915.2
393.34	6915.1	399.08	6915.1	401.83	6915.2	405.08	6915.3	408.65	6915.4
412.85	6915.5	415.87	6915.6	418.6	6915.7	420.79	6915.8	422.79	6915.9
425.48	6916	427.31	6916.1	428.92	6916.2	430.57	6916.3	432.55	6916.4
434.73	6916.5	436.91	6916.6	438.99	6916.7	440.98	6916.8	442.89	6916.9
445.34	6917	459.96	6917.09	460.83	6917.1	480.23	6917.2	495.08	6917.3
498.57	6917.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
159.96	.04	275.39	.04	319.18	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
275.39	319.18	0	0	0	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 4586.31

INPUT
Description: 1st cross section below Easton Ville Road culvert
Design Flow
from 4-Way Ranch LOMR
Station Elevation Data num= 94

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6998	18.59	6998	22.08	6997.9	23.64	6997.8	24.32	6997.7
25.07	6997.6	25.83	6997.5	26.54	6997.4	27.25	6997.3	27.96	6997.2
28.66	6997.1	36.84	6997	38.23	6996.9	39.58	6996.8	40.84	6996.7
42.05	6996.6	43.17	6996.5	44.37	6996.4	45.47	6996.3	46.68	6996.2
47.83	6996.1	50.15	6996	51.74	6995.9	52.34	6995.8	52.81	6995.7
53.25	6995.6	53.69	6995.5	54.14	6995.4	54.55	6995.3	54.97	6995.2
55.41	6995.1	55.84	6995	56.26	6994.9	56.7	6994.8	57.12	6994.7
57.54	6994.6	57.95	6994.5	58.37	6994.4	58.8	6994.3	59.21	6994.2
59.71	6994.1	76.28	6994	94.14	6994	101.01	6994.1	102.61	6994.2
104.22	6994.3	106.42	6994.4	109.15	6994.5	114.32	6994.5	121.06	6994.4
123.11	6994.3	124.69	6994.2	126.07	6994.1	139.87	6994.1	140.28	6994.2
140.65	6994.3	141	6994.4	141.36	6994.5	141.69	6994.6	142.01	6994.7
142.33	6994.8	142.65	6994.9	142.98	6995	143.31	6995.1	143.65	6995.2
144.01	6995.3	144.37	6995.4	144.74	6995.5	145.12	6995.6	145.5	6995.7
145.83	6995.8	146.16	6995.9	146.49	6996	147.2	6996.1	147.94	6996.2
148.68	6996.3	149.42	6996.4	150.16	6996.5	150.9	6996.6	151.64	6996.7
152.35	6996.8	153.1	6996.9	154.48	6997	155.18	6997.1	155.85	6997.2
156.51	6997.3	157.18	6997.4	157.85	6997.5	158.52	6997.6	159.2	6997.7
159.91	6997.8	160.65	6997.9	162.72	6998	163.57	6998		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	57.12	.04	142.01	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
57.12	142.01	74.93	53.19	50.82	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 4533.12

INPUT
Description:
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-35.21	6994	-17.02	6994	-14.19	6993.9	-12.14	6993.8	-10.06	6993.7
-7.97	6993.6	-5.87	6993.5	-3.78	6993.4	-1.69	6993.3	.39	6993.2
2.14	6993.12	2.48	6993.1	2.94	6993.1	14.45	6993	18.84	6992.9
27.62	6992.9	43.92	6993	52.8	6993.1	63.84	6993.1	69.97	6993
72.92	6992.9	75.53	6992.8	78.48	6992.7	91	6992.6	92.41	6992.52
92.86	6992.5	94.65	6992.4	95.09	6992.38	96.75	6992.3	102.53	6992.3
104.65	6992.4	106.68	6992.5	108.92	6992.6	110.73	6992.7	112.42	6992.8
114.21	6992.9	116.44	6993	119.27	6993.1	120.79	6993.2	122.02	6993.3
123.26	6993.4	124.58	6993.5	125.76	6993.6	126.93	6993.7	128.1	6993.8
129.28	6993.9	130.44	6994	131.32	6994.1	132.21	6994.2	133.11	6994.3
134	6994.4	134.9	6994.5	135.8	6994.6	136.69	6994.7	137.59	6994.8
138.49	6994.9	139.43	6995	141.49	6995				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-35.21	.04	63.84	.04	120.79	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
63.84	120.79	24.8	19.79	20.67	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 4513.33

INPUT
Description:
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
212.69	6993.4	215.97	6993.4	219.35	6993.3	222.62	6993.2	227.81	6993.1
234.41	6993	238.17	6992.9	241.45	6992.8	244.74	6992.7	247.6	6992.6
250.44	6992.5	253.26	6992.4	256.05	6992.3	258.82	6992.2	261.64	6992.1
309.21	6992.1	313.45	6992	315.57	6991.9	317.19	6991.8	318.84	6991.7
320.6	6991.6	322.57	6991.5	324.62	6991.4	327.04	6991.3	329.49	6991.2
329.55	6991.2	332.11	6991.1	335.49	6991.1	337.06	6991.2	338.43	6991.3
339.79	6991.4	341.21	6991.5	342.41	6991.6	343.56	6991.7	344.59	6991.8
345.61	6991.9	346.59	6992	347.39	6992.1	348.17	6992.2	348.95	6992.3
349.72	6992.4	350.51	6992.5	351.3	6992.6	352.12	6992.7	352.98	6992.8
353.85	6992.9	354.73	6993	355.66	6993.1	356.56	6993.2	357.46	6993.3
358.36	6993.4	359.24	6993.5	360.09	6993.6	360.94	6993.7	361.8	6993.8
362.73	6993.9	363.7	6994	368.59	6994.1	370.03	6994.2	370.25	6994.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
212.69	.04	309.21	.04	347.39	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
309.21	347.39	46.88	31.88	28.02	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 4481.45

INPUT
Description:
Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
31.09	6992.1	31.74	6992.1	36.67	6992	39.12	6991.9	40.98	6991.8
42.85	6991.7	44.67	6991.6	46.49	6991.5	48.31	6991.4	50.14	6991.3
51.98	6991.2	53.85	6991.1	56.96	6991	59.08	6990.9	61.1	6990.8
63.32	6990.7	65.6	6990.6	67.81	6990.5	70.02	6990.4	72.5	6990.3
75.85	6990.2	79.41	6990.1	84.01	6990.1	88.23	6990.2	91.46	6990.3
91.47	6990.3	96.94	6990.2	100.2	6990.1	124.47	6990.1	125.27	6990.2
126.09	6990.3	126.9	6990.4	127.7	6990.5	128.5	6990.6	129.32	6990.7
130.15	6990.8	130.97	6990.9	131.8	6991	132.66	6991.1	133.54	6991.2
134.42	6991.3	135.3	6991.4	136.18	6991.5	137.06	6991.6	137.94	6991.7
138.82	6991.8	139.68	6991.9	140.58	6992	141.56	6992.1	142.58	6992.2
143.63	6992.3	144.8	6992.4	145.93	6992.5	147.15	6992.6	148.5	6992.7
151.72	6992.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
31.09	.04	65.6	.04	128.5	.04

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          65.6   128.5             27.69   29.03   28.87             .1       .3

CROSS SECTION


RIVER: Gieck Ranch T1
REACH: GR_T1_R            RS: 4452.42

INPUT
Description:
Station Elevation Data    num=      51
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   19.11 6991.09   20.84    6991   22.77  6990.9   24.63  6990.8   26.64  6990.7
   28.67  6990.6   30.78  6990.5   33.19  6990.4   35.56  6990.3   37.88  6990.2
   40.08  6990.1   42.35    6990   44.44  6989.9   46.28  6989.8   48.12  6989.7
   49.84  6989.6   51.52  6989.5   53.22  6989.4   54.93  6989.3   56.95  6989.2
   59.94  6989.1   62.32  6989.1   69.66  6989.2   75.18  6989.3   80.25  6989.3
    83.9 6989.25   87.75  6989.2   94.97  6989.1    95.3  6989.1   98.54  6989.2
   99.93  6989.3  101.28  6989.4  102.64  6989.5  104.01  6989.6  105.37  6989.7
  106.77  6989.8  108.16  6989.9  109.54    6990  110.68  6990.1  111.79  6990.2
   112.9  6990.3  114.02  6990.4  115.14  6990.5  116.24  6990.6  117.36  6990.7
  118.49  6990.8   119.6  6990.9  121.51    6991  124.16  6991.1  126.35  6991.2
  128.16  6991.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   19.11     .04   51.52     .04  102.64     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          51.52  102.64            39.67   36.39   33.99             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   19.11   48.86 6989.69       F

CROSS SECTION


RIVER: Gieck Ranch T1
REACH: GR_T1_R            RS: 4416.03

INPUT
Description:
Station Elevation Data    num=      54
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   63.73  6990.7    69.6  6990.6   73.28  6990.5   75.31  6990.4   77.18  6990.3
   79.06  6990.2   80.94  6990.1   83.43    6990   84.85  6989.9   85.79  6989.8
   86.82  6989.7   87.79  6989.6    88.7  6989.5   89.69  6989.4   90.63  6989.3
   91.53  6989.2   92.48  6989.1    93.4    6989   94.29  6988.9   95.17  6988.8
   96.05  6988.7   96.93  6988.6   97.81  6988.5   98.68  6988.4   99.56  6988.3
  100.44  6988.2  101.32  6988.1  122.18  6988.1  127.07  6988.2  155.17  6988.2
  156.31  6988.3  157.08  6988.4  157.82  6988.5  158.54  6988.6  159.27  6988.7
  160.01  6988.8  160.72  6988.9  161.45    6989  162.22  6989.1  162.93  6989.2
  163.63  6989.3  164.34  6989.4  165.07  6989.5  165.79  6989.6  166.52  6989.7
  167.24  6989.8  167.97  6989.9  169.21    6990  181.81  6990.1  185.18  6990.2
  188.63  6990.3  191.14  6990.4  193.74  6990.5  196.72  6990.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   63.73     .04   96.93     .04  158.54     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
```

96.93	158.54		62.73	61.52	60.83		.1	.3	

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 4354.51

INPUT
Description:
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
23.33	6988.69	25.9	6988.6	28.73	6988.5	31.58	6988.4	34.43	6988.3
37.27	6988.2	40.1	6988.1	42.88	6988	44.26	6987.9	45.62	6987.8
46.96	6987.7	48.32	6987.6	49.67	6987.5	51.02	6987.4	52.37	6987.3
53.72	6987.2	55.07	6987.1	56.42	6987	57.78	6986.9	59.12	6986.8
60.48	6986.7	61.83	6986.6	63.15	6986.5	64.52	6986.4	65.83	6986.3
67.14	6986.2	68.48	6986.1	88.88	6986.1	90.28	6986.2	91.68	6986.3
93.07	6986.4	94.48	6986.5	95.87	6986.6	97.27	6986.7	98.67	6986.8
100.05	6986.9	101.33	6987	102.41	6987.1	103.47	6987.2	104.56	6987.3
105.56	6987.4	106.69	6987.5	107.74	6987.6	108.82	6987.7	109.93	6987.8
111.02	6987.9	112.25	6988	115.14	6988.1	118.39	6988.2	121.63	6988.3
124.91	6988.4	126.24	6988.4						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
23.33	.04	59.12	.04	98.67	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
59.12	98.67	65.22	61.88	60.79	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 4292.63

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
299.74	6987.9	306.06	6987.8	311.57	6987.7	316.41	6987.6	321.28	6987.5
326.19	6987.4	329.71	6987.3	332.9	6987.2	336.1	6987.1	348.78	6987
352.97	6986.9	356.31	6986.8	359.65	6986.7	362.99	6986.6	365.62	6986.5
366.75	6986.4	367.48	6986.3	368.2	6986.2	368.92	6986.1	432.2	6986.1
434.97	6986.2	437.68	6986.3	440.39	6986.4	443.08	6986.5	445.78	6986.6
448.49	6986.7	451.19	6986.8	453.89	6986.9	456.59	6987	459.96	6987.1
463.41	6987.2	466.87	6987.3	470.32	6987.4	473.78	6987.5	479.25	6987.6
483.73	6987.7	488.21	6987.8	493.03	6987.9	496.29	6987.9		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
299.74	.04	365.62	.04	443.08	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
365.62	443.08	71.46	75.82	72.83	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 4216.81

INPUT
Description:
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6986	5.91	6986	6.31	6985.9	6.68	6985.8	7.05	6985.7
7.42	6985.6	7.79	6985.5	8.16	6985.4	8.53	6985.3	8.9	6985.2
9.27	6985.1	9.63	6985	9.99	6984.9	10.34	6984.8	10.69	6984.7
11.04	6984.6	11.4	6984.5	11.76	6984.4	12.12	6984.3	12.47	6984.2
12.9	6984.1	22.17	6984.1	27.58	6984.2	46.11	6984.2	51.09	6984.1
69.63	6984.1	71.9	6984.2	74.14	6984.3	76.42	6984.4	78.76	6984.5
81.04	6984.6	83.32	6984.7	85.59	6984.8	87.85	6984.9	90.52	6985
93.27	6985.1	95.73	6985.2	98.47	6985.3	101.71	6985.4	104.95	6985.5
107.92	6985.6	110.82	6985.7	114.05	6985.8	117.91	6985.9	122.12	6986
123.44	6986								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	11.04	.04	81.04	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
11.04	81.04	119.88	112.87	109.68	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 4103.93

INPUT
Description:
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6983.3	1.14	6983.3	4.86	6983.2	7.18	6983.1	11.03	6983
13.54	6982.9	15.18	6982.8	16.67	6982.7	18.13	6982.6	19.56	6982.5
20.93	6982.4	22.3	6982.3	23.66	6982.2	24.97	6982.1	26.19	6982
26.77	6981.9	27.33	6981.8	27.89	6981.7	28.44	6981.6	28.94	6981.5
29.46	6981.4	29.99	6981.3	30.52	6981.2	31.04	6981.1	31.59	6981
32.19	6980.9	32.82	6980.8	33.46	6980.7	34.09	6980.6	34.73	6980.5
35.36	6980.4	36	6980.3	36.63	6980.2	37.27	6980.1	60.61	6980.1
61.25	6980.2	61.87	6980.3	62.46	6980.4	63.1	6980.5	63.68	6980.6
64.29	6980.7	64.85	6980.8	65.4	6980.9	65.94	6981	66.45	6981.1
66.97	6981.2	67.48	6981.3	68	6981.4	68.51	6981.5	69.03	6981.6
69.54	6981.7	70.06	6981.8	70.58	6981.9	71.21	6982	72.21	6982.1
73.35	6982.2	74.54	6982.3	75.84	6982.4	77.3	6982.5	78.81	6982.6
80.39	6982.7	82.1	6982.8	83.97	6982.9	85.94	6983	87.87	6983.1
89.77	6983.2	91.68	6983.3	92.05	6983.3				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	34.09	.04	63.68	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
34.09	63.68	102	101.14	101.38	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 4002.8

INPUT
Description:
Station Elevation Data num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
11.2	6981.2	11.65	6981.2	13.4	6981.1	15.2	6981	17.35	6980.9
19.5	6980.8	21.62	6980.7	23.7	6980.6	25.7	6980.5	27.67	6980.4
29.63	6980.3	31.55	6980.2	33.43	6980.1	35.15	6980	35.72	6979.9
36.17	6979.8	36.6	6979.7	37.03	6979.6	37.46	6979.5	37.89	6979.4
38.31	6979.3	38.74	6979.2	39.17	6979.1	39.66	6979	40.43	6978.9
41.12	6978.8	41.8	6978.7	42.51	6978.6	43.24	6978.5	44.33	6978.4
46.16	6978.4	47.13	6978.5	54.89	6978.5	56.66	6978.43	57.58	6978.4
59.74	6978.3	62.03	6978.2	64.91	6978.2	67.31	6978.3	68.2	6978.4
68.64	6978.5	69.08	6978.6	69.52	6978.7	69.87	6978.8	70.22	6978.9
70.58	6979	70.93	6979.1	71.28	6979.2	71.63	6979.3	72	6979.4
72.34	6979.5	72.69	6979.6	73.06	6979.7	73.44	6979.8	73.76	6979.9
74.17	6980	75.27	6980.1	76.42	6980.2	77.58	6980.3	78.75	6980.4
79.91	6980.5	81.06	6980.6	82.23	6980.7	83.39	6980.8	84.54	6980.9
85.64	6980.99								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
11.2	.04	41.12	.04	69.87	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
41.12	69.87	94.03	92.84	91.27	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 3909.96

INPUT
Description:
Station Elevation Data num= 95

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
540.52	6980.3	542.66	6980.3	545.68	6980.2	548.73	6980.1	551.55	6980
552.54	6979.9	553.36	6979.8	554.19	6979.7	555.01	6979.6	555.84	6979.5
556.67	6979.4	557.49	6979.3	558.32	6979.2	559.14	6979.1	559.96	6979
560.77	6978.9	561.59	6978.8	562.37	6978.7	563.21	6978.6	564.02	6978.5
564.83	6978.4	565.68	6978.3	566.49	6978.2	567.32	6978.1	571.18	6978
574.32	6977.9	576.74	6977.8	584.39	6977.8	585.96	6977.9	587.5	6978
590.41	6978	591.1	6977.9	591.52	6977.8	591.91	6977.7	592.32	6977.6
592.73	6977.5	593.13	6977.4	593.52	6977.3	593.92	6977.2	594.34	6977.1
594.76	6977	595.19	6976.9	595.62	6976.8	596.06	6976.7	596.5	6976.6
596.94	6976.5	597.38	6976.4	597.82	6976.3	598.26	6976.2	598.73	6976.1
617.89	6976.1	618.41	6976.2	618.9	6976.3	619.4	6976.4	619.89	6976.5
620.38	6976.6	620.88	6976.7	621.37	6976.8	621.87	6976.9	622.37	6977
622.88	6977.1	623.41	6977.2	623.93	6977.3	624.45	6977.4	624.99	6977.5
625.52	6977.6	626.04	6977.7	626.59	6977.8	627.14	6977.9	627.71	6978
628.32	6978.1	628.99	6978.2	629.7	6978.3	630.53	6978.4	631.54	6978.5
632.6	6978.6	633.8	6978.7	635.5	6978.8	637.2	6978.9	639.72	6979
645.98	6979.1	647.52	6979.2	649.07	6979.3	650.61	6979.4	652.13	6979.5
653.64	6979.6	655.16	6979.7	656.68	6979.8	658.2	6979.9	659.78	6980
662.36	6980.1	665.46	6980.2	668.76	6980.3	672.04	6980.4	674.83	6980.49

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
540.52	.04	594.76	.04	622.37	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
594.76	622.37	83.23	81.86	85.2	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 3828.1

INPUT
Description:
Station Elevation Data num= 106

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
153.54	6980	155.32	6980	158.87	6979.9	161.41	6979.8	163.96	6979.7
166.5	6979.6	169.04	6979.5	171.59	6979.4	174.14	6979.3	176.69	6979.2
180.08	6979.1	187.8	6979	196.35	6978.9	200.51	6978.8	208.49	6978.7
209.57	6978.69	216.83	6978.6	222.08	6978.5	226.47	6978.4	229.26	6978.3
232.09	6978.2	234.93	6978.1	237.55	6978	239.43	6977.9	241.21	6977.8
242.93	6977.7	244.7	6977.6	246.45	6977.5	248.18	6977.4	249.94	6977.3
251.67	6977.2	253.42	6977.1	255.15	6977	256.82	6976.9	258.47	6976.8
260.13	6976.7	261.78	6976.6	263.44	6976.5	265.1	6976.4	266.45	6976.3
267.45	6976.2	268.6	6976.1	270.22	6976	271.46	6975.9	272.7	6975.8
274.02	6975.7	275.36	6975.6	276.74	6975.5	278.08	6975.4	279.45	6975.3
280.8	6975.2	282.15	6975.1	299.5	6975.1	301.39	6975.2	303.24	6975.3
305.08	6975.4	306.93	6975.5	308.9	6975.6	310.7	6975.7	312.28	6975.8
313.79	6975.9	315.26	6976	315.68	6976.03	316.56	6976.1	317.79	6976.2
319.1	6976.3	320.36	6976.4	321.53	6976.5	322.78	6976.6	324.02	6976.7
325.2	6976.8	326.41	6976.9	327.61	6977	328.8	6977.1	329.99	6977.2
331.19	6977.3	332.38	6977.4	333.58	6977.5	334.77	6977.6	335.96	6977.7
337.16	6977.8	338.35	6977.9	339.57	6978	341.26	6978.1	342.97	6978.2
344.68	6978.3	346.4	6978.4	348.11	6978.5	349.82	6978.6	351.54	6978.7
353.25	6978.8	354.96	6978.9	356.68	6979	358.45	6979.1	360.22	6979.2
361.98	6979.3	363.77	6979.4	365.54	6979.5	367.32	6979.6	369.1	6979.7
370.88	6979.8	372.67	6979.9	374.51	6980	377.43	6980.1	380.42	6980.2
381.95	6980.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
153.54	.04	270.22	.04	315.68	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
270.22	315.68	282.55	281.89	286.25	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 3546.21

INPUT
Description:
Station Elevation Data num= 123

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
33.57	6980	86.86	6980	88.54	6979.9	89.38	6979.8	90.7	6979.7
92.49	6979.6	94.51	6979.5	97.25	6979.4	100.79	6979.3	102.26	6979.2
103.48	6979.1	107.41	6979	108.16	6978.9	108.36	6978.8	108.55	6978.7
108.75	6978.6	108.95	6978.5	109.14	6978.4	109.34	6978.3	109.53	6978.2
109.72	6978.1	109.92	6978	110.11	6977.9	110.3	6977.8	110.49	6977.7
110.68	6977.6	110.87	6977.5	111.06	6977.4	111.25	6977.3	111.44	6977.2
111.63	6977.1	111.82	6977	112.01	6976.9	112.2	6976.8	112.39	6976.7
112.59	6976.6	112.78	6976.5	112.97	6976.4	113.16	6976.3	113.34	6976.2
113.53	6976.1	113.71	6976	113.89	6975.9	114.06	6975.8	114.23	6975.7
114.39	6975.6	114.56	6975.5	114.72	6975.4	114.89	6975.3	115.05	6975.2
115.22	6975.1	115.37	6975	115.48	6974.9	115.58	6974.8	115.68	6974.7
115.78	6974.6	115.88	6974.5	115.98	6974.4	116.13	6974.3	116.33	6974.2
116.56	6974.1	126.26	6974.1	126.39	6974.2	126.53	6974.3	126.66	6974.4
126.79	6974.5	126.92	6974.6	127.05	6974.7	127.18	6974.8	127.31	6974.9
127.44	6975	127.57	6975.1	127.7	6975.2	127.83	6975.3	127.96	6975.4
128.09	6975.5	128.22	6975.6	128.35	6975.7	128.48	6975.8	128.61	6975.9

128.74	6976	128.87	6976.1	129	6976.2	129.13	6976.3	129.26	6976.4
129.39	6976.5	129.52	6976.6	129.65	6976.7	129.78	6976.8	129.91	6976.9
130.04	6977	130.17	6977.1	130.3	6977.2	130.43	6977.3	130.56	6977.4
130.69	6977.5	130.82	6977.6	130.95	6977.7	131.08	6977.8	131.21	6977.9
131.35	6978	131.48	6978.1	131.62	6978.2	131.75	6978.3	131.89	6978.4
132.02	6978.5	132.16	6978.6	132.29	6978.7	132.43	6978.8	132.57	6978.9
133.39	6979	149.05	6979.1	149.48	6979.2	149.9	6979.3	150.31	6979.4
150.81	6979.5	151.16	6979.6	151.6	6979.7	152.4	6979.8	152.68	6979.9
165.64	6979.9	182.18	6980	192.16	6980				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
33.57	.04	108.16	.04	132.57	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
108.16	132.57	73.79	62.57	59.38	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 3483.64

INPUT
Description:
Station Elevation Data num= 220

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
369.29	6973.8	370.06	6973.8	374.49	6973.7	376.52	6973.6	378.52	6973.5
380.34	6973.4	382.06	6973.3	383.69	6973.2	385.32	6973.1	387.89	6973
390.02	6972.9	391.5	6972.8	392.97	6972.7	394.44	6972.6	396.44	6972.5
398.06	6972.4	399.33	6972.3	400.6	6972.2	401.87	6972.1	403.11	6972
404.04	6971.9	404.89	6971.8	405.67	6971.7	406.54	6971.6	407.32	6971.5
408	6971.4	408.71	6971.3	409.48	6971.2	410.17	6971.1	411.13	6971
411.78	6970.9	412.31	6970.8	412.88	6970.7	413.36	6970.6	413.85	6970.5
414.38	6970.4	414.89	6970.3	415.37	6970.2	415.86	6970.1	416.37	6970
417.1	6969.9	417.65	6969.8	418.06	6969.7	418.48	6969.6	418.99	6969.5
419.41	6969.4	419.81	6969.3	420.25	6969.2	420.82	6969.1	421.46	6969
422.12	6968.9	422.56	6968.8	422.96	6968.7	423.34	6968.6	423.76	6968.5
424.18	6968.4	424.56	6968.3	424.96	6968.2	425.37	6968.1	425.83	6968
426.34	6967.9	426.91	6967.8	427.45	6967.7	428.03	6967.6	428.59	6967.5
429.13	6967.4	429.7	6967.3	430.25	6967.2	430.8	6967.1	431.34	6967
431.89	6966.9	432.51	6966.8	433.09	6966.7	433.67	6966.6	434.27	6966.5
434.88	6966.4	435.47	6966.3	436.08	6966.2	436.68	6966.1	437.53	6966
438.86	6965.9	440.25	6965.8	441.98	6965.7	443.69	6965.6	445.79	6965.5
448.09	6965.4	450.41	6965.3	452.67	6965.2	454.98	6965.1	462.28	6965.1
465.08	6965.2	467.71	6965.3	470.21	6965.4	472.55	6965.5	474.8	6965.6
477.06	6965.7	479.54	6965.8	480.97	6965.9	482.2	6966	482.7	6966.1
483.08	6966.2	483.44	6966.3	483.78	6966.4	484.11	6966.5	484.35	6966.6
484.58	6966.7	484.81	6966.8	485.04	6966.9	485.27	6967	485.49	6967.1
485.79	6967.2	486.17	6967.3	486.55	6967.4	486.93	6967.5	487.31	6967.6
487.69	6967.7	488.06	6967.8	488.44	6967.9	488.82	6968	489.2	6968.1
489.58	6968.2	489.96	6968.3	490.33	6968.4	490.71	6968.5	491.09	6968.6
491.47	6968.7	491.85	6968.8	492.28	6968.9	492.86	6969	494.13	6969
494.22	6968.9	494.3	6968.8	494.38	6968.7	494.46	6968.6	494.54	6968.5
494.62	6968.4	494.7	6968.3	494.77	6968.2	495.37	6968.1	495.82	6968.1
496.87	6968.2	497.92	6968.3	499.01	6968.4	500.09	6968.5	501.2	6968.6
502.33	6968.7	503.45	6968.8	504.87	6968.9	506.43	6969	508.05	6969.1
510.24	6969.2	512.95	6969.3	515.66	6969.4	518.37	6969.5	521.08	6969.6
523.78	6969.7	526.04	6969.8	527.95	6969.9	529.42	6970	530.29	6970.1
531.09	6970.2	531.85	6970.3	532.61	6970.4	533.37	6970.5	534.13	6970.6
534.89	6970.7	535.63	6970.8	536.39	6970.9	537.01	6971	537.57	6971.1
538.15	6971.2	538.71	6971.3	539.27	6971.4	539.83	6971.5	540.39	6971.6
540.95	6971.7	541.51	6971.8	542.07	6971.9	542.48	6972	542.8	6972.1

543.09	6972.2	543.35	6972.3	543.6	6972.4	543.84	6972.5	544.08	6972.6
544.32	6972.7	544.57	6972.8	544.84	6972.9	545.16	6973	546.43	6973.1
547.76	6973.2	549.15	6973.3	550.55	6973.4	551.93	6973.5	553.28	6973.6
554.59	6973.7	555.91	6973.8	557.23	6973.9	558.48	6974	559.24	6974.1
559.95	6974.2	560.66	6974.3	561.38	6974.4	562.08	6974.5	562.8	6974.6
563.52	6974.7	564.23	6974.8	564.96	6974.9	565.76	6975	567.12	6975.1
568.69	6975.2	570.28	6975.3	571.99	6975.4	573.8	6975.5	576.19	6975.6
578.23	6975.7	582.96	6975.8	587.91	6975.9	591.71	6976	601.16	6976

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
369.29	.04	434.88	.04	484.11	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
434.88	484.11	92.49	86.87	80.91	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 3396.77

INPUT
Description:
Station Elevation Data num= 205

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
695.39	6971.7	695.68	6971.7	700.76	6971.8	705.76	6971.9	711.43	6972
719.88	6972	720.5	6971.9	720.98	6971.8	721.41	6971.7	721.83	6971.6
722.25	6971.5	722.68	6971.4	723.11	6971.3	723.53	6971.2	723.96	6971.1
724.38	6971	724.81	6970.9	725.24	6970.8	725.67	6970.7	726.09	6970.6
726.52	6970.5	726.95	6970.4	727.38	6970.3	727.8	6970.2	728.23	6970.1
728.69	6970	729.13	6969.9	729.55	6969.8	730	6969.7	730.45	6969.6
730.91	6969.5	731.4	6969.4	731.82	6969.3	732.28	6969.2	732.77	6969.1
733.19	6969	733.62	6968.9	734.03	6968.8	734.42	6968.7	734.82	6968.6
735.21	6968.5	735.6	6968.4	736.08	6968.3	736.51	6968.2	736.84	6968.1
737.25	6968	737.71	6967.9	738.21	6967.8	738.67	6967.7	739.05	6967.6
739.55	6967.5	740.09	6967.4	740.56	6967.3	740.98	6967.2	741.46	6967.1
742.03	6967	742.57	6966.9	743.04	6966.8	743.5	6966.7	743.94	6966.6
744.4	6966.5	744.83	6966.4	745.25	6966.3	745.68	6966.2	746.06	6966.1
746.44	6966	747.02	6965.9	747.62	6965.8	748.22	6965.7	748.81	6965.6
749.39	6965.5	750.01	6965.4	750.59	6965.3	751.18	6965.2	751.78	6965.1
752.39	6965	752.98	6964.9	753.57	6964.8	754.16	6964.7	754.75	6964.6
755.34	6964.5	755.93	6964.4	756.52	6964.3	757.11	6964.2	757.7	6964.1
758.19	6964	758.59	6963.9	758.91	6963.8	759.22	6963.7	759.53	6963.6
759.84	6963.5	760.15	6963.4	760.46	6963.3	760.76	6963.2	761.21	6963.1
782.06	6963.1	783.58	6963.2	785.11	6963.3	786.63	6963.4	788.15	6963.5
789.67	6963.6	791.19	6963.7	792.71	6963.8	794.24	6963.9	795.63	6964
796.29	6964.1	796.83	6964.2	797.37	6964.3	797.91	6964.4	798.44	6964.5
798.88	6964.6	799.32	6964.7	799.76	6964.8	800.2	6964.9	800.75	6965
801.32	6965.1	801.9	6965.2	802.48	6965.3	803.06	6965.4	803.63	6965.5
804.21	6965.6	804.79	6965.7	805.37	6965.8	805.94	6965.9	806.66	6966
808.68	6966.1	810.85	6966.2	813.03	6966.3	815.2	6966.4	817.37	6966.5
819.54	6966.6	821.71	6966.7	823.88	6966.8	826.05	6966.9	828.23	6967
830.42	6967.1	832.6	6967.2	834.8	6967.3	837	6967.4	839.21	6967.5
841.42	6967.6	843.64	6967.7	845.85	6967.8	848.06	6967.9	850.11	6968
850.7	6968.1	851.21	6968.2	851.68	6968.3	852.14	6968.4	852.61	6968.5
853.07	6968.6	853.54	6968.7	854	6968.8	854.47	6968.9	854.93	6969
855.4	6969.1	855.87	6969.2	856.34	6969.3	856.81	6969.4	857.27	6969.5
857.74	6969.6	858.21	6969.7	858.67	6969.8	859.13	6969.9	859.6	6970
860.08	6970.1	860.55	6970.2	861.02	6970.3	861.49	6970.4	861.97	6970.5
862.44	6970.6	862.92	6970.7	863.4	6970.8	863.88	6970.9	864.35	6971
864.84	6971.1	865.34	6971.2	865.84	6971.3	866.33	6971.4	866.82	6971.5
867.32	6971.6	867.82	6971.7	868.32	6971.8	868.83	6971.9	869.41	6972

870.74	6972.1	872.2	6972.2	873.75	6972.3	875.34	6972.4	875.97	6972.44
876.88	6972.5	878.38	6972.6	879.86	6972.7	881.32	6972.8	882.77	6972.9
884.52	6973	886.29	6973.1	887.89	6973.2	889.48	6973.3	891.08	6973.4
893.09	6973.5	896.12	6973.6	898.14	6973.7	901.36	6973.8	904.95	6973.89

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
695.39	.04	758.59	.04	796.29	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
758.59	796.29	362.83	373	375.52	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 3023.77

INPUT
Description:
Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6964	1.41	6964	3.85	6963.9	5.72	6963.8	7.59	6963.7
9.45	6963.6	11.29	6963.5	13.15	6963.4	15.01	6963.3	16.87	6963.2
18.73	6963.1	20.83	6963	23.05	6962.9	24.95	6962.8	26.91	6962.7
28.86	6962.6	30.82	6962.5	32.61	6962.4	34.44	6962.3	36.18	6962.2
37.82	6962.1	39.38	6962	40.03	6961.9	40.6	6961.8	41.16	6961.7
41.75	6961.6	42.32	6961.5	42.89	6961.4	43.48	6961.3	44.08	6961.2
44.66	6961.1	45.25	6961	45.83	6960.9	46.4	6960.8	46.98	6960.7
47.55	6960.6	48.13	6960.5	48.7	6960.4	49.28	6960.3	49.86	6960.2
50.44	6960.1	51.07	6960	51.88	6959.9	52.75	6959.8	53.62	6959.7
54.48	6959.6	55.35	6959.5	56.22	6959.4	57.09	6959.3	57.96	6959.2
58.83	6959.1	60.07	6959	62.24	6958.9	63.03	6958.8	63.88	6958.7
65.4	6958.6	66.82	6958.5	68.2	6958.4	69.64	6958.3	70.78	6958.2
72.02	6958.1	75.34	6958.1	75.79	6958.2	76.16	6958.3	76.53	6958.4
76.9	6958.5	77.28	6958.6	77.65	6958.7	78.02	6958.8	78.39	6958.9
78.75	6959	79.11	6959.1	79.46	6959.2	79.8	6959.3	80.15	6959.4
80.49	6959.5	80.84	6959.6	81.19	6959.7	81.53	6959.8	81.88	6959.9
82.35	6960	82.92	6960.1	83.61	6960.2	84.3	6960.3	84.99	6960.4
85.68	6960.5	86.37	6960.6	87.06	6960.7	87.75	6960.8	88.44	6960.9
89.13	6961	89.8	6961.1	90.48	6961.2	91.15	6961.3	91.83	6961.4
92.5	6961.5	93.18	6961.6	93.86	6961.7	94.54	6961.8	95.22	6961.9
95.96	6962	96.85	6962.1	97.8	6962.2	98.75	6962.3	99.73	6962.4
100.75	6962.5	101.74	6962.6	102.75	6962.7	103.78	6962.8	104.8	6962.9
105.87	6963	106.96	6963.1	108.03	6963.2	109.11	6963.3	110.23	6963.4
111.46	6963.5	112.92	6963.6	115.24	6963.7	117.61	6963.8	120.23	6963.9
124.37	6964	127.01	6964						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	57.96	.04	79.46	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
57.96	79.46	361.09	357.03	345.31	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 2666.74

INPUT
Description:

Station Elevation Data num= 91

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6958.6	.5	6958.6	5.2	6958.5	9.67	6958.4	12.72	6958.3
15.68	6958.2	18.68	6958.1	21.5	6958	22.01	6957.9	22.46	6957.8
22.86	6957.7	23.26	6957.6	23.66	6957.5	24.07	6957.4	24.48	6957.3
24.87	6957.2	25.28	6957.1	25.68	6957	26.11	6956.9	26.56	6956.8
26.99	6956.7	27.43	6956.6	27.85	6956.5	28.27	6956.4	28.73	6956.3
29.17	6956.2	29.6	6956.1	30.04	6956	30.52	6955.9	31.09	6955.8
31.57	6955.7	32.11	6955.6	32.73	6955.5	33.25	6955.4	33.82	6955.3
34.39	6955.2	35.01	6955.1	35.6	6955	36.25	6954.9	36.89	6954.8
37.58	6954.7	38.25	6954.6	38.91	6954.5	39.58	6954.4	40.22	6954.3
40.91	6954.2	41.58	6954.1	64.77	6954.1	65.3	6954.2	65.8	6954.3
66.3	6954.4	66.8	6954.5	67.31	6954.6	67.81	6954.7	68.32	6954.8
68.82	6954.9	69.32	6955	69.82	6955.1	70.33	6955.2	70.83	6955.3
71.33	6955.4	71.83	6955.5	72.34	6955.6	72.84	6955.7	73.34	6955.8
73.84	6955.9	74.37	6956	75.11	6956.1	75.89	6956.2	76.71	6956.3
77.54	6956.4	78.36	6956.5	79.18	6956.6	80	6956.7	80.82	6956.8
81.63	6956.9	82.78	6957	83.92	6957.1	84.62	6957.2	85.29	6957.3
85.97	6957.4	86.68	6957.5	87.59	6957.6	88.66	6957.7	89.68	6957.8
90.66	6957.9	91.68	6958	95.94	6958.1	100.92	6958.2	111.33	6958.3
117.9	6958.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	36.25	.04	68.82	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
36.25	68.82	398.72	402.15	417.06	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 2264.59

INPUT
Description:
Station Elevation Data num= 128

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6949.2	1.88	6949.2	5.04	6949.1	7.9	6949	10.74	6948.9
13.57	6948.8	16.4	6948.7	18.91	6948.6	21.52	6948.5	24.56	6948.4
27.58	6948.3	30.26	6948.2	32.73	6948.1	35.05	6948	37.45	6947.9
39.85	6947.8	42.26	6947.7	44.68	6947.6	47.08	6947.5	49.49	6947.4
51.9	6947.3	54.31	6947.2	56.64	6947.1	58.42	6947	60.34	6946.9
61.41	6946.8	62.47	6946.7	63.53	6946.6	64.6	6946.5	65.67	6946.4
66.73	6946.3	67.8	6946.2	68.86	6946.1	78.38	6946.1	80.19	6946.2
82	6946.3	83.81	6946.4	85.61	6946.5	87.41	6946.6	89.19	6946.7
90.95	6946.8	92.72	6946.9	94.98	6947	103.98	6947	105.25	6946.9
106.04	6946.8	106.82	6946.7	107.47	6946.6	108.16	6946.5	108.8	6946.4
109.4	6946.3	109.97	6946.2	110.56	6946.1	111.06	6946	111.52	6945.9
111.92	6945.8	112.31	6945.7	112.71	6945.6	113.1	6945.5	113.49	6945.4
113.89	6945.3	114.28	6945.2	114.68	6945.1	117.82	6945.1	118.46	6945.2
119.17	6945.3	119.89	6945.4	120.53	6945.5	121.26	6945.6	121.99	6945.7
122.7	6945.8	123.44	6945.9	124.06	6946	124.48	6946.1	124.75	6946.2
125.04	6946.3	125.34	6946.4	125.65	6946.5	125.95	6946.6	126.19	6946.7
126.44	6946.8	126.71	6946.9	126.98	6947	127.22	6947.1	127.46	6947.2
127.69	6947.3	127.9	6947.4	128.13	6947.5	128.37	6947.6	128.61	6947.7
128.85	6947.8	129.08	6947.9	129.32	6948	130.92	6948.1	132.52	6948.2
134.12	6948.3	135.74	6948.4	137.35	6948.5	138.95	6948.6	140.55	6948.7
142.16	6948.8	143.76	6948.9	145.36	6949	146.93	6949.1	148.51	6949.2
150.08	6949.3	151.65	6949.4	153.23	6949.5	154.8	6949.6	156.37	6949.7
157.95	6949.8	159.52	6949.9	161.07	6950	162.45	6950.1	163.82	6950.2
165.18	6950.3	166.54	6950.4	167.92	6950.5	169.69	6950.6	171.56	6950.7

173.14	6950.8	175.05	6950.9	177.67	6951	180.91	6951.1	183.86	6951.2
188.52	6951.3	199.33	6951.4	209.29	6951.4				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	54.31	.04	127.46	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
54.31	127.46	162.34	169.36	188.75	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 2095.23

INPUT
Description:
Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6945.1	4.33	6945.1	17.57	6945	21.06	6944.9	24.04	6944.8
27.01	6944.7	29.99	6944.6	32.97	6944.5	35.95	6944.4	38.94	6944.3
41.93	6944.2	44.92	6944.1	47.51	6944	48.18	6943.9	48.6	6943.8
48.94	6943.7	49.28	6943.6	49.62	6943.5	49.96	6943.4	50.31	6943.3
50.65	6943.2	50.99	6943.1	51.34	6943	51.69	6942.9	52.04	6942.8
52.4	6942.7	52.75	6942.6	53.11	6942.5	53.47	6942.4	53.83	6942.3
54.19	6942.2	54.55	6942.1	74.4	6942.1	74.78	6942.2	75.09	6942.3
75.39	6942.4	75.7	6942.5	76.01	6942.6	76.31	6942.7	76.62	6942.8
76.92	6942.9	77.23	6943	77.54	6943.1	77.84	6943.2	78.15	6943.3
78.45	6943.4	78.76	6943.5	79.06	6943.6	79.37	6943.7	79.68	6943.8
80.03	6943.9	80.52	6944	83.31	6944.1	86.35	6944.2	89.38	6944.3
92.42	6944.4	95.44	6944.5	98.48	6944.6	101.49	6944.7	104.51	6944.8
107.53	6944.9	110.55	6945	113.58	6945.1	116.52	6945.2	119.48	6945.3
122.64	6945.4	125.77	6945.5	128.85	6945.6	129.79	6945.6		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	51.34	.04	77.23	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
51.34	77.23	160.43	157.09	158.4	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 1938.13

INPUT
Description:
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-180.04	6943.7	-179.39	6943.7	-176.23	6943.6	-173.07	6943.5	-169.91	6943.4
-166.74	6943.3	-163.39	6943.2	-158.77	6943.1	-152.38	6943	-150.05	6942.94
-148.18	6942.9	-144.19	6942.8	-140.22	6942.7	-136.32	6942.6	-132.67	6942.5
-129.08	6942.4	-126.16	6942.3	-123.24	6942.2	-120.31	6942.1	-82.31	6942.1
-74.4	6942.2	-65.29	6942.2	-51.03	6942.1	-36.05	6942	-34.56	6942
-31.87	6941.9	-29.28	6941.8	-26.98	6941.7	-25.37	6941.6	-23.9	6941.5
-22.58	6941.4	-21.35	6941.3	-20.13	6941.2	-18.92	6941.1	-17.71	6941
-16.5	6940.9	-15.28	6940.8	-14.07	6940.7	-12.85	6940.6	-11.64	6940.5
-10.43	6940.4	-9.22	6940.3	-8	6940.2	-6.79	6940.1	2.98	6940.1
3.63	6940.2	4.3	6940.3	4.95	6940.4	5.58	6940.5	6.21	6940.6
6.87	6940.7	7.54	6940.8	8.17	6940.9	8.81	6941	9.48	6941.1

10.17	6941.2	10.85	6941.3	11.53	6941.4	12.21	6941.5	12.89	6941.6
13.57	6941.7	14.25	6941.8	14.95	6941.9	15.79	6942	18.5	6942.1
21.58	6942.2	24.7	6942.3	27.83	6942.4	31.15	6942.5	34.45	6942.6
37.79	6942.7	41.35	6942.8	44.8	6942.9	49.63	6943	58.63	6943.1
87.82	6943.16	104.2	6943.2	112.02	6943.3	124.04	6943.4	141.3	6943.5
149.95	6943.54	160.73	6943.6	189.14	6943.7	201.63	6943.7		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-180.04	.04	-31.87	.04	14.95	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-31.87	14.95	302.92	295.64	307.22	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 1642.5

INPUT
Description:
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6938.97	.25	6938.9	.6	6938.8	.96	6938.7	1.31	6938.6
1.66	6938.5	2.01	6938.4	2.37	6938.3	2.75	6938.2	3.17	6938.1
8.72	6938	9.71	6937.9	10.54	6937.8	11.37	6937.7	12.2	6937.6
13.09	6937.5	14.98	6937.4	16.78	6937.3	19.38	6937.2	27.93	6937.1
29.55	6937	31.06	6936.9	31.93	6936.8	32.8	6936.7	33.67	6936.6
34.54	6936.5	35.4	6936.4	36.27	6936.3	37.14	6936.2	37.92	6936.1
52.45	6936.1	56.09	6936.2	59.73	6936.3	63.37	6936.4	67.01	6936.5
70.78	6936.6	75.03	6936.7	79.5	6936.8	82.37	6936.87	83.86	6936.9
89.04	6937	107.72	6937	122.03	6937.1	123	6937.2	124.2	6937.3
125.82	6937.4	126.87	6937.5	128.69	6937.6	132.18	6937.7	135.28	6937.8
138.51	6937.9	140.57	6938	143.35	6938.1	145.62	6938.2	147.4	6938.3
149.2	6938.4	150.96	6938.5	152.71	6938.6	154.35	6938.7	155.95	6938.8
157.55	6938.9	159.61	6939	161.14	6939.1	162.67	6939.2	164.28	6939.3
165.92	6939.4	167.68	6939.5	169.88	6939.6	173.38	6939.7	202.43	6939.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	29.55	.04	89.04	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
29.55	89.04	177.56	143.45	144.52	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 1499.05

INPUT
Description:
Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6938.6	2.2	6938.6	6.57	6938.5	10.95	6938.4	15.32	6938.3
19.68	6938.2	24.06	6938.1	28.24	6938	30.63	6937.9	32.83	6937.8
35.03	6937.7	37.21	6937.6	39.37	6937.5	41.39	6937.4	43.42	6937.3
45.42	6937.2	47.41	6937.1	49.57	6937	51.82	6936.9	53.88	6936.8
55.86	6936.7	57.66	6936.6	59.63	6936.5	61.68	6936.4	63.74	6936.3
65.81	6936.2	67.87	6936.1	69.88	6936	70.52	6935.9	71.01	6935.8
71.41	6935.7	71.8	6935.6	72.2	6935.5	72.59	6935.4	72.99	6935.3

73.38	6935.2	73.78	6935.1	74.17	6935	74.57	6934.9	74.96	6934.8
75.36	6934.7	75.75	6934.6	76.15	6934.5	76.54	6934.4	76.94	6934.3
77.32	6934.2	77.71	6934.1	78.1	6934	78.51	6933.9	78.93	6933.8
79.33	6933.7	79.73	6933.6	80.14	6933.5	80.53	6933.4	80.93	6933.3
81.33	6933.2	81.74	6933.1	82.15	6933	82.6	6932.9	83.04	6932.8
83.47	6932.7	83.9	6932.6	84.34	6932.5	84.81	6932.4	85.25	6932.3
85.67	6932.2	86.1	6932.1	86.59	6932	87.2	6931.9	87.87	6931.8
88.53	6931.7	89.2	6931.6	89.87	6931.5	90.54	6931.4	91.2	6931.3
91.87	6931.2	92.54	6931.1	93.2	6931	93.87	6930.9	94.55	6930.8
95.23	6930.7	95.88	6930.6	96.59	6930.5	97.24	6930.4	97.93	6930.3
98.62	6930.2	99.31	6930.1	113.14	6930.1	114.59	6930.2	116.04	6930.3
117.49	6930.4	118.94	6930.5	120.39	6930.6	121.84	6930.7	123.29	6930.8
124.75	6930.9	126.22	6931	128.01	6931.1	129.56	6931.2	131.06	6931.3
132.47	6931.4	133.87	6931.5	135.28	6931.6	136.67	6931.7	138.11	6931.8
139.58	6931.9	140.94	6932	141.92	6932.1	142.88	6932.2	143.83	6932.3
144.78	6932.4	145.71	6932.5	146.64	6932.6	147.57	6932.7	148.49	6932.8
149.38	6932.9	150.23	6933	151.04	6933.1	151.78	6933.2	152.62	6933.3
153.4	6933.4	154.27	6933.5	155.09	6933.6	156	6933.7	156.89	6933.8
157.79	6933.9	158.66	6934	159.38	6934.1	160.06	6934.2	160.74	6934.3
161.42	6934.4	162.09	6934.5	162.77	6934.6	163.45	6934.7	164.13	6934.8
164.81	6934.9	165.48	6935	166.17	6935.1	166.82	6935.2	167.51	6935.3
168.11	6935.4	168.76	6935.5	169.37	6935.6	169.98	6935.7	170.59	6935.8
171.2	6935.9	171.94	6936	174.62	6936.1	177.34	6936.2	180.32	6936.3
183.16	6936.4	188.34	6936.5	193.83	6936.6	198.26	6936.6		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	90.54	.04	132.47	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

90.54	132.47	171.19	145.42	171.33	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 1333.55

INPUT
Description:
Station Elevation Data num= 89

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6933.4	.35	6933.4	1.87	6933.3	3.4	6933.2	4.93	6933.1
6.45	6933	8.03	6932.9	9.62	6932.8	11.21	6932.7	12.82	6932.6
14.47	6932.5	16.09	6932.4	17.65	6932.3	19.21	6932.2	20.77	6932.1
22.13	6932	23.02	6931.9	23.69	6931.8	24.36	6931.7	25.04	6931.6
25.71	6931.5	26.39	6931.4	27.05	6931.3	27.72	6931.2	28.38	6931.1
29.05	6931	29.71	6930.9	30.38	6930.8	31.04	6930.7	31.7	6930.6
32.37	6930.5	33.03	6930.4	33.7	6930.3	34.36	6930.2	35.03	6930.1
36.03	6930	39.04	6929.9	42.57	6929.8	46.06	6929.7	49.69	6929.6
53.46	6929.5	57.24	6929.4	60.98	6929.3	64.63	6929.2	68.24	6929.1
92.38	6929.1	92.72	6929.2	93.06	6929.3	93.37	6929.4	93.69	6929.5
94	6929.6	94.32	6929.7	94.64	6929.8	94.97	6929.9	95.3	6930
95.88	6930.1	96.5	6930.2	97.13	6930.3	97.75	6930.4	98.38	6930.5
99.01	6930.6	99.67	6930.7	100.34	6930.8	101.01	6930.9	101.63	6931
102.24	6931.1	102.81	6931.2	103.39	6931.3	103.99	6931.4	104.61	6931.5
105.22	6931.6	105.85	6931.7	106.48	6931.8	107.15	6931.9	108.05	6932
109.56	6932.1	111.11	6932.2	112.72	6932.3	114.2	6932.4	115.76	6932.5
117.22	6932.6	118.8	6932.7	120.19	6932.8	121.63	6932.9	123.38	6933
135.52	6933.1	137.92	6933.2	141.39	6933.3	147.37	6933.3		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

0	.04	42.57	.04	94.64	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
42.57	94.64	76.57	56.34	54.66	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 1277.21

INPUT
Description:
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6929.87	.87	6929.8	2.08	6929.7	3.28	6929.6	4.49	6929.5
5.7	6929.4	6.9	6929.3	8.11	6929.2	9.32	6929.1	10.44	6929
11.38	6928.9	12.23	6928.8	13.06	6928.7	13.88	6928.6	14.71	6928.5
15.5	6928.4	16.31	6928.3	17.09	6928.2	17.85	6928.1	18.59	6928
19.22	6927.9	19.83	6927.8	20.43	6927.7	21.04	6927.6	21.64	6927.5
22.24	6927.4	22.85	6927.3	23.45	6927.2	24.07	6927.1	24.76	6927
27.26	6926.9	31.06	6926.8	34.99	6926.7	39.25	6926.6	52.73	6926.5
73.05	6926.5	74.46	6926.6	75.88	6926.7	77.29	6926.8	78.71	6926.9
80.67	6927	81.38	6927.1	82.06	6927.2	82.73	6927.3	83.41	6927.4
84.09	6927.5	84.76	6927.6	85.44	6927.7	86.11	6927.8	86.79	6927.9
87.51	6928	88.3	6928.1	89.14	6928.2	89.96	6928.3	90.79	6928.4
91.61	6928.5	92.44	6928.6	93.27	6928.7	94.09	6928.8	94.91	6928.9
95.83	6929	97.5	6929.1	99.26	6929.2	101.04	6929.3	102.81	6929.4
104.57	6929.5	106.34	6929.6	108.11	6929.7	109.88	6929.8	111.04	6929.87

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	24.07	.04	81.38	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
24.07	81.38	121.03	86.44	116.96	.1	.3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 1162.11

INPUT
Description:
Station Elevation Data num= 77

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6929	1.13	6929	2.81	6928.9	3.58	6928.8	4.28	6928.7
4.97	6928.6	5.73	6928.5	6.19	6928.4	6.98	6928.3	7.5	6928.2
8.09	6928.1	8.64	6928	9.2	6927.9	9.76	6927.8	10.31	6927.7
10.87	6927.6	11.42	6927.5	11.98	6927.4	12.53	6927.3	13.09	6927.2
13.64	6927.1	14.2	6927	14.76	6926.9	15.31	6926.8	15.87	6926.7
16.42	6926.6	16.98	6926.5	17.54	6926.4	18.09	6926.3	18.65	6926.2
19.2	6926.1	19.92	6926	20.92	6925.9	21.98	6925.8	23.23	6925.7
24.43	6925.6	25.63	6925.5	26.87	6925.4	28.11	6925.3	29.34	6925.2
30.58	6925.1	35.05	6925	39.28	6924.9	56.37	6924.8	77.42	6924.8
80.88	6924.9	83.5	6925	84.9	6925.1	85.99	6925.2	87.06	6925.3
88.11	6925.4	89.16	6925.5	90.2	6925.6	91.28	6925.7	92.31	6925.8
93.22	6925.9	94.49	6926	95.68	6926.1	96.57	6926.2	97.38	6926.3
98.14	6926.4	98.91	6926.5	99.63	6926.6	100.37	6926.7	101.17	6926.8
101.97	6926.9	103.62	6927	106.41	6927.1	108.41	6927.2	110.88	6927.3
113.86	6927.4	116.45	6927.5	118.85	6927.6	121.04	6927.7	122.87	6927.8
124.64	6927.9	124.68	6927.9						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	24.43	.04	91.28	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
24.43	91.28	135.04	129.61	126.31	.1 .3

CROSS SECTION

RIVER: Gieck Ranch T1
REACH: GR_T1_R RS: 870.4

INPUT
Description:
Station Elevation Data num= 250

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6925	.29	6924.99	.6	6924.98	1.03	6924.96	1.32	6924.95
1.53	6924.95	2.04	6924.93	2.73	6924.91	3.47	6924.88	4	6924.87
4.18	6924.86	4.43	6924.85	4.9	6924.83	5.24	6924.82	5.61	6924.81
6.13	6924.79	6.33	6924.79	6.48	6924.78	7.05	6924.76	7.72	6924.74
7.83	6924.74	8.48	6924.72	8.95	6924.7	9.19	6924.69	9.52	6924.68
9.91	6924.67	10.19	6924.66	10.63	6924.65	11.22	6924.62	11.43	6924.62
12.06	6924.6	12.66	6924.58	12.77	6924.57	12.92	6924.57	13.49	6924.55
13.9	6924.54	14.2	6924.53	14.62	6924.51	14.92	6924.5	15.14	6924.49
15.64	6924.48	16.32	6924.45	17.07	6924.43	17.61	6924.41	17.78	6924.41
18.02	6924.4	18.5	6924.38	18.85	6924.37	19.21	6924.36	19.71	6924.34
19.93	6924.33	20.09	6924.33	20.65	6924.31	21.32	6924.29	21.36	6924.29
21.41	6924.28	22.08	6924.26	22.56	6924.25	22.79	6924.24	23.11	6924.23
23.51	6924.21	23.8	6924.2	24.22	6924.19	24.81	6924.17	24.94	6924.17
25.03	6924.16	25.66	6924.14	26.27	6924.12	26.37	6924.12	26.51	6924.11
27.09	6924.09	27.51	6924.08	27.8	6924.07	28.21	6924.06	28.52	6924.04
28.75	6924.04	29.23	6924.02	29.91	6923.98	29.95	6923.98	30.67	6923.84
31.22	6923.73	31.38	6923.7	31.6	6923.65	32.1	6923.56	32.46	6923.48
32.81	6923.42	33.3	6923.32	33.53	6923.27	33.69	6923.24	34.24	6923.14
34.93	6923	34.96	6922.99	35	6922.99	35.68	6922.87	36.17	6922.77
36.39	6922.73	36.7	6922.68	37.11	6922.61	37.4	6922.55	37.82	6922.47
38.4	6922.37	38.54	6922.34	38.64	6922.32	39.25	6922.21	39.88	6922.1
39.97	6922.08	40.1	6922.07	40.69	6921.98	41.12	6921.95	41.4	6921.94
41.79	6921.91	42.12	6921.89	42.35	6921.88	42.83	6921.84	43.49	6921.81
43.55	6921.81	44.26	6921.76	44.83	6921.73	44.98	6921.72	45.19	6921.71
45.7	6921.68	46.06	6921.66	46.41	6921.64	46.89	6921.62	47.13	6921.61
47.3	6921.6	47.84	6921.56	48.54	6921.53	49.27	6921.49	49.78	6921.46
49.99	6921.45	50.29	6921.44	50.71	6921.42	51.01	6921.4	51.42	6921.39
51.98	6921.37	52.14	6921.37	52.25	6921.36	52.85	6921.35	53.49	6921.33
53.57	6921.33	53.68	6921.32	54.28	6921.31	54.72	6921.3	55	6921.29
55.38	6921.28	55.72	6921.27	55.96	6921.26	56.43	6921.25	57.08	6921.23
57.2	6921.23	57.86	6921.2	58.43	6921.19	58.58	6921.19	58.78	6921.18
59.3	6921.15	59.67	6921.14	59.78	6921.14	60.01	6921.13	60.48	6921.11
60.73	6921.1	60.91	6921.09	61.44	6921.08	62.15	6921.06	62.87	6921.05
63.38	6921.04	63.59	6921.03	63.87	6921.03	64.31	6921.02	64.62	6921.02
65.02	6921.01	65.57	6921	68.33	6921	68.6	6921.02	68.97	6921.05
69.32	6921.08	69.57	6921.1	70.03	6921.14	70.67	6921.19	70.75	6921.2
70.8	6921.2	71.46	6921.26	72.04	6921.31	72.18	6921.32	72.37	6921.34
72.89	6921.38	73.28	6921.42	73.61	6921.44	74.06	6921.49	74.33	6921.51
74.52	6921.52	75.04	6921.57	75.75	6921.63	76.47	6921.69	76.99	6921.73
77.19	6921.75	77.46	6921.77	77.9	6921.81	78.23	6921.83	78.62	6921.87
79.16	6921.91	79.34	6921.93	79.46	6921.94	80.05	6922.01	80.7	6922.14
80.77	6922.16	80.86	6922.18	81.48	6922.37	81.94	6922.49	82.2	6922.57
82.56	6922.67	82.91	6922.78	83.18	6922.85	83.63	6922.98	84.25	6923.16
84.35	6923.19	84.41	6923.21	85.06	6923.4	85.65	6923.56	85.78	6923.6
85.95	6923.65	86.49	6923.81	86.89	6923.92	87.21	6924.01	87.65	6924.14

87.92	6924.22	88.12	6924.27	88.64	6924.42	89.35	6924.62	90.07	6924.83
90.6	6924.98	90.79	6925.03	91.05	6925.11	91.5	6925.24	91.83	6925.33
92.22	6925.44	92.75	6925.6	92.93	6925.65	93.07	6925.69	93.65	6925.86
94.31	6926.02	94.37	6926.03	94.44	6926.04	95.08	6926.12	95.55	6926.18
95.8	6926.22	96.14	6926.26	96.51	6926.3	96.78	6926.31	98.41	6926.31

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	40.1	.04	80.05	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
40.1	80.05	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:EAST FORK

Reach	River Sta.	n1	n2	n3
EF_R1	4747.49	.05	.05	.05
EF_R1	4247.11	.05	.05	.05
EF_R1	3831.76	.05	.05	.05
EF_R1	3679.75	.05	.05	.05
EF_R1	3471.36	.05	.05	.05
EF_R1	3275.15	.05	.05	.05
EF_R1	3102.57	.05	.05	.05
EF_R1	2977.57	.05	.05	.05
EF_R1	2951.88	.05	.05	.05
EF_R1	2569.34	.05	.05	.05
EF_R1	2289.53	.05	.05	.05
EF_R1	2261.03	.05	.05	.05
EF_R1	2193.57	.05	.05	.05
EF_R1	1970.26	.05	.05	.05
EF_R1	1750.46	.05	.05	.05
EF_R1	1569.45	.05	.05	.05
EF_R1	1451	.05	.05	.05
EF_R1	1234.49	.05	.05	.05
EF_R1	1157.39	.05	.05	.05
EF_R1	928	.05	.05	.05
EF_R1	698.4	.05	.05	.05

River:EAST FORK T1

Reach	River Sta.	n1	n2	n3
EF_T1_R1	8248.03	.07	.07	.07
EF_T1_R1	8135.58	.07	.07	.07
EF_T1_R1	7906.99	.07	.07	.07
EF_T1_R1	7789.77	.07	.07	.07
EF_T1_R1	7705.88	.07	.07	.07
EF_T1_R1	7523.37	.07	.07	.07
EF_T1_R1	7465.15	.07	.07	.07
EF_T1_R1	7366.65	.07	.07	.07
EF_T1_R1	7228.09	.07	.07	.07
EF_T1_R1	7213.09	.07	.07	.07
EF_T1_R1	7089.83	.07	.07	.07
EF_T1_R1	6908.56	.07	.07	.07
EF_T1_R1	6741.62	.07	.07	.07
EF_T1_R1	6564.36	.07	.07	.07
EF_T1_R1	6369.47	.07	.07	.07

EF_T1_R1	6042.97	.07	.07	.07
EF_T1_R1	5607.4	.07	.07	.07
EF_T1_R1	5407.14	.07	.07	.07
EF_T1_R1	5282.66	.07	.07	.07
EF_T1_R1	5169.07	.07	.07	.07
EF_T1_R1	5044.93	.07	.07	.07
EF_T1_R1	4933.45	.07	.07	.07
EF_T1_R1	4893.61	.07	.07	.07
EF_T1_R1	4764.36	.07	.07	.07
EF_T1_R1	4702.1	.07	.07	.07
EF_T1_R1	4669.17	.07	.07	.07
EF_T1_R1	4488	.07	.07	.07
EF_T1_R1	4159.6	.07	.07	.07
EF_T1_R1	3779.48	.07	.07	.07
EF_T1_R1	3546.45	.07	.07	.07
EF_T1_R1	3297.35	.07	.07	.07
EF_T1_R1	3061.96	.07	.07	.07
EF_T1_R1	2833.32	.07	.07	.07
EF_T1_R1	2498.86	.07	.07	.07
EF_T1_R1	1976.23	.07	.07	.07
EF_T1_R1	1711.74	.07	.07	.07
EF_T1_R1	883	.07	.07	.07

River:Geick Ranch T2

Reach	River Sta.	n1	n2	n3
GR_T2_R1	5786.62	.04	.04	.04
GR_T2_R1	5374.98	.04	.04	.04
GR_T2_R1	4981.16	.04	.04	.04
GR_T2_R1	4359.24	.04	.04	.04
GR_T2_R1	4142.7	.04	.04	.04
GR_T2_R1	3908.91	.04	.04	.04
GR_T2_R1	3734.29	.04	.04	.04
GR_T2_R1	3510.58	.04	.04	.04
GR_T2_R1	3318.63	.04	.04	.04
GR_T2_R1	2982.55	.04	.04	.04
GR_T2_R1	2722.57	.04	.04	.04
GR_T2_R1	2600.57	.04	.04	.04
GR_T2_R1	2411.51	.04	.04	.04
GR_T2_R1	2024.23	.04	.04	.04
GR_T2_R1	1708.36	.04	.04	.04
GR_T2_R1	1617.36	.04	.04	.04
GR_T2_R1	1492.43	.04	.04	.04
GR_T2_R1	1329.76	.04	.04	.04
GR_T2_R1	1183.47	.04	.04	.04
GR_T2_R1	675	.04	.04	.04

River:Gieck Ranch T1

Reach	River Sta.	n1	n2	n3
GR_T1_R	4586.31	.04	.04	.04
GR_T1_R	4533.12	.04	.04	.04
GR_T1_R	4513.33	.04	.04	.04
GR_T1_R	4481.45	.04	.04	.04
GR_T1_R	4452.42	.04	.04	.04
GR_T1_R	4416.03	.04	.04	.04
GR_T1_R	4354.51	.04	.04	.04
GR_T1_R	4292.63	.04	.04	.04
GR_T1_R	4216.81	.04	.04	.04

GR_T1_R	4103.93	.04	.04	.04
GR_T1_R	4002.8	.04	.04	.04
GR_T1_R	3909.96	.04	.04	.04
GR_T1_R	3828.1	.04	.04	.04
GR_T1_R	3546.21	.04	.04	.04
GR_T1_R	3483.64	.04	.04	.04
GR_T1_R	3396.77	.04	.04	.04
GR_T1_R	3023.77	.04	.04	.04
GR_T1_R	2666.74	.04	.04	.04
GR_T1_R	2264.59	.04	.04	.04
GR_T1_R	2095.23	.04	.04	.04
GR_T1_R	1938.13	.04	.04	.04
GR_T1_R	1642.5	.04	.04	.04
GR_T1_R	1499.05	.04	.04	.04
GR_T1_R	1333.55	.04	.04	.04
GR_T1_R	1277.21	.04	.04	.04
GR_T1_R	1162.11	.04	.04	.04
GR_T1_R	870.4	.04	.04	.04

SUMMARY OF REACH LENGTHS

River: EAST FORK

Reach	River Sta.	Left	Channel	Right
EF_R1	4747.49	480.02	500.39	508.14
EF_R1	4247.11	422.47	415.35	387.57
EF_R1	3831.76	110.7	152.01	178.81
EF_R1	3679.75	200.98	208.39	210.66
EF_R1	3471.36	196.19	196.2	179.3
EF_R1	3275.15	183.43	172.58	146.69
EF_R1	3102.57	107.61	125.01	130.97
EF_R1	2977.57	25.03	25.69	30.84
EF_R1	2951.88	372.54	322.35	396.33
EF_R1	2569.34	263.52	279.81	292.62
EF_R1	2289.53	29.46	28.49	28.67
EF_R1	2261.03	52.1	67.46	80.58
EF_R1	2193.57	229.13	223.32	194.69
EF_R1	1970.26	221.03	219.8	178.05
EF_R1	1750.46	193.8	181	159.02
EF_R1	1569.45	113.19	118.51	131.86
EF_R1	1451	209.32	216.45	227.99
EF_R1	1234.49	73.95	77.1	81
EF_R1	1157.39	242.16	229.39	219.75
EF_R1	928	78.97	74.71	77.43
EF_R1	698.4	0	0	0

River: EAST FORK T1

Reach	River Sta.	Left	Channel	Right
EF_T1_R1	8248.03	107.48	112.64	116.77
EF_T1_R1	8135.58	222.01	228.4	232.45
EF_T1_R1	7906.99	113.09	117.22	124.18
EF_T1_R1	7789.77	82.91	83.89	83.27
EF_T1_R1	7705.88	183.01	182.46	179.23
EF_T1_R1	7523.37	58.07	58.27	57.35
EF_T1_R1	7465.15	114.76	98.5	85.2
EF_T1_R1	7366.65	123.65	138.56	147.67

EF_T1_R1	7228.09	25.66	15	17.72
EF_T1_R1	7213.09	133.2	123.26	108.37
EF_T1_R1	7089.83	178.18	181.27	181.33
EF_T1_R1	6908.56	169.26	166.94	160.01
EF_T1_R1	6741.62	172.83	177.26	179.79
EF_T1_R1	6564.36	194.03	194.89	197.6
EF_T1_R1	6369.47	322.64	326.5	327.4
EF_T1_R1	6042.97	435.01	435.57	424.51
EF_T1_R1	5607.4	181.46	200.26	206.07
EF_T1_R1	5407.14	126.84	124.48	126.08
EF_T1_R1	5282.66	110.79	113.59	117.88
EF_T1_R1	5169.07	128.22	124.14	123.79
EF_T1_R1	5044.93	120.08	111.48	103.58
EF_T1_R1	4933.45	40.85	39.84	42.39
EF_T1_R1	4893.61	133.86	129.25	140.26
EF_T1_R1	4764.36	82.05	62.26	76.8
EF_T1_R1	4702.1	37.66	32.93	34.45
EF_T1_R1	4669.17	186.65	181.24	179.49
EF_T1_R1	4488	335.24	328.33	325.59
EF_T1_R1	4159.6	381.23	380.12	383.37
EF_T1_R1	3779.48	232.25	233.03	234.42
EF_T1_R1	3546.45	254.27	249.1	242.55
EF_T1_R1	3297.35	231.53	235.39	241.08
EF_T1_R1	3061.96	231.2	228.64	224.54
EF_T1_R1	2833.32	360.53	334.46	346.03
EF_T1_R1	2498.86	517.19	522.63	548.72
EF_T1_R1	1976.23	244.72	264.49	317.22
EF_T1_R1	1711.74	452.92	489.55	528.67
EF_T1_R1	883	0	0	0

River: Geick Ranch T2

Reach	River Sta.	Left	Channel	Right
GR_T2_R1	5786.62	367.32	411.64	383.99
GR_T2_R1	5374.98	406.5	393.81	362.37
GR_T2_R1	4981.16	598.36	621.93	648.88
GR_T2_R1	4359.24	223.33	216.55	209.68
GR_T2_R1	4142.7	251.18	233.79	222.28
GR_T2_R1	3908.91	165.45	174.62	190.03
GR_T2_R1	3734.29	232.78	223.71	219.85
GR_T2_R1	3510.58	177.66	191.95	207.12
GR_T2_R1	3318.63	334.51	336.07	345.44
GR_T2_R1	2982.55	262.04	259.99	258.3
GR_T2_R1	2722.57	220.21	122	135.83
GR_T2_R1	2600.57	179.59	189.06	203.12
GR_T2_R1	2411.51	401.61	387.28	378.31
GR_T2_R1	2024.23	313.39	315.87	335.79
GR_T2_R1	1708.36	87.01	91	103.05
GR_T2_R1	1617.36	140.88	124.94	128.22
GR_T2_R1	1492.43	157.12	162.67	158.4
GR_T2_R1	1329.76	195.24	146.29	148.95
GR_T2_R1	1183.47	80.25	79.84	69.49
GR_T2_R1	675	0	0	0

River: Gieck Ranch T1

Reach	River Sta.	Left	Channel	Right
GR_T1_R	4586.31	74.93	53.19	50.82
GR_T1_R	4533.12	24.8	19.79	20.67

GR_T1_R	4513.33	46.88	31.88	28.02
GR_T1_R	4481.45	27.69	29.03	28.87
GR_T1_R	4452.42	39.67	36.39	33.99
GR_T1_R	4416.03	62.73	61.52	60.83
GR_T1_R	4354.51	65.22	61.88	60.79
GR_T1_R	4292.63	71.46	75.82	72.83
GR_T1_R	4216.81	119.88	112.87	109.68
GR_T1_R	4103.93	102	101.14	101.38
GR_T1_R	4002.8	94.03	92.84	91.27
GR_T1_R	3909.96	83.23	81.86	85.2
GR_T1_R	3828.1	282.55	281.89	286.25
GR_T1_R	3546.21	73.79	62.57	59.38
GR_T1_R	3483.64	92.49	86.87	80.91
GR_T1_R	3396.77	362.83	373	375.52
GR_T1_R	3023.77	361.09	357.03	345.31
GR_T1_R	2666.74	398.72	402.15	417.06
GR_T1_R	2264.59	162.34	169.36	188.75
GR_T1_R	2095.23	160.43	157.09	158.4
GR_T1_R	1938.13	302.92	295.64	307.22
GR_T1_R	1642.5	177.56	143.45	144.52
GR_T1_R	1499.05	171.19	145.42	171.33
GR_T1_R	1333.55	76.57	56.34	54.66
GR_T1_R	1277.21	121.03	86.44	116.96
GR_T1_R	1162.11	135.04	129.61	126.31
GR_T1_R	870.4	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: EAST FORK

Reach	River Sta.	Contr.	Expan.
EF_R1	4747.49	.1	.3
EF_R1	4247.11	.1	.3
EF_R1	3831.76	.1	.3
EF_R1	3679.75	.1	.3
EF_R1	3471.36	.1	.3
EF_R1	3275.15	.1	.3
EF_R1	3102.57	.1	.3
EF_R1	2977.57	.1	.3
EF_R1	2951.88	.1	.3
EF_R1	2569.34	.1	.3
EF_R1	2289.53	.1	.3
EF_R1	2261.03	.1	.3
EF_R1	2193.57	.1	.3
EF_R1	1970.26	.1	.3
EF_R1	1750.46	.1	.3
EF_R1	1569.45	.1	.3
EF_R1	1451	.1	.3
EF_R1	1234.49	.1	.3
EF_R1	1157.39	.1	.3
EF_R1	928	.1	.3
EF_R1	698.4	.1	.3

River: EAST FORK T1

Reach	River Sta.	Contr.	Expan.
EF_T1_R1	8248.03	.1	.3

EF_T1_R1	8135.58	.1	.3
EF_T1_R1	7906.99	.1	.3
EF_T1_R1	7789.77	.1	.3
EF_T1_R1	7705.88	.1	.3
EF_T1_R1	7523.37	.1	.3
EF_T1_R1	7465.15	.1	.3
EF_T1_R1	7366.65	.1	.3
EF_T1_R1	7228.09	.1	.3
EF_T1_R1	7213.09	.1	.3
EF_T1_R1	7089.83	.1	.3
EF_T1_R1	6908.56	.1	.3
EF_T1_R1	6741.62	.1	.3
EF_T1_R1	6564.36	.1	.3
EF_T1_R1	6369.47	.1	.3
EF_T1_R1	6042.97	.1	.3
EF_T1_R1	5607.4	.1	.3
EF_T1_R1	5407.14	.1	.3
EF_T1_R1	5282.66	.1	.3
EF_T1_R1	5169.07	.1	.3
EF_T1_R1	5044.93	.1	.3
EF_T1_R1	4933.45	.1	.3
EF_T1_R1	4893.61	.1	.3
EF_T1_R1	4764.36	.1	.3
EF_T1_R1	4702.1	.1	.3
EF_T1_R1	4669.17	.1	.3
EF_T1_R1	4488	.1	.3
EF_T1_R1	4159.6	.1	.3
EF_T1_R1	3779.48	.1	.3
EF_T1_R1	3546.45	.1	.3
EF_T1_R1	3297.35	.1	.3
EF_T1_R1	3061.96	.1	.3
EF_T1_R1	2833.32	.1	.3
EF_T1_R1	2498.86	.1	.3
EF_T1_R1	1976.23	.1	.3
EF_T1_R1	1711.74	.1	.3
EF_T1_R1	883	.1	.3

River: Geick Ranch T2

Reach	River Sta.	Contr.	Expan.
GR_T2_R1	5786.62	.1	.3
GR_T2_R1	5374.98	.1	.3
GR_T2_R1	4981.16	.1	.3
GR_T2_R1	4359.24	.1	.3
GR_T2_R1	4142.7	.1	.3
GR_T2_R1	3908.91	.1	.3
GR_T2_R1	3734.29	.1	.3
GR_T2_R1	3510.58	.1	.3
GR_T2_R1	3318.63	.1	.3
GR_T2_R1	2982.55	.1	.3
GR_T2_R1	2722.57	.1	.3
GR_T2_R1	2600.57	.1	.3
GR_T2_R1	2411.51	.1	.3
GR_T2_R1	2024.23	.1	.3
GR_T2_R1	1708.36	.1	.3
GR_T2_R1	1617.36	.1	.3
GR_T2_R1	1492.43	.1	.3
GR_T2_R1	1329.76	.1	.3
GR_T2_R1	1183.47	.1	.3
GR_T2_R1	675	.1	.3

River: Gieck Ranch T1

Reach	River Sta.	Contr.	Expan.
GR_T1_R	4586.31	.1	.3
GR_T1_R	4533.12	.1	.3
GR_T1_R	4513.33	.1	.3
GR_T1_R	4481.45	.1	.3
GR_T1_R	4452.42	.1	.3
GR_T1_R	4416.03	.1	.3
GR_T1_R	4354.51	.1	.3
GR_T1_R	4292.63	.1	.3
GR_T1_R	4216.81	.1	.3
GR_T1_R	4103.93	.1	.3
GR_T1_R	4002.8	.1	.3
GR_T1_R	3909.96	.1	.3
GR_T1_R	3828.1	.1	.3
GR_T1_R	3546.21	.1	.3
GR_T1_R	3483.64	.1	.3
GR_T1_R	3396.77	.1	.3
GR_T1_R	3023.77	.1	.3
GR_T1_R	2666.74	.1	.3
GR_T1_R	2264.59	.1	.3
GR_T1_R	2095.23	.1	.3
GR_T1_R	1938.13	.1	.3
GR_T1_R	1642.5	.1	.3
GR_T1_R	1499.05	.1	.3
GR_T1_R	1333.55	.1	.3
GR_T1_R	1277.21	.1	.3
GR_T1_R	1162.11	.1	.3
GR_T1_R	870.4	.1	.3

Profile Output Table - Standard Table 1

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Gieck Ranch T1	GR_T1_R	4586.31	100 Year	394.09	6994.00	6995.04	6995.04	6995.48	0.024446	5.30	74.62	87.43	1.00
Gieck Ranch T1	GR_T1_R	4533.12	100 Year	394.09	6992.30	6993.58	6993.58	6993.91	0.022624	5.12	88.38	132.96	0.96
Gieck Ranch T1	GR_T1_R	4513.33	100 Year	394.09	6991.10	6992.76	6992.76	6993.15	0.018076	5.67	85.45	109.86	0.91
Gieck Ranch T1	GR_T1_R	4481.45	100 Year	394.09	6990.10	6991.26	6991.26	6991.73	0.020800	5.60	74.02	83.23	0.95
Gieck Ranch T1	GR_T1_R	4452.42	100 Year	394.09	6989.10	6990.43	6990.43	6990.90	0.018601	5.73	75.42	81.81	0.92
Gieck Ranch T1	GR_T1_R	4416.03	100 Year	394.09	6988.10								

6989.27	6989.27	6989.77	0.021436	5.75	70.58	72.51	0.97	
Gieck Ranch T1	GR_T1_R	4354.51	100 Year	394.09	6986.10			
6987.94		6988.34	0.010423	5.33	82.20	67.75	0.73	
Gieck Ranch T1	GR_T1_R	4292.63	100 Year	394.09	6986.10			
6987.08	6987.08	6987.47	0.020166	5.08	83.72	121.28	0.92	
Gieck Ranch T1	GR_T1_R	4216.81	100 Year	394.09	6984.10			
6985.18	6985.18	6985.64	0.022079	5.50	74.24	86.18	0.97	
Gieck Ranch T1	GR_T1_R	4103.93	100 Year	394.09	6980.10			
6981.96	6981.88	6982.61	0.014699	6.68	63.97	44.57	0.88	
Gieck Ranch T1	GR_T1_R	4002.8	100 Year	394.09	6978.20			
6980.16	6980.16	6980.94	0.018358	7.28	58.60	43.69	0.97	
Gieck Ranch T1	GR_T1_R	3909.96	100 Year	394.09	6976.10			
6978.84		6979.09	0.003889	4.36	111.22	74.87	0.48	
Gieck Ranch T1	GR_T1_R	3828.1	100 Year	394.09	6975.10			
6978.90		6978.94	0.000430	1.78	288.50	159.06	0.17	
Gieck Ranch T1	GR_T1_R	3546.21	100 Year	394.09	6974.10			
6977.27	6977.27	6978.46	0.020136	8.75	45.05	19.08	1.00	
Gieck Ranch T1	GR_T1_R	3483.64	100 Year	394.09	6965.10			
6966.77	6966.77	6967.39	0.021548	6.35	62.46	52.02	1.00	
Gieck Ranch T1	GR_T1_R	3396.77	100 Year	394.09	6963.10			
6965.08	6964.81	6965.56	0.010858	5.66	73.09	49.28	0.75	
Gieck Ranch T1	GR_T1_R	3023.77	100 Year	394.09	6958.10			
6960.87	6960.68	6961.50	0.010906	6.75	66.88	42.24	0.78	
Gieck Ranch T1	GR_T1_R	2666.74	100 Year	394.09	6954.10			
6955.89	6955.89	6956.61	0.017685	6.94	59.76	43.17	0.95	
Gieck Ranch T1	GR_T1_R	2264.59	100 Year	394.09	6945.10			
6947.46	6947.35	6947.85	0.016934	5.03	79.04	79.97	0.86	
Gieck Ranch T1	GR_T1_R	2095.23	100 Year	394.09	6942.10			
6944.20	6944.20	6945.02	0.015907	7.38	57.54	44.45	0.92	
Gieck Ranch T1	GR_T1_R	1938.13	100 Year	394.09	6940.10			
6942.38	6942.38	6942.73	0.010558	5.00	97.62	155.38	0.72	
Gieck Ranch T1	GR_T1_R	1642.5	100 Year	394.09	6936.10			
6937.52	6937.52	6937.90	0.018285	5.22	85.87	114.43	0.89	
Gieck Ranch T1	GR_T1_R	1499.05	100 Year	394.09	6930.10			
6932.40		6932.74	0.007349	4.80	87.58	59.90	0.62	
Gieck Ranch T1	GR_T1_R	1333.55	100 Year	394.09	6929.10			
6930.49	6930.49	6931.03	0.020485	6.00	68.55	65.87	0.97	
Gieck Ranch T1	GR_T1_R	1277.21	100 Year	413.00	6926.50			
6927.83	6927.81	6928.36	0.019645	5.88	72.18	66.68	0.95	
Gieck Ranch T1	GR_T1_R	1162.11	100 Year	413.00	6924.80			
6926.02	6926.02	6926.54	0.022179	5.76	72.73	75.04	0.98	
Gieck Ranch T1	GR_T1_R	870.4	100 Year	413.00	6921.00			

6922.94	6922.90	6923.59	0.017537	6.54	65.24	48.22	0.93	
Geick Ranch T2	GR_T2_R1	5786.62	100 Year	219.31	7014.00			
7014.53	7014.49	7014.67	0.022131	2.96	75.51	218.74	0.83	
Geick Ranch T2	GR_T2_R1	5374.98	100 Year	219.31	7003.10			
7003.59	7003.59	7003.75	0.032423	3.25	69.74	233.67	0.98	
Geick Ranch T2	GR_T2_R1	4981.16	100 Year	219.31	6991.70			
6992.35	6992.35	6992.57	0.024237	3.89	61.97	149.09	0.92	
Geick Ranch T2	GR_T2_R1	4359.24	100 Year	219.31	6977.00			
6977.85		6978.02	0.013998	3.44	70.46	136.45	0.73	
Geick Ranch T2	GR_T2_R1	4142.7	100 Year	219.31	6973.10			
6973.72	6973.72	6973.96	0.026562	3.94	57.06	124.47	0.96	
Geick Ranch T2	GR_T2_R1	3908.91	100 Year	219.31	6966.40			
6967.26	6967.26	6967.47	0.015650	3.81	67.88	178.93	0.78	
Geick Ranch T2	GR_T2_R1	3734.29	100 Year	219.31	6962.00			
6963.00	6963.00	6963.32	0.021179	4.70	51.29	86.76	0.92	
Geick Ranch T2	GR_T2_R1	3510.58	100 Year	219.31	6954.40			
6955.60	6955.60	6956.02	0.020814	5.35	43.24	53.03	0.94	
Geick Ranch T2	GR_T2_R1	3318.63	100 Year	219.31	6950.10			
6951.40	6951.40	6951.86	0.018921	5.66	42.10	47.34	0.92	
Geick Ranch T2	GR_T2_R1	2982.55	100 Year	219.31	6942.10			
6943.51	6943.51	6943.78	0.013134	4.90	62.55	108.86	0.78	
Geick Ranch T2	GR_T2_R1	2722.57	100 Year	219.31	6938.10			
6939.23	6939.12	6939.47	0.011404	4.13	60.69	95.31	0.71	
Geick Ranch T2	GR_T2_R1	2600.57	100 Year	219.31	6936.50			
6937.25	6937.25	6937.46	0.023538	3.86	62.45	150.94	0.91	
Geick Ranch T2	GR_T2_R1	2411.51	100 Year	219.31	6933.10			
6933.99	6933.86	6934.15	0.012152	3.38	70.93	124.30	0.69	
Geick Ranch T2	GR_T2_R1	2024.23	100 Year	219.31	6927.20			
6928.44	6928.44	6928.64	0.016632	4.32	68.26	145.79	0.82	
Geick Ranch T2	GR_T2_R1	1708.36	100 Year	219.31	6923.00			
6924.11		6924.14	0.001427	1.28	182.70	250.92	0.24	
Geick Ranch T2	GR_T2_R1	1617.36	100 Year	219.31	6923.00			
6923.60	6923.60	6923.77	0.032368	3.37	66.33	200.29	0.99	
Geick Ranch T2	GR_T2_R1	1492.43	100 Year	236.70	6919.70			
6920.45		6920.60	0.015625	3.15	77.52	155.80	0.74	
Geick Ranch T2	GR_T2_R1	1329.76	100 Year	236.70	6918.00			
6918.87		6918.93	0.007219	2.17	123.78	276.97	0.51	
Geick Ranch T2	GR_T2_R1	1183.47	100 Year	280.00	6916.00			
6916.92	6916.92	6917.15	0.017283	4.13	81.83	170.48	0.83	
Geick Ranch T2	GR_T2_R1	675	100 Year	280.00	6914.10			
6915.45	6915.45	6915.71	0.012982	4.51	82.96	170.80	0.76	
EAST FORK T1	EF_T1_R1	8248.03	100 Year	115.80	6984.70			

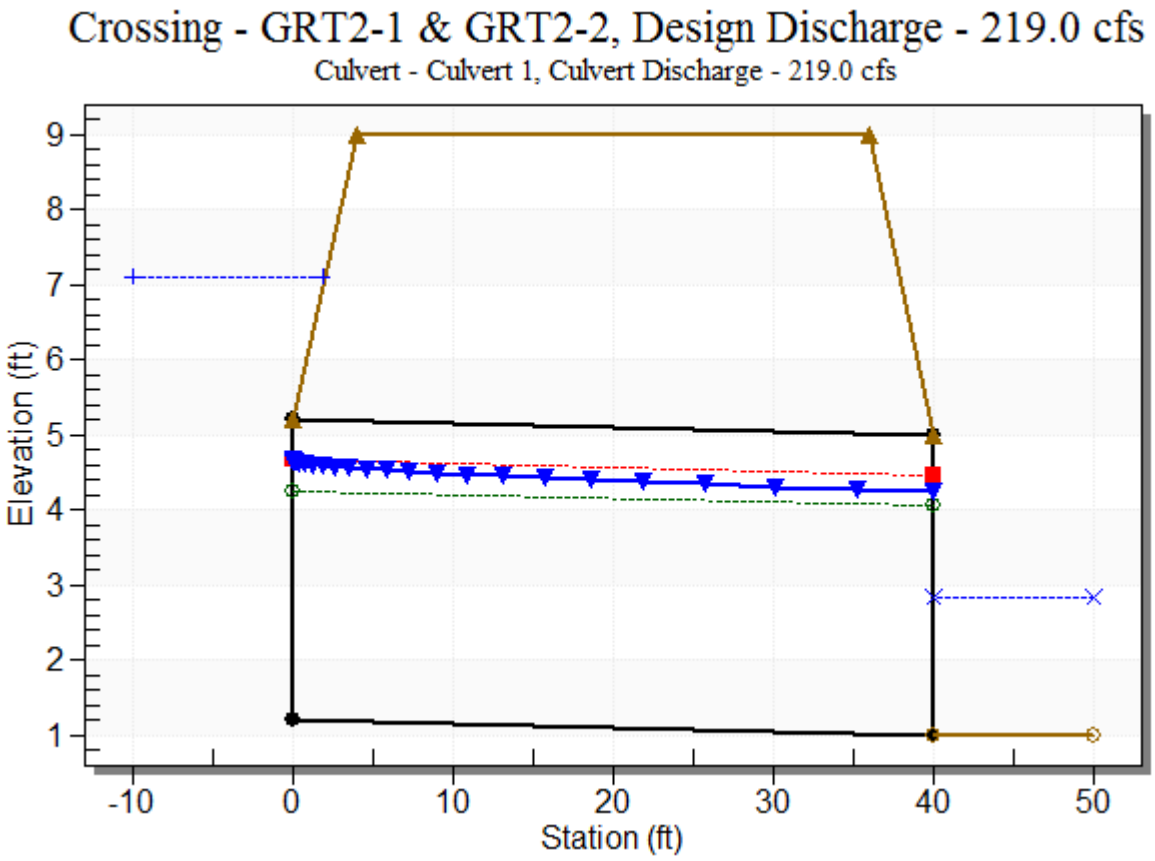
6985.87	6985.50	6985.97	0.014707		2.55	48.60	63.23	0.45
EAST FORK	T1	EF_T1_R1	8135.58	100 Year	115.80	6981.90		
6982.65	6982.65	6982.90	0.065184		4.31	30.44	59.37	0.90
EAST FORK	T1	EF_T1_R1	7906.99	100 Year	115.80	6976.10		
6977.41		6977.48	0.007846		2.09	57.83	59.44	0.34
EAST FORK	T1	EF_T1_R1	7789.77	100 Year	115.80	6975.10		
6976.30		6976.38	0.011470		2.44	55.43	87.67	0.41
EAST FORK	T1	EF_T1_R1	7705.88	100 Year	115.80	6973.60		
6974.55	6974.43	6974.73	0.039922		3.56	36.14	72.74	0.72
EAST FORK	T1	EF_T1_R1	7523.37	100 Year	115.80	6970.10		
6971.24		6971.32	0.010698		2.25	53.89	62.96	0.39
EAST FORK	T1	EF_T1_R1	7465.15	100 Year	115.80	6969.10		
6969.96	6969.86	6970.18	0.045472		3.87	32.26	52.79	0.77
EAST FORK	T1	EF_T1_R1	7366.65	100 Year	115.80	6966.10		
6967.87		6968.00	0.012820		3.10	43.57	49.98	0.45
EAST FORK	T1	EF_T1_R1	7228.09	100 Year	115.80	6965.00		
6965.77		6965.85	0.018941		2.31	52.79	87.60	0.49
EAST FORK	T1	EF_T1_R1	7213.09	100 Year	115.80	6964.20		
6965.26		6965.42	0.045717		3.29	37.14	74.17	0.74
EAST FORK	T1	EF_T1_R1	7089.83	100 Year	115.80	6962.10		
6963.35		6963.42	0.008070		2.15	56.53	56.17	0.35
EAST FORK	T1	EF_T1_R1	6908.56	100 Year	115.80	6959.10		
6959.85	6959.85	6960.15	0.069618		4.55	27.84	49.47	0.94
EAST FORK	T1	EF_T1_R1	6741.62	100 Year	115.80	6954.10		
6956.03		6956.14	0.009866		3.13	47.83	46.39	0.41
EAST FORK	T1	EF_T1_R1	6564.36	100 Year	115.80	6951.20		
6952.27	6952.27	6952.59	0.059662		4.89	27.37	43.95	0.90
EAST FORK	T1	EF_T1_R1	6369.47	100 Year	115.80	6946.10		
6947.85		6947.98	0.010214		3.03	41.79	32.22	0.41
EAST FORK	T1	EF_T1_R1	6042.97	100 Year	115.80	6943.10		
6944.24		6944.32	0.012222		2.45	52.36	65.36	0.42
EAST FORK	T1	EF_T1_R1	5607.4	100 Year	115.80	6934.10		
6935.31	6935.31	6935.60	0.038739		4.68	31.88	56.11	0.76
EAST FORK	T1	EF_T1_R1	5407.14	100 Year	115.80	6931.10		
6932.72	6932.00	6932.79	0.006180		2.21	60.77	60.24	0.32
EAST FORK	T1	EF_T1_R1	5282.66	100 Year	115.80	6929.73		
6930.63	6930.63	6930.91	0.074662		4.28	28.27	54.05	0.95
EAST FORK	T1	EF_T1_R1	5169.07	100 Year	115.80	6924.30		
6927.48		6927.56	0.003425		2.46	57.29	32.48	0.26
EAST FORK	T1	EF_T1_R1	5044.93	100 Year	115.80	6925.10		
6925.99	6925.99	6926.36	0.078875		4.94	24.65	41.44	1.00
EAST FORK	T1	EF_T1_R1	4933.45	100 Year	115.80	6922.00		

6925.51		6925.53	0.000618	1.16	152.01	124.68	0.11		
EAST FORK	T1	EF_T1_R1	4893.61	100 Year	176.90	6922.50			
6925.45		6925.48	0.001750	1.72	129.85	82.98	0.18		
EAST FORK	T1	EF_T1_R1	4764.36	100 Year	176.90	6920.10			
6925.46		6925.46	0.000032	0.37	587.15	165.57	0.03		
EAST FORK	T1	EF_T1_R1	4702.1	100 Year	176.90	6922.10			
6924.34	6924.34	6925.35	0.076775	8.06	21.96	11.09	1.01		
EAST FORK	T1	EF_T1_R1	4669.17	100 Year	176.90	6918.00			
6920.30	6919.36	6920.45	0.008091	3.16	61.83	40.19	0.38		
EAST FORK	T1	EF_T1_R1	4488	100 Year	176.90	6915.64			
6916.71	6916.71	6917.12	0.072521	5.12	35.08	45.34	0.98		
EAST FORK	T1	EF_T1_R1	4159.6	100 Year	176.90	6908.10			
6911.54	6910.45	6911.66	0.005684	3.16	74.39	53.40	0.33		
EAST FORK	T1	EF_T1_R1	3779.48	100 Year	176.90	6904.10			
6905.93	6905.93	6906.61	0.056192	6.80	28.12	23.43	0.95		
EAST FORK	T1	EF_T1_R1	3546.45	100 Year	176.90	6900.10			
6902.89		6903.00	0.004654	2.77	74.85	42.56	0.30		
EAST FORK	T1	EF_T1_R1	3297.35	100 Year	176.90	6898.10			
6899.57	6899.57	6900.15	0.056676	6.25	30.27	27.57	0.94		
EAST FORK	T1	EF_T1_R1	3061.96	100 Year	176.90	6893.90			
6895.86		6895.95	0.007240	2.57	75.77	57.85	0.35		
EAST FORK	T1	EF_T1_R1	2833.32	100 Year	176.90	6890.10			
6892.60	6892.60	6892.96	0.030203	5.92	44.67	50.08	0.72		
EAST FORK	T1	EF_T1_R1	2498.86	100 Year	176.90	6885.10			
6886.55	6886.15	6886.58	0.007917	1.42	136.36	248.71	0.31		
EAST FORK	T1	EF_T1_R1	1976.23	100 Year	176.90	6875.80			
6876.24	6876.24	6876.41	0.100737	3.34	52.94	151.14	1.00		
EAST FORK	T1	EF_T1_R1	1711.74	100 Year	176.90	6869.60			
6871.01		6871.05	0.005498	1.75	120.90	168.64	0.28		
EAST FORK	T1	EF_T1_R1	883	100 Year	176.90	6863.10			
6864.26	6864.26	6864.62	0.063411	4.93	38.50	56.99	0.92		
EAST FORK		EF_R1	4747.49	100 Year	359.67	6906.10			
6908.25		6908.51	0.008789	4.10	90.26	59.30	0.54		
EAST FORK		EF_R1	4247.11	100 Year	359.67	6899.10			
6900.92	6900.92	6901.54	0.024858	6.66	61.40	52.75	0.90		
EAST FORK		EF_R1	3831.76	100 Year	359.67	6894.10			
6895.85		6895.96	0.004232	2.79	140.15	105.78	0.37		
EAST FORK		EF_R1	3679.75	100 Year	359.67	6893.00			
6894.08	6894.08	6894.52	0.033583	5.39	70.19	86.70	0.96		
EAST FORK		EF_R1	3471.36	100 Year	359.67	6885.10			
6887.75	6887.75	6888.44	0.020922	7.68	60.99	44.82	0.87		
EAST FORK		EF_R1	3275.15	100 Year	359.67	6881.10			

6884.27	6883.31	6884.56	0.005780	4.68	90.10	42.23	0.48
EAST FORK	EF_R1	3102.57	100 Year	359.67	6880.00		
6881.85	6881.85	6882.64	0.027757	7.23	51.99	34.35	0.96
EAST FORK	EF_R1	2977.57	100 Year	359.67	6878.00		
6880.75		6880.89	0.003504	3.34	127.57	68.63	0.36
EAST FORK	EF_R1	2951.88	100 Year	418.07	6878.10		
6880.31	6879.83	6880.70	0.011448	5.17	85.72	50.31	0.63
EAST FORK	EF_R1	2569.34	100 Year	418.07	6873.10		
6874.83	6874.75	6875.40	0.024045	6.37	71.43	52.97	0.88
EAST FORK	EF_R1	2289.53	100 Year	418.07	6870.10		
6872.74		6872.92	0.004279	3.59	130.04	68.62	0.40
EAST FORK	EF_R1	2261.03	100 Year	435.47	6870.10		
6872.43	6871.88	6872.73	0.008690	4.67	108.73	80.67	0.56
EAST FORK	EF_R1	2193.57	100 Year	435.47	6870.10		
6871.96	6871.44	6872.16	0.007628	3.83	129.20	101.26	0.50
EAST FORK	EF_R1	1970.26	100 Year	435.47	6867.10		
6868.45	6868.45	6868.93	0.036031	5.60	78.70	84.38	0.99
EAST FORK	EF_R1	1750.46	100 Year	435.47	6864.10		
6866.58		6866.71	0.003256	2.99	156.27	81.70	0.34
EAST FORK	EF_R1	1569.45	100 Year	435.47	6864.10		
6865.12	6864.99	6865.44	0.023305	4.58	97.00	102.28	0.80
EAST FORK	EF_R1	1451	100 Year	435.47	6860.01		
6861.96	6861.96	6862.53	0.025017	6.46	77.63	68.75	0.90
EAST FORK	EF_R1	1234.49	100 Year	435.47	6854.10		
6856.00	6856.00	6856.77	0.027233	7.16	63.73	43.39	0.95
EAST FORK	EF_R1	1157.39	100 Year	435.47	6852.20		
6855.43		6855.68	0.005139	4.17	112.36	51.36	0.44
EAST FORK	EF_R1	928	100 Year	595.00	6851.40		
6854.19		6854.43	0.005650	4.05	158.50	82.63	0.46
EAST FORK	EF_R1	698.4	100 Year	595.00	6851.10		
6853.09	6852.85	6853.70	0.018526	6.33	97.00	53.71	0.80

HY-8 Culvert Analysis Report

Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 1.20 ft

Outlet Station: 40.00 ft

Outlet Elevation: 1.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Concrete Box

Barrel Span: 6.00 ft

Barrel Rise: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (30-75º flare) Wingwall

Inlet Depression: None

Tailwater Channel Data - GRT2-1 & GRT2-2

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 12.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0200

Channel Manning's n: 0.0400

Channel Invert Elevation: 1.00 ft

Roadway Data for Crossing: GRT2-1 & GRT2-2

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 9.00 ft

Roadway Surface: Paved

Roadway Top Width: 32.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 215 cfs

Design Flow: 219 cfs

Maximum Flow: 220 cfs

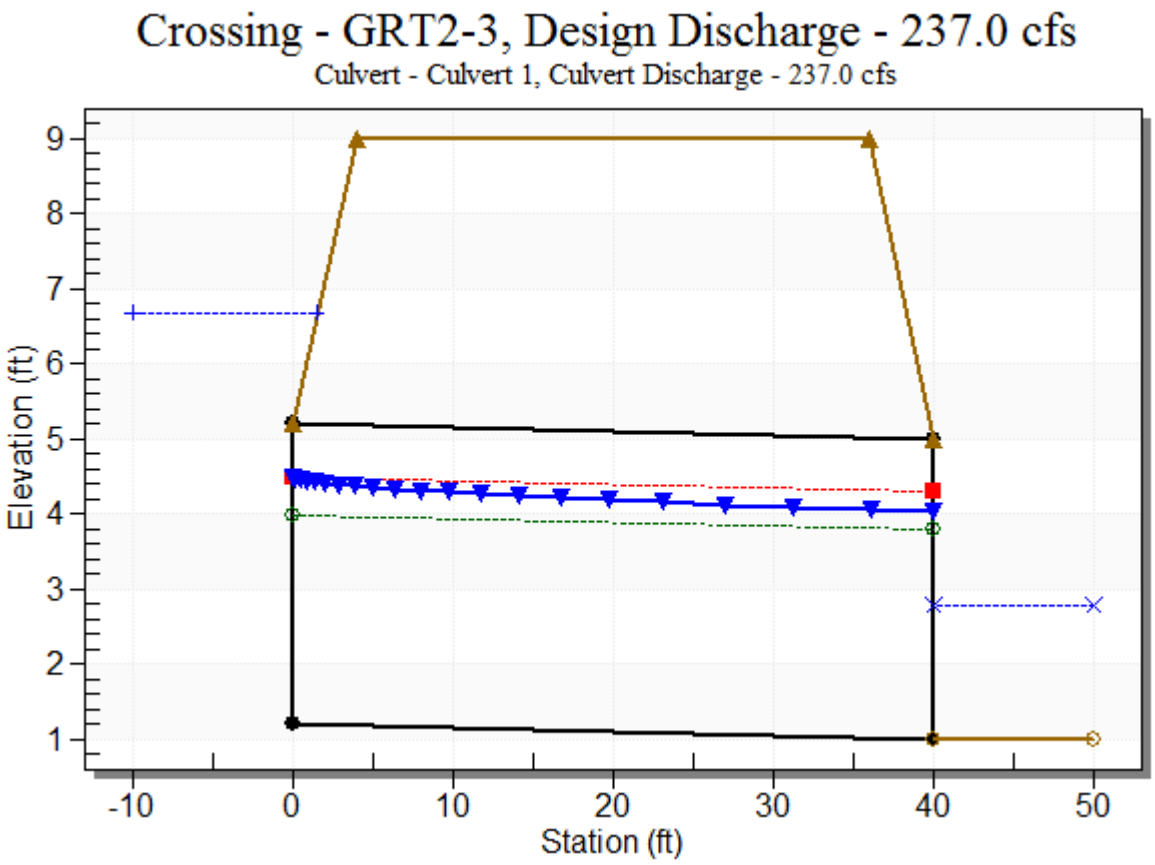
Table 1 - Downstream Channel Rating Curve (Crossing: GRT2-1 & GRT2-2)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
215.00	2.80	1.80	6.22	2.25	0.96
215.50	2.80	1.80	6.22	2.25	0.96
216.00	2.80	1.80	6.23	2.25	0.96
216.50	2.81	1.81	6.23	2.26	0.96
217.00	2.81	1.81	6.24	2.26	0.96
217.50	2.81	1.81	6.24	2.26	0.96
218.00	2.81	1.81	6.24	2.26	0.96
218.50	2.82	1.82	6.25	2.27	0.96
219.00	2.82	1.82	6.25	2.27	0.96
219.50	2.82	1.82	6.26	2.27	0.96
220.00	2.82	1.82	6.26	2.27	0.96

Table 2 - Summary of Culvert Flows at Crossing: GRT2-1 & GRT2-2

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
6.98	215.00	215.00	0.00	1
7.00	215.50	215.50	0.00	1
7.01	216.00	216.00	0.00	1
7.02	216.50	216.50	0.00	1
7.04	217.00	217.00	0.00	1
7.05	217.50	217.50	0.00	1
7.07	218.00	218.00	0.00	1
7.08	218.50	218.50	0.00	1
7.09	219.00	219.00	0.00	1
7.11	219.50	219.50	0.00	1
7.12	220.00	220.00	0.00	1
9.00	278.54	278.54	0.00	Overtopping

Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 1.20 ft

Outlet Station: 40.00 ft

Outlet Elevation: 1.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Concrete Box

Barrel Span: 7.00 ft

Barrel Rise: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (30-75º flare) Wingwall

Inlet Depression: None

Tailwater Channel Data - GRT2-3

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 14.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0200

Channel Manning's n: 0.0400

Channel Invert Elevation: 1.00 ft

Roadway Data for Crossing: GRT2-3

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 9.00 ft

Roadway Surface: Paved

Roadway Top Width: 32.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 235 cfs

Design Flow: 237 cfs

Maximum Flow: 240 cfs

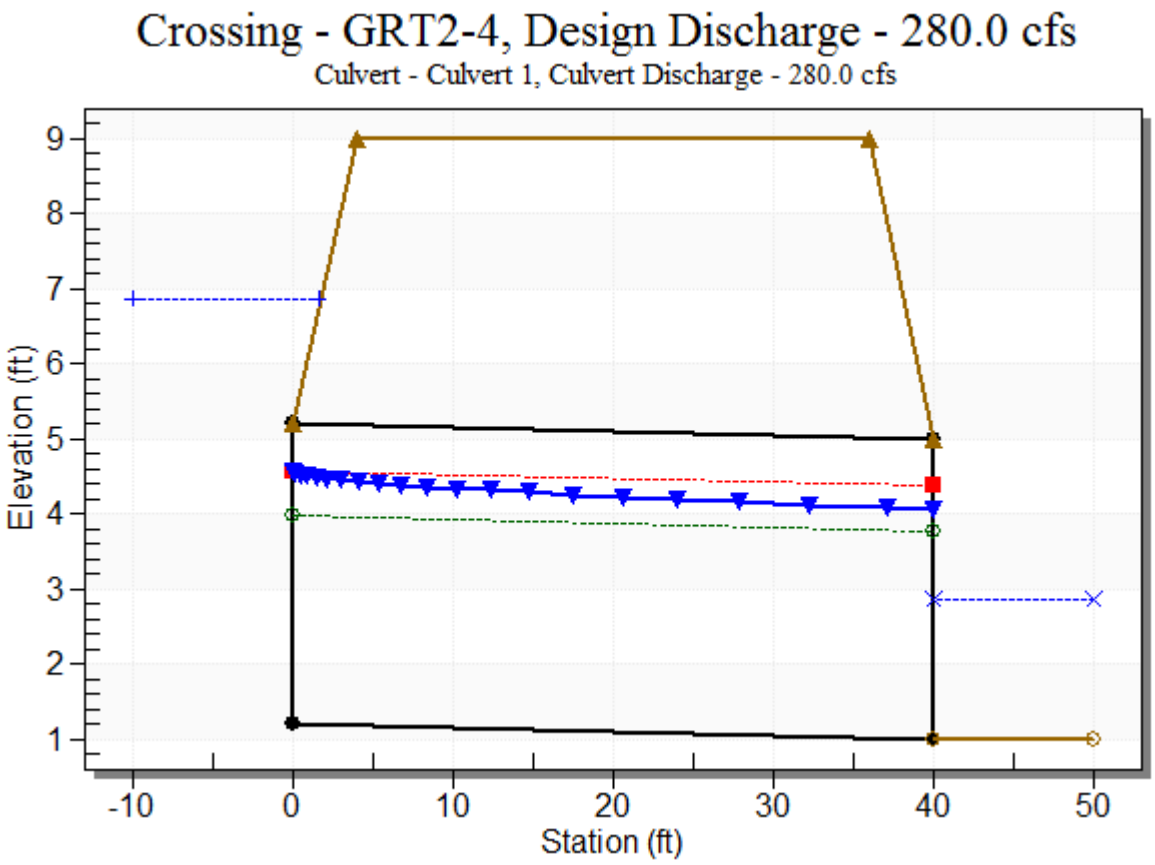
Table 3 - Downstream Channel Rating Curve (Crossing: GRT2-3)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
235.00	2.77	1.77	6.28	2.21	0.96
235.50	2.78	1.78	6.28	2.22	0.96
236.00	2.78	1.78	6.29	2.22	0.96
236.50	2.78	1.78	6.29	2.22	0.96
237.00	2.78	1.78	6.30	2.22	0.96
237.50	2.78	1.78	6.30	2.23	0.96
238.00	2.79	1.79	6.30	2.23	0.96
238.50	2.79	1.79	6.31	2.23	0.96
239.00	2.79	1.79	6.31	2.23	0.96
239.50	2.79	1.79	6.32	2.24	0.96
240.00	2.79	1.79	6.32	2.24	0.96

Table 4 - Summary of Culvert Flows at Crossing: GRT2-3

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
6.62	235.00	235.00	0.00	1
6.63	235.50	235.50	0.00	1
6.64	236.00	236.00	0.00	1
6.65	236.50	236.50	0.00	1
6.67	237.00	237.00	0.00	1
6.68	237.50	237.50	0.00	1
6.69	238.00	238.00	0.00	1
6.70	238.50	238.50	0.00	1
6.71	239.00	239.00	0.00	1
6.72	239.50	239.50	0.00	1
6.73	240.00	240.00	0.00	1
9.00	324.97	324.97	0.00	Overtopping

Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 1.20 ft

Outlet Station: 40.00 ft

Outlet Elevation: 1.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Concrete Box

Barrel Span: 8.00 ft

Barrel Rise: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (30-75º flare) Wingwall

Inlet Depression: None

Tailwater Channel Data - GRT2-4

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 16.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0200

Channel Manning's n: 0.0400

Channel Invert Elevation: 1.00 ft

Roadway Data for Crossing: GRT2-4

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 9.00 ft

Roadway Surface: Paved

Roadway Top Width: 32.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 275 cfs

Design Flow: 280 cfs

Maximum Flow: 285 cfs

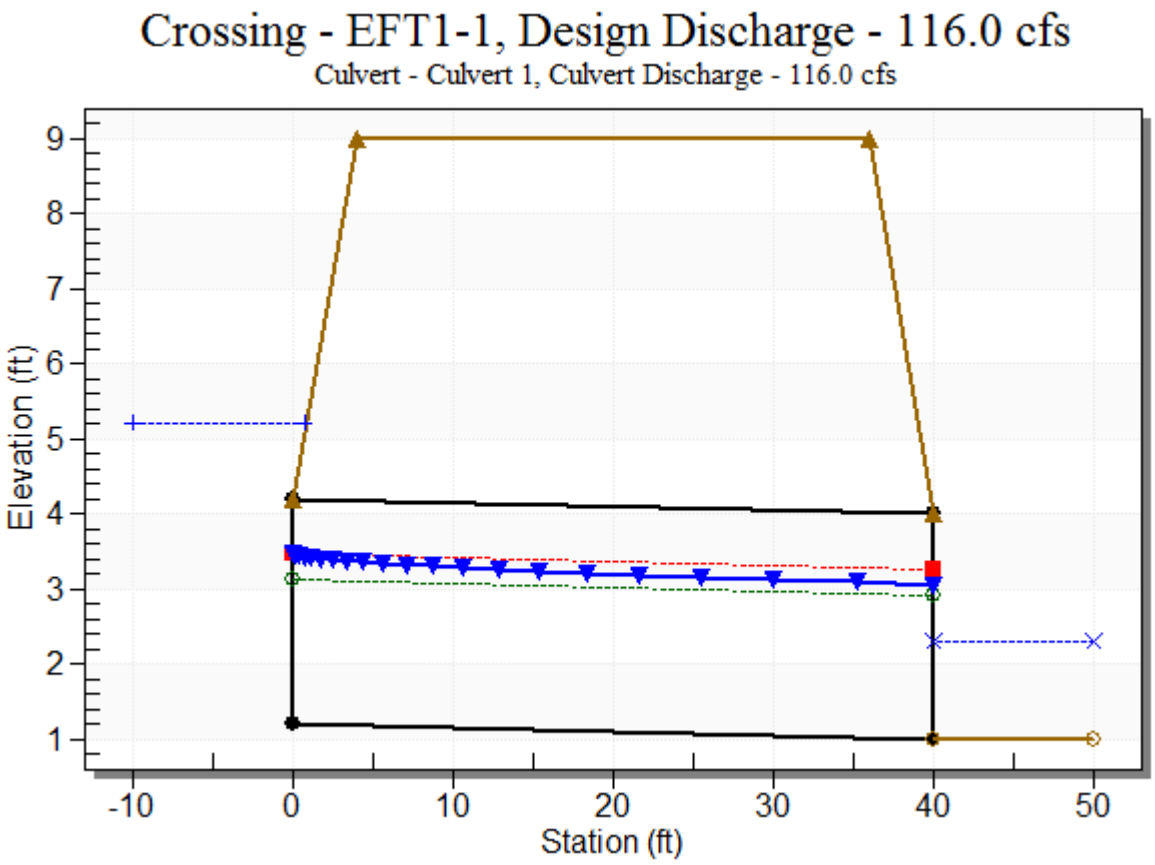
Table 5 - Downstream Channel Rating Curve (Crossing: GRT2-4)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
275.00	2.82	1.82	6.48	2.28	0.97
276.00	2.83	1.83	6.48	2.28	0.97
277.00	2.83	1.83	6.49	2.28	0.97
278.00	2.83	1.83	6.50	2.29	0.97
279.00	2.84	1.84	6.50	2.29	0.97
280.00	2.84	1.84	6.51	2.30	0.97
281.00	2.84	1.84	6.52	2.30	0.97
282.00	2.85	1.85	6.52	2.31	0.97
283.00	2.85	1.85	6.53	2.31	0.97
284.00	2.85	1.85	6.54	2.31	0.97
285.00	2.86	1.86	6.54	2.32	0.97

Table 6 - Summary of Culvert Flows at Crossing: GRT2-4

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
6.75	275.00	275.00	0.00	1
6.77	276.00	276.00	0.00	1
6.79	277.00	277.00	0.00	1
6.81	278.00	278.00	0.00	1
6.83	279.00	279.00	0.00	1
6.85	280.00	280.00	0.00	1
6.87	281.00	281.00	0.00	1
6.89	282.00	282.00	0.00	1
6.91	283.00	283.00	0.00	1
6.93	284.00	284.00	0.00	1
6.95	285.00	285.00	0.00	1
9.00	371.37	371.37	0.00	Overtopping

Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 1.20 ft

Outlet Station: 40.00 ft

Outlet Elevation: 1.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Concrete Box

Barrel Span: 6.00 ft

Barrel Rise: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90º) Headwall

Inlet Depression: None

Tailwater Channel Data - EFT1-1

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 12.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0200

Channel Manning's n: 0.0400

Channel Invert Elevation: 1.00 ft

Roadway Data for Crossing: EFT1-1

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 9.00 ft

Roadway Surface: Paved

Roadway Top Width: 32.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 115 cfs

Design Flow: 116 cfs

Maximum Flow: 120 cfs

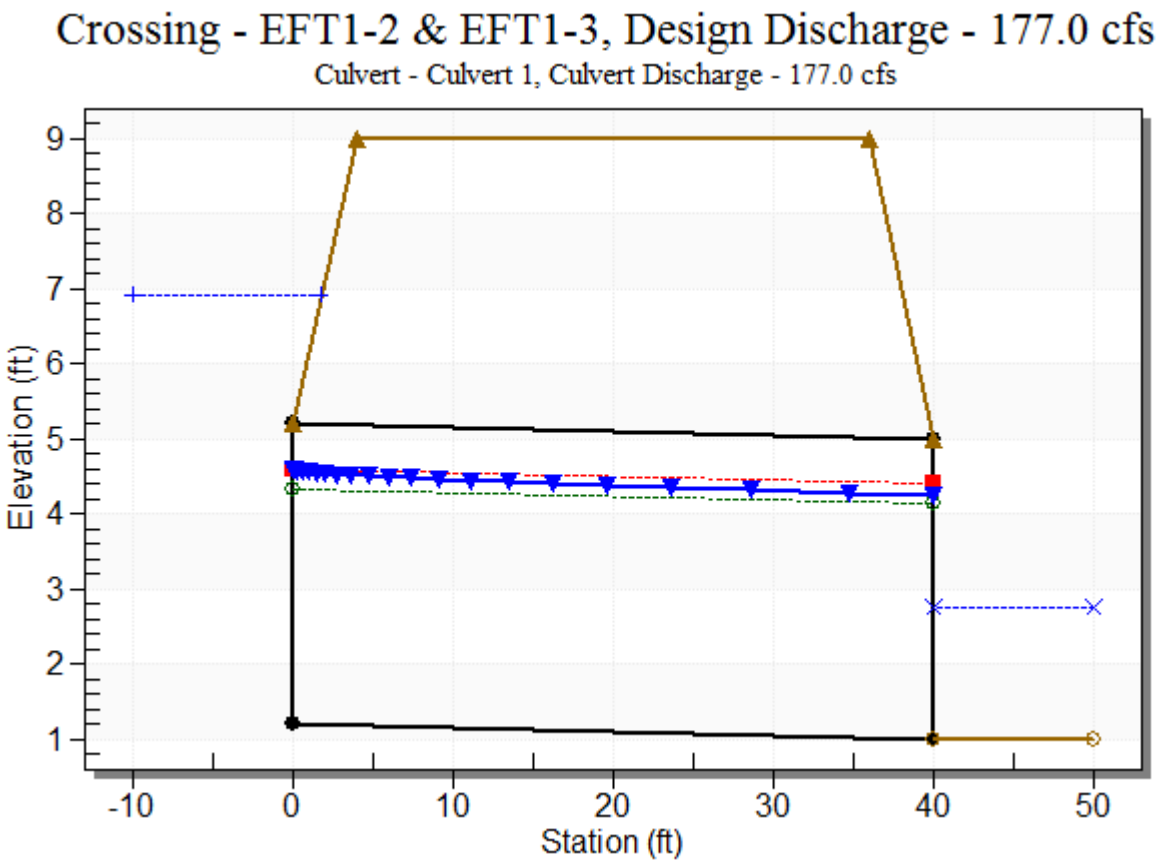
Table 7 - Downstream Channel Rating Curve (Crossing: EFT1-1)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
115.00	2.29	1.29	5.18	1.61	0.92
115.50	2.30	1.30	5.19	1.62	0.92
116.00	2.30	1.30	5.20	1.62	0.92
116.50	2.30	1.30	5.20	1.62	0.92
117.00	2.30	1.30	5.21	1.63	0.92
117.50	2.31	1.31	5.22	1.63	0.92
118.00	2.31	1.31	5.22	1.64	0.92
118.50	2.31	1.31	5.23	1.64	0.92
119.00	2.32	1.32	5.24	1.64	0.92
119.50	2.32	1.32	5.24	1.65	0.92
120.00	2.32	1.32	5.25	1.65	0.92

Table 8 - Summary of Culvert Flows at Crossing: EFT1-1

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
5.16	115.00	115.00	0.00	1
5.18	115.50	115.50	0.00	1
5.19	116.00	116.00	0.00	1
5.21	116.50	116.50	0.00	1
5.22	117.00	117.00	0.00	1
5.24	117.50	117.50	0.00	1
5.25	118.00	118.00	0.00	1
5.27	118.50	118.50	0.00	1
5.28	119.00	119.00	0.00	1
5.30	119.50	119.50	0.00	1
5.31	120.00	120.00	0.00	1
9.00	209.23	209.23	0.00	Overtopping

Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 1.20 ft

Outlet Station: 40.00 ft

Outlet Elevation: 1.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Concrete Box

Barrel Span: 5.00 ft

Barrel Rise: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (30-75º flare) Wingwall

Inlet Depression: None

Tailwater Channel Data - EFT1-2 & EFT1-3

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 10.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0200

Channel Manning's n: 0.0400

Channel Invert Elevation: 1.00 ft

Roadway Data for Crossing: EFT1-2 & EFT1-3

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 9.00 ft

Roadway Surface: Paved

Roadway Top Width: 32.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 175 cfs

Design Flow: 177 cfs

Maximum Flow: 180 cfs

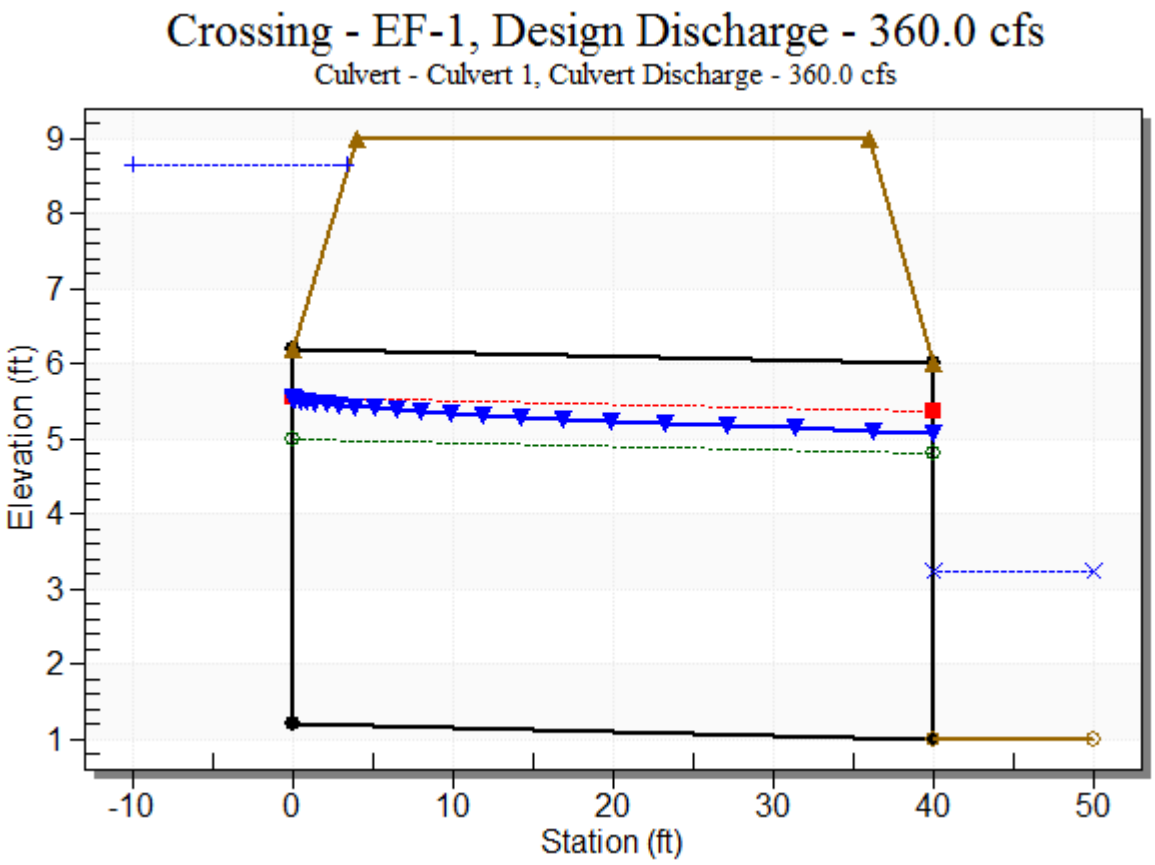
Table 9 - Downstream Channel Rating Curve (Crossing: EFT1-2 & EFT1-3)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
175.00	2.73	1.73	5.96	2.16	0.95
175.50	2.74	1.74	5.96	2.17	0.95
176.00	2.74	1.74	5.97	2.17	0.95
176.50	2.74	1.74	5.97	2.17	0.95
177.00	2.74	1.74	5.98	2.18	0.95
177.50	2.75	1.75	5.98	2.18	0.95
178.00	2.75	1.75	5.99	2.18	0.95
178.50	2.75	1.75	5.99	2.19	0.95
179.00	2.75	1.75	6.00	2.19	0.95
179.50	2.76	1.76	6.00	2.19	0.95
180.00	2.76	1.76	6.01	2.19	0.95

Table 10 - Summary of Culvert Flows at Crossing: EFT1-2 & EFT1-3

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
6.85	175.00	175.00	0.00	1
6.86	175.50	175.50	0.00	1
6.88	176.00	176.00	0.00	1
6.90	176.50	176.50	0.00	1
6.91	177.00	177.00	0.00	1
6.93	177.50	177.50	0.00	1
6.94	178.00	178.00	0.00	1
6.96	178.50	178.50	0.00	1
6.98	179.00	179.00	0.00	1
6.99	179.50	179.50	0.00	1
7.01	180.00	180.00	0.00	1
9.00	232.10	232.10	0.00	Overtopping

Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 1.20 ft

Outlet Station: 40.00 ft

Outlet Elevation: 1.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Concrete Box

Barrel Span: 7.00 ft

Barrel Rise: 5.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (30-75º flare) Wingwall

Inlet Depression: None

Tailwater Channel Data - EF-1

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 14.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0200

Channel Manning's n: 0.0400

Channel Invert Elevation: 1.00 ft

Roadway Data for Crossing: EF-1

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 9.00 ft

Roadway Surface: Paved

Roadway Top Width: 32.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 355 cfs

Design Flow: 360 cfs

Maximum Flow: 365 cfs

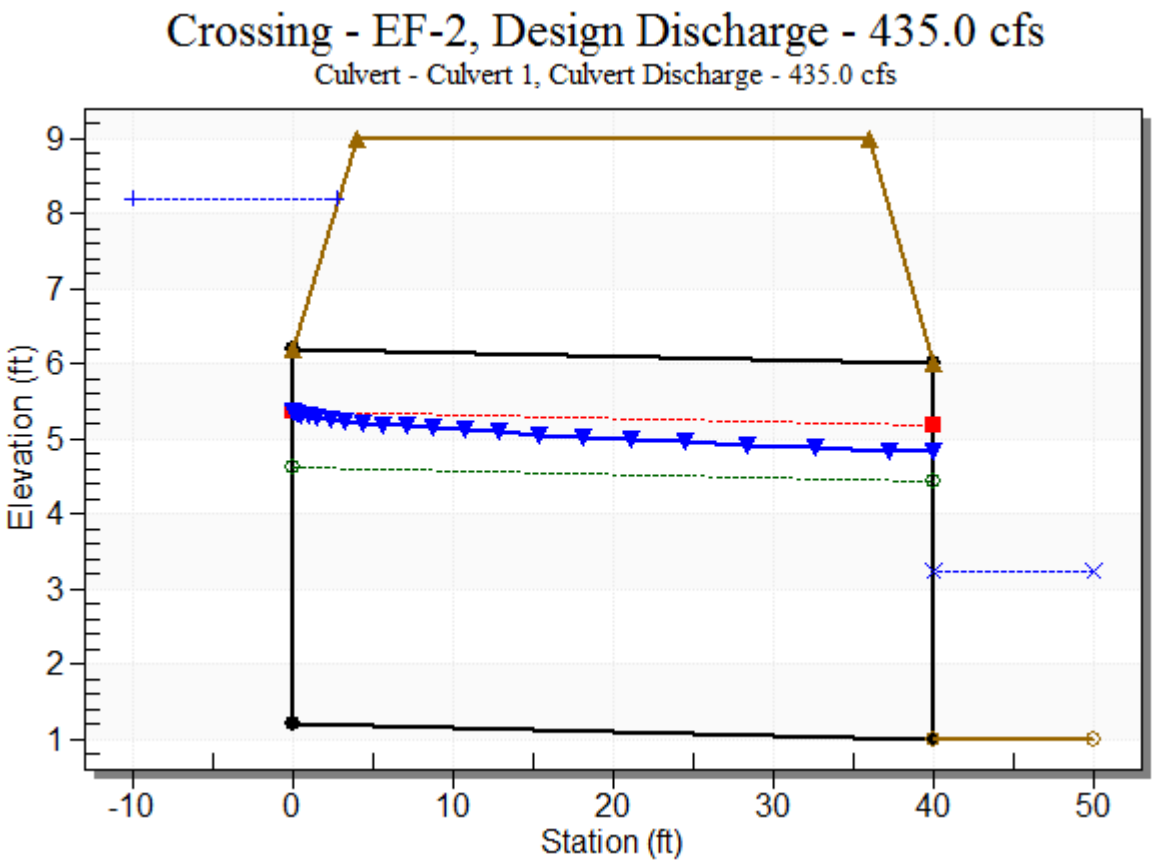
Table 11 - Downstream Channel Rating Curve (Crossing: EF-1)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
355.00	3.20	2.20	7.07	2.75	0.99
356.00	3.20	2.20	7.08	2.75	0.99
357.00	3.21	2.21	7.08	2.76	0.99
358.00	3.21	2.21	7.09	2.76	0.99
359.00	3.21	2.21	7.09	2.76	0.99
360.00	3.22	2.22	7.10	2.77	0.99
361.00	3.22	2.22	7.10	2.77	0.99
362.00	3.22	2.22	7.11	2.78	0.99
363.00	3.23	2.23	7.12	2.78	0.99
364.00	3.23	2.23	7.12	2.78	0.99
365.00	3.23	2.23	7.13	2.79	0.99

Table 12 - Summary of Culvert Flows at Crossing: EF-1

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
8.52	355.00	355.00	0.00	1
8.54	356.00	356.00	0.00	1
8.57	357.00	357.00	0.00	1
8.59	358.00	358.00	0.00	1
8.61	359.00	359.00	0.00	1
8.63	360.00	360.00	0.00	1
8.65	361.00	361.00	0.00	1
8.67	362.00	362.00	0.00	1
8.70	363.00	363.00	0.00	1
8.72	364.00	364.00	0.00	1
8.74	365.00	365.00	0.00	1
9.00	376.68	376.68	0.00	Overtopping

Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 1.20 ft

Outlet Station: 40.00 ft

Outlet Elevation: 1.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Concrete Box

Barrel Span: 9.00 ft

Barrel Rise: 5.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (30-75º flare) Wingwall

Inlet Depression: None

Tailwater Channel Data - EF-2

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 18.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0200

Channel Manning's n: 0.0400

Channel Invert Elevation: 1.00 ft

Roadway Data for Crossing: EF-2

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 9.00 ft

Roadway Surface: Paved

Roadway Top Width: 32.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 430 cfs

Design Flow: 435 cfs

Maximum Flow: 440 cfs

Table 13 - Downstream Channel Rating Curve (Crossing: EF-2)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
430.00	3.20	2.20	7.28	2.75	1.00
431.00	3.20	2.20	7.29	2.75	1.00
432.00	3.21	2.21	7.29	2.75	1.00
433.00	3.21	2.21	7.30	2.76	1.00
434.00	3.21	2.21	7.30	2.76	1.00
435.00	3.22	2.22	7.31	2.77	1.00
436.00	3.22	2.22	7.31	2.77	1.00
437.00	3.22	2.22	7.32	2.77	1.00
438.00	3.22	2.22	7.32	2.78	1.00
439.00	3.23	2.23	7.33	2.78	1.00
440.00	3.23	2.23	7.33	2.78	1.00

Table 14 - Summary of Culvert Flows at Crossing: EF-2

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
8.10	430.00	430.00	0.00	1
8.11	431.00	431.00	0.00	1
8.13	432.00	432.00	0.00	1
8.14	433.00	433.00	0.00	1
8.16	434.00	434.00	0.00	1
8.18	435.00	435.00	0.00	1
8.19	436.00	436.00	0.00	1
8.21	437.00	437.00	0.00	1
8.22	438.00	438.00	0.00	1
8.24	439.00	439.00	0.00	1
8.25	440.00	440.00	0.00	1
9.00	484.29	484.29	0.00	Overtopping

APPENDIX D

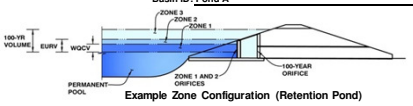
WATER QUALITY AND DETENTION CALCULATIONS

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Grandview Reserve

Basin ID: Pond A



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB	
Watershed Area =	136.48	acres
Watershed Length =	5,475	ft
Watershed Slope =	0.021	ft/ft
Watershed Imperviousness =	7.13%	percent
Percentage Hydrologic Soil Group A =	100.0%	percent
Percentage Hydrologic Soil Group B =	0.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	
Water Quality Capture Volume (WQCV) =	0.567	acre-feet
Excess Urban Runoff Volume (EURV) =	0.650	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.418	acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	0.578	acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	0.775	acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	1.192	acre-feet
50-yr Runoff Volume (P1 = 2.25 in.) =	2.453	acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	5.328	acre-feet
500-yr Runoff Volume (P1 = 3 in.) =	11.695	acre-feet
Approximate 2-yr Detention Volume =	0.384	acre-feet
Approximate 5-yr Detention Volume =	0.532	acre-feet
Approximate 10-yr Detention Volume =	0.711	acre-feet
Approximate 25-yr Detention Volume =	0.983	acre-feet
Approximate 50-yr Detention Volume =	1.436	acre-feet
Approximate 100-yr Detention Volume =	2.616	acre-feet

Optional User Override 1-hr Precipitation

1.19	inches
1.50	inches
1.75	inches
2.00	inches
2.25	inches
2.52	inches
3.00	inches

Stage-Storage Calculation

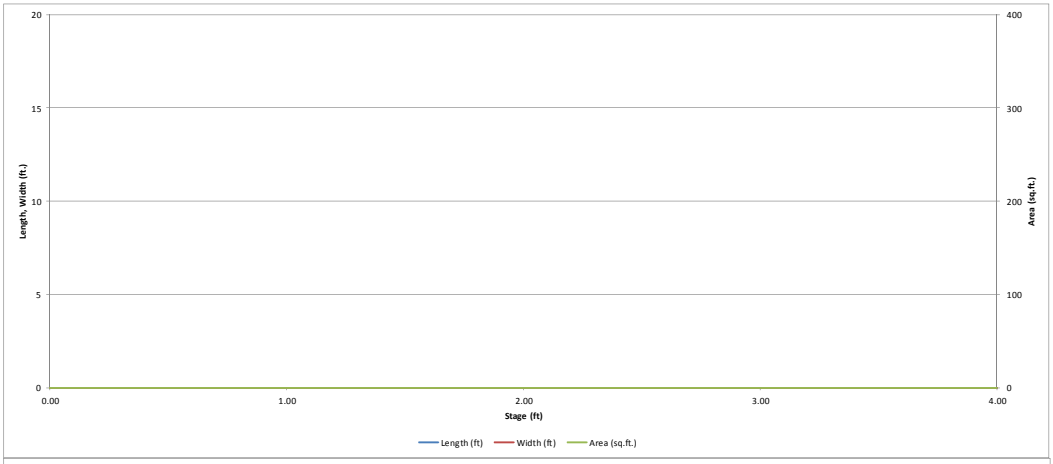
Zone 1 Volume (WQCV) =	0.567	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.083	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	1.965	acre-feet
Total Detention Basin Volume =	2.616	acre-feet
Initial Surcharge Volume (I_{SV}) =	user	ft^3
Initial Surcharge Depth (I_{SD}) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{IA}) =	user	ft^2
Surcharge Volume Length (L_{SV}) =	user	ft
Surcharge Volume Width (W_{SV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

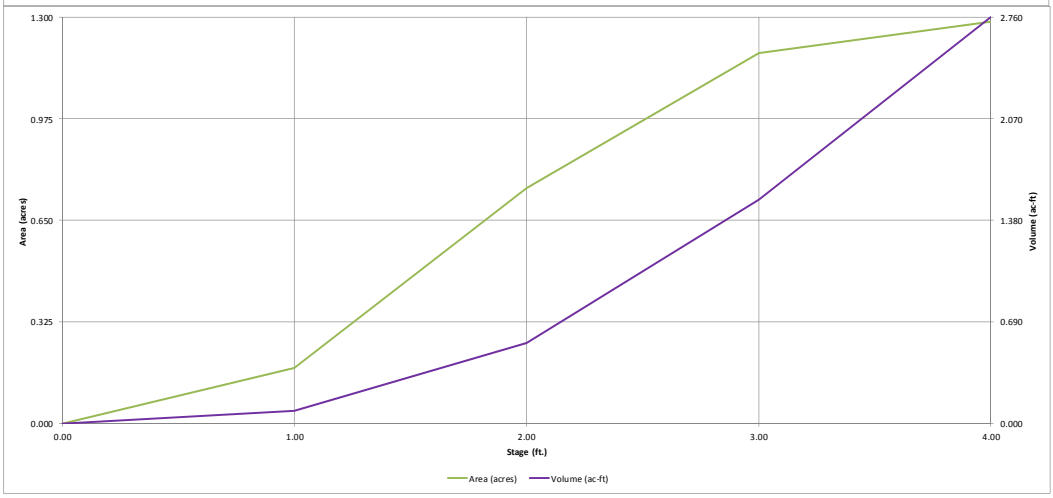
Depth Increment = 1 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	40	0.001		
6914	--	1.00	--	--	--	7,705	0.177	3,796	0.087
6915	--	2.00	--	--	--	32,750	0.752	23,773	0.546
6916	--	3.00	--	--	--	51,590	1.184	66,270	1.521
6917	--	4.00	--	--	--	55,990	1.285	120,060	2.756

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)



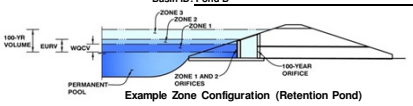


DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Grandview Reserve

Basin ID: Pond B



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB	
Watershed Area =	50.20	acres
Watershed Length =	3,894	ft
Watershed Slope =	0.020	ft/ft
Watershed Imperviousness =	7.75%	percent
Percentage Hydrologic Soil Group A =	100.0%	percent
Percentage Hydrologic Soil Group B =	0.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	
Water Quality Capture Volume (WQCV) =	0.225	acre-feet
Excess Urban Runoff Volume (EURV) =	0.266	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.171	acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	0.236	acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	0.316	acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	0.482	acre-feet
50-yr Runoff Volume (P1 = 2.25 in.) =	0.961	acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	2.020	acre-feet
500-yr Runoff Volume (P1 = 3 in.) =	4.361	acre-feet
Approximate 2-yr Detention Volume =	0.158	acre-feet
Approximate 5-yr Detention Volume =	0.218	acre-feet
Approximate 10-yr Detention Volume =	0.290	acre-feet
Approximate 25-yr Detention Volume =	0.399	acre-feet
Approximate 50-yr Detention Volume =	0.571	acre-feet
Approximate 100-yr Detention Volume =	1.010	acre-feet

Optional User Override 1-hr Precipitation

1.19	inches
1.50	inches
1.75	inches
2.00	inches
2.25	inches
2.52	inches
3.00	inches

Stage-Storage Calculation

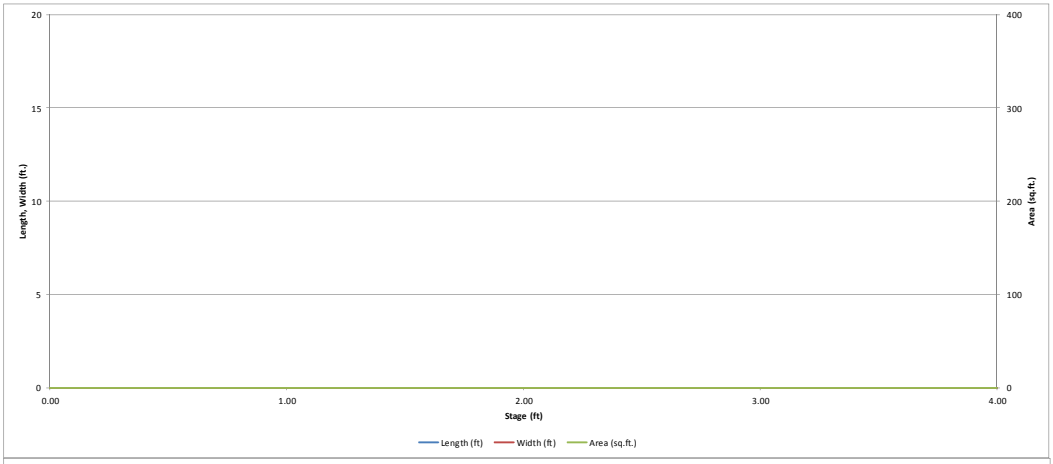
Zone 1 Volume (WQCV) =	0.225	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.041	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.744	acre-feet
Total Detention Basin Volume =	1.010	acre-feet
Initial Surcharge Volume (I_{SV}) =	user	ft^3
Initial Surcharge Depth (I_{SD}) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{IA}) =	user	ft^2
Surcharge Volume Length (L_{SV}) =	user	ft
Surcharge Volume Width (W_{SV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

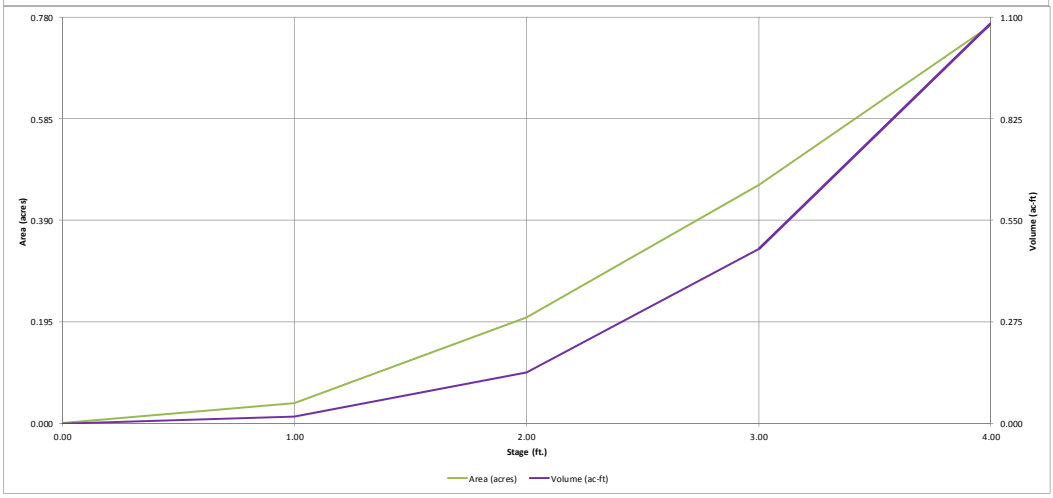
Depth Increment = 1 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	40	0.001		
6926	--	1.00	--	--	--	1,704	0.039	855	0.020
6927	--	2.00	--	--	--	8,850	0.203	6,061	0.139
6928	--	3.00	--	--	--	19,950	0.458	20,549	0.472
6929	--	4.00	--	--	--	33,275	0.764	47,161	1.083

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)



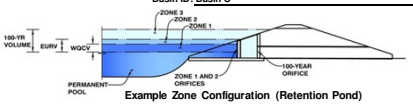


DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Grandview Reserve

Basin ID: Basin C



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB	
Watershed Area =	110.72	acres
Watershed Length =	3,954	ft
Watershed Slope =	0.016	ft/ft
Watershed Imperviousness =	7.61%	percent
Percentage Hydrologic Soil Group A =	100.0%	percent
Percentage Hydrologic Soil Group B =	0.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	
Water Quality Capture Volume (WQCV) =	0.488	acre-feet
Excess Urban Runoff Volume (EURV) =	0.573	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.369	acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	0.510	acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	0.682	acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	1.041	acre-feet
50-yr Runoff Volume (P1 = 2.25 in.) =	2.091	acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	4.425	acre-feet
500-yr Runoff Volume (P1 = 3 in.) =	9.590	acre-feet
Approximate 2-yr Detention Volume =	0.339	acre-feet
Approximate 5-yr Detention Volume =	0.469	acre-feet
Approximate 10-yr Detention Volume =	0.626	acre-feet
Approximate 25-yr Detention Volume =	0.862	acre-feet
Approximate 50-yr Detention Volume =	1.237	acre-feet
Approximate 100-yr Detention Volume =	2.204	acre-feet

Optional User Override 1-hr Precipitation

1.19	inches
1.50	inches
1.75	inches
2.00	inches
2.25	inches
2.52	inches
3.00	inches

Stage-Storage Calculation

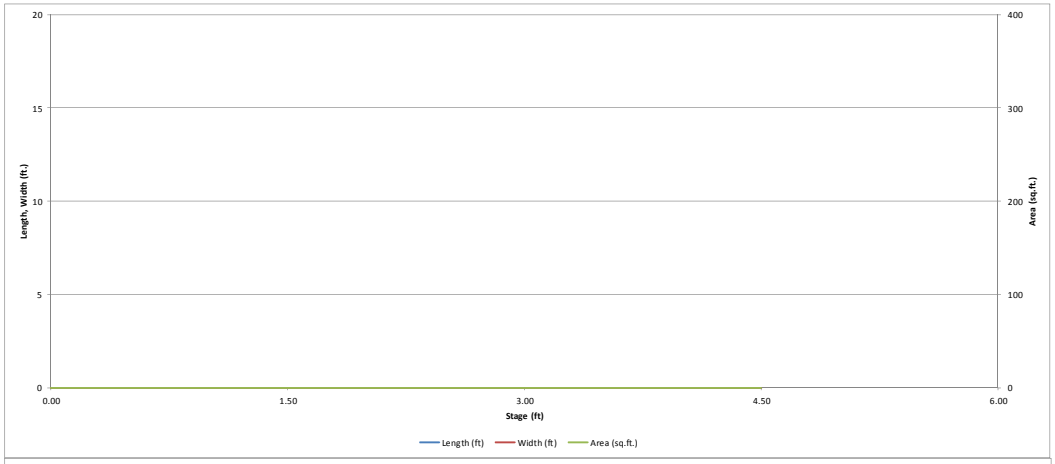
Zone 1 Volume (WQCV) =	0.488	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.086	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	1.630	acre-feet
Total Detention Basin Volume =	2.204	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	user	acre-feet

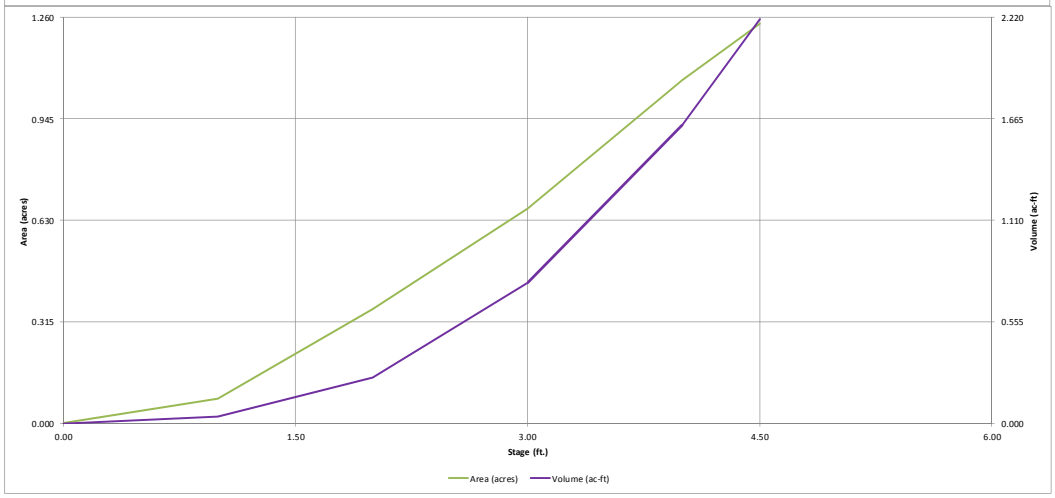
Depth Increment = 1 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	40	0.001		
6970	--	1.00	--	--	--	3,403	0.078	1,688	0.039
6971	--	2.00	--	--	--	15,473	0.355	11,005	0.253
6972	--	3.00	--	--	--	29,016	0.666	33,404	0.767
6973	--	4.00	--	--	--	46,382	1.065	71,103	1.632
6973.5	--	4.50	--	--	--	54,019	1.240	96,203	2.209

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)



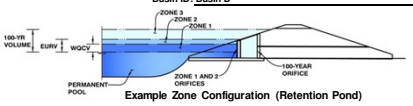


DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Grandview Reserve

Basin ID: Basin D



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB		
Watershed Area =	40.28	acres	
Watershed Length =	2,095	ft	
Watershed Slope =	0.029	ft/ft	
Watershed Imperviousness =	5.93%	percent	
Percentage Hydrologic Soil Group A =	0.0%	percent	
Percentage Hydrologic Soil Group B =	100.0%	percent	
Percentage Hydrologic Soil Groups C/D =	0.0%	percent	
Desired WQCV Drain Time =	40.0	hours	
Location for 1-hr Rainfall Depths =	User Input		
Water Quality Capture Volume (WQCV) =	0.142	acre-feet	Optional User Override 1-hr Precipitation
Excess Urban Runoff Volume (EURV) =	0.215	acre-feet	
2-yr Runoff Volume (P1 = 1.19 in.) =	0.141	acre-feet	1.19 inches
5-yr Runoff Volume (P1 = 1.5 in.) =	0.228	acre-feet	1.50 inches
10-yr Runoff Volume (P1 = 1.75 in.) =	0.691	acre-feet	1.75 inches
25-yr Runoff Volume (P1 = 2 in.) =	2.234	acre-feet	2.00 inches
50-yr Runoff Volume (P1 = 2.25 in.) =	3.190	acre-feet	2.25 inches
100-yr Runoff Volume (P1 = 2.52 in.) =	4.439	acre-feet	2.52 inches
500-yr Runoff Volume (P1 = 3 in.) =	6.542	acre-feet	3.00 inches
Approximate 2-yr Detention Volume =	0.130	acre-feet	
Approximate 5-yr Detention Volume =	0.213	acre-feet	
Approximate 10-yr Detention Volume =	0.576	acre-feet	
Approximate 25-yr Detention Volume =	0.864	acre-feet	
Approximate 50-yr Detention Volume =	0.886	acre-feet	
Approximate 100-yr Detention Volume =	1.175	acre-feet	

Stage-Storage Calculation

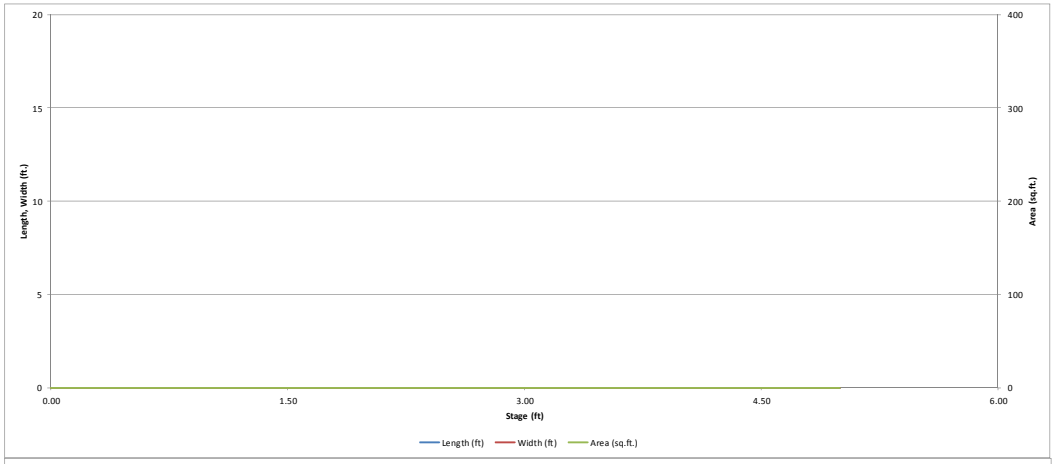
Zone 1 Volume (WQCV) =	0.142	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.073	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.960	acre-feet
Total Detention Basin Volume =	1.175	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

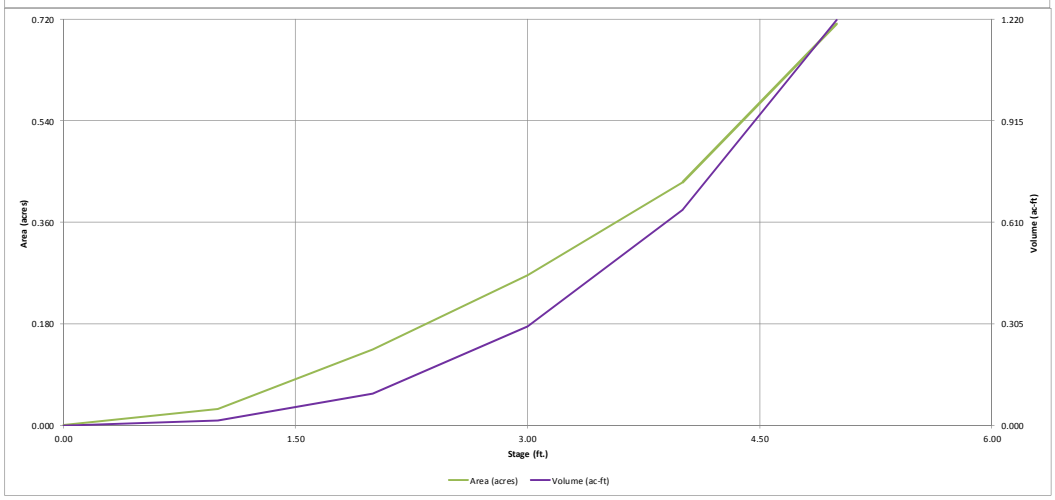
Depth Increment = 1 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	40	0.001		
6926	--	1.00	--	--	--	1,294	0.030	654	0.015
6927	--	2.00	--	--	--	5,872	0.135	4,191	0.096
6928	--	3.00	--	--	--	11,592	0.266	12,982	0.298
6929	--	4.00	--	--	--	18,737	0.430	28,146	0.646
6930	--	5.00	--	--	--	30,979	0.711	53,004	1.217

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)



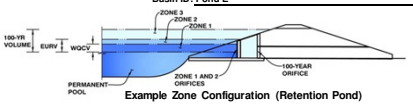


DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Grandview Reserve

Basin ID: Pond E



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB		
Watershed Area =	60.44	acres	
Watershed Length =	3,438	ft	
Watershed Slope =	0.028	ft/ft	
Watershed Imperviousness =	7.02%	percent	
Percentage Hydrologic Soil Group A =	0.0%	percent	
Percentage Hydrologic Soil Group B =	100.0%	percent	
Percentage Hydrologic Soil Groups C/D =	0.0%	percent	
Desired WQCV Drain Time =	40.0	hours	
Location for 1-hr Rainfall Depths =	User Input		
Water Quality Capture Volume (WQCV) =	0.248	acre-feet	
Excess Urban Runoff Volume (EURV) =	0.388	acre-feet	
2-yr Runoff Volume (P1 = 1.19 in.) =	0.257	acre-feet	1.19 inches
5-yr Runoff Volume (P1 = 1.5 in.) =	0.412	acre-feet	1.50 inches
10-yr Runoff Volume (P1 = 1.75 in.) =	1.130	acre-feet	1.75 inches
25-yr Runoff Volume (P1 = 2 in.) =	3.436	acre-feet	2.00 inches
50-yr Runoff Volume (P1 = 2.25 in.) =	4.867	acre-feet	2.25 inches
100-yr Runoff Volume (P1 = 2.52 in.) =	6.736	acre-feet	2.52 inches
500-yr Runoff Volume (P1 = 3 in.) =	9.887	acre-feet	3.00 inches
Approximate 2-yr Detention Volume =	0.238	acre-feet	
Approximate 5-yr Detention Volume =	0.385	acre-feet	
Approximate 10-yr Detention Volume =	0.948	acre-feet	
Approximate 25-yr Detention Volume =	1.395	acre-feet	
Approximate 50-yr Detention Volume =	1.441	acre-feet	
Approximate 100-yr Detention Volume =	1.898	acre-feet	

Optional User Override 1-hr Precipitation

Stage-Storage Calculation

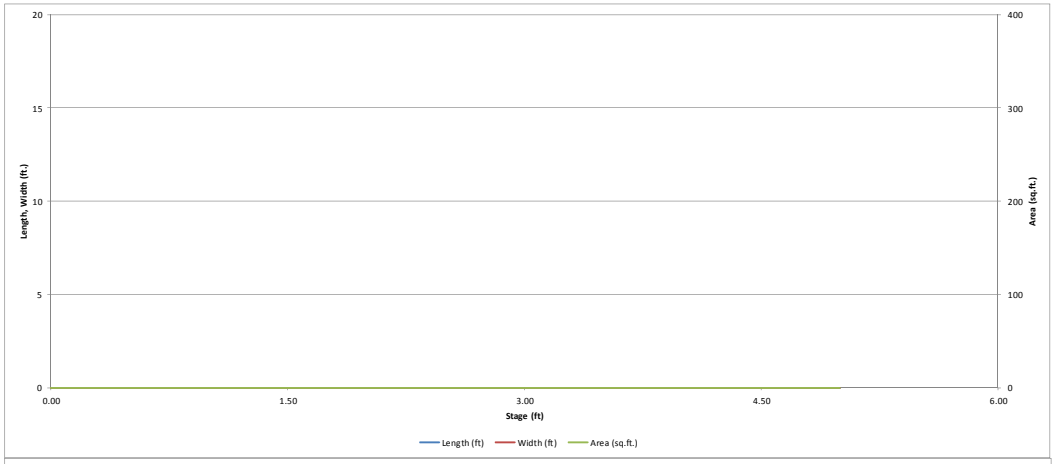
Zone 1 Volume (WQCV) =	0.248	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.140	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	1.510	acre-feet
Total Detention Basin Volume =	1.898	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

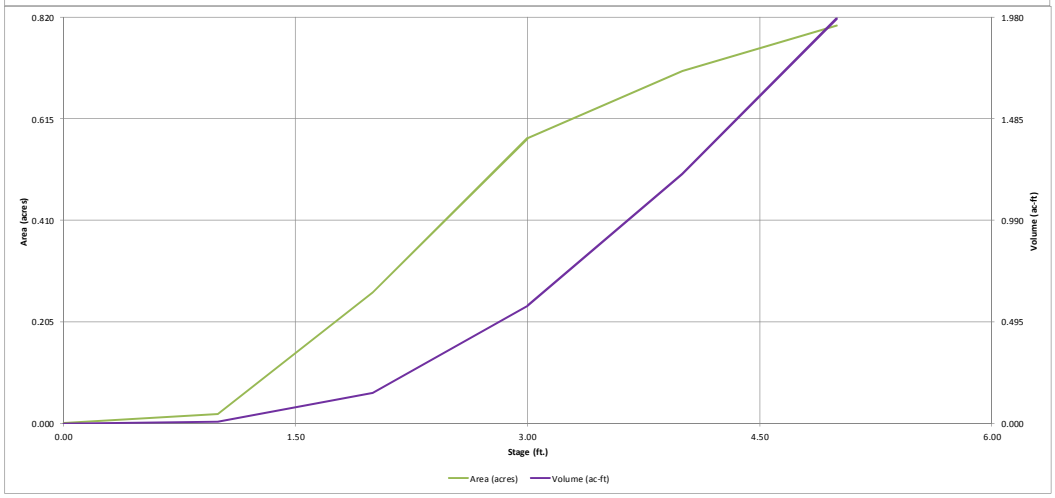
Depth Increment = 1 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	40	0.001		
6885	--	1.00	--	--	--	851	0.020	437	0.010
6886	--	2.00	--	--	--	11,499	0.264	6,506	0.149
6887	--	3.00	--	--	--	25,086	0.576	24,913	0.572
6888	--	4.00	--	--	--	30,960	0.711	52,936	1.215
6889	--	5.00	--	--	--	34,967	0.803	85,899	1.972

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)



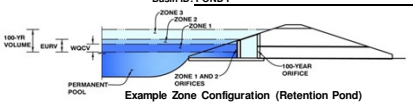


DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: GRANDVIEW RESERVE

Basin ID: POND F



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB	
Watershed Area =	105.74	acres
Watershed Length =	4,745	ft
Watershed Slope =	0.019	ft/ft
Watershed Imperviousness =	6.22%	percent
Percentage Hydrologic Soil Group A =	16.9%	percent
Percentage Hydrologic Soil Group B =	83.1%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	
Water Quality Capture Volume (WQCV) =	0.389	acre-feet
Excess Urban Runoff Volume (EURV) =	0.566	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.370	acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	0.588	acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	1.630	acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	5.041	acre-feet
50-yr Runoff Volume (P1 = 2.25 in.) =	7.283	acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	10.380	acre-feet
500-yr Runoff Volume (P1 = 3 in.) =	15.800	acre-feet
Approximate 2-yr Detention Volume =	0.342	acre-feet
Approximate 5-yr Detention Volume =	0.549	acre-feet
Approximate 10-yr Detention Volume =	1.367	acre-feet
Approximate 25-yr Detention Volume =	2.033	acre-feet
Approximate 50-yr Detention Volume =	2.143	acre-feet
Approximate 100-yr Detention Volume =	2.934	acre-feet

Optional User Override 1-hr Precipitation

1.19	inches
1.50	inches
1.75	inches
2.00	inches
2.25	inches
2.52	inches
3.00	inches

Stage-Storage Calculation

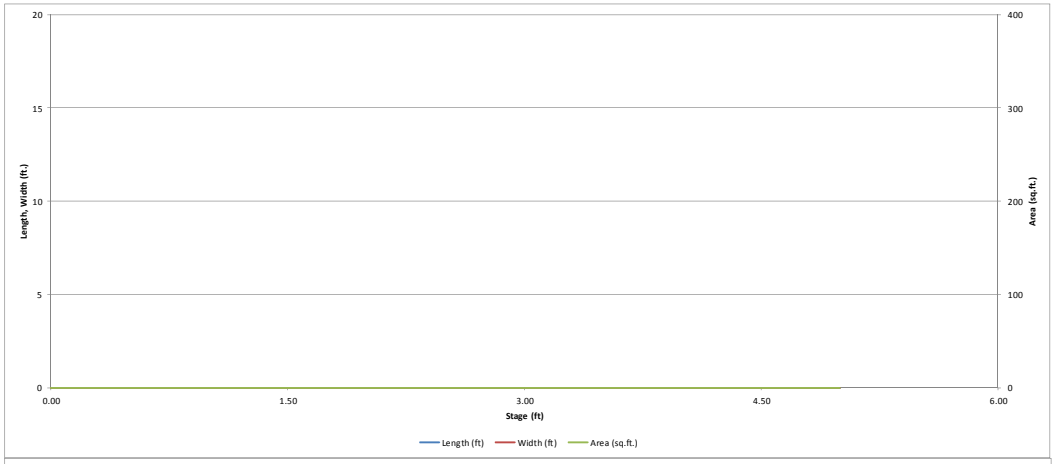
Zone 1 Volume (WQCV) =	0.389	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.177	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	2.368	acre-feet
Total Detention Basin Volume =	2.934	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

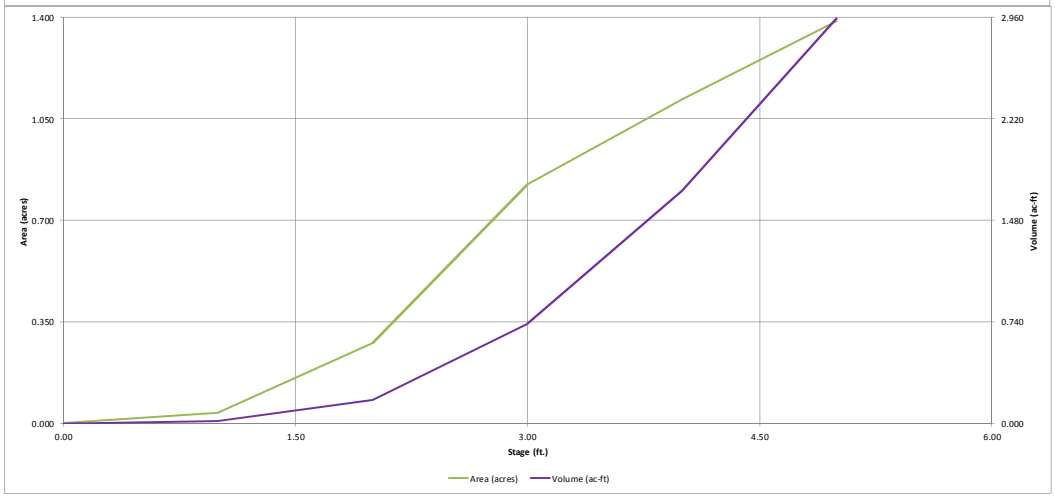
Depth Increment = 1 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	80	0.002		
6861	--	1.00	--	--	--	1,598	0.037	823	0.019
6862	--	2.00	--	--	--	12,112	0.278	7,573	0.174
6863	--	3.00	--	--	--	35,843	0.823	31,671	0.727
6864	--	4.00	--	--	--	48,685	1.118	73,935	1.697
6865	--	5.00	--	--	--	60,381	1.386	128,468	2.949

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)



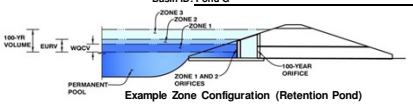


DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Grandview Reserve

Basin ID: Pond G



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB		
Watershed Area =	21.93	acres	
Watershed Length =	2,253	ft	
Watershed Slope =	0.016	ft/ft	
Watershed Imperviousness =	6.73%	percent	
Percentage Hydrologic Soil Group A =	0.0%	percent	
Percentage Hydrologic Soil Group B =	100.0%	percent	
Percentage Hydrologic Soil Groups C/D =	0.0%	percent	
Desired WQCV Drain Time =	40.0	hours	
Location for 1-hr Rainfall Depths =	User Input		
Water Quality Capture Volume (WQCV) =	0.087	acre-feet	Optional User Override 1-hr Precipitation
Excess Urban Runoff Volume (EURV) =	0.134	acre-feet	
2-yr Runoff Volume (P1 = 1.19 in.) =	0.089	acre-feet	1.19 inches
5-yr Runoff Volume (P1 = 1.5 in.) =	0.143	acre-feet	1.50 inches
10-yr Runoff Volume (P1 = 1.75 in.) =	0.401	acre-feet	1.75 inches
25-yr Runoff Volume (P1 = 2 in.) =	1.239	acre-feet	2.00 inches
50-yr Runoff Volume (P1 = 2.25 in.) =	1.758	acre-feet	2.25 inches
100-yr Runoff Volume (P1 = 2.52 in.) =	2.437	acre-feet	2.52 inches
500-yr Runoff Volume (P1 = 3 in.) =	3.580	acre-feet	3.00 inches
Approximate 2-yr Detention Volume =	0.082	acre-feet	
Approximate 5-yr Detention Volume =	0.134	acre-feet	
Approximate 10-yr Detention Volume =	0.336	acre-feet	
Approximate 25-yr Detention Volume =	0.497	acre-feet	
Approximate 50-yr Detention Volume =	0.512	acre-feet	
Approximate 100-yr Detention Volume =	0.676	acre-feet	

Stage-Storage Calculation

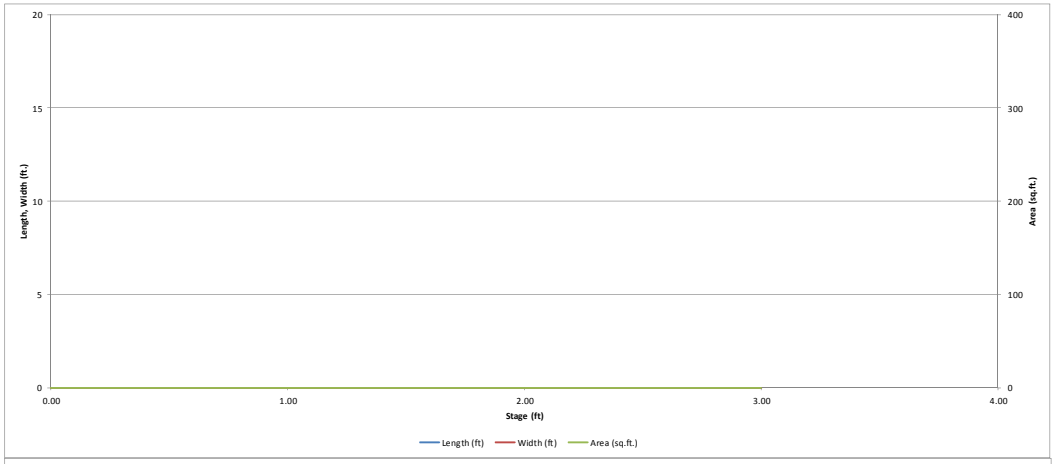
Zone 1 Volume (WQCV) =	0.087	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.048	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.542	acre-feet
Total Detention Basin Volume =	0.676	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

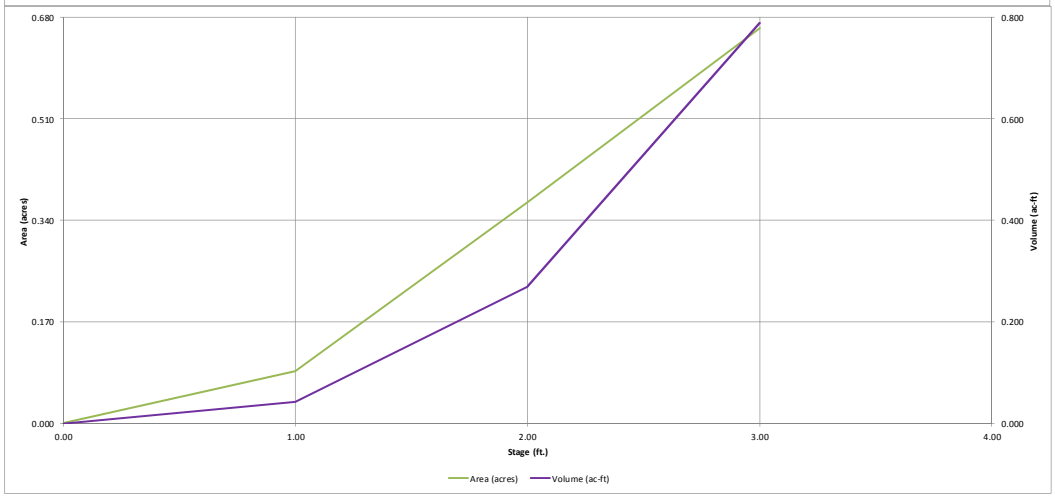
Depth Increment = 1 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	40	0.001		
6874	--	1.00	--	--	--	3,800	0.087	1,882	0.043
6875	--	2.00	--	--	--	16,115	0.370	11,717	0.269
6876	--	3.00	--	--	--	28,794	0.661	34,332	0.788

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)



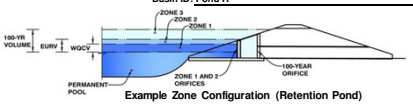


DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Grandview Reserve

Basin ID: Pond H



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB	
Watershed Area =	52.37	acres
Watershed Length =	2,330	ft
Watershed Slope =	0.018	ft/ft
Watershed Imperviousness =	5.11%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	100.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	
Water Quality Capture Volume (WQCV) =	0.161	acre-feet
Excess Urban Runoff Volume (EURV) =	0.238	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.153	acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	0.252	acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	0.838	acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	2.851	acre-feet
50-yr Runoff Volume (P1 = 2.25 in.) =	4.096	acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	5.721	acre-feet
500-yr Runoff Volume (P1 = 3 in.) =	8.459	acre-feet
Approximate 2-yr Detention Volume =	0.142	acre-feet
Approximate 5-yr Detention Volume =	0.236	acre-feet
Approximate 10-yr Detention Volume =	0.693	acre-feet
Approximate 25-yr Detention Volume =	1.055	acre-feet
Approximate 50-yr Detention Volume =	1.074	acre-feet
Approximate 100-yr Detention Volume =	1.433	acre-feet

Optional User Override 1-hr Precipitation	
1.19	inches
1.50	inches
1.75	inches
2.00	inches
2.25	inches
2.52	inches
3.00	inches

Stage-Storage Calculation

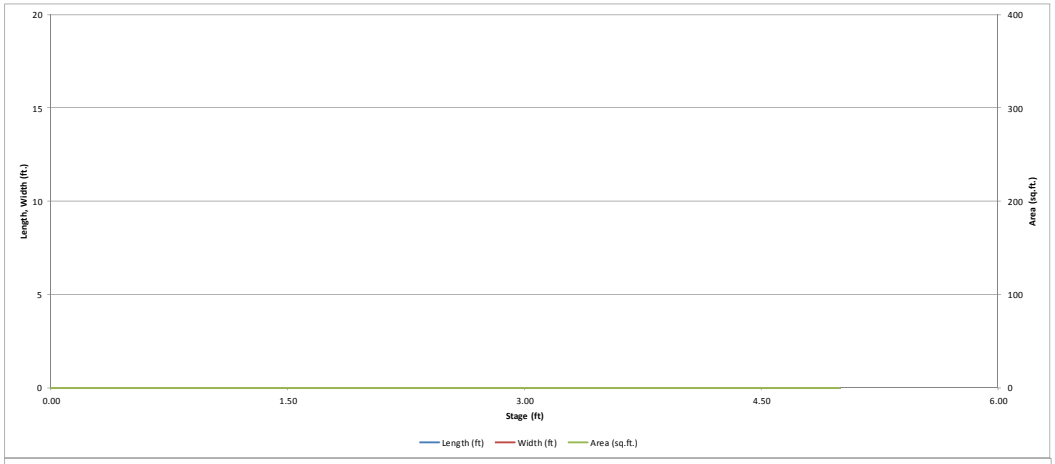
Zone 1 Volume (WQCV) =	0.161	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.077	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	1.195	acre-feet
Total Detention Basin Volume =	1.433	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	user	acre-feet

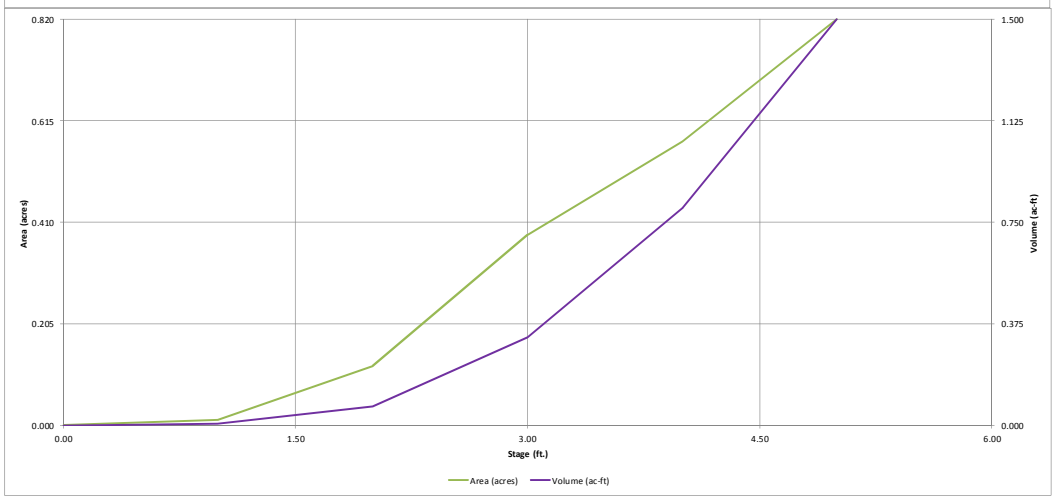
Depth Increment = 1 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	40	0.001		
6862	--	1.00	--	--	--	525	0.012	277	0.006
6863	--	2.00	--	--	--	5,215	0.120	3,101	0.071
6864	--	3.00	--	--	--	16,776	0.385	14,148	0.325
6865	--	4.00	--	--	--	24,933	0.572	35,002	0.804
6866	--	5.00	--	--	--	35,668	0.819	65,303	1.499

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

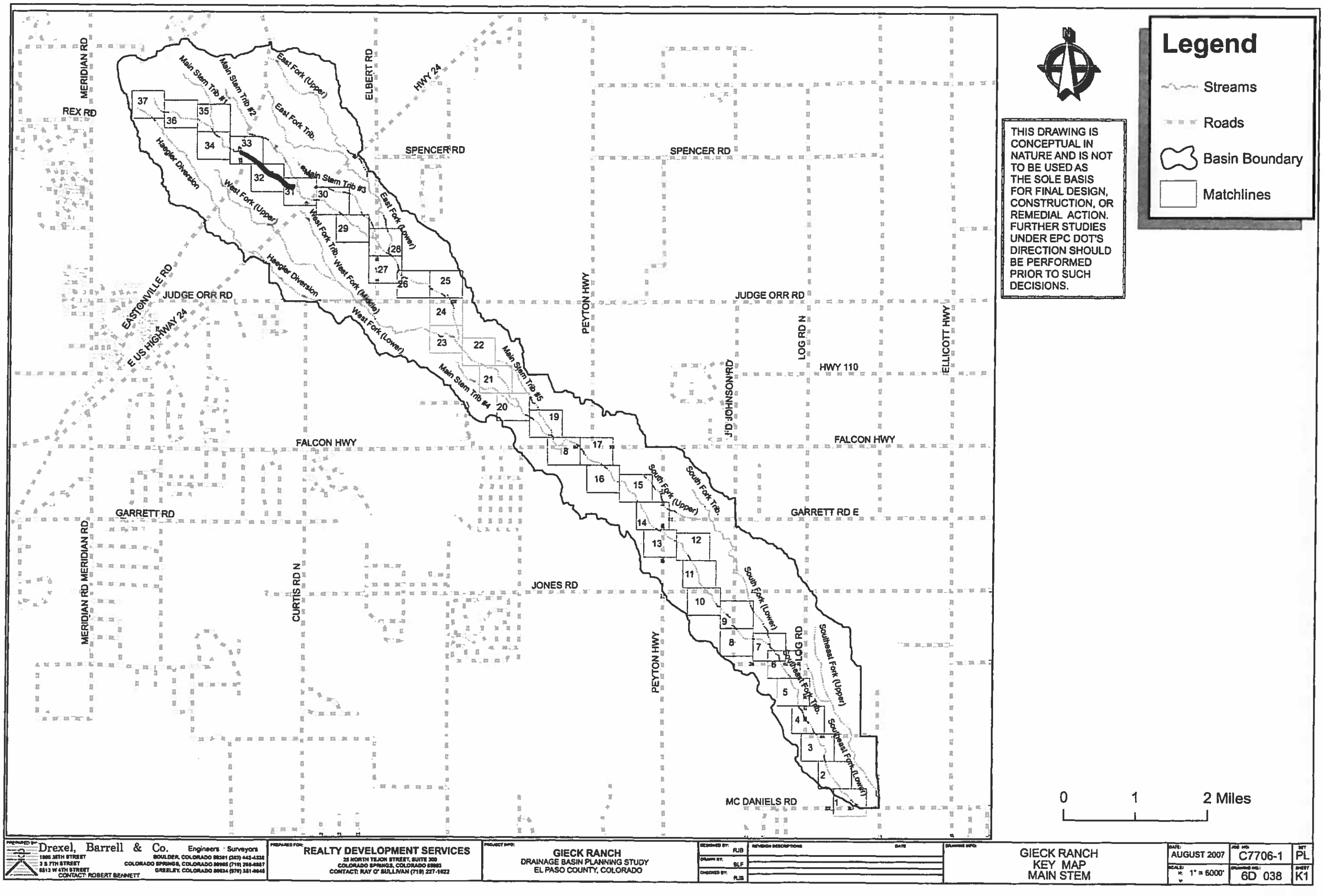




APPENDIX E

REFERENCE MATERIALS

Gieck Ranch DBPS



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6513 W 4TH STREET
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25 NORTH TEJON STREET, SUITE 300
COLORADO SPRINGS, COLORADO 80903
CONTACT: RAY O' SULLIVAN (719) 227-1622

PROJECT INFO: GIECK RANCH
DRAINAGE BASIN PLANNING STUDY
EL PASO COUNTY, COLORADO

DESIGNED BY: RJB
DRAWN BY: SLF
CHECKED BY: RJB

REVISION DESCRIPTIONS | DATE

DRAWING INFO: GIECK RANCH
KEY MAP
MAIN STEM

DATE: AUGUST 2007
SCALE: H: 1" = 6000' V:
JOB NO: C7706-1
DRAWING NO: 6D 038
SET: PL
SHEET: K1

MST2-R2

MST2-R2

POND: MS-S1
Q100 IN = 1210 CFS
Q100 OUT = 573 CFS
DETENTION STORAGE = 42 AC-FT

MS-R4b

MS-R5

PROPOSED STREET

REX RD

EASTONVILLE RD

See sheet 34

STRUCTURE #9
EXISTING: 24" CMP
PROPOSED: 2 - 10' X 5' CBC
(CONSIDER 3-SIDED CBC PER CDOW COMMENTS)
NOTE: ROAD TO BE RAISED TO ACCOMMODATE LARGER STRUCTURE.

GRADE CONTROL STRUCTURE
SEE FIGURE VII-7
(TYPICAL)

STRUCTURE #8
PROPOSED: 19' X 30" ERCP

See sheet 32

20 SE 21 SW 28 NE 28 NW

Environmental Key

- Ponds
- Riparian: Good
- Riparian: Poor
- Potential Wetlands

The channel is considered dry unless shown as one of the above environmental categories.

0 100 200 Feet

Legend

- *Proposed Future Conditions 100-yr Flood Limits*
- Streams
- Reaches
- Reach Breaklines
- Cross-sections
- Roads
- Structures
- Section Lines
- 5-ft contours
- 2-ft contours

Reach	Slope (%)	Q_{100} (cfs)	V_{100} (ft/s)
MS-R4b	1.76	1094	4.24
MS-R5	1.88	573	5.00

RECOMMENDED PLAN IMPROVEMENTS

Reach	
MS-R4b	Channelization
MS-R5	Vegetation Augmentation

Note:
See Technical Addenda for grade control data.

THIS DRAWING IS CONCEPTUAL IN NATURE AND IS NOT TO BE USED AS THE SOLE BASIS FOR FINAL DESIGN, CONSTRUCTION, OR REMEDIAL ACTION. FURTHER STUDIES UNDER EPC DOT'S DIRECTION SHOULD BE PERFORMED PRIOR TO SUCH DECISIONS.

PREPARED BY: Drexel, Barrell & Co. Engineers · Surveyors
1898 26TH STREET, BOULDER, COLORADO 80301 (303) 443-4339
3 S 7TH STREET, COLORADO SPRINGS, COLORADO 80905 (719) 260-0887
6313 W 4TH STREET, GREELEY, COLORADO 80634 (970) 351-0845
CONTACT: ROBERT BENNETT, P.E., CFM

PREPARED FOR: REALTY DEVELOPMENT SERVICES
25 NORTH TEJON STREET, SUITE 300
COLORADO SPRINGS, COLORADO 80903
CONTACT: RAY O' SULLIVAN (719) 227-1022

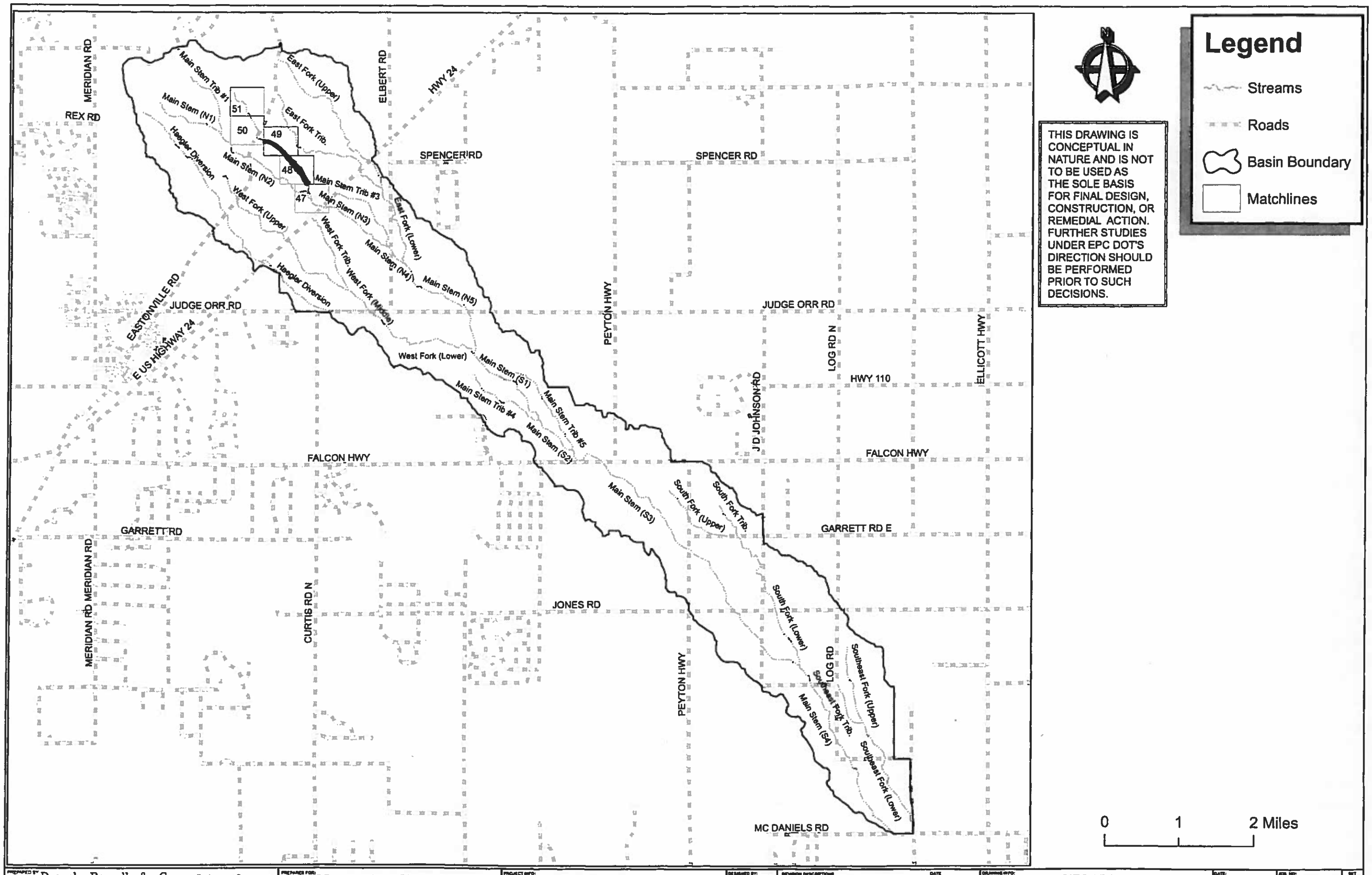
PROJECT INFO: GIECK RANCH
DRAINAGE BASIN PLANNING STUDY
EL PASO COUNTY, COLORADO

DESIGNED BY: RJB
DRAWN BY: BLF/MLM
CHECKED BY: RJB/TML

REVISION DESCRIPTIONS	DATE
PER EPC/CDOT COMMENTS	FEBRUARY 2008
PER EPC FINAL REVIEW	JANUARY 2010

DRAWING INFO: GIECK RANCH DBPS
PLAN VIEW
MAIN STEM #33

DATE: AUGUST 2007
SCALE: H: 1" = 200' V: NONE
JOB NO: C7706-2
DRAWING NO: 6D 038
SET: PL
SHEET: 33



THIS DRAWING IS CONCEPTUAL IN NATURE AND IS NOT TO BE USED AS THE SOLE BASIS FOR FINAL DESIGN, CONSTRUCTION, OR REMEDIAL ACTION. FURTHER STUDIES UNDER EPC DOT'S DIRECTION SHOULD BE PERFORMED PRIOR TO SUCH DECISIONS.

Legend

- Streams
- Roads
- Basin Boundary
- Matchlines

PREPARED BY: Drexel, Barrell & Co. Engineers · Surveyors
1560 30TH STREET
3 S 7TH STREET
6513 W 4TH STREET
CONTACT: ROBERT BENNETT
SOULDER, COLORADO 80301 (303) 442-4338
COLORADO SPRINGS, COLORADO 80905 (719) 260-0887
GREELEY, COLORADO 80634 (970) 351-9646

PREPARED FOR: REALTY DEVELOPMENT SERVICES
25 NORTH TEJON STREET, SUITE 300
COLORADO SPRINGS, COLORADO 80903
CONTACT: RAY O' SULLIVAN (719) 227-1022

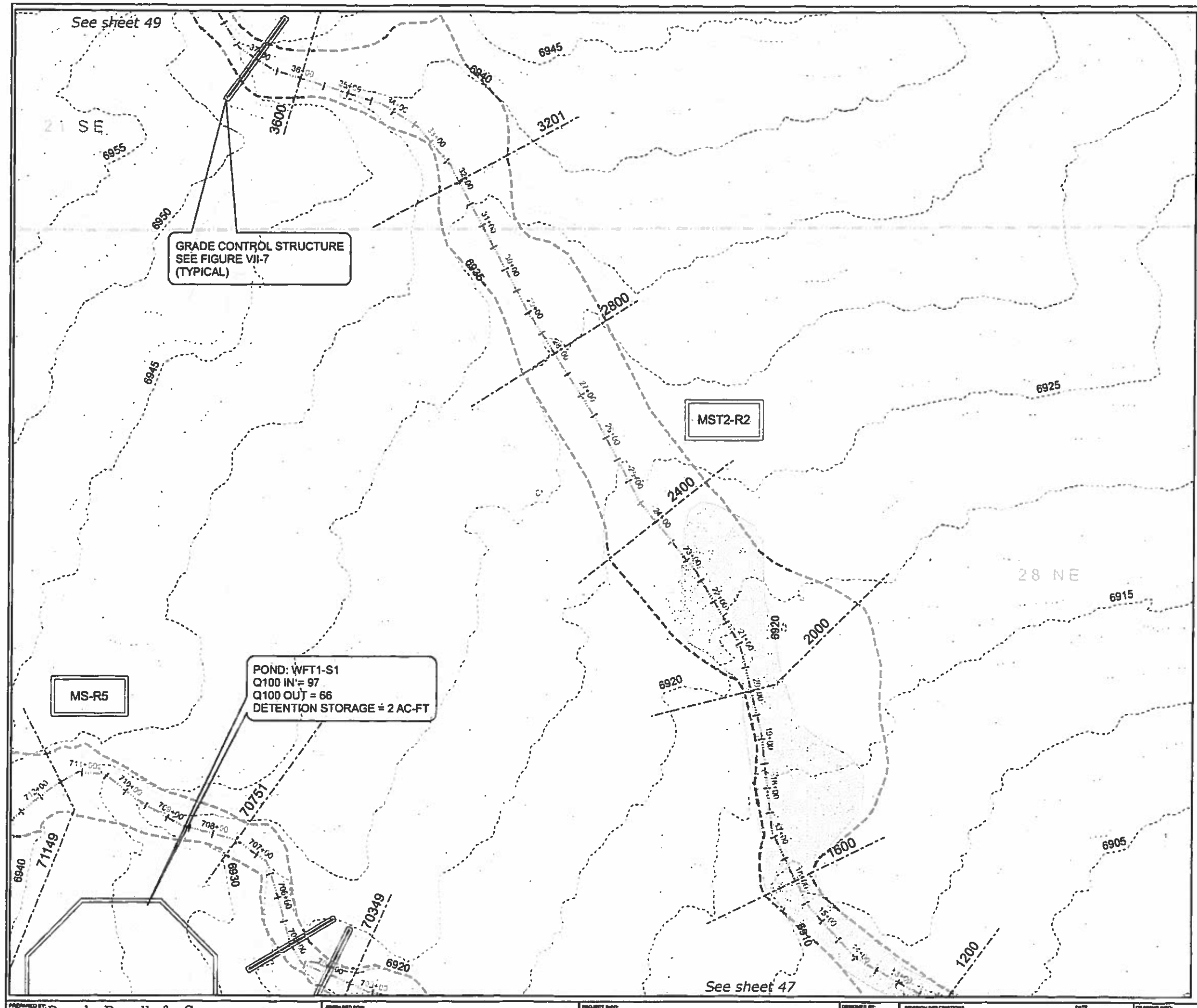
PROJECT INFO: GIECK RANCH
DRAINAGE BASIN PLANNING STUDY
EL PASO COUNTY, COLORADO

DESIGNED BY: RJB
DRAWN BY: BLF
CHECKED BY: RJB

REVISION DESCRIPTIONS	DATE

DRAWING INFO: GIECK RANCH
KEY MAP
MAIN STEM TRIBUTARY #2

DATE: AUGUST 2007
JOB NO: C7706-1
SET: PL
SCALE: H: 1" = 6000' V:
DRAWING NO.: 6D 038
SHEET: K5



Environmental Key

- Ponds
- Riparian: Good
- Riparian: Poor
- Potential Wetlands

The channel is considered dry unless shown as one of the above environmental categories.

0 100 200 Feet

Legend

- *Proposed Future Conditions 100-yr Flood Limits*
- Streams
- Reaches
- Reach Breaklines
- Cross-sections
- Roads
- Structures
- Section Lines
- 5-ft contours
- 2-ft contours

Reach	Slope (%)	Q_{100} (cfs)	V_{100} (ft/s)
MST2-R2	1.93	271	3.16

RECOMMENDED PLAN IMPROVEMENTS

Reach	
MST2-R2	Vegetation Augmentation

Note:
See Technical Addenda for grade control data.

THIS DRAWING IS CONCEPTUAL IN NATURE AND IS NOT TO BE USED AS THE SOLE BASIS FOR FINAL DESIGN, CONSTRUCTION, OR REMEDIAL ACTION. FURTHER STUDIES UNDER EPC DOT'S DIRECTION SHOULD BE PERFORMED PRIOR TO SUCH DECISIONS.

PREPARED BY: Drexel, Barrell & Co. Engineers · Surveyors
1609 35TH STREET, BOULDER, COLORADO 80301 (303) 442-4338
3 S 7TH STREET, COLORADO SPRINGS, COLORADO 80905 (719) 260-0887
5313 W 4TH STREET, GREELEY, COLORADO 80634 (970) 351-9648
CONTACT: ROBERT BENNETT, P.E., CFM

PREPARED FOR: REALTY DEVELOPMENT SERVICES
25 NORTH TEJON STREET, SUITE 308
COLORADO SPRINGS, COLORADO 80903
CONTACT: RAY O' SULLIVAN (719) 227-1022

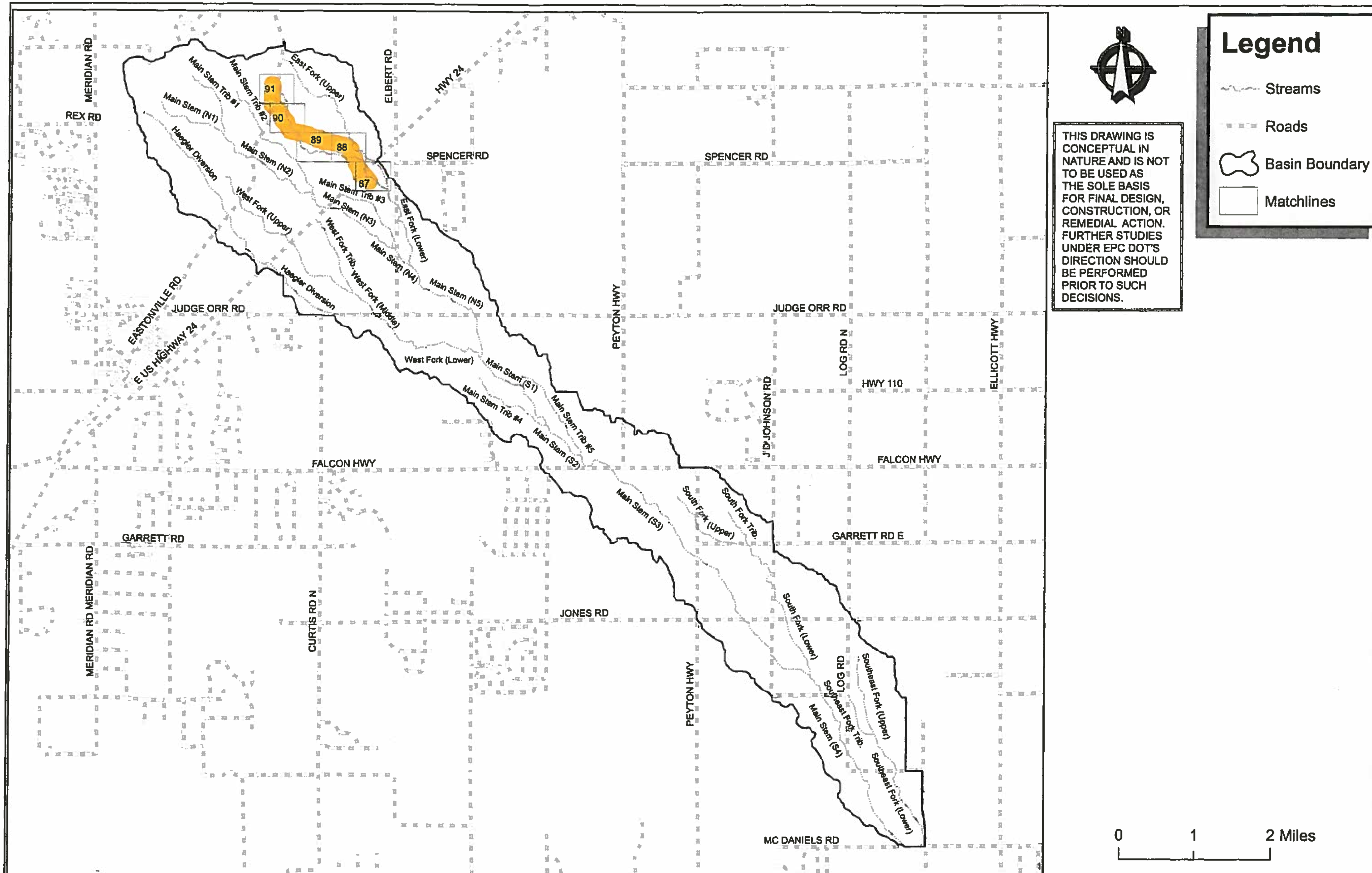
PROJECT INFO: GIECK RANCH
DRAINAGE BASIN PLANNING STUDY
EL PASO COUNTY, COLORADO

DESIGNED BY: RJB
DRAWN BY: BLF/MLM
CHECKED BY: RJB/TML

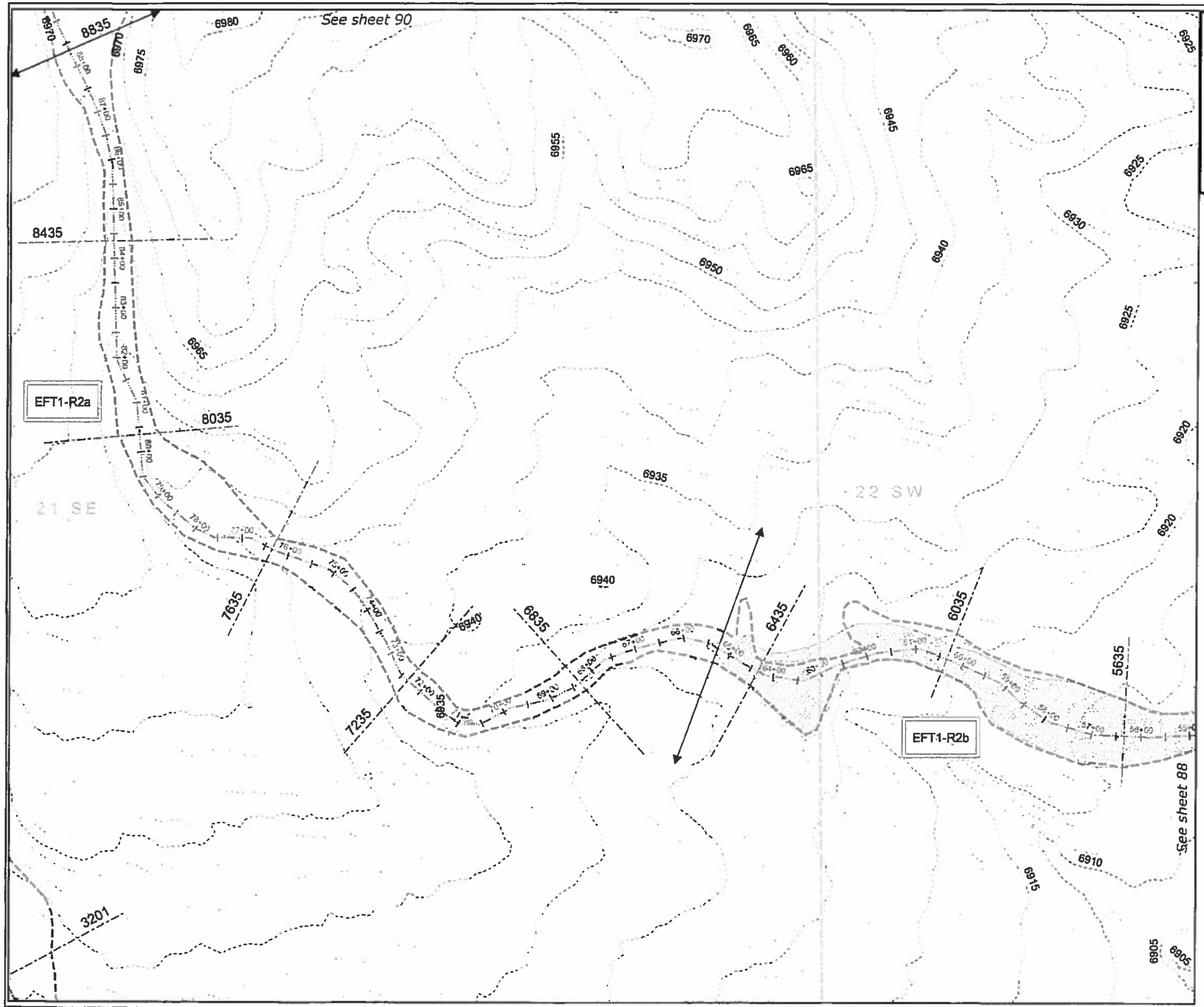
REVISION DESCRIPTIONS	DATE
PER EPCDOT COMMENTS	FEBRUARY 2008
PER EPC FINAL REVIEW	JANUARY 2010

DRAWING INFO: GIECK RANCH DBPS
PLAN VIEW
MAIN STEM TRIBUTARY-2 #2

DATE: AUGUST 2007
JOB NO: C7706-2
SET: PL
SCALE: 1" = 200' / NONE
DRAWING NO: 6D 038
SHEET: 48



PREPARED BY: Drexel, Barrell & Co. Engineers · Surveyors. 1800 38TH STREET, BOULDER, COLORADO 80301 (303) 442-4338; 3 S 7TH STREET, COLORADO SPRINGS, COLORADO 80905 (719) 260-0887; 1513 W 4TH STREET, GREELEY, COLORADO 80634 (970) 351-0645. CONTACT: ROBERT BENNETT	PREPARED FOR: REALTY DEVELOPMENT SERVICES, 25 NORTH TEJON STREET, SUITE 300, COLORADO SPRINGS, COLORADO 80903. CONTACT: RAY O' SULLIVAN (719) 227-1622	PROJECT INFO: GIECK RANCH DRAINAGE BASIN PLANNING STUDY EL PASO COUNTY, COLORADO	DESIGNED BY: RJB; DRAWN BY: BLF; CHECKED BY: RJB	DRAWING INFO: GIECK RANCH KEY MAP EAST FORK TRIBUTARY	DATE: AUGUST 2007; SCALE: H: 1" = 6000' V:; JOB NO: C7706-1; DRAWING NO.: 6D 038; SET: PL; SHEET: K11



Environmental Key

- Ponds
- Riparian: Good
- Riparian: Poor
- Potential Wetlands

The channel is considered dry unless shown as one of the above environmental categories.

Legend

- *Proposed Future Conditions 100-yr Flood Limits*
- Streams
- Reaches
- Reach Breaklines
- Cross-sections
- Roads
- Structures
- Section Lines
- 5-ft contours
- 2-ft contours

0 100 200 Feet

Reach	Slope (%)	Q_{100} (cfs)	V_{100} (ft/s)
EFT1-R2a	1.83	217	3.73
EFT1-R2b	1.60	217	2.68

RECOMMENDED PLAN IMPROVEMENTS

Reach	
EFT1-R2a	As-needed Improvements
EFT1-R2b	As-needed Improvements

THIS DRAWING IS CONCEPTUAL IN NATURE AND IS NOT TO BE USED AS THE SOLE BASIS FOR FINAL DESIGN, CONSTRUCTION, OR REMEDIAL ACTION. FURTHER STUDIES UNDER EPC DOT'S DIRECTION SHOULD BE PERFORMED PRIOR TO SUCH DECISIONS.

PREPARED BY: Drexel, Barrell & Co. Engineers · Surveyors
1800 28TH STREET, BOULDER, COLORADO 80301 (303) 442-4338
3 S 7TH STREET, COLORADO SPRINGS, COLORADO 80905 (719) 260-0887
8513 W 4TH STREET, GREELEY, COLORADO 80634 (970) 351-6445
CONTACT: ROBERT BENNETT, P.E., CFM

PREPARED FOR: REALTY DEVELOPMENT SERVICES
25 NORTH TEJON STREET, SUITE 300
COLORADO SPRINGS, COLORADO 80903
CONTACT: RAY O' SULLIVAN (719) 227-1022

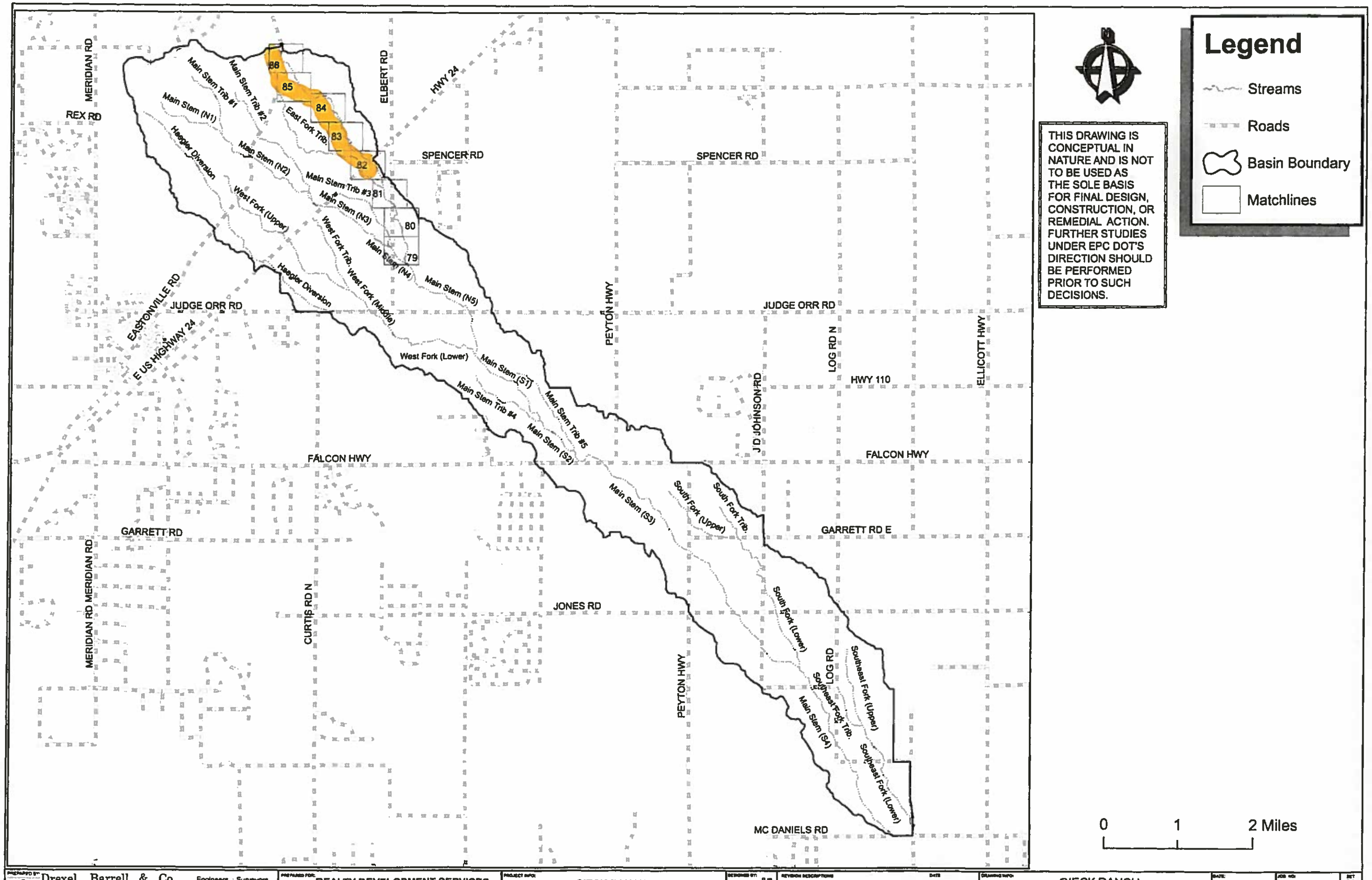
PROJECT INFO: GIECK RANCH
DRAINAGE BASIN PLANNING STUDY
EL PASO COUNTY, COLORADO

DESIGNED BY: RJB
DRAWN BY: BLF/MLM
CHECKED BY: RJB/TML

REVISION DESCRIPTION: PER EPC FINAL REVIEW
DATE: JANUARY 2010

DRAWING INFO: GIECK RANCH DBPS
PLAN VIEW
EAST FORK TRIBUTARY #3

DATE: AUGUST 2007
JOB NO: C7706-2
SET: PL
SCALE: H: 1" = 200' V: NONE
DRAWING NO.: 6D 038
SHEET: 89



PREPARED BY: Drexel, Barrell & Co. Engineers · Surveyors
1888 38TH STREET, BOULDER, COLORADO 80301 (303) 442-4338
3 S 7TH STREET, COLORADO SPRINGS, COLORADO 80905 (719) 358-0887
6313 W 4TH STREET, GREELEY, COLORADO 80634 (970) 351-0648
CONTACT: ROBERT BENNETT

PREPARED FOR: REALTY DEVELOPMENT SERVICES
25 NORTH TEJON STREET, SUITE 300
COLORADO SPRINGS, COLORADO 80903
CONTACT: RAY O' SULLIVAN (719) 227-1822

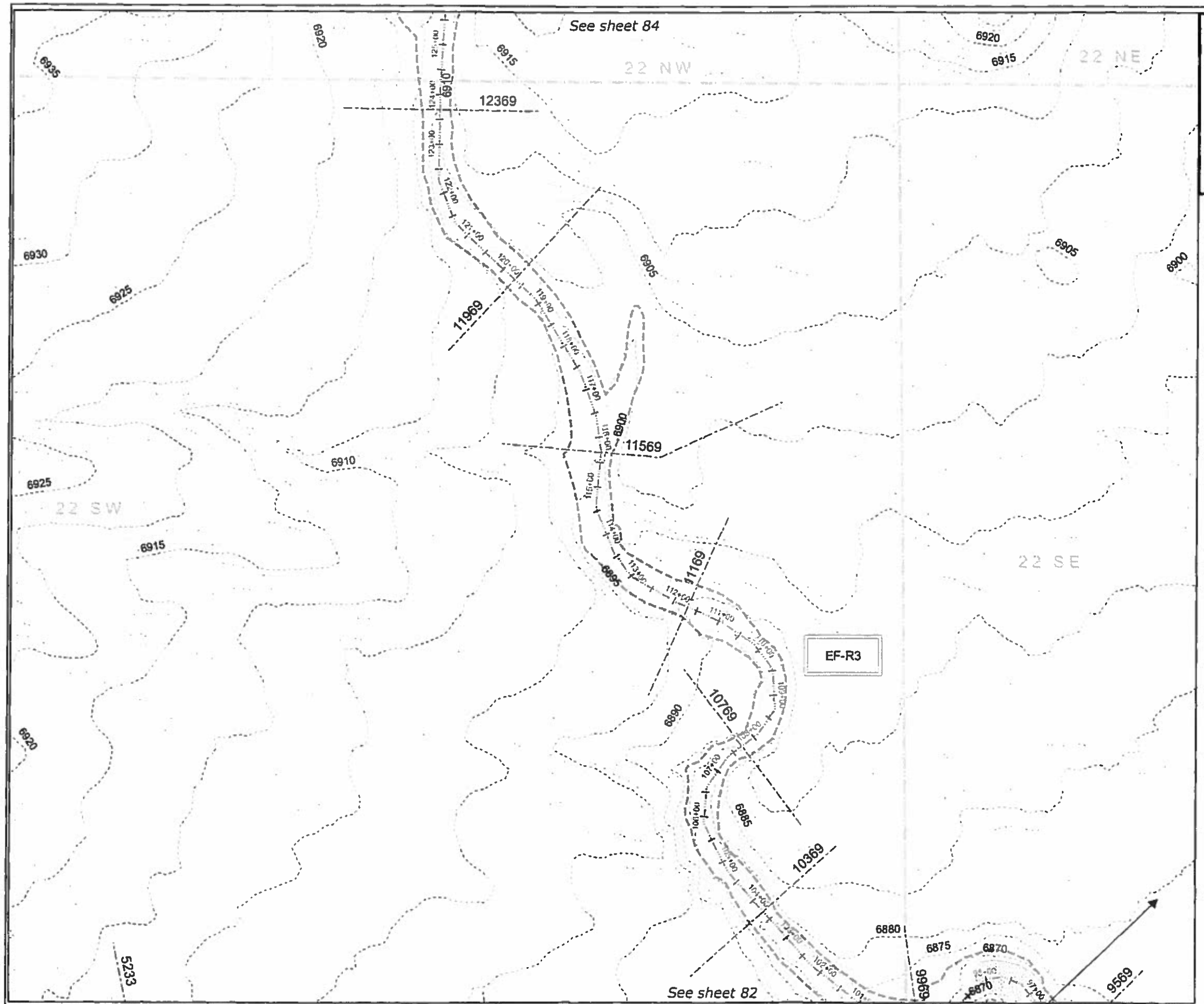
PROJECT INFO: GIECK RANCH
DRAINAGE BASIN PLANNING STUDY
EL PASO COUNTY, COLORADO

DESIGNED BY: RJB
DRAWN BY: SLF
CHECKED BY: RJB

REVISION DESCRIPTIONS | DATE

DRAWING INFO: GIECK RANCH
KEY MAP
EAST FORK

DATE: AUGUST 2007
SCALE: H. 1" = 6000' V.
JOB NO: C7706-1
DRAWING NO.: 6D 038
SHEET: PL
SHEET: K10



Environmental Key

- Ponds
- Riparian: Good
- Riparian: Poor
- Potential Wetlands

The channel is considered dry unless shown as one of the above environmental categories.

Legend

- *Proposed Future Conditions 100-yr Flood Limits*
- Streams
- Reaches
- Reach Breaklines
- Cross-sections
- Roads
- Structures
- Section Lines
- 5-ft contours
- 2-ft contours

0 100 200 Feet

Reach	Slope (%)	Q_{100} (cfs)	V_{100} (ft/s)
EF-R3	1.53	595	5.09

RECOMMENDED PLAN IMPROVEMENTS

Reach	
EF-R3	As-needed Improvements

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Drexel, Barrell & Co. Engineers · Surveyors
1888 38TH STREET
3 S 7TH STREET
8513 W 4TH STREET
CONTACT: ROBERT BENNETT, P.E., CFM
BOULDER, COLORADO 80301 (303) 443-4335
COLORADO SPRINGS, COLORADO 80905 (719) 260-0887
GREELEY, COLORADO 80634 (970) 351-9645

PREPARED FOR: REALTY DEVELOPMENT SERVICES
25 NORTH TEJON STREET, SUITE 200
COLORADO SPRINGS, COLORADO 80903
CONTACT: RAY O' SULLIVAN (719) 227-1022

PROJECT INFO: GIECK RANCH
DRAINAGE BASIN PLANNING STUDY
EL PASO COUNTY, COLORADO

DESIGNED BY: RJB
DRAWN BY: SLF/MLM
CHECKED BY: RJB/TML

REVISION DESCRIPTION & DATE: PER EPC FINAL REVIEW — JANUARY 2010

DRAWING INFO: GIECK RANCH DBPS
PLAN VIEW
EAST FORK #5

DATE: AUGUST 2007
JOB NO: C7706-2
SHEET: PL
SCALE: 1" = 200' / NONE
DRAWING NO.: 6D 038
SHEET: 83

Fourway LOMR

Federal Emergency Management Agency

Washington, D.C. 20472

FEB 19 2004

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Chuck Brown
Chairman, El Paso County
Board of Commissioners
27 East Vermijo Avenue
Colorado Springs, CO 80903-2208

IN REPLY REFER TO:
Case No.: 04-08-0012P
Community Name: El Paso County, CO
Community No.: 080059
Effective Date of This Revision: MAR 19 2004

Dear Mr. Brown:

The Flood Insurance Rate Map for your community has been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel(s) revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Federal Insurance and Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Denver, Colorado, at (303) 235-4830, or the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Sincerely,

Kevin C. Long

Kevin C. Long, CFM, Project Engineer
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

For: Doug Bellomo, P.E., CFM, Acting Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

List of Enclosures:
Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map

cc: Mr. Kevin Stilson, P.E., CFM
Floodplain Administrator
Pikes Peak Regional Building Department

Mr. Richard N. Wray, P.E.
Principal
Kiowa Engineering Corporation

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .55

23.00	1.35	6915.35	.00	.00	6915.49	.14	21.92	.07	6916.00
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.011316	1300.	1290.	1250.	4	0	0	.00	135.11	1182.63

0
1

THIS RUN EXECUTED 9/26/ 3 12:59:45

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HEC2 RELEASE DATED SEP 88 UPDATED APR 1989

ERROR CORR - 01,02
MODIFICATION -
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

100-YEAR FREQUENCY

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*K3	VCH	AREA	
	25.000	.00	.00	.00	6882.00	690.00	6883.04	.00	6884.26	79.42	4.53	152.26	[illegible]
*	24.000	660.00	.00	.00	6890.30	690.00	6892.76	6892.76	6893.51	206.30	7.13	96.47	[illegible]
*	23.000	1280.00	.00	.00	6914.00	690.00	6915.35	.00	6915.49	118.16	3.05	91.74	[illegible]

1

100-YEAR FREQUENCY

SUMMARY PRINTOUT TABLE 150

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*SECNO 24.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .63

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      .03       .00     7.15      .00     .000     .040     .000     .000  6890.00  1265.56
   .020137     700.     760.     750.       11       14        0      .00    60.74  1326.31
                        730
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*SECNO 21.000

3301 HV CHANGED MORE THAN HVINS

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     413.        0.     413.       0.       0.      98.       0.       4.       3.   6910.00
      .09       .00     4.22      .00     .000     .040     .000     .000  6908.00  1185.45
   .012056     950.     980.     950.        4        0        0      .00    92.82  1278.27
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*SECNO 20.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
     20.00     1.12  6927.12  6927.12      .00  6927.63      .50    15.80      .07  6928.00
     413.        0.     413.       0.       0.      72.       0.       6.       5.   6928.00
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1
     9/26/ 3      12: 0:55                                                                   PAGE    3


                                                               THIS RUN EXECUTED  9/26/ 3    12: 0:55
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  HEC2 RELEASE DATED SEP 88 UPDATED APR  1989


  ERROR CORR -   01,02
  MODIFICATION -
**************************************************


NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST


     100-YEAR FREQUENCY
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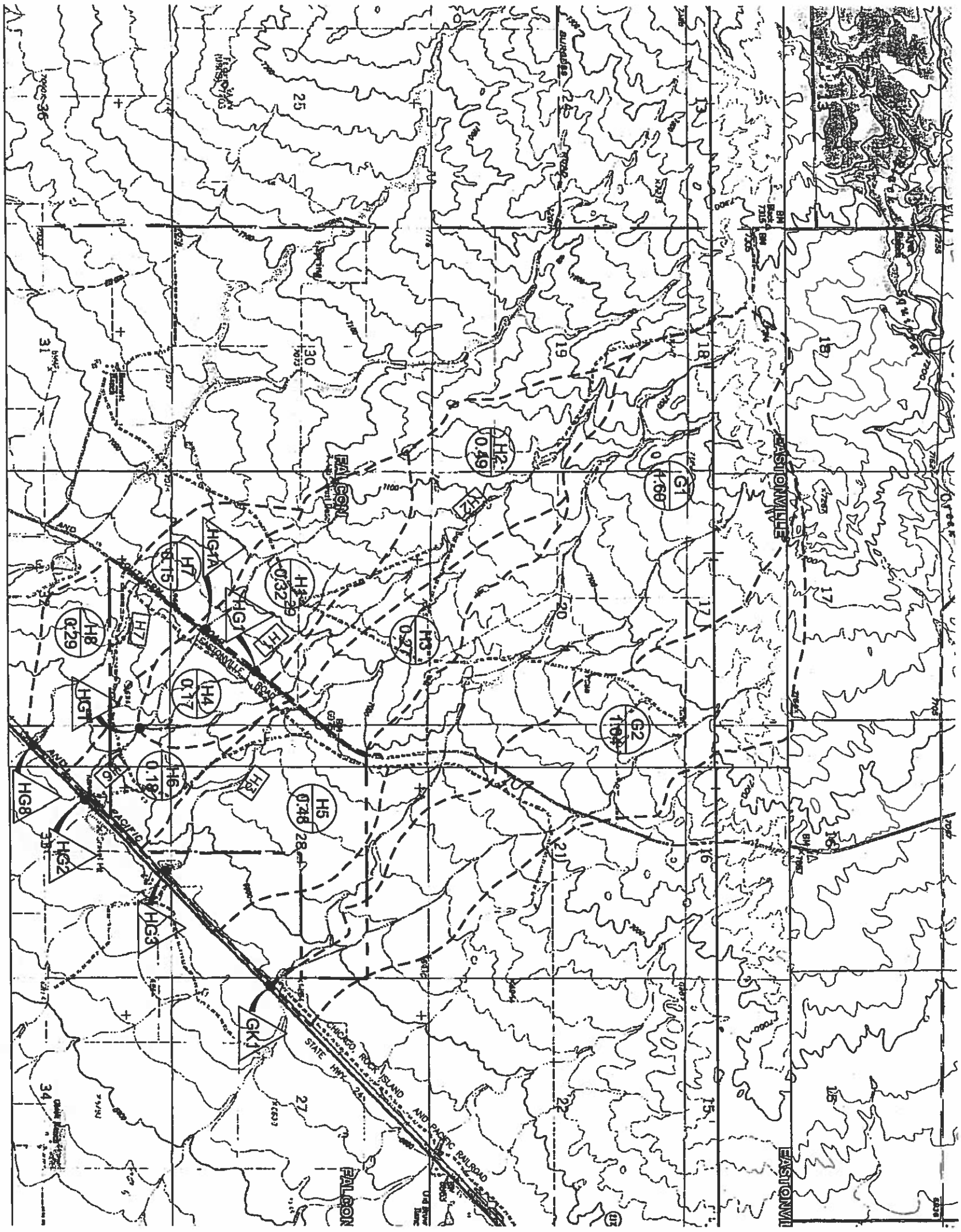
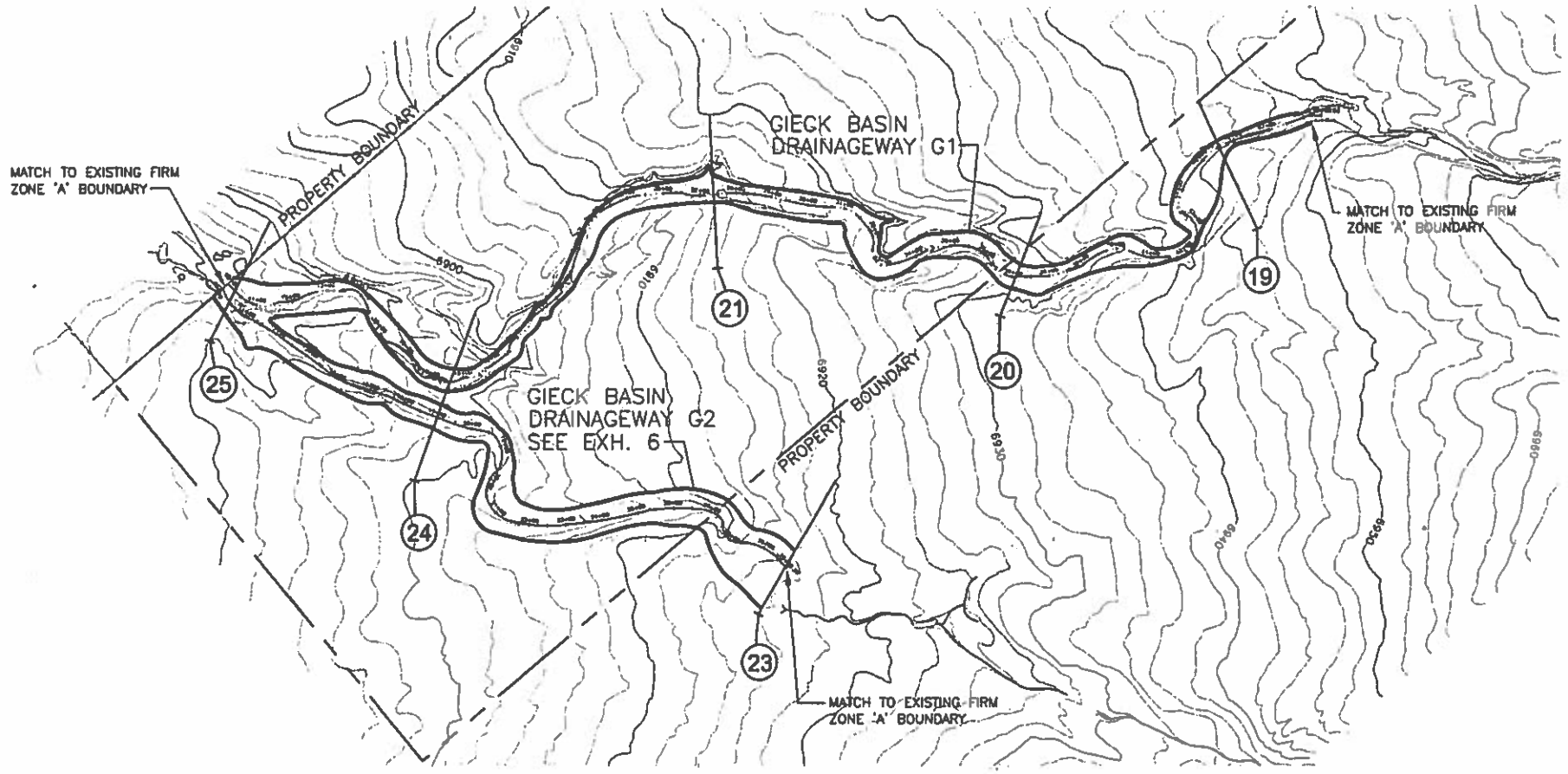


Exh. 1

Project No. 03031
Date: 9/10/2003
Design: RNW
Drawn: JLH
Check: RNW
Revisions:

FOUR WAY RANCH
LETTER OF MAP REVISION
HYDROLOGIC SUB-BASIN MAP
EL PASO COUNTY, COLORADO

Kiowa Engineering Corporation
1604 South 21st Street
Colorado Springs, Colorado
80904 - 4208
(719) 630-7342



NOTES :

1. CROSS-SECTIONS ORIENTED LEFT-TO-RIGHT FACING UPSTREAM.

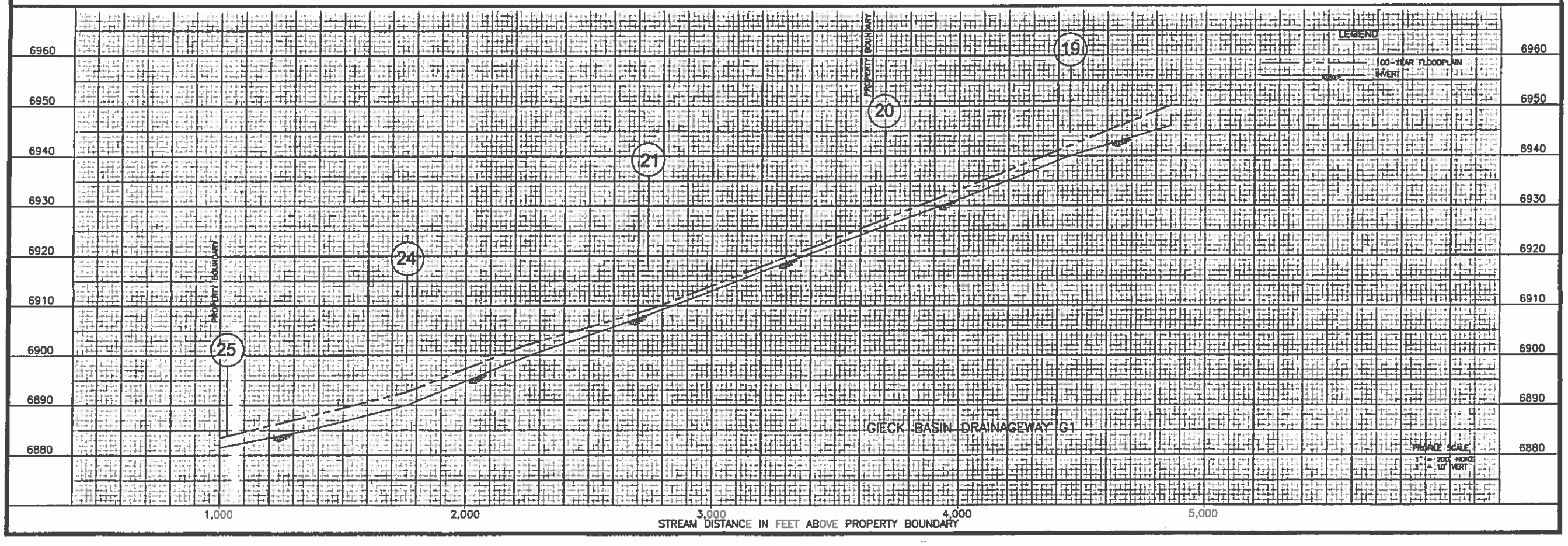
2. TOPOGRAPHY COMPILED USING DATA FROM SURVEY PERFORMED BY CLARK LAND SURVEYING, INC. JANUARY, 2003. ELEVATIONS BASED ON THE NAVD 88.

0 200' 400'

LEGEND

14 — HEC-2 CROSS-SECTION

100-YR FLOODPLAIN



Kiowa Engineering Corporation
1604 South 21st St.
Colorado Springs, Colorado
80904 - 4208
(719) 630-7342

FOUR WAY RANCH
LETTER OF MAP REVISION
100-YEAR FLOODPLAIN BOUNDARY & PROFILE WORKMAP
EL PASO COUNTY, COLORADO

Project No.:	03031
Date:	SEPT., 2003
Design:	RNW
Drawn:	JLN
Check:	RNW
Revisions:	

SHEET

EXH. 5

Elbert Road Site LOMR

Unnamed Tributary Black Squirrel Creek Drainage Basin

Letter of Map Revision

Elbert Road Site

El Paso County, Colorado

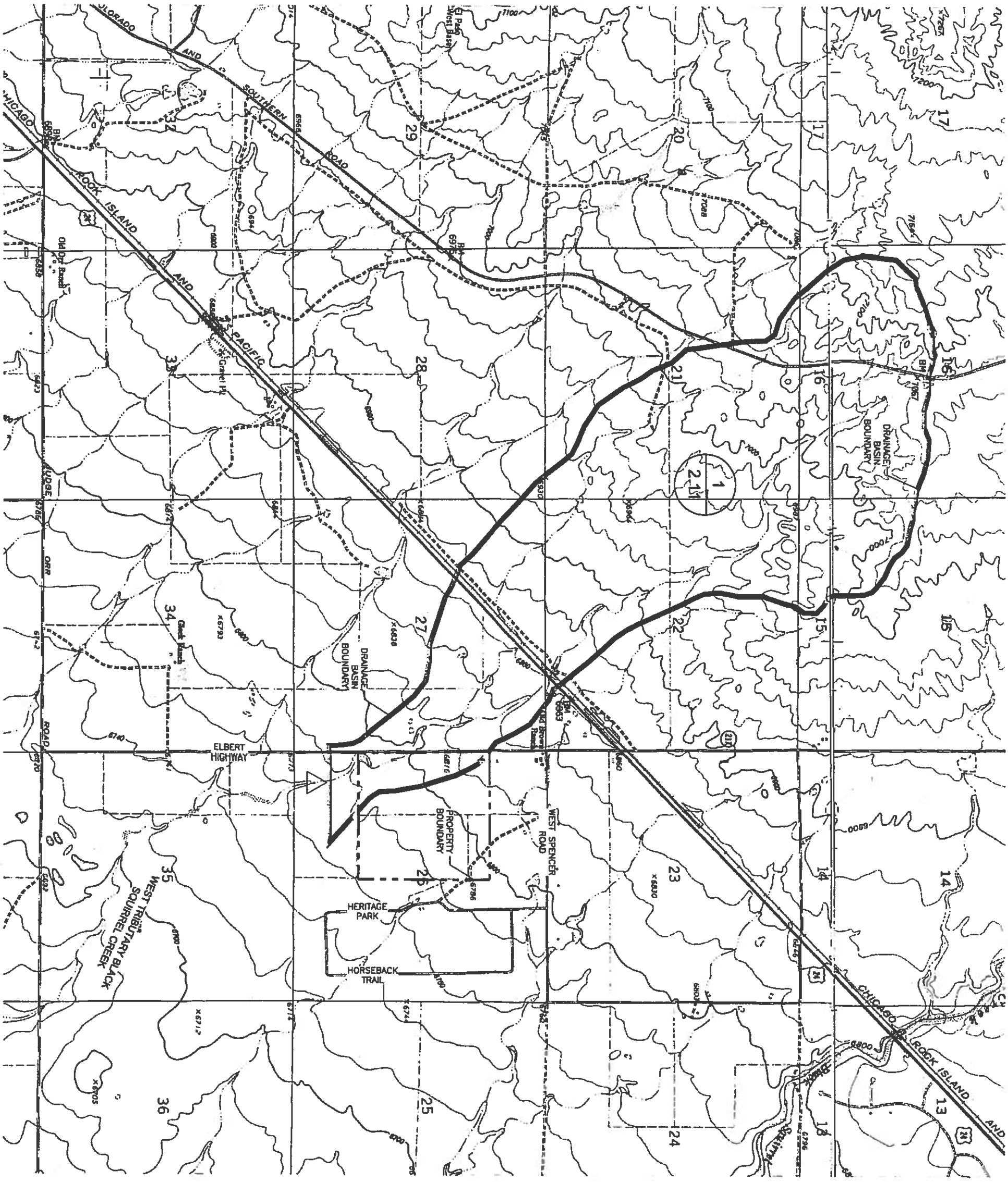
Prepared For:

Mr. Grant Langdon
Wilshire Development Corporation
6040 North 22nd Place
Phoenix, AZ 85016

Prepared By:

Kiowa Engineering Corporation
1604 South 21st Street
Colorado Springs, Colorado 80904

February 2006
Project No. 06001



UNNAMED TRIBUTARY TO BLACK SQUIRREL CREEK
LETTER OF MAP REVISION
HYDROLOGIC SUB-BASIN MAP
EL PASO COUNTY, COLORADO

Exh.1

Project No.: 06001
Date: 2/2008
Design: RWW
Drawn: MHH
Check: RWW
Revisions:

Kiowa Engineering Corporation
1604 South 21st Street
Colorado Springs, Colorado
80904 - 4208
(719) 630-7342

Meridian Ranch MDDP

J·R ENGINEERING

REVISION TO:
MASTER DEVELOPMENT
DRAINAGE PLAN
MERIDIAN RANCH
EL PASO COUNTY, COLORADO

MERIDIAN RANCH

A GOLF & RECREATIONAL COMMUNITY

January 2018

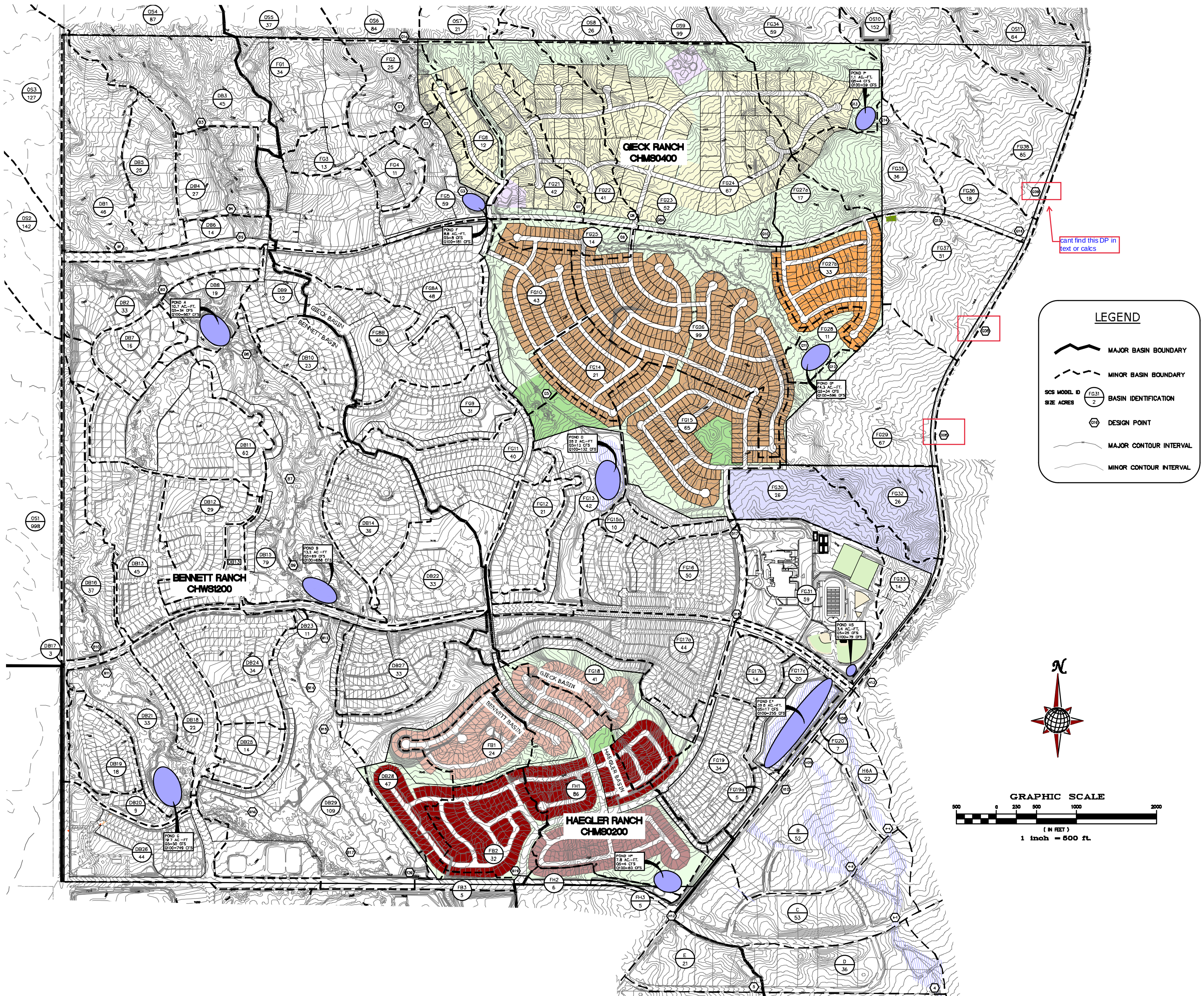
Prepared For:

GTL DEVELOPMENT, INC.
P.O. Box 80036
San Diego, CA 92138

Prepared By:
Tech Contractors
11886 Stapleton Drive
Falcon, CO 80831
719.495.7444

PCD Project No. SKP171

MASTER DEVELOPMENT DRAINAGE PLAN
MERIDIAN RANCH



*NOTE: PRELIMINARY STORAGE VOLUMES AND OUTFLOW QUANTITIES HAVE BEEN PROVIDED FOR EACH OF THE FUTURE DETENTION FACILITIES LOCATED WITHIN THE DEVELOPMENT. THE ACTUAL STORAGE VOLUMES AND DISCHARGE RATES WILL BE DETERMINED UPON A COMPLETE ANALYSIS FOR EACH DETENTION FACILITY PRIOR TO CONSTRUCTION. THE VALUES GIVEN FOR DISCHARGE AND VOLUME ARE ESTIMATES FOR PLANNING PURPOSES ONLY.

DEVELOPED CONDITIONS - SCS MAP

TECH CONTRACTORS
10305 ANGELES ROAD
FALCON, CO 80831
TELEPHONE: 719.495.7444
FAX: 719.495.7608

NOV 2017

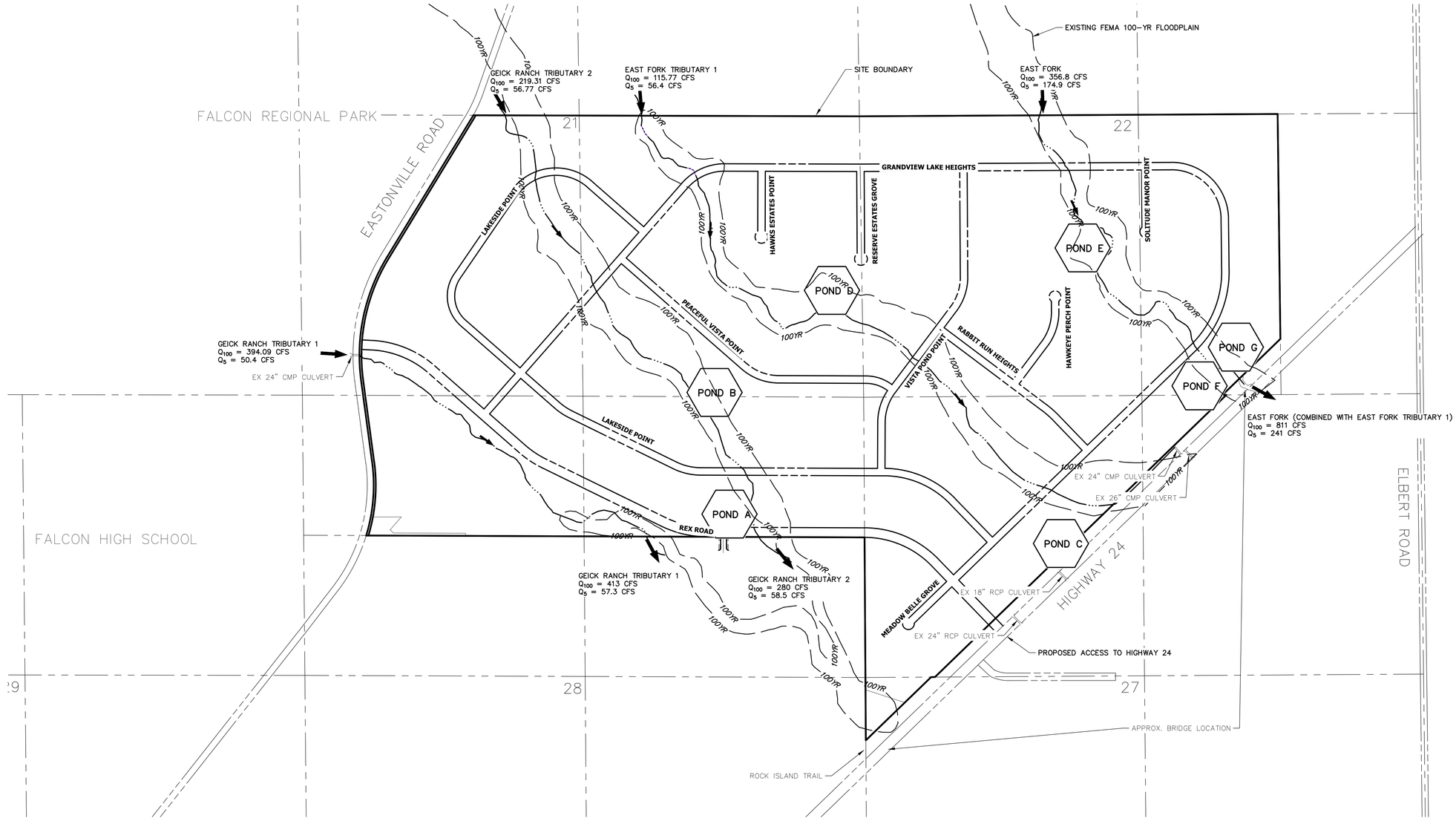
FIGURE 5

APPENDIX F

DRAINAGE MAPS

GRANDVIEW RESERVE

GENERAL LOCATION MAP



500 250 0 500

ORIGINAL SCALE: 1" = 500'

GENERAL LOCATION MAP
GRANDVIEW RESERVE
JOB NO. 29931.26
1/15/19
SHEET 1 OF 5

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GRANDVIEW RESERVE

DRAINAGE MAP

MAJOR DRAINAGEWAY DESIGN FLOW SUMMARY TABLE						
Name	Reach	Design Point	HEC-RAS X Sections		Flow Rate	
			Upstream	Downstream	Q_5 [cfs]	Q_{100} [cfs]
Gieck Ranch Tributary 1 (GRT1)	R1	GR-T1-R1	4586.31	1277.21	60	394
	R2	GR_T1_OUT	1277.21	870.4	67	413
Gieck Ranch Tributary 2 (GRT2)	R1	GR_T2_R1	5786.62	1492.43	57	219
	R2	GR_T2_R2	1492.43	1183.47	57	237
	R3	GR_T2_R3	1183.47	675	59	280
East Fork Tributary 1 (EFT1)	R1	EF_T1_R1	8248.03	4893.61	56	116
	R2	EF_T1_R2	4893.61	883	61	177
	R3	EF_T1_R3_P	Proposed Section Not Modeled		61	217
East Fork (EF)	R1	EF_R1	4747.49	2951.88	174	360
	R2	EF_R2	2951.88	2261.03	175	418
	R3	EF_R3	2261.03	928	180	435
	R4	EF_R4	928	698.4	245*	808*

*Combined flow from EF and EFT1

BASIN AND POND SUMMARY TABLE								
	IDENTIFIER	BASIN		RUNOFF/INFLOW		ALLOWABLE RELEASE RATE		POND VOLUME
	Basin/Pond	Area [ac]	Composite % Impervious	Q_5 [cfs]	Q_{100} [cfs]	Q_5 [cfs]	Q_{100} [cfs]	[Ac-ft]
Basin/Pond	A	136.48	7.1%	37.9	90.5	0.4	44.2	2.62
	B	50.20	7.8%	15.9	38.9	0.1	14.9	1.01
	C	110.73	7.6%	29.7	71.2	0.4	41.0	2.20
	D	40.28	5.9%	10.2	66.2	0.8	48.9	1.17
	E	60.44	7.0%	17.8	87.8	0.9	59.3	1.90
	F	105.74	6.2%	27.5	136.1	1.3	84.2	2.93
	G	21.93	6.7%	6.0	24.6	0.2	18.3	0.79
	H	52.37	5.1%	11.4	83.2	0.9	59.5	1.43
Basin	V	61.68	2.6%	6.9	18.9	NA	NA	NA
	W	14.49	2.0%	1.2	3.4	NA	NA	NA
	X	66.04	1.3%	3.6	13.2	NA	NA	NA
	Y	23.96	1.4%	1.5	6.6	NA	NA	NA
	Z	22.10	1.9%	1.8	17.6	NA	NA	NA

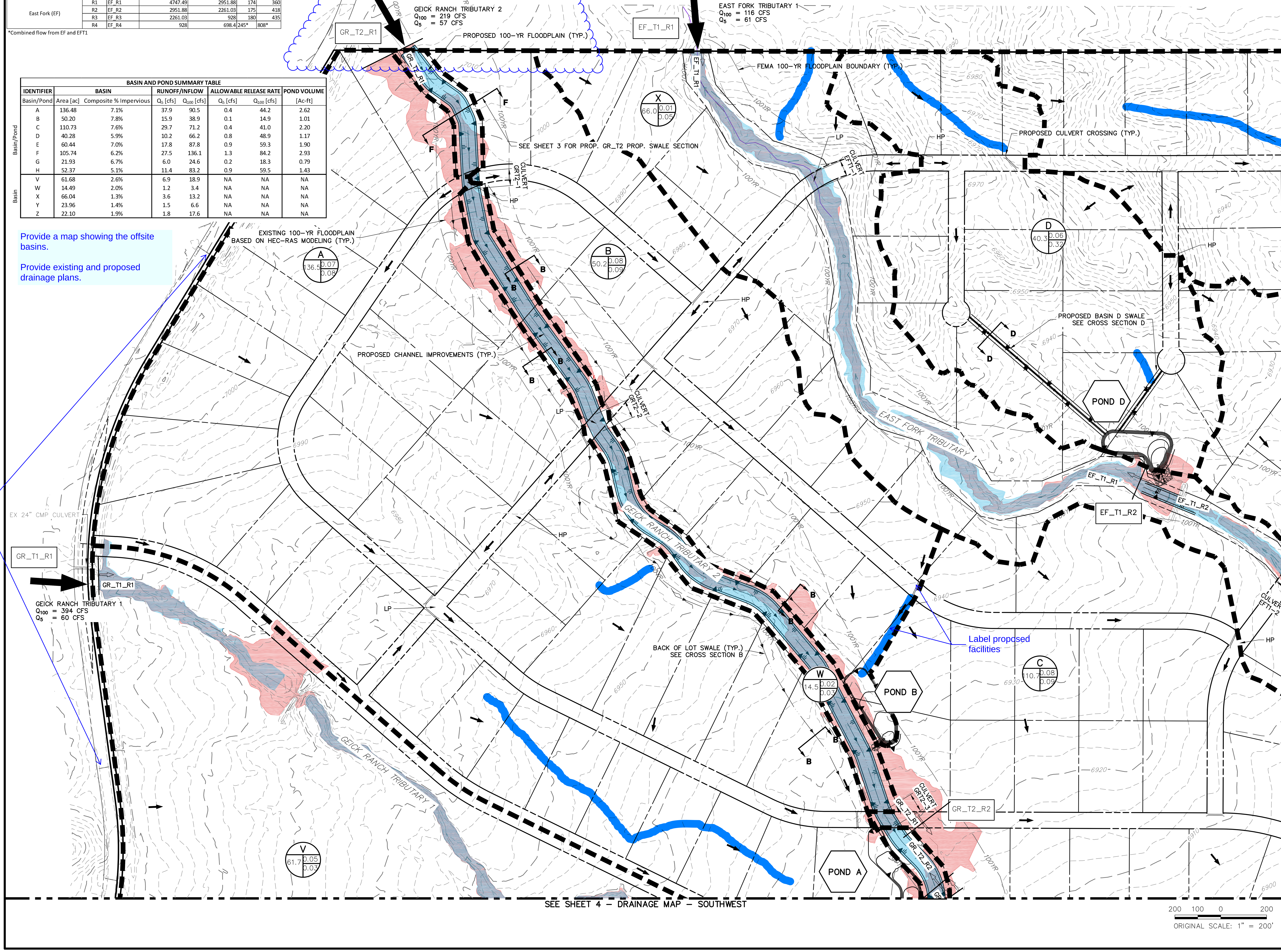
Without a defined channel offsite, how are flows directed into the proposed channel?

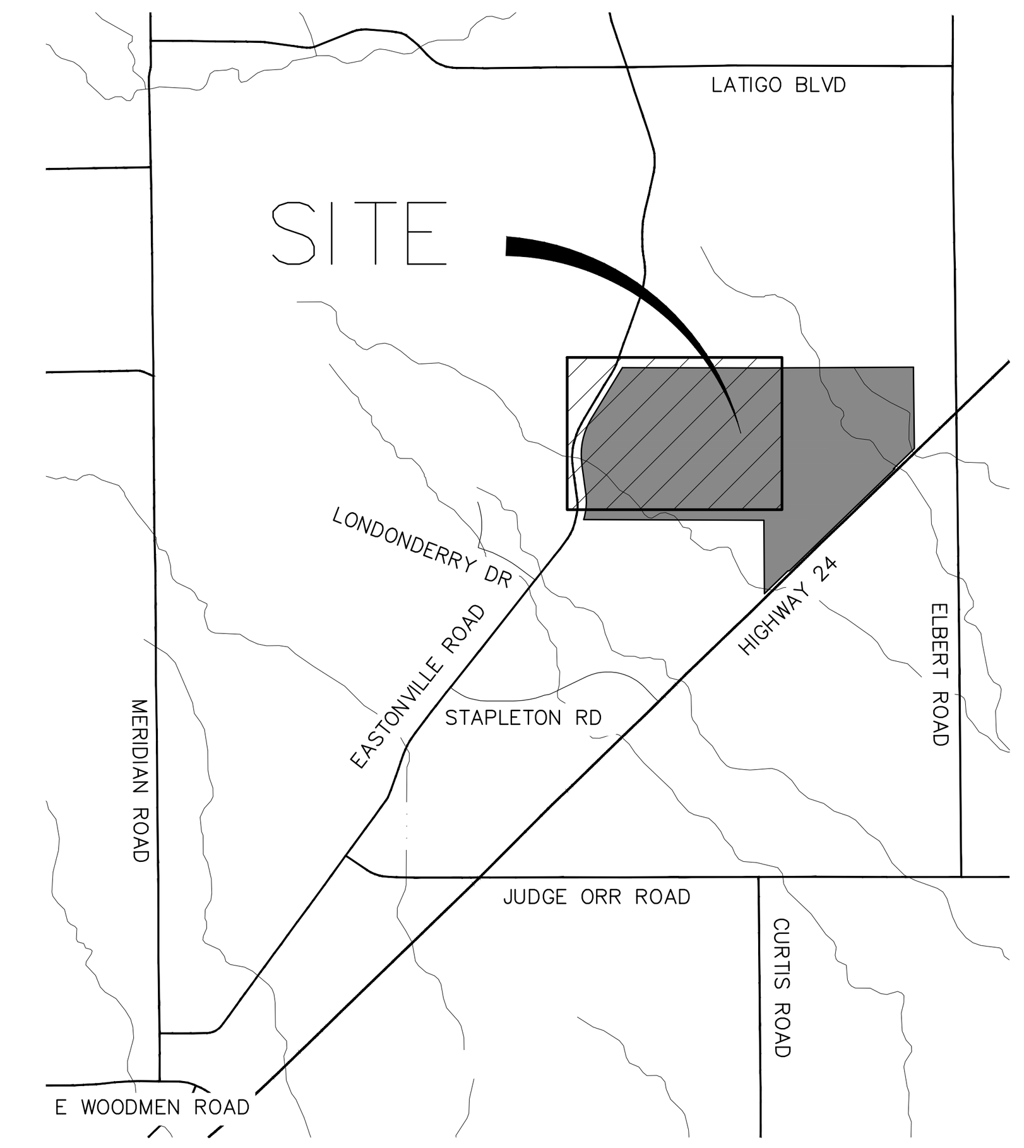
Provide a map showing the offsite basins.

Provide existing and proposed drainage plans.

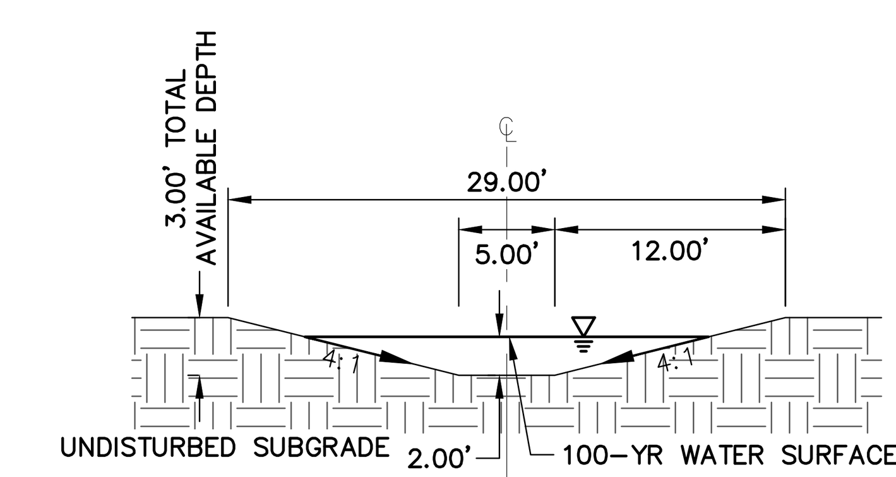
Label all culverts

Label proposed facilities

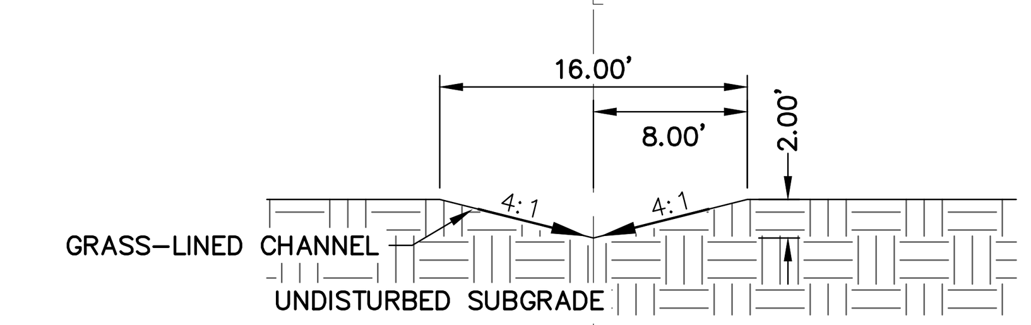




KEY MAP
SCALE: 1" = 5,000'



D BASIN D SWALE
SCALE: 1" = 10'



B BACK OF LOT SWALE
SCALE: 1" = 10'

LEGEND

- EXISTING PARCEL LINE
- EXISTING R.O.W.
- 5780 EXISTING MAJOR CONTOUR
- EXISTING 2' INTERMEDIATE CONTOUR
- PROPOSED STORM SEWER
- PROPOSED CULVERT
- EXISTING CULVERT
- BASIN ID
- DESIGN POINT DESIGNATION
- FLOW DIRECTION
- SUB-BASIN DRAINAGE AREA

200 100 0 200
ORIGINAL SCALE: 1" = 200'

DRAINAGE MAP – NORTHWEST
GRANDVIEW RESERVE
JOB NO. 29931.26
1/15/19
SHEET 2 OF 5

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GRANDVIEW RESERVE

DRAINAGE MAP

Provide design points at all culverts with calculated flows

Are these reversed?

EAST FORK
Q_{100} = 360 CFS
Q_5 = 174 CFS

BACK OF LOT SWALE (TYP.)
SEE SHEET 1 FOR CROSS SECTION

PROPOSED CULVERT CROSSING (TYP.)

PROPOSED 100-YR FLOODPLAIN (TYP.)

BACK OF LOT SWALE (TYP.)
SEE CROSS SECTION B

duplicate?

PROPOSED ROADSIDE DITCH (TYP.)
SEE CROSS SECTION A

PROPOSED EF_T1_R2_PROP CHANNEL SECTION
SEE CROSS SECTION G

PROPOSED CHANNEL IMPROVEMENTS (TYP.)

PROPOSED EF_T1_R3_PROP CHANNEL SECTION
SEE CROSS SECTION E

EXISTING 100-YR FLOODPLAIN
BASED ON HEC-RAS MODELING (TYP.)

FEMA 100-YR FLOODPLAIN BOUNDARY (TYP.)

PROPOSED BASIN C SWALE
SEE CROSS SECTION C

EX 18"

EX 24" RCP CULVERT

PROPOSED ACCESS TO HIGHWAY 24

EAST FORK
Q_{100} = 808 CFS
Q_5 = 245 CFS

EX BRIDGE

EAST FORK TRIBUTARY 1
Q_{100} = 217 CFS
Q_5 = 61 CFS

EX 24" CMP CULVERT

EX 24" CMP CULVERT

Provide design points at all outfalls and comparison of existing and developed flows.

Label Basin C

Road WQ BMPs?

SEE SHEET 2 – DRAINAGE MAP – NORTHWEST

SEE SHEET 4 – DRAINAGE MAP – SOUTHWEST

MAJOR DRAINAGEWAY DESIGN FLOW SUMMARY TABLE

Name	Reach	Design Point	HEC-RAS X Sections		Flow Rate	
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Gieck Ranch Tributary 1 (GRT1)	R1	GR-T1-R1	4586.31	1277.21	60	394
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	R2	GR_T2_R2	1492.43	1183.47	57	237
	R3	GR_T2_R3	1183.47	675	59	280
East Fork Tributary 1 (EFT1)	R1	EF_T1_R1	8248.03	4893.61	56	116
	R2	EF_T1_R2	4893.61	883	61	177
	R3	EF_T1_R3_P	Proposed Section Not Modeled		61	217
East Fork (EF)	R1	EF_R1	4747.49	2951.88	174	360
	R2	EF_R2	2951.88	2261.03	175	418
	R3	EF_R3	2261.03	928	180	435
	R4	EF_R4	928	698.4	245*	808*

*Combined flow from EF and EFT1

BASIN AND POND SUMMARY TABLE

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	C	110.73	7.6%	29.7	71.2	0.4	41.0	2.20
	D	40.28	5.9%	10.2	66.2	0.8	48.9	1.17
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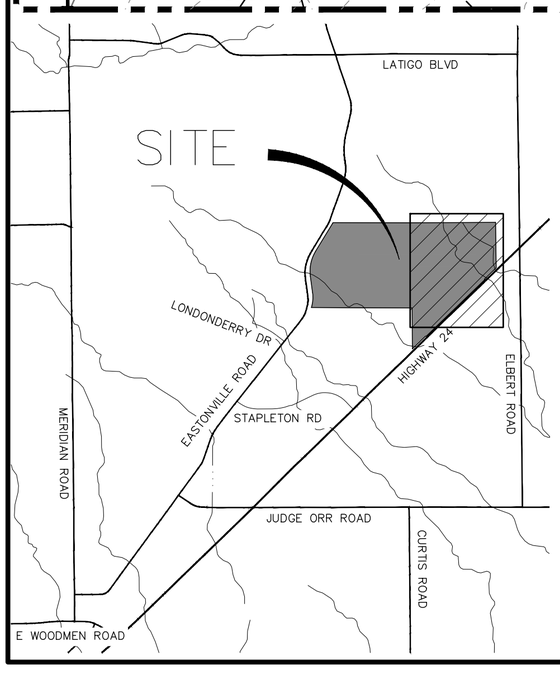
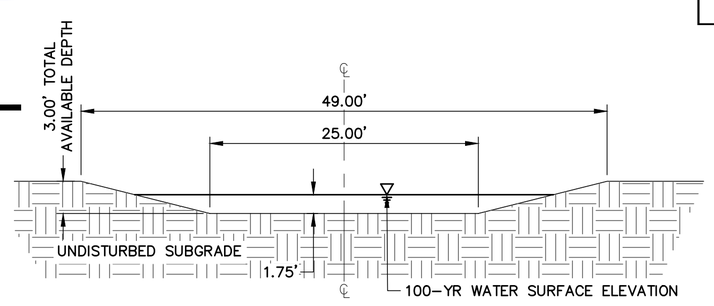
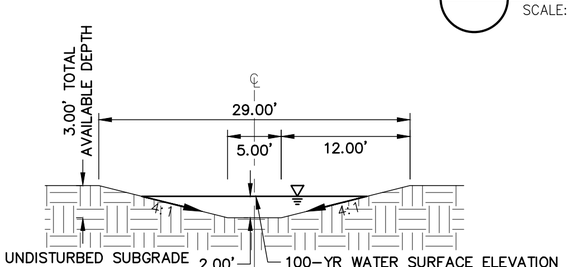
	F	105.74	6.2%	27.5	136.1	1.3	84.2	2.93
	G	21.93	6.7%	6.0	24.6	0.2	18.3	0.79
	H	52.37	5.1%	11.4	83.2	0.9	59.5	1.43
Basin	V	61.68	2.6%	6.9	18.9	NA	NA	NA
	W	14.49	2.0%	1.2	3.4	NA	NA	NA
	X	66.04	1.3%	3.6	13.2	NA	NA	NA
	Y	23.96	1.4%	1.5	6.6	NA	NA	NA
	Z	22.10	1.9%	1.8	17.6	NA	NA	NA

these seem low for developed flows

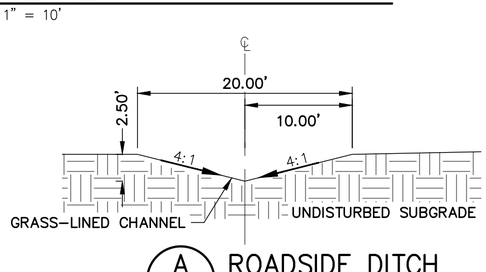




E EF_T1_R3_PROP CHANNEL SECT.
SCALE: 1" = 10'



D BASIN D SWALE
SCALE: 1" = 10'



A ROADSIDE DITCH
SCALE: 1" = 10'

Provide typical road sections.

200 100 0 200
ORIGINAL SCALE: 1" = 200'

DRAINAGE MAP – EAST
GRANDVIEW RESERVE
JOB NO. 29931.26
1/15/19
SHEET 3 OF 5

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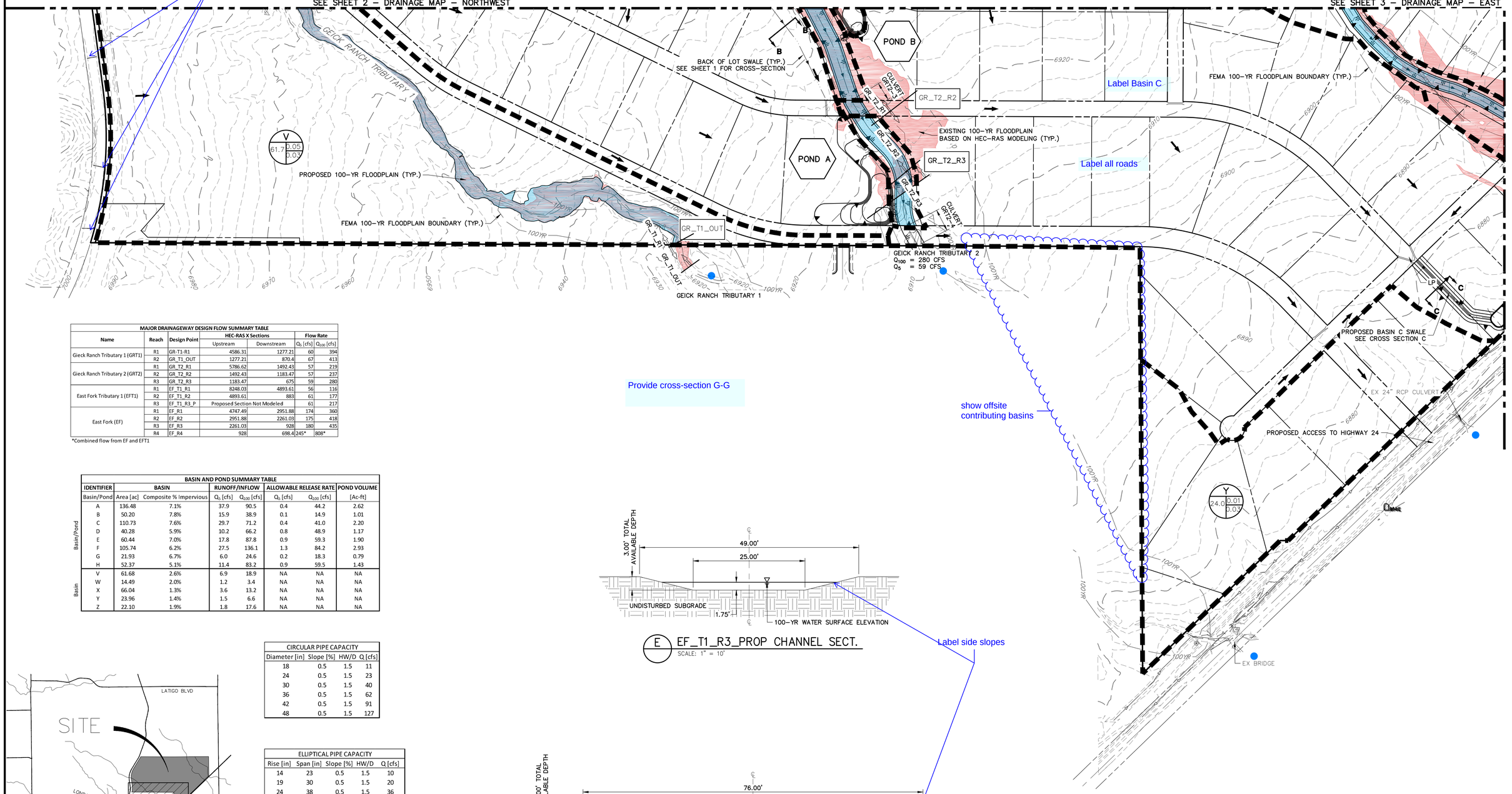
GRANDVIEW RESERVE

DRAINAGE MAP

Label all culverts



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BASIN AND POND SUMMARY TABLE

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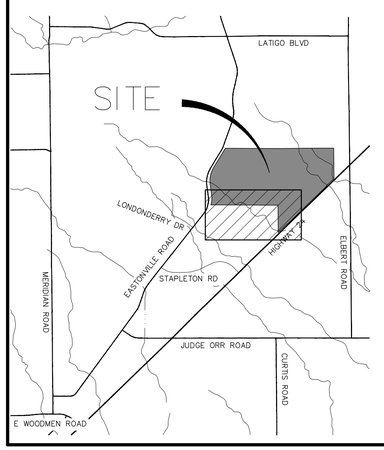
Basin	V	61.68	2.6%	6.9	18.9	NA	NA	NA
	W	14.49	2.0%	1.2	3.4	NA	NA	NA
	X	66.04	1.3%	3.6	13.2	NA	NA	NA
	Y	23.96	1.4%	1.5	6.6	NA	NA	NA
	Z	22.10	1.9%	1.8	17.6	NA	NA	NA



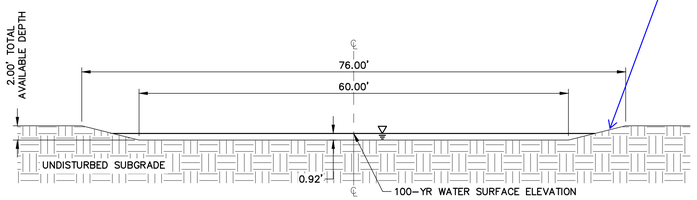
CIRCULAR PIPE CAPACITY			
Diameter [in]	Slope [%]	HW/D	Q [cfs]
18	0.5	1.5	11
24	0.5	1.5	23
30	0.5	1.5	40
36	0.5	1.5	62
42	0.5	1.5	91
48	0.5	1.5	127

ELLIPTICAL PIPE CAPACITY				
Rise [in]	Span [in]	Slope [%]	HW/D	Q [cfs]
14	23	0.5	1.5	10
19	30	0.5	1.5	20
24	38	0.5	1.5	36
29	45	0.5	1.5	56
34	53	0.5	1.5	84
38	60	0.5	1.5	112

ROADSIDE DITCH MIN/MAX CONDITIONS				
Condition	Slope	Depth [ft]	Velocity [fps]	Q [cfs]
Max Velocity	5%	0.68	5.19	9.6
Max Flow	1%	2.5	4.18	104.6
Min Flow/Velocity	1%	0.66	1.72	3.0

E EF_T1_R3_PROP CHANNEL SECT.
SCALE: 1" = 10'

Label side slopes



F GR_T2_PROP CHANNEL SECT.
SCALE: 1" = 10'

200 100 0 200
ORIGINAL SCALE: 1" = 200'

DRAINAGE MAP – SOUTHWEST
GRANDVIEW RESERVE
JOB NO. 29931.26
1/15/19
SHEET 4 OF 5

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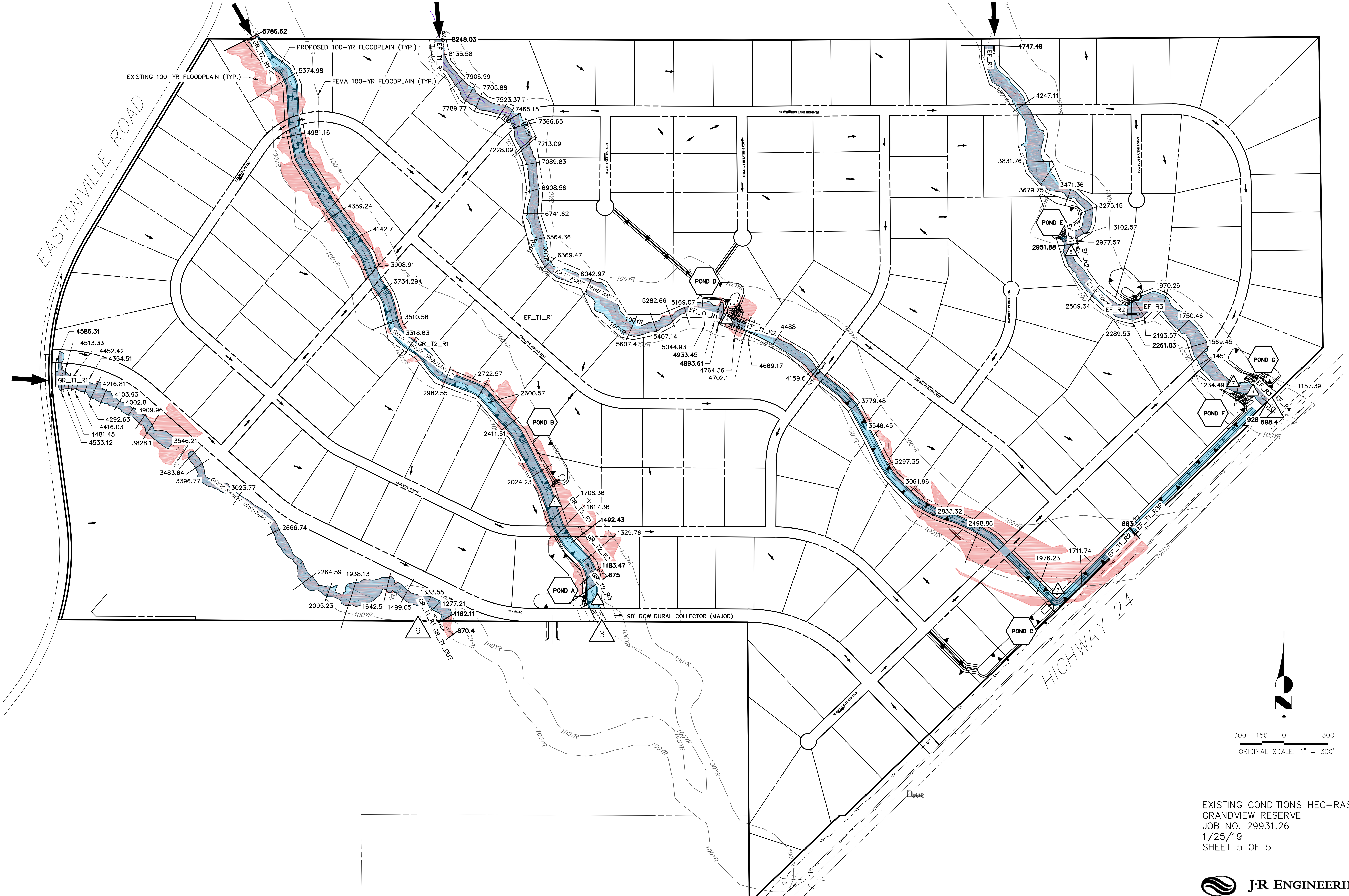
GRANDVIEW RESERVE
EXISTING CONDITIONS HEC-RAS



EXISTING CONDITIONS HEC-RAS
GRANDVIEW RESERVE
JOB NO. 29931.26
1/25/19
SHEET 5 OF 5

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Markup Summary

dsdparsons (1)

Subject: Callout
Page Label: 1
Author: dsdparsons
Date: 5/15/2019 1:12:23 PM
Color:

Due to the high groundwater the surface acreage of the pond(s) may need to be larger- Please verify with borings

dsdrice (70)

Subject: Highlight
Page Label: 215
Author: dsdrice
Date: 5/10/2019 10:44:50 AM
Color:

= 26.00
= 6.41
= 21.49

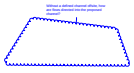
Subject: Highlight
Page Label: 53
Author: dsdrice
Date: 5/10/2019 10:54:42 AM
Color:

6.41

Subject: Highlight
Page Label: 53
Author: dsdrice
Date: 5/10/2019 3:14:40 PM
Color:

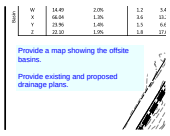
Subject: Text Box
Page Label: 5
Author: dsdrice
Date: 5/13/2019 3:06:59 PM
Color:

Mention Falcon Regional Park and Meridian Ranch to west.



Subject: Cloud+
Page Label: 218
Author: dsdrice
Date: 5/13/2019 3:30:04 PM
Color:

Without a defined channel offsite, how are flows directed into the proposed channel?



Subject: Text Box
Page Label: 218
Author: dsdrice
Date: 5/13/2019 3:33:00 PM
Color:

Provide a map showing the offsite basins.

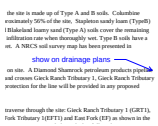
Provide existing and proposed drainage plans.

---

o. SP-19-004

Subject: Text Box
Page Label: 1
Author: dsdrice
Date: 5/13/2019 3:33:24 PM
Color:

SP-19-004

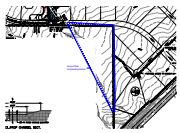


Subject: Callout
Page Label: 5
Author: dsdrice
Date: 5/13/2019 3:33:58 PM
Color:

show on drainage plans

Subject: Callout
Page Label: 218
Author: dsdrice
Date: 5/14/2019 1:21:56 PM
Color:

Label proposed facilities



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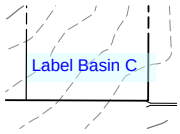
Author: dsdrice
Date: 5/14/2019 1:24:37 PM
Color:

show offsite contributing basins



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Author: dsdrice
Date: 5/14/2019 1:25:25 PM
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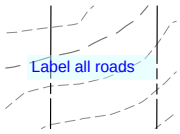
Label Basin C



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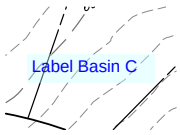
Page Label: 220
Author: dsdrice
Date: 5/14/2019 1:26:11 PM
Color:

Label all roads



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Page Label: 219
Author: dsdrice
Date: 5/14/2019 1:27:26 PM
Color:

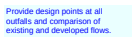
Label Basin C

Subject: Cloud+
Page Label: 10
Author: dsdrice
Date: 5/14/2019 1:29:00 PM
Color:

Not found on plan

Subject: Callout
Page Label: 219
Author: dsdrice
Date: 5/14/2019 1:29:55 PM
Color:

Road WQ BMPs?



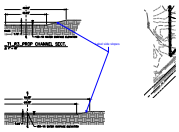
Subject: Text Box
Page Label: 219
Author: dsdrice
Date: 5/14/2019 1:51:30 PM
Color:

Provide design points at all outfalls and comparison of existing and developed flows.

Subject: Callout
Page Label: 10
Author: dsdrice
Date: 5/14/2019 1:52:35 PM
Color:

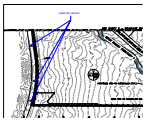
show on plan (not found)

Subject: Highlight
Page Label: 219
Author: dsdrice
Date: 5/14/2019 1:54:37 PM
Color:



Subject: Callout
Page Label: 220
Author: dsdrice
Date: 5/14/2019 1:57:08 PM
Color:

Label side slopes



Subject: Callout
Page Label: 220
Author: dsdrice
Date: 5/14/2019 10:38:12 AM
Color:

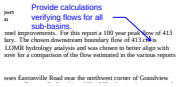
Label all culverts

Subject: Callout
Page Label: 218
Author: dsdrice
Date: 5/14/2019 10:39:30 AM
Color:

Label all culverts

Subject: Text Box
Page Label: 8
Author: dsdrice
Date: 5/14/2019 12:10:37 PM
Color:

Provide off-site sub-basins and design points.



Subject: Callout
Page Label: 9
Author: dsdrice
Date: 5/14/2019 12:12:06 PM
Color:

Provide calculations verifying flows for all sub-basins.

Subject: Callout
Page Label: 9
Author: dsdrice
Date: 5/14/2019 12:12:52 PM
Color:

What happens to overflows across Eastonville Road?

Subject: Cloud+
Page Label: 9
Author: dsdrice
Date: 5/14/2019 12:14:51 PM
Color:

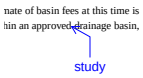
which tract?

Subject: Callout
Page Label: 9
Author: dsdrice
Date: 5/14/2019 12:19:28 PM
Color:

Should this be in "proposed" section of the report?

Subject: Cloud+
Page Label: 19
Author: dsdrice
Date: 5/14/2019 12:23:11 PM
Color:

?

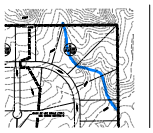


Subject: Callout
Page Label: 19
Author: dsdrice
Date: 5/14/2019 12:24:04 PM
Color:

study

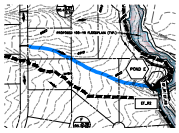
Subject: Highlight
Page Label: 218
Author: dsdrice
Date: 5/14/2019 2:01:45 PM
Color:

provide cross-lot drainage easments where applicable



Subject: Highlight
Page Label: 219
Author: dsdrice
Date: 5/14/2019 2:22:55 PM
Color:

provide cross-lot drainage easments where applicable

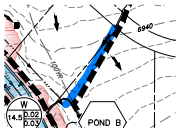


Subject: Highlight
Page Label: 219
Author: dsdrice
Date: 5/14/2019 2:22:55 PM
Color:

provide cross-lot drainage easments where applicable

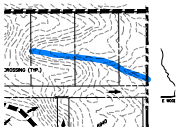
Subject: Highlight
Page Label: 219
Author: dsdrice
Date: 5/14/2019 2:22:55 PM
Color:

provide cross-lot drainage easments where applicable



Subject: Highlight
Page Label: 218
Author: dsdrice
Date: 5/14/2019 2:22:55 PM
Color:

provide cross-lot drainage easments where applicable



Subject: Highlight
Page Label: 218
Author: dsdrice
Date: 5/14/2019 2:22:55 PM
Color:

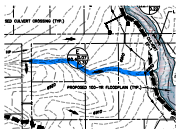
provide cross-lot drainage easments where applicable

Subject: Highlight
Page Label: 218
Author: dsdrice
Date: 5/14/2019 2:22:55 PM
Color:

provide cross-lot drainage easments where applicable

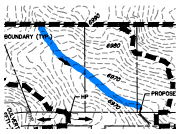
Subject: Highlight
Page Label: 219
Author: dsdrice
Date: 5/14/2019 2:22:55 PM
Color:

provide cross-lot drainage easments where applicable



Subject: Highlight
Page Label: 219
Author: dsdrice
Date: 5/14/2019 2:22:55 PM
Color:

provide cross-lot drainage easments where applicable



Subject: Highlight
Page Label: 218
Author: dsdrice
Date: 5/14/2019 2:22:55 PM
Color:

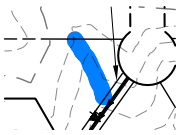
provide cross-lot drainage easments where applicable

Subject: Highlight
Page Label: 219
Author: dsdrice
Date: 5/14/2019 2:22:55 PM
Color:

provide cross-lot drainage easments where applicable

Subject: Highlight
Page Label: 218
Author: dsdrice
Date: 5/14/2019 2:22:55 PM
Color:

provide cross-lot drainage easments where applicable

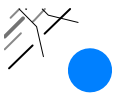


Subject: Highlight
Page Label: 218
Author: dsdrice
Date: 5/14/2019 2:22:55 PM
Color:

provide cross-lot drainage easments where applicable

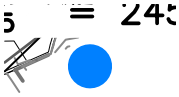
Subject: Highlight
Page Label: 219
Author: dsdrice
Date: 5/14/2019 2:22:55 PM
Color:

provide cross-lot drainage easments where applicable



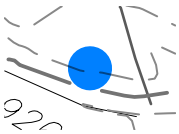
Subject: Highlight
Page Label: 220
Author: dsdrice
Date: 5/14/2019 2:24:11 PM
Color:

provide design point



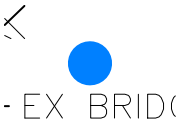
Subject: Highlight
Page Label: 219
Author: dsdrice
Date: 5/14/2019 2:24:11 PM
Color:

provide design point



Subject: Highlight
Page Label: 220
Author: dsdrice
Date: 5/14/2019 2:24:11 PM
Color:

provide design point



Subject: Highlight
Page Label: 220
Author: dsdrice
Date: 5/14/2019 2:24:11 PM
Color:

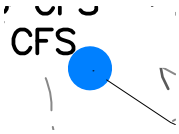
provide design point

Subject: Highlight
Page Label: 219
Author: dsdrice
Date: 5/14/2019 2:24:11 PM
Color:

provide design point

Subject: Highlight
Page Label: 219
Author: dsdrice
Date: 5/14/2019 2:24:11 PM
Color:

provide design point



Subject: Highlight
Page Label: 220
Author: dsdrice
Date: 5/14/2019 2:24:11 PM
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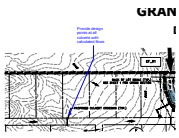
provide design point

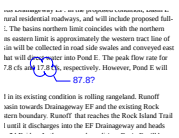
Subject: Highlight
Page Label: 219
Author: dsdrice
Date: 5/14/2019 2:24:11 PM
Color:

provide design point



Subject: Callout
Page Label: 219
Author: dsdrice
Date: 5/14/2019 2:27:03 PM
Color:

Provide design points at all culverts with calculated flows

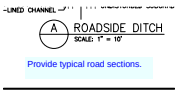


Subject: Cloud+
Page Label: 11
Author: dsdrice
Date: 5/14/2019 2:29:03 PM
Color:

87.8?

Subject: Text Box
Page Label: 220
Author: dsdrice
Date: 5/14/2019 3:26:02 PM
Color:

Provide cross-section G-G



Subject: Text Box
Page Label: 219
Author: dsdrice
Date: 5/14/2019 3:27:17 PM
Color:

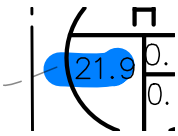
Provide typical road sections.

Subject: Highlight
Page Label: 219
Author: dsdrice
Date: 5/14/2019 3:29:23 PM
Color:

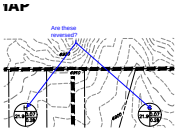
basin line?

Subject: Highlight
Page Label: 219
Author: dsdrice
Date: 5/14/2019 3:29:23 PM
Color:

basin line?

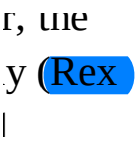


Subject: Highlight
Page Label: 219
Author: dsdrice
Date: 5/14/2019 3:30:13 PM
Color:



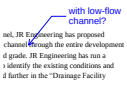
Subject: Callout
Page Label: 219
Author: dsdrice
Date: 5/14/2019 3:30:59 PM
Color:

Are these reversed?



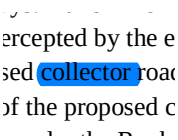
Subject: Highlight
Page Label: 12
Author: dsdrice
Date: 5/14/2019 3:33:20 PM
Color:

Rex



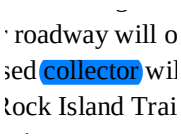
Subject: Callout
Page Label: 13
Author: dsdrice
Date: 5/14/2019 3:34:59 PM
Color:

with low-flow channel?



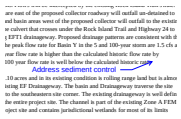
Subject: Highlight
Page Label: 14
Author: dsdrice
Date: 5/14/2019 3:39:58 PM
Color:

collector



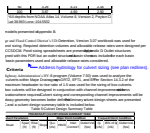
Subject: Highlight
Page Label: 14
Author: dsdrice
Date: 5/14/2019 3:40:08 PM
Color:

collector



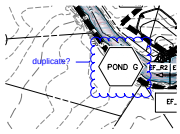
Subject: Callout
Page Label: 14
Author: dsdrice
Date: 5/14/2019 3:41:18 PM
Color:

Address sediment control



Subject: Callout
Page Label: 16
Author: dsdrice
Date: 5/14/2019 3:45:28 PM
Color:

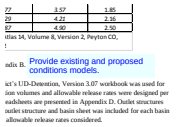
Address hydrology for culvert sizing (see plan redlines).



Subject: Cloud+
Page Label: 219
Author: dsdrice
Date: 5/14/2019 3:51:11 PM
Color:

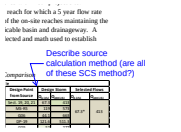
duplicate?

Subject: Highlight
Page Label: 46
Author: dsdrice
Date: 5/14/2019 3:54:17 PM
Color:



Subject: Text Box
Page Label: 16
Author: dsdrice
Date: 5/15/2019 12:43:46 PM
Color:

Provide existing and proposed conditions models.



Subject: Callout
Page Label: 7
Author: dsdrice
Date: 5/15/2019 12:53:34 PM
Color:

Describe source calculation method (are all of these SCS method?)

Subject: Callout
Page Label: 7
Author: dsdrice
Date: 5/15/2019 12:54:27 PM
Color:

These notes are hard to track to the table; consider using superscripts or additional asterisks.

Subject: Cloud+
Page Label: 219
Author: dsdrice
Date: 5/15/2019 9:22:18 AM
Color:

these seem low for developed flows