# Sierra Vista Specific Plan

## CITY OF ROSEVILLE, CA

PRELIMINARY
DRAINAGE AND STORMWATER MASTER PLAN

October 23, 2009

Prepared For
**MacKay & Somps**

Prepared By:

**CIVIL ENGINEERING SOLUTIONS INC.**
**1325 Howe Avenue Suite 202**
**Sacramento, CA 95825**
**(916) 563-7300**

**JOB # 2005.18**

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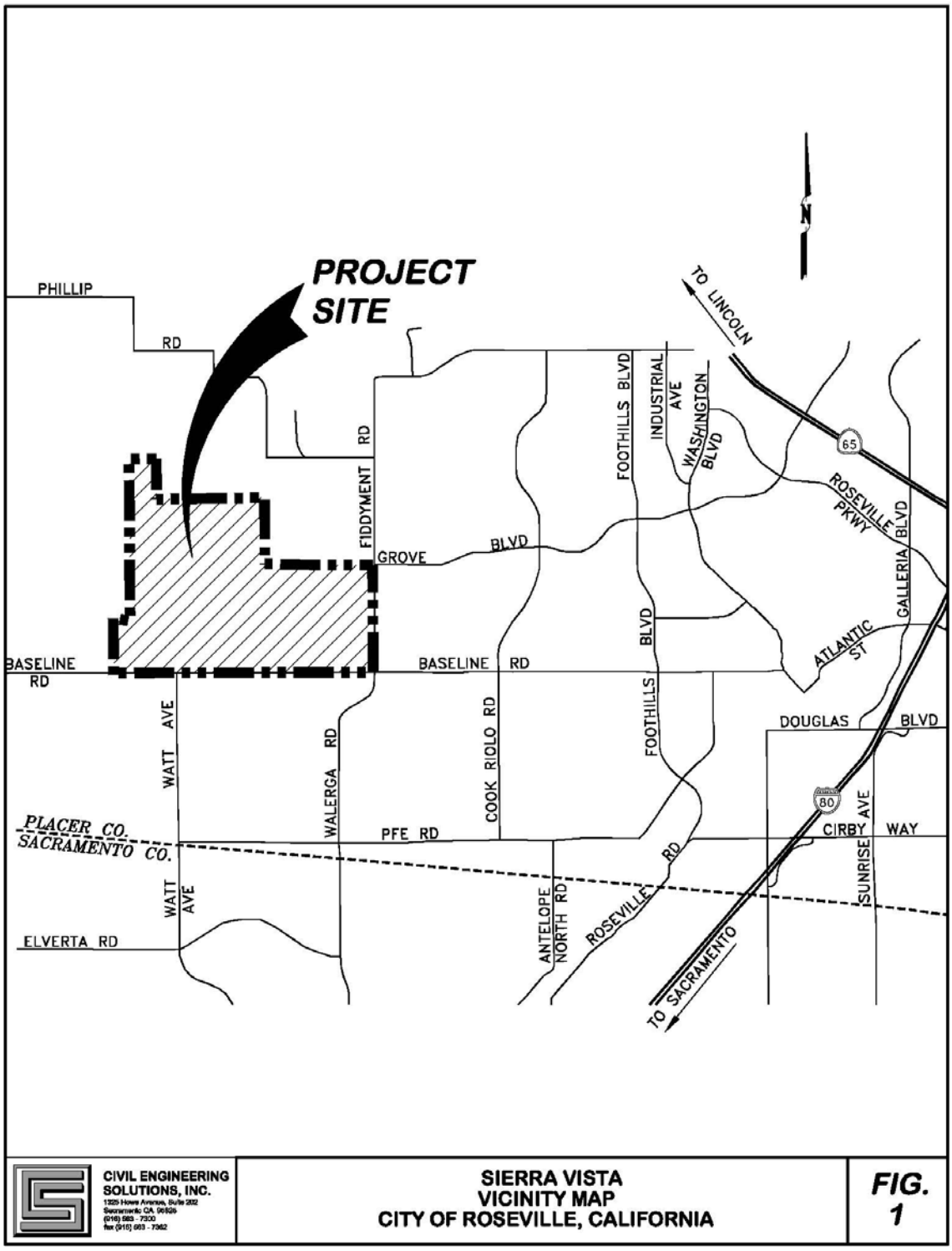


# I. Introduction:

## I.A Project Description

The proposed Sierra Vista Specific Plan Area (SVSP), approximately 2064± acres (including 427 acres of Urban Reserve), is wholly contained within the Curry Creek watershed, which drains to the Pleasant Grove Canal, then to the Natomas Cross Canal, and then the Sacramento River. The project is located adjacent to the western and southern limits of the City of Roseville. The project extends east from Fiddyment Road approximately 2.5 miles to west of Watt Avenue. The project is bounded by the existing West Park Development to the north, and Baseline Road to the South.

The current use of the project area lands is mostly unimproved. Some actively farmed "row crop" and "grain" lands are present within the project. The predominant agricultural production of the lands is grain crops and grazing fields. Curry Creek enters the project from the east at Fiddyment Road as a small seasonal stream. At Fiddyment Road the stream receives flows from storm drain pipe discharging on the west side of the roadway. The tributary areas upstream of Fiddyment Road are completely urbanized. Curry Creek traverses the southeastern corner of the project, in a southwestern direction towards Baseline Road. Curry Creek then crosses under Baseline Road near the proposed intersection of Market Avenue and Baseline Road. South of Baseline Road, Curry Creek passes through the "Placer Vineyards" Specific Plan Area. Then Curry Creek re-enters the SVSP, near Watt Avenue. Curry Creek then traverses the project in a northwesterly direction until exiting the project boundary, approximately 3,000 feet north of Baseline Road.

Within the central area of the project, a small seasonal swale is present which conveys flows in a westerly direction, joining Curry Creek near Watt Avenue. This project establishes the name for this swale feature as Federico Creek (named after the dominant historical property owner of the area the creek passes through). Federico Creek collects runoff from areas within the SVSP, and offsite urbanized areas at the Westpark development (a 32.25 acre, and 62.22 acre watershed).

In the extreme north portion of the project, the northern tributary of Curry Creek passes through the project boundary in the area which will remain "Urban Reserve" for this Specific Plan. This drainage report has established baseline hydrology and floodplain analysis for this tributary, however, development impacts for the "Urban Reserve" areas are not being assessed in this document, except where those areas will eventually pass through the areas with development land uses identified.

The northern tributary of Curry Creek conveys runoff from the Westpark development, west to the future extension of Watt Avenue at the western boundary of this plan area. West of the Watt Avenue extension, flows are discharged into Placer County at the "Regional University Specific Plan" (RUSP) project areas.

The proposed Sierra Vista Specific Plan, includes a mixture of land uses typically associated with a master planned community including, Low Density Residential (LDR), Medium Density Residential (MDR), High Density Residential (HDR), Commercial, Business Professional, Parks, Schools and other Quasi-Public land uses, and open space land uses are proposed along the

existing Creek Corridors, and power line easements.

Master watershed modeling for Curry Creek has been adapted from the original "Cross Canal Watershed Study" models of 1992, by several projects including: Regional University Specific Plan (RUSP), Placer Vineyards, and Westpark. The initial adaptation of the model was performed with the Westpark development (approved by the City of Roseville), which created a Kinematic Wave hydrology model for only the local areas of the Westpark development. The Placer Vineyards (Preliminary Master Drainage Plan has been accepted by Placer County), similarly prepared a local and tributary areas only update to the Curry Creek hydrology Analysis. The RUSP (Preliminary Master Drainage Plan has been accepted by Placer County) incorporated the Westpark and Placer Vineyards hydrology into a comprehensive Curry Creek hydrology model (Kinematic Wave) per the Placer County *"Stormwater Management Manual (SWMM)"* dated February 1994 and the SWMM Addendum 1, dated October 1997. The RUSP comprehensive model (which covers the Plan area) is used as the base analysis models for this plan. The existing conditions model assumes the Westpark development and urban areas east of Fiddyment Road are fully developed in the pre-project conditions analysis. The RUSP is shown as undeveloped in the plan models of the pre-project conditions. This would have little impact on this plan analysis as it is downstream of the SVSP, and if developed would propose to lower water surface elevations at the proposed extension of Watt Avenue. The proposed development at the Placer Vineyards project is also included in the analysis as developed in the pre-project analysis.

A detailed hydraulic analysis (HEC-RAS) of Curry Creek and the tributaries which will remain in their native state after the project is built, is provided for the pre-project and post-project conditions. Hydrology (flows) are input into the hydraulic floodplain analysis models based on the Pre-project, post-project unmitigated, and Post-project mitigated HEC-1 analysis'. Floodplain Exhibits (FP-1, FP-2, and FP-3) delineate the pre-project, post-project mitigated, and post-project unmitigated conditions floodplain limits and base flood elevations for the 100-year and 10-year events. A limited amount of detailed FEMA floodplain or floodway limits is currently defined within the SVSP near the western plan boundary. These areas are shown on the "FP" drawings for reference, as approximate Zone A. These exhibits are included in APPENDIX J.

All Drainage Improvements in the plan will comply with the City Design Standards, "Section 10 – Drainage". Stormwater Quality design elements will comply with the City Standards, "**Stormwater Quality Design Manual for the Sacramento and South Placer Regions".**

Per the Placer County Stormwater Management Manual(SWMM), Section VII.D.1a specifies sufficient onsite detention is required to mitigate post project runoff rates to less than the pre-project runoff rates as follows:

> *When storage is to be used to mitigate downstream impacts due to increased flows generated by development of a site, the objective flow shall be taken as the estimated pre-development peak flow rate less 10 % of the difference between the estimated predevelopment and post-development peak flow rates from the site for all standard design storms ranging in frequency from the 2-year and up to and*

> *including 100-year. In no case, however, shall the objective flow be less than 90 percent of the estimated pre-development flow. Figure 7-1 presents this criterion graphically.*

This project proposes to mitigate potential impacts to peak flood rates for the 2-year, 10-year and 100-year event as specified in the SWMM. The project proposes to mitigate peak flow impacts through the creation of additional on-stream and floodplain overbank attenuation at wetland creation areas within the open space stream corridors. Additionally, the project will employ the use of Low Impact Development (LID) measures, which will have a minor effect on the directly connected imperviousness of the plan developments, and provide some offsets for the development impacts. Within the overbank areas, conveyance and attenuation in excess of the existing conditions will be constructed as wetland creation areas. These areas will enhance the attenuation characteristics of the overbank areas. The addition of bridges and culverts is also expected to increase the in-stream storage characteristics of the floodplain. The included analysis demonstrates that adequate mitigation is provided within these systems to reduce runoff rates exiting the project limits per the SWMM requirements, without increasing 100-year hydraulic grade line elevations offsite.

The plan will also construct two traditional permanent "detention basins" for the purpose of stormwater peak flow attenuation. These basins will be constructed in series within the Power line corridor in the northcentral area of the project, providing ~ 20 acre feet of added storage within the Phase A project area. The project will mitigate peak flow increases via the proposed open space construction features, including: detention basins, created wetlands and stormwater quality features. Attenuation benefits of the proposed wetland creation areas, and stormwater quality features are quantified on Figure AT-1, the "Attenuation Plan".

The plan will construct "vegetated swales" within the Open Space corridors to convey and treat stormwater prior to discharging into the receiving creeks. Some of these features are within the overbank areas of the creeks and will be within the floodplain, and therefore will also contribute to overall floodplain storage.

The project will construct both: on-site LID, and treatment "Best Management Practices" (BMPs) to mitigate and treat the discharge of development constituents into the creeks and streams. Low Impact Development (LID) measures will be employed within the developments to reduce the amounts of runoff and required treatment from the projects. This plan will establish LID required volumetric removal (RVR) targets/quotas for each type of land use. This report also provides a sample plan identifying an example of how those targets will be obtained for each type of land use. The RVR's in conjunction with the proposed outfall vegetated swales, will obtain 100% mitigation of increased project runoff volumes for the $85^{th}$ percentile rainfall event. The LID RVR's will be the minimum threshold of LID elements allowed in the plan, although LID elements may be substituted, and greater levels of LID will be permitted, which could further reduce BMP treatment sizing. The combination of Best Management Practices and Low Impact Development Measures complete the elements of Source Control, Runoff Reduction, and Treatment Control measures included in the plan, which are referred to as the "Project Treatment Train", providing treatment and volumetric reduction measures to the maximum extent practicable for this plan.

The LID measures proposed, and the flood storage volumes being added within the floodplain areas will assist in the reduction of the potential for hydrograph modification. Hydrograph Modification (otherwise known as Hydromodification or Hydromod) can impact stream systems causing them to move into a state of accelerated evolution. Hydromodification impacts can occur resulting from non-mitigated development impacts, wherein added impervious areas can increase the total volume of runoff, and development storm drainage systems can accelerate the timing of the runoff, increasing the frequency of flows especially in smaller events. Hydromod is known, in some streams, to trigger stream evolution changes to occur in a more rapid time scale than would have normally occurred. Sudden evolution of a stream can result in the removal of significant amounts of soils from the project streams, and deposition of those soils elsewhere in the watershed. Suddent evolution is threfore a significant concern for water quality regulated streams (see Clean Water Act, Waters of the US and other water bodies). The Curry Creek stream includes areas identified as seasonal and perennial wetlands and therefore would be considered a water of the US. Migration which is a more natural occurrence, as the "S" curves of all streams naturally migrate in the downstream direction. In our surveys of the Curry Creek stream system we have seen evidence of scour and deposition which may be indicators of either migration and evolutionary issues. Because of the potential concerns over the Hydromodification impacts of this plan, an analysis is provided in this study which evaluates the hydromod related potential impacts of the project, and the benefits of the proposed project measures which are likely to mitigate most of the modification concerns.

Finally, as this development is contained within a watershed which discharges through the Natomas Cross Canal, it is subject to volumetric impacts analysis and potential mitigation requirements. A situation exists within Sutter County, within the sump areas upstream of the Natomas Cross Canal, wherein flooding is known to occur when the Sacramento River rises above a flood stage of 37.0 at the Verona Gage. This occurs as a result of the limited discharge capacity of the Natomas Cross Canal when the Sacramento River is flooding. As a result, the discharge of additional volumes of runoff during this type of event, could make the depth of flooding worse (per Cross Canal Watershed Study CH2MHILL – 1992-1994). Additionally, flooding of the sump area could occur from local runoff of the streams and watersheds which are tributary to the Natomas Cross Canal. As a result the City of Roseville collects a development fee, "The Pleasant Grove Watershed Mitigation Fee", which will ultimately construct facilities (Reason Farms) to mitigate such impacts. This report will quantify the estimated volumetric impact of the project for a 8-day 100-year event.

## I.B Conclusions

Peak flow rate increases which would result from the proposed development will be mitigated though the excavation of wetland creation areas, vegetated treatment swales, detention basins and additional conveyance within the overbank areas of Curry Creek. The project plan will create **91.1** additional acre feet of storage within the 100-year floodplain, which will mitigate peak flow increases for the 100-year event.

The development of the project has the potential to impact water quality in Curry Creek and its tributaries. As a result Best Management Practices (BMP's) and Low Impact Development (LID) measures will be implemented to reduce the potential of impact. LID measures will be

incorporated into the various development plans consistent with the guidelines of the proposed NPDES Stormwater Permit ( http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml ), such that 100% of the volumetric increase of a 85$^{th}$ percentile event will be mitigated onsite through LID measures.

The development of the project will impact the total volume of runoff contributing to the Natomas Cross Canal/Pleasant Grove Canal flooding sump at Sutter County. The estimated impact has been computed to be 196.7 acre feet for a 100-year 8-day storm event, which does not include the potential impacts of the urban reserve designated areas. The project impacts will be mitigated by the payment of the Pleasant Grove Watershed Mitigation Fee to the City of Roseville, from which funds are being used to construct volumetric mitigation at the Reason Farms project.

## I.C Project Phasing

The Sierra Vista Specific Plan Area is designed to allow the backbone infrastructure to be phased. Phases may be developed in any sequence provided public safety, health and welfare issues are addressed, subject to the approval of the City of Roseville. Parcel specific improvements will be determined with Small Lot Tentative Maps or subsequent entitlements. Peak flow discharges and stormwater management requirements will be further evaluated for each phase with mitigation occurring to accommodate the need for the particular phase being developed.

Four major phased areas of the project have been identified. Section II.E discusses the mitigation and impacts of each of the major phases and identifies which mitigation improvements will be needed by each phase to be able to be constructed independent of the others, providing sufficient peak flow attenuation to reduce peak flows from the pre-project conditions, downstream of each phase.

# II. Hydrology:

The Army Corps HEC-1 software was utilized to develop the included hydrologic models for the Sierra Vista Specific Plan project.

## II.A Standards:

Master watershed modeling for Curry Creek has been adapted from the original "Cross Canal" models of 1992, by several projects including: Regional University Specific Plan (RUSP), Placer Vineyards, and Westpark. The initial adaptation of the model was performed with the Westpark development, which created a Kinematic Wave hydrology model only for the local areas of the Westpark development. Placer Vineyards, similarly prepared a local and tributary areas only update to the Curry Creek hydrology analysis for that project. The RUSP incorporated the Westpark and Placer Vineyards hydrology into a comprehensive Curry Creek hydrology model (Kinematic Wave) per the "*Stormwater Management Manual (SWMM)"* dated February 1994 and the SWMM Addendum 1, dated October 1997. The RUSP comprehensive model is used as a base model for this project. The existing conditions model assumes the Westpark and development areas east of Fiddyment Road as developed (per the existing conditions). The RUSP is shown as undeveloped, but this has no impact on this project as it is downstream of the Sierra Vista project, and if developed would propose to lower water surface elevations at the proposed extension of Watt Avenue. The proposed development at the Placer Vineyards project is included in the base analysis.

### *II.A.1 Soils:*

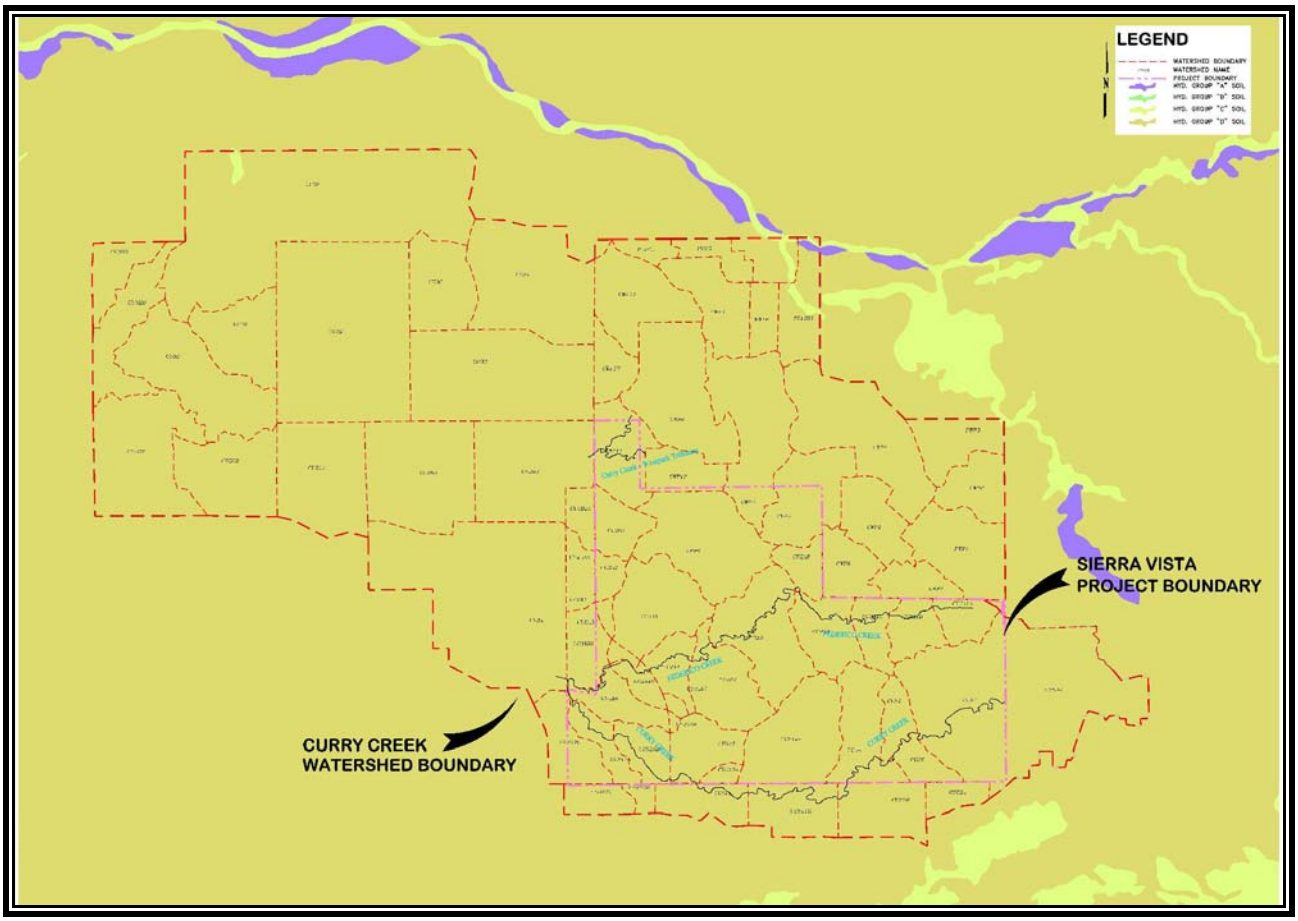
The soil type delineation was obtained from the "Soil Survey of Placer County, California Western Part". Hydrologic soil type "B" and "D" are the predominate soil types within the limits of the project boundary. Soils are classified into four hydrologic Categories:

> Group A: Consist of soils that have a high infiltration rate when thoroughly wet. These soils have a high rate of water transmission and low runoff potential. They are deep, well drained or excessively drained, and consist chiefly of sand, gravel, or both. No soils in this project are in Group A.
>
> Group B: Consist of soils having a moderate infiltration rate when thoroughly wet. These soils have a moderate runoff potential. They are moderately deep, well drained, and are medium in texture to moderately course in texture.
>
> Group C: Consist of soils having a slow infiltration rate when thoroughly wet. These soils have a slow rate of water transmission and high runoff potential. The have soil layers that impede downward movement of water and have a slow infiltration rate.
>
> Group D: Consist of soils having a slow infiltration rate when thoroughly wet. The rate of water transmission is very slow, and runoff potential is very high. This group includes:
>
> a. clay soils that have high shrink-swell potential

b. soils that have a permanent high water table
c. soils that have a clay pan or clay layer at or near the surface and
d. soils that are shallow over nearly impervious material

Figure II.A.1 shows the hydrologic soils group delineations as provided by the National Resources Conservation Service (NRCS – Formerly Soils Conservation Service). As seen on this exhibit, all areas of the watershed model are predominantly Soils Group "D", which indicates low permeability of the soils and high runoff rates. The Storm Water Management Manual for the Placer County flood Control and Water Conservation District prescribes constant infiltration rates for various land uses. This study defines the following values of use: 0.07 in/hour for native ground, 0.09 in/hr for developed landscaped areas, and 0.12 in/hr for developed park areas. Impervious surfaces are not considered to have infiltration in all included studies, except for the LID related studies, were non-directly connected impervious areas, and LID treated areas were considered to be "non-impervious".

**FIGURE II.A.1 – REGIONAL HYDROLOGIC SOILS GROUPS**

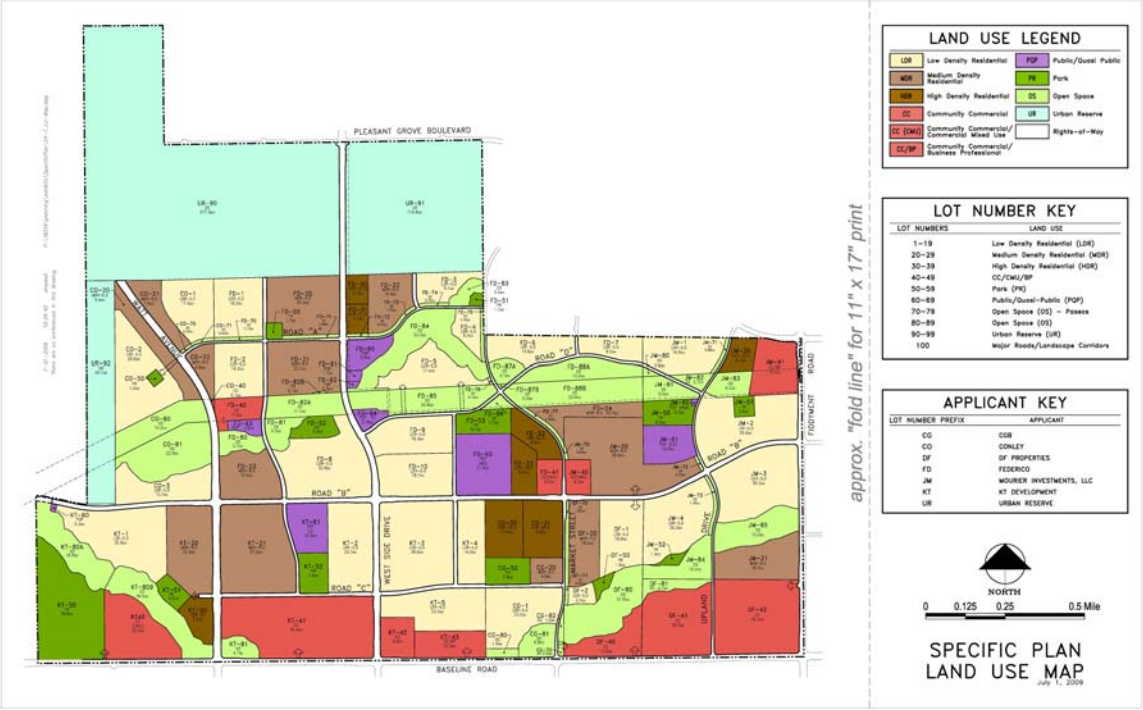



*An oversized copy of this exhibit is provided as an attachment to this report as "SOIL-1".*

## *II.A.2 Land Use:*

Civil Solutions was provided with a proposed land use map for the Sierra Vista Specific Plan project area as shown in Figure II.A.2 and on Exhibits SH-2 and FP-2. For the areas which are proposed for development with this project, separate watersheds were created in the post-project analysis. Factors for the Land Use were developed as shown in Tables II.A.1 and II.A.1.

**FIGURE II.A.2 – SIERRA VISTA SPECIFIC PLAN PROPOSED LAND USE**




## *II.A.3 Watershed Delineation:*

The lands of the proposed project are wholly contained within the Curry Creek watershed (see Exhibit SH1-SV - Oversized). The "natural" watershed boundaries have been modified by the existing roadways and agricultural operations.

For the Pre-Project analysis, the RUSP regional model was adapted for the more detailed project topography maps. Some minor shed limit boundaries were changed and corresponding areas were re-calculated. The project watershed limits for the pre-project model are shown on exhibit SH-1.

For the Post-Project analysis, watershed boundaries were adjusted to conform to the proposed development areas. Sub-watersheds were further subdivided to account for the

proposed site alterations including: changes in impermeability due to roofs and paving, and changes in boundary locations due to the proposed piping and grading. Tributary areas to each watershed closely match the Pre-Project parameters, but minor adjustments were made for the above-mentioned purpose. Flow paths through and off the site for the Post-Project are identified on the shed map SH-2.

Urban Reserve Areas Treatment: A portion of the area shown as Urban Reserve, north of the areas with designated land use, currently drains through the proposed development areas of the Plan. These areas do not have a land use type specified in the plan other than "urban reserve". For this analysis we have assumed only the areas which drain towards the project defined land use areas to be "Medium Density Residential – MDR" for all aspects of the analysis, and have treated these areas as if they were a part of the project with that land use. Mitigation alternatives will also consider these areas as developed. The remaining "Urban Reserve" areas which drain north and west of the project are considered in this analysis to remain un-altered in land use, and maintain their hydrologic open space equivalent factors in all aspects of this analysis.

*II.A.4 Storm Centering:*

The HEC-1 watershed model includes more than 1 square mile of area, and therefore, the effects of spatial distribution of a storm may have an impact on the computed peak flow rates. The Placer County Flood Control and Water Conservation District provides a software tool called "PDP", for use in generating HEC-1 precipitation for storm centering per the SWMM specifications. In late 2008 and early 2009, the district identified issues with the storm centering procedures and generated a beta test version PDP2 of the program which makes corrections for:

- The Area Reduction Coefficient is adjusted such that a minimum value is substituted so that precipitation values for the peak 1-hour will not drop below the precipitation rate at the edge of the peak 1-hour
- The 6-hour 100-year precipitation value from the SWMM tables is altered from 2.23 inches to 2.49 inches which is a statistically more normalized value with record data
- Log-linear interpolation is substituted for log-log interpolation

The analysis included in this report utilized the PDP2 version of the district's software.

Storm centering will be computed for CU2A3 in the pre-project events, and the CU2A8 location for the post-project events. These watershed identifiers are in the same location coordinate locations, but the post-project analysis includes substantial subdivision of watersheds, and the equivalent identifier was not carried forward to the post-project analysis. This location has been determined to control peak discharges through and downstream of the Plan area.

# II.A Pre-Project Model:

## *II.A.1 Base Model*

A Base HEC-1 data file for the base model was created using the RUSP pre-project conditions model. The Westpark development, urban areas upstream of Fiddyment Road and the Placer Vineyards developments are shown in this model per their ultimate buildout conditions. The complete listing of the HEC-1 input file is included in Appendix A.

### TABLE II.A.1 – Pre-project Base Model Hydrologic Factors

| | | PLANE 1 - NON URBAN WATERHSED FACTORS | | | | | | | PLANE 2 - URBAN WATERHSED FACTORS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE | BA | Init Inf 1 (in) | Const Inf 1 (in/hr) | % Imp 1 (%) | Length 1 (ft) | Slope 1 (ft/ft) | n Val 1 | % Shed 1 (%) | Init Inf 2 (in) | Const Inf 2 (in/hr) | % Imp 2 (%) | Length 2 (ft) | Slope 2 (ft/ft) | n Val 2 | % Shed 2 (%) |
| CUS3G | 0.43953 | 0.1 | 0.07 | 2 | 150 | 0.01 | 0.4 | 1 | 0.1 | 0.12 | 41 | 200 | 0.005 | 0.24 | 99 |
| CUS3 | 0.37719 | 0.1 | 0.0713 | 2 | 200 | 0.005 | 0.4 | 96.78 | 0.1 | 0.12 | 90 | 150 | 0.01 | 0.24 | 3.22 |
| CUS4 | 0.06109 | 0.1 | 0.0717 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| CUS5A | 0.05301 | 0.1 | 0.07 | 2 | 200 | 0.005 | 0.4 | 96.83 | 0.1 | 0.12 | 90 | 50 | 0.01 | 0.24 | 3.17 |
| CUS5 | 0.05453 | 0.1 | 0.0737 | 2 | 200 | 0.005 | 0.4 | 90.33 | 0.1 | 0.12 | 90 | 150 | 0.01 | 0.24 | 9.67 |
| CUS5B | 0.14453 | 0.1 | 0.07 | 2 | 200 | 0.005 | 0.4 | 12.43 | 0.1 | 0.1172 | 60.6 | 50 | 0.01 | 0.24 | 87.57 |
| CUS6 | 0.16844 | 0.1 | 0.0738 | 2 | 200 | 0.005 | 0.4 | 96.63 | 0.1 | 0.12 | 90 | 150 | 0.01 | 0.24 | 3.37 |
| CUS11B | 0.13531 | 0.1 | 0.0748 | 2 | 200 | 0.005 | 0.4 | 23.78 | 0.1 | 0.12 | 49.84 | 50 | 0.01 | 0.24 | 76.22 |
| CUS12A | 0.24688 | 0.1 | 0.071 | 2 | 200 | 0.005 | 0.4 | 98 | 0.1 | 0.12 | 90 | 150 | 0.01 | 0.24 | 2 |
| CUS13A | 0.01922 | 0.1 | 0.07 | 2 | 200 | 0.005 | 0.4 | 95 | 0.1 | 0.12 | 90 | 150 | 0.01 | 0.24 | 5 |
| CUS14 | 0.09641 | 0.1 | 0.076 | 2 | 200 | 0.005 | 0.4 | 17.02 | 0.1 | 0.1179 | 48.98 | 50 | 0.01 | 0.24 | 82.98 |
| CUS16B | 0.02156 | 0.1 | 0.072 | 2 | 200 | 0.005 | 0.4 | 2 | 0.1 | 0.1158 | 80.47 | 50 | 0.01 | 0.24 | 98 |
| CUS15 | 0.11427 | 0.1 | 0.072 | 2 | 300 | 0.01 | 0.4 | 100 | | | | | | | |
| CUS15B | 0.07977 | 0.1 | 0.072 | 2 | 250 | 0.0167 | 0.4 | 100 | | | | | | | |
| CUS17A | 0.06 | 0.1 | 0.07 | 2 | 200 | 0.005 | 0.4 | 2 | 0.1 | 0.1166 | 80.38 | 50 | 0.01 | 0.24 | 98 |
| CUS17B | 0.06844 | 0.1 | 0.0741 | 2 | 200 | 0.005 | 0.4 | 97 | 0.1 | 0.12 | 90 | 150 | 0.01 | 0.24 | 3 |
| CUS17C | 0.11938 | 0.1 | 0.0761 | 2 | 200 | 0.005 | 0.4 | 99 | 0.1 | 0.12 | 90 | 50 | 0.01 | 0.24 | 1 |
| CWP7 | 0.07797 | 0.1 | 0.06 | 41 | 150 | 0.02 | 0.11 | 99 | 0.1 | 0.06 | 2 | 300 | 0.02 | 0.35 | 1 |
| CU2A1A | 0.06625 | 0.1 | 0.07 | 2 | 280 | 0.01 | 0.4 | 100 | | | | | | | |
| CU2A1B | 0.08063 | 0.1 | 0.07 | 2 | 250 | 0.01 | 0.4 | 100 | | | | | | | |
| CU2A1C | 0.07188 | 0.1 | 0.07 | 2 | 300 | 0.01 | 0.4 | 100 | | | | | | | |
| CWP8 | 0.09922 | 0.1 | 0.07 | 40 | 150 | 0.02 | 0.11 | 99 | 0.1 | 0.06 | 2 | 300 | 0.02 | 0.35 | 1 |
| CU2A9 | 0.12672 | 0.1 | 0.07 | 2 | 200 | 0.01 | 0.4 | 100 | | | | | | | |
| CU2A8 | 0.06188 | 0.1 | 0.07 | 2 | 200 | 0.01 | 0.4 | 100 | | | | | | | |
| CU2A3 | 0.24438 | 0.1 | 0.07 | 2 | 300 | 0.01 | 0.4 | 100 | | | | | | | |
| CU2A7 | 0.16641 | 0.1 | 0.07 | 2 | 200 | 0.02 | 0.4 | 100 | | | | | | | |
| CU2A4 | 0.07478 | 0.1 | 0.07 | 2 | 600 | 0.004 | 0.4 | 100 | | | | | | | |
| CU2A4C | 0.01166 | 0.1 | 0.07 | 2 | 200 | 0.025 | 0.4 | 100 | | | | | | | |
| CU2A4B | 0.04077 | 0.1 | 0.07 | 2 | 200 | 0.015 | 0.4 | 100 | | | | | | | |
| CU2A5 | 0.20587 | 0.1 | 0.07 | 2 | 600 | 0.0067 | 0.4 | 100 | | | | | | | |
| CU2A5B | 0.01354 | 0.1 | 0.07 | 2 | 200 | 0.025 | 0.4 | 100 | | | | | | | |
| CU2A6B | 0.00529 | 0.1 | 0.07 | 2 | 100 | 0.02 | 0.4 | 100 | | | | | | | |
| CU2A6 | 0.08665 | 0.1 | 0.07 | 2 | 300 | 0.027 | 0.4 | 100 | | | | | | | |
| CU2A1 | 0.015 | 0.1 | 0.07 | 2 | 200 | 0.01 | 0.4 | 100 | | | | | | | |
| CU2A5C | 0.09156 | 0.1 | 0.07 | 2 | 200 | 0.01 | 0.4 | 100 | | | | | | | |
| CU2A2 | 0.03766 | 0.1 | 0.07 | 2 | 200 | 0.01 | 0.4 | 100 | | | | | | | |
| CU2A3A | 0.05969 | 0.1 | 0.07 | 2 | 200 | 0.01 | 0.4 | 100 | | | | | | | |
| CU2A | 0.75828 | 0.1 | 0.06 | 2 | 600 | 0.015 | 0.4 | 100 | | | | | | | |
| CWP1 | 0.14469 | 0.1 | 0.07 | 2 | 300 | 0.008 | 0.35 | 51 | 0.1 | 0.06 | 100 | 150 | 0.01 | 0.11 | 49 |
| CWP2 | 0.19688 | 0.1 | 0.07 | 100 | 150 | 0.008 | 0.11 | 27 | 0.1 | 0.06 | 2 | 300 | 0.01 | 0.35 | 73 |
| CWP4 | 0.3627 | 0.1 | 0.07 | 2 | 300 | 0.01 | 0.35 | 54 | 0.1 | 0.06 | 100 | 200 | 0.02 | 0.11 | 46 |
| CWP3 | 0.3 | 0.1 | 0.07 | 2 | 300 | 0.01 | 0.35 | 54 | 0.1 | 0.06 | 100 | 200 | 0.01 | 0.11 | 46 |
| CWP6 | 0.3039 | 0.1 | 0.09 | 2 | 300 | 0.01 | 0.35 | 72 | 0.1 | 0.06 | 100 | 200 | 0.008 | 0.11 | 28 |
| CWP9 | 0.29926 | 0.1 | 0.07 | 2 | 300 | 0.008 | 0.4 | 92 | 0.1 | 0.07 | 50 | 400 | 0.005 | 0.24 | 8 |
| CWP13 | 0.09422 | 0.1 | 0.07 | 2 | 300 | 0.008 | 0.35 | 67 | 0.1 | 0.07 | 100 | 150 | 0.008 | 0.11 | 33 |
| CWP14 | 0.1525 | 0.1 | 0.06 | 2 | 300 | 0.008 | 0.35 | 98 | 0.1 | 0.06 | 100 | 150 | 0.01 | 0.11 | 2 |
| CU2B1 | 0.115 | 0.1 | 0.06 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2B1A | 0.04563 | 0.1 | 0.06 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2B2 | 0.33563 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2B3 | 0.3455 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2C1 | 0.2913 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2C2 | 0.229 | 0.1 | 0.06 | 2 | 100 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2C3 | 0.33844 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CWP11A | 0.075 | 0.1 | 0.06 | 2 | 300 | 0.01 | 0.35 | 60 | 0.1 | 0.06 | 100 | 150 | 0.02 | 0.11 | 40 |
| CWP11 | 0.123 | 0.1 | 0.06 | 2 | 300 | 0.01 | 0.35 | 95 | 0.1 | 0.06 | 100 | 200 | 0.01 | 0.11 | 5 |
| CWP12 | 0.0678 | 0.1 | 0.06 | 100 | 600 | 0.01 | 0.11 | 2 | 0.1 | 0.06 | 2 | 600 | 0.01 | 0.4 | 98 |
| CU3A | 0.3864 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CU3B | 0.4803 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3C | 0.1723 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3D | 0.7278 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3E | 0.1747 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3F | 1.0026 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3G | 0.3125 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3HA | 0.08969 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CU3HB | 0.1658 | 0.1 | 0.06 | 2 | 300 | 0.001 | 0.4 | 100 | | | | | | | |
| CU4 | 3.58 | 0.1 | 0.06 | 2 | 600 | 0.015 | 0.4 | 100 | | | | | | | |
| CU5 | 0.28 | 0.1 | 0.06 | 2 | 600 | 0.015 | 0.4 | 100 | | | | | | | |
| CU6 | 0.87 | 0.1 | 0.06 | 2 | 600 | 0.015 | 0.4 | 100 | | | | | | | |

## II.B Post-Project "Future, Fully Developed, Unmitigated" Model:

Civil Solutions prepared a Post Project model based on the proposed project land use information and the soils delineation boundaries. This study is based on the updated plan information shown on Exhibits SH-2. Factors for the developing watershed areas were added as shown in TABLE II.B.1 in the Zone 2 watershed (secondary plane). Directly connected imperviousness was computed based on average coverage rates assumed for the various contributing area types as follows:

| **Land Use Type:** | **% Impervious** |
|---|---|
| Low Density Residential (LDR) | 40% |
| Medium Density Residential (MDR) | 50% |
| High Density Residential (HDR) | 60% |
| Commercial (Comm) | 70% |
| Park | 5% |
| Public/Quasi Public | 50% |
| Roadway | 85% |

Overland flow factors are also adjusted in the secondary (development) plane per typical values for the various development types.

Files for the post-project hydrology(HEC-1) models are included on the CD-ROM with this report, and a complete listing of this file is provided in Appendix C. This model is the "unmitigated" analysis for this project which means that no mitigation detention is included. This model is also adapted for the "Future, Fully Developed, Unmitigated" scenario, which means that all existing offsite detention has been removed, that all offsite areas are assumed to be fully developed, and that project detention is also removed.

This model is used as a base of comparison to the pre-project model for determining peak flow mitigation requirements per Chapter VII of the SWMM. This model is also used for the hydrology which is fed into the "Future Fully Developed Unmitigated" hydraulics analysis which forms the basis of the flow rates used in the final flood plain mapping where freeboard requirements are to be tested, and culvert and bridge sizing evaluated.

# TABLE II.B.1A – Post-Project Un-mitigated Hydrologic Factors

| | | PLANE 1 WATERSHED FACTORS (non-urban plane) | | | | | | | PLANE 2 WATERSHED FACTORS (Urban Plane) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE | BA | Init Inf 1 | Const Inf 1 | % Imp 1 | Length 1 | Slope 1 | n Val 1 | % Shed 1 | Init Inf 2 | Const Inf 2 | % Imp 2 | Length 2 | Slope 2 | n Val 2 | % Shed 2 |
| | | | | | | | | | | | | | | | |
| CUS3G | 0.4396 | 0.1 | 0.12 | 41.369 | 200 | 0.005 | 0.24 | 100 | | | | | | | |
| SS3 | 0.0707 | 0.1 | 0.07 | 4.982 | 150 | 0.01 | 0.4 | 5 | 0.1 | 0.12 | 56.659 | 96 | 0.0108 | 0.24 | 95 |
| SS3B | 0.0252 | 0.1 | 0.07 | 2.089 | 300 | 0.01 | 0.4 | 94 | 0.1 | 0.12 | 84.855 | 89 | 0.0122 | 0.24 | 6 |
| SS3C | 0.0981 | 0.1 | 0.07 | 4.997 | 150 | 0.01 | 0.4 | 7 | 0.1 | 0.12 | 42.681 | 130 | 0.01 | 0.24 | 93 |
| SS3D | 0.1037 | 0.1 | 0.07 | 4.993 | 150 | 0.01 | 0.4 | 1 | 0.1 | 0.12 | 65.734 | 85 | 0.013 | 0.24 | 99 |
| SS3E | 0.0236 | 0.1 | 0.07 | 2.084 | 300 | 0.01 | 0.4 | 100 | | | | | | | |
| SS5 | 0.0316 | 0.1 | 0.12 | 70 | 81 | 0.0138 | 0.24 | 100 | | | | | | | |
| SS3F | 0.1151 | 0.1 | 0.07 | 4.999 | 150 | 0.01 | 0.4 | 6 | 0.1 | 0.12 | 47.061 | 115 | 0.01 | 0.24 | 94 |
| CUS5A | 0.053 | 0.1 | 0.07 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| SS4A | 0.0381 | 0.1 | 0.07 | 2.254 | 300 | 0.01 | 0.4 | 100 | | | | | | | |
| SS5C | 0.0281 | 0.1 | 0.12 | 71.093 | 79 | 0.0142 | 0.24 | 100 | | | | | | | |
| SS4 | 0.1281 | 0.1 | 0.07 | 5 | 150 | 0.01 | 0.4 | 5 | 0.1 | 0.12 | 57.303 | 95 | 0.011 | 0.24 | 95 |
| SS5D | 0.0097 | 0.1 | 0.07 | 5 | 150 | 0.01 | 0.4 | 8 | 0.1 | 0.12 | 71.792 | 84 | 0.0132 | 0.24 | 92 |
| CUS6B | 0.0103 | 0.1 | 0.07 | 2.971 | 150 | 0.01 | 0.4 | 29 | 0.1 | 0.12 | 71.974 | 400 | 0.005 | 0.24 | 71 |
| SS6A | 0.0058 | 0.1 | 0.12 | 40 | 130 | 0.01 | 0.24 | 100 | | | | | | | |
| SS6 | 0.0122 | 0.1 | 0.07 | 2.425 | 150 | 0.01 | 0.4 | 88 | 0.1 | 0.12 | 85 | 115 | 0.01 | 0.24 | 12 |
| CUS5B | 0.147 | 0.1 | 0.07 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| CUS11B | 0.1374 | 0.1 | 0.0748 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| CUS14 | 0.097 | 0.1 | 0.076 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| CUS16B | 0.0208 | 0.1 | 0.072 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| SS12A | 0.0283 | 0.1 | 0.12 | 70.939 | 79 | 0.0142 | 0.24 | 100 | | | | | | | |
| SS13A | 0.2204 | 0.1 | 0.07 | 5 | 150 | 0.01 | 0.4 | 6 | 0.1 | 0.12 | 55.922 | 99 | 0.0102 | 0.24 | 94 |
| SS15 | 0.0104 | 0.1 | 0.07 | 2.585 | 300 | 0.01 | 0.4 | 69 | 0.1 | 0.12 | 84.484 | 89 | 0.0122 | 0.24 | 31 |
| CUS17A | 0.0597 | 0.1 | 0.07 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| SS15B | 0.0089 | 0.1 | 0.07 | 2.724 | 150 | 0.01 | 0.4 | 1 | 0.1 | 0.12 | 72.173 | 78 | 0.0144 | 0.24 | 99 |
| SS15A | 0.1168 | 0.1 | 0.07 | 4.996 | 150 | 0.01 | 0.4 | 13 | 0.1 | 0.12 | 57.177 | 94 | 0.0112 | 0.24 | 87 |
| SS15F | 0.0297 | 0.1 | 0.07 | 2.125 | 150 | 0.01 | 0.4 | 96 | 0.1 | 0.12 | 80.401 | 121 | 0.01 | 0.24 | 4 |
| SS15C | 0.0066 | 0.1 | 0.07 | 4.978 | 150 | 0.01 | 0.4 | 100 | | | | | | | |
| SS15D | 0.0108 | 0.1 | 0.07 | 2.742 | 150 | 0.01 | 0.4 | 1 | 0.1 | 0.12 | 40 | 130 | 0.01 | 0.24 | 99 |
| SS15E | 0.0306 | 0.1 | 0.07 | 2 | 150 | 0.01 | 0.4 | 1 | 0.1 | 0.12 | 70.638 | 79 | 0.0142 | 0.24 | 99 |
| SS17F | 0.0281 | 0.1 | 0.07 | 2.016 | 150 | 0.01 | 0.4 | 100 | | | | | | | |
| SS17B | 0.0529 | 0.1 | 0.07 | 4.998 | 150 | 0.01 | 0.4 | 95 | 0.1 | 0.12 | 84.405 | 290 | 0.0074 | 0.24 | 5 |
| SS17D | 0.024 | 0.1 | 0.07 | 4.501 | 150 | 0.01 | 0.4 | 7 | 0.1 | 0.12 | 46.994 | 115 | 0.01 | 0.24 | 93 |
| SS17E | 0.0119 | 0.1 | 0.07 | 4.967 | 150 | 0.01 | 0.4 | 100 | | | | | | | |
| CUS17C | 0.0629 | 0.1 | 0.07 | 2.004 | 150 | 0.01 | 0.4 | 100 | | | | | | | |
| CU2A1A | 0.0765 | 0.1 | 0.07 | 3.162 | 150 | 0.01 | 0.4 | 28 | 0.1 | 0.12 | 46.652 | 400 | 0.005 | 0.24 | 72 |
| S2A1B | 0.0203 | 0.1 | 0.07 | 4.953 | 150 | 0.01 | 0.4 | 62 | 0.1 | 0.12 | 49.962 | 178 | 0.0096 | 0.24 | 38 |
| CWP7 | 0.078 | 0.1 | 0.06 | 41.023 | 300 | 0.02 | 0.35 | 100 | | | | | | | |
| S2A1C | 0.0313 | 0.1 | 0.07 | 4.811 | 150 | 0.01 | 0.4 | 6 | 0.1 | 0.12 | 45.362 | 127 | 0.01 | 0.24 | 94 |
| S2A1D | 0.0617 | 0.1 | 0.07 | 2.005 | 150 | 0.01 | 0.4 | 100 | | | | | | | |
| S2A1E | 0.0057 | 0.1 | 0.07 | 5 | 150 | 0.01 | 0.4 | 8 | 0.1 | 0.12 | 40 | 136 | 0.01 | 0.24 | 92 |
| S2A1F | 0.0062 | 0.1 | 0.07 | 2.011 | 150 | 0.01 | 0.4 | 99 | 0.1 | 0.12 | 40 | 160 | 0.01 | 0.24 | 1 |
| S2AB2 | 0.0083 | 0.1 | 0.07 | 4.895 | 150 | 0.01 | 0.4 | 13 | 0.1 | 0.12 | 43.348 | 132 | 0.01 | 0.24 | 87 |
| S2AB3 | 0.0116 | 0.1 | 0.07 | 4.418 | 150 | 0.01 | 0.4 | 2 | 0.1 | 0.12 | 40.056 | 132 | 0.01 | 0.24 | 98 |
| S2AB4 | 0.0114 | 0.1 | 0.07 | 2.053 | 150 | 0.01 | 0.4 | 100 | | | | | | | |
| | | | | | | | | | | | | | | | |

# TABLE II.B.1B – Post-Project Un-mitigated Hydrologic Factors (Continued)

| | | PLANE 1 WATERSHED FACTORS (non-urban plane) | | | | | | | PLANE 2 WATERSHED FACTORS (Urban Plane) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE | BA | Init Inf 1 | Const Inf 1 | % Imp 1 | Length 1 | Slope 1 | n Val 1 | % Shed 1 | Init Inf 2 | Const Inf 2 | % Imp 2 | Length 2 | Slope 2 | n Val 2 | % Shed 2 |
| CWP8 | 0.0992 | 0.1 | 0.06 | 40 | 300 | 0.02 | 0.35 | 100 | | | | | | | |
| S2AC2 | 0.0052 | 0.1 | 0.07 | 2.132 | 150 | 0.01 | 0.4 | 100 | | | | | | | |
| S2AC1 | 0.0029 | 0.1 | 0.07 | 3.286 | 150 | 0.01 | 0.4 | 3 | 0.1 | 0.12 | 40.016 | 130 | 0.01 | 0.24 | 97 |
| CWP8A | 0.0274 | 0.1 | 0.12 | 50 | 150 | 0.005 | 0.24 | 100 | | | | | | | |
| S2AC3 | 0.0259 | 0.1 | 0.07 | 4.955 | 150 | 0.01 | 0.4 | 19 | 0.1 | 0.12 | 47.34 | 132 | 0.01 | 0.24 | 81 |
| S2AC6 | 0.035 | 0.1 | 0.07 | 2.025 | 150 | 0.01 | 0.4 | 97 | 0.1 | 0.12 | 82.339 | 77 | 0.0146 | 0.24 | 3 |
| S2AC4 | 0.0157 | 0.1 | 0.12 | 40 | 130 | 0.01 | 0.24 | 100 | | | | | | | |
| S2A9 | 0.0573 | 0.1 | 0.07 | 4.723 | 150 | 0.01 | 0.4 | 6 | 0.1 | 0.12 | 55.939 | 98 | 0.0104 | 0.24 | 94 |
| S2AB1 | 0.0523 | 0.1 | 0.07 | 4.44 | 150 | 0.01 | 0.4 | 29 | 0.1 | 0.12 | 57.7 | 127 | 0.01 | 0.24 | 71 |
| S2A1G | 0.007 | 0.1 | 0.07 | 2.201 | 600 | 0.015 | 0.4 | 88 | 0.1 | 0.12 | 82.72 | 68 | 0.0173 | 0.24 | 12 |
| S2AC5 | 0.0571 | 0.1 | 0.07 | 2.823 | 150 | 0.01 | 0.4 | 40 | 0.1 | 0.12 | 46.029 | 121 | 0.01 | 0.24 | 60 |
| S2AC7 | 0.0087 | 0.1 | 0.12 | 42.931 | 124 | 0.01 | 0.24 | 100 | | | | | | | |
| S2A8 | 0.1294 | 0.1 | 0.07 | 4.991 | 150 | 0.01 | 0.4 | 6 | 0.1 | 0.12 | 46.529 | 118 | 0.01 | 0.24 | 94 |
| S2A7A | 0.0583 | 0.1 | 0.07 | 4.911 | 150 | 0.01 | 0.4 | 14 | 0.1 | 0.12 | 52.734 | 112 | 0.01 | 0.24 | 86 |
| S2A7 | 0.0276 | 0.1 | 0.07 | 2.039 | 150 | 0.01 | 0.4 | 94 | 0.1 | 0.12 | 83.349 | 97 | 0.0106 | 0.24 | 6 |
| S2A7B | 0.0224 | 0.1 | 0.07 | 4.987 | 150 | 0.01 | 0.4 | 36 | 0.1 | 0.12 | 40 | 154 | 0.01 | 0.24 | 64 |
| S2A7C | 0.0812 | 0.1 | 0.07 | 5 | 150 | 0.01 | 0.4 | 5 | 0.1 | 0.12 | 45.12 | 132 | 0.01 | 0.24 | 95 |
| S2A4A | 0.0648 | 0.1 | 0.07 | 4.911 | 150 | 0.01 | 0.4 | 8 | 0.1 | 0.12 | 56.44 | 98 | 0.0104 | 0.24 | 92 |
| S2A4 | 0.0105 | 0.1 | 0.07 | 2.124 | 150 | 0.01 | 0.4 | 83 | 0.1 | 0.12 | 84.481 | 79 | 0.0142 | 0.24 | 17 |
| S2A5 | 0.17 | 0.1 | 0.07 | 4.944 | 150 | 0.01 | 0.4 | 7 | 0.1 | 0.12 | 49.625 | 109 | 0.01 | 0.24 | 93 |
| S2A6A | 0.0468 | 0.1 | 0.07 | 4.828 | 150 | 0.01 | 0.4 | 4 | 0.1 | 0.12 | 40.041 | 132 | 0.01 | 0.24 | 96 |
| S2A6B | 0.0161 | 0.1 | 0.07 | 4.622 | 150 | 0.01 | 0.4 | 6 | 0.1 | 0.12 | 40.014 | 134 | 0.01 | 0.24 | 94 |
| S2A6 | 0.0578 | 0.1 | 0.07 | 2.031 | 150 | 0.01 | 0.4 | 100 | | | | | | | |
| S2A6C | 0.0594 | 0.1 | 0.07 | 4.981 | 150 | 0.01 | 0.4 | 9 | 0.1 | 0.12 | 47.276 | 118 | 0.01 | 0.24 | 91 |
| S2A2 | 0.0275 | 0.1 | 0.07 | 2 | 200 | 0.01 | 0.4 | 100 | | | | | | | |
| S2A1 | 0.0131 | 0.1 | 0.07 | 2 | 200 | 0.01 | 0.4 | 100 | | | | | | | |
| S2A5C | 0.1082 | 0.1 | 0.07 | 2.03 | 200 | 0.01 | 0.4 | 100 | | | | | | | |
| CU2A3A | 0.0597 | 0.1 | 0.07 | 2 | 200 | 0.01 | 0.4 | 100 | | | | | | | |
| CU2A | 0.7583 | 0.1 | 0.06 | 2 | 600 | 0.015 | 0.4 | 100 | | | | | | | |
| CWP1 | 0.1447 | 0.1 | 0.06 | 2 | 300 | 0.008 | 0.35 | 51 | 0.1 | 0.06 | 100 | 150 | 0.01 | 0.11 | 49 |
| CWP2 | 0.1969 | 0.1 | 0.07 | 100 | 150 | 0.008 | 0.11 | 27 | 0.1 | 0.06 | 2 | 300 | 0.01 | 0.35 | 73 |
| CWP4 | 0.3627 | 0.1 | 0.06 | 2 | 300 | 0.01 | 0.35 | 54 | 0.1 | 0.06 | 100 | 200 | 0.02 | 0.11 | 46 |
| CWP3 | 0.3 | 0.1 | 0.07 | 2 | 300 | 0.01 | 0.35 | 54 | 0.1 | 0.06 | 100 | 200 | 0.01 | 0.11 | 46 |
| CWP6 | 0.3039 | 0.1 | 0.09 | 2 | 300 | 0.01 | 0.35 | 72 | 0.1 | 0.06 | 100 | 200 | 0.008 | 0.11 | 28 |
| SP9A | 0.0305 | 0.1 | 0.07 | 4.948 | 150 | 0.01 | 0.4 | 2 | 0.1 | 0.12 | 51.361 | 100 | 0.01 | 0.24 | 98 |
| CWP9 | 0.2329 | 0.1 | 0.07 | 2 | 300 | 0.008 | 0.4 | 98 | 0.1 | 0.07 | 84.266 | 400 | 0.005 | 0.24 | 2 |
| CWP13 | 0.0942 | 0.1 | 0.07 | 2 | 300 | 0.008 | 0.35 | 67 | 0.1 | 0.07 | 100 | 150 | 0.008 | 0.11 | 33 |
| CWP14 | 0.1525 | 0.1 | 0.06 | 2 | 300 | 0.008 | 0.35 | 98 | 0.1 | 0.06 | 100 | 150 | 0.01 | 0.11 | 2 |
| CU2B1 | 0.115 | 0.1 | 0.06 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2B1A | 0.0456 | 0.1 | 0.06 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2B2 | 0.3356 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2B3 | 0.3455 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2C1 | 0.2913 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2C2 | 0.229 | 0.1 | 0.06 | 2 | 100 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2C3 | 0.3384 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CWP11A | 0.075 | 0.1 | 0.06 | 2 | 300 | 0.01 | 0.35 | 60 | 0.1 | 0.06 | 100 | 150 | 0.02 | 0.11 | 40 |
| CWP11 | 0.123 | 0.1 | 0.06 | 2 | 300 | 0.01 | 0.35 | 95 | 0.1 | 0.06 | 100 | 200 | 0.01 | 0.11 | 5 |
| CWP12 | 0.0678 | 0.1 | 0.06 | 100 | 600 | 0.01 | 0.11 | 2 | 0.1 | 0.06 | 2 | 600 | 0.01 | 0.4 | 98 |
| CU3A | 0.3864 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CU3B | 0.4803 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3C | 0.1723 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3D | 0.7278 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3E | 0.1747 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3F | 1.0026 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3G | 0.3125 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3HA | 0.0897 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CU3HB | 0.1658 | 0.1 | 0.06 | 2 | 300 | 0.001 | 0.4 | 100 | | | | | | | |
| CU4 | 3.58 | 0.1 | 0.06 | 2 | 600 | 0.015 | 0.4 | 100 | | | | | | | |
| CU5 | 0.28 | 0.1 | 0.06 | 2 | 600 | 0.015 | 0.4 | 100 | | | | | | | |
| CU6 | 0.87 | 0.1 | 0.06 | 2 | 600 | 0.015 | 0.4 | 100 | | | | | | | |

## II.C Post-Project Mitigated Model:

Hydrologic (HEC-1) watershed factors for the two post project conditions are identical. This mitigation model also uses the Unsteady State HEC-RAS hydraulic analysis for the evaluation of the routing benefits of the proposed project improvements within the open space which will provide attenuation offsets to mitigate the development impacts.

Additionally, this model includes the evaluation of the need for a potential temporary detention basin in the north area of the project where a ~20 acre MDR site will drain north to the Urban Reserve areas. The analysis evaluated the total shed changes that occurred in cleaning up the boundaries for land use areas and the urban reserve boundary at the north end of the project, and found that approximately 12 acres total will be diverted from flowing north, and put into the Federico Creek system. As a result of the diversion of the runoff from the 12 acres to the Federico Tributary, the model demonstrates that peak flows to the north are reduced, even in the alternative where the 20 acre MDR site is developed without detention. Therefore no detention is proposed at this location. Attenuation within the Federico Tributary accounts for the flow diversion acreage mitigation needs.

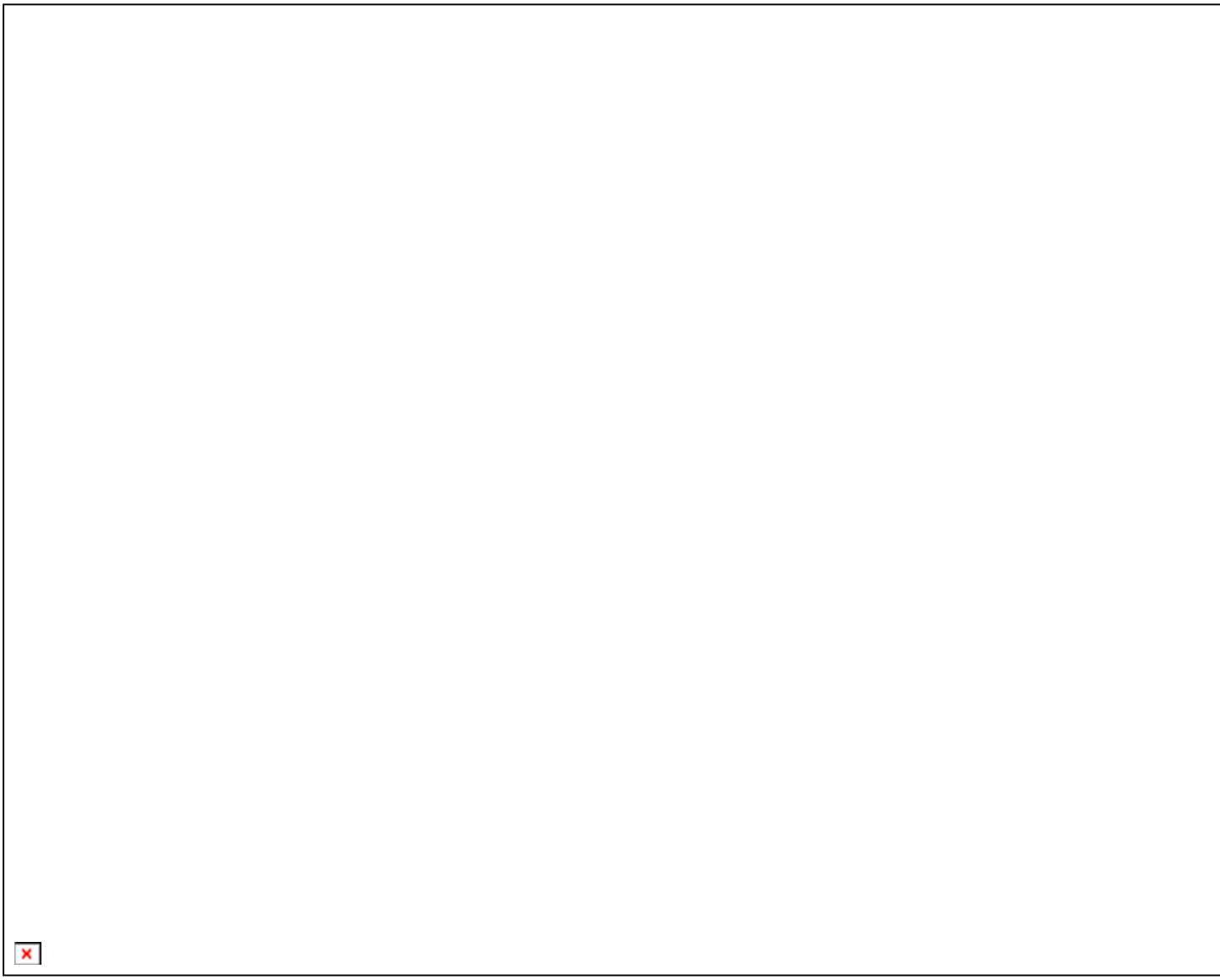
Two detention basins constructed in series will be located within the power line corridor adjacent to Federico Creek in the north central area of the project, providing approximately 20 acre feet of short term (less than 72 hour drawdown) detention storage. Flows will be diverted to the detention areas via a 42 inch diameter culvert to be located at the Market Street crossing of Federico Creek. The detention basins will also receive flows from the local areas which are directly tributary to their locations. The two detention basins will be interconnected by a 30 inch diameter pipe at the future roadway crossing. And the downstream basin will have a 30 inch diameter exit pipe crossing the proposed roadway, and exiting into the created wetland areas of the open space.

The proposed remaining attenuation areas will be located in the overbank areas of the existing Curry Creek streams, providing additional conveyance and storage capacity within the stream system. The added storage will function passively on the system, requiring no special operational maintenance. Additionally, the design of the floodplain areas, and attenuation features accounts for the type of vegetation which may develop in these areas as a result of added nuisance waters and nutrients known to occur with types of development planned in this project. Exhibit AT-1 shows the proposed areas where improvements are proposed within the stream corridors. A reduced version of Exhibit AT-1 is provided here in Figure II.C.

Figures II.C and AT-1 also identify areas shown as “Alternate Outfall Locations”. These locations have been identified as potential locations where additional storm drain outfalls and vegetated swales will be needed. If they are used in final design, a portion or all of the storm drain flows from an adjacent outfall will be relocated to this facility. Preliminary sizing shown on the exhibit assumed complete redundancy, and areas identified are for a complete relocation of flow discharges from an adjacent location. However, the grading for only the main outfall locations identified was included in the

mitigation hydrology and hydraulics analysis.

**FIGURE II.C – LOCATIONS OF IMPROVEMENTS PROPOSED IN STREAM CORRIDORS**



An oversized plot of this exhibit is provided in the back of this report, as Exhibit AT-1. Proposed project facilities and wetland resources within the open space are also more easily identified on the larger exhibit.

The post project models for the Unmitigated and Mitigated conditions do not include adjustments for the proposed use of Low Impact Development measures planned by this project. Those adjustments are only included in the Hydromodification Evaluation Hydrology Model (labeled some places as the "with LID" model).

## II.D Hydromodification Evaluation Post-Project Hydrology Model:

For the purposes of testing the potential Hydrograph Modification Benefits of the proposed LID program of this project, an alternate hydrology (HEC-1) analysis was performed which adjusts the imperviousness of the project for the LID components which will contribute to retention and infiltration of stormwater, which reduces runoff. This model includes the impervious area modifications for LID improvements by land use per TABLE II.D.1. Impervious area reductions are based on the Required Volume Reductions (RVR's) specified in section IV of this report. Timing of runoff passing through LID measures was not adjusted in this analysis compared to the other post-project hydrology models. Meaning that while a portion of area was converted to non-impervious type, it was retained in the urban plane of the watershed, and it is assumed that runoff coming from those areas will runoff in an urban timing. While changes in impervious area on type D soils are not a significant factor during the peak of flood events such as the 100-year, we have included these modifications so that impacts in smaller events such as SWQ and Hydromod events can be tested. Watershed HEC-1 factors are listed in Tables II.D.2A and II.D.2B.

**TABLE II.D.1 – IMPERVIOUS AREA REDUCTIONS FOR LID**

| Land Use Type | Non-modified Average Impervious % | Modified for LID Average Impervious % | Impervious Reduction for LID RVR's |
|---|---|---|---|
| LDR | 40% | 9% | 31% |
| MDR | 50% | 12% | 38% |
| HDR | 60% | 19% | 41% |
| Commercial | 70% | 20% | 50% |
| Public/Quasi Public | 40% | 9% | 31% |
| Park | 5% | 2% | 3% |
| Road | 85% | 26% | 59% |

# TABLE II.D.2A – HYDROLOGIC WATERSHED FACTORS – LID REDUCED

| | | PLANE 1 WATERSHED FACTORS (non-urban plane) | | | | | | | PLANE 2 WATERSHED FACTORS (Urban Plane) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE | BA | Init Inf 1 | Const Inf 1 | % Imp 1 | Length 1 | Slope 1 | n Val 1 | % Shed 1 | Init Inf 2 | Const Inf 2 | % Imp 2 | Length 2 | Slope 2 | n Val 2 | % Shed 2 |
| | | | | | | | | | | | | | | | |
| CUS3G | 0.4396 | 0.1 | 0.12 | 9.502 | 200 | 0.005 | 0.24 | 100 | | | | | | | |
| SS3 | 0.0707 | 0.1 | 0.07 | 4.982 | 150 | 0.01 | 0.4 | 5 | 0.1 | 0.12 | 15.178 | 96 | 0.0108 | 0.24 | 95 |
| SS3B | 0.0252 | 0.1 | 0.07 | 2.089 | 300 | 0.01 | 0.4 | 94 | 0.1 | 0.12 | 25.945 | 89 | 0.0122 | 0.24 | 6 |
| SS3C | 0.0981 | 0.1 | 0.07 | 4.997 | 150 | 0.01 | 0.4 | 7 | 0.1 | 0.12 | 10.013 | 130 | 0.01 | 0.24 | 93 |
| SS3D | 0.1037 | 0.1 | 0.07 | 4.993 | 150 | 0.01 | 0.4 | 1 | 0.1 | 0.12 | 18.294 | 85 | 0.013 | 0.24 | 99 |
| SS3E | 0.0236 | 0.1 | 0.07 | 2.084 | 300 | 0.01 | 0.4 | 100 | | | | | | | |
| SS5 | 0.0316 | 0.1 | 0.12 | 20 | 81 | 0.0138 | 0.24 | 100 | | | | | | | |
| SS3F | 0.1151 | 0.1 | 0.07 | 4.999 | 150 | 0.01 | 0.4 | 6 | 0.1 | 0.12 | 11.297 | 115 | 0.01 | 0.24 | 94 |
| CUS5A | 0.053 | 0.1 | 0.07 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| SS4A | 0.0381 | 0.1 | 0.07 | 2.254 | 300 | 0.01 | 0.4 | 100 | | | | | | | |
| SS5C | 0.0281 | 0.1 | 0.12 | 20.437 | 79 | 0.0142 | 0.24 | 100 | | | | | | | |
| SS4 | 0.1281 | 0.1 | 0.07 | 5 | 150 | 0.01 | 0.4 | 5 | 0.1 | 0.12 | 16.119 | 95 | 0.011 | 0.24 | 95 |
| SS5D | 0.0097 | 0.1 | 0.07 | 5 | 150 | 0.01 | 0.4 | 8 | 0.1 | 0.12 | 20.717 | 84 | 0.0132 | 0.24 | 92 |
| CUS6B | 0.0103 | 0.1 | 0.07 | 2.971 | 150 | 0.01 | 0.4 | 29 | 0.1 | 0.12 | 20.79 | 400 | 0.005 | 0.24 | 71 |
| SS6A | 0.0058 | 0.1 | 0.12 | 9 | 130 | 0.01 | 0.24 | 100 | | | | | | | |
| SS6 | 0.0122 | 0.1 | 0.07 | 2.425 | 150 | 0.01 | 0.4 | 88 | 0.1 | 0.12 | 26 | 115 | 0.01 | 0.24 | 12 |
| CUS5B | 0.147 | 0.1 | 0.07 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| CUS11B | 0.1374 | 0.1 | 0.0748 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| CUS14 | 0.097 | 0.1 | 0.076 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| CUS16B | 0.0208 | 0.1 | 0.072 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| SS12A | 0.0283 | 0.1 | 0.12 | 20.376 | 79 | 0.0142 | 0.24 | 100 | | | | | | | |
| SS13A | 0.2204 | 0.1 | 0.07 | 5 | 150 | 0.01 | 0.4 | 6 | 0.1 | 0.12 | 15.093 | 99 | 0.0102 | 0.24 | 94 |
| SS15 | 0.0104 | 0.1 | 0.07 | 2.585 | 300 | 0.01 | 0.4 | 69 | 0.1 | 0.12 | 25.794 | 89 | 0.0122 | 0.24 | 31 |
| CUS17A | 0.0597 | 0.1 | 0.07 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| SS15B | 0.0089 | 0.1 | 0.07 | 2.724 | 150 | 0.01 | 0.4 | 1 | 0.1 | 0.12 | 20.869 | 78 | 0.0144 | 0.24 | 99 |
| SS15A | 0.1168 | 0.1 | 0.07 | 4.996 | 150 | 0.01 | 0.4 | 13 | 0.1 | 0.12 | 15.384 | 94 | 0.0112 | 0.24 | 87 |
| SS15F | 0.0297 | 0.1 | 0.07 | 2.125 | 150 | 0.01 | 0.4 | 96 | 0.1 | 0.12 | 24.262 | 121 | 0.01 | 0.24 | 4 |
| SS15C | 0.0066 | 0.1 | 0.07 | 4.978 | 150 | 0.01 | 0.4 | 100 | | | | | | | |
| SS15D | 0.0108 | 0.1 | 0.07 | 2.742 | 150 | 0.01 | 0.4 | 1 | 0.1 | 0.12 | 9 | 130 | 0.01 | 0.24 | 99 |
| SS15E | 0.0306 | 0.1 | 0.07 | 2 | 150 | 0.01 | 0.4 | 1 | 0.1 | 0.12 | 20.255 | 79 | 0.0142 | 0.24 | 99 |
| SS17F | 0.0281 | 0.1 | 0.07 | 2.016 | 150 | 0.01 | 0.4 | 100 | | | | | | | |
| SS17B | 0.0529 | 0.1 | 0.07 | 4.998 | 150 | 0.01 | 0.4 | 95 | 0.1 | 0.12 | 25.762 | 290 | 0.0074 | 0.24 | 5 |
| SS17D | 0.024 | 0.1 | 0.07 | 4.501 | 150 | 0.01 | 0.4 | 7 | 0.1 | 0.12 | 11.642 | 115 | 0.01 | 0.24 | 93 |
| SS17E | 0.0119 | 0.1 | 0.07 | 4.967 | 150 | 0.01 | 0.4 | 100 | | | | | | | |
| CUS17C | 0.0629 | 0.1 | 0.07 | 2.004 | 150 | 0.01 | 0.4 | 100 | | | | | | | |
| CU2A1A | 0.0765 | 0.1 | 0.07 | 3.162 | 150 | 0.01 | 0.4 | 28 | 0.1 | 0.12 | 11.902 | 400 | 0.005 | 0.24 | 72 |
| S2A1B | 0.0203 | 0.1 | 0.07 | 4.953 | 150 | 0.01 | 0.4 | 62 | 0.1 | 0.12 | 11.989 | 178 | 0.0096 | 0.24 | 38 |
| CWP7 | 0.078 | 0.1 | 0.06 | 9.307 | 300 | 0.02 | 0.35 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S2A1C | 0.0313 | 0.1 | 0.07 | 4.811 | 150 | 0.01 | 0.4 | 6 | 0.1 | 0.12 | 11.026 | 127 | 0.01 | 0.24 | 94 |
| S2A1D | 0.0617 | 0.1 | 0.07 | 2.005 | 150 | 0.01 | 0.4 | 100 | | | | | | | |
| S2A1E | 0.0057 | 0.1 | 0.07 | 5 | 150 | 0.01 | 0.4 | 8 | 0.1 | 0.12 | 9 | 136 | 0.01 | 0.24 | 92 |
| S2A1F | 0.0062 | 0.1 | 0.07 | 2.011 | 150 | 0.01 | 0.4 | 99 | 0.1 | 0.12 | 9 | 160 | 0.01 | 0.24 | 1 |
| S2AB2 | 0.0083 | 0.1 | 0.07 | 4.895 | 150 | 0.01 | 0.4 | 13 | 0.1 | 0.12 | 10.265 | 132 | 0.01 | 0.24 | 87 |
| S2AB3 | 0.0116 | 0.1 | 0.07 | 4.418 | 150 | 0.01 | 0.4 | 2 | 0.1 | 0.12 | 9.021 | 132 | 0.01 | 0.24 | 98 |
| S2AB4 | 0.0114 | 0.1 | 0.07 | 2.053 | 150 | 0.01 | 0.4 | 100 | | | | | | | |

# TABLE II.D.2B – HYDROLOGIC WATERSHED FACTORS – LID REDUCED (CONT)

| | | PLANE 1 WATERSHED FACTORS (non-urban plane) | | | | | | | PLANE 2 WATERSHED FACTORS (Urban Plane) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE | BA | Init Inf 1 | Const Inf 1 | % Imp 1 | Length 1 | Slope 1 | n Val 1 | % Shed 1 | Init Inf 2 | Const Inf 2 | % Imp 2 | Length 2 | Slope 2 | n Val 2 | % Shed 2 |
| CWP8 | 0.0992 | 0.1 | 0.06 | 9 | 300 | 0.02 | 0.35 | 100 | | | | | | | |
| S2AC2 | 0.0052 | 0.1 | 0.07 | 2.132 | 150 | 0.01 | 0.4 | 100 | | | | | | | |
| S2AC1 | 0.0029 | 0.1 | 0.07 | 3.286 | 150 | 0.01 | 0.4 | 3 | 0.1 | 0.12 | 9.005 | 130 | 0.01 | 0.24 | 97 |
| CWP8A | 0.0274 | 0.1 | 0.12 | 12 | 150 | 0.005 | 0.24 | 100 | | | | | | | |
| S2AC3 | 0.0259 | 0.1 | 0.07 | 4.955 | 150 | 0.01 | 0.4 | 19 | 0.1 | 0.12 | 11.629 | 132 | 0.01 | 0.24 | 81 |
| S2AC6 | 0.035 | 0.1 | 0.07 | 2.025 | 150 | 0.01 | 0.4 | 97 | 0.1 | 0.12 | 24.995 | 77 | 0.0146 | 0.24 | 3 |
| S2AC4 | 0.0157 | 0.1 | 0.12 | 9 | 130 | 0.01 | 0.24 | 100 | | | | | | | |
| S2A9 | 0.0573 | 0.1 | 0.07 | 4.723 | 150 | 0.01 | 0.4 | 6 | 0.1 | 0.12 | 15.343 | 98 | 0.0104 | 0.24 | 94 |
| S2AB1 | 0.0523 | 0.1 | 0.07 | 4.44 | 150 | 0.01 | 0.4 | 29 | 0.1 | 0.12 | 16.098 | 127 | 0.01 | 0.24 | 71 |
| S2A1G | 0.007 | 0.1 | 0.07 | 2.201 | 600 | 0.015 | 0.4 | 88 | 0.1 | 0.12 | 25.139 | 160 | 0.01 | 0.24 | 12 |
| S2AC5 | 0.0571 | 0.1 | 0.07 | 2.823 | 150 | 0.01 | 0.4 | 40 | 0.1 | 0.12 | 11.278 | 121 | 0.01 | 0.24 | 60 |
| S2AC7 | 0.0087 | 0.1 | 0.12 | 10.107 | 250 | 0.008 | 0.24 | 100 | | | | | | | |
| S2A8 | 0.1294 | 0.1 | 0.07 | 4.991 | 150 | 0.01 | 0.4 | 6 | 0.1 | 0.12 | 11.467 | 118 | 0.01 | 0.24 | 94 |
| S2A7A | 0.0583 | 0.1 | 0.07 | 4.911 | 150 | 0.01 | 0.4 | 14 | 0.1 | 0.12 | 13.094 | 112 | 0.01 | 0.24 | 86 |
| S2A7 | 0.0276 | 0.1 | 0.07 | 2.039 | 150 | 0.01 | 0.4 | 94 | 0.1 | 0.12 | 25.376 | 97 | 0.0106 | 0.24 | 6 |
| S2A7B | 0.0224 | 0.1 | 0.07 | 4.987 | 150 | 0.01 | 0.4 | 36 | 0.1 | 0.12 | 9 | 154 | 0.01 | 0.24 | 64 |
| S2A7C | 0.0812 | 0.1 | 0.07 | 5 | 150 | 0.01 | 0.4 | 5 | 0.1 | 0.12 | 10.867 | 132 | 0.01 | 0.24 | 95 |
| S2A4A | 0.0648 | 0.1 | 0.07 | 4.911 | 150 | 0.01 | 0.4 | 8 | 0.1 | 0.12 | 14.576 | 98 | 0.0104 | 0.24 | 92 |
| S2A4 | 0.0105 | 0.1 | 0.07 | 2.124 | 150 | 0.01 | 0.4 | 83 | 0.1 | 0.12 | 25.802 | 79 | 0.0142 | 0.24 | 17 |
| S2A5 | 0.17 | 0.1 | 0.07 | 4.944 | 150 | 0.01 | 0.4 | 7 | 0.1 | 0.12 | 12.39 | 109 | 0.01 | 0.24 | 93 |
| S2A6A | 0.0468 | 0.1 | 0.07 | 4.828 | 150 | 0.01 | 0.4 | 4 | 0.1 | 0.12 | 9.012 | 132 | 0.01 | 0.24 | 96 |
| S2A6B | 0.0161 | 0.1 | 0.07 | 4.622 | 150 | 0.01 | 0.4 | 6 | 0.1 | 0.12 | 9.005 | 134 | 0.01 | 0.24 | 94 |
| S2A6 | 0.0578 | 0.1 | 0.07 | 2.031 | 150 | 0.01 | 0.4 | 100 | | | | | | | |
| S2A6C | 0.0594 | 0.1 | 0.07 | 4.981 | 150 | 0.01 | 0.4 | 9 | 0.1 | 0.12 | 11.475 | 118 | 0.01 | 0.24 | 91 |
| S2A2 | 0.0275 | 0.1 | 0.07 | 2 | 200 | 0.01 | 0.4 | 100 | | | | | | | |
| S2A1 | 0.0131 | 0.1 | 0.07 | 2 | 200 | 0.01 | 0.4 | 100 | | | | | | | |
| S2A5C | 0.1082 | 0.1 | 0.07 | 2.03 | 200 | 0.01 | 0.4 | 100 | | | | | | | |
| CU2A3A | 0.0597 | 0.1 | 0.07 | 2 | 200 | 0.01 | 0.4 | 100 | | | | | | | |
| CU2A | 0.7583 | 0.1 | 0.06 | 2 | 600 | 0.015 | 0.4 | 100 | | | | | | | |
| CWP1 | 0.1447 | 0.1 | 0.06 | 2 | 300 | 0.008 | 0.35 | 51 | 0.1 | 0.06 | 100 | 150 | 0.01 | 0.11 | 49 |
| CWP2 | 0.1969 | 0.1 | 0.07 | 100 | 150 | 0.008 | 0.11 | 27 | 0.1 | 0.06 | 2 | 300 | 0.01 | 0.35 | 73 |
| CWP4 | 0.3627 | 0.1 | 0.06 | 2 | 300 | 0.01 | 0.35 | 54 | 0.1 | 0.06 | 100 | 200 | 0.02 | 0.11 | 46 |
| CWP3 | 0.3 | 0.1 | 0.07 | 2 | 300 | 0.01 | 0.35 | 54 | 0.1 | 0.06 | 100 | 200 | 0.01 | 0.11 | 46 |
| CWP6 | 0.3039 | 0.1 | 0.09 | 2 | 300 | 0.01 | 0.35 | 72 | 0.1 | 0.06 | 100 | 200 | 0.008 | 0.11 | 28 |
| SP9A | 0.0305 | 0.1 | 0.07 | 4.948 | 150 | 0.01 | 0.4 | 2 | 0.1 | 0.12 | 12.544 | 100 | 0.01 | 0.24 | 98 |
| CWP9 | 0.2329 | 0.1 | 0.07 | 2 | 300 | 0.008 | 0.4 | 98 | 0.1 | 0.07 | 25.706 | 400 | 0.005 | 0.24 | 2 |
| CWP13 | 0.0942 | 0.1 | 0.07 | 2 | 300 | 0.008 | 0.35 | 67 | 0.1 | 0.07 | 100 | 150 | 0.008 | 0.11 | 33 |
| CWP14 | 0.1525 | 0.1 | 0.06 | 2 | 300 | 0.008 | 0.35 | 98 | 0.1 | 0.06 | 100 | 150 | 0.01 | 0.11 | 2 |
| CU2B1 | 0.115 | 0.1 | 0.06 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2B1A | 0.0456 | 0.1 | 0.06 | 2 | 200 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2B2 | 0.3356 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2B3 | 0.3455 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2C1 | 0.2913 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2C2 | 0.229 | 0.1 | 0.06 | 2 | 100 | 0.005 | 0.4 | 100 | | | | | | | |
| CU2C3 | 0.3384 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CWP11A | 0.075 | 0.1 | 0.06 | 2 | 300 | 0.01 | 0.35 | 60 | 0.1 | 0.06 | 100 | 150 | 0.02 | 0.11 | 40 |
| CWP11 | 0.123 | 0.1 | 0.06 | 2 | 300 | 0.01 | 0.35 | 95 | 0.1 | 0.06 | 100 | 200 | 0.01 | 0.11 | 5 |
| CWP12 | 0.0678 | 0.1 | 0.06 | 100 | 600 | 0.01 | 0.11 | 2 | 0.1 | 0.06 | 2 | 600 | 0.01 | 0.4 | 98 |
| CU3A | 0.3864 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CU3B | 0.4803 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3C | 0.1723 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3D | 0.7278 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3E | 0.1747 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3F | 1.0026 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3G | 0.3125 | 0.1 | 0.06 | 2 | 600 | 0.001 | 0.4 | 100 | | | | | | | |
| CU3HA | 0.0897 | 0.1 | 0.06 | 2 | 600 | 0.005 | 0.4 | 100 | | | | | | | |
| CU3HB | 0.1658 | 0.1 | 0.06 | 2 | 300 | 0.001 | 0.4 | 100 | | | | | | | |
| CU4 | 3.58 | 0.1 | 0.06 | 2 | 600 | 0.015 | 0.4 | 100 | | | | | | | |
| CU5 | 0.28 | 0.1 | 0.06 | 2 | 600 | 0.015 | 0.4 | 100 | | | | | | | |
| CU6 | 0.87 | 0.1 | 0.06 | 2 | 600 | 0.015 | 0.4 | 100 | | | | | | | |

## II.E Summary of Findings:

**TABLE II.E.3A – 100-YEAR (& 10-YEAR) PEAK FLOW COMPARISON**

| Stream Station | Description | Pre-Project Peak Flow (cfs) | Post-Project Future, Fully Developed, Unmitigated Peak Flow (cfs) | Post-Project Mitigated Peak Flow (cfs) | Post –Project Mitigated Net Peak Flow Reduction (cfs) |
|---|---|---|---|---|---|
| **Curry Creek – Main Channel** | | | | | |
| 1.44 | Fiddyment Road at Upstream end of Analysis | 285 (146) | 285 (146) | 285 (145) | 0 (1) (via diversion) |
| 1.385 | Upland Drive Crossing | 331 (170) | 272 (153) (note 2) | 255 (153) | 76 (17) |
| 1.333 | Pedestrian Crossing #1 | 477 (253) | 326 (184) (note 2) | 334 (186) | 143 (67) |
| 1.265 | Market Street Crossing | 406 (202) | 364 (226) (note 2) | 349 (219) | 57 (-17) (onsite) |
| 1.215 | Baseline Road Eastern Upstream Crossing | 458 (226) | 380 (237) (note 2) | 366 (230) | 88 (-4) (see note 1) |
| 1.025 | Baseline Road Western Downstream Crossing | 455 (210) | 397 (263) (note 2) | 414 (272) | 39 (-62) (onsite) |
| 0.87 | Watt Avenue Crossing | 431 (214) | 414 (274) (note 2) | 434 (280) | -3 (-5) (onsite) |
| 0.552 | Pedestrian Crossing #2 | 428 (215) | 424 (279) (note 2) | 454 (282) | -26 (-67) (onsite) |
| 0.33 | Pedestrian Crossing #3 At Existing Driveway Br. | 424 (216) | 425 (277) (note 2) | 455 (277) | -31 (-61) (onsite) |
| 0.03 | Downstream end of Curry Creek at Confl. with Federico Creek | 432 (220) | 429 (278) (note 2) | 461 (273) | -29 (-53) (onsite) |
| **Federico Creek** | | | | | |
| 1.15 | Pedestrian Crossing #4 | 116 (61) | 182 (99) | 121 (64) | -5 (-3) |
| 0.9954 | East-West Road | 185 (95) | 168 (105) (note 2) | 130 (76) | 55 (19) |
| 0.975 | Market Street | 194 (100) | 165 (105) (note 2) | 128 (76) | 66 (24) |
| 0.931 | Pedestrian Crossing #5 | 228 (121) | 172 (105) | 104 (59) | 124 (62) (onsite) |
| 0.865 | Westside Drive | 319 (176) | 223 (142) (note 2) | 157 (71) | 162 (105) |
| 0.805 | North-South Road | 366 (202) | 312 (213) (note 2) | 240 (132) | 126 (70) |
| 0.775 | Watt Avenue | 376 (207) | 320 (230) (note 2) | 252 (150) | 124 (57) |
| **CURRY CREEK DOWNSTREAM OF CONFLUENCE** | | | | | |
| 6.9 | Downstream Project Boundary | 804 (466) | 799 (488) | 740 (426) | 64 (40) (1 cfs reduction required by SWMM in 100-year) |

Note 1: Peak flow increases occur in the 10-year thru the reach south of Baseline Road. 100-year generates substantial flow reductions through this reach.

Note 2: An apparent flow reduction in the post-project un-mitigated results from the need for the Future Fully Developed Unmitigated alternative to include all bridges and worst case 'n' values for the purpose of determining the maximum floodplain elevations for design. Inherently this increases the amount of attenuation represented in this model.

Table II.E.3A compares the findings of the various hydrology analysis studies for the Peak 100-year flow rates at several key locations within the project. Flowrates reported in this table result from the hydraulic routing analysis, and are reported as the "Max" flows in the HEC-RAS files for these locations.

Table II.E.3A identifies that for all project exit points and downstream of the project, that peak flow rates will be reduced for the 100-year event. The net impact along the main corridor of Curry Creek at the west project boundary is a reduction of 37 cfs in the 100-year event.

**TABLE II.E.3B – REQUIRED ATTENUATION CREATION AREAS**

| Attenuation Location Name | Description | Pre-Project Storage this Reach (AF) | Post-Project Storage this Reach (AF) | Added Storage this Reach (AF) |
|---|---|---|---|---|
| **Curry Creek** | | | | |
| OS-16 | Downstream of Fiddyment, Upstream of Upland | 11.4 | 17.1 | **5.7** |
| OS-15C<br>OS-15D | Downstream of Upland<br>Upstream of Pedestrian Crossing #1 | 11.8 | 14.2 | **2.4** |
| OS-15A<br>OS-15B | Downstream of Ped Crossing #1,<br>Upstream of Market Street | 26.5 | 34.5 | **8.0** |
| OS-14 | Downstream of Market<br>Upstream of Baseline Road | 26.7 | 11.8 | **-14.9** |
| OS-12 | Downstream of Baseline Road,<br>Upstream of Watt Avenue | 15.1 | 15.9 | **0.8** |
| OS-11C | Downstream of Watt, Upstream of Ped. Crossing #2 | 9.1 | 21.6 | **12.5** |
| OS-11B | Downstream of Ped Crossing #2,<br>Upstream of Ped Crossing #3 | 6.6 | 24.7 | **18.2** |
| OS-11A | Downstream of Ped Crossing #3 to Confluence with Federico Creek | 17.4 | 31.7 | **14.3** |
| **Federico Creek** | | | | |
| OS-8B<br>OS-8C | Downstream of east-west road,<br>Upstream of Ped Crossing #4 | 3.3 | 3.8 | 0.5 |
| OS-8A | Downstream of Ped Crossing #4<br>Upstream of east-west road | 3.4 | 5.0 | 1.6 |
| OS-7A | Detention Basin within power line corridor downstream of Market Street | 0 | 20 | 20 |
| OS-3 | Downstream of east-west road,<br>Upstream of Market Street | 1.1 | 1.2 | 0.1 |
| OS-2B | Downstream of Market Street,<br>Upstream of Ped Crossing #5 | 6.3 | 8.8 | 2.4 |
| OS-2A | Downstream of Ped Crossing #5<br>Upstream of Westside Drive | 12.0 | 22.0 | 9.9 |
| OS-6B<br>OS-6A | Downstream of Westside Drive<br>Upstream of north-south road | 14.0 | 17.3 | 3.2 |
| OS-5 | Downstream of north-south road<br>Upstream of Watt Avenue | 6.8 | 7.8 | 1.0 |
| OS4B | Downstream of Watt Avenue to Confluence with Curry Creek | 29.8 | 36.7 | 6.9 |
| | | | | **TOTAL STORAGE ADDED = 91.1 AF** |

Table II.E.3B identifies the estimated amount of additional storage volume proposed at the various Attenuation Areas shown on Exhibit AT-1. The creation of these volumes provides storage in the creek system which mitigates peak flow increases from the proposed development areas. The table indicates that the project will construct 91,1 acre feet of added attenuation within the 100-year floodplain.

# III. Hydraulics:

## III.A Flood Plain Analysis:

A portion of the west end of the Sierra Vista Specific Plan is shown on the FEMA Flood Insurance Rate Map (FIRM) panel 06061C0475F dated June 8, 1998, as "Approximate Zone A" floodplain. This area does not have floodway delineation on the FIRM, nor are base flood elevations specified. The City of Roseville may require the project to submit Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR) applications to FEMA for the proposed Base Flood Elevation data where changes are proposed, and to remap the approximate Zone A floodplain to Zone A with Floodway throughout the project. A CLOMR is typically applied for once a project planning document is approved and the grading concept (for areas within the floodplain) is designed to a point where substantial revisions are not expected. A LOMR application is requested once all work within the floodplain is complete, and as-built information can be certified for FEMA.

The project proposes to provide onsite attenuation within the over bank areas as well as to cross the floodplain at several locations with bridge/culvert crossings for roadways and pedestrian trails as shown on exhibit AT-1.

The results of the detailed hydraulic study of the pre-project floodplains for all tributaries of Curry Creek within the project is shown on exhibit FP-1. The estimated Post-project floodplains for the mitigated condition are shown on exhibit FP-2. FP-3 identifies the "future fully developed, unmitigated" floodplains for the project which is the assumed post-project floodplain for design purposes.

Floodway analysis was not performed with the hydraulic analysis included with this study and will be performed with FEMA application studies.

The Army Corps HEC-RAS software version 3.1.3 was utilized to develop the included hydraulic models for the project. Floodplain elevations were determined for the 100-year event, for the Pre-Project and Post-Project conditions. The HEC-RAS base models used in this analysis were obtained from the RUSP analysis and the Placer Vineyards analysis. Detailed cross sections within the project areas were re-cut based on the project topography. Where grading is proposed for the project attenuation features, roadway and pedestrian trails, and stormwater quality improvements, the post-project models were updated accordingly. Figures III.A-1 to III.A-19 show the cross sections and locations of excavation where side-channel excavation for wetland creation and stormwater quality vegetated swales are proposed.

Future roadway culvert sizing for the crossing of Curry Creek and Baseline Road, were previously identified in the Placer Vineyards Study to require a single 14'x5.6' Conspan Arch at the upstream crossing (station 1.215) and a single 16'x5.5' Conspan Arch at the downstream crossing. We have not changed those recommendations, but have corrected the culvert lengths and inverts in our hydraulic analysis. Table III.A.1 identifies the

proposed culvert and bridge sizes per the HEC-RAS analysis throughout the project.

A comparison of the pre-project and post-project water surface elevations for the 100-year event, at project boundary and critical locations are presented in TABLE III.A.2.

## III.A.1 Pre-Project Hydraulic Model Parameters:

The HEC-RAS version 3.1.3 software was utilized to perform an unsteady state hydraulic analysis of the existing floodplains. A site visit was performed to evaluate the stream conditions and estimate 'n' values for channel friction at the low flow and overbank areas. We have established creek wide values of 0.045 for the low flow channel and 0.06 for the overbank areas for this model. Two culverts and a small bridge exist within the modeling reach. The two culverts are located at the two Baseline Road crossings on the main branch of Curry Creek, where runoff waters 1st leave the project into the Placer Vineyards Specific Plan, then Return into this Plan Area. The existing culverts at these locations are:

Station 1.21: Upstream Baseline Road Culvert = 8.5ft wide x 6 ft high metal arch

Station 1.04: Downstream Baseline Road Culvert = 2 culverts each is 5ft wide by 3.5 ft high metal arch.

A small agricultural bridge crossing also exists on the main Reach of Curry Creek within the project, downstream of the 2nd Baseline Road crossing. A cross section of this bridge is shown below. It is estimated that this bridge is overtopped in less than a 100-year event, from its appearance in the field.

The pre-project floodplain, mapped on the FP-1 exhibits is our best estimate of the 100-year flood limits in the existing conditions through the project. The pre-project model also generates the pre-project hydrology for the basis of comparison with post-project conditions analysis.

## III.A.2 Post-Project Mitigated Hydraulic Model Parameters:

The post-project mitigated condition hydraulic model includes all bridges, culverts, and attenuation features planned for the project within the creek corridors. 'n' values are adjusted for this model to account for nuisance flow contributions to vegetation growth along the stream corridor. 'n' values of 0.08 are assumed in the main channel and overbank areas. An 'n' value of 0.10 was applied to the wetland creation areas and the stormwater quality vegetated swales at the pipe outfalls.

Hydrology produced from this analysis is compared to the pre-project analysis to demonstrate mitigation objectives are being achieved by project improvements.

### III.A.3 Future, Fully Developed, Unmitigated Hydraulic Model Parameters:

For this scenario, 'n' values from the post-project mitigated scenario are used. Wetland Creation areas were removed from the hydraulic model, so that the attenuation resulting from the floodplain volumes created by these features would not be counted. The model removes the routing within the hydrology models for detention basins within the Westpark subdivision, and assumes that mitigation is no longer functioning. Additionally, within the model, the edges of the channel were obstructed approximately 5 feet horizontally into the floodplain to account for future variability in the design of the edge features.

This scenario forms the basis floodplain for use in design of the project. The floodplain limits identified by this model will be used in the project CLOMR when that is submitted to FEMA. The base flood elevations established in this analysis are used for determining the elevations with required freeboard of structures to be constructed on the project. Since the depths of the creeks within this project are generally less than 8 feet, the City of Roseville requires that all structures constructed within this project will be required to have a minimum of three (3) feet of freeboard between the base 100-year flood elevations and the proposed pad elevation.

**TABLE III.A.1 – PROPOSED CULVERT/BRIDGE SIZES**

| Station | Description | Approx. Crossing Length | Culverts |
|---|---|---|---|
| | **Main CURRY CREEK** | | |
| 1.385 | Curry Creek – Upland Drive | 108' | 1-14'w x 4.3'h CONSPAN |
| 1.265 | Curry Creek – Market Street | 60' | 1-14'w x 5.3'h CONSPAN |
| 1.215 | Curry Creek - Baseline Road upstream leaving project. | 214' | 1-14'w x 5.6'h CONSPAN |
| 1.025 | Curry Creek – Baseline Road downstream entering project | 289' | 1-16'w x 5.6'h CONSPAN |
| 0.87 | Curry Creek Main – Watt Avenue | 248' | 1-16'w x 5.6'h CONSPAN |
| | **Federico Creek** | | |
| 0.9954 | East-West Road | 128' | 1-12'w x3.5'h CONSPAN |
| 0.975 | Market Street | 95' | 1-12'w x 3.5'h CONSPAN |
| 0.975 | Market Street to Detention Basin | 250' | 1-42" pipe culvert |
| 0.865 | Westside Drive | 160' | 1-12'w x 3.5'h CONSPAN |
| 0.805 | North-South Road | 75' | 1-14'w x 4.2'h CONSPAN |
| 0.775 | Watt Avenue | 175' | 1-14'w x 4.2'h CONSPAN |
| | | | |

Note: the above design bridge and culvert sizes may be modified in final design, with alternate bridge and culvert types with equivalent capacity. Culvert design will impact the hydraulic grade lines, which in turn impact the proposed attenuation of the project, therefore, detailed analysis demonstrating the proposed hydraulic grade lines will be required with design plans for these culverts.

Baseline Road Culverts at stations 1.215 and 1.025 are located at the transition between Roseville and Placer County. Placer County has approved a project, "Placer Vineyards" which identifies the need for these culverts to be as noted in the below excerpt from that report. The

culverts specified in that study are hydraulically and dimensionally equivalent to the culverts specified for these locations in this study.

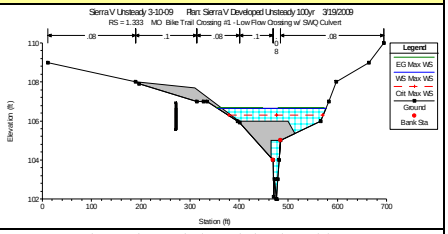
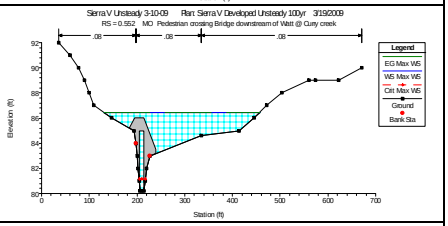
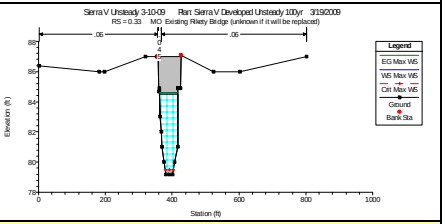
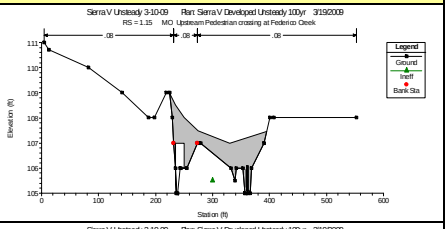
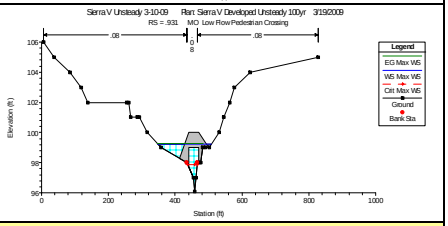
| Shed | Station | Culvert Description | Overtopping Flow Rate (cfs) | Post Project overtopping event (yr) | Post-project 100-year flowrate (cfs) |
|---|---|---|---|---|---|
| **CURRY CREEK** | | | | | |
| CUS6 | 1.215 | Baseline Road – Replace Existing Culvert with 150' of Dual 14'x5' CM Arch Culvert | 830 | 500 | 714<br>772 (2) |
| CUS11B | 1.158 | Inline Detention Weir – Notched at existing low flow channel | 665 | 200 | 478<br>509 (2) |
| CUS11B | 1.115 | Roadway Crossing 1-16x5.5 CM Arch | NONE | NONE | 403<br>411 (2) |
| CUS14 | 1.025 | Baseline Road – Replace existing culvert with 200' of 16'x5.5' CM Arch | NONE | NONE | 407<br>439 (2) |

Excerpt from Placer Vineyards Master Project Drainage Study TABLE IIIB1 – Culvert Sizing

Final design of the project culverts will require detailed hydraulic analysis demonstrating that the proposed hydraulic elevations will result for the proposed flow rates for the post –project mitigated and unmitigated peak flow rates in the 10-year and 100-year events, so as to maintain instream attenuation levels at the levels proposed by this study.

Pedestrian Trail Crossings are assumed to be flatcar or other bridge type of construction, to span the low flow creek resources. These crossings and the trails leading up to the bridges were placed at existing grade. Bridges were sized to span the natural resources in the low flow channel of the creeks. In some cases abutment rises were sloped so that the bridge could be raised so that flows could pass beneath the bridge deck soffit. The bridges and the ped trail paths at the open space crossing locations will not meet the current City design standards which require the bridges to be elevated above the 10-year floodplain elevation, and are expected to be overtopped in the 100-year event..

## TABLE III.A.2 – PROPOSED PEDESTRIAN CROSSINGS

| Station | Description | Approx. Crossing Length | Description | Cross Section |
|---|---|---|---|---|
| | **Main CURRY CREEK** | | | |
| 1.333 | Curry Creek – Pedestrian Crossing #1 | 15’ | Bridge spanning creek main channel, and 2x12” culverts at SWQ channel crossing |  |
| 0.552 | Curry Creek – Pedestrian Crossing #2 | 15’ | Bridge spanning creak main channel |  |
| 0.33 | Curry Creek – Pedestrian Crossing #3 | 15’ | Make use of existing bridge structure or replace structure in kind |  |
| | **FEDERICO CREEK** | | | |
| 1.15 | FC – Pedestrian Crossing #4 | 15’ | Bridge spanning creek main channel, and 2x12” culverts at SWQ channel crossing |  |
| 0.931 | FC – Pedestrian Crossing #5 | 15’ | Bridge spanning Main Creek Channel |  |
| | | | | |

Note: the above design bridge and culvert sizes may be modified in final design, with alternate bridge and culvert types with equivalent capacity.

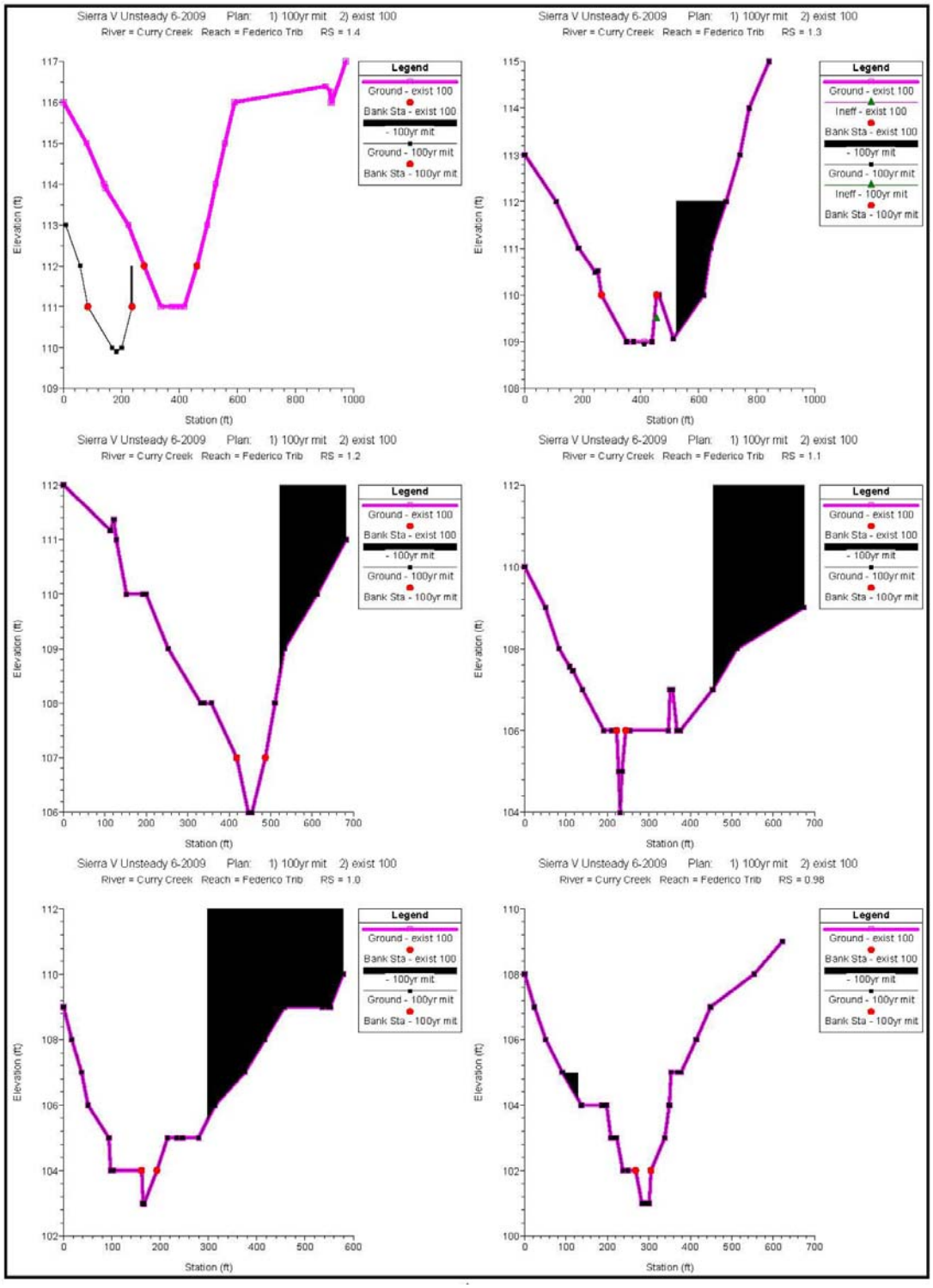
Table III.A.3 compares the hydraulic modeling results for the pre-project and post-project mitigated conditions at various project boundary locations for the peak flowrates of the 100-year event. The Table also demonstrates the project will not be adversely impacting offsite peak 100-year water surface elevations. Finally, Future, Fully Developed, Unmitigated conditions resulting water surface elevations are also reported, which are the basis for floodplain design considerations.

## TABLE III.A.3 –Water Surface Comparison (Pre- and Post-Project)

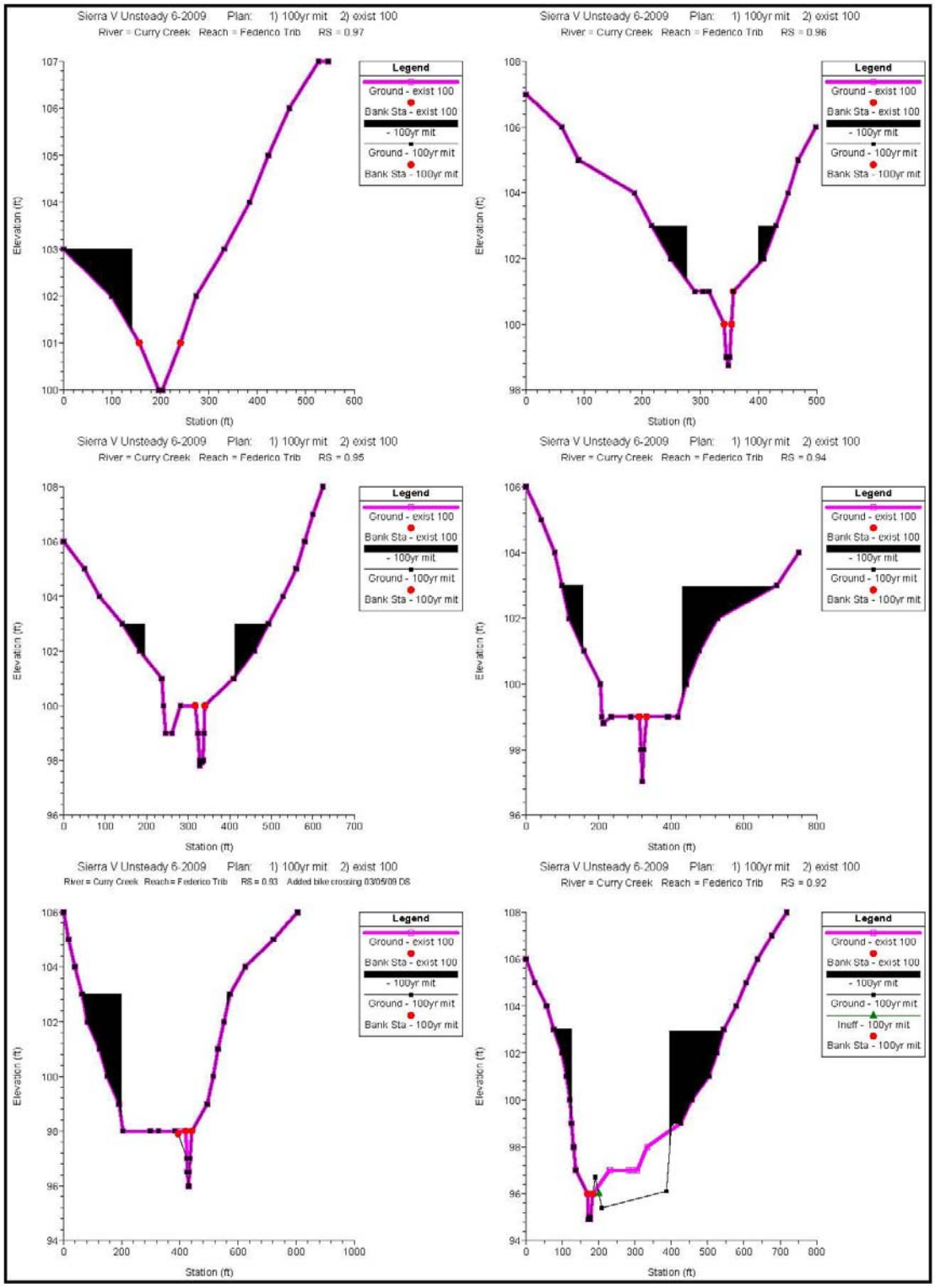
| Station | Description: | Pre-project 100-year HGL | Post-project 100-year HGL | Reduction (ft) |
|---|---|---|---|---|
| | **MAIN CURRY CREEK** | | | |
| 1.44 | Downstream side of Fiddyment Road | 114.55 | 114.55 | **0.00** |
| 1.22 | Upstream side of Baseline Road | 104.71 | 102.97 | **1.74** |
| 1.21 | Downstream side of Baseline Road (offsite) | 100.37 | 100.18 | **0.19** |
| 1.03 | Upstream side of Baseline Road (offsite) | 92.09 | 90.72 | **1.37** |
| 1.02 | Downstream Side of Baseline Road | 89.40 | 88.96 | **0.44** |
| 0.0007 | Flow at Confluence with Federico Creek | 80.49 | 80.37 | **0.12** |
| | **FEDERICO CREEK** | | | |
| 1.2 | Flow entering the northern boundary of the site at the Northern Tributary (flow added from CWP7) | 107.74 | 108.04 | **-0.30*** |
| 0.937 | Flow entering the east boundary of the site at the Northern Tributary. (added flow from CWP8) | 99.46 | 99.47 | **-0.01*** |

- Increases result from required 'n' value modification in channel for nuisance flow contribution to vegetation propagation.
- Note: Elevations for the post-project shown in this table are not intended for design. The values represented are for the post-project mitigated scenario, and design will be based on the post-project unmitigated values.

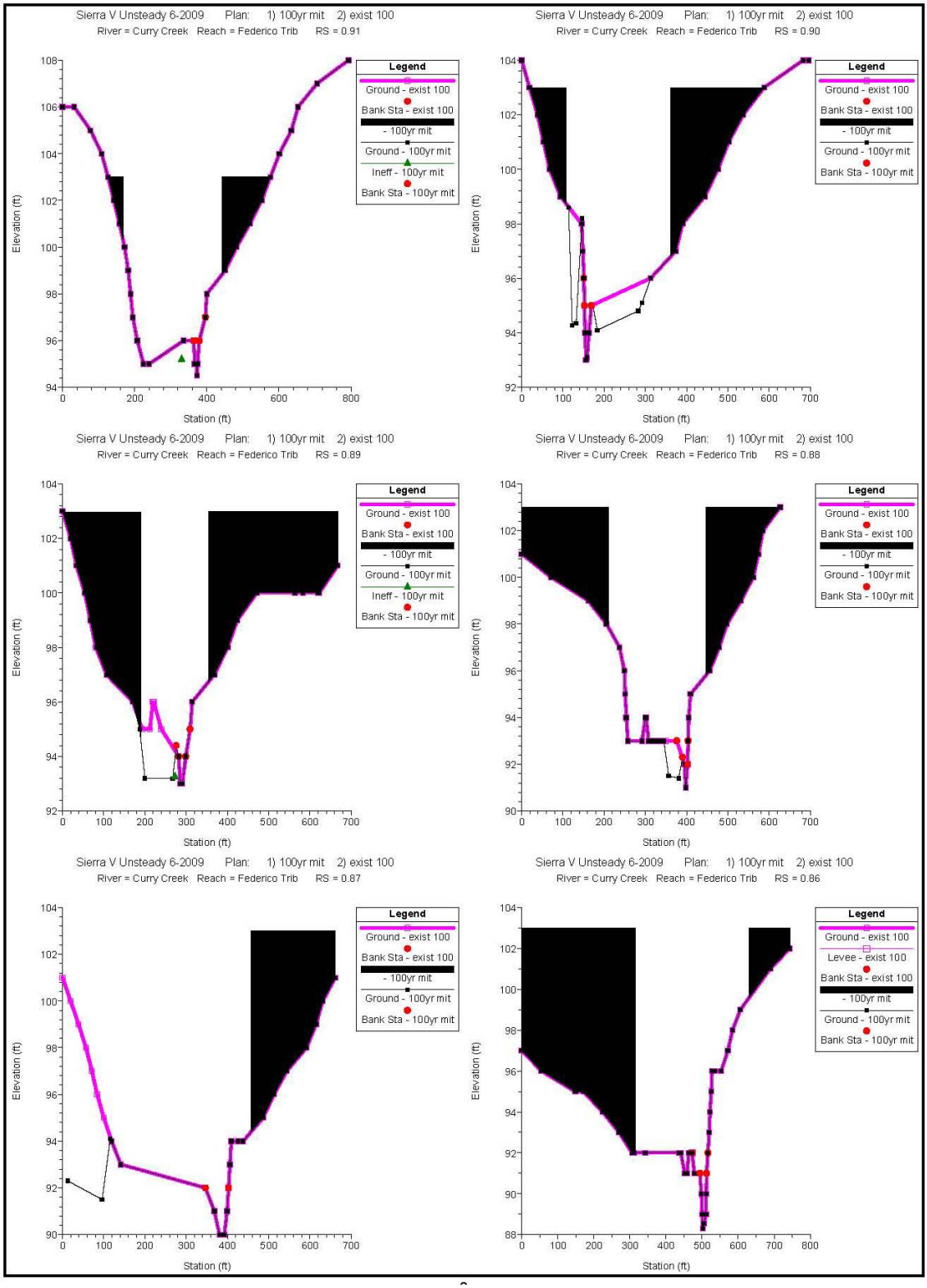
# FIGURE III.A-1 – HEC-RAS CROSS SECTIONS (Pre- and Post-Project Modified)



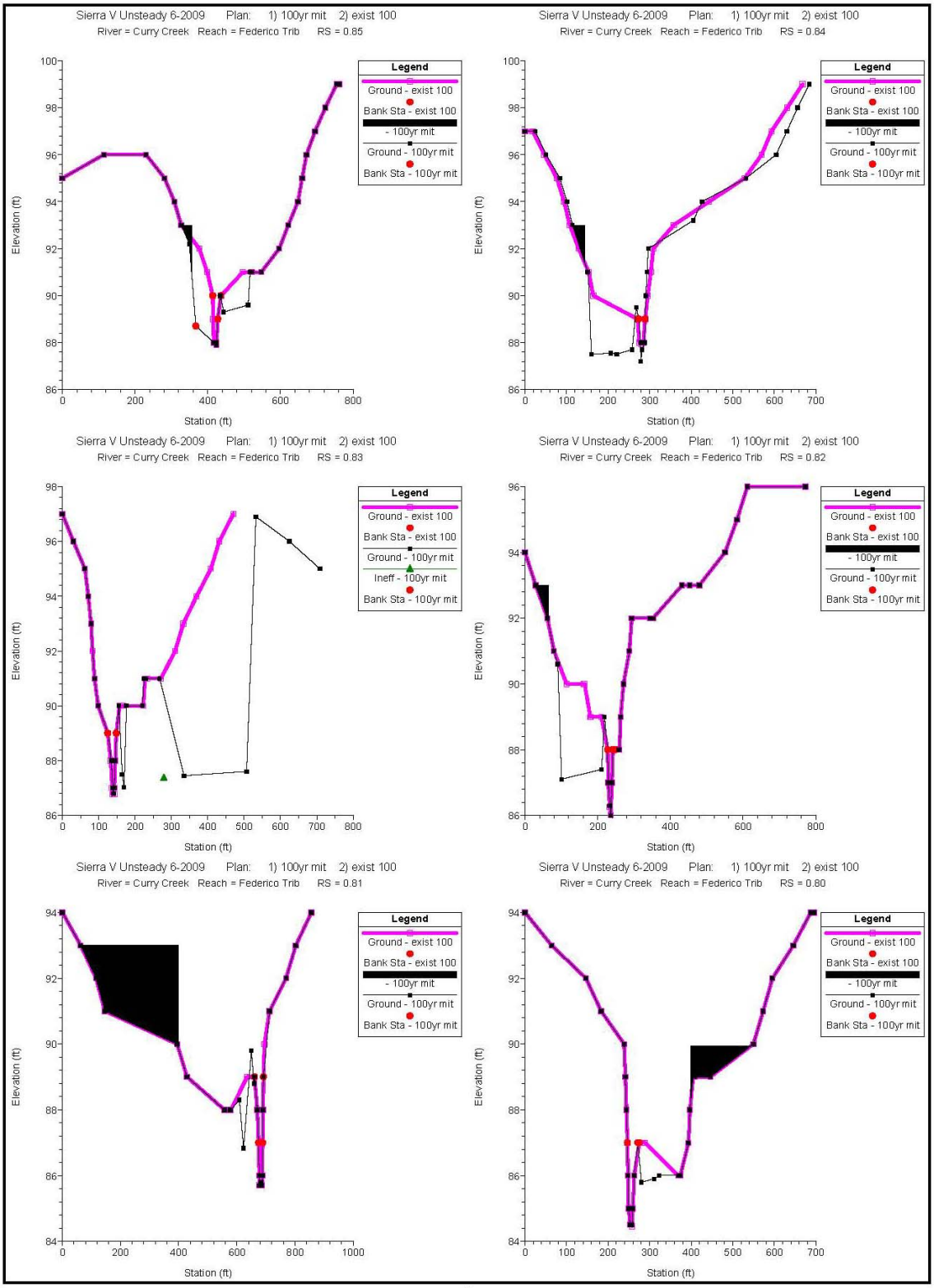
## FIGURE III.A-2 – HEC-RAS CROSS SECTIONS (Pre- and Post-Project Modified)



# FIGURE III.A-3 – HEC-RAS CROSS SECTIONS (Pre- and Post-Project Modified)

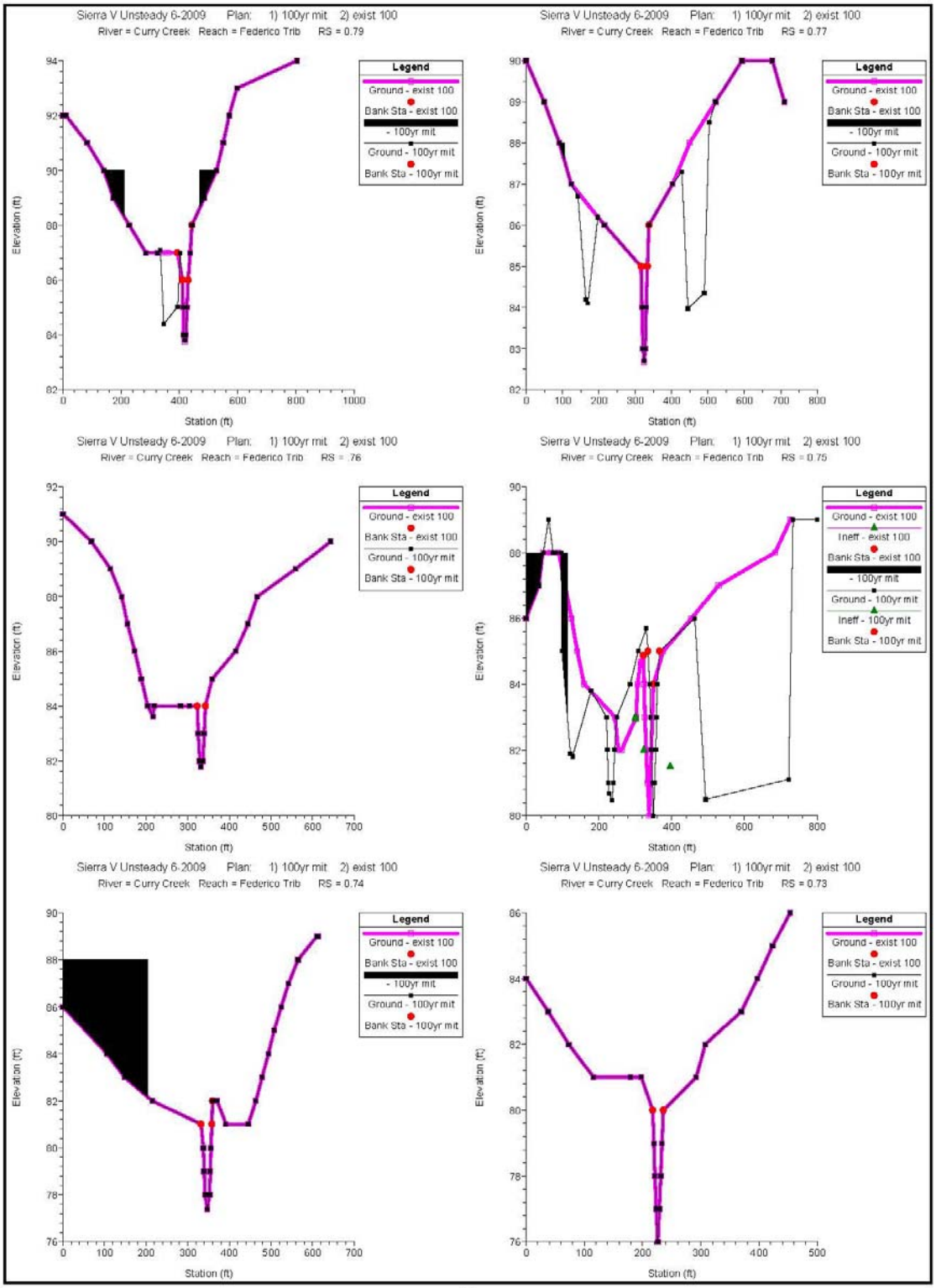


## FIGURE III.A-4 – HEC-RAS CROSS SECTIONS (Pre- and Post-Project Modified)



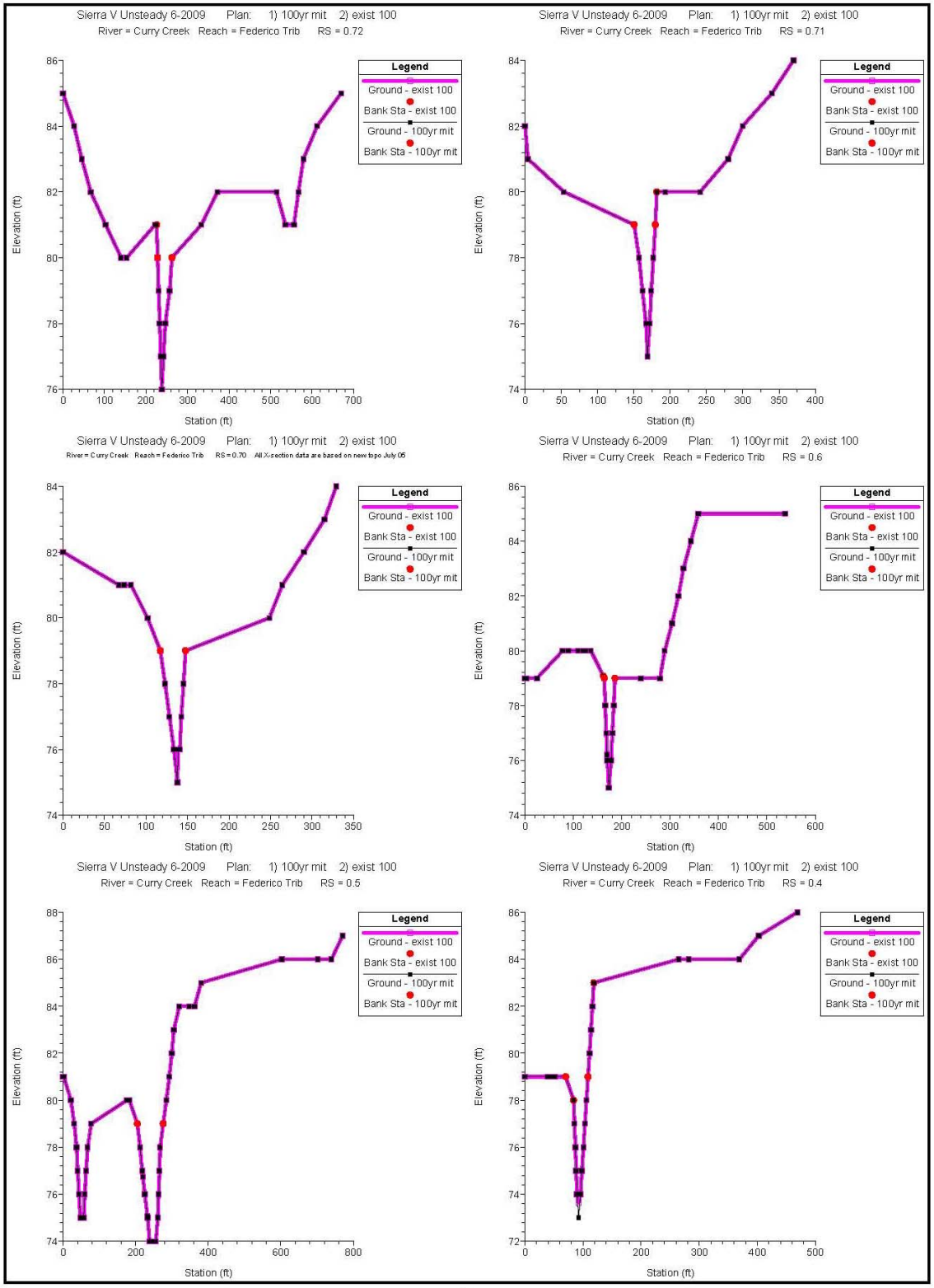

4

## FIGURE III.A-5 – HEC-RAS CROSS SECTIONS (Pre- and Post-Project Modified)



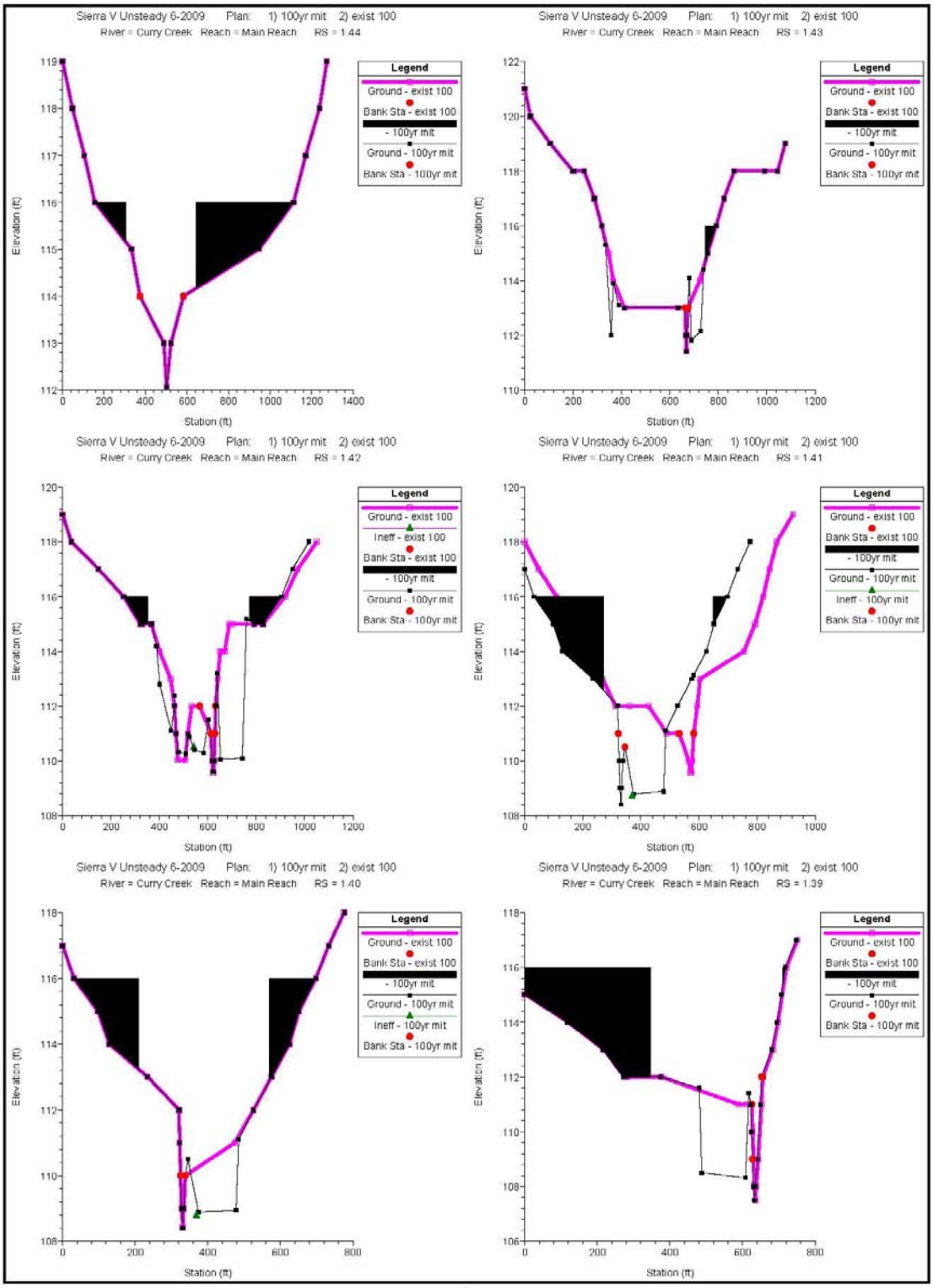

5

## FIGURE III.A-6 - HEC-RAS CROSS SECTIONS (Pre- and Post-Project Modified)

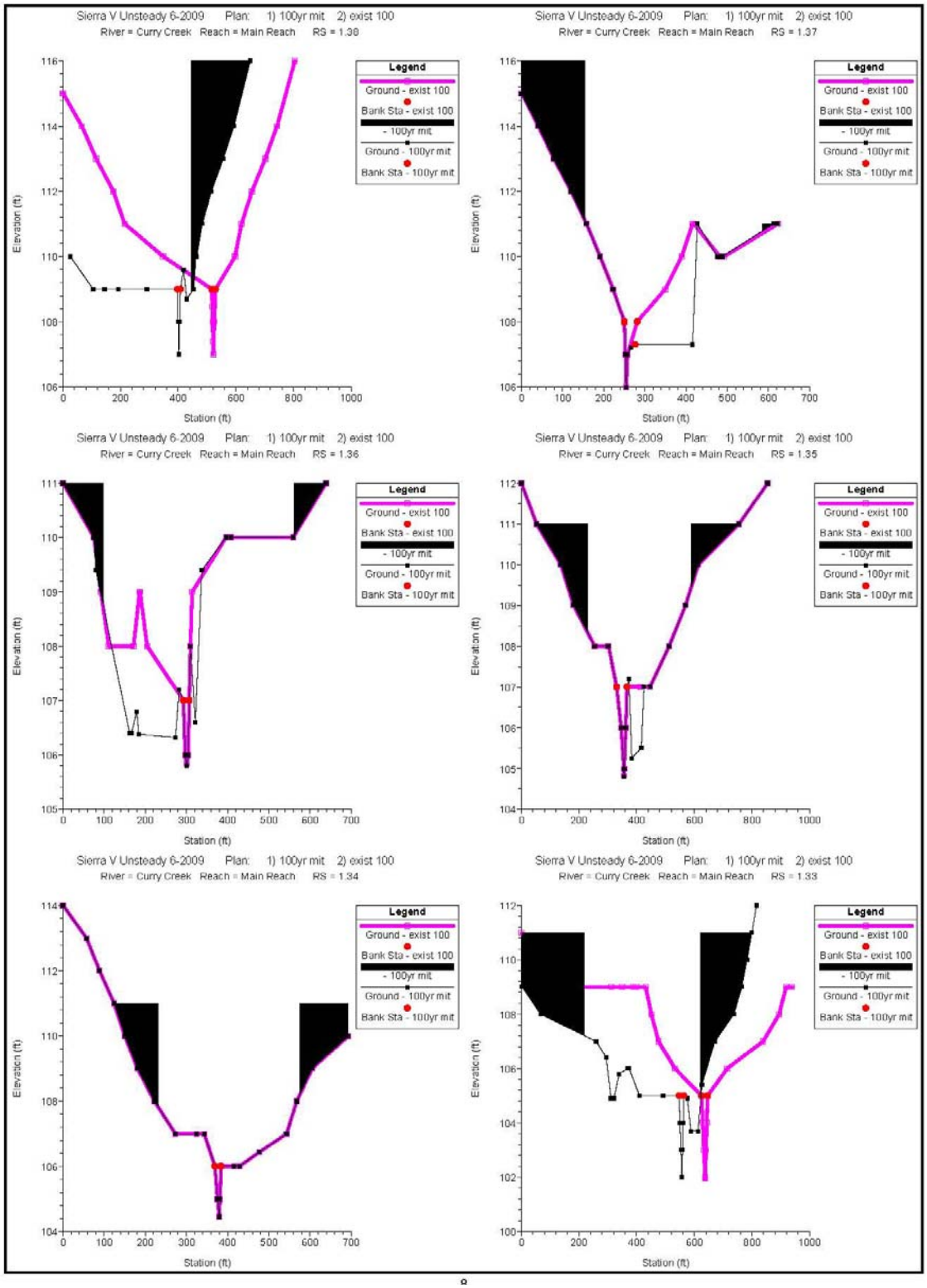



6

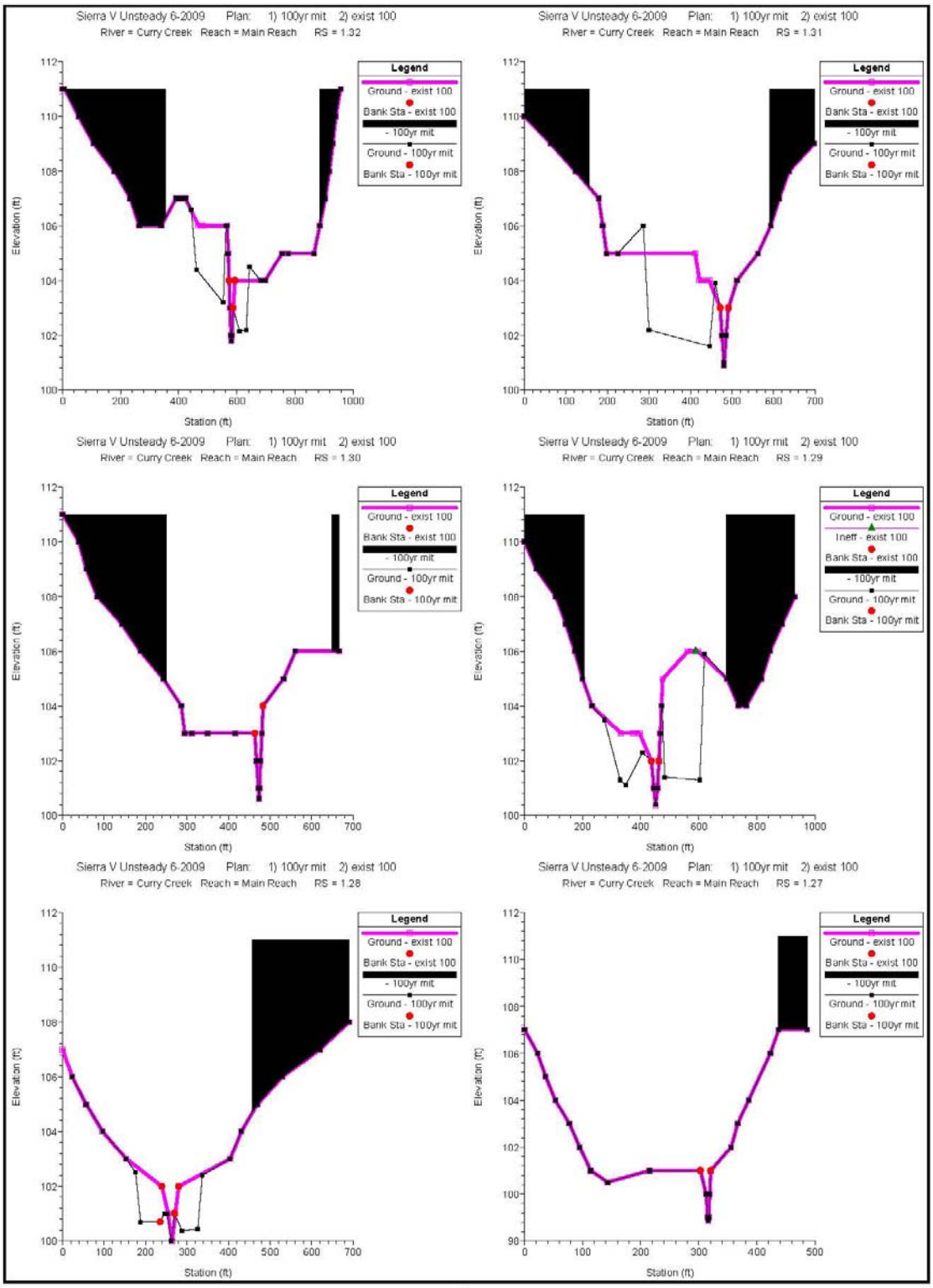
## FIGURE III.A-7 – HEC-RAS CROSS SECTIONS (Pre- and Post-Project Modified)



## FIGURE III.A-8 – HEC-RAS CROSS SECTIONS (Pre- and Post-Project Modified)

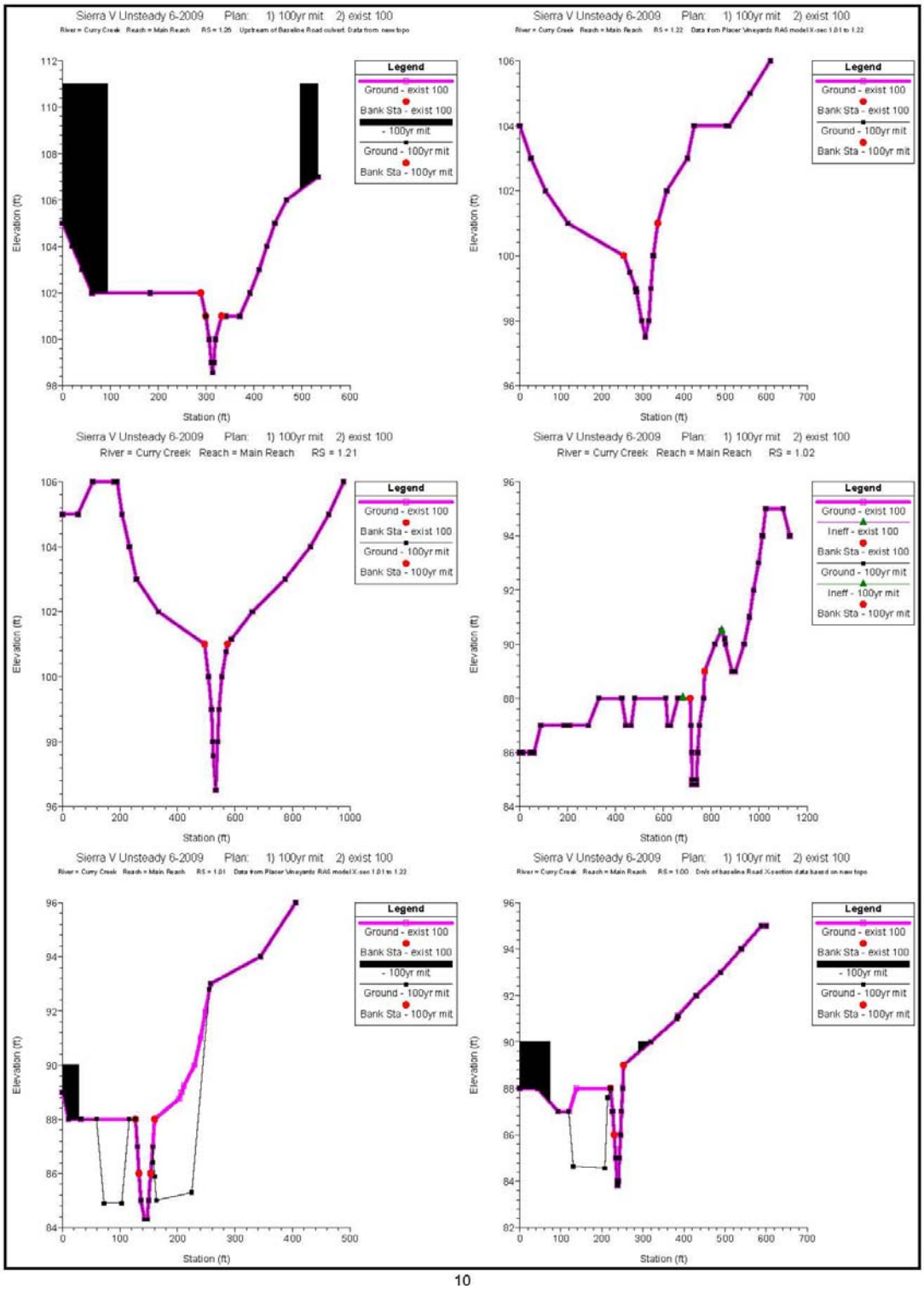


## FIGURE III.A-9 – HEC-RAS CROSS SECTIONS (Pre- and Post-Project Modified)

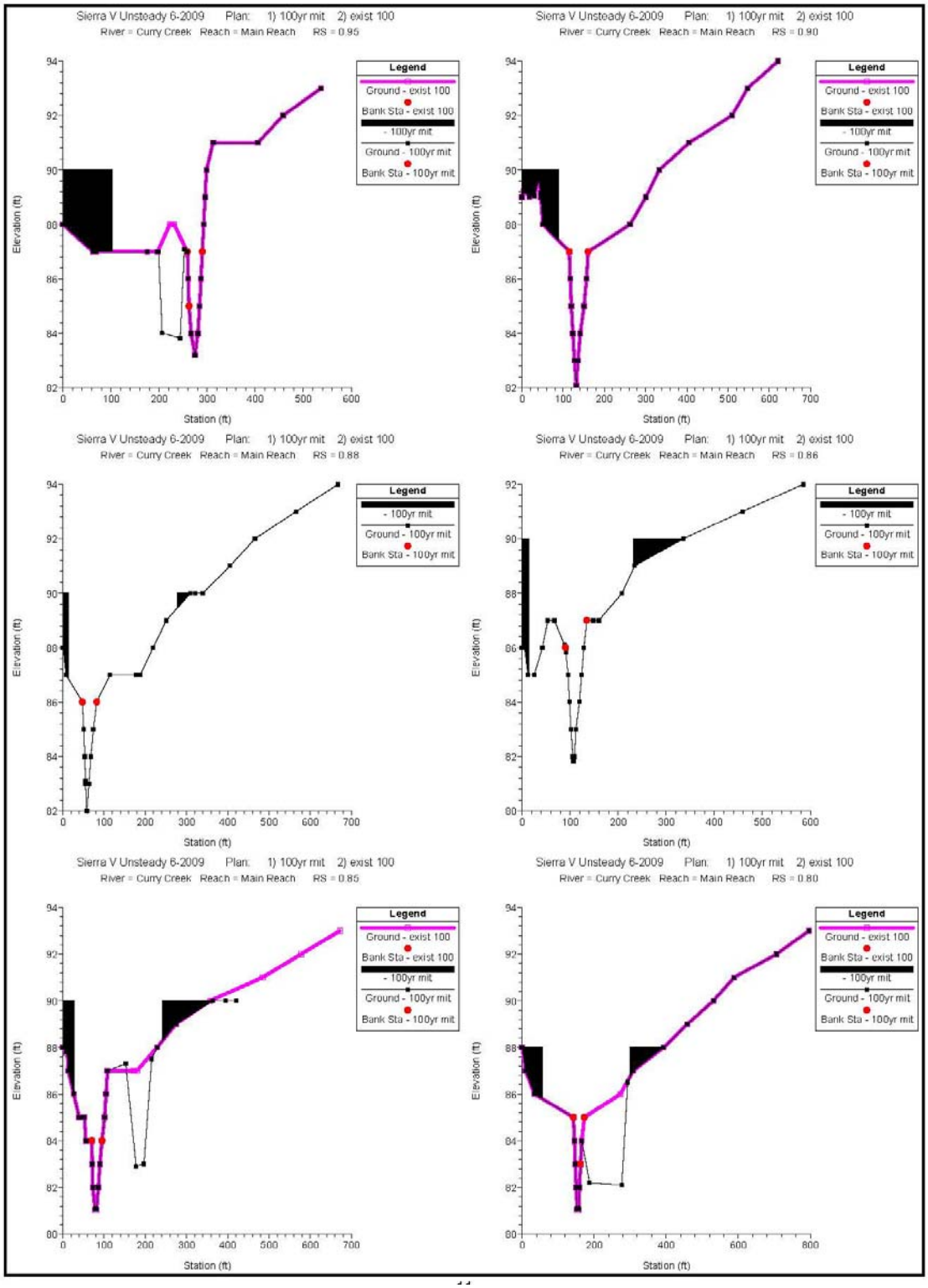



9

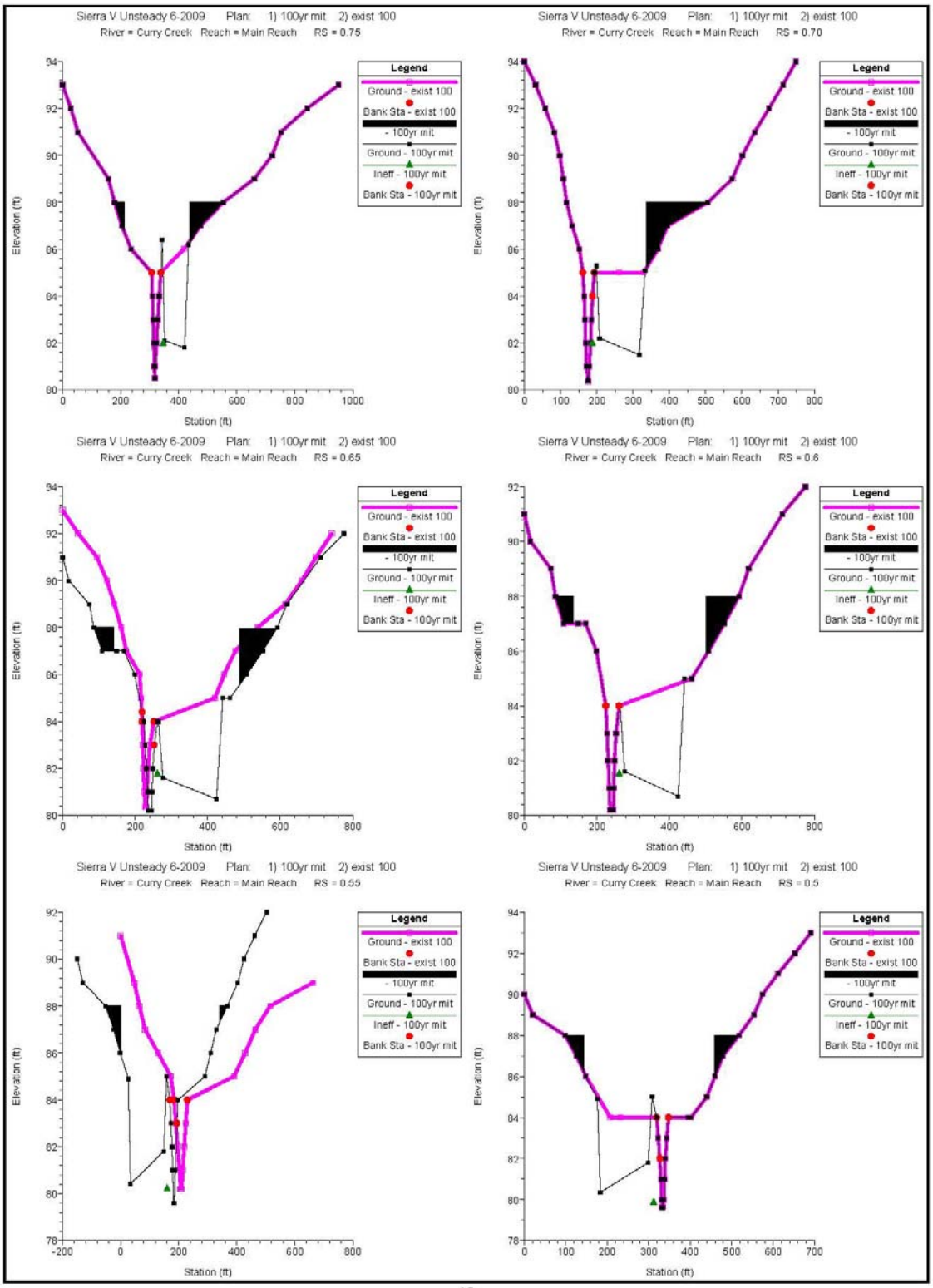
## FIGURE III.A-10 – HEC-RAS CROSS SECTIONS (Pre- and Post-Project Modified)



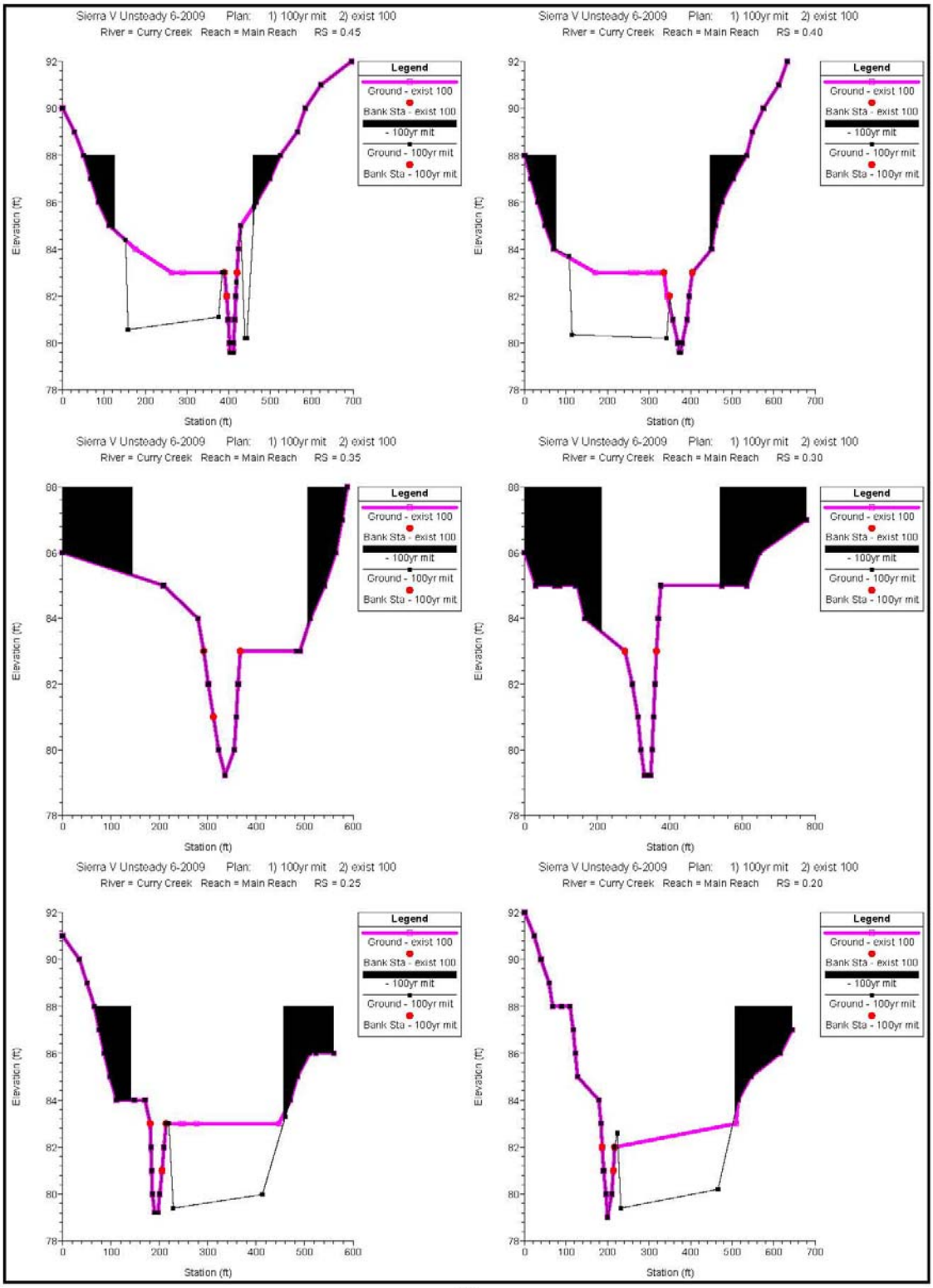
## FIGURE III.A-11 – HEC-RAS CROSS SECTIONS (Pre- and Post-Project Modified)



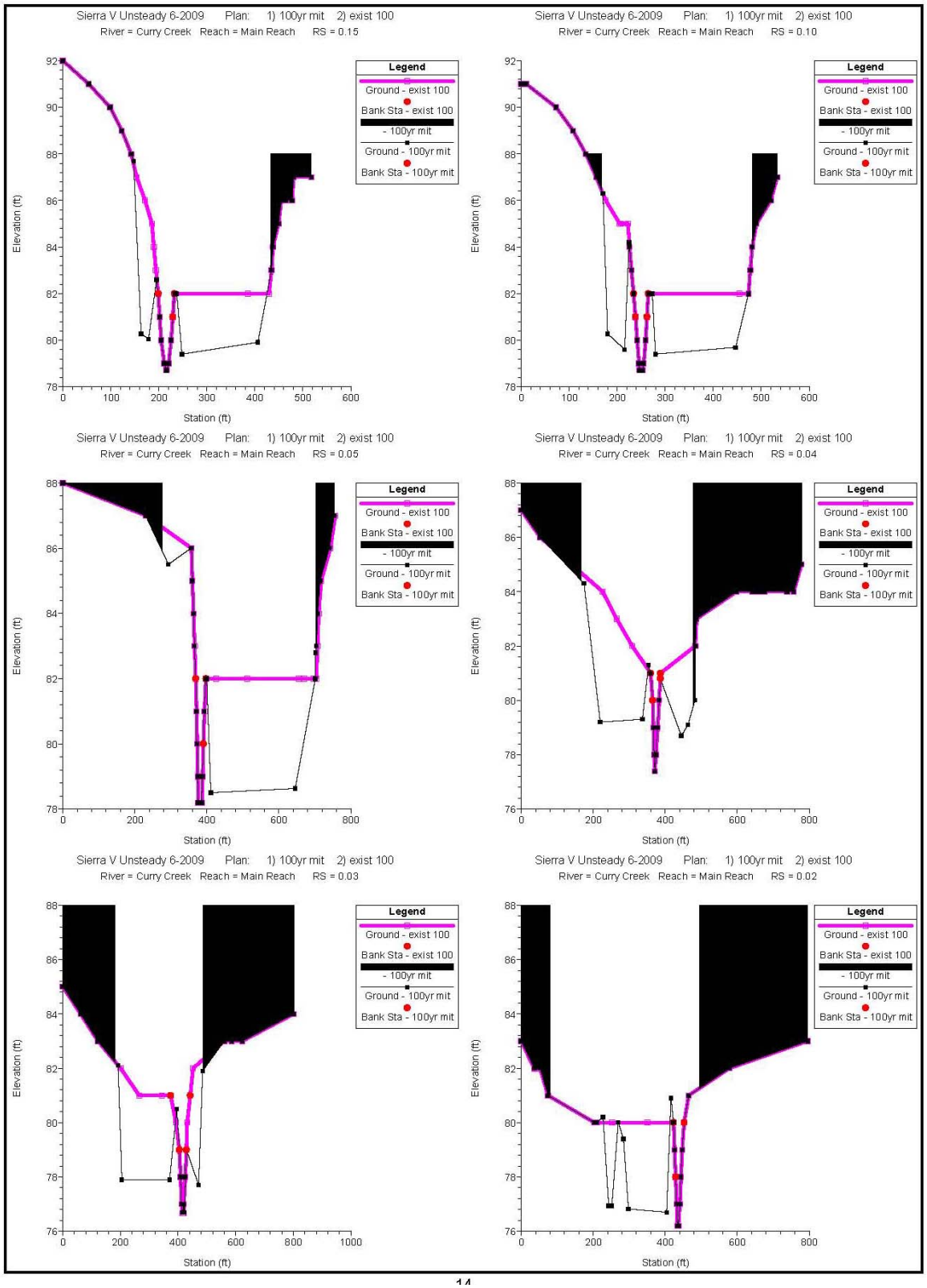
## FIGURE III.A-12 – HEC-RAS CROSS SECTIONS (Pre- and Post-Project Modified)



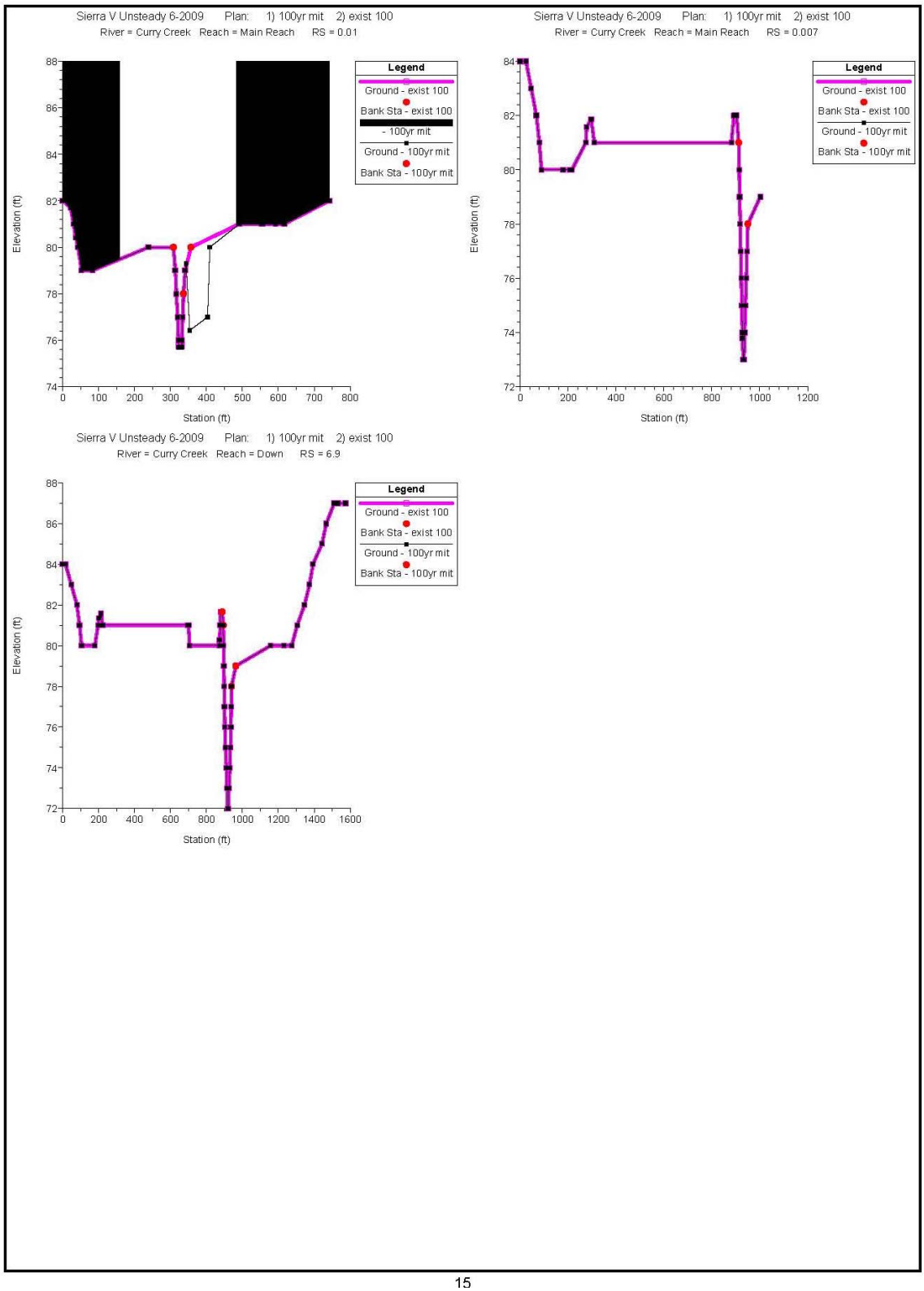
## FIGURE III.A-13 – HEC-RAS CROSS SECTIONS (Pre- and Post-Project Modified)



# FIGURE III.A-14 – HEC-RAS CROSS SECTIONS (Pre- and Post-Project Modified)

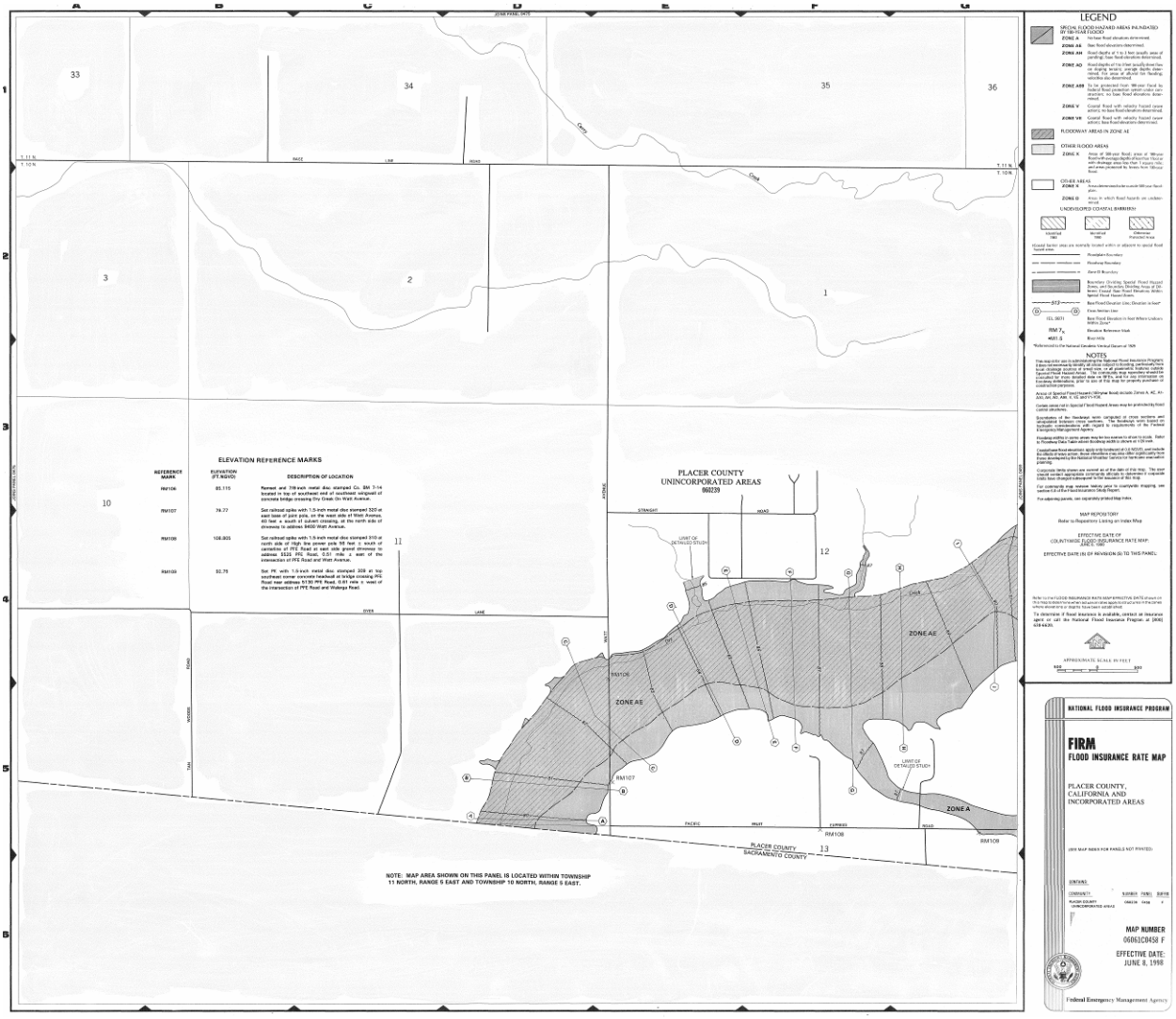


# FIGURE III.A-15 – HEC-RAS CROSS SECTIONS (Pre- and Post-Project Modified)

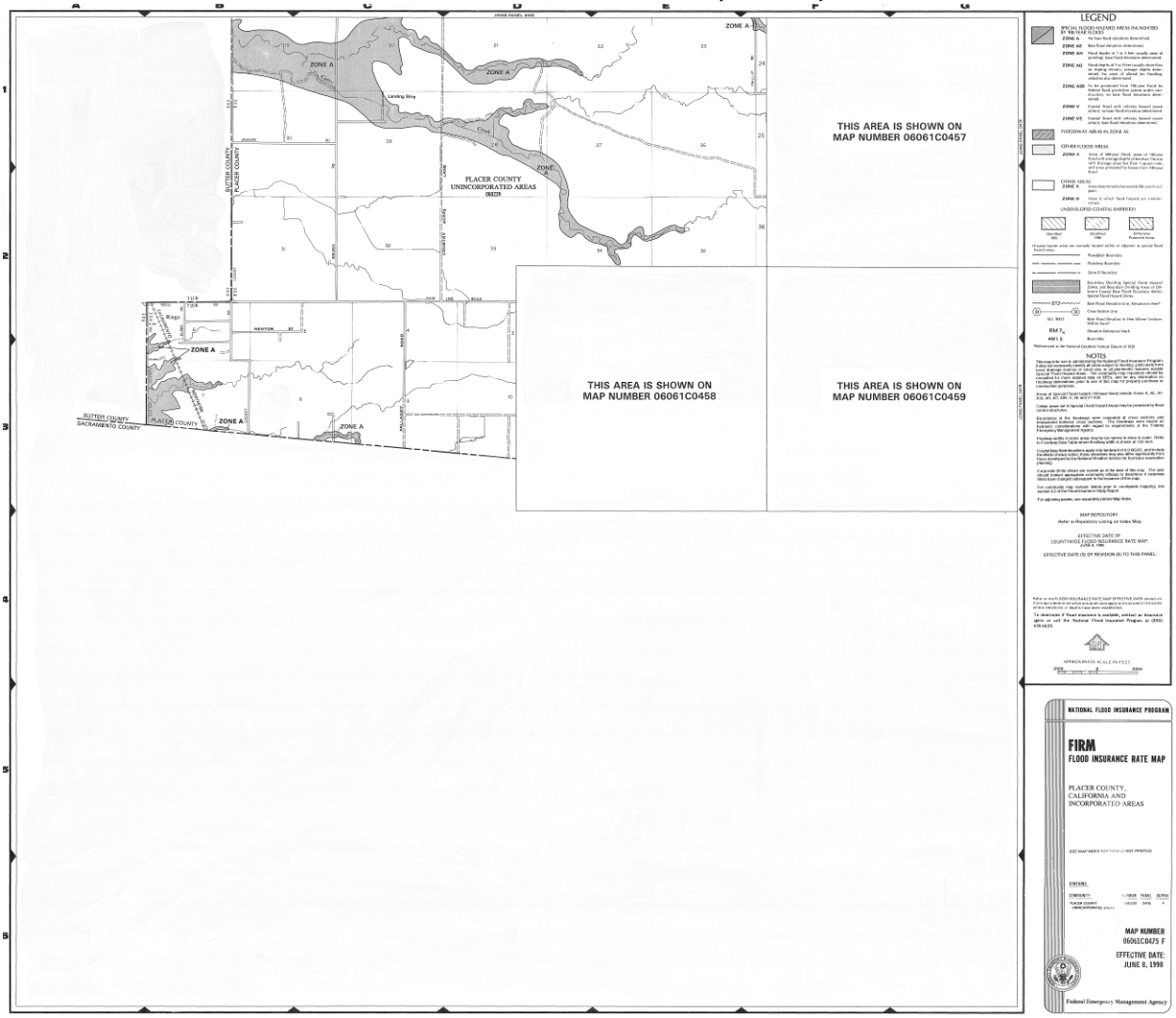



15

## FIGURE III.1 - FIRM MAP 458F, June 8, 1998



# FIGURE III.2 - FIRM MAP 475F, June 8, 1998



## III.B Storm Drain System:

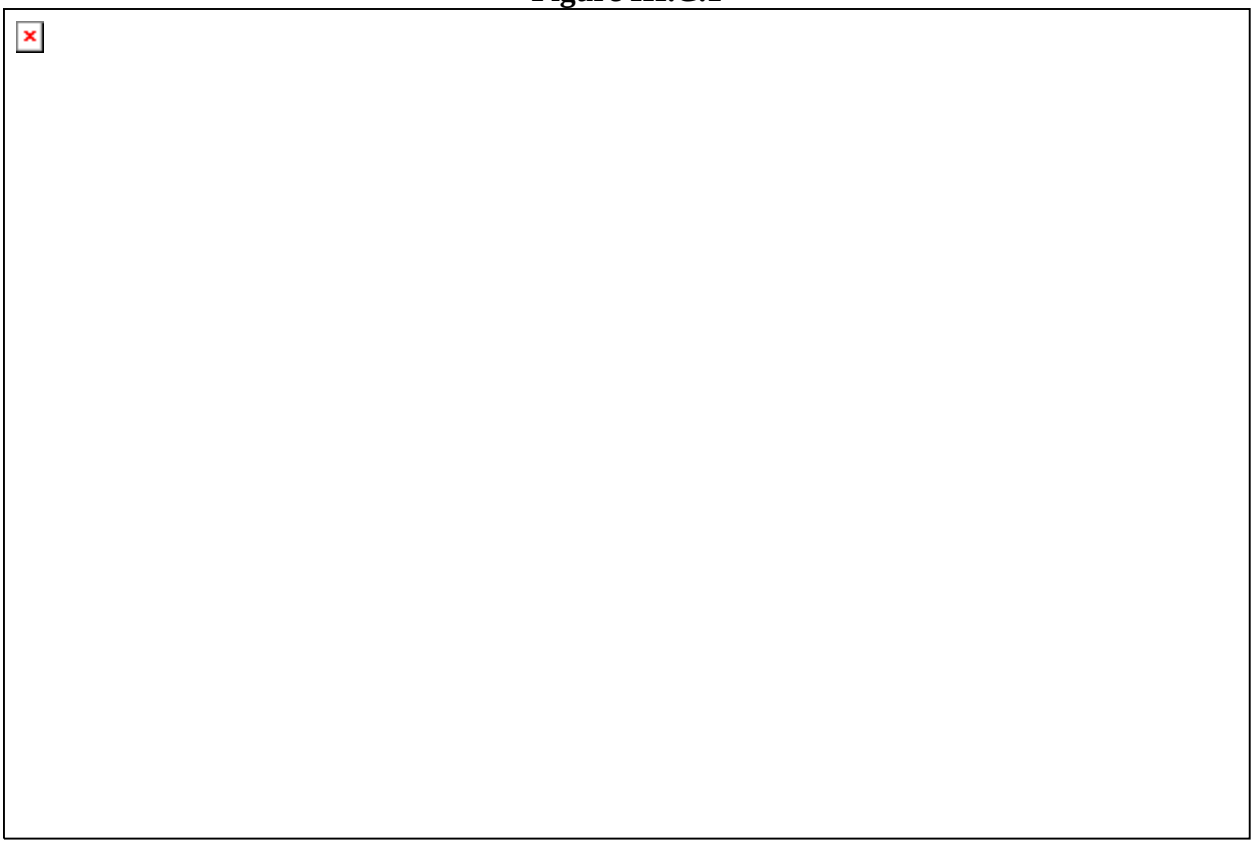
A preliminary storm drainage system is shown on Exhibit SD-1. This system has been analyzed using the CS-DRAINAGE STUDIO software program. The optimized pipe sizing is provided in the summary calculations provided in Appendix G for the 10-year and 100-year storm events. The pipes have been sized for one foot of freeboard below manhole rim elevations in the 10-year event. At Arterial and major collector streets, were street encroachments of the floodplain are limited to the non-traveled way areas in the 100-year event, the pipes have been designed to convey the 100-year flows without surface flow. Preliminary site grading was used to establish RIM grades as shown on the exhibit. These grades were also used to input surface flow channels. For both the 10-year and 100-year events, downstream floodplain elevations were specified per the post-project unmitigated floodplain analysis (see Exhibit FP-3), as the downstream "known water surface elevations".

The storm drainage pipes discharge at several locations into the creek corridors. Generally, a vegetated swale is proposed at these discharge locations for a designed distance (per the SWQ calculations for contact time), before discharging into the creeks.

## III.C Mitigation and Drainage Improvement Phasing:

A phasing plan for the project was provided by Mackay and Somps as shown in Figure III.C.1.

**Figure III.C.1**



The project infrastructure will be split into Four regional phases of construction. Landuse by Phase is estimated in Table III.C.1.

**TABLE III.C.1**

| | Landuse Areas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| PHASE | COM | HDR | LDR | MDR | UR | OS | PARK | PQP | ROAD |
| A | 34.8 | 22.2 | 357.6 | 94.7 | 94.8 | 94.5 | 45.9 | 60.8 | 29.8 |
| B | 102.3 | 28.1 | 151.1 | 34.8 | 38.1 | 58.7 | 25.5 | 12.0 | 24.0 |
| C | 87.2 | 7.6 | 156.7 | 120.5 | 291.5 | 80.8 | 77.6 | 14.8 | 48.3 |
| D | 0.0 | 8.3 | 18.5 | 62.9 | 5.7 | 23.2 | 10.7 | 7.3 | 10.1 |

We assume that the open space corridors will be constructed with the major infrastructure of each phase. The following drainage items are easily resolved by phase:

**Volumetric Mitigation:** A fee is collected by the City for these impacts, therefore, the fee will be paid at the appropriate time as the impact is constructed.

**Conveyance:** Trunk Facilities shown on Figure SD-1 will need to be constructed with the roadways of each phase. There are systems which will cross phase boundaries. Where this occurs, the quantity of facility that must be built will be dependant on which phase goes 1st. Where an upstream phase goes 1st, the conveyance will need to be constructed far enough downstream of the phase boundary that the facility can daylight to natural grades and can be discharged into an existing swale with proper erosion protection measures. In some cases, an upstream phase may have to excavate an outfall channel through a downstream phase to achieve daylight grade of the flows in a positive drainage, or to get to an existing swale. Where downstream phases are constructed 1st, the downstream phase will need to do sufficient analysis of the upstream phase grading and drainage to determine an appropriate pipe invert and size (see Storm Drain Analysis included herein for preliminary trunk facility sizing), such that the upstream phase can drain through the conveyance when it develops.

**Stormwater Quality Treatment:** For an upstream phase where temporary discharges are constructed into a downstream phase, temporary stormwater quality treatment will be necessary to treat discharges prior to release into a creek or delineated wetland (which has not been mitigated with the concurrent phase). For a downstream phase, permanent stormwater quality treatment will be built with the permanent outfall to the creek.

**Low Impact Development Measures**: These items will be integrated into the development. Each phase of construction will have to demonstrate that their RVR is met on a development land use area weighted basis, for each discharge location.

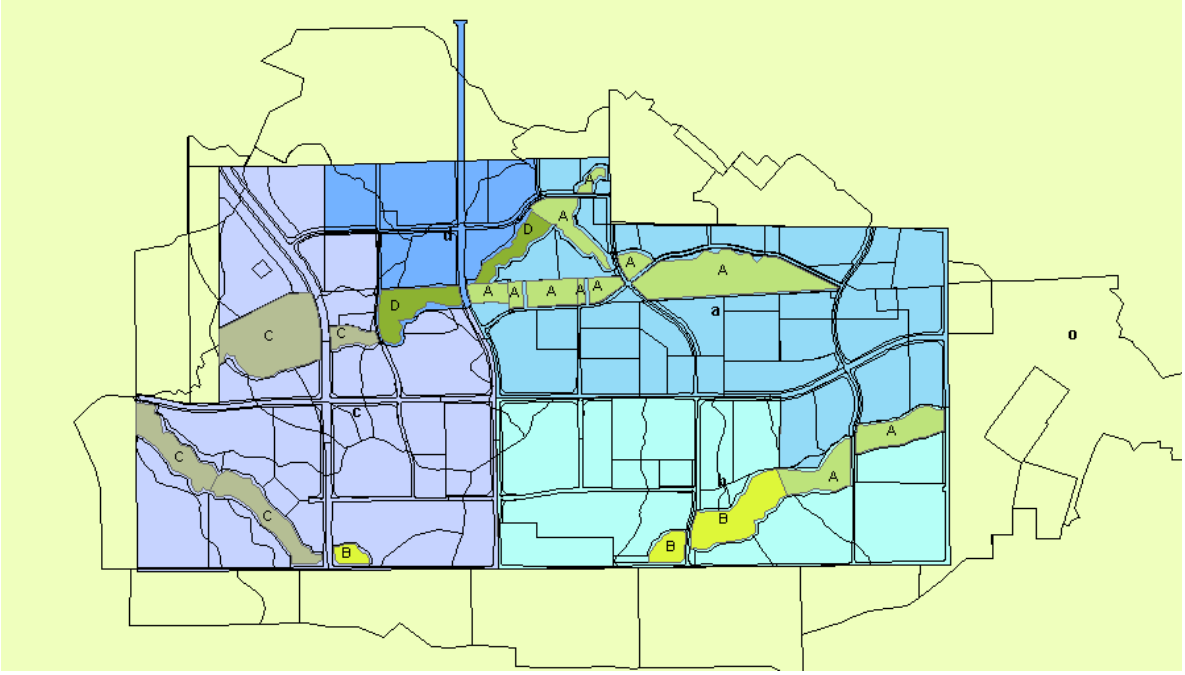
**Peak Flow Mitgation:** Four independent plans of analysis were developed, one for each of the major phases included in the plan. Plans were developed such that each analysis included development only within the phase under consideration. Then portions of the open space and detention mitigation areas were added until it could be demonstrated that peak flows were not increased for the 10-year event, at the downstream phase boundary, and downstream of the project. Where possible, mitigation areas within the phase or adjacent to the phase were included with each phase. Phase B includes a small portion of mitigation within Phase C, because trunk storm drain facilities will ultimately need to outfall into that location, stormwater quality improvements will be necessary and additional attenuation was needed above the amount contained within or adjacent to the phase. Figure III.C.2 shows the mitigation areas which will be required for each phase.

**TABLE III.C.2 – PROPOSED PEAK FLOW MITIGATION VOLUME BY PHASE**

| PHASE | Area of Phase (ac) | Mitigation Volume Provided (Acre feet) |
|---|---|---|
| A | 501.5 | 30.4 |
| B | 399.1 | 11.4 |
| C | 586.2 | 52.8 |
| D | 145.9 | 13.3 |

Table II.C.2 summarizes the amount of peak flow mitigation volumes proposed to be constructed by phase.

**Figure III.C.2**




As phases are initiated, follow-up impact and mitigation calculations will be needed to demonstrate that the proposed mitigation amounts will not result in an increase in peak flows for the post project. It is likely that early phases will have to perform more mitigation than the pro-rata share, and that later phases will have to do less, as the efficiencies of mitigation are reduced on a smaller scale.

# IV. Water Quality:

The Sierra Vista Specific Plan project intends to install improvements which will comply with the City of Roseville's Stormwater Quality criteria. The City of Roseville is a Phase II community and has developed, jointly with the regions Phase I communities, "Stormwater Quality Design Manual for the Sacramento and South Placer Regions"(SQDM). This document has been adopted by the City of Roseville on July 18, 2007.

The State is beginning to draft new requirements to the Storm Water Management permits. At the time that Sierra Vista develops it is anticipated that the NPDES permit will include requirements that hydrograph modification impacts be addressed to some level". The project drainage study includes a section addressing the potential hydrograph modification impacts of this project, and the net impacts of the project with the mitigations proposed.

## IV.A Stormwater Management During Construction Activities

The release of on-site stormwater runoff during Construction activities is regulated by the State General Construction Permit issued by the Regional Water Quality Control Board for all construction sites greater than one acre. The General Construction permit requires that a Storm Water Pollution Prevention Plan (SWPPP) is created to address how the storm water from a particular construction site will be maintained and treated prior to being discarded from the site. The SWPPP is an evolving document that changes with the dynamics of the site development.

The use of Best Management Practices (BMPs) during the construction process will generally incorporate erosion controls and sediment controls. Erosion and sediment control BMPs include such things as applying straw mulch to disturbed areas, the use of fiber rolls and silt fences, sedimentation basins, drain inlet protection, stabilized construction accesses, and material management. The final sizing and selection of BMPs will consider requirements specific to the Curry Creek watershed and proposed developed activities.

A Stormwater Pollution Prevention Plan (SWPPP) will be required to describe the BMPs which will be used to prevent erosion and to clean site discharge waters before entering State Waters. A permit with the Central Valley Regional Water Quality Control Board of the State of California will be obtained for the proposed construction activities. If construction occurs during the wet season, additional winterization improvements will be required to stabilize the disturbed areas of the site, prevent erosion, and clean discharge waters. All construction related BMP improvements must comply with the "NPDES General Permit for Storm Water Discharges Associated with Construction Activities, NPDES No. CAS000002, Order No. 99-08DWQ".

When the project reaches the point in processing at which the City is reviewing plan documents, a final Master Drainage Plan will be required which updates this plan for the final planned improvements. In addition, a detailed analysis of the proposed permanent and construction activities Best Management Practices shall be included either in the Final Master Drainage Plan, or as a separate "Water Quality BMP Plan". The BMP Plan shall identify expected pollutants, the expected activities, the effectiveness of the proposed BMPs and the maintenance plans for the BMP improvements.

## IV.B Post Construction Stormwater Management

Post construction stormwater management is intended to treat the urban runoff generated on-site in perpetuity. The BMP techniques within the plan area will reduce and/or eliminate the pollutants from the urban stormwater runoff and prevent the contamination of receiving waters. Sierra Vista will work with the then current permit criteria applicable at the time of development and in conformance with the City of Roseville Improvement Standards, the City's Stormwater Quality Design Manual, the Placer County Flood Control Agency's Stormwater Management Manual, the open space preserve Operations and Maintenance (O&M) Plan, to design and address post construction stormwater treatment.

Post construction stormwater treatment is composed of three general elements: source control, runoff reduction and treatment of runoff. All three elements will be used in the Sierra Vista SWMP. The basic practice of source control is to minimize the potential for constituents to enter runoff at the source. The tool the project will employ towards the goal of runoff reduction, is the use of Low Impact Development(LID) measures. Implementation of LID includes the construction of decentralized small scale improvements that provide for local infiltration and treatment opportunities that reduce the quantity of runoff which enters the storm drain systems during a rainfall event. LID will be implemented to offset for runoff increases that occur with the development as a matter of the conversion of native ground surfaces to impervious cover. Additional Treatment control BMPs will be located at the end of the pipe and provide further treatment of the stormwater before it enters into the natural creek system.

The final selection of Best Management Practices (BMPs) shall consider requirements specific to the Curry Creek watershed. Other best management practices will involve prompt re-vegetation of disturbed areas, and proper erosion protection per the NPDES permit during construction.

## IV.B Low Impact Development Measures

Low impact development (LID) is an approach to stormwater management that emphasizes the use of small-scale, natural, constructed and proprietary drainage features integrated throughout the city to capture urban runoff and precipitation. LID measures can slow, clean, infiltrate and evapotranspire runoff, which reduce the quantity of urban runoff entering the city storm drain systems. The added opportunities for infiltration offered by the use of LID can add water to local aquifers, increasing water reuse. It is a sustainable practice that benefits water quality protection, stream stability and can contribute to water supply. The intent is to weave the textures of natural processes into the fabric of development. Unlike traditional storm water management, which collects and conveys storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID within Sierra Vista will take a different approach by using site design elements, LID and storm water management to minimize changes to the site's pre-development runoff rates and volumes. Sierra Vista's LID elements will assist with the goal ofmimicing the site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Key principles of low impact development include:

- Decentralize and manage urban runoff to integrate storm water management throughout the watershed

- Preserve the ecosystem's natural hydrological functions and cycles.

- Account for a site's topographic features in its design.

- Reduce directly connected impervious surfaces to slow runoff and provide additional infiltration opportunities.

- Reduce impervious ground cover and maximize infiltration on-site.

It is also likely that the State Water Resources Control Board will adopt a new General Construction Permit before this project starts construction. Part of that permit addresses requirements for the use of permanent LID measures to mitigate runoff volume increases from development for the 85$^{th}$ percentile runoff event. The currently anticipated guidelines of the permit are presented at http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml.

The "Stormwater Quality Design Manual for the Sacramento and South Placer Regions" (SWDM), adopted by the City of Roseville, also specifies criteria for the design and analysis of LID measures for use in the City of Roseville. Computation methods are very similar for this manual as those presented in the Draft construction permit, however, the Draft construction permit computational methodology generates slightly lower volume reductions from some individual measures, and offers computational criteria for a greater diversity of LID measures, and therefore has been used for the LID calculations included with this project. The SVSP will have to meet the design guidelines specified in the SWDM, and it is very likely that the project

will also have to meet the guidelines of the Draft General Permit. The Appendix 4_1 Post-construction LID worksheets from the Draft General Permit #2 are used herein to estimate

## IV.B.1 Volume Reductions from LID measures:

LID measures provide treatment opportunities at or near the source of the runoff, and can substantially reduce the amount of treatment required. The Specific Plan will incorporate the use of LID throughout the Plan development areas, and herein prescribes certain minimum Required Volume Reductions (RVR) of LID performance for each land use as shown in Table IV.B.1. The amount listed in TABLE IV.B.1 are minimum thresholds required for each outfall location throughout the project, and the achievement of higher RVR through the use of LID measures is encouraged if possible. The values indicated in TABLE IV.B.1 represent the maximum amount of LID which can be applied to all product types expected for each of the land use types shown below, as determined by the project working group.

**TABLE IV.B.1 – LID Required Volume Reductions (RVR)**

| **Land Use Type:** | **LID 85$^{th}$ Percentile Event Volume Reduction from all measures except Vegetated Swales** |
|---|---|
| Low Density Residential (LDR) | 80.5% |
| Medium Density Residential(MDR) | 78.6% |
| High Density Residential (HDR) | 70.8% |
| Commercial | 74.2% |
| Park | 100% |
| Public/Quasi Public | 81.6% |
| Roadway | 71.4% |

Additional project design elements within the open space areas will also provide hydrograph modification benefits. The created wetland elements will provide additional floodplain storage capacity which is factored into the project hydrology analysis. The created wetlands also provide LID and treatment potential which has not been factored into the project mitigation, which include: added infiltration opportunities, evapotranspiration opportunities, nutrient uptake, biological filtering, and stream buffers.

Examples of LID Measures which may be used in this project are described in TABLE IV.B.2. This is only a partial list of the types of measures which may be selected.

## TABLE IV.B.2 – Applicable LID Measures By Development Type:

| LID Measure Descriptions | Benefits Description | Development Land Use Type which is applicable to LID Measure |
|---|---|---|
| Disconnected roof drains | Water running off of the impervious roof system is treated by biological filtration, and the runoff gains an opportunity to partially infiltrate. | Low Density Residential<br>Medium Density Residential<br>High Density Residential<br>Commercial, Public/Quasi Public, Parks |
| * Pervious or partially paved driveways & Porous pavement areas, and soil confinement | Pavement alternatives offer the opportunity for partial or complete infiltration of runoff. | Low Density Residential<br>Medium Density Residential<br>High Density Residential<br>Commercial, Public/Quasi Public, Park<br>Roadway |
| Separated sidewalks & Pavement Disconnection and eliminated pavement | Runoff from the impervious sidewalk, driveway, and pavement areas can be treated and infiltrated in landscape areas before entering the gutter pan and storm drain systems. (including residential walkways) In some areas of the development, un-necessary pavement may also be eliminated for stormwater benefit. | Low Density Residential<br>Medium Density Residential<br>High Density Residential<br>Commercial, Public/Quasi Public, Park<br>Roadway |
| Tree Planting and Canopy Preservation | The creation and preservation of tree canopy reduces the rate and amount of total runoff which enters the storm drain systems. | Low Density Residential<br>Medium Density Residential<br>High Density Residential<br>Commercial, Public/Quasi Public, Park<br>Roadway |
| Soil amendments in landscaped areas and Storm water planters. | The addition of organic material to impervious soils can add voids which can absorb runoff preventing it from entering storm drain systems. In residential areas, this may include amending a landscape strip adjacent to the street or pavement areas where large amounts of runoff can be intercepte from the lots. In commercial areas this is likely to be limited to stormwater planter areas. At roadways this will be used where roadway flows are diverted into the landscape areas. | Low Density Residential<br>Medium Density Residential<br>High Density Residential<br>Commercial, Public/Quasi Public, Park<br>Roadway |
| Stream Buffer | Sheet flows can be discharged into the stream corridors (at the surface overbank) directly providing significant treatment and infiltration opportunity prior to entering the streams. | High Density Residential **<br>Commercial **<br>Park<br>Public/Quasi Public ** |
| Vegetated Swales | *** Discharge of runoff into vegetated swales provides additional treatment in the in the treatment train, and opportunities for additional infiltration of runoff waters | Required at all storm drain outlet locations. |
| Stormwater Retention | These measures remove stormwater from the system, and trap constituents at the stormwater retention location such that it is not discharged. | Not currently anticipated within this plan area, however, with appropriate supporting documentation could be used in individual projects to achieve the RVR criteria. |

* The use of pervious pavement and other infiltration oriented paving systems are dependant on infiltration capacity of the underlying soils, and may not be used everywhere. Geotechnical investigations are necessary to support the use of these systems. ** Opportunities for the use of this measure and land use combination are extremely limited within the Specific Plan. *** Because infiltration potential of this measure is not directly computable without geotechnical investigations, this measure is not applicable in this plan towards the RVR criteria, however, this element is required at all storm drainage outfall locations to make up the shortfall of the RVR to the 100% criteria of the "Attachment F - New and Re-development Performance Standard".

TABLE IV.B.3 demonstrates an alternative for the quantity of individual LID measures needed to obtain each land uses RVR standard for this Specific Plan, using the Attachment F - New and Re-development Performance Standard worksheets (per http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml). Individual projects are not required to use these alternative measures and quantities exactly, and can change the selected measures by providing computations for alternate selections meeting the RVR's established for this Specific Plan. It will be required with the submittal of design plans and specifications that calculations supporting the achievement of the minimum RVR will be submitted for each outfall of the Specific Plan. Attachment F worksheets supporting the RVR's for sample development areas of each type are provided in Appendix H.

**TABLE IV.B.3 – Alternative LID Use to Achieve Minimum RVR**

| Land Use Type | Disconnected roof drains | Pervious or partially paved driveways & Porous pavement areas, and soil confinement | Separated sidewalks, Pavement Disconnection, and eliminated impervious paving areas (including sidewalks) | Tree Planting and Canopy Preservation *** | Soil amendments in landscaped areas & Planters (est. acreage of amendments per 100 acres of dev.) | Stream Buffer | Vegetated Swales | Required Volume Reduction (RVR) **** |
|---|---|---|---|---|---|---|---|---|
| LDR | * 95% | - | 8% | 3 per lot | 1.5 ac. | - | ** | 80.5% |
| MDR | * 80% | - | 8% | 1 per lot | 1.5 ac. | - | ** | 78.6% |
| HDR | * 50% | - | 15% | 1 per unit | 1.5 ac. | - | ** | 70.8% |
| COM | * 50% | - | 15% | 20 per acre | 2.0 ac. | - | ** | 74.2% |
| PARK | * 50% | - | 20% | 5 per acre | 0.5 ac. | 10% | ** | 100% |
| PQP | * 50% | - | 20% | 10 per acre | 1.5 ac. | - | ** | 81.6% |
| ROAD | - | - | 50% | 10 per acre | 1.0 ac. | - | ** | 71.4% |

* Disconnected Roof Drains will likely be implemented 100% for developments that use this measure, however some development product types are incompatible with this measure, and post construction adjustments to these systems do sometimes occur. For these reasons, the project wide average assumed usage of this measure has been reduced to the amount shown. ** Vegetated Swales will be used at each outfall and the minimum design will be per the width and length needed to generate a RVR of 100% for each outfall location per Appendix 4 criteria. *** Tree planting is assumed to be 50% evergreen and 50% deciduous in this example. **** Extensive LID practices are proposed in lieu of of Structural BMP Treatment Requirement in City Standards, and Structural BMP's will not be provided at/near storm drain outfall locations with this project.

## IV.B.2 End of Pipe Treatment:

The schematic Post-Project Drainage Systems Map is shown in Exhibits SD-1. The maps identify storm drain outfall locations. Treatment Facilities (BMPs) will be required upstream of discharge to Curry Creek or any other Regulated Water of the State such as wetlands. Based on the plan shown in SD-1, treatment consisting of a section of Vegetated Swale will be the most common form of outfall BMP. The minimum design length of Vegetated grassy swale will be computed as the minimum length needed to achieve an RVR of 100%. However, this design is only intended to be used where minimal length exists to construct a vegetated swale outlet. In the instance where the minimum length of swale is constructed, a supplemental treatment BMP will have to be used in compination with the swale to achieve 100% treatment per the City's requirements, assuming LID is ineffective.

The optimum design length of Vegetated grassy swale and the associated calculations are provided in TABLE IV.B.1. The design lengths represented in this table assume complete treatment via the Vegetated Grassy Swale, as if LID and source control measures were ineffective.

To comply with the requirements of the local Mosquito/Vector Abatement District, all BMP's will be required to be designed to discharge all waters within 96-hours of the completion of runoff from a storm event. All graded areas must drain so that no standing water could accumulate for more than 96-hours within water quality facilities.

# TABLE IV.B.1 – BMP SIZING AT OUTFALLS

| | NON-REDUCED - SWQ VOLUME/FLOWRATE DESIGN - PRSCG FACTORS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Outfall Location** | Total Area | Total % Imperv | C Value | Volume | Reserve Volume | **Total Volume** | **Design Flowrate** | **Min. Swale Length** | **Min. Swale Width** | **Velocity (fps)** | **Slope** |
| | | | | Ft^3 | Ft^3 | **Ft^3** | **cfs** | **ft** | **ft** | | **ft/ft** |
| **AA** | 73.7 | 25.62% | 0.20 | 38837 | 1942 | **40779** | **2.97** | **117** | **30.9** | **0.28** | 0.01 |
| **B** | 19.5 | 2.78% | 0.06 | 3110 | 155 | **3265** | **0.24** | **98** | **2.1** | **0.23** | 0.01 |
| **BB** | 18.0 | 55.61% | 0.38 | 17678 | 884 | **18562** | **1.35** | **114** | **13.9** | **0.27** | 0.01 |
| **CC** | 88.2 | 35.54% | 0.26 | 58831 | 2942 | **61772** | **4.50** | **144** | **38.3** | **0.34** | 0.015 |
| **DD** | 3.8 | 50.00% | 0.34 | 3346 | 167 | **3513** | **0.26** | **99** | **2.3** | **0.24** | 0.01 |
| **GG** | 6.5 | 42.06% | 0.29 | 4960 | 248 | **5208** | **0.38** | **104** | **3.6** | **0.25** | 0.01 |
| **HB** | 101.7 | 36.08% | 0.26 | 68620 | 3431 | **72051** | **5.25** | **145** | **44.7** | **0.34** | 0.015 |
| **HA** | 29.9 | 49.40% | 0.34 | 26241 | 1312 | **27553** | **2.01** | **116** | **20.8** | **0.28** | 0.01 |
| **HH** | 18.1 | 56.35% | 0.38 | 18075 | 904 | **18978** | **1.38** | **115** | **14.2** | **0.27** | 0.01 |
| **JJ** | 141.0 | 51.72% | 0.35 | 129118 | 6456 | **135574** | **9.88** | **168** | **73.1** | **0.40** | 0.02 |
| **L** | 88.4 | 49.20% | 0.33 | 77210 | 3861 | **81071** | **5.91** | **167** | **43.6** | **0.40** | 0.02 |
| **LL** | 81.4 | 14.40% | 0.14 | 29337 | 1467 | **30804** | **2.24** | **116** | **23.3** | **0.28** | 0.01 |
| **MA** | 20.9 | 25.79% | 0.20 | 11075 | 554 | **11629** | **0.85** | **112** | **8.6** | **0.27** | 0.01 |
| **MB** | 53.6 | 32.05% | 0.24 | 33072 | 1654 | **34725** | **2.53** | **117** | **26.3** | **0.28** | 0.01 |
| **MC** | 3.7 | 49.11% | 0.33 | 3201 | 160 | **3362** | **0.24** | **98** | **2.1** | **0.23** | 0.01 |
| **MD** | 11.8 | 46.29% | 0.32 | 9729 | 486 | **10216** | **0.74** | **111** | **7.5** | **0.26** | 0.01 |
| **ME** | 8.3 | 42.50% | 0.29 | 6347 | 317 | **6665** | **0.49** | **107** | **4.7** | **0.25** | 0.01 |
| **MF** | 49.0 | 37.70% | 0.27 | 34181 | 1709 | **35890** | **2.62** | **117** | **27.2** | **0.28** | 0.01 |
| **MG** | 8.0 | 40.12% | 0.28 | 5879 | 294 | **6173** | **0.45** | **106** | **4.4** | **0.25** | 0.01 |
| **MH** | 5.0 | 2.08% | 0.06 | 727 | 36 | **764** | **0.06** | **72** | **0.0** | **0.17** | 0.01 |
| **MM** | 4.2 | 39.74% | 0.28 | 3075 | 154 | **3228** | **0.24** | **98** | **2.0** | **0.23** | 0.01 |
| **NA** | 36.7 | 30.58% | 0.23 | 21886 | 1094 | **22981** | **1.67** | **115** | **17.3** | **0.27** | 0.01 |
| **NB** | 4.8 | 15.41% | 0.14 | 1818 | 91 | **1909** | **0.14** | **89** | **1.0** | **0.21** | 0.01 |
| **NC** | 11.7 | 45.05% | 0.31 | 9479 | 474 | **9953** | **0.73** | **110** | **7.3** | **0.26** | 0.01 |
| **NE** | 1.9 | 49.20% | 0.33 | 1656 | 83 | **1739** | **0.13** | **87** | **0.8** | **0.21** | 0.01 |
| **NF** | 5.6 | 49.75% | 0.34 | 4936 | 247 | **5183** | **0.38** | **104** | **3.6** | **0.25** | 0.01 |
| **NG** | 4.5 | 49.99% | 0.34 | 3959 | 198 | **4157** | **0.30** | **101** | **2.8** | **0.24** | 0.01 |
| **NH** | 7.4 | 49.56% | 0.34 | 6534 | 327 | **6861** | **0.50** | **107** | **4.9** | **0.25** | 0.01 |
| **NI** | 2.7 | 40.97% | 0.29 | 1976 | 99 | **2075** | **0.15** | **91** | **1.1** | **0.22** | 0.01 |
| **NJ** | 2.7 | 49.63% | 0.34 | 2364 | 118 | **2482** | **0.18** | **93** | **1.4** | **0.22** | 0.01 |
| **NN** | 5.7 | 51.41% | 0.35 | 5191 | 260 | **5450** | **0.40** | **104** | **3.8** | **0.25** | 0.01 |
| **OO** | 6.9 | 49.53% | 0.34 | 6069 | 303 | **6372** | **0.46** | **106** | **4.5** | **0.25** | 0.01 |
| **P** | 37.3 | 7.15% | 0.09 | 8933 | 447 | **9379** | **0.68** | **110** | **6.8** | **0.26** | 0.01 |
| **PP** | 19.6 | 57.00% | 0.39 | 19761 | 988 | **20749** | **1.51** | **115** | **15.6** | **0.27** | 0.01 |
| **Q** | 63.3 | 50.05% | 0.34 | 56173 | 2809 | **58981** | **4.30** | **144** | **36.6** | **0.34** | 0.015 |
| **S** | 41.5 | 5.01% | 0.08 | 8348 | 417 | **8766** | **0.64** | **109** | **6.4** | **0.26** | 0.01 |
| **SS** | 7.6 | 39.61% | 0.28 | 5532 | 277 | **5809** | **0.42** | **105** | **4.1** | **0.25** | 0.01 |
| **TA** | 38.0 | 30.01% | 0.23 | 22369 | 1118 | **23487** | **1.71** | **115** | **17.7** | **0.27** | 0.01 |
| **TB** | 3.3 | 48.98% | 0.33 | 2854 | 143 | **2997** | **0.22** | **96** | **1.9** | **0.23** | 0.01 |
| **TC** | 7.0 | 49.25% | 0.33 | 6162 | 308 | **6470** | **0.47** | **106** | **4.6** | **0.25** | 0.01 |
| **TT** | 15.4 | 41.96% | 0.29 | 11693 | 585 | **12278** | **0.89** | **112** | **9.1** | **0.27** | 0.01 |
| **U** | 45.2 | 46.64% | 0.32 | 37641 | 1882 | **39523** | **2.88** | **117** | **30.0** | **0.28** | 0.01 |
| **W** | 62.8 | 53.27% | 0.36 | 59158 | 2958 | **62116** | **4.53** | **144** | **38.5** | **0.34** | 0.015 |
| **X** | 66.4 | 37.57% | 0.27 | 46167 | 2308 | **48476** | **3.53** | **144** | **30.0** | **0.34** | 0.015 |
| **Z** | 20.2 | 59.70% | 0.41 | 21470 | 1073 | **22543** | **1.64** | **115** | **16.9** | **0.27** | 0.01 |

# TABLE IV.B.2 – MINIMUM VEGETATED SWALE SIZING AT OUTFALLS

| | REDUCED for LID - SWQ VOLUME/FLOWRATE DESIGN - PRSCG FACTORS | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Outfall** | Total | Imperv. | **LID Mit.** | Reduced | C | Volume | Reserve | **Total** | **Design** | **Min. Swale** | **Min. Swale** | Velocity | Design |
| **Location** | Area | Area | **Imp. Area** | % Imperv | Value | | Volume | **Volume** | **Flowrate** | **Length** | **B. Width** | < 1 fps | Slope |
| | ac | ac | **ac** | | | Ft^3 | Ft^3 | **Ft^3** | **cfs** | **ft** | **ft** | Check | ft/ft |
| **AA** | 73.7 | 18.9 | **14.3** | 6.19% | 0.09 | 16408 | 820 | **17229** | **1.26** | **50** | **30.9** | 0.12 | 0.010 |
| **B** | 19.5 | 0.5 | **0.1** | 2.11% | 0.06 | 2857 | 143 | **3000** | **0.22** | **90** | **2.1** | 0.21 | 0.010 |
| **BB** | 18.0 | 10.0 | **7.1** | 16.31% | 0.15 | 7001 | 350 | **7351** | **0.54** | **45** | **13.9** | 0.11 | 0.010 |
| **CC** | 88.2 | 31.4 | **23.9** | 8.50% | 0.10 | 23229 | 1161 | **24391** | **1.78** | **57** | **38.3** | 0.14 | 0.015 |
| **DD** | 3.8 | 1.9 | **1.5** | 10.70% | 0.11 | 1134 | 57 | **1190** | **0.09** | **33** | **2.3** | 0.08 | 0.010 |
| **GG** | 6.5 | 2.7 | **2.0** | 11.72% | 0.12 | 2066 | 103 | **2170** | **0.16** | **43** | **3.6** | 0.10 | 0.010 |
| **HB** | 101.7 | 36.7 | **27.9** | 8.65% | 0.10 | 27032 | 1352 | **28384** | **2.07** | **57** | **44.7** | 0.14 | 0.010 |
| **HA** | 29.9 | 14.8 | **11.6** | 10.54% | 0.11 | 8910 | 445 | **9355** | **0.68** | **39** | **20.8** | 0.09 | 0.010 |
| **HH** | 18.1 | 10.2 | **7.2** | 16.54% | 0.15 | 7125 | 356 | **7481** | **0.55** | **45** | **14.2** | 0.11 | 0.010 |
| **JJ** | 141.0 | 72.9 | **54.5** | 13.08% | 0.13 | 47843 | 2392 | **50235** | **3.66** | **62** | **73.1** | 0.15 | 0.020 |
| **L** | 88.4 | 43.5 | **33.2** | 11.67% | 0.12 | 27969 | 1398 | **29367** | **2.14** | **60** | **43.6** | 0.14 | 0.015 |
| **LL** | 81.4 | 11.7 | **8.0** | 4.60% | 0.07 | 15762 | 788 | **16550** | **1.21** | **63** | **23.3** | 0.15 | 0.010 |
| **MA** | 20.9 | 5.4 | **4.3** | 5.05% | 0.08 | 4224 | 211 | **4435** | **0.32** | **43** | **8.6** | 0.10 | 0.010 |
| **MB** | 53.6 | 17.2 | **12.9** | 7.95% | 0.10 | 13588 | 679 | **14268** | **1.04** | **48** | **26.3** | 0.11 | 0.010 |
| **MC** | 3.7 | 1.8 | **1.4** | 10.42% | 0.11 | 1086 | 54 | **1140** | **0.08** | **33** | **2.1** | 0.08 | 0.010 |
| **MD** | 11.8 | 5.4 | **4.3** | 9.92% | 0.11 | 3383 | 169 | **3552** | **0.26** | **38** | **7.5** | 0.09 | 0.010 |
| **ME** | 8.3 | 3.5 | **2.8** | 9.18% | 0.11 | 2270 | 114 | **2384** | **0.17** | **38** | **4.7** | 0.09 | 0.010 |
| **MF** | 49.0 | 18.5 | **14.7** | 7.76% | 0.10 | 12267 | 613 | **12880** | **0.94** | **42** | **27.2** | 0.10 | 0.010 |
| **MG** | 8.0 | 3.2 | **2.6** | 7.41% | 0.09 | 1958 | 98 | **2056** | **0.15** | **35** | **4.4** | 0.08 | 0.010 |
| **MH** | 5.0 | 0.1 | **0.0** | 1.95% | 0.05 | 715 | 36 | **751** | **0.05** | **71** | **0.0** | 0.17 | 0.010 |
| **MM** | 4.2 | 1.7 | **1.4** | 7.31% | 0.09 | 1025 | 51 | **1076** | **0.08** | **33** | **2.0** | 0.08 | 0.010 |
| **NA** | 36.7 | 11.2 | **8.2** | 8.22% | 0.10 | 9475 | 474 | **9948** | **0.72** | **50** | **17.3** | 0.12 | 0.010 |
| **NB** | 4.8 | 0.7 | **0.5** | 4.25% | 0.07 | 905 | 45 | **950** | **0.07** | **44** | **1.0** | 0.11 | 0.010 |
| **NC** | 11.7 | 5.3 | **4.2** | 9.47% | 0.11 | 3284 | 164 | **3449** | **0.25** | **38** | **7.3** | 0.09 | 0.010 |
| **NE** | 1.9 | 0.9 | **0.7** | 10.50% | 0.11 | 563 | 28 | **592** | **0.04** | **30** | **0.8** | 0.07 | 0.010 |
| **NF** | 5.6 | 2.8 | **2.2** | 10.64% | 0.11 | 1675 | 84 | **1758** | **0.13** | **35** | **3.6** | 0.08 | 0.010 |
| **NG** | 4.5 | 2.2 | **1.8** | 10.70% | 0.11 | 1341 | 67 | **1408** | **0.10** | **34** | **2.8** | 0.08 | 0.010 |
| **NH** | 7.4 | 3.7 | **2.9** | 10.58% | 0.11 | 2218 | 111 | **2328** | **0.17** | **36** | **4.9** | 0.09 | 0.010 |
| **NI** | 2.7 | 1.1 | **0.9** | 8.69% | 0.10 | 707 | 35 | **742** | **0.05** | **32** | **1.1** | 0.08 | 0.010 |
| **NJ** | 2.7 | 1.3 | **1.0** | 10.61% | 0.11 | 802 | 40 | **842** | **0.06** | **32** | **1.4** | 0.08 | 0.010 |
| **NN** | 5.7 | 2.9 | **2.1** | 15.21% | 0.14 | 2126 | 106 | **2233** | **0.16** | **43** | **3.8** | 0.10 | 0.010 |
| **OO** | 6.9 | 3.4 | **2.7** | 10.59% | 0.11 | 2061 | 103 | **2164** | **0.16** | **36** | **4.5** | 0.09 | 0.010 |
| **P** | 37.3 | 2.7 | **1.7** | 2.72% | 0.06 | 5893 | 295 | **6188** | **0.45** | **72** | **6.8** | 0.17 | 0.010 |
| **PP** | 19.6 | 11.1 | **7.9** | 16.69% | 0.15 | 7740 | 387 | **8127** | **0.59** | **45** | **15.6** | 0.11 | 0.010 |
| **Q** | 63.3 | 31.7 | **24.4** | 11.48% | 0.12 | 19826 | 991 | **20817** | **1.52** | **51** | **36.6** | 0.12 | 0.015 |
| **S** | 41.5 | 2.1 | **1.1** | 2.42% | 0.06 | 6323 | 316 | **6639** | **0.48** | **83** | **6.4** | 0.20 | 0.010 |
| **SS** | 7.6 | 3.0 | **2.5** | 7.28% | 0.09 | 1844 | 92 | **1937** | **0.14** | **35** | **4.1** | 0.08 | 0.010 |
| **TA** | 38.0 | 11.4 | **8.8** | 6.95% | 0.09 | 8967 | 448 | **9416** | **0.69** | **46** | **17.7** | 0.11 | 0.010 |
| **TB** | 3.3 | 1.6 | **1.3** | 10.46% | 0.11 | 972 | 49 | **1021** | **0.07** | **33** | **1.9** | 0.08 | 0.010 |
| **TC** | 7.0 | 3.5 | **2.7** | 10.45% | 0.11 | 2088 | 104 | **2193** | **0.16** | **36** | **4.6** | 0.09 | 0.010 |
| **TT** | 15.4 | 6.5 | **5.1** | 9.12% | 0.10 | 4213 | 211 | **4423** | **0.32** | **40** | **9.1** | 0.10 | 0.010 |
| **U** | 45.2 | 21.1 | **15.8** | 11.69% | 0.12 | 14325 | 716 | **15041** | **1.10** | **45** | **30.0** | 0.11 | 0.010 |
| **W** | 62.8 | 33.4 | **25.5** | 12.56% | 0.13 | 20769 | 1038 | **21808** | **1.59** | **51** | **38.5** | 0.12 | 0.015 |
| **X** | 66.4 | 24.9 | **17.3** | 11.42% | 0.12 | 20728 | 1036 | **21764** | **1.59** | **64** | **30.0** | 0.15 | 0.010 |
| **Z** | 20.2 | 12.1 | **8.5** | 17.37% | 0.16 | 8206 | 410 | **8616** | **0.63** | **44** | **16.9** | 0.10 | 0.010 |

* Vegetated Swales built to this minimum length complete the RVR to 100% for LID, but do not complete the total treatment requirements of the project, and additional BMP's will be required to obtain the treatment objectives.

## IV.C Hydrograph Modification Benefits from LID:

The development of the Specific Plan has the potential to modify the hydrologic response for given storm recurrences within the Curry Creek Watershed. It is commonly understood that development generally increases runoff volume and peak flows by increasing the amount of impervious areas within the watershed and by reducing the amount of time over which runoff occurs.

Streams naturally migrate and evolve. Migration is the progression of the stream meanders in a downstream direction. Migration can naturally occur over short time periods or long geological periods, depending on stream factors such as soil types, etc…Evolution is the modification of the stream type or classification, into another stream type or classification. Evolution naturally occurs in streams over long geological periods. Modifications to the hydrologic response of a watershed has the potential in some watersheds to result in downstream modifications to the stream, referred to as an evolutionary response. An evolutionary response can result in considerable additional sediment load within a stream corridor, and ultimately can result in the degradation of water quality, environmental resources, recreational resources, and navigable resources.

The MS4 permit of the City of Roseville requires new projects to mitigate stormwater quality impacts to the "Maximum Extent Practicable". In response, this project has reviewed the potential for hydrograph modification, resulting from the proposed development measures and has incorporated mitigation measures which will reduce the potential as follows:

- The project will incorporate the use of extensive Low Impact Development measures to reduce runoff impacts at the source of runoff from impervious surfaces.

- The project has developed a peak flow mitigation plan within the creek corridors which will provide increased offsetting attenuation for all storm events from 10% of the peak 2-year to the 100-year event.

### IV.C.2 Peak Flow Response:

In figure IV.C.1 we have plotted peak flow responses at the project exit to Curry Creek, for the Pre-Project and Post-Project Mitigated with LID scenarios. The response for the following events is compared in the graph: 10% of 2-year, 50% of 2-year, 2-year, 10-year, 100-year. The graph demonstrates that peak flow increases from the project area will not occur and are fully mitigated for the full range of events, by the proposed project mitigation plan.

**FIGURE IV.C.1 – Peak Flowrate Comparisons Leaving Project**

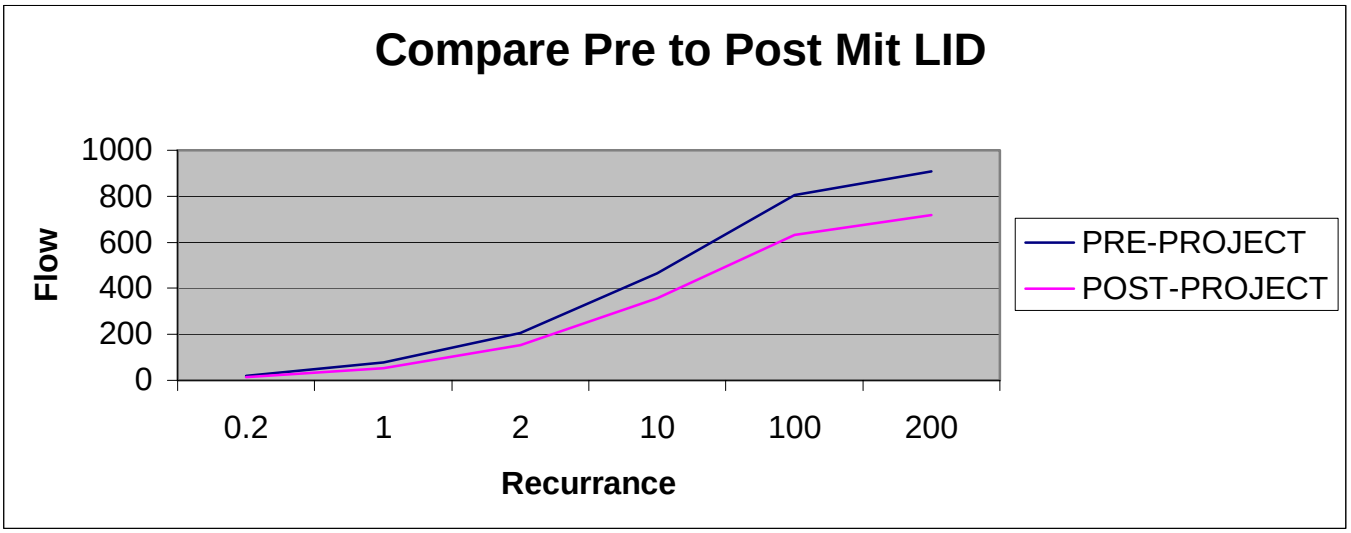
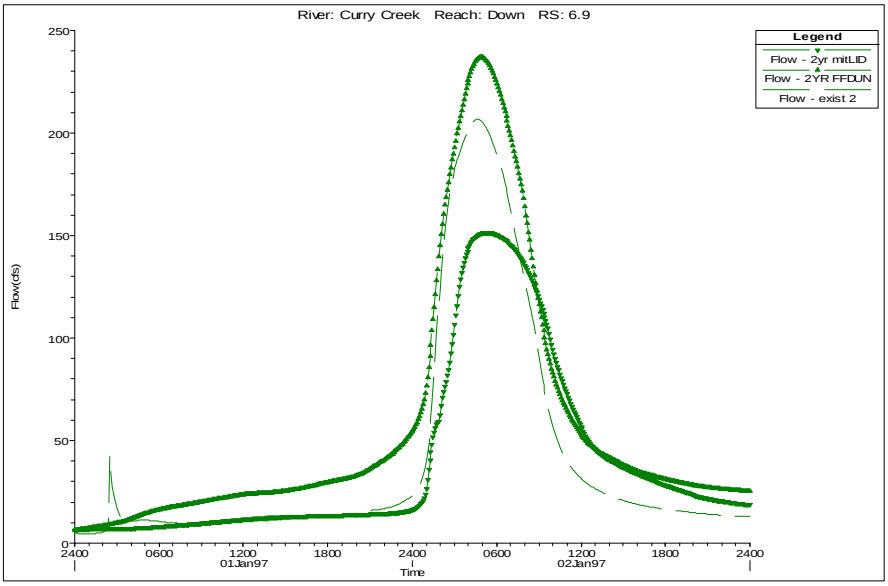



Figure IV.C.2 – plots the anticipated comparison of the resulting hydrographs at the project exit point for the 2-year design event. It is important to note that the mitigated with LID hydrograph is similar in overall timing and demonstrates a reduction in peak flow rate. The Future, Fully Developed, without mitigation hydrograph demonstrates an accelerated timing in the 2-year event, and a substantial increase in both peak flow and volume, which is summarized in TABLE IV.C.1.

**FIGURE IV.C.2 – Comparison of Pre-project and Post-project Hydrographs 2-year EVENT**



### III.C.3 Hydrograph Characteristics:

**TABLE IV.C.3: HYDROGRAPH CHARACTERISTICS AT PROJECT DISCHARGE**

| Event | 48-hour Runoff Volume (AF) | | | Peak Flow (CFS) | | |
|---|---|---|---|---|---|---|
| | PRE- | POST MIT LID | UN-MIT | PRE- | POST MIT LID | UN-MIT |
| **200-YEAR** | 648 | 597 | 712 | 907 | 720 | 882 |
| **100-YEAR** | 600 | 544 | 663 | 804 | 632 | 811 |
| **10-YEAR** | 411 | 374 | 437 | 466 | 357 | 472 |
| **2-YEAR** | 162 | 156 | 227 | 207 | 152 | 237 |
| **50% of 2-YEAR** | 82 | 86 | 118 | 77 | 54 | 91 |
| **10% of 2-YEAR** | 28 | 38 | 40 | 19 | 13 | 23 |

### III.C.4 Hydrograph "Flow Duration":

The duration of flow of certain flow rates over time will change the sediment load requirements of the channel. Traditionally, "Flow Duration analysis" involves preparing some continuous simulation models for the alternative project conditions, and running 30-years of gage records through the simulation, and compiling and comparing the results of flow exceedance verses time. Similarly we can use design events to chart the relative impact of the project. To do this, the hydrographs for the various project scenarios and design events are measured to determine the duration of exceedance of certain flow rates. For this analysis we selected flow rates of:

| Flow Rates for Flow Duration Analysis | Recurrance Events Studied |
|---|---|
| Baseflow + 5 cfs | 10% of the 2-year |
| Baseflow + 10 cfs | 50% of the 2-year |
| Baseflow + 25 cfs | 2-year |
| Baseflow + 50 cfs | 10-year |
| Baseflow + 100 cfs | 100-year |
| Baseflow + 150 cfs | 200 -year |
| Baseflow + 200 cfs | |
| Baseflow + 300 cfs | |
| Baseflow + 400 cfs | |
| Baseflow + 500 cfs | |
| Baseflow + 600 cfs | |
| Baseflow + 700 cfs | |
| Baseflow + 800 cfs | |

Data was assembled for comparison of the Pre-project conditions, Post-project conditions with mitigation and LID, and Post-project unmitigated conditions. Flows are compared at the exit point of the project downstream of the confluence of the Federico Tributary and the main branch of Curry Creek. Figure III.C.4 shows the comparison of these scenarios for flow duration where a log scale is used on the duration axis. The Duration Axis plots the total summation of duration for which flowrates are exceeded for the analyzed events for a normalized 100-year period.

**Figure III.C.4 – Flow-Duration Relative Comparison (logrythmic)**

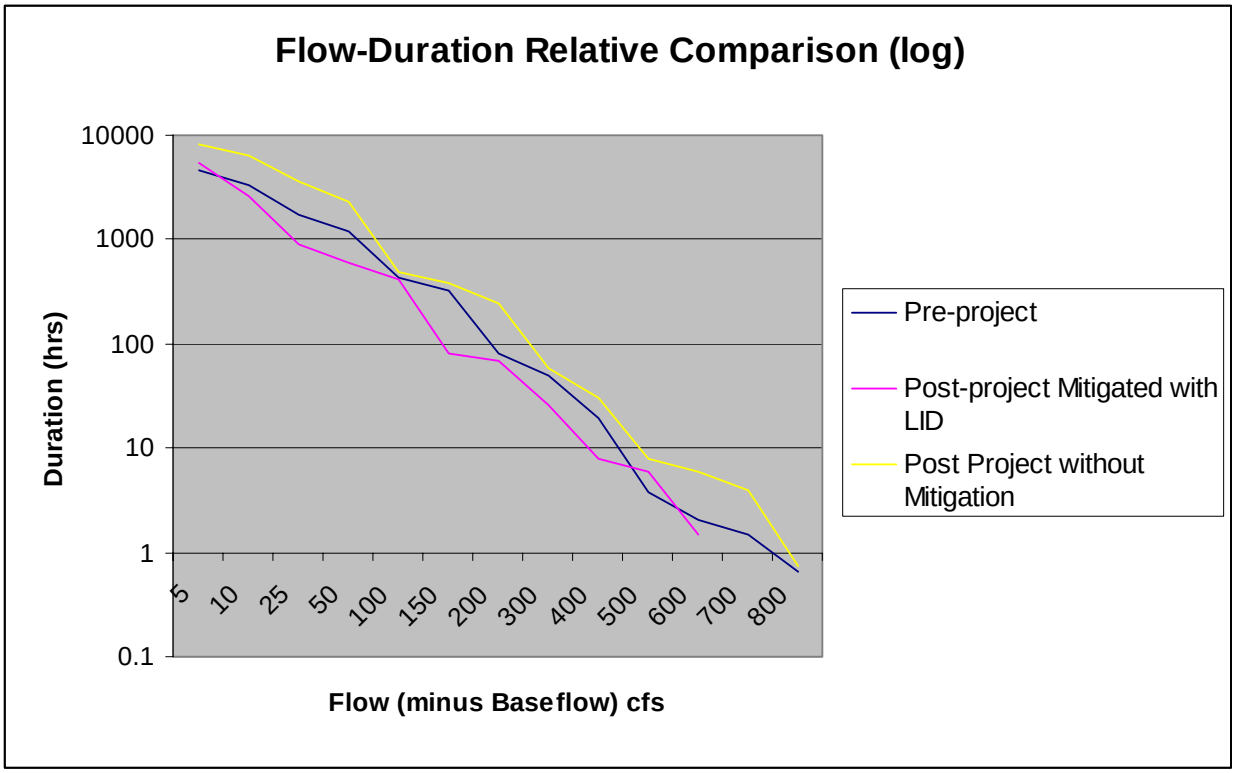
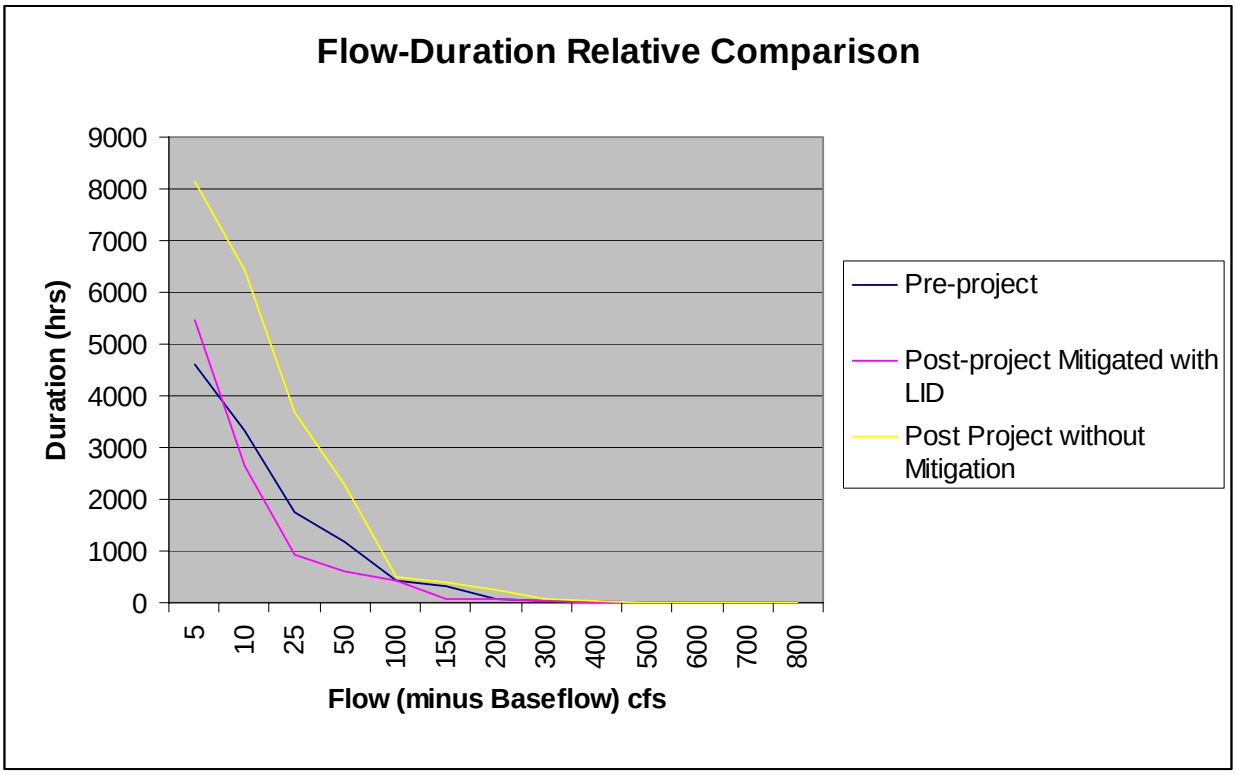



Figure III.C.4 shows that the project with LID and mitigation is expected to lessen or equal the flow duration amounts from the pre-project for all flows, while the project without mitigation would increase flow duration for all flows.

Figure III.C.5 shows the same correlation but on a non-logrythmic scale. On this figure it is easy to see the substantial relative impacts for the smaller and more frequently occurring flow rates, that the project without mitigation would have. The project with mitigation and LID demonstrates a much better relative correlation for the full array of flow rates expected at the exit point of the project.

**Figure III.C.5 – Flow Duration Relative Comparison (non logrythmic)**




Note: the above charts plot relative impacts for the storm events analyzed in this document. Adding storm event frequencies to this analysis would make the curves smoother (less jagged), but would not alter the results of the relative comparisons demonstrated.

# V. Volumetric Impacts:

The Sierra Vista Specific Plan drains via Curry Creek. Runoff from the project areas ultimately has to pass through the Natomas Cross Canal before entering the Sacramento River. The Cross Canal Watershed Study (CH2MHILL 1992-1994) identified that development within these watershed could make a flooding problem that exists within Sutter County, worse, by increasing runoff volumes. The City of Roseville has implemented a drainage fee to collect funds and to ultimately build a mitigation facility, currently planned at the Reason Farms site. The Pleasant Grove Watershed Mitigation Fee recently established the parameters shown in Table V.A for development in Type D soils.

**TABLE V.A – VOLUMETRIC IMPACT RATES IN TYPE D SOILS**

| LAND USE TYPE | LAND USE DESCRIPTION | % IMPERVIOUS | TYPE "D" SOIL IMPACT RATE (AF/ACRE) | LAND USE AREA (ACRE) | LAND USE IMPACT (ACRE FT) |
|---|---|---|---|---|---|
| **LDR** | Low Density Residential | 40 | 0.072 | 836.1 | 60.20 |
| **MDR** | Medium Density Residential | 50 | 0.126 | 279.8 | 35.25 |
| **HDR** | High Density Residential | 60 | 0.206 | 66.6 | 13.72 |
| **COMM** | Commercial | 70 | 0.233 | 228.8 | 53.31 |
| **Park** | Park | 5 | -0.115 | 154.7 | -17.79 |
| **PQP** | Public/Quasi Public | 50 | 0.126 | 103.4 | 13.03 |
| **ROAD** | Roadways | 85 | 0.313 | 124.4 | 38.94 |
| **UR** | Urban Reserve | 2 | 0 | 638.9 | 0.00 |
| **OS** | Open Space | 2 | 0 | 256.2 | 0.00 |
| | | | | **TOTAL=** | **196.66** |

The total computed impact of this development is 196.7 acre feet of volumetric storage for a 8-day 100-year event. This impact will be mitigated at the City of Roseville's Reason Farms Facility, once it is constructed. The Pleasant Grove Mitigation Fee did consider the Sierra Vista Specific Plan as a possible participant in the Reason Farms Project (identified as an MOU area in that study), and sufficient storage volume was shown to be available for this project in the preliminary studies.

# APPENDICES

# APPENDIX A
## CREATED WETLANDS NARATIVE

**SIERRA VISTA SPECIFIC PLAN**
**ON-SITE WETLANDS CREATION COMPONENT OF**
**WETLAND MITIGATION PLAN**

**GIBSON AND SKORDAL**
**CIVIL ENGINEERING SOLUTIONS, INC.**

**June 15, 2009**

**Mitigation Plan Overview**. The wetland mitigation plan for the Sierra Vista Specific Plan will consist of several different components including off-site wetlands preservation, off-site wetlands restoration/creation and on-site wetlands creation. Mitigation for impacts to wetlands that are considered habitat for listed branchiopods will consist of off-site preservation of existing habitat and restoration of previously existing habitat at ratios determined through consultation with the U.S. Fish and Wildlife Service (the "Service"). Which vernal pools and seasonal wetland swales, or portions thereof, are considered to be habitat for listed branchiopods will be determined through consultation with the Service. All, or a portion thereof, of the impacts to those wetlands that are not considered to be habitat for listed branchiopods will be mitigated through creation of wetlands on-site within the proposed open space corridors. The on-site creation will not provide for creation of vernal pools not considered to be habitat for listed branchiopods. In the event that the Corps determines that mitigation for impacts to these vernal pools must be in-kind, that will be accomplished off-site.

**On-site Mitigation Design.** The following objectives and/or criteria were considered in designing the proposed on-site wetland mitigation plan:

- Maximize the area of wetlands to be created after consideration of physical and logistical constraints;
- Design wetlands that maximize watershed support functions such as flood attenuation functions, surface water storage functions, water quality improvement functions and habitat connectivity;
- Design wetlands that will provide a diversity of habitats including short and long term inundation seasonal wetlands, emergent marshes and riparian scrub.;
- Design wetlands that are hydrologically interconnected to the existing watercourses;
- Design wetlands that promote the long-term stability of the existing watercourses in consideration of the geofluvial morphology of these watercourses;
- Design wetlands that minimize the potential to exacerbate vector breeding conditions;
- Site wetlands so that they are have adequate upland buffers separating them from the proposed development; and
- Site wetlands so that they are down gradient, and not within the proposed development's water quality treatment features such as bioswales.

Using these design criteria, Gibson & Skordal conceptually mapped the location and extent of wetlands to be created on-site. Following this conceptual mapping, it was reviewed by both MacKay & Somps and Civil Solutions. MacKay & Somps reviewed the plan with respect to its relation to the overall land plan. Civil Solutions reviewed the plan with respect to flood water attenuation, conveyance issues and quantified the hydrologic issues and benefits associated with the construction of the wetland features. Additionally, Civil Solutions evaluated preliminary stream stability guidance criteria to be used in their design. Based on their input, the plan was further refined. An overall plan drawing of the Specific Plan Area showing the conceptual layout of the wetlands to be created is attached. More detailed plan showing an example representative portion of the proposed wetland creation types is also attached.

A total of approximately 45 acres (± 2-3 acres) of wetlands will be constructed. The wetlands to be created will consist of a depression excavated in the overbank adjacent to existing watercourses but separated by a berm of native land. The wetlands to be created are situated along the inside edge of existing meanders and/or along relatively straight reaches. The depressional wetlands will be connected to the adjacent watercourses by openings through the berms of native land both on their up-gradient and down-gradients ends. The up-gradient openings (diversion weir) will have an invert elevation that is located above the active stream channel. Where the wetland to be created is not located down-gradient of a water quality treatment feature, the down-gradient openings will have an invert elevation that is 0.5-1.0 foot above the bottom elevation of the wetland. Where the wetland to be created is located down-gradient of a water quality treatment facility, the invert of the down-gradient opening will be at approximately the same elevation as the wetland. The openings will be protected from erosion by the use of a

vegetated/hydroseeded geotextile fabric rather than structural armoring. The interior slopes adjacent to the wetlands will be graded to approximately 5:1 or greater except where limited by proximity to the adjacent watercourse.

The wetlands will be constructed during the dry season when surface water is not present except possibly along certain reaches of Curry Creek. Where surface water is present throughout the summer along certain reaches of Curry Creek, the wetlands will be constructed "in the dry" by first completing the wetland grading for the wetland, then the down-gradient opening and finally the up-gradient opening. In constructing the wetlands, the first 4-6 inches of top soil will be salvaged and stockpiled. The wetland will then be excavated and graded to an elevation approximately 4-6 inches below design depth. The salvaged topsoil will then be placed to final grade. Once grading is completed, the slopes of the wetland will be hydro-seeded with a mixture of upland and wetland grasses and forbs. To minimize erosion, it may also be desirable to sprinkler irrigate the constructed wetlands and side slopes to promote establishment of a vegetative cover prior to the on-set of the rainy season.

**Related Issues**. The following is a discussion of specific issues raised by the City of Roseville staff regarding the proposed on-site wetlands creation.

*Vector Control:*

The hydrology characteristics of the wetlands to be created are important considerations in designing wetlands that will not exacerbate vector control issues. Both presence or absence of ponding versus saturation as well as the timing of inundation are important factors to consider. The following design criteria were used to assure that the wetlands to be constructed on-site would minimize the potential for creating vector control problems.

- Depressional wetlands that will be subject to ponding will be situated so that they do not receive surface runoff from developed areas. These wetlands will experience ponding only from during storm events. This will assure that ponding only occurs during the winter and early spring and that ponding will not be present during the late spring and summer when vector breeding is problematic.

- Where constructed wetlands will be situated down gradient of surface water runoff from developed areas, they will be designed so that they are sloped with planed surfaces. While these wetlands will receive runoff from irrigation and other (treated) nuisance runoff during the spring and summer, they will not have depressions that will create ponding conditions. In these cases, the wetland hydrology will be dependent on soil saturation and shallow sheet flow conditions.

*Channel Stability:*

The wetlands will be designed to minimize impacts to the existing low flow stream systems. The natural banks will be left in tact, and a minimum berm width of 5 feet horizontal will be maintained between the stream bank and the created wetland excavation top of slope. Weirs intended to divert waters in flood events from the main low flow channel into the wetland features, will be constructed at an elevation above the ordinary (bank full) flow channel, and will be armored using a synthetic geotextile fabric and hydroseeded so that vegetation will establish across the weir. Additionally, low areas of the separation berms will be armored to prevent scour at these natural weir locations, where additional 1st breakouts of flood events into the floodplain and wetland areas could occur. The remainder of the berm will not be armored as high velocity breakout overflows will not likely occur at these locations until equilibrium with the overbank and main channel elevations has occurred.

At the downstream end of the wetlands, a return channel will be cut through the berm, or a pipe return will be constructed through the berm permitting flows to return to the main channel of the creek. Soft armoring of the return channels with a synthetic geotextile fabric will be provided to maintain grade control of the outlet of the wetland area, and stream bank at these locations. Where pipe returns are built, individual analysis of pipe velocity will dictate the need for armoring at the pipe exit into the creek. A cutoff wall will be provided at the pipe trench to prevent seepage erosion and piping failures at these locations.

The design of the wetlands is intended to provide minimal connectivity of the stream waters to the wetlands except during flood events, which maintains the active stream channel conditions intact. The active stream channel zone is the critical area of the stream with respect to fluvial geomorphology processes. Minimizing impacts to the flows, sediment load, and stream dynamics within this zone will minimize adverse changes to the main stem stream stability, from their current levels.

**[The above section will be modified after the Initial review by the geomorphologist.]**

*Siltation within Constructed Wetlands*:

The construction of the wetlands will add substantial conveyance area to the stream overbank flow paths. Additionally, within these wetland areas, dense vegetation is likely to grow. The combination of these items indicates that slower velocities in these zones of the creek are likely to occur in the built conditions. Slower velocity flow will have less energy and less sediment carrying capabilities. It is likely that sediment discharged by the stream into these areas, will be deposited within the wetland areas.

Hydraulic analysis of the wetland areas accounts for this potential in several ways. Increased friction coefficients ('n'-values) are used in these areas to account for the increased vegetation densities expected. Also, in the "Future-Fully Developed,

Unmitigated" flood scenarios (which are used to establish design floodplain parameters), the wetlands are assumed to be fully obstructed to their existing ground elevations, by sediment and vegetation.

In the hydrologic analysis of the project, it was determined that 20% of these wetland volumes could be filled before the project would no longer meet the peak flow mitigation requirements (reduced post project peak 100-year flow rate by 10% of the difference between the pre-project and post-project unmitigated flow rates for the 2-year, 10-year and 100-year design storm events). These streams do not currently have the amount of sediment loading within them to generate this volume of sediment deposition. It is also likely that sediment loading will be reduced in the ultimate buildout and vegetated conditions of the project. However construction activities are known to increase sediment loading in the creeks, and therefore the wetlands should be inspected following project construction to verify that sediment accumulation has not exceeded the 20% threshold.

Finally, the sediment accumulations pose a minimal threat to the long-term maintenance of the constructed wetlands. As is readily demonstrated by examining existing channels, swales, depressional seasonal wetlands and vernal pools within the Specific Plan Area, sediment accumulation under baseline conditions is minimal. Given this and the relatively low sediment loading, it is reasonable to assume that the amount of sediment deposition in the constructed wetlands will also be relatively minor, certainly not of a magnitude that would undermine the success of the constructed wetlands. Sediment loading is normally highest, during the first couple of years following wetland construction due to construction activities and associated ground disturbance in adjacent development areas. If this were to occur at a level likely to undermine the success of the constructed wetlands it would be detected during the initial mitigation construction monitoring. In which case, remedial measures would be implemented to correct any such problems at that time.

*Long Term Maintenance:*

Following the construction activities related to the development projects, sediment loading within the creek corridors would be expected to stabilize at current amounts or lower amounts. It is not expected that repairs from normal flood event depositions would ever exceed the 20% threshold necessary to maintain the peak flood mitigation objectives of the project. During project design, a detailed geomorphic analysis will be performed to provide analysis of specific velocities and soils conditions, and design guidance which will lead to a stable stream and floodplain, ready to accept the development flows, and existing flows in a more stable manner than currently exists.

All stream low flow channels naturally migrate and evolve over time. It is likely that these activities will continue within this project, and the project and open space designs are intended to accommodate this by setting back the development areas outside of the meander amplitude of the stream. These meandering activities of the stream may pose some risk to the success of the wetland creation areas, However, this risk is no greater

than other natural locations were wetlands develop adjacent to streams. **[This discussion will be revised after we have the initial geomorphology investigations complete]**

**Pre-Project Stream Photos:**

Curry Creek Main Reach – Upstream of Baseline Road, Looking Upstream

Curry Creek Main Reach – Upstream of Baseline Road, Looking Upstream

Curry Creek Main Branch Upstream of Baseline Road

Curry Creek Main Branch, at Culvert Plunge Pool,

Curry Creek Main Branch – Incised Bank Example

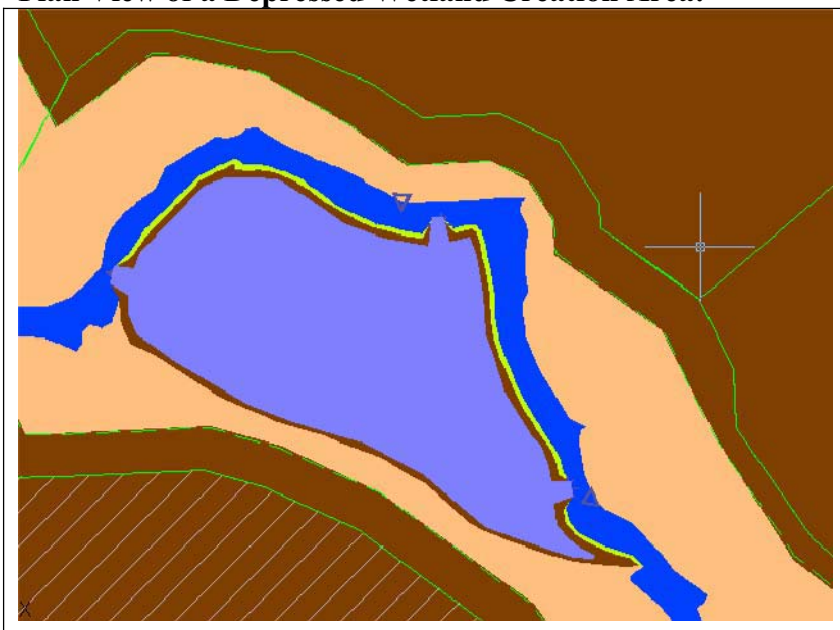
Curry Creek Main Branch – Straightened Reach.


Curry Creek Main Branch – Example of a Dry Season wet stretch of channel. Also demonstrates the up and down nature of the channel invert.


Curry Creek Main Branch – Example of Stream Bed Side materials at hardpan.


Westpark Outfall Channel at the Federico Tributary.

**Plan View of a Depressed Wetland Creation Area:**



**LEGEND:**

Existing Active Stream Channel Area

Proposed Depressed Wetland

Non-Graded area

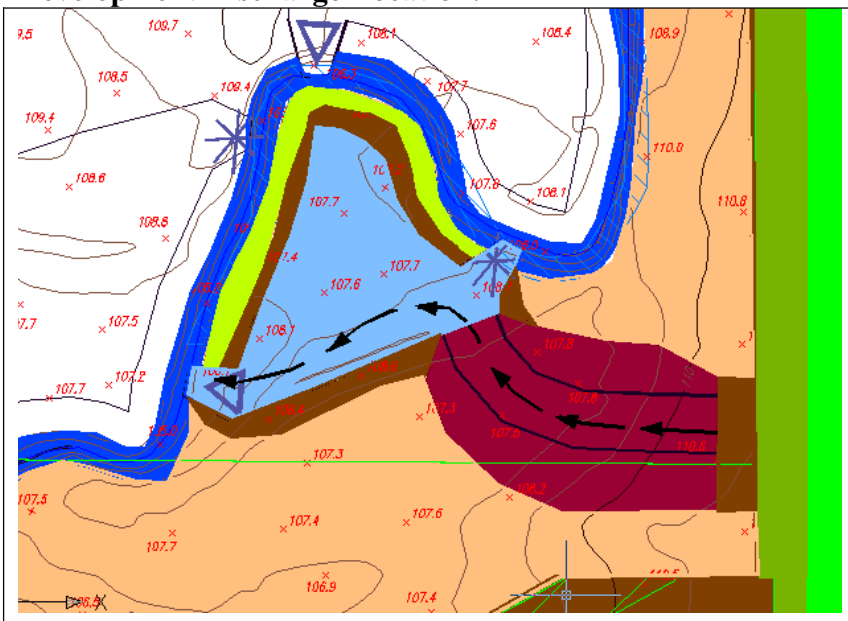
5 foot Channel Bank Buffer area

Urban Development Area, Setback Grading Zone and interior slope

Example of a weir connection to the creek.

The above example demonstrates the preliminary schematic example for the construction of a depressed wetland feature. The feature would not be directly connected to a development discharge and would not be anticipated to receive nuisance waters. Flooding of the depressed wetland would only occur from flood event waters, and would not be expected to be retained into the dry season.

**Plan View Example of a Draining Wetland Creation Area, downstream of a Development Discharge Location:**



Existing Active Stream Channel Area

Proposed Draining Wetland

Non-Graded area

5 foot Channel Bank Buffer area

Urban Development Area, Setback Grading Zone and interior slope

Example of a weir connection to the creek.

Stormwater Quality Treatment Swale at pipe discharge

Proposed Roadway

The above example of a Draining Wetland Creation Feature demonstrates that wetland creation areas subject to nuisance waters from development discharge points will be constructed to include positive drainage through the wetland feature and into the creek to reduce vector potential. By draining through the wetland feature, additional opportunities for water quality enhancement, infiltration and evapotranspiration of the nuisance runoff will occur, and these flows will help to maintain soil saturation in support of the wetland vegetation.

# APPENDIX B
## HEC-1 PRE-PROJECT INPUT FILE

```
ID CURRY CREEK - Southwest Roseville Specific Plan
ID pre-Development Conditions Job# 2005-18
ID June 16, 2005
ID HEC-1 File SWRSPex1.in
ID Shed CU2A is subdivided into several small sheds
* ID CURRY CREEK - De La Sal University
* ID Pre-Development model; Fiddeyment Rd. to Cross Canal
* ID Civil Solutions
* ID Rev 8/11/03 GSU
* ID FILE NAME: CDSE.DAT Curry ck DelaSal-Existing, Modified sheds; CU2A, CU2B &
*  CU3 to reflect detailed analysis within the DE LE SAL project boundaries.
*  The current models do not reflect the existing agricultural modifications
*  made to the drainage patterns.
*  ***************************************************************************
*  FILE NAME: CUDSE.DAT, CUrry ck DelaSal-Existing Rev 8/01/03 GSU
*  Sheds CUS1 thru CUS17C are from the Placer Vineyards post-mitigated model
*  (CUS-MIT.DAT) by Civil Solutions. Sheds CUS1 thru CUS14 have replaced Shed
*  CU1 and sheds CUS15 thru CUS17C replace a portion of Shed CU2A in the West-
*  park model (WPDET1.DAT) by Wood-Rodgers. The  proposed improvements for
*  Placer Vineyards and Westpark are included in this existing condition model.
*  ***********The following is from file: CUS-MIT.DAT *************************
* ID Placer Vineyards - Curry Creek Tributary
* ID Pre-development model : on-site CUS - Curry Creek
* ID TSP - Civil Solutions
* ID Post-development Mitigated
* ID April 2003
*  THIS FILE PREPARED USING THE PLACER COUNTY HEC-1 Pre-Processor
*  A Civil Solutions Product
*
* CUS in Shed Names Ommited for some nodes
* ************************** June 16,05 ************************
* ****************** Southwest Roseville Apecific Plan ************
* ****************** Project No. 2005-18 **********************
* ****************** HEC-1 File Copied from Project 2003-24 File:CDSE.IN *******
* ******************HEC-1 File:SWRSPex1.IN Existing conditions ****************
*
* ********** April 28,06 Watt Ave Extension File Wattex1.in ******************
* ********** new file copied from SWRSPex1.in *************************
* ********** Sheds cus15, cu2a6, cu2a4, cu2a5, cu2b2 and cu2b1 are subdivided **
* !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
* !!!!!!!!! MAY 17, 06 PULS ROUTING USED FOR CHANNELS PER RAS !!!!!!!!!!!!!!
* !!!!!!!!! NEW FILE : SVEXT1.IN COPIED FROM WATTEX1.IN  !!!!!!!!!!!!
*
* ########################## MAY 8, 08 EXISTING CONDITION #################
* ############    SET UP FOR UNSTEADY RAS MODEL ######################
* ############ NEW FILE : SVEXT2.IN COPIED FROM SVEXT1.IN  ##############
*
* ###########################################################################
* *********** March 5, 09 Existing Model Updated Per New offsite drainage info
* *********** Updated CUS3G, CWP7 & CWP8 shed delineation per existing stormdrain
* *********** system from City of Roseville ***********
* *********** NEW FILE : SVEXT3.IN COPIED FROM SVEXT2.IN **************
*
*
*  *DISPLAY
*DIAGRAM
IT     5 01JAN97       0     600
IO     5       0       0
* The following sheds are from the PV model
* Shed CUS1 is part of shed CUS3G, by DNM 3/5/09
* KK  CUS1
* ZW C=FLOW
* KM CUS1 43.7ac
* KM CUS1 58.789 AC
* BF    -1
* BA.06828
* BA.09186
* PB
* * PI
* LU   0.1    0.07       2
* UK   200   0.005     0.4     100
* RD  1600  0.0050   0.040            TRAP     2.0      10
*
* Shed CUS2 is part of shed CUS3G, by DNM 3/5/09
* KK  CUS2
* ZW C=FLOW
* KM CUS2 139.8ac
* KM CUS2 147.418 AC
* BF    -1
* BA.21844
* BA.23034
* PB
* * PI
```

```
* LU   0.1    0.07       2
* UK   200   0.005     0.4     100
* RD  1800  0.0050   0.040            TRAP     2.0      10     YES
*
* Changed to 281.3 from 58.88 to include sheds CUS1 & CUS2
* Changed by DNM 3/5/09
KK CUS3G
ZW C=FLOW
KM AREA EAST OF FIDDYMENT ROAD
KM AREA= 281.3 AC
BF    -1
BA.43953
PB
* PI
LU   0.1    0.07       2     0.1    0.12      41
UK   150    0.01     0.4       1
UK   200   0.005    0.24      99
RD  3000    .001   0.015            CIRC       3
RD  2300   .0005   0.015            CIRC       5
*
* KKCCUS3G
* ZW C=FLOW
* KM COMBINE ALL FLOW FROM SHEDS EAST OF FIDDYMENT ROAD
* HC     2
*
* ******** MAY 17,06 PULS ROUTING PER RAS ***********
KK CUS2R
ZW C=FLOW
KM STORAGE ROUTING PER RAS
RS     6    FLOW      -1
SV     0    4.57    8.15   17.05   24.42   30.95   37.10   40.86
SQ     0      50     100     250     400     550     700     800
*
KK  CUS3                                        21
ZW C=FLOW
* KO     3
* KM CUS3  310.4ac
KM CUS3 AREA (300.3AC-58.9=241.4) REVISED PER NEW TOPO ON JUNE 17,05
BF    -1
* BA.48500
BA.37719
PB
* PI
LU  0.10  0.0713       2    0.10  0.1200      90
UK   200  0.0050   0.400   96.78
UK   150  0.0100   0.240    3.22
RD  2500  0.0050   0.040            TRAP     2.0      10
* RD  3300  0.0050   0.040              TRAP     2.0      10     YES
RD  3300  0.0050   0.040            TRAP     2.0      10
*
KK CUS3C
ZW C=FLOW
KM COMBINE FLOW
HC     2
* ******** MAY 17,06 PULS ROUTING PER RAS
*
KK CUS3R
ZW C=FLOW
KM ROUTE FLOW THROUGH SHED CUS4
RS     3    FLOW      -1
SV     0    2.12    3.63   10.37   18.04   20.35   22.37   23.70
SQ     0      50     100     250     400     550     700     800
*
KK  CUS4
ZW C=FLOW
* KM CUS4 76.5ac
KM CSU4 AREA (39.1 AC) REVISED PER NEW TOPO ON JUNE 17,05
BF    -1
* BA.11953
BA.06109
PB
* PI
LU  0.10  0.0717       2
UK   200  0.0050   0.400     100
RD   400  0.0050   0.040            TRAP     2.0      10
* RD  1000  0.0050   0.040              TRAP     2.0      10     YES
RD  1000  0.0050   0.040            TRAP     2.0      10
*
KK CUS5A
ZW C=FLOW
* KM CUS5A 31.6ac
KM CUS5A 33.924 AC MAY 18,06
BF    -1
```

```
* BA.04938
BA.05301
PB
* PI
LU  0.10  0.0700       2    0.10  0.1200      90
UK   200  0.0050   0.400   96.83
UK    50  0.0100   0.240    3.17
RD   300  0.0050   0.040            TRAP     2.0      10
RD  1000  0.0050   0.040            TRAP     2.0      10
*
KK  CUS5
ZW C=FLOW
* KM CUS5 36.2ac
KM CUS5 AREA (34.9AC) REVISED PER NEW TOPO ON JUNE 17,05
BF    -1
* BA.05656
BA.05453
PB
* PI
LU  0.10  0.0737       2    0.10  0.1200      90
UK   200  0.0050   0.400   90.33
UK   150  0.0100   0.240    9.67
RD  2400  0.0050   0.040            TRAP     2.0      10
RD   500  0.0050   0.040            TRAP     2.0      10     YES
*
KKCCUS5C
KM COMBINE FLOW FROM CUS4, CUS5A & CUS5
ZW C=FLOW
HC     2
*
KK CUS5C
ZW C=FLOW
HC     2
*
KK CUS5B
ZW C=FLOW
KM CUS5B 92.5ac
* KM CUS5B 93.889 AC
BF    -1
BA.14453
* BA.14670
PB
* PI
LU  0.10  0.0700       2    0.10  0.1172    60.6
UK   200  0.0050   0.400   12.43
UK    50  0.0100   0.240   87.57
RD  1800  0.0050   0.040            TRAP     2.0      10
RD  1000  0.0050   0.040            TRAP     2.0      10
*
KKCUS5BC
ZW C=FLOW
KM COMBINE FLOW
* HC     3
HC     2
*
*
* ********* MAY 17,06 PULS ROUTING PER RAS
KK SUS5R
ZW C=FLOW
KM ROUTE FLOW TO BASELINE ROAD
RS     5    FLOW      -1
SV     0    2.21    5.37   27.75   41.15   42.72   43.82   44.50
SQ     0      50     100     250     400     550     700     800
*
KK  CUS6
ZW C=FLOW
KM CUS6 118.6ac
KM CUS6 AREA (107.8 AC) REVISED PER NEW TOPO ON JUNE 17,05
BF    -1
* BA.18531
BA.16844
PB
* PI
LU  0.10  0.0738       2    0.10  0.1200      90
UK   200  0.0050   0.400   96.63
UK   150  0.0100   0.240    3.37
RD  2400  0.0050   0.040            TRAP     2.0      10
* RD  1800  0.0050   0.040            TRAP     2.0      10     YES
RD  1800  0.0050   0.040            TRAP     2.0      10
*
KK CUS6C
ZW C=FLOW
KM COMBINE FLOW UP/S OF BASELINE ROAD
```

```
HC     2
*
* ********* MAY 17,06 ROUTING REVISED
* INSERT EXISTING PULS ROUTING UPSTREAM OF ROADWAY HERE!!!
* KK CUS6D
* ZW C=FLOW
* KM PULS ROUTING UPSTREAM OF CULVERT
* KO     1       2
* RS     1    FLOW      -1
* SV     0    3.68    55.7    57.9    59.4    60.5    61.6    62.7    63.9
* SQ     0     200     339     441     590     713     839     964    1180
*
*
* ********* MAY 17, 06 PULS ROUTING PER RAS
*
KKCUS5BR
ZW C=FLOW
KM ROUTE FLOW DN/S OF BASELINE ROAD THROUGH PLACER VINEYARDS
RS     8    FLOW      -1
SV     0     6.0   10.54   21.68   30.28   37.68   44.58   48.92
SQ     0      50     100     250     400     550     700     800
*
KKCUS11B
ZW C=FLOW
KM CUS11B  86.6ac
BF    -1
BA.13531
PB
* PI
LU  0.10  0.0748       2    0.10  0.1200   49.84
UK   200  0.0050   0.400   23.78
UK    50  0.0100   0.240   76.22
RD   500  0.0050   0.040            TRAP     2.0      10
* RD   150  0.0050   0.040              TRAP     2.0      10     YES
RD   150  0.0050   0.040            TRAP     2.0      10
*
KKCUS12A
ZW C=FLOW
* KMCUS12A 165.2ac
KM CUS12A AREA (158.00 AC) REVISED PER NEW TOPO ON JUNE 17,05
BF    -1
* BA.25813
BA.24688
PB
* PI
LU  0.10  0.0710       2    0.10  0.1200      90
UK   200  0.0050   0.400      98
UK   150  0.0100   0.240       2
RD  3200  0.0050   0.040            TRAP     2.0      10
RD   900  0.0050   0.040            TRAP     2.0      10
*
KKCS12AC
KM COMBINE FLOW FROM CUS11B & CUS12A
ZW C=FLOW
HC     2
*
KKS12ACC
ZW C=FLOW
HC     2
*
* ********* MAY 17, 06 PULS ROUTING PER RAS
*
KKS12ACR
ZW C=FLOW
KM ROUTE FLOW TO BASELINE ROAD CULVERT
RS     3    FLOW      -1
SV     0    1.82    4.14   10.69   18.67   33.44   46.30   48.62
SQ     0      50     100     250     400     550     700     800
*
* ********* MAY 17, 06 ROUTING REVISED PER ABOVE
*
* INSERT UPSTREAM DETENTION BASIN
* KKCUS12D
* ZW C=FLOW
* KM PULS ROUTING UPSTREAM OF CULVERT
* KO     1       2
* RS     1    FLOW      -1
* SV     0    20.6    23.5    26.1    30.2    34.1    37.5    58.5    67.7    80
* SQ     0     202     230     252     282     305     326     461     800    12
*
KKCUS13A
ZW C=FLOW
* KM CUS13A 8.6ac
```

```
KM CUS13A AREA (12.3 AC) REVISED PER NEW TOPO ON JUNE 17,05
BF    -1
* BA.01344
BA.01922
PB
* PI
LU  0.10  0.0700       2    0.10  0.1200      90
UK   200  0.0050   0.400      95
UK   150  0.0100   0.240       5
RD   800  0.0050   0.040            TRAP     2.0      10
RD   800  0.0050   0.040            TRAP     2.0      10
*
* ********** MAY 17,06 MOVE KKS13ACC AFTER CUS14
* ZW C=FLOW
* KKS13ACC
* ZW C=FLOW
* HC     2
* D/S end  CU1
*
KK CUS14
ZW C=FLOW
KMCUS14
BF    -1
BA.09641
PB
* PI
LU  0.10  0.0760       2    0.10  0.1179   48.98
UK   200  0.0050   0.400   17.02
UK    50  0.0100   0.240   82.98
RD   800  0.0050   0.040            TRAP     2.0      10
* RD   900  0.0050   0.040              TRAP     2.0      10     YES
RD   900  0.0050   0.040            TRAP     2.0      10
*
KKCS13AC
KM COMBINE FLOW FROM CUS13A & CUS14
ZW C=FLOW
HC     2
*
KKS13ACC
ZW C=FLOW
HC     2
*
* ********* MAY 17, 06 PULS ROUTING PER RAS
KKS13ACR
ZW C=FLOW
KM ROUTE FLOW FROM BASELINE RD TO WATT AVE
RS     2    FLOW      -1
SV     0    0.67    1.23    3.06    5.58    9.27   11.38   12.38
SQ     0      50     100     250     400     550     700     800
*
* ********* MAY 17, 06 ROUTING REVISED PER ABOVE
*
* INSERT DOWNSTREAM DETENTION BASIN!!!
* KKCUS16D
* ZW C=FLOW
* KM PULS ROUTING UPSTREAM OF CULVERT
* KO     1       2
* RS     1    FLOW      -1
* From Channel
* SV     0    18.6    25.5    26.0    26.8    27.4    28.0    29.6    33.3
* Modified for Detention Basin ?????
* SV     0      17    24.6    28.5    31.5    35.0    38.0    41.0    44.0    50
* SQ     0     180     236     264     288     322     345     368     496     9
*
KKCUS16B
ZW C=FLOW
KMCUS16B
BF    -1
BA.02156
PB
* PI
LU  0.10  0.0720       2    0.10  0.1158   80.47
UK   200  0.0050   0.400    2.00
UK    50  0.0100   0.240   98.00
RD   900  0.0050   0.040            TRAP     2.0      10
RD   900  0.0050   0.040            TRAP     2.0      10
*
KKS16BCC
ZW C=FLOW
HC     2
*
* ********** APRIL 28, 06 WATT AVE EXTENSION *********
* ******** CUS15 IS DIVIDED INTO CUS15 & CUS15B *********
```

```
* KK CUS15
* ZW C=FLOW
* KM CUS15 AREA (124.2 AC) REVISED PER NEW TOPO ON JUNE 17,05
* BF    -1
* BA.14891
* BA.19406
* PB
* * PI
* LU  0.10  0.0720       2    0.10    0.03     90
* UK   200  0.0050   0.400   98.00
* UK    50  0.0200   0.110    2.00
* RD  2400  0.0050   0.040            TRAP     2.0      10
* RD  1500  0.0050   0.040            TRAP     2.0      10     YES
*
KK CUS15
ZW C=FLOW
KM CUS15 AREA =73.135 PER WATT AVE
BF    -1
BA.11427
PB
* PI
LU   0.1    .072       2
UK   300    0.01    0.40     100
RD  2700    .008    0.04            TRAP       2      10
*
KKCCUS15
ZW C=FLOW
KM COMBINE FLOW AT WATT AVE EXTENTION
HC     2
*
* KKRCUS15
* ZW C=FLOW
* KM ROUTE FLOW FROM WATT AVE TO DN/S
* RD
* RC 0.055   0.055   0.055    2600   0.002
* RX   128     172     183     206     210     229     390     429
* RY    86      85      84      80      80      84      85      86
* ********** MAY 17, 06 PULS ROUTING PER RAS
*
KKRCUS15
ZW C=FLOW
KM ROUTE FLOW DN/S
RS     4    FLOW      -1
SV     0    2.17    3.69    9.34   14.20   18.27   21.98   24.30
SQ     0      50     100     250     400     550     700     800
*
KKCUS15B
ZW C=FLOW
KM CUS15B AREA=51.05 AC PER WATT AVE
BF    -1
BA.07977
PB
* PI
LU   0.1   0.072       2
UK   250  0.0167     0.4     100
RD  1600   .0075    .040            TRAP       2      10
*
KK ADD91
ZW C=FLOW
KM COMBINE FLOW
HC     2
*
* ******** MAY 17, 06 PULS ROUTING PER RAS
KKADD91R
ZW C=FLOW
KM ROUTE FLOW TO CONFLUENCE WITH CURRY CK TRIB
RS     2    FLOW      -1
SV     0    1.70    2.89    7.91   11.87   15.02   17.82   19.55
SQ     0      50     100     250     400     550     700     800
*
KKCUS17A
ZW C=FLOW
KMCUS17A
BF    -1
BA.06000
PB
* PI
LU  0.10  0.0700       2    0.10  0.1166   80.38
UK   200  0.0050   0.400       2
UK    50  0.0100   0.240      98
RD   500  0.0050   0.040            TRAP     2.0      10
RD   500  0.0050   0.040            TRAP     2.0      10
*
```

```
* ******** MAY 17,06 MOVE S17ACC AFTER CUS17C
*
KKCUS17B
ZW C=FLOW
KMCUS17B AREA (43.8 AC) REVISED PER NEW TOPO ON JUNE 17,05
BF    -1
* BA.10313
BA.06844
PB
* PI
LU  0.10  0.0741       2    0.10  0.1200      90
UK   200  0.0050   0.400   97.00
UK   150  0.0100   0.240    3.00
RD  1300  0.0050   0.040            TRAP     2.0      10
RD  2400  0.0050   0.040            TRAP     2.0      10     YES
*
* KKS17ACC
* ZW C=FLOW
* HC     2
*
KKADD_92
ZW C=FLOW
HC     2
*
KKCUS17C
ZW C=FLOW
KMCUS17C AREA (76.4 AC) REVISED PER NEW TOPO ON JUNE 17,05
BF    -1
* BA.15625
BA.11938
PB
* PI
LU  0.10  0.0761       2    0.10  0.1200      90
UK   200  0.0050   0.400   99.00
UK    50  0.0100   0.240    1.00
RD  1300  0.0050   0.040            TRAP     2.0      10
* RD  2400  0.0050   0.040              TRAP     2.0      10     YES
RD  2400  0.0050   0.040            TRAP     2.0      10
*
KKS17ACC
ZW C=FLOW
HC     2
*
KK S17BR
ZW C=FLOW
RD  2400  0.0050   0.040            TRAP     2.0      10
*
* END OF PLACER VINEYARDS SHEDS FOR CURRY CREEK * SHEDS FROM CUS-MIT.DAT
*  ************************************************************************
*  The following data is from the Wood-Rodgers Westpark model WPDET1.DAT
* ID CROSS CANAL WATERSHED MODEL
* ID Existing (1989) Conditions
* ID Original by CH2M Hill 1991
* ID Modified by Placer County Flood Control District 1992
* ID    - modified-puls routing changed to muskingum-cunge
* ID    - storm centering PI and PB added
* ID 5-03 MODELS REVISED PER WESTPARK LANDUSE BY WOOD-RODGERS
* ID
* ID Landuse: Offsite-Existing; Westpark - Developed w/detention
* ID File Name: Wpdet1.dat
* ID
*  *DIAGRAM
* IT     5                    300
* IO     0
* CU1 removed & replaced by Placer Vineyards sheds CUS1 thru CUS14 * GSU 8-2003
* KK   CU1 CURRY CREEK
* ZW C=FLOW
* BA  1.75
* PB
* * pi
* BF    -1
* LU    .1     .06       2
* UK   600    .015      .4     100
* RD   800     .03     .05     .10    TRAP       1      10
* RD  1500     .01     .05      .2    TRAP       5      10
* RD  7500    .005     .05            TRAP       5      10
*
* LH  0.05       0     1.5     1.4     0.1
* US3.0916     0.6
*
*  ROUTE S17BR TO CU2A+
* KK  RCH1 ROUTE FROM CU1 TO CU2A+
* ZW C=FLOW
```

```
* RS     1    FLOW      -1
* RD
* RC 0.055   0.055   0.055   14200  0.0014    1000
* RX     0       0     400     413     427     440     840     840
* RY  1020    1000     990   983.5   983.5     990    1000    1020
*
* Changed to 49.9 from 45.2 by DNM 3/5/09
* KK  CWP7   (45.2 ac)
KK  CWP7   (49.9 ac)
ZW C=FLOW
KM Curry Creek Basin CU2A   (5-03)
BA.07797
PB
* pi
BF    -1
LU    .1    0.06      41    0.10    0.06       2
UK   150   0.020     .11      99
UK   300   0.020   0.350       1
RD   600  0.0020   0.024     .02    TRAP     1.0       0
RD  1800  0.0070   0.024            TRAP     4.0       1
*
*    Possible Westpark Detention Basin Location
*
KK   DB3
ZW C=FLOW
KM Det Basin C (1.6 acre surface area;1-18";1-24" outfalls)
* KO     1       2
RS     1    FLOW      -1
SV     0     1.5     3.1     4.6     6.3     7.9
SE   109     110     111     112     113     114
SQ     0       2      12      23      40      90
*  remover RCH2 routing 8/11/03 gsu
*  KK  RCH2 ROUTE FROM WPA7 TO CU2A+
* ZW C=FLOW
*  * RS     1    FLOW      -1
*  RD
*  RC 0.055   0.055   0.055   14000  0.0014    1000
*  RX     0       0     400     413     427     440     840     840
*  RY  1020    1000     990   983.5   983.5     990    1000    1020
*
* ***ON June 17,05 Shed CU2A is subdivided for SW Roseville Specific Plan *****
* ****************** CU2A is subdivided into 8 Sheds ***************
*
* ***************** AUGUST 2, 05 ******************
* ************* SHED CU2A1 IS SUBDIVIDED INTO CU2A1A, CU2A1B & CU2A1C *****
* KK CU2A1  (139.7 AC)
* ZW C=FLOW
KKCU2A1A
ZW C=FLOW
* KM Shed CU2A1 is the eastern portion of Shed CU2A
KM SHED AREA=42.4 AC
BF    -1
* BA.21828
BA.06625
PB
* Pi
LU  0.10     .07       2
* UK   300    0.01     0.4     100
UK   280   0.010     0.4     100
RD   350   0.014    0.05            TRAP       5      10
* RD  4200  0.0054    0.05              TRAP      10      10
RD  1350  0.0096   0.055            TRAP      10      10
*
KK  RR_1
ZW C=FLOW
KM ROUTE FLOW THROUGH SHED CU2A1B
RD  1300   .0046   0.055            TRAP      10      10
* RC 0.055   0.055   0.055    1300  0.0046
* RX     0     160     290     400     600     650     750     880
* RY   110     107     104     101     101     104     108     110
*
KKCU2A1B
ZW C=FLOW
KM SHED AREA=51.6
BF    -1
BA.08063
PB
* PI
LU  0.10    0.07       2
UK   250   0.010     0.4     100
RD   350   0.011    0.05            TRAP       5      10
RD  1560  0.0071   0.055            TRAP      10      10
*
```

```
KK ADD_1
ZW C=FLOW
KM COMBINE FLOW FROM CU2A1A & CU2A1B
HC     2
*
KK  RR_2
ZW C=FLOW
KM ROUTE FLOW THROUGH SHED CU2A1C
RD  1150   .0017   0.055            TRAP      10      10
* RC 0.055   0.055   0.055    1150  0.0017
* RX     0     160     290     400     600     650     750     880
* RY   110     107     104     101     101     104     108     110
*
KKCU2A1C
ZW C=FLOW
KM SHED AREA=46.0 AC
BF    -1
BA.07188
PB
* PI
LU  0.10    0.07       2
UK   300   0.010     0.4     100
RD   650   0.011    0.05            TRAP       5      10
RD  2000   0.006   0.055            TRAP      10      10
*
* Changed 03/05/09 sicne label used already
KKCC2A1C
ZW C=FLOW
KM COMBINE FLOW WITH FROM(CU2A1A+CU2A1B)+CU2A1C WITH FLOW FROM C-WPY
* HC     2
HC     3
*
*
KKCU2A1R
ZW C=FLOW
KM ROUTE FLOW THROUGH SHED CU2A9
KM X-SECTION BASED ON NEW TOPO
RD
RC 0.055   0.055   0.055    1920  0.0047
RX     0     160     290     400     600     650     750     880
RY   110     107     104     101     101     104     108     110
*
* Changed to 63.5 from 64.9 by DNM 3/5/09
* KK  CWP8  (64.9 ac)
KK  CWP8  (63.5AC)
ZW C=FLOW
KM Basin CU2A     (5-03)
BF    -1
BA.09922
PB
* pi
BF    -1
LU    .1    0.07      40      .1    0.06       2
UK   150  0.0200    0.11      99
UK   300  0.0200   0.350       1
RD   610  0.0070   0.024     .02    TRAP     1.0       0
RD  2800  0.0020   0.024            TRAP     4.0       1
*
*    Proposed Westpark Detention Basin Location
*
KK   DB4
ZW C=FLOW
KM  Det Basin B for WP8 (1.6 acre surface area;1-18";1-24" outfalls)
* KO     1       2
RS     1    FLOW      -1
SV     0     1.5     3.1     4.6     6.3     7.9
SE   103     104     105     106     107     108
SQ     0       2      12      23      40      90
*
*  insert combine segment for DB3 & DB4 prior to routing thru CU2A+
* KK CDB34
ZW C=FLOW
* HC     2
*
KK CWP8R
ZW C=FLOW
KM ROUTE FLOW THROUGH SHED CU2A8
RD
RC 0.055   0.055   0.055     900  0.0091
RX     0      75     155     240     360     500     620     800
RY   106     104     102     100     100     102     104     106
*
KK CU2A9   (81.1 AC)
```

```
ZW C=FLOW
KM PORTION OF SHED CU2A
BF    -1
BA.12672
PB
* Pi
LU   0.1    0.07       2
UK   200   0.010     0.4     100
RD  1200    0.01    0.05            TRAP       5      10
RD  1050   0.003   0.055            TRAP      10      10
*
KKCU2A9C
ZW C=FLOW
KM COMBINE FLOW FROM C-WP8 & CU2A2 WITH FLOW FROM (CU2A1+C-WP7)
HC     2
*
KK CU2A8   (39.6 AC)
ZW C=FLOW
KM PORTION OF SHED CU2A
BF    -1
BA.06188
PB
* Pi
LU   0.1    0.07       2
UK   200   0.010     0.4     100
RD  1100    0.01    0.05            TRAP       5      10
RD   400   0.009   0.055            TRAP      10      10
*
KKCU2A2C
ZW C=FLOW
KM COMBINE FLOW FROM C-WP8 & CU2A2 WITH FLOW FROM (CU2A1+C-WP7)
HC     3
*
KKCU2A2R
ZW C=FLOW
KM ROUTE FLOW THROUGH SHED CU2A3
* KK  RCH3 ROUTE FROM A8 TO CU2A+
* ZW C=FLOW
* RS     1    FLOW      -1
RD
* RC 0.055   0.055   0.055   14000  0.0014    1000
* RX     0       0     400     413     427     440     840     840
* RY  1020    1000     990   983.5   983.5     990    1000    1020
* ***** ROUTE FLOW THROUGH SHED CU2A3  ************
* ************* X-SECTION BASED ON NEW TOPO *********
RC 0.055   0.055   0.055    2950  0.0017
RX     0     200     330     360     520     560     680     950
RY   105      98      93      91      91      93      97     105
*
KK CU2A3  (156.4 AC)
ZW C=FLOW
KM PORTION OF SHED CU2A
BF    -1
BA.24438
PB
* Pi
LU   0.1    0.07       2
UK   300    0.01     0.4     100
RD  1700   0.013    0.05            TRAP       5      10
RD   800  0.0030   0.055            TRAP      10      10
*
KKCU2A3C
ZW C=FLOW
KM COMBINE FLOW
HC     2
*
* ********** MAY 18, 06 PULS ROUTING PER RAS
KKCU2A3R
ZW C=FLOW
KM ROUTE FLOW THROUGH SHED CU2A7
RS     3    FLOW      -1
SV     0    1.33    2.67    5.06    7.13    8.83   10.41   11.86
SQ     0      50     100     200     300     400     500     600
*
* KKCU2A3R
* ZW C=FLOW
* KM ROUTE FLOW THROUHG SHED CU2A4
* RD
* RC 0.055   0.055   0.055    1100  0.0045
* RX     0     290     360     460     620     690     780     890
* RY    92      90      88      85      85      88      90      92
*
KK CU2A7 (106.5 AC)
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```
ZW C=FLOW
KM PORTION OF SHED CU2A
BF    -1
BA.16641
PB
* Pi
LU   0.1    0.07       2
UK   200    0.02     0.4     100
RD   700    0.01    0.05            TRAP       5      10
RD  1800  0.0072    0.05            TRAP      10      10
*
KKCU2A7C
ZW C=FLOW
KM COMBINE FLOW
HC     2
*
* ********** MAY 18, 06 PULS ROUTING PER RAS
KKCU2A7R
ZW C=FLOW
KM ROUTE FLOW THROUGH SHED CU2A4 TO WATT AVE
RS     3    FLOW      -1
SV     0    0.92    1.65    3.03    5.54    6.83    8.35    9.90
SQ     0      50     100     200     300     400     500     600
*
* KKCU2A7R
* ZW C=FLOW
* KM ROUTE FLOW THROUGH SHED CU2A4
* RD
* RC 0.055   0.055   0.055    1700   0.003
* RX     0     290     360     460     620     690     780     890
* RY    92      90      88      86      86      88      90      92
*
* ************ APRIL 28,06 WATT AVE EXTENSION *********
* CU2A4 DIVIDED INTO 3, CU2A4, CU2A4B & CU2A4C ******
* KK CU2A4  (81.40 AC)
* ZW C=FLOW
KK CU2A4
ZW C=FLOW
KM AREA=47.861 AC PER WATT AVE
* KM PORTION OF SHED CU2A
BF    -1
* BA.12719
BA.07478
PB
* Pi
LU   0.1    0.07       2
UK   600   0.004     0.4     100
RD  1000  0.0096   0.050            TRAP       5      10
RD   700  0.0030   0.055            TRAP      10      10
*
KKCCU2A4
ZW C=FLOW
KM COMBINE FLOW AT WATT AVE
HC     2
*
* KKCU2A4C
* ZW C=FLOW
* KM AREA=7.464 AC PER WATT AVE
* BF    -1
* BA.01166
* PB
* * PI
* LU   0.1    0.07       2
* UK   200   0.025     0.4     100
* RD   850   0.015   0.040            TRAP       2      10
*
* KKCC2A4C
* ZW C=FLOW
* HC     2
*
* ********** MAY 18, 06 PULS ROUTING PER RAS
KKROUTE1
ZW C=FLOW
KM ROUTE FLOW DN/S OF WATT AVE
RS     2    FLOW      -1
SV     0    0.94    1.87    4.07    5.36    6.69    7.89    9.03
SQ     0      50     100     200     300     400     500     600
*
* KKROUTE1
* ZW C=FLOW
* KM ROUTE FLOW FROM WATT AVE TO CURRY CK TRIB
* RD   600    .008    0.05            TRAP       5       5
*
```

```
KKCU2A4C
ZW C=FLOW
KM AREA=7.464 AC PER WATT AVE
BF    -1
BA.01166
PB
* PI
LU   0.1    0.07       2
UK   200   0.025     0.4     100
RD   850   0.015   0.040            TRAP       2      10
*
KK  RTE1
ZW C=FLOW
KM ROUTE FLOW FROM CU2A4C THRO CU2A4B
RD   800    .008    0.05            TRAP       5       5
*
KKCU2A4B
ZW C=FLOW
KM AREA 26.094 AC WEST OF WATT AVE EXTENSION
BF    -1
BA.04077
LU   0.1    0.07       2
UK   200   0.015     0.4     100
RD   900   0.011   0.040            TRAP       2      10
*
KKCC2A4B
ZW C=FLOW
HC     2
*
KKADD_50
ZW C=FLOW
HC     2
*
* ******* APRIL 28, 06 WATT AVE EXTENSION *****
* ****** CU2A5 IS DIVIDED INTO 2, CU2A5 AND CU2A5B
* KK  CU2A5  (140.4 AC)
* ZW C=FLOW
* KM PORTION OF SHED CU2A
KK CU2A5
ZW C=FLOW
KM AREA = 131.754 AC PER WATT AVE
BF    -1
*  BA.21938
BA.20587
PB
* Pi
LU   0.1    0.07       2
UK   600  0.0067     0.4     100
RD  1000   0.008   0.050            TRAP       5      10
RD  1550  0.0026   0.055            TRAP      10      10
*
KKCU2A5B
ZW C=FLOW
KM AREA = 8.664 AC PER WATT AVE
BF    -1
BA.01354
PB
* PI
LU   0.1    0.07       2
UK   200   0.025     0.4     100
RD   700   0.008   0.040            TRAP       2      10
*
KKCCU2A5
ZW C=FLOW
KM COMBINE FLOW
HC     2
*
KKCC2A5C
ZW C=FLOW
KM COMBINE FLOW
HC     2
*
* ************ MAY 17, 06 PULS ROUTING PER RAS
KKCU2A5R
ZW C=FLOW
KM ROUTE FLOW TO CONFLUENCE WITH CURRY CK MAIN CHANNEL
RS     3    FLOW      -1
SV     0    1.50    2.54    5.31    7.70    9.75   11.62   13.34
SQ     0      50     100     200     300     400     500     600
*
* KKCU2A5R
* ZW C=FLOW
* KM ROUTE FLOW TO CURRY CK CONFLUENCE
```

```
* RD  2100   0.003   0.055            TRAP      10      10
*
* ********* APRIL 28,06 WATT AVE EXTENSION ********
* ******** CU2A6 IS DIVIDED INTO 2, CU2A6 AND CU2A6B
KKCU2A6B
ZW C=FLOW
KM AREA 3.383 AC PER WATT AVE
BF    -1
BA.00529
PB
* PI
LU   0.1    0.07       2
UK   100    0.02     0.4     100
RD   300   0.025    0.05            TRAP       2      10
*
KKROUTE2
ZW C=FLOW
KM ROUTE FLOW THROUGH SHED CU2A6
RD  2200    .009   0.035            TRAP       5      10
*
* KK CU2A6  (58.8 AC)
* ZW C=FLOW
KK CU2A6
ZW C=FLOW
KM AREA =55.457 AC PER WATT AVE
* KM PORTION OF CU2A
BF    -1
* BA.09188
BA.08665
PB
* Pi
LU   0.1    0.07       2
UK   300   0.027     0.4     100
RD   600   0.013    0.05            TRAP       5      10
RD  1600  0.0063   0.055            TRAP      10      10
*
* KKCU2A6C
* ZW C=FLOW
* KM COMBINE ALL FLOWS BEFORE ADDING TO CURRY CK
* HC     2
* HC     3
*
* ************ APRIL 28, 06 WATT AVE EXTENSION ***********
* ****** THE UPPER PORTION OF CU2A IS CUT BT WATT AVE ****
* ** 2 SHEDS CU2A1 AND CU2A2 ARE UP/S OF WATT AVE **********
KK CU2A1
ZW C=FLOW
KM AREA = 9.6 AC UP/S OF WATT
BF    -1
BA .0150
PB
* PI
LU   0.1    0.07       2
UK   200    0.01     0.4     100
RD   900    0.01   0.040            TRAP       2      10
*
KKCU2A5C
ZW C=FLOW
KM AREA = 58.6 AC
BF    -1
BA.09156
PB
* PI
LU   0.1    0.07       2
UK   200    0.01     0.4     100
RD  1400    0.01   0.045            TRAP       2      10
*
KKCU2A6C
ZW C=FLOW
KM COMBINE  FLOWS from cu2a6b, cu2a6, cu2a1 & cu2a5c
* HC     2
HC     4
*
KKadd100
ZW C=FLOW
KM COMBINE ALL FLOWS BEFORE ADDING TO CURRY CK
HC     2
*
KK COMB1
ZW C=FLOW
KM COMBINE FLOWS WITH CURRY CREEK
HC     2
*
```

```
KK CU2A2
ZW C=FLOW
KM AREA = 24.1 AC UP/S OF WATT
BF    -1
BA.03766
PB
* PI
LU   0.1    0.07       2
UK   200    0.01     0.4     100
RD   800    0.01   0.045            TRAP       2      10
*
KKCU2A3A
ZW C=FLOW
KM AREA = 38.2 AC WEST OF WATT
BF    -1
BA.05969
PB
* PI
LU   0.1    0.07       2
UK   200    0.01     0.4     100
RD  1200    0.01   0.045            TRAP       2      10
*
KKU2A3AC
ZW C=FLOW
KM COMBINE FLOW FROM CU2A2 & CU2A3A AT WEST PROPERTY LINE
HC     2
*
KKU2A3AR
ZW C=FLOW
KM ROUTE FLOW THROUGH SHED CU2A
RD  2300    .001   0.055            TRAP      10       5
*
* ******************** JUNE 20,05 ************************
* ****** AREA OF CU2A IS SUBDIVIDED INTO 10 SUBSHEDS=804.2 AC *********
* ****** THE NEW AREA OF SHED CU2A IS 1386.5-804.2=582.3 AC ********
KK  CU2A CURRY CREEK
ZW C=FLOW
* KM CH2M Hill Original Basin (2.78 sq.mi.); Reduced for Westpark Prop.
* Reduces the Wood-Rodger Basin (2.64 SM) by 374.2 Ac for Placer Vineyard sheds
* USED THE COMPUTE AREA (2.64-.5847) BASED ON ABOVE DIFF
* 1386.5 Ac
* BA2.1664
*  BA.90984
* AREA REVISED PER WATT AVE, NEW AREA=549.34 AC =0.85835
KM AREA = 485.3 AC  NOV 29, 06
* BA.85835
BA.75828
PB
* pi
BF    -1
LU    .1     .06       2
UK   600    .015      .4     100
RD   800     .01     .05     .10    TRAP       1      10
RD  5500    .005     .05      .2    TRAP       5      10
RD 13500    .002     .05            TRAP       5      10
*
* LH  0.05       0     1.5     1.4     0.2
* US3.0486     0.6
*
KK CCU2A
ZW C=FLOW
KM COMBINED CU2A & RCH3 (2.64 SM + 0.1014 + 0.0706)+ S17BR
* HC     2
HC     3
* HC     4
*
* KK  CWP1    (On-site area 91.2 ac)
ZW C=FLOW
KK  CWP1    (92.6 AC 6-05)
ZW C=FLOW
KM AREA REVISED 6-05
* KM Revised Date (5-03)
* BA .1428
BA.14469
PB
* pi
BF    -1
LU    .1    0.07       2      .1    0.06     100
UK   300   0.008   0.350      51
UK   150   0.010   0.110      49
RD   450  0.0070   0.018     .05    TRAP     0.0       1
RD  2050  0.0020   0.015            TRAP     2.0       2
*
```

```
KK    R3
ZW C=FLOW
KM main channel through to c-5
RD  1700  0.0030   0.035            TRAP     3.5      10
*
* KK  CWP2  (On-site area 127.2 ac)
ZW C=FLOW
* KM Revise Date (5-03)
* BA .1988
KK  CWP2  (126.0 AC)
ZW C=FLOW
KM AREA REVISED 6-05
BA.19688
PB
* pi
BF    -1
LU    .1    0.07     100      .1    0.06       2
UK   150  0.0080   0.110      27
UK   300  0.0100   0.350      73
RD   450  0.0070   0.018     .05    TRAP     0.0       1
RD  2000  0.0020   0.020            TRAP     2.0       2
*
KK    C5
ZW C=FLOW
KM node combines area 1 & area 2
HC     2
*
KK    R4
ZW C=FLOW
KM main channel from C-WP2
RD  1800  0.0020   0.035            TRAP     3.5      10
*
KK  CWP4 (55.8 ac off-site(Fiddyment);232.1 ac)
ZW C=FLOW
KM Revise Date (5-03)
BA .3627
PB
* pi
BF    -1
LU    .1    0.07       2      .1    0.06     100
UK   300  0.0100   0.350      54
UK   200  0.0200    0.11      46
RD   450  0.0070   0.018     .05    TRAP     0.0       1
RD  2600  0.0020   0.020            TRAP     2.0       2
*
KK    R7
ZW C=FLOW
KM Main channel to C-6
RD  1935  0.0021   0.035            TRAP     3.5      10
*
* KK  CWP3 (190.5 ac)
ZW C=FLOW
* KM Revise Date (5-03)
* BA .2977
KK  CWP3  (192.0 AC)
ZW C=FLOW
KM AREA REVISED 6-05
BA 0.300
PB
* pi
BF    -1
LU    .1    0.07       2      .1    0.06     100
UK   300  0.0100   0.350      54
UK   200  0.0100    0.11      46
RD  2000  0.0020   0.020            TRAP     2.0       2
*
KK    C6
ZW C=FLOW
KM combines node C-5 and C-WP4
HC     3
*
*    Revised Storage per Wood-Rodgers(10-01)
*    Proposed Westpark Detention Basin Location
*
* KK  DBC6
ZW C=FLOW
* KM Detention Storage  (step boxes)(1-3x6;2-4x10 Box Culverts)
* KO     1       2
* RS     1    FLOW      -1
* SV     0      .7     3.5    10.3    22.8    42.5    69.7    88.0   106.0
* SE    86      88      89      90      91      92      93    93.5    94.0
* SQ     0      40      90     200     325     475     650     750   850.0
*
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KK  DBC6
ZW C=FLOW
KM Detention Storage  (step boxes)(2-5'x 10';2-4'x 10' Box Culverts)
* KO     1       2
RS     1    FLOW      -1
SV     0      .7     3.5    10.3    22.8    35.0    42.5    69.7    88.0
SE    86      88      89      90      91    91.5      92      93    93.5
SQ     0      40     175     350     600     800     850     950    1000
*
KK    R8
ZW C=FLOW
KM main channel through area five
RD  3700  0.0009   0.035            TRAP     3.5      10
*
KK  CWP6
ZW C=FLOW
KM Revise Date (5-03) (194.5 ac)
BA .3039
PB
* pi
BF    -1
LU    .1    0.09       2      .1    0.06     100
UK   300  0.0100   0.350      72
UK   200  0.0080    0.11      28
RD   450  0.0070   0.018     .05    TRAP     0.0       1
RD  2000  0.0040   0.020            TRAP     2.0       2
*
KK    C8
ZW C=FLOW
KM node combines node c-7 and area 6
HC     2
*
*    Revised Storage per Wood-Rodgers(10-01)
*    Proposed Westpark Detention Basin Location
*
* KK  DBC8
* ZW C=FLOW
* KM Detention Storage  (2-24" w/weir)
* KO     1       2
* RS     1    FLOW      -1
* SV     0     2.1    12.0    21.6    30.2    38.8    52.4    64.0    85.0   104
* SE    80      82      84      85    85.5      86    86.5    86.7    87.5    88
* SQ     0      20      50      60      70     200     650     900     900     9
*
KK  DBC8
ZW C=FLOW
KM Detention Storage  (3-36" w/weir)
* KO     1       2
RS     1    FLOW      -1
SV     0     2.1    12.0    21.6    30.2    38.8    42.5    52.4    64.0
SE    80      82      84      85    85.5      86    86.3    86.5    86.7
SQ     0      30     120     165     200     500     900     950    1050
*
KK   R13
ZW C=FLOW
KM main channel EXIT FROM NODE C-8
RD  2000   0.001   0.035            TRAP     5.0       5
*
* KK  CWP9   (241.9 off-site,assume future det)
* ZW C=FLOW
* KM  Revise Date (5-03)
* BA .3780
KK  CWP9   (218.2 AC)
ZW C=FLOW
KM AREA REVISED 6-05 area rewised to 191.524 ac
* BA.31094
BA.29926
PB
* pi
BF    -1
LU    .1    0.07       2      .1    0.07      50
UK   300  0.0080    0.40      92
UK   400  0.0050   0.240       8
RD  1450  0.0070   0.050      .      TRAP     0.0       1
RD  3600  0.0020   0.050            TRAP     2.0       2
*
KK  R913
ZW C=FLOW
KM Route shed through WP-13
RD  2000  0.0023   0.035            TRAP      10      10
*
*  KK CWP13        (62.0 ac)
* ZW C=FLOW
```

```
* KM Revise Date (5-03)
* BA .0969
KK CWP13   (60.3 AC)
ZW C=FLOW
KM AEEA REVISED 6-05
BA.09422
PB
* pi
BF    -1
LU    .1    0.07       2      .1    0.07     100
UK   300  0.0080   0.350      67
UK   150  0.0080    0.11      33
RD   450  0.0070   0.018     .03    TRAP     0.0       1
RD  2400  0.0020   0.020            TRAP     2.0       2
*
KK    C9
ZW C=FLOW
KM Combines Area WP9 & WP13
HC     2
*
KK   C13
ZW C=FLOW
HC     2
*
* KK CWP14 (47.4 ac)
* ZW C=FLOW
* KM Revise Date (5-03)
* BA .0741
KK CWP14   (97.6AC)
ZW C=FLOW
KM AERA REVISED 6-05
BA.15250
PB
* pi
BF    -1
LU    .1    0.06       2      .1    0.06     100
UK   300  0.0080   0.350      98
UK   150  0.0100   0.110       2
RD  1600  0.0020   0.020            TRAP     2.0       2
*
KKCCWP14
ZW C=FLOW
KM Combines Area WP14, C-8 & C-9
HC     2
*
KK CU2B1  (54.0 AC)
ZW C=FLOW
KM 53.9 ACRES
KM AREA REVISED 6-05
BA.11500
PB
* pi
BF    -1
LU    .1     .06       2
UK   200    .005      .4     100
RD  1900    .008     .05            TRAP       2      10
*
KKCU2B1A  (29.2AC)
ZW C=FLOW
KM 29.2 ACRES
KM AREA REVISED 6-05
BA.04563
PB
* pi
BF    -1
LU    .1     .06       2
UK   200    .005      .4     100
RD  1600    .008     .05            TRAP       2      10
*
KK   C10
ZW C=FLOW
KM COMBINE FLOW AT WATT AVE & PLEASANT GROVE BLVD
HC     3
*
*
* KK  RCH4 ROUTE FROM C-10 TO CU2A+
* ZW C=FLOW
* RS     1    FLOW      -1
* RD
*  REVISED ROUTING LENGTH FROM 8000' TO 6600' 8/12/03 - CS/gsu
* RC 0.055   0.055   0.055    6600  0.0014    1000
*  REVISED CHANNEL SECTION TO MATCH AG DITCH PER TOPO 8/12/03 - CS/gsu
* RX     0       0     400     413     427     440     840     840
```

```
* RY  1020    1000     990   983.5   983.5     990    1000    1020
*  CU2B REPLACED WITH; CU2B1, CU2B2, & CU2B3 (74ac+243.9ac+ 221.1ac=539ac)
*  WESTPARK BASIN CU2B (0.932 sq mi) REVISED TO REFLECT CURRENT AG FIELDS OPER.
* KK  CU2B CURRY CREEK
* ZW C=FLOW
* KM CH2M Hill Original Basin (2.71 sq.mi.); Reduced for Westpark Prop.
* BA  .932
* PB
* * pi
* BF    -1
* LU    .1     .06       2
* UK   600    .015      .4     100
* RD   800     .01     .05     .10    TRAP       1      10
* RD  5500    .005     .05      .2    TRAP       5      10
* RD 13500    .002     .05            TRAP       5      10
*
* * LH  0.05       0     1.5     1.4     0.2
* * US2.9025     0.6
*
* KK CU2B1  (54.0 AC)
* ZW C=FLOW
* KM 73.6 ACRES
* KM AREA REVISED 6-05
* BA .1150
* BA.08438
* PB
* * pi
* BF    -1
* LU    .1     .06       2
* UK   200    .005      .4     100
* RD  1900    .008     .05            TRAP       2      10
*
* KKCU2B1A  (29.2AC)
* ZW C=FLOW
* KM 73.6 ACRES
* KM AREA REVISED 6-05
* BA .1150
* BA.04563
* PB
* * pi
* BF    -1
* LU    .1     .06       2
* UK   200    .005      .4     100
* RD  1600    .008     .05            TRAP       2      10
*
* KKCU2B1C
* ZW C=FLOW
* KM COMBINE FLOW AT WATT AVE & PLEASANT GROVE BLVD
* HC     3
*
* ***********************************************************
*  *************** 9-17-03 ***************
* ****   STORAGE ROUTING BASED ON HEC-RAS DATA  *********
* ****   OVERLAND FLOW = 600FT OR LESS
* ****   %IMPERVIOUS = 2
* ****   CONSTTANT INFILT = 0.01
KK   RR1
ZW C=FLOW
KM ROUTE FLOW FROM C-10, 3500FT DNS TO CP-1
RS     4    FLOW      -1
SV     0     4.6     7.4      10    15.7    20.6    24.5    37.6    45.5
SQ     0     100     216     300     405     500     559     785     900
*
KK CU2B2
ZW C=FLOW
* KM  243.9 ACRES
KM AREA = 214.8 AC NOV 29, 06
* BA .3811
BA.33563
PB
* pi
BF    -1
LU    .1     .06       2
UK   600   .0050      .4     100
RD  2700   .0067     .05     .38    TRAP      10       2
*
* KK CU2B1  (54.0 AC)
* ZW C=FLOW
* KM 73.6 ACRES
* KM AREA REVISED 6-05
* BA .1150
* BA.08438
* PB
```

```
* * pi
* BF    -1
* LU    .1     .07       2
* UK   200    .005      .4     100
* RD  1900    .008     .05            TRAP       1      10
*
KK   CP1
ZW C=FLOW
KM COMBINE CU2B2 WITH FLOW AT CP-1
HC     2
* HC     3
*
KK   RR2
ZW C=FLOW
KM ROUTE FLOW FROM  CP-1 TO CU2A+
RS     4    FLOW      -1
SV     0    16.6    25.9    34.1    51.7    57.3    71.2    91.8    95.4
SQ     0     150     245     320     467     500     634     872     900
*
KK CU2B3
ZW C=FLOW
KM 221.1 ACRES
BA .3455
PB
* pi
BF    -1
LU    .1     .06       2
UK   600   .0050      .4     100
RD  6300   .0012     .05            TRAP       4     1.5
*
KK CU3B+
ZW C=FLOW
KM COMBINE CU3B & RR2
HC     2
*
KK CU2A+ COMBINE HYDROGRAPHS
ZW C=FLOW
* HC     6
HC     2
*
*  REV RCH5 ROUTING TO REFLECT CU2C1, CU2C2 & CU2C3 SUB-SHEDS
* KK  RCH5 ROUTE FROM CU2A TO CU2C+
* ZW C=FLOW
* RS     1    FLOW      -1
* RD
* RC 0.045   0.045   0.045    8800  0.0014    1000
* RX     0       0    1000    1013    1027    1040    2040    2040
* RY  1020    1000     990   983.5   983.5     990    1000    1020
*
*  REPLACE BASIN CU2C WITH CU2C1, CU2C2 & CU2C3 (186.4+146.6+246.6=579.6ac)
* KK  CU2C CURRY CREEK (441.6 ac.)
* ZW C=FLOW
* BA  0.69
* PB
* * pi
* BF    -1
* LU    .1     .06       2
* UK   600    .015      .4     100
* RD   800     .01     .05     .10    TRAP       1      10
* RD  3500    .005     .05      .2    TRAP       5      10
* RD  7500    .002     .05            TRAP       5      10
*
* * LU  0.05       0     1.5     1.4     0.2
* * US 1.676     0.6
*
*  REV SUB-SHEDS CU2C-1,2,&3
KK   RR3
ZW C=FLOW
KM ROUTE FLOW FROM CU2A+ TO CU2C1, 2800 FT
RS     3    FLOW      -1
SV     0     7.7    23.2   32.8    57.4    59.6    66.1    85.9    95.1
SQ     0     250     491    700    1369    1400    1566    2192    2500
*
KK CU2C1
ZW C=FLOW
KM 186.4 ACRE @ COUNTRY ACRE LN
BA .2913
PB
* pi
BF    -1
LU    .1     .06       2
UK   600   .0050      .4     100
RD  3700   .0016      .1     .25    TRAP      10      20
```

```
*
KK   CP2
ZW C=FLOW
KM COMBINE RUNOFF FROM CUUC1 WITH FLOW AT CP-2
HC     2
*
KK   RR4
ZW C=FLOW
KM ROUTE FLOW FROM CP-2 TO CP-3, 2800 FT DNS
RS     4    FLOW      -1
SV     0    20.7      34    44.3      64    70.7    81.8   112.3   125.6
SQ     0     250     500     700    1140    1300    1566    2185    2500
*
KK CU2C2
ZW C=FLOW
KM 146.6 ACRES COUNTRY ACRES LN TO "LANDING STRIP"
BA  .229
PB
* pi
BF    -1
LU    .1     .06       2
UK   100   .0050      .4     100
RD  4200    .009     .05            TRAP      15     2.8
*
KK   CP3
ZW C=FLOW
KM COMBINE RUNOFF FROM CU2C2 WITH FLOW AT CP-3
HC     2
*
KK   RR5
ZW C=FLOW
KM ROUTE FLOW FROM CP-3 TO BREWER ROAD 4200 FT DNS
RS     3    FLOW      -1
SV     0       7    11.1    12.2    15.8    17.2    19.8    27.2    30.1
SQ     0     260     513     720    1167    1350    1601    2230    2500
*
KK CU2C3
ZW C=FLOW
KM 216.6 ACRES "LANDING STRIP" TO BREWER RD
BA.33844
PB
* pi
BF    -1
LU    .1     .06       2
UK   600   .0050      .4     100
RD  1900   .0012      .1      .2    TRAP     300       1
RD   800   .0063     .05     .15    TRAP       2       2
* RD2600   .0040     .05            TRAP      15       2
*
KK CU2C+ COMBINE HYDROGRAPHS
ZW C=FLOW
HC     2
*
* KK  RCH6 ROUTE FROM CU2C+ TO CU4+
* ZW C=FLOW
* RS     1    FLOW      -1
* RD
* RC 0.045   0.045   0.045   12200   0.001    1000
* RX     0       0    1200  1210.5  1230.5    1241    2441    2441
* RY  1020    1000     995     988     988     995    1000    1020
*
KKCWP11A (48.0 ac)
ZW C=FLOW
KM Curry Creek Basin
BA .075
PB
* pi
BF    -1
LU    .1    0.06       2      .1    0.06     100
UK   300   0.010   0.350      60
UK   150   0.020    0.11      40
RD   500  0.0040   0.024     .08    TRAP       1       5
RD   900  0.0020   0.024            TRAP       2      10
*
KK   DB5
ZW C=FLOW
KM Det Basin A for C-WP11A (1.0 acre surface area; 2-18" outfalls)
* KO     1       2
RS     1    FLOW      -1
SV     0      .7     1.8     2.8     3.9     5.1     6.5
SE  87.3      88      89      90      91      92    92.5
SQ     0       2       7      15      24      55      90
*
```

```
KK   R11 ROUTE FROM DB5 thru C-WP11
ZW C=FLOW
RS     1    FLOW      -1
RD
RC 0.045   0.045   0.045    1800  0.0028    1000
RX     0       0    1000    1013    1027    1040    2040    2040
RY  1020    1000     990   983.5   983.5     990    1000    1020
*
KK CWP11  (78.9 ac)
ZW C=FLOW
KM Open Space
BA .123
PB
* pi
BF    -1
LU    .1    0.06       2      .1    0.06     100
UK   300   0.010   0.350      95
UK   200   0.010    0.11       5
RD  1900  0.0036   0.050     .08    TRAP     3.5      10
RD  1300  0.0028   0.050            TRAP     3.5      10
*
KK  CB11 COMBINE HYDROGRAPHS
ZW C=FLOW
HC     2
*
KK R1112
ZW C=FLOW
KM Route shed through WP-12
RD  1200  0.0036   0.035            TRAP      10      10
*
KK CWP12
ZW C=FLOW
* KM (43.4 ac.)
BA0.0678
PB
* pi
BF    -1
LU  0.10    0.06     100    0.10    0.06       2
UK   600  0.0100   0.110       2
UK   600  0.0100   0.400      98
RD  1400  0.0085   0.035            TRAP     3.5      10
*
KK C1112
ZW C=FLOW
KM combines WP11 and WP12 at Future Watt Ave.  170.3 ac=.266 sq mi
HC     2
*
* KK   R23
* ZW C=FLOW
* KM chanelized flow Basin CC3 exit route
* RD   100  0.0020   0.024            TRAP     3.5      10
*   ************************************************************************
*  REPLACED RCH7 ROUTING & CURRY CK SHED CU3 - W/ SHEDS CU3 A THRU J
*  CIVIL SOLUTIONS 8/03 gsu
* KK  RCH7 ROUTE FROM C11-12 TO CU3+
* ZW C=FLOW
* RS     1    FLOW      -1
* RD
* RC 0.045   0.045   0.045   16000  0.0014    1000
* RX     0       0    1000    1013    1027    1040    2040    2040
* RY  1020    1000     990   983.5   983.5     990    1000    1020
*
* KK   CU3 CURRY CREEK
* ZW C=FLOW
* KM CH2M Hill Original Basin (3.79 sq.mi.); Reduced for Westpark Prop.
* BA  3.48
* PB
* * pi
* BF    -1
* LU    .1     .06       2
* UK   600    .015      .4     100
* RD   800     .01     .05     .10    TRAP       1      10
* RD  7500    .005     .05      .2    TRAP       5      10
* RD 15000    .002     .05            TRAP       5      10
*
* * LH  0.05       0     1.5     1.4     0.3
* * US2.6124     0.6
*     ************************************************************************
* BEGIN DeLaSal sheds; Exist'g terraced field grading & Ag ditches
*
* ***** STORAGE ROUTING BASED ON HEC-RAS DATA ********   9-17-03
KK  RCU3B ROUTE FROM C11-12 THRU CU3B
ZW C=FLOW
```

```
* RS   1    FLOW      -1
* RD
* RC.045   0.045   0.045    5300  0.0022      80
* RX 745     753    1463    1467    1471    1485    1490    1500
* RY  78      76      76      77      77      74      74      78
KM ROUTE FLOW FROM C11-12 TO CU3B 5300 FT DNS
RS     6    FLOW      -1
SV     0     2.9    14.3    20.3    27.9    30.8    32.9    41.7    47.9
SQ     0      30      62      90     159     190     214     298     350
*
KK  CU3A
ZW C=FLOW
KM 247.3 acres
BA .3864
PB
* PI
BF    -1
LU    .1     .06       2
UK   600    .005      .4     100
RK  2000     .01     .05     .25    TRAP      10      10
RK  1500    .003     .05            TRAP       5       5
*
KK CU3AC
ZW C=FLOW
HC     2
*
* KK 3B2RR
* ZW C=FLOW
* KM ROUTE FLOW FROM WP to CULVERT 1
* KO     1
* RS     1    FLOW      -1
* * POST PROJECT UNMIT AND MIT PER Exist CHANNEL
* * STATION 70 to 68
* SV     0     0.3     1.1     1.7     2.2     2.8
* SQ     0      56     160     218     397     600
*
KK  CU3B
ZW C=FLOW
KM 307.4 ACRES
BA .4803
PB
* PI
BF    -1
LU    .1     .06       2
UK   600    .001      .4     100
RK  1800   .0013     .05            TRAP     200       1
RK  2600   .0022     .05            TRAP       5       3     YES
*
KK  CU3C
ZW C=FLOW
KM 110.3 acres
BA .1723
PB
* PI
BF    -1
LU    .1     .06       2
UK   600    .001      .4     100
RK  2900   .0076     .05            TRAP      10      10
*
KK CC3B+
ZW C=FLOW
KM COMBINE RCU3B+CU3B&CU3A+CU3C;170.3 + 307.4+247.3 + 110.3 = 835.3=1.3052 sq mi
HC     2
*
KK RC3B+ ROUTE  CC3B+ TO CU3D
ZW C=FLOW
* RS   1    FLOW      -1
* RD
* RC.050   0.050   0.050    3800  0.0006
* RX 365     380     565     570     578     600     820    1056
* RY  69      65      65      61      61      64      64      65
*
KM ROUTE FLOW FROM CC3B+ TO CU3D 3800 FT DNS
RS     4    FLOW      -1
SV     0     8.2    63.3    69.1    78.3    81.6    92.0   110.1   143.6
SQ     0      50      97     150     263     300     345     445     550
KK  CU3D
ZW C=FLOW
KM 465.8 acres   ROUTES & COMBINES 465.8+835.3=1,301.1 ac = 2.033 Sq. Mi.
BA .7278
PB
* PI
BF    -1
```

```
LU    .1     .06       2
UK   600    .001      .4     100
RK  4400   .0006     .05      .4    TRAP       7       3
RK  1500    .006     .06           TRAP     100       2     YES
*
KK RC3D+ ROUTE  CU3D TO CU3E+
ZW C=FLOW
* RS   1    FLOW      -1
* RD
* RC.050   0.050   0.050    3600 0.00086      60
* RX   0     128     160     166     184     192     270     320
* RY  59      59      58      57      57      58      59      59
KM ROUTE FLOW CU3D TO CU3E+ 3600 FT DNS
RS     4    FLOW      -1
SV     0     3.9     7.5    11.0    15.0    16.6    18.4    22.5    24.6
SQ     0      70     140     220     321     375     428     570     650
KK  CU3E
ZW C=FLOW
KM 111.8 acres
BA .1747
PB
* PI
BF    -1
LU    .1     .06       2
UK   600    .001      .4     100
RK  3600  .00086     .05           TRAP      18       8
*
KK CU3E+
ZW C=FLOW
KM COMBINE CU3E & RC3D+ 111.8+1301.1=1412.9 ac = 2.2077 Sq. Mi.
HC     2
*
KK RC3E+
ZW C=FLOW
KM ROUTE FLOW FROM CU3E+ TO CU3F+
RS     2    FLOW      -1
SV     0     2.8     4.6     7.1     9.4    10.2    11.4    14.1    15.0
SQ     0      75     153     200     351     400     466     618     700
KK  CU3F
ZW C=FLOW
KM 641.7ACRES
BA1.0026
PB
* PI
BF    -1
LU    .1     .06       2
UK   600    .001      .4     100
RK  4100   .0062     .05      .5    TRAP      15       3
RK  4400   .0013     .05           TRAP      12       2
*
*  RC3F+ ROUTE  CU3F TO CU3E+
* RS   1    FLOW      -1
* RD
* RC.050   0.050   0.050    1500  0.0006
* RX  43      65      85      93     230     268     446     473
* RY  60      59      58      57      57      58      58      60
*
KK CC3F+
ZW C=FLOW
KM COMBINE RC3F+ & CU3E+ (602.7+ 1412.9=2015.6 ac = 3.149 Sq. Mi.)
HC     2
*
KK RC3F+
ZW C=FLOW
KM ROUTE CC3F+ TO CU3+    2015.6 ac=3.149 Sq. Mi.
* RS   1    FLOW      -1
* RD
* RC.050   0.050   0.050    2700  .00019
* RX 205     305     620     719     772     776     809    1207
* RY  55      53      53      52      52      51      53      54
RS     3    FLOW      -1
SV     0    17.2    30.9    54.4    75.5    81.0    95.1   123.3   131.3
SQ     0      80     164     300     410     470     565     780     850
*
KK  CU3G
ZW C=FLOW
KM 200.0 acres
BA .3125
PB
* PI
BF    -1
LU    .1     .06       2
UK   600    .001      .4     100
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```
RK  4500    .001     .05            TRAP      70      90
*
KK CU3HA
ZW C=FLOW
KM 57.4 acres
BA.08969
PB
* PI
BF    -1
LU    .1     .06       2      .1     .06      50
UK   600   .0050      .4     100
RK  1500    .001     .05            TRAP      10       2
*
KK CU3HB
ZW C=FLOW
KM 106.1 acres
BA .1658
PB
* PI
BF    -1
LU    .1     .06       2
UK   300    .001      .4     100
RK  4000   .0034     .05            TRAP     100      50     YES
*
KK   CU3
ZW C=FLOW
KM COMBINE CU3H & CU3G & RC3F+ (106.1+200.0+2015.6=2321.7=3.627 Sq. Mi.
HC     3
*
KK CU3C+
ZW C=FLOW
KM COMBINE CU3 & CU2C+  (2321.7+
HC     2
KK  RCH8 ROUTE FROM CU3 TO CU4+
ZW C=FLOW
* RS     1    FLOW      -1
* RD
* RC.045   0.045   0.045   12200   0.001    1000
* RX   0       0    1200  1210.5  1230.5    1241    2441    2441
* RY1020    1000     995     988     988     995    1000    1020
* RS    14    FLOW      -1
RS    10    FLOW      -1
SV     0      51   115.5   194.1   281.7   287.9   335.4   390.5   400.2
SQ     0     400     621    1000    1387    1500    1900    2682    3200
* SQ     0     400     621    1000    1387    1500    1900    2682    2800
KK   CU4 CURRY CREEK (2291 ac)
ZW C=FLOW
BA  3.58
PB
* pi
BF    -1
LU    .1     .06       2
UK   600    .015      .4     100
RD   800     .01     .05     .10    TRAP       1      10
RD  8500    .005     .05      .2    TRAP       5      10
RD 12000    .002     .05            TRAP       5      10
*
* LH  0.06       0     1.5     1.4     0.5
* US2.3818     0.6
*
KK   CU5 CURRY CREEK
ZW C=FLOW
BA  0.28
PB
* pi
BF    -1
LU    .1     .06       2
UK   600    .015      .4     100
RD   500     .01     .05     .10    TRAP       1      10
RD  2500    .002     .05            TRAP       5      10
*
* LH  0.06       0     1.5     1.4     0.5
* US0.9782     0.6
*
KK  CU5+ COMBINE HYDROGRAPHS
ZW C=FLOW
HC     3
*
KK  RCH9 ROUTE FROM CU5 TO CU6
ZW C=FLOW
* RS     1    FLOW      -1
RD
RC  0.04    0.04    0.04    6000  0.0016    1000
```

```
RX     0       0    1200    1210    1230    1240    2440    2440
RY  1020    1000     995     990     990     995    1000    1020
*
KK   CU6 CURRY CREEK
ZW C=FLOW
BA  0.87
PB
* pi
BF    -1
LU    .1     .06       2
UK   600    .015      .4     100
RD   500     .01     .05     .10    TRAP       1      10
RD  1500    .005     .05      .2    TRAP       5      10
RD  6000    .002     .05            TRAP       5      10
*
* LH  0.06       0     1.5     1.4     0.5
* US1.2791     0.6
*
KK  CU6+ COMBINE HYDROGRAPHS - END CURRY CREEK
ZW C=FLOW
HC     2
*
ZZ
```

# APPENDIX C
## HEC-1 POST-PROJECT UNMITIGATED INPUT FILE

```
ID PLACER COUNTY WATERSHED MODEL, PLACER COUNTY, CA
ID WATERSHED UPDATE MODELS - DRAFT ULT BUILDOUT
ID DRAFT MODEL FOR HYD ROUTING - HEC1VOLS UTILITY
ID CESI 1401/25/2129
ID
IT     5 01JAN97       0     600
IO     5               0
IN     5       0       0
*DIAGRAM
*
*
KK CUS3G
KM   AREA EAST OF FIDDYMENT ROAD AREA= 281.3 AC
BA.43953
PB
* PI
BF    -1  -0.001    1.50
LU   0.1    0.07       2    0.10  0.1200  41.369
UK   150    0.01     0.4       1
UK   200  0.0050   0.240      99
RD  3000  0.0010   0.015            CIRC     3.0     0.0
RD  2300  0.0005   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK   SS3
KM   AREA=45.2 AC
BA0.0707
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.982    0.10  0.1200  56.659
UK   150  0.0100   0.400       5
UK    96  0.0108   0.240      95
RD   800  0.0010   0.015            CIRC     3.0     0.0
RD  2100  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK  SS3B
KM   AREA= 16.1 AC
BA0.0252
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.089    0.10  0.1200  84.855
UK   300  0.0100   0.400      94
UK    89  0.0122   0.240       6
RD   400  0.0010   0.055            TRAP     2.0    10.0
RD  1200  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KKYCUS3A
KM   COMBINE FLOW AT FIDDYMENT ROAD
HC     3
ZW C=FLOW
*
*
KKUCUS3A
KM   ROUTE FLOW FROM FIDDYMENT ROAD TO UPLAND DIRVE PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CH GRADING
RS     1    FLOW      -1
SV  0.00    2.12    3.42    7.01   11.20   16.54   20.91   25.87
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KK  SS3C
KM   AREA=62.8 AC
BA0.0981
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.997    0.10  0.1200  42.681
UK   150  0.0100   0.400       7
UK   130  0.0100   0.240      93
RD   800  0.0010   0.015            CIRC     3.0     0.0
RD  1700  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK  SS3D
KM   AREA= 66.4 AC
BA0.1037
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.993    0.10  0.1200  65.734
```

```
UK   150  0.0100   0.400       1
UK    85  0.0130   0.240      99
RD   850  0.0010   0.015            CIRC     3.0     0.0
RD  1250  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK  SS3E
KM   AREA= 15.1 AC
BA0.0236
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.084
UK   300  0.0100   0.400  100.00
RD   300  0.0010   0.055            TRAP     2.0    10.0
RD  1400  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KK   SS5
KM   AREA= 20.2 AC
BA0.0316
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.1200  70.000
UK    81  0.0138   0.240  100.00
RD   400  0.0010   0.055            TRAP     2.0    10.0
RD   700  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KKYCUS3B
KM   COMBINE FLOW AT UPLAND DRIVE
HC     5
ZW C=FLOW
*
*
KKUCUS3B
KM   ROUTE FLOW THROUGH SHED CUS3E PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CH GRADING
RS     1    FLOW      -1
SV  0.00    2.09    3.84    7.89   11.29   14.29   17.00   18.70
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KK  SS3F
KM   AREA= 73.7 AC
BA0.1151
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.999    0.10  0.1200  47.061
UK   150  0.0100   0.400       6
UK   115  0.0100   0.240      94
RD   750  0.0010   0.015            CIRC     3.0     0.0
RD  1200  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK CUS5A
KM   CUS5A 33.9 AC
BA0.0530
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000
UK   200  0.0050   0.400  100.00
RD   300  0.0050   0.040            TRAP     2.0    10.0
RD  1000  0.0010   0.040            TRAP     2.0    10.0
ZW C=FLOW
*
KK  SS4A
KM   AREA= 24.4 AC
BA0.0381
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.254
UK   300  0.0100   0.400  100.00
RD   400  0.0010   0.055            TRAP    10.0     5.0
RD  1900  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KK  SS5C
KM   AREA= 18.0  AC
BA0.0281
```

```
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.1200  71.093
UK    79  0.0142   0.240  100.00
RD  1200  0.0010   0.015            CIRC     3.0     0.0
ZW C=FLOW
*
KKYCUS3E
KM   COMBINE FLOWS
HC     5
ZW C=FLOW
*
*
KKUCUS3E
KM   ROUTE FLOW THROUGH SHED CUS4A TO MARKET STREET PUL'S STOTAGE ROUTING - NOV 7- 06 RAS PER CH GRADING
RS     1    FLOW      -1
SV  0.00    2.74    4.88   11.19   16.85   23.12   31.16   40.16
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KK   SS4
KM   AREA= 82.0 AC
BA0.1281
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   5.000    0.10  0.1200  57.303
UK   150  0.0100   0.400       5
UK    95  0.0110   0.240      95
RD   550  0.0010   0.015            CIRC     3.0     0.0
RD  2000  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK  SS5D
KM   AREA= 6.2 AC
BA0.0097
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   5.000    0.10  0.1200  71.792
UK   150  0.0100   0.400       8
UK    84  0.0132   0.240      92
RD   800  0.0010   0.015            CIRC     3.0     0.0
RD  1000  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK CUS6B
KM   AREA=  6.6 AC
BA0.0103
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.971    0.10  0.1200  71.974
UK   150  0.0100   0.400      29
UK   400  0.0050   0.240      71
RD   400  0.0016   0.015            CIRC     2.0     0.0
RD   400  0.0010   0.015            CIRC     3.0     0.0
ZW C=FLOW
*
KK  SS6A
KM   AREA=  3.7 AC
BA0.0058
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.1200  40.000
UK   130  0.0100   0.240  100.00
RD   235  0.0100   0.015            CIRC     3.0     0.0
ZW C=FLOW
*
KK   SS6
KM   AREA= 7.8 AC
BA0.0122
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.425    0.10  0.1200  85.000
UK   150  0.0100   0.400      88
UK   115  0.0100   0.240      12
RD   400  0.0010   0.055            TRAP    10.0     5.0
RD   500  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
```

```
*
KKYCUS4B
KM   COMBINE ALL FLOW AT MARKET STREET (EXCLUDING US ROUTING)
HC     5
ZW C=FLOW
*
KKYCUS4A
KM   COMBINE ALL FLOW AT MARKET STREET (INCLUDING US ROUTING)
HC     2
ZW C=FLOW
*
*
KKUCUS4A
KM   ROUTE FLOW THROUGH SHED CUS6 TO BASELINE ROAD PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CH GRADING
RS     1    FLOW      -1
SV  0.00    1.06    1.95    4.64    8.64   14.19   21.21   26.76
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KK CUS5B
KM   CUS5B 94.1 AC
BA0.1470
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000
UK   200  0.0050   0.400  100.00
RD  1800  0.0050   0.040            TRAP     2.0    10.0
RD  1000  0.0010   0.040            TRAP     2.0    10.0
ZW C=FLOW
*
KKYCCUS6
KM   COMBINE FLOW AT BASELINE ROAD
HC     2
ZW C=FLOW
*
*
KKUUS5BR
KM   ROUTE FLOW DN/S OF BASELINE ROAD THROUGH PLACER VINEYARDS
RS     1    FLOW      -1
SV  0.00    5.99   10.55   21.67   30.29   37.67   44.57   48.92
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KKCUS11B
KM   CUS11B  87.9ac
BA0.1374
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0748   2.000
UK   200  0.0050   0.400  100.00
RD   500  0.0050   0.040            TRAP     2.0    10.0
RD   150  0.0010   0.040            TRAP     2.0    10.0
ZW C=FLOW
*
KKY12ACC
KM   COMBINE FLOW AT WEST SIDE DRIVE
HC     2
ZW C=FLOW
*
*
KKU12ACR
KM   ROUTE FLOW TO BASELINE ROAD CULVERT
RS     1    FLOW      -1
SV  0.00    1.80    4.05   10.48   18.00   30.50   45.34   48.82
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KK CUS14
KM   CUS14 AREA = 62.1  AC
BA0.0970
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0760   2.000
UK   200  0.0050   0.400  100.00
RD   800  0.0050   0.040            TRAP     2.0    10.0
RD   900  0.0010   0.040            TRAP     2.0    10.0
ZW C=FLOW
*
KKYCUS14
KM   COMBINE FLOW UP/S OF BASELINE ROAD CULVERT
```

```
HC     2
ZW C=FLOW
*
*
KKU RR_7
KM   ROUTE FLOW THROUGH SHED CUS15C FROM BASELINE RD TO WATT AVE PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CH
GRADING
RS     1    FLOW      -1
SV  0.00    0.77    1.31    2.91    4.96    7.52   11.54   15.48
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KKCUS16B
KM
BA0.0208
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0720   2.000
UK   200  0.0050   0.400  100.00
RD   900  0.0050   0.040            TRAP     2.0    10.0
RD   900  0.0010   0.040            TRAP     2.0    10.0
ZW C=FLOW
*
KKYUS16B
KM
HC     2
ZW C=FLOW
*
KK SS12A
KM   AREA = 18.1  AC
BA0.0283
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.1200  70.939
UK    79  0.0142   0.240  100.00
RD   400  0.0016   0.015            CIRC     2.0     0.0
RD   900  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KK SS13A
KM   AREA=141.0 AC
BA0.2204
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   5.000    0.10  0.1200  55.922
UK   150  0.0100   0.400       6
UK    99  0.0102   0.240      94
RD   800  0.0010   0.015            CIRC     3.0     0.0
RD  4400  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KKYSS13A
KM  0
HC     2
ZW C=FLOW
*
KK  SS15
KM   AREA= 6.6 AC
BA0.0104
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.585    0.10  0.1200  84.484
UK   300  0.0100   0.400      69
UK    89  0.0122   0.240      31
RD   400  0.0010   0.055            TRAP     2.0    10.0
RD   600  0.0010   0.055            TRAP    10.0    10.0
ZW C=FLOW
*
KK YSS15
KM  0
HC     3
ZW C=FLOW
*
KKCUS17A
KM  CUS17A  AREA=38.2  AC
BA0.0597
PB
* PI
BF    -1  -0.001    1.50
```

```
LU  0.10  0.0700   2.000
UK   200  0.0050   0.400  100.00
RD   500  0.0050   0.040            TRAP     2.0    10.0
RD   500  0.0010   0.040            TRAP     2.0    10.0
ZW C=FLOW
*
KKV RR_9
KM   ROUTE FLOW FROM BASELINE ROAD TO MAIN CHANNEL
RD  1300  0.0010   0.055            TRAP     5.0     5.0
ZW C=FLOW
*
KK SS15B
KM   AREA= 5.7 AC
BA0.0089
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.724    0.10  0.1200  72.173
UK   150  0.0100   0.400       1
UK    78  0.0144   0.240      99
RD   400  0.0016   0.015            CIRC     2.0     0.0
RD   400  0.0010   0.015            CIRC     4.0     0.0     YES
ZW C=FLOW
*
KKYOMB_7
KM   COMBINE FLOW DN/S OF WATT AVE
HC     2
ZW C=FLOW
*
*
KKU RR_8
KM   ROUTE FLOW THROUGH SHED CUS15B PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CH GRADING
RS     1    FLOW      -1
SV  0.00    2.17    3.69    9.34   14.20   18.27   21.98   24.30
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KK SS15A
KM   AREA=74.8 AC
BA0.1168
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.996    0.10  0.1200  57.177
UK   150  0.0100   0.400      13
UK    94  0.0112   0.240      87
RD   500  0.0010   0.015            CIRC     3.0     0.0
RD  2600  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KKYSS15A
KM  0
HC     2
ZW C=FLOW
*
KK SS15F
KM   AREA=19.0 AC
BA0.0297
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.125    0.10  0.1200  80.401
UK   150  0.0100   0.400      96
UK   121  0.0100   0.240       4
RD   800  0.0010   0.055            TRAP    10.0     5.0
RD  1200  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KK SS15C
KM   AREA= 4.2 AC
BA0.0066
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.978
UK   150  0.0100   0.400  100.00
RD   200  0.0016   0.015            CIRC     2.0     0.0
RD   200  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KK SS15D
KM   AREA= 6.9 AC
BA0.0108
```

```
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.742    0.10  0.1200  40.000
UK   150  0.0100   0.400       1
UK   130  0.0100   0.240      99
RD   500  0.0010   0.015            CIRC     7.0     0.0
ZW C=FLOW
*
KK SS15E
KM   AREA=19.6 AC
BA0.0306
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000    0.10  0.1200  70.638
UK   150  0.0100   0.400       1
UK    79  0.0142   0.240      99
RD  1000  0.0010   0.015            CIRC     6.0     0.0
ZW C=FLOW
*
KKYOMB_9
KM   COMBINE FLOW AT EXISTING ROAD CULVERT
HC     5
ZW C=FLOW
*
*
KKU RR10
KM   ROUTE FLOW THROUGH SHED CUS17F TO CNFLUENCE WITH CURRY CK TRIB PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CH
GRADING
RS     1    FLOW      -1
SV  0.00    1.70    2.89    7.91   11.87   15.02   17.82   19.55
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KK SS17F
KM   AREA=18.0 AC
BA0.0281
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.016
UK   150  0.0100   0.400  100.00
RD  1800  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KK SS17B
KM   AREA=33.9 AC
BA0.0529
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.998    0.10  0.1200  84.405
UK   150  0.0100   0.400      95
UK   290  0.0074   0.240       5
RD  1200  0.0010   0.020            TRAP    10.0     5.0
RD   600  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KK SS17D
KM   AREA = 15.4
BA0.0240
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.501    0.10  0.1200  46.994
UK   150  0.0100   0.400       7
UK   115  0.0100   0.240      93
RD   500  0.0016   0.015            CIRC     2.0     0.0
RD   500  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KK SS17E
KM   AREA=7.6 AC
BA0.0119
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.967
UK   150  0.0100   0.400  100.00
RD   550  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
```

```
KKYOMB10
KM   COMBINE ALL FLOWS FROM CURRY CK AT CONFLUENCE W/ CURRY TRIB
HC     5
ZW C=FLOW
*
KKCUS17C
KM   AREA = 10.7
BA0.0629
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.004
UK   150  0.0100   0.400  100.00
RD  2500  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KKYUS17C
KM  0
HC     2
ZW C=FLOW
*
KKCU2A1A
KM   AREA = 49.0
BA0.0765
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   3.162    0.10  0.1200  46.652
UK   150  0.0100   0.400      28
UK   400  0.0050   0.240      72
RD  1000  0.0016   0.015            CIRC     2.0     0.0
RD  1000  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KKVR_201
KM   ROUTE FLOW THROUGH SHED CU2A1D
RD  1000  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KK S2A1B
KM   AREA = 13.0 AC
BA0.0203
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.953    0.10  0.1200  49.962
UK   150  0.0100   0.400      62
UK   178  0.0096   0.240      38
RD   700  0.0016   0.015            CIRC     2.0     0.0
RD   500  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KKYOM201
KM   COMBINE FLOW FROM CU2A1A & CU2A1B
HC     2
ZW C=FLOW
*
KK  CWP7
KM   Curry Creek Basin CU2A   (5-03)
BA0.0780
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600  41.023
UK   300  0.0200   0.350  100.00
RD   600  0.0020   0.024   .0200    TRAP     1.0     0.0
RD  1800  0.0010   0.024            TRAP     4.0     1.0
ZW C=FLOW
*
*
* KKU  DB3
* KM  " Det Basin C (1.6 acre surface area;1-18"";1-24"" outfalls)
* RS     1    FLOW      -1
* SV  0.00    1.50    3.10    4.60    6.30    7.90
* SQ   0.0     2.0    12.0    23.0    40.0    90.0
* ZW C=FLOW
*
KKVR_203
KM   ROUTE FLOW TO CURRY CK TRIB
RD   500  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KK YCWP7
```

```
KM  0
HC     2
ZW C=FLOW
*
KK S2A1C
KM   AREA = 20.0 AC
BA0.0313
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.811    0.10  0.1200  45.362
UK   150  0.0100   0.400       6
UK   127  0.0100   0.240      94
RD   300  0.0016   0.015            CIRC     2.0     0.0
RD  1500  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KKYOM202
KM   COMBINE FLOW WITH CU2A1C
HC     2
ZW C=FLOW
*
KKVR202A
KM   ROUTE FLOW THROUGH SHED CU2A1D
RD   800  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KK S2A1D
KM   AREA=39.5 AC
BA0.0617
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.005
UK   150  0.0100   0.400  100.00
RD  2400  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KKYM202B
KM   COMBINE FLOW WITH RR202A
HC     2
ZW C=FLOW
*
KKVR202B
KM   ROUTE FLOW TO MARKET STREET
RD   700  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KK S2A1E
KM   AREA = 3.7 AC
BA0.0057
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   5.000    0.10  0.1200  40.000
UK   150  0.0100   0.400       8
UK   136  0.0100   0.240      92
RD   350  0.0016   0.015            CIRC     2.0     0.0
ZW C=FLOW
*
KK S2A1F
KM   AREA=4.0 AC
BA0.0062
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.011    0.10  0.1200  40.000
UK   150  0.0100   0.400      99
UK   160  0.0100   0.240       1
RD   700  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KKYM202C
KM   COMBINE
HC     2
ZW C=FLOW
*
KKYOM203
KM   COMBINE FLOW AT MARKET STREET
HC     2
ZW C=FLOW
*
KKVRCM20
```

```
KM   ROUTE FLOW TO CURRY CK CHANNEL UP/S OF WEST SIDE DRIVE
RD  1100  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KK S2AB2
KM   AREA = 5.3 AC
BA0.0083
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.895    0.10  0.1200  43.348
UK   150  0.0100   0.400      13
UK   132  0.0100   0.240      87
RD   450  0.0016   0.015            CIRC     2.0     0.0
ZW C=FLOW
*
KK S2AB3
KM   AREA = 7.4 AC
BA0.0116
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.418    0.10  0.1200  40.056
UK   150  0.0100   0.400       2
UK   132  0.0100   0.240      98
RD   550  0.0016   0.015            CIRC     2.0     0.0
ZW C=FLOW
*
KK S2AB4
KM   AREA = 7.3 AC
BA0.0114
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.053
UK   150  0.0100   0.400  100.00
RD  1100  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KKYCM2AB
KM   COMBINE FLOW
HC     4
ZW C=FLOW
*
KK  CWP8
KM   Basin CU2A     (5-03)
BA0.0992
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600  40.000
UK   300  0.0200   0.350  100.00
RD   610  0.0070   0.024   .0200    TRAP     1.0     0.0
RD  2800  0.0010   0.024            TRAP     4.0     1.0
ZW C=FLOW
*
*
* KKU  DB4
* KM  "  Det Basin B for WP8 (1.6 acre surface area;1-18"";1-24"" outfalls)
* RS     1    FLOW      -1
* SV  0.00    1.50    3.10    4.60    6.30    7.90
* SQ   0.0     2.0    12.0    23.0    40.0    90.0
* ZW C=FLOW
*
KK S2AC2
KM   AREA = 3.3 AC
BA0.0052
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.132
UK   150  0.0100   0.400  100.00
RD   600  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KKYS2AC2
KM  0
HC     2
ZW C=FLOW
*
KK S2AC1
KM   AREA = 1.9 AC
BA0.0029
```

```
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   3.286    0.10  0.1200  40.016
UK   150  0.0100   0.400       3
UK   130  0.0100   0.240      97
RD   350  0.0016   0.015            CIRC     2.0     0.0
ZW C=FLOW
*
KKYS2AC1
KM  0
HC     2
ZW C=FLOW
*
KK CWP8A
KM   PORTION OF EXISTING SHED CU2A8- A=17.5  AC ASSUMED DEVELOPED MDResidential
BA0.0274
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.1200  50.000
UK   150  0.0050   0.240  100.00
RD  1100  0.0016   0.015            CIRC     6.0     0.0
ZW C=FLOW
*
KK S2AC3
KM   AREA = 16.6 AC
BA0.0259
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.955    0.10  0.1200  47.340
UK   150  0.0100   0.400      19
UK   132  0.0100   0.240      81
RD   350  0.0016   0.015            CIRC     2.0     0.0
RD   400  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KKYS2AC3
KM  0
HC     3
ZW C=FLOW
*
KK YCOMB
KM  0
HC     2
ZW C=FLOW
*
KK S2AC6
KM   AREA = 22.4
BA0.0350
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.025    0.10  0.1200  82.339
UK   150  0.0100   0.400      97
UK    77  0.0146   0.240       3
RD  2300  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KKYS2AC6
KM  0
HC     2
ZW C=FLOW
*
KK S2AC4
KM   AREA = 10.1
BA0.0157
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.1200  40.000
UK   130  0.0100   0.240  100.00
RD   700  0.0016   0.015            CIRC     2.0     0.0
ZW C=FLOW
*
KKYS2AC4
KM  0
HC     2
ZW C=FLOW
*
KK  S2A9
KM   AREA = 36.7 AC
```

```
BA0.0573
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.723    0.10  0.1200  55.939
UK   150  0.0100   0.400       6
UK    98  0.0104   0.240      94
RD  1000  0.0016   0.015            CIRC     2.0     0.0
RD  1550  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK YS2A9
KM  0
HC     2
ZW C=FLOW
*
KK S2AB1
KM   AREA = 53.6 AC
BA0.0523
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.440    0.10  0.1200  57.700
UK   150  0.0100   0.400      29
UK   127  0.0100   0.240      71
RD  1200  0.0016   0.015            CIRC     2.0     0.0
RD   300  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KK S2A1G
KM  0
BA0.0070
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.201    0.10  0.1200  82.720
UK   600  0.0150   0.400      88
UK    68  0.0173   0.240      12
RD   500  0.0010   0.050            TRAP     2.0     2.0
ZW C=FLOW
*
KKYS2A1G
KM  0
HC     2
ZW C=FLOW
*
KK S2AC5
KM   AREA = 20.9
BA0.0571
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.823    0.10  0.1200  46.029
UK   150  0.0100   0.400      40
UK   121  0.0100   0.240      60
RD   400  0.0016   0.015            CIRC     2.0     0.0
RD   450  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KKYS2AC5
KM  0
HC     2
ZW C=FLOW
*
KK S2AC7
KM  0
BA0.0087
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.1200  42.931
UK   124  0.0100   0.240  100.00
RD   500  0.0010   0.050            TRAP     2.0     2.0
ZW C=FLOW
*
KK  S2A8
KM   AREA = 88.4
BA0.1294
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.991    0.10  0.1200  46.529
UK   150  0.0100   0.400       6
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```
UK   118  0.0100   0.240      94
RD   600  0.0016   0.015            CIRC     2.0     0.0
RD  3500  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KKYM203F
KM   COMBINE FLOW
HC     2
ZW C=FLOW
*
KKYOM204
KM   COMBINE TOTAL FLOW AT WEST SIDE DRIVE
HC     2
ZW C=FLOW
*
*
KKUR_207
KM   ROUTE FLOW THROUGH SHED CU2A7B PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CHANNEL GRADING
RS     1    FLOW      -1
SV  0.00    2.28    4.19    7.75   10.94   13.89   16.81   21.00
SQ   0.0           100.0   200.0   300.0   400.0   500.0   600.0
ZW C=FLOW
*
KK S2A7A
KM   AREA = 37.3 AC
BA0.0583
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.911    0.10  0.1200  52.734
UK   150  0.0100   0.400      14
UK   112  0.0100   0.240      86
RD  1100  0.0016   0.015            CIRC     2.0     0.0
RD  1100  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KK  S2A7
KM   AREA = 17.7
BA0.0276
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.039    0.10  0.1200  83.349
UK   150  0.0100   0.400      94
UK    97  0.0106   0.240       6
RD   400  0.0010   0.055            TRAP    10.0     5.0
RD  1500  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KK S2A7B
KM   AREA = 14.4 AC
BA0.0224
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.987    0.10  0.1200  40.000
UK   150  0.0100   0.400      36
UK   154  0.0100   0.240      64
RD   550  0.0016   0.015            CIRC     2.0     0.0
RD   450  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KK S2A7C
KM   AREA = 51.9 AC
BA0.0812
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   5.000    0.10  0.1200  45.120
UK   150  0.0100   0.400       5
UK   132  0.0100   0.240      95
RD   450  0.0016   0.015            CIRC     2.0     0.0
RD  2000  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KKYOM205
KM   COMBINE FLOW FROM CU2A7 & CU2A7A
HC     4
ZW C=FLOW
*
KKYOM206
KM   COMBINE FLOW WITH IN THE CHANNEL
HC     2
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```
ZW C=FLOW
*
*
KKUR_208
KM   ROUTE FLOW THROUGH SHED CU2A4 TO WATT AVE PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CHANNEL GRADING
RS     1    FLOW      -1
SV  0.00    1.47    2.86    6.41   11.52   17.48   24.82   36.80
SQ   0.0           100.0   200.0   300.0   400.0   500.0   600.0
ZW C=FLOW
*
KK S2A4A
KM   AREA = 41.5 AC
BA0.0648
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.911    0.10  0.1200  56.440
UK   150  0.0100   0.400       8
UK    98  0.0104   0.240      92
RD  1000  0.0016   0.015            CIRC     2.0     0.0
RD  1400  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KK  S2A4
KM   AREA = 6.7 AC
BA0.0105
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.124    0.10  0.1200  84.481
UK   150  0.0100   0.400      83
UK    79  0.0142   0.240      17
RD  1500  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KK  S2A5
KM   AREA = 108.8 AC ASSUMED OFFSITE DEVELOPED MDResidential
BA0.1700
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.944    0.10  0.1200  49.625
UK   150  0.0100   0.400       7
UK   109  0.0100   0.240      93
RD  1500  0.0016   0.015            CIRC     2.0     0.0
RD  1300  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KKYOM208
KM   COMBINE FLOW FROM SHEDS CU2A5- CU2A4 & CU2A4A AT WATT AVE
HC     3
ZW C=FLOW
*
KKYOM110
KM   COMBINE FLOW AT WATT AVE CULVERT
HC     2
ZW C=FLOW
*
*
KKUR_210
KM   ROUTE FLOW THROUGH SHED CU2A6 TO CONFLUENCE WITH CURRY CK PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CHANNEL
GRADING
RS     1    FLOW      -1
SV  0.00    2.28    3.99    8.58   11.98   15.16   18.06   20.75   25.00
SQ   0.0    50.0   100.0   200.0   300.0   400.0   500.0   600.0   800.0
ZW C=FLOW
*
KK S2A6A
KM   AREA = 29.9 AC
BA0.0468
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.828    0.10  0.1200  40.041
UK   150  0.0100   0.400       4
UK   132  0.0100   0.240      96
RD   600  0.0016   0.015            CIRC     2.0     0.0
RD  1000  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KK S2A6B
KM   AREA = 10.3 AC
BA0.0161
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PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.622    0.10  0.1200  40.014
UK   150  0.0100   0.400       6
UK   134  0.0100   0.240      94
RD  1000  0.0016   0.015            CIRC     2.0     0.0
ZW C=FLOW
*
KK  S2A6
KM   AREA = 37.0 AC
BA0.0578
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.031
UK   150  0.0100   0.400  100.00
RD   400  0.0010   0.055            TRAP     2.0     5.0
RD  2500  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KK S2A6C
KM   AREA = 38.0 AC
BA0.0594
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.981    0.10  0.1200  47.276
UK   150  0.0100   0.400       9
UK   118  0.0100   0.240      91
RD   650  0.0016   0.015            CIRC     2.0     0.0
RD  1300  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KKYOM211
KM   COMBINE ALL FLOWS FROM CURRY CK TRIB
HC     5
ZW C=FLOW
*
KK  S2A2
KM   AREA = 17.6 AC UP/S OF WATT
BA0.0275
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000
UK   200  0.0100   0.400  100.00
RD   800  0.0100   0.045            TRAP     2.0    10.0
ZW C=FLOW
*
KK  S2A1
KM   AREA = 8.4 AC UP/S OF WATT
BA0.0131
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000
UK   200  0.0100   0.400  100.00
RD   900  0.0100   0.040            TRAP     2.0    10.0
ZW C=FLOW
*
KK YS2A1
KM  0
HC     2
ZW C=FLOW
*
KK S2A5C
KM   AREA = 69.3 AC
BA0.1082
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.030
UK   200  0.0100   0.400  100.00
RD  1400  0.0100   0.045            TRAP     2.0    10.0
ZW C=FLOW
*
KKYM2A5C
KM   COMBINE  FLOWS from cu2a1 & cu2a5c
HC     2
ZW C=FLOW
*
KKYDD100
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KM   COMBINE ALL FLOWS BEFORE ADDING TO CURRY CK
HC     2
ZW C=FLOW
*
KKVR_211
KM   ROUTE FLOW TO COMBINATION OF ALL CURRY CREEK FLOW
RD  1500  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KKYOM212
KM   COMBINE ALL FLOWS FROM CURRY CREEK AT PROJECT WEST BOUNDARY
HC     2
ZW C=FLOW
*
KKCU2A3A
KM   AREA = 38.2 AC WEST OF WATT
BA0.0597
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000
UK   200  0.0100   0.400  100.00
RD  1200  0.0100   0.045            TRAP     2.0    10.0
ZW C=FLOW
*
KKY2A3AC
KM   COMBINE FLOW FROM CU2A2 & CU2A3A
HC     2
ZW C=FLOW
*
KKV2A3AR
KM   ROUTE FLOW THROUGH SHED CU2A
RD  2300  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KK  CU2A
KM   AREA = 485.3 AC  NOV 29- 06
BA0.7583
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0150   0.400  100.00
RD   800  0.0100   0.050   .1000    TRAP     1.0    10.0
RD  5500  0.0010   0.050   .2000    TRAP     5.0    10.0
ZW C=FLOW
*
KKYCCU2A
KM   COMBINED CU2A & RCH3 (2.64 SM + 0.1014 + 0.0706)+ S17BR
HC     3
ZW C=FLOW
*
KK  CWP1
KM   AREA REVISED 6-05
BA0.1447
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000    0.10  0.0600 100.000
UK   300  0.0080   0.350      51
UK   150  0.0100   0.110      49
RD   450  0.0070   0.018   .0500    TRAP     0.0     1.0
RD  2050  0.0010   0.015            TRAP     2.0     2.0
ZW C=FLOW
*
KKV   R3
KM   main channel through to c-5
RD  1700  0.0030   0.035            TRAP     3.5    10.0
ZW C=FLOW
*
KK  CWP2
KM   AREA REVISED 6-05
BA0.1969
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700 100.000    0.10  0.0600   2.000
UK   150  0.0080   0.110      27
UK   300  0.0100   0.350      73
RD   450  0.0070   0.018   .0500    TRAP     0.0     1.0
RD  2000  0.0010   0.020            TRAP     2.0     2.0
ZW C=FLOW
*
```

```
KKY   C5
KM   node combines area 1 & area 2
HC     2
ZW C=FLOW
*
KKV   R4
KM   main channel from C-WP2
RD  1800  0.0020   0.035            TRAP     3.5    10.0
ZW C=FLOW
*
KK  CWP4
KM   Revise Date (5-03)
BA0.3627
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000    0.10  0.0600 100.000
UK   300  0.0100   0.350      54
UK   200  0.0200   0.110      46
RD   450  0.0070   0.018   .0500    TRAP     0.0     1.0
RD  2600  0.0010   0.020            TRAP     2.0     2.0
ZW C=FLOW
*
KKV   R7
KM   Main channel to C-6
RD  1935  0.0021   0.035            TRAP     3.5    10.0
ZW C=FLOW
*
KK  CWP3
KM   AREA REVISED 6-05
BA0.3000
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000    0.10  0.0600 100.000
UK   300  0.0100   0.350      54
UK   200  0.0100   0.110      46
RD  2000  0.0020   0.020            TRAP     2.0     2.0
ZW C=FLOW
*
KKY   C6
KM   combines node C-5 and C-WP4
HC     3
ZW C=FLOW
*
*
KKU DBC6
KM   Detention Storage  (step boxes)(2-5'x 10';2-4'x 10' Box Culverts)
RS     1    FLOW      -1
SV  0.00    0.70    3.50   10.30   22.80   35.00   42.50   69.70   88.00
SQ   0.0    40.0   175.0   350.0   600.0   800.0   850.0   950.0  1000.0
ZW C=FLOW
*
KKV   R8
KM   main channel through area five
RD  3700  0.0010   0.035            TRAP     3.5    10.0
ZW C=FLOW
*
KK  CWP6
KM   Revise Date (5-03) (194.5 ac)
BA0.3039
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0900   2.000    0.10  0.0600 100.000
UK   300  0.0100   0.350      72
UK   200  0.0080   0.110      28
RD   450  0.0070   0.018   .0500    TRAP     0.0     1.0
RD  2000  0.0010   0.020            TRAP     2.0     2.0
ZW C=FLOW
*
KKY   C8
KM   node combines node c-7 and area 6
HC     2
ZW C=FLOW
*
*
KKU DBC8
KM  " Detention Storage  (3-36"" w/weir)"
RS     1    FLOW      -1
SV  0.00    2.10   12.00   21.60   30.20   38.80   42.50   52.40   64.00
SQ   0.0    30.0   120.0   165.0   200.0   500.0   900.0   950.0  1050.0
ZW C=FLOW
```

```
*
KKV  R13
KM   main channel EXIT FROM NODE C-8
RD  2000  0.0010   0.035            TRAP     5.0     5.0
ZW C=FLOW
*
KK  SP9A
KM   AREA = 19.5  AC
BA0.0305
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.948    0.10  0.1200  51.361
UK   150  0.0100   0.400       2
UK   100  0.0100   0.240      98
RD  1200  0.0016   0.015            CIRC     3.0     0.0
RD   650  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK  CWP9
KM   AREA REVISED 149.0 ac
BA0.2329
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000    0.10  0.0700  84.266
UK   300  0.0080   0.400      98
UK   400  0.0050   0.240       2
RD  1450  0.0070   0.050            TRAP     0.0     1.0
RD  3600  0.0010   0.050            TRAP     2.0     2.0
ZW C=FLOW
*
KKYCCWP9
KM   COMBINE FLOW FROM CWP9A & CWP9 AT PLEASANT GROVE BLVD
HC     2
ZW C=FLOW
*
KKV R913
KM   Route shed through WP-13
RD  2000  0.0023   0.035            TRAP    10.0    10.0
ZW C=FLOW
*
KK CWP13
KM   AEEA REVISED 6-05
BA0.0942
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000    0.10  0.0700 100.000
UK   300  0.0080   0.350      67
UK   150  0.0080   0.110      33
RD   450  0.0070   0.018   .0300    TRAP     0.0     1.0
RD  2400  0.0010   0.020            TRAP     2.0     2.0
ZW C=FLOW
*
KKY   C9
KM   Combines Area WP9 & WP13
HC     2
ZW C=FLOW
*
KKY  C13
KM  0
HC     2
ZW C=FLOW
*
KK CWP14
KM   AERA REVISED 6-05
BA0.1525
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000    0.10  0.0600 100.000
UK   300  0.0080   0.350      98
UK   150  0.0100   0.110       2
RD  1600  0.0020   0.020            TRAP     2.0     2.0
ZW C=FLOW
*
KKYCWP14
KM   COMBINE FLOW
HC     2
ZW C=FLOW
*
KK CU2B1
```

```
KM   53.9 ACRES AREA REVISED 6-05
BA0.1150
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   200  0.0050   0.400  100.00
RD  1900  0.0080   0.050            TRAP     2.0    10.0
ZW C=FLOW
*
KKCU2B1A
KM   29.2 ACRES AREA REVISED 6-05
BA0.0456
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   200  0.0050   0.400  100.00
RD  1600  0.0080   0.050            TRAP     2.0    10.0
ZW C=FLOW
*
KKY  C10
KM   COMBINE FLOW AT WATT AVE & PLEASANT GROVE BLVD
HC     3
ZW C=FLOW
*
*
KKU  RR1
KM   ROUTE FLOW FROM C-10- 3500FT DNS TO CP-1
RS     1    FLOW      -1
SV  0.00    4.60    7.40   10.00   15.70   20.60   24.50   37.60   45.50
SQ   0.0   100.0   216.0   300.0   405.0   500.0   559.0   785.0   900.0
ZW C=FLOW
*
KK CU2B2
KM   AREA = 214.8 AC NOV 29- 06
BA0.3356
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0050   0.400  100.00
RD  2700  0.0067   0.050   .3800    TRAP    10.0     2.0
ZW C=FLOW
*
KKY  CP1
KM   COMBINE CU2B2 WITH FLOW AT CP-1
HC     2
ZW C=FLOW
*
*
KKU  RR2
KM   ROUTE FLOW FROM  CP-1 TO CU2A+
RS     1    FLOW      -1
SV  0.00   16.60   25.90   34.10   51.70   57.30   71.20   91.80   95.40
SQ   0.0   150.0   245.0   320.0   467.0   500.0   634.0   872.0   900.0
ZW C=FLOW
*
KK CU2B3
KM   221.1 ACRES
BA0.3455
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0050   0.400  100.00
RD  6300  0.0012   0.050            TRAP     4.0     2.0
ZW C=FLOW
*
KKYCU3B+
KM   COMBINE CU3B & RR2
HC     2
ZW C=FLOW
*
KKYCU2A+
KM  0
HC     2
ZW C=FLOW
*
*
KKU  RR3
KM   ROUTE FLOW FROM CU2A+ TO CU2C1- 2800 FT
RS     1    FLOW      -1
```

```
SV  0.00    7.70   23.20   32.80   57.40   59.60   66.10   85.90   95.10
SQ   0.0   250.0   491.0   700.0  1369.0  1400.0  1566.0  2192.0  2500.0
ZW C=FLOW
*
KK CU2C1
KM   186.4 ACRE @ COUNTRY ACRE LN
BA0.2913
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0050   0.400  100.00
RD  3700  0.0016   0.100   .2500    TRAP    10.0    20.0
ZW C=FLOW
*
KKY  CP2
KM   COMBINE RUNOFF FROM CUUC1 WITH FLOW AT CP-2
HC     2
ZW C=FLOW
*
*
KKU  RR4
KM   ROUTE FLOW FROM CP-2 TO CP-3- 2800 FT DNS
RS     1    FLOW      -1
SV  0.00   20.70   34.00   44.30   64.00   70.70   81.80  112.30  125.60
SQ   0.0   250.0   500.0   700.0  1140.0  1300.0  1566.0  2185.0  2500.0
ZW C=FLOW
*
KK CU2C2
KM  " 146.6 ACRES COUNTRY ACRES LN TO ""LANDING STRIP"""
BA0.2290
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   100  0.0050   0.400  100.00
RD  4200  0.0090   0.050            TRAP    15.0     3.0
ZW C=FLOW
*
KKY  CP3
KM   COMBINE RUNOFF FROM CU2C2 WITH FLOW AT CP-3
HC     2
ZW C=FLOW
*
*
KKU  RR5
KM   ROUTE FLOW FROM CP-3 TO BREWER ROAD 4200 FT DNS
RS     1    FLOW      -1
SV  0.00    7.00   11.10   12.20   15.80   17.20   19.80   27.20   30.10
SQ   0.0   260.0   513.0   720.0  1167.0  1350.0  1601.0  2230.0  2500.0
ZW C=FLOW
*
KK CU2C3
KM  " 216.6 ACRES ""LANDING STRIP"" TO BREWER RD"
BA0.3384
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0050   0.400  100.00
RD  1900  0.0012   0.100   .2000    TRAP   300.0     1.0
RD   800  0.0010   0.050   .1500    TRAP     2.0     2.0
ZW C=FLOW
*
KKYCU2C+
KM  0
HC     2
ZW C=FLOW
*
KKCWP11A
KM   Curry Creek Basin
BA0.0750
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000    0.10  0.0600 100.000
UK   300  0.0100   0.350      60
UK   150  0.0200   0.110      40
RD   500  0.0040   0.024   .0800    TRAP     1.0     5.0
RD   900  0.0010   0.024            TRAP     2.0    10.0
ZW C=FLOW
*
*
```

```
KKU  DB5
KM  " Det Basin A for C-WP11A (1.0 acre surface area; 2-18"" outfalls)"
RS     1    FLOW      -1
SV  0.00    0.70    1.80    2.80    3.90    5.10    6.50
SQ   0.0     2.0     7.0    15.0    24.0    55.0    90.0
ZW C=FLOW
*
KK8  R11
KM  0
RD
RC 0.045   0.045   0.045    1800  0.0028    1000
RX     0       0    1000    1013    1027    1040    2040    2040       0       0
RY1020.0  1000.0   990.0   984.0   984.0   990.0  1000.0  1020.0     0.0     0.0
ZW C=FLOW
*
KK CWP11
KM   Open Space
BA0.1230
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000    0.10  0.0600 100.000
UK   300  0.0100   0.350      95
UK   200  0.0100   0.110       5
RD  1900  0.0036   0.050   .0800    TRAP     3.5    10.0
RD  1300  0.0010   0.050            TRAP     3.5    10.0
ZW C=FLOW
*
KKY CB11
KM  0
HC     2
ZW C=FLOW
*
KKVR1112
KM   Route shed through WP-12
RD  1200  0.0036   0.035            TRAP    10.0    10.0
ZW C=FLOW
*
KK CWP12
KM  0
BA0.0678
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600 100.000    0.10  0.0600   2.000
UK   600  0.0100   0.110       2
UK   600  0.0100   0.400      98
RD  1400  0.0085   0.035            TRAP     3.5    10.0
ZW C=FLOW
*
KKYC1112
KM   combines WP11 and WP12 at Future Watt Ave.  170.3 ac=.266 sq mi
HC     2
ZW C=FLOW
*
*
KKU RCU3
KM   ROUTE FLOW FROM C11-12 TO CU3B 5300 FT DNS
RS     1    FLOW      -1
SV  0.00    2.90   14.30   20.30   27.90   30.80   32.90   41.70   47.90
SQ   0.0    30.0    62.0    90.0   159.0   190.0   214.0   298.0   350.0
ZW C=FLOW
*
KK  CU3A
KM   247.3 acres
BA0.3864
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0050   0.400  100.00
RD  2000  0.0100   0.050   .2500    TRAP    10.0    10.0
RD  1500  0.0010   0.050            TRAP     5.0     5.0
ZW C=FLOW
*
KKYCU3AC
KM  0
HC     2
ZW C=FLOW
*
KK  CU3B
KM   307.4 ACRES
BA0.4803
```

```
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0010   0.400  100.00
RD  1800  0.0013   0.050            TRAP   200.0     1.0
RD  2600  0.0010   0.050            TRAP     5.0     3.0     YES
ZW C=FLOW
*
KK  CU3C
KM   110.3 acres
BA0.1723
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0010   0.400  100.00
RD  2900  0.0076   0.050            TRAP    10.0    10.0
ZW C=FLOW
*
KKYCC3B+
KM   COMBINE RCU3B+CU3B&CU3A+CU3C;170.3 + 307.4+247.3 + 110.3 = 835.3=1.3052 sq mi
HC     2
ZW C=FLOW
*
*
KKURC3B+
KM   ROUTE FLOW FROM CC3B+ TO CU3D 3800 FT DNS
RS     1    FLOW      -1
SV  0.00    8.20   63.30   69.10   78.30   81.60   92.00  110.10  143.60
SQ   0.0    50.0    97.0   150.0   263.0   300.0   345.0   445.0   550.0
ZW C=FLOW
*
KK  CU3D
KM   465.8 acres   ROUTES & COMBINES 465.8+835.3=1-301.1 ac = 2.033 Sq. Mi.
BA0.7278
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0010   0.400  100.00
RD  4400  0.0010   0.050   .4000    TRAP     7.0     3.0
RD  1500  0.0010   0.060            TRAP   100.0     2.0     YES
ZW C=FLOW
*
*
KKURC3D+
KM   ROUTE FLOW CU3D TO CU3E+ 3600 FT DNS
RS     1    FLOW      -1
SV  0.00    3.90    7.50   11.00   15.00   16.60   18.40   22.50   24.60
SQ   0.0    70.0   140.0   220.0   321.0   375.0   428.0   570.0   650.0
ZW C=FLOW
*
KK  CU3E
KM   111.8 acres
BA0.1747
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0010   0.400  100.00
RD  3600  0.0010   0.050            TRAP    18.0     8.0
ZW C=FLOW
*
KKYCU3E+
KM   COMBINE CU3E & RC3D+ 111.8+1301.1=1412.9 ac = 2.2077 Sq. Mi.
HC     2
ZW C=FLOW
*
*
KKURC3E+
KM   ROUTE FLOW FROM CU3E+ TO CU3F+
RS     1    FLOW      -1
SV  0.00    2.80    4.60    7.10    9.40   10.20   11.40   14.10   15.00
SQ   0.0    75.0   153.0   200.0   351.0   400.0   466.0   618.0   700.0
ZW C=FLOW
*
KK  CU3F
KM   641.7ACRES
BA1.0026
PB
* PI
BF    -1  -0.001    1.50
```

```
LU  0.10  0.0600   2.000
UK   600  0.0010   0.400  100.00
RD  4100  0.0062   0.050   .5000    TRAP    15.0     3.0
RD  4400  0.0010   0.050            TRAP    12.0     2.0
ZW C=FLOW
*
KKYCC3F+
KM   COMBINE RC3F+ & CU3E+ (602.7+ 1412.9=2015.6 ac = 3.149 Sq. Mi.)
HC     2
ZW C=FLOW
*
*
KKURC3F+
KM   ROUTE CC3F+ TO CU3+    2015.6 ac=3.149 Sq. Mi.
RS     1    FLOW      -1
SV  0.00   17.20   30.90   54.40   75.50   81.00   95.10  123.30  131.30
SQ   0.0    80.0   164.0   300.0   410.0   470.0   565.0   780.0   850.0
ZW C=FLOW
*
KK  CU3G
KM   200.0 acres
BA0.3125
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0010   0.400  100.00
RD  4500  0.0010   0.050            TRAP    70.0    90.0
ZW C=FLOW
*
KK CU3HA
KM   57.4 acres
BA0.0897
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0050   0.400  100.00
RD  1500  0.0010   0.050            TRAP    10.0     2.0
ZW C=FLOW
*
KK CU3HB
KM   106.1 acres
BA0.1658
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   300  0.0010   0.400  100.00
RD  4000  0.0034   0.050            TRAP   100.0    50.0     YES
ZW C=FLOW
*
KKY  CU3
KM   COMBINE CU3H & CU3G & RC3F+ (106.1+200.0+2015.6=2321.7=3.627 Sq. Mi.
HC     3
ZW C=FLOW
*
KKYCU3C+
KM   COMBINE CU3 & CU2C+  (2321.7+
HC     2
ZW C=FLOW
*
*
KKU RCH8
KM  0
RS     1    FLOW      -1
SV  0.00   51.00  115.50  194.10  281.70  287.90  335.40  390.50  400.20
SQ   0.0   400.0   621.0  1000.0  1387.0  1500.0  1900.0  2682.0  3200.0
ZW C=FLOW
*
KK   CU4
KM  0
BA3.5800
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0150   0.400  100.00
RD   800  0.0100   0.050   .1000    TRAP     1.0    10.0
RD  8500  0.0010   0.050   .2000    TRAP     5.0    10.0
ZW C=FLOW
*
KK   CU5
```

```
KM  0
BA0.2800
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0150   0.400  100.00
RD   500  0.0100   0.050   .1000    TRAP     1.0    10.0
RD  2500  0.0010   0.050            TRAP     5.0    10.0
ZW C=FLOW
*
KKY CU5+
KM  0
HC     3
ZW C=FLOW
*
KK8 RCH9
KM  0
RD
RC 0.040   0.040   0.040    6000  0.0016    1000
RX     0       0    1200    1210    1230    1240    2440    2440       0       0
RY1020.0  1000.0   995.0   990.0   990.0   995.0  1000.0  1020.0     0.0     0.0
ZW C=FLOW
*
KK   CU6
KM  0
BA0.8700
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0150   0.400  100.00
RD   500  0.0100   0.050   .1000    TRAP     1.0    10.0
RD  1500  0.0010   0.050   .2000    TRAP     5.0    10.0
ZW C=FLOW
*
KKY CU6+
KM  0
HC     2
ZW C=FLOW
*
ZZ
```

# APPENDIX D
## HEC-1 POST-PROJECT MITIGATED SCENARIO INPUT FILE

```
ID PLACER COUNTY WATERSHED MODEL, PLACER COUNTY, CA
ID WATERSHED UPDATE MODELS - DRAFT ULT BUILDOUT
ID DRAFT MODEL FOR HYD ROUTING - HEC1VOLS UTILITY
ID CESI 1401/25/2129
ID
IT     5 01JAN97       0     600
IO     5               0
IN     5       0       0
*DIAGRAM
*
*
KK CUS3G
KM   AREA EAST OF FIDDYMENT ROAD AREA= 281.3 AC
BA.43953
PB
* PI
BF    -1  -0.001    1.50
LU   0.1    0.07       2    0.10  0.1200      41
UK   150    0.01     0.4       1
UK   200  0.0050   0.240      99
RD  3000  0.0010   0.015            CIRC     3.0     0.0
RD  2300  0.0005   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK   SS3
KM   AREA=45.2 AC
BA0.0707
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.982    0.10  0.1200  56.659
UK   150  0.0100   0.400       5
UK    96  0.0108   0.240      95
RD   800  0.0010   0.015            CIRC     3.0     0.0
RD  2100  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK  SS3B
KM   AREA= 16.1 AC
BA0.0252
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.089    0.10  0.1200  84.855
UK   300  0.0100   0.400      94
UK    89  0.0122   0.240       6
RD   400  0.0010   0.055            TRAP     2.0    10.0
RD  1200  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KKYCUS3A
KM   COMBINE FLOW AT FIDDYMENT ROAD
HC     3
ZW C=FLOW
*
*
KKUCUS3A
KM   ROUTE FLOW FROM FIDDYMENT ROAD TO UPLAND DIRVE PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CH GRADING
RS     1    FLOW      -1
SV  0.00    2.12    3.42    7.01   11.20   16.54   20.91   25.87
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KK  SS3C
KM   AREA=62.8 AC
BA0.0981
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.997    0.10  0.1200  42.681
UK   150  0.0100   0.400       7
UK   130  0.0100   0.240      93
RD   800  0.0010   0.015            CIRC     3.0     0.0
RD  1700  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK  SS3D
KM   AREA= 66.4 AC
BA0.1037
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.993    0.10  0.1200  65.734
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UK   150  0.0100   0.400       1
UK    85  0.0130   0.240      99
RD   850  0.0010   0.015            CIRC     3.0     0.0
RD  1250  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK  SS3E
KM   AREA= 15.1 AC
BA0.0236
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.084
UK   300  0.0100   0.400  100.00
RD   300  0.0010   0.055            TRAP     2.0    10.0
RD  1400  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KK   SS5
KM   AREA= 20.2 AC
BA0.0316
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.1200  70.000
UK    81  0.0138   0.240  100.00
RD   400  0.0010   0.055            TRAP     2.0    10.0
RD   700  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KKYCUS3B
KM   COMBINE FLOW AT UPLAND DRIVE
HC     5
ZW C=FLOW
*
*
KKUCUS3B
KM   ROUTE FLOW THROUGH SHED CUS3E PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CH GRADING
RS     1    FLOW      -1
SV  0.00    2.09    3.84    7.89   11.29   14.29   17.00   18.70
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KK  SS3F
KM   AREA= 73.7 AC
BA0.1151
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.999    0.10  0.1200  47.061
UK   150  0.0100   0.400       6
UK   115  0.0100   0.240      94
RD   750  0.0010   0.015            CIRC     3.0     0.0
RD  1200  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK CUS5A
KM   CUS5A 33.9 AC
BA0.0530
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000
UK   200  0.0050   0.400  100.00
RD   300  0.0050   0.040            TRAP     2.0    10.0
RD  1000  0.0010   0.040            TRAP     2.0    10.0
ZW C=FLOW
*
KK  SS4A
KM   AREA= 24.4 AC
BA0.0381
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.254
UK   300  0.0100   0.400  100.00
RD   400  0.0010   0.055            TRAP    10.0     5.0
RD  1900  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KK  SS5C
KM   AREA= 18.0  AC
BA0.0281
```

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PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.1200  71.093
UK    79  0.0142   0.240  100.00
RD  1200  0.0010   0.015            CIRC     3.0     0.0
ZW C=FLOW
*
KKYCUS3E
KM   COMBINE FLOWS
HC     5
ZW C=FLOW
*
*
KKUCUS3E
KM   ROUTE FLOW THROUGH SHED CUS4A TO MARKET STREET PUL'S STOTAGE ROUTING - NOV 7- 06 RAS PER CH GRADING
RS     1    FLOW      -1
SV  0.00    2.74    4.88   11.19   16.85   23.12   31.16   40.16
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KK   SS4
KM   AREA= 82.0 AC
BA0.1281
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   5.000    0.10  0.1200  57.303
UK   150  0.0100   0.400       5
UK    95  0.0110   0.240      95
RD   550  0.0010   0.015            CIRC     3.0     0.0
RD  2000  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK  SS5D
KM   AREA= 6.2 AC
BA0.0097
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   5.000    0.10  0.1200  71.792
UK   150  0.0100   0.400       8
UK    84  0.0132   0.240      92
RD   800  0.0010   0.015            CIRC     3.0     0.0
RD  1000  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK CUS6B
KM   AREA=  6.6 AC
BA0.0103
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.971    0.10  0.1200  71.974
UK   150  0.0100   0.400      29
UK   400  0.0050   0.240      71
RD   400  0.0016   0.015            CIRC     2.0     0.0
RD   400  0.0010   0.015            CIRC     3.0     0.0
ZW C=FLOW
*
KK  SS6A
KM   AREA=  3.7 AC
BA0.0058
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.1200  40.000
UK   130  0.0100   0.240  100.00
RD   235  0.0100   0.015            CIRC     3.0     0.0
ZW C=FLOW
*
KK   SS6
KM   AREA= 7.8 AC
BA0.0122
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.425    0.10  0.1200  85.000
UK   150  0.0100   0.400      88
UK   115  0.0100   0.240      12
RD   400  0.0010   0.055            TRAP    10.0     5.0
RD   500  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
```

```
*
KKYCUS4B
KM   COMBINE ALL FLOW AT MARKET STREET (EXCLUDING US ROUTING)
HC     5
ZW C=FLOW
*
KKYCUS4A
KM   COMBINE ALL FLOW AT MARKET STREET (INCLUDING US ROUTING)
HC     2
ZW C=FLOW
*
*
KKUCUS4A
KM   ROUTE FLOW THROUGH SHED CUS6 TO BASELINE ROAD PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CH GRADING
RS     1    FLOW      -1
SV  0.00    1.06    1.95    4.64    8.64   14.19   21.21   26.76
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KK CUS5B
KM   CUS5B 94.1 AC
BA0.1470
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000
UK   200  0.0050   0.400  100.00
RD  1800  0.0050   0.040            TRAP     2.0    10.0
RD  1000  0.0010   0.040            TRAP     2.0    10.0
ZW C=FLOW
*
KKYCCUS6
KM   COMBINE FLOW AT BASELINE ROAD
HC     2
ZW C=FLOW
*
*
KKUUS5BR
KM   ROUTE FLOW DN/S OF BASELINE ROAD THROUGH PLACER VINEYARDS
RS     1    FLOW      -1
SV  0.00    5.99   10.55   21.67   30.29   37.67   44.57   48.92
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KKCUS11B
KM   CUS11B  87.9ac
BA0.1374
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0748   2.000
UK   200  0.0050   0.400  100.00
RD   500  0.0050   0.040            TRAP     2.0    10.0
RD   150  0.0010   0.040            TRAP     2.0    10.0
ZW C=FLOW
*
KKY12ACC
KM   COMBINE FLOW AT WEST SIDE DRIVE
HC     2
ZW C=FLOW
*
*
KKU12ACR
KM   ROUTE FLOW TO BASELINE ROAD CULVERT
RS     1    FLOW      -1
SV  0.00    1.80    4.05   10.48   18.00   30.50   45.34   48.82
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KK CUS14
KM   CUS14 AREA = 62.1  AC
BA0.0970
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0760   2.000
UK   200  0.0050   0.400  100.00
RD   800  0.0050   0.040            TRAP     2.0    10.0
RD   900  0.0010   0.040            TRAP     2.0    10.0
ZW C=FLOW
*
KKYCUS14
KM   COMBINE FLOW UP/S OF BASELINE ROAD CULVERT
```

```
HC     2
ZW C=FLOW
*
*
KKU RR_7
KM   ROUTE FLOW THROUGH SHED CUS15C FROM BASELINE RD TO WATT AVE PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CH
GRADING
RS     1    FLOW      -1
SV  0.00    0.77    1.31    2.91    4.96    7.52   11.54   15.48
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KKCUS16B
KM
BA0.0208
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0720   2.000
UK   200  0.0050   0.400  100.00
RD   900  0.0050   0.040            TRAP     2.0    10.0
RD   900  0.0010   0.040            TRAP     2.0    10.0
ZW C=FLOW
*
KKYUS16B
KM
HC     2
ZW C=FLOW
*
KK SS12A
KM   AREA = 18.1  AC
BA0.0283
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.1200  70.939
UK    79  0.0142   0.240  100.00
RD   400  0.0016   0.015            CIRC     2.0     0.0
RD   900  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KK SS13A
KM   AREA=141.0 AC
BA0.2204
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   5.000    0.10  0.1200  55.922
UK   150  0.0100   0.400       6
UK    99  0.0102   0.240      94
RD   800  0.0010   0.015            CIRC     3.0     0.0
RD  4400  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KKYSS13A
KM  0
HC     2
ZW C=FLOW
*
KK  SS15
KM   AREA= 6.6 AC
BA0.0104
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.585    0.10  0.1200  84.484
UK   300  0.0100   0.400      69
UK    89  0.0122   0.240      31
RD   400  0.0010   0.055            TRAP     2.0    10.0
RD   600  0.0010   0.055            TRAP    10.0    10.0
ZW C=FLOW
*
KK YSS15
KM  0
HC     3
ZW C=FLOW
*
KKCUS17A
KM  CUS17A  AREA=38.2  AC
BA0.0597
PB
* PI
BF    -1  -0.001    1.50
```

```
LU  0.10  0.0700   2.000
UK   200  0.0050   0.400  100.00
RD   500  0.0050   0.040            TRAP     2.0    10.0
RD   500  0.0010   0.040            TRAP     2.0    10.0
ZW C=FLOW
*
KKV RR_9
KM   ROUTE FLOW FROM BASELINE ROAD TO MAIN CHANNEL
RD  1300  0.0010   0.055            TRAP     5.0     5.0
ZW C=FLOW
*
KK SS15B
KM   AREA= 5.7 AC
BA0.0089
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.724    0.10  0.1200  72.173
UK   150  0.0100   0.400       1
UK    78  0.0144   0.240      99
RD   400  0.0016   0.015            CIRC     2.0     0.0
RD   400  0.0010   0.015            CIRC     4.0     0.0     YES
ZW C=FLOW
*
KKYOMB_7
KM   COMBINE FLOW DN/S OF WATT AVE
HC     2
ZW C=FLOW
*
*
KKU RR_8
KM   ROUTE FLOW THROUGH SHED CUS15B PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CH GRADING
RS     1    FLOW      -1
SV  0.00    2.17    3.69    9.34   14.20   18.27   21.98   24.30
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KK SS15A
KM   AREA=74.8 AC
BA0.1168
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.996    0.10  0.1200  57.177
UK   150  0.0100   0.400      13
UK    94  0.0112   0.240      87
RD   500  0.0010   0.015            CIRC     3.0     0.0
RD  2600  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KKYSS15A
KM  0
HC     2
ZW C=FLOW
*
KK SS15F
KM   AREA=19.0 AC
BA0.0297
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.125    0.10  0.1200  80.401
UK   150  0.0100   0.400      96
UK   121  0.0100   0.240       4
RD   800  0.0010   0.055            TRAP    10.0     5.0
RD  1200  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KK SS15C
KM   AREA= 4.2 AC
BA0.0066
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.978
UK   150  0.0100   0.400  100.00
RD   200  0.0016   0.015            CIRC     2.0     0.0
RD   200  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KK SS15D
KM   AREA= 6.9 AC
BA0.0108
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PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.742    0.10  0.1200  40.000
UK   150  0.0100   0.400       1
UK   130  0.0100   0.240      99
RD   500  0.0010   0.015            CIRC     7.0     0.0
ZW C=FLOW
*
KK SS15E
KM   AREA=19.6 AC
BA0.0306
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000    0.10  0.1200  70.638
UK   150  0.0100   0.400       1
UK    79  0.0142   0.240      99
RD  1000  0.0010   0.015            CIRC     6.0     0.0
ZW C=FLOW
*
KKYOMB_9
KM   COMBINE FLOW AT EXISTING ROAD CULVERT
HC     5
ZW C=FLOW
*
*
KKU RR10
KM   ROUTE FLOW THROUGH SHED CUS17F TO CNFLUENCE WITH CURRY CK TRIB PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CH
GRADING
RS     1    FLOW      -1
SV  0.00    1.70    2.89    7.91   11.87   15.02   17.82   19.55
SQ   0.0    50.0   100.0   250.0   400.0   550.0   700.0   800.0
ZW C=FLOW
*
KK SS17F
KM   AREA=18.0 AC
BA0.0281
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.016
UK   150  0.0100   0.400  100.00
RD  1800  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KK SS17B
KM   AREA=33.9 AC
BA0.0529
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.998    0.10  0.1200  84.405
UK   150  0.0100   0.400      95
UK   290  0.0074   0.240       5
RD  1200  0.0010   0.020            TRAP    10.0     5.0
RD   600  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KK SS17D
KM   AREA = 15.4
BA0.0240
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.501    0.10  0.1200  46.994
UK   150  0.0100   0.400       7
UK   115  0.0100   0.240      93
RD   500  0.0016   0.015            CIRC     2.0     0.0
RD   500  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KK SS17E
KM   AREA=7.6 AC
BA0.0119
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.967
UK   150  0.0100   0.400  100.00
RD   550  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
```

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KKYOMB10
KM   COMBINE ALL FLOWS FROM CURRY CK AT CONFLUENCE W/ CURRY TRIB
HC     5
ZW C=FLOW
*
KKCUS17C
KM   AREA = 10.7
BA0.0629
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.004
UK   150  0.0100   0.400  100.00
RD  2500  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KKYUS17C
KM  0
HC     2
ZW C=FLOW
*
KKCU2A1A
KM   AREA = 49.0
BA0.0765
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   3.162    0.10  0.1200  46.652
UK   150  0.0100   0.400      28
UK   400  0.0050   0.240      72
RD  1000  0.0016   0.015            CIRC     2.0     0.0
RD  1000  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KKVR_201
KM   ROUTE FLOW THROUGH SHED CU2A1D
RD  1000  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KK S2A1B
KM   AREA = 13.0 AC
BA0.0203
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.953    0.10  0.1200  49.962
UK   150  0.0100   0.400      62
UK   178  0.0096   0.240      38
RD   700  0.0016   0.015            CIRC     2.0     0.0
RD   500  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KKYOM201
KM   COMBINE FLOW FROM CU2A1A & CU2A1B
HC     2
ZW C=FLOW
*
KK  CWP7
KM   Curry Creek Basin CU2A   (5-03)
BA0.0780
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600  41.023
UK   300  0.0200   0.350  100.00
RD   600  0.0020   0.024   .0200    TRAP     1.0     0.0
RD  1800  0.0010   0.024            TRAP     4.0     1.0
ZW C=FLOW
*
*
KKU  DB3
KM  " Det Basin C (1.6 acre surface area;1-18"";1-24"" outfalls)
"
RS     1    FLOW      -1
SV  0.00    1.50    3.10    4.60    6.30    7.90
SQ   0.0     2.0    12.0    23.0    40.0    90.0
ZW C=FLOW
*
KKVR_203
KM   ROUTE FLOW TO CURRY CK TRIB
RD   500  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
```

```
KK YCWP7
KM  0
HC     2
ZW C=FLOW
*
KK S2A1C
KM   AREA = 20.0 AC
BA0.0313
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.811    0.10  0.1200  45.362
UK   150  0.0100   0.400       6
UK   127  0.0100   0.240      94
RD   300  0.0016   0.015            CIRC     2.0     0.0
RD  1500  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KKYOM202
KM   COMBINE FLOW WITH CU2A1C
HC     2
ZW C=FLOW
*
KKVR202A
KM   ROUTE FLOW THROUGH SHED CU2A1D
RD   800  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KK S2A1D
KM   AREA=39.5 AC
BA0.0617
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.005
UK   150  0.0100   0.400  100.00
RD  2400  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KKYM202B
KM   COMBINE FLOW WITH RR202A
HC     2
ZW C=FLOW
*
KKVR202B
KM   ROUTE FLOW TO MARKET STREET
RD   700  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KK S2A1E
KM   AREA = 3.7 AC
BA0.0057
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   5.000    0.10  0.1200  40.000
UK   150  0.0100   0.400       8
UK   136  0.0100   0.240      92
RD   350  0.0016   0.015            CIRC     2.0     0.0
ZW C=FLOW
*
KK S2A1F
KM   AREA=4.0 AC
BA0.0062
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.011    0.10  0.1200  40.000
UK   150  0.0100   0.400      99
UK   160  0.0100   0.240       1
RD   700  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KKYM202C
KM   COMBINE
HC     2
ZW C=FLOW
*
KKYOM203
KM   COMBINE FLOW AT MARKET STREET
HC     2
ZW C=FLOW
*
```

```
KKVRCM20
KM   ROUTE FLOW TO CURRY CK CHANNEL UP/S OF WEST SIDE DRIVE
RD  1100  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KK S2AB2
KM   AREA = 5.3 AC
BA0.0083
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.895    0.10  0.1200  43.348
UK   150  0.0100   0.400      13
UK   132  0.0100   0.240      87
RD   450  0.0016   0.015            CIRC     2.0     0.0
ZW C=FLOW
*
KK S2AB3
KM   AREA = 7.4 AC
BA0.0116
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.418    0.10  0.1200  40.056
UK   150  0.0100   0.400       2
UK   132  0.0100   0.240      98
RD   550  0.0016   0.015            CIRC     2.0     0.0
ZW C=FLOW
*
KK S2AB4
KM   AREA = 7.3 AC
BA0.0114
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.053
UK   150  0.0100   0.400  100.00
RD  1100  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KKYCM2AB
KM   COMBINE FLOW
HC     4
ZW C=FLOW
*
KK  CWP8
KM   Basin CU2A     (5-03)
BA0.0992
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600  40.000
UK   300  0.0200   0.350  100.00
RD   610  0.0070   0.024   .0200    TRAP     1.0     0.0
RD  2800  0.0010   0.024            TRAP     4.0     1.0
ZW C=FLOW
*
*
KKU  DB4
KM  "  Det Basin B for WP8 (1.6 acre surface area;1-18"";1-24"" outfalls)
"
RS     1    FLOW      -1
SV  0.00    1.50    3.10    4.60    6.30    7.90
SQ   0.0     2.0    12.0    23.0    40.0    90.0
ZW C=FLOW
*
KK S2AC2
KM   AREA = 3.3 AC
BA0.0052
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.132
UK   150  0.0100   0.400  100.00
RD   600  0.0010   0.020            TRAP    10.0     5.0
ZW C=FLOW
*
KKYS2AC2
KM  0
HC     2
ZW C=FLOW
*
KK S2AC1
```

```
KM   AREA = 1.9 AC
BA0.0029
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   3.286    0.10  0.1200  40.016
UK   150  0.0100   0.400       3
UK   130  0.0100   0.240      97
RD   350  0.0016   0.015            CIRC     2.0     0.0
ZW C=FLOW
*
KKYS2AC1
KM  0
HC     2
ZW C=FLOW
*
KK CWP8A
KM   PORTION OF EXISTING SHED CU2A8- A=17.5  AC ASSUMED DEVELOPED MDResidential
BA0.0274
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.1200  50.000
UK   150  0.0050   0.240  100.00
RD  1100  0.0016   0.015            CIRC     6.0     0.0
ZW C=FLOW
*
KK S2AC3
KM   AREA = 16.6 AC
BA0.0259
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.955    0.10  0.1200  47.340
UK   150  0.0100   0.400      19
UK   132  0.0100   0.240      81
RD   350  0.0016   0.015            CIRC     2.0     0.0
RD   400  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KKYS2AC3
KM  0
HC     3
ZW C=FLOW
*
KK YCOMB
KM  0
HC     2
ZW C=FLOW
*
KK S2AC6
KM   AREA = 22.4
BA0.0350
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.025    0.10  0.1200  82.339
UK   150  0.0100   0.400      97
UK    77  0.0146   0.240       3
RD  2300  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KKYS2AC6
KM  0
HC     2
ZW C=FLOW
*
KK S2AC4
KM   AREA = 10.1
BA0.0157
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.1200  40.000
UK   130  0.0100   0.240  100.00
RD   700  0.0016   0.015            CIRC     2.0     0.0
ZW C=FLOW
*
KKYS2AC4
KM  0
HC     2
ZW C=FLOW
*
```

```
KK  S2A9
KM   AREA = 36.7 AC
BA0.0573
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.723    0.10  0.1200  55.939
UK   150  0.0100   0.400       6
UK    98  0.0104   0.240      94
RD  1000  0.0016   0.015            CIRC     2.0     0.0
RD  1550  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK YS2A9
KM  0
HC     2
ZW C=FLOW
*
KK S2AB1
KM   AREA = 53.6 AC
BA0.0523
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.440    0.10  0.1200  57.700
UK   150  0.0100   0.400      29
UK   127  0.0100   0.240      71
RD  1200  0.0016   0.015            CIRC     2.0     0.0
RD   300  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KK S2A1G
KM  0
BA0.0070
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.201    0.10  0.1200  82.720
UK   600  0.0150   0.400      88
UK    68  0.0173   0.240      12
RD   500  0.0010   0.050            TRAP     2.0     2.0
ZW C=FLOW
*
KKYS2A1G
KM  0
HC     2
ZW C=FLOW
*
KK S2AC5
KM   AREA = 20.9
BA0.0571
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.823    0.10  0.1200  46.029
UK   150  0.0100   0.400      40
UK   121  0.0100   0.240      60
RD   400  0.0016   0.015            CIRC     2.0     0.0
RD   450  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KKYS2AC5
KM  0
HC     2
ZW C=FLOW
*
KK S2AC7
KM  0
BA0.0087
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.1200  42.931
UK   124  0.0100   0.240  100.00
RD   500  0.0010   0.050            TRAP     2.0     2.0
ZW C=FLOW
*
KK  S2A8
KM   AREA = 88.4
BA0.1294
PB
* PI
BF    -1  -0.001    1.50
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```
LU  0.10  0.0700   4.991    0.10  0.1200  46.529
UK   150  0.0100   0.400       6
UK   118  0.0100   0.240      94
RD   600  0.0016   0.015            CIRC     2.0     0.0
RD  3500  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KKYM203F
KM   COMBINE FLOW
HC     2
ZW C=FLOW
*
KKYOM204
KM   COMBINE TOTAL FLOW AT WEST SIDE DRIVE
HC     2
ZW C=FLOW
*
*
KKUR_207
KM   ROUTE FLOW THROUGH SHED CU2A7B PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CHANNEL GRADING
RS     1    FLOW      -1
SV  0.00    2.28    4.19    7.75   10.94   13.89   16.81   21.00
SQ   0.0           100.0   200.0   300.0   400.0   500.0   600.0
ZW C=FLOW
*
KK S2A7A
KM   AREA = 37.3 AC
BA0.0583
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.911    0.10  0.1200  52.734
UK   150  0.0100   0.400      14
UK   112  0.0100   0.240      86
RD  1100  0.0016   0.015            CIRC     2.0     0.0
RD  1100  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KK  S2A7
KM   AREA = 17.7
BA0.0276
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.039    0.10  0.1200  83.349
UK   150  0.0100   0.400      94
UK    97  0.0106   0.240       6
RD   400  0.0010   0.055            TRAP    10.0     5.0
RD  1500  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KK S2A7B
KM   AREA = 14.4 AC
BA0.0224
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.987    0.10  0.1200  40.000
UK   150  0.0100   0.400      36
UK   154  0.0100   0.240      64
RD   550  0.0016   0.015            CIRC     2.0     0.0
RD   450  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KK S2A7C
KM   AREA = 51.9 AC
BA0.0812
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   5.000    0.10  0.1200  45.120
UK   150  0.0100   0.400       5
UK   132  0.0100   0.240      95
RD   450  0.0016   0.015            CIRC     2.0     0.0
RD  2000  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KKYOM205
KM   COMBINE FLOW FROM CU2A7 & CU2A7A
HC     4
ZW C=FLOW
*
KKYOM206
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KM   COMBINE FLOW WITH IN THE CHANNEL
HC     2
ZW C=FLOW
*
*
KKUR_208
KM   ROUTE FLOW THROUGH SHED CU2A4 TO WATT AVE PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CHANNEL GRADING
RS     1    FLOW      -1
SV  0.00    1.47    2.86    6.41   11.52   17.48   24.82   36.80
SQ   0.0           100.0   200.0   300.0   400.0   500.0   600.0
ZW C=FLOW
*
KK S2A4A
KM   AREA = 41.5 AC
BA0.0648
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.911    0.10  0.1200  56.440
UK   150  0.0100   0.400       8
UK    98  0.0104   0.240      92
RD  1000  0.0016   0.015            CIRC     2.0     0.0
RD  1400  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KK  S2A4
KM   AREA = 6.7 AC
BA0.0105
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.124    0.10  0.1200  84.481
UK   150  0.0100   0.400      83
UK    79  0.0142   0.240      17
RD  1500  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KK  S2A5
KM   AREA = 108.8 AC ASSUMED OFFSITE DEVELOPED MDResidential
BA0.1700
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.944    0.10  0.1200  49.625
UK   150  0.0100   0.400       7
UK   109  0.0100   0.240      93
RD  1500  0.0016   0.015            CIRC     2.0     0.0
RD  1300  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KKYOM208
KM   COMBINE FLOW FROM SHEDS CU2A5- CU2A4 & CU2A4A AT WATT AVE
HC     3
ZW C=FLOW
*
KKYOM110
KM   COMBINE FLOW AT WATT AVE CULVERT
HC     2
ZW C=FLOW
*
*
KKUR_210
KM   ROUTE FLOW THROUGH SHED CU2A6 TO CONFLUENCE WITH CURRY CK PUL'S STORAGE ROUTING - NOV 7- 06 RAS PER CHANNEL
GRADING
RS     1    FLOW      -1
SV  0.00    2.28    3.99    8.58   11.98   15.16   18.06   20.75   25.00
SQ   0.0    50.0   100.0   200.0   300.0   400.0   500.0   600.0   800.0
ZW C=FLOW
*
KK S2A6A
KM   AREA = 29.9 AC
BA0.0468
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.828    0.10  0.1200  40.041
UK   150  0.0100   0.400       4
UK   132  0.0100   0.240      96
RD   600  0.0016   0.015            CIRC     2.0     0.0
RD  1000  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KK S2A6B
```

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KM   AREA = 10.3 AC
BA0.0161
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.622    0.10  0.1200  40.014
UK   150  0.0100   0.400       6
UK   134  0.0100   0.240      94
RD  1000  0.0016   0.015            CIRC     2.0     0.0
ZW C=FLOW
*
KK  S2A6
KM   AREA = 37.0 AC
BA0.0578
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.031
UK   150  0.0100   0.400  100.00
RD   400  0.0010   0.055            TRAP     2.0     5.0
RD  2500  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KK S2A6C
KM   AREA = 38.0 AC
BA0.0594
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.981    0.10  0.1200  47.276
UK   150  0.0100   0.400       9
UK   118  0.0100   0.240      91
RD   650  0.0016   0.015            CIRC     2.0     0.0
RD  1300  0.0010   0.015            CIRC     4.0     0.0
ZW C=FLOW
*
KKYOM211
KM   COMBINE ALL FLOWS FROM CURRY CK TRIB
HC     5
ZW C=FLOW
*
KK  S2A2
KM   AREA = 17.6 AC UP/S OF WATT
BA0.0275
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000
UK   200  0.0100   0.400  100.00
RD   800  0.0100   0.045            TRAP     2.0    10.0
ZW C=FLOW
*
KK  S2A1
KM   AREA = 8.4 AC UP/S OF WATT
BA0.0131
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000
UK   200  0.0100   0.400  100.00
RD   900  0.0100   0.040            TRAP     2.0    10.0
ZW C=FLOW
*
KK YS2A1
KM  0
HC     2
ZW C=FLOW
*
KK S2A5C
KM   AREA = 69.3 AC
BA0.1082
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.030
UK   200  0.0100   0.400  100.00
RD  1400  0.0100   0.045            TRAP     2.0    10.0
ZW C=FLOW
*
KKYM2A5C
KM   COMBINE  FLOWS from cu2a1 & cu2a5c
HC     2
ZW C=FLOW
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```
*
KKYDD100
KM   COMBINE ALL FLOWS BEFORE ADDING TO CURRY CK
HC     2
ZW C=FLOW
*
KKVR_211
KM   ROUTE FLOW TO COMBINATION OF ALL CURRY CREEK FLOW
RD  1500  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KKYOM212
KM   COMBINE ALL FLOWS FROM CURRY CREEK AT PROJECT WEST BOUNDARY
HC     2
ZW C=FLOW
*
KKCU2A3A
KM   AREA = 38.2 AC WEST OF WATT
BA0.0597
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000
UK   200  0.0100   0.400  100.00
RD  1200  0.0100   0.045            TRAP     2.0    10.0
ZW C=FLOW
*
KKY2A3AC
KM   COMBINE FLOW FROM CU2A2 & CU2A3A
HC     2
ZW C=FLOW
*
KKV2A3AR
KM   ROUTE FLOW THROUGH SHED CU2A
RD  2300  0.0010   0.055            TRAP    10.0     5.0
ZW C=FLOW
*
KK  CU2A
KM   AREA = 485.3 AC  NOV 29- 06
BA0.7583
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0150   0.400  100.00
RD   800  0.0100   0.050   .1000    TRAP     1.0    10.0
RD  5500  0.0010   0.050   .2000    TRAP     5.0    10.0
ZW C=FLOW
*
KKYCCU2A
KM   COMBINED CU2A & RCH3 (2.64 SM + 0.1014 + 0.0706)+ S17BR
HC     3
ZW C=FLOW
*
KK  CWP1
KM   AREA REVISED 6-05
BA0.1447
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000    0.10  0.0600 100.000
UK   300  0.0080   0.350      51
UK   150  0.0100   0.110      49
RD   450  0.0070   0.018   .0500    TRAP     0.0     1.0
RD  2050  0.0010   0.015            TRAP     2.0     2.0
ZW C=FLOW
*
KKV   R3
KM   main channel through to c-5
RD  1700  0.0030   0.035            TRAP     3.5    10.0
ZW C=FLOW
*
KK  CWP2
KM   AREA REVISED 6-05
BA0.1969
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700 100.000    0.10  0.0600   2.000
UK   150  0.0080   0.110      27
UK   300  0.0100   0.350      73
RD   450  0.0070   0.018   .0500    TRAP     0.0     1.0
RD  2000  0.0010   0.020            TRAP     2.0     2.0
```

```
ZW C=FLOW
*
KKY   C5
KM   node combines area 1 & area 2
HC     2
ZW C=FLOW
*
KKV   R4
KM   main channel from C-WP2
RD  1800  0.0020   0.035            TRAP     3.5    10.0
ZW C=FLOW
*
KK  CWP4
KM   Revise Date (5-03)
BA0.3627
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000    0.10  0.0600 100.000
UK   300  0.0100   0.350      54
UK   200  0.0200   0.110      46
RD   450  0.0070   0.018   .0500    TRAP     0.0     1.0
RD  2600  0.0010   0.020            TRAP     2.0     2.0
ZW C=FLOW
*
KKV   R7
KM   Main channel to C-6
RD  1935  0.0021   0.035            TRAP     3.5    10.0
ZW C=FLOW
*
KK  CWP3
KM   AREA REVISED 6-05
BA0.3000
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000    0.10  0.0600 100.000
UK   300  0.0100   0.350      54
UK   200  0.0100   0.110      46
RD  2000  0.0020   0.020            TRAP     2.0     2.0
ZW C=FLOW
*
KKY   C6
KM   combines node C-5 and C-WP4
HC     3
ZW C=FLOW
*
*
KKU DBC6
KM   Detention Storage  (step boxes)(2-5'x 10';2-4'x 10' Box Culverts)
RS     1    FLOW      -1
SV  0.00    0.70    3.50   10.30   22.80   35.00   42.50   69.70   88.00
SQ   0.0    40.0   175.0   350.0   600.0   800.0   850.0   950.0  1000.0
ZW C=FLOW
*
KKV   R8
KM   main channel through area five
RD  3700  0.0010   0.035            TRAP     3.5    10.0
ZW C=FLOW
*
KK  CWP6
KM   Revise Date (5-03) (194.5 ac)
BA0.3039
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0900   2.000    0.10  0.0600 100.000
UK   300  0.0100   0.350      72
UK   200  0.0080   0.110      28
RD   450  0.0070   0.018   .0500    TRAP     0.0     1.0
RD  2000  0.0010   0.020            TRAP     2.0     2.0
ZW C=FLOW
*
KKY   C8
KM   node combines node c-7 and area 6
HC     2
ZW C=FLOW
*
*
KKU DBC8
KM  " Detention Storage  (3-36"" w/weir)"
RS     1    FLOW      -1
SV  0.00    2.10   12.00   21.60   30.20   38.80   42.50   52.40   64.00
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```
SQ   0.0    30.0   120.0   165.0   200.0   500.0   900.0   950.0  1050.0
ZW C=FLOW
*
KKV  R13
KM   main channel EXIT FROM NODE C-8
RD  2000  0.0010   0.035            TRAP     5.0     5.0
ZW C=FLOW
*
KK  SP9A
KM   AREA = 19.5  AC
BA0.0305
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   4.948    0.10  0.1200  51.361
UK   150  0.0100   0.400       2
UK   100  0.0100   0.240      98
RD  1200  0.0016   0.015            CIRC     3.0     0.0
RD   650  0.0010   0.015            CIRC     5.0     0.0
ZW C=FLOW
*
KK  CWP9
KM   AREA REVISED 149.0 ac
BA0.2329
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000    0.10  0.0700  84.266
UK   300  0.0080   0.400      98
UK   400  0.0050   0.240       2
RD  1450  0.0070   0.050            TRAP     0.0     1.0
RD  3600  0.0010   0.050            TRAP     2.0     2.0
ZW C=FLOW
*
KKYCCWP9
KM   COMBINE FLOW FROM CWP9A & CWP9 AT PLEASANT GROVE BLVD
HC     2
ZW C=FLOW
*
KKV R913
KM   Route shed through WP-13
RD  2000  0.0023   0.035            TRAP    10.0    10.0
ZW C=FLOW
*
KK CWP13
KM   AEEA REVISED 6-05
BA0.0942
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0700   2.000    0.10  0.0700 100.000
UK   300  0.0080   0.350      67
UK   150  0.0080   0.110      33
RD   450  0.0070   0.018   .0300    TRAP     0.0     1.0
RD  2400  0.0010   0.020            TRAP     2.0     2.0
ZW C=FLOW
*
KKY   C9
KM   Combines Area WP9 & WP13
HC     2
ZW C=FLOW
*
KKY  C13
KM  0
HC     2
ZW C=FLOW
*
KK CWP14
KM   AERA REVISED 6-05
BA0.1525
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000    0.10  0.0600 100.000
UK   300  0.0080   0.350      98
UK   150  0.0100   0.110       2
RD  1600  0.0020   0.020            TRAP     2.0     2.0
ZW C=FLOW
*
KKYCWP14
KM   COMBINE FLOW
HC     2
ZW C=FLOW
```

```
*
KK CU2B1
KM   53.9 ACRES AREA REVISED 6-05
BA0.1150
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   200  0.0050   0.400  100.00
RD  1900  0.0080   0.050            TRAP     2.0    10.0
ZW C=FLOW
*
KKCU2B1A
KM   29.2 ACRES AREA REVISED 6-05
BA0.0456
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   200  0.0050   0.400  100.00
RD  1600  0.0080   0.050            TRAP     2.0    10.0
ZW C=FLOW
*
KKY  C10
KM   COMBINE FLOW AT WATT AVE & PLEASANT GROVE BLVD
HC     3
ZW C=FLOW
*
*
KKU  RR1
KM   ROUTE FLOW FROM C-10- 3500FT DNS TO CP-1
RS     1    FLOW      -1
SV  0.00    4.60    7.40   10.00   15.70   20.60   24.50   37.60   45.50
SQ   0.0   100.0   216.0   300.0   405.0   500.0   559.0   785.0   900.0
ZW C=FLOW
*
KK CU2B2
KM   AREA = 214.8 AC NOV 29- 06
BA0.3356
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0050   0.400  100.00
RD  2700  0.0067   0.050   .3800    TRAP    10.0     2.0
ZW C=FLOW
*
KKY  CP1
KM   COMBINE CU2B2 WITH FLOW AT CP-1
HC     2
ZW C=FLOW
*
*
KKU  RR2
KM   ROUTE FLOW FROM  CP-1 TO CU2A+
RS     1    FLOW      -1
SV  0.00   16.60   25.90   34.10   51.70   57.30   71.20   91.80   95.40
SQ   0.0   150.0   245.0   320.0   467.0   500.0   634.0   872.0   900.0
ZW C=FLOW
*
KK CU2B3
KM   221.1 ACRES
BA0.3455
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0050   0.400  100.00
RD  6300  0.0012   0.050            TRAP     4.0     2.0
ZW C=FLOW
*
KKYCU3B+
KM   COMBINE CU3B & RR2
HC     2
ZW C=FLOW
*
KKYCU2A+
KM  0
HC     2
ZW C=FLOW
*
*
KKU  RR3
```

```
KM   ROUTE FLOW FROM CU2A+ TO CU2C1- 2800 FT
RS     1    FLOW      -1
SV  0.00    7.70   23.20   32.80   57.40   59.60   66.10   85.90   95.10
SQ   0.0   250.0   491.0   700.0  1369.0  1400.0  1566.0  2192.0  2500.0
ZW C=FLOW
*
KK CU2C1
KM   186.4 ACRE @ COUNTRY ACRE LN
BA0.2913
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0050   0.400  100.00
RD  3700  0.0016   0.100   .2500    TRAP    10.0    20.0
ZW C=FLOW
*
KKY  CP2
KM   COMBINE RUNOFF FROM CUUC1 WITH FLOW AT CP-2
HC     2
ZW C=FLOW
*
*
KKU  RR4
KM   ROUTE FLOW FROM CP-2 TO CP-3- 2800 FT DNS
RS     1    FLOW      -1
SV  0.00   20.70   34.00   44.30   64.00   70.70   81.80  112.30  125.60
SQ   0.0   250.0   500.0   700.0  1140.0  1300.0  1566.0  2185.0  2500.0
ZW C=FLOW
*
KK CU2C2
KM  " 146.6 ACRES COUNTRY ACRES LN TO ""LANDING STRIP"""
BA0.2290
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   100  0.0050   0.400  100.00
RD  4200  0.0090   0.050            TRAP    15.0     3.0
ZW C=FLOW
*
KKY  CP3
KM   COMBINE RUNOFF FROM CU2C2 WITH FLOW AT CP-3
HC     2
ZW C=FLOW
*
*
KKU  RR5
KM   ROUTE FLOW FROM CP-3 TO BREWER ROAD 4200 FT DNS
RS     1    FLOW      -1
SV  0.00    7.00   11.10   12.20   15.80   17.20   19.80   27.20   30.10
SQ   0.0   260.0   513.0   720.0  1167.0  1350.0  1601.0  2230.0  2500.0
ZW C=FLOW
*
KK CU2C3
KM  " 216.6 ACRES ""LANDING STRIP"" TO BREWER RD"
BA0.3384
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0050   0.400  100.00
RD  1900  0.0012   0.100   .2000    TRAP   300.0     1.0
RD   800  0.0010   0.050   .1500    TRAP     2.0     2.0
ZW C=FLOW
*
KKYCU2C+
KM  0
HC     2
ZW C=FLOW
*
KKCWP11A
KM   Curry Creek Basin
BA0.0750
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000    0.10  0.0600 100.000
UK   300  0.0100   0.350      60
UK   150  0.0200   0.110      40
RD   500  0.0040   0.024   .0800    TRAP     1.0     5.0
RD   900  0.0010   0.024            TRAP     2.0    10.0
ZW C=FLOW
```

```
*
*
KKU  DB5
KM  " Det Basin A for C-WP11A (1.0 acre surface area; 2-18"" outfalls)"
RS     1    FLOW      -1
SV  0.00    0.70    1.80    2.80    3.90    5.10    6.50
SQ   0.0     2.0     7.0    15.0    24.0    55.0    90.0
ZW C=FLOW
*
KK8  R11
KM  0
RD
RC 0.045   0.045   0.045    1800  0.0028    1000
RX     0       0    1000    1013    1027    1040    2040    2040       0       0
RY1020.0  1000.0   990.0   984.0   984.0   990.0  1000.0  1020.0     0.0     0.0
ZW C=FLOW
*
KK CWP11
KM   Open Space
BA0.1230
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000    0.10  0.0600 100.000
UK   300  0.0100   0.350      95
UK   200  0.0100   0.110       5
RD  1900  0.0036   0.050   .0800    TRAP     3.5    10.0
RD  1300  0.0010   0.050            TRAP     3.5    10.0
ZW C=FLOW
*
KKY CB11
KM  0
HC     2
ZW C=FLOW
*
KKVR1112
KM   Route shed through WP-12
RD  1200  0.0036   0.035            TRAP    10.0    10.0
ZW C=FLOW
*
KK CWP12
KM  0
BA0.0678
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600 100.000    0.10  0.0600   2.000
UK   600  0.0100   0.110       2
UK   600  0.0100   0.400      98
RD  1400  0.0085   0.035            TRAP     3.5    10.0
ZW C=FLOW
*
KKYC1112
KM   combines WP11 and WP12 at Future Watt Ave.  170.3 ac=.266 sq mi
HC     2
ZW C=FLOW
*
*
KKU RCU3
KM   ROUTE FLOW FROM C11-12 TO CU3B 5300 FT DNS
RS     1    FLOW      -1
SV  0.00    2.90   14.30   20.30   27.90   30.80   32.90   41.70   47.90
SQ   0.0    30.0    62.0    90.0   159.0   190.0   214.0   298.0   350.0
ZW C=FLOW
*
KK  CU3A
KM   247.3 acres
BA0.3864
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0050   0.400  100.00
RD  2000  0.0100   0.050   .2500    TRAP    10.0    10.0
RD  1500  0.0010   0.050            TRAP     5.0     5.0
ZW C=FLOW
*
KKYCU3AC
KM  0
HC     2
ZW C=FLOW
*
KK  CU3B
```

```
KM   307.4 ACRES
BA0.4803
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0010   0.400  100.00
RD  1800  0.0013   0.050            TRAP   200.0     1.0
RD  2600  0.0010   0.050            TRAP     5.0     3.0     YES
ZW C=FLOW
*
KK  CU3C
KM   110.3 acres
BA0.1723
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0010   0.400  100.00
RD  2900  0.0076   0.050            TRAP    10.0    10.0
ZW C=FLOW
*
KKYCC3B+
KM   COMBINE RCU3B+CU3B&CU3A+CU3C;170.3 + 307.4+247.3 + 110.3 = 835.3=1.3052 sq mi
HC     2
ZW C=FLOW
*
*
KKURC3B+
KM   ROUTE FLOW FROM CC3B+ TO CU3D 3800 FT DNS
RS     1    FLOW      -1
SV  0.00    8.20   63.30   69.10   78.30   81.60   92.00  110.10  143.60
SQ   0.0    50.0    97.0   150.0   263.0   300.0   345.0   445.0   550.0
ZW C=FLOW
*
KK  CU3D
KM   465.8 acres   ROUTES & COMBINES 465.8+835.3=1-301.1 ac = 2.033 Sq. Mi.
BA0.7278
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0010   0.400  100.00
RD  4400  0.0010   0.050   .4000    TRAP     7.0     3.0
RD  1500  0.0010   0.060            TRAP   100.0     2.0     YES
ZW C=FLOW
*
*
KKURC3D+
KM   ROUTE FLOW CU3D TO CU3E+ 3600 FT DNS
RS     1    FLOW      -1
SV  0.00    3.90    7.50   11.00   15.00   16.60   18.40   22.50   24.60
SQ   0.0    70.0   140.0   220.0   321.0   375.0   428.0   570.0   650.0
ZW C=FLOW
*
KK  CU3E
KM   111.8 acres
BA0.1747
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0010   0.400  100.00
RD  3600  0.0010   0.050            TRAP    18.0     8.0
ZW C=FLOW
*
KKYCU3E+
KM   COMBINE CU3E & RC3D+ 111.8+1301.1=1412.9 ac = 2.2077 Sq. Mi.
HC     2
ZW C=FLOW
*
*
KKURC3E+
KM   ROUTE FLOW FROM CU3E+ TO CU3F+
RS     1    FLOW      -1
SV  0.00    2.80    4.60    7.10    9.40   10.20   11.40   14.10   15.00
SQ   0.0    75.0   153.0   200.0   351.0   400.0   466.0   618.0   700.0
ZW C=FLOW
*
KK  CU3F
KM   641.7ACRES
BA1.0026
PB
```

```
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0010   0.400  100.00
RD  4100  0.0062   0.050   .5000    TRAP    15.0     3.0
RD  4400  0.0010   0.050            TRAP    12.0     2.0
ZW C=FLOW
*
KKYCC3F+
KM   COMBINE RC3F+ & CU3E+ (602.7+ 1412.9=2015.6 ac = 3.149 Sq. Mi.)
HC     2
ZW C=FLOW
*
*
KKURC3F+
KM   ROUTE CC3F+ TO CU3+    2015.6 ac=3.149 Sq. Mi.
RS     1    FLOW      -1
SV  0.00   17.20   30.90   54.40   75.50   81.00   95.10  123.30  131.30
SQ   0.0    80.0   164.0   300.0   410.0   470.0   565.0   780.0   850.0
ZW C=FLOW
*
KK  CU3G
KM   200.0 acres
BA0.3125
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0010   0.400  100.00
RD  4500  0.0010   0.050            TRAP    70.0    90.0
ZW C=FLOW
*
KK CU3HA
KM   57.4 acres
BA0.0897
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0050   0.400  100.00
RD  1500  0.0010   0.050            TRAP    10.0     2.0
ZW C=FLOW
*
KK CU3HB
KM   106.1 acres
BA0.1658
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   300  0.0010   0.400  100.00
RD  4000  0.0034   0.050            TRAP   100.0    50.0     YES
ZW C=FLOW
*
KKY  CU3
KM   COMBINE CU3H & CU3G & RC3F+ (106.1+200.0+2015.6=2321.7=3.627 Sq. Mi.
HC     3
ZW C=FLOW
*
KKYCU3C+
KM   COMBINE CU3 & CU2C+  (2321.7+
HC     2
ZW C=FLOW
*
*
KKU RCH8
KM  0
RS     1    FLOW      -1
SV  0.00   51.00  115.50  194.10  281.70  287.90  335.40  390.50  400.20
SQ   0.0   400.0   621.0  1000.0  1387.0  1500.0  1900.0  2682.0  3200.0
ZW C=FLOW
*
KK   CU4
KM  0
BA3.5800
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0150   0.400  100.00
RD   800  0.0100   0.050   .1000    TRAP     1.0    10.0
RD  8500  0.0010   0.050   .2000    TRAP     5.0    10.0
ZW C=FLOW
```

```
*
KK   CU5
KM  0
BA0.2800
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0150   0.400  100.00
RD   500  0.0100   0.050   .1000    TRAP     1.0    10.0
RD  2500  0.0010   0.050            TRAP     5.0    10.0
ZW C=FLOW
*
KKY CU5+
KM  0
HC     3
ZW C=FLOW
*
KK8 RCH9
KM  0
RD
RC 0.040   0.040   0.040    6000  0.0016    1000
RX     0       0    1200    1210    1230    1240    2440    2440       0       0
RY1020.0  1000.0   995.0   990.0   990.0   995.0  1000.0  1020.0     0.0     0.0
ZW C=FLOW
*
KK   CU6
KM  0
BA0.8700
PB
* PI
BF    -1  -0.001    1.50
LU  0.10  0.0600   2.000
UK   600  0.0150   0.400  100.00
RD   500  0.0100   0.050   .1000    TRAP     1.0    10.0
RD  1500  0.0010   0.050   .2000    TRAP     5.0    10.0
ZW C=FLOW
*
KKY CU6+
KM  0
HC     2
ZW C=FLOW
*
ZZ
```

# APPENDIX E
## HEC-RAS PRE-PROJECT SUMMARY TABLE

HEC-RAS Profile: Max WS

| Reach | River Sta | Profile | Plan | 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) | |
| Main Reach | 1.44 | Max WS | exist 10 | 146.35 | 112.07 | 114.24 | | 114.25 | 0.002007 | 0.77 | 198.09 | 304.87 | 0.14 |
| Main Reach | 1.44 | Max WS | exist 100 | 285.15 | 112.07 | 114.54 | | 114.56 | 0.002486 | 1.04 | 310.30 | 428.77 | 0.17 |
| Main Reach | 1.43666* | Max WS | exist 10 | 146.34 | 111.85 | 114.13 | | 114.14 | 0.000019 | 0.89 | 188.39 | 249.30 | 0.15 |
| Main Reach | 1.43666* | Max WS | exist 100 | 285.08 | 111.85 | 114.40 | | 114.43 | 0.000035 | 1.39 | 264.09 | 319.84 | 0.21 |
| Main Reach | 1.43333* | Max WS | exist 10 | 143.04 | 111.63 | 114.04 | | 114.06 | 0.001716 | 0.97 | 207.16 | 359.94 | 0.14 |
| Main Reach | 1.43333* | Max WS | exist 100 | 284.43 | 111.63 | 114.26 | | 114.28 | 0.002979 | 1.40 | 288.27 | 385.13 | 0.19 |
| Main Reach | 1.43 | Max WS | exist 10 | 146.87 | 111.41 | 113.43 | | 113.46 | 0.010060 | 1.98 | 130.83 | 303.56 | 0.33 |
| Main Reach | 1.43 | Max WS | exist 100 | 284.08 | 111.41 | 113.72 | | 113.75 | 0.007689 | 2.01 | 220.90 | 330.54 | 0.30 |
| Main Reach | 1.42 | Max WS | exist 10 | 142.39 | 109.58 | 112.15 | | 112.16 | 0.001016 | 1.05 | 164.45 | 174.19 | 0.18 |
| Main Reach | 1.42 | Max WS | exist 100 | 278.53 | 109.58 | 112.73 | | 112.75 | 0.000823 | 1.28 | 269.04 | 187.88 | 0.18 |
| Main Reach | 1.41 | Max WS | exist 10 | 140.46 | 109.58 | 111.98 | | 112.00 | 0.000691 | 1.22 | 161.61 | 166.65 | 0.17 |
| Main Reach | 1.41 | Max WS | exist 100 | 277.32 | 109.58 | 112.60 | | 112.61 | 0.000570 | 1.36 | 342.29 | 314.30 | 0.16 |
| Main Reach | 1.40 | Max WS | exist 10 | 155.18 | 108.42 | 111.82 | | 111.84 | 0.000425 | 1.29 | 236.97 | 195.91 | 0.14 |
| Main Reach | 1.40 | Max WS | exist 100 | 304.64 | 108.42 | 112.44 | | 112.46 | 0.000496 | 1.60 | 376.03 | 265.17 | 0.16 |
| Main Reach | 1.39 | Max WS | exist 10 | 169.81 | 107.49 | 111.26 | | 111.38 | 0.003054 | 2.88 | 73.31 | 119.61 | 0.35 |
| Main Reach | 1.39 | Max WS | exist 100 | 330.85 | 107.49 | 111.77 | | 111.92 | 0.003669 | 3.51 | 162.80 | 230.05 | 0.40 |
| Main Reach | 1.38 | Max WS | exist 10 | 191.26 | 107.00 | 110.14 | | 110.18 | 0.002217 | 2.50 | 178.95 | 270.95 | 0.30 |
| Main Reach | 1.38 | Max WS | exist 100 | 368.24 | 107.00 | 110.64 | | 110.67 | 0.001671 | 2.50 | 335.83 | 349.63 | 0.27 |
| Main Reach | 1.37 | Max WS | exist 10 | 209.51 | 106.00 | 109.39 | | 109.44 | 0.001604 | 2.12 | 154.76 | 154.58 | 0.26 |
| Main Reach | 1.37 | Max WS | exist 100 | 400.06 | 106.00 | 109.94 | | 110.01 | 0.001827 | 2.65 | 250.67 | 194.20 | 0.29 |
| Main Reach | 1.36 | Max WS | exist 10 | 228.81 | 105.84 | 108.48 | | 108.55 | 0.002642 | 2.90 | 157.70 | 192.17 | 0.34 |
| Main Reach | 1.36 | Max WS | exist 100 | 433.90 | 105.84 | 108.98 | | 109.05 | 0.002638 | 3.30 | 259.98 | 219.90 | 0.35 |
| Main Reach | 1.35 | Max WS | exist 10 | 240.32 | 104.83 | 107.91 | | 107.96 | 0.001908 | 2.18 | 178.63 | 201.45 | 0.28 |
| Main Reach | 1.35 | Max WS | exist 100 | 453.87 | 104.83 | 108.36 | | 108.43 | 0.002176 | 2.69 | 299.24 | 305.41 | 0.31 |
| Main Reach | 1.34 | Max WS | exist 10 | 253.38 | 104.46 | 107.23 | | 107.28 | 0.002432 | 2.59 | 206.63 | 287.68 | 0.32 |
| Main Reach | 1.34 | Max WS | exist 100 | 476.55 | 104.46 | 107.69 | | 107.74 | 0.002159 | 2.79 | 347.12 | 322.63 | 0.31 |
| Main Reach | 1.33 | Max WS | exist 10 | 252.39 | 101.96 | 105.94 | | 106.09 | 0.003667 | 3.57 | 123.67 | 172.64 | 0.40 |
| Main Reach | 1.33 | Max WS | exist 100 | 475.31 | 101.96 | 106.49 | | 106.63 | 0.003535 | 4.01 | 245.70 | 271.06 | 0.41 |
| Main Reach | 1.32 | Max WS | exist 10 | 257.18 | 101.80 | 105.28 | | 105.31 | 0.001287 | 2.08 | 260.28 | 302.06 | 0.24 |
| Main Reach | 1.32 | Max WS | exist 100 | 486.15 | 101.80 | 105.89 | | 105.92 | 0.000954 | 2.08 | 450.70 | 316.72 | 0.21 |
| Main Reach | 1.31 | Max WS | exist 10 | 262.52 | 100.91 | 104.67 | | 104.79 | 0.002643 | 3.23 | 138.04 | 131.67 | 0.35 |
| Main Reach | 1.31 | Max WS | exist 100 | 472.32 | 100.91 | 105.33 | | 105.44 | 0.002437 | 3.59 | 307.18 | 378.14 | 0.35 |
| Main Reach | 1.30 | Max WS | exist 10 | 267.85 | 100.63 | 104.06 | | 104.09 | 0.001625 | 2.06 | 223.70 | 202.77 | 0.26 |
| Main Reach | 1.30 | Max WS | exist 100 | 407.91 | 100.63 | 104.94 | | 104.96 | 0.000613 | 1.61 | 439.05 | 284.89 | 0.17 |
| Main Reach | 1.29 | Max WS | exist 10 | 267.15 | 100.36 | 103.62 | | 103.70 | 0.001970 | 2.70 | 176.00 | 199.84 | 0.30 |
| Main Reach | 1.29 | Max WS | exist 100 | 402.46 | 100.36 | 104.83 | | 104.85 | 0.000406 | 1.59 | 470.71 | 373.80 | 0.15 |
| Main Reach | 1.28 | Max WS | exist 10 | 207.82 | 100.00 | 103.31 | | 103.33 | 0.000570 | 1.35 | 266.11 | 277.13 | 0.16 |
| Main Reach | 1.28 | Max WS | exist 100 | 401.92 | 100.00 | 104.76 | | 104.77 | 0.000146 | 0.95 | 754.35 | 394.52 | 0.09 |
| Main Reach | 1.27 | Max WS | exist 10 | 202.45 | 98.88 | 103.23 | | 103.24 | 0.000060 | 0.53 | 619.30 | 299.99 | 0.05 |
| Main Reach | 1.27 | Max WS | exist 100 | 405.84 | 98.88 | 104.74 | | 104.74 | 0.000043 | 0.59 | 1116.80 | 358.95 | 0.05 |
| Main Reach | 1.26 | Max WS | exist 10 | 200.32 | 98.56 | 103.21 | | 103.22 | 0.000093 | 0.69 | 550.07 | 377.53 | 0.07 |
| Main Reach | 1.26 | Max WS | exist 100 | 405.13 | 98.56 | 104.73 | | 104.73 | 0.000045 | 0.62 | 1162.76 | 433.26 | 0.05 |
| Main Reach | 1.255 | Max WS | exist 10 | 209.11 | 97.97 | 103.19 | | 103.19 | 0.000030 | 0.46 | 924.95 | 470.63 | 0.04 |
| Main Reach | 1.255 | Max WS | exist 100 | 424.29 | 97.97 | 104.72 | | 104.72 | 0.000020 | 0.46 | 1669.87 | 503.37 | 0.03 |
| Main Reach | 1.22 | Max WS | exist 10 | 226.40 | 97.51 | 103.19 | | 103.19 | 0.000020 | 0.38 | 897.73 | 389.22 | 0.03 |
| Main Reach | 1.22 | Max WS | exist 100 | 458.22 | 97.51 | 104.71 | | 104.71 | 0.000019 | 0.46 | 1603.59 | 546.34 | 0.03 |
| Main Reach | 1.215 | | | Culvert | | | | | | | | | |
| Main Reach | 1.21 | Max WS | exist 10 | 226.40 | 96.51 | 99.85 | | 100.04 | 0.006647 | 3.48 | 64.97 | 43.52 | 0.50 |
| Main Reach | 1.21 | Max WS | exist 100 | 458.07 | 96.51 | 100.37 | | 100.76 | 0.013238 | 5.05 | 90.73 | 58.58 | 0.71 |
| Main Reach | 1.20 | Max WS | exist 10 | 226.38 | 96.05 | 99.46 | | 99.60 | 0.006865 | 3.54 | 102.63 | 171.78 | 0.50 |
| Main Reach | 1.20 | Max WS | exist 100 | 456.63 | 96.05 | 99.95 | | 100.10 | 0.005785 | 3.91 | 197.25 | 210.30 | 0.48 |
| Main Reach | 1.19 | Max WS | exist 10 | 226.82 | 95.07 | 98.36 | | 98.40 | 0.001317 | 1.70 | 171.80 | 235.83 | 0.23 |
| Main Reach | 1.19 | Max WS | exist 100 | 452.57 | 95.07 | 99.05 | | 99.09 | 0.001012 | 1.87 | 365.51 | 320.07 | 0.21 |
| Main Reach | 1.18 | Max WS | exist 10 | 227.45 | 94.10 | 97.66 | | 97.76 | 0.002855 | 3.28 | 122.23 | 114.46 | 0.36 |
| Main Reach | 1.18 | Max WS | exist 100 | 452.43 | 94.10 | 98.34 | | 98.48 | 0.003118 | 4.00 | 215.27 | 158.77 | 0.39 |
| Main Reach | 1.17 | Max WS | exist 10 | 228.25 | 93.80 | 97.01 | | 97.05 | 0.000816 | 1.64 | 169.13 | 137.09 | 0.19 |
| Main Reach | 1.17 | Max WS | exist 100 | 452.60 | 93.80 | 97.53 | | 97.61 | 0.001363 | 2.43 | 251.51 | 179.34 | 0.25 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Main Reach | 1.16 | Max WS | exist 10 | 228.64 | 93.25 | 96.46 | | 96.53 | 0.002175 | 2.52 | 167.08 | 281.53 | 0.30 |
| Main Reach | 1.16 | Max WS | exist 100 | 447.99 | 93.25 | 96.93 | | 97.00 | 0.002051 | 2.80 | 314.20 | 337.36 | 0.31 |
| Main Reach | 1.15 | Max WS | exist 10 | 229.29 | 92.65 | 96.02 | | 96.04 | 0.000429 | 1.32 | 359.15 | 424.67 | 0.14 |
| Main Reach | 1.15 | Max WS | exist 100 | 446.58 | 92.65 | 96.50 | | 96.52 | 0.000493 | 1.58 | 566.71 | 438.99 | 0.16 |
| Main Reach | 1.14 | Max WS | exist 10 | 230.56 | 92.20 | 94.73 | | 94.80 | 0.003981 | 2.83 | 140.89 | 185.59 | 0.39 |
| Main Reach | 1.14 | Max WS | exist 100 | 447.14 | 92.20 | 95.19 | | 95.28 | 0.003827 | 3.29 | 232.98 | 212.65 | 0.40 |
| Main Reach | 1.13 | Max WS | exist 10 | 231.11 | 91.95 | 93.93 | | 93.94 | 0.000490 | 0.72 | 319.71 | 324.63 | 0.13 |
| Main Reach | 1.13 | Max WS | exist 100 | 442.10 | 91.95 | 94.44 | | 94.45 | 0.000443 | 0.89 | 500.26 | 540.00 | 0.13 |
| Main Reach | 1.12 | Max WS | exist 10 | 231.34 | 90.70 | 93.31 | | 93.40 | 0.003495 | 3.05 | 134.77 | 162.33 | 0.38 |
| Main Reach | 1.12 | Max WS | exist 100 | 439.07 | 90.70 | 93.93 | | 94.01 | 0.002843 | 3.29 | 254.38 | 228.07 | 0.36 |
| Main Reach | 1.11 | Max WS | exist 10 | 231.41 | 90.02 | 92.80 | | 92.81 | 0.000403 | 0.97 | 337.98 | 311.24 | 0.13 |
| Main Reach | 1.11 | Max WS | exist 100 | 436.82 | 90.02 | 93.51 | | 93.53 | 0.000323 | 1.09 | 572.19 | 340.77 | 0.12 |
| Main Reach | 1.10 | Max WS | exist 10 | 231.28 | 88.90 | 92.21 | | 92.32 | 0.003090 | 2.64 | 89.26 | 69.23 | 0.35 |
| Main Reach | 1.10 | Max WS | exist 100 | 428.03 | 88.90 | 92.97 | | 93.11 | 0.002724 | 3.16 | 167.25 | 137.53 | 0.35 |
| Main Reach | 1.09 | Max WS | exist 10 | 246.17 | 87.51 | 91.67 | | 91.68 | 0.000212 | 1.00 | 417.54 | 305.34 | 0.10 |
| Main Reach | 1.09 | Max WS | exist 100 | 448.47 | 87.51 | 92.51 | | 92.52 | 0.000184 | 1.10 | 705.22 | 358.37 | 0.10 |
| Main Reach | 1.08 | Max WS | exist 10 | 243.35 | 87.08 | 91.39 | | 91.45 | 0.001370 | 2.29 | 185.08 | 196.40 | 0.25 |
| Main Reach | 1.08 | Max WS | exist 100 | 449.05 | 87.08 | 92.36 | | 92.40 | 0.000694 | 2.01 | 431.69 | 293.71 | 0.19 |
| Main Reach | 1.07 | Max WS | exist 10 | 219.94 | 87.00 | 91.01 | | 91.06 | 0.001135 | 1.88 | 166.13 | 182.83 | 0.22 |
| Main Reach | 1.07 | Max WS | exist 100 | 452.16 | 87.00 | 92.19 | | 92.22 | 0.000512 | 1.68 | 482.05 | 340.85 | 0.16 |
| Main Reach | 1.06 | Max WS | exist 10 | 210.54 | 86.38 | 90.84 | | 90.84 | 0.000074 | 0.60 | 525.32 | 358.13 | 0.06 |
| Main Reach | 1.06 | Max WS | exist 100 | 453.06 | 86.38 | 92.11 | | 92.11 | 0.000063 | 0.70 | 1026.53 | 436.91 | 0.06 |
| Main Reach | 1.05 | Max WS | exist 10 | 210.36 | 85.43 | 90.83 | | 90.83 | 0.000046 | 0.53 | 622.31 | 341.05 | 0.05 |
| Main Reach | 1.05 | Max WS | exist 100 | 453.66 | 85.43 | 92.09 | | 92.10 | 0.000050 | 0.67 | 1129.06 | 458.18 | 0.05 |
| Main Reach | 1.04 | Max WS | exist 10 | 210.41 | 84.89 | 90.82 | | 90.82 | 0.000001 | 0.07 | 4683.00 | 1990.79 | 0.01 |
| Main Reach | 1.04 | Max WS | exist 100 | 454.34 | 84.89 | 92.09 | | 92.09 | 0.000001 | 0.10 | 7234.61 | 2043.52 | 0.01 |
| Main Reach | 1.03 | Max WS | exist 10 | 210.43 | 84.80 | 90.82 | | 90.82 | 0.000001 | 0.05 | 5078.08 | 1780.56 | 0.01 |
| Main Reach | 1.03 | Max WS | exist 100 | 454.61 | 84.80 | 92.09 | | 92.09 | 0.000001 | 0.08 | 7389.98 | 1868.37 | 0.01 |
| Main Reach | 1.025 | | | Culvert | | | | | | | | | |
| Main Reach | 1.02 | Max WS | exist 10 | 209.42 | 84.82 | 88.69 | | 88.69 | 0.000033 | 0.34 | 1086.01 | 770.73 | 0.04 |
| Main Reach | 1.02 | Max WS | exist 100 | 423.76 | 84.82 | 89.42 | | 89.42 | 0.000035 | 0.41 | 1653.57 | 832.18 | 0.04 |
| Main Reach | 1.01 | Max WS | exist 10 | 210.09 | 84.33 | 88.10 | | 88.20 | 0.002019 | 2.60 | 91.74 | 156.82 | 0.30 |
| Main Reach | 1.01 | Max WS | exist 100 | 425.24 | 84.33 | 88.76 | | 88.89 | 0.002232 | 3.22 | 209.92 | 200.56 | 0.32 |
| Main Reach | 1.00 | Max WS | exist 10 | 210.90 | 83.82 | 87.58 | | 87.76 | 0.005107 | 3.59 | 78.59 | 92.63 | 0.45 |
| Main Reach | 1.00 | Max WS | exist 100 | 425.93 | 83.82 | 88.36 | | 88.49 | 0.003844 | 3.60 | 214.90 | 251.27 | 0.41 |
| Main Reach | 0.95 | Max WS | exist 10 | 212.10 | 83.21 | 86.87 | | 87.00 | 0.002588 | 2.92 | 72.54 | 30.43 | 0.33 |
| Main Reach | 0.95 | Max WS | exist 100 | 427.80 | 83.21 | 87.84 | | 87.94 | 0.001719 | 2.97 | 258.41 | 265.24 | 0.29 |
| Main Reach | 0.90 | Max WS | exist 10 | 213.66 | 82.09 | 86.32 | | 86.40 | 0.001938 | 2.39 | 89.34 | 41.37 | 0.29 |
| Main Reach | 0.90 | Max WS | exist 100 | 431.17 | 82.09 | 87.19 | | 87.36 | 0.002739 | 3.37 | 130.77 | 77.09 | 0.36 |
| Main Reach | 0.85 | Max WS | exist 10 | 213.60 | 81.05 | 86.02 | | 86.07 | 0.000513 | 1.79 | 161.89 | 79.13 | 0.16 |
| Main Reach | 0.85 | Max WS | exist 100 | 429.10 | 81.05 | 86.77 | | 86.86 | 0.000939 | 2.73 | 225.31 | 91.24 | 0.22 |
| Main Reach | 0.80 | Max WS | exist 10 | 214.57 | 81.05 | 85.84 | | 85.90 | 0.001043 | 2.10 | 159.79 | 204.56 | 0.22 |
| Main Reach | 0.80 | Max WS | exist 100 | 429.89 | 81.05 | 86.58 | | 86.64 | 0.000942 | 2.32 | 345.47 | 273.69 | 0.22 |
| Main Reach | 0.75 | Max WS | exist 10 | 214.70 | 80.50 | 85.56 | | 85.64 | 0.001423 | 2.38 | 109.91 | 115.76 | 0.25 |
| Main Reach | 0.75 | Max WS | exist 100 | 429.00 | 80.50 | 86.26 | | 86.38 | 0.001777 | 3.09 | 225.88 | 205.41 | 0.29 |
| Main Reach | 0.70 | Max WS | exist 10 | 214.76 | 80.36 | 85.28 | | 85.36 | 0.001393 | 2.32 | 126.09 | 181.41 | 0.25 |
| Main Reach | 0.70 | Max WS | exist 100 | 428.06 | 80.36 | 85.95 | | 86.04 | 0.001512 | 2.80 | 257.60 | 213.44 | 0.27 |
| Main Reach | 0.65 | Max WS | exist 10 | 214.89 | 80.36 | 85.09 | | 85.13 | 0.000805 | 1.82 | 192.44 | 206.17 | 0.19 |
| Main Reach | 0.65 | Max WS | exist 100 | 427.61 | 80.36 | 85.74 | | 85.78 | 0.000917 | 2.23 | 330.56 | 224.51 | 0.21 |
| Main Reach | 0.6 | Max WS | exist 10 | 215.09 | 80.20 | 84.92 | | 84.96 | 0.000627 | 1.67 | 199.05 | 232.97 | 0.17 |
| Main Reach | 0.6 | Max WS | exist 100 | 427.80 | 80.20 | 85.53 | | 85.58 | 0.000783 | 2.11 | 358.88 | 281.66 | 0.20 |
| Main Reach | 0.55 | Max WS | exist 10 | 215.32 | 80.20 | 84.77 | | 84.81 | 0.000585 | 1.56 | 178.69 | 178.68 | 0.17 |
| Main Reach | 0.55 | Max WS | exist 100 | 428.45 | 80.20 | 85.30 | | 85.37 | 0.000953 | 2.24 | 293.88 | 243.00 | 0.22 |
| Main Reach | 0.5 | Max WS | exist 10 | 215.49 | 79.65 | 84.05 | | 84.24 | 0.004211 | 3.45 | 70.66 | 197.95 | 0.41 |
| Main Reach | 0.5 | Max WS | exist 100 | 427.45 | 79.65 | 84.65 | | 84.81 | 0.003654 | 3.79 | 201.51 | 238.63 | 0.40 |
| Main Reach | 0.45 | Max WS | exist 10 | 215.53 | 79.65 | 83.50 | | 83.57 | 0.001473 | 2.29 | 151.11 | 202.68 | 0.25 |
| Main Reach | 0.45 | Max WS | exist 100 | 424.98 | 79.65 | 84.14 | | 84.20 | 0.001416 | 2.61 | 298.12 | 256.89 | 0.26 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Main Reach | 0.40 | Max WS | exist 10 | 215.63 | 79.65 | 83.34 | | 83.36 | 0.000541 | 1.30 | 217.17 | 283.58 | 0.15 |
| Main Reach | 0.40 | Max WS | exist 100 | 424.16 | 79.65 | 83.97 | | 84.00 | 0.000570 | 1.58 | 426.73 | 376.88 | 0.16 |
| Main Reach | 0.35 | Max WS | exist 10 | 215.77 | 79.23 | 83.27 | | 83.29 | 0.000300 | 1.07 | 229.63 | 207.79 | 0.12 |
| Main Reach | 0.35 | Max WS | exist 100 | 424.37 | 79.23 | 83.88 | | 83.91 | 0.000458 | 1.53 | 362.65 | 228.52 | 0.15 |
| Main Reach | 0.30 | Max WS | exist 10 | 215.77 | 79.23 | 83.24 | | 83.26 | 0.000329 | 1.05 | 207.70 | 114.85 | 0.12 |
| Main Reach | 0.30 | Max WS | exist 100 | 424.22 | 79.23 | 83.83 | | 83.87 | 0.000572 | 1.61 | 294.75 | 182.55 | 0.17 |
| Main Reach | 0.25 | Max WS | exist 10 | 216.30 | 79.23 | 82.98 | | 83.09 | 0.002102 | 2.68 | 80.78 | 32.97 | 0.30 |
| Main Reach | 0.25 | Max WS | exist 100 | 424.24 | 79.23 | 83.56 | | 83.68 | 0.002255 | 3.19 | 235.54 | 285.27 | 0.32 |
| Main Reach | 0.20 | Max WS | exist 10 | 216.71 | 79.02 | 82.83 | | 82.89 | 0.001238 | 2.15 | 179.88 | 276.03 | 0.24 |
| Main Reach | 0.20 | Max WS | exist 100 | 424.69 | 79.02 | 83.41 | | 83.45 | 0.001091 | 2.31 | 364.14 | 329.91 | 0.23 |
| Main Reach | 0.15 | Max WS | exist 10 | 217.42 | 78.73 | 82.65 | | 82.68 | 0.000685 | 1.67 | 222.80 | 237.18 | 0.18 |
| Main Reach | 0.15 | Max WS | exist 100 | 426.10 | 78.73 | 83.22 | | 83.26 | 0.000815 | 2.06 | 358.51 | 242.37 | 0.20 |
| Main Reach | 0.10 | Max WS | exist 10 | 217.80 | 78.71 | 82.55 | | 82.59 | 0.000985 | 1.94 | 197.30 | 243.90 | 0.21 |
| Main Reach | 0.10 | Max WS | exist 100 | 426.83 | 78.71 | 83.11 | | 83.15 | 0.001065 | 2.29 | 334.09 | 248.35 | 0.23 |
| Main Reach | 0.05 | Max WS | exist 10 | 218.57 | 78.19 | 82.22 | | 82.31 | 0.001713 | 2.54 | 143.29 | 336.37 | 0.27 |
| Main Reach | 0.05 | Max WS | exist 100 | 428.65 | 78.19 | 82.85 | | 82.91 | 0.001173 | 2.42 | 358.11 | 340.44 | 0.23 |
| Main Reach | 0.04 | Max WS | exist 10 | 219.42 | 77.40 | 81.38 | | 81.58 | 0.004725 | 3.68 | 68.62 | 83.03 | 0.44 |
| Main Reach | 0.04 | Max WS | exist 100 | 430.49 | 77.40 | 82.06 | | 82.30 | 0.004698 | 4.40 | 158.95 | 178.01 | 0.46 |
| Main Reach | 0.03 | Max WS | exist 10 | 220.10 | 76.67 | 80.80 | | 80.86 | 0.001933 | 2.06 | 106.88 | 62.42 | 0.28 |
| Main Reach | 0.03 | Max WS | exist 100 | 431.68 | 76.67 | 81.36 | | 81.47 | 0.002700 | 2.80 | 188.22 | 204.04 | 0.34 |
| Main Reach | 0.02 | Max WS | exist 10 | 197.58 | 76.20 | 80.25 | | 80.34 | 0.002074 | 2.55 | 127.66 | 285.12 | 0.30 |
| Main Reach | 0.02 | Max WS | exist 100 | 432.95 | 76.20 | 80.94 | | 80.99 | 0.001445 | 2.53 | 356.11 | 382.15 | 0.26 |
| Main Reach | 0.01 | Max WS | exist 10 | 191.07 | 75.74 | 79.96 | | 79.99 | 0.000924 | 1.51 | 196.72 | 237.64 | 0.19 |
| Main Reach | 0.01 | Max WS | exist 100 | 435.05 | 75.74 | 80.72 | | 80.74 | 0.000692 | 1.62 | 470.44 | 420.36 | 0.18 |
| Main Reach | 0.009 | Max WS | exist 10 | 191.47 | 75.08 | 79.89 | | 79.90 | 0.000428 | 1.37 | 273.55 | 260.91 | 0.14 |
| Main Reach | 0.009 | Max WS | exist 100 | 436.26 | 75.08 | 80.66 | | 80.67 | 0.000420 | 1.58 | 570.21 | 472.16 | 0.14 |
| Main Reach | 0.008 | Max WS | exist 10 | 193.26 | 73.85 | 79.76 | | 79.80 | 0.000458 | 1.59 | 125.29 | 46.21 | 0.15 |
| Main Reach | 0.008 | Max WS | exist 100 | 300.53 | 73.85 | 80.54 | | 80.58 | 0.000426 | 1.70 | 306.25 | 364.64 | 0.15 |
| Main Reach | 0.007 | Max WS | exist 10 | 192.90 | 73.00 | 79.71 | | 79.72 | 0.000196 | 1.15 | 209.47 | 87.32 | 0.10 |
| Main Reach | 0.007 | Max WS | exist 100 | 300.51 | 73.00 | 80.49 | | 80.51 | 0.000212 | 1.30 | 347.93 | 248.33 | 0.11 |
| Federico Trib | 1.6 | Max WS | exist 10 | 27.65 | 117.18 | 117.59 | | 117.60 | 0.005080 | 0.82 | 36.66 | 163.31 | 0.32 |
| Federico Trib | 1.6 | Max WS | exist 100 | 55.41 | 117.18 | 117.72 | | 117.73 | 0.005146 | 0.99 | 59.87 | 200.49 | 0.34 |
| Federico Trib | 1.58333* | Max WS | exist 10 | 27.64 | 116.48 | 117.00 | | 117.02 | 0.005759 | 1.02 | 29.87 | 135.98 | 0.35 |
| Federico Trib | 1.58333* | Max WS | exist 100 | 55.32 | 116.48 | 117.15 | | 117.17 | 0.005294 | 1.16 | 52.99 | 175.86 | 0.35 |
| Federico Trib | 1.56666* | Max WS | exist 10 | 27.63 | 115.79 | 116.36 | | 116.38 | 0.006078 | 1.12 | 24.74 | 86.52 | 0.37 |
| Federico Trib | 1.56666* | Max WS | exist 100 | 55.30 | 115.79 | 116.54 | | 116.56 | 0.005880 | 1.31 | 42.14 | 112.92 | 0.38 |
| Federico Trib | 1.55* | Max WS | exist 10 | 27.62 | 115.09 | 115.71 | | 115.73 | 0.005959 | 1.17 | 23.71 | 76.70 | 0.37 |
| Federico Trib | 1.55* | Max WS | exist 100 | 55.27 | 115.09 | 115.90 | | 115.93 | 0.005759 | 1.37 | 40.40 | 100.12 | 0.38 |
| Federico Trib | 1.53333* | Max WS | exist 10 | 27.61 | 114.39 | 115.07 | | 115.09 | 0.005753 | 1.22 | 22.67 | 66.86 | 0.37 |
| Federico Trib | 1.53333* | Max WS | exist 100 | 55.26 | 114.39 | 115.28 | | 115.31 | 0.005385 | 1.41 | 39.11 | 87.80 | 0.37 |
| Federico Trib | 1.51666* | Max WS | exist 10 | 27.60 | 113.70 | 114.46 | | 114.49 | 0.005298 | 1.27 | 21.81 | 57.06 | 0.36 |
| Federico Trib | 1.51666* | Max WS | exist 100 | 55.24 | 113.70 | 114.68 | | 114.72 | 0.005463 | 1.53 | 36.08 | 78.33 | 0.38 |
| Federico Trib | 1.5 | Max WS | exist 10 | 27.60 | 113.00 | 113.87 | | 113.90 | 0.005552 | 1.41 | 19.59 | 45.21 | 0.38 |
| Federico Trib | 1.5 | Max WS | exist 100 | 55.16 | 113.00 | 114.10 | | 114.14 | 0.005141 | 1.68 | 38.63 | 136.44 | 0.38 |
| Federico Trib | 1.48333* | Max WS | exist 10 | 27.59 | 112.67 | 113.33 | | 113.35 | 0.004656 | 1.25 | 22.06 | 53.33 | 0.34 |
| Federico Trib | 1.48333* | Max WS | exist 100 | 55.13 | 112.67 | 113.57 | | 113.60 | 0.004808 | 1.51 | 36.40 | 67.63 | 0.36 |
| Federico Trib | 1.46666* | Max WS | exist 10 | 27.57 | 112.33 | 112.87 | | 112.89 | 0.004040 | 1.11 | 24.79 | 64.22 | 0.32 |
| Federico Trib | 1.46666* | Max WS | exist 100 | 55.09 | 112.33 | 113.09 | | 113.12 | 0.004201 | 1.37 | 40.33 | 79.08 | 0.34 |
| Federico Trib | 1.45* | Max WS | exist 10 | 27.56 | 112.00 | 112.47 | | 112.48 | 0.003688 | 1.01 | 27.29 | 76.32 | 0.30 |
| Federico Trib | 1.45* | Max WS | exist 100 | 55.04 | 112.00 | 112.66 | | 112.69 | 0.003863 | 1.26 | 43.80 | 91.41 | 0.32 |
| Federico Trib | 1.43333* | Max WS | exist 10 | 27.55 | 111.67 | 112.08 | | 112.09 | 0.003662 | 0.95 | 29.01 | 88.54 | 0.29 |
| Federico Trib | 1.43333* | Max WS | exist 100 | 55.00 | 111.67 | 112.26 | | 112.28 | 0.003789 | 1.19 | 46.33 | 103.81 | 0.31 |
| Federico Trib | 1.41666* | Max WS | exist 10 | 27.53 | 111.33 | 111.70 | | 111.71 | 0.003532 | 0.89 | 30.97 | 101.58 | 0.28 |
| Federico Trib | 1.41666* | Max WS | exist 100 | 54.93 | 111.33 | 111.86 | | 111.88 | 0.003615 | 1.11 | 49.28 | 117.14 | 0.30 |
| Federico Trib | 1.4 | Max WS | exist 10 | 27.53 | 111.00 | 111.34 | | 111.35 | 0.003306 | 0.83 | 33.22 | 115.27 | 0.27 |
| Federico Trib | 1.4 | Max WS | exist 100 | 54.92 | 111.00 | 111.51 | | 111.52 | 0.003096 | 1.01 | 54.22 | 132.40 | 0.28 |
| Federico Trib | 1.38* | Max WS | exist 10 | 34.20 | 110.60 | 110.98 | | 110.99 | 0.003318 | 0.89 | 38.52 | 120.77 | 0.28 |
| Federico Trib | 1.38* | Max WS | exist 100 | 67.35 | 110.60 | 111.16 | | 111.18 | 0.003155 | 1.08 | 62.17 | 139.23 | 0.29 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Federico Trib | 1.36* | Max WS | exist 10 | 40.95 | 110.20 | 110.62 | | 110.63 | 0.003339 | 0.94 | 43.55 | 125.86 | 0.28 |
| Federico Trib | 1.36* | Max WS | exist 100 | 79.90 | 110.20 | 110.81 | | 110.83 | 0.003203 | 1.14 | 69.80 | 145.57 | 0.29 |
| Federico Trib | 1.34* | Max WS | exist 10 | 47.70 | 109.80 | 110.25 | | 110.26 | 0.003465 | 1.00 | 47.84 | 130.22 | 0.29 |
| Federico Trib | 1.34* | Max WS | exist 100 | 92.45 | 109.80 | 110.45 | | 110.48 | 0.003216 | 1.20 | 77.34 | 151.64 | 0.29 |
| Federico Trib | 1.32* | Max WS | exist 10 | 54.44 | 109.40 | 109.90 | | 109.92 | 0.002830 | 0.97 | 56.26 | 137.59 | 0.27 |
| Federico Trib | 1.32* | Max WS | exist 100 | 105.00 | 109.40 | 110.07 | | 110.09 | 0.003749 | 1.31 | 80.33 | 154.52 | 0.32 |
| Federico Trib | 1.3 | Max WS | exist 10 | 61.10 | 109.00 | 109.44 | | 109.47 | 0.005466 | 1.25 | 48.80 | 194.55 | 0.36 |
| Federico Trib | 1.3 | Max WS | exist 100 | 117.42 | 109.00 | 109.61 | | 109.64 | 0.004557 | 1.38 | 97.33 | 240.20 | 0.35 |
| Federico Trib | 1.28* | Max WS | exist 10 | 61.07 | 108.40 | 108.90 | | 108.92 | 0.005208 | 1.29 | 47.29 | 118.53 | 0.36 |
| Federico Trib | 1.28* | Max WS | exist 100 | 117.29 | 108.40 | 109.11 | | 109.15 | 0.004981 | 1.55 | 78.47 | 172.62 | 0.37 |
| Federico Trib | 1.26* | Max WS | exist 10 | 61.02 | 107.80 | 108.36 | | 108.39 | 0.005248 | 1.36 | 44.75 | 103.96 | 0.37 |
| Federico Trib | 1.26* | Max WS | exist 100 | 117.14 | 107.80 | 108.61 | | 108.65 | 0.004742 | 1.59 | 73.56 | 125.49 | 0.37 |
| Federico Trib | 1.24* | Max WS | exist 10 | 60.91 | 107.20 | 107.91 | | 107.94 | 0.003554 | 1.25 | 48.57 | 95.48 | 0.31 |
| Federico Trib | 1.24* | Max WS | exist 100 | 117.08 | 107.20 | 108.17 | | 108.21 | 0.003881 | 1.55 | 75.45 | 115.14 | 0.34 |
| Federico Trib | 1.22* | Max WS | exist 10 | 60.89 | 106.60 | 107.68 | | 107.70 | 0.001192 | 0.91 | 67.03 | 100.27 | 0.19 |
| Federico Trib | 1.22* | Max WS | exist 100 | 116.84 | 106.60 | 107.88 | | 107.91 | 0.001910 | 1.36 | 88.71 | 118.94 | 0.25 |
| Federico Trib | 1.20 | Max WS | exist 10 | 60.81 | 106.00 | 107.61 | | 107.61 | 0.000372 | 0.71 | 96.73 | 120.69 | 0.12 |
| Federico Trib | 1.20 | Max WS | exist 100 | 115.68 | 106.00 | 107.74 | | 107.76 | 0.000889 | 1.18 | 114.03 | 132.33 | 0.18 |
| Federico Trib | 1.10 | Max WS | exist 10 | 75.98 | 104.00 | 106.22 | | 106.28 | 0.004585 | 2.36 | 58.14 | 195.91 | 0.40 |
| Federico Trib | 1.10 | Max WS | exist 100 | 144.16 | 104.00 | 106.49 | | 106.54 | 0.003480 | 2.39 | 118.05 | 236.06 | 0.36 |
| Federico Trib | 1.0 | Max WS | exist 10 | 95.22 | 102.98 | 105.05 | | 105.06 | 0.000543 | 1.04 | 135.53 | 189.64 | 0.15 |
| Federico Trib | 1.0 | Max WS | exist 100 | 184.69 | 102.98 | 105.56 | | 105.57 | 0.000562 | 1.28 | 240.75 | 228.64 | 0.16 |
| Federico Trib | 0.99 | Max WS | exist 10 | 95.18 | 102.09 | 103.82 | | 104.00 | 0.008055 | 3.48 | 32.34 | 37.99 | 0.54 |
| Federico Trib | 0.99 | Max WS | exist 100 | 184.41 | 102.09 | 104.26 | | 104.49 | 0.008409 | 4.33 | 67.22 | 107.83 | 0.58 |
| Federico Trib | 0.98 | Max WS | exist 10 | 100.49 | 101.00 | 102.37 | | 102.44 | 0.003821 | 2.19 | 56.00 | 85.90 | 0.37 |
| Federico Trib | 0.98 | Max WS | exist 100 | 193.63 | 101.00 | 102.81 | | 102.89 | 0.003572 | 2.63 | 97.75 | 106.77 | 0.37 |
| Federico Trib | 0.97 | Max WS | exist 10 | 106.31 | 100.00 | 101.75 | | 101.76 | 0.000521 | 0.90 | 135.54 | 152.04 | 0.14 |
| Federico Trib | 0.97 | Max WS | exist 100 | 203.26 | 100.00 | 102.22 | | 102.24 | 0.000592 | 1.17 | 217.76 | 208.60 | 0.16 |
| Federico Trib | 0.96 | Max WS | exist 10 | 110.19 | 98.75 | 101.21 | | 101.34 | 0.004479 | 3.14 | 53.66 | 86.28 | 0.42 |
| Federico Trib | 0.96 | Max WS | exist 100 | 210.05 | 98.75 | 101.66 | | 101.80 | 0.004532 | 3.67 | 101.43 | 128.15 | 0.44 |
| Federico Trib | 0.95 | Max WS | exist 10 | 115.84 | 97.82 | 100.22 | | 100.27 | 0.002455 | 2.15 | 82.52 | 115.61 | 0.30 |
| Federico Trib | 0.95 | Max WS | exist 100 | 219.76 | 97.82 | 100.61 | | 100.68 | 0.002737 | 2.63 | 132.91 | 144.13 | 0.33 |
| Federico Trib | 0.94 | Max WS | exist 10 | 121.43 | 97.03 | 99.65 | | 99.67 | 0.001078 | 1.41 | 161.50 | 226.22 | 0.20 |
| Federico Trib | 0.94 | Max WS | exist 100 | 229.06 | 97.03 | 99.96 | | 99.99 | 0.001293 | 1.75 | 233.25 | 234.54 | 0.23 |
| Federico Trib | 0.937 | Max WS | exist 10 | 120.86 | 96.60 | 99.23 | | 99.25 | 0.001338 | 1.19 | 160.44 | 356.61 | 0.21 |
| Federico Trib | 0.937 | Max WS | exist 100 | 227.53 | 96.60 | 99.46 | | 99.48 | 0.001602 | 1.50 | 246.25 | 396.70 | 0.24 |
| Federico Trib | 0.93 | Max WS | exist 10 | 139.62 | 95.99 | 98.34 | | 98.41 | 0.004461 | 2.69 | 106.46 | 260.15 | 0.40 |
| Federico Trib | 0.93 | Max WS | exist 100 | 255.01 | 95.99 | 98.61 | | 98.67 | 0.003878 | 2.83 | 180.26 | 278.34 | 0.39 |
| Federico Trib | 0.925 | Max WS | exist 10 | 149.34 | 95.00 | 97.74 | | 97.76 | 0.001544 | 0.95 | 156.86 | 246.56 | 0.21 |
| Federico Trib | 0.925 | Max WS | exist 100 | 271.92 | 95.00 | 98.08 | | 98.10 | 0.001441 | 1.07 | 255.07 | 332.08 | 0.21 |
| Federico Trib | 0.92 | Max WS | exist 10 | 149.22 | 94.89 | 97.21 | | 97.29 | 0.003411 | 2.97 | 101.39 | 176.59 | 0.37 |
| Federico Trib | 0.92 | Max WS | exist 100 | 271.53 | 94.89 | 97.60 | | 97.68 | 0.002999 | 3.14 | 173.35 | 189.40 | 0.36 |
| Federico Trib | 0.91 | Max WS | exist 10 | 153.58 | 94.51 | 96.63 | | 96.64 | 0.000844 | 0.93 | 199.36 | 190.39 | 0.17 |
| Federico Trib | 0.91 | Max WS | exist 100 | 278.77 | 94.51 | 97.07 | | 97.09 | 0.000899 | 1.10 | 285.88 | 201.88 | 0.18 |
| Federico Trib | 0.90 | Max WS | exist 10 | 158.67 | 93.00 | 96.09 | | 96.15 | 0.002148 | 2.41 | 123.08 | 167.61 | 0.29 |
| Federico Trib | 0.90 | Max WS | exist 100 | 287.44 | 93.00 | 96.56 | | 96.62 | 0.001916 | 2.61 | 209.53 | 197.63 | 0.29 |
| Federico Trib | 0.89 | Max WS | exist 10 | 162.28 | 93.00 | 95.23 | | 95.35 | 0.004541 | 3.36 | 76.57 | 100.79 | 0.43 |
| Federico Trib | 0.89 | Max WS | exist 100 | 293.65 | 93.00 | 95.65 | | 95.81 | 0.005036 | 4.05 | 123.80 | 123.71 | 0.47 |
| Federico Trib | 0.88 | Max WS | exist 10 | 168.07 | 91.00 | 93.61 | | 93.68 | 0.003806 | 2.51 | 105.33 | 142.52 | 0.37 |
| Federico Trib | 0.88 | Max WS | exist 100 | 303.66 | 91.00 | 94.03 | | 94.10 | 0.003412 | 2.83 | 166.67 | 151.88 | 0.37 |
| Federico Trib | 0.875 | Max WS | exist 10 | 171.14 | 90.70 | 93.07 | | 93.10 | 0.001164 | 1.24 | 142.27 | 181.90 | 0.20 |
| Federico Trib | 0.875 | Max WS | exist 100 | 309.36 | 90.70 | 93.54 | | 93.57 | 0.001122 | 1.50 | 232.52 | 203.85 | 0.21 |
| Federico Trib | 0.87 | Max WS | exist 10 | 176.48 | 90.00 | 92.59 | | 92.63 | 0.001200 | 1.65 | 134.74 | 179.50 | 0.22 |
| Federico Trib | 0.87 | Max WS | exist 100 | 319.16 | 90.00 | 93.01 | | 93.06 | 0.001457 | 2.10 | 227.36 | 264.76 | 0.25 |
| Federico Trib | 0.86 | Max WS | exist 10 | 179.77 | 88.30 | 91.90 | | 92.01 | 0.003985 | 2.71 | 66.37 | 43.12 | 0.38 |
| Federico Trib | 0.86 | Max WS | exist 100 | 325.09 | 88.30 | 92.37 | | 92.48 | 0.003498 | 2.99 | 164.66 | 225.07 | 0.38 |
| Federico Trib | 0.85 | Max WS | exist 10 | 183.07 | 87.91 | 91.16 | | 91.25 | 0.002117 | 2.65 | 113.45 | 160.00 | 0.30 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Federico Trib | 0.85 | Max WS | exist 100 | 331.17 | 87.91 | 91.72 | | 91.80 | 0.001874 | 2.87 | 213.60 | 199.78 | 0.29 |
| Federico Trib | 0.84 | Max WS | exist 10 | 187.58 | 87.92 | 90.68 | | 90.71 | 0.000863 | 1.76 | 183.41 | 144.02 | 0.20 |
| Federico Trib | 0.84 | Max WS | exist 100 | 339.64 | 87.92 | 91.25 | | 91.28 | 0.000977 | 2.14 | 268.11 | 157.21 | 0.22 |
| Federico Trib | 0.83 | Max WS | exist 10 | 190.74 | 86.77 | 90.11 | | 90.25 | 0.003100 | 3.15 | 82.74 | 125.82 | 0.37 |
| Federico Trib | 0.83 | Max WS | exist 100 | 345.64 | 86.77 | 90.69 | | 90.83 | 0.002896 | 3.53 | 158.23 | 134.39 | 0.37 |
| Federico Trib | 0.82 | Max WS | exist 10 | 190.72 | 86.01 | 89.42 | | 89.52 | 0.002621 | 2.81 | 98.01 | 93.33 | 0.33 |
| Federico Trib | 0.82 | Max WS | exist 100 | 345.55 | 86.01 | 89.88 | | 90.03 | 0.003452 | 3.65 | 143.41 | 104.21 | 0.39 |
| Federico Trib | 0.81 | Max WS | exist 10 | 194.01 | 85.71 | 89.05 | | 89.09 | 0.001564 | 1.93 | 184.66 | 265.14 | 0.25 |
| Federico Trib | 0.81 | Max WS | exist 100 | 351.44 | 85.71 | 89.47 | | 89.51 | 0.001419 | 2.10 | 300.28 | 280.98 | 0.24 |
| Federico Trib | 0.807 | Max WS | exist 10 | 201.91 | 84.70 | 88.23 | | 88.25 | 0.001007 | 1.33 | 199.06 | 201.28 | 0.19 |
| Federico Trib | 0.807 | Max WS | exist 100 | 365.56 | 84.70 | 88.76 | | 88.78 | 0.000911 | 1.56 | 319.00 | 251.84 | 0.20 |
| Federico Trib | 0.80 | Max WS | exist 10 | 207.68 | 84.46 | 87.94 | | 87.96 | 0.000553 | 1.31 | 234.78 | 152.67 | 0.15 |
| Federico Trib | 0.80 | Max WS | exist 100 | 376.04 | 84.46 | 88.45 | | 88.47 | 0.000754 | 1.75 | 312.86 | 157.52 | 0.19 |
| Federico Trib | 0.79 | Max WS | exist 10 | 207.34 | 83.77 | 87.39 | | 87.46 | 0.002449 | 2.29 | 124.26 | 176.72 | 0.31 |
| Federico Trib | 0.79 | Max WS | exist 100 | 375.50 | 83.77 | 87.87 | | 87.95 | 0.002373 | 2.58 | 217.42 | 207.11 | 0.32 |
| Federico Trib | 0.78 | Max WS | exist 10 | 212.33 | 82.76 | 86.87 | | 86.89 | 0.000598 | 1.41 | 271.79 | 267.46 | 0.16 |
| Federico Trib | 0.78 | Max WS | exist 100 | 385.16 | 82.76 | 87.35 | | 87.38 | 0.000669 | 1.65 | 414.04 | 319.49 | 0.17 |
| Federico Trib | 0.77 | Max WS | exist 10 | 216.53 | 82.68 | 86.04 | | 86.19 | 0.004488 | 3.53 | 99.18 | 128.12 | 0.43 |
| Federico Trib | 0.77 | Max WS | exist 100 | 393.01 | 82.68 | 86.55 | | 86.70 | 0.004201 | 3.95 | 186.12 | 209.22 | 0.43 |
| Federico Trib | 0.76 | Max WS | exist 10 | 221.46 | 81.79 | 85.06 | | 85.09 | 0.001162 | 2.02 | 195.82 | 174.80 | 0.23 |
| Federico Trib | 0.76 | Max WS | exist 100 | 402.35 | 81.79 | 85.60 | | 85.65 | 0.001238 | 2.38 | 302.18 | 214.18 | 0.24 |
| Federico Trib | .75875* | Max WS | exist 10 | 221.42 | 81.64 | 84.96 | | 85.00 | 0.001296 | 2.17 | 186.09 | 178.11 | 0.24 |
| Federico Trib | .75875* | Max WS | exist 100 | 402.27 | 81.64 | 85.50 | | 85.55 | 0.001343 | 2.51 | 292.18 | 214.68 | 0.25 |
| Federico Trib | .7575* | Max WS | exist 10 | 221.38 | 81.49 | 84.84 | | 84.90 | 0.001525 | 2.36 | 171.46 | 180.89 | 0.26 |
| Federico Trib | .7575* | Max WS | exist 100 | 402.18 | 81.49 | 85.39 | | 85.45 | 0.001511 | 2.68 | 277.74 | 214.17 | 0.27 |
| Federico Trib | .75625* | Max WS | exist 10 | 221.32 | 81.35 | 84.70 | | 84.78 | 0.001907 | 2.63 | 151.05 | 179.28 | 0.29 |
| Federico Trib | .75625* | Max WS | exist 100 | 402.10 | 81.35 | 85.26 | | 85.33 | 0.001774 | 2.90 | 258.47 | 211.30 | 0.29 |
| Federico Trib | 0.755 | Max WS | exist 10 | 221.31 | 81.20 | 84.57 | | 84.64 | 0.001735 | 2.50 | 143.01 | 129.43 | 0.28 |
| Federico Trib | 0.755 | Max WS | exist 100 | 402.02 | 81.20 | 85.09 | | 85.19 | 0.002258 | 3.23 | 230.90 | 205.64 | 0.33 |
| Federico Trib | .754* | Max WS | exist 10 | 221.29 | 80.96 | 84.44 | | 84.52 | 0.001968 | 2.57 | 143.40 | 150.27 | 0.29 |
| Federico Trib | .754* | Max WS | exist 100 | 401.97 | 80.96 | 84.94 | | 85.03 | 0.002218 | 3.10 | 234.40 | 198.96 | 0.32 |
| Federico Trib | .753* | Max WS | exist 10 | 221.27 | 80.72 | 84.31 | | 84.38 | 0.002131 | 2.56 | 146.12 | 165.53 | 0.30 |
| Federico Trib | .753* | Max WS | exist 100 | 401.93 | 80.72 | 84.80 | | 84.88 | 0.002214 | 2.98 | 237.04 | 196.40 | 0.32 |
| Federico Trib | .752* | Max WS | exist 10 | 221.27 | 80.48 | 84.16 | | 84.23 | 0.002274 | 2.52 | 147.65 | 169.11 | 0.31 |
| Federico Trib | .752* | Max WS | exist 100 | 401.89 | 80.48 | 84.65 | | 84.73 | 0.002295 | 2.91 | 236.70 | 195.22 | 0.32 |
| Federico Trib | .751* | Max WS | exist 10 | 221.26 | 80.24 | 84.00 | | 84.07 | 0.002594 | 2.65 | 136.53 | 150.66 | 0.33 |
| Federico Trib | .751* | Max WS | exist 100 | 401.87 | 80.24 | 84.46 | | 84.56 | 0.003005 | 3.16 | 216.21 | 194.12 | 0.36 |
| Federico Trib | 0.75 | Max WS | exist 10 | 221.25 | 80.00 | 83.78 | | 83.88 | 0.003478 | 3.02 | 121.41 | 151.47 | 0.37 |
| Federico Trib | 0.75 | Max WS | exist 100 | 401.85 | 80.00 | 84.22 | | 84.33 | 0.003780 | 3.44 | 198.05 | 186.09 | 0.40 |
| Federico Trib | .7494* | Max WS | exist 10 | 225.32 | 80.00 | 83.57 | | 83.64 | 0.003078 | 2.75 | 147.40 | 181.95 | 0.35 |
| Federico Trib | .7494* | Max WS | exist 100 | 409.57 | 80.00 | 84.01 | | 84.09 | 0.003119 | 2.99 | 230.91 | 196.50 | 0.36 |
| Federico Trib | .7488* | Max WS | exist 10 | 225.27 | 80.00 | 83.36 | | 83.42 | 0.003321 | 2.75 | 151.25 | 189.76 | 0.36 |
| Federico Trib | .7488* | Max WS | exist 100 | 409.46 | 80.00 | 83.80 | | 83.87 | 0.003457 | 3.04 | 239.86 | 227.83 | 0.37 |
| Federico Trib | .7482* | Max WS | exist 10 | 225.23 | 80.00 | 83.18 | | 83.22 | 0.002537 | 2.32 | 182.35 | 222.53 | 0.31 |
| Federico Trib | .7482* | Max WS | exist 100 | 409.30 | 80.00 | 83.63 | | 83.67 | 0.002238 | 2.37 | 285.60 | 233.46 | 0.30 |
| Federico Trib | .7476* | Max WS | exist 10 | 225.18 | 80.00 | 83.00 | | 83.04 | 0.002679 | 2.30 | 180.50 | 216.18 | 0.31 |
| Federico Trib | .7476* | Max WS | exist 100 | 409.17 | 80.00 | 83.48 | | 83.52 | 0.002204 | 2.29 | 286.72 | 227.12 | 0.29 |
| Federico Trib | 0.747 | Max WS | exist 10 | 225.03 | 80.00 | 82.81 | | 82.85 | 0.002875 | 2.28 | 177.52 | 210.60 | 0.32 |
| Federico Trib | 0.747 | Max WS | exist 100 | 409.03 | 80.00 | 83.34 | | 83.37 | 0.002099 | 2.17 | 289.95 | 219.94 | 0.28 |
| Federico Trib | 0.744 | Max WS | exist 10 | 224.89 | 79.00 | 82.56 | | 82.63 | 0.001574 | 2.59 | 164.28 | 198.64 | 0.27 |
| Federico Trib | 0.744 | Max WS | exist 100 | 408.86 | 79.00 | 83.13 | | 83.20 | 0.001513 | 2.86 | 281.47 | 214.32 | 0.27 |
| Federico Trib | 0.74 | Max WS | exist 10 | 224.79 | 77.38 | 81.88 | | 81.93 | 0.001056 | 2.08 | 186.61 | 219.11 | 0.22 |
| Federico Trib | 0.74 | Max WS | exist 100 | 408.62 | 77.38 | 82.48 | | 82.53 | 0.000997 | 2.28 | 343.88 | 288.65 | 0.22 |
| Federico Trib | 0.73 | Max WS | exist 10 | 260.83 | 76.00 | 81.37 | | 81.47 | 0.001690 | 2.94 | 164.49 | 197.84 | 0.28 |
| Federico Trib | 0.73 | Max WS | exist 100 | 476.30 | 76.00 | 82.00 | | 82.09 | 0.001636 | 3.22 | 299.44 | 233.98 | 0.28 |
| Federico Trib | 0.72 | Max WS | exist 10 | 264.40 | 76.00 | 80.85 | | 80.92 | 0.001517 | 2.36 | 168.71 | 199.79 | 0.26 |
| Federico Trib | 0.72 | Max WS | exist 100 | 483.14 | 76.00 | 81.52 | | 81.59 | 0.001267 | 2.51 | 347.99 | 307.63 | 0.25 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Federico Trib | 0.71 | Max WS | exist 10 | 268.24 | 75.00 | 80.41 | | 80.46 | 0.000963 | 2.08 | 214.09 | 223.46 | 0.21 |
| Federico Trib | 0.71 | Max WS | exist 100 | 490.94 | 75.00 | 81.15 | | 81.20 | 0.000829 | 2.23 | 403.72 | 279.37 | 0.20 |
| | | | | | | | | | | | | | |
| Federico Trib | 0.70 | Max WS | exist 10 | 269.84 | 75.00 | 80.24 | | 80.30 | 0.001073 | 2.24 | 182.67 | 155.48 | 0.22 |
| Federico Trib | 0.70 | Max WS | exist 100 | 494.28 | 75.00 | 80.98 | | 81.05 | 0.001113 | 2.63 | 307.51 | 181.73 | 0.24 |
| | | | | | | | | | | | | | |
| Federico Trib | .65* | Max WS | exist 10 | 271.08 | 75.00 | 80.06 | | 80.14 | 0.001415 | 2.51 | 164.21 | 133.38 | 0.25 |
| Federico Trib | .65* | Max WS | exist 100 | 497.05 | 75.00 | 80.81 | | 80.89 | 0.001394 | 2.88 | 311.34 | 265.65 | 0.26 |
| | | | | | | | | | | | | | |
| Federico Trib | 0.6 | Max WS | exist 10 | 272.06 | 75.00 | 79.89 | | 79.95 | 0.001362 | 2.40 | 209.23 | 220.49 | 0.25 |
| Federico Trib | 0.6 | Max WS | exist 100 | 499.81 | 75.00 | 80.68 | | 80.72 | 0.000879 | 2.26 | 434.11 | 299.02 | 0.21 |
| | | | | | | | | | | | | | |
| Federico Trib | 0.5 | Max WS | exist 10 | 273.28 | 74.00 | 79.80 | | 79.81 | 0.000105 | 0.82 | 451.19 | 229.01 | 0.07 |
| Federico Trib | 0.5 | Max WS | exist 100 | 503.14 | 74.00 | 80.62 | | 80.63 | 0.000148 | 1.10 | 666.23 | 280.28 | 0.09 |
| | | | | | | | | | | | | | |
| Federico Trib | 0.4 | Max WS | exist 10 | 272.80 | 73.64 | 79.71 | | 79.78 | 0.000968 | 2.32 | 164.81 | 110.36 | 0.21 |
| Federico Trib | 0.4 | Max WS | exist 100 | 503.04 | 73.64 | 80.49 | | 80.58 | 0.001267 | 2.89 | 251.72 | 112.35 | 0.25 |
| | | | | | | | | | | | | | |
| Down | 6.9 | Max WS | exist 10 | 465.70 | 72.00 | 79.71 | | 79.76 | 0.000737 | 1.92 | 303.09 | 205.08 | 0.15 |
| Down | 6.9 | Max WS | exist 100 | 803.55 | 72.00 | 80.49 | | 80.54 | 0.000801 | 2.15 | 681.58 | 654.44 | 0.16 |
| | | | | | | | | | | | | | |
| Down | 6.85* | Max WS | exist 10 | 465.69 | 71.71 | 79.63 | | 79.69 | 0.000842 | 2.03 | 303.88 | 196.48 | 0.16 |
| Down | 6.85* | Max WS | exist 100 | 803.53 | 71.71 | 80.39 | | 80.46 | 0.001084 | 2.48 | 511.35 | 353.69 | 0.18 |
| | | | | | | | | | | | | | |
| Down | 6.8 | Max WS | exist 10 | 465.69 | 71.43 | 79.54 | 75.51 | 79.61 | 0.001061 | 2.23 | 278.10 | 155.52 | 0.17 |
| Down | 6.8 | Max WS | exist 100 | 803.53 | 71.43 | 80.26 | 76.61 | 80.35 | 0.001460 | 2.82 | 419.79 | 256.40 | 0.21 |

# APPENDIX F
## HEC-RAS POST-PROJECT MITIGATED AND FUTURE, FULLY DEVELOPED, UNMITIGATED SUMMARY TABLE

HEC-RAS Profile: Max WS

| Reach | River Sta | Profile | Plan | 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) | |
| Federico Trib | 1.4 | Max WS | 10yr mit | 48.20 | 109.90 | 110.82 | | 110.82 | 0.003371 | 0.70 | 68.65 | 130.67 | 0.17 |
| Federico Trib | 1.4 | Max WS | 100yr mit | 94.14 | 109.90 | 111.09 | | 111.11 | 0.003325 | 0.87 | 108.91 | 152.20 | 0.18 |
| Federico Trib | 1.375* | Max WS | 10yr mit | 48.12 | 109.66 | 110.51 | | 110.52 | 0.003277 | 0.69 | 70.12 | 135.17 | 0.17 |
| Federico Trib | 1.375* | Max WS | 100yr mit | 93.96 | 109.66 | 110.78 | | 110.79 | 0.003446 | 0.85 | 111.04 | 165.71 | 0.18 |
| Federico Trib | 1.35* | Max WS | 10yr mit | 48.01 | 109.43 | 110.20 | | 110.21 | 0.003435 | 0.69 | 69.96 | 143.52 | 0.17 |
| Federico Trib | 1.35* | Max WS | 100yr mit | 93.71 | 109.43 | 110.46 | | 110.47 | 0.003614 | 0.84 | 113.07 | 186.12 | 0.18 |
| Federico Trib | 1.325* | Max WS | 10yr mit | 47.89 | 109.19 | 109.90 | | 109.91 | 0.003049 | 0.64 | 76.43 | 166.85 | 0.16 |
| Federico Trib | 1.325* | Max WS | 100yr mit | 93.50 | 109.19 | 110.14 | | 110.15 | 0.003376 | 0.80 | 120.42 | 204.41 | 0.18 |
| Federico Trib | 1.3 | Max WS | 10yr mit | 47.84 | 108.95 | 109.54 | | 109.55 | 0.004818 | 0.75 | 64.78 | 178.72 | 0.20 |
| Federico Trib | 1.3 | Max WS | 100yr mit | 93.43 | 108.95 | 109.78 | | 109.79 | 0.004420 | 0.88 | 111.75 | 216.03 | 0.20 |
| Federico Trib | 1.275* | Max WS | 10yr mit | 51.88 | 108.21 | 108.94 | | 108.95 | 0.004717 | 0.80 | 65.27 | 143.43 | 0.20 |
| Federico Trib | 1.275* | Max WS | 100yr mit | 100.60 | 108.21 | 109.21 | | 109.22 | 0.004358 | 0.93 | 112.72 | 201.57 | 0.20 |
| Federico Trib | 1.25* | Max WS | 10yr mit | 55.87 | 107.47 | 108.37 | | 108.38 | 0.004496 | 0.85 | 66.09 | 118.14 | 0.20 |
| Federico Trib | 1.25* | Max WS | 100yr mit | 107.60 | 107.47 | 108.68 | | 108.69 | 0.003865 | 1.01 | 109.59 | 180.90 | 0.20 |
| Federico Trib | 1.225* | Max WS | 10yr mit | 59.84 | 106.74 | 107.92 | | 107.93 | 0.002504 | 0.78 | 77.73 | 115.32 | 0.16 |
| Federico Trib | 1.225* | Max WS | 100yr mit | 114.57 | 106.74 | 108.27 | | 108.29 | 0.002431 | 0.99 | 124.85 | 156.25 | 0.16 |
| Federico Trib | 1.2 | Max WS | 10yr mit | 63.63 | 106.00 | 107.71 | | 107.71 | 0.000898 | 0.65 | 109.46 | 129.36 | 0.10 |
| Federico Trib | 1.2 | Max WS | 100yr mit | 121.01 | 106.00 | 108.04 | | 108.05 | 0.001340 | 0.93 | 157.61 | 183.15 | 0.13 |
| Federico Trib | 1.18* | Max WS | 10yr mit | 76.20 | 105.50 | 107.53 | | 107.55 | 0.001873 | 0.95 | 94.68 | 134.95 | 0.15 |
| Federico Trib | 1.18* | Max WS | 100yr mit | 144.04 | 105.50 | 107.76 | | 107.78 | 0.003227 | 1.39 | 126.83 | 146.67 | 0.20 |
| Federico Trib | 1.161 | Max WS | 10yr mit | 78.41 | 105.00 | 107.44 | | 107.44 | 0.000406 | 0.44 | 189.70 | 163.89 | 0.07 |
| Federico Trib | 1.161 | Max WS | 100yr mit | 147.90 | 105.00 | 107.58 | | 107.59 | 0.000988 | 0.74 | 213.54 | 165.85 | 0.11 |
| Federico Trib | 1.16 | Max WS | 10yr mit | 78.73 | 105.00 | 107.43 | | | 0.000413 | 0.45 | 189.13 | 163.84 | 0.07 |
| Federico Trib | 1.16 | Max WS | 100yr mit | 148.50 | 105.00 | 107.57 | | | 0.001020 | 0.75 | 211.95 | 165.71 | 0.11 |
| Federico Trib | 1.15 | | | Mult Open | | | | | | | | | |
| Federico Trib | 1.14 | Max WS | 10yr mit | 78.72 | 105.00 | 106.92 | | 106.92 | 0.000577 | 0.60 | 169.86 | 168.71 | 0.08 |
| Federico Trib | 1.14 | Max WS | 100yr mit | 147.87 | 105.00 | 107.19 | | 107.20 | 0.001177 | 0.95 | 243.19 | 310.18 | 0.12 |
| Federico Trib | 1.139 | Max WS | 10yr mit | 79.05 | 104.80 | 106.91 | | 106.92 | 0.000580 | 0.61 | 169.69 | 168.67 | 0.08 |
| Federico Trib | 1.139 | Max WS | 100yr mit | 148.43 | 104.80 | 107.18 | | 107.19 | 0.001218 | 0.97 | 240.28 | 309.62 | 0.13 |
| Federico Trib | 1.1 | Max WS | 10yr mit | 83.96 | 104.00 | 106.38 | | 106.40 | 0.005181 | 1.55 | 91.88 | 219.43 | 0.24 |
| Federico Trib | 1.1 | Max WS | 100yr mit | 151.03 | 104.00 | 106.68 | | 106.69 | 0.003733 | 1.51 | 163.31 | 262.35 | 0.21 |
| Federico Trib | 1.0 | Max WS | 10yr mit | 76.54 | 102.98 | 105.02 | | 105.03 | 0.000915 | 0.75 | 129.69 | 187.24 | 0.11 |
| Federico Trib | 1.0 | Max WS | 100yr mit | 130.05 | 102.98 | 105.86 | | 105.86 | 0.000313 | 0.59 | 312.05 | 240.91 | 0.07 |
| Federico Trib | .999* | Max WS | 10yr mit | 76.49 | 102.79 | 104.99 | | 105.00 | 0.000725 | 0.67 | 152.08 | 187.02 | 0.09 |
| Federico Trib | .999* | Max WS | 100yr mit | 130.03 | 102.79 | 105.85 | | 105.85 | 0.000251 | 0.53 | 342.41 | 259.39 | 0.06 |
| Federico Trib | .998* | Max WS | 10yr mit | 76.45 | 102.59 | 104.97 | | 104.97 | 0.000605 | 0.61 | 165.61 | 188.06 | 0.09 |
| Federico Trib | .998* | Max WS | 100yr mit | 129.94 | 102.59 | 105.84 | | 105.84 | 0.000207 | 0.48 | 361.72 | 253.57 | 0.05 |
| Federico Trib | .9971 | Max WS | 10yr mit | 76.44 | 102.40 | 104.95 | | 104.95 | 0.000563 | 0.59 | 164.49 | 167.28 | 0.08 |
| Federico Trib | .9971 | Max WS | 100yr mit | 129.92 | 102.40 | 105.84 | | 105.84 | 0.000218 | 0.49 | 323.38 | 190.08 | 0.06 |
| Federico Trib | 0.997 | Max WS | 10yr mit | 76.44 | 102.40 | 104.94 | | 104.95 | 0.000572 | 0.59 | 163.54 | 167.00 | 0.08 |
| Federico Trib | 0.997 | Max WS | 100yr mit | 129.92 | 102.40 | 105.83 | | 105.84 | 0.000219 | 0.49 | 322.96 | 190.02 | 0.06 |
| Federico Trib | .9954 | | | Culvert | | | | | | | | | |
| Federico Trib | 0.993 | Max WS | 10yr mit | 76.42 | 102.20 | 103.92 | | 103.95 | 0.006443 | 1.27 | 60.26 | 76.74 | 0.25 |
| Federico Trib | 0.993 | Max WS | 100yr mit | 129.70 | 102.20 | 104.25 | | 104.28 | 0.005478 | 1.44 | 95.84 | 121.09 | 0.25 |
| Federico Trib | .9929 | Max WS | 10yr mit | 76.40 | 102.20 | 103.84 | | 103.88 | 0.008439 | 1.41 | 54.36 | 72.64 | 0.29 |
| Federico Trib | .9929 | Max WS | 100yr mit | 129.61 | 102.20 | 104.19 | | 104.22 | 0.006960 | 1.56 | 87.78 | 118.78 | 0.27 |
| Federico Trib | 0.98 | Max WS | 10yr mit | 75.98 | 101.00 | 102.69 | | 102.71 | 0.002100 | 1.08 | 86.19 | 101.42 | 0.16 |
| Federico Trib | 0.98 | Max WS | 100yr mit | 128.56 | 101.00 | 103.35 | | 103.36 | 0.001110 | 1.01 | 165.95 | 137.60 | 0.12 |
| Federico Trib | .9799 | | | Lat Struct | | | | | | | | | |
| Federico Trib | .979* | Max WS | 10yr mit | 58.17 | 100.80 | 102.64 | | 102.65 | 0.001277 | 0.82 | 87.01 | 96.17 | 0.12 |
| Federico Trib | .979* | Max WS | 100yr mit | 98.97 | 100.80 | 103.32 | | 103.33 | 0.000693 | 0.77 | 163.11 | 126.40 | 0.09 |
| Federico Trib | .978* | Max WS | 10yr mit | 58.16 | 100.60 | 102.59 | | 102.60 | 0.001115 | 0.76 | 91.93 | 89.60 | 0.10 |
| Federico Trib | .978* | Max WS | 100yr mit | 98.94 | 100.60 | 103.29 | | 103.30 | 0.000714 | 0.77 | 168.23 | 137.00 | 0.09 |
| Federico Trib | .9771 | Max WS | 10yr mit | 58.15 | 100.40 | 102.57 | | 102.57 | 0.000746 | 0.62 | 113.36 | 107.03 | 0.08 |
| Federico Trib | .9771 | Max WS | 100yr mit | 98.94 | 100.40 | 103.28 | | 103.28 | 0.000485 | 0.61 | 209.73 | 180.73 | 0.07 |
| Federico Trib | 0.977 | Max WS | 10yr mit | 58.15 | 100.40 | 102.56 | | 102.57 | 0.000761 | 0.62 | 112.55 | 106.72 | 0.08 |
| Federico Trib | 0.977 | Max WS | 100yr mit | 98.94 | 100.40 | 103.27 | | 103.28 | 0.000490 | 0.62 | 208.85 | 180.21 | 0.07 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Federico Trib | 0.975 | | | Culvert | | | | | | | | | |
| | | | | | | | | | | | | | |
| Federico Trib | 0.973 | Max WS | 10yr mit | 57.94 | 100.00 | 101.50 | | 101.51 | 0.002109 | 0.95 | 80.42 | 133.41 | 0.15 |
| Federico Trib | 0.973 | Max WS | 100yr mit | 98.82 | 100.00 | 101.84 | | 101.85 | 0.001689 | 1.01 | 130.50 | 159.32 | 0.14 |
| | | | | | | | | | | | | | |
| Federico Trib | .9729 | Max WS | 10yr mit | 57.92 | 100.00 | 101.48 | | 101.49 | 0.002324 | 0.99 | 77.46 | 131.72 | 0.16 |
| Federico Trib | .9729 | Max WS | 100yr mit | 98.81 | 100.00 | 101.83 | | 101.84 | 0.001790 | 1.03 | 127.70 | 157.98 | 0.15 |
| | | | | | | | | | | | | | |
| Federico Trib | 0.97 | Max WS | 10yr mit | 57.88 | 100.00 | 101.45 | | 101.45 | 0.001280 | 0.66 | 92.21 | 114.35 | 0.12 |
| Federico Trib | 0.97 | Max WS | 100yr mit | 98.78 | 100.00 | 101.80 | | 101.81 | 0.001231 | 0.79 | 134.18 | 125.58 | 0.12 |
| | | | | | | | | | | | | | |
| Federico Trib | .9675* | Max WS | 10yr mit | 58.58 | 99.69 | 101.40 | | 101.40 | 0.000917 | 0.66 | 97.56 | 115.19 | 0.10 |
| Federico Trib | .9675* | Max WS | 100yr mit | 99.86 | 99.69 | 101.74 | | 101.75 | 0.001017 | 0.81 | 142.63 | 144.03 | 0.11 |
| | | | | | | | | | | | | | |
| Federico Trib | .965* | Max WS | 10yr mit | 58.55 | 99.38 | 101.35 | | 101.36 | 0.000842 | 0.72 | 93.59 | 106.78 | 0.10 |
| Federico Trib | .965* | Max WS | 100yr mit | 99.85 | 99.38 | 101.69 | | 101.70 | 0.001042 | 0.91 | 134.68 | 136.32 | 0.12 |
| | | | | | | | | | | | | | |
| Federico Trib | .9625* | Max WS | 10yr mit | 58.53 | 99.06 | 101.31 | | 101.32 | 0.001096 | 0.91 | 80.33 | 97.83 | 0.12 |
| Federico Trib | .9625* | Max WS | 100yr mit | 99.84 | 99.06 | 101.63 | | 101.65 | 0.001416 | 1.16 | 116.96 | 128.00 | 0.14 |
| | | | | | | | | | | | | | |
| Federico Trib | 0.96 | Max WS | 10yr mit | 58.52 | 98.75 | 101.17 | | 101.21 | 0.003732 | 1.76 | 50.34 | 82.59 | 0.22 |
| Federico Trib | 0.96 | Max WS | 100yr mit | 99.84 | 98.75 | 101.49 | | 101.53 | 0.003985 | 2.00 | 80.37 | 106.11 | 0.23 |
| | | | | | | | | | | | | | |
| Federico Trib | .956666* | Max WS | 10yr mit | 60.59 | 98.44 | 100.78 | | 100.82 | 0.004262 | 1.74 | 51.16 | 100.82 | 0.23 |
| Federico Trib | .956666* | Max WS | 100yr mit | 102.76 | 98.44 | 101.08 | | 101.12 | 0.004183 | 1.91 | 84.64 | 122.25 | 0.23 |
| | | | | | | | | | | | | | |
| Federico Trib | .953333* | Max WS | 10yr mit | 60.53 | 98.13 | 100.41 | | 100.44 | 0.003729 | 1.50 | 57.75 | 102.90 | 0.21 |
| Federico Trib | .953333* | Max WS | 100yr mit | 102.66 | 98.13 | 100.70 | | 100.73 | 0.003746 | 1.68 | 90.07 | 123.48 | 0.22 |
| | | | | | | | | | | | | | |
| Federico Trib | 0.95 | Max WS | 10yr mit | 60.50 | 97.82 | 100.13 | | 100.14 | 0.002437 | 1.15 | 72.01 | 108.73 | 0.17 |
| Federico Trib | 0.95 | Max WS | 100yr mit | 102.52 | 97.82 | 100.38 | | 100.40 | 0.002830 | 1.38 | 101.91 | 127.34 | 0.19 |
| | | | | | | | | | | | | | |
| Federico Trib | 0.94 | Max WS | 10yr mit | 59.77 | 97.03 | 99.40 | | 99.41 | 0.001947 | 0.94 | 105.70 | 219.53 | 0.15 |
| Federico Trib | 0.94 | Max WS | 100yr mit | 102.72 | 97.03 | 99.71 | | 99.72 | 0.001277 | 0.89 | 174.53 | 224.05 | 0.12 |
| | | | | | | | | | | | | | |
| Federico Trib | .937 | Max WS | 10yr mit | 59.35 | 96.60 | 99.05 | | 99.05 | 0.000146 | 0.34 | 310.32 | 325.14 | 0.04 |
| Federico Trib | .937 | Max WS | 100yr mit | 104.12 | 96.60 | 99.47 | | 99.47 | 0.000141 | 0.38 | 461.04 | 398.46 | 0.04 |
| | | | | | | | | | | | | | |
| Federico Trib | .936* | Max WS | 10yr mit | 85.49 | 96.43 | 99.02 | | 99.02 | 0.000808 | 0.78 | 198.39 | 259.06 | 0.10 |
| Federico Trib | .936* | Max WS | 100yr mit | 151.61 | 96.43 | 99.44 | | 99.44 | 0.000660 | 0.81 | 319.86 | 325.88 | 0.10 |
| | | | | | | | | | | | | | |
| Federico Trib | .935* | Max WS | 10yr mit | 85.45 | 96.27 | 98.92 | | 98.93 | 0.001573 | 1.04 | 124.48 | 155.26 | 0.14 |
| Federico Trib | .935* | Max WS | 100yr mit | 151.57 | 96.27 | 99.35 | | 99.37 | 0.001450 | 1.16 | 204.36 | 210.74 | 0.14 |
| | | | | | | | | | | | | | |
| Federico Trib | .934 | Max WS | 10yr mit | 85.43 | 96.10 | 98.71 | | 98.73 | 0.003874 | 1.46 | 74.13 | 101.23 | 0.21 |
| Federico Trib | .934 | Max WS | 100yr mit | 151.55 | 96.10 | 99.16 | | 99.19 | 0.003328 | 1.63 | 132.03 | 156.30 | 0.21 |
| | | | | | | | | | | | | | |
| Federico Trib | 0.933 | Max WS | 10yr mit | 85.43 | 96.10 | 98.66 | | | 0.004476 | 1.53 | 69.74 | 97.59 | 0.23 |
| Federico Trib | 0.933 | Max WS | 100yr mit | 151.55 | 96.10 | 99.13 | | 99.16 | 0.003715 | 1.69 | 126.24 | 153.71 | 0.22 |
| | | | | | | | | | | | | | |
| Federico Trib | .931 | | | Mult Open | | | | | | | | | |
| | | | | | | | | | | | | | |
| Federico Trib | 0.93 | Max WS | 10yr mit | 85.43 | 96.00 | 98.26 | | 98.27 | 0.004236 | 1.23 | 100.82 | 254.72 | 0.21 |
| Federico Trib | 0.93 | Max WS | 100yr mit | 151.53 | 96.00 | 98.47 | | 98.49 | 0.004294 | 1.40 | 155.56 | 267.46 | 0.22 |
| | | | | | | | | | | | | | |
| Federico Trib | .929 | Max WS | 10yr mit | 85.43 | 96.00 | 98.20 | | 98.23 | 0.006023 | 1.41 | 86.61 | 250.99 | 0.25 |
| Federico Trib | .929 | Max WS | 100yr mit | 151.53 | 96.00 | 98.41 | | 98.44 | 0.005568 | 1.55 | 141.55 | 264.67 | 0.25 |
| | | | | | | | | | | | | | |
| Federico Trib | .927666* | Max WS | 10yr mit | 85.37 | 95.70 | 97.81 | | 97.83 | 0.005503 | 1.24 | 99.34 | 226.53 | 0.24 |
| Federico Trib | .927666* | Max WS | 100yr mit | 151.34 | 95.70 | 98.07 | | 98.09 | 0.004516 | 1.34 | 164.44 | 273.50 | 0.22 |
| | | | | | | | | | | | | | |
| Federico Trib | .926333* | Max WS | 10yr mit | 85.29 | 95.40 | 97.60 | | 97.60 | 0.001272 | 0.62 | 174.56 | 243.52 | 0.11 |
| Federico Trib | .926333* | Max WS | 100yr mit | 151.13 | 95.40 | 97.88 | | 97.88 | 0.001454 | 0.79 | 246.62 | 270.33 | 0.13 |
| | | | | | | | | | | | | | |
| Federico Trib | .925 | Max WS | 10yr mit | 85.06 | 95.10 | 97.41 | | 97.42 | 0.004047 | 1.15 | 134.78 | 289.35 | 0.20 |
| Federico Trib | .925 | Max WS | 100yr mit | 150.99 | 95.10 | 97.74 | | 97.75 | 0.002382 | 1.07 | 232.87 | 307.67 | 0.16 |
| | | | | | | | | | | | | | |
| Federico Trib | .923333* | Max WS | 10yr mit | 84.88 | 95.03 | 97.27 | | 97.28 | 0.000479 | 0.48 | 244.56 | 251.09 | 0.07 |
| Federico Trib | .923333* | Max WS | 100yr mit | 150.91 | 95.03 | 97.65 | | 97.65 | 0.000544 | 0.60 | 344.39 | 276.47 | 0.08 |
| | | | | | | | | | | | | | |
| Federico Trib | .921666* | Max WS | 10yr mit | 84.85 | 94.97 | 97.25 | | 97.25 | 0.000276 | 0.43 | 285.77 | 245.07 | 0.06 |
| Federico Trib | .921666* | Max WS | 100yr mit | 150.89 | 94.97 | 97.62 | | 97.62 | 0.000364 | 0.56 | 377.98 | 251.59 | 0.07 |
| | | | | | | | | | | | | | |
| Federico Trib | 0.92 | Max WS | 10yr mit | 84.84 | 94.90 | 97.23 | | 97.23 | 0.000260 | 0.46 | 298.66 | 256.57 | 0.06 |
| Federico Trib | 0.92 | Max WS | 100yr mit | 150.88 | 94.90 | 97.60 | | 97.60 | 0.000342 | 0.60 | 393.20 | 260.57 | 0.07 |
| | | | | | | | | | | | | | |
| Federico Trib | .9175* | Max WS | 10yr mit | 90.62 | 94.80 | 97.17 | | 97.18 | 0.001222 | 1.00 | 168.77 | 223.13 | 0.13 |
| Federico Trib | .9175* | Max WS | 100yr mit | 161.01 | 94.80 | 97.54 | | 97.55 | 0.001201 | 1.11 | 254.46 | 240.37 | 0.13 |
| | | | | | | | | | | | | | |
| Federico Trib | .915* | Max WS | 10yr mit | 90.56 | 94.70 | 97.00 | | 97.03 | 0.003276 | 1.55 | 93.20 | 133.50 | 0.20 |
| Federico Trib | .915* | Max WS | 100yr mit | 160.92 | 94.70 | 97.36 | | 97.39 | 0.003364 | 1.77 | 147.99 | 172.03 | 0.21 |
| | | | | | | | | | | | | | |
| Federico Trib | .9125* | Max WS | 10yr mit | 90.44 | 94.60 | 96.77 | | 96.79 | 0.003297 | 1.42 | 102.07 | 157.04 | 0.20 |
| Federico Trib | .9125* | Max WS | 100yr mit | 160.78 | 94.60 | 97.15 | | 97.17 | 0.002629 | 1.47 | 163.10 | 165.54 | 0.18 |
| | | | | | | | | | | | | | |
| Federico Trib | 0.91 | Max WS | 10yr mit | 90.35 | 94.50 | 96.64 | | 96.65 | 0.000571 | 0.56 | 195.84 | 190.66 | 0.08 |
| Federico Trib | 0.91 | Max WS | 100yr mit | 160.71 | 94.50 | 97.04 | | 97.05 | 0.000631 | 0.69 | 274.41 | 201.56 | 0.09 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Federico Trib | .908* | Max WS | 10yr mit | 90.33 | 94.20 | 96.56 | | 96.57 | 0.001844 | 1.08 | 130.16 | 170.77 | 0.15 |
| Federico Trib | .908* | Max WS | 100yr mit | 160.70 | 94.20 | 96.97 | | 96.98 | 0.001550 | 1.15 | 201.28 | 178.58 | 0.14 |
| Federico Trib | .906* | Max WS | 10yr mit | 90.33 | 93.90 | 96.35 | | 96.37 | 0.004014 | 1.62 | 80.66 | 91.84 | 0.22 |
| Federico Trib | .906* | Max WS | 100yr mit | 160.67 | 93.90 | 96.74 | | 96.77 | 0.004567 | 1.99 | 128.15 | 164.70 | 0.24 |
| Federico Trib | .904* | Max WS | 10yr mit | 90.32 | 93.60 | 96.00 | | 96.04 | 0.005773 | 1.88 | 72.57 | 99.32 | 0.26 |
| Federico Trib | .904* | Max WS | 100yr mit | 160.65 | 93.60 | 96.35 | | 96.39 | 0.006688 | 2.30 | 113.08 | 136.54 | 0.29 |
| Federico Trib | .902* | Max WS | 10yr mit | 90.28 | 93.30 | 95.55 | | 95.59 | 0.007601 | 1.98 | 75.63 | 128.29 | 0.29 |
| Federico Trib | .902* | Max WS | 100yr mit | 160.60 | 93.30 | 95.89 | | 95.93 | 0.006901 | 2.18 | 124.54 | 154.66 | 0.29 |
| Federico Trib | 0.90 | Max WS | 10yr mit | 90.22 | 93.00 | 95.19 | | 95.21 | 0.003348 | 1.26 | 116.58 | 156.74 | 0.19 |
| Federico Trib | 0.90 | Max WS | 100yr mit | 160.55 | 93.00 | 95.56 | | 95.58 | 0.003063 | 1.42 | 176.64 | 167.81 | 0.19 |
| Federico Trib | 0.89 | Max WS | 10yr mit | 91.08 | 93.00 | 94.37 | | 94.39 | 0.003411 | 0.87 | 104.39 | 110.84 | 0.18 |
| Federico Trib | 0.89 | Max WS | 100yr mit | 162.11 | 93.00 | 94.77 | | 94.79 | 0.003423 | 1.08 | 150.07 | 116.66 | 0.19 |
| Federico Trib | 0.88 | Max WS | 10yr mit | 90.47 | 91.00 | 93.21 | | 93.22 | 0.002447 | 1.18 | 101.49 | 134.42 | 0.17 |
| Federico Trib | 0.88 | Max WS | 100yr mit | 141.02 | 91.00 | 93.85 | | 93.86 | 0.001122 | 1.01 | 191.19 | 147.17 | 0.12 |
| Federico Trib | .8799 | | | Lat Struct | | | | | | | | | |
| Federico Trib | .875 | Max WS | 10yr mit | 103.30 | 90.70 | 92.95 | | 92.95 | 0.000588 | 0.64 | 275.08 | 313.73 | 0.09 |
| Federico Trib | .875 | Max WS | 100yr mit | 157.35 | 90.70 | 93.74 | | 93.74 | 0.000186 | 0.46 | 595.39 | 464.84 | 0.05 |
| Federico Trib | 0.87 | Max WS | 10yr mit | 71.24 | 90.00 | 92.89 | | 92.89 | 0.000160 | 0.38 | 287.83 | 335.90 | 0.05 |
| Federico Trib | 0.87 | Max WS | 100yr mit | 156.97 | 90.00 | 93.71 | | 93.72 | 0.000111 | 0.39 | 591.05 | 383.39 | 0.04 |
| Federico Trib | 0.868 | Max WS | 10yr mit | 105.38 | 89.01 | 92.44 | | 92.46 | 0.002859 | 1.24 | 99.28 | 140.29 | 0.18 |
| Federico Trib | 0.868 | Max WS | 100yr mit | 161.66 | 89.01 | 93.66 | | 93.67 | 0.000280 | 0.59 | 381.11 | 277.98 | 0.06 |
| Federico Trib | 0.867 | Max WS | 10yr mit | 105.38 | 89.00 | 92.36 | | 92.39 | 0.003987 | 1.50 | 87.77 | 144.99 | 0.22 |
| Federico Trib | 0.867 | Max WS | 100yr mit | 161.66 | 89.00 | 93.66 | | 93.66 | 0.000263 | 0.59 | 395.04 | 283.14 | 0.06 |
| Federico Trib | .865 | | | Culvert | | | | | | | | | |
| Federico Trib | 0.864 | Max WS | 10yr mit | 105.38 | 88.45 | 91.62 | | 91.68 | 0.004424 | 1.96 | 56.74 | 35.08 | 0.24 |
| Federico Trib | 0.864 | Max WS | 100yr mit | 161.66 | 88.45 | 92.04 | | 92.13 | 0.005638 | 2.50 | 78.23 | 197.41 | 0.28 |
| Federico Trib | 0.86 | Max WS | 10yr mit | 105.37 | 88.30 | 91.35 | | 91.45 | 0.008050 | 2.59 | 47.26 | 49.12 | 0.32 |
| Federico Trib | 0.86 | Max WS | 100yr mit | 161.66 | 88.30 | 91.78 | | 91.89 | 0.007836 | 2.89 | 70.74 | 60.44 | 0.32 |
| Federico Trib | .856666* | Max WS | 10yr mit | 105.85 | 88.17 | 90.81 | | 90.86 | 0.005816 | 1.95 | 56.95 | 45.36 | 0.27 |
| Federico Trib | .856666* | Max WS | 100yr mit | 162.34 | 88.17 | 91.23 | | 91.31 | 0.005822 | 2.27 | 78.24 | 52.53 | 0.28 |
| Federico Trib | .853333* | Max WS | 10yr mit | 105.81 | 88.03 | 90.50 | | 90.52 | 0.002329 | 1.28 | 86.52 | 60.17 | 0.17 |
| Federico Trib | .853333* | Max WS | 100yr mit | 162.32 | 88.03 | 90.93 | | 90.96 | 0.002486 | 1.54 | 114.10 | 70.96 | 0.18 |
| Federico Trib | 0.85 | Max WS | 10yr mit | 105.79 | 87.90 | 90.39 | | 90.40 | 0.000579 | 0.61 | 210.99 | 155.71 | 0.07 |
| Federico Trib | 0.85 | Max WS | 100yr mit | 162.31 | 87.90 | 90.82 | | 90.83 | 0.000600 | 0.71 | 278.35 | 159.50 | 0.08 |
| Federico Trib | .845* | Max WS | 10yr mit | 107.08 | 87.55 | 89.76 | | 89.82 | 0.006284 | 1.89 | 58.97 | 46.29 | 0.28 |
| Federico Trib | .845* | Max WS | 100yr mit | 137.76 | 87.55 | 90.21 | | 90.26 | 0.004096 | 1.83 | 82.75 | 70.12 | 0.23 |
| Federico Trib | 0.84 | Max WS | 10yr mit | 108.35 | 87.20 | 89.17 | | 89.18 | 0.000876 | 0.60 | 186.03 | 127.55 | 0.10 |
| Federico Trib | 0.84 | Max WS | 100yr mit | 150.56 | 87.20 | 89.85 | | 89.85 | 0.000505 | 0.61 | 276.04 | 136.45 | 0.08 |
| Federico Trib | 0.83 | Max WS | 10yr mit | 82.07 | 86.80 | 89.04 | | 89.04 | 0.000178 | 0.27 | 332.00 | 245.88 | 0.04 |
| Federico Trib | 0.83 | Max WS | 100yr mit | 170.39 | 86.80 | 89.76 | | 89.76 | 0.000193 | 0.38 | 525.23 | 290.45 | 0.05 |
| Federico Trib | 0.82 | Max WS | 10yr mit | 110.59 | 86.00 | 88.96 | | 88.97 | 0.000418 | 0.62 | 254.54 | 167.51 | 0.07 |
| Federico Trib | 0.82 | Max WS | 100yr mit | 210.10 | 86.00 | 89.68 | | 89.68 | 0.000451 | 0.78 | 377.02 | 175.60 | 0.08 |
| Federico Trib | 0.81 | Max WS | 10yr mit | 127.60 | 85.70 | 88.58 | | 88.61 | 0.003288 | 1.96 | 119.77 | 182.29 | 0.21 |
| Federico Trib | 0.81 | Max WS | 100yr mit | 231.72 | 85.70 | 89.55 | | 89.56 | 0.000813 | 1.20 | 356.45 | 282.94 | 0.11 |
| Federico Trib | 0.807 | Max WS | 10yr mit | 132.13 | 84.70 | 88.11 | | 88.12 | 0.000101 | 0.38 | 523.61 | 259.83 | 0.04 |
| Federico Trib | 0.807 | Max WS | 100yr mit | 239.97 | 84.70 | 89.44 | | 89.44 | 0.000064 | 0.39 | 867.29 | 259.83 | 0.03 |
| Federico Trib | 0.806 | Max WS | 10yr mit | 155.78 | 84.72 | 88.08 | | 88.09 | 0.000536 | 0.89 | 267.67 | 231.67 | 0.09 |
| Federico Trib | 0.806 | Max WS | 100yr mit | 274.12 | 84.72 | 89.42 | | 89.43 | 0.000175 | 0.65 | 592.67 | 246.47 | 0.05 |
| Federico Trib | .805 | | | Culvert | | | | | | | | | |
| Federico Trib | 0.804 | Max WS | 10yr mit | 152.93 | 84.90 | 87.60 | | 87.60 | 0.001041 | 0.93 | 220.15 | 168.01 | 0.12 |
| Federico Trib | 0.804 | Max WS | 100yr mit | 254.39 | 84.90 | 88.36 | | 88.37 | 0.000726 | 0.97 | 360.47 | 197.24 | 0.10 |
| Federico Trib | 0.803 | Max WS | 10yr mit | 152.45 | 84.46 | 87.58 | | 87.59 | 0.000711 | 0.91 | 230.21 | 168.73 | 0.10 |
| Federico Trib | 0.803 | Max WS | 100yr mit | 254.07 | 84.46 | 88.35 | | 88.35 | 0.000561 | 0.96 | 365.48 | 182.27 | 0.09 |
| Federico Trib | 0.80 | Max WS | 10yr mit | 150.35 | 84.50 | 87.42 | | 87.43 | 0.001224 | 0.96 | 212.74 | 149.53 | 0.12 |
| Federico Trib | 0.80 | Max WS | 100yr mit | 251.67 | 84.50 | 88.24 | | 88.25 | 0.000781 | 0.98 | 336.78 | 155.40 | 0.11 |
| Federico Trib | 0.79 | Max WS | 10yr mit | 149.64 | 83.80 | 87.05 | | 87.06 | 0.000955 | 1.02 | 196.26 | 151.04 | 0.11 |
| Federico Trib | 0.79 | Max WS | 100yr mit | 251.72 | 83.80 | 88.01 | | 88.01 | 0.000572 | 0.98 | 373.06 | 215.77 | 0.09 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Federico Trib | 0.777 | Max WS | 10yr mit | 150.54 | 83.00 | 86.84 | | 86.85 | 0.001122 | 1.28 | 218.08 | 233.17 | 0.13 |
| Federico Trib | 0.777 | Max WS | 100yr mit | 253.17 | 83.00 | 87.92 | | 87.93 | 0.000264 | 0.76 | 574.86 | 346.50 | 0.07 |
| Federico Trib | 0.776 | Max WS | 10yr mit | 150.52 | 82.76 | 86.79 | | 86.81 | 0.001020 | 1.31 | 204.62 | 231.03 | 0.12 |
| Federico Trib | 0.776 | Max WS | 100yr mit | 253.16 | 82.76 | 87.91 | | 87.92 | 0.000280 | 0.83 | 547.71 | 345.70 | 0.07 |
| Federico Trib | .775 | | | Culvert | | | | | | | | | |
| Federico Trib | 0.774 | Max WS | 10yr mit | 150.30 | 82.74 | 86.27 | | 86.30 | 0.002691 | 1.76 | 137.56 | 168.96 | 0.19 |
| Federico Trib | 0.774 | Max WS | 100yr mit | 250.33 | 82.74 | 86.66 | | 86.69 | 0.002926 | 2.02 | 216.05 | 234.45 | 0.21 |
| Federico Trib | .7739 | Max WS | 10yr mit | 150.26 | 82.74 | 86.24 | | 86.27 | 0.002887 | 1.81 | 132.72 | 164.06 | 0.20 |
| Federico Trib | .7739 | Max WS | 100yr mit | 248.32 | 82.74 | 86.63 | | 86.67 | 0.003103 | 2.06 | 208.70 | 229.12 | 0.21 |
| Federico Trib | 0.773 | Max WS | 10yr mit | 150.22 | 82.74 | 86.23 | | 86.25 | 0.001185 | 1.21 | 157.92 | 195.28 | 0.13 |
| Federico Trib | 0.773 | Max WS | 100yr mit | 247.45 | 82.74 | 86.61 | | 86.64 | 0.001489 | 1.48 | 240.85 | 239.39 | 0.15 |
| Federico Trib | .7715* | Max WS | 10yr mit | 150.16 | 82.72 | 86.12 | | 86.14 | 0.001627 | 1.38 | 178.80 | 247.51 | 0.15 |
| Federico Trib | .7715* | Max WS | 100yr mit | 218.75 | 82.72 | 86.50 | | 86.52 | 0.001274 | 1.34 | 284.74 | 286.22 | 0.14 |
| Federico Trib | 0.77 | Max WS | 10yr mit | 147.26 | 82.70 | 86.03 | | 86.03 | 0.000926 | 1.00 | 246.06 | 233.61 | 0.11 |
| Federico Trib | 0.77 | Max WS | 100yr mit | 205.50 | 82.70 | 86.43 | | 86.44 | 0.000717 | 0.97 | 353.67 | 285.29 | 0.10 |
| Federico Trib | .768* | Max WS | 10yr mit | 188.90 | 82.52 | 85.89 | | 85.91 | 0.002343 | 1.62 | 215.47 | 252.83 | 0.18 |
| Federico Trib | .768* | Max WS | 100yr mit | 332.17 | 82.52 | 86.29 | | 86.32 | 0.002388 | 1.81 | 323.22 | 284.20 | 0.19 |
| Federico Trib | .766* | Max WS | 10yr mit | 189.57 | 82.34 | 85.67 | | 85.70 | 0.003493 | 1.97 | 172.65 | 234.33 | 0.22 |
| Federico Trib | .766* | Max WS | 100yr mit | 333.07 | 82.34 | 86.08 | | 86.11 | 0.003216 | 2.09 | 277.68 | 274.09 | 0.22 |
| Federico Trib | .764* | Max WS | 10yr mit | 190.25 | 82.15 | 85.39 | | 85.43 | 0.003952 | 2.05 | 151.14 | 186.42 | 0.23 |
| Federico Trib | .764* | Max WS | 100yr mit | 334.17 | 82.15 | 85.81 | | 85.85 | 0.003838 | 2.25 | 237.57 | 231.06 | 0.24 |
| Federico Trib | .762* | Max WS | 10yr mit | 190.95 | 81.97 | 85.10 | | 85.14 | 0.003880 | 1.99 | 150.83 | 169.18 | 0.23 |
| Federico Trib | .762* | Max WS | 100yr mit | 335.33 | 81.97 | 85.52 | | 85.56 | 0.003986 | 2.25 | 226.99 | 199.16 | 0.24 |
| Federico Trib | .76 | Max WS | 10yr mit | 191.66 | 81.79 | 84.82 | | 84.85 | 0.003685 | 1.90 | 156.26 | 165.13 | 0.22 |
| Federico Trib | .76 | Max WS | 100yr mit | 336.57 | 81.79 | 85.21 | | 85.26 | 0.004184 | 2.25 | 224.11 | 186.09 | 0.24 |
| Federico Trib | .759375* | Max WS | 10yr mit | 192.01 | 81.72 | 84.68 | | 84.71 | 0.004089 | 1.90 | 154.75 | 170.17 | 0.23 |
| Federico Trib | .759375* | Max WS | 100yr mit | 337.11 | 81.72 | 85.05 | | 85.09 | 0.004592 | 2.25 | 225.99 | 208.19 | 0.25 |
| Federico Trib | .75875* | Max WS | 10yr mit | 192.38 | 81.64 | 84.51 | | 84.55 | 0.004610 | 1.90 | 156.01 | 204.04 | 0.24 |
| Federico Trib | .75875* | Max WS | 100yr mit | 337.71 | 81.64 | 84.87 | | 84.91 | 0.004956 | 2.21 | 234.23 | 233.42 | 0.26 |
| Federico Trib | .758125* | Max WS | 10yr mit | 192.74 | 81.57 | 84.33 | | 84.37 | 0.005198 | 1.88 | 161.65 | 225.93 | 0.25 |
| Federico Trib | .758125* | Max WS | 100yr mit | 338.26 | 81.57 | 84.69 | | 84.72 | 0.005165 | 2.12 | 246.29 | 250.59 | 0.26 |
| Federico Trib | .7575* | Max WS | 10yr mit | 193.10 | 81.49 | 84.12 | | 84.16 | 0.006081 | 1.94 | 161.02 | 223.04 | 0.27 |
| Federico Trib | .7575* | Max WS | 100yr mit | 338.61 | 81.49 | 84.47 | | 84.51 | 0.006371 | 2.17 | 246.47 | 267.95 | 0.28 |
| Federico Trib | .756875* | Max WS | 10yr mit | 193.47 | 81.42 | 83.88 | | 83.91 | 0.007292 | 2.01 | 160.89 | 233.12 | 0.29 |
| Federico Trib | .756875* | Max WS | 100yr mit | 337.73 | 81.42 | 84.21 | | 84.25 | 0.007625 | 2.25 | 246.46 | 292.62 | 0.31 |
| Federico Trib | .75625* | Max WS | 10yr mit | 192.40 | 81.35 | 83.56 | | 83.59 | 0.009434 | 2.13 | 165.46 | 300.72 | 0.33 |
| Federico Trib | .75625* | Max WS | 100yr mit | 330.47 | 81.35 | 83.97 | | 84.00 | 0.005356 | 1.82 | 307.60 | 372.93 | 0.26 |
| Federico Trib | .755625* | Max WS | 10yr mit | 189.98 | 81.27 | 83.34 | | 83.35 | 0.003120 | 1.14 | 245.32 | 346.25 | 0.19 |
| Federico Trib | .755625* | Max WS | 100yr mit | 325.34 | 81.27 | 83.85 | | 83.86 | 0.001817 | 1.06 | 425.22 | 365.26 | 0.15 |
| Federico Trib | .755 | Max WS | 10yr mit | 188.94 | 81.20 | 83.26 | | 83.27 | 0.001462 | 0.70 | 311.56 | 343.23 | 0.11 |
| Federico Trib | .755 | Max WS | 100yr mit | 324.31 | 81.20 | 83.80 | | 83.81 | 0.001093 | 0.76 | 497.45 | 360.83 | 0.11 |
| Federico Trib | .754* | Max WS | 10yr mit | 197.28 | 80.96 | 83.19 | | 83.19 | 0.000712 | 0.53 | 403.84 | 342.13 | 0.09 |
| Federico Trib | .754* | Max WS | 100yr mit | 340.64 | 80.96 | 83.74 | | 83.75 | 0.000685 | 0.63 | 613.40 | 397.80 | 0.09 |
| Federico Trib | .753* | Max WS | 10yr mit | 196.82 | 80.72 | 83.15 | | 83.15 | 0.000636 | 0.54 | 389.99 | 316.12 | 0.08 |
| Federico Trib | .753* | Max WS | 100yr mit | 340.28 | 80.72 | 83.70 | | 83.70 | 0.000644 | 0.61 | 590.90 | 390.87 | 0.09 |
| Federico Trib | .752* | Max WS | 10yr mit | 196.23 | 80.48 | 83.11 | | 83.11 | 0.000414 | 0.46 | 442.57 | 287.09 | 0.07 |
| Federico Trib | .752* | Max WS | 100yr mit | 340.08 | 80.48 | 83.66 | | 83.66 | 0.000501 | 0.57 | 614.58 | 342.70 | 0.08 |
| Federico Trib | .751* | Max WS | 10yr mit | 196.37 | 80.24 | 83.09 | | 83.09 | 0.000263 | 0.39 | 521.38 | 287.58 | 0.05 |
| Federico Trib | .751* | Max WS | 100yr mit | 340.47 | 80.24 | 83.63 | | 83.64 | 0.000347 | 0.50 | 700.07 | 365.47 | 0.06 |
| Federico Trib | 0.75 | Max WS | 10yr mit | 196.30 | 80.00 | 83.06 | | 83.07 | 0.000509 | 0.56 | 456.80 | 341.34 | 0.08 |
| Federico Trib | 0.75 | Max WS | 100yr mit | 340.73 | 80.00 | 83.60 | | 83.61 | 0.000542 | 0.65 | 657.49 | 409.64 | 0.08 |
| Federico Trib | .7494* | Max WS | 10yr mit | 198.21 | 79.90 | 83.04 | | 83.04 | 0.000315 | 0.43 | 547.62 | 408.26 | 0.06 |
| Federico Trib | .7494* | Max WS | 100yr mit | 345.04 | 79.90 | 83.57 | | 83.58 | 0.000347 | 0.50 | 773.11 | 432.93 | 0.06 |
| Federico Trib | .7488* | Max WS | 10yr mit | 198.64 | 79.80 | 83.02 | | 83.02 | 0.000198 | 0.33 | 569.10 | 299.47 | 0.04 |
| Federico Trib | .7488* | Max WS | 100yr mit | 345.64 | 79.80 | 83.55 | | 83.55 | 0.000274 | 0.42 | 738.84 | 347.49 | 0.05 |
| Federico Trib | .7482* | Max WS | 10yr mit | 198.99 | 79.70 | 83.01 | | 83.01 | 0.000083 | 0.21 | 717.60 | 325.46 | 0.03 |
| Federico Trib | .7482* | Max WS | 100yr mit | 346.54 | 79.70 | 83.54 | | 83.54 | 0.000134 | 0.28 | 895.86 | 350.09 | 0.03 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Federico Trib | .7476* | Max WS | 10yr mit | 199.52 | 79.60 | 83.01 | | 83.01 | 0.000033 | 0.13 | 908.69 | 331.45 | 0.02 |
| Federico Trib | .7476* | Max WS | 100yr mit | 347.64 | 79.60 | 83.53 | | 83.53 | 0.000061 | 0.18 | 1094.05 | 381.50 | 0.02 |
| Federico Trib | .747 | Max WS | 10yr mit | 199.92 | 79.50 | 82.97 | | 82.98 | 0.000872 | 0.77 | 382.71 | 359.56 | 0.10 |
| Federico Trib | .747 | Max WS | 100yr mit | 348.36 | 79.50 | 83.50 | | 83.51 | 0.000759 | 0.78 | 583.70 | 401.98 | 0.09 |
| Federico Trib | .744 | Max WS | 10yr mit | 200.19 | 79.00 | 82.84 | | 82.86 | 0.001530 | 1.53 | 219.68 | 205.44 | 0.15 |
| Federico Trib | .744 | Max WS | 100yr mit | 349.23 | 79.00 | 83.37 | | 83.39 | 0.001568 | 1.71 | 332.70 | 222.92 | 0.16 |
| Federico Trib | 0.74 | Max WS | 10yr mit | 201.02 | 77.38 | 82.09 | | 82.12 | 0.001338 | 1.43 | 238.21 | 257.05 | 0.14 |
| Federico Trib | 0.74 | Max WS | 100yr mit | 352.89 | 77.38 | 82.64 | | 82.66 | 0.001213 | 1.51 | 382.83 | 269.12 | 0.14 |
| Federico Trib | 0.73 | Max WS | 10yr mit | 204.50 | 76.00 | 81.58 | | 81.61 | 0.001684 | 1.71 | 207.02 | 209.90 | 0.16 |
| Federico Trib | 0.73 | Max WS | 100yr mit | 359.59 | 76.00 | 82.14 | | 82.17 | 0.001708 | 1.90 | 333.35 | 247.57 | 0.16 |
| Federico Trib | 0.72 | Max WS | 10yr mit | 202.26 | 76.00 | 81.04 | | 81.06 | 0.001598 | 1.48 | 210.79 | 255.65 | 0.15 |
| Federico Trib | 0.72 | Max WS | 100yr mit | 356.91 | 76.00 | 81.64 | | 81.66 | 0.001334 | 1.53 | 383.36 | 319.66 | 0.14 |
| Federico Trib | 0.71 | Max WS | 10yr mit | 206.11 | 75.00 | 80.55 | | 80.57 | 0.001079 | 1.32 | 248.17 | 236.52 | 0.13 |
| Federico Trib | 0.71 | Max WS | 100yr mit | 365.13 | 75.00 | 81.22 | | 81.24 | 0.000938 | 1.39 | 424.34 | 281.14 | 0.12 |
| Federico Trib | 0.70 | Max WS | 10yr mit | 208.83 | 75.00 | 80.35 | | 80.38 | 0.001428 | 1.49 | 200.91 | 159.58 | 0.15 |
| Federico Trib | 0.70 | Max WS | 100yr mit | 369.14 | 75.00 | 81.03 | | 81.06 | 0.001484 | 1.72 | 316.64 | 199.85 | 0.15 |
| Federico Trib | .666666* | Max WS | 10yr mit | 209.94 | 75.00 | 80.20 | | 80.24 | 0.001816 | 1.67 | 176.70 | 134.97 | 0.16 |
| Federico Trib | .666666* | Max WS | 100yr mit | 368.81 | 75.00 | 80.87 | | 80.91 | 0.001995 | 1.98 | 285.59 | 242.59 | 0.18 |
| Federico Trib | .633333* | Max WS | 10yr mit | 209.42 | 75.00 | 80.02 | | 80.06 | 0.002199 | 1.81 | 169.98 | 171.80 | 0.18 |
| Federico Trib | .633333* | Max WS | 100yr mit | 363.98 | 75.00 | 80.71 | | 80.74 | 0.001692 | 1.81 | 334.09 | 274.92 | 0.16 |
| Federico Trib | 0.6 | Max WS | 10yr mit | 208.53 | 75.00 | 79.83 | | 79.86 | 0.002268 | 1.79 | 195.52 | 214.75 | 0.18 |
| Federico Trib | 0.6 | Max WS | 100yr mit | 358.22 | 75.00 | 80.59 | | 80.61 | 0.001178 | 1.49 | 407.16 | 297.65 | 0.13 |
| Federico Trib | .55* | Max WS | 10yr mit | 218.84 | 74.50 | 79.72 | | 79.73 | 0.000759 | 1.14 | 246.73 | 171.60 | 0.11 |
| Federico Trib | .55* | Max WS | 100yr mit | 368.73 | 74.50 | 80.52 | | 80.53 | 0.000667 | 1.23 | 434.39 | 251.55 | 0.11 |
| Federico Trib | 0.5 | Max WS | 10yr mit | 218.67 | 74.00 | 79.69 | | 79.69 | 0.000212 | 0.64 | 425.95 | 213.23 | 0.06 |
| Federico Trib | 0.5 | Max WS | 100yr mit | 366.59 | 74.00 | 80.49 | | 80.50 | 0.000239 | 0.77 | 631.28 | 276.84 | 0.06 |
| Federico Trib | .45* | Max WS | 10yr mit | 218.52 | 73.50 | 79.66 | | 79.67 | 0.000543 | 0.98 | 282.90 | 184.95 | 0.09 |
| Federico Trib | .45* | Max WS | 100yr mit | 363.29 | 73.50 | 80.46 | | 80.48 | 0.000509 | 1.09 | 438.66 | 198.55 | 0.09 |
| Federico Trib | 0.4 | Max WS | 10yr mit | 217.63 | 73.00 | 79.56 | | 79.60 | 0.002352 | 1.75 | 150.38 | 109.98 | 0.18 |
| Federico Trib | 0.4 | Max WS | 100yr mit | 346.92 | 73.00 | 80.37 | | 80.41 | 0.001756 | 1.78 | 241.17 | 112.07 | 0.16 |
| Main Reach | 1.44 | Max WS | 10yr mit | 145.43 | 112.07 | 114.17 | | 114.18 | 0.002632 | 0.84 | 178.10 | 277.05 | 0.16 |
| Main Reach | 1.44 | Max WS | 100yr mit | 284.71 | 112.07 | 114.55 | | 114.57 | 0.002511 | 1.05 | 287.58 | 294.14 | 0.17 |
| Main Reach | 1.43666* | Max WS | 10yr mit | 145.37 | 111.85 | 113.92 | | 113.93 | 0.002368 | 0.86 | 185.44 | 247.08 | 0.16 |
| Main Reach | 1.43666* | Max WS | 100yr mit | 284.25 | 111.85 | 114.30 | | 114.31 | 0.002583 | 1.13 | 286.56 | 291.96 | 0.17 |
| Main Reach | 1.43333* | Max WS | 10yr mit | 145.24 | 111.62 | 113.72 | | 113.73 | 0.001843 | 0.84 | 191.29 | 260.13 | 0.14 |
| Main Reach | 1.43333* | Max WS | 100yr mit | 283.25 | 111.62 | 114.04 | | 114.06 | 0.002541 | 1.18 | 310.14 | 408.74 | 0.17 |
| Main Reach | 1.43 | Max WS | 10yr mit | 145.18 | 111.40 | 113.24 | | 113.27 | 0.007844 | 1.55 | 141.30 | 355.03 | 0.28 |
| Main Reach | 1.43 | Max WS | 100yr mit | 282.66 | 111.40 | 113.46 | | 113.49 | 0.009004 | 1.91 | 220.64 | 367.15 | 0.31 |
| Main Reach | 1.425* | Max WS | 10yr mit | 145.13 | 110.50 | 112.08 | | 112.11 | 0.012264 | 1.90 | 107.16 | 203.51 | 0.35 |
| Main Reach | 1.425* | Max WS | 100yr mit | 272.04 | 110.50 | 112.50 | | 112.52 | 0.006614 | 1.80 | 210.32 | 280.70 | 0.27 |
| Main Reach | 1.42 | Max WS | 10yr mit | 142.92 | 109.60 | 111.30 | | 111.31 | 0.001447 | 0.79 | 240.29 | 263.67 | 0.13 |
| Main Reach | 1.42 | Max WS | 100yr mit | 245.69 | 109.60 | 112.11 | | 112.12 | 0.000544 | 0.68 | 479.74 | 317.61 | 0.08 |
| Main Reach | 1.41 | Max WS | 10yr mit | 154.41 | 108.40 | 111.13 | | 111.13 | 0.000395 | 0.47 | 322.95 | 163.89 | 0.07 |
| Main Reach | 1.41 | Max WS | 100yr mit | 254.10 | 108.40 | 112.03 | | 112.04 | 0.000296 | 0.56 | 491.15 | 209.77 | 0.06 |
| Main Reach | 1.40 | Max WS | 10yr mit | 154.02 | 108.40 | 110.99 | | 110.99 | 0.000549 | 0.64 | 289.92 | 162.10 | 0.08 |
| Main Reach | 1.40 | Max WS | 100yr mit | 253.64 | 108.40 | 111.94 | | 111.94 | 0.000355 | 0.68 | 461.19 | 202.37 | 0.07 |
| Main Reach | 1.39 | Max WS | 10yr mit | 153.37 | 107.50 | 110.87 | | 110.88 | 0.000265 | 0.47 | 358.10 | 158.64 | 0.06 |
| Main Reach | 1.39 | Max WS | 100yr mit | 255.41 | 107.50 | 111.86 | | 111.86 | 0.000226 | 0.52 | 530.87 | 240.39 | 0.06 |
| Main Reach | 1.388 | Max WS | 10yr mit | 154.27 | 107.00 | 110.67 | | 110.68 | 0.001271 | 1.04 | 253.64 | 409.21 | 0.13 |
| Main Reach | 1.388 | Max WS | 100yr mit | 259.00 | 107.00 | 111.81 | | 111.81 | 0.000156 | 0.49 | 756.48 | 444.40 | 0.05 |
| Main Reach | 1.387 | Max WS | 10yr mit | 154.24 | 107.00 | 110.65 | | 110.65 | 0.000265 | 0.58 | 440.26 | 500.80 | 0.06 |
| Main Reach | 1.387 | Max WS | 100yr mit | 258.98 | 107.00 | 111.81 | | 111.81 | 0.000066 | 0.37 | 1019.28 | 500.80 | 0.03 |
| Main Reach | 1.385 | | | Culvert | | | | | | | | | |
| Main Reach | 1.384 | Max WS | 10yr mit | 154.21 | 107.00 | 109.69 | | 109.70 | 0.001314 | 0.95 | 285.09 | 435.26 | 0.13 |
| Main Reach | 1.384 | Max WS | 100yr mit | 258.97 | 107.00 | 109.96 | | 109.97 | 0.001310 | 1.04 | 407.52 | 474.32 | 0.13 |
| Main Reach | 1.38 | Max WS | 10yr mit | 154.17 | 107.00 | 109.56 | | 109.57 | 0.004345 | 1.56 | 212.54 | 384.71 | 0.22 |
| Main Reach | 1.38 | Max WS | 100yr mit | 258.88 | 107.00 | 109.86 | | 109.87 | 0.003202 | 1.51 | 329.44 | 409.29 | 0.20 |
| Main Reach | 1.37 | Max WS | 10yr mit | 167.74 | 106.00 | 108.69 | | 108.69 | 0.001264 | 0.90 | 245.35 | 188.96 | 0.12 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Main Reach | 1.37 | Max WS | 100yr mit | 269.38 | 106.00 | 109.16 | | 109.17 | 0.001210 | 1.04 | 338.32 | 204.17 | 0.13 |
| Main Reach | 1.36 | Max WS | 10yr mit | 181.55 | 105.80 | 108.28 | | 108.29 | 0.000678 | 0.78 | 336.79 | 220.70 | 0.10 |
| Main Reach | 1.36 | Max WS | 100yr mit | 328.66 | 105.80 | 108.68 | | 108.69 | 0.001092 | 1.11 | 427.92 | 233.94 | 0.12 |
| Main Reach | 1.35 | Max WS | 10yr mit | 183.48 | 104.80 | 108.10 | | 108.11 | 0.000757 | 0.82 | 291.40 | 271.43 | 0.10 |
| Main Reach | 1.35 | Max WS | 100yr mit | 330.30 | 104.80 | 108.36 | | 108.38 | 0.001420 | 1.22 | 366.63 | 304.30 | 0.14 |
| Main Reach | 1.34 | Max WS | 10yr mit | 185.66 | 104.46 | 107.03 | | 107.07 | 0.006148 | 2.16 | 150.48 | 272.46 | 0.28 |
| Main Reach | 1.34 | Max WS | 100yr mit | 333.68 | 104.46 | 107.43 | | 107.46 | 0.004442 | 2.09 | 266.02 | 302.94 | 0.25 |
| Main Reach | 1.335 | Max WS | 10yr mit | 192.57 | 102.00 | 105.78 | | 105.79 | 0.001422 | 1.25 | 208.49 | 145.72 | 0.13 |
| Main Reach | 1.335 | Max WS | 100yr mit | 358.61 | 102.00 | 106.39 | | 106.41 | 0.001659 | 1.55 | 347.29 | 281.33 | 0.15 |
| Main Reach | 1.333 | | | Mult Open | | | | | | | | | |
| Main Reach | 1.33 | Max WS | 10yr mit | 192.57 | 102.00 | 105.49 | | 105.51 | 0.003813 | 1.78 | 193.25 | 259.41 | 0.22 |
| Main Reach | 1.33 | Max WS | 100yr mit | 358.51 | 102.00 | 105.97 | | 106.00 | 0.003490 | 1.95 | 328.59 | 314.17 | 0.22 |
| Main Reach | 1.32 | Max WS | 10yr mit | 152.17 | 101.80 | 104.98 | | 104.98 | 0.000482 | 0.71 | 357.65 | 287.24 | 0.08 |
| Main Reach | 1.32 | Max WS | 100yr mit | 357.89 | 101.80 | 105.30 | | 105.31 | 0.001263 | 1.26 | 483.87 | 409.13 | 0.13 |
| Main Reach | 1.31 | Max WS | 10yr mit | 204.99 | 100.90 | 104.89 | | 104.89 | 0.000141 | 0.44 | 602.49 | 267.22 | 0.05 |
| Main Reach | 1.31 | Max WS | 100yr mit | 415.09 | 100.90 | 105.06 | | 105.06 | 0.000470 | 0.84 | 648.68 | 306.04 | 0.08 |
| Main Reach | 1.30 | Max WS | 10yr mit | 208.92 | 100.63 | 103.80 | | 103.82 | 0.004594 | 1.81 | 171.70 | 194.92 | 0.24 |
| Main Reach | 1.30 | Max WS | 100yr mit | 331.32 | 100.63 | 104.75 | | 104.76 | 0.001146 | 1.18 | 385.18 | 266.73 | 0.13 |
| Main Reach | 1.29 | Max WS | 10yr mit | 214.88 | 100.40 | 103.26 | | 103.27 | 0.000379 | 0.60 | 515.87 | 322.16 | 0.07 |
| Main Reach | 1.29 | Max WS | 100yr mit | 341.19 | 100.40 | 104.62 | | 104.62 | 0.000125 | 0.48 | 1011.21 | 402.80 | 0.04 |
| Main Reach | 1.28 | Max WS | 10yr mit | 217.56 | 100.00 | 103.16 | | 103.16 | 0.000351 | 0.63 | 429.74 | 263.83 | 0.07 |
| Main Reach | 1.28 | Max WS | 100yr mit | 346.52 | 100.00 | 104.58 | | 104.58 | 0.000134 | 0.53 | 887.26 | 379.50 | 0.05 |
| Main Reach | 1.27 | Max WS | 10yr mit | 218.83 | 98.88 | 103.09 | | 103.09 | 0.000165 | 0.48 | 576.11 | 293.72 | 0.05 |
| Main Reach | 1.27 | Max WS | 100yr mit | 348.95 | 98.88 | 104.55 | | 104.55 | 0.000072 | 0.41 | 1050.26 | 352.36 | 0.03 |
| Main Reach | 1.268 | Max WS | 10yr mit | 219.55 | 98.63 | 103.06 | | 103.06 | 0.000304 | 0.67 | 488.33 | 422.32 | 0.07 |
| Main Reach | 1.268 | Max WS | 100yr mit | 350.11 | 98.63 | 104.54 | | 104.54 | 0.000078 | 0.44 | 1144.87 | 452.33 | 0.04 |
| Main Reach | 1.267 | Max WS | 10yr mit | 219.53 | 98.60 | 103.05 | | 103.05 | 0.000305 | 0.61 | 494.14 | 393.00 | 0.07 |
| Main Reach | 1.267 | Max WS | 100yr mit | 350.09 | 98.60 | 104.54 | | 104.54 | 0.000086 | 0.44 | 1104.21 | 430.85 | 0.04 |
| Main Reach | 1.265 | | | Culvert | | | | | | | | | |
| Main Reach | 1.26 | Max WS | 10yr mit | 219.04 | 98.56 | 102.20 | | 102.24 | 0.003709 | 1.69 | 181.27 | 302.04 | 0.22 |
| Main Reach | 1.26 | Max WS | 100yr mit | 347.63 | 98.56 | 103.11 | | 103.12 | 0.000874 | 1.07 | 461.49 | 318.99 | 0.11 |
| Main Reach | 1.259 | Max WS | 10yr mit | 218.68 | 98.50 | 102.11 | | 102.13 | 0.001621 | 1.41 | 310.56 | 365.83 | 0.15 |
| Main Reach | 1.259 | Max WS | 100yr mit | 347.65 | 98.50 | 103.09 | | 103.09 | 0.000397 | 0.86 | 667.28 | 367.87 | 0.08 |
| Main Reach | 1.255 | Max WS | 10yr mit | 229.72 | 97.97 | 101.78 | | 101.78 | 0.000448 | 0.76 | 456.10 | 360.10 | 0.08 |
| Main Reach | 1.255 | Max WS | 100yr mit | 366.05 | 97.97 | 103.00 | | 103.00 | 0.000143 | 0.55 | 952.57 | 424.90 | 0.05 |
| Main Reach | 1.22 | Max WS | 10yr mit | 229.67 | 97.50 | 101.71 | | 101.71 | 0.000412 | 0.73 | 404.69 | 272.68 | 0.08 |
| Main Reach | 1.22 | Max WS | 100yr mit | 366.04 | 97.50 | 102.97 | | 102.98 | 0.000166 | 0.60 | 815.65 | 378.67 | 0.05 |
| Main Reach | 1.215 | | | Culvert | | | | | | | | | |
| Main Reach | 1.21 | Max WS | 10yr mit | 229.66 | 96.51 | 99.86 | | 100.05 | 0.006808 | 3.53 | 65.10 | 43.58 | 0.51 |
| Main Reach | 1.21 | Max WS | 100yr mit | 366.00 | 96.51 | 100.18 | | 100.50 | 0.010878 | 4.54 | 80.55 | 52.53 | 0.65 |
| Main Reach | 1.20 | Max WS | 10yr mit | 229.38 | 96.05 | 99.48 | | 99.62 | 0.006439 | 3.46 | 106.85 | 173.68 | 0.49 |
| Main Reach | 1.20 | Max WS | 100yr mit | 364.57 | 96.05 | 99.81 | | 99.94 | 0.005604 | 3.66 | 166.98 | 198.79 | 0.47 |
| Main Reach | 1.19 | Max WS | 10yr mit | 252.75 | 95.07 | 98.45 | | 98.49 | 0.001273 | 1.73 | 194.62 | 247.51 | 0.23 |
| Main Reach | 1.19 | Max WS | 100yr mit | 406.58 | 95.07 | 98.94 | | 98.98 | 0.001027 | 1.83 | 331.38 | 308.39 | 0.21 |
| Main Reach | 1.18 | Max WS | 10yr mit | 251.53 | 94.10 | 97.80 | | 97.90 | 0.002591 | 3.24 | 139.51 | 123.16 | 0.34 |
| Main Reach | 1.18 | Max WS | 100yr mit | 404.69 | 94.10 | 98.35 | | 98.45 | 0.002484 | 3.57 | 215.66 | 158.94 | 0.35 |
| Main Reach | 1.17 | Max WS | 10yr mit | 283.27 | 93.80 | 97.15 | | 97.20 | 0.000980 | 1.87 | 189.83 | 148.84 | 0.21 |
| Main Reach | 1.17 | Max WS | 100yr mit | 487.11 | 93.80 | 97.59 | | 97.68 | 0.001434 | 2.53 | 262.87 | 184.41 | 0.26 |
| Main Reach | 1.16 | Max WS | 10yr mit | 282.57 | 93.25 | 96.59 | | 96.66 | 0.002160 | 2.62 | 205.77 | 297.23 | 0.31 |
| Main Reach | 1.16 | Max WS | 100yr mit | 482.62 | 93.25 | 97.00 | | 97.06 | 0.002028 | 2.83 | 335.62 | 344.73 | 0.30 |
| Main Reach | 1.15 | Max WS | 10yr mit | 282.12 | 92.65 | 96.15 | | 96.17 | 0.000455 | 1.40 | 414.21 | 428.52 | 0.15 |
| Main Reach | 1.15 | Max WS | 100yr mit | 481.95 | 92.65 | 96.57 | | 96.59 | 0.000500 | 1.61 | 595.77 | 440.95 | 0.16 |
| Main Reach | 1.14 | Max WS | 10yr mit | 282.07 | 92.20 | 94.85 | | 94.93 | 0.003960 | 2.97 | 164.11 | 192.77 | 0.40 |
| Main Reach | 1.14 | Max WS | 100yr mit | 481.77 | 92.20 | 95.25 | | 95.34 | 0.003842 | 3.36 | 245.63 | 216.10 | 0.41 |
| Main Reach | 1.13 | Max WS | 10yr mit | 281.33 | 91.95 | 94.06 | | 94.07 | 0.000488 | 0.77 | 365.71 | 501.11 | 0.13 |
| Main Reach | 1.13 | Max WS | 100yr mit | 475.65 | 91.95 | 94.50 | | 94.52 | 0.000448 | 0.92 | 522.47 | 546.13 | 0.13 |
| Main Reach | 1.12 | Max WS | 10yr mit | 280.70 | 90.70 | 93.48 | | 93.57 | 0.003317 | 3.13 | 163.16 | 180.12 | 0.38 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Main Reach | 1.12 | Max WS | 100yr mit | 470.52 | 90.70 | 94.00 | | 94.08 | 0.002817 | 3.34 | 270.45 | 235.51 | 0.36 |
| Main Reach | 1.11 | Max WS | 10yr mit | 280.04 | 90.02 | 92.99 | | 93.00 | 0.000368 | 1.00 | 400.19 | 319.53 | 0.13 |
| Main Reach | 1.11 | Max WS | 100yr mit | 468.64 | 90.02 | 93.59 | | 93.60 | 0.000326 | 1.12 | 598.66 | 343.92 | 0.12 |
| Main Reach | 1.10 | Max WS | 10yr mit | 279.37 | 88.90 | 92.37 | | 92.50 | 0.003293 | 2.90 | 101.77 | 84.01 | 0.37 |
| Main Reach | 1.10 | Max WS | 100yr mit | 466.87 | 88.90 | 92.92 | | 93.10 | 0.003514 | 3.54 | 160.67 | 133.13 | 0.40 |
| Main Reach | 1.09 | Max WS | 10yr mit | 278.59 | 87.51 | 91.81 | | 91.82 | 0.000212 | 1.04 | 462.57 | 320.92 | 0.10 |
| Main Reach | 1.09 | Max WS | 100yr mit | 465.62 | 87.51 | 92.33 | | 92.34 | 0.000260 | 1.27 | 638.53 | 352.20 | 0.12 |
| Main Reach | 1.08 | Max WS | 10yr mit | 281.23 | 87.08 | 91.55 | | 91.61 | 0.001304 | 2.33 | 218.28 | 216.73 | 0.24 |
| Main Reach | 1.08 | Max WS | 100yr mit | 470.69 | 87.08 | 92.04 | | 92.10 | 0.001392 | 2.68 | 339.93 | 275.89 | 0.26 |
| Main Reach | 1.07 | Max WS | 10yr mit | 280.61 | 87.00 | 90.53 | | 90.71 | 0.004845 | 3.46 | 95.50 | 112.63 | 0.45 |
| Main Reach | 1.07 | Max WS | 100yr mit | 418.63 | 87.00 | 91.22 | | 91.34 | 0.002651 | 3.06 | 207.94 | 213.75 | 0.34 |
| Main Reach | 1.06 | Max WS | 10yr mit | 271.62 | 86.38 | 89.68 | | 89.73 | 0.000965 | 1.65 | 187.91 | 163.53 | 0.20 |
| Main Reach | 1.06 | Max WS | 100yr mit | 409.88 | 86.38 | 90.80 | | 90.81 | 0.000298 | 1.20 | 510.33 | 355.56 | 0.12 |
| Main Reach | 1.05 | Max WS | 10yr mit | 270.26 | 85.43 | 89.50 | | 89.53 | 0.000565 | 1.37 | 259.29 | 205.61 | 0.16 |
| Main Reach | 1.05 | Max WS | 100yr mit | 410.68 | 85.43 | 90.74 | | 90.75 | 0.000195 | 1.07 | 592.60 | 332.22 | 0.10 |
| Main Reach | 1.04 | Max WS | 10yr mit | 271.84 | 84.89 | 89.44 | | 89.45 | 0.000389 | 1.05 | 410.82 | 1271.70 | 0.13 |
| Main Reach | 1.04 | Max WS | 100yr mit | 413.62 | 84.89 | 90.72 | | 90.73 | 0.000042 | 0.46 | 2118.24 | 1987.18 | 0.05 |
| Main Reach | 1.03 | Max WS | 10yr mit | 271.80 | 84.80 | 89.37 | | 89.40 | 0.000971 | 1.49 | 221.38 | 1347.04 | 0.20 |
| Main Reach | 1.03 | Max WS | 100yr mit | 413.61 | 84.80 | 90.72 | | 90.72 | 0.000078 | 0.60 | 1537.96 | 1770.00 | 0.06 |
| Main Reach | 1.025 | | | Culvert | | | | | | | | | |
| Main Reach | 1.02 | Max WS | 10yr mit | 270.28 | 84.82 | 88.39 | | 88.41 | 0.001962 | 1.36 | 372.90 | 769.25 | 0.16 |
| Main Reach | 1.02 | Max WS | 100yr mit | 412.42 | 84.82 | 88.96 | | 88.97 | 0.000586 | 0.84 | 814.63 | 772.04 | 0.09 |
| Main Reach | 1.01 | Max WS | 10yr mit | 269.29 | 84.30 | 87.96 | | 87.97 | 0.000527 | 0.90 | 409.45 | 165.43 | 0.09 |
| Main Reach | 1.01 | Max WS | 100yr mit | 412.37 | 84.30 | 88.77 | | 88.78 | 0.000475 | 0.99 | 576.83 | 210.72 | 0.09 |
| Main Reach | 1.00 | Max WS | 10yr mit | 281.20 | 83.80 | 87.89 | | 87.90 | 0.000609 | 0.84 | 384.55 | 174.31 | 0.09 |
| Main Reach | 1.00 | Max WS | 100yr mit | 432.97 | 83.80 | 88.70 | | 88.71 | 0.000565 | 0.91 | 529.09 | 178.93 | 0.09 |
| Main Reach | 0.95 | Max WS | 10yr mit | 281.69 | 83.20 | 87.77 | | 87.78 | 0.000629 | 1.04 | 360.41 | 189.14 | 0.10 |
| Main Reach | 0.95 | Max WS | 100yr mit | 433.97 | 83.20 | 88.59 | | 88.60 | 0.000544 | 1.12 | 517.64 | 191.46 | 0.10 |
| Main Reach | 0.90 | Max WS | 10yr mit | 279.86 | 82.09 | 87.08 | | 87.16 | 0.004151 | 2.27 | 123.65 | 59.84 | 0.24 |
| Main Reach | 0.90 | Max WS | 100yr mit | 433.93 | 82.09 | 88.20 | | 88.26 | 0.002226 | 2.10 | 270.85 | 180.30 | 0.19 |
| Main Reach | 0.88 | Max WS | 10yr mit | 279.06 | 82.00 | 86.77 | | 86.89 | 0.006954 | 2.88 | 112.35 | 90.28 | 0.31 |
| Main Reach | 0.88 | Max WS | 100yr mit | 433.93 | 82.00 | 88.12 | | 88.16 | 0.001614 | 1.83 | 349.70 | 209.66 | 0.16 |
| Main Reach | .87 | | | Culvert | | | | | | | | | |
| Main Reach | 0.86 | Max WS | 10yr mit | 275.87 | 81.83 | 86.21 | | 86.32 | 0.007816 | 2.77 | 114.86 | 74.86 | 0.33 |
| Main Reach | 0.86 | Max WS | 100yr mit | 433.92 | 81.83 | 86.79 | | 86.92 | 0.008197 | 3.14 | 165.37 | 98.61 | 0.34 |
| Main Reach | 0.85 | Max WS | 10yr mit | 274.28 | 81.10 | 85.99 | | 86.02 | 0.001155 | 1.50 | 263.60 | 126.95 | 0.14 |
| Main Reach | 0.85 | Max WS | 100yr mit | 433.92 | 81.10 | 86.57 | | 86.60 | 0.001446 | 1.84 | 338.97 | 134.59 | 0.15 |
| Main Reach | 0.80 | Max WS | 10yr mit | 278.07 | 81.10 | 85.92 | | 85.92 | 0.000239 | 0.65 | 548.65 | 234.13 | 0.06 |
| Main Reach | 0.80 | Max WS | 100yr mit | 444.50 | 81.10 | 86.47 | | 86.48 | 0.000341 | 0.85 | 679.47 | 236.20 | 0.07 |
| Main Reach | 0.75 | Max WS | 10yr mit | 281.18 | 80.50 | 85.85 | | 85.86 | 0.000401 | 0.76 | 426.77 | 183.75 | 0.08 |
| Main Reach | 0.75 | Max WS | 100yr mit | 451.60 | 80.50 | 86.37 | | 86.38 | 0.000600 | 1.03 | 531.45 | 212.90 | 0.10 |
| Main Reach | 0.70 | Max WS | 10yr mit | 280.80 | 80.40 | 85.79 | | 85.80 | 0.000191 | 0.58 | 581.55 | 182.02 | 0.05 |
| Main Reach | 0.70 | Max WS | 100yr mit | 451.53 | 80.40 | 86.28 | | 86.29 | 0.000314 | 0.81 | 672.67 | 189.64 | 0.07 |
| Main Reach | 0.65 | Max WS | 10yr mit | 280.98 | 80.20 | 85.77 | | 85.77 | 0.000080 | 0.40 | 869.85 | 285.60 | 0.04 |
| Main Reach | 0.65 | Max WS | 100yr mit | 452.23 | 80.20 | 86.24 | | 86.25 | 0.000134 | 0.56 | 1007.87 | 295.85 | 0.05 |
| Main Reach | 0.6 | Max WS | 10yr mit | 281.58 | 80.20 | 85.75 | | 85.75 | 0.000070 | 0.38 | 902.81 | 294.79 | 0.03 |
| Main Reach | 0.6 | Max WS | 100yr mit | 453.55 | 80.20 | 86.21 | | 86.22 | 0.000121 | 0.54 | 1043.50 | 309.99 | 0.05 |
| Main Reach | 0.555 | Max WS | 10yr mit | 281.89 | 80.20 | 85.73 | | | 0.000121 | 0.52 | 685.05 | 263.99 | 0.04 |
| Main Reach | 0.555 | Max WS | 100yr mit | 454.20 | 80.20 | 86.18 | | | 0.000206 | 0.73 | 808.51 | 283.48 | 0.06 |
| Main Reach | 0.552 | | | Mult Open | | | | | | | | | |
| Main Reach | 0.55 | Max WS | 10yr mit | 278.13 | 79.60 | 83.80 | | 83.81 | 0.000681 | 0.81 | 379.70 | 153.52 | 0.09 |
| Main Reach | 0.55 | Max WS | 100yr mit | 452.97 | 79.60 | 84.75 | | 84.76 | 0.000615 | 0.95 | 558.75 | 237.50 | 0.09 |
| Main Reach | 0.5 | Max WS | 10yr mit | 276.45 | 79.60 | 83.60 | | 83.61 | 0.000830 | 0.90 | 354.61 | 151.22 | 0.10 |
| Main Reach | 0.5 | Max WS | 100yr mit | 452.60 | 79.60 | 84.58 | | 84.59 | 0.000690 | 1.00 | 547.32 | 241.61 | 0.10 |
| Main Reach | 0.45 | Max WS | 10yr mit | 276.01 | 79.60 | 83.50 | | 83.50 | 0.000181 | 0.49 | 724.02 | 291.19 | 0.05 |
| Main Reach | 0.45 | Max WS | 100yr mit | 453.06 | 79.60 | 84.49 | | 84.50 | 0.000164 | 0.57 | 1020.16 | 308.42 | 0.05 |
| Main Reach | 0.40 | Max WS | 10yr mit | 277.05 | 79.60 | 83.47 | | 83.47 | 0.000091 | 0.33 | 904.28 | 318.48 | 0.04 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Main Reach | 0.40 | Max WS | 100yr mit | 455.01 | 79.60 | 84.47 | | 84.47 | 0.000091 | 0.41 | 1260.02 | 372.00 | 0.04 |
| | | | | | | | | | | | | | |
| Main Reach | 0.35 | Max WS | 10yr mit | 277.04 | 79.23 | 83.34 | | 83.37 | 0.001260 | 1.40 | 244.39 | 210.19 | 0.14 |
| Main Reach | 0.35 | Max WS | 100yr mit | 454.99 | 79.23 | 84.39 | | 84.41 | 0.000755 | 1.32 | 483.00 | 254.53 | 0.11 |
| | | | | | | | | | | | | | |
| Main Reach | 0.33 | | | Mult Open | | | | | | | | | |
| | | | | | | | | | | | | | |
| Main Reach | 0.30 | Max WS | 10yr mit | 276.84 | 79.23 | 82.20 | | 82.28 | 0.006982 | 2.28 | 121.23 | 67.44 | 0.30 |
| Main Reach | 0.30 | Max WS | 100yr mit | 454.95 | 79.23 | 82.87 | | 82.98 | 0.007822 | 2.64 | 172.10 | 83.72 | 0.32 |
| | | | | | | | | | | | | | |
| Main Reach | 0.25 | Max WS | 10yr mit | 276.03 | 79.20 | 81.65 | | 81.66 | 0.000809 | 0.78 | 430.29 | 238.93 | 0.10 |
| Main Reach | 0.25 | Max WS | 100yr mit | 454.84 | 79.20 | 82.28 | | 82.29 | 0.000854 | 0.94 | 583.80 | 253.00 | 0.11 |
| | | | | | | | | | | | | | |
| Main Reach | 0.20 | Max WS | 10yr mit | 276.66 | 79.00 | 81.56 | | 81.57 | 0.000768 | 0.68 | 470.38 | 284.42 | 0.10 |
| Main Reach | 0.20 | Max WS | 100yr mit | 456.94 | 79.00 | 82.18 | | 82.19 | 0.000747 | 0.82 | 652.05 | 299.34 | 0.10 |
| | | | | | | | | | | | | | |
| Main Reach | 0.15 | Max WS | 10yr mit | 276.75 | 78.70 | 81.34 | | 81.35 | 0.001409 | 1.01 | 357.38 | 234.64 | 0.13 |
| Main Reach | 0.15 | Max WS | 100yr mit | 459.85 | 78.70 | 81.97 | | 81.98 | 0.001300 | 1.14 | 512.36 | 252.92 | 0.13 |
| | | | | | | | | | | | | | |
| Main Reach | 0.10 | Max WS | 10yr mit | 276.25 | 78.70 | 81.19 | | 81.20 | 0.001306 | 0.95 | 380.31 | 254.10 | 0.13 |
| Main Reach | 0.10 | Max WS | 100yr mit | 460.39 | 78.70 | 81.84 | | 81.85 | 0.001140 | 1.10 | 551.03 | 270.19 | 0.13 |
| | | | | | | | | | | | | | |
| Main Reach | 0.05 | Max WS | 10yr mit | 275.30 | 78.20 | 81.02 | | 81.02 | 0.000250 | 0.49 | 677.10 | 303.96 | 0.06 |
| Main Reach | 0.05 | Max WS | 100yr mit | 460.52 | 78.20 | 81.68 | | 81.69 | 0.000307 | 0.61 | 884.53 | 321.23 | 0.07 |
| | | | | | | | | | | | | | |
| Main Reach | 0.04 | Max WS | 10yr mit | 273.98 | 77.40 | 80.80 | | 80.81 | 0.001550 | 1.10 | 362.25 | 261.96 | 0.14 |
| Main Reach | 0.04 | Max WS | 100yr mit | 460.69 | 77.40 | 81.50 | | 81.51 | 0.001173 | 1.18 | 553.01 | 279.55 | 0.13 |
| | | | | | | | | | | | | | |
| Main Reach | 0.03 | Max WS | 10yr mit | 273.12 | 76.70 | 80.62 | | 80.62 | 0.000203 | 0.55 | 691.47 | 284.64 | 0.06 |
| Main Reach | 0.03 | Max WS | 100yr mit | 460.84 | 76.70 | 81.36 | | 81.36 | 0.000245 | 0.70 | 903.10 | 289.44 | 0.06 |
| | | | | | | | | | | | | | |
| Main Reach | 0.02 | Max WS | 10yr mit | 273.16 | 76.20 | 80.58 | | 80.58 | 0.000171 | 0.48 | 688.99 | 327.85 | 0.05 |
| Main Reach | 0.02 | Max WS | 100yr mit | 461.01 | 76.20 | 81.31 | | 81.31 | 0.000207 | 0.61 | 964.17 | 415.90 | 0.06 |
| | | | | | | | | | | | | | |
| Main Reach | 0.01 | Max WS | 10yr mit | 274.57 | 75.70 | 80.51 | | 80.52 | 0.000439 | 0.84 | 440.03 | 292.29 | 0.08 |
| Main Reach | 0.01 | Max WS | 100yr mit | 464.62 | 75.70 | 81.23 | | 81.24 | 0.000454 | 0.97 | 668.12 | 324.20 | 0.09 |
| | | | | | | | | | | | | | |
| Main Reach | 0.009 | Max WS | 10yr mit | 274.60 | 75.08 | 80.40 | | 80.42 | 0.001309 | 1.49 | 281.15 | 223.00 | 0.14 |
| Main Reach | 0.009 | Max WS | 100yr mit | 464.68 | 75.08 | 81.13 | | 81.15 | 0.001061 | 1.53 | 445.39 | 223.00 | 0.13 |
| | | | | | | | | | | | | | |
| Main Reach | 0.008 | Max WS | 10yr mit | 274.22 | 73.85 | 79.87 | | 79.94 | 0.002628 | 2.18 | 130.54 | 48.35 | 0.20 |
| Main Reach | 0.008 | Max WS | 100yr mit | 462.58 | 73.85 | 80.74 | | 80.79 | 0.002010 | 2.12 | 379.69 | 402.67 | 0.18 |
| | | | | | | | | | | | | | |
| Main Reach | 0.007 | Max WS | 10yr mit | 208.69 | 73.00 | 79.56 | | 79.58 | 0.000781 | 1.27 | 196.50 | 87.02 | 0.11 |
| Main Reach | 0.007 | Max WS | 100yr mit | 393.21 | 73.00 | 80.37 | | 80.41 | 0.001132 | 1.68 | 320.67 | 240.74 | 0.14 |
| | | | | | | | | | | | | | |
| Down | 6.9 | Max WS | 10yr mit | 426.32 | 72.00 | 79.56 | | 79.60 | 0.000892 | 1.70 | 274.76 | 175.85 | 0.16 |
| Down | 6.9 | Max WS | 100yr mit | 740.13 | 72.00 | 80.37 | | 80.42 | 0.000904 | 1.94 | 609.07 | 646.42 | 0.16 |
| | | | | | | | | | | | | | |
| Down | 6.85* | Max WS | 10yr mit | 426.31 | 71.71 | 79.48 | | 79.53 | 0.000802 | 1.80 | 286.23 | 183.52 | 0.15 |
| Down | 6.85* | Max WS | 100yr mit | 740.11 | 71.71 | 80.28 | | 80.34 | 0.000988 | 2.20 | 489.65 | 344.82 | 0.17 |
| | | | | | | | | | | | | | |
| Down | 6.8 | Max WS | 10yr mit | 426.31 | 71.43 | 79.38 | 75.36 | 79.45 | 0.001046 | 2.18 | 254.28 | 146.62 | 0.17 |
| Down | 6.8 | Max WS | 100yr mit | 740.11 | 71.43 | 80.15 | 76.42 | 80.24 | 0.001412 | 2.73 | 392.96 | 251.35 | 0.20 |

HEC-RAS Profile: Max WS

| Reach | River Sta | Profile | Plan | 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) | |
| Federico Trib | 1.4 | Max WS | 10yr FFDUNM | 82.79 | 109.90 | 111.05 | | 111.06 | 0.003258 | 0.82 | 101.36 | 150.87 | 0.17 |
| Federico Trib | 1.4 | Max WS | Dev Unmit100 | 153.64 | 109.90 | 111.34 | | 111.35 | 0.003399 | 1.06 | 146.34 | 158.65 | 0.19 |
| Federico Trib | 1.375* | Max WS | 10yr FFDUNM | 82.63 | 109.66 | 110.73 | | 110.74 | 0.003356 | 0.80 | 103.07 | 160.26 | 0.18 |
| Federico Trib | 1.375* | Max WS | Dev Unmit100 | 152.85 | 109.66 | 111.01 | | 111.03 | 0.003453 | 1.03 | 149.79 | 172.69 | 0.19 |
| Federico Trib | 1.35* | Max WS | 10yr FFDUNM | 82.37 | 109.43 | 110.41 | | 110.42 | 0.003491 | 0.80 | 103.92 | 177.93 | 0.18 |
| Federico Trib | 1.35* | Max WS | Dev Unmit100 | 152.36 | 109.43 | 110.68 | | 110.70 | 0.003555 | 1.00 | 156.42 | 200.89 | 0.19 |
| Federico Trib | 1.325* | Max WS | 10yr FFDUNM | 82.14 | 109.19 | 110.09 | | 110.10 | 0.003262 | 0.77 | 110.81 | 196.82 | 0.17 |
| Federico Trib | 1.325* | Max WS | Dev Unmit100 | 151.87 | 109.19 | 110.35 | | 110.37 | 0.003434 | 0.95 | 167.43 | 230.22 | 0.19 |
| Federico Trib | 1.3 | Max WS | 10yr FFDUNM | 81.95 | 108.95 | 109.72 | | 109.73 | 0.004556 | 0.86 | 100.19 | 207.47 | 0.20 |
| Federico Trib | 1.3 | Max WS | Dev Unmit100 | 151.51 | 108.95 | 109.98 | | 109.99 | 0.004526 | 1.01 | 158.46 | 247.62 | 0.21 |
| Federico Trib | 1.275* | Max WS | 10yr FFDUNM | 86.41 | 108.21 | 109.14 | | 109.15 | 0.004458 | 0.90 | 99.17 | 187.76 | 0.20 |
| Federico Trib | 1.275* | Max WS | Dev Unmit100 | 159.35 | 108.21 | 109.42 | | 109.44 | 0.004106 | 1.07 | 158.27 | 225.63 | 0.20 |
| Federico Trib | 1.25* | Max WS | 10yr FFDUNM | 90.69 | 107.47 | 108.58 | | 108.60 | 0.004198 | 0.97 | 93.98 | 140.52 | 0.20 |
| Federico Trib | 1.25* | Max WS | Dev Unmit100 | 166.79 | 107.47 | 108.93 | | 108.95 | 0.003488 | 1.14 | 156.95 | 198.15 | 0.20 |
| Federico Trib | 1.225* | Max WS | 10yr FFDUNM | 94.95 | 106.74 | 108.15 | | 108.16 | 0.002602 | 0.94 | 105.85 | 139.00 | 0.17 |
| Federico Trib | 1.225* | Max WS | Dev Unmit100 | 174.38 | 106.74 | 108.54 | | 108.56 | 0.002493 | 1.15 | 170.45 | 186.36 | 0.17 |
| Federico Trib | 1.2 | Max WS | 10yr FFDUNM | 99.23 | 106.00 | 107.90 | | 107.91 | 0.001254 | 0.85 | 135.67 | 145.60 | 0.12 |
| Federico Trib | 1.2 | Max WS | Dev Unmit100 | 182.01 | 106.00 | 108.27 | | 108.29 | 0.001627 | 1.13 | 203.77 | 207.06 | 0.15 |
| Federico Trib | 1.18* | Max WS | 10yr FFDUNM | 112.27 | 105.50 | 107.65 | | 107.67 | 0.002792 | 1.23 | 110.54 | 142.14 | 0.18 |
| Federico Trib | 1.18* | Max WS | Dev Unmit100 | 206.60 | 105.50 | 107.93 | | 107.97 | 0.004031 | 1.67 | 153.03 | 153.67 | 0.23 |
| Federico Trib | 1.161 | Max WS | 10yr FFDUNM | 114.50 | 105.00 | 107.50 | | 107.50 | 0.000737 | 0.62 | 199.43 | 164.69 | 0.09 |
| Federico Trib | 1.161 | Max WS | Dev Unmit100 | 210.56 | 105.00 | 107.70 | | 107.71 | 0.001508 | 0.97 | 233.32 | 167.45 | 0.14 |
| Federico Trib | 1.16 | Max WS | 10yr FFDUNM | 114.83 | 105.00 | 107.49 | | | 0.000755 | 0.62 | 198.28 | 164.59 | 0.09 |
| Federico Trib | 1.16 | Max WS | Dev Unmit100 | 211.21 | 105.00 | 107.68 | | | 0.001571 | 0.98 | 230.78 | 167.24 | 0.14 |
| Federico Trib | 1.15 | | | Mult Open | | | | | | | | | |
| Federico Trib | 1.14 | Max WS | 10yr FFDUNM | 114.83 | 105.00 | 107.06 | | 107.06 | 0.001225 | 0.92 | 200.46 | 303.69 | 0.12 |
| Federico Trib | 1.14 | Max WS | Dev Unmit100 | 210.92 | 105.00 | 107.35 | | 107.36 | 0.001405 | 1.10 | 292.08 | 317.44 | 0.14 |
| Federico Trib | 1.139 | Max WS | 10yr FFDUNM | 115.14 | 104.80 | 107.05 | | 107.05 | 0.001256 | 0.94 | 198.27 | 303.23 | 0.13 |
| Federico Trib | 1.139 | Max WS | Dev Unmit100 | 211.40 | 104.80 | 107.34 | | 107.35 | 0.001459 | 1.12 | 288.23 | 316.75 | 0.14 |
| Federico Trib | 1.1 | Max WS | 10yr FFDUNM | 118.51 | 104.00 | 106.54 | | 106.56 | 0.004277 | 1.52 | 129.40 | 242.93 | 0.22 |
| Federico Trib | 1.1 | Max WS | Dev Unmit100 | 184.98 | 104.00 | 106.96 | | 106.97 | 0.001912 | 1.21 | 242.65 | 302.98 | 0.16 |
| Federico Trib | 1.0 | Max WS | 10yr FFDUNM | 105.43 | 102.98 | 105.48 | | 105.49 | 0.000594 | 0.72 | 193.79 | 184.04 | 0.09 |
| Federico Trib | 1.0 | Max WS | Dev Unmit100 | 168.18 | 102.98 | 106.52 | | 106.52 | 0.000196 | 0.54 | 386.02 | 185.75 | 0.05 |
| Federico Trib | .999* | Max WS | 10yr FFDUNM | 105.35 | 102.79 | 105.46 | | 105.47 | 0.000390 | 0.59 | 229.00 | 185.63 | 0.07 |
| Federico Trib | .999* | Max WS | Dev Unmit100 | 168.33 | 102.79 | 106.51 | | 106.51 | 0.000149 | 0.48 | 453.84 | 239.91 | 0.05 |
| Federico Trib | .998* | Max WS | 10yr FFDUNM | 105.33 | 102.59 | 105.45 | | 105.45 | 0.000362 | 0.56 | 231.31 | 177.17 | 0.07 |
| Federico Trib | .998* | Max WS | Dev Unmit100 | 168.25 | 102.59 | 106.50 | | 106.51 | 0.000151 | 0.48 | 446.24 | 239.86 | 0.05 |
| Federico Trib | .9971 | Max WS | 10yr FFDUNM | 105.32 | 102.40 | 105.44 | | 105.44 | 0.000368 | 0.57 | 209.89 | 127.05 | 0.07 |
| Federico Trib | .9971 | Max WS | Dev Unmit100 | 168.22 | 102.40 | 106.50 | | 106.50 | 0.000187 | 0.54 | 344.70 | 127.05 | 0.05 |
| Federico Trib | 0.997 | Max WS | 10yr FFDUNM | 105.32 | 102.40 | 105.43 | | 105.44 | 0.000372 | 0.57 | 208.89 | 126.65 | 0.07 |
| Federico Trib | 0.997 | Max WS | Dev Unmit100 | 168.21 | 102.40 | 106.50 | | 106.50 | 0.000188 | 0.54 | 343.51 | 126.65 | 0.05 |
| Federico Trib | .9954 | | | Culvert | | | | | | | | | |
| Federico Trib | 0.993 | Max WS | 10yr FFDUNM | 104.71 | 102.20 | 104.18 | | 104.21 | 0.004612 | 1.26 | 87.29 | 118.64 | 0.22 |
| Federico Trib | 0.993 | Max WS | Dev Unmit100 | 165.40 | 102.20 | 104.74 | | 104.76 | 0.002143 | 1.16 | 158.60 | 137.72 | 0.16 |
| Federico Trib | .9929 | Max WS | 10yr FFDUNM | 104.56 | 102.20 | 104.13 | | 104.16 | 0.005647 | 1.35 | 80.87 | 116.77 | 0.24 |
| Federico Trib | .9929 | Max WS | Dev Unmit100 | 165.30 | 102.20 | 104.72 | | 104.74 | 0.002265 | 1.18 | 155.49 | 136.95 | 0.17 |
| Federico Trib | 0.98 | Max WS | 10yr FFDUNM | 104.70 | 101.00 | 103.45 | | 103.46 | 0.000748 | 0.86 | 146.42 | 97.68 | 0.10 |
| Federico Trib | 0.98 | Max WS | Dev Unmit100 | 164.75 | 101.00 | 104.44 | | 104.45 | 0.000386 | 0.79 | 248.07 | 105.54 | 0.08 |
| Federico Trib | .979* | Max WS | 10yr FFDUNM | 105.45 | 100.80 | 103.42 | | 103.43 | 0.000860 | 0.88 | 131.68 | 68.83 | 0.10 |
| Federico Trib | .979* | Max WS | Dev Unmit100 | 166.42 | 100.80 | 104.42 | | 104.43 | 0.000553 | 0.90 | 200.75 | 68.83 | 0.09 |
| Federico Trib | .978* | Max WS | 10yr FFDUNM | 105.03 | 100.60 | 103.39 | | 103.40 | 0.000724 | 0.79 | 145.46 | 75.58 | 0.09 |
| Federico Trib | .978* | Max WS | Dev Unmit100 | 166.41 | 100.60 | 104.40 | | 104.41 | 0.000463 | 0.79 | 222.14 | 75.58 | 0.07 |
| Federico Trib | .9771 | Max WS | 10yr FFDUNM | 104.96 | 100.40 | 103.38 | | 103.38 | 0.000451 | 0.61 | 178.69 | 87.05 | 0.07 |
| Federico Trib | .9771 | Max WS | Dev Unmit100 | 166.41 | 100.40 | 104.40 | | 104.40 | 0.000303 | 0.62 | 267.51 | 87.05 | 0.06 |
| Federico Trib | 0.977 | Max WS | 10yr FFDUNM | 104.93 | 100.40 | 103.37 | | 103.38 | 0.000469 | 0.62 | 174.25 | 84.34 | 0.07 |
| Federico Trib | 0.977 | Max WS | Dev Unmit100 | 166.41 | 100.40 | 104.39 | | 104.40 | 0.000318 | 0.63 | 260.42 | 84.34 | 0.06 |
| Federico Trib | 0.975 | | | Culvert | | | | | | | | | |
| Federico Trib | 0.973 | Max WS | 10yr FFDUNM | 103.28 | 100.00 | 101.94 | | 101.95 | 0.001359 | 0.94 | 146.13 | 166.58 | 0.13 |
| Federico Trib | 0.973 | Max WS | Dev Unmit100 | 166.12 | 100.00 | 102.31 | | 102.32 | 0.001260 | 1.04 | 213.03 | 190.36 | 0.13 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Federico Trib | .9729 | Max WS | 10yr FFDUNM | 103.19 | 100.00 | 101.92 | | 101.93 | 0.001417 | 0.96 | 143.79 | 165.51 | 0.13 |
| Federico Trib | .9729 | Max WS | Dev Unmit100 | 166.12 | 100.00 | 102.30 | | 102.31 | 0.001302 | 1.06 | 210.54 | 189.55 | 0.13 |
| Federico Trib | 0.97 | Max WS | 10yr FFDUNM | 103.04 | 100.00 | 101.90 | | 101.91 | 0.001014 | 0.76 | 147.49 | 128.94 | 0.11 |
| Federico Trib | 0.97 | Max WS | Dev Unmit100 | 166.08 | 100.00 | 102.27 | | 102.29 | 0.001124 | 0.93 | 198.84 | 148.12 | 0.12 |
| Federico Trib | .9675* | Max WS | 10yr FFDUNM | 103.57 | 99.69 | 101.86 | | 101.87 | 0.000825 | 0.77 | 159.69 | 154.42 | 0.10 |
| Federico Trib | .9675* | Max WS | Dev Unmit100 | 167.15 | 99.69 | 102.23 | | 102.24 | 0.000940 | 0.93 | 223.46 | 191.80 | 0.11 |
| Federico Trib | .965* | Max WS | 10yr FFDUNM | 103.44 | 99.38 | 101.82 | | 101.83 | 0.000840 | 0.85 | 152.34 | 148.86 | 0.11 |
| Federico Trib | .965* | Max WS | Dev Unmit100 | 167.11 | 99.38 | 102.18 | | 102.19 | 0.001004 | 1.04 | 212.31 | 183.12 | 0.12 |
| Federico Trib | .9625* | Max WS | 10yr FFDUNM | 103.39 | 99.06 | 101.77 | | 101.78 | 0.001100 | 1.06 | 135.42 | 141.33 | 0.12 |
| Federico Trib | .9625* | Max WS | Dev Unmit100 | 167.09 | 99.06 | 102.12 | | 102.14 | 0.001318 | 1.28 | 190.90 | 174.00 | 0.14 |
| Federico Trib | 0.96 | Max WS | 10yr FFDUNM | 103.28 | 98.75 | 101.67 | | 101.70 | 0.002429 | 1.65 | 101.27 | 115.96 | 0.18 |
| Federico Trib | 0.96 | Max WS | Dev Unmit100 | 167.07 | 98.75 | 102.02 | | 102.05 | 0.002559 | 1.84 | 143.08 | 124.45 | 0.19 |
| Federico Trib | .956666* | Max WS | 10yr FFDUNM | 105.30 | 98.44 | 101.34 | | 101.38 | 0.004092 | 2.04 | 84.59 | 140.05 | 0.24 |
| Federico Trib | .956666* | Max WS | Dev Unmit100 | 169.99 | 98.44 | 101.71 | | 101.75 | 0.003457 | 2.07 | 141.74 | 168.45 | 0.22 |
| Federico Trib | .953333* | Max WS | 10yr FFDUNM | 105.20 | 98.13 | 100.98 | | 101.02 | 0.003281 | 1.73 | 85.66 | 100.90 | 0.21 |
| Federico Trib | .953333* | Max WS | Dev Unmit100 | 169.87 | 98.13 | 101.32 | | 101.37 | 0.004171 | 2.15 | 130.13 | 167.79 | 0.24 |
| Federico Trib | 0.95 | Max WS | 10yr FFDUNM | 104.88 | 97.82 | 100.63 | | 100.66 | 0.003798 | 1.75 | 89.37 | 145.27 | 0.22 |
| Federico Trib | 0.95 | Max WS | Dev Unmit100 | 169.67 | 97.82 | 100.94 | | 100.98 | 0.003676 | 1.91 | 138.69 | 168.39 | 0.22 |
| Federico Trib | 0.94 | Max WS | 10yr FFDUNM | 104.13 | 97.03 | 99.90 | | 99.91 | 0.000652 | 0.68 | 217.82 | 224.77 | 0.09 |
| Federico Trib | 0.94 | Max WS | Dev Unmit100 | 170.52 | 97.03 | 100.23 | | 100.23 | 0.000722 | 0.80 | 291.24 | 235.47 | 0.10 |
| Federico Trib | .937 | Max WS | 10yr FFDUNM | 105.19 | 96.60 | 99.69 | | 99.69 | 0.000594 | 0.83 | 299.70 | 424.50 | 0.09 |
| Federico Trib | .937 | Max WS | Dev Unmit100 | 172.28 | 96.60 | 100.01 | | 100.01 | 0.000518 | 0.84 | 438.55 | 438.33 | 0.09 |
| Federico Trib | .936* | Max WS | 10yr FFDUNM | 131.31 | 96.43 | 99.53 | | 99.57 | 0.003069 | 1.80 | 155.57 | 339.70 | 0.21 |
| Federico Trib | .936* | Max WS | Dev Unmit100 | 214.59 | 96.43 | 99.91 | | 99.93 | 0.001894 | 1.56 | 293.16 | 388.04 | 0.17 |
| Federico Trib | .935* | Max WS | 10yr FFDUNM | 131.08 | 96.27 | 99.35 | | 99.37 | 0.002040 | 1.37 | 159.53 | 210.50 | 0.17 |
| Federico Trib | .935* | Max WS | Dev Unmit100 | 214.46 | 96.27 | 99.78 | | 99.79 | 0.001640 | 1.39 | 257.13 | 246.24 | 0.15 |
| Federico Trib | .934 | Max WS | 10yr FFDUNM | 130.97 | 96.10 | 99.19 | | 99.21 | 0.002338 | 1.37 | 135.36 | 157.78 | 0.17 |
| Federico Trib | .934 | Max WS | Dev Unmit100 | 214.41 | 96.10 | 99.64 | | 99.66 | 0.001956 | 1.45 | 214.26 | 189.37 | 0.17 |
| Federico Trib | 0.933 | Max WS | 10yr FFDUNM | 130.97 | 96.10 | 99.16 | | | 0.002515 | 1.41 | 131.39 | 156.02 | 0.18 |
| Federico Trib | 0.933 | Max WS | Dev Unmit100 | 214.39 | 96.10 | 99.62 | | 99.64 | 0.002051 | 1.47 | 210.36 | 187.93 | 0.17 |
| Federico Trib | .931 | | | Mult Open | | | | | | | | | |
| Federico Trib | 0.93 | Max WS | 10yr FFDUNM | 129.95 | 96.00 | 98.90 | | 98.90 | 0.000593 | 0.63 | 276.50 | 290.44 | 0.09 |
| Federico Trib | 0.93 | Max WS | Dev Unmit100 | 213.71 | 96.00 | 99.30 | | 99.30 | 0.000540 | 0.70 | 395.35 | 301.87 | 0.09 |
| Federico Trib | .929 | Max WS | 10yr FFDUNM | 129.95 | 96.00 | 98.89 | | 98.90 | 0.000604 | 0.64 | 274.75 | 290.12 | 0.09 |
| Federico Trib | .929 | Max WS | Dev Unmit100 | 213.71 | 96.00 | 99.29 | | 99.30 | 0.000547 | 0.70 | 393.70 | 301.75 | 0.09 |
| Federico Trib | .927666* | Max WS | 10yr FFDUNM | 129.75 | 95.70 | 98.85 | | 98.86 | 0.000560 | 0.67 | 272.15 | 304.71 | 0.09 |
| Federico Trib | .927666* | Max WS | Dev Unmit100 | 213.55 | 95.70 | 99.26 | | 99.26 | 0.000545 | 0.75 | 397.02 | 314.61 | 0.09 |
| Federico Trib | .926333* | Max WS | 10yr FFDUNM | 129.60 | 95.40 | 98.78 | | 98.79 | 0.001356 | 1.11 | 195.16 | 227.62 | 0.13 |
| Federico Trib | .926333* | Max WS | Dev Unmit100 | 213.43 | 95.40 | 99.20 | | 99.21 | 0.001075 | 1.11 | 333.35 | 357.12 | 0.12 |
| Federico Trib | .925 | Max WS | 10yr FFDUNM | 129.48 | 95.10 | 98.70 | | 98.70 | 0.001146 | 1.06 | 221.33 | 341.28 | 0.12 |
| Federico Trib | .925 | Max WS | Dev Unmit100 | 213.36 | 95.10 | 99.13 | | 99.14 | 0.000889 | 1.04 | 370.58 | 349.06 | 0.11 |
| Federico Trib | .923333* | Max WS | 10yr FFDUNM | 129.45 | 95.03 | 98.52 | | 98.56 | 0.003658 | 2.05 | 108.56 | 141.73 | 0.22 |
| Federico Trib | .923333* | Max WS | Dev Unmit100 | 213.31 | 95.03 | 99.03 | | 99.05 | 0.001949 | 1.69 | 267.30 | 323.61 | 0.17 |
| Federico Trib | .921666* | Max WS | 10yr FFDUNM | 129.43 | 94.97 | 98.15 | | 98.25 | 0.005981 | 2.66 | 57.31 | 28.18 | 0.29 |
| Federico Trib | .921666* | Max WS | Dev Unmit100 | 213.30 | 94.97 | 98.67 | | 98.80 | 0.007039 | 3.25 | 110.32 | 219.55 | 0.32 |
| Federico Trib | 0.92 | Max WS | 10yr FFDUNM | 129.43 | 94.90 | 97.93 | | 97.96 | 0.002331 | 1.70 | 102.51 | 64.88 | 0.18 |
| Federico Trib | 0.92 | Max WS | Dev Unmit100 | 213.18 | 94.90 | 98.39 | | 98.44 | 0.003014 | 2.14 | 132.81 | 67.55 | 0.21 |
| Federico Trib | .9175* | Max WS | 10yr FFDUNM | 136.17 | 94.80 | 97.76 | | 97.79 | 0.002269 | 1.62 | 115.12 | 80.60 | 0.18 |
| Federico Trib | .9175* | Max WS | Dev Unmit100 | 225.45 | 94.80 | 98.17 | | 98.21 | 0.003009 | 2.06 | 148.65 | 84.56 | 0.21 |
| Federico Trib | .915* | Max WS | 10yr FFDUNM | 135.98 | 94.70 | 97.66 | | 97.67 | 0.001091 | 1.10 | 202.29 | 196.09 | 0.12 |
| Federico Trib | .915* | Max WS | Dev Unmit100 | 225.27 | 94.70 | 98.04 | | 98.05 | 0.001311 | 1.32 | 284.21 | 234.92 | 0.14 |
| Federico Trib | .9125* | Max WS | 10yr FFDUNM | 135.90 | 94.60 | 97.60 | | 97.60 | 0.000608 | 0.81 | 241.17 | 190.60 | 0.09 |
| Federico Trib | .9125* | Max WS | Dev Unmit100 | 225.21 | 94.60 | 97.96 | | 97.97 | 0.000788 | 1.01 | 316.37 | 219.99 | 0.11 |
| Federico Trib | 0.91 | Max WS | 10yr FFDUNM | 135.88 | 94.50 | 97.55 | | 97.56 | 0.000745 | 0.88 | 236.06 | 206.75 | 0.10 |
| Federico Trib | 0.91 | Max WS | Dev Unmit100 | 225.17 | 94.50 | 97.90 | | 97.91 | 0.000870 | 1.05 | 310.17 | 210.41 | 0.11 |
| Federico Trib | .908* | Max WS | 10yr FFDUNM | 135.79 | 94.20 | 97.36 | | 97.41 | 0.004116 | 2.11 | 115.56 | 192.47 | 0.24 |
| Federico Trib | .908* | Max WS | Dev Unmit100 | 225.01 | 94.20 | 97.73 | | 97.77 | 0.003661 | 2.19 | 191.44 | 218.20 | 0.23 |
| Federico Trib | .906* | Max WS | 10yr FFDUNM | 135.72 | 93.90 | 97.15 | | 97.17 | 0.002378 | 1.63 | 157.05 | 205.29 | 0.18 |
| Federico Trib | .906* | Max WS | Dev Unmit100 | 224.84 | 93.90 | 97.54 | | 97.56 | 0.002130 | 1.70 | 243.03 | 233.21 | 0.18 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Federico Trib | .904* | Max WS | 10yr FFDUNM | 135.68 | 93.60 | 96.99 | | 97.01 | 0.002356 | 1.66 | 140.10 | 137.18 | 0.18 |
| Federico Trib | .904* | Max WS | Dev Unmit100 | 224.65 | 93.60 | 97.37 | | 97.40 | 0.002789 | 1.98 | 200.27 | 225.24 | 0.20 |
| Federico Trib | .902* | Max WS | 10yr FFDUNM | 135.63 | 93.30 | 96.72 | | 96.78 | 0.004781 | 2.35 | 102.21 | 155.15 | 0.26 |
| Federico Trib | .902* | Max WS | Dev Unmit100 | 223.87 | 93.30 | 97.10 | | 97.16 | 0.004557 | 2.52 | 164.18 | 173.43 | 0.26 |
| Federico Trib | 0.90 | Max WS | 10yr FFDUNM | 135.56 | 93.00 | 96.42 | | 96.47 | 0.004104 | 2.16 | 118.91 | 188.54 | 0.24 |
| Federico Trib | 0.90 | Max WS | Dev Unmit100 | 221.70 | 93.00 | 96.85 | | 96.88 | 0.003192 | 2.11 | 204.39 | 212.83 | 0.22 |
| Federico Trib | 0.89 | Max WS | 10yr FFDUNM | 136.66 | 93.00 | 95.47 | | 95.49 | 0.003861 | 1.58 | 120.79 | 121.49 | 0.22 |
| Federico Trib | 0.89 | Max WS | Dev Unmit100 | 214.29 | 93.00 | 96.29 | | 96.30 | 0.001520 | 1.30 | 224.08 | 139.60 | 0.15 |
| Federico Trib | 0.88 | Max WS | 10yr FFDUNM | 134.63 | 91.00 | 94.04 | | 94.07 | 0.003179 | 1.80 | 118.68 | 104.23 | 0.21 |
| Federico Trib | 0.88 | Max WS | Dev Unmit100 | 209.03 | 91.00 | 95.93 | | 95.94 | 0.000333 | 0.87 | 341.08 | 145.45 | 0.07 |
| Federico Trib | .875 | Max WS | 10yr FFDUNM | 137.82 | 90.70 | 93.72 | | 93.73 | 0.000650 | 0.86 | 230.43 | 153.68 | 0.10 |
| Federico Trib | .875 | Max WS | Dev Unmit100 | 216.41 | 90.70 | 95.90 | | 95.90 | 0.000082 | 0.47 | 623.53 | 184.14 | 0.04 |
| Federico Trib | 0.87 | Max WS | 10yr FFDUNM | 141.60 | 90.00 | 93.64 | | 93.64 | 0.000266 | 0.60 | 284.77 | 147.43 | 0.06 |
| Federico Trib | 0.87 | Max WS | Dev Unmit100 | 223.25 | 90.00 | 95.89 | | 95.89 | 0.000052 | 0.39 | 675.07 | 178.52 | 0.03 |
| Federico Trib | 0.868 | Max WS | 10yr FFDUNM | 144.65 | 89.01 | 93.55 | | 93.56 | 0.000410 | 0.69 | 244.75 | 131.72 | 0.08 |
| Federico Trib | 0.868 | Max WS | Dev Unmit100 | 228.97 | 89.01 | 95.87 | | 95.87 | 0.000078 | 0.47 | 550.27 | 131.72 | 0.04 |
| Federico Trib | 0.867 | Max WS | 10yr FFDUNM | 144.66 | 89.00 | 93.54 | | 93.55 | 0.000608 | 0.87 | 193.88 | 97.17 | 0.09 |
| Federico Trib | 0.867 | Max WS | Dev Unmit100 | 228.97 | 89.00 | 95.87 | | 95.87 | 0.000130 | 0.61 | 420.30 | 97.17 | 0.05 |
| Federico Trib | .865 | | | Culvert | | | | | | | | | |
| Federico Trib | 0.864 | Max WS | 10yr FFDUNM | 144.57 | 88.45 | 92.26 | | 92.30 | 0.002566 | 1.78 | 121.33 | 198.32 | 0.19 |
| Federico Trib | 0.864 | Max WS | Dev Unmit100 | 228.90 | 88.45 | 92.69 | | 92.72 | 0.002094 | 1.78 | 207.13 | 200.11 | 0.18 |
| Federico Trib | 0.86 | Max WS | 10yr FFDUNM | 144.51 | 88.30 | 92.14 | | 92.19 | 0.003588 | 2.14 | 112.99 | 202.31 | 0.22 |
| Federico Trib | 0.86 | Max WS | Dev Unmit100 | 228.83 | 88.30 | 92.61 | | 92.65 | 0.002298 | 1.89 | 209.26 | 203.84 | 0.18 |
| Federico Trib | .856666* | Max WS | 10yr FFDUNM | 144.95 | 88.17 | 91.95 | | 91.97 | 0.001453 | 1.38 | 122.55 | 74.72 | 0.15 |
| Federico Trib | .856666* | Max WS | Dev Unmit100 | 229.66 | 88.17 | 92.43 | | 92.47 | 0.001832 | 1.73 | 164.78 | 99.82 | 0.17 |
| Federico Trib | .853333* | Max WS | 10yr FFDUNM | 144.88 | 88.03 | 91.88 | | 91.89 | 0.000492 | 0.87 | 200.45 | 129.86 | 0.09 |
| Federico Trib | .853333* | Max WS | Dev Unmit100 | 229.33 | 88.03 | 92.35 | | 92.36 | 0.000660 | 1.11 | 269.17 | 161.56 | 0.10 |
| Federico Trib | 0.85 | Max WS | 10yr FFDUNM | 144.82 | 87.90 | 91.81 | | 91.83 | 0.001059 | 1.43 | 220.21 | 231.78 | 0.13 |
| Federico Trib | 0.85 | Max WS | Dev Unmit100 | 228.87 | 87.90 | 92.28 | | 92.30 | 0.000909 | 1.43 | 333.85 | 248.09 | 0.12 |
| Federico Trib | .845* | Max WS | 10yr FFDUNM | 137.87 | 87.55 | 91.71 | | 91.71 | 0.000275 | 0.69 | 296.23 | 203.21 | 0.07 |
| Federico Trib | .845* | Max WS | Dev Unmit100 | 206.71 | 87.55 | 92.19 | | 92.20 | 0.000291 | 0.78 | 397.88 | 220.75 | 0.07 |
| Federico Trib | 0.84 | Max WS | 10yr FFDUNM | 147.26 | 87.20 | 91.31 | | 91.39 | 0.003871 | 2.48 | 96.18 | 149.11 | 0.24 |
| Federico Trib | 0.84 | Max WS | Dev Unmit100 | 217.90 | 87.20 | 91.96 | | 92.00 | 0.002155 | 2.09 | 195.38 | 152.97 | 0.18 |
| Federico Trib | 0.83 | Max WS | 10yr FFDUNM | 161.11 | 86.80 | 90.69 | | 90.71 | 0.001284 | 1.30 | 188.68 | 132.11 | 0.14 |
| Federico Trib | 0.83 | Max WS | Dev Unmit100 | 237.77 | 86.80 | 91.63 | | 91.64 | 0.000629 | 1.10 | 342.80 | 181.89 | 0.10 |
| Federico Trib | 0.82 | Max WS | 10yr FFDUNM | 187.17 | 86.00 | 90.17 | | 90.22 | 0.002607 | 2.07 | 121.15 | 59.57 | 0.20 |
| Federico Trib | 0.82 | Max WS | Dev Unmit100 | 278.76 | 86.00 | 91.33 | | 91.37 | 0.001520 | 1.93 | 203.23 | 85.21 | 0.16 |
| Federico Trib | 0.81 | Max WS | 10yr FFDUNM | 205.35 | 85.70 | 89.84 | | 89.86 | 0.000942 | 1.36 | 243.78 | 146.98 | 0.12 |
| Federico Trib | 0.81 | Max WS | Dev Unmit100 | 302.79 | 85.70 | 91.16 | | 91.17 | 0.000358 | 1.02 | 447.72 | 168.42 | 0.08 |
| Federico Trib | 0.807 | Max WS | 10yr FFDUNM | 212.91 | 84.70 | 89.64 | | 89.64 | 0.000276 | 0.83 | 336.78 | 81.78 | 0.07 |
| Federico Trib | 0.807 | Max WS | Dev Unmit100 | 311.80 | 84.70 | 91.07 | | 91.08 | 0.000229 | 0.91 | 453.72 | 81.78 | 0.07 |
| Federico Trib | 0.806 | Max WS | 10yr FFDUNM | 243.37 | 84.72 | 89.60 | | 89.61 | 0.000395 | 1.00 | 305.73 | 100.40 | 0.08 |
| Federico Trib | 0.806 | Max WS | Dev Unmit100 | 348.52 | 84.72 | 91.04 | | 91.05 | 0.000246 | 0.95 | 450.52 | 100.40 | 0.07 |
| Federico Trib | .805 | | | Culvert | | | | | | | | | |
| Federico Trib | 0.804 | Max WS | 10yr FFDUNM | 242.01 | 84.90 | 88.81 | | 88.85 | 0.001941 | 1.75 | 167.15 | 77.14 | 0.17 |
| Federico Trib | 0.804 | Max WS | Dev Unmit100 | 318.07 | 84.90 | 89.63 | | 89.65 | 0.000924 | 1.41 | 343.31 | 227.98 | 0.12 |
| Federico Trib | 0.803 | Max WS | 10yr FFDUNM | 242.01 | 84.46 | 88.81 | | 88.82 | 0.000691 | 1.17 | 317.09 | 157.13 | 0.11 |
| Federico Trib | 0.803 | Max WS | Dev Unmit100 | 318.06 | 84.46 | 89.62 | | 89.63 | 0.000417 | 1.03 | 445.29 | 157.13 | 0.08 |
| Federico Trib | 0.80 | Max WS | 10yr FFDUNM | 235.31 | 84.50 | 88.61 | | 88.68 | 0.001238 | 1.34 | 129.35 | 157.21 | 0.14 |
| Federico Trib | 0.80 | Max WS | Dev Unmit100 | 317.27 | 84.50 | 89.57 | | 89.60 | 0.000085 | 0.42 | 281.16 | 160.00 | 0.04 |
| Federico Trib | 0.79 | Max WS | 10yr FFDUNM | 230.12 | 83.80 | 88.16 | | 88.18 | 0.001566 | 1.67 | 224.04 | 148.58 | 0.16 |
| Federico Trib | 0.79 | Max WS | Dev Unmit100 | 320.20 | 83.80 | 89.49 | | 89.50 | 0.000474 | 1.14 | 421.61 | 148.58 | 0.09 |
| Federico Trib | 0.777 | Max WS | 10yr FFDUNM | 230.49 | 83.00 | 87.98 | | 87.98 | 0.000270 | 0.77 | 451.75 | 217.28 | 0.07 |
| Federico Trib | 0.777 | Max WS | Dev Unmit100 | 321.89 | 83.00 | 89.43 | | 89.44 | 0.000096 | 0.56 | 768.20 | 217.28 | 0.04 |
| Federico Trib | 0.776 | Max WS | 10yr FFDUNM | 230.48 | 82.76 | 87.96 | | 87.97 | 0.000290 | 0.85 | 436.92 | 227.66 | 0.07 |
| Federico Trib | 0.776 | Max WS | Dev Unmit100 | 321.88 | 82.76 | 89.43 | | 89.43 | 0.000097 | 0.59 | 770.32 | 227.66 | 0.04 |
| Federico Trib | .775 | | | Culvert | | | | | | | | | |
| Federico Trib | 0.774 | Max WS | 10yr FFDUNM | 228.58 | 82.74 | 86.94 | | 86.97 | 0.001819 | 1.69 | 249.07 | 282.27 | 0.17 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Federico Trib | 0.774 | Max WS | Dev Unmit100 | 320.13 | 82.74 | 87.42 | | 87.44 | 0.001115 | 1.45 | 402.94 | 334.46 | 0.13 |
| Federico Trib | .7739 | Max WS | 10yr FFDUNM | 228.26 | 82.74 | 86.92 | | 86.95 | 0.001883 | 1.72 | 244.57 | 279.06 | 0.17 |
| Federico Trib | .7739 | Max WS | Dev Unmit100 | 320.04 | 82.74 | 87.41 | | 87.43 | 0.001135 | 1.46 | 399.98 | 333.93 | 0.13 |
| Federico Trib | 0.773 | Max WS | 10yr FFDUNM | 228.16 | 82.74 | 86.92 | | 86.93 | 0.000739 | 1.11 | 310.90 | 274.90 | 0.11 |
| Federico Trib | 0.773 | Max WS | Dev Unmit100 | 320.04 | 82.74 | 87.41 | | 87.42 | 0.000584 | 1.08 | 465.00 | 330.69 | 0.10 |
| Federico Trib | .77225* | Max WS | 10yr FFDUNM | 228.09 | 82.73 | 86.89 | | 86.90 | 0.000787 | 1.14 | 316.88 | 322.26 | 0.11 |
| Federico Trib | .77225* | Max WS | Dev Unmit100 | 320.36 | 82.73 | 87.38 | | 87.39 | 0.000553 | 1.05 | 498.76 | 386.33 | 0.10 |
| Federico Trib | .7715* | Max WS | 10yr FFDUNM | 228.23 | 82.72 | 86.86 | | 86.87 | 0.000787 | 1.14 | 335.04 | 325.04 | 0.11 |
| Federico Trib | .7715* | Max WS | Dev Unmit100 | 320.87 | 82.72 | 87.36 | | 87.37 | 0.000542 | 1.04 | 518.37 | 386.29 | 0.09 |
| Federico Trib | .77075* | Max WS | 10yr FFDUNM | 228.19 | 82.71 | 86.83 | | 86.84 | 0.000702 | 1.07 | 362.83 | 322.61 | 0.10 |
| Federico Trib | .77075* | Max WS | Dev Unmit100 | 321.25 | 82.71 | 87.34 | | 87.35 | 0.000500 | 0.99 | 547.07 | 386.43 | 0.09 |
| Federico Trib | 0.77 | Max WS | 10yr FFDUNM | 228.05 | 82.70 | 86.78 | | 86.80 | 0.001683 | 1.61 | 241.96 | 250.68 | 0.16 |
| Federico Trib | 0.77 | Max WS | Dev Unmit100 | 321.15 | 82.70 | 87.31 | | 87.32 | 0.001030 | 1.39 | 393.15 | 314.30 | 0.13 |
| Federico Trib | .769* | Max WS | 10yr FFDUNM | 253.92 | 82.61 | 86.71 | | 86.73 | 0.001763 | 1.66 | 255.92 | 244.70 | 0.16 |
| Federico Trib | .769* | Max WS | Dev Unmit100 | 375.31 | 82.61 | 87.26 | | 87.28 | 0.001198 | 1.52 | 410.17 | 306.96 | 0.14 |
| Federico Trib | .768* | Max WS | 10yr FFDUNM | 252.27 | 82.52 | 86.65 | | 86.67 | 0.001433 | 1.51 | 273.86 | 243.80 | 0.15 |
| Federico Trib | .768* | Max WS | Dev Unmit100 | 374.50 | 82.52 | 87.22 | | 87.24 | 0.001003 | 1.41 | 430.71 | 298.59 | 0.13 |
| Federico Trib | .767* | Max WS | 10yr FFDUNM | 251.01 | 82.43 | 86.60 | | 86.62 | 0.001152 | 1.37 | 295.09 | 244.89 | 0.13 |
| Federico Trib | .767* | Max WS | Dev Unmit100 | 374.51 | 82.43 | 87.19 | | 87.20 | 0.000838 | 1.30 | 454.24 | 290.12 | 0.12 |
| Federico Trib | .766* | Max WS | 10yr FFDUNM | 250.34 | 82.34 | 86.57 | | 86.58 | 0.000920 | 1.24 | 319.38 | 248.82 | 0.12 |
| Federico Trib | .766* | Max WS | Dev Unmit100 | 374.69 | 82.34 | 87.16 | | 87.17 | 0.000698 | 1.20 | 480.74 | 285.01 | 0.11 |
| Federico Trib | .765* | Max WS | 10yr FFDUNM | 249.88 | 82.24 | 86.54 | | 86.55 | 0.000731 | 1.12 | 346.48 | 253.26 | 0.11 |
| Federico Trib | .765* | Max WS | Dev Unmit100 | 375.01 | 82.24 | 87.14 | | 87.15 | 0.000581 | 1.11 | 509.19 | 281.88 | 0.10 |
| Federico Trib | .764* | Max WS | 10yr FFDUNM | 249.43 | 82.15 | 86.52 | | 86.52 | 0.000585 | 1.02 | 374.50 | 257.99 | 0.10 |
| Federico Trib | .764* | Max WS | Dev Unmit100 | 375.47 | 82.15 | 87.12 | | 87.13 | 0.000487 | 1.03 | 537.84 | 279.94 | 0.09 |
| Federico Trib | .763* | Max WS | 10yr FFDUNM | 249.37 | 82.06 | 86.50 | | 86.50 | 0.000466 | 0.93 | 404.82 | 259.22 | 0.09 |
| Federico Trib | .763* | Max WS | Dev Unmit100 | 375.68 | 82.06 | 87.10 | | 87.11 | 0.000407 | 0.96 | 568.69 | 283.15 | 0.08 |
| Federico Trib | .762* | Max WS | 10yr FFDUNM | 249.15 | 81.97 | 86.48 | | 86.49 | 0.000373 | 0.84 | 435.73 | 259.18 | 0.08 |
| Federico Trib | .762* | Max WS | Dev Unmit100 | 376.26 | 81.97 | 87.09 | | 87.10 | 0.000343 | 0.89 | 601.18 | 287.63 | 0.08 |
| Federico Trib | .761* | Max WS | 10yr FFDUNM | 249.28 | 81.88 | 86.47 | | 86.48 | 0.000302 | 0.77 | 467.45 | 260.30 | 0.07 |
| Federico Trib | .761* | Max WS | Dev Unmit100 | 376.62 | 81.88 | 87.08 | | 87.09 | 0.000290 | 0.83 | 635.25 | 290.96 | 0.07 |
| Federico Trib | .76 | Max WS | 10yr FFDUNM | 249.42 | 81.79 | 86.46 | | 86.46 | 0.000264 | 0.73 | 500.21 | 264.51 | 0.07 |
| Federico Trib | .76 | Max WS | Dev Unmit100 | 377.20 | 81.79 | 87.07 | | 87.08 | 0.000270 | 0.81 | 670.08 | 292.45 | 0.07 |
| Federico Trib | .759375* | Max WS | 10yr FFDUNM | 249.57 | 81.72 | 86.45 | | 86.45 | 0.000293 | 0.77 | 467.00 | 256.04 | 0.07 |
| Federico Trib | .759375* | Max WS | Dev Unmit100 | 377.68 | 81.72 | 87.06 | | 87.06 | 0.000294 | 0.85 | 632.31 | 286.88 | 0.07 |
| Federico Trib | .75875* | Max WS | 10yr FFDUNM | 249.58 | 81.64 | 86.44 | | 86.44 | 0.000332 | 0.81 | 441.44 | 235.79 | 0.07 |
| Federico Trib | .75875* | Max WS | Dev Unmit100 | 378.17 | 81.64 | 87.05 | | 87.05 | 0.000338 | 0.91 | 599.40 | 278.46 | 0.08 |
| Federico Trib | .758125* | Max WS | 10yr FFDUNM | 249.75 | 81.57 | 86.42 | | 86.43 | 0.000354 | 0.84 | 429.19 | 207.39 | 0.08 |
| Federico Trib | .758125* | Max WS | Dev Unmit100 | 378.67 | 81.57 | 87.03 | | 87.04 | 0.000371 | 0.95 | 571.96 | 263.16 | 0.08 |
| Federico Trib | .7575* | Max WS | 10yr FFDUNM | 249.91 | 81.49 | 86.41 | | 86.42 | 0.000377 | 0.86 | 427.14 | 203.49 | 0.08 |
| Federico Trib | .7575* | Max WS | Dev Unmit100 | 379.25 | 81.49 | 87.02 | | 87.02 | 0.000399 | 0.98 | 555.43 | 225.06 | 0.08 |
| Federico Trib | .756875* | Max WS | 10yr FFDUNM | 249.95 | 81.42 | 86.39 | | 86.40 | 0.000401 | 0.88 | 426.35 | 206.55 | 0.08 |
| Federico Trib | .756875* | Max WS | Dev Unmit100 | 379.75 | 81.42 | 87.00 | | 87.01 | 0.000421 | 1.00 | 551.90 | 207.82 | 0.08 |
| Federico Trib | .75625* | Max WS | 10yr FFDUNM | 250.01 | 81.35 | 86.38 | | 86.39 | 0.000419 | 0.89 | 424.75 | 205.44 | 0.08 |
| Federico Trib | .75625* | Max WS | Dev Unmit100 | 380.26 | 81.35 | 86.98 | | 86.99 | 0.000440 | 1.01 | 549.39 | 206.48 | 0.09 |
| Federico Trib | .755625* | Max WS | 10yr FFDUNM | 250.19 | 81.27 | 86.36 | | 86.37 | 0.000448 | 0.91 | 420.53 | 204.55 | 0.08 |
| Federico Trib | .755625* | Max WS | Dev Unmit100 | 380.84 | 81.27 | 86.97 | | 86.98 | 0.000471 | 1.04 | 544.39 | 205.42 | 0.09 |
| Federico Trib | .755 | Max WS | 10yr FFDUNM | 250.27 | 81.20 | 86.34 | | 86.35 | 0.000509 | 0.90 | 413.05 | 203.84 | 0.08 |
| Federico Trib | .755 | Max WS | Dev Unmit100 | 381.35 | 81.20 | 86.95 | | 86.96 | 0.000528 | 1.02 | 536.28 | 204.58 | 0.09 |
| Federico Trib | .754* | Max WS | 10yr FFDUNM | 258.93 | 80.96 | 86.31 | | 86.32 | 0.000490 | 0.93 | 424.49 | 214.66 | 0.09 |
| Federico Trib | .754* | Max WS | Dev Unmit100 | 397.79 | 80.96 | 86.91 | | 86.92 | 0.000514 | 1.06 | 553.95 | 215.75 | 0.09 |
| Federico Trib | .753* | Max WS | 10yr FFDUNM | 259.20 | 80.72 | 86.28 | | 86.29 | 0.000471 | 0.90 | 436.06 | 225.94 | 0.08 |
| Federico Trib | .753* | Max WS | Dev Unmit100 | 398.49 | 80.72 | 86.88 | | 86.89 | 0.000487 | 1.02 | 572.21 | 227.62 | 0.09 |
| Federico Trib | .752* | Max WS | 10yr FFDUNM | 259.38 | 80.48 | 86.25 | | 86.26 | 0.000423 | 0.84 | 459.95 | 238.30 | 0.08 |
| Federico Trib | .752* | Max WS | Dev Unmit100 | 399.41 | 80.48 | 86.85 | | 86.86 | 0.000437 | 0.95 | 607.36 | 270.68 | 0.08 |
| Federico Trib | .751* | Max WS | 10yr FFDUNM | 259.69 | 80.24 | 86.22 | | 86.23 | 0.000361 | 0.75 | 507.18 | 291.48 | 0.07 |
| Federico Trib | .751* | Max WS | Dev Unmit100 | 400.32 | 80.24 | 86.82 | | 86.83 | 0.000359 | 0.84 | 698.39 | 330.88 | 0.07 |
| Federico Trib | 0.75 | Max WS | 10yr FFDUNM | 260.11 | 80.00 | 86.20 | | 86.21 | 0.000281 | 0.69 | 610.68 | 350.36 | 0.07 |
| Federico Trib | 0.75 | Max WS | Dev Unmit100 | 401.19 | 80.00 | 86.80 | | 86.81 | 0.000272 | 0.76 | 821.63 | 352.33 | 0.07 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Federico Trib | .7494* | Max WS | 10yr FFDUNM | 262.39 | 80.00 | 86.18 | | 86.18 | 0.000451 | 0.90 | 506.81 | 349.86 | 0.08 |
| Federico Trib | .7494* | Max WS | Dev Unmit100 | 405.65 | 80.00 | 86.78 | | 86.79 | 0.000404 | 0.94 | 722.86 | 360.48 | 0.08 |
| Federico Trib | .7488* | Max WS | 10yr FFDUNM | 262.80 | 80.00 | 86.13 | | 86.14 | 0.000775 | 1.20 | 389.43 | 285.26 | 0.11 |
| Federico Trib | .7488* | Max WS | Dev Unmit100 | 406.61 | 80.00 | 86.74 | | 86.75 | 0.000636 | 1.20 | 591.94 | 351.43 | 0.10 |
| Federico Trib | .7482* | Max WS | 10yr FFDUNM | 263.25 | 80.00 | 86.04 | | 86.07 | 0.001529 | 1.70 | 283.33 | 259.58 | 0.15 |
| Federico Trib | .7482* | Max WS | Dev Unmit100 | 407.58 | 80.00 | 86.67 | | 86.70 | 0.001115 | 1.61 | 454.66 | 331.77 | 0.13 |
| Federico Trib | .7476* | Max WS | 10yr FFDUNM | 263.72 | 80.00 | 85.76 | | 85.89 | 0.005072 | 3.03 | 134.22 | 237.54 | 0.27 |
| Federico Trib | .7476* | Max WS | Dev Unmit100 | 408.56 | 80.00 | 86.54 | | 86.59 | 0.002311 | 2.31 | 344.55 | 328.57 | 0.19 |
| Federico Trib | .747 | Max WS | 10yr FFDUNM | 264.23 | 80.00 | 84.64 | | 85.05 | 0.021715 | 5.17 | 52.22 | 21.51 | 0.53 |
| Federico Trib | .747 | Max WS | Dev Unmit100 | 409.56 | 80.00 | 85.39 | | 85.98 | 0.023396 | 6.24 | 71.00 | 30.17 | 0.57 |
| Federico Trib | .746* | Max WS | 10yr FFDUNM | 264.48 | 79.67 | 83.89 | | 84.30 | 0.021376 | 5.18 | 53.59 | 25.12 | 0.54 |
| Federico Trib | .746* | Max WS | Dev Unmit100 | 410.05 | 79.67 | 84.25 | | 84.99 | 0.033623 | 7.03 | 63.60 | 31.44 | 0.68 |
| Federico Trib | .745* | Max WS | 10yr FFDUNM | 264.28 | 79.33 | 83.37 | | 83.67 | 0.014864 | 4.57 | 75.80 | 123.88 | 0.46 |
| Federico Trib | .745* | Max WS | Dev Unmit100 | 409.96 | 79.33 | 83.81 | | 84.05 | 0.012776 | 4.63 | 157.09 | 206.98 | 0.44 |
| Federico Trib | .744 | Max WS | 10yr FFDUNM | 264.19 | 79.00 | 83.23 | | 83.25 | 0.001149 | 1.43 | 303.50 | 218.06 | 0.13 |
| Federico Trib | .744 | Max WS | Dev Unmit100 | 410.26 | 79.00 | 83.68 | | 83.70 | 0.001266 | 1.63 | 404.41 | 234.43 | 0.14 |
| Federico Trib | 0.74 | Max WS | 10yr FFDUNM | 265.26 | 77.38 | 82.43 | | 82.46 | 0.001866 | 1.80 | 244.47 | 265.94 | 0.17 |
| Federico Trib | 0.74 | Max WS | Dev Unmit100 | 414.56 | 77.38 | 82.90 | | 82.93 | 0.001679 | 1.86 | 370.75 | 272.98 | 0.16 |
| Federico Trib | 0.73 | Max WS | 10yr FFDUNM | 267.57 | 76.00 | 81.83 | | 81.85 | 0.001691 | 1.79 | 260.58 | 224.17 | 0.16 |
| Federico Trib | 0.73 | Max WS | Dev Unmit100 | 420.82 | 76.00 | 82.32 | | 82.35 | 0.001734 | 1.96 | 379.06 | 264.98 | 0.16 |
| Federico Trib | 0.72 | Max WS | 10yr FFDUNM | 264.77 | 76.00 | 81.29 | | 81.32 | 0.001508 | 1.52 | 280.37 | 283.20 | 0.15 |
| Federico Trib | 0.72 | Max WS | Dev Unmit100 | 418.58 | 76.00 | 81.81 | | 81.84 | 0.001301 | 1.56 | 442.13 | 338.71 | 0.14 |
| Federico Trib | 0.71 | Max WS | 10yr FFDUNM | 267.88 | 75.00 | 80.83 | | 80.85 | 0.001062 | 1.38 | 315.91 | 260.53 | 0.13 |
| Federico Trib | 0.71 | Max WS | Dev Unmit100 | 426.47 | 75.00 | 81.41 | | 81.43 | 0.000928 | 1.43 | 476.80 | 285.59 | 0.12 |
| Federico Trib | 0.70 | Max WS | 10yr FFDUNM | 270.23 | 75.00 | 80.62 | | 80.65 | 0.001483 | 1.60 | 244.81 | 169.06 | 0.15 |
| Federico Trib | 0.70 | Max WS | Dev Unmit100 | 430.63 | 75.00 | 81.20 | | 81.23 | 0.001569 | 1.82 | 352.97 | 216.11 | 0.16 |
| Federico Trib | .666666* | Max WS | 10yr FFDUNM | 271.25 | 75.00 | 80.46 | | 80.50 | 0.001963 | 1.83 | 213.19 | 149.52 | 0.17 |
| Federico Trib | .666666* | Max WS | Dev Unmit100 | 431.41 | 75.00 | 81.03 | | 81.08 | 0.002073 | 2.08 | 327.72 | 262.22 | 0.18 |
| Federico Trib | .633333* | Max WS | 10yr FFDUNM | 270.52 | 75.00 | 80.27 | | 80.31 | 0.002258 | 1.93 | 218.32 | 217.39 | 0.18 |
| Federico Trib | .633333* | Max WS | Dev Unmit100 | 429.52 | 75.00 | 80.87 | | 80.90 | 0.001726 | 1.88 | 378.49 | 277.48 | 0.17 |
| Federico Trib | 0.6 | Max WS | 10yr FFDUNM | 269.70 | 75.00 | 80.08 | | 80.11 | 0.002192 | 1.85 | 257.32 | 289.97 | 0.18 |
| Federico Trib | 0.6 | Max WS | Dev Unmit100 | 427.59 | 75.00 | 80.75 | | 80.77 | 0.001235 | 1.57 | 453.85 | 300.01 | 0.14 |
| Federico Trib | .55* | Max WS | 10yr FFDUNM | 279.34 | 74.50 | 79.96 | | 79.99 | 0.000916 | 1.32 | 297.12 | 240.38 | 0.12 |
| Federico Trib | .55* | Max WS | Dev Unmit100 | 443.51 | 74.50 | 80.67 | | 80.69 | 0.000778 | 1.36 | 471.84 | 252.92 | 0.11 |
| Federico Trib | 0.5 | Max WS | 10yr FFDUNM | 278.99 | 74.00 | 79.93 | | 79.94 | 0.000267 | 0.75 | 481.28 | 246.52 | 0.07 |
| Federico Trib | 0.5 | Max WS | Dev Unmit100 | 442.73 | 74.00 | 80.63 | | 80.64 | 0.000297 | 0.88 | 671.15 | 280.76 | 0.07 |
| Federico Trib | .45* | Max WS | 10yr FFDUNM | 278.74 | 73.50 | 79.90 | | 79.91 | 0.000633 | 1.10 | 327.33 | 192.07 | 0.10 |
| Federico Trib | .45* | Max WS | Dev Unmit100 | 441.67 | 73.50 | 80.60 | | 80.62 | 0.000639 | 1.24 | 465.68 | 199.12 | 0.10 |
| Federico Trib | 0.4 | Max WS | 10yr FFDUNM | 277.23 | 73.00 | 79.78 | | 79.83 | 0.002663 | 1.95 | 174.59 | 110.55 | 0.20 |
| Federico Trib | 0.4 | Max WS | Dev Unmit100 | 437.37 | 73.00 | 80.48 | | 80.54 | 0.002436 | 2.14 | 253.00 | 112.33 | 0.19 |
| Main Reach | 1.44 | Max WS | 10yr FFDUNM | 146.00 | 112.07 | 114.33 | | 114.34 | 0.001391 | 0.69 | 223.62 | 285.17 | 0.12 |
| Main Reach | 1.44 | Max WS | Dev Unmit100 | 285.12 | 112.07 | 114.75 | | 114.76 | 0.001434 | 0.88 | 346.46 | 302.17 | 0.13 |
| Main Reach | 1.43666* | Max WS | 10yr FFDUNM | 145.98 | 111.85 | 114.18 | | 114.19 | 0.001618 | 0.84 | 183.23 | 193.47 | 0.14 |
| Main Reach | 1.43666* | Max WS | Dev Unmit100 | 283.82 | 111.85 | 114.56 | | 114.58 | 0.002252 | 1.19 | 268.74 | 280.79 | 0.17 |
| Main Reach | 1.43333* | Max WS | 10yr FFDUNM | 145.91 | 111.62 | 113.94 | | 113.96 | 0.003056 | 1.23 | 159.78 | 320.82 | 0.19 |
| Main Reach | 1.43333* | Max WS | Dev Unmit100 | 280.21 | 111.62 | 114.29 | | 114.31 | 0.003101 | 1.45 | 274.28 | 336.99 | 0.20 |
| Main Reach | 1.43 | Max WS | 10yr FFDUNM | 145.75 | 111.40 | 113.49 | | 113.51 | 0.006282 | 1.62 | 151.08 | 299.95 | 0.26 |
| Main Reach | 1.43 | Max WS | Dev Unmit100 | 278.31 | 111.40 | 114.04 | | 114.05 | 0.002098 | 1.20 | 320.36 | 315.61 | 0.16 |
| Main Reach | 1.425* | Max WS | 10yr FFDUNM | 143.87 | 110.50 | 113.00 | | 113.01 | 0.002342 | 1.32 | 137.76 | 112.61 | 0.17 |
| Main Reach | 1.425* | Max WS | Dev Unmit100 | 277.80 | 110.50 | 113.67 | | 113.71 | 0.004596 | 2.28 | 223.79 | 259.84 | 0.25 |
| Main Reach | 1.42 | Max WS | 10yr FFDUNM | 141.55 | 109.60 | 112.84 | | 112.85 | 0.000506 | 0.81 | 221.80 | 175.81 | 0.09 |
| Main Reach | 1.42 | Max WS | Dev Unmit100 | 274.60 | 109.60 | 113.41 | | 113.42 | 0.000762 | 1.13 | 322.43 | 177.72 | 0.11 |
| Main Reach | 1.41 | Max WS | 10yr FFDUNM | 152.21 | 108.40 | 112.69 | | 112.71 | 0.000984 | 1.20 | 244.61 | 288.41 | 0.12 |
| Main Reach | 1.41 | Max WS | Dev Unmit100 | 282.71 | 108.40 | 113.25 | | 113.26 | 0.000903 | 1.29 | 411.96 | 315.76 | 0.12 |
| Main Reach | 1.40 | Max WS | 10yr FFDUNM | 153.32 | 108.40 | 112.46 | | 112.47 | 0.000646 | 1.03 | 294.43 | 267.99 | 0.10 |
| Main Reach | 1.40 | Max WS | Dev Unmit100 | 273.56 | 108.40 | 113.03 | | 113.04 | 0.000620 | 1.12 | 468.24 | 339.15 | 0.10 |
| Main Reach | 1.39 | Max WS | 10yr FFDUNM | 152.82 | 107.50 | 111.76 | | 111.82 | 0.004091 | 2.16 | 91.73 | 213.22 | 0.24 |
| Main Reach | 1.39 | Max WS | Dev Unmit100 | 272.16 | 107.50 | 112.83 | | 112.84 | 0.000797 | 1.19 | 414.99 | 329.42 | 0.11 |
| Main Reach | 1.388 | Max WS | 10yr FFDUNM | 153.67 | 107.00 | 111.21 | | 111.21 | 0.000378 | 0.67 | 323.36 | 246.15 | 0.07 |
| Main Reach | 1.388 | Max WS | Dev Unmit100 | 275.46 | 107.00 | 112.71 | | 112.72 | 0.000112 | 0.50 | 694.04 | 246.15 | 0.04 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Main Reach | 1.387 | Max WS | 10yr FFDUNM | 153.65 | 107.00 | 111.20 | | 111.20 | 0.000123 | 0.45 | 478.61 | 283.35 | 0.04 |
| Main Reach | 1.387 | Max WS | Dev Unmit100 | 275.41 | 107.00 | 112.71 | | 112.71 | 0.000055 | 0.39 | 906.52 | 283.35 | 0.03 |
| Main Reach | 1.385 | | | Culvert | | | | | | | | | |
| Main Reach | 1.384 | Max WS | 10yr FFDUNM | 153.65 | 107.00 | 110.70 | | 110.71 | 0.000227 | 0.54 | 386.41 | 235.14 | 0.06 |
| Main Reach | 1.384 | Max WS | Dev Unmit100 | 275.40 | 107.00 | 111.33 | | 111.33 | 0.000257 | 0.66 | 533.37 | 235.14 | 0.06 |
| Main Reach | 1.38 | Max WS | 10yr FFDUNM | 153.64 | 107.00 | 110.63 | | 110.65 | 0.002438 | 1.66 | 144.83 | 99.50 | 0.18 |
| Main Reach | 1.38 | Max WS | Dev Unmit100 | 275.39 | 107.00 | 111.26 | | 111.28 | 0.002403 | 1.90 | 349.12 | 420.80 | 0.19 |
| Main Reach | 1.37 | Max WS | 10yr FFDUNM | 166.40 | 106.00 | 109.95 | | 109.98 | 0.001596 | 1.48 | 147.37 | 90.58 | 0.15 |
| Main Reach | 1.37 | Max WS | Dev Unmit100 | 296.66 | 106.00 | 110.52 | | 110.56 | 0.002075 | 1.91 | 234.86 | 212.83 | 0.18 |
| Main Reach | 1.36 | Max WS | 10yr FFDUNM | 180.45 | 105.80 | 108.96 | | 108.99 | 0.003145 | 2.02 | 174.32 | 212.10 | 0.21 |
| Main Reach | 1.36 | Max WS | Dev Unmit100 | 318.69 | 105.80 | 109.37 | | 109.40 | 0.003460 | 2.32 | 261.47 | 240.00 | 0.23 |
| Main Reach | 1.35 | Max WS | 10yr FFDUNM | 182.22 | 104.80 | 108.15 | | 108.19 | 0.003244 | 1.74 | 166.55 | 278.30 | 0.21 |
| Main Reach | 1.35 | Max WS | Dev Unmit100 | 321.92 | 104.80 | 108.51 | | 108.54 | 0.003325 | 1.95 | 271.85 | 312.57 | 0.22 |
| Main Reach | 1.34 | Max WS | 10yr FFDUNM | 184.47 | 104.46 | 107.20 | | 107.22 | 0.003056 | 1.62 | 197.21 | 285.18 | 0.20 |
| Main Reach | 1.34 | Max WS | Dev Unmit100 | 325.88 | 104.46 | 107.66 | | 107.68 | 0.002198 | 1.57 | 336.33 | 320.08 | 0.18 |
| Main Reach | 1.335 | Max WS | 10yr FFDUNM | 192.01 | 102.00 | 106.39 | | 106.40 | 0.001654 | 1.55 | 213.62 | 184.34 | 0.15 |
| Main Reach | 1.335 | Max WS | Dev Unmit100 | 330.27 | 102.00 | 107.04 | | 107.06 | 0.001382 | 1.60 | 345.67 | 242.80 | 0.14 |
| Main Reach | 1.333 | | | Mult Open | | | | | | | | | |
| Main Reach | 1.33 | Max WS | 10yr FFDUNM | 191.89 | 102.00 | 106.32 | | 106.37 | 0.003843 | 2.23 | 127.12 | 80.57 | 0.23 |
| Main Reach | 1.33 | Max WS | Dev Unmit100 | 330.29 | 102.00 | 107.00 | | 107.07 | 0.003933 | 2.60 | 181.86 | 80.57 | 0.24 |
| Main Reach | 1.32 | Max WS | 10yr FFDUNM | 189.52 | 101.80 | 105.67 | | 105.68 | 0.000851 | 1.13 | 337.27 | 311.55 | 0.11 |
| Main Reach | 1.32 | Max WS | Dev Unmit100 | 330.03 | 101.80 | 106.39 | | 106.39 | 0.000546 | 1.04 | 566.16 | 330.38 | 0.09 |
| Main Reach | 1.31 | Max WS | 10yr FFDUNM | 211.67 | 100.90 | 105.06 | | 105.11 | 0.003297 | 2.22 | 139.28 | 103.80 | 0.22 |
| Main Reach | 1.31 | Max WS | Dev Unmit100 | 389.97 | 100.90 | 105.71 | | 105.79 | 0.003856 | 2.73 | 213.70 | 123.75 | 0.25 |
| Main Reach | 1.30 | Max WS | 10yr FFDUNM | 214.46 | 100.63 | 104.44 | | 104.45 | 0.000877 | 0.96 | 308.63 | 238.56 | 0.11 |
| Main Reach | 1.30 | Max WS | Dev Unmit100 | 352.92 | 100.63 | 105.13 | | 105.14 | 0.000633 | 0.96 | 492.07 | 285.91 | 0.10 |
| Main Reach | 1.29 | Max WS | 10yr FFDUNM | 228.55 | 100.40 | 103.99 | | 104.04 | 0.002853 | 2.00 | 202.37 | 238.61 | 0.21 |
| Main Reach | 1.29 | Max WS | Dev Unmit100 | 360.85 | 100.40 | 104.94 | | 104.96 | 0.000992 | 1.43 | 443.19 | 264.64 | 0.13 |
| Main Reach | 1.28 | Max WS | 10yr FFDUNM | 225.42 | 100.00 | 103.40 | | 103.42 | 0.001484 | 1.41 | 287.57 | 284.31 | 0.15 |
| Main Reach | 1.28 | Max WS | Dev Unmit100 | 362.24 | 100.00 | 104.77 | | 104.78 | 0.000283 | 0.80 | 753.65 | 392.50 | 0.07 |
| Main Reach | 1.27 | Max WS | 10yr FFDUNM | 226.31 | 98.88 | 103.18 | | 103.18 | 0.000154 | 0.47 | 602.89 | 297.63 | 0.05 |
| Main Reach | 1.27 | Max WS | Dev Unmit100 | 364.31 | 98.88 | 104.73 | | 104.73 | 0.000066 | 0.41 | 1112.93 | 358.57 | 0.03 |
| Main Reach | 1.268 | Max WS | 10yr FFDUNM | 227.12 | 98.63 | 103.14 | | 103.14 | 0.000479 | 0.86 | 396.06 | 424.81 | 0.09 |
| Main Reach | 1.268 | Max WS | Dev Unmit100 | 365.32 | 98.63 | 104.72 | | 104.72 | 0.000092 | 0.50 | 1098.80 | 452.33 | 0.04 |
| Main Reach | 1.267 | Max WS | 10yr FFDUNM | 227.11 | 98.60 | 103.11 | | 103.12 | 0.000564 | 0.84 | 306.00 | 230.51 | 0.09 |
| Main Reach | 1.267 | Max WS | Dev Unmit100 | 365.34 | 98.60 | 104.71 | | 104.71 | 0.000128 | 0.55 | 962.10 | 437.18 | 0.05 |
| Main Reach | 1.265 | | | Culvert | | | | | | | | | |
| Main Reach | 1.26 | Max WS | 10yr FFDUNM | 225.88 | 98.56 | 102.24 | | 102.27 | 0.003480 | 1.66 | 193.07 | 302.79 | 0.21 |
| Main Reach | 1.26 | Max WS | Dev Unmit100 | 362.02 | 98.56 | 103.20 | | 103.21 | 0.000793 | 1.04 | 490.04 | 320.42 | 0.11 |
| Main Reach | 1.259 | Max WS | 10yr FFDUNM | 225.47 | 98.50 | 102.16 | | 102.17 | 0.001481 | 1.36 | 327.46 | 365.92 | 0.15 |
| Main Reach | 1.259 | Max WS | Dev Unmit100 | 361.87 | 98.50 | 103.18 | | 103.18 | 0.000367 | 0.84 | 700.88 | 368.07 | 0.08 |
| Main Reach | 1.255 | Max WS | 10yr FFDUNM | 237.35 | 97.97 | 101.86 | | 101.86 | 0.000405 | 0.74 | 484.48 | 366.68 | 0.08 |
| Main Reach | 1.255 | Max WS | Dev Unmit100 | 379.70 | 97.97 | 103.10 | | 103.10 | 0.000135 | 0.54 | 994.13 | 425.83 | 0.05 |
| Main Reach | 1.22 | Max WS | 10yr FFDUNM | 237.31 | 97.50 | 101.79 | | 101.80 | 0.000381 | 0.71 | 428.03 | 279.14 | 0.08 |
| Main Reach | 1.22 | Max WS | Dev Unmit100 | 379.69 | 97.50 | 103.07 | | 103.07 | 0.000158 | 0.59 | 853.50 | 384.21 | 0.05 |
| Main Reach | 1.215 | | | Culvert | | | | | | | | | |
| Main Reach | 1.21 | Max WS | 10yr FFDUNM | 237.30 | 96.51 | 99.88 | | 100.08 | 0.007058 | 3.60 | 65.90 | 43.95 | 0.52 |
| Main Reach | 1.21 | Max WS | Dev Unmit100 | 379.65 | 96.51 | 100.21 | | 100.54 | 0.011229 | 4.62 | 82.18 | 53.54 | 0.66 |
| Main Reach | 1.20 | Max WS | 10yr FFDUNM | 237.08 | 96.05 | 99.50 | | 99.64 | 0.006380 | 3.48 | 110.45 | 175.28 | 0.49 |
| Main Reach | 1.20 | Max WS | Dev Unmit100 | 378.94 | 96.05 | 99.83 | | 99.97 | 0.005595 | 3.69 | 172.36 | 200.88 | 0.47 |
| Main Reach | 1.19 | Max WS | 10yr FFDUNM | 260.45 | 95.07 | 98.48 | | 98.52 | 0.001258 | 1.74 | 201.52 | 250.94 | 0.23 |
| Main Reach | 1.19 | Max WS | Dev Unmit100 | 410.47 | 95.07 | 98.95 | | 98.99 | 0.001029 | 1.84 | 333.93 | 309.41 | 0.21 |
| Main Reach | 1.18 | Max WS | 10yr FFDUNM | 257.85 | 94.10 | 97.82 | | 97.92 | 0.002620 | 3.27 | 141.90 | 124.31 | 0.35 |
| Main Reach | 1.18 | Max WS | Dev Unmit100 | 406.72 | 94.10 | 98.35 | | 98.45 | 0.002504 | 3.59 | 215.84 | 159.02 | 0.35 |
| Main Reach | 1.17 | Max WS | 10yr FFDUNM | 289.16 | 93.80 | 97.17 | | 97.22 | 0.000995 | 1.89 | 192.17 | 150.11 | 0.21 |
| Main Reach | 1.17 | Max WS | Dev Unmit100 | 486.59 | 93.80 | 97.59 | | 97.68 | 0.001432 | 2.52 | 262.81 | 184.38 | 0.26 |
| Main Reach | 1.16 | Max WS | 10yr FFDUNM | 288.66 | 93.25 | 96.61 | | 96.68 | 0.002148 | 2.62 | 210.38 | 299.05 | 0.31 |
| Main Reach | 1.16 | Max WS | Dev Unmit100 | 482.72 | 93.25 | 97.00 | | 97.06 | 0.002027 | 2.83 | 335.72 | 344.77 | 0.30 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Main Reach | 1.15 | Max WS | 10yr FFDUNM | 288.53 | 92.65 | 96.17 | | 96.18 | 0.000457 | 1.41 | 420.97 | 428.98 | 0.15 |
| Main Reach | 1.15 | Max WS | Dev Unmit100 | 482.38 | 92.65 | 96.57 | | 96.59 | 0.000501 | 1.61 | 595.72 | 440.95 | 0.16 |
| Main Reach | 1.14 | Max WS | 10yr FFDUNM | 288.86 | 92.20 | 94.87 | | 94.94 | 0.003952 | 2.98 | 167.15 | 193.69 | 0.40 |
| Main Reach | 1.14 | Max WS | Dev Unmit100 | 482.43 | 92.20 | 95.25 | | 95.34 | 0.003837 | 3.36 | 246.00 | 216.20 | 0.41 |
| Main Reach | 1.13 | Max WS | 10yr FFDUNM | 288.06 | 91.95 | 94.08 | | 94.09 | 0.000483 | 0.77 | 372.33 | 503.10 | 0.13 |
| Main Reach | 1.13 | Max WS | Dev Unmit100 | 476.73 | 91.95 | 94.50 | | 94.52 | 0.000447 | 0.92 | 523.46 | 546.40 | 0.13 |
| Main Reach | 1.12 | Max WS | 10yr FFDUNM | 287.44 | 90.70 | 93.50 | | 93.59 | 0.003281 | 3.14 | 167.31 | 182.57 | 0.38 |
| Main Reach | 1.12 | Max WS | Dev Unmit100 | 471.96 | 90.70 | 94.00 | | 94.09 | 0.002806 | 3.33 | 271.57 | 431.06 | 0.36 |
| Main Reach | 1.11 | Max WS | 10yr FFDUNM | 286.85 | 90.02 | 93.02 | | 93.03 | 0.000364 | 1.00 | 408.67 | 320.62 | 0.12 |
| Main Reach | 1.11 | Max WS | Dev Unmit100 | 470.59 | 90.02 | 93.60 | | 93.61 | 0.000326 | 1.12 | 600.68 | 344.16 | 0.12 |
| Main Reach | 1.10 | Max WS | 10yr FFDUNM | 286.44 | 88.90 | 92.39 | | 92.53 | 0.003337 | 2.94 | 103.42 | 85.77 | 0.37 |
| Main Reach | 1.10 | Max WS | Dev Unmit100 | 469.09 | 88.90 | 92.91 | | 93.10 | 0.003585 | 3.57 | 159.85 | 132.57 | 0.40 |
| Main Reach | 1.09 | Max WS | 10yr FFDUNM | 286.17 | 87.51 | 91.82 | | 91.83 | 0.000220 | 1.06 | 466.07 | 322.10 | 0.10 |
| Main Reach | 1.09 | Max WS | Dev Unmit100 | 468.12 | 87.51 | 92.31 | | 92.32 | 0.000270 | 1.29 | 631.62 | 351.55 | 0.12 |
| Main Reach | 1.08 | Max WS | 10yr FFDUNM | 287.95 | 87.08 | 91.54 | | 91.60 | 0.001384 | 2.39 | 216.95 | 215.95 | 0.25 |
| Main Reach | 1.08 | Max WS | Dev Unmit100 | 406.69 | 87.08 | 92.05 | | 92.09 | 0.001030 | 2.30 | 341.18 | 276.13 | 0.22 |
| Main Reach | 1.07 | Max WS | 10yr FFDUNM | 275.99 | 87.00 | 90.72 | | 90.84 | 0.003209 | 2.96 | 119.26 | 140.22 | 0.37 |
| Main Reach | 1.07 | Max WS | Dev Unmit100 | 396.49 | 87.00 | 91.78 | | 91.82 | 0.000819 | 1.95 | 349.15 | 295.13 | 0.20 |
| Main Reach | 1.06 | Max WS | 10yr FFDUNM | 262.86 | 86.38 | 90.22 | | 90.23 | 0.000352 | 1.13 | 313.73 | 319.94 | 0.13 |
| Main Reach | 1.06 | Max WS | Dev Unmit100 | 393.85 | 86.38 | 91.65 | | 91.65 | 0.000081 | 0.74 | 833.97 | 405.85 | 0.07 |
| Main Reach | 1.05 | Max WS | 10yr FFDUNM | 261.98 | 85.43 | 90.15 | | 90.16 | 0.000181 | 0.91 | 415.53 | 273.72 | 0.09 |
| Main Reach | 1.05 | Max WS | Dev Unmit100 | 395.04 | 85.43 | 91.63 | | 91.63 | 0.000062 | 0.70 | 927.06 | 415.53 | 0.06 |
| Main Reach | 1.04 | Max WS | 10yr FFDUNM | 263.38 | 84.89 | 90.13 | | 90.14 | 0.000118 | 0.68 | 951.24 | 1965.47 | 0.07 |
| Main Reach | 1.04 | Max WS | Dev Unmit100 | 397.54 | 84.89 | 91.63 | | 91.63 | 0.000006 | 0.21 | 3925.28 | 2020.32 | 0.02 |
| Main Reach | 1.03 | Max WS | 10yr FFDUNM | 263.28 | 84.80 | 90.12 | | 90.13 | 0.000198 | 0.82 | 495.94 | 1708.85 | 0.09 |
| Main Reach | 1.03 | Max WS | Dev Unmit100 | 397.53 | 84.80 | 91.63 | | 91.63 | 0.000010 | 0.25 | 3175.84 | 1835.40 | 0.02 |
| Main Reach | 1.025 | | | Culvert | | | | | | | | | |
| Main Reach | 1.02 | Max WS | 10yr FFDUNM | 262.51 | 84.82 | 89.45 | | 89.45 | 0.000073 | 0.33 | 1196.48 | 835.15 | 0.03 |
| Main Reach | 1.02 | Max WS | Dev Unmit100 | 396.29 | 84.82 | 90.15 | | 90.15 | 0.000049 | 0.31 | 1762.74 | 907.02 | 0.03 |
| Main Reach | 1.01 | Max WS | 10yr FFDUNM | 262.46 | 84.30 | 89.18 | | 89.22 | 0.001374 | 1.80 | 227.50 | 129.04 | 0.15 |
| Main Reach | 1.01 | Max WS | Dev Unmit100 | 396.21 | 84.30 | 89.91 | | 89.95 | 0.001223 | 1.89 | 321.74 | 129.04 | 0.15 |
| Main Reach | 1.00 | Max WS | 10yr FFDUNM | 274.07 | 83.80 | 88.86 | | 88.91 | 0.003276 | 2.25 | 193.13 | 179.34 | 0.22 |
| Main Reach | 1.00 | Max WS | Dev Unmit100 | 412.88 | 83.80 | 89.73 | | 89.76 | 0.001561 | 1.80 | 365.96 | 215.58 | 0.16 |
| Main Reach | 0.95 | Max WS | 10yr FFDUNM | 274.61 | 83.20 | 88.25 | | 88.33 | 0.002786 | 2.39 | 124.42 | 41.34 | 0.21 |
| Main Reach | 0.95 | Max WS | Dev Unmit100 | 413.63 | 83.20 | 89.33 | | 89.41 | 0.002199 | 2.50 | 222.91 | 105.36 | 0.20 |
| Main Reach | 0.90 | Max WS | 10yr FFDUNM | 274.48 | 82.09 | 87.67 | | 87.72 | 0.001894 | 1.75 | 173.11 | 90.69 | 0.17 |
| Main Reach | 0.90 | Max WS | Dev Unmit100 | 413.50 | 82.09 | 88.93 | | 88.97 | 0.001100 | 1.66 | 287.58 | 90.69 | 0.14 |
| Main Reach | 0.88 | Max WS | 10yr FFDUNM | 274.45 | 82.00 | 87.60 | | 87.63 | 0.001541 | 1.63 | 244.52 | 193.31 | 0.15 |
| Main Reach | 0.88 | Max WS | Dev Unmit100 | 413.51 | 82.00 | 88.91 | | 88.93 | 0.000502 | 1.15 | 525.93 | 235.32 | 0.09 |
| Main Reach | .87 | | | Culvert | | | | | | | | | |
| Main Reach | 0.86 | Max WS | 10yr FFDUNM | 274.20 | 81.83 | 87.14 | | 87.17 | 0.002006 | 1.66 | 207.28 | 152.28 | 0.17 |
| Main Reach | 0.86 | Max WS | Dev Unmit100 | 413.08 | 81.83 | 87.78 | | 87.82 | 0.001723 | 1.76 | 315.57 | 183.34 | 0.16 |
| Main Reach | 0.85 | Max WS | 10yr FFDUNM | 274.09 | 81.10 | 87.06 | | 87.08 | 0.000769 | 1.44 | 243.61 | 89.32 | 0.11 |
| Main Reach | 0.85 | Max WS | Dev Unmit100 | 412.97 | 81.10 | 87.70 | | 87.74 | 0.000949 | 1.74 | 322.67 | 193.53 | 0.13 |
| Main Reach | 0.80 | Max WS | 10yr FFDUNM | 278.77 | 81.10 | 86.94 | | 86.96 | 0.001105 | 1.65 | 286.50 | 242.60 | 0.14 |
| Main Reach | 0.80 | Max WS | Dev Unmit100 | 420.27 | 81.10 | 87.59 | | 87.61 | 0.000909 | 1.63 | 445.13 | 242.60 | 0.13 |
| Main Reach | 0.75 | Max WS | 10yr FFDUNM | 281.59 | 80.50 | 86.66 | | 86.70 | 0.001480 | 1.71 | 248.98 | 222.45 | 0.15 |
| Main Reach | 0.75 | Max WS | Dev Unmit100 | 424.87 | 80.50 | 87.38 | | 87.41 | 0.001067 | 1.63 | 410.42 | 224.10 | 0.13 |
| Main Reach | 0.70 | Max WS | 10yr FFDUNM | 280.03 | 80.40 | 86.43 | | 86.45 | 0.000914 | 1.42 | 327.60 | 192.56 | 0.12 |
| Main Reach | 0.70 | Max WS | Dev Unmit100 | 423.75 | 80.40 | 87.20 | | 87.22 | 0.000740 | 1.43 | 482.62 | 206.97 | 0.11 |
| Main Reach | 0.65 | Max WS | 10yr FFDUNM | 279.50 | 80.20 | 86.31 | | 86.32 | 0.000401 | 0.97 | 475.71 | 253.75 | 0.08 |
| Main Reach | 0.65 | Max WS | Dev Unmit100 | 423.51 | 80.20 | 87.11 | | 87.11 | 0.000345 | 1.01 | 690.15 | 302.97 | 0.08 |
| Main Reach | 0.6 | Max WS | 10yr FFDUNM | 279.32 | 80.20 | 86.20 | | 86.21 | 0.000509 | 1.10 | 443.77 | 309.49 | 0.09 |
| Main Reach | 0.6 | Max WS | Dev Unmit100 | 424.03 | 80.20 | 87.02 | | 87.03 | 0.000368 | 1.04 | 709.72 | 366.89 | 0.08 |
| Main Reach | 0.555 | Max WS | 10yr FFDUNM | 279.22 | 80.20 | 86.09 | | 86.10 | 0.000619 | 1.25 | 367.63 | 210.70 | 0.10 |
| Main Reach | 0.555 | Max WS | Dev Unmit100 | 424.29 | 80.20 | 86.94 | | 86.95 | 0.000496 | 1.25 | 559.81 | 242.10 | 0.09 |
| Main Reach | 0.552 | | | Mult Open | | | | | | | | | |
| Main Reach | 0.55 | Max WS | 10yr FFDUNM | 278.68 | 79.60 | 85.89 | | 85.91 | 0.000922 | 1.43 | 348.63 | 306.46 | 0.12 |

HEC-RAS Profile: Max WS (Continued)

| Reach | River Sta | Profile | Plan | 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) | |
| Main Reach | 0.55 | Max WS | Dev Unmit100 | 423.76 | 79.60 | 86.69 | | 86.70 | 0.000557 | 1.25 | 603.02 | 323.16 | 0.10 |
| | | | | | | | | | | | | | |
| Main Reach | 0.5 | Max WS | 10yr FFDUNM | 276.65 | 79.60 | 85.61 | | 85.63 | 0.001187 | 1.58 | 298.06 | 294.00 | 0.14 |
| Main Reach | 0.5 | Max WS | Dev Unmit100 | 423.29 | 79.60 | 86.55 | | 86.56 | 0.000556 | 1.24 | 588.46 | 314.70 | 0.10 |
| | | | | | | | | | | | | | |
| Main Reach | 0.45 | Max WS | 10yr FFDUNM | 276.09 | 79.60 | 85.43 | | 85.44 | 0.000521 | 1.17 | 456.95 | 333.80 | 0.09 |
| Main Reach | 0.45 | Max WS | Dev Unmit100 | 423.53 | 79.60 | 86.46 | | 86.47 | 0.000277 | 0.97 | 801.49 | 333.80 | 0.07 |
| | | | | | | | | | | | | | |
| Main Reach | 0.40 | Max WS | 10yr FFDUNM | 277.10 | 79.60 | 85.37 | | 85.37 | 0.000131 | 0.58 | 780.93 | 372.00 | 0.05 |
| Main Reach | 0.40 | Max WS | Dev Unmit100 | 425.05 | 79.60 | 86.43 | | 86.43 | 0.000093 | 0.56 | 1173.72 | 372.00 | 0.04 |
| | | | | | | | | | | | | | |
| Main Reach | 0.35 | Max WS | 10yr FFDUNM | 277.08 | 79.23 | 85.35 | | 85.35 | 0.000091 | 0.53 | 770.23 | 362.30 | 0.04 |
| Main Reach | 0.35 | Max WS | Dev Unmit100 | 425.03 | 79.23 | 86.41 | | 86.42 | 0.000070 | 0.52 | 1154.61 | 362.30 | 0.04 |
| | | | | | | | | | | | | | |
| Main Reach | 0.33 | | | Mult Open | | | | | | | | | |
| | | | | | | | | | | | | | |
| Main Reach | 0.30 | Max WS | 10yr FFDUNM | 276.95 | 79.23 | 84.19 | | 84.20 | 0.000469 | 0.89 | 348.12 | 157.57 | 0.09 |
| Main Reach | 0.30 | Max WS | Dev Unmit100 | 424.89 | 79.23 | 84.68 | | 84.70 | 0.000629 | 1.13 | 426.03 | 161.16 | 0.10 |
| | | | | | | | | | | | | | |
| Main Reach | 0.25 | Max WS | 10yr FFDUNM | 276.89 | 79.20 | 84.05 | | 84.08 | 0.001247 | 1.62 | 331.54 | 315.70 | 0.14 |
| Main Reach | 0.25 | Max WS | Dev Unmit100 | 424.83 | 79.20 | 84.54 | | 84.56 | 0.001161 | 1.68 | 485.82 | 315.70 | 0.14 |
| | | | | | | | | | | | | | |
| Main Reach | 0.20 | Max WS | 10yr FFDUNM | 277.64 | 79.00 | 83.81 | | 83.87 | 0.002524 | 2.21 | 210.38 | 327.12 | 0.20 |
| Main Reach | 0.20 | Max WS | Dev Unmit100 | 426.38 | 79.00 | 84.34 | | 84.39 | 0.002012 | 2.16 | 388.47 | 345.64 | 0.18 |
| | | | | | | | | | | | | | |
| Main Reach | 0.15 | Max WS | 10yr FFDUNM | 278.33 | 78.70 | 83.41 | | 83.44 | 0.001600 | 1.75 | 269.53 | 237.35 | 0.16 |
| Main Reach | 0.15 | Max WS | Dev Unmit100 | 428.25 | 78.70 | 84.01 | | 84.04 | 0.001376 | 1.79 | 411.84 | 237.35 | 0.15 |
| | | | | | | | | | | | | | |
| Main Reach | 0.10 | Max WS | 10yr FFDUNM | 278.51 | 78.70 | 83.22 | | 83.26 | 0.001723 | 1.84 | 283.40 | 250.08 | 0.17 |
| Main Reach | 0.10 | Max WS | Dev Unmit100 | 428.59 | 78.70 | 83.86 | | 83.89 | 0.001293 | 1.77 | 444.05 | 254.29 | 0.15 |
| | | | | | | | | | | | | | |
| Main Reach | 0.05 | Max WS | 10yr FFDUNM | 278.44 | 78.20 | 82.95 | | 82.96 | 0.000852 | 1.29 | 440.24 | 336.94 | 0.12 |
| Main Reach | 0.05 | Max WS | Dev Unmit100 | 428.65 | 78.20 | 83.66 | | 83.67 | 0.000564 | 1.17 | 681.78 | 338.96 | 0.10 |
| | | | | | | | | | | | | | |
| Main Reach | 0.04 | Max WS | 10yr FFDUNM | 278.51 | 77.40 | 82.32 | | 82.41 | 0.004115 | 2.65 | 136.84 | 55.12 | 0.25 |
| Main Reach | 0.04 | Max WS | Dev Unmit100 | 428.77 | 77.40 | 83.06 | | 83.16 | 0.004175 | 3.03 | 211.76 | 141.97 | 0.26 |
| | | | | | | | | | | | | | |
| Main Reach | 0.03 | Max WS | 10yr FFDUNM | 278.57 | 76.70 | 81.56 | | 81.65 | 0.003087 | 2.56 | 134.65 | 89.61 | 0.22 |
| Main Reach | 0.03 | Max WS | Dev Unmit100 | 428.89 | 76.70 | 82.09 | | 82.25 | 0.004628 | 3.41 | 183.32 | 294.37 | 0.28 |
| | | | | | | | | | | | | | |
| Main Reach | 0.02 | Max WS | 10yr FFDUNM | 278.64 | 76.20 | 81.05 | | 81.08 | 0.001835 | 1.74 | 330.20 | 390.91 | 0.17 |
| Main Reach | 0.02 | Max WS | Dev Unmit100 | 428.94 | 76.20 | 81.50 | | 81.52 | 0.001391 | 1.65 | 512.70 | 415.90 | 0.15 |
| | | | | | | | | | | | | | |
| Main Reach | 0.01 | Max WS | 10yr FFDUNM | 279.97 | 75.70 | 80.65 | | 80.68 | 0.001740 | 1.72 | 282.83 | 304.17 | 0.16 |
| Main Reach | 0.01 | Max WS | Dev Unmit100 | 431.11 | 75.70 | 81.20 | | 81.22 | 0.001272 | 1.62 | 457.53 | 324.20 | 0.14 |
| | | | | | | | | | | | | | |
| Main Reach | 0.009 | Max WS | 10yr FFDUNM | 279.71 | 75.08 | 80.49 | | 80.51 | 0.001125 | 1.41 | 302.78 | 223.00 | 0.13 |
| Main Reach | 0.009 | Max WS | Dev Unmit100 | 430.65 | 75.08 | 81.07 | | 81.09 | 0.001004 | 1.47 | 430.90 | 223.00 | 0.13 |
| | | | | | | | | | | | | | |
| Main Reach | 0.008 | Max WS | 10yr FFDUNM | 276.51 | 73.85 | 80.03 | | 80.09 | 0.002320 | 2.09 | 144.27 | 261.96 | 0.19 |
| Main Reach | 0.008 | Max WS | Dev Unmit100 | 367.98 | 73.85 | 80.71 | | 80.74 | 0.001333 | 1.72 | 369.56 | 397.63 | 0.15 |
| | | | | | | | | | | | | | |
| Main Reach | 0.007 | Max WS | 10yr FFDUNM | 210.69 | 73.00 | 79.78 | | 79.79 | 0.000631 | 1.17 | 215.66 | 87.46 | 0.10 |
| Main Reach | 0.007 | Max WS | Dev Unmit100 | 361.37 | 73.00 | 80.48 | | 80.51 | 0.000838 | 1.46 | 346.42 | 247.92 | 0.12 |
| | | | | | | | | | | | | | |
| Down | 6.9 | Max WS | 10yr FFDUNM | 487.92 | 72.00 | 79.78 | | 79.82 | 0.000918 | 1.79 | 318.10 | 218.99 | 0.16 |
| Down | 6.9 | Max WS | Dev Unmit100 | 798.73 | 72.00 | 80.48 | | 80.52 | 0.000871 | 1.93 | 677.61 | 654.01 | 0.16 |
| | | | | | | | | | | | | | |
| Down | 6.85* | Max WS | 10yr FFDUNM | 487.90 | 71.71 | 79.70 | | 79.75 | 0.000833 | 1.89 | 328.61 | 207.44 | 0.16 |
| Down | 6.85* | Max WS | Dev Unmit100 | 798.71 | 71.71 | 80.38 | | 80.44 | 0.001013 | 2.26 | 525.98 | 359.07 | 0.18 |
| | | | | | | | | | | | | | |
| Down | 6.8 | Max WS | 10yr FFDUNM | 487.89 | 71.43 | 79.59 | 75.59 | 79.66 | 0.001100 | 2.28 | 286.82 | 158.65 | 0.18 |
| Down | 6.8 | Max WS | Dev Unmit100 | 798.70 | 71.43 | 80.25 | 76.59 | 80.34 | 0.001471 | 2.81 | 417.73 | 256.01 | 0.21 |

# APPENDIX G
## PROPOSED ONSITE PROJECT STORM DRAIN ANALYSIS 10-YEAR and 100-YEAR CSDS REPORT

| Up Node Name | Down Node Name | Convey Size (in or ft) | Trib. Area at Up Node (acre) | Cumul. Area (acre) | Total Computed Response Time at Up Node (min.) | Computed Flow at Convey (cfs) | Total Flow at Convey (cfs) | Convey 'n' Value | Total Length (feet) | Average Velocity (fps) | Rim/Grate at Up Node (feet) | Up HGL (feet) | Down HGL (feet) | Up (RIM-HGL) (feet) | Energy Slope (ft/ft) | Up EGL (feet) | Down EGL (feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AA14 | AA13 | 24 | 0.1 | 0.1 | 13.5 | 0.16 | 0.16 | 0.015 | 308.00 | 5.13 | 117.00 | 111.60 | 111.60 | 5.40 | 0.0000 | 111.60 | 111.60 |
| | | N/A | | | | 0.00 | | 0.015 | 308.00 | 0.00 | 117.00 | 111.60 | 111.60 | N/A | 0.0000 | 111.60 | 111.60 |
| AA13 | AA12 | 36 | 8.04 | 8.14 | 14.5 | 11.31 | 11.31 | 0.015 | 364.00 | 6.07 | 116.50 | 111.56 | 111.42 | 4.94 | 0.0004 | 111.60 | 111.46 |
| | | N/A | | | | 0.00 | | 0.015 | 364.00 | 0.00 | 116.50 | 111.56 | 111.42 | N/A | 0.0004 | 111.60 | 111.46 |
| AA12 | AA11 | 42 | 16.74 | 24.88 | 15.5 | 33.50 | 33.5 | 0.015 | 282.00 | 4.70 | 116.20 | 111.25 | 110.84 | 4.95 | 0.0015 | 111.46 | 111.05 |
| | | N/A | | | | 0.00 | | 0.015 | 282.00 | 0.00 | 116.20 | 111.25 | 110.84 | N/A | 0.0015 | 111.46 | 111.05 |
| AA11 | AA10 | 42 | 3.49 | 28.37 | 16.5 | 36.40 | 36.4 | 0.015 | 307.00 | 5.12 | 115.00 | 110.80 | 110.26 | 4.20 | 0.0017 | 111.04 | 110.51 |
| | | N/A | | | | 0.00 | | 0.015 | 307.00 | 0.00 | 115.00 | 110.80 | 110.26 | N/A | 0.0017 | 111.04 | 110.51 |
| AA10 | AA9 | 42 | 5. | 33.37 | 17.5 | 40.88 | 40.88 | 0.015 | 297.00 | 4.95 | 113.50 | 110.20 | 109.54 | 3.30 | 0.0022 | 110.51 | 109.86 |
| | | N/A | | | | 0.00 | | 0.015 | 297.00 | 0.00 | 113.50 | 110.20 | 109.54 | N/A | 0.0022 | 110.51 | 109.86 |
| AA9 | AA2 | 42 | 4.35 | 37.72 | 18.5 | 44.37 | 44.37 | 0.015 | 228.00 | 4.61 | 111.50 | 109.49 | 108.90 | 2.01 | 0.0026 | 109.85 | 109.26 |
| | | N/A | | | | 0.00 | | 0.015 | 228.00 | 0.00 | 111.50 | 109.49 | 108.90 | N/A | 0.0026 | 109.85 | 109.26 |
| AA8 | AA7 | 36 | 13.67 | 13.67 | 13.5 | 19.89 | 19.89 | 0.015 | 268.00 | 4.47 | 118.10 | 111.69 | 111.37 | 6.41 | 0.0012 | 111.83 | 111.51 |
| | | N/A | | | | 0.00 | | 0.015 | 268.00 | 0.00 | 118.10 | 111.69 | 111.37 | N/A | 0.0012 | 111.83 | 111.51 |
| AA7 | AA6 | 36 | 0.1 | 13.77 | 14.5 | 19.29 | 19.29 | 0.015 | 282.00 | 4.70 | 117.00 | 111.38 | 111.06 | 5.62 | 0.0011 | 111.51 | 111.19 |
| | | N/A | | | | 0.00 | | 0.015 | 282.00 | 0.00 | 117.00 | 111.38 | 111.06 | N/A | 0.0011 | 111.51 | 111.19 |
| AA6 | AA5 | 36 | 4.03 | 17.8 | 15.5 | 23.43 | 23.43 | 0.015 | 301.00 | 5.02 | 116.00 | 111.00 | 110.51 | 5.00 | 0.0016 | 111.19 | 110.70 |
| | | N/A | | | | 0.00 | | 0.015 | 301.00 | 0.00 | 116.00 | 111.00 | 110.51 | N/A | 0.0016 | 111.19 | 110.70 |
| AA5 | AA4 | 36 | 4.87 | 22.67 | 16.5 | 28.34 | 28.34 | 0.015 | 308.00 | 5.13 | 114.00 | 110.42 | 109.68 | 3.58 | 0.0024 | 110.69 | 109.95 |
| | | N/A | | | | 0.00 | | 0.015 | 308.00 | 0.00 | 114.00 | 110.42 | 109.68 | N/A | 0.0024 | 110.69 | 109.95 |
| AA4 | AA3 | 42 | 5.28 | 27.95 | 17.5 | 33.38 | 33.38 | 0.015 | 218.00 | 3.63 | 111.50 | 109.75 | 109.43 | 1.75 | 0.0015 | 109.95 | 109.63 |
| | | N/A | | | | 0.00 | | 0.015 | 218.00 | 0.00 | 111.50 | 109.75 | 109.43 | N/A | 0.0015 | 109.95 | 109.63 |
| AA3 | AA2 | 48 | 4.76 | 32.71 | 18.5 | 37.51 | 37.51 | 0.015 | 405.00 | 6.75 | 110.00 | 109.48 | 109.11 | 0.52 | 0.0009 | 109.63 | 109.26 |
| | | N/A | | | | 0.00 | | 0.015 | 405.00 | 0.00 | 110.00 | 109.48 | 109.11 | N/A | 0.0009 | 109.63 | 109.26 |
| AA2 | AA1 | 48 | 3.52 | 73.95 | 19.32 | 83.36 | 83.36 | 0.015 | 112.00 | 6.63 | 109.50 | 108.50 | 108.00 | 1.00 | 0.0045 | 109.26 | 108.76 |
| | | N/A | | | | 0.00 | | 0.015 | 112.00 | 0.00 | 109.50 | 108.50 | 108.00 | N/A | 0.0045 | 109.26 | 108.76 |
| B4 | B3 | 24 | 0.01 | 0.01 | 13.5 | 0.01 | 0.01 | 0.015 | 316.00 | 5.27 | 102.00 | 89.77 | 89.76 | 12.23 | 0.0000 | 89.77 | 89.76 |
| | | N/A | | | | 0.00 | | 0.015 | 316.00 | 0.00 | 102.00 | 89.77 | 89.76 | N/A | 0.0000 | 89.77 | 89.76 |
| B3 | B2 | 30 | 9.89 | 9.9 | 14.5 | 13.87 | 13.87 | 0.015 | 317.00 | 5.28 | 102.00 | 89.62 | 89.14 | 12.38 | 0.0015 | 89.76 | 89.27 |
| | | N/A | | | | 0.00 | | 0.015 | 317.00 | 0.00 | 102.00 | 89.62 | 89.14 | N/A | 0.0015 | 89.76 | 89.27 |
| B2 | B1 | 30 | 9.65 | 19.55 | 15.5 | 26.36 | 26.36 | 0.015 | 104.00 | 6.31 | 101.00 | 88.59 | 87.75 | 12.41 | 0.0061 | 89.27 | 88.64 |
| | | N/A | | | | 0.00 | | 0.015 | 1047.00 | 0.00 | 101.00 | 88.59 | 87.75 | N/A | 0.0006 | 89.27 | 88.64 |
| BB2 | BB1 | 48 | 17.81 | 17.81 | 13.5 | 25.42 | 27.6 | 0.015 | 87.00 | 4.36 | 105.00 | 105.02 | 104.49 | -0.02 | 0.0025 | 105.32 | 105.10 |
| | | N/A | | | | 2.19 | | 0.015 | 87.00 | 1.45 | 105.00 | 105.27 | 103.50 | -0.27 | 0.0209 | 105.32 | 103.50 |
| CC11 | CC12 | 24 | 3.33 | 3.33 | 15. | 4.88 | 4.88 | 0.015 | 310.00 | 5.17 | 110.50 | 103.19 | 103.01 | 7.31 | 0.0006 | 103.25 | 103.06 |
| | | N/A | | | | 0.00 | | 0.015 | 310.00 | 0.00 | 110.50 | 103.19 | 103.01 | N/A | 0.0006 | 103.25 | 103.06 |
| CC12 | CC13 | 24 | 0.01 | 3.34 | 16. | 4.74 | 4.74 | 0.015 | 260.00 | 4.33 | 107.60 | 103.01 | 102.89 | 4.59 | 0.0005 | 103.06 | 102.93 |
| | | N/A | | | | 0.00 | | 0.015 | 260.00 | 0.00 | 107.60 | 103.01 | 102.89 | N/A | 0.0005 | 103.06 | 102.93 |
| CC13 | CC14 | 24 | 2.91 | 6.25 | 17. | 8.60 | 8.6 | 0.015 | 260.00 | 4.33 | 106.50 | 102.78 | 102.31 | 3.72 | 0.0019 | 102.93 | 102.44 |
| | | N/A | | | | 0.00 | | 0.015 | 260.00 | 0.00 | 106.50 | 102.78 | 102.31 | N/A | 0.0019 | 102.93 | 102.44 |
| CC14 | CC1-1 | 30 | 0.01 | 6.26 | 18. | 8.37 | 8.37 | 0.015 | 63.00 | 1.70 | 106.00 | 102.39 | 102.35 | 3.61 | 0.0006 | 102.44 | 102.40 |
| | | N/A | | | | 0.00 | | 0.015 | 918.00 | 0.00 | 106.00 | 102.39 | 102.35 | N/A | 0.0000 | 102.44 | 102.40 |
| CC4 | CC3 | 54 | 10.6 | 65.03 | 19.8 | 78.10 | 78.1 | 0.015 | 206.00 | 4.91 | 107.80 | 107.23 | 106.80 | 0.57 | 0.0021 | 107.65 | 107.21 |
| | | N/A | | | | 0.00 | | 0.015 | 206.00 | 0.00 | 107.80 | 107.23 | 106.80 | N/A | 0.0021 | 107.65 | 107.21 |
| CC3 | CC2 | 60 | 4.7 | 69.73 | 20.5 | 78.91 | 81.8 | 0.015 | 109.00 | 4.02 | 106.50 | 106.57 | 106.43 | -0.07 | 0.0012 | 106.84 | 106.71 |
| | | N/A | | | | 2.89 | | 0.015 | 109.00 | 1.82 | 106.50 | 106.80 | 106.71 | -0.30 | 0.0013 | 106.85 | 106.71 |
| CC5 | CC4 | 54 | 3.58 | 54.43 | 18.87 | 68.72 | 68.72 | 0.015 | 242.00 | 4.32 | 110.30 | 107.72 | 107.33 | 2.58 | 0.0016 | 108.04 | 107.65 |
| | | N/A | | | | 0.00 | | 0.015 | 242.00 | 0.00 | 110.30 | 107.72 | 107.33 | N/A | 0.0016 | 108.04 | 107.65 |
| CC6 | CC5 | 48 | 11.71 | 50.85 | 18. | 65.77 | 65.77 | 0.015 | 272.00 | 5.23 | 112.40 | 108.33 | 107.57 | 4.07 | 0.0028 | 108.80 | 108.04 |
| | | N/A | | | | 0.00 | | 0.015 | 272.00 | 0.00 | 112.40 | 108.33 | 107.57 | N/A | 0.0028 | 108.80 | 108.04 |
| CC7 | CC6 | 48 | 16.14 | 39.14 | 17. | 52.03 | 52.03 | 0.015 | 307.00 | 5.12 | 115.20 | 109.05 | 108.51 | 6.15 | 0.0017 | 109.34 | 108.80 |
| | | N/A | | | | 0.00 | | 0.015 | 307.00 | 0.00 | 115.20 | 109.05 | 108.51 | N/A | 0.0017 | 109.34 | 108.80 |
| CC8 | CC7 | 48 | 0.1 | 23. | 16. | 32.37 | 32.37 | 0.015 | 400.00 | 6.67 | 117.10 | 109.50 | 109.23 | 7.60 | 0.0007 | 109.61 | 109.34 |
| | | N/A | | | | 0.00 | | 0.015 | 400.00 | 0.00 | 117.10 | 109.50 | 109.23 | N/A | 0.0007 | 109.61 | 109.34 |
| CC10 | CC8 | 48 | 9.17 | 9.17 | 15. | 13.17 | 13.17 | 0.015 | 354.00 | 5.90 | 118.10 | 109.64 | 109.60 | 8.47 | 0.0001 | 109.65 | 109.61 |
| | | N/A | | | | 0.00 | | 0.015 | 354.00 | 0.00 | 118.10 | 109.64 | 109.60 | N/A | 0.0001 | 109.65 | 109.61 |
| CC9 | CC8 | 48 | 13.73 | 13.73 | 15. | 20.14 | 20.14 | 0.015 | 374.00 | 6.23 | 116.30 | 109.67 | 109.57 | 6.63 | 0.0003 | 109.71 | 109.61 |
| | | N/A | | | | 0.00 | | 0.015 | 374.00 | 0.00 | 116.30 | 109.67 | 109.57 | N/A | 0.0003 | 109.71 | 109.61 |
| CC2 | CC1 | 66 | 0.01 | 69.74 | 20.93 | 54.47 | 80.19 | 0.015 | 337.00 | 5.62 | 106.00 | 106.62 | 106.50 | -0.62 | 0.0003 | 106.71 | 106.59 |
| | | N/A | | | | 25.72 | | 0.015 | 337.00 | 5.62 | 106.00 | 106.64 | 105.60 | -0.64 | 0.0030 | 106.71 | 105.69 |
| DD3 | DD2 | 18 | 0.1 | 0.1 | 13.5 | 0.16 | 0.16 | 0.015 | 170.00 | 2.83 | 107.00 | 102.12 | 102.12 | 4.88 | 0.0000 | 102.12 | 102.12 |

| | Up Node Name | Down Node Name | Convey Size (in or ft) | Trib. Area at Up Node (acre) | Cumul. Area (acre) | Total Computed Response Time at Up Node (min.) | Computed Flow at Convey (cfs) | Total Flow at Convey (cfs) | Convey 'n' Value | Total Length (feet) | Average Velocity (fps) | Rim/Grate at Up Node (feet) | Up HGL (feet) | Down HGL (feet) | Up (RIM-HGL) (feet) | Energy Slope (ft/ft) | Up EGL (feet) | Down EGL (feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | N/A | | | | 0.00 | | 0.015 | 170.00 | 0.00 | 107.00 | 102.12 | 102.12 | N/A | 0.0000 | 102.12 | 102.12 |
| | DD2 | DD1 | 18 | 3.77 | 3.87 | 14.5 | 4.93 | 4.93 | 0.015 | 40.00 | 2.79 | 106.00 | 101.99 | 101.87 | 4.01 | 0.0029 | 102.12 | 102.00 |
| | | | N/A | | | | 0.00 | | 0.015 | 40.00 | 0.00 | 106.00 | 101.99 | 101.87 | N/A | 0.0029 | 102.12 | 102.00 |
| | GG4 | GG3 | 24 | 0.27 | 0.27 | 0.01 | 15.65 | 15.65 | 0.015 | 380.00 | 6.33 | 106.00 | 105.25 | 102.83 | 0.75 | 0.0064 | 105.68 | 103.26 |
| | | | N/A | | | | 0.00 | | 0.015 | 380.00 | 0.00 | 106.00 | 105.25 | 102.83 | N/A | 0.0064 | 105.68 | 103.26 |
| | GG3 | GG2 | 24 | 1.22 | 1.49 | 13.5 | 1.98 | 1.98 | 0.015 | 310.00 | 5.17 | 105.00 | 102.13 | 102.11 | 2.87 | 0.0001 | 102.14 | 102.11 |
| | | | N/A | | | | 0.00 | | 0.015 | 310.00 | 0.00 | 105.00 | 102.13 | 102.11 | N/A | 0.0001 | 102.14 | 102.11 |
| | GG2 | GG1 | 24 | 0.99 | 2.48 | 14.5 | 3.05 | 3.05 | 0.015 | 45.00 | 0.97 | 104.00 | 102.10 | 102.09 | 1.90 | 0.0002 | 102.11 | 102.10 |
| | | | N/A | | | | 0.00 | | 0.015 | 45.00 | 0.00 | 104.00 | 102.10 | 102.09 | N/A | 0.0002 | 102.11 | 102.10 |
| | H5A | H4A | 24 | 9.77 | 9.77 | 13.5 | 12.94 | 12.94 | 0.015 | 432.00 | 7.20 | 98.00 | 91.88 | 90.00 | 6.12 | 0.0044 | 92.17 | 90.29 |
| | | | N/A | | | | 0.00 | | 0.015 | 432.00 | 0.00 | 98.00 | 91.88 | 90.00 | N/A | 0.0044 | 92.17 | 90.29 |
| | H4A | H3A | 24 | 9.11 | 18.88 | 14.5 | 23.81 | 23.81 | 0.015 | 416.00 | 7.58 | 94.00 | 89.30 | 83.16 | 4.70 | 0.0147 | 90.29 | 84.15 |
| | | | N/A | | | | 0.00 | | 0.015 | 416.00 | 0.00 | 94.00 | 89.30 | 83.16 | N/A | 0.0147 | 90.29 | 84.15 |
| | H3A | H2A | 36 | 0.01 | 18.89 | 15.41 | 22.96 | 22.96 | 0.015 | 286.00 | 4.77 | 89.00 | 83.97 | 83.52 | 5.03 | 0.0016 | 84.15 | 83.70 |
| | | | N/A | | | | 0.00 | | 0.015 | 286.00 | 0.00 | 89.00 | 83.97 | 83.52 | N/A | 0.0016 | 84.15 | 83.70 |
| | H2A | H1A | 36 | 11.07 | 29.96 | 16.41 | 35.12 | 35.12 | 0.015 | 73.00 | 4.97 | 87.00 | 83.27 | 83.00 | 3.73 | 0.0037 | 83.70 | 83.43 |
| | | | N/A | | | | 0.00 | | 0.015 | 73.00 | 0.00 | 87.00 | 83.27 | 83.00 | N/A | 0.0037 | 83.70 | 83.43 |
| | H16B | H15B | 30 | 4.42 | 4.42 | 15. | 5.68 | 5.68 | 0.015 | 340.00 | 5.67 | 101.00 | 93.74 | 93.52 | 7.26 | 0.0007 | 93.82 | 93.58 |
| | | | N/A | | | | 0.00 | | 0.015 | 340.00 | 0.00 | 101.00 | 93.74 | 93.52 | N/A | 0.0007 | 93.82 | 93.58 |
| | H15B | H14B | 30 | 0.3 | 4.72 | 16. | 5.90 | 5.9 | 0.015 | 352.00 | 5.87 | 101.00 | 93.51 | 93.35 | 7.49 | 0.0005 | 93.58 | 93.40 |
| | | | N/A | | | | 0.00 | | 0.015 | 352.00 | 0.00 | 101.00 | 93.51 | 93.35 | N/A | 0.0005 | 93.58 | 93.40 |
| | H14B | H13B | 36 | 2.44 | 7.16 | 20. | 7.95 | 7.95 | 0.015 | 340.00 | 5.67 | 101.00 | 93.36 | 93.30 | 7.64 | 0.0002 | 93.40 | 93.33 |
| | | | N/A | | | | 0.00 | | 0.015 | 340.00 | 0.00 | 101.00 | 93.36 | 93.30 | N/A | 0.0002 | 93.40 | 93.33 |
| | H13B | H12B | 36 | 0.3 | 7.46 | 21. | 7.93 | 7.93 | 0.015 | 398.00 | 6.63 | 101.00 | 93.30 | 93.23 | 7.70 | 0.0002 | 93.33 | 93.25 |
| | | | N/A | | | | 0.00 | | 0.015 | 398.00 | 0.00 | 101.00 | 93.30 | 93.23 | N/A | 0.0002 | 93.33 | 93.25 |
| | H12B | H11B | 36 | 0.3 | 7.76 | 22. | 7.92 | 7.92 | 0.015 | 467.00 | 7.78 | 100.70 | 93.23 | 93.14 | 7.47 | 0.0002 | 93.25 | 93.16 |
| | | | N/A | | | | 0.00 | | 0.015 | 467.00 | 0.00 | 100.70 | 93.23 | 93.14 | N/A | 0.0002 | 93.25 | 93.16 |
| | H11B | H10B | 42 | 11.4 | 19.16 | 23. | 19.29 | 19.29 | 0.015 | 402.00 | 6.70 | 102.00 | 93.09 | 92.89 | 8.91 | 0.0005 | 93.16 | 92.96 |
| | | | N/A | | | | 0.00 | | 0.015 | 402.00 | 0.00 | 102.00 | 93.09 | 92.89 | N/A | 0.0005 | 93.16 | 92.96 |
| | H10B | H6B | 60 | 5.09 | 24.25 | 24. | 23.48 | 23.48 | 0.015 | 493.00 | 8.22 | 100.20 | 92.94 | 92.88 | 7.26 | 0.0001 | 92.96 | 92.91 |
| | | | N/A | | | | 0.00 | | 0.015 | 493.00 | 0.00 | 100.20 | 92.94 | 92.88 | N/A | 0.0001 | 92.96 | 92.91 |
| | H9B | H8B | 60 | 20.09 | 20.09 | 15. | 24.79 | 24.79 | 0.015 | 387.00 | 6.45 | 99.30 | 93.41 | 93.36 | 5.89 | 0.0001 | 93.44 | 93.39 |
| | | | N/A | | | | 0.00 | | 0.015 | 387.00 | 0.00 | 99.30 | 93.41 | 93.36 | N/A | 0.0001 | 93.44 | 93.39 |
| | H8B | H7B | 60 | 16.88 | 36.97 | 16. | 43.97 | 43.97 | 0.015 | 326.00 | 5.43 | 98.50 | 93.30 | 93.18 | 5.20 | 0.0004 | 93.39 | 93.26 |
| | | | N/A | | | | 0.00 | | 0.015 | 326.00 | 0.00 | 98.50 | 93.30 | 93.18 | N/A | 0.0004 | 93.39 | 93.26 |
| | H7B | H6B | 60 | 24.21 | 61.18 | 17. | 70.74 | 70.74 | 0.015 | 359.00 | 5.98 | 98.00 | 93.04 | 92.69 | 4.96 | 0.0010 | 93.26 | 92.91 |
| | | | N/A | | | | 0.00 | | 0.015 | 359.00 | 0.00 | 98.00 | 93.04 | 92.69 | N/A | 0.0010 | 93.26 | 92.91 |
| | H6B | H5B | 66 | 5.9 | 91.33 | 18. | 104.99 | 104.99 | 0.015 | 428.00 | 7.13 | 97.30 | 92.57 | 92.01 | 4.73 | 0.0013 | 92.91 | 92.35 |
| | | | N/A | | | | 0.00 | | 0.015 | 359.00 | 0.00 | 97.30 | 92.57 | 92.01 | N/A | 0.0016 | 92.91 | 92.35 |
| | H5B | H4B | 66 | 0.01 | 91.34 | 19. | 101.67 | 101.67 | 0.015 | 368.00 | 6.13 | 95.00 | 92.03 | 91.58 | 2.97 | 0.0012 | 92.35 | 91.90 |
| | | | N/A | | | | 0.00 | | 0.015 | 368.00 | 0.00 | 95.00 | 92.03 | 91.58 | N/A | 0.0012 | 92.35 | 91.90 |
| | H4B | H3B | 66 | 5.94 | 97.28 | 20. | 107.28 | 107.28 | 0.015 | 414.00 | 6.90 | 93.00 | 91.55 | 90.98 | 1.45 | 0.0014 | 91.90 | 91.34 |
| | | | N/A | | | | 0.00 | | 0.015 | 414.00 | 0.00 | 93.00 | 91.55 | 90.98 | N/A | 0.0014 | 91.90 | 91.34 |
| | H3B | H2B | 66 | 8.18 | 105.46 | 21. | 111.30 | 112.04 | 0.015 | 169.00 | 4.68 | 91.00 | 90.96 | 90.71 | 0.04 | 0.0015 | 91.33 | 91.09 |
| | | | N/A | | | | 0.74 | | 0.015 | 169.00 | 2.82 | 91.00 | 91.33 | 91.19 | -0.33 | 0.0006 | 91.33 | 91.23 |
| | H2B | H1B | 72 | 3.95 | 109.41 | 21.6 | 55.05 | 113.06 | 0.015 | 80.00 | 1.95 | 89.90 | 91.02 | 91.00 | -1.12 | 0.0002 | 91.08 | 91.07 |
| | | | N/A | | | | 58.01 | | 0.015 | 80.00 | 3.52 | 89.90 | 90.63 | 89.73 | -0.73 | 0.0113 | 90.82 | 89.92 |
| | HH4 | HH3 | 24 | 5.3 | 5.3 | 10. | 9.56 | 9.56 | 0.015 | 352.00 | 5.87 | 102.50 | 97.23 | 96.39 | 5.27 | 0.0024 | 97.39 | 96.55 |
| | | | N/A | | | | 0.00 | | 0.015 | 352.00 | 0.00 | 102.50 | 97.23 | 96.39 | N/A | 0.0024 | 97.39 | 96.55 |
| | HH3 | HH2 | 24 | 3.7 | 9. | 11. | 15.46 | 15.46 | 0.015 | 417.00 | 6.95 | 101.00 | 96.13 | 93.54 | 4.87 | 0.0062 | 96.55 | 93.96 |
| | | | N/A | | | | 0.00 | | 0.015 | 417.00 | 0.00 | 101.00 | 96.13 | 93.54 | N/A | 0.0062 | 96.55 | 93.96 |
| | HH2 | HH1 | 30 | 9.23 | 18.23 | 15. | 26.74 | 26.74 | 0.015 | 186.00 | 5.45 | 99.50 | 93.44 | 92.39 | 6.06 | 0.0057 | 93.95 | 92.90 |
| | | | N/A | | | | 0.00 | | 0.015 | 186.00 | 0.00 | 99.50 | 93.44 | 92.39 | N/A | 0.0057 | 93.95 | 92.90 |
| | JJ17 | JJ9 | 18 | 0.3 | 0.3 | 15. | 0.45 | 0.45 | 0.015 | 470.00 | 7.83 | 109.00 | 95.34 | 95.33 | 13.66 | 0.0000 | 95.34 | 95.33 |
| | | | N/A | | | | 0.00 | | 0.015 | 470.00 | 0.00 | 109.00 | 95.34 | 95.33 | N/A | 0.0000 | 95.34 | 95.33 |
| | JJ16 | JJ15 | 36 | 11.33 | 11.33 | 15. | 15.13 | 15.13 | 0.015 | 550.00 | 9.17 | 110.10 | 98.93 | 98.56 | 11.17 | 0.0007 | 99.01 | 98.63 |
| | | | N/A | | | | 0.00 | | 0.015 | 550.00 | 0.00 | 110.10 | 98.93 | 98.56 | N/A | 0.0007 | 99.01 | 98.63 |
| | JJ15 | JJ14 | 42 | 12.6 | 23.93 | 16. | 30.18 | 30.18 | 0.015 | 350.00 | 5.83 | 106.50 | 98.46 | 98.04 | 8.04 | 0.0012 | 98.63 | 98.21 |
| | | | N/A | | | | 0.00 | | 0.015 | 350.00 | 0.00 | 106.50 | 98.46 | 98.04 | N/A | 0.0012 | 98.63 | 98.21 |
| | JJ14 | JJ12 | 42 | 10.98 | 34.91 | 17. | 40.16 | 40.16 | 0.015 | 110.00 | 4.17 | 105.50 | 97.91 | 97.68 | 7.59 | 0.0021 | 98.21 | 97.98 |
| | | | N/A | | | | 0.00 | | 0.015 | 110.00 | 0.00 | 105.50 | 97.91 | 97.68 | N/A | 0.0021 | 98.21 | 97.98 |
| | JJ13 | JJ12 | 48 | 9.5 | 9.5 | 15. | 11.80 | 11.8 | 0.015 | 550.00 | 9.17 | 109.20 | 98.01 | 97.96 | 11.19 | 0.0001 | 98.03 | 97.98 |

| | Up Node Name | Down Node Name | Convey Size (in or ft) | Trib. Area at Up Node (acre) | Cumul. Area (acre) | Total Computed Response Time at Up Node (min.) | Compute d Flow at Convey (cfs) | Total Flow at Convey (cfs) | Convey 'n' Value | Total Length (feet) | Average Velocity (fps) | Rim/Grate at Up Node (feet) | Up HGL (feet) | Down HGL (feet) | Up (RIM-HGL) (feet) | Energy Slope (ft/ft) | Up EGL (feet) | Down EGL (feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 15 | | | | 0.00 | | 0.015 | 550.00 | 0.00 | 109.20 | 98.01 | 97.96 | N/A | 0.0001 | 98.03 | 97.98 |
| | JJ12 | JJ11 | 48 | 9.16 | 53.57 | 17.44 | 60.70 | 60.7 | 0.015 | 335.00 | 5.58 | 105.00 | 97.57 | 96.78 | 7.43 | 0.0024 | 97.98 | 97.18 |
| | | | N/A | | | | 0.00 | | 0.015 | 335.00 | 0.00 | 105.00 | 97.57 | 96.78 | N/A | 0.0024 | 97.98 | 97.18 |
| | JJ11 | JJ10 | 48 | 10.67 | 64.24 | 18.44 | 70.34 | 70.34 | 0.015 | 330.00 | 5.60 | 104.00 | 96.64 | 95.59 | 7.36 | 0.0032 | 97.18 | 96.12 |
| | | | N/A | | | | 0.00 | | 0.015 | 330.00 | 0.00 | 104.00 | 96.64 | 95.59 | N/A | 0.0032 | 97.18 | 96.12 |
| | JJ10 | JJ9 | 60 | 10.17 | 74.41 | 19.42 | 78.91 | 78.91 | 0.015 | 650.00 | 10.83 | 103.20 | 95.84 | 95.05 | 7.36 | 0.0012 | 96.12 | 95.33 |
| | | | N/A | | | | 0.00 | | 0.015 | 650.00 | 0.00 | 103.20 | 95.84 | 95.05 | N/A | 0.0012 | 96.12 | 95.33 |
| | JJ9 | JJ8 | 60 | 11.73 | 86.44 | 20.42 | 89.51 | 89.51 | 0.015 | 350.00 | 5.83 | 101.50 | 94.97 | 94.42 | 6.53 | 0.0016 | 95.33 | 94.78 |
| | | | N/A | | | | 0.00 | | 0.015 | 350.00 | 0.00 | 101.50 | 94.97 | 94.42 | N/A | 0.0016 | 95.33 | 94.78 |
| | JJ8 | JJ7 | 66 | 9.6 | 96.04 | 21.42 | 95.38 | 95.38 | 0.015 | 335.00 | 5.58 | 100.50 | 94.50 | 94.14 | 6.00 | 0.0011 | 94.77 | 94.41 |
| | | | N/A | | | | 0.00 | | 0.015 | 335.00 | 0.00 | 100.50 | 94.50 | 94.14 | N/A | 0.0011 | 94.77 | 94.41 |
| | JJ7 | JJ6 | 66 | 4.2 | 100.24 | 22.42 | 95.62 | 95.62 | 0.015 | 370.00 | 6.17 | 99.50 | 94.13 | 93.73 | 5.37 | 0.0011 | 94.41 | 94.01 |
| | | | N/A | | | | 0.00 | | 0.015 | 370.00 | 0.00 | 99.50 | 94.13 | 93.73 | N/A | 0.0011 | 94.41 | 94.01 |
| | JJ6 | JJ5 | 66 | 0. | 100.24 | 23.42 | 91.18 | 91.18 | 0.015 | 425.00 | 7.08 | 98.50 | 93.76 | 93.34 | 4.74 | 0.0010 | 94.01 | 93.59 |
| | | | N/A | | | | 0.00 | | 0.015 | 425.00 | 0.00 | 98.50 | 93.76 | 93.34 | N/A | 0.0010 | 94.01 | 93.59 |
| | JJ5 | JJ4 | 66 | 4.9 | 105.14 | 24.42 | 92.34 | 92.34 | 0.015 | 510.00 | 8.50 | 97.50 | 93.33 | 92.82 | 4.17 | 0.0010 | 93.59 | 93.08 |
| | | | N/A | | | | 0.00 | | 0.015 | 510.00 | 0.00 | 97.50 | 93.33 | 92.82 | N/A | 0.0010 | 93.59 | 93.08 |
| | JJ4 | JJ3 | 72 | 11.04 | 116.18 | 25.42 | 99.79 | 99.79 | 0.015 | 410.00 | 6.83 | 96.00 | 92.86 | 92.56 | 3.14 | 0.0007 | 93.08 | 92.77 |
| | | | N/A | | | | 0.00 | | 0.015 | 410.00 | 0.00 | 96.00 | 92.86 | 92.56 | N/A | 0.0007 | 93.08 | 92.77 |
| | JJ3 | JJ2 | 72 | 10.43 | 126.61 | 26.42 | 106.13 | 106.13 | 0.015 | 480.00 | 8.00 | 94.40 | 92.53 | 92.13 | 1.87 | 0.0008 | 92.77 | 92.37 |
| | | | N/A | | | | 0.00 | | 0.015 | 480.00 | 0.00 | 94.40 | 92.53 | 92.13 | N/A | 0.0008 | 92.77 | 92.37 |
| | JJ2 | JJ1 | 72 | 14.81 | 141.42 | 27.42 | 112.73 | 116.31 | 0.015 | 100.00 | 3.99 | 92.00 | 92.10 | 92.00 | -0.10 | 0.0009 | 92.37 | 92.28 |
| | | | N/A | | | | 3.58 | | 0.015 | 100.00 | 3.19 | 92.00 | 92.31 | 91.50 | -0.31 | 0.0086 | 92.37 | 91.51 |
| | L2 | L1 | 60 | 6.38 | 88.65 | 27.67 | 66.38 | 66.38 | 0.015 | 250.00 | 4.17 | 98.00 | 96.22 | 96.00 | 1.78 | 0.0009 | 96.41 | 96.20 |
| | | | N/A | | | | 0.00 | | 0.015 | 250.00 | 0.00 | 98.00 | 96.22 | 96.00 | N/A | 0.0009 | 96.41 | 96.20 |
| | L3 | L2 | 54 | 7.86 | 82.27 | 26.67 | 64.04 | 64.04 | 0.015 | 350.00 | 5.83 | 100.00 | 96.63 | 96.14 | 3.37 | 0.0014 | 96.91 | 96.41 |
| | | | N/A | | | | 0.00 | | 0.015 | 350.00 | 0.00 | 100.00 | 96.63 | 96.14 | N/A | 0.0014 | 96.91 | 96.41 |
| | L4 | L3 | 54 | 7.26 | 7.26 | 20. | 7.74 | 7.74 | 0.015 | 330.00 | 5.50 | 101.00 | 96.91 | 96.91 | 4.09 | 0.0000 | 96.91 | 96.91 |
| | | | N/A | | | | 0.00 | | 0.015 | 330.00 | 0.00 | 101.00 | 96.91 | 96.91 | N/A | 0.0000 | 96.91 | 96.91 |
| | L5 | L3 | 48 | 15.41 | 67.15 | 25.67 | 54.48 | 54.48 | 0.015 | 480.00 | 8.00 | 103.00 | 97.51 | 96.59 | 5.49 | 0.0019 | 97.83 | 96.91 |
| | | | N/A | | | | 0.00 | | 0.015 | 480.00 | 0.00 | 103.00 | 97.51 | 96.59 | N/A | 0.0019 | 97.83 | 96.91 |
| | L6 | L5 | 48 | 10.14 | 51.74 | 24.67 | 44.04 | 44.04 | 0.015 | 340.00 | 5.67 | 106.00 | 97.77 | 97.61 | 8.23 | 0.0017 | 98.39 | 97.83 |
| | | | N/A | | | | 0.00 | | 0.015 | 340.00 | 0.00 | 106.00 | 97.77 | 97.61 | N/A | 0.0017 | 98.39 | 97.83 |
| | L7 | L6 | 42 | 4.88 | 41.6 | 23.95 | 36.71 | 36.71 | 0.015 | 310.00 | 7.20 | 108.00 | 99.44 | 98.08 | 8.56 | 0.0050 | 100.28 | 98.74 |
| | | | N/A | | | | 0.00 | | 0.015 | 310.00 | 0.00 | 108.00 | 99.44 | 98.08 | N/A | 0.0050 | 100.28 | 98.74 |
| | L8 | L7 | 24 | 5.6 | 5.6 | 20. | 5.93 | 5.93 | 0.015 | 415.00 | 6.92 | 110.00 | 102.50 | 100.42 | 7.50 | 0.0050 | 102.86 | 100.78 |
| | | | N/A | | | | 0.00 | | 0.015 | 415.00 | 0.00 | 110.00 | 102.50 | 100.42 | N/A | 0.0050 | 102.86 | 100.78 |
| | L9 | L7 | 36 | 9.8 | 31.12 | 22.95 | 28.94 | 28.94 | 0.015 | 525.00 | 8.75 | 110.00 | 102.43 | 99.70 | 7.57 | 0.0050 | 103.23 | 100.62 |
| | | | N/A | | | | 0.00 | | 0.015 | 525.00 | 0.00 | 110.00 | 102.43 | 99.70 | N/A | 0.0050 | 103.23 | 100.62 |
| | L10 | L9 | 36 | 7.11 | 21.32 | 21.95 | 21.00 | 21. | 0.015 | 490.00 | 8.17 | 112.00 | 105.11 | 102.96 | 6.89 | 0.0049 | 105.75 | 103.36 |
| | | | N/A | | | | 0.00 | | 0.015 | 490.00 | 0.00 | 112.00 | 105.11 | 102.96 | N/A | 0.0049 | 105.75 | 103.36 |
| | L11 | L10 | 30 | 0.3 | 14.21 | 21. | 14.87 | 14.87 | 0.015 | 305.00 | 5.34 | 113.10 | 106.96 | 105.44 | 6.14 | 0.0050 | 107.53 | 106.01 |
| | | | N/A | | | | 0.00 | | 0.015 | 305.00 | 0.00 | 113.10 | 106.96 | 105.44 | N/A | 0.0050 | 107.53 | 106.01 |
| | L12 | L11 | 30 | 7.5 | 7.5 | 20. | 8.26 | 8.26 | 0.015 | 650.00 | 10.83 | 113.90 | 110.37 | 107.27 | 3.53 | 0.0050 | 110.76 | 107.53 |
| | | | N/A | | | | 0.00 | | 0.015 | 650.00 | 0.00 | 113.90 | 110.37 | 107.27 | N/A | 0.0050 | 110.76 | 107.53 |
| | L13 | L11 | 24 | 6.41 | 6.41 | 20. | 7.06 | 7.06 | 0.015 | 550.00 | 9.17 | 115.00 | 109.85 | 107.26 | 5.15 | 0.0050 | 110.26 | 107.53 |
| | | | N/A | | | | 0.00 | | 0.015 | 550.00 | 0.00 | 115.00 | 109.85 | 107.26 | N/A | 0.0050 | 110.26 | 107.53 |
| | LL12 | LL5 | 24 | 7.52 | 7.52 | 15. | 10.36 | 10.36 | 0.015 | 410.00 | 6.83 | 100.50 | 98.68 | 97.54 | 1.82 | 0.0028 | 98.87 | 97.73 |
| | | | N/A | | | | 0.00 | | 0.015 | 410.00 | 0.00 | 100.50 | 98.68 | 97.54 | N/A | 0.0028 | 98.87 | 97.73 |
| | LL11 | LL10 | 24 | 7.22 | 7.22 | 15. | 0.49 | 9.79 | 0.015 | 470.00 | 7.83 | 107.00 | 107.41 | 106.49 | -0.41 | 0.0021 | 107.50 | 106.49 |
| | | | N/A | | | | 9.29 | | 0.015 | 470.00 | 7.83 | 107.00 | 107.46 | 106.41 | -0.46 | 0.0022 | 107.51 | 106.49 |
| | LL10 | LL9 | 24 | 7.46 | 14.68 | 15.99 | 10.22 | 19.4 | 0.015 | 430.00 | 7.17 | 106.00 | 106.22 | 104.54 | -0.22 | 0.0033 | 106.49 | 105.06 |
| | | | N/A | | | | 9.18 | | 0.015 | 430.00 | 7.17 | 106.00 | 106.41 | 104.12 | -0.41 | 0.0055 | 106.49 | 104.13 |
| | LL9 | LL8 | 36 | 6.56 | 21.23 | 16.99 | 7.83 | 27.3 | 0.015 | 400.00 | 6.67 | 103.50 | 103.85 | 102.37 | -0.35 | 0.0037 | 104.13 | 102.66 |
| | | | N/A | | | | 19.47 | | 0.015 | 400.00 | 6.67 | 103.50 | 104.02 | 102.21 | -0.52 | 0.0047 | 104.13 | 102.23 |
| | LL8 | LL7 | 42 | 5.64 | 26.87 | 17.7 | 3.82 | 33.82 | 0.015 | 450.00 | 7.50 | 101.50 | 102.01 | 100.23 | -0.51 | 0.0044 | 102.23 | 100.27 |
| | | | N/A | | | | 29.99 | | 0.015 | 450.00 | 7.50 | 101.50 | 102.14 | 100.21 | -0.64 | 0.0044 | 102.23 | 100.27 |
| | LL7 | LL6 | 42 | 8.62 | 35.49 | 18.59 | 7.75 | 43.51 | 0.015 | 350.00 | 5.83 | 99.50 | 99.94 | 98.21 | -0.44 | 0.0057 | 100.27 | 98.28 |
| | | | N/A | | | | 35.76 | | 0.015 | 350.00 | 5.83 | 99.50 | 100.15 | 98.19 | -0.65 | 0.0057 | 100.27 | 98.28 |
| | LL6 | LL5 | 42 | 6.1 | 41.59 | 19.41 | 13.55 | 49.61 | 0.015 | 130.00 | 4.35 | 97.50 | 97.83 | 97.63 | -0.33 | 0.0043 | 98.28 | 97.73 |
| | | | N/A | | | | 36.05 | | 0.015 | 130.00 | 2.34 | 97.50 | 98.19 | 97.63 | -0.69 | 0.0039 | 98.28 | 97.77 |
| | LL5 | LL4 | 42 | 6.01 | 55.12 | 20.08 | 35.46 | 65.44 | 0.015 | 340.00 | 8.59 | 97.00 | 96.91 | 94.61 | 0.09 | 0.0081 | 97.72 | 94.96 |

| | Up Node Name | Down Node Name | Convey Size (in or ft) | Trib. Area at Up Node (acre) | Cumul. Area (acre) | Total Computed Response Time at Up Node (min.) | Compute d Flow at Convey (cfs) | Total Flow at Convey (cfs) | Convey 'n' Value | Total Length (feet) | Average Velocity (fps) | Rim/Grate at Up Node (feet) | Up HGL (feet) | Down HGL (feet) | Up (RIM-HGL) (feet) | Energy Slope (ft/ft) | Up EGL (feet) | Down EGL (feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | N/A | | | | 29.98 | | 0.015 | 340.00 | 5.67 | 97.00 | 97.59 | 94.80 | -0.59 | 0.0085 | 97.72 | 94.83 |
| | LL4 | LL3 | 48 | 10.87 | 65.98 | 20.9 | 43.03 | 76.29 | 0.015 | 295.00 | 9.79 | 94.00 | 93.90 | 90.19 | 0.10 | 0.0103 | 94.75 | 91.71 |
| | | | N/A | | | | 33.26 | | 0.015 | 295.00 | 4.92 | 94.00 | 94.61 | 91.85 | -0.61 | 0.0097 | 94.75 | 91.88 |
| | LL3 | LL2 | 54 | 8.8 | 74.78 | 21.62 | 55.56 | 84.32 | 0.015 | 205.00 | 10.00 | 91.00 | 90.78 | 89.38 | 0.22 | 0.0099 | 91.71 | 89.68 |
| | | | N/A | | | | 28.76 | | 0.015 | 205.00 | 3.42 | 91.00 | 91.59 | 89.53 | -0.59 | 0.0096 | 91.71 | 89.74 |
| | LL2 | LL1 | 54 | 11.85 | 86.62 | 21.84 | 88.53 | 96.16 | 0.015 | 100.00 | 7.89 | 89.00 | 88.51 | 87.75 | 0.49 | 0.0041 | 89.47 | 89.05 |
| | | | N/A | | | | 7.63 | | 0.015 | 100.00 | 3.77 | 89.00 | 89.38 | 88.60 | -0.38 | 0.0086 | 89.46 | 88.61 |
| | M4A | M3A | 30 | 7.16 | 7.16 | 15. | 8.52 | 8.52 | 0.015 | 305.00 | 5.08 | 103.00 | 95.46 | 95.01 | 7.54 | 0.0014 | 95.60 | 95.17 |
| | | | N/A | | | | 0.00 | | 0.015 | 305.00 | 0.00 | 103.00 | 95.46 | 95.01 | N/A | 0.0014 | 95.60 | 95.17 |
| | M3A | M2A | 42 | 0.3 | 16.86 | 16. | 19.85 | 19.85 | 0.015 | 358.00 | 5.97 | 102.40 | 95.03 | 94.76 | 7.37 | 0.0007 | 95.16 | 94.90 |
| | | | N/A | | | | 0.00 | | 0.015 | 358.00 | 0.00 | 102.40 | 95.03 | 94.76 | N/A | 0.0007 | 95.16 | 94.90 |
| | M5A | M3A | 30 | 9.4 | 9.4 | 15. | 11.69 | 11.69 | 0.015 | 388.00 | 6.47 | 106.00 | 95.85 | 95.03 | 10.15 | 0.0018 | 96.02 | 95.32 |
| | | | N/A | | | | 0.00 | | 0.015 | 388.00 | 0.00 | 106.00 | 95.85 | 95.03 | N/A | 0.0018 | 96.02 | 95.32 |
| | M2A | M1A | 42 | 4.38 | 21.24 | 17. | 23.93 | 23.93 | 0.015 | 445.00 | 7.42 | 102.00 | 94.68 | 93.50 | 7.32 | 0.0017 | 94.89 | 94.14 |
| | | | N/A | | | | 0.00 | | 0.015 | 445.00 | 0.00 | 102.00 | 94.68 | 93.50 | N/A | 0.0017 | 94.89 | 94.14 |
| | M10B | M3B | 24 | 0.3 | 0.3 | 15. | 0.45 | 0.45 | 0.015 | 305.00 | 5.08 | 110.00 | 105.03 | 105.04 | 4.97 | 0.0000 | 105.03 | 105.04 |
| | | | N/A | | | | 0.00 | | 0.015 | 305.00 | 0.00 | 110.00 | 105.03 | 105.04 | N/A | 0.0000 | 105.03 | 105.04 |
| | M9B | M8B | 36 | 10.6 | 10.6 | 20. | 12.55 | 12.55 | 0.015 | 358.00 | 5.97 | 115.00 | 106.53 | 106.36 | 8.47 | 0.0005 | 106.58 | 106.42 |
| | | | N/A | | | | 0.00 | | 0.015 | 358.00 | 0.00 | 115.00 | 106.53 | 106.36 | N/A | 0.0005 | 106.58 | 106.42 |
| | M8B | M7B | 36 | 7.16 | 17.76 | 21. | 19.80 | 19.8 | 0.015 | 388.00 | 6.47 | 112.50 | 106.28 | 105.82 | 6.22 | 0.0012 | 106.41 | 105.96 |
| | | | N/A | | | | 0.00 | | 0.015 | 388.00 | 0.00 | 112.50 | 106.28 | 105.82 | N/A | 0.0012 | 106.41 | 105.96 |
| | M7B | M3B | 36 | 6.45 | 24.21 | 22. | 26.22 | 26.22 | 0.015 | 445.00 | 7.42 | 110.00 | 105.72 | 104.80 | 4.28 | 0.0021 | 105.96 | 105.04 |
| | | | N/A | | | | 0.00 | | 0.015 | 445.00 | 0.00 | 110.00 | 105.72 | 104.80 | N/A | 0.0021 | 105.96 | 105.04 |
| | M6B | M5B | 36 | 10.29 | 10.29 | 20. | 11.41 | 11.41 | 0.015 | 417.00 | 6.95 | 109.40 | 105.58 | 105.42 | 3.82 | 0.0004 | 105.63 | 105.47 |
| | | | N/A | | | | 0.00 | | 0.015 | 417.00 | 0.00 | 109.40 | 105.58 | 105.42 | N/A | 0.0004 | 105.63 | 105.47 |
| | M5B | M4B | 36 | 7.41 | 17.7 | 21. | 13.75 | 17.72 | 0.015 | 450.00 | 7.50 | 104.00 | 105.40 | 105.14 | -1.40 | 0.0006 | 105.46 | 105.21 |
| | | | N/A | | | | 3.97 | | 0.015 | 450.00 | 7.50 | 104.00 | 105.46 | 105.32 | -1.46 | 0.0002 | 105.46 | 105.38 |
| | M4B | M3B | 48 | 9.37 | 27.07 | 21.78 | 25.07 | 25.07 | 0.015 | 420.00 | 7.00 | 105.00 | 105.13 | 104.97 | -0.13 | 0.0004 | 105.21 | 105.04 |
| | | | N/A | | | | 0.00 | | 0.015 | 420.00 | 0.00 | 105.00 | 105.13 | 104.97 | N/A | 0.0004 | 105.21 | 105.04 |
| | M3B | M2B | 54 | 2.29 | 53.87 | 22.78 | 51.83 | 51.83 | 0.015 | 330.00 | 5.50 | 108.30 | 104.84 | 104.58 | 3.46 | 0.0008 | 105.04 | 104.77 |
| | | | N/A | | | | 0.00 | | 0.015 | 330.00 | 0.00 | 108.30 | 104.84 | 104.58 | N/A | 0.0008 | 105.04 | 104.77 |
| | M2B | M1B | 54 | 0.01 | 53.88 | 23.78 | 49.52 | 49.52 | 0.015 | 114.00 | 3.11 | 107.00 | 104.60 | 104.50 | 2.40 | 0.0008 | 104.77 | 104.67 |
| | | | N/A | | | | 0.00 | | 0.015 | 114.00 | 0.00 | 107.00 | 104.60 | 104.50 | N/A | 0.0008 | 104.77 | 104.67 |
| | M2C | M1C | 18 | 3.67 | 3.67 | 15. | 4.52 | 4.52 | 0.015 | 384.00 | 6.40 | 108.50 | 106.13 | 103.82 | 2.37 | 0.0060 | 106.50 | 104.18 |
| | | | N/A | | | | 0.00 | | 0.015 | 384.00 | 0.00 | 108.50 | 106.13 | 103.82 | N/A | 0.0060 | 106.50 | 104.18 |
| | M4D | M2D | 24 | 7.25 | 7.25 | 15. | 9.04 | 9.04 | 0.015 | 384.00 | 6.40 | 110.00 | 108.00 | 107.18 | 2.00 | 0.0021 | 108.14 | 107.32 |
| | | | N/A | | | | 0.00 | | 0.015 | 384.00 | 0.00 | 110.00 | 108.00 | 107.18 | N/A | 0.0021 | 108.14 | 107.32 |
| | M3D | M2D | 30 | 4.52 | 4.52 | 15. | 5.65 | 5.65 | 0.015 | 222.00 | 3.70 | 111.00 | 106.32 | 106.19 | 4.68 | 0.0006 | 106.39 | 106.25 |
| | | | N/A | | | | 0.00 | | 0.015 | 222.00 | 0.00 | 111.00 | 106.32 | 106.19 | N/A | 0.0006 | 106.39 | 106.25 |
| | M2D | M1D | 36 | 0.3 | 12.07 | 16. | 14.49 | 14.49 | 0.015 | 192.00 | 3.20 | 108.00 | 106.08 | 105.82 | 1.92 | 0.0013 | 106.24 | 106.00 |
| | | | N/A | | | | 0.00 | | 0.015 | 192.00 | 0.00 | 108.00 | 106.08 | 105.82 | N/A | 0.0013 | 106.24 | 106.00 |
| | M6E | M2E | 36 | 49.9 | 49.9 | 15. | 62.00 | 62. | 0.015 | 384.00 | 8.77 | 118.00 | 111.63 | 107.22 | 6.37 | 0.0115 | 112.96 | 108.54 |
| | | | N/A | | | | 0.00 | | 0.015 | 384.00 | 0.00 | 118.00 | 111.63 | 107.22 | N/A | 0.0115 | 112.96 | 108.54 |
| | M4E | M3E | 24 | 3.05 | 3.05 | 15. | 3.81 | 3.81 | 0.015 | 222.00 | 3.70 | 114.00 | 108.63 | 108.54 | 5.37 | 0.0004 | 108.65 | 108.57 |
| | | | N/A | | | | 0.00 | | 0.015 | 222.00 | 0.00 | 114.00 | 108.63 | 108.54 | N/A | 0.0004 | 108.65 | 108.57 |
| | M3E | M2E | 36 | 2.55 | 5.6 | 16. | 6.74 | 6.74 | 0.015 | 192.00 | 3.20 | 111.00 | 108.55 | 108.53 | 2.45 | 0.0001 | 108.57 | 108.54 |
| | | | N/A | | | | 0.00 | | 0.015 | 192.00 | 0.00 | 111.00 | 108.55 | 108.53 | N/A | 0.0001 | 108.57 | 108.54 |
| | M5E | M2E | 24 | 2.68 | 2.68 | 15. | 3.43 | 3.43 | 0.015 | 280.00 | 4.67 | 111.90 | 108.61 | 108.52 | 3.29 | 0.0003 | 108.63 | 108.54 |
| | | | N/A | | | | 0.00 | | 0.015 | 280.00 | 0.00 | 111.90 | 108.61 | 108.52 | N/A | 0.0003 | 108.63 | 108.54 |
| | M2E | M1E | 42 | 0.3 | 58.48 | 15.73 | 70.76 | 70.76 | 0.015 | 112.00 | 7.35 | 108.00 | 107.61 | 106.87 | 0.39 | 0.0066 | 108.54 | 107.80 |
| | | | N/A | | | | 0.00 | | 0.015 | 112.00 | 0.00 | 108.00 | 107.61 | 106.87 | N/A | 0.0066 | 108.54 | 107.80 |
| | M7F | M6F | 36 | 2.87 | 2.87 | 20. | 3.17 | 3.17 | 0.015 | 625.00 | 10.42 | 121.00 | 116.32 | 116.28 | 4.68 | 0.0001 | 116.32 | 116.28 |
| | | | N/A | | | | 0.00 | | 0.015 | 625.00 | 0.00 | 121.00 | 116.32 | 116.28 | N/A | 0.0001 | 116.32 | 116.28 |
| | M6F | M4F | 36 | 6.48 | 9.35 | 21. | 10.65 | 10.65 | 0.015 | 436.00 | 7.27 | 120.20 | 116.24 | 116.09 | 3.96 | 0.0003 | 116.28 | 116.13 |
| | | | N/A | | | | 0.00 | | 0.015 | 436.00 | 0.00 | 120.20 | 116.24 | 116.09 | N/A | 0.0003 | 116.28 | 116.13 |
| | M5F | M4F | 42 | 10.79 | 10.79 | 20. | 11.09 | 11.09 | 0.015 | 297.00 | 4.95 | 119.50 | 116.15 | 116.11 | 3.35 | 0.0002 | 116.18 | 116.13 |
| | | | N/A | | | | 0.00 | | 0.015 | 297.00 | 0.00 | 119.50 | 116.15 | 116.11 | N/A | 0.0002 | 116.18 | 116.13 |
| | M4F | M3F | 42 | 6.98 | 27.12 | 21. | 27.75 | 27.75 | 0.015 | 500.00 | 8.33 | 119.00 | 115.99 | 115.48 | 3.01 | 0.0010 | 116.13 | 115.62 |
| | | | N/A | | | | 0.00 | | 0.015 | 500.00 | 0.00 | 119.00 | 115.99 | 115.48 | N/A | 0.0010 | 116.13 | 115.62 |
| | M3F | M2F | 48 | 11.48 | 38.6 | 22. | 37.08 | 37.08 | 0.015 | 495.00 | 8.25 | 117.00 | 115.47 | 115.03 | 1.53 | 0.0009 | 115.62 | 115.18 |
| | | | N/A | | | | 0.00 | | 0.015 | 495.00 | 0.00 | 117.00 | 115.47 | 115.03 | N/A | 0.0009 | 115.62 | 115.18 |
| | M8F | M2F | 36 | 2.56 | 2.56 | 20. | 2.73 | 2.73 | 0.015 | 242.00 | 4.03 | 115.50 | 114.58 | 114.57 | 0.92 | 0.0001 | 114.59 | 114.57 |

| | Up Node Name | Down Node Name | Convey Size (in or ft) | Trib. Area at Up Node (acre) | Cumul. Area (acre) | Total Computed Response Time at Up Node (min.) | Compute d Flow at Convey (cfs) | Total Flow at Convey (cfs) | Convey 'n' Value | Total Length (feet) | Average Velocity (fps) | Rim/Grate at Up Node (feet) | Up HGL (feet) | Down HGL (feet) | Up (RIM-HGL) (feet) | Energy Slope (ft/ft) | Up EGL (feet) | Down EGL (feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | N/A | | | | 0.00 | | 0.015 | 242.00 | 0.00 | 115.50 | 114.58 | 114.57 | N/A | 0.0001 | 114.59 | 114.57 |
| | M2F | M1F | 48 | 10.69 | 51.85 | 23. | 47.41 | 47.41 | 0.015 | 82.00 | 10.41 | 115.00 | 113.66 | 111.51 | 1.34 | 0.0121 | 114.57 | 113.57 |
| | | | N/A | | | | 0.00 | | 0.015 | 82.00 | 0.00 | 115.00 | 113.66 | 111.51 | N/A | 0.0121 | 114.57 | 113.57 |
| | M2G | M1G | 36 | 8.02 | 8.02 | 15. | 0.33 | 8.78 | 0.015 | 92.00 | 1.53 | 114.00 | 114.45 | 114.18 | -0.45 | 0.0025 | 114.48 | 114.25 |
| | | | N/A | | | | 8.45 | | 0.015 | 92.00 | 3.66 | 114.00 | 114.40 | 113.63 | -0.40 | 0.0091 | 114.48 | 113.64 |
| | M2H | M1H | 24 | 4.99 | 4.99 | 15. | 4.15 | 6.84 | 0.015 | 80.00 | 3.61 | 112.00 | 112.05 | 111.72 | -0.05 | 0.0041 | 112.34 | 112.01 |
| | | | N/A | | | | 2.69 | | 0.015 | 80.00 | 2.62 | 112.00 | 112.28 | 111.51 | -0.28 | 0.0103 | 112.34 | 111.51 |
| | MM2 | MM1 | 18 | 4.22 | 4.22 | 13.5 | 4.97 | 4.97 | 0.015 | 120.00 | 2.81 | 90.00 | 86.02 | 85.67 | 3.98 | 0.0030 | 86.16 | 85.80 |
| | | | N/A | | | | 0.00 | | 0.015 | 120.00 | 0.00 | 90.00 | 86.02 | 85.67 | N/A | 0.0030 | 86.16 | 85.80 |
| | N6A | N5A | 18 | 3.64 | 3.64 | 15. | 4.77 | 4.77 | 0.015 | 433.00 | 7.22 | 104.00 | 97.98 | 96.79 | 6.02 | 0.0027 | 98.10 | 96.91 |
| | | | N/A | | | | 0.00 | | 0.015 | 433.00 | 0.00 | 104.00 | 97.98 | 96.79 | N/A | 0.0027 | 98.10 | 96.91 |
| | N5A | N4A | 36 | 13.64 | 17.28 | 16. | 22.24 | 22.24 | 0.015 | 471.00 | 7.85 | 102.00 | 96.74 | 96.04 | 5.26 | 0.0015 | 96.91 | 96.21 |
| | | | N/A | | | | 0.00 | | 0.015 | 471.00 | 0.00 | 102.00 | 96.74 | 96.04 | N/A | 0.0015 | 96.91 | 96.21 |
| | N4A | N3A | 42 | 6.84 | 29.32 | 17. | 37.62 | 37.62 | 0.015 | 600.00 | 10.00 | 100.20 | 95.95 | 94.83 | 4.25 | 0.0019 | 96.21 | 95.10 |
| | | | N/A | | | | 0.00 | | 0.015 | 600.00 | 0.00 | 100.20 | 95.95 | 94.83 | N/A | 0.0019 | 96.21 | 95.10 |
| | N3A | N2A | 48 | 5.98 | 35.3 | 18. | 43.36 | 43.36 | 0.015 | 269.00 | 4.48 | 98.00 | 94.89 | 94.56 | 3.11 | 0.0012 | 95.09 | 94.77 |
| | | | N/A | | | | 0.00 | | 0.015 | 269.00 | 0.00 | 98.00 | 94.89 | 94.56 | N/A | 0.0012 | 95.09 | 94.77 |
| | N7A | N4A | 24 | 5.2 | 5.2 | 15. | 7.53 | 7.53 | 0.015 | 638.00 | 10.63 | 106.00 | 97.06 | 96.11 | 8.94 | 0.0015 | 97.15 | 96.21 |
| | | | N/A | | | | 0.00 | | 0.015 | 638.00 | 0.00 | 106.00 | 97.06 | 96.11 | N/A | 0.0015 | 97.15 | 96.21 |
| | N2A | N1A | 48 | 1.42 | 36.72 | 19. | 43.74 | 43.74 | 0.015 | 111.00 | 3.48 | 98.00 | 94.14 | 94.00 | 3.86 | 0.0012 | 94.35 | 94.21 |
| | | | N/A | | | | 0.00 | | 0.015 | 111.00 | 0.00 | 98.00 | 94.14 | 94.00 | N/A | 0.0012 | 94.35 | 94.21 |
| | N3B | N2B | 18 | 2.94 | 2.94 | 15. | 4.08 | 4.08 | 0.015 | 266.00 | 4.43 | 108.00 | 101.37 | 100.41 | 6.63 | 0.0029 | 101.52 | 100.74 |
| | | | N/A | | | | 0.00 | | 0.015 | 266.00 | 0.00 | 108.00 | 101.37 | 100.41 | N/A | 0.0029 | 101.52 | 100.74 |
| | N2B | N1B | 24 | 1.9 | 4.84 | 16. | 6.23 | 6.23 | 0.015 | 82.00 | 3.25 | 106.70 | 100.34 | 99.88 | 6.36 | 0.0031 | 100.51 | 100.26 |
| | | | N/A | | | | 0.00 | | 0.015 | 82.00 | 0.00 | 106.70 | 100.34 | 99.88 | N/A | 0.0031 | 100.51 | 100.26 |
| | N8C | N2C | 24 | 5.76 | 5.76 | 13.5 | 7.63 | 7.63 | 0.015 | 266.00 | 4.43 | 108.00 | 101.94 | 101.11 | 6.06 | 0.0024 | 102.10 | 101.46 |
| | | | N/A | | | | 0.00 | | 0.015 | 266.00 | 0.00 | 108.00 | 101.94 | 101.11 | N/A | 0.0024 | 102.10 | 101.46 |
| | N7C | N6C | 18 | 0.1 | 0.1 | 13.5 | 0.16 | 0.16 | 0.015 | 196.00 | 3.27 | 102.00 | 101.61 | 101.34 | 0.39 | 0.0014 | 101.62 | 101.35 |
| | | | N/A | | | | 0.00 | | 0.015 | 196.00 | 0.00 | 102.00 | 101.61 | 101.34 | N/A | 0.0014 | 101.62 | 101.35 |
| | N5C | N6C | 24 | 2.61 | 2.61 | 13.5 | 3.38 | 3.38 | 0.015 | 105.00 | 2.52 | 112.00 | 101.63 | 101.32 | 10.37 | 0.0021 | 101.73 | 101.50 |
| | | | N/A | | | | 0.00 | | 0.015 | 105.00 | 0.00 | 112.00 | 101.63 | 101.32 | N/A | 0.0021 | 101.73 | 101.50 |
| | N6C | N4C | 30 | 0.1 | 2.81 | 14.2 | 3.58 | 3.58 | 0.015 | 192.00 | 3.20 | 109.00 | 101.31 | 101.24 | 7.69 | 0.0004 | 101.35 | 101.27 |
| | | | N/A | | | | 0.00 | | 0.015 | 192.00 | 0.00 | 109.00 | 101.31 | 101.24 | N/A | 0.0004 | 101.35 | 101.27 |
| | N4C | N3C | 30 | 1.84 | 4.65 | 15.2 | 5.67 | 5.67 | 0.015 | 197.00 | 3.28 | 110.00 | 101.17 | 100.88 | 8.83 | 0.0013 | 101.27 | 101.01 |
| | | | N/A | | | | 0.00 | | 0.015 | 197.00 | 0.00 | 110.00 | 101.17 | 100.88 | N/A | 0.0013 | 101.27 | 101.01 |
| | N3C | N3C1 | 30 | 0.21 | 4.86 | 16.2 | 5.76 | 5.76 | 0.015 | 150.00 | 2.97 | 109.00 | 100.87 | 100.34 | 8.13 | 0.0023 | 101.01 | 100.66 |
| | | | N/A | | | | 0.00 | | 0.015 | 150.00 | 0.00 | 109.00 | 100.87 | 100.34 | N/A | 0.0023 | 101.01 | 100.66 |
| | N2C | N1C | 36 | 1.96 | 7.72 | 14.5 | 9.78 | 9.78 | 0.015 | 79.00 | 3.30 | 108.00 | 100.41 | 99.99 | 7.59 | 0.0024 | 100.58 | 100.39 |
| | | | N/A | | | | 0.00 | | 0.015 | 79.00 | 0.00 | 108.00 | 100.41 | 99.99 | N/A | 0.0024 | 100.58 | 100.39 |
| | N2D | N1D | 24 | 1.89 | 1.89 | 15. | 2.34 | 2.34 | 0.015 | 109.00 | 2.28 | 105.00 | 101.91 | 101.53 | 3.09 | 0.0023 | 101.99 | 101.74 |
| | | | N/A | | | | 0.00 | | 0.015 | 109.00 | 0.00 | 105.00 | 101.91 | 101.53 | N/A | 0.0023 | 101.99 | 101.74 |
| | N5E | N4E | 30 | 10.46 | 10.46 | 15. | 13.00 | 13. | 0.015 | 461.00 | 7.68 | 107.00 | 101.85 | 101.24 | 5.15 | 0.0013 | 101.97 | 101.36 |
| | | | N/A | | | | 0.00 | | 0.015 | 461.00 | 0.00 | 107.00 | 101.85 | 101.24 | N/A | 0.0013 | 101.97 | 101.36 |
| | N4E | N3E | 30 | 7.06 | 17.52 | 16. | 20.94 | 20.94 | 0.015 | 285.00 | 4.75 | 109.00 | 101.04 | 100.05 | 7.96 | 0.0035 | 101.36 | 100.37 |
| | | | N/A | | | | 0.00 | | 0.015 | 285.00 | 0.00 | 109.00 | 101.04 | 100.05 | N/A | 0.0035 | 101.36 | 100.37 |
| | N3E | N2E | 30 | 0.3 | 17.82 | 17. | 20.60 | 20.6 | 0.015 | 154.00 | 4.20 | 110.00 | 100.06 | 99.55 | 9.94 | 0.0034 | 100.37 | 99.85 |
| | | | N/A | | | | 0.00 | | 0.015 | 154.00 | 0.00 | 110.00 | 100.06 | 99.55 | N/A | 0.0034 | 100.37 | 99.85 |
| | N2E | N1E | 36 | 0.01 | 17.83 | 17.61 | 20.17 | 20.17 | 0.015 | 119.00 | 2.85 | 109.00 | 99.71 | 99.56 | 9.29 | 0.0012 | 99.85 | 99.70 |
| | | | N/A | | | | 0.00 | | 0.015 | 119.00 | 0.00 | 109.00 | 99.71 | 99.56 | N/A | 0.0012 | 99.85 | 99.70 |
| | N2F | N1F | 30 | 5.5 | 5.5 | 15. | 6.83 | 6.83 | 0.015 | 105.00 | 3.09 | 109.00 | 95.33 | 94.87 | 13.67 | 0.0024 | 95.48 | 95.22 |
| | | | N/A | | | | 0.00 | | 0.015 | 105.00 | 0.00 | 109.00 | 95.33 | 94.87 | N/A | 0.0024 | 95.48 | 95.22 |
| | N2G | N1G | 30 | 4.5 | 4.5 | 15. | 5.59 | 5.59 | 0.015 | 83.00 | 2.90 | 101.00 | 97.17 | 96.79 | 3.83 | 0.0025 | 97.30 | 97.10 |
| | | | N/A | | | | 0.00 | | 0.015 | 83.00 | 0.00 | 101.00 | 97.17 | 96.79 | N/A | 0.0025 | 97.30 | 97.10 |
| | N2H | N1H | 36 | 7.3 | 7.3 | 15. | 9.07 | 9.07 | 0.015 | 108.00 | 3.26 | 105.00 | 101.41 | 101.02 | 3.59 | 0.0021 | 101.57 | 101.34 |
| | | | N/A | | | | 0.00 | | 0.015 | 108.00 | 0.00 | 105.00 | 101.41 | 101.02 | N/A | 0.0021 | 101.57 | 101.34 |
| | N2I | N1I | 18 | 2.1 | 2.1 | 15. | 2.61 | 2.61 | 0.015 | 90.00 | 2.68 | 110.00 | 103.03 | 102.61 | 6.97 | 0.0031 | 103.15 | 102.87 |
| | | | N/A | | | | 0.00 | | 0.015 | 90.00 | 0.00 | 110.00 | 103.03 | 102.61 | N/A | 0.0031 | 103.15 | 102.87 |
| | N2J | N1J | 18 | 2.8 | 2.8 | 15. | 3.48 | 3.48 | 0.015 | 77.00 | 1.97 | 104.00 | 99.75 | 99.64 | 4.25 | 0.0015 | 99.81 | 99.70 |
| | | | N/A | | | | 0.00 | | 0.015 | 77.00 | 0.00 | 104.00 | 99.75 | 99.64 | N/A | 0.0015 | 99.81 | 99.70 |
| | N2k | N1k | 60 | 62.79 | 62.79 | 15. | 78.02 | 78.02 | 0.015 | 120.00 | 3.97 | 105.00 | 99.57 | 99.43 | 5.43 | 0.0012 | 99.85 | 99.70 |
| | | | N/A | | | | 0.00 | | 0.015 | 120.00 | 0.00 | 105.00 | 99.57 | 99.43 | N/A | 0.0012 | 99.85 | 99.70 |
| | NN7 | NN6 | 18 | 0.1 | 0.1 | 13.5 | 0.15 | 0.15 | 0.015 | 518.00 | 8.63 | 97.00 | 88.28 | 87.24 | 8.72 | 0.0021 | 88.34 | 87.24 |

| | Up Node Name | Down Node Name | Convey Size (in or ft) | Trib. Area at Up Node (acre) | Cumul. Area (acre) | Total Computed Response Time at Up Node (min.) | Compute d Flow at Convey (cfs) | Total Flow at Convey (cfs) | Convey 'n' Value | Total Length (feet) | Average Velocity (fps) | Rim/Grate at Up Node (feet) | Up HGL (feet) | Down HGL (feet) | Up (RIM-HGL) (feet) | Energy Slope (ft/ft) | Up EGL (feet) | Down EGL (feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | N/A | | | | 0.00 | | 0.015 | 518.00 | 0.00 | 97.00 | 88.28 | 87.24 | N/A | 0.0021 | 88.34 | 87.24 |
| | NN6 | NN5 | 18 | 0.1 | 0.2 | 14.5 | 0.30 | 0.3 | 0.015 | 462.00 | 7.70 | 96.00 | 87.22 | 86.91 | 8.78 | 0.0007 | 87.24 | 86.91 |
| | | | N/A | | | | 0.00 | | 0.015 | 462.00 | 0.00 | 96.00 | 87.22 | 86.91 | N/A | 0.0007 | 87.24 | 86.91 |
| | NN5 | NN4 | 18 | 0.1 | 0.3 | 15.5 | 0.43 | 0.43 | 0.015 | 402.00 | 6.70 | 94.00 | 86.91 | 86.90 | 7.09 | 0.0000 | 86.91 | 86.90 |
| | | | N/A | | | | 0.00 | | 0.015 | 402.00 | 0.00 | 94.00 | 86.91 | 86.90 | N/A | 0.0000 | 86.91 | 86.90 |
| | NN4 | NN3 | 18 | 0.01 | 0.31 | 16.5 | 0.43 | 0.43 | 0.015 | 438.00 | 7.30 | 93.00 | 86.90 | 86.89 | 6.10 | 0.0000 | 86.90 | 86.89 |
| | | | N/A | | | | 0.00 | | 0.015 | 438.00 | 0.00 | 93.00 | 86.90 | 86.89 | N/A | 0.0000 | 86.90 | 86.89 |
| | NN3 | NN2 | 24 | 5.71 | 6.02 | 17.5 | 8.17 | 8.17 | 0.015 | 400.00 | 6.67 | 91.50 | 86.78 | 86.08 | 4.72 | 0.0017 | 86.89 | 86.20 |
| | | | N/A | | | | 0.00 | | 0.015 | 400.00 | 0.00 | 91.50 | 86.78 | 86.08 | N/A | 0.0017 | 86.89 | 86.20 |
| | NN2 | NN1 | 24 | 0.1 | 6.12 | 18.5 | 8.08 | 8.08 | 0.015 | 47.00 | 2.57 | 90.00 | 86.08 | 86.00 | 3.92 | 0.0017 | 86.20 | 86.12 |
| | | | N/A | | | | 0.00 | | 0.015 | 47.00 | 0.00 | 90.00 | 86.08 | 86.00 | N/A | 0.0017 | 86.20 | 86.12 |
| | OO2 | OO1 | 30 | 6.91 | 6.91 | 13.5 | 9.14 | 9.14 | 0.015 | 105.00 | 1.86 | 90.00 | 85.81 | 85.74 | 4.19 | 0.0007 | 85.87 | 85.80 |
| | | | N/A | | | | 0.00 | | 0.015 | 105.00 | 0.00 | 90.00 | 85.81 | 85.74 | N/A | 0.0007 | 85.87 | 85.80 |
| | P5 | P4 | 36 | 10.66 | 10.66 | 13.5 | 14.61 | 14.61 | 0.015 | 270.00 | 4.50 | 100.50 | 94.60 | 94.43 | 5.90 | 0.0006 | 94.68 | 94.51 |
| | | | N/A | | | | 0.00 | | 0.015 | 270.00 | 0.00 | 100.50 | 94.60 | 94.43 | N/A | 0.0006 | 94.68 | 94.51 |
| | P4 | P3 | 36 | 8.47 | 19.13 | 14.5 | 25.70 | 25.7 | 0.015 | 298.00 | 4.97 | 99.00 | 94.28 | 93.69 | 4.72 | 0.0020 | 94.50 | 93.91 |
| | | | N/A | | | | 0.00 | | 0.015 | 298.00 | 0.00 | 99.00 | 94.28 | 93.69 | N/A | 0.0020 | 94.50 | 93.91 |
| | P3 | P2 | 42 | 8.29 | 27.42 | 15.5 | 35.91 | 35.91 | 0.015 | 346.00 | 5.77 | 97.60 | 93.67 | 93.09 | 3.93 | 0.0017 | 93.91 | 93.33 |
| | | | N/A | | | | 0.00 | | 0.015 | 346.00 | 0.00 | 97.60 | 93.67 | 93.09 | N/A | 0.0017 | 93.91 | 93.33 |
| | P2 | P1 | 48 | 9.54 | 36.96 | 16.5 | 47.02 | 47.02 | 0.015 | 57.00 | 3.74 | 95.00 | 93.08 | 93.00 | 1.92 | 0.0014 | 93.32 | 93.24 |
| | | | N/A | | | | 0.00 | | 0.015 | 57.00 | 0.00 | 95.00 | 93.08 | 93.00 | N/A | 0.0014 | 93.32 | 93.24 |
| | PP3 | PP2 | 48 | 19.55 | 19.55 | 15. | 28.64 | 28.64 | 0.015 | 259.00 | 4.32 | 89.00 | 86.18 | 86.04 | 2.82 | 0.0005 | 86.27 | 86.13 |
| | | | N/A | | | | 0.00 | | 0.015 | 259.00 | 0.00 | 89.00 | 86.18 | 86.04 | N/A | 0.0005 | 86.27 | 86.13 |
| | PP2 | PP1 | 48 | 0.3 | 19.85 | 16. | 28.14 | 28.14 | 0.015 | 85.00 | 2.24 | 88.00 | 86.05 | 86.00 | 1.95 | 0.0005 | 86.13 | 86.09 |
| | | | N/A | | | | 0.00 | | 0.015 | 85.00 | 0.00 | 88.00 | 86.05 | 86.00 | N/A | 0.0005 | 86.13 | 86.09 |
| | Q7 | Q6 | 36 | 8.95 | 8.95 | 13.5 | 11.93 | 11.93 | 0.015 | 418.00 | 6.97 | 106.00 | 94.81 | 94.63 | 11.19 | 0.0004 | 94.86 | 94.68 |
| | | | N/A | | | | 0.00 | | 0.015 | 418.00 | 0.00 | 106.00 | 94.81 | 94.63 | N/A | 0.0004 | 94.86 | 94.68 |
| | Q6 | Q4 | 36 | 9.69 | 18.64 | 14.5 | 23.87 | 23.87 | 0.015 | 612.00 | 10.20 | 103.50 | 94.48 | 93.44 | 9.02 | 0.0017 | 94.68 | 93.63 |
| | | | N/A | | | | 0.00 | | 0.015 | 612.00 | 0.00 | 103.50 | 94.48 | 93.44 | N/A | 0.0017 | 94.68 | 93.63 |
| | Q5 | Q4 | 36 | 8.34 | 8.34 | 13.5 | 10.50 | 10.5 | 0.015 | 604.00 | 10.07 | 105.00 | 93.80 | 93.60 | 11.20 | 0.0003 | 93.83 | 93.63 |
| | | | N/A | | | | 0.00 | | 0.015 | 604.00 | 0.00 | 105.00 | 93.80 | 93.60 | N/A | 0.0003 | 93.83 | 93.63 |
| | Q4 | Q3 | 42 | 7.04 | 34.02 | 15.5 | 41.41 | 41.41 | 0.015 | 425.00 | 7.08 | 100.30 | 93.31 | 92.36 | 6.99 | 0.0023 | 93.63 | 92.67 |
| | | | N/A | | | | 0.00 | | 0.015 | 425.00 | 0.00 | 100.30 | 93.31 | 92.36 | N/A | 0.0023 | 93.63 | 92.67 |
| | Q3 | Q2 | 48 | 14.93 | 48.95 | 16.5 | 57.27 | 57.27 | 0.015 | 380.00 | 6.33 | 96.20 | 92.32 | 91.51 | 3.88 | 0.0021 | 92.67 | 91.87 |
| | | | N/A | | | | 0.00 | | 0.015 | 380.00 | 0.00 | 96.20 | 92.32 | 91.51 | N/A | 0.0021 | 92.67 | 91.87 |
| | Q2 | Q1 | 54 | 3.1 | 52.05 | 17.5 | 58.88 | 58.88 | 0.015 | 108.00 | 3.70 | 92.00 | 91.63 | 91.50 | 0.37 | 0.0012 | 91.87 | 91.74 |
| | | | N/A | | | | 0.00 | | 0.015 | 108.00 | 0.00 | 92.00 | 91.63 | 91.50 | N/A | 0.0012 | 91.87 | 91.74 |
| | QQ3 | QQ2 | 42 | 0.3 | 0.3 | 15. | 0.35 | 0.35 | 0.015 | 450.00 | 7.50 | 88.00 | 86.02 | 86.02 | 1.98 | 0.0000 | 86.02 | 86.02 |
| | | | N/A | | | | 0.00 | | 0.015 | 450.00 | 0.00 | 88.00 | 86.02 | 86.02 | N/A | 0.0000 | 86.02 | 86.02 |
| | QQ2 | QQ1 | 42 | 33.85 | 34.15 | 16. | 36.37 | 36.37 | 0.015 | 156.00 | 3.78 | 88.00 | 85.77 | 85.50 | 2.23 | 0.0017 | 86.02 | 85.75 |
| | | | N/A | | | | 0.00 | | 0.015 | 156.00 | 0.00 | 88.00 | 85.77 | 85.50 | N/A | 0.0017 | 86.02 | 85.75 |
| | R2 | R1 | 42 | 14.36 | 14.36 | 13.5 | 18.66 | 18.66 | 0.015 | 129.00 | 3.93 | 94.00 | 89.92 | 89.32 | 4.08 | 0.0023 | 90.16 | 89.87 |
| | | | N/A | | | | 0.00 | | 0.015 | 129.00 | 0.00 | 94.00 | 89.92 | 89.32 | N/A | 0.0023 | 90.16 | 89.87 |
| | S5 | S3 | 30 | 13.04 | 13.04 | 15. | 17.73 | 17.73 | 0.015 | 708.00 | 11.80 | 103.00 | 93.30 | 91.54 | 9.70 | 0.0025 | 93.52 | 91.76 |
| | | | N/A | | | | 0.00 | | 0.015 | 708.00 | 0.00 | 103.00 | 93.30 | 91.54 | N/A | 0.0025 | 93.52 | 91.76 |
| | S4 | S3 | 36 | 13.33 | 13.33 | 13.5 | 19.38 | 19.38 | 0.015 | 441.00 | 7.35 | 99.00 | 92.13 | 91.63 | 6.87 | 0.0011 | 92.26 | 91.76 |
| | | | N/A | | | | 0.00 | | 0.015 | 441.00 | 0.00 | 99.00 | 92.13 | 91.63 | N/A | 0.0011 | 92.26 | 91.76 |
| | S3 | S2 | 42 | 8.55 | 34.92 | 14.5 | 48.75 | 48.75 | 0.015 | 724.00 | 12.07 | 96.00 | 91.32 | 89.05 | 4.68 | 0.0031 | 91.76 | 89.50 |
| | | | N/A | | | | 0.00 | | 0.015 | 724.00 | 0.00 | 96.00 | 91.32 | 89.05 | N/A | 0.0031 | 91.76 | 89.50 |
| | S2 | S1 | 48 | 6.61 | 41.53 | 15.5 | 55.94 | 55.94 | 0.015 | 75.00 | 4.45 | 89.80 | 89.15 | 89.00 | 0.65 | 0.0020 | 89.49 | 89.34 |
| | | | N/A | | | | 0.00 | | 0.015 | 75.00 | 0.00 | 89.80 | 89.15 | 89.00 | N/A | 0.0020 | 89.49 | 89.34 |
| | SS2 | SS1 | 30 | 7.63 | 7.63 | 13.5 | 8.96 | 8.96 | 0.015 | 160.00 | 2.67 | 85.00 | 81.75 | 81.64 | 3.25 | 0.0006 | 81.80 | 81.70 |
| | | | N/A | | | | 0.00 | | 0.015 | 160.00 | 0.00 | 85.00 | 81.75 | 81.64 | N/A | 0.0006 | 81.80 | 81.70 |
| | U8 | U7 | 30 | 8.26 | 8.26 | 15. | 12.12 | 12.12 | 0.015 | 350.00 | 7.04 | 131.00 | 123.94 | 120.28 | 7.06 | 0.0098 | 124.44 | 121.02 |
| | | | N/A | | | | 0.00 | | 0.015 | 350.00 | 0.00 | 131.00 | 123.94 | 120.28 | N/A | 0.0098 | 124.44 | 121.02 |
| | U7 | U6 | 30 | 7.46 | 15.72 | 15.83 | 22.44 | 22.44 | 0.015 | 430.00 | 7.17 | 128.00 | 120.60 | 118.38 | 7.40 | 0.0050 | 121.18 | 119.02 |
| | | | N/A | | | | 0.00 | | 0.015 | 430.00 | 0.00 | 128.00 | 120.60 | 118.38 | N/A | 0.0050 | 121.18 | 119.02 |
| | U6 | U5 | 36 | 6.88 | 22.6 | 16.83 | 29.27 | 29.27 | 0.015 | 450.00 | 7.50 | 124.00 | 118.37 | 116.83 | 5.63 | 0.0032 | 118.83 | 117.38 |
| | | | N/A | | | | 0.00 | | 0.015 | 450.00 | 0.00 | 124.00 | 118.37 | 116.83 | N/A | 0.0032 | 118.83 | 117.38 |
| | U5 | U4 | 48 | 6.8 | 29.4 | 17.83 | 35.97 | 35.97 | 0.015 | 500.00 | 8.33 | 123.00 | 117.14 | 116.83 | 5.86 | 0.0008 | 117.38 | 116.97 |
| | | | N/A | | | | 0.00 | | 0.015 | 500.00 | 0.00 | 123.00 | 117.14 | 116.83 | N/A | 0.0008 | 117.38 | 116.97 |
| | U4 | U3 | 48 | 7.1 | 36.5 | 22. | 37.91 | 37.91 | 0.015 | 475.00 | 7.92 | 120.00 | 116.81 | 116.37 | 3.19 | 0.0009 | 116.97 | 116.53 |

| | Up Node Name | Down Node Name | Convey Size (in or ft) | Trib. Area at Up Node (acre) | Cumul. Area (acre) | Total Computed Response Time at Up Node (min.) | Compute d Flow at Convey (cfs) | Total Flow at Convey (cfs) | Convey 'n' Value | Total Length (feet) | Average Velocity (fps) | Rim/Grate at Up Node (feet) | Up HGL (feet) | Down HGL (feet) | Up (RIM-HGL) (feet) | Energy Slope (ft/ft) | Up EGL (feet) | Down EGL (feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | N/A | | | | 0.00 | | 0.015 | 475.00 | 0.00 | 120.00 | 116.81 | 116.37 | N/A | 0.0009 | 116.97 | 116.53 |
| | U3 | U2 | 48 | 7.69 | 44.19 | 23. | 43.22 | 43.22 | 0.015 | 160.00 | 3.44 | 118.00 | 116.32 | 116.13 | 1.68 | 0.0012 | 116.53 | 116.33 |
| | | | N/A | | | | 0.00 | | 0.015 | 160.00 | 0.00 | 118.00 | 116.32 | 116.13 | N/A | 0.0012 | 116.53 | 116.33 |
| | U2 | U1 | 48 | 0.3 | 44.49 | 23.78 | 42.02 | 42.02 | 0.015 | 130.00 | 3.48 | 117.70 | 116.13 | 116.00 | 1.57 | 0.0010 | 116.32 | 116.19 |
| | | | N/A | | | | 0.00 | | 0.015 | 130.00 | 0.00 | 117.70 | 116.13 | 116.00 | N/A | 0.0010 | 116.32 | 116.19 |
| | T2B | T1B | 18 | 3.29 | 3.29 | 13.5 | 4.35 | 4.35 | 0.015 | 91.00 | 3.19 | 88.00 | 84.33 | 83.80 | 3.67 | 0.0037 | 84.49 | 84.16 |
| | | | N/A | | | | 0.00 | | 0.015 | 91.00 | 0.00 | 88.00 | 84.33 | 83.80 | N/A | 0.0037 | 84.49 | 84.16 |
| | T2C | T1C | 30 | 7.05 | 7.05 | 13.5 | 9.26 | 9.26 | 0.015 | 100.00 | 3.31 | 89.00 | 83.54 | 83.30 | 5.46 | 0.0020 | 83.72 | 83.52 |
| | | | N/A | | | | 0.00 | | 0.015 | 100.00 | 0.00 | 89.00 | 83.54 | 83.30 | N/A | 0.0020 | 83.72 | 83.52 |
| | T5A | T4A | 36 | 15.39 | 15.39 | 16.5 | 19.73 | 19.73 | 0.015 | 401.00 | 6.68 | 93.00 | 85.36 | 84.89 | 7.64 | 0.0012 | 85.49 | 85.03 |
| | | | N/A | | | | 0.00 | | 0.015 | 401.00 | 0.00 | 93.00 | 85.36 | 84.89 | N/A | 0.0012 | 85.49 | 85.03 |
| | T4A | T3A | 36 | 7.45 | 22.84 | 17.5 | 27.62 | 27.62 | 0.015 | 419.00 | 6.98 | 91.00 | 84.76 | 83.81 | 6.24 | 0.0023 | 85.03 | 84.07 |
| | | | N/A | | | | 0.00 | | 0.015 | 419.00 | 0.00 | 91.00 | 84.76 | 83.81 | N/A | 0.0023 | 85.03 | 84.07 |
| | T3A | T2A | 42 | 10.02 | 32.86 | 18.5 | 37.72 | 37.72 | 0.015 | 354.00 | 5.90 | 88.50 | 83.80 | 83.14 | 4.70 | 0.0019 | 84.07 | 83.41 |
| | | | N/A | | | | 0.00 | | 0.015 | 354.00 | 0.00 | 88.50 | 83.80 | 83.14 | N/A | 0.0019 | 84.07 | 83.41 |
| | T2A | T1A | 48 | 4.71 | 37.57 | 19.5 | 41.52 | 41.52 | 0.015 | 123.00 | 3.30 | 86.00 | 83.14 | 83.00 | 2.86 | 0.0011 | 83.33 | 83.19 |
| | | | N/A | | | | 0.00 | | 0.015 | 123.00 | 0.00 | 86.00 | 83.14 | 83.00 | N/A | 0.0011 | 83.33 | 83.19 |
| | TT5 | TT4 | 30 | 0.7 | 0.7 | 15. | 1.04 | 1.04 | 0.015 | 465.00 | 7.75 | 83.00 | 83.41 | 83.05 | -0.41 | 0.0008 | 83.45 | 83.06 |
| | | | N/A | | | | 0.00 | | 0.015 | 465.00 | 0.00 | 83.00 | 83.41 | 83.05 | N/A | 0.0008 | 83.45 | 83.06 |
| | TT4 | TT2 | 48 | 6.1 | 16.09 | 16. | 19.81 | 19.81 | 0.015 | 506.00 | 8.43 | 84.00 | 82.90 | 81.84 | 1.10 | 0.0014 | 83.06 | 82.37 |
| | | | N/A | | | | 0.00 | | 0.015 | 506.00 | 0.00 | 84.00 | 82.90 | 81.84 | N/A | 0.0014 | 83.06 | 82.37 |
| | TT3 | TT4 | 48 | 9.29 | 9.29 | 15. | 11.66 | 11.66 | 0.015 | 243.00 | 4.05 | 85.00 | 83.07 | 83.04 | 1.93 | 0.0002 | 83.10 | 83.07 |
| | | | N/A | | | | 0.00 | | 0.015 | 243.00 | 0.00 | 85.00 | 83.07 | 83.04 | N/A | 0.0002 | 83.10 | 83.07 |
| | TT2 | TT1 | 48 | 0.1 | 16.19 | 17. | 19.25 | 19.25 | 0.015 | 63.00 | 3.38 | 85.00 | 81.90 | 81.80 | 3.10 | 0.0013 | 82.09 | 82.01 |
| | | | N/A | | | | 0.00 | | 0.015 | 63.00 | 0.00 | 85.00 | 81.90 | 81.80 | N/A | 0.0013 | 82.09 | 82.01 |
| | V3 | V2 | 12 | 0.3 | 0.3 | 13.5 | 0.47 | 0.47 | 0.015 | 423.00 | 7.05 | 120.00 | 114.35 | 114.25 | 5.65 | 0.0003 | 114.37 | 114.25 |
| | | | N/A | | | | 0.00 | | 0.015 | 423.00 | 0.00 | 120.00 | 114.35 | 114.25 | N/A | 0.0003 | 114.37 | 114.25 |
| | V2 | V1 | 12 | 0.3 | 0.6 | 14.5 | 0.91 | 0.91 | 0.015 | 55.00 | 1.16 | 119.00 | 114.23 | 114.18 | 4.77 | 0.0009 | 114.25 | 114.20 |
| | | | N/A | | | | 0.00 | | 0.015 | 55.00 | 0.00 | 119.00 | 114.23 | 114.18 | N/A | 0.0009 | 114.25 | 114.20 |
| | W2 | W1 | 54 | 0.01 | 62.84 | 19.16 | 67.79 | 67.79 | 0.015 | 75.00 | 4.26 | 114.00 | 111.62 | 111.50 | 2.38 | 0.0016 | 111.93 | 111.81 |
| | | | N/A | | | | 0.00 | | 0.015 | 75.00 | 0.00 | 114.00 | 111.62 | 111.50 | N/A | 0.0016 | 111.93 | 111.81 |
| | W3 | W2 | 54 | 7.5 | 62.83 | 18.51 | 69.23 | 69.23 | 0.015 | 170.00 | 4.35 | 114.50 | 111.89 | 111.61 | 2.61 | 0.0017 | 112.21 | 111.93 |
| | | | N/A | | | | 0.00 | | 0.015 | 170.00 | 0.00 | 114.50 | 111.89 | 111.61 | N/A | 0.0017 | 112.21 | 111.93 |
| | W4 | W3 | 48 | 13.2 | 55.33 | 18. | 62.07 | 62.07 | 0.015 | 150.00 | 4.94 | 114.60 | 112.17 | 111.80 | 2.43 | 0.0025 | 112.59 | 112.22 |
| | | | N/A | | | | 0.00 | | 0.015 | 150.00 | 0.00 | 114.60 | 112.17 | 111.80 | N/A | 0.0025 | 112.59 | 112.22 |
| | W5 | W4 | 42 | 14. | 42.13 | 17. | 49.06 | 49.06 | 0.015 | 425.00 | 7.08 | 115.50 | 113.49 | 112.14 | 2.01 | 0.0032 | 113.94 | 112.59 |
| | | | N/A | | | | 0.00 | | 0.015 | 425.00 | 0.00 | 115.50 | 113.49 | 112.14 | N/A | 0.0032 | 113.94 | 112.59 |
| | W6 | W5 | 36 | 11.12 | 28.13 | 16. | 34.15 | 34.15 | 0.015 | 340.00 | 5.67 | 117.30 | 114.72 | 113.54 | 2.58 | 0.0035 | 115.12 | 113.94 |
| | | | N/A | | | | 0.00 | | 0.015 | 340.00 | 0.00 | 117.30 | 114.72 | 113.54 | N/A | 0.0035 | 115.12 | 113.94 |
| | W7 | W6 | 30 | 12.69 | 12.69 | 15. | 16.31 | 16.31 | 0.015 | 340.00 | 5.67 | 119.50 | 115.65 | 114.94 | 3.85 | 0.0021 | 115.84 | 115.13 |
| | | | N/A | | | | 0.00 | | 0.015 | 340.00 | 0.00 | 119.50 | 115.65 | 114.94 | N/A | 0.0021 | 115.84 | 115.13 |
| | W8 | W6 | 24 | 4.32 | 4.32 | 15. | 5.37 | 5.37 | 0.015 | 680.00 | 11.33 | 119.00 | 115.59 | 115.08 | 3.41 | 0.0007 | 115.64 | 115.13 |
| | | | N/A | | | | 0.00 | | 0.015 | 680.00 | 0.00 | 119.00 | 115.59 | 115.08 | N/A | 0.0007 | 115.64 | 115.13 |
| | X13 | X2 | 48 | 21.23 | 21.23 | 15. | 29.09 | 29.09 | 0.015 | 337.00 | 5.62 | 113.50 | 111.92 | 111.73 | 1.58 | 0.0005 | 112.01 | 111.83 |
| | | | N/A | | | | 0.00 | | 0.015 | 337.00 | 0.00 | 113.50 | 111.92 | 111.73 | N/A | 0.0005 | 112.01 | 111.83 |
| | X3 | X2 | 42 | 15.5 | 30.82 | 19. | 40.07 | 40.07 | 0.015 | 315.00 | 5.25 | 115.50 | 112.19 | 111.53 | 3.31 | 0.0021 | 112.49 | 111.83 |
| | | | N/A | | | | 0.00 | | 0.015 | 315.00 | 0.00 | 115.50 | 112.19 | 111.53 | N/A | 0.0021 | 112.49 | 111.83 |
| | X4 | X3 | 36 | 5.1 | 15.32 | 18. | 20.47 | 20.47 | 0.015 | 242.00 | 4.03 | 116.50 | 112.65 | 112.35 | 3.85 | 0.0013 | 112.80 | 112.49 |
| | | | N/A | | | | 0.00 | | 0.015 | 242.00 | 0.00 | 116.50 | 112.65 | 112.35 | N/A | 0.0013 | 112.80 | 112.49 |
| | X5 | X4 | 36 | 0.01 | 10.22 | 17. | 14.06 | 14.06 | 0.015 | 272.00 | 4.53 | 117.30 | 112.89 | 112.73 | 4.41 | 0.0006 | 112.96 | 112.80 |
| | | | N/A | | | | 0.00 | | 0.015 | 272.00 | 0.00 | 117.30 | 112.89 | 112.73 | N/A | 0.0006 | 112.96 | 112.80 |
| | X6 | X5 | 36 | 5.4 | 10.21 | 16. | 14.49 | 14.49 | 0.015 | 307.00 | 5.12 | 120.00 | 113.08 | 112.89 | 6.92 | 0.0006 | 113.15 | 112.96 |
| | | | N/A | | | | 0.00 | | 0.015 | 307.00 | 0.00 | 120.00 | 113.08 | 112.89 | N/A | 0.0006 | 113.15 | 112.96 |
| | X7 | X6 | 30 | 4.81 | 4.81 | 15. | 7.06 | 7.06 | 0.015 | 400.00 | 6.67 | 122.00 | 113.27 | 113.12 | 8.73 | 0.0004 | 113.31 | 113.16 |
| | | | N/A | | | | 0.00 | | 0.015 | 400.00 | 0.00 | 122.00 | 113.27 | 113.12 | N/A | 0.0004 | 113.31 | 113.16 |
| | X12 | X11 | 24 | 0.3 | 0.3 | 15. | 0.44 | 0.44 | 0.015 | 354.00 | 5.90 | 122.50 | 112.08 | 112.04 | 10.43 | 0.0001 | 112.09 | 112.05 |
| | | | N/A | | | | 0.00 | | 0.015 | 354.00 | 0.00 | 122.50 | 112.08 | 112.04 | N/A | 0.0001 | 112.09 | 112.05 |
| | X11 | X10 | 30 | 0.3 | 0.6 | 16. | 0.85 | 0.85 | 0.015 | 918.00 | 15.30 | 121.50 | 112.04 | 112.09 | 9.46 | -0.0001 | 112.04 | 112.09 |
| | | | N/A | | | | 0.00 | | 0.015 | 918.00 | 0.00 | 121.50 | 112.04 | 112.09 | N/A | -0.0001 | 112.04 | 112.09 |
| | X10 | X9 | 30 | 0.3 | 0.9 | 17. | 1.24 | 1.24 | 0.015 | 260.00 | 4.33 | 121.00 | 112.09 | 112.09 | 8.91 | 0.0000 | 112.09 | 112.09 |
| | | | N/A | | | | 0.00 | | 0.015 | 260.00 | 0.00 | 121.00 | 112.09 | 112.09 | N/A | 0.0000 | 112.09 | 112.09 |
| | X9 | X8 | 36 | 7.5 | 8.4 | 18. | 11.23 | 11.23 | 0.015 | 260.00 | 4.33 | 119.00 | 112.05 | 111.95 | 6.95 | 0.0004 | 112.09 | 111.99 |

| | Up Node Name | Down Node Name | Convey Size (in or ft) | Trib. Area at Up Node (acre) | Cumul. Area (acre) | Total Computed Response Time at Up Node (min.) | Computed Flow at Convey (cfs) | Total Flow at Convey (cfs) | Convey 'n' Value | Total Length (feet) | Average Velocity (fps) | Rim/Grate at Up Node (feet) | Up HGL (feet) | Down HGL (feet) | Up (RIM-HGL) (feet) | Energy Slope (ft/ft) | Up EGL (feet) | Down EGL (feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | N/A | | | | 0.00 | | 0.015 | 260.00 | 0.00 | 119.00 | 112.05 | 111.95 | N/A | 0.0004 | 112.09 | 111.99 |
| | X8 | X2 | 42 | 7. | 15.4 | 19. | 20.02 | 20.02 | 0.015 | 310.00 | 5.17 | 116.00 | 111.91 | 111.75 | 4.09 | 0.0005 | 111.99 | 111.83 |
| | | | N/A | | | | 0.00 | | 0.015 | 310.00 | 0.00 | 116.00 | 111.91 | 111.75 | N/A | 0.0005 | 111.99 | 111.83 |
| | X2 | X1 | 60 | 0.3 | 67.75 | 20. | 84.88 | 84.88 | 0.015 | 354.00 | 5.90 | 114.50 | 111.50 | 111.00 | 3.00 | 0.0014 | 111.82 | 111.32 |
| | | | N/A | | | | 0.00 | | 0.015 | 354.00 | 0.00 | 114.50 | 111.50 | 111.00 | N/A | 0.0014 | 111.82 | 111.32 |
| | Z2 | Z1 | 48 | 20.19 | 20.19 | 13.5 | 31.15 | 31.15 | 0.015 | 73.00 | 3.04 | 111.00 | 107.09 | 107.04 | 3.91 | 0.0007 | 107.25 | 107.20 |
| | | | N/A | | | | 0.00 | | 0.015 | 73.00 | 0.00 | 111.00 | 107.09 | 107.04 | N/A | 0.0007 | 107.25 | 107.20 |

| Up Node Name | Down Node Name | Convey Size (in or ft) | Trib. Area at Up Node (acre) | Cumul. Area (acre) | Total Computed Response Time at Up Node (min.) | Computed Flow at Convey (cfs) | Total Flow at Convey (cfs) | Convey 'n' Value | Total Length (feet) | Average Velocity (fps) | Rim/Grate at Up Node (feet) | Up HGL (feet) | Down HGL (feet) | Up (RIM-HGL) (feet) | Energy Slope (ft/ft) | Up EGL (feet) | Down EGL (feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AA14 | AA13 | 24 | 0.1 | 0.1 | 13.5 | 0.25 | 0.25 | 0.015 | 308.00 | 5.13 | 117.00 | 116.45 | 116.45 | 0.55 | 0.0000 | 116.45 | 116.45 |
| | | N/A | | | | 0.00 | | 0.015 | 308.00 | 0.00 | 117.00 | 116.45 | 116.45 | N/A | 0.0000 | 116.45 | 116.45 |
| AA13 | AA12 | 36 | 8.04 | 8.14 | 14.5 | 18.75 | 18.75 | 0.015 | 364.00 | 6.07 | 116.50 | 116.33 | 115.95 | 0.17 | 0.0011 | 116.45 | 116.07 |
| | | N/A | | | | 0.00 | | 0.015 | 364.00 | 0.00 | 116.50 | 116.33 | 115.95 | N/A | 0.0011 | 116.45 | 116.07 |
| AA12 | AA11 | 42 | 16.74 | 24.88 | 15.5 | 55.49 | 55.49 | 0.015 | 282.00 | 5.77 | 116.20 | 115.49 | 114.35 | 0.71 | 0.0041 | 116.07 | 114.92 |
| | | N/A | | | | 0.00 | | 0.015 | 282.00 | 0.00 | 116.20 | 115.49 | 114.35 | N/A | 0.0041 | 116.07 | 114.92 |
| AA11 | AA10 | 42 | 3.49 | 28.37 | 16.31 | 61.07 | 61.07 | 0.015 | 307.00 | 6.35 | 115.00 | 114.23 | 112.72 | 0.77 | 0.0049 | 114.92 | 113.42 |
| | | N/A | | | | 0.00 | | 0.015 | 307.00 | 0.00 | 115.00 | 114.23 | 112.72 | N/A | 0.0049 | 114.92 | 113.42 |
| AA10 | AA9 | 42 | 5. | 33.37 | 17.12 | 69.45 | 69.45 | 0.015 | 297.00 | 7.22 | 113.50 | 112.52 | 110.63 | 0.98 | 0.0063 | 113.41 | 111.53 |
| | | N/A | | | | 0.00 | | 0.015 | 297.00 | 0.00 | 113.50 | 112.52 | 110.63 | N/A | 0.0063 | 113.41 | 111.53 |
| AA9 | AA2 | 42 | 4.35 | 37.72 | 17.81 | 64.97 | 76.45 | 0.015 | 228.00 | 6.75 | 111.50 | 110.74 | 109.48 | 0.76 | 0.0056 | 111.53 | 110.26 |
| | | N/A | | | | 11.48 | | 0.015 | 228.00 | 3.80 | 111.50 | 111.44 | 110.44 | 0.06 | 0.0044 | 111.53 | 110.53 |
| AA8 | AA7 | 36 | 13.67 | 13.67 | 13.5 | 32.84 | 32.84 | 0.015 | 268.00 | 4.65 | 118.10 | 116.54 | 115.68 | 1.56 | 0.0032 | 116.92 | 116.05 |
| | | N/A | | | | 0.00 | | 0.015 | 268.00 | 0.00 | 118.10 | 116.54 | 115.68 | N/A | 0.0032 | 116.92 | 116.05 |
| AA7 | AA6 | 36 | 0.1 | 13.77 | 14.46 | 31.92 | 31.92 | 0.015 | 282.00 | 4.70 | 117.00 | 115.70 | 114.84 | 1.30 | 0.0030 | 116.05 | 115.19 |
| | | N/A | | | | 0.00 | | 0.015 | 282.00 | 0.00 | 117.00 | 115.70 | 114.84 | N/A | 0.0030 | 116.05 | 115.19 |
| AA6 | AA5 | 36 | 4.03 | 17.8 | 15.46 | 39.22 | 39.22 | 0.015 | 301.00 | 5.55 | 116.00 | 114.66 | 113.27 | 1.34 | 0.0046 | 115.19 | 113.80 |
| | | N/A | | | | 0.00 | | 0.015 | 301.00 | 0.00 | 116.00 | 114.66 | 113.27 | N/A | 0.0046 | 115.19 | 113.80 |
| AA5 | AA4 | 36 | 4.87 | 22.67 | 16.37 | 47.97 | 47.97 | 0.015 | 308.00 | 6.79 | 114.00 | 113.01 | 110.89 | 0.99 | 0.0069 | 113.80 | 111.68 |
| | | N/A | | | | 0.00 | | 0.015 | 308.00 | 0.00 | 114.00 | 113.01 | 110.89 | N/A | 0.0069 | 113.80 | 111.68 |
| AA4 | AA3 | 42 | 5.28 | 27.95 | 17.12 | 56.93 | 57.31 | 0.015 | 218.00 | 5.92 | 111.50 | 111.07 | 110.14 | 0.43 | 0.0043 | 111.68 | 110.75 |
| | | N/A | | | | 0.37 | | 0.015 | 218.00 | 3.63 | 111.50 | 111.64 | 110.75 | -0.14 | 0.0043 | 111.67 | 110.75 |
| AA3 | AA2 | 48 | 4.76 | 32.71 | 17.73 | 42.99 | 65.49 | 0.015 | 405.00 | 6.75 | 110.00 | 110.54 | 110.06 | -0.54 | 0.0012 | 110.75 | 110.26 |
| | | N/A | | | | 22.50 | | 0.015 | 405.00 | 6.75 | 110.00 | 110.71 | 110.23 | -0.71 | 0.0012 | 110.74 | 110.26 |
| AA2 | AA1 | 48 | 3.52 | 73.95 | 18.28 | 111.61 | 146.27 | 0.015 | 112.00 | 8.88 | 109.50 | 108.90 | 108.00 | 0.60 | 0.0080 | 110.26 | 109.36 |
| | | N/A | | | | 34.66 | | 0.015 | 112.00 | 6.72 | 109.50 | 110.12 | 107.43 | -0.62 | 0.0252 | 110.26 | 107.44 |
| B4 | B3 | 24 | 0.01 | 0.01 | 13.5 | 0.02 | 0.02 | 0.015 | 316.00 | 5.27 | 102.00 | 92.75 | 92.75 | 9.25 | 0.0000 | 92.75 | 92.75 |
| | | N/A | | | | 0.00 | | 0.015 | 316.00 | 0.00 | 102.00 | 92.75 | 92.75 | N/A | 0.0000 | 92.75 | 92.75 |
| B3 | B2 | 30 | 9.89 | 9.9 | 14.5 | 22.92 | 22.92 | 0.015 | 317.00 | 5.28 | 102.00 | 92.38 | 91.06 | 9.62 | 0.0042 | 92.75 | 91.43 |
| | | N/A | | | | 0.00 | | 0.015 | 317.00 | 0.00 | 102.00 | 92.38 | 91.06 | N/A | 0.0042 | 92.75 | 91.43 |
| B2 | B1 | 30 | 9.65 | 19.55 | 15.5 | 43.65 | 43.65 | 0.015 | 104.00 | 8.89 | 101.00 | 90.07 | 88.50 | 10.93 | 0.0151 | 91.43 | 89.86 |
| | | N/A | | | | 0.00 | | 0.015 | 1047.00 | 0.00 | 101.00 | 90.07 | 88.50 | N/A | 0.0015 | 91.43 | 89.86 |
| BB2 | BB1 | 48 | 17.81 | 17.81 | 13.5 | 30.90 | 44.47 | 0.015 | 87.00 | 4.73 | 105.00 | 105.21 | 104.65 | -0.21 | 0.0025 | 105.56 | 105.34 |
| | | N/A | | | | 13.58 | | 0.015 | 87.00 | 1.45 | 105.00 | 105.46 | 103.50 | -0.46 | 0.0237 | 105.56 | 103.50 |
| CC11 | CC12 | 24 | 3.33 | 3.33 | 15. | 7.88 | 7.88 | 0.015 | 310.00 | 5.17 | 110.50 | 104.59 | 104.09 | 5.91 | 0.0016 | 104.70 | 104.20 |
| | | N/A | | | | 0.00 | | 0.015 | 310.00 | 0.00 | 110.50 | 104.59 | 104.09 | N/A | 0.0016 | 104.70 | 104.20 |
| CC12 | CC13 | 24 | 0.01 | 3.34 | 16. | 7.65 | 7.65 | 0.015 | 260.00 | 4.33 | 107.60 | 104.09 | 103.70 | 3.51 | 0.0015 | 104.19 | 103.80 |
| | | N/A | | | | 0.00 | | 0.015 | 260.00 | 0.00 | 107.60 | 104.09 | 103.70 | N/A | 0.0015 | 104.19 | 103.80 |
| CC13 | CC14 | 24 | 2.91 | 6.25 | 17. | 13.88 | 13.88 | 0.015 | 260.00 | 4.42 | 106.50 | 103.46 | 102.16 | 3.04 | 0.0050 | 103.80 | 102.49 |
| | | N/A | | | | 0.00 | | 0.015 | 260.00 | 0.00 | 106.50 | 103.46 | 102.16 | N/A | 0.0050 | 103.80 | 102.49 |
| CC14 | CC1-1 | 30 | 0.01 | 6.26 | 17.98 | 13.51 | 13.51 | 0.015 | 63.00 | 2.75 | 106.00 | 102.36 | 102.27 | 3.64 | 0.0014 | 102.49 | 102.40 |
| | | N/A | | | | 0.00 | | 0.015 | 918.00 | 0.00 | 106.00 | 102.36 | 102.27 | N/A | 0.0001 | 102.49 | 102.40 |
| CC4 | CC3 | 54 | 10.6 | 65.03 | 18.84 | 118.49 | 132.35 | 0.015 | 206.00 | 7.45 | 107.80 | 108.12 | 107.13 | -0.32 | 0.0048 | 109.08 | 108.08 |
| | | N/A | | | | 12.55 | | 0.015 | 206.00 | 3.43 | 107.80 | 108.09 | 107.21 | -0.29 | 0.0090 | 109.08 | 107.22 |
| CC3 | CC2 | 60 | 4.7 | 69.73 | 19.26 | 111.00 | 139.6 | 0.015 | 109.00 | 5.65 | 106.50 | 106.67 | 106.40 | -0.17 | 0.0024 | 107.22 | 106.95 |
| | | N/A | | | | 28.60 | | 0.015 | 109.00 | 1.82 | 106.50 | 107.13 | 106.93 | -0.62 | 0.0024 | 107.22 | 106.95 |
| CC5 | CC4 | 54 | 3.58 | 54.43 | 18.28 | 114.17 | 114.17 | 0.015 | 242.00 | 7.18 | 110.30 | 109.28 | 108.19 | 1.02 | 0.0045 | 110.17 | 109.08 |
| | | N/A | | | | 0.00 | | 0.015 | 242.00 | 0.00 | 110.30 | 109.28 | 108.19 | N/A | 0.0045 | 110.17 | 109.08 |
| CC6 | CC5 | 48 | 11.71 | 50.85 | 17.76 | 108.24 | 108.24 | 0.015 | 272.00 | 8.61 | 112.40 | 110.95 | 108.89 | 1.45 | 0.0076 | 112.22 | 110.17 |
| | | N/A | | | | 0.00 | | 0.015 | 272.00 | 0.00 | 112.40 | 110.95 | 108.89 | N/A | 0.0076 | 112.22 | 110.17 |
| CC7 | CC6 | 48 | 16.14 | 39.14 | 17. | 85.07 | 85.07 | 0.015 | 307.00 | 6.77 | 115.20 | 112.87 | 111.44 | 2.33 | 0.0047 | 113.66 | 112.23 |
| | | N/A | | | | 0.00 | | 0.015 | 307.00 | 0.00 | 115.20 | 112.87 | 111.44 | N/A | 0.0047 | 113.66 | 112.23 |
| CC8 | CC7 | 48 | 0.1 | 23. | 16. | 52.38 | 52.38 | 0.015 | 400.00 | 6.67 | 117.10 | 114.07 | 113.36 | 3.03 | 0.0018 | 114.37 | 113.66 |
| | | N/A | | | | 0.00 | | 0.015 | 400.00 | 0.00 | 117.10 | 114.07 | 113.36 | N/A | 0.0018 | 114.37 | 113.66 |
| CC10 | CC8 | 48 | 9.17 | 9.17 | 15. | 21.41 | 21.41 | 0.015 | 354.00 | 5.90 | 118.10 | 114.43 | 114.32 | 3.67 | 0.0003 | 114.48 | 114.37 |
| | | N/A | | | | 0.00 | | 0.015 | 354.00 | 0.00 | 118.10 | 114.43 | 114.32 | N/A | 0.0003 | 114.48 | 114.37 |
| CC9 | CC8 | 48 | 13.73 | 13.73 | 15. | 32.48 | 32.48 | 0.015 | 374.00 | 6.23 | 116.30 | 114.51 | 114.26 | 1.79 | 0.0007 | 114.63 | 114.37 |
| | | N/A | | | | 0.00 | | 0.015 | 374.00 | 0.00 | 116.30 | 114.51 | 114.26 | N/A | 0.0007 | 114.63 | 114.37 |
| CC2 | CC1 | 66 | 0.01 | 69.74 | 19.51 | 79.90 | 138.65 | 0.015 | 337.00 | 5.62 | 106.00 | 106.76 | 106.50 | -0.76 | 0.0008 | 106.95 | 106.70 |
| | | N/A | | | | 58.75 | | 0.015 | 337.00 | 5.62 | 106.00 | 106.84 | 105.73 | -0.84 | 0.0031 | 106.95 | 105.92 |
| DD3 | DD2 | 18 | 0.1 | 0.1 | 13.5 | 0.25 | 0.25 | 0.015 | 170.00 | 2.83 | 107.00 | 102.35 | 102.35 | 4.65 | 0.0000 | 102.35 | 102.35 |

| | Up Node Name | Down Node Name | Convey Size (in or ft) | Trib. Area at Up Node (acre) | Cumul. Area (acre) | Total Computed Response Time at Up Node (min.) | Compute d Flow at Convey (cfs) | Total Flow at Convey (cfs) | Convey 'n' Value | Total Length (feet) | Average Velocity (fps) | Rim/Grate at Up Node (feet) | Up HGL (feet) | Down HGL (feet) | Up (RIM-HGL) (feet) | Energy Slope (ft/ft) | Up EGL (feet) | Down EGL (feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | N/A | | | | 0.00 | | 0.015 | 170.00 | 0.00 | 107.00 | 102.35 | 102.35 | N/A | 0.0000 | 102.35 | 102.35 |
| | DD2 | DD1 | 18 | 3.77 | 3.87 | 14.5 | 8.47 | 8.47 | 0.015 | 40.00 | 4.79 | 106.00 | 101.95 | 101.61 | 4.05 | 0.0087 | 102.35 | 102.00 |
| | | | N/A | | | | 0.00 | | 0.015 | 40.00 | 0.00 | 106.00 | 101.95 | 101.61 | N/A | 0.0087 | 102.35 | 102.00 |
| | GG4 | GG3 | 24 | 0.27 | 0.27 | 0.01 | 17.67 | 25.05 | 0.015 | 380.00 | 6.33 | 106.00 | 105.92 | 102.83 | 0.08 | 0.0081 | 106.47 | 103.38 |
| | | | N/A | | | | 7.38 | | 0.015 | 380.00 | 6.33 | 106.00 | 106.42 | 105.39 | -0.42 | 0.0026 | 106.47 | 105.46 |
| | GG3 | GG2 | 24 | 1.22 | 1.49 | 13.5 | 3.39 | 3.39 | 0.015 | 310.00 | 5.17 | 105.00 | 102.21 | 102.12 | 2.79 | 0.0003 | 102.23 | 102.14 |
| | | | N/A | | | | 0.00 | | 0.015 | 310.00 | 0.00 | 105.00 | 102.21 | 102.12 | N/A | 0.0003 | 102.23 | 102.14 |
| | GG2 | GG1 | 24 | 0.99 | 2.48 | 14.5 | 5.31 | 5.31 | 0.015 | 45.00 | 1.69 | 104.00 | 102.09 | 102.05 | 1.91 | 0.0007 | 102.13 | 102.10 |
| | | | N/A | | | | 0.00 | | 0.015 | 45.00 | 0.00 | 104.00 | 102.09 | 102.05 | N/A | 0.0007 | 102.13 | 102.10 |
| | H5A | H4A | 24 | 9.77 | 9.77 | 13.5 | 18.40 | 22.2 | 0.015 | 432.00 | 7.20 | 98.00 | 97.78 | 93.98 | 0.22 | 0.0088 | 98.37 | 94.57 |
| | | | N/A | | | | 3.24 | | 0.015 | 432.00 | 7.20 | 98.00 | 98.27 | 94.57 | -0.27 | 0.0088 | 98.37 | 94.57 |
| | H4A | H3A | 24 | 9.11 | 18.88 | 14.33 | 27.12 | 41.34 | 0.015 | 416.00 | 8.63 | 94.00 | 93.28 | 85.32 | 0.72 | 0.0191 | 94.57 | 86.61 |
| | | | N/A | | | | 14.22 | | 0.015 | 416.00 | 6.93 | 94.00 | 94.47 | 89.72 | -0.47 | 0.0116 | 94.57 | 89.73 |
| | H3A | H2A | 36 | 0.01 | 18.89 | 14.86 | 40.53 | 40.53 | 0.015 | 286.00 | 5.73 | 89.00 | 86.04 | 84.63 | 2.96 | 0.0049 | 86.60 | 85.20 |
| | | | N/A | | | | 0.00 | | 0.015 | 286.00 | 0.00 | 89.00 | 86.04 | 84.63 | N/A | 0.0049 | 86.60 | 85.20 |
| | H2A | H1A | 36 | 11.07 | 29.96 | 15.69 | 62.42 | 62.42 | 0.015 | 73.00 | 8.83 | 87.00 | 83.85 | 83.00 | 3.15 | 0.0117 | 85.20 | 84.34 |
| | | | N/A | | | | 0.00 | | 0.015 | 73.00 | 0.00 | 87.00 | 83.85 | 83.00 | N/A | 0.0117 | 85.20 | 84.34 |
| | H16B | H15B | 30 | 4.42 | 4.42 | 15. | 9.65 | 9.65 | 0.015 | 340.00 | 5.67 | 101.00 | 98.36 | 98.11 | 2.64 | 0.0007 | 98.43 | 98.18 |
| | | | N/A | | | | 0.00 | | 0.015 | 340.00 | 0.00 | 101.00 | 98.36 | 98.11 | N/A | 0.0007 | 98.43 | 98.18 |
| | H15B | H14B | 30 | 0.3 | 4.72 | 16. | 10.01 | 10.01 | 0.015 | 352.00 | 5.87 | 101.00 | 98.10 | 97.82 | 2.90 | 0.0008 | 98.17 | 97.90 |
| | | | N/A | | | | 0.00 | | 0.015 | 352.00 | 0.00 | 101.00 | 98.10 | 97.82 | N/A | 0.0008 | 98.17 | 97.90 |
| | H14B | H13B | 36 | 2.44 | 7.16 | 20. | 13.59 | 13.59 | 0.015 | 340.00 | 5.67 | 101.00 | 97.83 | 97.64 | 3.17 | 0.0006 | 97.89 | 97.71 |
| | | | N/A | | | | 0.00 | | 0.015 | 340.00 | 0.00 | 101.00 | 97.83 | 97.64 | N/A | 0.0006 | 97.89 | 97.71 |
| | H13B | H12B | 36 | 0.3 | 7.46 | 21. | 13.57 | 13.57 | 0.015 | 398.00 | 6.63 | 101.00 | 97.64 | 97.42 | 3.36 | 0.0006 | 97.70 | 97.49 |
| | | | N/A | | | | 0.00 | | 0.015 | 398.00 | 0.00 | 101.00 | 97.64 | 97.42 | N/A | 0.0006 | 97.70 | 97.49 |
| | H12B | H11B | 36 | 0.3 | 7.76 | 22. | 13.55 | 13.55 | 0.015 | 467.00 | 7.78 | 100.70 | 97.42 | 97.16 | 3.28 | 0.0005 | 97.48 | 97.23 |
| | | | N/A | | | | 0.00 | | 0.015 | 467.00 | 0.00 | 100.70 | 97.42 | 97.16 | N/A | 0.0005 | 97.48 | 97.23 |
| | H11B | H10B | 42 | 11.4 | 19.16 | 23. | 32.66 | 32.66 | 0.015 | 402.00 | 6.70 | 102.00 | 97.03 | 96.46 | 4.97 | 0.0014 | 97.22 | 96.66 |
| | | | N/A | | | | 0.00 | | 0.015 | 402.00 | 0.00 | 102.00 | 97.03 | 96.46 | N/A | 0.0014 | 97.22 | 96.66 |
| | H10B | H6B | 60 | 5.09 | 24.25 | 24. | 39.79 | 39.79 | 0.015 | 493.00 | 8.22 | 100.20 | 96.59 | 96.44 | 3.61 | 0.0003 | 96.66 | 96.51 |
| | | | N/A | | | | 0.00 | | 0.015 | 493.00 | 0.00 | 100.20 | 96.59 | 96.44 | N/A | 0.0003 | 96.66 | 96.51 |
| | H9B | H8B | 60 | 20.09 | 20.09 | 15. | 42.85 | 42.85 | 0.015 | 387.00 | 6.45 | 99.30 | 97.99 | 97.85 | 1.31 | 0.0004 | 98.08 | 97.94 |
| | | | N/A | | | | 0.00 | | 0.015 | 387.00 | 0.00 | 99.30 | 97.99 | 97.85 | N/A | 0.0004 | 98.08 | 97.94 |
| | H8B | H7B | 60 | 16.88 | 36.97 | 16. | 76.13 | 76.13 | 0.015 | 326.00 | 5.43 | 98.50 | 97.67 | 97.30 | 0.83 | 0.0011 | 97.93 | 97.56 |
| | | | N/A | | | | 0.00 | | 0.015 | 326.00 | 0.00 | 98.50 | 97.67 | 97.30 | N/A | 0.0011 | 97.93 | 97.56 |
| | H7B | H6B | 60 | 24.21 | 61.18 | 17. | 122.38 | 122.38 | 0.015 | 359.00 | 6.23 | 98.00 | 96.89 | 95.84 | 1.11 | 0.0029 | 97.56 | 96.51 |
| | | | N/A | | | | 0.00 | | 0.015 | 359.00 | 0.00 | 98.00 | 96.89 | 95.84 | N/A | 0.0029 | 97.56 | 96.51 |
| | H6B | H5B | 66 | 5.9 | 91.33 | 17.96 | 180.12 | 180.12 | 0.015 | 428.00 | 7.58 | 97.30 | 95.51 | 93.88 | 1.79 | 0.0038 | 96.50 | 94.86 |
| | | | N/A | | | | 0.00 | | 0.015 | 359.00 | 0.00 | 97.30 | 95.51 | 93.88 | N/A | 0.0046 | 96.50 | 94.86 |
| | H5B | H4B | 66 | 0.01 | 91.34 | 18.9 | 175.10 | 175.1 | 0.015 | 368.00 | 7.37 | 95.00 | 93.93 | 92.60 | 1.07 | 0.0036 | 94.86 | 93.53 |
| | | | N/A | | | | 0.00 | | 0.015 | 368.00 | 0.00 | 95.00 | 93.93 | 92.60 | N/A | 0.0036 | 94.86 | 93.53 |
| | H4B | H3B | 66 | 5.94 | 97.28 | 19.73 | 171.32 | 182.7 | 0.015 | 414.00 | 7.21 | 93.00 | 92.63 | 91.20 | 0.37 | 0.0035 | 93.53 | 92.09 |
| | | | N/A | | | | 11.38 | | 0.015 | 414.00 | 6.90 | 93.00 | 93.43 | 92.09 | -0.43 | 0.0035 | 93.53 | 92.09 |
| | H3B | H2B | 66 | 8.18 | 105.46 | 20.63 | 144.57 | 195.03 | 0.015 | 169.00 | 6.09 | 91.00 | 91.45 | 91.04 | -0.45 | 0.0025 | 92.09 | 91.68 |
| | | | N/A | | | | 50.45 | | 0.015 | 169.00 | 2.82 | 91.00 | 92.06 | 91.73 | -1.06 | 0.0013 | 92.09 | 91.87 |
| | H2B | H1B | 72 | 3.95 | 109.41 | 20.97 | 75.06 | 199.29 | 0.015 | 80.00 | 2.65 | 89.90 | 91.04 | 91.00 | -1.14 | 0.0004 | 91.16 | 91.12 |
| | | | N/A | | | | 124.23 | | 0.015 | 80.00 | 6.65 | 89.90 | 90.86 | 90.28 | -0.96 | 0.0095 | 91.16 | 90.39 |
| | HH4 | HH3 | 24 | 5.3 | 5.3 | 10. | 12.84 | 15.39 | 0.015 | 352.00 | 5.87 | 102.50 | 102.55 | 101.04 | -0.05 | 0.0043 | 102.83 | 101.32 |
| | | | N/A | | | | 2.55 | | 0.015 | 352.00 | 5.87 | 102.50 | 102.79 | 101.29 | -0.29 | 0.0043 | 102.83 | 101.33 |
| | HH3 | HH2 | 24 | 3.7 | 9. | 10.83 | 22.88 | 25.1 | 0.015 | 417.00 | 7.28 | 101.00 | 100.41 | 94.73 | 0.59 | 0.0136 | 101.32 | 95.64 |
| | | | N/A | | | | 2.22 | | 0.015 | 417.00 | 6.95 | 101.00 | 101.29 | 99.78 | -0.28 | 0.0036 | 101.32 | 99.82 |
| | HH2 | HH1 | 30 | 9.23 | 18.23 | 15. | 43.12 | 43.12 | 0.015 | 186.00 | 8.78 | 99.50 | 94.31 | 91.57 | 5.19 | 0.0147 | 95.64 | 92.90 |
| | | | N/A | | | | 0.00 | | 0.015 | 186.00 | 0.00 | 99.50 | 94.31 | 91.57 | N/A | 0.0147 | 95.64 | 92.90 |
| | JJ17 | JJ9 | 18 | 0.3 | 0.3 | 15. | 0.72 | 0.72 | 0.015 | 470.00 | 7.83 | 109.00 | 102.26 | 102.23 | 6.74 | 0.0001 | 102.26 | 102.23 |
| | | | N/A | | | | 0.00 | | 0.015 | 470.00 | 0.00 | 109.00 | 102.26 | 102.23 | N/A | 0.0001 | 102.26 | 102.23 |
| | JJ16 | JJ15 | 36 | 11.33 | 11.33 | 15. | 25.31 | 25.31 | 0.015 | 550.00 | 9.17 | 110.10 | 107.83 | 106.77 | 2.27 | 0.0019 | 108.05 | 106.99 |
| | | | N/A | | | | 0.00 | | 0.015 | 550.00 | 0.00 | 110.10 | 107.83 | 106.77 | N/A | 0.0019 | 108.05 | 106.99 |
| | JJ15 | JJ14 | 42 | 12.6 | 23.93 | 16. | 42.22 | 51. | 0.015 | 350.00 | 5.83 | 106.50 | 106.66 | 105.84 | -0.16 | 0.0023 | 106.99 | 106.17 |
| | | | N/A | | | | 8.79 | | 0.015 | 350.00 | 5.83 | 106.50 | 106.93 | 106.16 | -0.43 | 0.0023 | 106.99 | 106.17 |
| | JJ14 | JJ12 | 42 | 10.98 | 34.91 | 16.83 | 47.52 | 70.03 | 0.015 | 110.00 | 4.94 | 105.50 | 105.75 | 105.42 | -0.25 | 0.0030 | 106.17 | 105.84 |
| | | | N/A | | | | 22.51 | | 0.015 | 110.00 | 2.03 | 105.50 | 106.01 | 105.82 | -0.51 | 0.0030 | 106.17 | 105.84 |
| | JJ13 | JJ12 | 48 | 9.5 | 9.5 | 15. | 20.34 | 20.34 | 0.015 | 550.00 | 9.17 | 109.20 | 105.94 | 105.80 | 3.26 | 0.0003 | 105.99 | 105.84 |

| | Up Node Name | Down Node Name | Convey Size (in or ft) | Trib. Area at Up Node (acre) | Cumul. Area (acre) | Total Computed Response Time at Up Node (min.) | Compute d Flow at Convey (cfs) | Total Flow at Convey (cfs) | Convey 'n' Value | Total Length (feet) | Average Velocity (fps) | Rim/Grate at Up Node (feet) | Up HGL (feet) | Down HGL (feet) | Up (RIM-HGL) (feet) | Energy Slope (ft/ft) | Up EGL (feet) | Down EGL (feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 15 | | | | 0.00 | | 0.015 | 550.00 | 0.00 | 109.20 | 105.94 | 105.80 | N/A | 0.0003 | 105.99 | 105.84 |
| | JJ12 | JJ11 | 48 | 9.16 | 53.57 | 17.08 | 64.46 | 106.58 | 0.015 | 335.00 | 5.58 | 105.00 | 105.39 | 104.49 | -0.39 | 0.0027 | 105.84 | 104.94 |
| | | | N/A | | | | 42.12 | | 0.015 | 335.00 | 5.58 | 105.00 | 105.75 | 104.90 | -0.75 | 0.0027 | 105.84 | 104.94 |
| | JJ11 | JJ10 | 48 | 10.67 | 64.24 | 18.08 | 69.59 | 123.78 | 0.015 | 330.00 | 5.54 | 104.00 | 104.41 | 103.38 | -0.41 | 0.0031 | 104.94 | 103.91 |
| | | | N/A | | | | 54.19 | | 0.015 | 330.00 | 5.50 | 104.00 | 104.85 | 103.91 | -0.85 | 0.0026 | 104.94 | 104.09 |
| | JJ10 | JJ9 | 60 | 10.17 | 74.41 | 19.08 | 114.61 | 139.08 | 0.015 | 650.00 | 10.83 | 103.20 | 103.32 | 101.64 | -0.12 | 0.0026 | 103.91 | 102.23 |
| | | | N/A | | | | 24.47 | | 0.015 | 650.00 | 10.83 | 103.20 | 103.85 | 102.19 | -0.65 | 0.0026 | 103.91 | 102.23 |
| | JJ9 | JJ8 | 60 | 11.73 | 86.44 | 19.9 | 129.92 | 157.81 | 0.015 | 350.00 | 6.62 | 101.50 | 101.47 | 100.31 | 0.03 | 0.0033 | 102.23 | 101.07 |
| | | | N/A | | | | 27.88 | | 0.015 | 350.00 | 5.83 | 101.50 | 102.16 | 101.09 | -0.66 | 0.0029 | 102.23 | 101.21 |
| | JJ8 | JJ7 | 66 | 9.6 | 96.04 | 20.63 | 159.07 | 173.06 | 0.015 | 335.00 | 6.70 | 100.50 | 100.30 | 99.29 | 0.20 | 0.0030 | 101.07 | 100.07 |
| | | | N/A | | | | 13.99 | | 0.015 | 335.00 | 5.58 | 100.50 | 100.99 | 99.97 | -0.49 | 0.0030 | 101.07 | 100.06 |
| | JJ7 | JJ6 | 66 | 4.2 | 100.24 | 21.39 | 163.51 | 175.12 | 0.015 | 370.00 | 6.88 | 99.50 | 99.25 | 98.08 | 0.25 | 0.0032 | 100.06 | 98.90 |
| | | | N/A | | | | 11.61 | | 0.015 | 370.00 | 6.17 | 99.50 | 99.89 | 98.94 | -0.39 | 0.0028 | 100.06 | 99.03 |
| | JJ6 | JJ5 | 66 | 0. | 100.24 | 22.23 | 164.46 | 168.59 | 0.015 | 425.00 | 7.08 | 98.50 | 98.07 | 96.71 | 0.43 | 0.0032 | 98.89 | 97.54 |
| | | | N/A | | | | 4.14 | | 0.015 | 425.00 | 7.08 | 98.50 | 98.86 | 97.82 | -0.36 | 0.0024 | 98.89 | 97.88 |
| | JJ5 | JJ4 | 66 | 4.9 | 105.14 | 23.2 | 170.44 | 170.45 | 0.015 | 510.00 | 8.50 | 97.50 | 96.63 | 94.88 | 0.87 | 0.0034 | 97.51 | 95.76 |
| | | | N/A | | | | 0.01 | | 0.015 | 510.00 | 8.50 | 97.50 | 97.53 | 96.03 | -0.03 | 0.0029 | 97.53 | 96.03 |
| | JJ4 | JJ3 | 72 | 11.04 | 116.18 | 24.2 | 182.77 | 182.77 | 0.015 | 410.00 | 6.83 | 96.00 | 95.04 | 94.02 | 0.96 | 0.0025 | 95.76 | 94.74 |
| | | | N/A | | | | 0.00 | | 0.015 | 410.00 | 0.00 | 96.00 | 95.04 | 94.02 | N/A | 0.0025 | 95.76 | 94.74 |
| | JJ3 | JJ2 | 72 | 10.43 | 126.61 | 25.2 | 190.87 | 193.22 | 0.015 | 480.00 | 8.00 | 94.40 | 93.96 | 92.66 | 0.44 | 0.0027 | 94.74 | 93.44 |
| | | | N/A | | | | 2.34 | | 0.015 | 480.00 | 8.00 | 94.40 | 94.68 | 92.82 | -0.28 | 0.0040 | 94.72 | 92.82 |
| | JJ2 | JJ1 | 72 | 14.81 | 141.42 | 26.19 | 167.72 | 210.22 | 0.015 | 100.00 | 5.93 | 92.00 | 92.21 | 92.00 | -0.21 | 0.0021 | 92.82 | 92.61 |
| | | | N/A | | | | 42.50 | | 0.015 | 100.00 | 4.26 | 92.00 | 92.66 | 91.86 | -0.66 | 0.0090 | 92.82 | 91.91 |
| | L2 | L1 | 60 | 6.38 | 88.65 | 27.47 | 119.96 | 119.96 | 0.015 | 250.00 | 6.11 | 98.00 | 96.71 | 96.00 | 1.29 | 0.0028 | 97.35 | 96.64 |
| | | | N/A | | | | 0.00 | | 0.015 | 250.00 | 0.00 | 98.00 | 96.71 | 96.00 | N/A | 0.0028 | 97.35 | 96.64 |
| | L3 | L2 | 54 | 7.86 | 82.27 | 26.66 | 114.58 | 114.58 | 0.015 | 350.00 | 7.20 | 100.00 | 98.04 | 96.46 | 1.96 | 0.0045 | 98.93 | 97.35 |
| | | | N/A | | | | 0.00 | | 0.015 | 350.00 | 0.00 | 100.00 | 98.04 | 96.46 | N/A | 0.0045 | 98.93 | 97.35 |
| | L4 | L3 | 54 | 7.26 | 7.26 | 20. | 13.46 | 13.46 | 0.015 | 330.00 | 5.50 | 101.00 | 98.94 | 98.92 | 2.06 | 0.0001 | 98.95 | 98.93 |
| | | | N/A | | | | 0.00 | | 0.015 | 330.00 | 0.00 | 101.00 | 98.94 | 98.92 | N/A | 0.0001 | 98.95 | 98.93 |
| | L5 | L3 | 48 | 15.41 | 67.15 | 25.66 | 97.13 | 97.13 | 0.015 | 480.00 | 8.00 | 103.00 | 100.83 | 97.91 | 2.17 | 0.0061 | 101.86 | 98.93 |
| | | | N/A | | | | 0.00 | | 0.015 | 480.00 | 0.00 | 103.00 | 100.83 | 97.91 | N/A | 0.0061 | 101.86 | 98.93 |
| | L6 | L5 | 48 | 10.14 | 51.74 | 24.74 | 77.79 | 77.79 | 0.015 | 340.00 | 6.19 | 106.00 | 102.53 | 101.20 | 3.47 | 0.0039 | 103.19 | 101.86 |
| | | | N/A | | | | 0.00 | | 0.015 | 340.00 | 0.00 | 106.00 | 102.53 | 101.20 | N/A | 0.0039 | 103.19 | 101.86 |
| | L7 | L6 | 42 | 4.88 | 41.6 | 23.97 | 64.68 | 64.68 | 0.015 | 310.00 | 6.72 | 108.00 | 104.11 | 102.41 | 3.89 | 0.0055 | 104.89 | 103.19 |
| | | | N/A | | | | 0.00 | | 0.015 | 310.00 | 0.00 | 108.00 | 104.11 | 102.41 | N/A | 0.0055 | 104.89 | 103.19 |
| | L8 | L7 | 24 | 5.6 | 5.6 | 20. | 10.34 | 10.34 | 0.015 | 415.00 | 6.92 | 110.00 | 105.86 | 104.71 | 4.14 | 0.0028 | 106.05 | 104.89 |
| | | | N/A | | | | 0.00 | | 0.015 | 415.00 | 0.00 | 110.00 | 105.86 | 104.71 | N/A | 0.0028 | 106.05 | 104.89 |
| | L9 | L7 | 36 | 9.8 | 31.12 | 22.97 | 50.65 | 50.65 | 0.015 | 525.00 | 8.75 | 110.00 | 108.04 | 104.01 | 1.96 | 0.0077 | 108.93 | 104.89 |
| | | | N/A | | | | 0.00 | | 0.015 | 525.00 | 0.00 | 110.00 | 108.04 | 104.01 | N/A | 0.0077 | 108.93 | 104.89 |
| | L10 | L9 | 36 | 7.11 | 21.32 | 21.97 | 36.46 | 36.46 | 0.015 | 490.00 | 8.17 | 112.00 | 110.42 | 108.47 | 1.58 | 0.0040 | 110.88 | 108.93 |
| | | | N/A | | | | 0.00 | | 0.015 | 490.00 | 0.00 | 112.00 | 110.42 | 108.47 | N/A | 0.0040 | 110.88 | 108.93 |
| | L11 | L10 | 30 | 0.3 | 14.21 | 21. | 25.61 | 25.61 | 0.015 | 305.00 | 5.22 | 113.10 | 111.99 | 110.41 | 1.11 | 0.0052 | 112.46 | 110.88 |
| | | | N/A | | | | 0.00 | | 0.015 | 305.00 | 0.00 | 113.10 | 111.99 | 110.41 | N/A | 0.0052 | 112.46 | 110.88 |
| | L12 | L11 | 30 | 7.5 | 7.5 | 20. | 14.17 | 14.17 | 0.015 | 650.00 | 10.83 | 113.90 | 113.35 | 112.32 | 0.55 | 0.0016 | 113.50 | 112.46 |
| | | | N/A | | | | 0.00 | | 0.015 | 650.00 | 0.00 | 113.90 | 113.35 | 112.32 | N/A | 0.0016 | 113.50 | 112.46 |
| | L13 | L11 | 24 | 6.41 | 6.41 | 20. | 12.11 | 12.11 | 0.015 | 550.00 | 9.17 | 115.00 | 114.31 | 112.21 | 0.69 | 0.0038 | 114.56 | 112.46 |
| | | | N/A | | | | 0.00 | | 0.015 | 550.00 | 0.00 | 115.00 | 114.31 | 112.21 | N/A | 0.0038 | 114.56 | 112.46 |
| | LL12 | LL5 | 24 | 7.52 | 7.52 | 15. | 16.14 | 17.12 | 0.015 | 410.00 | 6.83 | 100.50 | 100.30 | 97.52 | 0.20 | 0.0068 | 100.75 | 97.97 |
| | | | N/A | | | | 0.98 | | 0.015 | 410.00 | 6.83 | 100.50 | 100.70 | 97.97 | -0.20 | 0.0068 | 100.75 | 97.97 |
| | LL11 | LL10 | 24 | 7.22 | 7.22 | 15. | 0.85 | 16.27 | 0.015 | 470.00 | 7.83 | 107.00 | 107.55 | 106.64 | -0.55 | 0.0021 | 107.62 | 106.65 |
| | | | N/A | | | | 15.42 | | 0.015 | 470.00 | 7.83 | 107.00 | 107.58 | 106.62 | -0.58 | 0.0021 | 107.62 | 106.65 |
| | LL10 | LL9 | 24 | 7.46 | 14.68 | 15.95 | 10.76 | 32.22 | 0.015 | 430.00 | 7.17 | 106.00 | 106.30 | 104.57 | -0.30 | 0.0034 | 106.57 | 105.11 |
| | | | N/A | | | | 21.45 | | 0.015 | 430.00 | 7.17 | 106.00 | 106.53 | 104.25 | -0.53 | 0.0055 | 106.65 | 104.27 |
| | LL9 | LL8 | 36 | 6.56 | 21.23 | 16.61 | 9.69 | 45.76 | 0.015 | 400.00 | 6.67 | 103.50 | 103.87 | 102.41 | -0.37 | 0.0037 | 104.27 | 102.81 |
| | | | N/A | | | | 36.07 | | 0.015 | 400.00 | 6.67 | 103.50 | 104.16 | 102.34 | -0.66 | 0.0047 | 104.27 | 102.38 |
| | LL8 | LL7 | 42 | 5.64 | 26.87 | 17.4 | 5.30 | 56.55 | 0.015 | 450.00 | 7.50 | 101.50 | 102.11 | 100.40 | -0.61 | 0.0043 | 102.38 | 100.45 |
| | | | N/A | | | | 51.25 | | 0.015 | 450.00 | 7.50 | 101.50 | 102.25 | 100.37 | -0.75 | 0.0043 | 102.38 | 100.44 |
| | LL7 | LL6 | 42 | 8.62 | 35.49 | 18.31 | 10.10 | 72.74 | 0.015 | 350.00 | 5.83 | 99.50 | 100.06 | 98.39 | -0.56 | 0.0056 | 100.44 | 98.48 |
| | | | N/A | | | | 62.64 | | 0.015 | 350.00 | 5.83 | 99.50 | 100.27 | 98.37 | -0.77 | 0.0056 | 100.44 | 98.48 |
| | LL6 | LL5 | 42 | 6.1 | 41.59 | 19.17 | 16.90 | 83. | 0.015 | 130.00 | 4.50 | 97.50 | 97.96 | 97.86 | -0.46 | 0.0039 | 98.48 | 97.97 |
| | | | N/A | | | | 66.10 | | 0.015 | 130.00 | 2.83 | 97.50 | 98.34 | 97.76 | -0.84 | 0.0039 | 98.48 | 97.96 |
| | LL5 | LL4 | 42 | 6.01 | 55.12 | 19.78 | 41.34 | 108.29 | 0.015 | 340.00 | 8.75 | 97.00 | 97.06 | 94.80 | -0.06 | 0.0081 | 97.97 | 95.22 |

| | Up Node Name | Down Node Name | Convey Size (in or ft) | Trib. Area at Up Node (acre) | Cumul. Area (acre) | Total Computed Response Time at Up Node (min.) | Compute d Flow at Convey (cfs) | Total Flow at Convey (cfs) | Convey 'n' Value | Total Length (feet) | Average Velocity (fps) | Rim/Grate at Up Node (feet) | Up HGL (feet) | Down HGL (feet) | Up (RIM-HGL) (feet) | Energy Slope (ft/ft) | Up EGL (feet) | Down EGL (feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | N/A | | | | 66.96 | | 0.015 | 340.00 | 5.67 | 97.00 | 97.76 | 94.96 | -0.76 | 0.0086 | 97.97 | 95.05 |
| | LL4 | LL3 | 48 | 10.87 | 65.98 | 20.64 | 50.66 | 127.77 | 0.015 | 295.00 | 10.01 | 94.00 | 94.07 | 91.79 | -0.07 | 0.0096 | 95.02 | 92.18 |
| | | | N/A | | | | 77.11 | | 0.015 | 295.00 | 4.92 | 94.00 | 94.80 | 92.05 | -0.80 | 0.0098 | 95.03 | 92.13 |
| | LL3 | LL2 | 54 | 8.8 | 74.78 | 21.44 | 65.47 | 140.45 | 0.015 | 205.00 | 9.36 | 91.00 | 90.97 | 89.71 | 0.03 | 0.0095 | 92.02 | 90.06 |
| | | | N/A | | | | 74.98 | | 0.015 | 205.00 | 3.42 | 91.00 | 91.79 | 89.81 | -0.79 | 0.0098 | 92.01 | 90.01 |
| | LL2 | LL1 | 54 | 11.85 | 86.62 | 22.15 | 102.26 | 157.38 | 0.015 | 100.00 | 7.95 | 89.00 | 88.82 | 87.97 | 0.18 | 0.0044 | 89.87 | 89.42 |
| | | | N/A | | | | 55.13 | | 0.015 | 100.00 | 4.64 | 89.00 | 89.71 | 88.93 | -0.71 | 0.0090 | 89.90 | 89.00 |
| | M4A | M3A | 30 | 7.16 | 7.16 | 15. | 14.95 | 14.95 | 0.015 | 305.00 | 5.08 | 103.00 | 97.80 | 97.26 | 5.20 | 0.0018 | 97.96 | 97.42 |
| | | | N/A | | | | 0.00 | | 0.015 | 305.00 | 0.00 | 103.00 | 97.80 | 97.26 | N/A | 0.0018 | 97.96 | 97.42 |
| | M3A | M2A | 42 | 0.3 | 16.86 | 16. | 34.52 | 34.52 | 0.015 | 358.00 | 5.97 | 102.40 | 97.19 | 96.63 | 5.21 | 0.0016 | 97.42 | 96.86 |
| | | | N/A | | | | 0.00 | | 0.015 | 358.00 | 0.00 | 102.40 | 97.19 | 96.63 | N/A | 0.0016 | 97.42 | 96.86 |
| | M5A | M3A | 30 | 9.4 | 9.4 | 15. | 20.13 | 20.13 | 0.015 | 388.00 | 6.47 | 106.00 | 98.37 | 97.13 | 7.63 | 0.0032 | 98.66 | 97.42 |
| | | | N/A | | | | 0.00 | | 0.015 | 388.00 | 0.00 | 106.00 | 98.37 | 97.13 | N/A | 0.0032 | 98.66 | 97.42 |
| | M2A | M1A | 42 | 4.38 | 21.24 | 17. | 41.86 | 41.86 | 0.015 | 445.00 | 7.42 | 102.00 | 96.53 | 95.50 | 5.47 | 0.0023 | 96.85 | 95.83 |
| | | | N/A | | | | 0.00 | | 0.015 | 445.00 | 0.00 | 102.00 | 96.53 | 95.50 | N/A | 0.0023 | 96.85 | 95.83 |
| | M10B | M3B | 24 | 0.3 | 0.3 | 15. | 0.72 | 0.72 | 0.015 | 305.00 | 5.08 | 110.00 | 106.19 | 106.19 | 3.81 | 0.0000 | 106.19 | 106.19 |
| | | | N/A | | | | 0.00 | | 0.015 | 305.00 | 0.00 | 110.00 | 106.19 | 106.19 | N/A | 0.0000 | 106.19 | 106.19 |
| | M9B | M8B | 36 | 10.6 | 10.6 | 20. | 20.90 | 20.9 | 0.015 | 358.00 | 5.97 | 115.00 | 110.34 | 109.88 | 4.66 | 0.0013 | 110.49 | 110.03 |
| | | | N/A | | | | 0.00 | | 0.015 | 358.00 | 0.00 | 115.00 | 110.34 | 109.88 | N/A | 0.0013 | 110.49 | 110.03 |
| | M8B | M7B | 36 | 7.16 | 17.76 | 21. | 33.22 | 33.22 | 0.015 | 388.00 | 6.47 | 112.50 | 109.64 | 108.36 | 2.86 | 0.0033 | 110.03 | 108.74 |
| | | | N/A | | | | 0.00 | | 0.015 | 388.00 | 0.00 | 112.50 | 109.64 | 108.36 | N/A | 0.0033 | 110.03 | 108.74 |
| | M7B | M3B | 36 | 6.45 | 24.21 | 22. | 43.79 | 43.79 | 0.015 | 445.00 | 7.42 | 110.00 | 108.08 | 105.53 | 1.92 | 0.0057 | 108.74 | 106.19 |
| | | | N/A | | | | 0.00 | | 0.015 | 445.00 | 0.00 | 110.00 | 108.08 | 105.53 | N/A | 0.0057 | 108.74 | 106.19 |
| | M6B | M5B | 36 | 10.29 | 10.29 | 20. | 19.52 | 19.52 | 0.015 | 417.00 | 6.95 | 109.40 | 107.07 | 106.60 | 2.33 | 0.0011 | 107.20 | 106.73 |
| | | | N/A | | | | 0.00 | | 0.015 | 417.00 | 0.00 | 109.40 | 107.07 | 106.60 | N/A | 0.0011 | 107.20 | 106.73 |
| | M5B | M4B | 36 | 7.41 | 17.7 | 21. | 0.90 | 31.09 | 0.015 | 450.00 | 7.50 | 104.00 | 106.73 | 106.73 | -2.73 | 0.0000 | 106.73 | 106.73 |
| | | | N/A | | | | 30.19 | | 0.015 | 450.00 | 7.50 | 104.00 | 106.71 | 106.72 | -2.71 | 0.0000 | 106.71 | 106.73 |
| | M4B | M3B | 48 | 9.37 | 27.07 | 21.97 | 44.48 | 44.48 | 0.015 | 420.00 | 7.00 | 105.00 | 106.51 | 105.97 | -1.51 | 0.0013 | 106.73 | 106.19 |
| | | | N/A | | | | 0.00 | | 0.015 | 420.00 | 0.00 | 105.00 | 106.51 | 105.97 | N/A | 0.0013 | 106.73 | 106.19 |
| | M3B | M2B | 54 | 2.29 | 53.87 | 22.97 | 89.01 | 89.01 | 0.015 | 330.00 | 5.59 | 108.30 | 105.65 | 104.75 | 2.65 | 0.0027 | 106.19 | 105.29 |
| | | | N/A | | | | 0.00 | | 0.015 | 330.00 | 0.00 | 108.30 | 105.65 | 104.75 | N/A | 0.0027 | 106.19 | 105.29 |
| | M2B | M1B | 54 | 0.01 | 53.88 | 23.95 | 85.43 | 85.43 | 0.015 | 114.00 | 5.37 | 107.00 | 104.79 | 104.50 | 2.21 | 0.0025 | 105.29 | 105.00 |
| | | | N/A | | | | 0.00 | | 0.015 | 114.00 | 0.00 | 107.00 | 104.79 | 104.50 | N/A | 0.0025 | 105.29 | 105.00 |
| | M2C | M1C | 18 | 3.67 | 3.67 | 15. | 7.82 | 7.82 | 0.015 | 384.00 | 6.40 | 108.50 | 107.33 | 104.50 | 1.17 | 0.0074 | 107.67 | 104.84 |
| | | | N/A | | | | 0.00 | | 0.015 | 384.00 | 0.00 | 108.50 | 107.33 | 104.50 | N/A | 0.0074 | 107.67 | 104.84 |
| | M4D | M2D | 24 | 7.25 | 7.25 | 15. | 15.38 | 15.55 | 0.015 | 384.00 | 6.40 | 110.00 | 109.72 | 107.36 | 0.28 | 0.0062 | 110.14 | 107.78 |
| | | | N/A | | | | 0.18 | | 0.015 | 384.00 | 6.40 | 110.00 | 110.12 | 109.11 | -0.12 | 0.0026 | 110.14 | 109.13 |
| | M3D | M2D | 30 | 4.52 | 4.52 | 15. | 9.71 | 9.71 | 0.015 | 222.00 | 3.70 | 111.00 | 107.68 | 107.51 | 3.32 | 0.0007 | 107.74 | 107.58 |
| | | | N/A | | | | 0.00 | | 0.015 | 222.00 | 0.00 | 111.00 | 107.68 | 107.51 | N/A | 0.0007 | 107.74 | 107.58 |
| | M2D | M1D | 36 | 0.3 | 12.07 | 15.99 | 25.00 | 25. | 0.015 | 192.00 | 3.54 | 108.00 | 107.36 | 107.00 | 0.64 | 0.0019 | 107.58 | 107.22 |
| | | | N/A | | | | 0.00 | | 0.015 | 192.00 | 0.00 | 108.00 | 107.36 | 107.00 | N/A | 0.0019 | 107.58 | 107.22 |
| | M6E | M2E | 36 | 49.9 | 49.9 | 15. | 86.45 | 106.84 | 0.015 | 384.00 | 12.23 | 118.00 | 116.06 | 107.47 | 1.94 | 0.0224 | 118.64 | 110.05 |
| | | | N/A | | | | 20.39 | | 0.015 | 384.00 | 6.40 | 118.00 | 118.52 | 111.94 | -0.52 | 0.0174 | 118.64 | 111.95 |
| | M4E | M3E | 24 | 3.05 | 3.05 | 15. | 6.55 | 6.55 | 0.015 | 222.00 | 3.70 | 114.00 | 110.30 | 110.05 | 3.70 | 0.0011 | 110.38 | 110.13 |
| | | | N/A | | | | 0.00 | | 0.015 | 222.00 | 0.00 | 114.00 | 110.30 | 110.05 | N/A | 0.0011 | 110.38 | 110.13 |
| | M3E | M2E | 36 | 2.55 | 5.6 | 16. | 11.61 | 11.61 | 0.015 | 192.00 | 3.20 | 111.00 | 110.08 | 110.00 | 0.92 | 0.0004 | 110.13 | 110.05 |
| | | | N/A | | | | 0.00 | | 0.015 | 192.00 | 0.00 | 111.00 | 110.08 | 110.00 | N/A | 0.0004 | 110.13 | 110.05 |
| | M5E | M2E | 24 | 2.68 | 2.68 | 15. | 5.84 | 5.84 | 0.015 | 280.00 | 4.67 | 111.90 | 110.24 | 109.99 | 1.66 | 0.0009 | 110.30 | 110.05 |
| | | | N/A | | | | 0.00 | | 0.015 | 280.00 | 0.00 | 111.90 | 110.24 | 109.99 | N/A | 0.0009 | 110.30 | 110.05 |
| | M2E | M1E | 42 | 0.3 | 58.48 | 15.42 | 123.42 | 123.42 | 0.015 | 112.00 | 12.83 | 108.00 | 107.21 | 104.97 | 0.79 | 0.0200 | 110.05 | 107.80 |
| | | | N/A | | | | 0.00 | | 0.015 | 112.00 | 0.00 | 108.00 | 107.21 | 104.97 | N/A | 0.0200 | 110.05 | 107.80 |
| | M7F | M6F | 36 | 2.87 | 2.87 | 20. | 5.43 | 5.43 | 0.015 | 625.00 | 10.42 | 121.00 | 119.08 | 119.03 | 1.92 | 0.0001 | 119.09 | 119.04 |
| | | | N/A | | | | 0.00 | | 0.015 | 625.00 | 0.00 | 121.00 | 119.08 | 119.03 | N/A | 0.0001 | 119.09 | 119.04 |
| | M6F | M4F | 36 | 6.48 | 9.35 | 21. | 17.72 | 17.72 | 0.015 | 436.00 | 7.27 | 120.20 | 118.93 | 118.52 | 1.27 | 0.0009 | 119.04 | 118.63 |
| | | | N/A | | | | 0.00 | | 0.015 | 436.00 | 0.00 | 120.20 | 118.93 | 118.52 | N/A | 0.0009 | 119.04 | 118.63 |
| | M5F | M4F | 42 | 10.79 | 10.79 | 20. | 19.60 | 19.6 | 0.015 | 297.00 | 4.95 | 119.50 | 118.70 | 118.55 | 0.80 | 0.0005 | 118.78 | 118.63 |
| | | | N/A | | | | 0.00 | | 0.015 | 297.00 | 0.00 | 119.50 | 118.70 | 118.55 | N/A | 0.0005 | 118.78 | 118.63 |
| | M4F | M3F | 42 | 6.98 | 27.12 | 21. | 48.24 | 48.24 | 0.015 | 500.00 | 8.33 | 119.00 | 118.19 | 116.66 | 0.81 | 0.0031 | 118.62 | 117.09 |
| | | | N/A | | | | 0.00 | | 0.015 | 500.00 | 0.00 | 119.00 | 118.19 | 116.66 | N/A | 0.0031 | 118.62 | 117.09 |
| | M3F | M2F | 48 | 11.48 | 38.6 | 22. | 65.02 | 65.08 | 0.015 | 495.00 | 8.25 | 117.00 | 116.63 | 115.28 | 0.37 | 0.0027 | 117.09 | 115.74 |
| | | | N/A | | | | 0.07 | | 0.015 | 495.00 | 8.25 | 117.00 | 117.08 | 115.74 | -0.08 | 0.0027 | 117.09 | 115.74 |
| | M8F | M2F | 36 | 2.56 | 2.56 | 20. | 4.31 | 4.75 | 0.015 | 242.00 | 4.03 | 115.50 | 115.75 | 115.73 | -0.25 | 0.0001 | 115.76 | 115.74 |

| | Up Node Name | Down Node Name | Convey Size (in or ft) | Trib. Area at Up Node (acre) | Cumul. Area (acre) | Total Computed Response Time at Up Node (min.) | Compute d Flow at Convey (cfs) | Total Flow at Convey (cfs) | Convey 'n' Value | Total Length (feet) | Average Velocity (fps) | Rim/Grate at Up Node (feet) | Up HGL (feet) | Down HGL (feet) | Up (RIM-HGL) (feet) | Energy Slope (ft/ft) | Up EGL (feet) | Down EGL (feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | N/A | | | | 0.43 | | 0.015 | 242.00 | 4.03 | 115.50 | 115.75 | 115.74 | -0.25 | 0.0001 | 115.75 | 115.74 |
| | M2F | M1F | 48 | 10.69 | 51.85 | 23. | 82.76 | 83.6 | 0.015 | 82.00 | 11.17 | 115.00 | 114.36 | 112.10 | 0.64 | 0.0120 | 115.74 | 114.76 |
| | | | N/A | | | | 0.84 | | 0.015 | 82.00 | 1.60 | 115.00 | 115.69 | 115.20 | -0.69 | 0.0061 | 115.74 | 115.24 |
| | M2G | M1G | 36 | 8.02 | 8.02 | 15. | 0.72 | 15.99 | 0.015 | 92.00 | 1.76 | 114.00 | 114.48 | 114.29 | -0.48 | 0.0023 | 114.58 | 114.37 |
| | | | N/A | | | | 15.27 | | 0.015 | 92.00 | 3.94 | 114.00 | 114.48 | 113.71 | -0.48 | 0.0093 | 114.58 | 113.73 |
| | M2H | M1H | 24 | 4.99 | 4.99 | 15. | 4.95 | 11.32 | 0.015 | 80.00 | 3.88 | 112.00 | 112.12 | 111.79 | -0.12 | 0.0041 | 112.44 | 112.11 |
| | | | N/A | | | | 6.37 | | 0.015 | 80.00 | 3.94 | 112.00 | 112.36 | 111.59 | -0.36 | 0.0105 | 112.44 | 111.60 |
| | MM2 | MM1 | 18 | 4.22 | 4.22 | 13.5 | 8.96 | 8.96 | 0.015 | 120.00 | 5.07 | 90.00 | 86.52 | 85.36 | 3.48 | 0.0097 | 86.97 | 85.80 |
| | | | N/A | | | | 0.00 | | 0.015 | 120.00 | 0.00 | 90.00 | 86.52 | 85.36 | N/A | 0.0097 | 86.97 | 85.80 |
| | N6A | N5A | 18 | 3.64 | 3.64 | 15. | 7.68 | 8.04 | 0.015 | 433.00 | 7.22 | 104.00 | 103.85 | 100.77 | 0.15 | 0.0071 | 104.17 | 101.09 |
| | | | N/A | | | | 0.36 | | 0.015 | 433.00 | 7.22 | 104.00 | 104.14 | 102.13 | -0.14 | 0.0046 | 104.17 | 102.17 |
| | N5A | N4A | 36 | 13.64 | 17.28 | 15.96 | 37.33 | 37.33 | 0.015 | 471.00 | 7.85 | 102.00 | 100.61 | 98.65 | 1.39 | 0.0042 | 101.09 | 99.13 |
| | | | N/A | | | | 0.00 | | 0.015 | 471.00 | 0.00 | 102.00 | 100.61 | 98.65 | N/A | 0.0042 | 101.09 | 99.13 |
| | N4A | N3A | 42 | 6.84 | 29.32 | 16.96 | 62.45 | 62.45 | 0.015 | 600.00 | 10.00 | 100.20 | 98.40 | 95.32 | 1.80 | 0.0051 | 99.12 | 96.05 |
| | | | N/A | | | | 0.00 | | 0.015 | 600.00 | 0.00 | 100.20 | 98.40 | 95.32 | N/A | 0.0051 | 99.12 | 96.05 |
| | N3A | N2A | 48 | 5.98 | 35.3 | 17.96 | 72.41 | 72.41 | 0.015 | 269.00 | 5.76 | 98.00 | 95.47 | 94.56 | 2.53 | 0.0034 | 96.04 | 95.13 |
| | | | N/A | | | | 0.00 | | 0.015 | 269.00 | 0.00 | 98.00 | 95.47 | 94.56 | N/A | 0.0034 | 96.04 | 95.13 |
| | N7A | N4A | 24 | 5.2 | 5.2 | 15. | 12.20 | 12.2 | 0.015 | 638.00 | 10.63 | 106.00 | 101.34 | 98.87 | 4.66 | 0.0039 | 101.60 | 99.13 |
| | | | N/A | | | | 0.00 | | 0.015 | 638.00 | 0.00 | 106.00 | 101.34 | 98.87 | N/A | 0.0039 | 101.60 | 99.13 |
| | N2A | N1A | 48 | 1.42 | 36.72 | 18.73 | 73.61 | 73.61 | 0.015 | 111.00 | 5.86 | 98.00 | 94.39 | 94.00 | 3.61 | 0.0035 | 94.98 | 94.59 |
| | | | N/A | | | | 0.00 | | 0.015 | 111.00 | 0.00 | 98.00 | 94.39 | 94.00 | N/A | 0.0035 | 94.98 | 94.59 |
| | N3B | N2B | 18 | 2.94 | 2.94 | 15. | 6.72 | 6.72 | 0.015 | 266.00 | 4.43 | 108.00 | 102.63 | 101.18 | 5.37 | 0.0054 | 102.88 | 101.43 |
| | | | N/A | | | | 0.00 | | 0.015 | 266.00 | 0.00 | 108.00 | 102.63 | 101.18 | N/A | 0.0054 | 102.88 | 101.43 |
| | N2B | N1B | 24 | 1.9 | 4.84 | 16. | 10.44 | 10.44 | 0.015 | 82.00 | 3.32 | 106.70 | 101.23 | 101.00 | 5.47 | 0.0028 | 101.43 | 101.19 |
| | | | N/A | | | | 0.00 | | 0.015 | 82.00 | 0.00 | 106.70 | 101.23 | 101.00 | N/A | 0.0028 | 101.43 | 101.19 |
| | N8C | N2C | 24 | 5.76 | 5.76 | 13.5 | 13.08 | 13.08 | 0.015 | 266.00 | 4.43 | 108.00 | 103.26 | 102.07 | 4.74 | 0.0045 | 103.55 | 102.37 |
| | | | N/A | | | | 0.00 | | 0.015 | 266.00 | 0.00 | 108.00 | 103.26 | 102.07 | N/A | 0.0045 | 103.55 | 102.37 |
| | N7C | N6C | 18 | 0.1 | 0.1 | 13.5 | 0.25 | 0.25 | 0.015 | 196.00 | 3.27 | 102.00 | 102.56 | 102.57 | -0.56 | 0.0000 | 102.56 | 102.57 |
| | | | N/A | | | | 0.00 | | 0.015 | 196.00 | 0.00 | 102.00 | 102.56 | 102.57 | N/A | 0.0000 | 102.56 | 102.57 |
| | N5C | N6C | 24 | 2.61 | 2.61 | 13.5 | 5.85 | 5.85 | 0.015 | 105.00 | 1.90 | 112.00 | 102.59 | 102.51 | 9.41 | 0.0007 | 102.65 | 102.57 |
| | | | N/A | | | | 0.00 | | 0.015 | 105.00 | 0.00 | 112.00 | 102.59 | 102.51 | N/A | 0.0007 | 102.65 | 102.57 |
| | N6C | N4C | 30 | 0.1 | 2.81 | 14.42 | 6.12 | 6.12 | 0.015 | 192.00 | 3.20 | 109.00 | 102.54 | 102.49 | 6.46 | 0.0003 | 102.57 | 102.52 |
| | | | N/A | | | | 0.00 | | 0.015 | 192.00 | 0.00 | 109.00 | 102.54 | 102.49 | N/A | 0.0003 | 102.57 | 102.52 |
| | N4C | N3C | 30 | 1.84 | 4.65 | 15.42 | 9.74 | 9.74 | 0.015 | 197.00 | 3.28 | 110.00 | 102.45 | 102.30 | 7.55 | 0.0007 | 102.52 | 102.37 |
| | | | N/A | | | | 0.00 | | 0.015 | 197.00 | 0.00 | 110.00 | 102.45 | 102.30 | N/A | 0.0007 | 102.52 | 102.37 |
| | N3C | N3C1 | 30 | 0.21 | 4.86 | 16.42 | 9.88 | 9.88 | 0.015 | 150.00 | 3.62 | 109.00 | 101.22 | 100.68 | 7.78 | 0.0025 | 101.42 | 101.04 |
| | | | N/A | | | | 0.00 | | 0.015 | 150.00 | 0.00 | 109.00 | 101.22 | 100.68 | N/A | 0.0025 | 101.42 | 101.04 |
| | N2C | N1C | 36 | 1.96 | 7.72 | 14.5 | 16.84 | 16.84 | 0.015 | 79.00 | 2.38 | 108.00 | 102.07 | 102.00 | 5.93 | 0.0008 | 102.17 | 102.10 |
| | | | N/A | | | | 0.00 | | 0.015 | 79.00 | 0.00 | 108.00 | 102.07 | 102.00 | N/A | 0.0008 | 102.17 | 102.10 |
| | N2D | N1D | 24 | 1.89 | 1.89 | 15. | 4.04 | 4.04 | 0.015 | 109.00 | 2.79 | 105.00 | 102.14 | 101.71 | 2.86 | 0.0025 | 102.26 | 101.99 |
| | | | N/A | | | | 0.00 | | 0.015 | 109.00 | 0.00 | 105.00 | 102.14 | 101.71 | N/A | 0.0025 | 102.26 | 101.99 |
| | N5E | N4E | 30 | 10.46 | 10.46 | 15. | 22.40 | 22.4 | 0.015 | 461.00 | 7.68 | 107.00 | 106.17 | 104.34 | 0.83 | 0.0040 | 106.53 | 104.70 |
| | | | N/A | | | | 0.00 | | 0.015 | 461.00 | 0.00 | 107.00 | 106.17 | 104.34 | N/A | 0.0040 | 106.53 | 104.70 |
| | N4E | N3E | 30 | 7.06 | 17.52 | 16. | 36.18 | 36.18 | 0.015 | 285.00 | 7.37 | 109.00 | 103.76 | 100.81 | 5.24 | 0.0104 | 104.70 | 101.74 |
| | | | N/A | | | | 0.00 | | 0.015 | 285.00 | 0.00 | 109.00 | 103.76 | 100.81 | N/A | 0.0104 | 104.70 | 101.74 |
| | N3E | N2E | 30 | 0.3 | 17.82 | 16.64 | 36.07 | 36.07 | 0.015 | 154.00 | 7.35 | 110.00 | 100.81 | 99.23 | 9.19 | 0.0103 | 101.74 | 100.16 |
| | | | N/A | | | | 0.00 | | 0.015 | 154.00 | 0.00 | 110.00 | 100.81 | 99.23 | N/A | 0.0103 | 101.74 | 100.16 |
| | N2E | N1E | 36 | 0.01 | 17.83 | 16.99 | 35.67 | 35.67 | 0.015 | 119.00 | 5.05 | 109.00 | 99.72 | 99.26 | 9.28 | 0.0038 | 100.15 | 99.70 |
| | | | N/A | | | | 0.00 | | 0.015 | 119.00 | 0.00 | 109.00 | 99.72 | 99.26 | N/A | 0.0038 | 100.15 | 99.70 |
| | N2F | N1F | 30 | 5.5 | 5.5 | 15. | 11.78 | 11.78 | 0.015 | 105.00 | 3.81 | 109.00 | 95.71 | 95.15 | 13.29 | 0.0028 | 95.93 | 95.64 |
| | | | N/A | | | | 0.00 | | 0.015 | 105.00 | 0.00 | 109.00 | 95.71 | 95.15 | N/A | 0.0028 | 95.93 | 95.64 |
| | N2G | N1G | 30 | 4.5 | 4.5 | 15. | 9.63 | 9.63 | 0.015 | 83.00 | 3.58 | 101.00 | 97.50 | 97.04 | 3.50 | 0.0028 | 97.70 | 97.47 |
| | | | N/A | | | | 0.00 | | 0.015 | 83.00 | 0.00 | 101.00 | 97.50 | 97.04 | N/A | 0.0028 | 97.70 | 97.47 |
| | N2H | N1H | 36 | 7.3 | 7.3 | 15. | 15.63 | 15.63 | 0.015 | 108.00 | 3.95 | 105.00 | 101.82 | 101.26 | 3.18 | 0.0025 | 102.06 | 101.79 |
| | | | N/A | | | | 0.00 | | 0.015 | 108.00 | 0.00 | 105.00 | 101.82 | 101.26 | N/A | 0.0025 | 102.06 | 101.79 |
| | N2I | N1I | 18 | 2.1 | 2.1 | 15. | 4.50 | 4.5 | 0.015 | 90.00 | 2.86 | 110.00 | 103.71 | 103.50 | 6.29 | 0.0023 | 103.82 | 103.61 |
| | | | N/A | | | | 0.00 | | 0.015 | 90.00 | 0.00 | 110.00 | 103.71 | 103.50 | N/A | 0.0023 | 103.82 | 103.61 |
| | N2J | N1J | 18 | 2.8 | 2.8 | 15. | 6.00 | 6. | 0.015 | 77.00 | 3.39 | 104.00 | 99.84 | 99.50 | 4.16 | 0.0043 | 100.04 | 99.70 |
| | | | N/A | | | | 0.00 | | 0.015 | 77.00 | 0.00 | 104.00 | 99.84 | 99.50 | N/A | 0.0043 | 100.04 | 99.70 |
| | N2k | N1k | 60 | 62.79 | 62.79 | 15. | 134.44 | 134.44 | 0.015 | 120.00 | 6.85 | 105.00 | 99.32 | 98.89 | 5.68 | 0.0035 | 100.13 | 99.70 |
| | | | N/A | | | | 0.00 | | 0.015 | 120.00 | 0.00 | 105.00 | 99.32 | 98.89 | N/A | 0.0035 | 100.13 | 99.70 |
| | NN7 | NN6 | 18 | 0.1 | 0.1 | 13.5 | 0.25 | 0.25 | 0.015 | 518.00 | 8.63 | 97.00 | 88.42 | 88.38 | 8.58 | 0.0001 | 88.44 | 88.38 |

| | Up Node Name | Down Node Name | Convey Size (in or ft) | Trib. Area at Up Node (acre) | Cumul. Area (acre) | Total Computed Response Time at Up Node (min.) | Compute d Flow at Convey (cfs) | Total Flow at Convey (cfs) | Convey 'n' Value | Total Length (feet) | Average Velocity (fps) | Rim/Grate at Up Node (feet) | Up HGL (feet) | Down HGL (feet) | Up (RIM-HGL) (feet) | Energy Slope (ft/ft) | Up EGL (feet) | Down EGL (feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | N/A | | | | 0.00 | | 0.015 | 518.00 | 0.00 | 97.00 | 88.42 | 88.38 | N/A | 0.0001 | 88.44 | 88.38 |
| | NN6 | NN5 | 18 | 0.1 | 0.2 | 14.5 | 0.48 | 0.48 | 0.015 | 462.00 | 7.70 | 96.00 | 88.38 | 88.37 | 7.62 | 0.0000 | 88.38 | 88.37 |
| | | | N/A | | | | 0.00 | | 0.015 | 462.00 | 0.00 | 96.00 | 88.38 | 88.37 | N/A | 0.0000 | 88.38 | 88.37 |
| | NN5 | NN4 | 18 | 0.1 | 0.3 | 15.5 | 0.70 | 0.7 | 0.015 | 402.00 | 6.70 | 94.00 | 88.37 | 88.34 | 5.63 | 0.0001 | 88.37 | 88.35 |
| | | | N/A | | | | 0.00 | | 0.015 | 402.00 | 0.00 | 94.00 | 88.37 | 88.34 | N/A | 0.0001 | 88.37 | 88.35 |
| | NN4 | NN3 | 18 | 0.01 | 0.31 | 16.5 | 0.70 | 0.7 | 0.015 | 438.00 | 7.30 | 93.00 | 88.34 | 88.32 | 4.66 | 0.0001 | 88.34 | 88.32 |
| | | | N/A | | | | 0.00 | | 0.015 | 438.00 | 0.00 | 93.00 | 88.34 | 88.32 | N/A | 0.0001 | 88.34 | 88.32 |
| | NN3 | NN2 | 24 | 5.71 | 6.02 | 17.5 | 13.18 | 13.18 | 0.015 | 400.00 | 6.67 | 91.50 | 88.01 | 86.20 | 3.49 | 0.0045 | 88.32 | 86.51 |
| | | | N/A | | | | 0.00 | | 0.015 | 400.00 | 0.00 | 91.50 | 88.01 | 86.20 | N/A | 0.0045 | 88.32 | 86.51 |
| | NN2 | NN1 | 24 | 0.1 | 6.12 | 18.5 | 13.03 | 13.03 | 0.015 | 47.00 | 4.15 | 90.00 | 86.21 | 86.00 | 3.79 | 0.0044 | 86.51 | 86.30 |
| | | | N/A | | | | 0.00 | | 0.015 | 47.00 | 0.00 | 90.00 | 86.21 | 86.00 | N/A | 0.0044 | 86.51 | 86.30 |
| | OO2 | OO1 | 30 | 6.91 | 6.91 | 13.5 | 15.68 | 15.68 | 0.015 | 105.00 | 3.19 | 90.00 | 85.83 | 85.63 | 4.17 | 0.0019 | 86.01 | 85.80 |
| | | | N/A | | | | 0.00 | | 0.015 | 105.00 | 0.00 | 90.00 | 85.83 | 85.63 | N/A | 0.0019 | 86.01 | 85.80 |
| | P5 | P4 | 36 | 10.66 | 10.66 | 13.5 | 24.71 | 24.71 | 0.015 | 270.00 | 4.50 | 100.50 | 97.54 | 97.05 | 2.96 | 0.0018 | 97.75 | 97.26 |
| | | | N/A | | | | 0.00 | | 0.015 | 270.00 | 0.00 | 100.50 | 97.54 | 97.05 | N/A | 0.0018 | 97.75 | 97.26 |
| | P4 | P3 | 36 | 8.47 | 19.13 | 14.5 | 43.19 | 43.19 | 0.015 | 298.00 | 6.11 | 99.00 | 96.61 | 94.95 | 2.39 | 0.0056 | 97.26 | 95.59 |
| | | | N/A | | | | 0.00 | | 0.015 | 298.00 | 0.00 | 99.00 | 96.61 | 94.95 | N/A | 0.0056 | 97.26 | 95.59 |
| | P3 | P2 | 42 | 8.29 | 27.42 | 15.31 | 60.54 | 60.54 | 0.015 | 346.00 | 6.29 | 97.60 | 94.91 | 93.24 | 2.69 | 0.0048 | 95.59 | 93.92 |
| | | | N/A | | | | 0.00 | | 0.015 | 346.00 | 0.00 | 97.60 | 94.91 | 93.24 | N/A | 0.0048 | 95.59 | 93.92 |
| | P2 | P1 | 48 | 9.54 | 36.96 | 16.23 | 79.39 | 79.39 | 0.015 | 57.00 | 6.32 | 95.00 | 93.23 | 93.00 | 1.77 | 0.0041 | 93.92 | 93.69 |
| | | | N/A | | | | 0.00 | | 0.015 | 57.00 | 0.00 | 95.00 | 93.23 | 93.00 | N/A | 0.0041 | 93.92 | 93.69 |
| | PP3 | PP2 | 48 | 19.55 | 19.55 | 15. | 46.21 | 46.21 | 0.015 | 259.00 | 4.32 | 89.00 | 86.47 | 86.11 | 2.53 | 0.0014 | 86.70 | 86.34 |
| | | | N/A | | | | 0.00 | | 0.015 | 259.00 | 0.00 | 89.00 | 86.47 | 86.11 | N/A | 0.0014 | 86.70 | 86.34 |
| | PP2 | PP1 | 48 | 0.3 | 19.85 | 16. | 45.41 | 45.41 | 0.015 | 85.00 | 3.61 | 88.00 | 86.12 | 86.00 | 1.88 | 0.0013 | 86.34 | 86.23 |
| | | | N/A | | | | 0.00 | | 0.015 | 85.00 | 0.00 | 88.00 | 86.12 | 86.00 | N/A | 0.0013 | 86.34 | 86.23 |
| | Q7 | Q6 | 36 | 8.95 | 8.95 | 13.5 | 20.40 | 20.4 | 0.015 | 418.00 | 6.97 | 106.00 | 101.24 | 100.72 | 4.76 | 0.0012 | 101.38 | 100.86 |
| | | | N/A | | | | 0.00 | | 0.015 | 418.00 | 0.00 | 106.00 | 101.24 | 100.72 | N/A | 0.0012 | 101.38 | 100.86 |
| | Q6 | Q4 | 36 | 9.69 | 18.64 | 14.5 | 40.91 | 40.91 | 0.015 | 612.00 | 10.20 | 103.50 | 100.28 | 97.22 | 3.22 | 0.0050 | 100.86 | 97.79 |
| | | | N/A | | | | 0.00 | | 0.015 | 612.00 | 0.00 | 103.50 | 100.28 | 97.22 | N/A | 0.0050 | 100.86 | 97.79 |
| | Q5 | Q4 | 36 | 8.34 | 8.34 | 13.5 | 18.40 | 18.4 | 0.015 | 604.00 | 10.07 | 105.00 | 98.29 | 97.68 | 6.71 | 0.0010 | 98.41 | 97.79 |
| | | | N/A | | | | 0.00 | | 0.015 | 604.00 | 0.00 | 105.00 | 98.29 | 97.68 | N/A | 0.0010 | 98.41 | 97.79 |
| | Q4 | Q3 | 42 | 7.04 | 34.02 | 15.5 | 71.48 | 71.48 | 0.015 | 425.00 | 7.43 | 100.30 | 96.84 | 93.99 | 3.46 | 0.0067 | 97.79 | 94.94 |
| | | | N/A | | | | 0.00 | | 0.015 | 425.00 | 0.00 | 100.30 | 96.84 | 93.99 | N/A | 0.0067 | 97.79 | 94.94 |
| | Q3 | Q2 | 48 | 14.93 | 48.95 | 16.45 | 99.36 | 99.36 | 0.015 | 380.00 | 7.91 | 96.20 | 93.86 | 91.44 | 2.34 | 0.0064 | 94.93 | 92.51 |
| | | | N/A | | | | 0.00 | | 0.015 | 380.00 | 0.00 | 96.20 | 93.86 | 91.44 | N/A | 0.0064 | 94.93 | 92.51 |
| | Q2 | Q1 | 54 | 3.1 | 52.05 | 17.25 | 97.88 | 103. | 0.015 | 108.00 | 6.15 | 92.00 | 91.86 | 91.50 | 0.14 | 0.0033 | 92.51 | 92.15 |
| | | | N/A | | | | 5.12 | | 0.015 | 108.00 | 1.80 | 92.00 | 92.50 | 92.34 | -0.50 | 0.0009 | 92.51 | 92.41 |
| | QQ3 | QQ2 | 42 | 0.3 | 0.3 | 15. | 0.62 | 0.62 | 0.015 | 450.00 | 7.50 | 88.00 | 87.21 | 87.21 | 0.79 | 0.0000 | 87.21 | 87.21 |
| | | | N/A | | | | 0.00 | | 0.015 | 450.00 | 0.00 | 88.00 | 87.21 | 87.21 | N/A | 0.0000 | 87.21 | 87.21 |
| | QQ2 | QQ1 | 42 | 33.85 | 34.15 | 16. | 66.08 | 66.08 | 0.015 | 156.00 | 6.87 | 88.00 | 86.40 | 85.50 | 1.60 | 0.0057 | 87.21 | 86.31 |
| | | | N/A | | | | 0.00 | | 0.015 | 156.00 | 0.00 | 88.00 | 86.40 | 85.50 | N/A | 0.0057 | 87.21 | 86.31 |
| | R2 | R1 | 42 | 14.36 | 14.36 | 13.5 | 32.25 | 32.25 | 0.015 | 129.00 | 3.35 | 94.00 | 91.68 | 91.50 | 2.32 | 0.0014 | 91.87 | 91.70 |
| | | | N/A | | | | 0.00 | | 0.015 | 129.00 | 0.00 | 94.00 | 91.68 | 91.50 | N/A | 0.0014 | 91.87 | 91.70 |
| | S5 | S3 | 30 | 13.04 | 13.04 | 15. | 29.45 | 29.45 | 0.015 | 708.00 | 11.80 | 103.00 | 100.53 | 95.67 | 2.47 | 0.0069 | 101.15 | 96.29 |
| | | | N/A | | | | 0.00 | | 0.015 | 708.00 | 0.00 | 103.00 | 100.53 | 95.67 | N/A | 0.0069 | 101.15 | 96.29 |
| | S4 | S3 | 36 | 13.33 | 13.33 | 13.5 | 32.01 | 32.01 | 0.015 | 441.00 | 7.35 | 99.00 | 97.29 | 95.94 | 1.71 | 0.0031 | 97.64 | 96.29 |
| | | | N/A | | | | 0.00 | | 0.015 | 441.00 | 0.00 | 99.00 | 97.29 | 95.94 | N/A | 0.0031 | 97.64 | 96.29 |
| | S3 | S2 | 42 | 8.55 | 34.92 | 14.5 | 79.14 | 80.66 | 0.015 | 724.00 | 12.07 | 96.00 | 95.12 | 89.16 | 0.88 | 0.0082 | 96.29 | 90.33 |
| | | | N/A | | | | 1.53 | | 0.015 | 724.00 | 12.07 | 96.00 | 96.23 | 90.32 | -0.23 | 0.0082 | 96.29 | 90.32 |
| | S2 | S1 | 48 | 6.61 | 41.53 | 15.48 | 91.61 | 92.71 | 0.015 | 75.00 | 7.29 | 89.80 | 89.41 | 89.00 | 0.39 | 0.0054 | 90.32 | 89.92 |
| | | | N/A | | | | 1.08 | | 0.015 | 75.00 | 1.25 | 89.80 | 90.32 | 90.22 | -0.52 | 0.0009 | 90.32 | 90.26 |
| | SS2 | SS1 | 30 | 7.63 | 7.63 | 13.5 | 16.19 | 16.19 | 0.015 | 160.00 | 3.30 | 85.00 | 81.85 | 81.51 | 3.15 | 0.0021 | 82.03 | 81.70 |
| | | | N/A | | | | 0.00 | | 0.015 | 160.00 | 0.00 | 85.00 | 81.85 | 81.51 | N/A | 0.0021 | 82.03 | 81.70 |
| | U8 | U7 | 30 | 8.26 | 8.26 | 15. | 19.54 | 19.54 | 0.015 | 350.00 | 5.83 | 131.00 | 128.36 | 127.31 | 2.64 | 0.0030 | 128.64 | 127.58 |
| | | | N/A | | | | 0.00 | | 0.015 | 350.00 | 0.00 | 131.00 | 128.36 | 127.31 | N/A | 0.0030 | 128.64 | 127.58 |
| | U7 | U6 | 30 | 7.46 | 15.72 | 16. | 35.99 | 35.99 | 0.015 | 430.00 | 7.33 | 128.00 | 126.65 | 122.24 | 1.35 | 0.0102 | 127.58 | 123.17 |
| | | | N/A | | | | 0.00 | | 0.015 | 430.00 | 0.00 | 128.00 | 126.65 | 122.24 | N/A | 0.0102 | 127.58 | 123.17 |
| | U6 | U5 | 36 | 6.88 | 22.6 | 16.98 | 48.22 | 48.22 | 0.015 | 450.00 | 7.50 | 124.00 | 122.37 | 119.23 | 1.63 | 0.0070 | 123.17 | 120.04 |
| | | | N/A | | | | 0.00 | | 0.015 | 450.00 | 0.00 | 124.00 | 122.37 | 119.23 | N/A | 0.0070 | 123.17 | 120.04 |
| | U5 | U4 | 48 | 6.8 | 29.4 | 17.98 | 59.93 | 59.93 | 0.015 | 500.00 | 8.33 | 123.00 | 119.64 | 118.48 | 3.36 | 0.0023 | 120.03 | 118.88 |
| | | | N/A | | | | 0.00 | | 0.015 | 500.00 | 0.00 | 123.00 | 119.64 | 118.48 | N/A | 0.0023 | 120.03 | 118.88 |
| | U4 | U3 | 48 | 7.1 | 36.5 | 22. | 64.39 | 64.39 | 0.015 | 475.00 | 7.92 | 120.00 | 118.42 | 117.15 | 1.58 | 0.0027 | 118.87 | 117.60 |

| | Up Node Name | Down Node Name | Convey Size (in or ft) | Trib. Area at Up Node (acre) | Cumul. Area (acre) | Total Computed Response Time at Up Node (min.) | Compute d Flow at Convey (cfs) | Total Flow at Convey (cfs) | Convey 'n' Value | Total Length (feet) | Average Velocity (fps) | Rim/Grate at Up Node (feet) | Up HGL (feet) | Down HGL (feet) | Up (RIM-HGL) (feet) | Energy Slope (ft/ft) | Up EGL (feet) | Down EGL (feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | N/A | | | | 0.00 | | 0.015 | 475.00 | 0.00 | 120.00 | 118.42 | 117.15 | N/A | 0.0027 | 118.87 | 117.60 |
| | U3 | U2 | 48 | 7.69 | 44.19 | 23. | 74.07 | 74.07 | 0.015 | 160.00 | 5.89 | 118.00 | 117.00 | 116.44 | 1.00 | 0.0035 | 117.60 | 117.03 |
| | | | N/A | | | | 0.00 | | 0.015 | 160.00 | 0.00 | 118.00 | 117.00 | 116.44 | N/A | 0.0035 | 117.60 | 117.03 |
| | U2 | U1 | 48 | 0.3 | 44.49 | 23.45 | 73.16 | 73.16 | 0.015 | 130.00 | 5.82 | 117.70 | 116.45 | 116.00 | 1.25 | 0.0035 | 117.03 | 116.58 |
| | | | N/A | | | | 0.00 | | 0.015 | 130.00 | 0.00 | 117.70 | 116.45 | 116.00 | N/A | 0.0035 | 117.03 | 116.58 |
| | T2B | T1B | 18 | 3.29 | 3.29 | 13.5 | 7.46 | 7.46 | 0.015 | 91.00 | 4.22 | 88.00 | 85.11 | 84.50 | 2.89 | 0.0067 | 85.42 | 84.81 |
| | | | N/A | | | | 0.00 | | 0.015 | 91.00 | 0.00 | 88.00 | 85.11 | 84.50 | N/A | 0.0067 | 85.42 | 84.81 |
| | T2C | T1C | 30 | 7.05 | 7.05 | 13.5 | 15.94 | 15.94 | 0.015 | 100.00 | 3.25 | 89.00 | 84.70 | 84.50 | 4.30 | 0.0020 | 84.88 | 84.68 |
| | | | N/A | | | | 0.00 | | 0.015 | 100.00 | 0.00 | 89.00 | 84.70 | 84.50 | N/A | 0.0020 | 84.88 | 84.68 |
| | T5A | T4A | 36 | 15.39 | 15.39 | 16.5 | 32.92 | 32.92 | 0.015 | 401.00 | 6.68 | 93.00 | 89.54 | 88.24 | 3.46 | 0.0032 | 89.92 | 88.62 |
| | | | N/A | | | | 0.00 | | 0.015 | 401.00 | 0.00 | 93.00 | 89.54 | 88.24 | N/A | 0.0032 | 89.92 | 88.62 |
| | T4A | T3A | 36 | 7.45 | 22.84 | 17.5 | 46.62 | 46.62 | 0.015 | 419.00 | 6.98 | 91.00 | 87.87 | 85.14 | 3.13 | 0.0065 | 88.62 | 85.89 |
| | | | N/A | | | | 0.00 | | 0.015 | 419.00 | 0.00 | 91.00 | 87.87 | 85.14 | N/A | 0.0065 | 88.62 | 85.89 |
| | T3A | T2A | 42 | 10.02 | 32.86 | 18.5 | 64.31 | 64.31 | 0.015 | 354.00 | 6.68 | 88.50 | 85.12 | 83.19 | 3.38 | 0.0054 | 85.89 | 83.96 |
| | | | N/A | | | | 0.00 | | 0.015 | 354.00 | 0.00 | 88.50 | 85.12 | 83.19 | N/A | 0.0054 | 85.89 | 83.96 |
| | T2A | T1A | 48 | 4.71 | 37.57 | 19.38 | 71.37 | 71.37 | 0.015 | 123.00 | 5.68 | 86.00 | 83.41 | 83.00 | 2.59 | 0.0033 | 83.96 | 83.56 |
| | | | N/A | | | | 0.00 | | 0.015 | 123.00 | 0.00 | 86.00 | 83.41 | 83.00 | N/A | 0.0033 | 83.96 | 83.56 |
| | TT5 | TT4 | 30 | 0.7 | 0.7 | 15. | 1.67 | 1.67 | 0.015 | 465.00 | 7.75 | 83.00 | 85.01 | 85.03 | -2.01 | 0.0000 | 85.01 | 85.03 |
| | | | N/A | | | | 0.00 | | 0.015 | 465.00 | 0.00 | 83.00 | 85.01 | 85.03 | N/A | 0.0000 | 85.01 | 85.03 |
| | TT4 | TT2 | 48 | 6.1 | 16.09 | 16. | 33.81 | 33.81 | 0.015 | 506.00 | 8.43 | 84.00 | 84.91 | 84.53 | -0.91 | 0.0007 | 85.03 | 84.66 |
| | | | N/A | | | | 0.00 | | 0.015 | 506.00 | 0.00 | 84.00 | 84.91 | 84.53 | N/A | 0.0007 | 85.03 | 84.66 |
| | TT3 | TT4 | 48 | 9.29 | 9.29 | 15. | 19.93 | 20.01 | 0.015 | 243.00 | 4.05 | 85.00 | 85.05 | 84.99 | -0.05 | 0.0003 | 85.09 | 85.03 |
| | | | N/A | | | | 0.07 | | 0.015 | 243.00 | 4.05 | 85.00 | 85.08 | 85.03 | -0.08 | 0.0003 | 85.09 | 85.03 |
| | TT2 | TT1 | 48 | 0.1 | 16.19 | 17. | 32.92 | 32.92 | 0.015 | 63.00 | 2.62 | 85.00 | 84.05 | 84.00 | 0.95 | 0.0007 | 84.16 | 84.12 |
| | | | N/A | | | | 0.00 | | 0.015 | 63.00 | 0.00 | 85.00 | 84.05 | 84.00 | N/A | 0.0007 | 84.16 | 84.12 |
| | V3 | V2 | 12 | 0.3 | 0.3 | 13.5 | 0.76 | 0.76 | 0.015 | 423.00 | 7.05 | 120.00 | 114.55 | 114.31 | 5.45 | 0.0006 | 114.58 | 114.33 |
| | | | N/A | | | | 0.00 | | 0.015 | 423.00 | 0.00 | 120.00 | 114.55 | 114.31 | N/A | 0.0006 | 114.58 | 114.33 |
| | V2 | V1 | 12 | 0.3 | 0.6 | 14.5 | 1.46 | 1.46 | 0.015 | 55.00 | 1.86 | 119.00 | 114.27 | 114.14 | 4.73 | 0.0022 | 114.32 | 114.20 |
| | | | N/A | | | | 0.00 | | 0.015 | 55.00 | 0.00 | 119.00 | 114.27 | 114.14 | N/A | 0.0022 | 114.32 | 114.20 |
| | W2 | W1 | 54 | 0.01 | 62.84 | 18.28 | 120.90 | 120.9 | 0.015 | 75.00 | 7.60 | 114.00 | 111.88 | 111.50 | 2.12 | 0.0050 | 112.87 | 112.50 |
| | | | N/A | | | | 0.00 | | 0.015 | 75.00 | 0.00 | 114.00 | 111.88 | 111.50 | N/A | 0.0050 | 112.87 | 112.50 |
| | W3 | W2 | 54 | 7.5 | 62.83 | 17.91 | 122.28 | 122.28 | 0.015 | 170.00 | 7.69 | 114.50 | 112.73 | 111.86 | 1.77 | 0.0051 | 113.75 | 112.87 |
| | | | N/A | | | | 0.00 | | 0.015 | 170.00 | 0.00 | 114.50 | 112.73 | 111.86 | N/A | 0.0051 | 113.75 | 112.87 |
| | W4 | W3 | 48 | 13.2 | 55.33 | 17.63 | 107.91 | 108.73 | 0.015 | 150.00 | 8.59 | 114.60 | 113.61 | 112.48 | 0.99 | 0.0075 | 114.88 | 113.75 |
| | | | N/A | | | | 0.83 | | 0.015 | 150.00 | 2.50 | 114.60 | 114.87 | 114.69 | -0.27 | 0.0010 | 114.88 | 114.74 |
| | W5 | W4 | 42 | 14. | 42.13 | 16.63 | 50.55 | 85.68 | 0.015 | 425.00 | 7.08 | 115.50 | 115.83 | 114.41 | -0.33 | 0.0034 | 116.31 | 114.88 |
| | | | N/A | | | | 35.13 | | 0.015 | 425.00 | 7.08 | 115.50 | 116.25 | 115.22 | -0.75 | 0.0022 | 116.31 | 115.36 |
| | W6 | W5 | 36 | 11.12 | 28.13 | 15.95 | 39.79 | 58.73 | 0.015 | 340.00 | 5.67 | 117.30 | 117.38 | 115.77 | -0.08 | 0.0047 | 117.92 | 116.31 |
| | | | N/A | | | | 18.95 | | 0.015 | 340.00 | 5.67 | 117.30 | 117.81 | 116.30 | -0.51 | 0.0047 | 117.92 | 116.31 |
| | W7 | W6 | 30 | 12.69 | 12.69 | 15. | 26.27 | 27.71 | 0.015 | 340.00 | 5.67 | 119.50 | 119.29 | 117.43 | 0.21 | 0.0055 | 119.78 | 117.93 |
| | | | N/A | | | | 1.44 | | 0.015 | 340.00 | 5.67 | 119.50 | 119.73 | 117.92 | -0.23 | 0.0055 | 119.78 | 117.92 |
| | W8 | W6 | 24 | 4.32 | 4.32 | 15. | 8.59 | 9.25 | 0.015 | 680.00 | 11.33 | 119.00 | 119.10 | 117.80 | -0.10 | 0.0019 | 119.23 | 117.92 |
| | | | N/A | | | | 0.66 | | 0.015 | 680.00 | 11.33 | 119.00 | 119.21 | 117.92 | -0.21 | 0.0019 | 119.23 | 117.92 |
| | X13 | X2 | 48 | 21.23 | 21.23 | 15. | 48.16 | 48.16 | 0.015 | 337.00 | 5.62 | 113.50 | 113.42 | 112.92 | 0.08 | 0.0015 | 113.67 | 113.17 |
| | | | N/A | | | | 0.00 | | 0.015 | 337.00 | 0.00 | 113.50 | 113.42 | 112.92 | N/A | 0.0015 | 113.67 | 113.17 |
| | X3 | X2 | 42 | 15.5 | 30.82 | 18.86 | 64.91 | 64.91 | 0.015 | 315.00 | 6.75 | 115.50 | 114.13 | 112.39 | 1.37 | 0.0055 | 114.91 | 113.17 |
| | | | N/A | | | | 0.00 | | 0.015 | 315.00 | 0.00 | 115.50 | 114.13 | 112.39 | N/A | 0.0055 | 114.91 | 113.17 |
| | X4 | X3 | 36 | 5.1 | 15.32 | 18. | 33.04 | 33.04 | 0.015 | 242.00 | 4.67 | 116.50 | 115.33 | 114.54 | 1.17 | 0.0033 | 115.71 | 114.92 |
| | | | N/A | | | | 0.00 | | 0.015 | 242.00 | 0.00 | 116.50 | 115.33 | 114.54 | N/A | 0.0033 | 115.71 | 114.92 |
| | X5 | X4 | 36 | 0.01 | 10.22 | 17. | 22.69 | 22.69 | 0.015 | 272.00 | 4.53 | 117.30 | 115.95 | 115.53 | 1.35 | 0.0015 | 116.13 | 115.71 |
| | | | N/A | | | | 0.00 | | 0.015 | 272.00 | 0.00 | 117.30 | 115.95 | 115.53 | N/A | 0.0015 | 116.13 | 115.71 |
| | X6 | X5 | 36 | 5.4 | 10.21 | 16. | 23.37 | 23.37 | 0.015 | 307.00 | 5.12 | 120.00 | 116.44 | 115.94 | 3.56 | 0.0016 | 116.63 | 116.13 |
| | | | N/A | | | | 0.00 | | 0.015 | 307.00 | 0.00 | 120.00 | 116.44 | 115.94 | N/A | 0.0016 | 116.63 | 116.13 |
| | X7 | X6 | 30 | 4.81 | 4.81 | 15. | 11.38 | 11.38 | 0.015 | 400.00 | 6.67 | 122.00 | 116.95 | 116.54 | 5.05 | 0.0010 | 117.04 | 116.63 |
| | | | N/A | | | | 0.00 | | 0.015 | 400.00 | 0.00 | 122.00 | 116.95 | 116.54 | N/A | 0.0010 | 117.04 | 116.63 |
| | X12 | X11 | 24 | 0.3 | 0.3 | 15. | 0.71 | 0.71 | 0.015 | 354.00 | 5.90 | 122.50 | 113.88 | 113.88 | 8.62 | 0.0000 | 113.88 | 113.88 |
| | | | N/A | | | | 0.00 | | 0.015 | 354.00 | 0.00 | 122.50 | 113.88 | 113.88 | N/A | 0.0000 | 113.88 | 113.88 |
| | X11 | X10 | 30 | 0.3 | 0.6 | 16. | 1.37 | 1.37 | 0.015 | 918.00 | 15.30 | 121.50 | 113.88 | 113.86 | 7.62 | 0.0000 | 113.88 | 113.86 |
| | | | N/A | | | | 0.00 | | 0.015 | 918.00 | 0.00 | 121.50 | 113.88 | 113.86 | N/A | 0.0000 | 113.88 | 113.86 |
| | X10 | X9 | 30 | 0.3 | 0.9 | 17. | 2.00 | 2. | 0.015 | 260.00 | 4.33 | 121.00 | 113.86 | 113.85 | 7.14 | 0.0000 | 113.86 | 113.85 |
| | | | N/A | | | | 0.00 | | 0.015 | 260.00 | 0.00 | 121.00 | 113.86 | 113.85 | N/A | 0.0000 | 113.86 | 113.85 |
| | X9 | X8 | 36 | 7.5 | 8.4 | 18. | 18.12 | 18.12 | 0.015 | 260.00 | 4.33 | 119.00 | 113.74 | 113.48 | 5.26 | 0.0010 | 113.85 | 113.60 |

| | Up Node Name | Down Node Name | Convey Size (in or ft) | Trib. Area at Up Node (acre) | Cumul. Area (acre) | Total Computed Response Time at Up Node (min.) | Compute d Flow at Convey (cfs) | Total Flow at Convey (cfs) | Convey 'n' Value | Total Length (feet) | Average Velocity (fps) | Rim/Grate at Up Node (feet) | Up HGL (feet) | Down HGL (feet) | Up (RIM-HGL) (feet) | Energy Slope (ft/ft) | Up EGL (feet) | Down EGL (feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | N/A | | | | 0.00 | | 0.015 | 260.00 | 0.00 | 119.00 | 113.74 | 113.48 | N/A | 0.0010 | 113.85 | 113.60 |
| | X8 | X2 | 42 | 7. | 15.4 | 19. | 32.32 | 32.32 | 0.015 | 310.00 | 5.17 | 116.00 | 113.40 | 112.97 | 2.60 | 0.0014 | 113.59 | 113.17 |
| | | | N/A | | | | 0.00 | | 0.015 | 310.00 | 0.00 | 116.00 | 113.40 | 112.97 | N/A | 0.0014 | 113.59 | 113.17 |
| | X2 | X1 | 60 | 0.3 | 67.75 | 19.64 | 137.73 | 137.73 | 0.015 | 354.00 | 7.01 | 114.50 | 112.32 | 111.00 | 2.18 | 0.0037 | 113.17 | 111.85 |
| | | | N/A | | | | 0.00 | | 0.015 | 354.00 | 0.00 | 114.50 | 112.32 | 111.00 | N/A | 0.0037 | 113.17 | 111.85 |
| | Z2 | Z1 | 48 | 20.19 | 20.19 | 13.5 | 50.27 | 50.27 | 0.015 | 73.00 | 4.00 | 111.00 | 108.12 | 108.00 | 2.88 | 0.0016 | 108.40 | 108.28 |
| | | | N/A | | | | 0.00 | | 0.015 | 73.00 | 0.00 | 111.00 | 108.12 | 108.00 | N/A | 0.0016 | 108.40 | 108.28 |

# APPENDIX H
## STORMWATER QUALITY CALCULATIONS
## LID CALCULATIONS

On-site drainage improvements consist of a combination of conventional subsurface and surface drainage systems, construction of pipe conveyance systems, and construction of culverts and bridges at roadway and trail crossings of creeks and tributaries. Stormwater will be discharged through outfalls into open space corridors. Vegetated swales, soft armoring, mechanical storm filters, structural interceptors and other best management practices will be utilized at pipe outfalls or other appropriate locations for water quality management, and to convey stormwater runoff to receiving waters while minimizing impacts to open space resources. All outfall structures will be extended past any bikeways that are constructed within the open spaces.

The number and location of outfalls in Figure 8-4 is based on the best available information and is subject to refinement during the subdivision map and improvement plan approvals, as well as state/federal permitting. Drainage facilities will be designed and constructed in conformance with the City of Roseville Improvement Standards, the City's Stormwater Quality Design Manual, the Placer County Flood Control Agency's Stormwater Management Manual, and the open space preserve Operations and Maintenance (O&M) Plan, the preparation of which is a requirement of the Clean Water Act 404 permit. The Preserve O&M Plan will include requirements to minimize erosion and direct drainage away from vernal pool habitat by employing conceptual drainage improvements to be outlined in the plan (swales, outfalls, energy dissipation, and erosion control).

Specific detail regarding the project drainage system is contained in the Drainage and Storm Water Master Plan on file with the City.

## 8.6 Stormwater Quality

Sierra Vista provides a comprehensive plan for the management of urban runoff for flow control and water quality improvement. The integrated stormwater management plan, which is reflected within the specific design criteria contained in this section. The objectives of the Sierra Vista stormwater management plan (SWMP) are intended to fulfill the requirements of the City's National Pollutant Discharge Elimination System (NPDES) Phase II Permit, as issued by the State Water Resources Control Board, and to minimize the effects of urban storm water runoff on the natural open space areas, including wetland areas and principal drainage corridors.

The Sierra Vista SWMP will be in accordance with the then current permit criteria applicable at the time of development. The SWMP provides the frame work for stormwater treatment during two distinct components of the development process, first, during the construction phase while infrastructure is being built to support the community, and the post construction phase which will be part of the improvements that make up the community and continue to protect the natural resources in perpetuity.

The Sierra Vista SWMP will be in accordance with the then current permit criteria applicable at the time of development. The SWMP provides the frame work for stormwater treatment during two district

components of the development process, first, during the construction phase while infrastructure is being built to support the community, and the post construction phase which will be part of the improvements that make up the community and continue to protect the natural resources in perpetuity.

### A. Stormwater Management During Construction Activities

The release of on-site stormwater runoff during Construction activities is regulated by the State General Construction Permit issued by the Regional Water Quality Control Board for all construction sites greater than one acre. The General Construction permit requires that a Storm Water Pollution Prevention Plan (SWPPP) is created to address how the storm water from a particular construction site will be maintained and treated prior to being discarded from the site. The SWPPP is an evolving document that changes with the dynamics of the site development.

The use of Best Management Practices (BMPs) during the construction process will generally incorporate erosion controls and sediment controls. Erosion and sediment control BMPs include such things as applying straw mulch to disturbed areas, the use of fiber rolls and silt fences, sedimentation basins, drain inlet protection, stabilized construction accesses, and material management. The final sizing and selection of BMPs will consider requirements specific to the Curry Creek watershed and proposed developed activities.

### B. Post Construction Stormwater Management

Post construction stormwater management is intended to treat the urban runoff generated on-site in perpetuity. The BMP techniques within the plan area will reduce and/or eliminate the pollutants from the urban stormwater runoff and prevent the contamination of receiving waters. Sierra Vista will work with the then current permit criteria applicable at the time of development and in conformance with the City of Roseville Improvement Standards, the City's Stormwater Quality Design Manual, the Placer County Flood Control Agency's Stormwater Management Manual, the open space preserve Operations and Maintenance (O&M) Plan, to design and address post construction stormwater treatment.

Post construction stormwater treatment is composed of three general elements, source control, runoff reduction and treatment of runoff. All three elements will be used in the Sierra Vista SWMP. The basic practice of source control is to minimize the potential for constituents to enter runoff at the source. The main tool the project will employ towards the goal of runoff reduction, is the use of Low Impact Development(LID) measures. Implementation of LID includes the construction of decentralized small scale improvements that provide for local infiltration and treatment opportunities that reduce the quantity of runoff which enters the storm drain systems during a rainfall event. LID will be implemented to offset for runoff increases that occur with the development as a matter of the conversion of native f ground surfaces to impervious cover. Additional Treatment control BMPs will be located at the end of the pipe and provide further treatment of the stormwater before it enters into the natural creek system.

**Low Impact Development (LID)**

Low impact development (LID) is an approach to stormwater management that emphasizes the use of small-scale, natural, constructed and proprietary drainage features integrated throughout the city to capture urban runoff and precipitation. LID measures can slow, clean, infiltrate and evapotranspire runoff, which reduce the quantity of urban runoff entering the city storm drain systems. The added opportunities for infiltration offered by the use of LID can add water to local aquifers, increasing water reuse. It is a sustainable practice that benefits water quality protection, stream stability and can contribute to water supply. The intent is to weave the textures of natural processes into the fabric of development. Unlike traditional storm water management, which collects and conveys storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID within Sierra Vista will take a different approach by using site design elements, LID and storm water management to minimize changes to the site's pre-development runoff rates and volumes. Sierra Vista's LID elements are will assist with the goal ofmimicing the site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Key principles of low impact development include:

- Decentralize and manage urban runoff to integrate storm water management throughout the watershed
- Preserve the ecosystem's natural hydrological functions and cycles.
- Account for a site's topographic features in its design.
- Reduce directly connected impervious surfaces to slow runoff and provide additional infiltration opportunities.
- Reduce impervious ground cover and maximize infiltration on-site.

As Sierra Vista develops, specific LID techniques, tools, and material will be used and specified in the construction documents that will control the amount of impervious surface, increase infiltration, and improve water quality by reducing runoff from the developed sites. The Sierra Vista master drainage study has accounted for the percent of runoff reduction expected with the implementation of these LID practices. "Additional project design elements within the open space areas will also provide hydrograph modification benefits. The created wetland elements will provide additional floodplain storage capacity which is factored into the project hydrology analysis. The created wetlands also provide LID and treatment potential which has not been factored into the project mitigation, which include: added infiltration opportunities, evapotranspiration opportunities, nutrient uptake, biological filtering, and stream buffers."

LID elements within Sierra Vista may include

- Disconnected roof drains
- Disconnected and separated pavement
- Bioretention facilities, rain gardens, and bioswales
- Tree Planting
- Grass swales and channels,

- Curb cuts and vegetated filter strips,
- Impervious surface reduction – permeable pavements and porous pavements,
- Stream Buffers
- Soil Amendments
- Pollution prevention and good housekeeping.

PROVIDE GRAPHICS OF EXAMPLE BMP'S HERE

The State is beginning to draft new requirements to the Storm Water Management permits. At the time that Sierra Vista develops it is anticipated that the NPDES permit will include will include requirements that hydrograph modification impacts be addressed to some level". The project drainage study includes a section addressing the potential hydrograph modification impacts of this project, and the net impacts of the project with the mitigations proposed.

**End of Pipe Stormwater Treatment Control**

In addition to the implementation of the above referenced LID measures, the storm drain system will be designed to provide additional protection of the natural environment and receiving water of Curry Creek by providing end of pipe treatment techniques. This element adds to the treatment train and consists treatment elements such as structural BMP's or Grass treatment swales.

Special consideration will be taken within Sierra Vista to capture, convey and release the urban storm water to the creek system. The treatment and conveyance of storm runoff in and through the open spaces will be made part of the Corp of Engineers 404 permitting process. Standard practices include the use of headwall structures, directly at the outfall location, that stabilize and protect the outlet pipe, surrounding topography and aid in velocity attenuation while minimizing future maintenance costs. Conveyance "grassy swales" that direct the storm water from the pipe outlet to the receiving waters, while avoiding sensitive habitat and distributing the concentrated pipe flows to a spread sheet flow will be used at every outfall in the project. Depending on the size of and frequency of particular storm events, and the actual drainage area being conveyed, the conveyance swales will be armored with geo-synthetics that will minimize the potential for future erosion and rilling of the open space. This soft armoring approach will provide opportunity to create grassy swales and additional wetlands that will aide in storm water filtration and infiltration. Additional structural BMP's can be added to the treatment train and end of pipe treatment as needed, they include such devices as:

Installation of "fossil filter" or equivalent petroleum absorbing insert assemblies in the project drop inlets;

Trash screen vaults;

Structural BMPs such as vortex devices;

The final selection of BMPs will consider requirements specific to the Curry Creek watershed and proposed development flows. Other BMPs will involve prompt re-vegetation of disturbed areas and proper erosion protection per the NPDES permit during construction. The end of pipe BMP's will be designed with complete redundancy as if no other stormwater quality improvements or LID measures

were to be implemented (City requirement). Upon exiting the Sierra Vista Treatment Train, runoff will have been reduced, controlled and treated in excess of the minimum standards.

# Post-Construction Water Balance Calculator

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | User may make changes from any cell that is orange or brown in color (similar to the cells to the immediate right). Cells in green are calculated for you. | NON-SWALE LID RVR V | (Step 1a) If you know the 85th percentile storm event for your location enter it in the box below | (Step 1b) If you can not answer 1a then select the county where the project is located (click on the cell to the right for drop-down): This will determine the average 85th percentile 24 hr. storm event for your site, which will appear under precipitation to left. | PLACER | | | | | | | |
| 4 | | 71.3879453 | | (Step 1c) If you would like a more percise value select the location closest to your site. If you do not recgonize any of these locations, leave this drop-down menu at location. The average value for the County will be used. | SACRAMENTO FAA ARPT | | | | | | | |
| 5 | **Project Information** | | | **Runoff Calculations** | | | | | | | | |
| 6 | ***Project Name:*** | ***Sierra Vista Specific Plan*** | | (Step 2) Indicate the Soil Type (dropdown menu to right): | ***Group D Soils*** | ***Very low infiltration. Clay loam, silty clay loam, sandy clay, silty clay, or clay. Infiltration rate 0 to 0.05 inch/hr when wet.*** | | | | | | |
| 7 | ***Waste Discharge Identification (WDID):*** | ***Curry Creek*** | | (Step 3) Indicate the existing **dominant** non-built land Use Type (dropdown menu to right): | ***Pasture/Grassland/Range: 50% to 75% ground cover & not heavily grazed*** | | | | | | | |
| 8 | ***Date:*** | ***9-Jun-08*** | | (Step 4) Indicate the proposed **dominant** non-built land Use Type (dropdown menu to right): | ***A mix of lawn, grass, pasture and tress covering less than 50% of the open space*** | | | | | | | |
| 9 | ***Sub Drainage Area Name (from map):*** | ***SAMPLE PQP*** | | | **Complete Either** | | | | | | | |
| 10 | **Runoff Curve Numbers** | | | | **Sq Ft** | **Acres** | **Acres** | | | | | |
| 11 | **Existing Pervious Runoff Curve Number** | **84** | | *(Step 5) Total Project Site Area:* | | **100.00** | **100.00** | | | | | |
| 12 | **Proposed Development Pervious Runoff Curve Number** | **96** | | *(Step 6) Sub-watershed Area:* | | **100.00** | **100.00** | | | | | |
| 13 | **Design Storm** | | | *Percent of total project :* | **100%** | | | | | | | |
| 14 | Based on the County you indicated above, we have included the 85 percentile average 24 hr event - P85 (in)^ for your area. | **0.62** | **in** | | | | | | | | | |
| 15 | The Amount of rainfall needed for runoff to occur (Existing runoff curve number -P from existing RCN (in)^) | **0.38** | **In** | ***(Step 7) Sub-watershed Conditions*** | **Complete Either** | | **Calculated Acres** | | | | | |
| 16 | P used for calculations (in) (the greater of the above two criteria) | **0.62** | **In** | Sub-watershed Area (acres) | **Sq Ft** | **Acres** | **100.00** | | | | | |
| 17 | ^Available at www.cabmphandbooks.com | | | Existing Rooftop Impervious Coverage | | **0** | **0.00** | | | | | |
| 18 | | | | Existing Non-Rooftop Impervious Coverage | | **0** | **0.00** | | | | | |
| 19 | | | | Proposed Rooftop Impervious Coverage | | **0** | **0.00** | | | | | |
| 20 | | | | Proposed Non-Rooftop Impervious Coverage | | **85** | **85.00** | | | | | |
| 21 | | | | | | | | | | | | |
| 22 | | | | ***Credits*** | **Acres** | | **Square Feet** | | | | | |
| 23 | | | | Porous Pavement | **0.00** | | **0** | | | | | |
| 24 | | | | Tree Planting | **3.75** | | **163,350** | | | | | |
| 25 | **Pre-Project Runoff Volume (cu ft)** | **9,770** | **Cu.Ft.** | Downspout Disconnection | **0.00** | | **0** | | | | | |
| 26 | **Project-Related Runoff Volume Increase w/o credits (cu ft)** | **149,374** | **Cu.Ft.** | Impervious Area Disconnection | **42.50** | | **1,851,300** | | | | | |
| 27 | | | | Green Roof | **0.00** | | **0** | | | | | |
| 28 | | | | Stream Buffer | **0.00** | | **0** | | | | | |
| 29 | | | | Vegetated Swales | **37.78** | | **1,645,697** | | | | | |
| 30 | **Project-Related Volume Increase with Credits (cu ft)** | **-27,658** | **Cu.Ft.** | **Subtotal** | **84.03** | | **3,660,347** | | | | | |
| 31 | | | | **Subtotal Runoff Volume Reduction Credit** | **151674 Cu. Ft.** | | | | | | | |
| 32 | | | | | | | | | | | | |
| 33 | You have achieved your minimum requirements | | | ***(Step 9) Impervious Volume Reduction Credits*** | **Volume (cubic feet)** | | | | | | | |
| 34 | | | | Rain Barrels/Cisterns | **0 Cu. Ft.** | | | | | | | |
| 35 | | | | Soil Quality | **25,358 Cu. Ft.** | | | | | | | |
| 36 | | | | **Subtotal Runoff Volume Reduction** | **25,358 Cu. Ft.** | | | | | | | |
| 37 | | | | **Total Runoff Volume Reduction Credit** | **177,032 Cu. Ft.** | | | | | | | |
| 38 | | | | | | | | | | | | |
| 39 | | | | | | | | | | | | |

# Post-Construction Water Balance Calculator

User may make changes from any cell that is orange or brown in color (similar to the cells to the immediate right). Cells in green are calculated for you.

NON-SWALE LID RVR V

81.61538034

(Step 1a) If you know the 85th percentile storm event for your location enter it in the box below

(Step 1b) If you can not answer 1a then select the county where the project is located (click on the cell to the right for drop-down): This will determine the average 85th percentile 24 hr. storm event for your site, which will appear under precipitation to left.

**PLACER**

(Step 1c) If you would like a more percise value select the location closest to your site. If you do not recgonize any of these locations, leave this drop-down menu at location. The average value for the County will be used.

**SACRAMENTO FAA ARPT**

## Project Information

| | |
|---|---|
| ***Project Name:*** | ***Sierra Vista Specific Plan*** |
| ***Waste Discharge Identification (WDID):*** | ***Curry Creek*** |
| ***Date:*** | ***9-Jun-08*** |
| ***Sub Drainage Area Name (from map):*** | ***SAMPLE PQP*** |

### Runoff Curve Numbers

| | |
|---|---|
| **Existing Pervious Runoff Curve Number** | **84** |
| **Proposed Development Pervious Runoff Curve Number** | **91** |

### Design Storm

| | | |
|---|---|---|
| Based on the County you indicated above, we have included the 85 percentile average 24 hr event - P85 (in)^ for your area. | **0.62** | **in** |
| The Amount of rainfall needed for runoff to occur (Existing runoff curve number -P from existing RCN (in)^) | **0.38** | **In** |
| P used for calculations (in) (the greater of the above two criteria) | **0.62** | **In** |

^Available at www.cabmphandbooks.com

| | | |
|---|---|---|
| **Pre-Project Runoff Volume (cu ft)** | **9,770** | **Cu.Ft.** |
| **Project-Related Runoff Volume Increase w/o credits (cu ft)** | **90,024** | **Cu.Ft.** |
| **Project-Related Volume Increase with Credits (cu ft)** | **-25,939** | **Cu.Ft.** |

You have achieved your minimum requirements

## Runoff Calculations

(Step 2) Indicate the Soil Type (dropdown menu to right):

***Group D Soils*** — **Very low infiltration. Clay loam, silty clay loam, sandy clay, silty clay, or clay. Infiltration rate 0 to 0.05 inch/hr when wet.**

(Step 3) Indicate the existing **dominant** non-built land Use Type (dropdown menu to right):

***Pasture/Grassland/Range: 50% to 75% ground cover & not heavily grazed***

(Step 4) Indicate the proposed **dominant** non-built land Use Type (dropdown menu to right):

***A mix of lawn, grass, pasture and tress covering less than 50% of the open space***

| | Complete Either Sq Ft | Acres | Acres |
|---|---|---|---|
| *(Step 5) Total Project Site Area:* | | 100.00 | 100.00 |
| *(Step 6) Sub-watershed Area:* | | 100.00 | 100.00 |
| *Percent of total project :* | | 100% | |

### (Step 7) Sub-watershed Conditions

| | Complete Either Sq Ft | Acres | Calculated Acres |
|---|---|---|---|
| Sub-watershed Area (acres) | | | 100.00 |
| Existing Rooftop Impervious Coverage | | 0 | 0.00 |
| Existing Non-Rooftop Impervious Coverage | | 0 | 0.00 |
| Proposed Rooftop Impervious Coverage | | 16 | 16.00 |
| Proposed Non-Rooftop Impervious Coverage | | 24 | 24.00 |

| ***Credits*** | Acres | Square Feet |
|---|---|---|
| Porous Pavement | 0.00 | 0 |
| Tree Planting | 3.75 | 163,350 |
| Downspout Disconnection | 8.00 | 348,480 |
| Impervious Area Disconnection | 4.80 | 209,088 |
| Green Roof | 0.00 | 0 |
| Stream Buffer | 0.00 | 0 |
| Vegetated Swales | 22.07 | 961,369 |
| **Subtotal** | 38.62 | 1,682,287 |
| **Subtotal Runoff Volume Reduction Credit** | 79737 Cu. Ft. | |

### (Step 9) Impervious Volume Reduction Credits

| | Volume (cubic feet) |
|---|---|
| Rain Barrels/Cisterns | 0 Cu. Ft. |
| Soil Quality | 36,226 Cu. Ft. |
| **Subtotal Runoff Volume Reduction** | 36,226 Cu. Ft. |
| **Total Runoff Volume Reduction Credit** | 115,963 Cu. Ft. |

# Post-Construction Water Balance Calculator

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | User may make changes from any cell that is orange or brown in color (similar to the cells to the immediate right). Cells in green are calculated for you. | NON-SWALE LID RVR V | (Step 1a) If you know the 85th percentile storm event for your location enter it in the box below | (Step 1b) If you can not answer 1a then select the county where the project is located (click on the cell to the right for drop-down): This will determine the average 85th percentile 24 hr. storm event for your site, which will appear under precipitation to left. | PLACER | | | | | | | |
| 4 | | 99.96558827 | | (Step 1c) If you would like a more percise value select the location closest to your site. If you do not recgonize any of these locations, leave this drop-down menu at location. The average value for the County will be used. | SACRAMENTO FAA ARPT | | | | | | | |
| 5 | **Project Information** | | | **Runoff Calculations** | | | | | | | | |
| 6 | ***Project Name:*** | ***Sierra Vista Specific Plan*** | | (Step 2) Indicate the Soil Type (dropdown menu to right): | ***Group D Soils*** | ***Very low infiltration. Clay loam, silty clay loam, sandy clay, silty clay, or clay. Infiltration rate 0 to 0.05 inch/hr when wet.*** | | | | | | |
| 7 | ***Waste Discharge Identification (WDID):*** | ***Curry Creek*** | | (Step 3) Indicate the existing **dominant** non-built land Use Type (dropdown menu to right): | ***Pasture/Grassland/Range: 50% to 75% ground cover & not heavily grazed*** | | | | | | | |
| 8 | ***Date:*** | ***9-Jun-08*** | | (Step 4) Indicate the proposed **dominant** non-built land Use Type (dropdown menu to right): | ***A mix of lawn, grass, pasture and tress covering less than 50% of the open space*** | | | | | | | |
| 9 | ***Sub Drainage Area Name (from map):*** | ***SAMPLE PARK*** | | | **Complete Either** | | | | | | | |
| 10 | **Runoff Curve Numbers** | | | | **Sq Ft** | **Acres** | **Acres** | | | | | |
| 11 | **Existing Pervious Runoff Curve Number** | **84** | | *(Step 5) Total Project Site Area:* | | **100.00** | **100.00** | | | | | |
| 12 | **Proposed Development Pervious Runoff Curve Number** | **87** | | *(Step 6) Sub-watershed Area:* | | **100.00** | **100.00** | | | | | |
| 13 | **Design Storm** | | | *Percent of total project :* | **100%** | | | | | | | |
| 14 | Based on the County you indicated above, we have included the 85 percentile average 24 hr event - P85 (in)^ for your area. | **0.62** | **in** | | | | | | | | | |
| 15 | The Amount of rainfall needed for runoff to occur (Existing runoff curve number -P from existing RCN (in)^) | **0.38** | **In** | ***(Step 7) Sub-watershed Conditions*** | **Complete Either** | | **Calculated Acres** | | | | | |
| 16 | P used for calculations (in) (the greater of the above two criteria) | **0.62** | **In** | Sub-watershed Area (acres) | **Sq Ft** | **Acres** | **100.00** | | | | | |
| 17 | ^Available at www.cabmphandbooks.com | | | Existing Rooftop Impervious Coverage | | **0** | **0.00** | | | | | |
| 18 | | | | Existing Non-Rooftop Impervious Coverage | | **0** | **0.00** | | | | | |
| 19 | | | | Proposed Rooftop Impervious Coverage | | **1** | **1.00** | | | | | |
| 20 | | | | Proposed Non-Rooftop Impervious Coverage | | **4** | **4.00** | | | | | |
| 21 | | | | | | | | | | | | |
| 22 | | | | ***Credits*** | **Acres** | | **Square Feet** | | | | | |
| 23 | | | | Porous Pavement | **0.00** | | **0** | | | | | |
| 24 | | | | Tree Planting | **1.88** | | **81,893** | | | | | |
| 25 | **Pre-Project Runoff Volume (cu ft)** | **9,770** | **Cu.Ft.** | Downspout Disconnection | **0.50** | | **21,780** | | | | | |
| 26 | **Project-Related Runoff Volume Increase w/o credits (cu ft)** | **27,479** | **Cu.Ft.** | Impervious Area Disconnection | **0.80** | | **34,848** | | | | | |
| 27 | | | | Green Roof | **0.00** | | **0** | | | | | |
| 28 | | | | Stream Buffer | **0.50** | | **21,780** | | | | | |
| 29 | | | | Vegetated Swales | **1.54** | | **67,082** | | | | | |
| 30 | **Project-Related Volume Increase with Credits (cu ft)** | **8,805** | **Cu.Ft.** | **Subtotal** | **5.22** | | **227,383** | | | | | |
| 31 | | | | **Subtotal Runoff Volume Reduction Credit** | **11429 Cu. Ft.** | | | | | | | |
| 32 | You need to do more impervious area reduction to meet minimum requirements | | | | | | | | | | | |
| 33 | | | | ***(Step 9) Impervious Volume Reduction Credits*** | **Volume (cubic feet)** | | | | | | | |
| 34 | | | | Rain Barrels/Cisterns | **0 Cu. Ft.** | | | | | | | |
| 35 | | | | Soil Quality | **7,245 Cu. Ft.** | | | | | | | |
| 36 | | | | **Subtotal Runoff Volume Reduction** | **7,245 Cu. Ft.** | | | | | | | |
| 37 | | | | **Total Runoff Volume Reduction Credit** | **18,674 Cu. Ft.** | | | | | | | |
| 38 | | | | | | | | | | | | |
| 39 | | | | | | | | | | | | |

# Post-Construction Water Balance Calculator

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | User may make changes from any cell that is orange or brown in color (similar to the cells to the immediate right). Cells in green are calculated for you. | NON-SWALE LID RVR V | (Step 1a) If you know the 85th percentile storm event for your location enter it in the box below | (Step 1b) If you can not answer 1a then select the county where the project is located (click on the cell to the right for drop-down): This will determine the average 85th percentile 24 hr. storm event for your site, which will appear under precipitation to left. | PLACER | | | | | | | |
| 4 | | 78.5938265 | | (Step 1c) If you would like a more percise value select the location closest to your site. If you do not recgonize any of these locations, leave this drop-down menu at location. The average value for the County will be used. | SACRAMENTO FAA ARPT | | | | | | | |
| 5 | **Project Information** | | | **Runoff Calculations** | | | | | | | | |
| 6 | ***Project Name:*** | ***Sierra Vista Specific Plan*** | | (Step 2) Indicate the Soil Type (dropdown menu to right): | ***Group D Soils*** | ***Very low infiltration. Clay loam, silty clay loam, sandy clay, silty clay, or clay. Infiltration rate 0 to 0.05 inch/hr when wet.*** | | | | | | |
| 7 | ***Waste Discharge Identification (WDID):*** | ***Curry Creek*** | | (Step 3) Indicate the existing **dominant** non-built land Use Type (dropdown menu to right): | ***Pasture/Grassland/Range: 50% to 75% ground cover & not heavily grazed*** | | | | | | | |
| 8 | ***Date:*** | ***9-Jun-08*** | | (Step 4) Indicate the proposed **dominant** non-built land Use Type (dropdown menu to right): | ***A mix of lawn, grass, pasture and tress covering less than 50% of the open space*** | | | | | | | |
| 9 | ***Sub Drainage Area Name (from map):*** | ***SAMPLE MDR*** | | | **Complete Either** | | | | | | | |
| 10 | ***Runoff Curve Numbers*** | | | | **Sq Ft** | **Acres** | **Acres** | | | | | |
| 11 | **Existing Pervious Runoff Curve Number** | **84** | | *(Step 5) Total Project Site Area:* | | **100.00** | **100.00** | | | | | |
| 12 | **Proposed Development Pervious Runoff Curve Number** | **92** | | *(Step 6) Sub-watershed Area:* | | **100.00** | **100.00** | | | | | |
| 13 | ***Design Storm*** | | | *Percent of total project :* | **100%** | | | | | | | |
| 14 | Based on the County you indicated above, we have included the 85 percentile average 24 hr event - P85 (in)^ for your area. | **0.62** | **in** | | | | | | | | | |
| 15 | The Amount of rainfall needed for runoff to occur (Existing runoff curve number -P from existing RCN (in)^) | **0.38** | **In** | ***(Step 7) Sub-watershed Conditions*** | **Complete Either** | | **Calculated Acres** | | | | | |
| 16 | P used for calculations (in) (the greater of the above two criteria) | **0.62** | **In** | Sub-watershed Area (acres) | **Sq Ft** | **Acres** | **100.00** | | | | | |
| 17 | ^Available at www.cabmphandbooks.com | | | Existing Rooftop Impervious Coverage | | **0** | **0.00** | | | | | |
| 18 | | | | Existing Non-Rooftop Impervious Coverage | | **0** | **0.00** | | | | | |
| 19 | | | | Proposed Rooftop Impervious Coverage | | **20** | **20.00** | | | | | |
| 20 | | | | Proposed Non-Rooftop Impervious Coverage | | **30** | **30.00** | | | | | |
| 21 | | | | | | | | | | | | |
| 22 | | | | ***Credits*** | **Acres** | | **Square Feet** | | | | | |
| 23 | | | | Porous Pavement | **0.00** | | **0** | | | | | |
| 24 | | | | Tree Planting | **3.75** | | **163,350** | | | | | |
| 25 | **Pre-Project Runoff Volume (cu ft)** | **9,770** | **Cu.Ft.** | Downspout Disconnection | **16.00** | | **696,960** | | | | | |
| 26 | **Project-Related Runoff Volume Increase w/o credits (cu ft)** | **105,634** | **Cu.Ft.** | Impervious Area Disconnection | **2.40** | | **104,544** | | | | | |
| 27 | | | | Green Roof | **0.00** | | **0** | | | | | |
| 28 | | | | Stream Buffer | **0.00** | | **0** | | | | | |
| 29 | | | | Vegetated Swales | **26.48** | | **1,153,469** | | | | | |
| 30 | **Project-Related Volume Increase with Credits (cu ft)** | **-29,366** | **Cu.Ft.** | **Subtotal** | **48.63** | | **2,118,323** | | | | | |
| 31 | | | | **Subtotal Runoff Volume Reduction Credit** | **98774 Cu. Ft.** | | | | | | | |
| 32 | | | | | | | | | | | | |
| 33 | You have achieved your minimum requirements | | | ***(Step 9) Impervious Volume Reduction Credits*** | **Volume (cubic feet)** | | | | | | | |
| 34 | | | | Rain Barrels/Cisterns | **0 Cu. Ft.** | | | | | | | |
| 35 | | | | Soil Quality | **36,226 Cu. Ft.** | | | | | | | |
| 36 | | | | **Subtotal Runoff Volume Reduction** | **36,226 Cu. Ft.** | | | | | | | |
| 37 | | | | **Total Runoff Volume Reduction Credit** | **135,000 Cu. Ft.** | | | | | | | |
| 38 | | | | | | | | | | | | |
| 39 | | | | | | | | | | | | |

# Post-Construction Water Balance Calculator

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | User may make changes from any cell that is orange or brown in color (similar to the cells to the immediate right). Cells in green are calculated for you. | NON-SWALE LID RVR V | (Step 1a) If you know the 85th percentile storm event for your location enter it in the box below | (Step 1b) If you can not answer 1a then select the county where the project is located (click on the cell to the right for drop-down): This will determine the average 85th percentile 24 hr. storm event for your site, which will appear under precipitation to left. | PLACER | | | | | | | |
| 4 | | 88.50830604 | | (Step 1c) If you would like a more percise value select the location closest to your site. If you do not recgonize any of these locations, leave this drop-down menu at location. The average value for the County will be used. | SACRAMENTO FAA ARPT | | | | | | | |
| 5 | **Project Information** | | | **Runoff Calculations** | | | | | | | | |
| 6 | ***Project Name:*** | ***Sierra Vista Specific Plan*** | | (Step 2) Indicate the Soil Type (dropdown menu to right): | ***Group D Soils*** | ***Very low infiltration. Clay loam, silty clay loam, sandy clay, silty clay, or clay. Infiltration rate 0 to 0.05 inch/hr when wet.*** | | | | | | |
| 7 | ***Waste Discharge Identification (WDID):*** | ***Curry Creek*** | | (Step 3) Indicate the existing **dominant** non-built land Use Type (dropdown menu to right): | ***Pasture/Grassland/Range: 50% to 75% ground cover & not heavily grazed*** | | | | | | | |
| 8 | ***Date:*** | ***9-Jun-08*** | | (Step 4) Indicate the proposed **dominant** non-built land Use Type (dropdown menu to right): | ***A mix of lawn, grass, pasture and tress covering less than 50% of the open space*** | | | | | | | |
| 9 | ***Sub Drainage Area Name (from map):*** | ***SAMPLE LDR*** | | | **Complete Either** | | | | | | | |
| 10 | ***Runoff Curve Numbers*** | | | | **Sq Ft** | **Acres** | **Acres** | | | | | |
| 11 | **Existing Pervious Runoff Curve Number** | **84** | | *(Step 5) Total Project Site Area:* | | **100.00** | **100.00** | | | | | |
| 12 | **Proposed Development Pervious Runoff Curve Number** | **91** | | *(Step 6) Sub-watershed Area:* | | **100.00** | **100.00** | | | | | |
| 13 | ***Design Storm*** | | | *Percent of total project :* | **100%** | | | | | | | |
| 14 | Based on the County you indicated above, we have included the 85 percentile average 24 hr event - P85 (in)^ for your area. | **0.62** | **in** | | | | | | | | | |
| 15 | The Amount of rainfall needed for runoff to occur (Existing runoff curve number -P from existing RCN (in)^) | **0.38** | **In** | ***(Step 7) Sub-watershed Conditions*** | **Complete Either** | | **Calculated Acres** | | | | | |
| 16 | P used for calculations (in) (the greater of the above two criteria) | **0.62** | **In** | Sub-watershed Area (acres) | **Sq Ft** | **Acres** | **100.00** | | | | | |
| 17 | ^Available at www.cabmphandbooks.com | | | Existing Rooftop Impervious Coverage | | **0** | **0.00** | | | | | |
| 18 | | | | Existing Non-Rooftop Impervious Coverage | | **0** | **0.00** | | | | | |
| 19 | | | | Proposed Rooftop Impervious Coverage | | **13.32** | **13.32** | | | | | |
| 20 | | | | Proposed Non-Rooftop Impervious Coverage | | **26.64** | **26.64** | | | | | |
| 21 | | | | | | | | | | | | |
| 22 | | | | ***Credits*** | **Acres** | | **Square Feet** | | | | | |
| 23 | | | | Porous Pavement | **0.00** | | **0** | | | | | |
| 24 | | | | Tree Planting | **4.50** | | **196,020** | | | | | |
| 25 | **Pre-Project Runoff Volume (cu ft)** | **9,770** | **Cu.Ft.** | Downspout Disconnection | **12.65** | | **551,034** | | | | | |
| 26 | **Project-Related Runoff Volume Increase w/o credits (cu ft)** | **89,980** | **Cu.Ft.** | Impervious Area Disconnection | **2.13** | | **92,783** | | | | | |
| 27 | | | | Green Roof | **0.00** | | **0** | | | | | |
| 28 | | | | Stream Buffer | **0.00** | | **0** | | | | | |
| 29 | | | | Vegetated Swales | **19.30** | | **840,708** | | | | | |
| 30 | **Project-Related Volume Increase with Credits (cu ft)** | **-25,901** | **Cu.Ft.** | **Subtotal** | **38.58** | | **1,680,545** | | | | | |
| 31 | | | | **Subtotal Runoff Volume Reduction Credit** | **79655 Cu. Ft.** | | | | | | | |
| 32 | | | | | | | | | | | | |
| 33 | You have achieved your minimum requirements | | | ***(Step 9) Impervious Volume Reduction Credits*** | **Volume (cubic feet)** | | | | | | | |
| 34 | | | | Rain Barrels/Cisterns | **0 Cu. Ft.** | | | | | | | |
| 35 | | | | Soil Quality | **36,226 Cu. Ft.** | | | | | | | |
| 36 | | | | **Subtotal Runoff Volume Reduction** | **36,226 Cu. Ft.** | | | | | | | |
| 37 | | | | **Total Runoff Volume Reduction Credit** | **115,881 Cu. Ft.** | | | | | | | |
| 38 | | | | | | | | | | | | |
| 39 | | | | | | | | | | | | |

# Post-Construction Water Balance Calculator

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | User may make changes from any cell that is orange or brown in color (similar to the cells to the immediate right). Cells in green are calculated for you. | NON-SWALE LID RVR V | (Step 1a) If you know the 85th percentile storm event for your location enter it in the box below | (Step 1b) If you can not answer 1a then select the county where the project is located (click on the cell to the right for drop-down): This will determine the average 85th percentile 24 hr. storm event for your site, which will appear under precipitation to left. | PLACER | | | | | | | |
| 4 | | 70.79997123 | | (Step 1c) If you would like a more percise value select the location closest to your site. If you do not recgonize any of these locations, leave this drop-down menu at location. The average value for the County will be used. | SACRAMENTO FAA ARPT | | | | | | | |
| 5 | **Project Information** | | | **Runoff Calculations** | | | | | | | | |
| 6 | ***Project Name:*** | ***Sierra Vista Specific Plan*** | | (Step 2) Indicate the Soil Type (dropdown menu to right): | ***Group D Soils*** | ***Very low infiltration. Clay loam, silty clay loam, sandy clay, silty clay, or clay. Infiltration rate 0 to 0.05 inch/hr when wet.*** | | | | | | |
| 7 | ***Waste Discharge Identification (WDID):*** | ***Curry Creek*** | | (Step 3) Indicate the existing **dominant** non-built land Use Type (dropdown menu to right): | ***Pasture/Grassland/Range: 50% to 75% ground cover & not heavily grazed*** | | | | | | | |
| 8 | ***Date:*** | ***9-Jun-08*** | | (Step 4) Indicate the proposed **dominant** non-built land Use Type (dropdown menu to right): | ***A mix of lawn, grass, pasture and tress covering less than 50% of the open space*** | | | | | | | |
| 9 | ***Sub Drainage Area Name (from map):*** | ***SAMPLE HDR*** | | | **Complete Either** | | | | | | | |
| 10 | **Runoff Curve Numbers** | | | | **Sq Ft** | **Acres** | **Acres** | | | | | |
| 11 | **Existing Pervious Runoff Curve Number** | **84** | | *(Step 5) Total Project Site Area:* | | **100.00** | **100.00** | | | | | |
| 12 | **Proposed Development Pervious Runoff Curve Number** | **94** | | *(Step 6) Sub-watershed Area:* | | **100.00** | **100.00** | | | | | |
| 13 | **Design Storm** | | | *Percent of total project :* | **100%** | | | | | | | |
| 14 | Based on the County you indicated above, we have included the 85 percentile average 24 hr event - P85 (in)^ for your area. | **0.62** | **in** | | | | | | | | | |
| 15 | The Amount of rainfall needed for runoff to occur (Existing runoff curve number -P from existing RCN (in)^) | **0.38** | **In** | ***(Step 7) Sub-watershed Conditions*** | **Complete Either** | | **Calculated Acres** | | | | | |
| 16 | P used for calculations (in) (the greater of the above two criteria) | **0.62** | **In** | Sub-watershed Area (acres) | **Sq Ft** | **Acres** | **100.00** | | | | | |
| 17 | ^Available at www.cabmphandbooks.com | | | Existing Rooftop Impervious Coverage | | **0** | **0.00** | | | | | |
| 18 | | | | Existing Non-Rooftop Impervious Coverage | | **0** | **0.00** | | | | | |
| 19 | | | | Proposed Rooftop Impervious Coverage | | **30** | **30.00** | | | | | |
| 20 | | | | Proposed Non-Rooftop Impervious Coverage | | **35** | **35.00** | | | | | |
| 21 | | | | | | | | | | | | |
| 22 | | | | ***Credits*** | **Acres** | | **Square Feet** | | | | | |
| 23 | | | | Porous Pavement | **0.00** | | **0** | | | | | |
| 24 | | | | Tree Planting | **7.50** | | **326,700** | | | | | |
| 25 | **Pre-Project Runoff Volume (cu ft)** | **9,770** | **Cu.Ft.** | Downspout Disconnection | **15.00** | | **653,400** | | | | | |
| 26 | **Project-Related Runoff Volume Increase w/o credits (cu ft)** | **128,883** | **Cu.Ft.** | Impervious Area Disconnection | **5.25** | | **228,690** | | | | | |
| 27 | | | | Green Roof | **0.00** | | **0** | | | | | |
| 28 | | | | Stream Buffer | **0.00** | | **0** | | | | | |
| 29 | | | | Vegetated Swales | **35.87** | | **1,562,497** | | | | | |
| 30 | **Project-Related Volume Increase with Credits (cu ft)** | **-29,519** | **Cu.Ft.** | **Subtotal** | **63.62** | | **2,771,287** | | | | | |
| 31 | | | | **Subtotal Runoff Volume Reduction Credit** | **122176 Cu. Ft.** | | | | | | | |
| 32 | | | | | | | | | | | | |
| 33 | You have achieved your minimum requirements | | | ***(Step 9) Impervious Volume Reduction Credits*** | **Volume (cubic feet)** | | | | | | | |
| 34 | | | | Rain Barrels/Cisterns | **0 Cu. Ft.** | | | | | | | |
| 35 | | | | Soil Quality | **36,226 Cu. Ft.** | | | | | | | |
| 36 | | | | **Subtotal Runoff Volume Reduction** | **36,226 Cu. Ft.** | | | | | | | |
| 37 | | | | **Total Runoff Volume Reduction Credit** | **158,402 Cu. Ft.** | | | | | | | |
| 38 | | | | | | | | | | | | |
| 39 | | | | | | | | | | | | |

# Post-Construction Water Balance Calculator

User may make changes from any cell that is orange or brown in color (similar to the cells to the immediate right). Cells in green are calculated for you.

NON-SWALE LID RVR V

74.21563317

(Step 1a) If you know the 85th percentile storm event for your location enter it in the box below

(Step 1b) If you can not answer 1a then select the county where the project is located (click on the cell to the right for drop-down): This will determine the average 85th percentile 24 hr. storm event for your site, which will appear under precipitation to left.

**PLACER**

(Step 1c) If you would like a more percise value select the location closest to your site. If you do not recgonize any of these locations, leave this drop-down menu at location. The average value for the County will be used.

**SACRAMENTO FAA ARPT**

## Project Information

| | |
|---|---|
| ***Project Name:*** | ***Sierra Vista Specific Plan*** |
| ***Waste Discharge Identification (WDID):*** | ***Curry Creek*** |
| ***Date:*** | ***9-Jun-08*** |
| ***Sub Drainage Area Name (from map):*** | ***SAMPLE COMMERCIAL*** |

### Runoff Curve Numbers

| | |
|---|---|
| **Existing Pervious Runoff Curve Number** | **84** |
| **Proposed Development Pervious Runoff Curve Number** | **95** |

### Design Storm

| | | |
|---|---|---|
| Based on the County you indicated above, we have included the 85 percentile average 24 hr event - P85 (in)^ for your area. | **0.62** | **in** |
| The Amount of rainfall needed for runoff to occur (Existing runoff curve number -P from existing RCN (in)^) | **0.38** | **In** |
| P used for calculations (in) (the greater of the above two criteria) | **0.62** | **In** |

^Available at www.cabmphandbooks.com

| | | |
|---|---|---|
| **Pre-Project Runoff Volume (cu ft)** | **9,770** | **Cu.Ft.** |
| **Project-Related Runoff Volume Increase w/o credits (cu ft)** | **140,300** | **Cu.Ft.** |
| **Project-Related Volume Increase with Credits (cu ft)** | **-47,483** | **Cu.Ft.** |

You have achieved your minimum requirements

## Runoff Calculations

(Step 2) Indicate the Soil Type (dropdown menu to right):

***Group D Soils*** — **Very low infiltration. Clay loam, silty clay loam, sandy clay, silty clay, or clay. Infiltration rate 0 to 0.05 inch/hr when wet.**

(Step 3) Indicate the existing **dominant** non-built land Use Type (dropdown menu to right):

***Pasture/Grassland/Range: 50% to 75% ground cover & not heavily grazed***

(Step 4) Indicate the proposed **dominant** non-built land Use Type (dropdown menu to right):

***A mix of lawn, grass, pasture and tress covering less than 50% of the open space***

| | Complete Either | | |
|---|---|---|---|
| | **Sq Ft** | **Acres** | **Acres** |
| *(Step 5) Total Project Site Area:* | | **100.00** | **100.00** |
| *(Step 6) Sub-watershed Area:* | | **100.00** | **100.00** |
| *Percent of total project :* | | **100%** | |

| ***(Step 7) Sub-watershed Conditions*** | **Complete Either** | | **Calculated Acres** |
|---|---|---|---|
| | **Sq Ft** | **Acres** | |
| Sub-watershed Area (acres) | | | **100.00** |
| Existing Rooftop Impervious Coverage | | **0** | **0.00** |
| Existing Non-Rooftop Impervious Coverage | | **0** | **0.00** |
| Proposed Rooftop Impervious Coverage | | **28** | **28.00** |
| Proposed Non-Rooftop Impervious Coverage | | **47** | **47.00** |

| ***Credits*** | **Acres** | **Square Feet** |
|---|---|---|
| Porous Pavement | **0.00** | **0** |
| Tree Planting | **7.50** | **326,700** |
| Downspout Disconnection | **14.00** | **609,840** |
| Impervious Area Disconnection | **7.05** | **307,098** |
| Green Roof | **0.00** | **0** |
| Stream Buffer | **0.00** | **0** |
| Vegetated Swales | **44.52** | **1,939,291** |
| **Subtotal** | **73.07** | **3,182,929** |

**Subtotal Runoff Volume Reduction Credit** — **137066 Cu. Ft.**

| ***(Step 9) Impervious Volume Reduction Credits*** | **Volume (cubic feet)** |
|---|---|
| Rain Barrels/Cisterns | **0 Cu. Ft.** |
| Soil Quality | **50,717 Cu. Ft.** |
| **Subtotal Runoff Volume Reduction** | **50,717 Cu. Ft.** |
| **Total Runoff Volume Reduction Credit** | **187,783 Cu. Ft.** |

# APPENDIX I
## CD-ROM of Project Files

# APPENDIX K
## Oversized Exhibits