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SERENO CANYON

DESIGN GUIDELINES

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SECTION I – INTRODUCTION

1.1 DESIGN PHILOSOPHY

Welcome to the Sereno Canyon community, a unique residential property located in the Sonoran desert of North Scottsdale. The desert of Sereno Canyon offers many design opportunities that are appropriate to the Southwest. Such opportunities should especially concern materials, landscape and climate.

All structures require special attention to height, massing, scale, balance and proportion. The material selections and their integration, along with consideration of color, texture, landscaping, and solar orientation on the site are all important factors to consider when preparing designs. For example, deep overhangs to protect from the desert sun are encouraged while unprotected glass is discouraged. Creativity and innovative use of materials are positively encouraged, with the goal of compatibility and harmony with the desert context and community character.

Some limitations have been put on architectural forms, details, lighting, landscape and planning of the sites in order to comply with City of Scottsdale building restrictions, development standards of sense of community, respect for the environment, and protection of property values.

The intent of these Guidelines is to create the opportunity within a defined process to provide for beautiful, comfortable homes in a dramatic scenic environment.

1.2 SPECIFIC DESIGN FOR EACH LOT

The Owner's plan must be specifically designed or adapted for Sereno Canyon and their lot. Our goal is to restrict forced designs that are not site specific or unresponsive to unique landforms.

1.3 DESIGN PROFESSIONALS

Consideration of hillside slopes, view corridors, drainage of water, existing and added landscaping, etc. are all elements of design that will require experienced design professionals. In that high quality planning and architecture is a requirement of Sereno Canyon, the first important decision in designing a custom home is the selection of the design and building team. All homes within Sereno Canyon must be designed by a professional architect or residential designer. A list of pre-approved architects and landscape architects for Sereno Canyon is attached to the Guidelines.

If an Owner wishes to utilize the services of an architect or landscape architect not on the list, an interview must be scheduled between that professional and the Committee. At this meeting, the Committee will make a determination as to the professional's understanding of the intent and goals of these Guidelines and their ability to design harmoniously with the desert environment and its unique topographic conditions. Upon the approval of the professional's credentials, the professional may be placed on the approved list for utilization by any Lot Owner.

1.4 THE BUILDING ENVELOPE

The boundaries and the areas designated for building on all Lots were individually located based on the preservation of rock outcroppings and desert vegetation, the relationship to other Buildable Site Areas and topography, and to provide optimum views and exposures for the Residences on each site.

Each Lot diagram conveys the configuration and size of the Building Envelope provided for each respective Lot. All Improvements inclusive of structures, walls, grading, and landscaping are to be made within the Building Envelope. Configuration of Building Envelope will be provided electronically to each Lot Owner and their design professional. Modifications to the Buildable Site Area are discouraged and may only be made with prior approval of the City of Scottsdale and the Committee.

In cases where an Owner owns two contiguous Lots and would like to combine them into a single Lot, the combination may only be made with the prior approval of the City of Scottsdale and the Committee.

1.5 DESIGN GUIDELINE ADMINISTRATION

These Guidelines have been promulgated pursuant to the "Declaration of Covenants, Conditions and Restrictions" (Declaration) for Sereno Canyon. Both documents are binding upon all Owners and persons in accordance with the Declaration, who at any time construct, reconstruct, refinish, alter or maintain any Improvement within Sereno Canyon or make any change in the natural or existing surface, drainage or plant life thereof.

The purpose of the Committee is to evaluate each proposed design, alteration, addition or Improvement for appropriateness to its Lot within the context of the development as a whole. The Committee may determine that what was found acceptable in one situation may not be acceptable in another. The Committee's goal is to encourage quality and variety within the greater context of the community and the national setting. Success of the process will be measured by achieving a pleasing context of the built environment within a harmonious setting.

Submittals describing any and all Improvements, modifications or landscaping to the exterior of any Lot shall be approved by the Committee before commencing any work. The Committee is responsible for the prompt review of all such requests, and for issuing all approvals, disapprovals and any other decision concerning any such submittal.

The Committee shall interpret the Guidelines and reserves the right to disapprove any design that it decides, in its opinion, does not meet: the intent of these Guidelines; the intent of minimum visual impact; the intent of fitting within the context of the desert hillside environment; and the intent of harmonizing with the built and natural environment.

Adherence to the objective and technical requirements set forth in these Guidelines is as important as adherence to the spirit of the Guidelines. Applicants must do both to gain approval from the Committee.

In addition to adherence to these Guidelines and approval from the Committee, each Owner is responsible for adhering to the overriding requirements of the City of Scottsdale and their hillside development regulations (ESLO) as well as to the stipulations placed on each Lot by the City through the initial platting process. Each Owner should receive a copy of the stipulations at the orientation meeting.

SECTION II — REVIEW AND APPROVAL PROCESS

2.1 PROCESS OVERVIEW

Step 1 **Orientation Meeting**

A representative of the Design Review Committee will meet with the Owner(s) of the property to discuss the tenants and philosophy of the development and the unique features of their lot, review the Lot diagram, review the designs-review process, and answer questions.

Step 2 **Conceptual Design Meeting**

This is a discussion of the initial design concept and how it meets the goal of compatibility and harmony with the desert context and overall character of Sereno Canyon.

Step 3 **Preliminary Design Submittal**

This review will focus on the following:

- Conceptual architectural massing
- Height appropriateness
- Siting of structures
- Location of building masses
- Treatment of Significant Natural Features
- Landscape concepts and Native Plant Inventory
- Grading concepts
- Appropriateness of the design to the Sereno Canyon context
- Access and driveway slope criteria

Step 4 **Final Design Submittal**

The Final Design Submittal shall relate to all aspects of the Design Review Guidelines. The Committee will approve, approve with changes, or deny the submittal.

Step 5 **Construction and Inspections**

During the construction phase, the Committee may make periodic inspections to ensure compliance with the approved design.

Step 6 **Certificate of Construction Approval**

- Final architecture and landscape Inspection (all outstanding issues must be resolved)

- Nighttime lighting Inspection
- Bond refunds (as applicable)

2.2 ORIENTATION MEETING

Prior to commencing conceptual design of a custom home, the Owner should schedule a meeting with a representative of the Design Review Committee. The Owner's selected Architect or design professional should attend with Owner.

The following will be discussed:

- Design philosophy
- Introduction to unique natural features of the Lot
- Building Envelope opportunities
- Site constraints and other restrictions such as driveway slopes
- Review process
- Fee requirements
- Discussion of Owner's preference of design styles and its compatibility with selected site and the project
- Siting and drainage issues
- Landscape guidelines and Native Plant Inventory
-

2.3 CONCEPTUAL DESIGN REVIEW

Meeting 2: Concept Design

- Discuss sitting and grading issues.
- Review Style selection; Owners must declare which architectural Style they are pursuing; architectural Style selection is the determining factor for all other design issues.
- Review massing and spatial organization of Home in diagram only.
- Review hardscape elements (including pools, terraces, site walls).
- Landscape concepts shall be presented (turf areas, garden areas, formal tree placements, etc.)
- Review 404 staking (if applicable).

Applicants are encouraged to provide a conceptual site plan/building plan to bring to this meeting.

2.4 PRELIMINARY DESIGN REVIEW

Documents Required:

1. Completed application form (one copy) - See Forms Section for required forms

2. Detailed survey, at no less than 1" = 20', prepared by a land surveyor or civil engineer registered in the state of Arizona, showing Lot boundaries and dimensions, easements, setbacks, Buildable Site Area, centerline of adjacent streets, utility tap locations, existing surface contours at one-foot intervals, Significant Natural Features such as washes, major boulders or boulder clusters (in excess of four feet (4'-0") in height) and bedrock outcroppings. Each Owner submitting drawings for approval to the Committee shall be responsible for the accuracy of all information contained therein.

3. Architectural site plan (scale at 1" = 10' or 1" = 8') showing location of the Buildable Site Area, the Residence and all buildings, driveways, parking areas, existing and proposed topography, finished floor elevations, water feature locations, swimming pools, all protected plants or special terrain features to be preserved, trees and cacti to be removed, if any, all utility sources and connections, site walls and any other proposed Improvements or changes. In a chart, list the following: size of the Lot; square footage of condition space; square footage of everything under the roof; preliminary calculations on land disturbance and Cut and Fill volumes.

4. Aerial site plan, a recent color aerial photo of the site (less than three (3) years old), with topography, Lot lines, and the building Footprint superimposed on it, and identification of Significant Natural Features as well as adjacent Lots and structures within one hundred (100) feet of the perimeter of the subject property.

5. Schematic floor plans (scale 1/4", 3/16" or 1/8" = l'-0") to show proposed finished floor elevations with door and window locations, proposed hardscape/patios and locations of mechanical equipment.

6. Schematic exterior elevations (scale 1/4" or 1/8" = 1'- 0") to show proposed grade lines, plate heights, ridge/parapet heights and the height of all appurtenances.

7. Schematic roof plan (scale 1/4" or 1/8" = 0" or larger) showing roof pitches, materials, skylights, ridge and eave heights. Roof plan is to be superimposed over the site with topography shown at one foot (1') intervals. All proposed site Improvements should be shown with their respective datums/elevations called out.

8. Schematic site/building sections (2 minimum). Site sections shall be taken in the most appropriate places to demonstrate the proposed Residence. To design, show baseline of existing grades, show maximum height of the Building Envelope, heights of major architectural elements, and finished floor elevations. The scale shall be equal to or greater than the site plan. Show the maximum allowable height across each section.

9. A 3-dimensional representation of the general massing to scale of all proposed structures (e.g. a mass model, a 3-D rendering or a computer generated model in relation to topography - not a detail model).

10. Preliminary material palette. Include: all proposed exterior materials, finishes and color; windows/glass; paving, hardscape and driveway materials.

11. Landscape Plan. Preliminary landscape plan including proposed building Footprint(s), all existing major vegetation, Significant Natural Features to be preserved, trees and plant material to be removed, if any, and locations of walls, fences, gates, driveways, walks and patios. Indicate all landscape zones and turf, with associated square footage, all hardscape, walls, drainage routes, and existing and proposed topography. Indicate all protected plants as defined in the landscape guidelines (Section 3.10.A). Indicate elevations (datum's) of all site walls.

The Committee will review the exhibits and will endeavor to respond in writing within thirty (30) days, indicating its approval, approval with stipulation, or rejection with explanation. Any response as Owner may wish to make regarding the results of a design review must be addressed to the Committee in writing. The Committee's approval of a preliminary design is valid for twelve (12) months.

A note on all required materials:
All drawings submitted must be prepared in a clean, professional manner. Graphic scales, north arrows, drawing references, consistency of drawing techniques and a clear, understandable presentation are expected. The Committee will not accept the submittal if this standard of care is not met. Partial submittals are not accepted. All drawings within a submittal must be on the same paper size, either 24" x 36" or 30" x 42". Drawing scales shall be sufficient to demonstrate the design concepts. Minimum 1/8" scale for plans and sections; 1:20 for site plans (unless noted otherwise). Please submit three (3) copies of all required materials at each phase along with one set of 11x17 reductions and a CD containing PDF files of drawings.

2.5 FINAL DESIGN SUBMITTAL

The final design submittal must follow within twelve (12) months of the Committee's approval of the preliminary design and must include all items listed in the preliminary submittal with the following additions/changes:

Architectural:

a. Submittal form
b. Letter describing all differences and changes to pre design submittal in bullet point format
c. Civil site plan including a hydrology report certifying historical exiting points of drainage water (signed and sealed by a registered civil engineer of the state of Arizona)
d. Architectural site plan
e. Aerial site plan photo image
f. Floor plans (scale 1/4", 3/16" or 1/8" = 1'-0")
g. Roof plan with top of parapet/ridge designations
h. Elevations: Exterior elevations of all views (scale 1/4" or 1/8" = 1'-0" and the same scale as the floor plans) Include all materials and their locations (corresponding to the material board)
i. Sections: Include a minimum of three (3) sections with at least two (2) taken perpendicularly to the contours through the building. These should be to the

same scale as the floor plans.

j. Lighting Plan: With a background of the site plan, or landscape plan, highlight all exterior light fixture locations (both architectural and landscape), provide cut-sheets of the fixtures on the street (or subsequent sheet - not 8 1/2" x 11"). Note lumens and wattages of all lamps in all fixtures, aiming angles, accessories and colors.

k. Updated 3-D rendering developed for preliminary submittal or create detailed scale model: The detailed architectural model shall be no less that (1/16) inch = one (1) foot and show the relationship of all proposed Improvements to the contours of the Lot. The model must accurately represent the massing color of all Improvements including:
   - All windows, exterior doors and skylights.
   - Enough of the property to visually relate the proposed structure and necessary uses to the natural terrain.
   - The Applicant's, Architect's and Builder's names, Lot number, scale and north arrow.

l. Materials board: Exterior materials and finishes are to be properly labeled and affixed to a presentation board(s) in a professional manner and/or compiled in a binder. Boards/binders shall include the names of the Owner, Architect and Builder, and the Lot number. Include LRV's or estimated LRV's for all materials and finishes. In lieu of a materials board/binder, digital submission of materials is acceptable.

Final post-approval requirement:

After the submittal has been approved, the Committee will require a full set of documents on disc in PDF format and site plan in auto CAD format (scanned to disc) for the Committee's files.

The following standards exist to guide the designer in dealing with such issues as siting, excavating, grading, landscaping, lighting and open space.

It is important to integrate the Residence within the site in such a manner that the Residence responds to the natural characteristics of its specific Lot. Each Lot in the Sereno Canyon development has unique features that must be analyzed when designing a Residence. These features include boulders, vegetation, views, slope, drainage, topography & access.

Keep in mind that the Sonoran desert's natural landscape is fragile and may take many years to recover from impacts to the site and the vegetation. As such, it is up to the Sereno Canyon development to provide protection for these natural desert areas and to reduce the overall impact on the natural desert landscape.

SECTION III – SITE DEVELOPMENTS GUIDELINES

3.1 BUILDABLE SITE AREA

Each lot at Sereno Canyon contains a maximum building construction site area (Building Envelope). The Building Envelope is that portion of the site, designated by the developer, within which all construction and Improvements must occur, including the entry driveway.

The reason for designating the Buildable Envelope is to help preserve natural features and vegetation within the NAOS and to maintain view angles from all home sites. Maximum square footage of Building Envelope and minimum square footage of NAOS dedication are provided

on each Lot diagram in accordance with the plat criteria on file with the City of Scottsdale. Each Applicant must comply with this criteria and meet the configuration rules for NAOS as administrated by the City of Scottsdale.

No construction activity or modifications to existing landscape will be allowed outside the Building Envelope, including any grading, access, or storage of construction materials. To insure that this occurs, all Improvements, equipment and construction workers are to be within the Building Envelope with all vertical construction held back a minimum five (5) feet from the Building Envelope line and all grading and flat work held back a minimum of one (1) foot from the Building Envelope line. All utility lines running to the street for connection shall be inside the Building Envelope and should be placed under the entry driveway unless special permission to the contrary is granted from the Committee, in its sole discretion. Utility lines not located inside the Building Envelope or under the entry driveway require appropriate mitigation and revegetation to densities and varieties consistent with adjacent undisturbed NAOS areas.

Modifications to the Building Envelope will be considered by the Committee for design-specific requests. Such requests must include the following:

1. Cannot exceed original buildable area square footage.
2. Cannot encroach 22.5 or less to any grade yard adjoining another Lot.
3. Cannot adversely affect, in the opinion of the Committee, another property.

3.2 NATURAL AREA OPEN SPACE

The Natural Area Open Space (NAOS) of any site is the area where no construction or Improvements may occur and is defined by the area of the Lot outside the Building Envelope except for the entry driveway. This area is to remain natural and untouched. Under some conditions, where natural vegetation is unnaturally sparse, additional plant material may be added if approved or required by the Committee. If additional plant material is to be added to the natural area, it must consist of plants that are indigenous to the area and be of a mix and density found in the general area. This additional plant material may not be permanently irrigated as this could negatively impact the existing natural plants. Temporary irrigation of these plants in areas of additional vegetation will be allowed. If any plants are damaged in the NAOS, they must be replaced in the original location with the same species at the same maturity, without limitations. Damaged topography must be repaired to its original state. Applicants are encouraged to become familiar with City ordinance concerning NAOS.

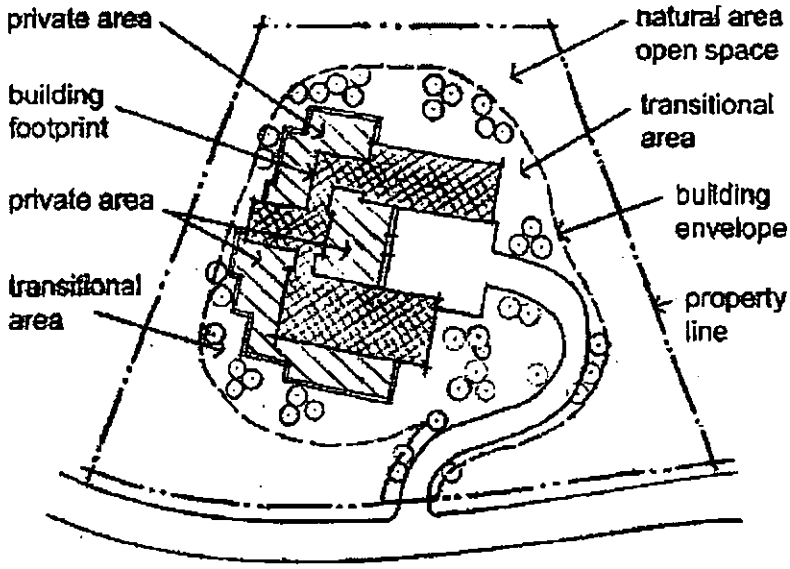
3.3 TRANSITIONAL AREA

The Transitional Area is the portion of the Lot inside the Building Envelope that is not covered by the Residence or other Improvement and is visible from off-property. The Transitional Area is to be revegetated at the end of construction and shall consist of a mix of plants from the approved plant list (Section 3.10.B). The density of the vegetation in the Transitional Area needs to match the density of the NAOS area where they are adjacent and can blend to higher density near the Residence.

Revegetated plant material in the Transitional Area may be irrigated with a drip watering system. Keep in mind that the irrigation system must be carefully designed such that no run-off or overspray from the system lands in the natural area, as this may negatively impact the plant material in that area.

3.4 PRIVATE AREA

The Private Area is the exterior portion of the Lot inside the Building Envelope that is generally not visible from off-property because it is hidden behind walls, vegetation or other structures. Plant materials allowed in the Private Area are any plants on the approved plant list (Section 3.10.B) and any plants not on the prohibited plant list (Section 3.10.C) and approved in writing by the Committee. Plant material in the Private Area that is not on the approved plant list (Section 3.10.B) may not be visible from off-property at maturity.



Site Area Diagram

3.5 SETBACK REQUIREMENTS

The Setback Requirements being imposed in the Sereno Canyon development are outlined in the following table (PAD 5). The more restrictive of these setbacks or the Building Envelope will govern unless otherwise approved in writing by the Committee.

Case 22-PP-2005

Summary of Development Standards

Subdivision Name	Sereno Canyon			
Zoning	R1-130 ESL			
	Ordinance Requirements	Maximum Reduction Allowed	Amended Standards	(%) Proposed Reduction
Min. Lot Area	130,000 s.f.	47%	60,000 s.f.	47%
Min. Lot Width				
Standard Lot	200'	25%	150'	25%
Flag Lot	Not Allowed	N/A	20'	N/A
Maximum Building Height	24'	N/A	24'	N/A
Min. Yard Setbacks				
Front Yard				
Front (to face of building)	60'	25%	45'	25%
Front (to face of garage)	60'	25%	45'	25%
Front (corner lot, side street)	60'	25%	45'	25%
Front (corner lot, adjacent to key lot, side street)	60'	25%	45'	25%
Front (double frontage)	60'	25%	45'	25%
Side Yard				
Minimum	30'	25%	22.5'	25%
Minimum aggregate	60'	25%	45'	25%
Rear Yard				
Standard Depth	60'	25%	45'	25%
Min. Depth (% of difference which can be occupied)	N/A	N/A	N/A	N/A
Patio*	N/A	N/A	N/A	N/A
Distance Between Buildings (Min)				
Accessory & Main	10'	N/A	10'	N/A
Main Buildings/Adjacent Lots	60'	25%	45'	25%
Maximum Wall Height				
Front	3'	N/A	3'	N/A
Side	8'	N/A	8' on PL *	N/A
Rear	8'	N/A	8' on PL *	N/A
Corner side not next to key lot	8'	N/A	8' *	N/A
Corral fence height (on prop line)	6'	N/A	6'	N/A
Development Perimeter Setbacks				
Notes & Exceptions **See Legislative Draft for approved Development Standards.** ***The recommended wall height at Sereno Canyon is six feet (6').**				

3.6 DRIVEWAYS

Driveways require careful design consideration in order to reduce their visual impact to the overall project and to accentuate important natural features like significant plant materials, washes and rock outcroppings. Driveways should be kept to a maximum width of sixteen (16) feet but twelve (12) feet wide is preferable. All driveways, per the City of Scottsdale Fire Department regulations, can be at no more than a twenty percent (20%) grade. Driveways can be finished in a number of materials such as colored concrete, concrete pavers, brick pavers, natural stone pavers or contained decomposed granite meeting County and City dust control standards. Standard black asphalt is not allowed. The material chosen must blend into the natural landscape as much as possible thereby reducing its visual impact. Some driveways will require retaining walls due to the high degree of slope. If a transition to another material is requested, the transition shall be designed as a clear offset or separation (in plain view) to avoid direct transitions in the same plane.

3.7 SITE WORK

When designing, the relationship between the home, retaining walls, patios, etc. to the site, is of utmost importance on hillside properties. It is important to consider the impact the Improvements will have on adjacent properties in respect to natural drainage, privacy, and view corridors. It is important that the site design is well thought out so that structures, driveways and other Improvements fit well into the existing contours of the site therefore minimizing the Excavation required. Excessive site alterations are not an acceptable option to accommodate a poorly designed structure and Improvements.

- All buildings, structures and driveways shall, to the fullest extent practicable, follow and utilize the natural contours of the land to minimize disturbance. The maximum height of any Cuts used to establish a building site shall not exceed eight (8) feet per Cut without mitigating measures. Any proposed Cut greater than eight (8) feet may be considered by the Committee (on a case by case basis) for approval if the impact is deemed acceptable.

- Earth contiguous to the structure must contact that structure at an angle approximating that of the Natural Grade, with allowance for proper drainage away from the structure.

3.8 CUT AND FILL STANDARD REQUIREMENTS

Buildings and other Improvements should follow existing contours and minimize the amount of Cut and Fill by using terraced floor levels and using multi-level solutions wherever possible. A natural resolve or fit between the buildings and Lot topography is encouraged. Unnecessary "platforming" of the buildings and site areas is discouraged. The Committee can at its discretion, approve or disapprove (on a case by case basis) the amount of Cut and Fill used in a design. (As an example: 100% Fill or Cut will be disapproved, i.e., no pad construction.)

- Raw spill slopes are prohibited. Any violation of this will be subject to a stop work order until the spill slope is removed, restored to its Natural Grade, re-vegetated and approved by the Committee. Retaining walls no greater than six (6) feet in height must be used and clad in an approved finish material as part of the design submittal and construction execution.

- All surplus excavated material must be removed from the Lot prior to the issuance of the certificate of final construction approval.

3.9 SITE DRAINAGE AND GRADING

In order to maintain a natural looking site, care shall be taken to minimize the disruption of the Lot for grading and drainage purposes. Generally, all sites shall be designed so that grading, walks, driveways and porches produce a positive drainage away from the Residence and other buildings.

No changes to site grading and drainage may occur that result in changes to the natural, historic drainage patterns entering or leaving the Building Envelope. The Committee will approve changes to the natural surface drainage patterns within the Building Envelope in most cases, as long as it has no impact on drainage patterns outside the Building Envelope and has a natural appearance. Changes made to drainage ways need to be given a natural appearance by grading and adding mature native plant and landscape material. Native rock and plant materials should be used in all Disturbed Areas to minimize soil erosion.

In drainage ways that require additional erosion protection, rip rap will be allowed. The rip rap may not be river-run rock or bright faced cut granite. Native, natural granite indigenous to the site or stained granite can be used. Wherever possible, all rip rap should be covered with eight (8) inches of native topsoil and revegetated to give it a more natural appearance.

- Protected hillside washes may not be diverted, relocated or moved from their present position to another location without the permission of the Committee and the City of Scottsdale and or the FEMA authority. However, a hillside wash may be bridged by a structure so long as such a structure does not impede the flow of the hillside wash.

- After final grading, no more than five percent (5%) of the Lot, excluding the driveway and the building Footprints, may be steeper than the Natural Grade of the Lot. This is to prevent large amounts of unnatural slope on the site and help the home blend into the site. Exceptions will be considered by the Committee.

3.10 LANDSCAPE

The landscape should not be an afterthought of any project. The Owner should understand that in order to be successful with landscaping, it should be an integral part of the design.

All landscape visible offsite should blend into, rather than overshadow, the surrounding natural landscape. It is important to remember that the natural landscape may be different from one site to the next. Lots that are highly sloped tend to have sparse natural plant material when compared to those which are not. As a result, more care must be taken when designing the site of homes on highly sloped Lots as they are much easier to over-landscape. The result of over-landscaping is an "oasis" appearance that would not blend into the natural landscape. The design goal is to achieve a contextual landscape design that helps marry the home to its site so that neither the structures nor the landscape gain large visual prominence.

The landscape should be integrated with the design of the Residence and other Improvements during the planning process. Whenever possible, mature existing plants should be utilized in the design of the landscape. It may also be beneficial to plant deciduous trees near the

Residence to protect it from summer sun but care must be given keep a natural appearance. When any revegetation is required the plant material should be placed randomly, to appear as if they naturally occurred, and not in a formal or geometric pattern. In all landscaping, except that in the Private Area of the site, the ground shall be covered with native rock (salvaged from the site if possible) and topsoil and have a natural appearance.

Provisions have been made to maintain the natural look of the landscape in the development. The provisions require the designs for Lots to conform to the requirements of the native plant salvage plan (Section 3.10.A) and the Significant Natural Feature requirements (Section 3.10.E).

A. Native Plant Salvage Program

The development is within a virgin desert landscape and as a result contains only indigenous plants. It is not possible for all of the indigenous plants to be kept or reused on the site. Pursuant to City of Scottsdale regulations and these Guidelines, the native plant salvage program designates which plants are required to be salvaged. These plants are referred to as protected native plants. Protected native plants are any cacti which are three (3) feet tall or more and trees which are four (4) inches or more in caliper, measured two (2) feet from the base of the trunk, and of the species listed as protected plants in Section 3.10.D.

All protected native plants shall be tagged and numbered according to whether they remain in place, are relocated or are planned for destruction. In order for a protected native plant to be considered for destruction it shall be determined to be unable to be successfully relocated. This means that the plant has deteriorated health, physical constraints that prevent the plant from being safely removed, or both. Assessment of native plants shall be made by an approved inventory/salvage contractor.

All protected plants shall be tagged prior to the final design submittal. The tags shall be color coded to designate what is to happen to the plant. The plants tagged with blue plastic tape are proposed for destruction, they are to be tagged with red plastic tape if they proposed for relocation and they are to be tagged with white plastic tape if they are proposed to remain in place. The tags shall contain a number that corresponds to the number given to the plant on the native plant inventory and shall not be removed until after the plants have been placed in their final location in compliance with the approved native plant program and a certificate of final construction approval has been issued.

The native plant program shall contain the following information. Additional information may be requested by the Committee to fulfill the purpose of the program. The program includes a native plant inventory, a native plant relocation methodology and a nursery site.

1. The native plant inventory shall contain a site plan, at a minimum scale of 1" = 20', which indicates the location of all protected native plants within the proposed Limits of Construction and Buildable Site Area, and all plants within twenty (20) feet outside the Buildable Site Area line. Include a chart listing all such native

plants, the number they are tagged with in the field, the species, size, general condition, and salvage status of each protected native plant.

2. The native plant relocation plan shall be a site plan, at a minimum scale 1"=20' and shall contain the proposed locations, within the proposed Limits of Construction, of all the protected native plants being relocated, including the tagged number of each plant. It shall also indicate the Footprint along with the Building Envelope line and all other proposed landscaping.

3. The nursery site is the location of all the plants during construction that are to be relocated on site. The location of this nursery shall be indicated on the site plan and be within the Building Envelope.

If any native plants are destroyed or mutilated without prior approval from the Committee, they must be replaced in the original location with the same species of plant at the same maturity as the destroyed plant, without limitations.

B. APPROVED PLANT LIST

Trees

Acacia Abyssinica	Abyssinian Acacia
Acacia cavenia	
Acacia ebumia	Needle Acacia
Acacia farnesiana (smallii)	Sweet Acicia
Acacia occidentalis	
Acacia schaffneri	
Acacia species	
Caesalpinia cacalaco	Cascalote
Canotia holacantha	Crucifixion Thorn
Celtis pallida	Desert Hackberry
Celtis reticulate	Net Leaf Hackberry, Palo Blanco
Cercidium floridum	Blue Palo Verde
Cercidium Praecox	Palo Brea
Chilopsis linearis	Desert Willow, Desert Catalpa
Olyneya tesota	Ironwood
Pithecollobium bervefolium	Apes Earring
Pithecollobium flexicaule	Texas Ebony
Prosopis alba	Argentine Mesquite, White Mesquite
Prosopis chilensis	Chilian Mesquite
Prosopis glandulosa	Honey Mesquite
Prosopis pubescens	Screwbean Mesquite
Prosopis velutina (juliflora)	Velvet Mesquite

Shrubs

Acacia angustissima	Fern Acacia
Acacia constricta	White Thorn Acacia
Acacia craspedocarpa	Leather Leaf Acacia
Acacia greggii	Catclaw Acacia
Agave species	Parryi Tomeyi
Aloysia wrightii	Highmass
Ambrosia ambrosioides	Canyon Ragweed
Ambrosia deltoidea	Bursage
Ambrosia dumosa	White Bursage
Anisacanthus thurberi	Desert Honeysuckle
Asclepias subulata	Desert Milkweed
Asclepias tuberosa	Butterfly Weed
Atriplex canescens	Four-Wing Salt Bush
Atriplex lentiformis	Quail Bush
Atriplex mulleri	
Atriplex nummularia	Old Man Salt Bush
Atriplex polycarpa	Desert Salt Bush / Cattle Spinach
Berberis haematocarpa	Barberry
Buddleia marrubifolia	Woolly Butterfly Bush
Bursera fagaroides	Fragrant Bursera
Caesalpinia gilliesii	Yellow Bird of Paradise
Caesalpinia mexicana	Mexican Bird of Paradise
Caesalpinia pulcherrima	Mexican Bird of Paradise
Calliandra eriophylla	Pink Fairy Duster
Calliandra californica	Red Fairy Duster
Senna artemisioides	Feathery Cassia
Senna biflora	Texas Cassia
Senna leptophylla	Gold Medallion Tree
Senna nemophylla	Green Feathery Cassia
Senna phyllodenia	Silver Cassia
Senna wislizenii	Shrubby Cassia
Ceanothus greggii	Desert Ceanothus
Chrysactinia mexicana	Damianita
Cordia parvifolia	
Dalea bicolor	Indigo Bush
Dalea Formosa	Feather Dalea
Dalea greggii	Prostate Indigo Bush
Dalea pulchra	Gregg Dalea
Dalea wislizeni	Indigo Bush
Dodonaea viscosa	Hopbush
Encelia farinosa	Brittle Bush
Ephedra aspera	Mormon Tea
Ericameria laricifolia	Turpentine Bush
Eriogonum fasciculatum	Desert Buckwheat
Eriogonum fasciculatum v. polifofolium	Flattop Buckwheat
Eriogonum wrightii	Wright's Buckwheat
Fallugia paradoxa	Apache Plume
Fouquieria splendens	Ocotillo
Hyptis emoryi	Desert Lavender
Jatropha cardiophylla	Limber Bush
Justicia californica	Chuparosa

Vines

Antigonon leptopus	Coral Vine
Cissus trifoliate	Arizona Grape Ivy
Clematis drummondii	Old Man's Beard
Mascagnia lilacina	Lilac Orchid Vine

Groundcovers

Acacia redolens	Trailing Acacia
Dalea greggii	Trailing indigo Bush
Verbena peruviana	Peruvian Verbena
Verbena pulchelia	

Perennials

Baileya multiradiata	Desert Marigold
Cassia covesii	Desert Senna
Castilleja chromosa	Indian Paintbrush
Delphinium scaposum	Bare-Stemmed Larkspur
Dichelostemma pulchellum	Blue Dick, Desert Hyacinth
Dyssodia porophylloides	Dyssodia
Machaeranthera asteroides	Purple Aster
Melampodium leucanthum	Blackfoot Daisy
Menodora scabra	Menodora
Mirabilis multiflora	Desert Four O'Clock
Oenothera	Evening Primrose
Penstemon eatoni	Beard Tongue
Penstemon parryi	Beard Tongue, Parry's Penstemon
Penstemon species	
Penstemon superbus	Beard Tongue
Phlox tenuifolia	Phlox
Psilostrophe cooperi	Paperflower
Salvia farinacea	Mealycup Sage
Senecio douglasii	Groundsel
Sphaeralcea ambigua	Desert Globemallow
Tagetes lemmoni	Mt. Lemmon Marigold
Verbena (Glandularia)	Vervain
Verbena gooddingii	Goodding's Verbena
Verbena rigida	Vervain

Annuals

Datura meteloides	Sacred Datura
Erigeron species	Fleabane Daisy
Eschscholzia mexicana	Mexican Gold Poppy
Gilia flavocincta	Gilia
Kallstroemia grandiflora	Arizona Poppy
Lupinus concinnus	Lupine
Lupinus sparsiflorus	Desert Lupine
Lupinus succulentus	Lupine
Mentzelia species	Stickleaf, Blazing Star
Oenothera species	Evening Primrose
Phacelia campanularia	Desert Bluebell
Rafinesquia neomexicana	Desert Chicory
Salvia columbariae	Desert Chia

Succulents and Cacti

Agave species	Century Plants (Parryi, Toumeyi)
Aloe species	
Carnegiea gigantea	Saguaro
Cereus greggi	Night-Blooming Cereus
Dasylirion wheeleri	Desert Spoon
Echinocactus grusonii	Golden Barrel Cactus
Echinocereus Engelmannii	Hedgehog Cactus
Ferocactus acanthodes	Compass Barrel
Ferocactus wislizenii	Fishhook Barrel
Hesperaloe parviflora	Coral Yucca
Mammillaria microcarpa	Fishhook Pincushion
Opuntia canthocarpa	Buckhorn Cholla
Opuntia basilaris	Beavertail Prickly Pear
Opuntia bigelovii	Teddy Bear Cholla
Opuntia chlorotica	Pancake Prickly Pear
Opuntia engelmannii	Desert Prickly Pear
Opuntia fulgida	Chain Fruit Cholla
Opuntia leptocaulis	Desert Christmas Cholla
Opuntia violacea	Purple Prickly Pear
Yucca baccata	Banana Yucca
Yucca elata	Soaptree Yucca

C. PROHIBITED PLANT LIST

The following may not be planted or maintained anywhere in the Sereno Canyon community:

1. Any species of tree or shrub whose mature height may reasonably be expected to exceed twenty (20) feet, with the exception of those species specifically listed on the approved plant list (Section 3.10.B).

2. All Palms (Palmae) whose mature height may reasonably be expected to exceed twenty (20) feet are prohibited for aesthetic reasons as well as their high maintenance requirements. Dwarf varieties, and those whose mature height may reasonably be expected to be less than six (6) feet, may be used in Private Areas.

3. All Pines (Pinus), Cypress (Cupressus), False Cypress (Chamaecyparis), Juniper or Cedar (Juniperus), except those species specifically approved, whose mature height may reasonably be expected to exceed six (6) feet, are prohibited for aesthetic reasons. Dwarf varieties, and those whose mature height may reasonably be expected to be less than six (6) feet, may be used in Private Areas.

4. Olive trees (Olea europaea) will be prohibited for reasons of their profuse production of allergy-producing pollen, as well as for staining of the ground plane caused by its fruit. A limited number may be allowed in the Private Area.

5. Oleanders (Nerium oleander) and Thevetia (Thevetia species) are prohibited for aesthetic reasons, their profuse production of allergy-producing pollen, poisonous characteristics, and their high maintenance requirements and excessive height. Dwarf varieties may be allowed only in Private Areas.

6. Fountain Grass (Pennisetum setaceum) is prohibited as a defined weed with the potential to spread throughout the development and as a fire hazard.

7. All varieties of citrus are prohibited for aesthetic reasons, high requirement of water, and for their profuse production of allergy-producing pollen. Dwarf varieties may be permissible only in Private Areas.

8. Common Bermuda Grass (Cynodon dactylon) is prohibited as a defined weed. Other hybrid varieties will be allowed in Private Areas.

9. Mexican Palo Verde (Parkinsonia aculeatra) is prohibited as a harbor of pests and because of its ability to spread throughout the development, thereby altering the present natural desert.

10. Desert Broom (Buccharis sarothroides - female) is prohibited as a defined weed with potential to spread throughout the development. Male plants are acceptable provided they are marked (tagged) as such and purchased from a reputable nursery.

D. Protected Native Plants

Trees

Acacia canstricta	Whitethorn Acacia
Acacia greggii	Catclaw Acacia
Berberis haematocarpato	Red Barberry
Canotia holacantha	Crucifixion Thorn
Celtis pallida	Hackberry
Cercidium floridum	Blue Palo Verde
Cercidium microphyllum	Foothill Palo Verde
Chilopsis linearis	Desert Willow
Juniperous species	Juniper
Olnyea tesota	Ironwood
Populus fremontii	Cottonwood
Prosopis species	Mesquite
Quercus species	Scrub Oak
Rhus ovata	Sugar Sumac
Vauquelinea Californica	Arizona Rosewood

Cacti

Carnegiea gigantean	Saguaro
Ferocactus species	Barrel
Fouquieria splendens	Ocotillo
Peniocereus greggii	Night-Blooming Cereus
Yuccaa elata	Soaptree Yucca

E. Significant Natural Features

There are many Significant Natural Features that are to be protected throughout the community. These features may be large rock outcroppings, a wash, large native trees or cacti and may be located in Common Areas as well as within individual Lots. In the design of any home site, much consideration should be given to all the significant features of that site. The features should be maintained intact whenever possible so both the Owner and the entire community may enjoy them.

3.11 PARKING

Each lot is to contain parking for at least three (3) automobiles in an enclosed garage either attached to or detached from the main Residence structure. In addition, there shall be parking for at least two (2) guest automobiles on the driveway surface, near the main Residence. Owners are encouraged to consider having more onsite parking than the minimum. Screening, either with vegetation, a low site wall or a combination of elements, is required to obscure the visual appearance of the guest parking area. No Recreational Vehicle (RV) garages are permitted at Sereno Canyon. Owners who possess trucks (equal to or greater than 1 ton capacity), trailers, buses, campers, boats, motor homes, or any other motorized vehicle other than a conventional automobile, motorcycle, small truck, or sport utility vehicle, must store or park such vehicles offsite from Sereno Canyon. No commercial vehicles may be parked at Sereno Canyon in a visible location overnight.

3.12 STORAGE TANKS

Storage tanks are limited to the storage of rainwater only. It is important to the visual quality of the development that all storage tanks or similar storage facilities are buried underground and have visible projections screened from view. When locating the tanks on the Lot, it is important to consider how the tank will be serviced. Vehicles that will service the tanks, and fill or drain lines, shall not be allowed on, or lines laid across, the NAOS of the site.

3.13 SWIMMING POOLS AND SPAS

The color of tile or other finish that may be exposed on the negative-edge of a pool shall be of a color that blends with the surrounding environment. It may be a brighter accent color but will be considered with the accent color allowed on the house as discussed in Section 4.7.

Swimming pools and spas, and the doors and gates leading thereto, must be constructed in accordance with the regulations of the City of Scottsdale, including fence and enclosure heights. Associated mechanical equipment must not be visible from offsite, and must be enclosed by

walls or other suitably effective screening method (Section 4.13) and be compliant with exterior sound guidelines (Section 3.21). Swimming pools and spas should be designed as being visually connected to the Residence through the use of common materials and their visual impact must be minimized from offsite. Based on policies by the City of Scottsdale, disposal of pool backwash or a pool draining into the sanitary sewer system may not be allowed. Due to environmental concerns, pool backwash and water from pool draining is not allowed into a wash or other natural area. It is recommended that a dry well be shown on the plans and constructed to allow for disposal of pool backwash and draining. Any applicable regulations governing disposal of pool water must be followed.

3.14 SPORT AND TENNIS COURTS

For reasons of aesthetics, light and noise control, sports/tennis court will be allowed in the Private Area of a home site only if approved by the Committee where the impact on Neighboring Property is likely to be minimal. Sport/tennis court lighting is discouraged. Such court lighting may only be allowed under the strictest screening criteria whenever no upward or outward ambient light may escape. If approved in advance by the Committee, a sports/tennis court may contain a basketball hoop and backboard.

3.15 BASKETBALL HOOPS

Other than as approved as part of a sports/tennis court pursuant to Section 3.14, basketball hoops and backboards may not be installed at any Residence.

3.16 EXTERIOR RECREATIONAL OR PLAY EQUIPMENT

All exterior recreational or play equipment, such as play structures, jungle gyms, swing sets, slides, and similar equipment, must meet the intent and requirements of all sections of these Guidelines, including color. Such equipment or structures shall be located in the Private Area of the Lot. In addition, every reasonable attempt to screen this equipment from off-property should be made, including the installation of mature landscaping, if necessary. The height of this equipment shall be limited to a maximum of eight feet (8'-0") above Finished Grade. Due to the fragile nature of the desert environment, tree houses or other play structures attached to native plants are prohibited. All exterior recreational or play equipment requires specific approval by the Committee prior to installation.

3.17 ADDRESS IDENTIFICATION, SIGNAGE

An address identification marker shall be provided by the Owner of the Residence. The marker shall be subtle and be designed to be complementary to the design of the main Residence. It shall implement the same materials and having the same design character as the main Residence. The marker should be appropriate in scale and proportion for the intended purpose and may also state the names of the Owners or the name of the home. The final design submittal must include the design of the marker and it must be approved by the Committee before it can be installed.

The address identification marker shall be placed where the private driveway meets the street. In locations of a shared driveway, markers for all Residences will be placed in relative proximity with at least five (5) feet between each marker and one mature indigenous tree.

No additional signage beyond the address identification shall be allowed, except for temporary construction signs or other signs permitted by the Committee. For more information about construction signage see Section 5.12.

3.18 FLAG POLES

No freestanding flag poles will be allowed in the development. Displaying one (1) flag is allowed. A maximum of a 3'x5' flag may be displayed if it is hung on a six (6) foot or shorter pole that is attached to the main structure with a pole bracket. The pole bracket shall not be mounted more than ten (10) feet above grade. An optional display is to hang it from a roof overhang of the main structure. No other mounting techniques will be allowed.

3.19 EXTERIOR LIGHTING

The intention of the outdoor lighting guidelines is to preserve the inherent low light level of the natural desert. It is important to supply the light necessary for safety, security and the enjoyment of outdoor living spaces but the objective is to keep light levels low enough to protect against glare and excessive lighting. This will protect the view of the night sky for everyone in the development as well as prevent light trespass. The Committee reserves the right to refuse approval of any exterior lighting if, in its sole discretion, the Committee feels that the lighting would appear excessive or inappropriate in any way.

A. Lighting Design Standards

Any light fixture mounted on the building shall be a fully screened source. All recessed lights located in exterior ceilings, soffits and eaves shall have a 45 degree cutoff. The main entrance to the primary structure may have a maximum of two (2) translucent wall mounted fixtures but they must not exceed 750 lumens each. One (1) wall mounted fixture, of 750 lumens or less will be allowed per every car width of garage door. All other entrances shall be limited to no more than one (1) wall mounted fixture that may not exceed 750 lumens.

All fixtures shall be directed downward, except landscape up-lights (see below). Lights should be properly aimed to maximize their effectiveness. All lights shall have a 45 degree cutoff to keep Spill Light from going onto adjacent Lots, streets, or anywhere outside the Buildable Site Area. The maximum lighting intensity, when measured at the property line, shall not exceed 0.25 foot candles. Lights may be aimed to light architectural features by only in a very limited fashion and as expressly approved by the Committee. Owners are responsible for maintaining the aim of all light fixtures.

A line of lights along driveways and walkways that access public streets will not be allowed, although sparse random lighting in these locations may be allowed. It is

important that driveway and walkway lights be mounted in such a manner as to not cause glare or Spill Light off property or onto areas other than the driveway or walkway they are intended to light. Driveway and walkway lights shall not exceed a maximum of 0.25 foot candles at any point more than ten (10) feet from the fixture.

All light fixtures, except lighted entry markers, must be set back at least ten (10) feet from the property lines. A lighted entry marker may be placed on either side of the driveway and have a maximum height of four (4) feet or less above Finished Grade. The light source for the lighted entry marker shall not exceed 250 lumens. Owners are encouraged to incorporate their address marker (Section 3.17) into the lighted entry markers.

B. Light Fixtures

All light fixtures shall meet the following requirements:

1. The color of the light fixture, its shield, housing or trim, including soffit lights, shall match or blend with the adjacent building color. The color (except the shield portion) must also meet the LRV requirements addressed in Section 4.7.
2. The fixtures attached to the structure and in the vicinity of a building entrance or outdoor living area shall not exceed 750 lumens.
3. At all other uses, fixtures shall not exceed 250 lumens.
4. Security lighting is allowed in the development but requires special approval from the Committee. It shall be controlled separately from all other lighting and is limited to lamps with a maximum of 750 lumens and must be on timers that regulate their operation to a maximum of ten (10) minutes.
5. Rope light used on the exterior of a Residence cannot exceed five (5) watts per lineal foot.

C. Fixture Mounting Locations

All non-structure mounted fixtures shall be mounted in the ground or on a post that does not exceed thirty-six (36) inches above Finished Grade. If the fixtures are mounted to trees or in or on the wall of a building they shall be mounted at a height not to exceed nine (9) feet above Finished Grade. Security lighting shall be mounted at a height not to exceed twelve (12) feet above Finished Grade.

D. Landscape Up-Lighting

The number of landscape up-lights is limited to one fixture per one thousand two hundred (1,200) square feet of Buildable Site Area. All landscape up-lights shall be cutoff a minimum of forty-five (45) degrees above horizontal. These fixtures are to be mounted on the ground or less than one (1) foot above Finished Grade. Landscape up-lighting shall not exceed 150 lumens.

E. Overall Restrictions

In addition to the limitations noted prior, there are other lights and lighting effects that are and may be prohibited, such as any temporary lighting that violates the provisions of this lighting Section; exterior lights that illuminate the adjacent mountain side or other nuisance lighting as deemed by the Committee.

F. Changes to Exterior Lighting

If at any point after approval is given to the exterior lighting design the Owner wishes to change any lighting, the Owner must submit this change to the Committee and it must be approved prior to the changes being made.

3.20 SEASONAL HOLIDAY DECORATIONS

The intent of this section is to maintain a standard of quality with subtle, soft and tasteful decorations. Decoration displays should not be "overdone" or have a commercial appearance. The Committee reserves the right to prohibit or require the removal of any holiday decorations deemed inappropriate in the opinion of the Committee.

"Lawn ornament" type holiday decorations or plastic sculptures may only be displayed in the Private Area of the site and not visible from off-property. Roof-mounted decorations or decorations located outside of the site walls or the Building Envelope are prohibited. Cut evergreen trees, decorated as holiday trees, will not be allowed on the exterior of the Residence. Although holiday lights are allowed, no chasing, twinkling, blinking lights or exposed spotlights will be allowed. No more than eight (8) trees, cacti or plants may be decorated with lights. This does not include small plants immediately adjacent to the front door or patio doors of a home. Lights will not be allowed to outline an entire home or to be located on ridges or gables of pitched roofs. Lights are allowed around occasional window frames and soffit/eave lines. Luminaries will be allowed along driveways and patios but not on roofs or parapets. Paper luminaries with candles are not allowed due to potential fire danger. Care must be taken that luminaries do not blow away or litter adjacent properties.

In general, exterior holiday decorations are permitted only in the period beginning not earlier than two weeks before the holiday, and ending not later than one week after the holiday. Exterior Christmas decorations are permitted only in the period beginning not earlier than Thanksgiving, and ending not later than January 10th. Any holiday decoration, whether or not actively illuminated, must be removed from the Lot and structures by the end of the period herein defined.

3.21 EXTERIOR SOUND GENERATION

One of the most unique characteristics of Sereno Canyon is the quiet, serene environment within the surrounding urban area. This section exists to maintain this attribute for the benefit of all. Exterior sound generation is allowed in the development but it is limited to sound generated for personal or social enjoyment at outdoor living spaces such as patios, terraces,

pools, etc. Noise level limits specified in this Section shall also apply to residential air conditioning equipment and swimming pool filtering equipment and every effort must be made to mitigate noise emanating from this equipment. No sound generation associated with holiday decorations will be allowed. All sound that emanates from any property, except sound produced by motor vehicles, needs to meet the following restrictions:

Time	Maximum Allowable Noise Level dB (A)
9:00 am to 10:00 pm	56
10:00 pm to 9:00 am	45
All Sundays and Legal Holidays	45

1. Maximum repetitive impulse noise levels shall be 10 dB (A) lower than the maximum allowable for steady noise levels according to the above table.

2. All measurements of noise levels shall be made at the property line of the property on which said noise is generated or perceived, as appropriate, at an elevation of not less than four (4) feet above ground level.

In order to maintain the peaceful solitude of the natural environment, motor vehicles are not to be abnormally loud. More than the occasional operation of such noisy vehicles is prohibited.

The use of gas-powered leaf blowers and other maintenance equipment is discouraged. Electrical motors for the same purpose are encouraged. If gas-powered, operation of such equipment is allowed only between the hours of 8:30 a.m. and 5:30 p.m. Monday through Friday. Operation is prohibited during other hours and at all times on weekends and Legal Holidays.

SECTION IV - ARCHITECTURAL DESIGN GUIDELINES

The following standards are to be used as a guide in the design of any structure constructed in the Sereno Canyon development. These standards were developed from a combination of the desired feel that the development would have, response to the climate, the hillside topography, maintenance of views, and other aesthetic considerations

4.1 DESIGN CHARACTER

The overriding spirit of these Guidelines is to encourage the development of homes with limited visual impact that employ the highest quality, thoughtful design appropriate to our location on the desert mountainside. The intent is to allow for diversity in the development while maintaining an aesthetically pleasing appearance of the overall community.

When designing for this desert mountainside environment, one must consider the dry, arid nature of the climate; techniques to mitigate the oppressive nature of the summer sun and the cool temperatures of the winter; the expansive, distant views that all may enjoy; indigenous desert landscape; and preservation of the many Significant Natural Features within the development. One must also consider the natural solitude of the mountainside, the variety of animals living in the ecosystem and the torrential monsoons that visit us each year. All of these characteristics have affected the land for millennia and will continue to do so. Appropriate architecture will take all of this into account while composing a structure with the basic design tenants of balance, harmony, proportion, contrast, etc. The aspiration is the beautiful architecture that is appropriate to the climate.

The following are explanations and examples of many basic design principles that should be incorporated into your residential design.

- Building materials with a variety of texture like stone and masonry help in the reduction of the visual impact of the Residence. The quality of the design can be vastly improved by the proper use of textural materials. Stone and masonry should not have an applied appearance as in thin veneers or floating elements but rather should be used as strong appropriately scaled masses.

- Deep recesses and strong shadow lines add interest and improve the visual appearance of the building. These can be achieved by employing large overhangs, recessed voids, sheltered windows and well-articulated massing. The application of large overhangs also has technical impacts on a Residence by protecting the outside walls of the building from the sun and weather.

- The proportions of the Residence should be emphasized in the horizontal rather than the vertical direction. This will prevent the Residence from appearing too tall and towering over low-lying desert plants and natural features.

- Taller masses should be surrounded by lower masses.

- The design of a Residence should be of good quality on all sides including the roof. The visual integrity, design details and cohesiveness from all sides should be the same.

- Orientation of the structure(s) to take advantage of naturally cooling breezes and other passive and active solar techniques are encouraged.

- Large areas of an unbroken monolithic material should be avoided. The use of long walls of unbroken stucco or similar monolithic material usually shows a lack of good design and has little visual interest. These walls include site walls, retaining walls and parapet walls. To avoid this type of a situation the design should make use of other materials, openings, massing elements or some other form of articulation to break up long walls.

The designs of Residences in the Sereno Canyon development are to use multiple exterior materials, textures, natural elements and complementing colors to add texture and visual interest to the project. Materials for roofs, patios and driveways should be different from those used for walls. Complementing exterior materials should be articulated in such a manner as to create a Residence that appears as an integrated whole rather than appear like different structures forced together.

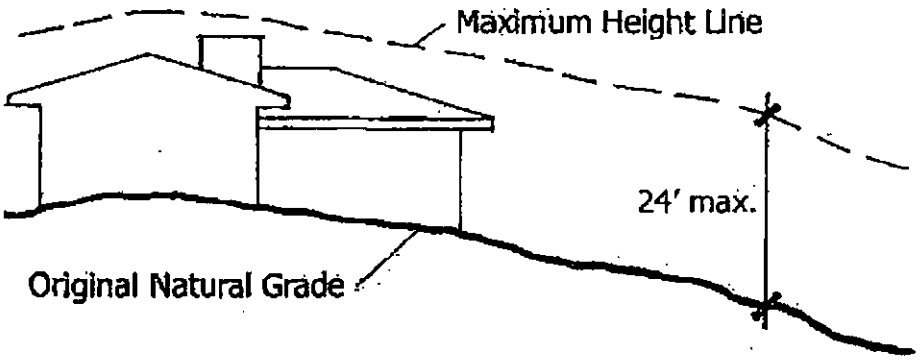
The use of natural materials like stone and adobe as well as materials that integrate well into the desert environment, like colored concrete and rammed earth, are strongly encouraged. Use of materials in thin veneers giving an unnatural appearance should be avoided. The colors of fascias, roof materials, window frames, railings, etc., require careful consideration to create an integrated visual composition.

4.2 BUILDING SIZE

The minimum Floor Area of a Residence is three thousand-five hundred (3,500) square feet. If the proposed Residence has twelve thousand (12,000) square feet of enclosed area or more, it will require special approval from the Committee. Residences outside these limits may be allowed by the Committee, if, in its opinion, the Residence is appropriate in size and scale for the Lot and the development.

4.3 BUILDING HEIGHT

- Overall building height: no portion of the Residence or other structures, except chimneys, may penetrate a twenty-four (24) foot imaginary plane that parallels the existing Natural Grade, as measured vertically from any point under the Residence or other structure.
- Finish floor to height configuration will be required for floors to roof structure.



Vertical Height

4.4 BUILDING MASSING

The building massing is the arrangement of three-dimensional building solids (masses) that form the "body" of the home. The design of Residences should be composed of multiple building masses that are distinguished by a minimum of a two (2) foot offset both horizontally and vertically. These building masses should be visible on all sides of the building and relate in proportion and size to the overall square footage of the Residence. Scale and quantity of masses should complement the selected architectural style. As a general guideline, no single building mass should exceed sixty (60) feet in length or be less than two (2) feet in a single dimension but may be evaluated on a case by case basis by the Committee.

4.5 ROOFS

The design of a roof can have a large visual impact on the elevations of the building as well as itself. For this reason it is important to carefully consider the design of the roof. Also keep in mind that most home sites and Common Areas in the Sereno Canyon development will have a clear view of the roofs of other homes so it is important that the design of the roof complements the building as a whole. It is recommended that roofs be designed with broad overhangs to provide shade and strong shadow lines whenever possible. No roof mounted mechanical equipment will be allowed; however, at the discretion of the Committee and if appropriately screened from view, certain types of solar panels may be permitted pursuant to Section 4.15.

Pitched roofs shall have a maximum slope of five (5) to twelve (12) in order to prevent the Residence from having excessive visual massiveness. Roofs with a slope greater than five (5) to twelve (12) will be allowed if, in the opinion of the Committee in its sole discretion, the roof area is a small portion and balances the overall composition. Mansard roofs are not permitted under any circumstances.

A flat roof is any roof that has a slope of one (1) to twelve (12) or less. Patches and joints must match the adjacent roof surface and parapets should return into a building mass. Flat roofs that do not have a parapet wall must be of a material that is visually appealing and must be free of any roof penetrations, roof vents, plumbing vents, drainage crickets, etc. visible from off-site. If a parapet wall is used, it must be at least ten (10) inches above the adjacent roof. Flat roofs surrounded by parapet walls shall be the same color as the parapet including all penetrations and attachments. A maximum LRV of thirty-eight (38) and a minimum LRV of fifteen (15) is required and the color must blend into the local environment.

Approved roof materials include: metal with patina, slate tiles, and clay tiles.

Non-approved roof materials include: wood shingles or other combustible material, any permanently reflective material and white flat roofs.

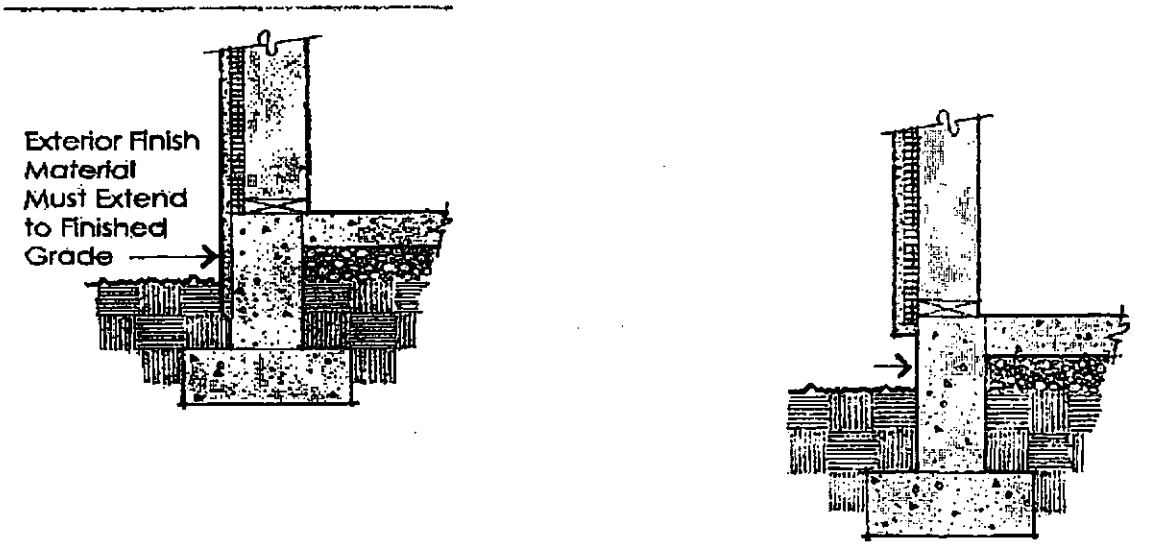
4.6 MATERIALS, EXTERIOR SURFACES AND FOUNDATIONS

In reviewing exterior materials, the Committee will consider the materials in respect to their use and to their appropriateness to the desert landscape, the climate and the development. Exterior materials must harmonize with the natural desert landscape. All color, material or detailing changes should occur at an inside corner. Wood is a desirable material but does not weather

well in the desert due to the extreme heat from the sun. It is strongly recommended that wood be used in limited applications where it is exposed to direct sunlight. If used, it shall have an appropriate sealer. The use of small modular materials like stone and block are encouraged because they create a dramatic texture that breaks down large visual masses - similar to the way the large expanses of desert are broken up by the natural variety of landscape elements.

No unfinished stem walls will be allowed. On all site walls, screen walls and building walls, subject to City of Scottsdale building codes, the finish of the wall must continue down below grade in the same plane.

Foundation Wall



Below is a list of acceptable and unacceptable exterior wall finishes. This is not an exhaustive list and is to be used as a guideline only. The final approval or denial of any material, whether listed as acceptable or not, is at the sole discretion of the Committee on a case-by-case basis. The Committee will first review material selections in the preliminary design submittal outlined in Section 2.

Acceptable exterior finish materials:

- Natural stone
- Exposed concrete with a custom finish (integrally colored and/or thoughtfully formed)
- Rammed or cast earth
- Integrally colored, stained or mortar-washed masonry (appropriately colored brick, concrete block, etc.)
- Exposed adobe block or adobe with a stucco finish
- Flat metal cladding, naturally weathered or with a patina
- Accents or special features which can be other metal cladding, red brick or slump block (an accent or special feature is defined as a material composing not more than twenty-five (25) percent of the total wall surface area.)
- Stucco, synthetic stucco, plaster

Unacceptable exterior finish materials:

- Red brick and slump block (unless used as an accent material only)
- Any material as an entire wall surface without some relief or complimentary material, unless it is a feature or defining element of the composition and used as such
- Vinyl, steel, aluminum and wood lap siding
- Manufactured stone products (faux-stone) (unless an actual sample wall or existing application is provided and approved during pre-design.)
- Materials that are not U.V. stable in the desert environment
- Highly reflective materials in general

Exterior Wall Construction. Homes may be constructed using the following methods and materials:

- Natural stone
- Masonry (concrete block, brick, etc.)
- Steel framing
- Wood frame
- Concrete wall construction techniques utilizing foam and concrete that are not time tested (minimum 10 years) and proven in quality construction techniques are not allowed unless specifically approved by the Committee
- Other materials that are specifically approved on a case-by-case basis

Exterior Wall Finish Materials. Exterior materials appropriate to each style are defined in each Style section and in the Color and Material Palette section. The number of exterior materials used on an elevation must complement the architectural Style. For most of the design Styles defined herein, a singular exterior material composition is strongly encouraged. Use of stone or masonry will be limited to the entire exterior composition, major distinct individual masses, or an accented base. Minor areas of the exterior façade accented in secondary wall materials will not be permitted. The elegance of the identified Styles is dependent upon singular material expressions. Those Styles that allow individual, distinct masses in accent materials must conform to the following criteria for proper integration:

- Horizontal material changes must occur along a horizontal line only. No "eroded" transitions from stone or masonry to stucco materials will be allowed.
- Vertical material changes must occur at logical articulations of the building wall, typically at inside corners only. No changes shall be allowed at exterior corners.
- Veneer materials, including unit masonry, shall be used only where there is no exposed edge of the veneer.

4.7 COLORS

The goal of this section is to describe appropriate hues that blend with the natural landscape. Exterior colors of any Residence or other Improvements, including flat and sloping roofs and approved fences must have a maximum LRV of thirty-eight (38) and a minimum LRV of fifteen (15).

In general all colors used in the development must be somewhat complimentary. However, colors should vary from home to home. The colors of a Residence should simulate the overall colors of the natural desert.

The colors for any exterior artwork, sculpture, or fountain visible from off-property, should also be muted tones that blend into the natural desert and complement the primary wall color of the Residence. A separate submission to the Committee for any exterior artwork, sculpture, or fountain visible from off-property is required. There is no submission requirement for artwork that is not visible from off-property.

4.8 PATIOS AND COURTYARDS

All patios and courtyards should be designed as an integral part of the Residence and landscaping. They should be oriented so they can receive some shade and protection from the building. Outdoor fire pits (gas only) and fireplaces (gas only) must be designed to minimize the potential for fires by providing a minimum of ten (10) feet in a horizontal plane from adjacent combustible materials. All outdoor furniture and umbrellas must meet the requirements of Section 4.7, if visible from off-property.

4.9 ANCILLARY EXTERIOR FEATURES

Ancillary exterior features include, but are not limited to, decorative gates, entry arches, stairs, railings, shade structures, cabanas, gazebos, ramadas, fountains and exterior fireplaces (gas only). These features must be an integral part of the design of the Residence. In a request for approval of any ancillary exterior feature, sketches, cut sheets and photographs should be included. This information should be submitted as part of the final submittal for approval by the Committee.

Specific restrictions include:

- Exterior stair assemblies must be incorporated into the design of the Residence and should be screened from view from the street, Common Areas and neighboring home sites with an opaque material.

- Dog runs and pet enclosures are to be integral with the design and materials of the Residence.

- Fountains and other water displays must not be audible from adjacent properties or Common Areas and are subject to the parameters of Section 3.21.

4.10 GARAGES AND PARKING

Every Residence must have an enclosed garage with parking for at least three (3) vehicles. Appropriate effort must be given to minimizing the visual impact of garage doors from the street and adjacent Lots. Garage doors are to be a complementary color/material that complies with the LRV stipulations of these Guidelines and the City of Scottsdale. Placement of the doors on the Residence along with limiting the number of doors adjacent to one another is very important. Garage doors should be recessed into the face of the building by a minimum of one (1) foot. Two (2) single garage doors or one (1) single and one (1) double garage door may be adjacent to each other in the same plane. If two (2) double garage doors will be adjacent to each other they must be offset by a minimum of four (4) feet horizontally. The maximum garage door height is eight (8) feet. No Recreational Vehicle (RV) garages are allowed at Sereno Canyon.

4.11 GUEST HOUSES, GUEST SUITES AND ACCESSORY BUILDINGS

A free-standing Guest House or accessory building(s) may be built on any Lot provided it complies with the regulations of all applicable governing agencies and receives approval from the Committee. The Guest House or accessory building(s) must be integrated into the design and visually related to the main Residence.

4.12 WALLS AND FENCES

Walls and fences are allowed to the extent necessary to retain earth in order to establish and maintain structure within the Buildable Site Area. In general, walls and fences may be used to enclose yard areas, but such enclosures must fit within the overall composition and style of the architecture and be designed as visual extensions of the main Residence. Attention must be paid to the color and texture of the walls in order to reduce their visual imposition on the land. Length, height and composition of site walls shall complement the architectural style. The maximum wall run length is sixty (60) feet at which point a visible break in the wall is required. Walls and fences shall not exceed six feet (6'). Walls and fences, in combination with retention walls shall not exceed ten feet (10').

Massings less than twenty four (24) inches in height are not considered walls.

All trash containers, mechanical equipment, pool equipment, etc. must be completely screened (in a horizontal plane) from off-property. Walls used for such screening must be of minimum height and length and not exceed six (6) feet in height. Access gates to these areas must be opaque. Walls higher than six (6) feet may be allowed in the case of unusually sized mechanical equipment, with approval from the Committee. Walls shall be a minimum of twelve inches (12") above equipment.

Pool barriers must meet City of Scottsdale building code and are subject to aesthetic review by the Committee. Fencing surrounding tennis/sport courts may be no greater than ten (10) feet in height and must be colored to blend with the surrounding landscape.

4.13 ANTENNAE AND SATELLITE DISHES

To eliminate the visual impact of such items no antenna or satellite dish may be installed in such a manner as to be visible from off-property. These items must comply with all regulations set forth by other governing agencies.

4.14 SKYLIGHTS

All plastic "bubble" skylights must be fully screened in the horizontal plane. Skylight / clerestory assemblies of glass are allowed but must be adequately protected so as not to cause undue heat gain or to cause reflections to neighboring Lots. Limited use of interior lighting within the skylight is permitted, but must not be directed upward or cause glare to any up-hill Lot.

4.15 SOLAR COLLECTION APPLICATIONS AND SOLAR PROTECTION

Passive solar collection methods and other "green" design principles are encouraged whenever possible to help reduce our dependence on non-renewable resources. Active solar collection methods require considerable thought to enable them to be implemented without having negative visual impact on the Residence. As standard solar panels can cause excessive glare and reflection, they will be approved only if they are integrated into the structures or landscaping on a Lot. Solar collectors must be an integral design and color with the rest of the Residence, be aesthetically pleasing and not cause excessive glare. Collectors that are merely "dropped" onto a roof must be fully screened from off-property (including from up-hill Lots).

Roll-down shade screens must be thoughtfully integrated into the design of the home. The following should be taken into consideration:

- The color of screen materials must be dark so as to look similar to uncovered windows.

- Retractable solar screens must be integrated into the Residence so that when the shades are rolled up, the shades and the retracting mechanism are not visible. They should be hidden either in the soffit above the window or in the header of the window, or match the color of the window frame.

4.16 RADON GAS PROTECTION

There has been no indication that large amounts of radon gas exist in the soil of the Sereno Canyon development. However, the Committee recommends that each Lot be tested by a competent professional for the presence of radon gas before starting design. If radon gas does exist, the Owner and design professional should be made aware so that provisions for properly dealing with the gas can be integrated into the design of the Residence.

SECTION V - CONSTRUCTION REGULATIONS

5.1 PRE-CONSTRUCTION MEETING

The purpose of this meeting is to familiarize the Owner and Builder with the specific requirements of the construction regulations. The meeting is also used to open channels of communication between the person who will be responsible for the construction and the Committee representative(s) directly concerned with the construction.

At this meeting, the Owner or Builder shall provide the following:

A. Construction Deposit
B. Construction Schedule

C. Construction Area Plan
D. Construction Team Summary

A. Construction Deposit

Before the construction of any Improvement, each Owner/Builder shall pay the Association a "Construction Deposit" in cash or other form acceptable to the Board in its sole discretion (refer to Section 6.3, Schedule of Fees). The construction deposit may be used by the Association to pay any fines assessed by the Association against the Builder or to pay any cost incurred by the Association in connection with the inspection of the construction to ascertain that any Improvements have been, or are being built in compliance with the Declaration, these Guidelines, and the plans and specifications approved by the Committee. The construction deposit may also be used to reimburse the Association for any court costs, attorneys fees, or other costs (including, by not limited to, costs incurred to correct violations) incurred by the Association in connection with any violation of these Guidelines or the construction regulations.

Upon completion of the construction of the Improvements on the Lot, the Committee or its agent(s) shall inspect the Improvements to determine whether the Improvements have been constructed in accordance with the Declaration, these Guidelines, and the approved plans and specifications. In addition, the Committee or its agent(s) will determine any violations of the Declaration or these Guidelines with respect to the Lot. The unused portion of the construction deposit shall be refunded to the Owner/Builder. The construction deposit shall be in addition to the design review fee(s) payable pursuant to Section 6.3 of these Guidelines.

B. Construction Schedule

Indicate approximant milestone dates for the following:

- Start of construction
- Completion of foundations/slab
- Completion of framing
- Completion of exterior wall surfaces
- Completion of roofing
- Completion of all construction
- Anticipated utility hook-up
- Completion of landscaping
- Anticipation of occupancy

C. Construction Area Plan

This plan, submitted on 30" x 42" paper at a scale sufficient to clearly describe its contents, shall use the architectural site plan as a background and must contain the following:

- Buildable Site Area
- Location of construction fencing
- Parking plan for workers
- Point of ingress/egress
- Location of dumpsters, salvaged plants, portable toilets, construction trailers and storage of building materials (all to be within the construction fencing)

- Location of significant natural materials to be protected
- Plant nursery

This plan is to be approved by the Committee or its representatives prior to any construction activity.

D. Construction Team Summary

This summary is to identify all contractors, sub-contractors, suppliers and people for whom gate access into Sereno Canyon is sponsored by the Owner/Builder in connection with construction on a designated Lot, and for whom the Builder is fully responsible. This list may be amended, as necessary, by the Owner and/or Builder. At the conclusion of any sub-contractors work, notification must be given to the Association's construction coordinator or representative for removal from the list.

5.2 CONSTRUCTION FENCING/SITE PROTECTION AND ORGANIZATION

All new homes are to be properly fenced in order to contain construction debris and limit disturbances to the Natural Area Open Space (NAOS). Fencing must be installed prior to the salvage or grubbing stages of construction. Fences may not be required for remodels, as determined by the Design Review Committee.

- The approved Limits of Construction must be fenced within a six (6) foot minimum cyclone fence with wind screen. (Due to extreme terrain, some portions of the construction limit may be inaccessible. These areas are given consideration by the Committee.)

- The fence shall follow the approved Limits of Construction and shall not encroach into the NAOS.

- All Improvements must occur within the fenced area and be shown on the construction area plan for approval.

- Construction fencing should be maintained in a straight and orderly condition throughout the construction period.

- Rope off property along the street to prevent damage to the landscape on the street shoulder.

- The only entrance into the fenced enclosure shall be located at the driveway entrance. This will serve as the only point of ingress/egress to the site.

5.3 CONSTRUCTION TRAILERS AND PORTABLE OFFICES

Any Owner or Builder who desires to bring a construction trailer, field office, or the like to Sereno Canyon shall first apply for, and obtain written approval from, the Committee as a part of

the construction area plan submittal. Such temporary structures shall be removed upon completion of construction. No signage shall be allowed on any construction trailer, and the color of the trailer or field office shall comply with Section 4.7 of these guidelines. In considering a request for approval of the placement of such temporary facilities, the Committee will evaluate the context of the proposed location and the impact, if any, upon neighboring Lots. The Committee may deny approval of a request for the placement of temporary facilities on a construction site.

5.4 OSHA COMPLIANCE

All applicable Occupational Safety and Health Act (OSHA) regulations and guidelines must be strictly observed at all times.

5.5 DEBRIS CONTAINMENT, TRASH REMOVAL AND SITE MAINTENANCE

The Builder is responsible for ensuring that all construction generated dirt and debris are contained within the Lot on which construction is being performed, and does not spill over or otherwise migrate to any neighboring Lot, street, Common Areas, or other neighboring tract or property whether in Sereno Canyon or not.

Builders shall clean up all trash and debris on the construction site at the end of each day. Trash and debris shall be removed from each construction site frequently and not be permitted to accumulate. Lightweight material, packing, and other construction items shall be covered or weighed down to prevent being blown from the construction site. In no case may debris and trash be allowed to exceed the top of the required and approved dumpsters. The Committee reserves the right to assess fines to Builders who fail to prevent debris from blowing or being disposed of on other Lots or Common Areas. Builders are prohibited from dumping, burying, or burning trash anywhere within Sereno Canyon except as expressly permitted by the Committee. During the construction period, each site shall be kept neat & clean and shall be properly policed to prevent it from becoming a public eyesore.

5.6 EXCAVATION MATERIALS

Any excess excavation materials generated during construction must be hauled away in a timely fashion and disposed of off-property. Dumping of excess excavation materials within Sereno Canyon is prohibited.

5.7 REPAIR AND RESTORATION OF PROPERTY OTHER THAN THE LOT

Damage and scaring to property other than the Lot resulting from construction operations including, but not limited to, NAOS, landscape, boulders, other Lots, roads, driveways, community retaining walls, concrete curb and gutter, and/or other Improvements, will not be permitted. If such damage occurs, it must be repaired and/or restored promptly to its original state at the expense of the Builder responsible for construction of the Lot.

5.8 BLASTING AND IMPACT DIGGING

If any blasting is to occur, the Committee must be informed at least four (4) weeks in advance to allow it to make, or require, such investigation as it deems necessary to confirm that all appropriate protective measures will be taken prior to the blasting. No blasting or impact digging

causing seismic vibrations may be undertaken without the approval of the Committee. Applicable government requirements concerning blasting must be observed (including pre-blast & post-blast surveys).

For site blasting or impact digging, a schedule (including all dates and times) for such operation must be included in the required construction schedule. The Builder will be required to notify all Lot Owners within the community of such schedule, as well as those Owners contiguous to the community.

5.9 SANITARY FACILITIES

Each Builder shall be responsible for providing and maintaining adequate sanitary facilities for their construction workers. Portable toilets or similar temporary toilet facilities shall be located only within the Limits of Construction and in the location indicated on the construction area plan.

5.10 PARKING AREAS

Construction crews shall not park on or otherwise use other Lots or any Common Areas. Private and construction vehicles as well as machinery shall, where possible, be parked only within the Limits of Construction or in areas designated by the Committee. Vehicles may be parked along the roadway during normal working hours if parked as to not inhibit traffic. Parking may only occur on one side of the street. Alternate parking must be approved by the Committee.

5.11 CONSERVATION OF NATURAL LANDSCAPING

Builders are advised that the Lots, Common Areas, and other open spaces of Sereno Canyon contain valuable native plants and other features such as decomposed granite, rock outcroppings, boulders and vegetation that should be protected during construction. The philosophy for the conservation of landscape materials is covered under Section 3.10 of the Guidelines and shall be strictly followed. The Committee shall specify and require that certain specific plants, terrain features, and other landscaping materials be protected with fencing or other appropriate means.

5.12 CONSTRUCTION SIGNAGE

During the period of construction on the Lot, one (1) standard construction sign may be erected. The sign shall be single faced, panel type, shall not exceed five (5) feet in height, or six (6) square feet in area, and may not be placed closer than ten (10) feet behind the curb. The construction sign may not be lighted, and must be removed from the property not later than the completion of the final inspection or the construction or earlier if directed by the Committee.

Only the following information may appear on the construction sign:

- Builder's name and contact information
- Architect's name and contact information
- Owner's name
- Lot number/address

No information describing the house or its availability for rent or sale may appear.

5.13 CONSTRUCTION TIME RESTRICTIONS

No construction audible from off-property is allowed on Saturdays and no construction at all is allowed on Sundays or Legal Holidays. Exterior construction and/or construction causing noise audible from off-property shall be allowed from sunrise or 7:00 a.m., whichever is later, to sunset or 5:00 p.m., whichever is earlier Monday through Friday unless other hours are designated in writing by the Committee or the Association. Additional restrictions and regulations on hours of construction may be determined by the Committee.

5.14 NOISE

No radio or other audio equipment shall be audible beyond the perimeter of an individual Lot. The Committee reserves the right to prohibit any on-site use of radios or other equipment during construction where violations of this provision have occurred, whether on or off property.

Arrangements for temporary power at the site, and temporary connection to the electric utility lines must be complete before commencing construction. Auxiliary generators may be used for electric power at the site briefly and in an emergency. Such generators should be located to minimize off-site noise.

5.15 GENERAL CONSTRUCTION PRACTICES

All owners shall be responsible for the conduct and behavior of their agents, representatives, Builders, contractors, subcontractors and their employees while in Sereno Canyon. Construction access will be denied, without limitation, if the following standards are not met.

a. Speed in excess of 25 MPH or passing of any vehicle is prohibited.

b. Storage or parking of non-construction-related vehicles, such as trailers, boats, etc., at the construction site is not permitted.

c. Changing oil or otherwise servicing any vehicle or equipment on the site itself or at any other location within Sereno Canyon, other than at a location specifically designated for that purpose by the Committee is not permitted.

d. Catering trucks will not be permitted to use their horns. Trash generated by the purchase of items from these services is to be contained and disposed of properly. Repeated problems with these requirements may result in denying admittance to the catering trucks.

e. Careless treatment or removal of any desert plant materials not previously approved for removal by the Committee is not permitted.

f. Removing any rocks, plant materials, topsoil, or similar items from any Lot or property within Sereno Canyon, including other construction sites is not permitted.

g. Firearms are not permitted.

h. Washout of concrete delivery trucks or the washout, cleaning or dumping of any equipment or containers used by masons, plasterers, painters, dry-wallers or any other construction trades must be contained within the Limits of Construction. Washout or cleaning residue may not be allowed to flow out of the Limits of Construction or to be otherwise dumped or deposited upon any wash, drainage-way, NAOS, neighboring Lot, street or Common Area.

i. Pets, including dogs, may not be brought into Sereno Canyon by any construction person. Exceptions will be made for service animals.

j. All cigarettes and smoking materials must be completely extinguished before being neatly disposed. Fire is an ever-present danger in the dry desert area, and on construction sites. Strong preventative care must be exercised at all times.

k. At least one full and operable 10-pound ABC-rated dry chemical fire extinguisher shall be present and available in a conspicuous place on the construction site at all times. Absence of such a device may result in the Builders and subcontractors being denied access to the construction site.

l. Fires for any purpose of warming in winter are not permitted.

5.16 INSPECTIONS

Sereno Canyon reserves the right to inspect single family construction sites at any time during the construction process. It is the responsibility of the contractor to adhere to approvals gained through the design review process and to abide by construction site regulations. The contractor must have any changes approved by the Committee first.

5.17 INSPECTION FOR FINAL APPROVAL

An inspection is required for Final Approval of Improvements. All exterior finishes, sitework, landscaping, and hardscape should be complete at this time and the site should be in its final presentation state. Sereno Canyon will reimburse the Construction Deposit upon Final Approval.

The inspection for Final Approval will include:

- Adherence to technical requirements of the Design Criteria outlined in the Design Guidelines
- Adherence to Approved Design
- Site condition
- Maximum height verification, provide engineer's certified verification of ridge and parapet elevations to assure compliance to maximum heights.

SECTION VI – APPENDICES

6.1 DEFINITIONS

Applicant: The individual identified as the applicant on the application form submitted to the Committee to whom all design review correspondence shall be addressed.

Architect: Individual appropriately licensed to practice architecture or landscape architecture in the State of Arizona.

Association: The organization of Sereno Canyon Owners established by the Declaration of Covenants, Conditions, and Restrictions (Declaration).

Accessory Structure: A subordinate building, the use of which is incidental to that of the dominant use of the main building or premises, including staff quarters, Guest House, gazebo, water feature, trellis, etc.

Basement: A story having more than one-half (1/2) its volume below Natural Grade.

Board: Board of Directors of the Association.

Builder: The person, company, or general contractor retained by an Owner to perform construction of Improvements on a Lot, including the Owner acting as builder.

Buildable Site Area: See Section 3.1

Building Envelope: That portion of a building forming the enclosing structure and consisting of the exterior walls, roof and floor at lowest level. (Buildable area)

City: The City of Scottsdale, Arizona, a municipal corporation of the State of Arizona.

Common Area: All real property and Improvements situated thereon, owned or leased by the Association for the use and enjoyment of the Owners and other persons as provided in the Declaration, including private right-of-ways.

Cut: Removal of soil, rock, or other earth materials to create a Finished Grade that is lower than the existing Natural Grade.

Committee: The Design Review Committee of Sereno Canyon as established by the Declaration.

Declaration: The Declaration of Covenants, Conditions, and Restrictions (CC&Rs) of Sereno Canyon as originally recorded in the State of Arizona, Maricopa County on April 17, 2007 at Instrument No. 2007-0448214 and thereafter amended.

Design Review Coordinator: The individual appointed by the Committee or Association to serve as the coordinator and liaison for the Committee.

Disturbed Area: That area of natural ground, excluding the Footprint of the Residence, that has been or is proposed to be altered through grading, Cut and Fill, removal of natural vegetation, placement of material, trenching, or by any means that causes a change in the undisturbed natural surface of the land or natural vegetation.

Excavation: Any disturbance of the surface of the land (except to the extent reasonably necessary for planting of approved vegetation), including any trenching which results in the removal of soil, rock, other earth materials, or other substance from a depth of more than twelve (12) inches below the existing surface of the land.

Fill: Any addition of soil, rock, or other earth materials to the surface of the land which increases the elevation of such surface from its existing state.

Finished Grade: The prepared elevation of the ground surface under a structure and within the Lot lines.

Floor Area: The area under the roof added to the floor area of any second story. The total floor area includes, in addition to the main building or premises, all area under roof in accessory buildings (such as gazebos, armadas, etc.), but excluding the floor area of any fully subterranean portions of a building. The calculations for enclosed areas are taken from the exterior face of exterior walls.

Footprint: That area of the Residence measured from the outside walls (excluding any overhanging portions) which includes indoor (including attached garage, carport, utility room, etc.), but excludes outdoor uses such as patios and breezeways.

Fully Shielded (Cut-Off): A fixture shielded with an opaque material so light emitted from the fixture can be controlled to shine only where desired. Usually described as the angle below horizontal where the light is allowed to shine.

Guest House: A structure, separate from the main structure of the Residence, having sleeping facilities for one or more guests.

Improvement: Any change, alteration, or addition to a Lot, including any Excavation, Cut, Fill, building, Accessory Structure, roads, driveways, parking areas, walls, retaining walls, stairs, patios, courtyards, landscaping, associated irrigation systems and facilities, poles, signs, exterior area, and any structure or other modification of any type or kind.

Legal Holidays: Christmas Day, New Year's Day, Martin Luther King Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, and Thanksgiving Day.

Limits of Construction: The perimeter or border of any construction activities, including but not limited to storage of construction materials, construction equipment, and waste materials from construction.

Lot: Any separately owned unit of real property within Sereno Canyon that is identified as a lot on a recorded subdivision plan (or as a unit on a recorded condominium map). Synonym: Property

LRV: Light Reflectance Value

Maximum Building Height: The maximum vertical distance of a building's face from Natural Grade to the highest portion of the structure.

Maximum Exposed Building Face: The maximum un-interrupted vertical distance in a single plane of a building's, or multiple buildings', exposure from the top of the structure to the Natural

Grade at its lowest point adjacent to the building.

Natural Area Open Space: See Section 3.2

Natural Grade: The elevation of the ground surface in its natural state before manmade alterations.

Neighboring Property: Any off-site property, public or private, within the Sereno Canyon development.

Owner: One or more persons who hold record title to any portion of real property within Sereno Canyon. For the purposes herein, the Owner may act through a designated agent, provided that such agent is authorized in writing or by law to act in such capacity.

Partially Shielded (Partial Cut-off): A fixture that allows light rays to be emitted up and down and shielded with an opaque material in such a manner as to prevent the bulb from being seen.

Private Area: See Section 3.4

Project Cost: The total cost of construction of the project in question as evidenced by a legally binding construction contract between the Owner and the Builder or, if no such contract exists, a cost breakdown budget certified as true and correct by the Owner and reasonably believed by the Committee to be an accurate estimate of such costs.

Residence: Any building or buildings, including any garage, Guest House, or other accessory building used for residential purposes, constructed on a Lot, and any Improvements constructed in connection therewith. Unless otherwise defined, Residence shall mean a single family residence.

Safety Lighting: Lighting that provides low-level illumination for vehicular and pedestrian circulation.

Security Lighting: Fully shielded lighting that provides bright illumination during, emergency situations only.

Significant Natural Feature: A naturally occurring, localized surface deviation from the natural land contour or any old, abundant, or unusually sized vegetation or grouping of vegetation, or combination thereof. Significant Natural Features may include rock outcroppings, boulders, quartz rock, washes, trees or cacti with a height greater than twelve (12) feet, or unusual grouping thereof.

Spill Light: Light beyond the area where the fixture is intended to illuminate.

Transitional Area: See Section 3.3

Trespass Light: Spill Light that encroaches onto adjacent properties.

Visible from Neighboring Property: With respect to any given Improvement, that such Improvement is or would be visible to a natural person six (6) feet tall, standing at ground level on any part of a Lot, Common Area, street, or any other part of the project, and viewing in a horizontal plane.

Visual Enjoyment Lighting: Lighting used in outdoor living areas.

6.2 LEGAL AUTHORITY

The underlying authority for the Design Review Committee and for the Design Review Process for Sereno Canyon is a legally binding and enforceable document known as the Declaration recorded in the land records of Maricopa County. The Declaration establishes the Committee and empowers it on both objective and subjective bases, to ensure that the vision for Sereno Canyon is protected and carried forward in all types of development. The Committee reserves all authority set forth in the Declaration with respect to approval or disapproval of design submissions; nothing in these Sereno Canyon Guidelines is intended to limit or restrict that authority in any manner whatsoever.

6.3 SCHEDULE OF FEES

Orientation Meeting	$250 (will be credited towards Preliminary Design Review fee at submittal)
Conceptual Submittals	1st conceptual included
Preliminary Design Review	$2,500
Final Design Review	$2,500
Construction Deposit	$25,000
Construction Inspections	$150 / hr / person
Additions / Improvements (Minor)	500 square foot under roof $250 min. - $500 max.
Additions / Improvements (Major)	$2,500
Professional Consultant Fee (per 30 minute session)	$100
Review of - changes during construction, - lighting changes / inspection - holiday lighting approvals	$150/hr.

Negligence

Non-compliance at any time during or after construction	$2,500 per occurrence
Encroachment into the NAOS	$1,000 per occurrence, per day
Raw spill slopes	See Sec. 3.8 plus $2,000 per day
Dumping of construction debris, excavation materials	$2,000 per day
Destroying any native plant without approval	see Sec. 3.10.A plus $200/ft. of plant above three (3) feet tall
Disruptive and abnormal noise generation from motor vehicles	$200 per occurrence
Trash, debris, construction materials, etc. blown from the Buildable Site Area	$100 per occurrence plus the cost to remediate as determined by the Committee

6.4 SUBMITTAL FORMS

- Pre-Design Submittal
- Arial Design Submittal
- Certificate of Design Approval
- Final Lighting Inspection
- Final Construction Inspection
- Certificate of Final Construction Approval

6.5 DESIGN & BUILD TEAM PRE-APPROVED LIST

FIRM NAME	CONTACT	PHONE NO.	WEBSITE
Architects			
Blochberger Design	Jim Blochberger	602-692-9081	
Brissette Architects	Ron Brissette	480-596-3882	
Craig Wickersham, AIA	Craig Wickersham	480-609-6766	www.craigwickersham.com
DLB Custom Homes	Daniel Boylan	480-396-8556	www.dlbhomes.com
Design Barbarians	Daniel Eastburn	623-581-1163	www.designbarbarians.com
Swaback Partners	Jeffrey Denzak	480-367-2100	www.swabackpartners.com
Landscape Architects			
Arcadia Studio	Kimberly Arevalo	602-955-0301	Arcadiastudio.com
Berghoff Deisng Group	Jeff Berghoff	480-481-3433	Berghoffdesign.com
Enchanted Gardens	Donna Winters	480-483-7289	Enchantedgardenaz.com
Floor and Associates	Kris Floor	602-462-1425	Floorassociates.com
LVA	Steve Voss	480-994-0994	LVAdesign.com

6.6 CITY OF SCOTTSDALE STIPULATIONS (NOT INCLUSIVE)

CONCEPTUAL DESIGN REVIEW APPLICATION FORM
SERENO CANYON

To: **Sereno Canyon Design Review Committee**

Date of Submittal: _____

Subject: **Conceptual Design Review Submittal**

From:

Owner's Name: _____

Phone Number: _____

Address: _____

_____

Architect: _____

Phone Number: _____

Address: _____

_____

Builder/Contractor: _____

Phone Number: _____

Address: _____

_____

C0NCEPTUAL DESIGN REVIEW APPLICATION FORM
SERENO CANYON

Site Information:

Lot Number: _____
Lot area: _____
Building Envelope Area: _____

Proposed residence information:

Enclosed air conditioned area: _____

Enclosed un-conditioned area: _____

Total area under roof: _____

Description of submittal:

_____

_____

_____

Applicant:
As the applicant, the Owner or Owner's agent, I have read the Sereno Canyon design guidelines and the CC&R's concerning design and construction in Sereno Canyon.

_____ _____ _____
Applicant's Signture Print Name Date

_____

Received by:_____ Date: _____

SERENO CANYON

CONCEPTUAL DESIGN REVIEW REPORT

Date of Submittal:

Type of Review: **Conceptual Design Review**

Review conducted by:

Lot #:

Owner's name:

Phone number:

Address:

Architect:

Phone Number:

Address:

Builder/Contractor:

Phone Number:

Address:

Site Information:

Lot number:
Lot area:
Building Envelope area:

Proposed Residence Information:

Enclosed air-conditioned area:

Enclosed un-conditioned area:

Total area under roof:

Description of submittal & elements considered:

Conceptual floor plan
Conceptual Site plan
Site analysis
Architectural character images

Result of discussion:

- The conceptual floor plan was in keeping with the intent of Sereno Canyon's design guidelines

- The Conceptual site plan proposed a deviation from the original envelope to accommodate the crossing of a wash

- Site analysis illustrated sensitivity to the adjacent properties and to views

- Architectural character images were in keeping with the intent of Sereno Canyon's design philosophy

Direction:

Committee

PRELIMINARY DESIGN REVIEW APPLICATION FORM

SERENO CANYON

Proposed Exterior Materials & Colors Information List:

Roof:

Material: _____

Color: _____

Fascia:

Material: _____

Color: _____

Primary Walls:

Material: _____

Color: _____

Secondary Walls:

Material: _____

Color: _____

Architectural Stone:

Material: _____

Location: _____

Color: _____

Stone Veneer:

Material: _____

Location: _____

Color: _____

Wood Stain:

Locations: _____

Color: _____

Window Frame:

Maker: _____

Ext. Material: _____

Color: _____

Garage Doors:

Material: _____

Color: _____

Driveway:

Material: _____

Color: _____

Wrought Iron/Railings/Metal Fence:

Material: _____

Color: _____

Any exterior paint used:

1. Location: _____

   Color: _____

   LRV: _____

2. Location: _____

   Color: _____

   LRV: _____

3. Location: _____

   Color: _____

   LRV: _____

Please list any other exterior materials that do not appear on the list above, along with their location and LRV values.

1. _____

   Location: _____

   Color/LRV: _____

2. _____

Location: _____

Color/LRV: _____

3. _____

Location: _____

Color/LRV: _____

PRELIMINARY DESIGN REVIEW SUBMITTAL CHECKLIST
SERENO CANYON

The following items are requested for Preliminary Design Review:

[Three (3) sets of each of the full sized exhibits & one (1) set of the 11 x 17 reductions are required]

- Detailed Survey, at no less than 1" = 20', prepared by a land surveyor or civil engineer registered in the state of Arizona, showing Lot boundaries and dimensions, easements, setbacks, Buildable Site Area, centerline of adjacent streets, utility tap locations, existing surface contours at one-foot intervals, Significant Natural Features such as washes, major boulders or boulder clusters (in excess of four feet (4'-0") in height) and bedrock outcroppings. Major boulder outcroppings shall be protected and maintained. Each Owner submitting drawings for approval to the Committee shall be responsible for the accuracy of all information contained therein.

- Architectural site plan (scale at 1" = 10' or 1" = 8') showing location of the Buildable Site Area, the Residence and all buildings, driveways, parking areas, existing and proposed topography, finished floor elevations, water feature locations, swimming pools, all protected plants or special terrain features to be preserved, trees and cacti to be removed, if any, all utility sources and connections, site walls and any other proposed Improvements or changes. In a chart, list the following: size of the Lot; square footage of conditioned space; square footage of everything under the roof; preliminary calculations on land disturbance and Cut and Fill volumes.

- Aerial site plan, a recent color aerial of the site (less than three (3) years old), with topography, Lot lines, and the building Footprint superimposed on it, and identification of Significant Natural Features as well as adjacent Lots and structures within one hundred (100) feet of the perimeter of the subject property.

- Schematic floor plans (scale 1/4", 3/16" or 1/8" – 1'0") to show proposed finished floor elevations with door and window locations, proposed hardscape/patios and locations of mechanical equipment yards.

- Schematic exterior elevations, (scale 1/4" or 1/8" = 1'0" or larger) showing both existing and proposed grade lines, plate heights, ridge/parapet heights and the height of all appurtenances. Call out all materials and colors.

- Schematic Roof Plan, (scale 1/4" or 1/8" = 1'0" or larger) showing roof pitches, materials, skylights, crickets, ridge and eave heights. Roof plan is to be superimposed over the site with topography shown at one (1) foot intervals. All proposed site Improvements should be shown with their respective datums/elevations called out. Remember City of Scottsdale stipulated maximum heights of twenty-four (24) feet above Natural Grade.

- Schematic site/building sections (two (2) minimum). Site sections shall be taken in the most appropriate places to demonstrate the proposed Residence and to show maximum height of the building in its envelope, heights of major architectural elements, and finished floor elevations. The scale shall be equal to or greater than the site plan. Show the maximum allowable height across each section.

- A 3-dimensional representation of the general massing of all proposed structures (e.g. a mass model) a 3-D rendering or a computer generated model in relation to topography – not a detail model).

- Preliminary material palette. Include: all proposed exterior materials, finishes and colors; windows/glass; paving, hardscape and driveway materials.

- Preliminary landscape plan. Include: proposed building Footprint(s), all existing major vegetation, Significant Natural Features to be preserved, trees and plant material to be removed, if any, and locations of walls, fences, gates, driveways, walks and patios. Indicate all landscape zones and turf, with associated square footage, all hardscape, walls, drainage routes, and existing and proposed topography. Indicate all protected plants as defined in the landscape guidelines (Section 3.10.A). Elevations (datum's) of all site walls.

- Site stake. Applicant shall install markers to designate the location of the house at the major building corners. The markers should be at least three (3) feet in height with a colored ribbon at the top of the marker. The Applicant shall install markers at the time of the submittal.

- Design review application

- 11x17 set of reductions of the above exhibits

- Design Review Fee, Two thousand five hundred dollars ($2500.00)
  Check number _____

Note:
All of the required exhibits listed above are required at the time of the submittal, prior to the scheduling of the review.

The Committee will review the exhibits and will endeavor to respond in writing within thirty (30) days, indicating its approval, approval with stipulations, or rejection. Any response an Owner may wish to make regarding the results of a design review must be addressed to the Committee in writing. The Committee's approval of a preliminary design is valid for twelve (12) months.

A note on all required materials:
All drawings/copies submitted must be prepared in a clean, professional manner. Graphic scales, north arrows, drawing references, consistency of drawing techniques and a clear, understandable presentation are expected. The Committee will not accept the submission if this standard of care is not met. Partial submittals are not accepted. All drawings within a submittal must be on the same paper size, either 24"x36" or 30"x42". Drawing scales shall be sufficient to demonstrate the design concepts. Minimum 1/8" scale for plans and sections; 1:20 for site plans (unless noted otherwise).

Please submit three (3) full sized copies of all required materials at each phase, along with one (1) set of 11x17 reductions.

PRELIMINARY DESIGN REVIEW APPLICATION FORM
SERENO CANYON

To: **Sereno Canyon Design Review Committee**

Date of Submittal: _____

Subject: **Preliminary Design Review Submittal**

From:

Owners Name: _____

Phone Number: _____

Address: _____

_____

Architect: _____

Phone Number: _____

Address: _____

_____

Builder/Contractor: _____

Phone Number: _____

Address: _____

_____

PRELIMINARY DESIGN REVIEW APPLICATION FORM
SERENO CANYON

Site Information:

Lot Number: _____
Lot Area: _____

Building Envelope Area: _____

Proposed Residence Information:

Enclosed air conditioned area: _____

Enclosed un-conditioned area: _____

Total area under roof: _____

Description of submittal:

_____

_____

_____

Applicant:
As the Applicant, the Owner or Owner's agent, I have read the Sereno Canyon Design Guidelines and the CC&R's concerning design and construction in Sereno Canyon.

_____ _____ _____
Applicant's Signature Print Name Date

Received by: _____ Date: _____

FINAL DESIGN REVIEW APPLICATION FORM
SERENO CANYON

To: **Sereno Canyon Design Review Committee**

Date of Submittal: _____

Subject: **Final Design Review Submittal**

From:

Owners Name: _____

Phone Number: _____

Address: _____

_____

Architect: _____

Phone Number: _____

Address: _____

_____

Builder/Contractor: _____

Phone Number: _____

Address: _____

_____

FINAL DESIGN REVIEW APPLICATION FORM
SERENO CANYON

Site Information:

Lot Number: _____
Lot Area: _____

Building Envelope Area: _____

Proposed Residence Information:

Enclosed air conditioned area: _____

Enclosed un-conditioned area: _____

Total area under roof: _____

Description of submittal:

_____

_____

_____

Applicant:
As the Applicant, the Owner or Owner's agent, I have read the Sereno Canyon Design Guidelines and the CC&R's concerning design and construction in Sereno Canyon.

_____ _____ _____
Applicant's Signature Print Name Date

Received by: _____ Date: _____

FINAL DESIGN REVIEW FORM
SERENO CANYON

To: **Sereno Canyon Design Review Committee**

Date of Submittal: _____
Lot Number: _____

Subject: **Final Design Review Submittal**

From:

Owners Name: _____
Phone Number: _____
Address: _____
_____

I/we _____
confirm that there have been no changes, modifications or additions to the preliminary plans approved by the Design Review Committee, except as listed below:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Applicant:
As the Applicant, the Owner or Owner's agent, I have read the Sereno Canyon Design Guidelines and CC&R's concerning design and construction in Sereno Canyon.

_____	_____	_____
Applicant's Signature	Printed Name	Date

FINAL DESIGN REVIEW SUBMITTAL CHECKLIST
SERENO CANYON

The following items are requested for Final Design Review:

- One (1) complete set of construction documents. Include civil engineering grading and drainage.

- Photo image board of the actual samples of all exterior materials with their specific colors shown, including exterior hardscape and paving materials, decorative iron, railings, sills, columns, etc. Include cut sheets of exterior lighting fixtures, and any specific appurtenances. See Materials check list. The image board must include the Lot number & Owner's name.

- One (1) complete set of landscape plans. (scale ¼", 3/16" or 1/8" = 1'0")
    1. Proposed contour revisions that deviate from the civil grading & drainage plans.
    2. Areas to be irrigated, call out location of backflow preventer.
    3. Location and sizes of existing plants and proposed plants. Indicate the relocated plants.
    4. Location of areas of re-vegetation.
    5. Show Building Envelope.
    6. Specify the color and size of the mineral landscape groundcover.
    7. Fountains, benches, fire pits, sculptures, created boulder features.
    8. List all proposed plants including common and botanical names.
    9. Location of exterior landscape lighting including cut sheets on type, wattage of bulbs, color/finish, etc.

- 11"x17" set of: site plan, floor plan, elevation, & roof plan, if there are deviations from the approved preliminary design submittal.

- A current hydrology report performed by a licensed civil engineer.

- Construction schedule indicating the approximate time-frame/milestone dates for:
    1. Start of construction
    2. Completion of slab/flatwork
    3. Completion of framing
    4. Completion of roofing
    5. Completion to the dry-in stage
    6. Completion of all construction
    7. Anticipated utility hook up
    8. Completion of landscaping
    9. Anticipated occupancy date

- Design Review Application

- Final Design Review Fee, Two thousand five hundred dollars ($2500.00)
  Check number: _____

Note:

All of the required exhibits listed above are required at the time of the final submittal, prior to the scheduling of the review.

All items that deviate from the approved preliminary submittal shall be highlighted in color. Including any changes made due to the City of Scottsdale planning/building review process.

The Committee will review the exhibits and will endeavor to respond in writing within thirty (30) days, indicating its approval, approval with stipulations, or rejection. Any response an Owner may wish to make regarding the results of a design review must be addressed to the Committee in writing.

Received by: _____ Date: _____

BUILDER ACKNOWLEDGMENT
SERENO CANYON

Acknowledgment of Construction Regulations

Contractor: _____

Lot: _____

Contact Person: _____

Phone #: _____

I acknowledge that I have read and that I understand the Construction Criteria for Sereno Canyon. I commit to observe and comply with these regulations, and realize that the community has the authority to halt construction activities on my Lot if it is determined that I or any of my agents are in violation of these requirements. I acknowledge that all suppliers, subcontractors, and consultants for this project are my responsibility, and therefore I will ensure that they understand and abide by these regulations.

Signature: _____

Date: _____

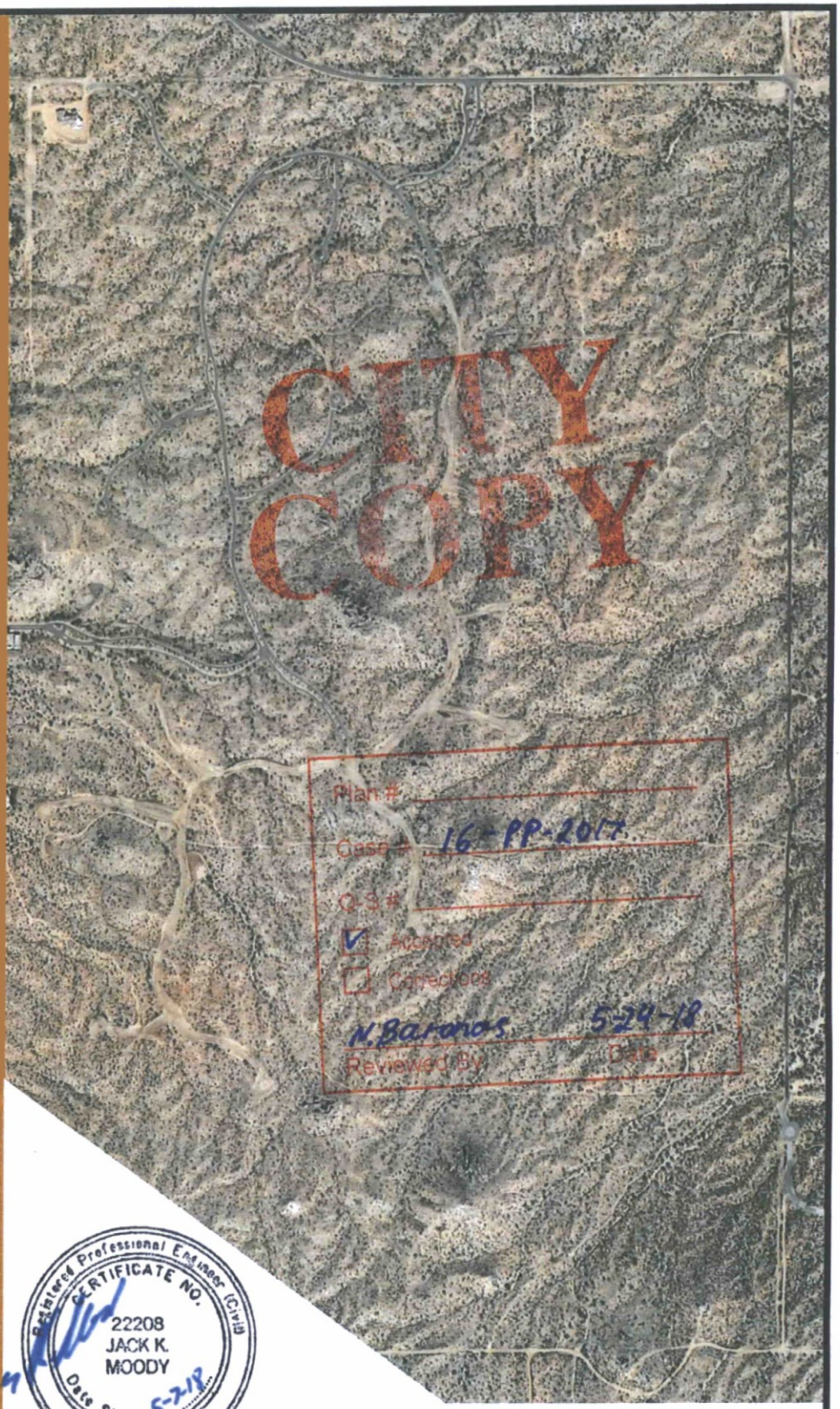
Submit this form at Pre-construction Meeting

Preliminary Drainage Report for

Sereno Canyon – Phase 4

Scottsdale, AZ

May 7, 2018



Prepared For:

Toll Brothers Inc.
8767 E. Via de Ventura
Suite 390
Scottsdale, AZ 85258
480.951.0782

Prepared By:

SHG Inc.
11201 N. Tatum Blvd. #250
Phoenix, Arizona 85028
www.shg-inc.com
jmoody@shg-inc.com

SHG Job Number:

TOL1702-000

Registered Professional Engineer (Civil) CERTIFICATE NO. 22208 JACK K. MOODY Date Signed 5-21-18 ARIZONA, U. S. A.

SLATER HANIFAN GROUP

"The Benchmark of Our Profession."

16-PP-2017
05/07/18

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Appendix A: References and CD

Appendix B: General Documentation

Appendix C: Hydrologic Analysis Supporting Documentation

Appendix D: Hydraulic Analysis Supporting Documentation

Appendix E: Sereno Canyon Phase 4 Maps

List of Tables

Table 1.1: Land Use Summary Table

Table 4.1: HEC-1 Model Identification

Table 4.2: Rainfall Depths

List of Maps

Sereno Canyon Soils Data Map *(from approved Master Drainage Report)*

Sereno Canyon Existing Conditions HEC-1 Schematic *(from approved Master Drainage Report)*

Map A: Sereno Canyon Phase 4 – Proposed Conditions Land Use Map

Map B: Sereno Canyon Phase 4 – Proposed Conditions Hydrology Map

Map C: Sereno Canyon Phase 4 – Proposed Development Layout

Map D: Sereno Canyon Phase 4 – Proposed Conditions HEC-1 Schematic

Map E: Sereno Canyon Phase 4 – Proposed Conditions HEC-RAS Cross Sections and Floodplains

1. Introduction

1.1. *Report Purpose*

This report contains drainage data analyses to support the Preliminary Plat for the Sereno Canyon Phase 4 project in Scottsdale, Arizona. This report builds on a previous report prepared by Argus Consulting, P.C., and uses language developed previously for this Preliminary Drainage Report with permission from Argus.

1.2. *Location of Study*

Sereno Canyon is located in Section 11, Township 4, Range 5 East of the Gila and Salt River Base and Meridian. The site is bound to the west by the existing Sonoran Crest Development (122nd Street alignment), to the east by the 128th Street alignment, to the north by the Happy Valley Road alignment, and to the south by the McDowell Mountain Sonoran Preserve. A Vicinity Map is provided in **Appendix B**.

1.3. *Project Background and Description*

The Sereno Canyon development is a planned 350-acre development (Phase 1-4) that contains three different zoning categories: a Single-family Residential District, Environmentally Sensitive Lands (RI-130/ESL) zoning designation; a Single-family Residential District, Environmentally Sensitive Lands (RI-43/ESL) zoning designation; and a Resort/Townhouse Residential, Environmentally Sensitive Lands (R-4R/ESL) zoning. The City Council approved, through cases 10-GP-2011, 1-ZN-2005#2, and 16-ZN-2011, a low density, master planned resort community complete with residential and guest services on the site.

In 2012, Sereno Canyon was approved for a Non-Major General Plan Amendment and Rezoning that allowed for increased residential density and a resort/townhouse use. The rezoning modified the existing RI-130 ESL on approximately 227 acres of the overall property to a combination of RI-43 ESL and R-4R. The approved Case No. 19-PP-2013 provided Phases 1-3 with 98 single-family lots and Phase 4 with a 299-unit Resort/Townhouse portion of the development.

Currently, Sereno Canyon contains an existing network of private internal streets that can be accessed via Ranch Gate Road through an existing gate and guardhouse. A majority of the property (Phase 1-3) was platted in 2008 and Crown Community Development subsequently improved the Phase 1 area, as well as an extensive off-site network of roadways and utilities as required by the City.

It is important to note that the herein presented study utilizes information previously approved by the City of Scottsdale for Sereno Canyon project as listed following:

- *Sereno Canyon Master Drainage Plan* (Approved MDP) – November 15, 2006
- *Sereno Canyon Master Drainage Plan Amendment I* (Amendment I) – January 9, 2012
- *Sereno Canyon Master Drainage Plan Amendment II* (Amendment II) – September 18, 2012

It should be noted that the hydrologic modeling, computational approaches and drainage concepts presented herein adhere significantly to those discussed in the above listed approved reports. It should also be noted that the Preliminary Drainage Report (Phase 4) is an amendment to Amendment II; therefore, the reader is encouraged to reference the listed report above for additional details regarding currently approved drainage concepts and facilities. Digital copies of the approved documents have been provided on a separate CD with this report.

The Federal Emergency Management Agency (FEMA), under the National Flood Insurance Program (NFIP), has issued on October 16, 2013, Flood Insurance Rate Map (Map Number: 04013C1330L), indicating that a portion of the Sereno Canyon Phase 4 is within designated 'Other Flood Areas' Zones X. Zone X is defined as "Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood". FEMA has also issued on November 4, 2015, Flood Insurance Rate Maps (Map Number: 04013C1335M) indicating that a portion of the Sereno Canyon Phase 4 is within designated 'Other Flood Areas' Zones D. Zone D is defined as "Areas in which flood hazards are undetermined, but possible". Please see the floodplain map, provided in **Appendix B**, for reference to the FEMA designated flood zones.

The Sereno Canyon plan provides 176 acres of NAOS; more than 50% of the project area. The required NAOS for Phase 1-3 (approximately 120 Acres) has been dedicated through previous plat approval. Phase 4 is required to provide 54 acres with final plat, as shown on the NAOS map provided in **Appendix B**.

1.4. *Proposed Land Use Plan Description*

Sereno Canyon is intended to be a low-impact development that maintains and incorporates natural Sonoran Desert landscape. This study has been prepared in support of this land use. Four primary land-use types are being proposed within the Sereno Canyon Phase 4 development: Estate Lot Residential, Villa Lot Residential, Resort Residential Townhomes, and a Lodge House (Resort & Spa). General Transportation sections have been placed throughout the perimeter of Sereno Canyon Phase 4 as access roads are proposed surrounding the residential areas. The proposed land use plan for the Sereno Canyon Phase 4 can be found in **Appendix E**, and a general development layout can be found in **Appendix A**. The proposed gross density for Phase 4 is 2.32 Du/Ac. The Sereno Canyon Land Use Map contains a table with IA, RTIMP, Vegetation Cover, DTHETA, and Kb values for each of the land use zoning categories, and a summary table has been duplicated below as **Table 1.1**. Standard values as outlined in the *City of Scottsdale Design Standards and Policies Manual* (DS&PM), as well as the *Flood Control District of Maricopa County's Hydrology Manual* and DDMSW program defaults, were maintained for the proposed conditions hydrologic modeling. **Table 1.1** below identifies the values associated with each of the Green and Ampt parameters associated with the hydrology model, discussed further in Section 4 of this report.

Table 1.1 – Land Use Summary Table

Land Use Description	Associated City Land Use Code	FCDMC Land Use Code	IA (inches)	RTIMP (%)	Vegetation Cover (%)	DTHETA (-)	Kb (-)
Resort Residential (2 DU/Ac.) Average Lot = 1/2 Acre	R1-18	140	0.25	30	50	Normal	Min.
Villa Lot Average Lot = 1 Acres	R1-43	130	0.30	15	50	Normal	Min.
Estate Lot Average Lot = 3 Acres	R1-130	120	0.30	5	30	Normal	Min.
Resort & Spa	R-4R	510	0.10	80	75	Normal	Min.
General Transportation	Road	605 (Custom)	0.10	100	0	Normal	Min.

1.4.1. Estate Lot Residential

Estate Lot Residential land-use will consist of single family residence located on lots that are typically two to three acres or greater in size. The City land-use code associated with this development is R1-130.

1.4.2. Villa Lot Residential

Villa Lot Residential land-use will consist of single family residences located on lots that are one acre or greater in size. The City land-use code associated with this development is R1-43.

1.4.3. Resort Lot Residential

Resort Residential units will be a combination of attached and detached housing types at an average density of approximately two units per acre. The City land-use code associated with this development is R1-18 although the actual underlying zoning district for the Resort Residential area is R1-18.

1.4.4. Resort & Spa

The Sereno Canyon Lodge House property will be a low-intensity, experiential resort that integrates within the surrounding natural desert. The City land use code associated with this development is R-4R.

1.5. Special Conditions

Several stipulations were previously identified and approved for the Sereno Canyon development and are applicable to Phase 4. The stipulations that relate to this drainage report are included below.

1.5.1. Project Stipulations

- Submit a final drainage report that demonstrates consistency with the DSPM and the case drainage report (19-PP-2013) accepted in concept by the Director, or designee, of the Stormwater Management Division of the Municipal Services Department.
- Demonstrate consistency with the accepted master drainage plan and report. For any design that modifies the accepted master drainage report, the owner shall submit a site-specific addendum to the final drainage report and plan, subject to review and acceptance by the Stormwater Management Division's Director or designee.
- An addendum generated by the final drainage analysis for this site shall be added to the appendix of the final drainage report.

1.5.2. Existing and Proposed Site Conditions

Existing condition analyses were based on natural Sonoran Desert landscape. Proposed condition analyses include the land use plan components (buildings, roads, drainage structures, etc.). Onsite infrastructure improvements include several in-line storage basins. Flow in excess of storage basin capacity is typically conveyed downstream via a designated overflow area. Further discussion regarding storage basins and outlet structures is provided in Section 5. Additionally, discussion regarding drainage structures is provided in Section 3.5 of the Approved MDP.

1.5.3. CWA Section 404 Washes

A jurisdictional delineation of Waters of the U.S. (WUS) and Section 404 Permit was granted for Phase 1-3 (USCOE File No. 2005-01561-AP). All permitted activities for Phase 1-3 have been completed.

An application for a jurisdictional delineation of WUS is currently being submitted for Sereno Canyon Phase 4. The proposed 404 Washes are depicted in the Preliminary Grading and Drainage Plan as part of this submittal.

2. Description of Area Study

2.1. *Existing Site Conditions*

For this Preliminary Drainage Plan (Phase 4) amendment, the existing site conditions is undeveloped, natural Sonoran Desert as discussed in the Approved MDP, Amendment I, and Amendment II reports. Please refer to Amendment II for detailed discussion regarding the most recent existing condition hydrologic modeling and results.

2.2. *Proposed Site Conditions*

The proposed Preliminary Drainage Plan for Sereno Canyon Phase 4 allows existing drainage ways to be maintained in their natural location and condition where possible. Under the preliminary plan, flow enters and exits the project site at historic locations. In addition, flow exiting the project site will not adversely impact downstream property owners. Detailed discussion regarding the Sereno Canyon Master Drainage Plan is provided in the Approved MDP, Amendment I, and Amendment II reports.

3. Site Mapping Information

The available mapping utilized in this study was developed by Vertical Mapping (Flight Date: 4/21/17) as follows:

1. Topographic Map: A digital topographic map was developed for the project site with a contour interval of 1-foot. This data was utilized for on-site grading and drainage design. Map Scale 1"=40'.

2. Aerial Photo: Aerial photograph, used in conjunction with the topographic mapping, was utilized to provide vegetation cover patterns and identify existing improvements, flow paths, and rock outcrop locations. Photo Scale 1:3600.

4. Hydrologic Analysis

Existing condition HEC-1 modeling is presented and discussed in detail in the Amendment I (January 2012) report and approved by City of Scottsdale. A digital copy of the existing conditions HEC-1 model is included in **Appendix A**.

Hydrologic calculations in this report were prepared only for Proposed Conditions (Post-Development) to update the previously approved Amendment II (September 2012) HEC-1 model using the proposed land use.

The proposed conditions HEC-1 models (2-, 10-, and 100-year) presented in Amendment II report are utilized in this study and modified as needed to represent Phase 4 development therefore maintaining the integrity of the previously approved analyses. When subbasin data was modified due to revisions within the Phase 4 development, the original 'E' (east) and 'W' (west) letters on the subbasin names were removed (for example: SBE01A to SB01A or SBW07B to SB07B). Additionally, when 'new' sub basins were created due to subdividing drainage areas, the original 'E' (east) and 'W' (west) letters were again removed and a numerical identification was added at the end of the name (for example: SBE02A to SB02A1).

Rainfall runoff modeling of the proposed developed condition was accomplished using the U.S. Army Corps of Engineers HEC-1 computer program, version 4.1. HEC-1 models were developed based on guidelines presented in the City of Scottsdale's Design Standards and Policy Manual (DS&PM, 2018) and Flood Control District of Maricopa County's Hydrology Drainage Design Manual for Maricopa County, Arizona (FCD Hydrology Manual, 2013). In addition, the Drainage Design Management System (DDMSW, version 5.3.0) program provided by FCDMC was used to develop hydrologic modeling parameters.

HEC-1 models were developed for the 2-, 10-, and 100-year, 6-hour storm events. HEC-1 model identification is provided below in **Table 4.1**.

Table 4.1 – HEC-1 Model Identification

HEC-1 Model	Condition and Storm Event
SerenoPrelPh4_DEV_2yr.dat	Developed Condition 2-Yr/6-Hr
SerenoPrelPh4_DEV_10yr.dat	Developed Condition 10-Yr/6-Hr
SerenoPrelPh4_DEV_100yr.dat	Developed Condition 100-Yr/6-Hr

4.1. *Design Rainfall*

Per the City's DS&PM, hydrologic modeling was completed for the 2-, 10-, and 100-year, 6-hour design storm events. Maximum rainfall values for the project area were determined in the previous project studies using DDMSW and are listed following in **Table 4.2**.

A GIS-based approach was used for determining design rainfall depths derived from NOAA Atlas 14 point precipitation estimates. A shapefile is included with the digital files accompanying this report (Rainfall_Basin.shp) which was used in DDMSW to determine rainfall depths for the Sereno Canyon development.

Table 4.2 – Design Rainfall Depth Values

Design Rainfall	Rainfall Depth [inch]
2-Year, 6-Hour	1.42
10-Year, 6-Hour	2.11
100-Year, 6-Hour	3.18

The developed condition HEC-1 model uses the depth/area record (JD record) and cumulative precipitation time series (PC record) to simulate the rainfall depths, area reduction, and rainfall distribution. Rainfall distribution and depth/area values were computed using DDMSW.

4.2. *Rainfall Losses*

Rainfall losses are generally considered to be the result of evaporation of water from the land surface, interception of rainfall by vegetal cover, depression storage on the land surface (paved or unpaved), and the infiltration of water into the soil matrix. Detailed discussion regarding soil information for the Sereno Canyon project is provided in the Amendment I report.

The selection of parameters to simulate rainfall losses was performed using the DDMSW computer program available through the FCDMC. Soil data was used with the DDMSW software to calculate Green and Ampt parameters. Urban development was represented by the proposed land use, accompanied by adding a percentage of impervious cover to the drainage subbasin. HEC-1 computes 100% of runoff from the percent of a subbasin area indicated in the LG record (impervious area). Output tables for rainfall loss parameters are provided in **Appendix C**. Please note that the current DDMSW software program outputs do not display the initial abstraction (IA) values properly within the PDF summary report; however, the IA values have been checked in individual subbasins as well as the HEC-1 models and is accurate based on the subbasin characteristics. It is simply an output display issue that could not be addressed within DDMSW.

It should be noted that the existing conditions HEC-1 model remains unchanged from the previously approved models as part of the Amendment I report. Differences between the previously approved existing conditions hydrologic model parameters and the current proposed parameters are a result of utilizing the default values within the DDMSW program and City and District guidelines for land use codes. The proposed conditions model uses equivalent proposed land use values based on the proposed site plan for the Phase 4 development to alter the HEC-1 records according to the proposed development.

4.3. *Unit Hygrograph*

The Clark Unit Hydrograph method, per the City's DS&PM and FCDMC Hydrology Manual, was utilized to compute developed condition peak discharges and runoff volumes at select concentration points. Clark Unit Hydrograph parameters include the time of concentration (Tc), storage coefficient (R), and a time-area relation. Tc and R values were computed using the DDMSW program.

4.4. *Time of Concentration (Tc)*

The time of concentration (Tc) for use with the Clark Unit Hydrograph is estimated using the following equation from the FCDMC Hydrology Manual:

$$T_c = 11.4\, L^{0.5} K_b^{0.52} S^{-0.31} i^{-0.38}$$

where:

T_c = time of concentration, in hours

L = length of the hydraulically longest flow path, in miles

K_b = watershed resistance coefficient (Figure 5.5 or Table 5.3 FCD Hydrology Manual)

S = watercourse slope, in feet/mile

i = the average rainfall excess intensity, in inches/hour

The solution for the Tc equation is an iterative process that was accomplished using the DDMSW computer program. Developed conditions subbasin Tc values are provided in output tables contained in **Appendix C**. Values of Tc that are indicated as non-default or out-of-range values within DDMSW output tables are due to the NMIN parameter selected for the hydrologic model. Due to the varying subbasin sizes and hillside slopes of the terrain in and around the development, some subbasins will result in out-of-range values for the time of concentration according to the requirements of the FCDMC's Hydrology Manual. However, this does not significantly affect the output results.

4.5. *Flood Hydrograph Routing*

4.5.1. *Channel*

Hydrograph routing was simulated using the Normal-Depth method (Modified Puls) as recommended by the City's DS&PM and FCD Hydrology Manual. The HEC-1 Routing Data Table is included in **Appendix C**.

4.5.2. *Reservoir*

Flood hydrograph routing through proposed detention basins was simulated using the HEC-1 reservoir routing routine through a stage-storage-discharge relationship (SV, SE, SQ). The HEC-1 model in **Appendix C** contains the SV, SE, and SQ records used for each storage basin, and the peak stages and discharges can be viewed in the HEC-1 results.

Appendix C contains the hydrologic parameters summary tables for rainfall, soils, and land use developed within DDMSW and utilized in the HEC-1 model for proposed conditions. Drainage areas are shown in Map B in **Appendix E**.

4.6. *Hydrologic Analysis Results (HEC-1 Model)*

Existing condition and proposed condition peak discharges (2-, 10-, and 100-year, 6-hour) at identified locations along the project site boundary are provided in table format in **Appendix C** after each of the separate HEC-1 model output files.

4.7. *Discussion of Flow Increases from Pre- to Post-Development*

CE065A has increased by 2 cfs in the 100-year event and 9 cfs in the 10-year event from the existing conditions hydrologic model. This natural wash reach where the flow has been slightly increased is currently undeveloped natural desert. At the property boundary where the flow increase happens, the wash has sufficient capacity to maintain the flows within the channel banks, and equates to an approximate water surface elevation increase of 0.02 feet in the 100-year event and 0.08 feet in the 10-year event. Furthermore, the overall depth within the natural wash channel banks is approximately 10 feet, whereas the flow depth is under 2 feet for both the 10- and 100-year events. Therefore, this flow increase is insignificant and will not adversely impact the natural wash conditions.

Other increases throughout the site (SB08A, SB10A, SBE16A, SBE21A, and SBW04A) were present in the approved Amendment II report. They occur in areas where the 100-year peak discharge is relatively small, no greater than 7cfs, as documented in the approved Amendment II report. Additionally, the 100-year increases were all limited to 1 cfs at these locations.

In the 10-year event, increases occur at similar locations (CE065A, SB10A, SBE16A, SBE21A, and SBW04A), but also occur at two other locations (SBE20A and SBW13A). While not explicitly documented in the Amendment II report, the hydrologic parameters were not altered from the Amendment II hydrology for these subbasin areas. Furthermore, these subbasins do not receive flows from the Phase 4 development area and are not within the limits of development for Phase 4.

Please refer to the HEC-1 output summary tables for documentation of flow increases at the above described locations in **Appendix C**.

5. Stormwater Storage

Additional discussion regarding the approach to stormwater storage within the Sereno Canyon Development is provided in Section 3.3 and Section 3.5 of the Approved MDP, Section 6 of Amendment I, and in Section 4 of Amendment II. Stormwater storage basins will continue to be further assessed during subsequent, more detailed, final design phase of the Sereno Canyon Development. The stormwater storage volumes and basin configurations and locations presented within this report have been estimated using the proposed land use and the preliminary grading and drainage plan.

5.1. *Stormwater Storage Volume*

Stormwater storage areas were identified at several locations throughout Sereno Canyon Phase 4. These storage basins are all in-line basins which discharge to natural wash areas throughout the development. A list of each 'new' basin identified in Phase 4 with the associated stormwater storage volume can be found in **Appendix C**. Because the Phase 4 development is within an ESLO zoning district, the stormawater storage approach was a pre-development vs. post-development analysis and storage basins were generally designed to attenuate post-development peak discharge rates for the 10- and 100-year events. Please refer to section 4.7 above for a discussion of any increases in post-development peak discharges.

Detention basin outlet structures will be further designed to manage the multi-frequency event peak flow discharges (2-, 10-, and 100-yr) based on final grading and design. General culvert outlet structures were modeled in HY-8, and output summaries are included in **Appendix D**.

5.2. *First Flush*

Numerous discharge locations located throughout the Sereno Canyon Phase 4 development makes a First Flush approach impractical for the site, especially when trying to preserve the natural habitat of the environment where possible. The development is located in an area which is not at a high risk for pollutant discharges as the majority of Phase 4 will be Estate and Villa lots, coupled with Resort and Resort Residential areas. The relatively upscale development will be designed and constructed to fit into the natural environment, and significant natural washes have been intentionally avoided to maintain the integrity of the washes.

The critical period for sedimentation and pollutants to enter the natural washes will be during the construction of the development. During the construction period, a Stormwater Pollution Prevention Plan (SWPPP) and an Arizona Pollutant Discharge Elimination System (AZPDES) will be developed and enacted. Additionally, disturbances for the construction of first flush basins would potentially increase the turbidity during construction as they would be numerous and likely placed adjacent to or within natural wash corridors.

6. Hydraulic Analysis

6.1 General

The City of Scottsdale's Environmentally Sensitive Lands Ordinance (ESLO) regulates the location and design of residential in the project's area. The ordinance requires that specific environmental features, such natural washes, be preserved in their native locations and conditions.

The ESLO is seeking to minimize modifications of the flow and natural features of "significant washes", which are defined as having a 100-year storm flow of 50 cfs or more. Based on the results of the hydrologic analysis presented herein, three ephemeral washes have been identified as having a 100-year storm flow of 50 cfs or more. A reach boundary condition using normal depths and channel slopes of existing conditions topography was used for the hydraulic analysis. The topography will remain unchanged at the downstream extent of the reaches beyond property boundaries. A subcritical flow regime was used for the proposed conditions hydraulic assessment. This was done in order to establish pad elevations and finished floor elevations of lots adjacent to washes as the subcritical flow regime will produce the most conservative channel depths within wash sections. In final design, a mixed flow regime will be used to further evaluate channel hydraulics for velocities and scour potential. The levee function of HEC-RAS was used to identify natural ineffective flow areas. This is not a physical man-made levee, but a representation of a natural high point modeled within HEC-RAS. A floodplain delineation was prepared utilizing a proposed conditions HEC-RAS model, and results for significant washes throughout the proposed development can be found in **Appendix D**. The preliminary grading and drainage plan and Map E show the floodplain limits.

Curb openings and culverts were placed at locations necessary to maintain hydrologic boundaries and drain sump locations throughout the proposed development. They have been preliminarily designed to remove runoff from road pavement and to convey flows under street corridors to discharge to storage basins and washes. Hydraulic calculations can be found in **Appendix D.**

7. Erosion, Sedimentation and Maintenance

7.1. *Erosion and Setbacks*

Erosion protection components are proposed throughout the project to prevent scour by using rock riprap, concrete, and slope compaction/revegetation. The soil classification for the site is Gran-Wickenburg Complex. Field investigation revealed a surface covered with pebbles, cobbles and rock outcrops, which are indicators of surface armoring (erosion hazard slight).

Following the guidelines by the Arizona Department of Water Resources (ADWR) in the State Standard No.5-96, an erosion setback line was establish along those channels with floodplains (Map E). Watercourses in Sereno Canyon Phase 4 are under the category of "watercourses with minor curvature". For such watercourses which have drainage areas of less than 30 square miles, the recommended erosion setback allowance is calculated as follows:

$$\text{Setback} = 1.0\ (Q_{100})^{0.5}$$

where setback is in feet and Q_{100} is in cubic feet per second.

In all cases, the "minimum" setback for a watercourse with "minor" curvature shall be 20 feet, measured from the 100-yr floodway or the top of the channel bank. No on-site washes convey flows in excess of the minimum value required to surpass the 20-foot minimum erosion hazard setback, thus the 20-foot minimum setback will be implemented for all on-site washes.

7.2. *Sedimentation*

Vertical roadway alignments proposed in Final Design will consider the use of modified culvert inlets to maintain the natural wash/channel velocities through the culvert crossing, and will maintain existing sediment transport conditions of the natural wash. Channel hydraulics from the previously approved Master Drainage Report and Amendments I and II were utilized for this report and remain unchanged. The results are included in **Appendix D**.

7.3. *Maintenance*

Ongoing maintenance of the drainage systems are required to preserve their design integrity and function. Failure to provide adequate maintenance can prevent the drainage systems from performing in accordance with their design intent. It is the responsibility of the owner of the facilities to provide maintenance and to ensure the drainage structures are functioning as intended. A regular maintenance program is required for the drainage system to function and maintain the level of protection provided with the intent of the design presented herein.

Per the approved Sereno Canyon Master Drainage Plan Amendment, a Facility Maintenance Plan will accompany final design of facilities. Maintenance activities will include, but not be limited to, the following:

- Removal of sediment accumulation within stormwater storage basins
- Repairing of basin sideslopes that have been impacted by rilling from local runoff
- Maintaining a clear bleed-off pipe at outlet structures
- Maintain grated inlets at outlet structures
- Maintaining channel plan, profile, and cross-sectional geometry to mitigate against development of unstable channels

Appendix A: References

List of References

Digital Copies of Reference Materials (See CD included)

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Appendix A Referenced Documents

1. Wood, Patel &, Inc., *Master Drainage Report for McDowell Mountain Back Bowl.* Revised May 12, 2005.
2. Wood, Patel &, Inc., *Master Drainage Report for Sereno Canyon.* November 15, 2006.
3. JE Fuller/Hydrology & Geomorphology, Inc., *Master Drainage Plan for Sereno Canyon (Amendment I).* January 9, 2012.
4. JE Fuller/Hydrology & Geomorphology, Inc., *Master Drainage Plan for Sereno Canyon (Amendment II).* September 18, 2012.
5. City of Scottsdale, *Design Standards & Policies Manual*, 2018.
6. Flood Control District of Maricopa County, *Drainage Design Manual for Maricopa County, Volume I Hydrology*. August 15, 2013.
7. Flood Control District of Maricopa County, *Drainage Design Manual for Maricopa County, Volume II Hydraulics*. August 15, 2013.
8. Arizona Department of Water Resources, *State Standard for Watercourse System Sediment Balance (SS 5-96).* September 1996.
9. U.S. Army Corps of Engineers, HEC-*RAS River Analysis System, Version 4.1.0.* January, 2010.
10. Flood Control District of Maricopa County, *Drainage Design Management System for Windows (DDMSW), Version 5.3.0.*

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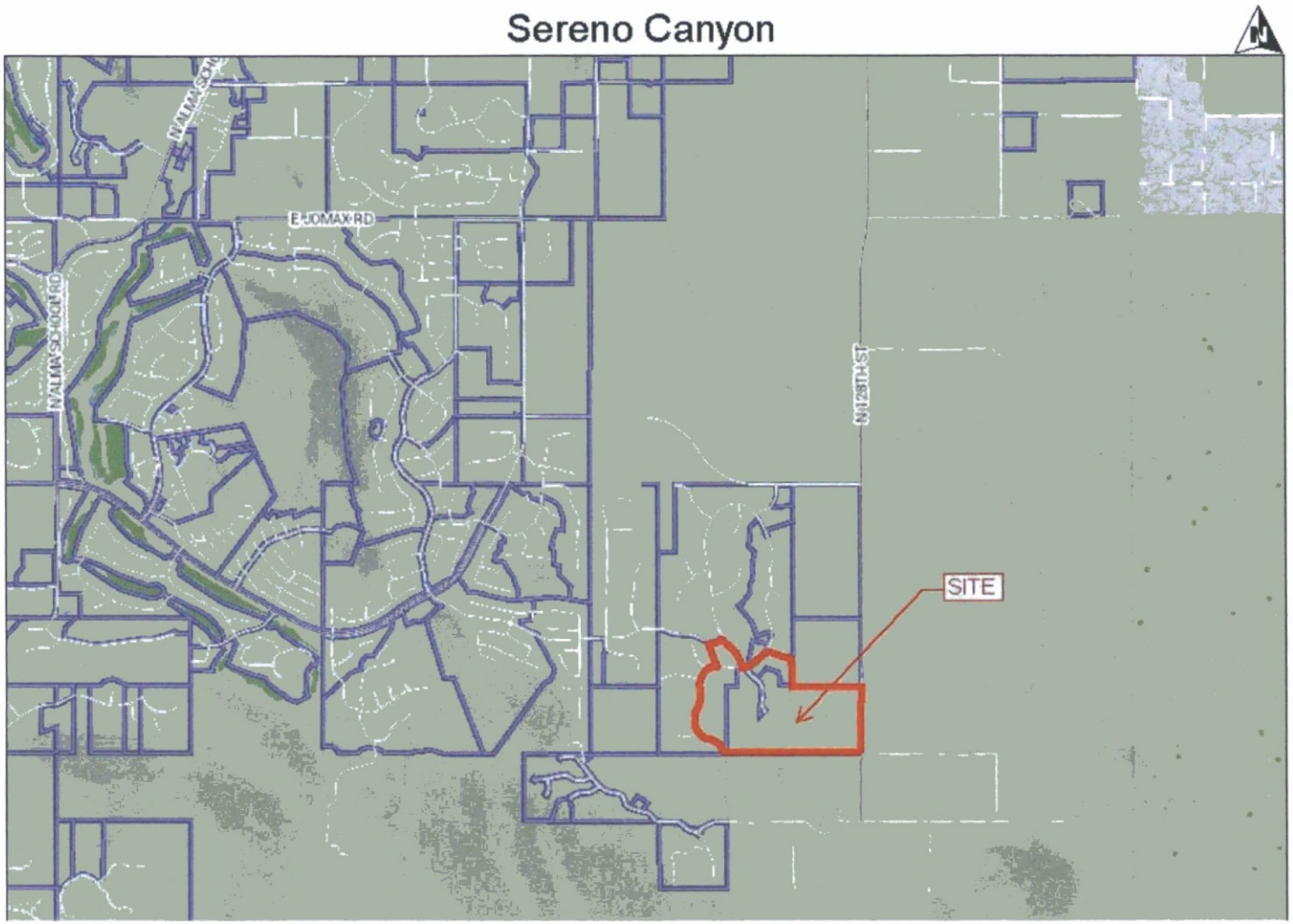


Exhibit A – Vicinity Map
Project Name: Sereno Canyon
Project Number: AC# 385-17

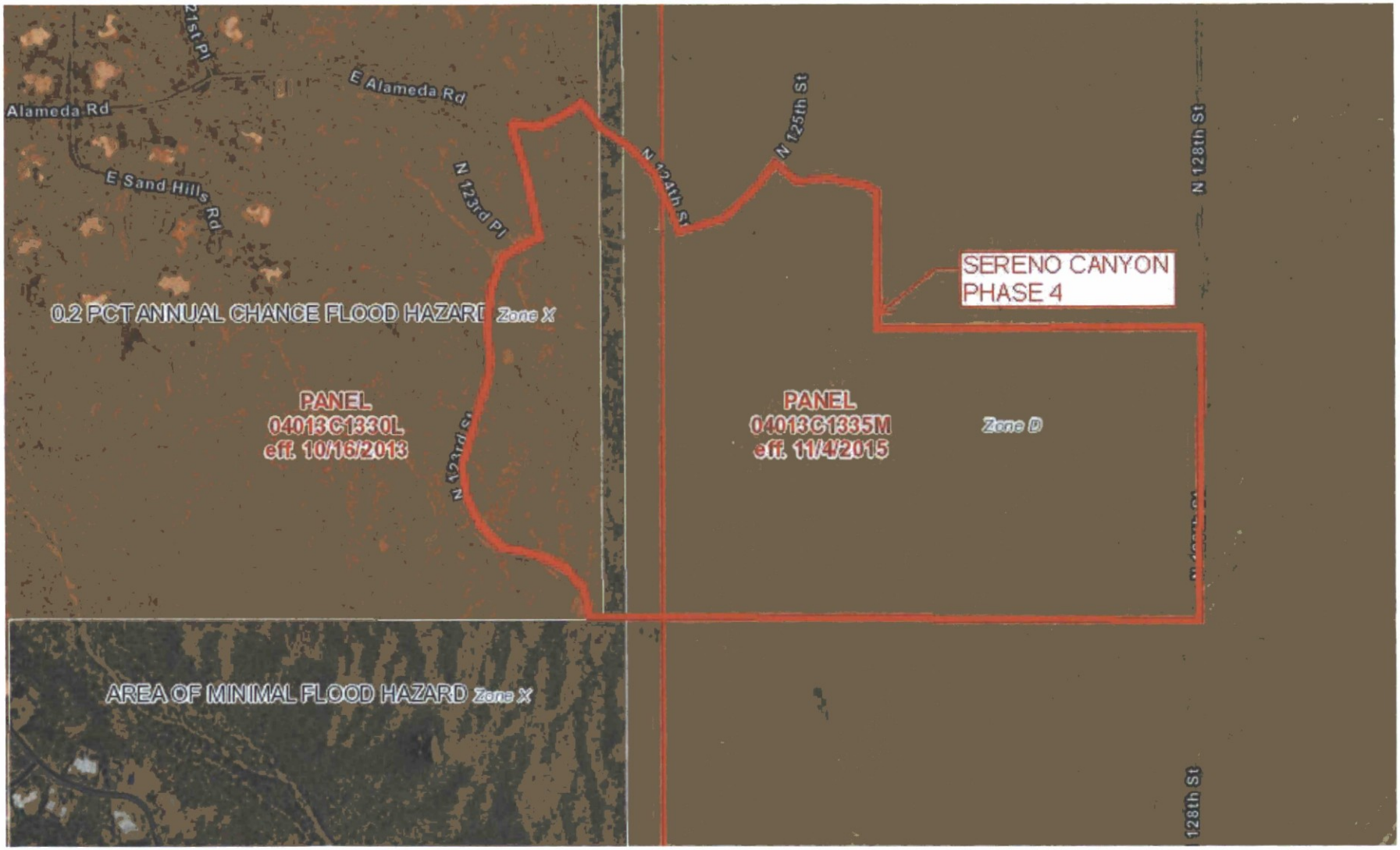


Exhibit B – Floodplain Map
Project Name: Sereno Canyon
Project Number: AC# 385-17

SITE DATA

GROSS AREA:	129.03 ACRES	
NET AREA:	127.82 ACRES	
EXISTING ZONING:	R-4R/ESL	
PROPOSED ZONING:	UNCHANGED	
LOT COUNTS:	ESTATE VACATION HOMES	5
	LODGE COTTAGES	29
	RESORT VILLAS	129
	RESORT PAIRED VILLAS	44
	RESORT TOWNHOMES	90
	TOTAL	297
GROSS DENSITY:	2.32 DU/AC	

APNs: 217-01-010, 217-01-011A, 217-01-011C, 217-01-011D, 217-01-016F, 217-01-016K, 217-01-016L, 217-01-161, 217-01-162, 217-01-180 TO 217-01-189, 217-01-194 TO 217-01-199, 217-01-216, 217-01-217

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Appendix C: Hydrology

DDMSW Summary Tables

USGS Soils Data

HEC-1 Model Outputs

HEC-1 Summary Tables

Basin Stage-Storage Calculations

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ID	Method	Duration	2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
DEFAULT	NOAA14	5 MIN	0.315	0.424	0.505	0.611	0.690	0.769
	NOAA14	10 MIN	0.479	0.645	0.768	0.929	1.050	1.170
	NOAA14	15 MIN	0.594	0.799	0.952	1.152	1.301	1.451
	NOAA14	30 MIN	0.800	1.076	1.282	1.552	1.753	1.953
	NOAA14	1 HOUR	0.990	1.332	1.587	1.920	2.169	2.418
	NOAA14	2 HOUR	1.125	1.492	1.769	2.142	2.421	2.707
	NOAA14	3 HOUR	1.194	1.554	1.840	2.235	2.547	2.866
	NOAA14	6 HOUR	1.421	1.803	2.108	2.523	2.845	3.178
	NOAA14	12 HOUR	1.706	2.144	2.491	2.962	3.324	3.695
	NOAA14	24 HOUR	2.118	2.755	3.268	3.995	4.579	5.196

SEE SHAPE FILE "RAINFALL_BASIN" FOR LOCATION.

SOURCE: MDP, AMENDMENTS I & II

Flood Control District of Maricopa County
Drainage Design Management System
SUB BASINS

Project Reference: SERENO CANYON PH.4

Area ID	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
SB01A	0.119	0.97	410.1	290.3	NATURAL	0.103	0.10	0.25	6.00	0.284	1	**Tc (Hrs)**	0.709*	0.667*	0.600*	0.532*	0.491*	0.460 *
												Vel (f/s)	2.01	2.13	2.37	2.67	2.90	3.09
												R (Hrs)	0.830	0.775	0.689	0.603	0.552	0.513
SB02A1	0.059	0.73	425.9	292.9	NATURAL	0.111	0.10	0.25	6.00	0.284		**Tc (Hrs)**	0.641*	0.602*	0.541*	0.479*	0.442*	0.414 *
												Vel (f/s)	1.67	1.78	1.98	2.24	2.42	2.59
												R (Hrs)	0.881	0.822	0.730	0.638	0.584	0.543
SB02A2	0.003	0.14	219.6	217.9	URBAN	0.038	0.25	0.25	6.00	0.216	30	**Tc (Hrs)**	0.154	0.147	0.135	0.122	0.114	0.108
												Vel (f/s)	1.33	1.40	1.52	1.68	1.80	1.90
												R (Hrs)	0.265	0.251	0.228	0.204	0.189	0.178
SB02A3	0.003	0.14	264.5	248.1	NATURAL	0.143	0.10	0.25	6.00	0.284		**Tc (Hrs)**	0.337*	0.317*	0.284*	0.252*	0.233	0.218
												Vel (f/s)	0.61	0.65	0.72	0.81	0.88	0.94
												R (Hrs)	0.629	0.587	0.521	0.456	0.417	0.388
SB03A	0.003	0.09	288.9	259.2	NATURAL	0.143	0.10	0.25	6.00	0.284		**Tc (Hrs)**	0.266*	0.250*	0.225	0.199	0.184	0.172
												Vel (f/s)	0.50	0.53	0.59	0.66	0.72	0.77
												R (Hrs)	0.340	0.318	0.282	0.247	0.226	0.210
SB03A1	0.002	0.16	195.0	195.0	NATURAL	0.147	0.10	0.25	6.00	0.284		**Tc (Hrs)**	0.394*	0.370*	0.332*	0.294*	0.272*	0.255 *
												Vel (f/s)	0.60	0.63	0.71	0.80	0.86	0.92
												R (Hrs)	1.048	0.979	0.869	0.760	0.695	0.646
SB04A	0.008	0.17	241.4	234.3	URBAN	0.036	0.25	0.25	6.00	0.216	30	**Tc (Hrs)**	0.162	0.154	0.141	0.128	0.120	0.113
												Vel (f/s)	1.54	1.62	1.77	1.95	2.08	2.21
												R (Hrs)	0.186	0.176	0.160	0.143	0.133	0.125
SB04B	0.011	0.26	246.1	237.4	URBAN	0.035	0.25	0.25	6.00	0.216	30	**Tc (Hrs)**	0.196	0.187	0.172	0.155	0.145	0.137
												Vel (f/s)	1.95	2.04	2.22	2.46	2.63	2.78
												R (Hrs)	0.270	0.256	0.233	0.208	0.193	0.182
SB04C	0.002	0.13	278.1	254.6	NATURAL	0.137	0.10	0.25	6.00	0.269	10	**Tc (Hrs)**	0.298*	0.282*	0.256*	0.228	0.212	0.200
												Vel (f/s)	0.64	0.68	0.74	0.84	0.90	0.95
												R (Hrs)	0.652	0.613	0.550	0.485	0.447	0.418

* Non default value or value out of range

Area ID	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
Major Basin ID: 01																		
SB05A	0.004	0.25	203.2	203.0	NATURAL	0.140	0.10	0.25	6.00	0.284		**Tc (Hrs)**	0.474*	0.445*	0.400*	0.354*	0.327*	0.306 *
												Vel (f/s)	0.77	0.82	0.92	1.04	1.12	1.20
												R (Hrs)	1.240	1.157	1.028	0.898	0.822	0.764
SB05B1	0.007	0.15	1154.5	313.0	NATURAL	0.134	0.10	0.25	6.00	0.284		**Tc (Hrs)**	0.314*	0.295*	0.265*	0.235	0.217	0.203
												Vel (f/s)	0.70	0.75	0.83	0.94	1.01	1.08
												R (Hrs)	0.379	0.354	0.314	0.274	0.251	0.234
SB05B2	0.006	0.21	913.7	313.0	NATURAL	0.135	0.10	0.25	6.00	0.284		**Tc (Hrs)**	0.373*	0.350*	0.315*	0.279*	0.257*	0.241
												Vel (f/s)	0.83	0.88	0.98	1.10	1.20	1.28
												R (Hrs)	0.655	0.612	0.543	0.475	0.434	0.404
SB05B3	0.004	0.16	201.3	201.2	URBAN	0.037	0.25	0.25	6.00	0.216	30	**Tc (Hrs)**	0.167	0.159	0.146	0.132	0.123	0.117
												Vel (f/s)	1.41	1.48	1.61	1.78	1.91	2.01
												R (Hrs)	0.272	0.258	0.234	0.210	0.195	0.183
SB05B4	0.004	0.11	263.6	247.6	URBAN	0.089	0.18	0.25	6.00	0.251	15	**Tc (Hrs)**	0.218	0.206	0.187	0.168	0.156	0.147
												Vel (f/s)	0.74	0.78	0.86	0.96	1.03	1.10
												R (Hrs)	0.271	0.255	0.230	0.203	0.187	0.175
SB06A	0.006	0.12	247.5	238.3	URBAN	0.036	0.25	0.25	6.00	0.216	30	**Tc (Hrs)**	0.135	0.129	0.118	0.107	0.100	0.095
												Vel (f/s)	1.30	1.36	1.49	1.64	1.76	1.85
												R (Hrs)	0.136	0.129	0.117	0.105	0.097	0.091
SB06B	0.004	0.24	169.5	169.5	NATURAL	0.140	0.10	0.25	6.00	0.284		**Tc (Hrs)**	0.491*	0.461*	0.415*	0.367*	0.339*	0.318 *
												Vel (f/s)	0.72	0.76	0.85	0.96	1.04	1.11
												R (Hrs)	1.248	1.165	1.035	0.904	0.827	0.769
SB06B1	0.003	0.13	423.3	292.5	URBAN	0.091	0.18	0.25	6.00	0.251	15	**Tc (Hrs)**	0.227	0.215	0.196	0.175	0.163	0.153
												Vel (f/s)	0.84	0.89	0.97	1.09	1.17	1.25
												R (Hrs)	0.383	0.361	0.324	0.287	0.265	0.248
SB06C1	0.015	0.31	317.3	269.1	NATURAL	0.080	0.10	0.25	6.00	0.272	40	**Tc (Hrs)**	0.307*	0.294*	0.271*	0.247	0.232	0.220
												Vel (f/s)	1.48	1.55	1.68	1.84	1.96	2.07
												R (Hrs)	0.428	0.408	0.373	0.336	0.314	0.296

Area ID	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
SB06C2	0.020	0.51	328.4	272.3	NATURAL	0.122	0.10	0.25	6.00	0.284		**Tc (Hrs)**	0.575*	0.541*	0.486*	0.430*	0.397*	0.372 *
												Vel (f/s)	1.30	1.38	1.54	1.74	1.88	2.01
												R (Hrs)	1.087	1.014	0.901	0.787	0.720	0.670
SB06C3	0.005	0.13	200.0	199.9	URBAN	0.037	0.25	0.25	6.00	0.216	30	**Tc (Hrs)**	0.151	0.144	0.132	0.119	0.111	0.105
												Vel (f/s)	1.26	1.32	1.44	1.60	1.72	1.82
												R (Hrs)	0.181	0.172	0.156	0.140	0.130	0.122
SB06D1	0.004	0.18	483.5	300.6	URBAN	0.109	0.10	0.25	6.00	0.276	24	**Tc (Hrs)**	0.281*	0.267*	0.244	0.221	0.206	0.195
												Vel (f/s)	0.94	0.99	1.08	1.19	1.28	1.35
												R (Hrs)	0.533	0.505	0.457	0.408	0.378	0.355
SB06D2	0.009	0.22	203.7	203.5	URBAN	0.035	0.25	0.25	6.00	0.216	30	**Tc (Hrs)**	0.189	0.181	0.165	0.150	0.140	0.132
												Vel (f/s)	1.71	1.78	1.96	2.15	2.30	2.44
												R (Hrs)	0.255	0.242	0.219	0.196	0.182	0.171
SB08A	0.001	0.04	476.2	299.7	NATURAL	0.155	0.10	0.25	6.00	0.284		**Tc (Hrs)**	0.177	0.166	0.150	0.132	0.122	0.115
												Vel (f/s)	0.33	0.35	0.39	0.44	0.48	0.51
												R (Hrs)	0.212	0.197	0.175	0.153	0.140	0.130
SB09A	0.001	0.05	1047.2	313.0	NATURAL	0.155	0.10	0.25	6.00	0.284		**Tc (Hrs)**	0.195	0.184	0.165	0.146	0.135	0.126
												Vel (f/s)	0.38	0.40	0.44	0.50	0.54	0.58
												R (Hrs)	0.282	0.263	0.234	0.204	0.187	0.174
SB10A	0.001	0.03	233.3	228.7	NATURAL	0.155	0.10	0.25	6.00	0.284		**Tc (Hrs)**	0.167	0.157	0.141	0.125	0.115	0.108
												Vel (f/s)	0.26	0.28	0.31	0.35	0.38	0.41
												R (Hrs)	0.157	0.147	0.130	0.114	0.104	0.097
SB11A	0.007	0.18	288.9	259.2	NATURAL	0.134	0.10	0.25	6.00	0.284		**Tc (Hrs)**	0.364*	0.342*	0.308*	0.273*	0.252*	0.236
												Vel (f/s)	0.73	0.77	0.86	0.97	1.05	1.12
												R (Hrs)	0.518	0.483	0.429	0.375	0.343	0.319
SB11A1	0.003	0.12	491.9	301.6	URBAN	0.091	0.18	0.25	6.00	0.251	15	**Tc (Hrs)**	0.216	0.205	0.186	0.167	0.155	0.146
												Vel (f/s)	0.81	0.86	0.95	1.05	1.14	1.21
												R (Hrs)	0.340	0.320	0.288	0.255	0.235	0.220

Area ID	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
SB11B	0.013	0.28	165.5	165.5	URBAN	0.076	0.18	0.25	6.00	0.246	17	**Tc (Hrs)**	0.359*	0.340*	0.310*	0.277*	0.258*	0.243
												Vel (f/s)	1.14	1.21	1.32	1.48	1.59	1.69
												R (Hrs)	0.509	0.480	0.432	0.383	0.354	0.331
SBE12A	0.002	0.08	353.3	278.7	URBAN	0.039	0.23	0.25	6.00	0.206	40	**Tc (Hrs)**	0.106	0.101	0.093	0.085	0.080	0.075
												Vel (f/s)	1.11	1.16	1.26	1.38	1.47	1.56
												R (Hrs)	0.140	0.133	0.121	0.109	0.102	0.096
SBE13A	0.003	0.09	379.3	284.5	URBAN	0.038	0.25	0.25	6.00	0.216	30	**Tc (Hrs)**	0.114	0.109	0.100	0.090	0.084	0.080
												Vel (f/s)	1.16	1.21	1.32	1.47	1.57	1.65
												R (Hrs)	0.133	0.126	0.114	0.102	0.095	0.089
SBE16A	0.001	0.06	428.6	293.3	URBAN	0.041	0.30	0.25	6.00	0.216	15	**Tc (Hrs)**	0.102	0.097	0.088	0.079	0.073	0.069
												Vel (f/s)	0.86	0.91	1.00	1.11	1.21	1.28
												R (Hrs)	0.159	0.150	0.134	0.119	0.109	0.102
SBE17A	0.018	0.31	296.2	262.0	URBAN	0.033	0.26	0.25	6.00	0.207	29	**Tc (Hrs)**	0.202	0.192	0.176	0.159	0.149	0.141
												Vel (f/s)	2.25	2.37	2.58	2.86	3.05	3.22
												R (Hrs)	0.242	0.230	0.208	0.186	0.173	0.163
SB17B	0.015	0.23	237.1	231.4	URBAN	0.040	0.24	0.25	6.00	0.200	29	**Tc (Hrs)**	0.199	0.189	0.173	0.157	0.147	0.139
												Vel (f/s)	1.70	1.78	1.95	2.15	2.29	2.43
												R (Hrs)	0.208	0.197	0.179	0.160	0.149	0.140
SBE18A	0.001	0.05	293.5	261.0	URBAN	0.041	0.30	0.25	6.00	0.216	15	**Tc (Hrs)**	0.097	0.092	0.083	0.074	0.069	0.065
												Vel (f/s)	0.76	0.80	0.88	0.99	1.06	1.13
												R (Hrs)	0.129	0.122	0.109	0.096	0.089	0.083
SBE19A	0.001	0.04	385.7	285.8	URBAN	0.041	0.30	0.25	6.00	0.216	15	**Tc (Hrs)**	0.084	0.080	0.072	0.065	0.060	0.056
												Vel (f/s)	0.70	0.73	0.81	0.90	0.98	1.05
												R (Hrs)	0.093	0.087	0.078	0.069	0.064	0.059
SBE20A	0.001	0.04	425.0	292.8	URBAN	0.041	0.30	0.25	6.00	0.216	15	**Tc (Hrs)**	0.084	0.079	0.072	0.064	0.060	0.056
												Vel (f/s)	0.70	0.74	0.81	0.92	0.98	1.05
												R (Hrs)	0.092	0.087	0.078	0.068	0.063	0.059

* Non default value or value out of range

Area ID	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
SBE21A	0.001	0.05	397.9	288.1	URBAN	0.041	0.30	0.25	6.00	0.216	15	**Tc (Hrs)**	0.094	0.089	0.081	0.072	0.067	0.063
												Vel (f/s)	0.78	0.82	0.91	1.02	1.09	1.16
												R (Hrs)	0.125	0.118	0.106	0.093	0.086	0.080
SBE22A	0.007	0.18	263.7	247.6	URBAN	0.036	0.30	0.25	6.00	0.216	15	**Tc (Hrs)**	0.175	0.165	0.150	0.134	0.124	0.117
												Vel (f/s)	1.51	1.60	1.76	1.97	2.13	2.26
												R (Hrs)	0.229	0.215	0.193	0.170	0.157	0.147
SBE23A	0.006	0.14	146.0	146.0	URBAN	0.036	0.29	0.25	6.00	0.212	21	**Tc (Hrs)**	0.176	0.168	0.153	0.137	0.128	0.120
												Vel (f/s)	1.17	1.22	1.34	1.50	1.60	1.71
												R (Hrs)	0.207	0.195	0.176	0.156	0.144	0.135
SBE23B	0.004	0.12	230.8	226.8	URBAN	0.037	0.27	0.25	6.00	0.204	28	**Tc (Hrs)**	0.140	0.133	0.122	0.110	0.103	0.097
												Vel (f/s)	1.26	1.32	1.44	1.60	1.71	1.81
												R (Hrs)	0.178	0.169	0.153	0.136	0.127	0.119
SBE23C	0.053	0.54	186.0	186.0	URBAN	0.030	0.28	0.25	6.00	0.185	13	**Tc (Hrs)**	0.297*	0.281*	0.254*	0.227	0.211	0.199
												Vel (f/s)	2.67	2.82	3.12	3.49	3.75	3.98
												R (Hrs)	0.313	0.295	0.263	0.232	0.215	0.201
SBE23D	0.041	0.47	159.5	159.5	URBAN	0.031	0.28	0.25	6.00	0.189	15	**Tc (Hrs)**	0.294*	0.278*	0.252*	0.226	0.210	0.198
												Vel (f/s)	2.34	2.48	2.74	3.05	3.28	3.48
												R (Hrs)	0.321	0.302	0.271	0.239	0.221	0.207
SBE23E	0.005	0.17	707.8	313.0	URBAN	0.037	0.29	0.25	6.00	0.204	19	**Tc (Hrs)**	0.156	0.148	0.135	0.121	0.113	0.106
												Vel (f/s)	1.60	1.68	1.85	2.06	2.21	2.35
												R (Hrs)	0.234	0.221	0.199	0.176	0.163	0.152
SBE24A	0.007	0.19	172.0	172.0	URBAN	0.036	0.27	0.25	6.00	0.203	29	**Tc (Hrs)**	0.188	0.179	0.164	0.148	0.139	0.131
												Vel (f/s)	1.48	1.56	1.70	1.88	2.00	2.13
												R (Hrs)	0.260	0.246	0.223	0.199	0.185	0.174
SBE24B	0.005	0.17	190.8	190.8	URBAN	0.037	0.28	0.25	6.00	0.179	15	**Tc (Hrs)**	0.182	0.173	0.156	0.140	0.131	0.123
												Vel (f/s)	1.37	1.44	1.60	1.78	1.90	2.03
												R (Hrs)	0.278	0.262	0.234	0.207	0.192	0.180

Flood Control District of Maricopa County
Drainage Design Management System
SUB BASINS
Project Reference: SERENO CANYON PH.4

Area ID	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
SBE24C	0.015	0.26	175.1	175.1	URBAN	0.034	0.28	0.25	6.00	0.188	17	**Tc (Hrs)**	0.221	0.209	0.190	0.170	0.159	0.150
												Vel (f/s)	1.73	1.82	2.01	2.24	2.40	2.54
												R (Hrs)	0.258	0.243	0.218	0.193	0.179	0.168
SBE24D	0.010	0.15	198.6	198.6	URBAN	0.035	0.30	0.25	6.00	0.186	6	**Tc (Hrs)**	0.172	0.162	0.145	0.129	0.120	0.113
												Vel (f/s)	1.28	1.36	1.52	1.71	1.83	1.95
												R (Hrs)	0.158	0.148	0.132	0.115	0.106	0.099
SBE25A	0.003	0.10	252.5	241.4	URBAN	0.038	0.25	0.25	6.00	0.195	38	**Tc (Hrs)**	0.122	0.117	0.107	0.098	0.092	0.087
												Vel (f/s)	1.20	1.25	1.37	1.50	1.59	1.69
												R (Hrs)	0.156	0.148	0.135	0.122	0.113	0.107
SBE25B	0.006	0.17	178.4	178.4	URBAN	0.036	0.29	0.25	6.00	0.212	20	**Tc (Hrs)**	0.183	0.174	0.158	0.142	0.132	0.125
												Vel (f/s)	1.36	1.43	1.58	1.76	1.89	1.99
												R (Hrs)	0.252	0.238	0.214	0.190	0.175	0.164
SBE25C	0.005	0.12	229.5	225.8	URBAN	0.037	0.27	0.25	6.00	0.177	17	**Tc (Hrs)**	0.144	0.136	0.124	0.111	0.104	0.098
												Vel (f/s)	1.22	1.29	1.42	1.59	1.69	1.80
												R (Hrs)	0.162	0.152	0.136	0.121	0.112	0.105
SBE26A	0.010	0.24	205.5	205.2	URBAN	0.035	0.26	0.25	6.00	0.200	31	**Tc (Hrs)**	0.196	0.187	0.171	0.155	0.145	0.137
												Vel (f/s)	1.80	1.88	2.06	2.27	2.43	2.57
												R (Hrs)	0.267	0.253	0.230	0.205	0.191	0.180
SBE27A	0.002	0.08	275.6	253.5	URBAN	0.039	0.30	0.25	6.00	0.216	15	**Tc (Hrs)**	0.120	0.114	0.103	0.092	0.086	0.081
												Vel (f/s)	0.98	1.03	1.14	1.28	1.36	1.45
												R (Hrs)	0.162	0.152	0.137	0.121	0.111	0.104
SBE28A	0.013	0.22	194.4	194.4	URBAN	0.034	0.29	0.25	6.00	0.200	17	**Tc (Hrs)**	0.198	0.188	0.171	0.153	0.142	0.134
												Vel (f/s)	1.63	1.72	1.89	2.11	2.27	2.41
												R (Hrs)	0.217	0.205	0.184	0.163	0.150	0.141
SBE29A	0.015	0.21	195.1	195.1	URBAN	0.075	0.20	0.25	6.00	0.228	10	**Tc (Hrs)**	0.300*	0.283*	0.257*	0.229	0.212	0.200
												Vel (f/s)	1.03	1.09	1.20	1.34	1.45	1.54
												R (Hrs)	0.305	0.287	0.257	0.226	0.208	0.195

* Non default value or value out of range

Area ID	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
SBW01 A	0.002	0.08	1020.0	313.0	URBAN	0.127	0.14	0.25	6.00	0.264	1	**Tc (Hrs)**	0.221	0.208	0.187	0.165	0.153	0.143
												Vel (f/s)	0.53	0.56	0.63	0.71	0.77	0.82
												R (Hrs)	0.317	0.296	0.263	0.230	0.210	0.196
SBW02 A	0.007	0.18	565.6	310.6	URBAN	0.094	0.18	0.25	6.00	0.243	2	**Tc (Hrs)**	0.281*	0.265*	0.238	0.211	0.195	0.183
												Vel (f/s)	0.94	1.00	1.11	1.25	1.35	1.44
												R (Hrs)	0.388	0.363	0.323	0.282	0.259	0.241
SBW04 A	0.002	0.07	746.4	313.0	URBAN	0.039	0.30	0.25	6.00	0.183	5	**Tc (Hrs)**	0.108	0.102	0.091	0.081	0.075	0.071
												Vel (f/s)	0.95	1.01	1.13	1.27	1.37	1.45
												R (Hrs)	0.129	0.121	0.107	0.094	0.086	0.080
SBW05 A	0.010	0.20	430.0	293.5	URBAN	0.035	0.29	0.25	6.00	0.191	11	**Tc (Hrs)**	0.172	0.163	0.147	0.131	0.122	0.115
												Vel (f/s)	1.71	1.80	2.00	2.24	2.40	2.55
												R (Hrs)	0.200	0.188	0.168	0.148	0.136	0.127
SBW06 A	0.004	0.12	442.1	295.3	URBAN	0.037	0.29	0.25	6.00	0.185	11	**Tc (Hrs)**	0.137	0.129	0.116	0.104	0.097	0.091
												Vel (f/s)	1.28	1.36	1.52	1.69	1.81	1.93
												R (Hrs)	0.173	0.163	0.145	0.128	0.118	0.110
SBW07 A	0.013	0.30	289.8	259.6	URBAN	0.034	0.27	0.25	6.00	0.197	22	**Tc (Hrs)**	0.207	0.196	0.179	0.161	0.150	0.142
												Vel (f/s)	2.13	2.24	2.46	2.73	2.93	3.10
												R (Hrs)	0.292	0.276	0.249	0.221	0.205	0.192
SB07B	0.007	0.22	563.4	310.3	NATURAL	0.134	0.10	0.25	6.00	0.284		**Tc (Hrs)**	0.381*	0.358*	0.322*	0.285*	0.263*	0.246
												Vel (f/s)	0.85	0.90	1.00	1.13	1.23	1.31
												R (Hrs)	0.639	0.596	0.529	0.463	0.423	0.394
SBW07 C	0.005	0.16	609.0	313.0	URBAN	0.084	0.21	0.25	6.00	0.230	3	**Tc (Hrs)**	0.248	0.233	0.210	0.186	0.172	0.162
												Vel (f/s)	0.95	1.01	1.12	1.26	1.36	1.45
												R (Hrs)	0.372	0.348	0.310	0.270	0.248	0.231
SBW08 A	0.009	0.17	514.5	304.2	URBAN	0.035	0.27	0.25	6.00	0.185	21	**Tc (Hrs)**	0.150	0.143	0.130	0.117	0.109	0.103
												Vel (f/s)	1.66	1.74	1.92	2.13	2.29	2.42
												R (Hrs)	0.160	0.151	0.136	0.121	0.112	0.105

Area ID	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
SBW09 A	0.008	0.22	255.8	243.3	URBAN	0.036	0.27	0.25	6.00	0.197	24	**Tc (Hrs)**	0.185	0.176	0.160	0.144	0.135	0.127
												Vel (f/s)	1.74	1.83	2.02	2.24	2.39	2.54
												R (Hrs)	0.265	0.251	0.226	0.201	0.187	0.176
SBW09 B	0.005	0.11	367.0	281.9	URBAN	0.037	0.27	0.25	6.00	0.204	29	**Tc (Hrs)**	0.125	0.119	0.109	0.098	0.092	0.087
												Vel (f/s)	1.29	1.36	1.48	1.65	1.75	1.85
												R (Hrs)	0.129	0.122	0.111	0.099	0.092	0.086
SB09C	0.036	0.53	309.9	266.8	NATURAL	0.116	0.10	0.25	6.00	0.284		**Tc (Hrs)**	0.575*	0.540*	0.486*	0.430*	0.397*	0.372 *
												Vel (f/s)	1.35	1.44	1.60	1.81	1.96	2.09
												R (Hrs)	0.801	0.748	0.664	0.580	0.531	0.494
SB09D1	0.009	0.18	373.6	283.3	URBAN	0.035	0.25	0.25	6.00	0.216	30	**Tc (Hrs)**	0.155	0.147	0.135	0.122	0.114	0.108
												Vel (f/s)	1.70	1.80	1.96	2.16	2.32	2.44
												R (Hrs)	0.173	0.164	0.149	0.133	0.124	0.116
SB09D2	0.005	0.22	189.5	189.5	URBAN	0.037	0.25	0.25	6.00	0.216	30	**Tc (Hrs)**	0.199	0.190	0.174	0.157	0.147	0.139
												Vel (f/s)	1.62	1.70	1.85	2.06	2.20	2.32
												R (Hrs)	0.377	0.357	0.324	0.290	0.269	0.253
SB09E	0.005	0.18	445.1	295.7	NATURAL	0.137	0.10	0.25	6.00	0.284		**Tc (Hrs)**	0.354*	0.333*	0.299*	0.265*	0.244	0.229
												Vel (f/s)	0.75	0.79	0.88	1.00	1.08	1.15
												R (Hrs)	0.607	0.567	0.503	0.440	0.402	0.374
SB10A W	0.029	0.31	176.8	176.8	URBAN	0.032	0.26	0.25	6.00	0.189	28	**Tc (Hrs)**	0.224	0.213	0.195	0.176	0.165	0.156
												Vel (f/s)	2.03	2.13	2.33	2.58	2.76	2.91
												R (Hrs)	0.207	0.196	0.177	0.158	0.147	0.139
SB10A1	0.005	0.14	243.5	235.7	URBAN	0.037	0.25	0.25	6.00	0.216	30	**Tc (Hrs)**	0.149	0.142	0.130	0.117	0.110	0.104
												Vel (f/s)	1.38	1.45	1.58	1.75	1.87	1.97
												R (Hrs)	0.190	0.180	0.163	0.146	0.135	0.127
SB10B	0.009	0.23	221.7	219.6	URBAN	0.035	0.26	0.25	6.00	0.195	33	**Tc (Hrs)**	0.186	0.178	0.163	0.148	0.138	0.131
												Vel (f/s)	1.81	1.90	2.07	2.28	2.44	2.58
												R (Hrs)	0.259	0.246	0.223	0.200	0.186	0.175

Area ID	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
SB10C1	0.009	0.23	179.4	179.4	URBAN	0.035	0.25	0.25	6.00	0.216	30	**Tc (Hrs)**	0.201	0.192	0.176	0.159	0.149	0.141
												Vel (f/s)	1.68	1.76	1.92	2.12	2.26	2.39
												R (Hrs)	0.283	0.268	0.243	0.217	0.202	0.190
SB10C2	0.008	0.22	144.2	144.2	URBAN	0.036	0.25	0.25	6.00	0.216	30	**Tc (Hrs)**	0.214	0.204	0.187	0.169	0.158	0.150
												Vel (f/s)	1.51	1.58	1.73	1.91	2.04	2.15
												R (Hrs)	0.312	0.296	0.268	0.240	0.223	0.210
SB10C3	0.004	0.14	156.5	156.5	NATURAL	0.119	0.10	0.25	6.00	0.254	20	**Tc (Hrs)**	0.319*	0.303*	0.277*	0.249	0.233	0.220
												Vel (f/s)	0.64	0.68	0.74	0.82	0.88	0.93
												R (Hrs)	0.503	0.475	0.429	0.382	0.354	0.332
SBW11 A	0.001	0.03	741.9	313.0	URBAN	0.041	0.30	0.25	6.00	0.183	5	**Tc (Hrs)**	0.073	0.068	0.061	0.054	0.051	0.048
												Vel (f/s)	0.60	0.65	0.72	0.81	0.86	0.92
												R (Hrs)	0.062	0.058	0.052	0.045	0.042	0.039
SBW12 A	0.017	0.19	275.1	253.3	URBAN	0.034	0.29	0.25	6.00	0.191	13	**Tc (Hrs)**	0.172	0.162	0.147	0.131	0.122	0.115
												Vel (f/s)	1.62	1.72	1.90	2.13	2.28	2.42
												R (Hrs)	0.141	0.133	0.119	0.105	0.097	0.091
SBW13 A	0.001	0.04	607.1	313.0	URBAN	0.041	0.30	0.25	6.00	0.183	5	**Tc (Hrs)**	0.084	0.079	0.071	0.063	0.058	0.055
												Vel (f/s)	0.70	0.74	0.83	0.93	1.01	1.07
												R (Hrs)	0.092	0.086	0.077	0.067	0.062	0.058
SBW14 A	0.009	0.12	286.3	258.1	URBAN	0.047	0.28	0.25	6.00	0.197	4	**Tc (Hrs)**	0.167	0.157	0.141	0.125	0.116	0.109
												Vel (f/s)	1.05	1.12	1.25	1.41	1.52	1.61
												R (Hrs)	0.136	0.128	0.113	0.099	0.091	0.085

Area ID	Book Number	Map Unit	Soil ID	Area (sq mi)	Area (%)	XKSAT	Rock Percent (%)	Effective Rock (%)	Comments
Major Basin ID: 01									
SB01A	645	61	64561	0.112	94.10	0.150	-	100	
	645	63	64563	0.007	5.90	0.140	25.00	100	
SB02A1	645	61	64561	0.059	100.00	0.150	-	100	
SB02A2	645	61	64561	0.003	100.00	0.150	-	100	
SB02A3	645	61	64561	0.003	100.00	0.150	-	100	
SB03A	645	61	64561	0.003	100.00	0.150	-	100	
SB03A1	645	61	64561	0.002	100.00	0.150	-	100	
SB04A	645	61	64561	0.008	100.00	0.150	-	100	
SB04B	645	61	64561	0.011	100.00	0.150	-	100	
SB04C	645	61	64561	0.002	100.00	0.150	-	100	
SB05A	645	61	64561	0.004	100.00	0.150	-	100	
SB05B1	645	61	64561	0.007	100.00	0.150	-	100	
SB05B2	645	61	64561	0.006	100.00	0.150	-	100	
SB05B3	645	61	64561	0.004	100.00	0.150	-	100	
SB05B4	645	61	64561	0.004	100.00	0.150	-	100	
SB06A	645	61	64561	0.006	100.00	0.150	-	100	
SB06B	645	61	64561	0.004	100.00	0.150	-	100	
SB06B1	645	61	64561	0.003	100.00	0.150	-	100	
SB06C1	645	61	64561	0.015	100.00	0.150	-	100	
SB06C2	645	61	64561	0.020	100.00	0.150	-	100	
SB06C3	645	61	64561	0.005	100.00	0.150	-	100	
SB06D1	645	61	64561	0.004	100.00	0.150	-	100	
SB06D2	645	61	64561	0.009	100.00	0.150	-	100	
SB07B	645	61	64561	0.007	100.00	0.150	-	100	
SB08A	645	61	64561	0.001	100.00	0.150	-	100	
SB09A	645	61	64561	0.001	100.00	0.150	-	100	
SB09C	645	61	64561	0.036	100.00	0.150	-	100	
SB09D1	645	61	64561	0.009	100.00	0.150	-	100	
SB09D2	645	61	64561	0.005	100.00	0.150	-	100	
SB09E	645	61	64561	0.005	100.00	0.150	-	100	
SB10A	645	61	64561	0.001	100.00	0.150	-	100	
SB10A1	645	61	64561	0.005	100.00	0.150	-	100	
SB10AW	645	61	64561	0.029	100.00	0.150	-	100	
SB10B	645	61	64561	0.009	100.00	0.150	-	100	
SB10C1	645	61	64561	0.009	100.00	0.150	-	100	
SB10C2	645	61	64561	0.008	100.00	0.150	-	100	
SB10C3	645	61	64561	0.004	100.00	0.150	-	100	
SB11A	645	61	64561	0.007	100.00	0.150	-	100	
SB11A1	645	61	64561	0.003	100.00	0.150	-	100	
SB11B	645	61	64561	0.013	100.00	0.150	-	100	
SB17B	645	61	64561	0.015	100.00	0.150	-	100	
SBE01A	645	61	64561	0.112	94.20	0.150	-	100	
	645	63	64563	0.007	5.80	0.140	25.00	100	
SBE12A	645	61	64561	0.002	100.00	0.150	-	100	
SBE13A	645	61	64561	0.003	100.00	0.150	-	100	
SBE16A	645	61	64561	0.001	100.00	0.150	-	100	
SBE17A	645	61	64561	0.018	100.00	0.150	-	100	

Area ID	Book Number	Map Unit	Soil ID	Area (sq mi)	Area (%)	XKSAT	Rock Percent (%)	Effective Rock (%)	Comments
Major Basin ID: 01									
SBE18A	645	61	64561	0.001	100.00	0.150	-	100	
SBE19A	645	61	64561	0.001	100.00	0.150	-	100	
SBE20A	645	61	64561	0.001	100.00	0.150	-	100	
SBE21A	645	61	64561	0.001	100.00	0.150	-	100	
SBE22A	645	61	64561	0.007	100.00	0.150	-	100	
SBE23A	645	61	64561	0.006	100.00	0.150	-	100	
SBE23B	645	61	64561	0.004	100.00	0.150	-	100	
SBE23C	645	61	64561	0.053	100.00	0.150	-	100	
SBE23D	645	61	64561	0.041	100.00	0.150	-	100	
SBE23E	645	61	64561	0.005	100.00	0.150	-	100	
SBE24A	645	61	64561	0.007	100.00	0.150	-	100	
SBE24B	645	61	64561	0.005	100.00	0.150	-	100	
SBE24C	645	61	64561	0.015	100.00	0.150	-	100	
SBE24D	645	61	64561	0.010	100.00	0.150	-	100	
SBE25A	645	61	64561	0.003	100.00	0.150	-	100	
SBE25B	645	61	64561	0.006	100.00	0.150	-	100	
SBE25C	645	61	64561	0.005	100.00	0.150	-	100	
SBE26A	645	61	64561	0.011	100.00	0.150	-	100	
SBE27A	645	61	64561	0.002	100.00	0.150	-	100	
SBE28A	645	61	64561	0.013	100.00	0.150	-	100	
SBE29A	645	61	64561	0.015	100.00	0.150	-	100	
SBW01A	645	61	64561	0.002	100.00	0.150	-	100	
SBW02A	645	61	64561	0.007	100.00	0.150	-	100	
SBW04A	645	61	64561	0.002	100.00	0.150	-	100	
SBW05A	645	61	64561	0.010	100.00	0.150	-	100	
SBW06A	645	61	64561	0.004	100.00	0.150	-	100	
SBW07A	645	61	64561	0.013	100.00	0.150	-	100	
SBW07C	645	61	64561	0.005	100.00	0.150	-	100	
SBW08A	645	61	64561	0.009	100.00	0.150	-	100	
SBW09A	645	61	64561	0.008	100.00	0.150	-	100	
SBW09B	645	61	64561	0.005	100.00	0.150	-	100	
SBW11A	645	61	64561	0.001	100.00	0.150	-	100	
SBW12A	645	61	64561	0.017	100.00	0.150	-	100	
SBW13A	645	61	64561	0.001	100.00	0.150	-	100	
SBW14A	645	61	64561	0.009	100.00	0.150	-	100	

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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
SB01A	730	0.1190	100.0	0.10	0	90.0	NORMAL	0.103	Passive Open Space (Includes mountain preserves and washes)
		0.1190	**100.0**						
SB02A1	730	0.0590	100.0	0.10	0	90.0	NORMAL	0.111	Passive Open Space (Includes mountain preserves and washes)
		0.0590	**100.0**						
SB02A2	140	0.0030	100.0	0.25	30	50.0	NORMAL	0.038	Medium Lot Residential - Single Family (2-4 du per acre)
		0.0030	**100.0**						
SB02A3	730	0.0030	100.0	0.10	0	90.0	NORMAL	0.143	Passive Open Space (Includes mountain preserves and washes)
		0.0030	**100.0**						
SB03A	730	0.0030	100.0	0.10	0	90.0	NORMAL	0.143	Passive Open Space (Includes mountain preserves and washes)
		0.0030	**100.0**						
SB03A1	730	0.0020	100.0	0.10	0	90.0	NORMAL	0.147	Passive Open Space (Includes mountain preserves and washes)
		0.0020	**100.0**						
SB04A	140	0.0080	100.0	0.25	30	50.0	NORMAL	0.036	Medium Lot Residential - Single Family (2-4 du per acre)
		0.0080	**100.0**						
SB04B	140	0.0110	100.0	0.25	30	50.0	NORMAL	0.035	Medium Lot Residential - Single Family (2-4 du per acre)
		0.0110	**100.0**						
SB04C	605	0.0001	10.0	0.10	100	0.0	NORMAL	0.039	Road-General Transportation-Residential Road
	730	0.0009	90.0	0.10	0	90.0	NORMAL	0.147	Passive Open Space (Includes mountain preserves and washes)
		0.0010	**100.0**						
SB05A	730	0.0040	100.0	0.10	0	90.0	NORMAL	0.140	Passive Open Space (Includes mountain preserves and washes)

* Non default value

Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
		0.0040	**100.0**						
SB05B1	730	0.0070	100.0	0.10	0	90.0	NORMAL	0.134	Passive Open Space (Includes mountain preserves and washes)
		0.0070	**100.0**						
SB05B2	730	0.0060	100.0	0.10	0	90.0	NORMAL	0.135	Passive Open Space (Includes mountain preserves and washes)
		0.0060	**100.0**						
SB05B3	140	0.0040	100.0	0.25	30	50.0	NORMAL	0.037	Medium Lot Residential - Single Family (2-4 du per acre)
		0.0040	**100.0**						
SB05B4	140	0.0020	50.0	0.25	30	50.0	NORMAL	0.037	Medium Lot Residential - Single Family (2-4 du per acre)
	730	0.0020	50.0	0.10	0	90.0	NORMAL	0.140	Passive Open Space (Includes mountain preserves and washes)
		0.0040	**100.0**						
SB06A	140	0.0060	100.0	0.25	30	50.0	NORMAL	0.036	Medium Lot Residential - Single Family (2-4 du per acre)
		0.0060	**100.0**						
SB06B	730	0.0040	100.0	0.10	0	90.0	NORMAL	0.140	Passive Open Space (Includes mountain preserves and washes)
		0.0040	**100.0**						
SB06B1	140	0.0015	50.0	0.25	30	50.0	NORMAL	0.038	Medium Lot Residential - Single Family (2-4 du per acre)
	730	0.0015	50.0	0.10	0	90.0	NORMAL	0.143	Passive Open Space (Includes mountain preserves and washes)
		0.0030	**100.0**						
SB06C1	510	0.0075	50.0	0.10	80	75.0	NORMAL	0.034	Tourist and Visitor Accommodations (Hotels, motels, resorts)
	730	0.0075	50.0	0.10	0	90.0	NORMAL	0.125	Passive Open Space (Includes mountain preserves and washes)
		0.0150	**100.0**						
SB06C2	730	0.0200	100.0	0.10	0	90.0	NORMAL	0.122	Passive Open Space (Includes mountain preserves and washes)

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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
		0.0200	**100.0**						
SB06C3	140	0.0050	100.0	0.25	30	50.0	NORMAL	0.037	Medium Lot Residential - Single Family (2-4 du per acre)
		0.0050	**100.0**						
SB06D1	510	0.0012	30.0	0.10	80	75.0	NORMAL	0.037	Tourist and Visitor Accommodations (Hotels, motels, resorts)
	730	0.0028	70.0	0.10	0	90.0	NORMAL	0.140	Passive Open Space (Includes mountain preserves and washes)
		0.0040	**100.0**						
SB06D2	140	0.0090	100.0	0.25	30	50.0	NORMAL	0.035	Medium Lot Residential - Single Family (2-4 du per acre)
		0.0090	**100.0**						
SB07B	730	0.0070	100.0	0.10	0	90.0	NORMAL	0.134	Passive Open Space (Includes mountain preserves and washes)
		0.0070	**100.0**						
SB08A	730	0.0010	100.0	0.10	0	90.0	NORMAL	0.155	Passive Open Space (Includes mountain preserves and washes)
		0.0010	**100.0**						
SB09A	730	0.0010	100.0	0.10	0	90.0	NORMAL	0.155	Passive Open Space (Includes mountain preserves and washes)
		0.0010	**100.0**						
SB09C	730	0.0360	100.0	0.10	0	90.0	NORMAL	0.116	Passive Open Space (Includes mountain preserves and washes)
		0.0360	**100.0**						
SB09D1	140	0.0090	100.0	0.25	30	50.0	NORMAL	0.035	Medium Lot Residential - Single Family (2-4 du per acre)
		0.0090	**100.0**						
SB09D2	140	0.0050	100.0	0.25	30	50.0	NORMAL	0.037	Medium Lot Residential - Single Family (2-4 du per acre)
		0.0050	**100.0**						

* Non default value

Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
SB09E	730	0.0050	100.0	0.10	0	90.0	NORMAL	0.137	Passive Open Space (Includes mountain preserves and washes)
		0.0050	**100.0**						
SB10A	730	0.0010	100.0	0.10	0	90.0	NORMAL	0.155	Passive Open Space (Includes mountain preserves and washes)
		0.0010	**100.0**						
SB10A1	140	0.0050	100.0	0.25	30	50.0	NORMAL	0.037	Medium Lot Residential - Single Family (2-4 du per acre)
		0.0050	**100.0**						
SB10AW	120	0.0110	39.3	0.30	5	30.0	NORMAL	0.032	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0080	28.6	0.30	15	50.0	NORMAL	0.032	Large Lot Residential - Single Family (1-2 du per acre)
	140	0.0040	14.3	0.25	30	50.0	NORMAL	0.032	Medium Lot Residential - Single Family (2-4 du per acre)
	605	0.0050	17.9	0.10	100	0.0	NORMAL	0.032	Road-General Transportation-Residential Road
		0.0280	**100.1**						
SB10B	120	0.0010	11.1	0.30	5	30.0	NORMAL	0.035	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0060	66.7	0.30	15	50.0	NORMAL	0.035	Large Lot Residential - Single Family (1-2 du per acre)
	605	0.0020	22.2	0.10	100	0.0	NORMAL	0.035	Road-General Transportation-Residential Road
		0.0090	**100.0**						
SB10C1	140	0.0090	100.0	0.25	30	50.0	NORMAL	0.035	Medium Lot Residential - Single Family (2-4 du per acre)
		0.0090	**100.0**						
SB10C2	140	0.0080	100.0	0.25	30	50.0	NORMAL	0.036	Medium Lot Residential - Single Family (2-4 du per acre)
		0.0080	**100.0**						
SB10C3	605	0.0008	20.0	0.10	100	0.0	NORMAL	0.037	Road-General Transportation-Residential Road
	730	0.0032	80.0	0.10	0	90.0	NORMAL	0.140	Passive Open Space (Includes mountain preserves and washes)

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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
		0.0040	**100.0**						
SB11A	730	0.0070	100.0	0.10	0	90.0	NORMAL	0.134	Passive Open Space (Includes mountain preserves and washes)
		0.0070	**100.0**						
SB11A1	140	0.0015	50.0	0.25	30	50.0	NORMAL	0.038	Medium Lot Residential - Single Family (2-4 du per acre)
	730	0.0015	50.0	0.10	0	90.0	NORMAL	0.143	Passive Open Space (Includes mountain preserves and washes)
		0.0030	**100.0**						
SB11B	140	0.0071	55.0	0.25	30	50.0	NORMAL	0.034	Medium Lot Residential - Single Family (2-4 du per acre)
	730	0.0058	45.0	0.10	0	90.0	NORMAL	0.127	Passive Open Space (Includes mountain preserves and washes)
		0.0129	**100.0**						
SB17B	120	0.0050	33.3	0.30	5	30.0	NORMAL	0.034	Estate Residential (1/5 du per acre to 1 du per acre)
	140	0.0070	46.7	0.25	30	50.0	NORMAL	0.034	Medium Lot Residential - Single Family (2-4 du per acre)
	605	0.0020	13.3	0.10	100	0.0	NORMAL	0.034	Road-General Transportation-Residential Road
	730	0.0010	6.7	0.10	0	90.0	NORMAL	0.125	Passive Open Space (Includes mountain preserves and washes)
		0.0150	**100.0**						
SBE12A	140	0.0018	85.7	0.25	30	50.0	NORMAL	0.039	Medium Lot Residential - Single Family (2-4 du per acre)
	605	0.0003	14.3	0.10	100	0.0	NORMAL	0.039	Road-General Transportation-Residential Road
		0.0021	**100.0**						
SBE13A	140	0.0026	100.0	0.25	30	50.0	NORMAL	0.038	Medium Lot Residential - Single Family (2-4 du per acre)
		0.0026	**100.0**						
SBE16A	130	0.0012	100.0	0.30	15	50.0	NORMAL	0.041	Large Lot Residential - Single Family (1-2 du per acre)

* Non default value

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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
		0.0012	**100.0**						
SBE17A	120	0.0004	2.2	0.30	5	30.0	NORMAL	0.033	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0105	58.0	0.30	15	50.0	NORMAL	0.033	Large Lot Residential - Single Family (1-2 du per acre)
	140	0.0051	28.2	0.25	30	50.0	NORMAL	0.033	Medium Lot Residential - Single Family (2-4 du per acre)
	605	0.0021	11.6	0.10	100	0.0	NORMAL	0.033	Road-General Transportation-Residential Road
		0.0181	**100.0**						
SBE18A	130	0.0010	100.0	0.30	15	50.0	NORMAL	0.041	Large Lot Residential - Single Family (1-2 du per acre)
		0.0010	**100.0**						
SBE19A	130	0.0007	100.0	0.30	15	50.0	NORMAL	0.041	Large Lot Residential - Single Family (1-2 du per acre)
		0.0007	**100.0**						
SBE20A	130	0.0006	100.0	0.30	15	50.0	NORMAL	0.041	Large Lot Residential - Single Family (1-2 du per acre)
		0.0006	**100.0**						
SBE21A	130	0.0007	100.0	0.30	15	50.0	NORMAL	0.041	Large Lot Residential - Single Family (1-2 du per acre)
		0.0007	**100.0**						
SBE22A	130	0.0070	100.0	0.30	15	50.0	NORMAL	0.036	Large Lot Residential - Single Family (1-2 du per acre)
		0.0070	**100.0**						
SBE23A	130	0.0058	93.5	0.30	15	50.0	NORMAL	0.036	Large Lot Residential - Single Family (1-2 du per acre)
	605	0.0004	6.5	0.10	100	0.0	NORMAL	0.036	Road-General Transportation-Residential Road
		0.0062	**100.0**						
SBE23B	130	0.0033	84.6	0.30	15	50.0	NORMAL	0.037	Large Lot Residential - Single Family (1-2 du per acre)
	605	0.0006	15.4	0.10	100	0.0	NORMAL	0.037	Road-General Transportation-Residential Road

* Non default value

Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
		0.0039	**100.0**						
SBE23C	120	0.0421	80.2	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0055	10.5	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1-2 du per acre)
	140	0.0011	2.1	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	605	0.0038	7.2	0.10	100	0.0	NORMAL	0.030	Road-General Transportation-Residential Road
		0.0525	**100.0**						
SBE23D	120	0.0268	65.4	0.30	5	30.0	NORMAL	0.031	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0110	26.8	0.30	15	50.0	NORMAL	0.031	Large Lot Residential - Single Family (1-2 du per acre)
	605	0.0032	7.8	0.10	100	0.0	NORMAL	0.031	Road-General Transportation-Residential Road
		0.0410	**100.0**						
SBE23E	120	0.0010	18.5	0.30	5	30.0	NORMAL	0.037	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0040	74.1	0.30	15	50.0	NORMAL	0.037	Large Lot Residential - Single Family (1-2 du per acre)
	605	0.0004	7.4	0.10	100	0.0	NORMAL	0.037	Road-General Transportation-Residential Road
		0.0054	**100.0**						
SBE24A	130	0.0059	83.1	0.30	15	50.0	NORMAL	0.036	Large Lot Residential - Single Family (1-2 du per acre)
	605	0.0012	16.9	0.10	100	0.0	NORMAL	0.036	Road-General Transportation-Residential Road
		0.0071	**100.0**						
SBE24B	120	0.0044	89.8	0.30	5	30.0	NORMAL	0.037	Estate Residential (1/5 du per acre to 1 du per acre)
	605	0.0005	10.2	0.10	100	0.0	NORMAL	0.037	Road-General Transportation-Residential Road
		0.0049	**100.0**						

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: SERENO CANYON PH.4

Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
SBE24C	120	0.0095	64.2	0.30	5	30.0	NORMAL	0.034	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0038	25.7	0.30	15	50.0	NORMAL	0.034	Large Lot Residential - Single Family (1-2 du per acre)
	605	0.0015	10.1	0.10	100	0.0	NORMAL	0.034	Road-General Transportation-Residential Road
		0.0148	**100.0**						
SBE24D	120	0.0089	93.7	0.30	5	30.0	NORMAL	0.035	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0006	6.3	0.30	15	50.0	NORMAL	0.035	Large Lot Residential - Single Family (1-2 du per acre)
		0.0095	**100.0**						
SBE25A	130	0.0025	73.5	0.30	15	50.0	NORMAL	0.038	Large Lot Residential - Single Family (1-2 du per acre)
	605	0.0009	26.5	0.10	100	0.0	NORMAL	0.038	Road-General Transportation-Residential Road
		0.0034	**100.0**						
SBE25B	130	0.0060	93.8	0.30	15	50.0	NORMAL	0.036	Large Lot Residential - Single Family (1-2 du per acre)
	605	0.0004	6.3	0.10	100	0.0	NORMAL	0.036	Road-General Transportation-Residential Road
		0.0064	**100.1**						
SBE25C	120	0.0040	87.0	0.30	5	30.0	NORMAL	0.037	Estate Residential (1/5 du per acre to 1 du per acre)
	605	0.0006	13.0	0.10	100	0.0	NORMAL	0.037	Road-General Transportation-Residential Road
		0.0046	**100.0**						
SBE26A	120	0.0005	4.8	0.30	5	30.0	NORMAL	0.035	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0080	76.2	0.30	15	50.0	NORMAL	0.035	Large Lot Residential - Single Family (1-2 du per acre)
	605	0.0020	19.0	0.10	100	0.0	NORMAL	0.035	Road-General Transportation-Residential Road
		0.0105	**100.0**						
SBE27A	130	0.0020	100.0	0.30	15	50.0	NORMAL	0.039	Large Lot Residential - Single Family (1-2 du per acre)

* Non default value

Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
SBW05A	605	0.0004	3.8	0.10	100	0.0	NORMAL	0.035	Road-General Transportation-Residential Road
		0.0104	**100.0**						
SBW06A	120	0.0032	82.1	0.30	5	30.0	NORMAL	0.037	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0005	12.8	0.30	15	50.0	NORMAL	0.037	Large Lot Residential - Single Family (1-2 du per acre)
	605	0.0002	5.1	0.10	100	0.0	NORMAL	0.037	Road-General Transportation-Residential Road
		0.0039	**100.0**						
SBW07A	120	0.0049	36.3	0.30	5	30.0	NORMAL	0.034	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0057	42.2	0.30	15	50.0	NORMAL	0.034	Large Lot Residential - Single Family (1-2 du per acre)
	140	0.0015	11.1	0.25	30	50.0	NORMAL	0.034	Medium Lot Residential - Single Family (2-4 du per acre)
	605	0.0014	10.4	0.10	100	0.0	NORMAL	0.034	Road-General Transportation-Residential Road
		0.0135	**100.0**						
SBW07C	120	0.0026	53.1	0.30	5	30.0	NORMAL	0.037	Estate Residential (1/5 du per acre to 1 du per acre)
	730	0.0023	46.9	0.10	0	90.0	NORMAL	0.137	Passive Open Space (Includes mountain preserves and washes)
		0.0049	**100.0**						
SBW08A	120	0.0057	62.6	0.30	5	30.0	NORMAL	0.035	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0021	23.1	0.30	15	50.0	NORMAL	0.035	Large Lot Residential - Single Family (1-2 du per acre)
	605	0.0013	14.3	0.10	100	0.0	NORMAL	0.035	Road-General Transportation-Residential Road
		0.0091	**100.0**						
SBW09A	120	0.0023	28.0	0.30	5	30.0	NORMAL	0.036	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0048	58.5	0.30	15	50.0	NORMAL	0.036	Large Lot Residential - Single Family (1-2 du per acre)
	605	0.0011	13.4	0.10	100	0.0	NORMAL	0.036	Road-General Transportation-Residential Road

Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
		0.0082	**99.9**						
SBW09B	130	0.0042	84.0	0.30	15	50.0	NORMAL	0.037	Large Lot Residential - Single Family (1-2 du per acre)
	605	0.0008	16.0	0.10	100	0.0	NORMAL	0.037	Road-General Transportation-Residential Road
		0.0050	**100.0**						
SBW11A	120	0.0007	100.0	0.30	5	30.0	NORMAL	0.041	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0007	**100.0**						
SBW12A	120	0.0107	63.7	0.30	5	30.0	NORMAL	0.034	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0052	31.0	0.30	15	50.0	NORMAL	0.034	Large Lot Residential - Single Family (1-2 du per acre)
	605	0.0009	5.4	0.10	100	0.0	NORMAL	0.034	Road-General Transportation-Residential Road
		0.0168	**100.1**						
SBW13A	120	0.0010	100.0	0.30	5	30.0	NORMAL	0.041	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0010	**100.0**						
SBW14A	120	0.0077	87.5	0.30	5	30.0	NORMAL	0.035	Estate Residential (1/5 du per acre to 1 du per acre)
	730	0.0011	12.5	0.10	0	90.0	NORMAL	0.131	Passive Open Space (Includes mountain preserves and washes)
		0.0088	**100.0**						

Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
NORMAL DEPTH															
Major Basin 01															
RE01B	0.060	0.060	0.060	5,189.00	0.0788	2,910.00	X:	-	23.00	87.00	103.00	111.00	119.00	158.00	178.00
							Y:	2,910.00	2,908.00	2,906.00	2,905.50	2,904.40	2,905.50	2,907.00	2,910.00
Route flow from SBE01B through Basin SBE01A															
RE04B	0.060	0.060	0.060	449.00	0.0367	2,755.00	X:	-	15.00	24.00	28.00	30.00	33.00	46.00	62.00
							Y:	2,754.90	2,752.60	2,750.80	2,750.00	2,750.00	2,751.00	2,752.90	2,755.00
Route flow from SBE04B into SBE04A															
RE04C	0.060	0.060	0.060	455.00	0.0363	2,755.00	X:	-	17.00	22.00	27.00	32.00	44.00	61.00	88.00
							Y:	2,755.00	2,753.00	2,751.90	2,750.00	2,750.00	2,751.90	2,753.20	2,754.90
Route flow from SBE04C into SBE04A															
RE04CB	0.060	0.060	0.060	247.00	0.0344	2,744.90	X:	-	11.00	21.00	31.00	34.00	50.00	69.00	88.00
							Y:	2,744.90	2,742.70	2,741.40	2,740.00	2,740.00	2,741.80	2,743.00	2,743.90
Route flow from CE04AI through rest of Basin SBE04A															
RE05B	0.060	0.060	0.060	907.00	0.0435	2,760.30	X:	-	11.00	26.00	40.00	47.00	56.00	76.00	89.00
							Y:	2,760.10	2,759.00	2,757.70	2,757.00	2,757.00	2,757.40	2,758.80	2,760.30
Route flow from SBE05B through SBE05A															
RE06B	0.060	0.060	0.060	814.00	0.0319	2,761.00	X:	-	21.00	55.00	63.00	82.00	92.00	104.00	113.00
							Y:	2,761.00	2,758.90	2,758.50	2,758.00	2,758.00	2,758.50	2,759.70	2,760.80
Route flow from CE06B through Basin SBE06A															
RE06C	0.060	0.060	0.060	591.00	0.0431	2,786.60	X:	-	6.00	16.00	26.00	36.00	40.00	41.00	44.00
							Y:	2,786.60	2,786.00	2,785.00	2,784.00	2,784.00	2,785.00	2,785.50	2,786.40
Route flow from SBE06C through Basin SBE06B															
RE06D	0.060	0.060	0.060	677.00	0.0369	2,785.90	X:	-	15.00	27.00	34.00	41.00	45.00	52.00	59.00
							Y:	2,785.80	2,784.00	2,783.00	2,782.00	2,782.00	2,782.70	2,784.20	2,785.90
Route flow from SBE06D through Basin SBE06B															
RE11B	0.060	0.060	0.060	914.00	0.0334	2,770.20	X:	-	10.00	16.00	23.00	25.00	34.00	48.00	64.00
							Y:	2,770.20	2,767.10	2,765.30	2,762.00	2,762.00	2,765.00	2,766.60	2,768.30
Route flow from SBE11B through SBE11A															
RE17B	0.060	0.060	0.060	1,169.00	0.0265	2,740.10	X:	-	9.00	22.00	33.00	44.00	54.00	62.00	69.00
							Y:	2,740.10	2,738.60	2,737.00	2,736.10	2,736.00	2,737.00	2,738.40	2,740.10
Route flow from SBE17B through SBE 17A															
RE23B	0.060	0.060	0.060	112.00	0.0267	2,685.90	X:	-	8.00	12.00	14.00	24.00	30.00	32.00	49.00
							Y:	2,685.60	2,684.80	2,684.20	2,684.00	2,684.00	2,684.70	2,685.00	2,685.90
Route flow from CE23B into SBE23A to intermediate combine															

Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
RE23BD	0.060	0.060	0.060	238.00	0.0242	2,685.00	X:	-	21.00	62.00	74.00	82.00	86.00	101.00	141.00
							Y:	2,684.90	2,682.70	2,681.00	2,679.00	2,679.00	2,680.10	2,681.90	2,685.00
Route Intermediate combined flow from CE23AI through SBE23A															
RE23C	0.060	0.060	0.060	457.00	0.0235	2,693.90	X:	-	15.00	28.00	35.00	35.10	45.00	86.00	114.00
							Y:	2,693.80	2,692.20	2,691.00	2,690.00	2,690.00	2,690.90	2,692.90	2,693.90
Route flow from CE23C through SBE23B															
RE23D	0.060	0.060	0.060	465.00	0.0269	2,688.30	X:	-	14.00	27.00	32.00	40.00	44.00	55.00	68.00
							Y:	2,688.30	2,687.30	2,685.00	2,684.10	2,684.00	2,685.00	2,686.10	2,686.70
Route flow from SBE23D through Basin SBE23A															
RE23E	0.060	0.060	0.060	1,112.00	0.0261	2,720.00	X:	-	20.00	57.00	64.00	65.00	70.00	90.00	114.00
							Y:	2,720.00	2,716.50	2,712.10	2,711.00	2,711.00	2,713.20	2,716.60	2,719.90
Route flow from SBE23E through Basin SBE23C															
RE24B	0.060	0.060	0.060	873.00	0.0229	2,690.20	X:	-	10.00	16.00	23.00	27.00	35.00	49.00	67.00
							Y:	2,689.80	2,688.70	2,687.90	2,687.00	2,687.00	2,687.90	2,688.80	2,690.20
Route flow from CE24B through Basin SBE24A															
RE24C	0.060	0.060	0.060	624.00	0.0232	2,706.80	X:	10.00	25.00	45.00	49.00	55.00	62.00	75.00	103.00
							Y:	2,706.80	2,705.20	2,702.10	2,701.00	2,701.00	2,702.00	2,703.30	2,706.70
Route flow from CE24C through Basin SBE24B															
RE24D	0.060	0.060	0.060	634.00	0.0252	2,725.50	X:	-	16.00	24.00	27.00	31.00	34.00	44.00	60.00
							Y:	2,725.50	2,723.20	2,721.80	2,721.00	2,721.00	2,722.00	2,723.00	2,726.10
Route runoff from basin SBE24D through Basin SBE24C															
RE25B	0.060	0.060	0.060	412.00	0.0279	2,680.70	X:	-	16.00	29.00	32.00	32.10	36.00	47.00	67.00
							Y:	2,680.30	2,678.70	2,677.10	2,676.00	2,676.00	2,676.90	2,678.00	2,680.70
Route runoff from CE25B through Basin SBE25A															
RE25C	0.060	0.060	0.060	709.00	0.0268	2,694.40	X:	-	21.00	53.00	58.00	63.00	70.00	90.00	99.00
							Y:	2,694.30	2,691.90	2,688.00	2,687.00	2,687.00	2,689.00	2,693.30	2,694.40
Route runoff from SBE25C through Basin SBE25B															
RW07BC	0.060	0.060	0.060	1,452.00	0.0465	2,800.10	X:	-	6.00	20.00	26.00	29.00	38.00	50.00	68.00
							Y:	2,800.10	2,799.00	2,796.00	2,793.00	2,793.00	2,796.00	2,797.00	2,798.40
Route flow from CW07BC through SBW07A															
RW09B	0.060	0.060	0.060	1,036.00	0.0415	2,765.60	X:	-	8.00	49.00	58.00	67.00	72.00	85.00	104.00
							Y:	2,764.90	2,764.80	2,764.00	2,763.00	2,763.00	2,764.00	2,765.10	2,765.60
Route flow from CW09B through Basin SBW09A															
RW09D	0.060	0.060	0.060	367.00	0.0368	2,782.10	X:	-	11.00	27.00	31.00	38.00	42.00	73.00	90.00
							Y:	2,782.10	2,780.10	2,780.00	2,779.00	2,779.00	2,779.50	2,780.90	2,781.30
Route flow from CW09D through Basin SBW09B															

Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
RW09E	0.060	0.060	0.060	985.00	0.0442	2,805.10	X:	-	10.00	12.00	14.00	17.00	23.00	29.00	48.00
							Y:	2,805.30	2,803.10	2,802.10	2,800.70	2,800.70	2,802.00	2,802.90	2,805.10
Route flow from SBW09E through Basin SBW09D															
RW10B	0.060	0.060	0.060	653.00	0.0276	2,732.00	X:	-	68.00	75.00	79.00	86.00	92.00	106.00	150.00
							Y:	2,732.00	2,728.10	2,721.10	2,726.10	2,726.00	2,726.60	2,727.00	2,732.00
Route flow from CE10WB through Basin SBW10A															
RW10C	0.060	0.060	0.060	952.00	0.0310	2,757.80	X:	-	34.00	47.00	62.00	62.10	68.00	73.00	78.00
							Y:	2,757.80	2,754.40	2,754.00	2,752.10	2,752.00	2,753.70	2,755.70	2,757.50
Route flow from SBW10C through Basin SBW10B															

Engineering Properties

Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties

[Absence of an entry indicates that the data were not estimated. This report shows only the major soils in each map unit]

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
61:												
Gran	0-1	Very gravelly sandy loam	SC-SM, SM, SP-SM	A-1	0	0	90-100	30-50	20-35	10-20	10-20	NP-5
	1-12	Very gravelly clay, very gravelly sandy clay, extremely gravelly sandy clay	SC	A-2	0	0	90-100	20-50	20-40	15-30	45-55	20-30
	12-36	Bedrock	---	---	---	---	---	---	---	---	---	---
	36-60	Bedrock	---	---	---	---	---	---	---	---	---	---
Wickenburg	0-1	Gravelly sandy loam	SM	A-1, A-2, A-4	0	0	60-100	50-100	30-70	15-40	15-20	NP-5
	1-12	Very gravelly loam, very gravelly sandy clay loam, very gravelly sandy loam	GC-GM	A-2	0	0	40-60	30-50	25-45	10-35	20-30	5-10
	12-60	Bedrock	---	---	---	---	---	---	---	---	---	---
63:												
Gran	0-1	Very gravelly sandy loam	SC-SM, SM, SP-SM	A-1	0	0	90-100	30-50	20-35	10-20	10-20	NP-5
	1-12	Very gravelly clay, very gravelly sandy clay, extremely gravelly sandy clay	SC	A-2	0	0	90-100	20-50	20-40	15-30	45-55	20-30
	12-36	Bedrock	---	---	---	---	---	---	---	---	---	---
	36-60	Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop	---	---	---	---	---	---	---	---	---	---	---	---

Engineering Properties

Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
63:												
Wickenburg	0-1	Gravelly sandy loam	GM, SM	A-1, A-2, A-4	0	0	60-100	50-100	30-70	15-40	15-20	NP-5
	1-12	Very gravelly loam, very gravelly sandy clay loam, very gravelly sandy loam	GC-GM	A-2	0	0	40-60	30-50	25-45	10-35	20-30	5-10
	12-60	Bedrock	---	---	---	---	---	---	---	---	---	---

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   07MAY18  TIME  09:27:39   *
*                                       *
*****************************************
```

100-Year 6-Hour Model

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

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

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

    1         ID        SERENO CANYON (PHASE 4) - DEVELOPED CONDITIONS
    2         ID        STORM EVENT: 100-YR, 6-HOUR
    3         ID        05/04/2018
    4         ID        PREPARED BY: SLATER HANIFAN GROUP
    5         ID       ********************************************************************************
    6         ID       ********************************************************************************
    7         ID        Flood Control District of Maricopa County
    8         ID        Sereno Canyon Developed Conditions
    9         ID        100 YEAR
   10         ID        6 Hour  Storm
   11         ID        Unit Hydrograph: Clark
   12         ID        09/18/2012
   13         ID        Sereno Canyon-Developed Conditions
   14         ID        100-Year, 6-Hour Storm Event
   15         ID        Prepared By: JE Fuller Hydrology and Geomorphology
   16         ID        Modeled By: Brian Schalk P.E., CFM and Nathan Logan P.E., CFM
   17         ID        Submitted To: City of Scottsdale
   18         ID       ********************************************************************************
   19         ID       ********************************************************************************
   20         IT       1 01DEC11       0    2000
   21         IO       5
   22         IN      15
              *DIAGRAM
              *
              *

   23         KK  SBE29A   BASIN
   24         KM        SBE29A Basin Runoff
   25         BA   0.015
   26         PB   3.178
   27         PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
   28         PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
   29         PC   0.962   0.972   0.983   0.991   1.000
   30         LG    0.20    0.25    6.00    0.23      10
   31         UC   0.200   0.195
   32         UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
   33         UA     100
              *

   34         KK  DBE29A STORAGE
   35         KM    Retention Basin Storage/Outflow rating curve for Basin DBE29A
   36         RS       1    STOR       0
   37         SV    0.01    0.05    0.10    0.15    0.20    0.26    0.32    0.38    0.45    0.51
   38         SV    0.59    0.66    0.74    0.83    0.92    0.97
   39         SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.49
   40         SQ    3.46    8.43   14.56   21.75   29.86   33.07
   41         SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
   42         SE    4.00    4.40    4.80    5.20    5.60    5.80
              *
```

1 HEC-1 INPUT PAGE 2

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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   43         KK  SBE28A   BASIN
   44         KM        SBE28A Basin Runoff
   45         BA   0.013
   46         LG    0.29    0.25    6.00    0.20      17
```

```
 47          UC   0.134   0.141
 48          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 49          UA     100
             *

 50          KK  DBE28A STORAGE
 51          KM    Retention Basin Storage/Outflow rating curve for Basin DBE28A
 52          RS       1    STOR       0
 53          SV    0.01    0.07    0.13    0.21    0.28    0.36    0.45    0.54    0.64    0.74
 54          SV    0.84    0.95    1.08
 55          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 56          SQ    6.93   19.60   36.01
 57          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 58          SE    5.00    5.50    6.00
             *

 59          KK  SBE27A   BASIN
 60          KM        SBE27A Basin Runoff
 61          BA   0.002
 62          LG    0.30    0.25    6.00    0.22      15
 63          UC   0.081   0.104
 64          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 65          UA     100
             *

 66          KK  DBE27A STORAGE
 67          KM    Retention Basin Storage/Outflow rating curve for Basin DBE27A
 68          RS       1    STOR       0
 69          SV    0.01    0.01    0.02    0.03    0.04    0.06    0.07    0.08    0.10    0.11
 70          SV    0.12    0.14    0.16    0.17    0.19    0.21
 71          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 72          SQ    0.01    0.96    2.64    4.81    7.38   10.29
 73          SE    0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
 74          SE    3.00    3.30    3.60    3.90    4.20    4.50
             *

 75          KK  SBE26A   BASIN
 76          KM        SBE26A Basin Runoff
 77          BA   0.010
 78          LG    0.26    0.25    6.00    0.20      31
 79          UC   0.137   0.180
 80          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 81          UA     100
             *
```



```
LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 82          KK  DBE26A STORAGE
 83          KM    Retention Basin Storage/Outflow rating curve for Basin DBE26A
 84          RS       1    STOR       0
 85          SV    0.01    0.06    0.12    0.19    0.26    0.33    0.41    0.49    0.58    0.67
 86          SV    0.76    0.87    0.98    1.11
 87          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 88          SQ    0.01    5.94   16.80   30.86
 89          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 90          SE    5.00    5.50    6.00    6.50
             *

 91          KK  SBE25C   BASIN
 92          KM        SBE25C Basin Runoff
 93          BA   0.005
 94          LG    0.27    0.25    6.00    0.18      17
 95          UC   0.098   0.105
 96          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 97          UA     100
             *

 98          KK  DBE25C STORAGE
 99          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25C
100          RS       1    STOR       0
101          SV    0.01    0.02    0.05    0.07    0.10    0.13    0.16    0.19    0.22    0.25
102          SV    0.28    0.31    0.35    0.39    0.43    0.47    0.47
103          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
104          SQ    2.87    8.53   15.86   24.66   34.72   45.79   47.52
105          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
106          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
             *

107          KK   RE25C   ROUTE
108          KM        Route runoff from SBE25C through Basin SBE25B
109          RS       1    FLOW
110          RC   0.060   0.060   0.060     709  0.0268 2694.40
111          RX    0.00   21.00   53.00   58.00   63.00   70.00   90.00   99.00
112          RY  2694.3 2691.90 2688.00 2687.00 2687.00 2689.00 2693.30 2694.40
             *

113          KK  SBE25B   BASIN
114          KM        SBE25B Basin Runoff
115          BA   0.006
116          LG    0.29    0.25    6.00    0.21      20
117          UC   0.125   0.164
118          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
119          UA     100
             *
```

```
          120          KK   CE25B COMBINE
          121          KM        Combine Route RE25C and Basin SBE25B
          122          HC        2
                       *
1                                                HEC-1 INPUT                                                PAGE  4

        LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          123          KK  DBE25B STORAGE
          124          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25B
          125          RS        1     STOR        0
          126          SV    0.01    0.05    0.09    0.14    0.19    0.25    0.30    0.36    0.42    0.49
          127          SV    0.55    0.62    0.70    0.78    0.84
          128          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.68    7.93
          129          SQ   16.80   27.91   40.62   54.86   56.70
          130          SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
          131          SE    4.00    4.40    4.80    5.20    5.50
                       *
          132          KK   RE25B   ROUTE
          133          KM        Route runoff from CE25B through Basin SBE25A
          134          RS        1     FLOW
          135          RC   0.060   0.060   0.060     412  0.0279 2680.70
          136          RX    0.00   16.00   29.00   32.00   32.10   36.00   47.00   67.00
          137          RY  2680.3 2678.70 2677.10 2676.00 2676.00 2676.90 2678.00 2680.70
                       *
          138          KK  SBE25A   BASIN
          139          KM         SBE25A Basin Runoff
          140          BA   0.003
          141          LG    0.25    0.25    6.00    0.20      38
          142          UC   0.087   0.107
          143          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          144          UA     100
                       *
          145          KK   CE25A COMBINE
          146          KM        Combine Route RE25B and Basin SBE25A
          147          HC        2
                       *
          148          KK  DBE25A STORAGE
          149          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25A
          150          RS        1     STOR        0
          151          SV    0.01    0.02    0.04    0.06    0.08    0.10    0.12    0.14    0.16    0.18
          152          SV    0.21    0.23    0.26    0.29    0.31    0.34    0.37    0.39
          153          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          154          SQ    0.01    0.01    1.12    5.87   13.22   22.40   33.27   41.15
          155          SE    0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
          156          SE    3.00    3.30    3.60    3.90    4.20    4.50    4.80    5.00
                       *
          157          KK   CLEAR COMBINE
          158          KM        Clear Hydrograph Stack
          159          HC        5
                       *
1                                                HEC-1 INPUT                                                PAGE  5

        LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          160          KK  SBE24D   BASIN
          161          KM        SBE254D Basin Runoff
          162          BA   0.010
          163          LG    0.30    0.25    6.00    0.19       6
          164          UC   0.113   0.099
          165          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          166          UA     100
                       *
          167          KK  DBE24D STORAGE
          168          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24D
          169          RS        1     STOR        0
          170          SV    0.01    0.06    0.13    0.20    0.28    0.36    0.44    0.53    0.63    0.73
          171          SV    0.83
          172          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    5.94   16.80   30.86
          173          SQ   47.52
          174          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
          175          SE    5.00
                       *
          176          KK   RE24D   ROUTE
          177          KM        Route runoff from basin SBE24D through Basin SBE24C
          178          RS        1     FLOW
          179          RC   0.060   0.060   0.060     634  0.0252 2725.50
          180          RX    0.00   16.00   24.00   27.00   31.00   34.00   44.00   60.00
          181          RY  2725.5 2723.20 2721.80 2721.00 2721.00 2722.00 2723.00 2726.10
                       *
          182          KK  SBE24C   BASIN
          183          KM        SBE24C Basin Runoff
          184          BA   0.015
          185          LG    0.28    0.25    6.00    0.19      17
          186          UC   0.150   0.168
```

```
 187          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 188          UA     100
              *

 189          KK   CE24C COMBINE
 190          KM        Combine RE24D and SBE24C
 191          HC       2
              *

 192          KK  DBE24C STORAGE
 193          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24C
 194          RS       1    STOR       0
 195          SV    0.01    0.08    0.17    0.25    0.35    0.45    0.55    0.66    0.77    0.89
 196          SV    1.02    1.15    1.17
 197          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.63   10.24   23.43
 198          SQ   39.87   59.15   61.38
 199          SE    0.10    0.50    0.90    1.40    1.80    2.30    2.70    3.20    3.60    4.10
 200          SE    4.50    5.00    5.00
              *
1                                      HEC-1 INPUT                                          PAGE  6

       LINE   ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 201          KK   RE24C   ROUTE
 202          KM        Route flow from CE24C through Basin SBE24B
 203          RS       1    FLOW
 204          RC   0.060   0.060   0.060     624  0.0232 2706.80
 205          RX   10.00   25.00   45.00   49.00   55.00   62.00   75.00  103.00
 206          RY  2706.8 2705.20 2702.10 2701.00 2701.00 2702.00 2703.30 2706.70
              *

 207          KK  SBE24B   BASIN
 208          KM        SBE24B Basin Runoff
 209          BA   0.005
 210          LG    0.28    0.25    6.00    0.18      15
 211          UC   0.123   0.180
 212          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 213          UA     100
              *

 214          KK   CE24B COMBINE
 215          KM        Combine RE24C and SBE24B
 216          HC       2
              *

 217          KK  DBE24B STORAGE
 218          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24B
 219          RS       1    STOR       0
 220          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.43    0.51    0.60    0.70
 221          SV    0.80    0.91    1.02    1.15    1.20
 222          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.63   10.24   23.43
 223          SQ   39.87   59.15   80.76   73.24   73.24
 224          SE    0.10    0.50    0.90    1.40    1.80    2.30    2.70    3.20    3.60    4.10
 225          SE    4.50    5.00    5.40    5.90    6.00
              *

 226          KK   RE24B   ROUTE
 227          KM        Route flow from CE24B through Basin SBE24A
 228          RS       1    FLOW
 229          RC   0.060   0.060   0.060     873  0.0229 2690.20
 230          RX    0.00   10.00   16.00   23.00   27.00   35.00   49.00   67.00
 231          RY  2689.8 2688.70 2687.90 2687.00 2687.00 2687.90 2688.80 2690.20
              *

 232          KK  SBE24A   BASIN
 233          KM        SBE24A Basin Runoff
 234          BA   0.007
 235          LG    0.27    0.25    6.00    0.20      29
 236          UC   0.131   0.174
 237          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 238          UA     100
              *
1                                      HEC-1 INPUT                                          PAGE  7

       LINE   ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 239          KK   CE24A COMBINE
 240          KM        Combine RE24B and SBE24A
 241          HC       2
              *

 242          KK  DBE24A STORAGE
 243          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24A
 244          RS       1    STOR       0
 245          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.44    0.52    0.62    0.71
 246          SV    0.82    0.93
 247          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    6.93   19.60
 248          SQ   36.01   55.44
 249          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 250          SE    5.00    5.50
              *

 251          KK  SBE23D   BASIN
 252          KM        SBE23D Basin Runoff
```

```
          253          BA   0.041
          254          LG    0.28    0.25    6.00    0.19      15
          255          UC   0.198   0.207
          256          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          257          UA     100
                       *

          258          KK  DBE23D STORAGE
          259          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23D
          260          RS       1    STOR       0
          261          SV    0.01    0.11    0.22    0.34    0.47    0.61    0.76    0.92    1.10    1.30
          262          SV    1.52    1.75    2.01    2.30    2.61    2.61
          263          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          264          SQ    0.01    0.01    0.01    0.01   15.51   80.61
          265          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
          266          SE    5.00    5.50    6.00    6.50    7.00    8.00
                       *

          267          KK   RE23D   ROUTE
          268          KM        Route flow from SBE23D through Basin SBE23A
          269          RS       1    FLOW
          270          RC   0.060   0.060   0.060     465  0.0269 2688.30
          271          RX    0.00   14.00   27.00   32.00   40.00   44.00   55.00   68.00
          272          RY  2688.3 2687.30 2685.00 2684.10 2684.00 2685.00 2686.10 2686.70
                       *

          273          KK  SBE23E   BASIN
          274          KM        SBE23E Basin Runoff
          275          BA   0.005
          276          LG    0.29    0.25    6.00    0.20      19
          277          UC   0.106   0.152
          278          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          279          UA     100
                       *
1                                                HEC-1 INPUT                                          PAGE  8

        LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          280          KK  DBE23E STORAGE
          281          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23E
          282          RS       1    STOR       0
          283          SV    0.01    0.04    0.09    0.14    0.19    0.24    0.29    0.35    0.41    0.48
          284          SV    0.55
          285          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.63    3.96    9.07
          286          SQ   15.43
          287          SE    0.10    0.50    0.90    1.40    1.80    2.30    2.70    3.20    3.60    4.10
          288          SE    4.50
                       *

          289          KK   RE23E   ROUTE
          290          KM        Route flow from SBE23E through Basin SBE23C
          291          RS       2    FLOW
          292          RC   0.060   0.060   0.060    1112  0.0261 2720.00
          293          RX    0.00   20.00   57.00   64.00   65.00   70.00   90.00  114.00
          294          RY  2720.0 2716.50 2712.10 2711.00 2711.00 2713.20 2716.60 2719.90
                       *

          295          KK  SBE23C   BASIN
          296          KM        SBE23C Basin Runoff
          297          BA   0.053
          298          LG    0.28    0.25    6.00    0.18      13
          299          UC   0.199   0.201
          300          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          301          UA     100
                       *

          302          KK   CE23C COMBINE
          303          KM        Combine RE23E and SBE23C
          304          HC       2
                       *

          305          KK  DBE23C STORAGE
          306          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23C
          307          RS       1    STOR       0
          308          SV    0.01    0.15    0.31    0.47    0.65    0.84    1.03    1.24    1.46    1.69
          309          SV    1.93    2.19    2.46    2.76    3.08
          310          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          311          SQ    0.01    0.01   27.72   78.40  144.03
          312          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
          313          SE    5.00    5.50    6.00    6.50    7.00
                       *

          314          KK   RE23C   ROUTE
          315          KM        Route flow from CE23C through SBE23B
          316          RS       1    FLOW
          317          RC   0.060   0.060   0.060     457  0.0235 2693.90
          318          RX    0.00   15.00   28.00   35.00   35.10   45.00   86.00  114.00
          319          RY  2693.8 2692.20 2691.00 2690.00 2690.00 2690.90 2692.90 2693.90
                       *
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        LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          320          KK  SBE23B   BASIN
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```
321          KM        SBE23B Basin Runoff
322          BA   0.004
323          LG    0.27    0.25    6.00    0.20      28
324          UC   0.097   0.119
325          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
326          UA     100
             *

327          KK   CE23B COMBINE
328          KM        Combine flow from RE23C and SBE23B
329          HC       2
             *

330          KK   RE23B   ROUTE
331          KM        Route flow from CE23B into SBE23A to intermediate combine
332          RS       1    FLOW
333          RC   0.060   0.060   0.060     112  0.0267 2685.90
334          RX    0.00    8.00   12.00   14.00   24.00   30.00   32.00   49.00
335          RY  2685.6 2684.80 2684.20 2684.00 2684.00 2684.70 2685.00 2685.90
             *

336          KK  CE23AI COMBINE
337          KM        Intermediate combine of RE23D and RE23B to route through SBE23A
338          HC       2
             *

339          KK  RE23BD   ROUTE
340          KM        Route Intermediate combined flow from CE23AI through SBE23A
341          RS       1    FLOW
342          RC   0.060   0.060   0.060     238  0.0242 2685.00
343          RX    0.00   21.00   62.00   74.00   82.00   86.00  101.00  141.00
344          RY  2684.9 2682.70 2681.00 2679.00 2679.00 2680.10 2681.90 2685.00
             *

345          KK  SBE23A   BASIN
346          KM        SBE23A Basin Runoff
347          BA   0.006
348          LG    0.29    0.25    6.00    0.21      21
349          UC   0.120   0.135
350          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
351          UA     100
             *

352          KK   CE23A COMBINE
353          KM        Combine flow from SBE23A and RE23BD
354          HC       2
             *
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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

355          KK  DBE23A STORAGE
356          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23A
357          RS       1    STOR       0
358          SV    0.01    0.09    0.18    0.28    0.38    0.49    0.61    0.73    0.86    0.99
359          SV    1.13    1.29    1.45    1.62    1.80    2.00    2.21    2.45
360          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
361          SQ    0.01    0.01    0.01    0.01    0.01   49.50  140.00  257.20
362          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
363          SE    5.00    5.50    6.00    6.50    7.00    7.50    8.00    8.50
             *

364          KK   CLEAR COMBINE
365          HC       3
             *

366          KK  SBE22A   BASIN
367          KM        SBE22A Basin Runoff
368          BA   0.007
369          LG    0.30    0.25    6.00    0.22      15
370          UC   0.117   0.147
371          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
372          UA     100
             *

373          KK  DBE22A STORAGE
374          KM    Retention Basin Storage/Outflow rating curve for Basin DBE22A
375          RS       1    STOR       0
376          SV    0.01    0.03    0.07    0.12    0.16    0.21    0.27    0.33    0.39    0.47
377          SV    0.55    0.63
378          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    3.96
379          SQ   11.20   20.58
380          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
381          SE    5.00    5.50
             *

382          KK  SBE21A   BASIN
383          KM        SBE21A Basin Runoff
384          BA   0.001
385          LG    0.30    0.25    6.00    0.22      15
386          UC   0.063   0.080
387          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
388          UA     100
             *
```

```
          389          KK  SBE20A   BASIN
          390          KM        SBE20A Basin Runoff
          391          BA   0.001
          392          LG    0.30    0.25    6.00    0.22      15
          393          UC   0.056   0.059
          394          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          395          UA     100
                       *
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        LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          396          KK  SBE19A   BASIN
          397          KM        SBE19A Basin Runoff
          398          BA   0.001
          399          LG    0.30    0.25    6.00    0.22      15
          400          UC   0.057   0.060
          401          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          402          UA     100
                       *
          403          KK  SBE18A   BASIN
          404          KM        SBE18A Basin Runoff
          405          BA   0.001
          406          LG    0.30    0.25    6.00    0.22      15
          407          UC   0.065   0.083
          408          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          409          UA     100
                       *
          410          KK  DBE18A STORAGE
          411          KM    Retention Basin Storage/Outflow rating curve for Basin DBE18A
          412          RS       1    STOR       0
          413          SV    0.01    0.01    0.02    0.02    0.03    0.04    0.05    0.06    0.07    0.08
          414          SV    0.09    0.10    0.12    0.13    0.14    0.16    0.17
          415          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          416          SQ    0.01    0.35    0.99    1.82    2.80    3.91    5.14
          417          SE    0.10    0.30    0.50    0.80    1.00    1.30    1.50    1.80    2.00    2.30
          418          SE    2.50    2.80    3.00    3.30    3.50    3.80    4.00
                       *
          419          KK   CLEAR COMBINE
          420          KM        Clear Hydrograph Stack
          421          HC       6
                       *
          422          KK   SB17B   BASIN
          423          KM        SB17B Basin Runoff
          424          BA   0.015
          425          LG    0.24    0.25    6.00    0.20      29
          426          UC   0.139   0.140
          427          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          428          UA     100
                       *
          429          KK  DBE17B STORAGE
          430          KM    Retention Basin Storage/Outflow rating curve for Basin DBE17B
          431          RS       1    STOR       0
          432          SV    0.01    0.08    0.17    0.26    0.35    0.46    0.56    0.68    0.80    0.92
          433          SV    1.06    1.20    1.35    1.51    1.68
          434          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          435          SQ    0.01    0.01    9.90   28.00   51.44
          436          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
          437          SE    5.00    5.50    6.00    6.50    7.00
                       *
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        LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          438          KK   RE17B   ROUTE
          439          KM        Route flow from SBE17B through SBE 17A
          440          RS       2    FLOW
          441          RC   0.060   0.060   0.060    1169  0.0265 2740.10
          442          RX    0.00    9.00   22.00   33.00   44.00   54.00   62.00   69.00
          443          RY  2740.1 2738.60 2737.00 2736.10 2736.00 2737.00 2738.40 2740.10
                       *
          444          KK  SBE17A   BASIN
          445          KM        SBE17A Basin Runoff
          446          BA   0.018
          447          LG    0.26    0.25    6.00    0.21      29
          448          UC   0.141   0.163
          449          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          450          UA     100
                       *
          451          KK   CE17A COMBINE
          452          KM        Combine flow from RE17B and SBE17A
          453          HC       2
                       *
          454          KK  DBE17A STORAGE
          455          KM    Retention Basin Storage/Outflow rating curve for Basin DBE17A
          456          RS       1    STOR       0
```

```
 457          SV    0.01    0.09    0.19    0.29    0.41    0.54    0.68    0.84    1.01    1.19
 458          SV    1.39    1.62    1.86    2.13
 459          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 460          SQ    0.01   17.82   50.40   92.59
 461          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 462          SE    5.00    5.50    6.00    6.50
              *
 463          KK  SBE16A   BASIN
 464          KM        SBE16A Basin Runoff
 465          BA   0.001
 466          LG    0.30    0.25    6.00    0.22      15
 467          UC   0.069   0.102
 468          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 469          UA     100
              *
 470          KK  SBE13A   BASIN
 471          KM        SBE13A Basin Runoff
 472          BA   0.003
 473          LG    0.25    0.25    6.00    0.22      30
 474          UC   0.080   0.089
 475          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 476          UA     100
              *
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      LINE    ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 477          KK  DBE13A STORAGE
 478          KM    Retention Basin Storage/Outflow rating curve for Basin DBE13A
 479          RS        1    STOR        0
 480          SV    0.01    0.02    0.04    0.06    0.08    0.10    0.13    0.16    0.19    0.23
 481          SV    0.27    0.31    0.35
 482          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 483          SQ    1.98    5.60   10.29
 484          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 485          SE    5.00    5.50    6.00
              *
 486          KK  SBE12A   BASIN
 487          KM        SBE12A Basin Runoff
 488          BA   0.002
 489          LG    0.23    0.25    6.00    0.21      40
 490          UC   0.076   0.096
 491          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 492          UA     100
              *
 493          KK  DBE12A STORAGE
 494          KM    Retention Basin Storage/Outflow rating curve for Basin DBE12A
 495          RS        1    STOR        0
 496          SV    0.01    0.02    0.03    0.05    0.07    0.09    0.10    0.12    0.14    0.17
 497          SV    0.19    0.21    0.24    0.26    0.28
 498          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 499          SQ    0.96    2.84    5.29    8.22   10.29
 500          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
 501          SE    3.30    3.60    4.00    4.30    4.50
              *
 502          KK   SB11B   BASIN
 503          KM        SB11B Basin Runoff
 504          BA   0.013
 505          LG    0.18    0.25    6.00   0.246      17
 506          UC   0.243   0.331
 507          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 508          UA     100
              *
 509          KK   DB11B STORAGE
 510          KM    Retention Basin Storage/Outflow rating curve for Basin DB11B
 511          RS        1    STOR        0
 512          SV    0.01    0.05    0.16    0.28    0.43    0.61    0.80
 513          SQ    0.01       4      11      22      33      41      50
 514          SE  2777.5    2778    2779    2780    2781    2782    2783
              *
 515          KK   RE11B   ROUTE
 516          KM        Route flow from SBE11B through SBE11A
 517          RS        1    FLOW
 518          RC   0.060   0.060   0.060     914  0.0334 2770.20
 519          RX    0.00   10.00   16.00   23.00   25.00   34.00   48.00   64.00
 520          RY  2770.2 2767.10 2765.30 2762.00 2762.00 2765.00 2766.60 2768.30
              *
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      LINE    ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 521          KK   SB11A   BASIN
 522          KM        SB11A Basin Runoff
 523          BA   0.007
 524          LG    0.10    0.25    6.00   0.284
 525          UC   0.236   0.319
 526          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
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```
          527          UA     100
                       *

          528          KK  SB11A1   BASIN
          529          KM        SB11A1 Basin Runoff
          530          BA   0.003
          531          LG    0.18    0.25    6.00   0.251      15
          532          UC   0.146   0.220
          533          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          534          UA     100
                       *

          535          KK   CE11A COMBINE
          536          KM        Combine flow from RE11B, SB11A and SB11A1
          537          HC       3
                       *

          538          KK   CLEAR COMBINE
          539          KM        Clear Hydrograph Stack
          540          HC       6
                       *

          541          KK   SB10A   BASIN
          542          KM        SB10A Basin Runoff
          543          BA   0.001
          544          LG    0.10    0.25    6.00   0.284
          545          UC   0.108   0.097
          546          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          547          UA     100
                       *

          548          KK   SB09A   BASIN
          549          KM        SB09A Basin Runoff
          550          BA   0.001
          551          LG    0.10    0.25    6.00   0.284
          552          UC   0.126   0.174
          553          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          554          UA     100
                       *

          555          KK   SB08A   BASIN
          556          KM        SB08A Basin Runoff
          557          BA   0.001
          558          LG    0.10    0.25    6.00   0.284
          559          UC   0.115   0.130
          560          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          561          UA     100
                       *
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        LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          562          KK   CLEAR COMBINE
          563          KM        Clear Hydrograph Stack
          564          HC       4
                       *
                       *

          565          KK  SB06D1   BASIN
          566          KM        SB06D1 Basin Runoff
          567          BA   0.004
          568          LG    0.10    0.25    6.00   0.276      24
          569          UC   0.195   0.355
          570          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          571          UA     100
                       *

          572          KK  SB06D2   BASIN
          573          KM        SB06D2 Basin Runoff
          574          BA   0.009
          575          LG    0.25    0.25    6.00   0.216      30
          576          UC   0.132   0.171
          577          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          578          UA     100
                       *

          579          KK   CE06D COMBINE
          580          KM        Combine flow from SB06D1 and SB06D2
          581          HC       2
                       *

          582          KK  DB06D1 STORAGE
          583          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06D
          584          RS       1    STOR       0
          585          SV    0.01    0.12    0.26    0.44    0.64    0.64
          586          SQ    0.01       3       9      12      15      31
          587          SE    2795    2796    2797    2798    2799  2799.3
                       *

          588          KK  SB06C1   BASIN
          589          KM        SB06C1 Basin Runoff
          590          BA   0.015
          591          LG    0.10    0.25    6.00   0.272      40
          592          UC   0.220   0.296
          593          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
          594          UA     100
                       *

          595          KK  CE06CD COMBINE
          596          KM        Combine flow from DB06D1 and SB06C1
          597          HC       2
                       *
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        LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9.....10

          598          KK  DB06C1 STORAGE
          599          KM    Retention Basin Storage/Outflow rating curve for Basin DB06C1
          600          RS       1    STOR       0
          601          SV    0.01    0.10    0.23    0.41
          602          SQ    0.01       9      24      41
          603          SE    2792    2793    2794    2795
                       *

          604          KK  SB06C2   BASIN
          605          KM        SB06C2 Basin Runoff
          606          BA   0.020
          607          LG    0.10    0.25    6.00   0.284
          608          UC   0.372   0.670
          609          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          610          UA     100
                       *

          611          KK  SB06C3   BASIN
          612          KM        SB06C3 Basin Runoff
          613          BA   0.005
          614          LG    0.25    0.25    6.00   0.216      30
          615          UC   0.105   0.122
          616          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          617          UA     100
                       *

          618          KK   CE06C COMBINE
          619          KM        Combine flow from SB06C2 and SB06C3
          620          HC       2
                       *

          621          KK  DB06C2 STORAGE
          622          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06C
          623          RS       1    STOR       0
          624          SV    0.01    0.08    0.19    0.32    0.49
          625          SQ    0.01       4      13      20      22
          626          SE    2788    2789    2790    2791    2792
                       *

          627          KK  CE06CI COMBINE
          628          KM        Combine flow from DB06C2 and DB06C1
          629          HC       2
                       *

          630          KK   RE06C   ROUTE
          631          KM        Route flow from CE06CI through Basin SBE06B
          632          RS       1    FLOW
          633          RC   0.060   0.060   0.060     591  0.0431 2786.60
          634          RX    0.00    6.00   16.00   26.00   36.00   40.00   41.00   44.00
          635          RY  2786.6 2786.00 2785.00 2784.00 2784.00 2785.00 2785.50 2786.40
                       *
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        LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9.....10

          636          KK  SB06B1   BASIN
          637          KM        SB06B1 Basin Runoff
          638          BA   0.003
          639          LG    0.18    0.25    6.00   0.251      15
          640          UC   0.153   0.248
          641          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          642          UA     100
                       *

          643          KK  CE06CI COMBINE
          644          KM        Combine flow from SB06B1 and RE06C
          645          HC       2
                       *

          646          KK   RE06B   ROUTE
          647          KM        Route flow from CE06CI through Basin SB06B
          648          RS       1    FLOW
          649          RC   0.060   0.060   0.060     814  0.0319 2761.00
          650          RX    0.00   21.00   55.00   63.00   82.00   92.00  104.00  113.00
          651          RY  2761.0 2758.90 2758.50 2758.00 2758.00 2758.50 2759.70 2760.80
                       *

          652          KK   SB06B   BASIN
          653          KM        SB06B Basin Runoff
          654          BA   0.004
          655          LG    0.10    0.25    6.00   0.284
          656          UC   0.318   0.769
          657          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
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```
          658          UA     100
                       *

          659          KK   SB06A   BASIN
          660          KM        SB06A Basin Runoff
          661          BA   0.006
          662          LG    0.25    0.25    6.00   0.216      30
          663          UC   0.095   0.091
          664          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          665          UA     100
                       *

          666          KK   DB06A STORAGE
          667          KM    Retention Basin Storage/Outflow rating curve for Basin DB06A
          668          RS       1    STOR       0
          669          SV    0.01    0.02    0.08    0.16    0.26
          670          SQ    0.01       1       6      11      14
          671          SE  2752.5    2753    2754    2755    2756
                       *

          672          KK   CE06A COMBINE
          673          KM        Combine flow from DB06A, SB06B and RE06B
          674          HC       3
                       *
1                                                HEC-1 INPUT                                                 PAGE 18

        LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          675          KK  SB05B1   BASIN
          676          KM        SB05B1 Basin Runoff
          677          BA   0.007
          678          LG    0.10    0.25    6.00   0.284
          679          UC   0.203   0.234
          680          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          681          UA     100
                       *

          682          KK  DB05B1 STORAGE
          683          KM    Retention Basin Storage/Outflow rating curve for Basin DBE05B
          684          KM    Outlet control structure
          685          RS       1    STOR       0
          686          SV    0.01    0.02    0.06    0.11
          687          SQ    0.01    0.01       9      13
          688          SE    2810    2811    2812    2813
                       *

          689          KK  SB05B2   BASIN
          690          KM        SB05B2 Basin Runoff
          691          BA   0.006
          692          LG    0.10    0.25    6.00   0.284
          693          UC   0.241   0.404
          694          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          695          UA     100
                       *

          696          KK   CE05B COMBINE
          697          KM        Combine flow from DB05B1 and Basin SBE05B2
          698          HC       2
                       *

          699          KK  DB05B2 STORAGE
          700          KM    Retention Basin Storage/Outflow rating curve for Basin DB05B2
          701          RS       1    STOR       0
          702          SV    0.01    0.01    0.02   0.044
          703          SQ    0.01    0.01      18      24
          704          SE    2800    2801    2802    2803
                       *

          705          KK   RE05B   ROUTE
          706          KM        Route flow from SBE05B through SBE05A
          707          RS       1    FLOW
          708          RC   0.060   0.060   0.060     907  0.0435 2760.30
          709          RX    0.00   11.00   26.00   40.00   47.00   56.00   76.00   89.00
          710          RY  2760.1 2759.00 2757.70 2757.00 2757.00 2757.40 2758.80 2760.30
                       *

          711          KK  SB05B3   BASIN
          712          KM        SB05B3 Basin Runoff
          713          BA   0.004
          714          LG    0.25    0.25    6.00   0.216      30
          715          UC   0.117   0.183
          716          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1                                                HEC-1 INPUT                                                 PAGE 19

        LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          717          UA     100
                       *

          718          KK  SB05B4   BASIN
          719          KM        SB05B4 Basin Runoff
          720          BA   0.004
          721          LG    0.18    0.25    6.00   0.251      15
          722          UC   0.147   0.175
          723          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
 724          UA     100
              *

 725          KK  CE05B3 COMBINE
 726          KM        Combine flow from SB05B4, SB05B3 and RE05B
 727          HC        3
              *

 728          KK  DB05B3 STORAGE
 729          KM    Retention Basin Storage/Outflow rating curve for Basin DB05B3
 730          RS        1    STOR        0
 731          SV     0.01    0.01    0.03   0.084
 732          SQ     0.01       8      25      41
 733          SE     2782    2783    2784    2785
              *

 734          KK  RE05B3   ROUTE
 735          KM        Route flow from DB05B3 through SBE05A
 736          RS        1    FLOW
 737          RC    0.060   0.060   0.060     907  0.0435 2760.30
 738          RX     0.00   11.00   26.00   40.00   47.00   56.00   76.00   89.00
 739          RY  2760.1 2759.00 2757.70 2757.00 2757.00 2757.40 2758.80 2760.30
              *

 740          KK   SB05A   BASIN
 741          KM        SB05A Basin Runoff
 742          BA    0.004
 743          LG     0.10    0.25    6.00   0.284
 744          UC    0.306   0.764
 745          UA        0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 746          UA      100
              *

 747          KK  CE065A COMBINE
 748          KM        Combine flow from SB05A, RE05B3 and CE06A
 749          HC        3
              *

 750          KK   SB04C   BASIN
 751          KM        SB04C Basin Runoff
 752          BA    0.002
 753          LG     0.10    0.25    6.00   0.269      10
 754          UC    0.200   0.418
 755          UA        0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 756          UA      100
              *
```



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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 757          KK   SB04B   BASIN
 758          KM        SB04B Basin Runoff
 759          BA    0.011
 760          LG     0.25    0.25    6.00   0.216      30
 761          UC    0.137   0.182
 762          UA        0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 763          UA      100
              *

 764          KK   CE04B COMBINE
 765          KM        Combine flow from SB04C and SB04B
 766          HC        2
              *

 767          KK   DB04B STORAGE
 768          KM    Retention Basin Storage/Outflow rating curve for Basin DBE04C
 769          RS        1    STOR        0
 770          SV     0.01    0.06    0.15   0.261  0.0262
 771          SQ     0.01       5      13      21      27
 772          SE     2755    2756    2757    2758  2758.2
              *

 773          KK   RE04C   ROUTE
 774          KM        Route flow from DB04B into SBE04A
 775          RS        1    FLOW
 776          RC    0.060   0.060   0.060     455  0.0363 2755.00
 777          RX     0.00   17.00   22.00   27.00   32.00   44.00   61.00   88.00
 778          RY  2755.0 2753.00 2751.90 2750.00 2750.00 2751.90 2753.20 2754.90
              *

 779          KK   SB04A   BASIN
 780          KM        SB04A Basin Runoff
 781          BA    0.008
 782          LG     0.25    0.25    6.00   0.216      30
 783          UC    0.113   0.125
 784          UA        0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 785          UA      100
              *

 786          KK   CE04A COMBINE
 787          KM        Combine Flowe from RE04C and SB04A
 788          HC        2
              *

 789          KK   DB04A STORAGE
```

```
 790          KM    Retention Basin Storage/Outflow rating curve for Basin DB04A
 791          RS       1    STOR       0
 792          SV    0.01    0.05    0.16    0.30    0.47    0.67
 793          SQ    0.01       2      10      17      22      28
 794          SE  2738.5    2739    2740    2741    2742    2743
              *
1                                      HEC-1 INPUT                                                    PAGE 21

LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 795          KK  SB03A1   BASIN
 796          KM        SB03A1 Basin Runoff
 797          BA   0.002
 798          LG    0.10    0.25    6.00   0.284
 799          UC   0.255   0.646
 800          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 801          UA     100
              *

 802          KK  DB03A1 STORAGE
 803          KM    Retention Basin Storage/Outflow rating curve for Basin DB03A1
 804          RS       1    STOR       0
 805          SV    0.01    0.07    0.16    0.27    0.40
 806          SQ    0.01       3       7      13      20
 807          SE    2750    2751    2752    2753    2754
              *

 808          KK   SB03A   BASIN
 809          KM        SB03A Basin Runoff
 810          BA   0.003
 811          LG    0.10    0.25    6.00   0.284
 812          UC   0.172   0.210
 813          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 814          UA     100
              *

 815          KK   CE03A COMBINE
 816          KM        Combine Flows from DB03A and SB03A
 817          HC       2
              *

 818          KK  SB02A1   BASIN
 819          KM        SB02A1 Basin Runoff
 820          BA   0.059
 821          LG    0.10    0.25    6.00   0.284
 822          UC   0.414   0.543
 823          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 824          UA     100
              *

 825          KK  DB02A1 STORAGE
 826          KM    Retention Basin Storage/Outflow rating curve for Basin DB02A1
 827          RS       1    STOR       0
 828          SV    0.01    0.04    0.14    0.25    0.26
 829          SQ    0.01       6      21      48      70
 830          SE  2789.5    2790    2791    2792    2793
              *

 831          KK   R02A1   ROUTE
 832          KM        Route flow from DB02A1 into SB02A3
 833          RS       1    FLOW
 834          RC   0.060   0.060   0.060     455  0.0363 2755.00
 835          RX    0.00   17.00   22.00   27.00   32.00   44.00   61.00   88.00
 836          RY  2755.0 2753.00 2751.90 2750.00 2750.00 2751.90 2753.20 2754.90
              *
1                                      HEC-1 INPUT                                                    PAGE 22

LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 837          KK  SB02A2   BASIN
 838          KM        SB02A2 Basin Runoff
 839          BA   0.003
 840          LG    0.25    0.25    6.00   0.216      30
 841          UC   0.108   0.178
 842          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 843          UA     100
              *

 844          KK  DB02A2 STORAGE
 845          KM    Retention Basin Storage/Outflow rating curve for Basin DB02A2
 846          RS       1    STOR       0
 847          SV    0.01    0.14    0.32    0.53
 848          SQ    0.01    0.01    0.01       4
 849          SE    2762    2763    2764    2765
              *

 850          KK  SB02A3   BASIN
 851          KM        SB02A3 Basin Runoff
 852          BA   0.003
 853          LG    0.10    0.25    6.00   0.284
 854          UC   0.218   0.388
 855          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 856          UA     100
              *
```

```
857          KK   CE02A COMBINE
858          KM        Combine Flows from R02A1, DB02A2 and SB02A3
859          HC        3
             *

860          KK   SB01A   BASIN
861          KM        SB01A Basin Runoff
862          BA   0.119
863          LG    0.10    0.25    6.00    0.28       1
864          UC   0.460   0.513
865          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
866          UA     100
             *

867          KK   CLEAR COMBINE
868          KM        Clear Hydrograph Stack
869          HC        6
             *

870          KK  SBW14A   BASIN
871          KM        SBW14A Basin Runoff
872          BA   0.009
873          LG    0.28    0.25    6.00    0.20       4
874          UC   0.109   0.085
875          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
876          UA     100
             *
1                                        HEC-1 INPUT                                        PAGE 23

LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

877          KK  DBW14A STORAGE
878          KM    Retention Basin Storage/Outflow rating curve for Basin DBW14A
879          RS        1    STOR        0
880          SV    0.01    0.04    0.07    0.11    0.15    0.19    0.23    0.28    0.32    0.37
881          SV    0.42    0.47    0.52    0.58    0.63    0.70
882          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.84
883          SQ    2.97    6.04    9.74   13.95   18.64   23.76
884          SE    0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
885          SE    3.00    3.30    3.60    3.90    4.20    4.50
             *

886          KK  SBW13A   BASIN
887          KM        SBW13A Basin Runoff
888          BA   0.001
889          LG    0.30    0.25    6.00    0.18       5
890          UC   0.055   0.058
891          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
892          UA     100
             *

893          KK  SBW12A   BASIN
894          KM        SBW12A Basin Runoff
895          BA   0.017
896          LG    0.29    0.25    6.00    0.19      13
897          UC   0.115   0.091
898          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
899          UA     100
             *

900          KK  DBW12A STORAGE
901          KM    Retention Basin Storage/Outflow rating curve for Basin DBW12A
902          RS        1    STOR        0
903          SV    0.01    0.08    0.16    0.24    0.33    0.43    0.53    0.64    0.75    0.87
904          SV    0.99    1.13    1.27    1.43
905          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
906          SQ    5.94   16.80   30.86   47.52
907          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
908          SE    5.00    5.50    6.00    6.50
             *

909          KK  SBW11A   BASIN
910          KM        SBW11A Basin Runoff
911          BA   0.001
912          LG    0.30    0.25    6.00    0.18       5
913          UC   0.047   0.039
914          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
915          UA     100
             *
1                                        HEC-1 INPUT                                        PAGE 24

LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

916          KK   CLEAR COMBINE
917          KM        Clear Hydrograph Stack
918          HC        5
             *

919          KK  SB10C1   BASIN
920          KM        SB10C1 Basin Runoff
921          BA   0.009
922          LG    0.25    0.25    6.00   0.216      30
923          UC   0.141   0.190
```

```
          924          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          925          UA     100
                       *

          926          KK  SB10C2   BASIN
          927          KM        SB10C2 Basin Runoff
          928          BA   0.008
          929          LG    0.25    0.25    6.00   0.216      30
          930          UC   0.150   0.210
          931          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          932          UA     100
                       *

          933          KK  SB10C3   BASIN
          934          KM        SB10C3 Basin Runoff
          935          BA   0.004
          936          LG    0.10    0.25    6.00   0.254      20
          937          UC   0.220   0.332
          938          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          939          UA     100
                       *

          940          KK   CW10C COMBINE
          941          KM        Combine flow from SB10C1, SB10C2 and SB10C3
          942          HC       3
                       *

          943          KK   DB10C STORAGE
          944          KM    Retention Basin Storage/Outflow rating curve for Basin DB10C
          945          RS       1    STOR       0
          946          SV    0.01    0.15    0.34    0.57    0.83
          947          SQ    0.01      10      33      47      65
          948          SE    2767    2768    2769    2770    2771
                       *

          949          KK   RW10C   ROUTE
          950          KM        Route flow from SBW10C through Basin SBW10B
          951          RS       2    FLOW
          952          RC   0.060   0.060   0.060     952  0.0310 2757.80
          953          RX    0.00   34.00   47.00   62.00   62.10   68.00   73.00   78.00
          954          RY  2757.8 2754.40 2754.00 2752.10 2752.00 2753.70 2755.70 2757.50
                       *
1                                                HEC-1 INPUT                                                PAGE 25

     LINE              ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          955          KK   SB10B   BASIN
          956          KM        SB10B Basin Runoff
          957          BA   0.009
          958          LG    0.26    0.25    6.00   0.195      33
          959          UC   0.131   0.175
          960          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          961          UA     100
                       *

          962          KK   CW10B COMBINE
          963          KM        Combine flow from RW10C and SBW10B
          964          HC       2
                       *

          965          KK  DBW10B STORAGE
          966          KM    Retention Basin Storage/Outflow rating curve for Basin DBW10B
          967          RS       1    STOR       0
          968          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.44    0.53    0.62    0.73
          969          SV    0.84    0.95    1.08    1.22    1.30
          970          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          971          SQ    0.01    0.01    2.27   46.37   71.0
          972          SE    0.10    0.60    1.20    1.80    2.40    3.00    3.60    4.20    4.80    5.40
          973          SE    6.00    6.60    7.20    7.80    8.20
                       *

          974          KK   RW10B   ROUTE
          975          KM        Route flow from CE10WB through Basin SBW10A
          976          RS       1    FLOW
          977          RC   0.060   0.060   0.060     653  0.0276 2732.00
          978          RX    0.00   68.00   75.00   79.00   86.00   92.00  106.00  150.00
          979          RY  2732.0 2728.10 2721.10 2726.10 2726.00 2726.60 2727.00 2732.00
                       *

          980          KK  SB10AW   BASIN
          981          KM        SB10AW Basin Runoff
          982          BA   0.029
          983          LG    0.26    0.25    6.00   0.189      28
          984          UC   0.156   0.139
          985          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          986          UA     100
                       *

          987          KK   CW10A COMBINE
          988          KM        Combine flow from RW10B and SBW10A
          989          HC       2
                       *

          990          KK  DBW10A STORAGE
          991          KM    Retention Basin Storage/Outflow rating curve for Basin DBW10A
```

```
 992          RS       1    STOR       0
 993          SV    0.01    0.20    0.41    0.63    0.87    1.12    1.40    1.69    2.00    2.33
 994          SV    2.68    3.07    3.50    3.98    4.15
 995          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   14.68
 996          SQ   56.00  113.58  182.88  189.00  189.00
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 997          SE    0.10    0.60    1.20    1.80    2.40    3.00    3.60    4.20    4.80    5.40
 998          SE    6.00    6.60    7.20    7.80    8.00
              *

 999          KK   SB09E   BASIN
1000          KM        SB09E Basin Runoff
1001          BA   0.005
1002          LG    0.10    0.25    6.00   0.284
1003          UC   0.229   0.374
1004          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1005          UA     100
              *

1006          KK   DB09E STORAGE
1007          KM    Retention Basin Storage/Outflow rating curve for Basin DB09E
1008          RS       1    STOR       0
1009          SV    0.01    0.06    0.14    0.24    0.37    0.52
1010          SQ    0.01       3       9      13      16      19
1011          SE    2826    2827    2828    2829    2830    2831
              *

1012          KK   RW09E   ROUTE
1013          KM        Route flow from SBW09E through Basin SBW09D
1014          RS       1    FLOW
1015          RC   0.060   0.060   0.060     985  0.0442 2805.10
1016          RX    0.00   10.00   12.00   14.00   17.00   23.00   29.00   48.00
1017          RY  2805.3 2803.10 2802.10 2800.70 2800.70 2802.00 2802.90 2805.10
              *

1018          KK  SB09D1   BASIN
1019          KM        SB09D1 Basin Runoff
1020          BA   0.009
1021          LG    0.24    0.25    6.00   0.216      30
1022          UC   0.108   0.116
1023          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1024          UA     100
              *

1025          KK  SB09D2   BASIN
1026          KM        SB09D2 Basin Runoff
1027          BA   0.005
1028          LG    0.25    0.25    6.00   0.216      30
1029          UC   0.139   0.253
1030          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1031          UA     100
              *

1032          KK  CW09DI COMBINE
1033          HC       3
              *
1                                      HEC-1 INPUT                                          PAGE 27

LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1034          KK   SB09C   BASIN
1035          KM        SB09C Basin Runoff
1036          BA   0.036
1037          LG    0.10    0.25    6.00   0.284
1038          UC   0.372   0.494
1039          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1040          UA     100
              *

1041          KK   CW09D COMBINE
1042          KM        Combine flow from CW09DI and SBW09C
1043          HC       2
              *

1044          KK  DBW09C STORAGE
1045          KM    Retention Basin Storage/Outflow rating curve for Basin DBW09C
1046          RS       1    STOR       0
1047          SV    0.01    0.21    0.43    0.66    0.90    1.16    1.44    1.73    2.05    2.41
1048          SV    2.79
1049          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   19.80   56.00
1050          SQ  102.88
1051          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1052          SE    5.00
              *

1053          KK   RW09D   ROUTE
1054          KM        Route flow from CW09D through Basin SBW09B
1055          RS       1    FLOW
1056          RC   0.060   0.060   0.060     367  0.0368 2782.10
1057          RX    0.00   11.00   27.00   31.00   38.00   42.00   73.00   90.00
1058          RY  2782.1 2780.10 2780.00 2779.00 2779.00 2779.50 2780.90 2781.30
              *
```

```
1059          KK  SBW09B   BASIN
1060          KM        SBW09B Basin Runoff
1061          BA   0.005
1062          LG    0.27    0.25    6.00    0.20      29
1063          UC   0.087   0.086
1064          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1065          UA     100
              *

1066          KK   CW09B COMBINE
1067          KM        Combine flow from RW09D and SBW09B
1068          HC       2
              *

1069          KK  DBW09B STORAGE
1070          KM    Retention Basin Storage/Outflow rating curve for Basin DBW09B
1071          RS       1    STOR       0
1072          SV    0.01    0.05    0.10    0.15    0.21    0.27    0.34    0.40    0.48    0.55
1073          SV    0.63    0.72
1074          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   20.79
1075          SQ   58.80  108.02
1                                        HEC-1 INPUT                                          PAGE 28

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1076          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1077          SE    5.00    5.50
              *

1078          KK   RW09B   ROUTE
1079          KM        Route flow from CW09B through Basin SBW09A
1080          RS       1    FLOW
1081          RC   0.060   0.060   0.060    1036  0.0415 2765.60
1082          RX    0.00    8.00   49.00   58.00   67.00   72.00   85.00  104.00
1083          RY  2764.9 2764.80 2764.00 2763.00 2763.00 2764.00.2765.10 2765.60
              *

1084          KK  SBW09A   BASIN
1085          KM        SBW09A Basin Runoff
1086          BA   0.008
1087          LG    0.27    0.25    6.00    0.20      24
1088          UC   0.128   0.176
1089          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1090          UA     100
              *

1091          KK   CW09A COMBINE
1092          KM        Combine flow from RW09B and SBW09A
1093          HC       2
              *

1094          KK  DBW09A STORAGE
1095          KM    Retention Basin Storage/Outflow rating curve for Basin DBW09A
1096          RS       1    STOR       0
1097          SV    0.01    0.04    0.08    0.12    0.17    0.21    0.26    0.32    0.37    0.43
1098          SV    0.50    0.57    0.64
1099          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1100          SQ   22.77   64.40  118.31
1101          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1102          SE    5.00    5.50    6.00
              *

1103          KK  SBW08A   BASIN
1104          KM        SBW08A Basin Runoff
1105          BA   0.009
1106          LG    0.27    0.25    6.00    0.18      21
1107          UC   0.103   0.105
1108          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1109          UA     100
              *

1110          KK  DBW08A STORAGE
1111          KM    Retention Basin Storage/Outflow rating curve for Basin DBW08A
1112          RS       1    STOR       0
1113          SV    0.01    0.04    0.09    0.14    0.18    0.24    0.29    0.34    0.40    0.46
1114          SV    0.52    0.58    0.65    0.71    0.79    0.86    0.87
1115          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1116          SQ    0.01    1.09    5.33   11.85   20.01   29.39   30.86
1117          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1118          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
              *
1                                        HEC-1 INPUT                                          PAGE 29

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1119          KK  SBW07C   BASIN
1120          KM        SBW07C Basin Runoff
1121          BA   0.005
1122          LG    0.21    0.25    6.00    0.23       3
1123          UC   0.162   0.231
1124          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1125          UA     100
              *
```

```
1126          KK  DBW07C STORAGE
1127          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07C
1128          RS       1     STOR        0
1129          SV    0.01     0.01     0.02     0.03     0.04     0.05     0.07     0.08     0.09     0.11
1130          SV    0.12     0.14     0.16     0.18     0.20     0.22     0.22
1131          SQ    0.01     0.01     0.01     0.01     0.01     0.01     0.01     0.01     0.01     0.01
1132          SQ    0.01     0.55     2.66     5.93    10.00    14.69    15.43
1133          SE    0.10     0.30     0.70     1.00     1.30     1.70     2.00     2.30     2.60     3.00
1134          SE    3.30     3.60     4.00     4.30     4.60     5.00     5.00
              *

1135          KK   SB07B    BASIN
1136          KM         SB07B Basin Runoff
1137          BA   0.007
1138          LG    0.10     0.25     6.00    0.284
1139          UC   0.246    0.394
1140          UA       0      5.0     16.0     30.0     65.0     77.0     84.0     90.0     94.0     97.0
1141          UA     100
              *

1142          KK  DBW07B STORAGE
1143          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07B
1144          RS       1     STOR        0
1145          SV    0.01     0.01     0.03     0.04     0.05     0.07     0.09     0.10     0.12     0.14
1146          SV    0.17     0.19     0.21     0.24     0.27     0.29     0.30
1147          SQ    0.01     0.01     0.01     0.01     0.01     0.01     0.01     0.01     0.01     0.01
1148          SQ    0.01     0.55     2.66     5.93    10.00    14.69    15.43
1149          SE    0.10     0.30     0.70     1.00     1.30     1.70     2.00     2.30     2.60     3.00
1150          SE    3.30     3.60     4.00     4.30     4.60     5.00     5.00
              *

1151          KK  CW07BC COMBINE
1152          KM        Combine flow from SBW07C andSBW07B
1153          HC        2
              *

1154          KK  RW07BC    ROUTE
1155          KM        Route flow from CW07BC through SBW07A
1156          RS        1     FLOW
1157          RC   0.060    0.060    0.060     1452   0.0465 2800.10
1158          RX    0.00     6.00    20.00    26.00    29.00    38.00    50.00    68.00
1159          RY  2800.1 2799.00 2796.00 2793.00 2793.00 2796.00 2797.00 2798.40
              *
1                                        HEC-1 INPUT                                        PAGE 30

LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1160          KK  SBW07A    BASIN
1161          KM        SBW07A Basin Runoff
1162          BA   0.013
1163          LG    0.28     0.25     6.00     0.20       22
1164          UC   0.142    0.193
1165          UA       0      5.0     16.0     30.0     65.0     77.0     84.0     90.0     94.0     97.0
1166          UA     100
              *

1167          KK   CW07A COMBINE
1168          KM        Combine flow from RW07BC and SBW07A
1169          HC        2
              *

1170          KK  DBW07A STORAGE
1171          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07A
1172          RS       1     STOR        0
1173          SV    0.01     0.09     0.18     0.28     0.39     0.50     0.62     0.74     0.88     1.01
1174          SV    1.16     1.32
1175          SQ    0.01     0.01     0.01     0.01     0.01     0.01     0.01     0.01     0.01    10.89
1176          SQ   30.80    56.58
1177          SE    0.10     0.50     1.00     1.50     2.00     2.50     3.00     3.50     4.00     4.50
1178          SE    5.00     5.50
              *

1179          KK   CLEAR COMBINE
1180          HC        5
              *

1181          KK  SBW06A    BASIN
1182          KM        SBW06A Basin Runoff
1183          BA   0.004
1184          LG    0.29     0.25     6.00     0.18       11
1185          UC   0.091    0.110
1186          UA       0      5.0     16.0     30.0     65.0     77.0     84.0     90.0     94.0     97.0
1187          UA     100
              *

1188          KK  DBW06A STORAGE
1189          KM    Retention Basin Storage/Outflow rating curve for Basin DBW06A
1190          RS       1     STOR        0
1191          SV    0.01     0.02     0.03     0.05     0.07     0.09     0.11     0.14     0.16     0.19
1192          SV    0.21     0.24     0.28     0.31     0.34     0.38     0.39
1193          SQ    0.01     0.01     0.01     0.01     0.01     0.01     0.01     0.01     0.01     0.01
1194          SQ    0.01     0.55     2.66     5.93    10.00    14.69    15.43
1195          SE    0.10     0.30     0.70     1.00     1.30     1.70     2.00     2.30     2.60     3.00
1196          SE    3.30     3.60     4.00     4.30     4.60     5.00     5.00
              *
```

```
1                                        HEC-1 INPUT                                        PAGE 31

          LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          1197          KK  SBW05A   BASIN
          1198          KM        SBW05A Basin Runoff
          1199          BA   0.010
          1200          LG    0.29    0.25    6.00    0.19      11
          1201          UC   0.115   0.127
          1202          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1203          UA     100
                        *

          1204          KK  DBW05A STORAGE
          1205          KM    Retention Basin Storage/Outflow rating curve for Basin DBW05A
          1206          RS       1    STOR       0
          1207          SV    0.01    0.05    0.09    0.15    0.20    0.26    0.32    0.38    0.45    0.52
          1208          SV    0.59    0.67    0.76
          1209          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          1210          SQ    5.94   16.80   30.86
          1211          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
          1212          SE    5.00    5.50    6.00
                        *

          1213          KK  SBW04A   BASIN
          1214          KM        SBW04A Basin Runoff
          1215          BA   0.002
          1216          LG    0.30    0.25    6.00    0.18       5
          1217          UC   0.071   0.080
          1218          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1219          UA     100
                        *

          1220          KK  SBW02A   BASIN
          1221          KM        SBW02A Basin Runoff
          1222          BA   0.007
          1223          LG    0.18    0.25    6.00    0.24       2
          1224          UC   0.183   0.241
          1225          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1226          UA     100
                        *

          1227          KK  DBW02A STORAGE
          1228          KM    Retention Basin Storage/Outflow rating curve for Basin DBW02A
          1229          RS       1    STOR       0
          1230          SV    0.01    0.01    0.03    0.05    0.06    0.08    0.10    0.12    0.14    0.16
          1231          SV    0.18    0.20    0.22    0.25    0.27
          1232          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          1233          SQ    0.01    2.20    6.04   11.07   15.43
          1234          SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
          1235          SE    4.00    4.40    4.80    5.20    5.50
                        *
1                                        HEC-1 INPUT                                        PAGE 32

          LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

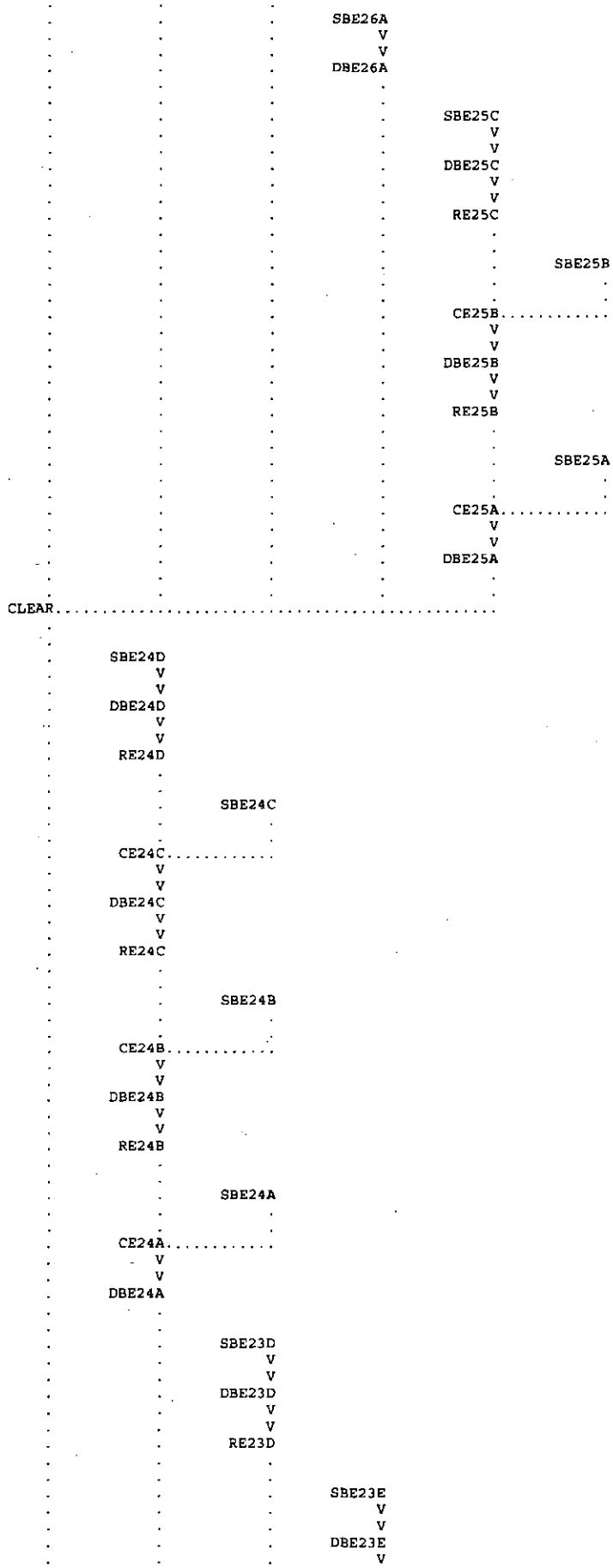
          1236          KK  SBW01A   BASIN
          1237          KM        SBW01A Basin Runoff
          1238          BA   0.002
          1239          LG    0.14    0.25    6.00    0.26       1
          1240          UC   0.143   0.196
          1241          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1242          UA     100
                        *

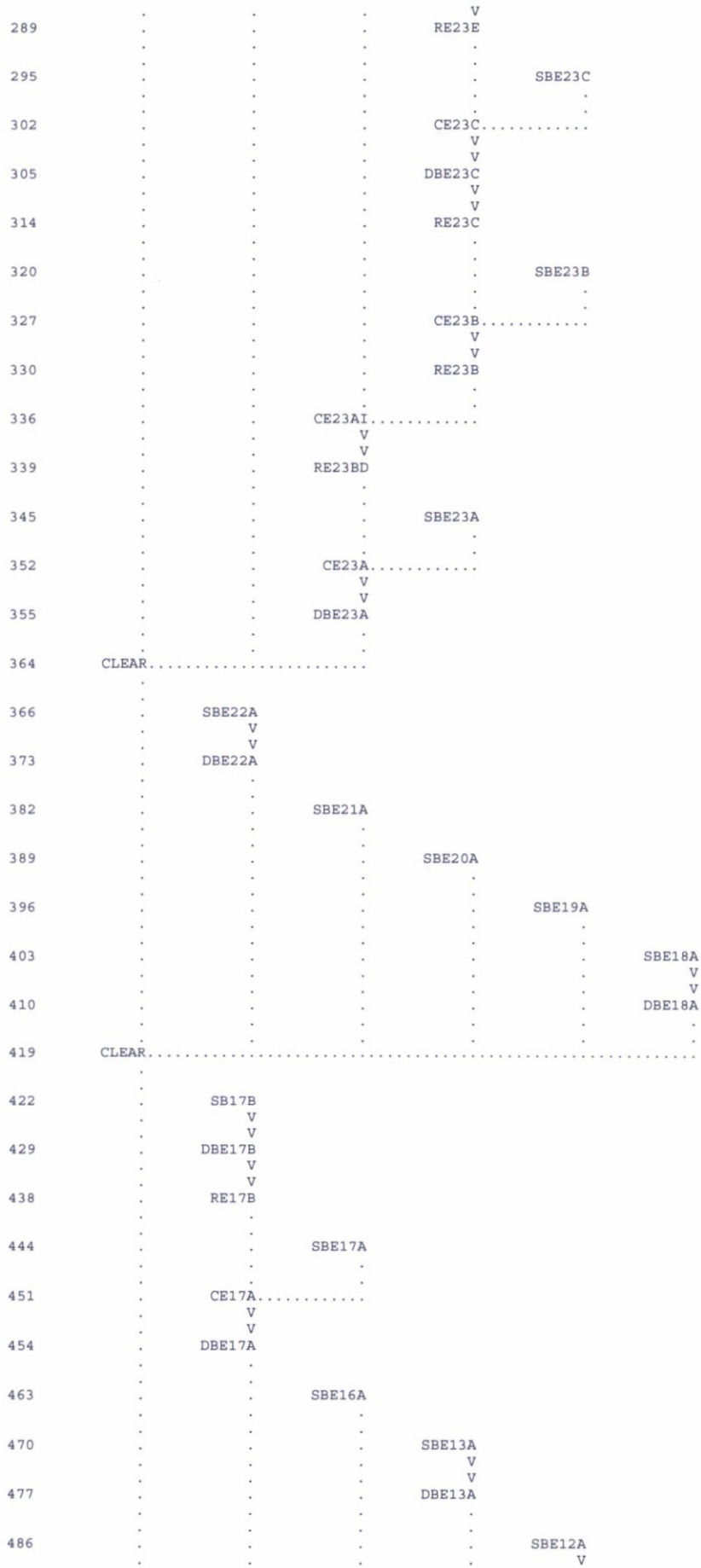
          1243          KK   CLEAR COMBINE
          1244          KM        Clear Hydrograph Stack
          1245          HC       6
                        *
          1246          ZZ
1
               SCHEMATIC DIAGRAM OF STREAM NETWORK

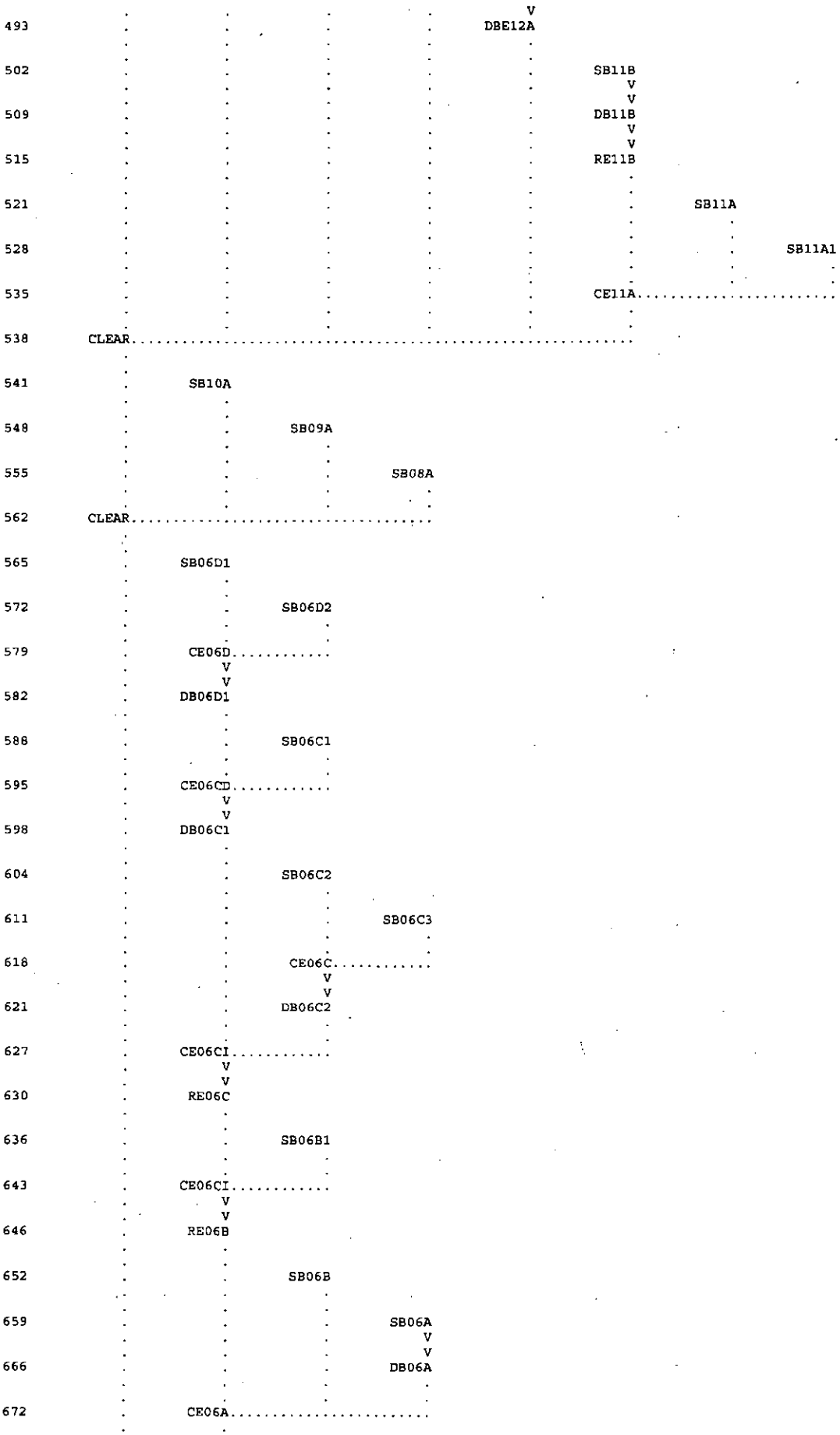
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

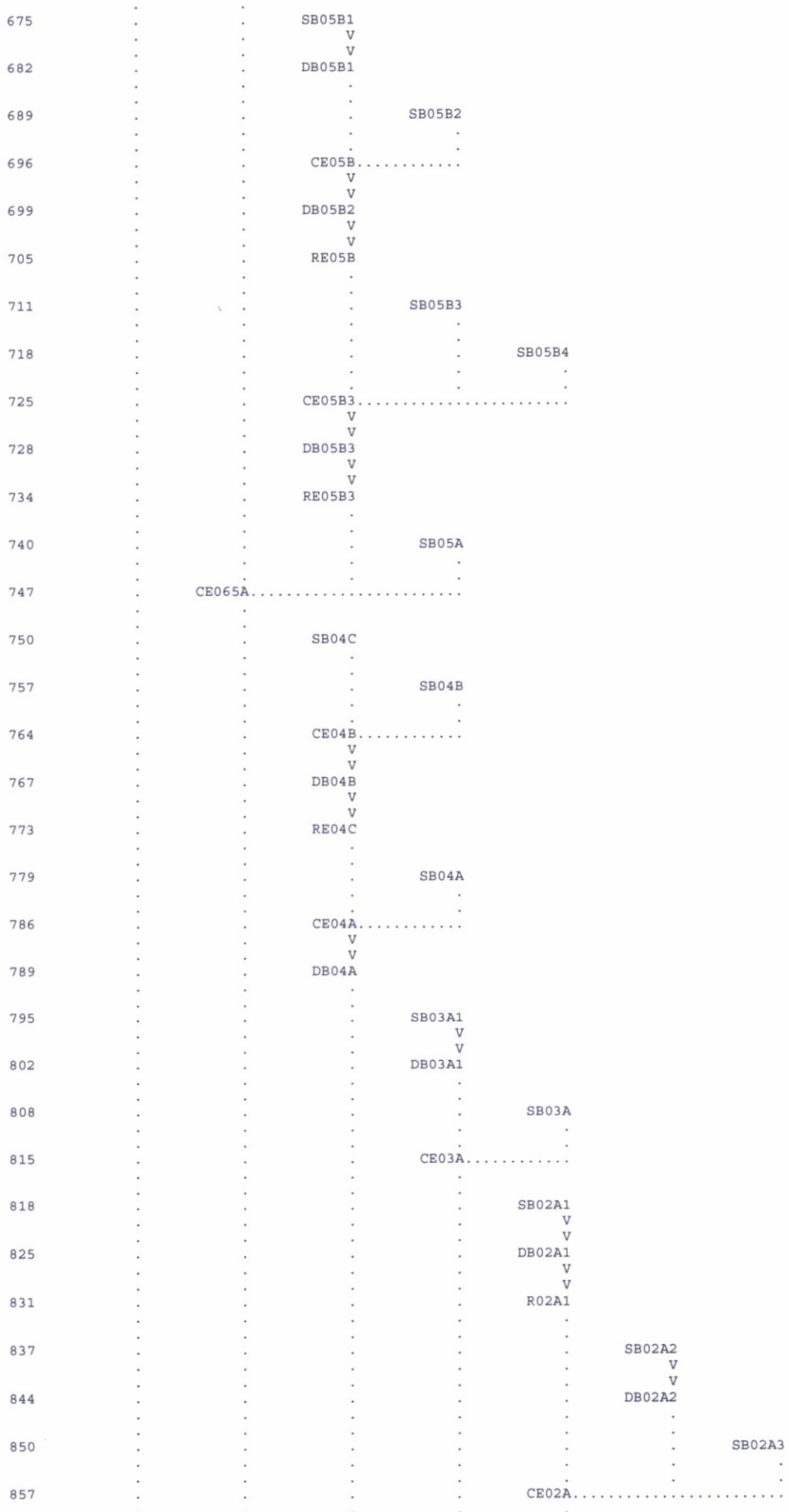
   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

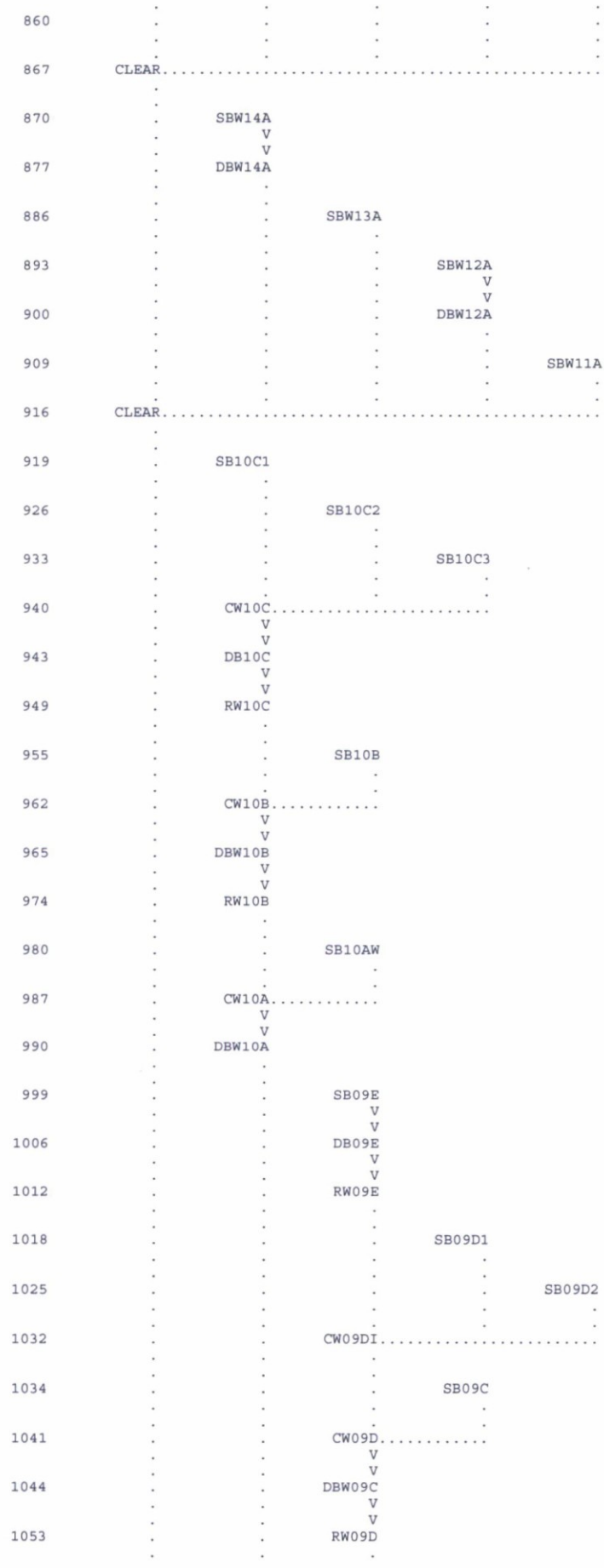
    23      SBE29A
                 V
                 V
    34      DBE29A
                 .
                 .
    43           .      SBE28A
                 .           V
                 .           V
    50           .      DBE28A
                 .           .
                 .           .
    59           .           .      SBE27A
                 .           .           V
                 .           .           V
    66           .           .      DBE27A
                 .           .           .
```

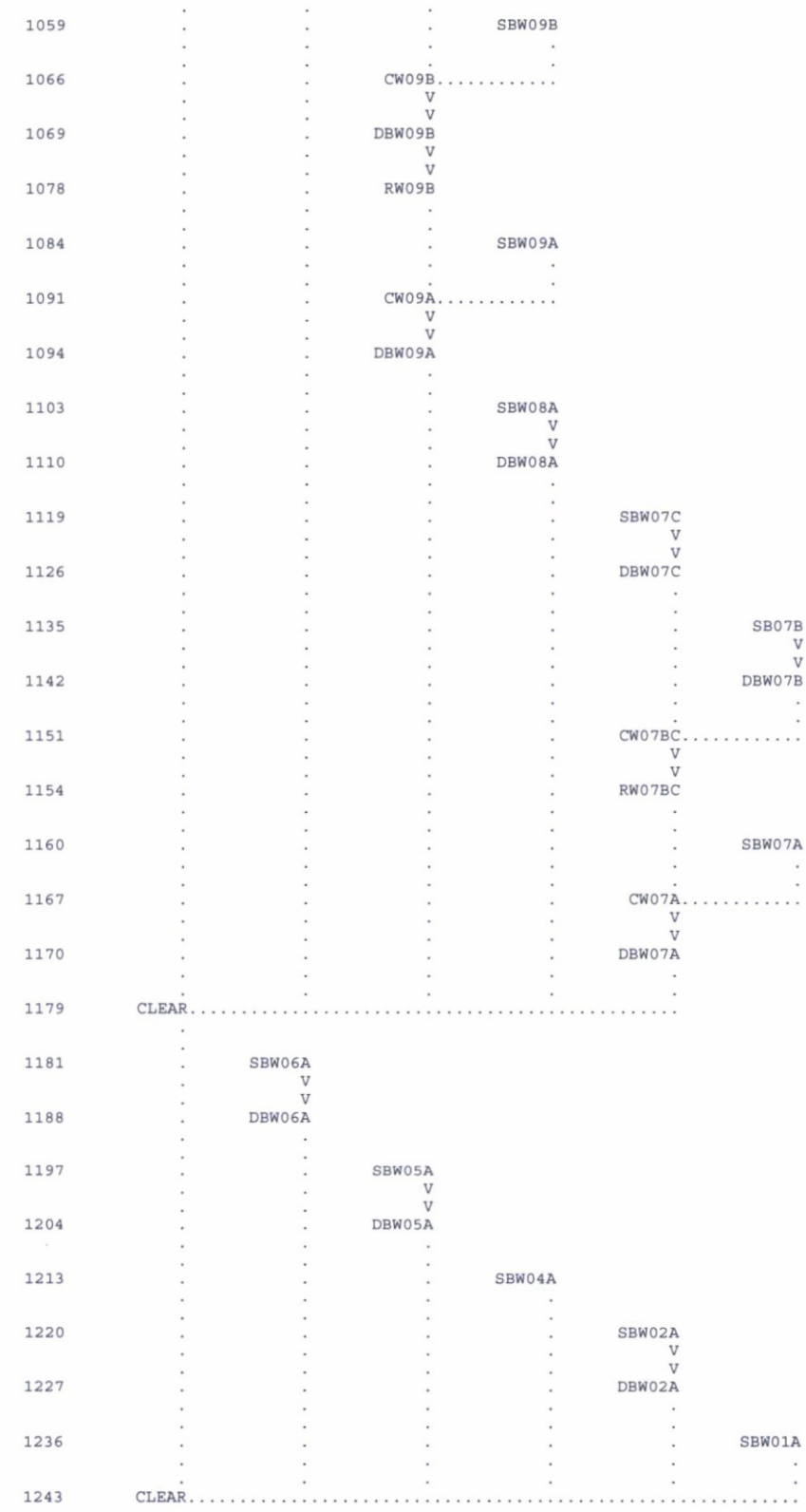

75 SBE26A
82 DBE26A
91 SBE25C
98 DBE25C
107 RE25C
113 SBE25B
120 CE25B
123 DBE25B
132 RE25B
138 SBE25A
145 CE25A
148 DBE25A
157 CLEAR
160 SBE24D
167 DBE24D
176 RE24D
182 SBE24C
189 CE24C
192 DBE24C
201 RE24C
207 SBE24B
214 CE24B
217 DBE24B
226 RE24B
232 SBE24A
239 CE24A
242 DBE24A
251 SBE23D
258 DBE23D
267 RE23D
273 SBE23E
280 DBE23E


RE23E
SBE23C
CE23C
DBE23C
RE23C
SBE23B
CE23B
RE23B
CE23AI
RE23BD
SBE23A
CE23A
DBE23A
CLEAR
SBE22A
DBE22A
SBE21A
SBE20A
SBE19A
SBE18A
DBE18A
CLEAR
SB17B
DBE17B
RE17B
SBE17A
CE17A
DBE17A
SBE16A
SBE13A
DBE13A
SBE12A


493 DBE12A
502 SB11B
509 DB11B
515 RE11B
521 SB11A
528 SB11A1
535 CE11A
538 CLEAR
541 SB10A
548 SB09A
555 SB08A
562 CLEAR
565 SB06D1
572 SB06D2
579 CE06D
582 DB06D1
588 SB06C1
595 CE06CD
598 DB06C1
604 SB06C2
611 SB06C3
618 CE06C
621 DB06C2
627 CE06CI
630 RE06C
636 SB06B1
643 CE06CI
646 RE06B
652 SB06B
659 SB06A
666 DB06A
672 CE06A


675 SB05B1
682 DB05B1
689 SB05B2
696 CE05B
699 DB05B2
705 RE05B
711 SB05B3
718 SB05B4
725 CE05B3
728 DB05B3
734 RE05B3
740 SB05A
747 CE065A
750 SB04C
757 SB04B
764 CE04B
767 DB04B
773 RE04C
779 SB04A
786 CE04A
789 DB04A
795 SB03A1
802 DB03A1
808 SB03A
815 CE03A
818 SB02A1
825 DB02A1
831 R02A1
837 SB02A2
844 DB02A2
850 SB02A3
857 CE02A


860 SB01A
867 CLEAR
870 SBW14A
877 DBW14A
886 SBW13A
893 SBW12A
900 DBW12A
909 SBW11A
916 CLEAR
919 SB10C1
926 SB10C2
933 SB10C3
940 CW10C
943 DB10C
949 RW10C
955 SB10B
962 CW10B
965 DBW10B
974 RW10B
980 SB10AW
987 CW10A
990 DBW10A
999 SB09E
1006 DB09E
1012 RW09E
1018 SB09D1
1025 SB09D2
1032 CW09DI
1034 SB09C
1041 CW09D
1044 DBW09C
1053 RW09D



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   07MAY18  TIME  09:27:39   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
                          SERENO CANYON (PHASE 4) - DEVELOPED CONDITIONS
                          STORM EVENT: 100-YR, 6-HOUR
                          05/04/2018
                          PREPARED BY: SLATER HANIFAN GROUP
                         ********************************************************************************
                         ********************************************************************************
                          Flood Control District of Maricopa County
                          Sereno Canyon Developed Conditions
                          100 YEAR
                          6 Hour  Storm
                          Unit Hydrograph: Clark
                          09/18/2012
                          Sereno Canyon-Developed Conditions
                          100-Year, 6-Hour Storm Event
                          Prepared By: JE Fuller Hydrology and Geomorphology
                          Modeled By: Brian Schalk P.E., CFM and Nathan Logan P.E., CFM
                          Submitted To: City of Scottsdale
                         ********************************************************************************
                         ********************************************************************************

  21 IO          OUTPUT CONTROL VARIABLES
                       IPRNT          5  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL          0. HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                       NMIN           1  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1DEC11  STARTING DATE
                       ITIME        0000  STARTING TIME
                          NQ        2000  NUMBER OF HYDROGRAPH ORDINATES
                       NDDATE     2DEC11  ENDING DATE
                       NDTIME       0919  ENDING TIME
                       ICENT          19  CENTURY MARK

                     COMPUTATION INTERVAL     0.02 HOURS
                         TOTAL TIME BASE    33.32 HOURS

           ENGLISH UNITS
                DRAINAGE AREA          SQUARE MILES
                PRECIPITATION DEPTH    INCHES
                LENGTH, ELEVATION      FEET
                FLOW                   CUBIC FEET PER SECOND
                STORAGE VOLUME         ACRE-FEET
                SURFACE AREA           ACRES
                TEMPERATURE            DEGREES FAHRENHEIT
1

                                                RUNOFF SUMMARY
                                          FLOW IN CUBIC FEET PER SECOND
                                       TIME IN HOURS,  AREA IN SQUARE MILES

                                    PEAK    TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD      BASIN     MAXIMUM     TIME OF
           OPERATION      STATION   FLOW     PEAK      6-HOUR     24-HOUR     72-HOUR        AREA      STAGE     MAX STAGE
+
           HYDROGRAPH AT
+                         SBE29A     36.     4.05         3.          1.          1.        0.01
           ROUTED TO
+                         DBE29A     21.     4.23         2.          1.          0.        0.01
+                                                                                                        5.15        4.23
           HYDROGRAPH AT
+                         SBE28A     37.     4.03         3.          1.          0.        0.01
           ROUTED TO
+                         DBE28A     17.     4.18         1.          0.          0.        0.01
+                                                                                                        5.41        4.18
           HYDROGRAPH AT
+                         SBE27A      6.     4.02         0.          0.          0.        0.00
           ROUTED TO
+                         DBE27A      2.     4.17         0.          0.          0.        0.00
+                                                                                                        3.49        4.17
           HYDROGRAPH AT
+                         SBE26A     27.     4.03         2.          1.          0.        0.01
           ROUTED TO
+                         DBE26A      8.     4.33         1.          0.          0.        0.01
+                                                                                                        5.61        4.33
           HYDROGRAPH AT
+                         SBE25C     16.     4.02         1.          0.          0.        0.00
           ROUTED TO
+                         DBE25C     11.     4.08         1.          0.          0.        0.00
+                                                                                                        3.74        4.08
           ROUTED TO
+                          RE25C      9.     4.17         1.          0.          0.        0.00
+                                                                                                     2687.51        4.17
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+	HYDROGRAPH AT	SBE25B	16.	4.03	1.	0.	0.	0.01	
+	2 COMBINED AT	CE25B	20.	4.10	2.	0.	0.	0.01	
+	ROUTED TO	DBE25B	14.	4.25	1.	0.	0.	0.01	3.85 4.25
+	ROUTED TO	RE25B	13.	4.28	1.	0.	0.	0.01	2677.09 4.28
+	HYDROGRAPH AT	SBE25A	10.	4.02	1.	0.	0.	0.00	
+	2 COMBINED AT	CE25A	15.	4.27	2.	0.	0.	0.01	
+	ROUTED TO	DBE25A	15.	4.32	1.	0.	0.	0.01	4.24 4.32
+	5 COMBINED AT	CLEAR	59.	4.27	6.	1.	1.	0.05	
+	HYDROGRAPH AT	SBE24D	31.	4.02	2.	0.	0.	0.01	
+	ROUTED TO	DBE24D	17.	4.12	1.	0.	0.	0.01	4.02 4.12
+	ROUTED TO	RE24D	16.	4.18	1.	0.	0.	0.01	2721.82 4.18
+	HYDROGRAPH AT	SBE24C	40.	4.03	3.	1.	1.	0.01	
+	2 COMBINED AT	CE24C	45.	4.08	4.	1.	1.	0.02	
+	ROUTED TO	DBE24C	36.	4.22	3.	1.	1.	0.02	4.40 4.22
+	ROUTED TO	RE24C	34.	4.27	3.	1.	1.	0.02	2702.00 4.27
+	HYDROGRAPH AT	SBE24B	13.	4.03	1.	0.	0.	0.00	
+	2 COMBINED AT	CE24B	40.	4.25	4.	1.	1.	0.03	
+	ROUTED TO	DBE24B	33.	4.37	3.	1.	1.	0.03	4.34 4.37
+	ROUTED TO	RE24B	30.	4.45	3.	1.	1.	0.03	2687.95 4.45
+	HYDROGRAPH AT	SBE24A	19.	4.03	2.	0.	0.	0.01	
+	2 COMBINED AT	CE24A	34.	4.43	5.	1.	1.	0.04	
+	ROUTED TO	DBE24A	30.	4.52	4.	1.	1.	0.04	4.83 4.52
+	HYDROGRAPH AT	SBE23D	98.	4.07	9.	2.	2.	0.04	
+	ROUTED TO	DBE23D	75.	4.17	4.	1.	1.	0.04	7.88 4.17
+	ROUTED TO	RE23D	60.	4.23	4.	1.	1.	0.04	2685.21 4.23
+	HYDROGRAPH AT	SBE23E	14.	4.02	1.	0.	0.	0.00	
+	ROUTED TO	DBE23E	4.	4.30	0.	0.	0.	0.00	3.60 4.30
+	ROUTED TO	RE23E	4.	4.45	0.	0.	0.	0.00	

+								2711.52	4.45
+	HYDROGRAPH AT	SBE23C	128.	4.05	11.	3.	2.	0.05	
+	2 COMBINED AT	CE23C	128.	4.05	11.	3.	2.	0.06	
+	ROUTED TO	DBE23C	94.	4.18	7.	2.	1.	0.06	
+								6.62	4.18
+	ROUTED TO	RE23C	91.	4.22	7.	2.	1.	0.06	
+								2691.59	4.22
+	HYDROGRAPH AT	SBE23B	12.	4.02	1.	0.	0.	0.00	
+	2 COMBINED AT	CE23B	95.	4.22	8.	2.	1.	0.06	
+	ROUTED TO	RE23B	95.	4.22	8.	2.	1.	0.06	
+								2685.22	4.22
+	2 COMBINED AT	CE23AI	155.	4.22	12.	3.	2.	0.10	
+	ROUTED TO	RE23BD	154.	4.23	12.	3.	2.	0.10	
+								2680.91	4.23
+	HYDROGRAPH AT	SBE23A	17.	4.02	1.	0.	0.	0.01	
+	2 COMBINED AT	CE23A	160.	4.23	13.	3.	2.	0.11	
+	ROUTED TO	DBE23A	137.	4.32	10.	2.	2.	0.11	
+								7.98	4.32
+	3 COMBINED AT	CLEAR	208.	4.32	19.	5.	3.	0.20	
+	HYDROGRAPH AT	SBE22A	19.	4.03	1.	0.	0.	0.01	
+	ROUTED TO	DBE22A	7.	4.23	1.	0.	0.	0.01	
+								4.74	4.23
+	HYDROGRAPH AT	SBE21A	3.	4.00	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SBE20A	3.	4.00	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SBE19A	3.	4.00	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SBE18A	3.	4.00	0.	0.	0.	0.00	
+	ROUTED TO	DBE18A	0.	4.38	0.	0.	0.	0.00	
+								2.59	4.40
+	6 COMBINED AT	CLEAR	215.	4.32	20.	5.	4.	0.21	
+	HYDROGRAPH AT	SB17B	43.	4.03	3.	1.	1.	0.01	
+	ROUTED TO	DBE17B	12.	4.30	1.	0.	0.	0.01	
+								6.07	4.30
+	ROUTED TO	RE17B	10.	4.47	1.	0.	0.	0.01	
+								2736.41	4.47
+	HYDROGRAPH AT	SBE17A	49.	4.03	4.	1.	1.	0.02	
+	2 COMBINED AT	CE17A	49.	4.03	5.	1.	1.	0.03	
+	ROUTED TO	DBE17A	18.	4.42	2.	1.	0.	0.03	
+								5.50	4.42
+	HYDROGRAPH AT	SBE16A	3.	4.00	0.	0.	0.	0.00	

+	HYDROGRAPH AT	SBE13A	10.	4.00	1.	0.	0.	0.00	
+	ROUTED TO	DBE13A	2.	4.20	0.	0.	0.	0.00	5.07 4.20
+	HYDROGRAPH AT	SBE12A	6.	4.00	0.	0.	0.	0.00	
+	ROUTED TO	DBE12A	2.	4.22	0.	0.	0.	0.00	3.41 4.22
+	HYDROGRAPH AT	SB11B	24.	4.08	3.	1.	0.	0.01	
+	ROUTED TO	DB11B	20.	4.22	3.	1.	0.	0.01	2779.78 4.22
+	ROUTED TO	RE11B	19.	4.28	3.	1.	0.	0.01	2763.10 4.28
+	HYDROGRAPH AT	SB11A	12.	4.08	1.	0.	0.	0.01	
+	HYDROGRAPH AT	SB11A1	7.	4.05	1.	0.	0.	0.00	
+	3 COMBINED AT	CE11A	33.	4.17	4.	1.	1.	0.02	
+	6 COMBINED AT	CLEAR	265.	4.32	28.	7.	5.	0.27	
+	HYDROGRAPH AT	SB10A	3.	4.02	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SB09A	2.	4.03	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SB08A	3.	4.02	0.	0.	0.	0.00	
+	4 COMBINED AT	CLEAR	266.	4.32	28.	7.	5.	0.28	
+	HYDROGRAPH AT	SB06D1	7.	4.07	1.	0.	0.	0.00	
+	HYDROGRAPH AT	SB06D2	24.	4.03	2.	1.	0.	0.01	
+	2 COMBINED AT	CE06D	31.	4.03	3.	1.	1.	0.01	
+	ROUTED TO	DB06D1	14.	4.28	3.	1.	1.	0.01	2798.76 4.28
+	HYDROGRAPH AT	SB06C1	31.	4.08	4.	1.	1.	0.01	
+	2 COMBINED AT	CE06CD	44.	4.08	6.	2.	1.	0.03	
+	ROUTED TO	DB06C1	38.	4.22	6.	2.	1.	0.03	2794.84 4.22
+	HYDROGRAPH AT	SB06C2	21.	4.17	3.	1.	1.	0.02	
+	HYDROGRAPH AT	SB06C3	15.	4.02	1.	0.	0.	0.00	
+	2 COMBINED AT	CE06C	31.	4.05	5.	1.	1.	0.02	
+	ROUTED TO	DB06C2	21.	4.33	5.	1.	1.	0.02	2791.63 4.33
+	2 COMBINED AT	CE06CI	59.	4.23	11.	3.	2.	0.05	
+	ROUTED TO	RE06C	59.	4.27	11.	3.	2.	0.05	2784.92 4.25
+	HYDROGRAPH AT	SB06B1	7.	4.05	1.	0.	0.	0.00	
	2 COMBINED AT								

+		CE06CI	63.	4.23	12.	3.	2.	0.06	
+	ROUTED TO	RE06B	62.	4.30	12.	3.	2.	0.06	2758.67 4.30
+	HYDROGRAPH AT	SB06B	4.	4.15	1.	0.	0.	0.00	
+	HYDROGRAPH AT	SB06A	19.	4.02	1.	0.	0.	0.01	
+	ROUTED TO	DB06A	13.	4.08	1.	0.	0.	0.01	2755.52 4.08
+	3 COMBINED AT	CE06A	75.	4.25	14.	3.	3.	0.07	
+	HYDROGRAPH AT	SB05B1	15.	4.07	1.	0.	0.	0.01	
+	ROUTED TO	DB05B1	12.	4.15	1.	0.	0.	0.01	2812.84 4.15
+	HYDROGRAPH AT	SB05B2	9.	4.08	1.	0.	0.	0.01	
+	2 COMBINED AT	CE05B	21.	4.12	2.	1.	0.	0.01	
+	ROUTED TO	DB05B2	21.	4.17	2.	1.	0.	0.01	2802.48 4.17
+	ROUTED TO	RE05B	20.	4.25	2.	1.	0.	0.01	2757.47 4.25
+	HYDROGRAPH AT	SB05B3	11.	4.03	1.	0.	0.	0.00	
+	HYDROGRAPH AT	SB05B4	10.	4.03	1.	0.	0.	0.00	
+	3 COMBINED AT	CE05B3	34.	4.07	4.	1.	1.	0.02	
+	ROUTED TO	DB05B3	33.	4.12	4.	1.	1.	0.02	2784.52 4.12
+	ROUTED TO	RE05B3	32.	4.20	4.	1.	1.	0.02	2757.58 4.20
+	HYDROGRAPH AT	SB05A	4.	4.15	1.	0.	0.	0.00	
+	3 COMBINED AT	CE065A	110.	4.23	18.	5.	3.	0.09	
+	HYDROGRAPH AT	SB04C	3.	4.08	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SB04B	29.	4.03	3.	1.	0.	0.01	
+	2 COMBINED AT	CE04B	32.	4.03	3.	1.	1.	0.01	
+	ROUTED TO	DB04B	21.	4.03	3.	1.	1.	0.01	2758.00 4.05
+	ROUTED TO	RE04C	20.	4.38	3.	1.	1.	0.01	2750.77 4.38
+	HYDROGRAPH AT	SB04A	24.	4.02	2.	0.	0.	0.01	
+	2 COMBINED AT	CE04A	43.	4.03	5.	1.	1.	0.02	
+	ROUTED TO	DB04A	26.	4.27	5.	1.	1.	0.02	2742.61 4.27
+	HYDROGRAPH AT	SB03A1	2.	4.12	0.	0.	0.	0.00	
+	ROUTED TO	DB03A1	2.	4.40	0.	0.	0.	0.00	2750.55 4.40

+	HYDROGRAPH AT	SB03A	7.	4.05	1.	0.	0.	0.00	
+	2 COMBINED AT	CE03A	7.	4.07	1.	0.	0.	0.00	
+	HYDROGRAPH AT	SB02A1	70.	4.17	10.	3.	2.	0.06	
+	ROUTED TO	DB02A1	70.	4.18	10.	3.	2.	0.06	
+									2792.99 4.18
+	ROUTED TO	R02A1	69.	4.22	10.	3.	2.	0.06	
+									2751.40 4.22
+	HYDROGRAPH AT	SB02A2	8.	4.03	1.	0.	0.	0.00	
+	ROUTED TO	DB02A2	0.	4.95	0.	0.	0.	0.00	
+									2764.03 4.95
+	HYDROGRAPH AT	SB02A3	5.	4.08	1.	0.	0.	0.00	
+	3 COMBINED AT	CE02A	73.	4.20	11.	3.	2.	0.06	
+	HYDROGRAPH AT	SB01A	144.	4.18	21.	5.	4.	0.12	
+	6 COMBINED AT	CLEAR	608.	4.30	84.	21.	15.	0.58	
+	HYDROGRAPH AT	SBW14A	28.	4.02	2.	0.	0.	0.01	
+	ROUTED TO	DBW14A	14.	4.12	1.	0.	0.	0.01	
+									3.90 4.12
+	HYDROGRAPH AT	SBW13A	3.	4.00	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SBW12A	54.	4.02	3.	1.	1.	0.02	
+	ROUTED TO	DBW12A	26.	4.13	2.	0.	0.	0.02	
+									5.83 4.13
+	HYDROGRAPH AT	SBW11A	3.	4.00	0.	0.	0.	0.00	
+	5 COMBINED AT	CLEAR	633.	4.30	87.	22.	16.	0.61	
+	HYDROGRAPH AT	SB10C1	23.	4.03	2.	1.	0.	0.01	
+	HYDROGRAPH AT	SB10C2	20.	4.05	2.	0.	0.	0.01	
+	HYDROGRAPH AT	SB10C3	8.	4.08	1.	0.	0.	0.00	
+	3 COMBINED AT	CW10C	50.	4.05	5.	1.	1.	0.02	
+	ROUTED TO	DB10C	40.	4.13	5.	1.	1.	0.02	
+									2769.49 4.13
+	ROUTED TO	RW10C	39.	4.20	5.	1.	1.	0.02	
+									2753.47 4.20
+	HYDROGRAPH AT	SB10B	24.	4.03	2.	1.	0.	0.01	
+	2 COMBINED AT	CW10B	56.	4.08	7.	2.	1.	0.03	
+	ROUTED TO	DBW10B	52.	4.20	5.	1.	1.	0.03	
+									7.90 4.20
+	ROUTED TO	RW10B	51.	4.25	5.	1.	1.	0.03	
+									2724.61 4.25
+	HYDROGRAPH AT	SB10AW	83.	4.03	7.	2.	1.	0.03	

+	2 COMBINED AT	CW10A	92.	4.17	11.	3.	2.	0.06	
+	ROUTED TO	DBW10A	73.	4.30	8.	2.	1.	0.06	6.18 4.30
+	HYDROGRAPH AT	SB09E	8.	4.08	1.	0.	0.	0.00	
+	ROUTED TO	DB09E	6.	4.23	1.	0.	0.	0.00	2827.55 4.23
+	ROUTED TO	RW09E	6.	4.33	1.	0.	0.	0.00	2801.20 4.33
+	HYDROGRAPH AT	SB09D1	27.	4.02	2.	1.	0.	0.01	
+	HYDROGRAPH AT	SB09D2	11.	4.05	1.	0.	0.	0.00	
+	3 COMBINED AT	CW09DI	40.	4.03	4.	1.	1.	0.02	
+	HYDROGRAPH AT	SB09C	46.	4.15	6.	2.	1.	0.04	
+	2 COMBINED AT	CW09D	77.	4.05	10.	3.	2.	0.05	
+	ROUTED TO	DBW09C	52.	4.35	7.	2.	1.	0.05	4.44 4.35
+	ROUTED TO	RW09D	51.	4.38	7.	2.	1.	0.05	2779.98 4.38
+	HYDROGRAPH AT	SBW09B	16.	4.00	1.	0.	0.	0.00	
+	2 COMBINED AT	CW09B	52.	4.37	8.	2.	1.	0.06	
+	ROUTED TO	DBW09B	52.	4.40	7.	2.	1.	0.06	4.91 4.40
+	ROUTED TO	RW09B	50.	4.48	7.	2.	1.	0.06	2763.88 4.48
+	HYDROGRAPH AT	SBW09A	21.	4.03	2.	0.	0.	0.01	
+	2 COMBINED AT	CW09A	53.	4.47	9.	2.	2.	0.07	
+	ROUTED TO	DBW09A	53.	4.48	8.	2.	1.	0.07	5.36 4.48
+	HYDROGRAPH AT	SBW08A	28.	4.02	2.	0.	0.	0.01	
+	ROUTED TO	DBW08A	12.	4.15	1.	0.	0.	0.01	4.32 4.15
+	HYDROGRAPH AT	SBW07C	11.	4.05	1.	0.	0.	0.00	
+	ROUTED TO	DBW07C	9.	4.15	1.	0.	0.	0.00	4.52 4.15
+	HYDROGRAPH AT	SB07B	11.	4.10	1.	0.	0.	0.01	
+	ROUTED TO	DBW07B	8.	4.30	1.	0.	0.	0.01	4.44 4.30
+	2 COMBINED AT	CW07BC	15.	4.23	2.	0.	0.	0.01	
+	ROUTED TO	RW07BC	13.	4.35	2.	0.	0.	0.01	2793.76 4.35
+	HYDROGRAPH AT	SBW07A	33.	4.03	3.	1.	1.	0.01	

	2 COMBINED AT								
+		CW07A	34.	4.05	4.	1.	1.	0.03	
	ROUTED TO								
+		DBW07A	23.	4.35	3.	1.	0.	0.03	
+									4.81 4.35
	5 COMBINED AT								
+		CLEAR	766.	4.32	106.	27.	19.	0.77	
	HYDROGRAPH AT								
+		SBW06A	12.	4.02	1.	0.	0.	0.00	
	ROUTED TO								
+		DBW06A	5.	4.17	0.	0.	0.	0.00	
+									4.20 4.17
	HYDROGRAPH AT								
+		SBW05A	29.	4.02	2.	1.	0.	0.01	
	ROUTED TO								
+		DBW05A	16.	4.15	1.	0.	0.	0.01	
+									5.46 4.15
	HYDROGRAPH AT								
+		SBW04A	6.	4.00	0.	0.	0.	0.00	
	HYDROGRAPH AT								
+		SBW02A	15.	4.05	1.	0.	0.	0.01	
	ROUTED TO								
+		DBW02A	12.	4.15	1.	0.	0.	0.01	
+									5.28 4.15
	HYDROGRAPH AT								
+		SBW01A	5.	4.03	0.	0.	0.	0.00	
	6 COMBINED AT								
+		CLEAR	791.	4.30	109.	27.	20.	0.79	

*** NORMAL END OF HEC-1 ***

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

Project: SERENO CANYON PHASE 4
Project No.: TOL1702.000
Location: SCOTTSDALE, AZ

HEC-1 Results - Proposed Conditions 100-yr, 6-hr

HEC-1 ID		Existing Condition Peak Discharge (A)	Developed Condition Peak Discharge (B)	(B) – (A)
Ex.Cond.	Prop.Cond.	[cfs]	[cfs]	[cfs]
CE01A	SB01A	201	144	-57
CE04A	DB04A	46	26	-20
CE065A	CE065A	108	110	2
CE11A	CE11A	49	33	-16
CE17A	DBE17A	57	18	-39
CE23A	DBE23A	148	137	-11
CE24A	DBE24A	60	30	-30
CE25A	DBE25A	25	15	-10
CW07A	DBW07A	39	23	-16
CW09A	DBW09A	101	53	-48
CW10A	DBW10A	107	73	-34
SBE02A	CE02A	75	73	-2
SBE03A	CE03A	14	7	-7
SBE08A	SB08A	2	3	1
SBE09A	SB09A	6	2	-4
SBE10A	SB10A	2	3	1
SBE12A	DBE12A	4	2	-2
SBE13A	DBE13A	7	2	-5
SBE16A	SBE16A	2	3	1
SBE18A	DBE18A	2	0	-2
SBE19A	SBE19A	3	3	0
SBE20A	SBE20A	3	3	0
SBE21A	SBE21A	2	3	1
SBE26A	DBE26A	15	8	-7
SBE27A	DBE27A	4	2	-2
SBE28A	DBE28A	23	17	-6
SBE29A	DBE29A	29	21	-8
SBW01A	SBW01A	5	5	0
SBW02A	DBW02A	13	12	-1
SBW04A	SBW04A	5	6	1
SBW05A	DBW05A	19	16	-3
SBW06A	DBW06A	8	5	-3
SBW08A	DBW08A	19	12	-7
SBW11A	SBW11A	3	3	0
SBW12A	DBW12A	38	26	-12
SBW13A	SBW13A	3	3	0
SBW14A	DBW14A	23	14	-9

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1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *             JUN   1998                *
 *           VERSION 4.1                 *
 *                                       *
 *  RUN DATE   07MAY18  TIME  09:27:22   *
 *                                       *
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10-Year 6-Hour Model

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*                                   *
*    U.S. ARMY CORPS OF ENGINEERS   *
*    HYDROLOGIC ENGINEERING CENTER  *
*         609 SECOND STREET         *
*       DAVIS, CALIFORNIA 95616     *
*           (916) 756-1104          *
*                                   *
*************************************
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   1          ID        SERENO CANYON (PHASE 4) - DEVELOPED CONDITIONS
   2          ID        STORM EVENT: 10-YR, 6-HOUR
   3          ID        05/04/2018
   4          ID        PREPARED BY: SLATER HANIFAN GROUP
   5          ID       ********************************************************************************
   6          ID       ********************************************************************************
   7          ID        Flood Control District of Maricopa County
   8          ID        Sereno Canyon Developed Conditions
   9          ID        10 YEAR
  10          ID        6 Hour  Storm
  11          ID        Unit Hydrograph: Clark
  12          ID        09/18/2012
  13          ID        Sereno Canyon-Developed Conditions
  14          ID        10-Year, 6-Hour Storm Event
  15          ID        Prepared By: JE Fuller Hydrology and Geomorphology
  16          ID        Modeled By: Brian Schalk P.E., CFM and Nathan Logan P.E., CFM
  17          ID        Submitted To: City of Scottsdale
  18          ID       ********************************************************************************
  19          ID       ********************************************************************************
  20          IT       1 01DEC11       0    2000
  21          IO       5
  22          IN      15
              *DIAGRAM
              *
              *

  23          KK  SBE29A   BASIN
  24          KM        SBE29A Basin Runoff
  25          BA   0.015
  26          PB   2.108
  27          PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
  28          PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
  29          PC   0.962   0.972   0.983   0.991   1.000
  30          LG    0.20    0.25    6.00    0.23      10
  31          UC   0.257   0.257
  32          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
  33          UA     100
              *

  34          KK  DBE29A STORAGE
  35          KM    Retention Basin Storage/Outflow rating curve for Basin DBE29A
  36          RS       1    STOR       0
  37          SV    0.01    0.05    0.10    0.15    0.20    0.26    0.32    0.38    0.45    0.51
  38          SV    0.59    0.66    0.74    0.83    0.92    0.97
  39          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.49
  40          SQ    3.46    8.43   14.56   21.75   29.86   33.07
  41          SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
  42          SE    4.00    4.40    4.80    5.20    5.60    5.80
              *
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1 HEC-1 INPUT PAGE 2

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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  43          KK  SBE28A   BASIN
  44          KM        SBE28A Basin Runoff
  45          BA   0.013
  46          LG    0.29    0.25    6.00    0.20      17
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 47          UC   0.171   0.184
 48          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 49          UA     100
             *

 50          KK  DBE28A STORAGE
 51          KM    Retention Basin Storage/Outflow rating curve for Basin DBE28A
 52          RS       1    STOR       0
 53          SV    0.01    0.07    0.13    0.21    0.28    0.36    0.45    0.54    0.64    0.74
 54          SV    0.84    0.95    1.08
 55          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 56          SQ    6.93   19.60   36.01
 57          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 58          SE    5.00    5.50    6.00
             *

 59          KK  SBE27A   BASIN
 60          KM        SBE27A Basin Runoff
 61          BA   0.002
 62          LG    0.30    0.25    6.00    0.22      15
 63          UC   0.104   0.137
 64          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 65          UA     100
             *

 66          KK  DBE27A STORAGE
 67          KM    Retention Basin Storage/Outflow rating curve for Basin DBE27A
 68          RS       1    STOR       0
 69          SV    0.01    0.01    0.02    0.03    0.04    0.06    0.07    0.08    0.10    0.11
 70          SV    0.12    0.14    0.16    0.17    0.19    0.21
 71          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 72          SQ    0.01    0.96    2.64    4.81    7.38   10.29
 73          SE    0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
 74          SE    3.00    3.30    3.60    3.90    4.20    4.50
             *

 75          KK  SBE26A   BASIN
 76          KM        SBE26A Basin Runoff
 77          BA   0.010
 78          LG    0.26    0.25    6.00    0.20      31
 79          UC   0.171   0.230
 80          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 81          UA     100
             *
1                                        HEC-1 INPUT                                        PAGE  3
     LINE        ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 82          KK  DBE26A STORAGE
 83          KM    Retention Basin Storage/Outflow rating curve for Basin DBE26A
 84          RS       1    STOR       0
 85          SV    0.01    0.06    0.12    0.19    0.26    0.33    0.41    0.49    0.58    0.67
 86          SV    0.76    0.87    0.98    1.11
 87          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 88          SQ    0.01    5.94   16.80   30.86
 89          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 90          SE    5.00    5.50    6.00    6.50
             *

 91          KK  SBE25C   BASIN
 92          KM        SBE25C Basin Runoff
 93          BA   0.005
 94          LG    0.27    0.25    6.00    0.18      17
 95          UC   0.124   0.137
 96          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 97          UA     100
             *

 98          KK  DBE25C STORAGE
 99          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25C
100          RS       1    STOR       0
101          SV    0.01    0.02    0.05    0.07    0.10    0.13    0.16    0.19    0.22    0.25
102          SV    0.28    0.31    0.35    0.39    0.43    0.47    0.47
103          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
104          SQ    2.87    8.53   15.86   24.66   34.72   45.79   47.52
105          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
106          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
             *

107          KK   RE25C   ROUTE
108          KM        Route runoff from SBE25C through Basin SBE25B
109          RS       1    FLOW
110          RC   0.060   0.060   0.060     709  0.0268 2694.40
111          RX    0.00   21.00   53.00   58.00   63.00   70.00   90.00   99.00
112          RY  2694.3 2691.90 2688.00 2687.00 2687.00 2689.00 2693.30 2694.40
             *

113          KK  SBE25B   BASIN
114          KM        SBE25B Basin Runoff
115          BA   0.006
116          LG    0.29    0.25    6.00    0.21      20
117          UC   0.158   0.214
118          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
119          UA     100
             *
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 120          KK   CE25B COMBINE
 121          KM        Combine Route RE25C and Basin SBE25B
 122          HC       2
              *
1                                        HEC-1 INPUT                                                    PAGE  4

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 123          KK  DBE25B STORAGE
 124          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25B
 125          RS       1    STOR       0
 126          SV    0.01    0.05    0.09    0.14    0.19    0.25    0.30    0.36    0.42    0.49
 127          SV    0.55    0.62    0.70    0.78    0.84
 128          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.68    7.93
 129          SQ   16.80   27.91   40.62   54.86   56.70
 130          SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
 131          SE    4.00    4.40    4.80    5.20    5.50
              *
 132          KK   RE25B   ROUTE
 133          KM        Route runoff from CE25B through Basin SBE25A
 134          RS       1    FLOW
 135          RC   0.060   0.060   0.060     412  0.0279 2680.70
 136          RX    0.00   16.00   29.00   32.00   32.10   36.00   47.00   67.00
 137          RY  2680.3 2678.70 2677.10 2676.00 2676.00 2676.90 2678.00 2680.70
              *
 138          KK  SBE25A   BASIN
 139          KM        SBE25A Basin Runoff
 140          BA   0.003
 141          LG    0.25    0.25    6.00    0.20      38
 142          UC   0.108   0.135
 143          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 144          UA     100
              *
 145          KK   CE25A COMBINE
 146          KM        Combine Route RE25B and Basin SBE25A
 147          HC       2
              *
 148          KK  DBE25A STORAGE
 149          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25A
 150          RS       1    STOR       0
 151          SV    0.01    0.02    0.04    0.06    0.08    0.10    0.12    0.14    0.16    0.18
 152          SV    0.21    0.23    0.26    0.29    0.31    0.34    0.37    0.39
 153          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 154          SQ    0.01    0.01    1.12    5.87   13.22   22.40   33.27   41.15
 155          SE    0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
 156          SE    3.00    3.30    3.60    3.90    4.20    4.50    4.80    5.00
              *
 157          KK   CLEAR COMBINE
 158          KM        Clear Hydrograph Stack
 159          HC       5
              *
1                                        HEC-1 INPUT                                                    PAGE  5

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 160          KK  SBE24D   BASIN
 161          KM        SBE24D Basin Runoff
 162          BA   0.010
 163          LG    0.30    0.25    6.00    0.19       6
 164          UC   0.146   0.132
 165          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 166          UA     100
              *
 167          KK  DBE24D STORAGE
 168          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24D
 169          RS       1    STOR       0
 170          SV    0.01    0.06    0.13    0.20    0.28    0.36    0.44    0.53    0.63    0.73
 171          SV    0.83
 172          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    5.94   16.80   30.86
 173          SQ   47.52
 174          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 175          SE    5.00
              *
 176          KK   RE24D   ROUTE
 177          KM        Route runoff from basin SBE24D through Basin SBE24C
 178          RS       1    FLOW
 179          RC   0.060   0.060   0.060     634  0.0252 2725.50
 180          RX    0.00   16.00   24.00   27.00   31.00   34.00   44.00   60.00
 181          RY  2725.5 2723.20 2721.80 2721.00 2721.00 2722.00 2723.00 2726.10
              *
 182          KK  SBE24C   BASIN
 183          KM        SBE24C Basin Runoff
 184          BA   0.015
 185          LG    0.28    0.25    6.00    0.19      17
 186          UC   0.190   0.219
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187          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
188          UA     100
             *

189          KK   CE24C COMBINE
190          KM        Combine RE24D and SBE24C
191          HC       2
             *

192          KK  DBE24C STORAGE
193          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24C
194          RS       1    STOR       0
195          SV    0.01    0.08    0.17    0.25    0.35    0.45    0.55    0.66    0.77    0.89
196          SV    1.02    1.15    1.17
197          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.63   10.24   23.43
198          SQ   39.87   59.15   61.38
199          SE    0.10    0.50    0.90    1.40    1.80    2.30    2.70    3.20    3.60    4.10
200          SE    4.50    5.00    5.00
             *
1                                          HEC-1 INPUT                                          PAGE  6

        LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

201          KK   RE24C   ROUTE
202          KM        Route flow from CE24C through Basin SBE24B
203          RS       1    FLOW
204          RC   0.060   0.060   0.060     624  0.0232 2706.80
205          RX   10.00   25.00   45.00   49.00   55.00   62.00   75.00  103.00
206          RY  2706.8 2705.20 2702.10 2701.00 2701.00 2702.00 2703.30 2706.70
             *

207          KK  SBE24B   BASIN
208          KM        SBE24B Basin Runoff
209          BA   0.005
210          LG    0.28    0.25    6.00    0.18      15
211          UC   0.156   0.234
212          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
213          UA     100
             *

214          KK   CE24B COMBINE
215          KM        Combine RE24C and SBE24B
216          HC       2
             *

217          KK  DBE24B STORAGE
218          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24B
219          RS       1    STOR       0
220          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.43    0.51    0.60    0.70
221          SV    0.80    0.91    1.02    1.15    1.20
222          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.63   10.24   23.43
223          SQ   39.87   59.15   80.76   73.24   73.24
224          SE    0.10    0.50    0.90    1.40    1.80    2.30    2.70    3.20    3.60    4.10
225          SE    4.50    5.00    5.40    5.90    6.00
             *

226          KK   RE24B   ROUTE
227          KM        Route flow from CE24B through Basin SBE24A
228          RS       1    FLOW
229          RC   0.060   0.060   0.060     873  0.0229 2690.20
230          RX    0.00   10.00   16.00   23.00   27.00   35.00   49.00   67.00
231          RY  2689.8 2688.70 2687.90 2687.00 2687.00 2687.90 2688.80 2690.20
             *

232          KK  SBE24A   BASIN
233          KM        SBE24A Basin Runoff
234          BA   0.007
235          LG    0.27    0.25    6.00    0.20      29
236          UC   0.164   0.223
237          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
238          UA     100
             *
1                                          HEC-1 INPUT                                          PAGE  7

        LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

239          KK   CE24A COMBINE
240          KM        Combine RE24B and SBE24A
241          HC       2
             *

242          KK  DBE24A STORAGE
243          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24A
244          RS       1    STOR       0
245          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.44    0.52    0.62    0.71
246          SV    0.82    0.93
247          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    6.93   19.60
248          SQ   36.01   55.44
249          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
250          SE    5.00    5.50
             *

251          KK  SBE23D   BASIN
252          KM        SBE23D Basin Runoff
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 253          BA   0.041
 254          LG    0.28    0.25    6.00    0.19      15
 255          UC   0.252   0.271
 256          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 257          UA     100
              *

 258          KK  DBE23D STORAGE
 259          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23D
 260          RS       1    STOR       0
 261          SV    0.01    0.11    0.22    0.34    0.47    0.61    0.76    0.92    1.10    1.30
 262          SV    1.52    1.75    2.01    2.30    2.61    2.61
 263          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 264          SQ    0.01    0.01    0.01    0.01   15.51   80.61
 265          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 266          SE    5.00    5.50    6.00    6.50    7.00    8.00
              *

 267          KK   RE23D   ROUTE
 268          KM        Route flow from SBE23D through Basin SBE23A
 269          RS       1    FLOW
 270          RC   0.060   0.060   0.060     465  0.0269 2688.30
 271          RX    0.00   14.00   27.00   32.00   40.00   44.00   55.00   68.00
 272          RY  2688.3 2687.30 2685.00 2684.10 2684.00 2685.00 2686.10 2686.70
              *

 273          KK  SBE23E   BASIN
 274          KM       SBE23E Basin Runoff
 275          BA   0.005
 276          LG    0.29    0.25    6.00    0.20      19
 277          UC   0.135   0.198
 278          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 279          UA     100
              *
1                                        HEC-1 INPUT                                        PAGE  8

     LINE     ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 280          KK  DBE23E STORAGE
 281          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23E
 282          RS       1    STOR       0
 283          SV    0.01    0.04    0.09    0.14    0.19    0.24    0.29    0.35    0.41    0.48
 284          SV    0.55
 285          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.63    3.96    9.07
 286          SQ   15.43
 287          SE    0.10    0.50    0.90    1.40    1.80    2.30    2.70    3.20    3.60    4.10
 288          SE    4.50
              *

 289          KK   RE23E   ROUTE
 290          KM        Route flow from SBE23E through Basin SBE23C
 291          RS       2    FLOW
 292          RC   0.060   0.060   0.060    1112  0.0261 2720.00
 293          RX    0.00   20.00   57.00   64.00   65.00   70.00   90.00  114.00
 294          RY  2720.0 2716.50 2712.10 2711.00 2711.00 2713.20 2716.60 2719.90
              *

 295          KK  SBE23C   BASIN
 296          KM       SBE23C Basin Runoff
 297          BA   0.053
 298          LG    0.28    0.25    6.00    0.18      13
 299          UC   0.253   0.262
 300          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 301          UA     100
              *

 302          KK   CE23C COMBINE
 303          KM        Combine RE23E and SBE23C
 304          HC       2
              *

 305          KK  DBE23C STORAGE
 306          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23C
 307          RS       1    STOR       0
 308          SV    0.01    0.15    0.31    0.47    0.65    0.84    1.03    1.24    1.46    1.69
 309          SV    1.93    2.19    2.46    2.76    3.08
 310          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 311          SQ    0.01    0.01   27.72   78.40  144.03
 312          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 313          SE    5.00    5.50    6.00    6.50    7.00
              *

 314          KK   RE23C   ROUTE
 315          KM        Route flow from CE23C through SBE23B
 316          RS       1    FLOW
 317          RC   0.060   0.060   0.060     457  0.0235 2693.90
 318          RX    0.00   15.00   28.00   35.00   35.10   45.00   86.00  114.00
 319          RY  2693.8 2692.20 2691.00 2690.00 2690.00 2690.90 2692.90 2693.90
              *
1                                        HEC-1 INPUT                                        PAGE  9

     LINE     ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 320          KK  SBE23B   BASIN
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```
321          KM        SBE23B Basin Runoff
322          BA   0.004
323          LG    0.27    0.25    6.00    0.20      28
324          UC   0.122   0.152
325          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
326          UA     100
             *

327          KK   CE23B COMBINE
328          KM        Combine flow from RE23C and SBE23B
329          HC       2
             *

330          KK   RE23B   ROUTE
331          KM        Route flow from CE23B into SBE23A to intermediate combine
332          RS       1    FLOW
333          RC   0.060   0.060   0.060     112  0.0267 2685.90
334          RX    0.00    8.00   12.00   14.00   24.00   30.00   32.00   49.00
335          RY  2685.6 2684.80 2684.20 2684.00 2684.00 2684.70 2685.00 2685.90
             *

336          KK  CE23AI COMBINE
337          KM        Intermediate combine of RE23D and RE23B to route through SBE23A
338          HC       2
             *

339          KK  RE23BD   ROUTE
340          KM        Route Intermediate combined flow from CE23AI through SBE23A
341          RS       1    FLOW
342          RC   0.060   0.060   0.060     238  0.0242 2685.00
343          RX    0.00   21.00   62.00   74.00   82.00   86.00  101.00  141.00
344          RY  2684.9 2682.70 2681.00 2679.00 2679.00 2680.10 2681.90 2685.00
             *

345          KK  SBE23A   BASIN
346          KM        SBE23A Basin Runoff
347          BA   0.006
348          LG    0.29    0.25    6.00    0.21      21
349          UC   0.152   0.176
350          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
351          UA     100
             *

352          KK   CE23A COMBINE
353          KM        Combine flow from SBE23A and RE23BD
354          HC       2
             *
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

355          KK  DBE23A STORAGE
356          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23A
357          RS       1    STOR       0
358          SV    0.01    0.09    0.18    0.28    0.38    0.49    0.61    0.73    0.86    0.99
359          SV    1.13    1.29    1.45    1.62    1.80    2.00    2.21    2.45
360          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
361          SQ    0.01    0.01    0.01    0.01    0.01   49.50  140.00  257.20
362          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
363          SE    5.00    5.50    6.00    6.50    7.00    7.50    8.00    8.50
             *

364          KK   CLEAR COMBINE
365          HC       3
             *

366          KK  SBE22A   BASIN
367          KM        SBE22A Basin Runoff
368          BA   0.007
369          LG    0.30    0.25    6.00    0.22      15
370          UC   0.150   0.194
371          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
372          UA     100
             *

373          KK  DBE22A STORAGE
374          KM    Retention Basin Storage/Outflow rating curve for Basin DBE22A
375          RS       1    STOR       0
376          SV    0.01    0.03    0.07    0.12    0.16    0.21    0.27    0.33    0.39    0.47
377          SV    0.55    0.63
378          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    3.96
379          SQ   11.20   20.58
380          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
381          SE    5.00    5.50
             *

382          KK  SBE21A   BASIN
383          KM        SBE21A Basin Runoff
384          BA   0.001
385          LG    0.30    0.25    6.00    0.22      15
386          UC   0.081   0.106
387          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
388          UA     100
             *
```

```
          389          KK  SBE20A   BASIN
          390          KM        SBE20A Basin Runoff
          391          BA   0.001
          392          LG    0.30    0.25    6.00    0.22      15
          393          UC   0.072   0.078
          394          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          395          UA     100
                       *
1                                        HEC-1 INPUT                                                    PAGE 11

        LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          396          KK  SBE19A   BASIN
          397          KM        SBE19A Basin Runoff
          398          BA   0.001
          399          LG    0.30    0.25    6.00    0.22      15
          400          UC   0.073   0.079
          401          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          402          UA     100
                       *
          403          KK  SBE18A   BASIN
          404          KM        SBE18A Basin Runoff
          405          BA   0.001
          406          LG    0.30    0.25    6.00    0.22      15
          407          UC   0.083   0.110
          408          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          409          UA     100
                       *
          410          KK  DBE18A STORAGE
          411          KM    Retention Basin Storage/Outflow rating curve for Basin DBE18A
          412          RS       1    STOR       0
          413          SV    0.01    0.01    0.02    0.02    0.03    0.04    0.05    0.06    0.07    0.08
          414          SV    0.09    0.10    0.12    0.13    0.14    0.16    0.17
          415          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          416          SQ    0.01    0.35    0.99    1.82    2.80    3.91    5.14
          417          SE    0.10    0.30    0.50    0.80    1.00    1.30    1.50    1.80    2.00    2.30
          418          SE    2.50    2.80    3.00    3.30    3.50    3.80    4.00
                       *
          419          KK   CLEAR COMBINE
          420          KM        Clear Hydrograph Stack
          421          HC       6
                       *
          422          KK   SB17B   BASIN
          423          KM        SB17B Basin Runoff
          424          BA   0.016
          425          LG    0.24    0.25    6.00    0.20      29
          426          UC   0.159   0.157
          427          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          428          UA     100
                       *
          429          KK  DBE17B STORAGE
          430          KM    Retention Basin Storage/Outflow rating curve for Basin DBE17B
          431          RS       1    STOR       0
          432          SV    0.01    0.08    0.17    0.26    0.35    0.46    0.56    0.68    0.80    0.92
          433          SV    1.06    1.20    1.35    1.51    1.68
          434          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          435          SQ    0.01    0.01    9.90   28.00   51.44
          436          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
          437          SE    5.00    5.50    6.00    6.50    7.00
                       *
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        LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          438          KK   RE17B   ROUTE
          439          KM        Route flow from SBE17B through SBE 17A
          440          RS       2    FLOW
          441          RC   0.060   0.060   0.060    1169  0.0265 2740.10
          442          RX    0.00    9.00   22.00   33.00   44.00   54.00   62.00   69.00
          443          RY  2740.1 2738.60 2737.00 2736.10 2736.00 2737.00 2738.40 2740.10
                       *
          444          KK  SBE17A   BASIN
          445          KM        SBE17A Basin Runoff
          446          BA   0.018
          447          LG    0.26    0.25    6.00    0.21      29
          448          UC   0.176   0.208
          449          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          450          UA     100
                       *
          451          KK   CE17A COMBINE
          452          KM        Combine flow from RE17B and SBE17A
          453          HC       2
                       *
          454          KK  DBE17A STORAGE
          455          KM    Retention Basin Storage/Outflow rating curve for Basin DBE17A
          456          RS       1    STOR       0
```

```
 457          SV    0.01    0.09    0.19    0.29    0.41    0.54    0.68    0.84    1.01    1.19
 458          SV    1.39    1.62    1.86    2.13
 459          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 460          SQ    0.01   17.82   50.40   92.59
 461          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 462          SE    5.00    5.50    6.00    6.50
              *

 463          KK  SBE16A   BASIN
 464          KM       SBE16A Basin Runoff
 465          BA   0.001
 466          LG    0.30    0.25    6.00    0.22      15
 467          UC   0.088   0.135
 468          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 469          UA     100
              *

 470          KK  SBE13A   BASIN
 471          KM       SBE13A Basin Runoff
 472          BA   0.003
 473          LG    0.25    0.25    6.00    0.22      30
 474          UC   0.100   0.114
 475          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 476          UA     100
              *
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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 477          KK  DBE13A STORAGE
 478          KM   Retention Basin Storage/Outflow rating curve for Basin DBE13A
 479          RS       1    STOR       0
 480          SV    0.01    0.02    0.04    0.06    0.08    0.10    0.13    0.16    0.19    0.23
 481          SV    0.27    0.31    0.35
 482          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 483          SQ    1.98    5.60   10.29
 484          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 485          SE    5.00    5.50    6.00
              *

 486          KK  SBE12A   BASIN
 487          KM       SBE12A Basin Runoff
 488          BA   0.002
 489          LG    0.23    0.25    6.00    0.21      40
 490          UC   0.093   0.121
 491          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 492          UA     100
              *

 493          KK  DBE12A STORAGE
 494          KM   Retention Basin Storage/Outflow rating curve for Basin DBE12A
 495          RS       1    STOR       0
 496          SV    0.01    0.02    0.03    0.05    0.07    0.09    0.10    0.12    0.14    0.17
 497          SV    0.19    0.21    0.24    0.26    0.28
 498          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 499          SQ    0.96    2.84    5.29    8.22   10.29
 500          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
 501          SE    3.30    3.60    4.00    4.30    4.50
              *

 502          KK   SB11B   BASIN
 503          KM       SB11B Basin Runoff
 504          BA   0.013
 505          LG    0.18    0.25    6.00   0.246      17
 506          UC   0.310   0.432
 507          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 508          UA     100
              *

 509          KK   DB11B STORAGE
 510          KM   Retention Basin Storage/Outflow rating curve for Basin DB11B
 511          RS       1    STOR       0
 512          SV    0.01    0.05    0.16    0.28    0.43    0.61    0.80
 513          SQ    0.01       4      11      22      33      41      50
 514          SE  2777.5    2778    2779    2780    2781    2782    2783
              *

 515          KK   RE11B   ROUTE
 516          KM       Route flow from SBE11B through SBE11A
 517          RS       1    FLOW
 518          RC   0.060   0.060   0.060     914  0.0334 2770.20
 519          RX    0.00   10.00   16.00   23.00   25.00   34.00   48.00   64.00
 520          RY  2770.2 2767.10 2765.30 2762.00 2762.00 2765.00 2766.60 2768.30
              *
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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 521          KK   SB11A   BASIN
 522          KM       SB11A Basin Runoff
 523          BA   0.007
 524          LG    0.10    0.25    6.00   0.284
 525          UC   0.308   0.429
 526          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
527          UA     100
             *

528          KK  SB11A1   BASIN
529          KM        SB11A1 Basin Runoff
530          BA   0.003
531          LG    0.18    0.25    6.00   0.251      15
532          UC   0.186   0.288
533          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
534          UA     100
             *

535          KK   CE11A COMBINE
536          KM        Combine flow from RE11B, SB11A and SB11A1
537          HC       3
             *

538          KK   CLEAR COMBINE
539          KM        Clear Hydrograph Stack
540          HC       6
             *

541          KK   SB10A   BASIN
542          KM        SB10A Basin Runoff
543          BA   0.001
544          LG    0.10    0.25    6.00   0.284
545          UC   0.141   0.130
546          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
547          UA     100
             *

548          KK   SB09A   BASIN
549          KM        SB09A Basin Runoff
550          BA   0.001
551          LG    0.10    0.25    6.00   0.284
552          UC   0.165   0.234
553          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
554          UA     100
             *

555          KK   SB08A   BASIN
556          KM        SB08A Basin Runoff
557          BA   0.001
558          LG    0.10    0.25    6.00   0.284
559          UC   0.150   0.175
560          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
561          UA     100
             *
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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

562          KK   CLEAR COMBINE
563          KM        Clear Hydrograph Stack
564          HC       4
             *
             *

565          KK  SB06D1   BASIN
566          KM        SB06D1 Basin Runoff
567          BA   0.004
568          LG    0.10    0.25    6.00   0.276      24
569          UC   0.244   0.457
570          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
571          UA     100
             *

572          KK  SB06D2   BASIN
573          KM        SB06D2 Basin Runoff
574          BA   0.009
575          LG    0.25    0.25    6.00   0.216      30
576          UC   0.165   0.269
577          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
578          UA     100
             *

579          KK   CE06D COMBINE
580          KM        Combine flow from SB06D1 and SB06D2
581          HC       2
             *

582          KK  DB06D1 STORAGE
583          KM    Retention Basin Storage/Outflow rating curve for Basin DB06D1
584          RS       1    STOR       0
585          SV    0.01    0.12    0.26    0.44    0.64    0.64
586          SQ    0.01       3       9      12      15      31
587          SE    2795    2796    2797    2798    2799  2799.3
             *

588          KK  SB06C1   BASIN
589          KM        SB06C1 Basin Runoff
590          BA   0.015
591          LG    0.10    0.25    6.00   0.272      40
592          UC   0.271   0.373
593          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
 594          UA     100
              *

 595          KK  CE06CD COMBINE
 596          KM        Combine flow from DB06D1 and SB06C1
 597          HC       2
              *
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 598          KK  DB06C1 STORAGE
 599          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06C
 600          RS       1    STOR        0
 601          SV    0.01    0.10    0.23    0.41
 602          SQ    0.01       9      24      41
 603          SE    2792    2793    2794    2795
              *

 604          KK  SB06C2   BASIN
 605          KM        SB06C2 Basin Runoff
 606          BA   0.020
 607          LG    0.10    0.25    6.00   0.284
 608          UC   0.486   0.901
 609          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 610          UA     100
              *

 611          KK  SB06C3   BASIN
 612          KM        SB06C3 Basin Runoff
 613          BA   0.005
 614          LG    0.25    0.25    6.00   0.216      30
 615          UC   0.132   0.156
 616          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 617          UA     100
              *

 618          KK   CE06C COMBINE
 619          KM        Combine flow from SB06C2 and SB06C3
 620          HC       2
              *

 621          KK  DB06C2 STORAGE
 622          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06C
 623          RS       1    STOR        0
 624          SV    0.01    0.08    0.19    0.32    0.49
 625          SQ    0.01       4      13      20      22
 626          SE    2788    2789    2790    2791    2792
              *

 627          KK  CE06CI COMBINE
 628          KM        Combine flow from DB06C2 and DB06C1
 629          HC       2
              *

 630          KK   RE06C   ROUTE
 631          KM        Route flow from CE06CI through Basin SBE06B
 632          RS       1    FLOW
 633          RC   0.060   0.060   0.060     591  0.0431 2786.60
 634          RX    0.00    6.00   16.00   26.00   36.00   40.00   41.00   44.00
 635          RY  2786.6 2786.00 2785.00 2784.00 2784.00 2785.00 2785.50 2786.40
              *
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 636          KK  SB06B1   BASIN
 637          KM        SB06B1 Basin Runoff
 638          BA   0.003
 639          LG    0.18    0.25    6.00   0.251      15
 640          UC   0.196   0.324
 641          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 642          UA     100
              *

 643          KK  CE06CI COMBINE
 644          KM        Combine flow from SB06B1 and RE06C
 645          HC       2
              *

 646          KK   RE06B   ROUTE
 647          KM        Route flow from CE06CI through Basin SB06B
 648          RS       1    FLOW
 649          RC   0.060   0.060   0.060     814  0.0319 2761.00
 650          RX    0.00   21.00   55.00   63.00   82.00   92.00  104.00  113.00
 651          RY  2761.0 2758.90 2758.50 2758.00 2758.00 2758.50 2759.70 2760.80
              *

 652          KK   SB06B   BASIN
 653          KM        SB06B Basin Runoff
 654          BA   0.004
 655          LG    0.10    0.25    6.00   0.284
 656          UC   0.415   1.035
 657          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
          658          UA     100
                       *

          659          KK   SB06A   BASIN
          660          KM        SB06A Basin Runoff
          661          BA   0.006
          662          LG    0.25    0.25    6.00   0.216      30
          663          UC   0.118   0.117
          664          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          665          UA     100
                       *

          666          KK   DB06A STORAGE
          667          KM    Retention Basin Storage/Outflow rating curve for Basin DB06A
          668          RS       1    STOR       0
          669          SV    0.01    0.02    0.08    0.16    0.26
          670          SQ    0.01       1       6      11      14
          671          SE  2752.5    2753    2754    2755    2756
                       *

          672          KK   CE06A COMBINE
          673          KM        Combine flow from DB06A, SB06B and RE06B
          674          HC       3
                       *
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        LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          675          KK  SB05B1   BASIN
          676          KM        SB05B1 Basin Runoff
          677          BA   0.007
          678          LG    0.10    0.25    6.00   0.284
          679          UC   0.265   0.314
          680          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          681          UA     100
                       *

          682          KK  DB05B1 STORAGE
          683          KM    Retention Basin Storage/Outflow rating curve for Basin DBE05B
          684          KM    Outlet control structure
          685          RS       1    STOR       0
          686          SV    0.01    0.02    0.06    0.11
          687          SQ    0.01    0.01       9      13
          688          SE    2810    2811    2812    2813
                       *

          689          KK  SB05B2   BASIN
          690          KM        SB05B2 Basin Runoff
          691          BA   0.006
          692          LG    0.10    0.25    6.00   0.284
          693          UC   0.315   0.543
          694          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          695          UA     100
                       *

          696          KK   CE05B COMBINE
          697          KM        Combine flow from DB05B1 and Basin SBE05B2
          698          HC       2
                       *

          699          KK  DB05B2 STORAGE
          700          KM    Retention Basin Storage/Outflow rating curve for Basin DBE05B
          701          RS       1    STOR       0
          702          SV    0.01    0.01    0.02   0.044
          703          SQ    0.01    0.01      18      24
          704          SE    2800    2801    2802    2803
                       *

          705          KK   RE05B   ROUTE
          706          KM        Route flow from SBE05B through SBE05A
          707          RS       1    FLOW
          708          RC   0.060   0.060   0.060     907  0.0435 2760.30
          709          RX    0.00   11.00   26.00   40.00   47.00   56.00   76.00   89.00
          710          RY  2760.1 2759.00 2757.70 2757.00 2757.00 2757.40 2758.80 2760.30
                       *

          711          KK  SB05B3   BASIN
          712          KM        SB05B3 Basin Runoff
          713          BA   0.004
          714          LG    0.25    0.25    6.00   0.216      30
          715          UC   0.146   0.234
          716          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1                                                HEC-1 INPUT                                                    PAGE 19

        LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          717          UA     100
                       *

          718          KK  SB05B4   BASIN
          719          KM        SB05B4 Basin Runoff
          720          BA   0.004
          721          LG    0.18    0.25    6.00   0.251      15
          722          UC   0.187   0.230
          723          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
          724          UA     100
                       *

          725          KK  CE05B3 COMBINE
          726          KM        Combine flow from SB05B4, SB05B3 and RE05B
          727          HC        3
                       *

          728          KK  DB05B3 STORAGE
          729          KM    Retention Basin Storage/Outflow rating curve for Basin DB05B3
          730          RS        1    STOR        0
          731          SV     0.01    0.01     0.03    0.084
          732          SQ     0.01       8       25       36
          733          SE     2782    2783     2784     2785
                       *

          734          KK  RE05B3   ROUTE
          735          KM        Route flow from DB05B3 through SBE05A
          736          RS        1    FLOW
          737          RC    0.060   0.060    0.060      907  0.0435 2760.30
          738          RX     0.00   11.00    26.00    40.00   47.00   56.00   76.00   89.00
          739          RY   2760.1 2759.00 2757.70 2757.00 2757.00 2757.40 2758.80 2760.30
                       *

          740          KK   SB05A   BASIN
          741          KM        SB05A Basin Runoff
          742          BA    0.004
          743          LG     0.10    0.25    6.00   0.284
          744          UC    0.400   1.028
          745          UA        0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          746          UA      100
                       *

          747          KK  CE065A COMBINE
          748          KM        Combine flow from SB05A, RE05B3 and CE06A
          749          HC        3
                       *

          750          KK   SB04C   BASIN
          751          KM        SB04C Basin Runoff
          752          BA    0.002
          753          LG     0.10    0.25    6.00   0.269      10
          754          UC    0.256   0.550
          755          UA        0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          756          UA      100
                       *
1                                                HEC-1 INPUT                                          PAGE 20

        LINE           ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          757          KK   SB04B   BASIN
          758          KM        SB04B Basin Runoff
          759          BA    0.011
          760          LG     0.25    0.25    6.00   0.216      30
          761          UC    0.172   0.233
          762          UA        0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          763          UA      100
                       *

          764          KK   CE04B COMBINE
          765          KM        Combine flow from SB04C and SB04B
          766          HC        2
                       *

          767          KK   DB04B STORAGE
          768          KM    Retention Basin Storage/Outflow rating curve for Basin DBE04C
          769          RS        1    STOR        0
          770          SV     0.01    0.06     0.15    0.261  0.0262
          771          SQ     0.01       5       13       21      27
          772          SE     2755    2756     2757     2758  2758.2
                       *

          773          KK   RE04C   ROUTE
          774          KM        Route flow from DB04B into SBE04A
          775          RS        1    FLOW
          776          RC    0.060   0.060    0.060      455  0.0363 2755.00
          777          RX     0.00   17.00    22.00    27.00   32.00   44.00   61.00   88.00
          778          RY   2755.0 2753.00 2751.90 2750.00 2750.00 2751.90 2753.20 2754.90
                       *

          779          KK   SB04A   BASIN
          780          KM        SB04A Basin Runoff
          781          BA    0.008
          782          LG     0.25    0.25    6.00   0.216      30
          783          UC    0.141   0.160
          784          UA        0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          785          UA      100
                       *

          786          KK   CE04A COMBINE
          787          KM        Combine Flows from RE04C and SB04A
          788          HC        2
                       *

          789          KK   DB04A STORAGE
```

```
          790          KM    Retention Basin Storage/Outflow rating curve for Basin DB04A
          791          RS       1    STOR       0
          792          SV    0.01    0.05    0.16    0.30    0.47    0.67
          793          SQ    0.01       2      10      17      22      28
          794          SE  2738.5    2739    2740    2741    2742    2743
                       *
1                                        HEC-1 INPUT                                                    PAGE 21

        LINE           ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          795          KK  SB03A1   BASIN
          796          KM        SB03A1 Basin Runoff
          797          BA   0.002
          798          LG    0.10    0.25    6.00   0.284
          799          UC   0.332   0.869
          800          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          801          UA     100
                       *

          802          KK  DB03A1 STORAGE
          803          KM    Retention Basin Storage/Outflow rating curve for Basin DBE03A1
          804          RS       1    STOR       0
          805          SV    0.01    0.07    0.16    0.27    0.40
          806          SQ    0.01       3       7      13      20
          807          SE    2750    2751    2752    2753    2754
                       *

          808          KK   SB03A   BASIN
          809          KM        SB03A Basin Runoff
          810          BA   0.003
          811          LG    0.10    0.25    6.00   0.284
          812          UC   0.225   0.282
          813          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          814          UA     100
                       *

          815          KK   CE03A COMBINE
          816          KM        Combine Flows from DB03A and SB03A
          817          HC       2
                       *

          818          KK  SB02A1   BASIN
          819          KM        SB02A1 Basin Runoff
          820          BA   0.059
          821          LG    0.10    0.25    6.00   0.284
          822          UC   0.541   0.730
          823          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          824          UA     100
                       *

          825          KK  DB02A1 STORAGE
          826          KM    Retention Basin Storage/Outflow rating curve for Basin DB02A1
          827          RS       1    STOR       0
          828          SV    0.01    0.04    0.14    0.25    0.26
          829          SQ    0.01       6      21      48      70
          830          SE  2789.5    2790    2791    2792    2793
                       *

          831          KK   R02A1   ROUTE
          832          KM        Route flow from DB02A1 into SB02A3
          833          RS       1    FLOW
          834          RC   0.060   0.060   0.060     455  0.0363 2755.00
          835          RX    0.00   17.00   22.00   27.00   32.00   44.00   61.00   88.00
          836          RY  2755.0 2753.00 2751.90 2750.00 2750.00 2751.90 2753.20 2754.90
                       *
1                                        HEC-1 INPUT                                                    PAGE 22

        LINE           ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          837          KK  SB02A2   BASIN
          838          KM        SB02A2 Basin Runoff
          839          BA   0.003
          840          LG    0.25    0.25    6.00   0.216      30
          841          UC   0.135   0.228
          842          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          843          UA     100
                       *

          844          KK  DB02A2 STORAGE
          845          KM    Retention Basin Storage/Outflow rating curve for Basin DB02A2
          846          KM    Outlet control structure
          847          RS       1    STOR       0
          848          SV    0.01    0.14    0.32    0.53
          849          SQ    0.01    0.01    0.01       4
          850          SE    2762    2763    2764    2765
                       *

          851          KK  SB02A3   BASIN
          852          KM        SB02A3 Basin Runoff
          853          BA   0.003
          854          LG    0.10    0.25    6.00   0.284
          855          UC   0.284   0.521
          856          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          857          UA     100
```

```
                *
          858   KK  CE02A COMBINE
          859   KM       Combine Flows from R02A1, DB02A2 and SB02A3
          860   HC     3
                *
          861   KK  SB01A   BASIN
          862   KM       SB01A Basin Runoff
          863   BA  0.119
          864   LG   0.10    0.25    6.00    0.28       1
          865   UC  0.600   0.689
          866   UA     0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          867   UA   100
                *
          868   KK  CLEAR COMBINE
          869   KM       Clear Hydrograph Stack
          870   HC     6
                *
          871   KK  SBW14A   BASIN
          872   KM       SBW14A Basin Runoff
          873   BA  0.009
          874   LG   0.28    0.25    6.00    0.20       4
          875   UC  0.141   0.113
          876   UA     0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          877   UA   100
                *
1                                        HEC-1 INPUT                                        PAGE 23

     LINE     ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          878   KK  DBW14A STORAGE
          879   KM   Retention Basin Storage/Outflow rating curve for Basin DBW14A
          880   RS      1    STOR       0
          881   SV   0.01    0.04    0.07    0.11    0.15    0.19    0.23    0.28    0.32    0.37
          882   SV   0.42    0.47    0.52    0.58    0.63    0.70
          883   SQ   0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.84
          884   SQ   2.97    6.04    9.74   13.95   18.64   23.76
          885   SE   0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
          886   SE   3.00    3.30    3.60    3.90    4.20    4.50
                *
          887   KK  SBW13A   BASIN
          888   KM       SBW13A Basin Runoff
          889   BA  0.001
          890   LG   0.30    0.25    6.00    0.18       5
          891   UC  0.071   0.076
          892   UA     0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          893   UA   100
                *
          894   KK  SBW12A   BASIN
          895   KM       SBW12A Basin Runoff
          896   BA  0.017
          897   LG   0.29    0.25    6.00    0.19      13
          898   UC  0.147   0.119
          899   UA     0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          900   UA   100
                *
          901   KK  DBW12A STORAGE
          902   KM   Retention Basin Storage/Outflow rating curve for Basin DBW12A
          903   RS      1    STOR       0
          904   SV   0.01    0.08    0.16    0.24    0.33    0.43    0.53    0.64    0.75    0.87
          905   SV   0.99    1.13    1.27    1.43
          906   SQ   0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          907   SQ   5.94   16.80   30.86   47.52
          908   SE   0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
          909   SE   5.00    5.50    6.00    6.50
                *
          910   KK  SBW11A   BASIN
          911   KM       SBW11A Basin Runoff
          912   BA  0.001
          913   LG   0.30    0.25    6.00    0.18       5
          914   UC  0.061   0.052
          915   UA     0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          916   UA   100
                *
1                                        HEC-1 INPUT                                        PAGE 24

     LINE     ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          917   KK  CLEAR COMBINE
          918   KM       Clear Hydrograph Stack
          919   HC     5
                *
          920   KK  SB10C1   BASIN
          921   KM       SB10C1 Basin Runoff
          922   BA  0.009
          923   LG   0.25    0.25    6.00   0.216      30
```

```
 924          UC   0.176   0.243
 925          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 926          UA     100
              *

 927          KK  SB10C2   BASIN
 928          KM        SB10C2 Basin Runoff
 929          BA   0.008
 930          LG    0.25    0.25    6.00   0.216      30
 931          UC   0.187   0.268
 932          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 933          UA     100
              *

 934          KK  SB10C3   BASIN
 935          KM        SB10C3 Basin Runoff
 936          BA   0.004
 937          LG    0.10    0.25    6.00   0.254      20
 938          UC   0.277   0.429
 939          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 940          UA     100
              *

 941          KK   CW10C COMBINE
 942          KM        Combine flow from SB10C1, SB10C2 and SB10C3
 943          HC       3
              *

 944          KK  DB10C STORAGE
 945          KM   Retention Basin Storage/Outflow rating curve for Basin DB10C
 946          RS       1    STOR       0
 947          SV    0.01    0.15    0.34    0.57    0.83
 948          SQ    0.01      10      33      47      65
 949          SE    2767    2768    2769    2770    2771
              *

 950          KK   RW10C   ROUTE
 951          KM        Route flow from SBW10C through Basin SBW10B
 952          RS       2    FLOW
 953          RC   0.060   0.060   0.060     952  0.0310 2757.80
 954          RX    0.00   34.00   47.00   62.00   62.10   68.00   73.00   78.00
 955          RY  2757.8 2754.40 2754.00 2752.10 2752.00 2753.70 2755.70 2757.50
              *
1                                      HEC-1 INPUT                                        PAGE 25

LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 956          KK   SB10B   BASIN
 957          KM        SB10B Basin Runoff
 958          BA   0.009
 959          LG    0.26    0.25    6.00   0.195      33
 960          UC   0.163   0.223
 961          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 962          UA     100
              *

 963          KK   CW10B COMBINE
 964          KM        Combine flow from RW10C and SBW10B
 965          HC       2
              *

 966          KK  DBW10B STORAGE
 967          KM   Retention Basin Storage/Outflow rating curve for Basin DBW10B
 968          RS       1    STOR       0
 969          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.44    0.53    0.62    0.73
 970          SV    0.84    0.95    1.08    1.22    1.30
 971          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 972          SQ    0.01    0.01    2.27   46.37    71.0
 973          SE    0.10    0.60    1.20    1.80    2.40    3.00    3.60    4.20    4.80    5.40
 974          SE    6.00    6.60    7.20    7.80    8.20
              *

 975          KK   RW10B   ROUTE
 976          KM        Route flow from CE10WB through Basin SBW10A
 977          RS       1    FLOW
 978          RC   0.060   0.060   0.060     653  0.0276 2732.00
 979          RX    0.00   68.00   75.00   79.00   86.00   92.00  106.00  150.00
 980          RY  2732.0 2728.10 2721.10 2726.10 2726.00 2726.60 2727.00 2732.00
              *

 981          KK  SB10AW   BASIN
 982          KM        SB10AW Basin Runoff
 983          BA   0.029
 984          LG    0.26    0.25    6.00   0.189      28
 985          UC   0.195   0.177
 986          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 987          UA     100
              *

 988          KK   CW10A COMBINE
 989          KM        Combine flow from RW10B and SBW10A
 990          HC       2
              *

 991          KK  DBW10A STORAGE
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```
 992          KM    Retention Basin Storage/Outflow rating curve for Basin DBW10A
 993          RS       1    STOR       0
 994          SV    0.01    0.20    0.41    0.63    0.87    1.12    1.40    1.69    2.00    2.33
 995          SV    2.68    3.07    3.50    3.98    4.15
 996          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   14.68
 997          SQ   56.00  113.58  182.88  189.00  189.00
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 998          SE    0.10    0.60    1.20    1.80    2.40    3.00    3.60    4.20    4.80    5.40
 999          SE    6.00    6.60    7.20    7.80    8.00
              *

1000          KK   SB09E   BASIN
1001          KM        SB09E Basin Runoff
1002          BA   0.005
1003          LG    0.10    0.25    6.00   0.284
1004          UC   0.299   0.503
1005          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1006          UA     100
              *

1007          KK   DB09E STORAGE
1008          KM    Retention Basin Storage/Outflow rating curve for Basin DB09E
1009          RS       1    STOR       0
1010          SV    0.01    0.06    0.14    0.24    0.37    0.52
1011          SQ    0.01       3       9      13      16      19
1012          SE    2826    2827    2828    2829    2830    2831
              *

1013          KK   RW09E   ROUTE
1014          KM        Route flow from SBW09E through Basin SBW09D
1015          RS       1    FLOW
1016          RC   0.060   0.060   0.060     985  0.0442 2805.10
1017          RX    0.00   10.00   12.00   14.00   17.00   23.00   29.00   48.00
1018          RY  2805.3 2803.10 2802.10 2800.70 2800.70 2802.00 2802.90 2805.10
              *

1019          KK  SB09D1   BASIN
1020          KM        SB09D1 Basin Runoff
1021          BA   0.009
1022          LG    0.24    0.25    6.00   0.216      30
1023          UC   0.135   0.149
1024          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1025          UA     100
              *

1026          KK  SB09D2   BASIN
1027          KM        SB09D2 Basin Runoff
1028          BA   0.005
1029          LG    0.25    0.25    6.00   0.216      30
1030          UC   0.174   0.324
1031          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1032          UA     100
              *

1033          KK  CW09DI COMBINE
1034          HC       3
              *
1                                    HEC-1 INPUT                                          PAGE 27

LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1035          KK   SB09C   BASIN
1036          KM        SB09C Basin Runoff
1037          BA   0.036
1038          LG    0.10    0.25    6.00   0.284
1039          UC   0.486   0.664
1040          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1041          UA     100
              *

1042          KK   CW09D COMBINE
1043          KM        Combine flow from CW09DI and SBW09C
1044          HC       2
              *

1045          KK  DBW09C STORAGE
1046          KM    Retention Basin Storage/Outflow rating curve for Basin DBW09C
1047          RS       1    STOR       0
1048          SV    0.01    0.21    0.43    0.66    0.90    1.16    1.44    1.73    2.05    2.41
1049          SV    2.79
1050          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   19.80   56.00
1051          SQ  102.88
1052          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1053          SE    5.00
              *

1054          KK   RW09D   ROUTE
1055          KM        Route flow from CW09D through Basin SBW09B
1056          RS       1    FLOW
1057          RC   0.060   0.060   0.060     367  0.0368 2782.10
1058          RX    0.00   11.00   27.00   31.00   38.00   42.00   73.00   90.00
1059          RY  2782.1 2780.10 2780.00 2779.00 2779.00 2779.50 2780.90 2781.30
```

```
                *
1060            KK  SBW09B   BASIN
1061            KM        SBW09B Basin Runoff
1062            BA   0.005
1063            LG    0.27    0.25    6.00    0.20      29
1064            UC   0.109   0.110
1065            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1066            UA     100
                *
1067            KK   CW09B COMBINE
1068            KM        Combine flow from RW09D and SBW09B
1069            HC       2
                *
1070            KK  DBW09B STORAGE
1071            KM    Retention Basin Storage/Outflow rating curve for Basin DBW09B
1072            RS       1    STOR       0
1073            SV    0.01    0.05    0.10    0.15    0.21    0.27    0.34    0.40    0.48    0.55
1074            SV    0.63    0.72
1075            SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   20.79
1076            SQ   58.80  108.02
1                                       HEC-1 INPUT                                          PAGE 28

LINE            ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1077            SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1078            SE    5.00    5.50
                *
1079            KK   RW09B   ROUTE
1080            KM        Route flow from CW09B through Basin SBW09A
1081            RS       1    FLOW
1082            RC   0.060   0.060   0.060    1036  0.0415 2765.60
1083            RX    0.00    8.00   49.00   58.00   67.00   72.00   85.00  104.00
1084            RY  2764.9 2764.80 2764.00 2763.00 2763.00 2764.00 2765.10 2765.60
                *
1085            KK  SBW09A   BASIN
1086            KM        SBW09A Basin Runoff
1087            BA   0.008
1088            LG    0.27    0.25    6.00    0.20      24
1089            UC   0.161   0.227
1090            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1091            UA     100
                *
1092            KK   CW09A COMBINE
1093            KM        Combine flow from RW09B and SBW09A
1094            HC       2
                *
1095            KK  DBW09A STORAGE
1096            KM    Retention Basin Storage/Outflow rating curve for Basin DBW09A
1097            RS       1    STOR       0
1098            SV    0.01    0.04    0.08    0.12    0.17    0.21    0.26    0.32    0.37    0.43
1099            SV    0.50    0.57    0.64
1100            SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1101            SQ   22.77   64.40  118.31
1102            SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1103            SE    5.00    5.50    6.00
                *
1104            KK  SBW08A   BASIN
1105            KM        SBW08A Basin Runoff
1106            BA   0.009
1107            LG    0.27    0.25    6.00    0.18      21
1108            UC   0.129   0.136
1109            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1110            UA     100
                *
1111            KK  DBW08A STORAGE
1112            KM    Retention Basin Storage/Outflow rating curve for Basin DBW08A
1113            RS       1    STOR       0
1114            SV    0.01    0.04    0.09    0.14    0.18    0.24    0.29    0.34    0.40    0.46
1115            SV    0.52    0.58    0.65    0.71    0.79    0.86    0.87
1116            SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1117            SQ    0.01    1.09    5.33   11.85   20.01   29.39   30.86
1118            SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1119            SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
                *
1                                       HEC-1 INPUT                                          PAGE 29

LINE            ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1120            KK  SBW07C   BASIN
1121            KM        SBW07C Basin Runoff
1122            BA   0.005
1123            LG    0.21    0.25    6.00    0.23       3
1124            UC   0.210   0.310
1125            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1126            UA     100
                *
```

```
1127          KK  DBW07C STORAGE
1128          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07C
1129          RS       1    STOR       0
1130          SV    0.01    0.01    0.02    0.03    0.04    0.05    0.07    0.08    0.09    0.11
1131          SV    0.12    0.14    0.16    0.18    0.20    0.22    0.22
1132          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1133          SQ    0.01    0.55    2.66    5.93   10.00   14.69   15.43
1134          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1135          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
              *

1136          KK   SB07B   BASIN
1137          KM         SB07B Basin Runoff
1138          BA   0.007
1139          LG    0.10    0.25    6.00   0.284
1140          UC   0.322   0.529
1141          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1142          UA     100
              *

1143          KK  DBW07B STORAGE
1144          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07B
1145          RS       1    STOR       0
1146          SV    0.01    0.01    0.03    0.04    0.05    0.07    0.09    0.10    0.12    0.14
1147          SV    0.17    0.19    0.21    0.24    0.27    0.29    0.30
1148          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1149          SQ    0.01    0.55    2.66    5.93   10.00   14.69   15.43
1150          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1151          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
              *

1152          KK  CW07BC COMBINE
1153          KM         Combine flow from SBW07C andSBW07B
1154          HC       2
              *

1155          KK  RW07BC   ROUTE
1156          KM         Route flow from CW07BC through SBW07A
1157          RS       1    FLOW
1158          RC   0.060   0.060   0.060    1452  0.0465 2800.10
1159          RX    0.00    6.00   20.00   26.00   29.00   38.00   50.00   68.00
1160          RY  2800.1 2799.00 2796.00 2793.00 2793.00 2796.00 2797.00 2798.40
              *
1                                        HEC-1 INPUT                                    PAGE 30

LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10


1161          KK  SBW07A   BASIN
1162          KM         SBW07A Basin Runoff
1163          BA   0.013
1164          LG    0.28    0.25    6.00    0.20      22
1165          UC   0.180   0.249
1166          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1167          UA     100
              *

1168          KK   CW07A COMBINE
1169          KM         Combine flow from RW07BC and SBW07A
1170          HC       2
              *

1171          KK  DBW07A STORAGE
1172          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07A
1173          RS       1    STOR       0
1174          SV    0.01    0.09    0.18    0.28    0.39    0.50    0.62    0.74    0.88    1.01
1175          SV    1.16    1.32
1176          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   10.89
1177          SQ   30.80   56.58
1178          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1179          SE    5.00    5.50
              *

1180          KK   CLEAR COMBINE
1181          HC       5
              *

1182          KK  SBW06A   BASIN
1183          KM         SBW06A Basin Runoff
1184          BA   0.004
1185          LG    0.29    0.25    6.00    0.18      11
1186          UC   0.116   0.145
1187          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1188          UA     100
              *

1189          KK  DBW06A STORAGE
1190          KM    Retention Basin Storage/Outflow rating curve for Basin DBW06A
1191          RS       1    STOR       0
1192          SV    0.01    0.02    0.03    0.05    0.07    0.09    0.11    0.14    0.16    0.19
1193          SV    0.21    0.24    0.28    0.31    0.34    0.38    0.39
1194          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1195          SQ    0.01    0.55    2.66    5.93   10.00   14.69   15.43
1196          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1197          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
```

```
                     *
1                                        HEC-1 INPUT                                                    PAGE 31

          LINE       ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          1198       KK  SBW05A   BASIN
          1199       KM        SBW05A Basin Runoff
          1200       BA   0.010
          1201       LG    0.29    0.25    6.00    0.19      11
          1202       UC   0.147   0.168
          1203       UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1204       UA     100
                     *

          1205       KK  DBW05A STORAGE
          1206       KM    Retention Basin Storage/Outflow rating curve for Basin DBW05A
          1207       RS       1    STOR       0
          1208       SV    0.01    0.05    0.09    0.15    0.20    0.26    0.32    0.38    0.45    0.52
          1209       SV    0.59    0.67    0.76
          1210       SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          1211       SQ    5.94   16.80   30.86
          1212       SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
          1213       SE    5.00    5.50    6.00
                     *

          1214       KK  SBW04A   BASIN
          1215       KM        SBW04A Basin Runoff
          1216       BA   0.002
          1217       LG    0.30    0.25    6.00    0.18       5
          1218       UC   0.091   0.107
          1219       UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1220       UA     100
                     *

          1221       KK  SBW02A   BASIN
          1222       KM        SBW02A Basin Runoff
          1223       BA   0.007
          1224       LG    0.18    0.25    6.00    0.24       2
          1225       UC   0.238   0.322
          1226       UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1227       UA     100
                     *

          1228       KK  DBW02A STORAGE
          1229       KM    Retention Basin Storage/Outflow rating curve for Basin DBW02A
          1230       RS       1    STOR       0
          1231       SV    0.01    0.01    0.03    0.05    0.06    0.08    0.10    0.12    0.14    0.16
          1232       SV    0.18    0.20    0.22    0.25    0.27
          1233       SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          1234       SQ    0.01    2.20    6.04   11.07   15.43
          1235       SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
          1236       SE    4.00    4.40    4.80    5.20    5.50
                     *
1                                        HEC-1 INPUT                                                    PAGE 32

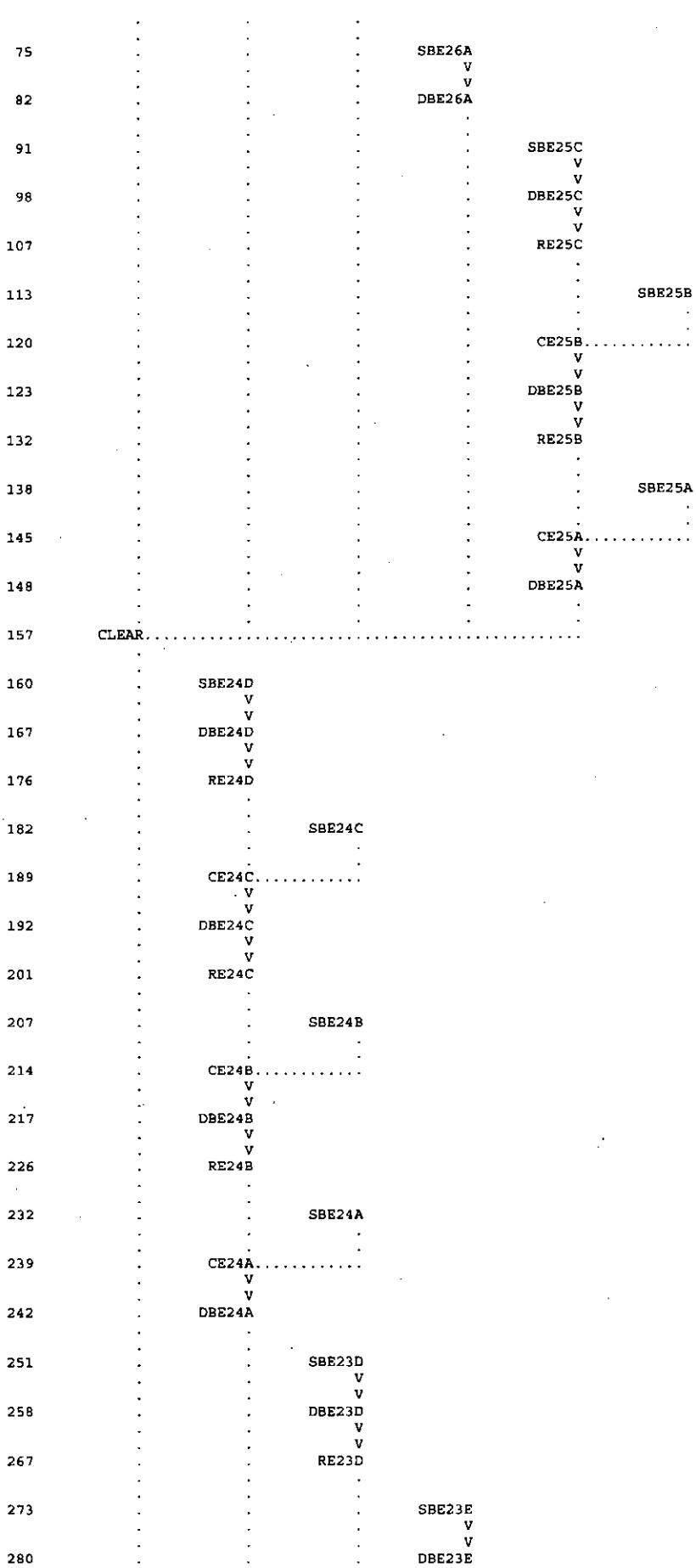
          LINE       ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

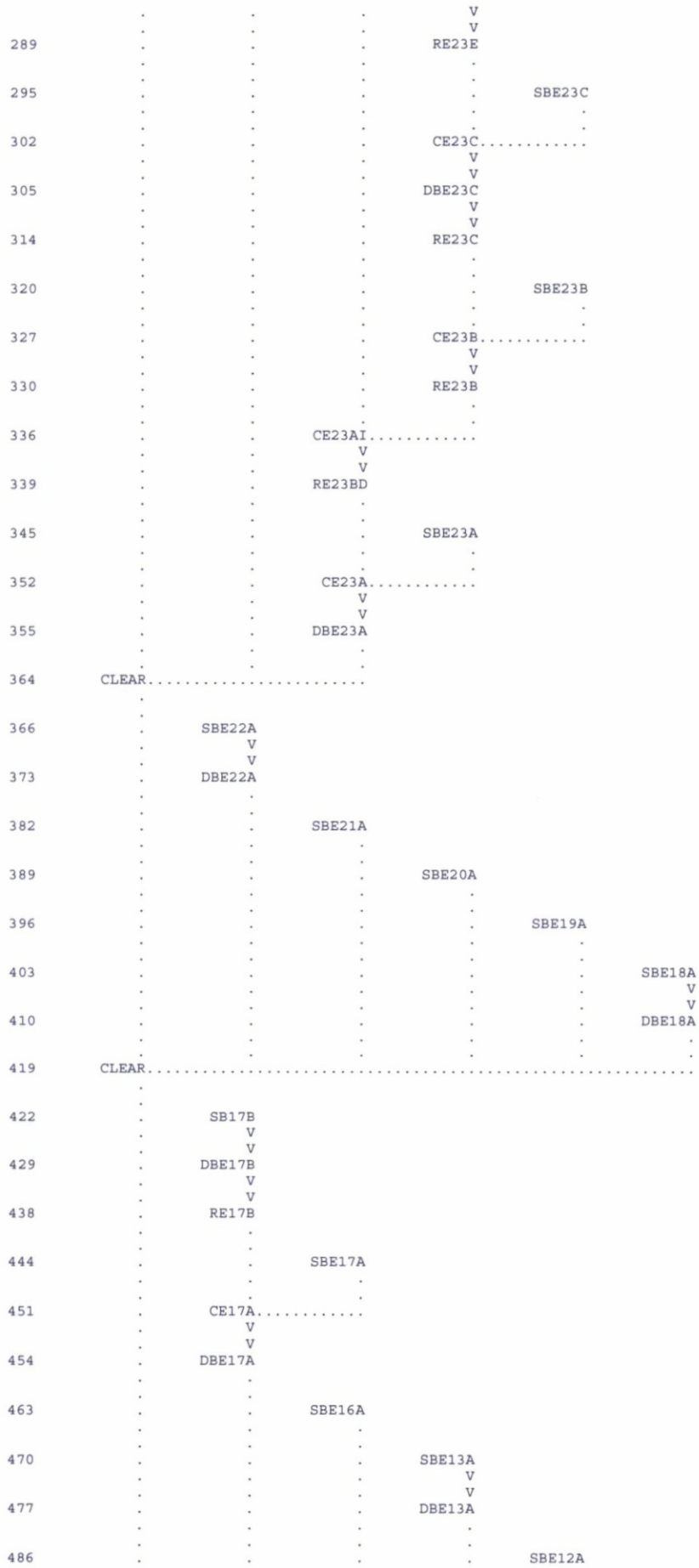
          1237       KK  SBW01A   BASIN
          1238       KM        SBW01A Basin Runoff
          1239       BA   0.002
          1240       LG    0.14    0.25    6.00    0.26       1
          1241       UC   0.186   0.262
          1242       UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1243       UA     100
                     *

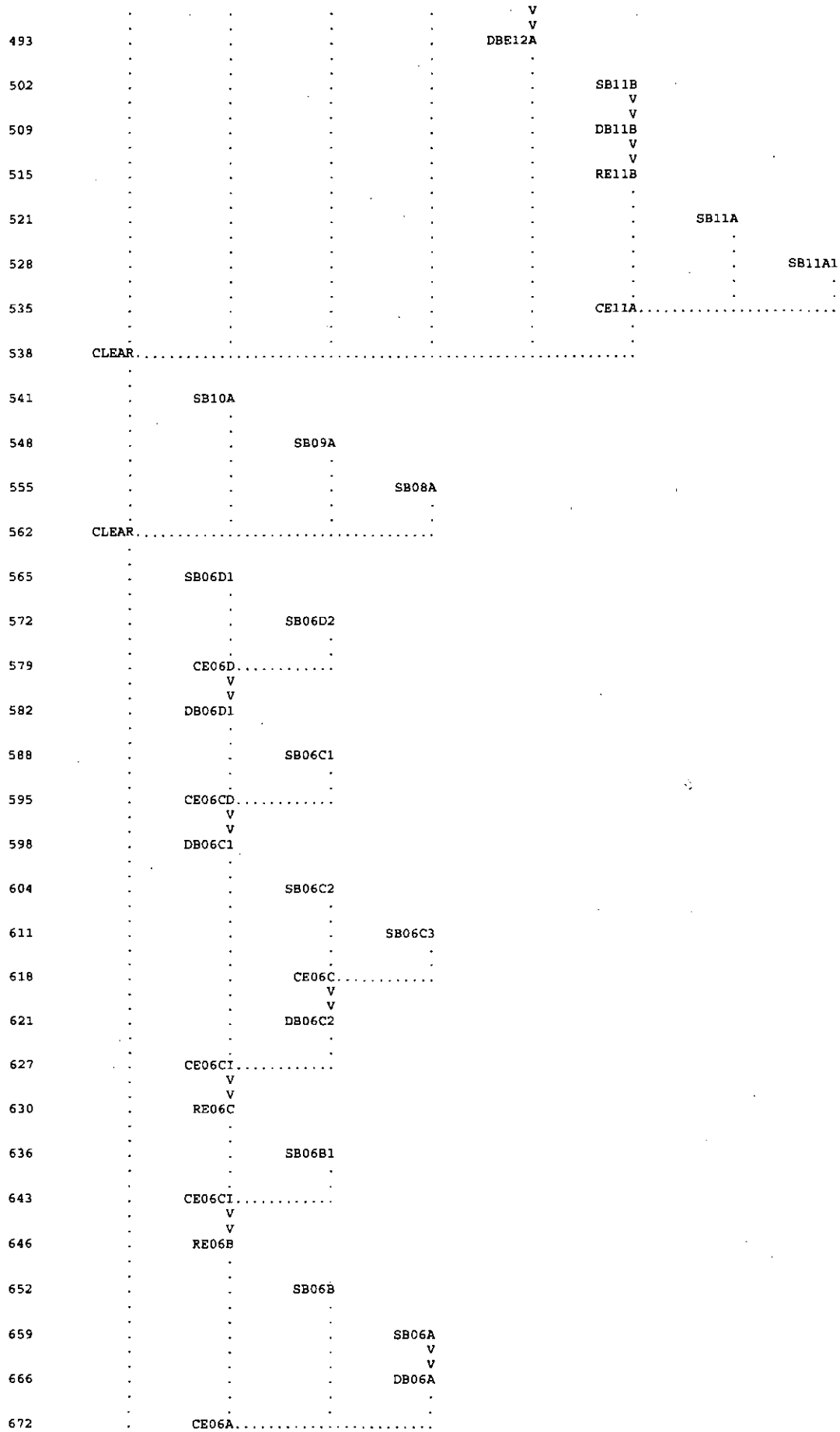
          1244       KK   CLEAR COMBINE
          1245       KM        Clear Hydrograph Stack
          1246       HC       6
                     *
          1247       ZZ
1
               SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

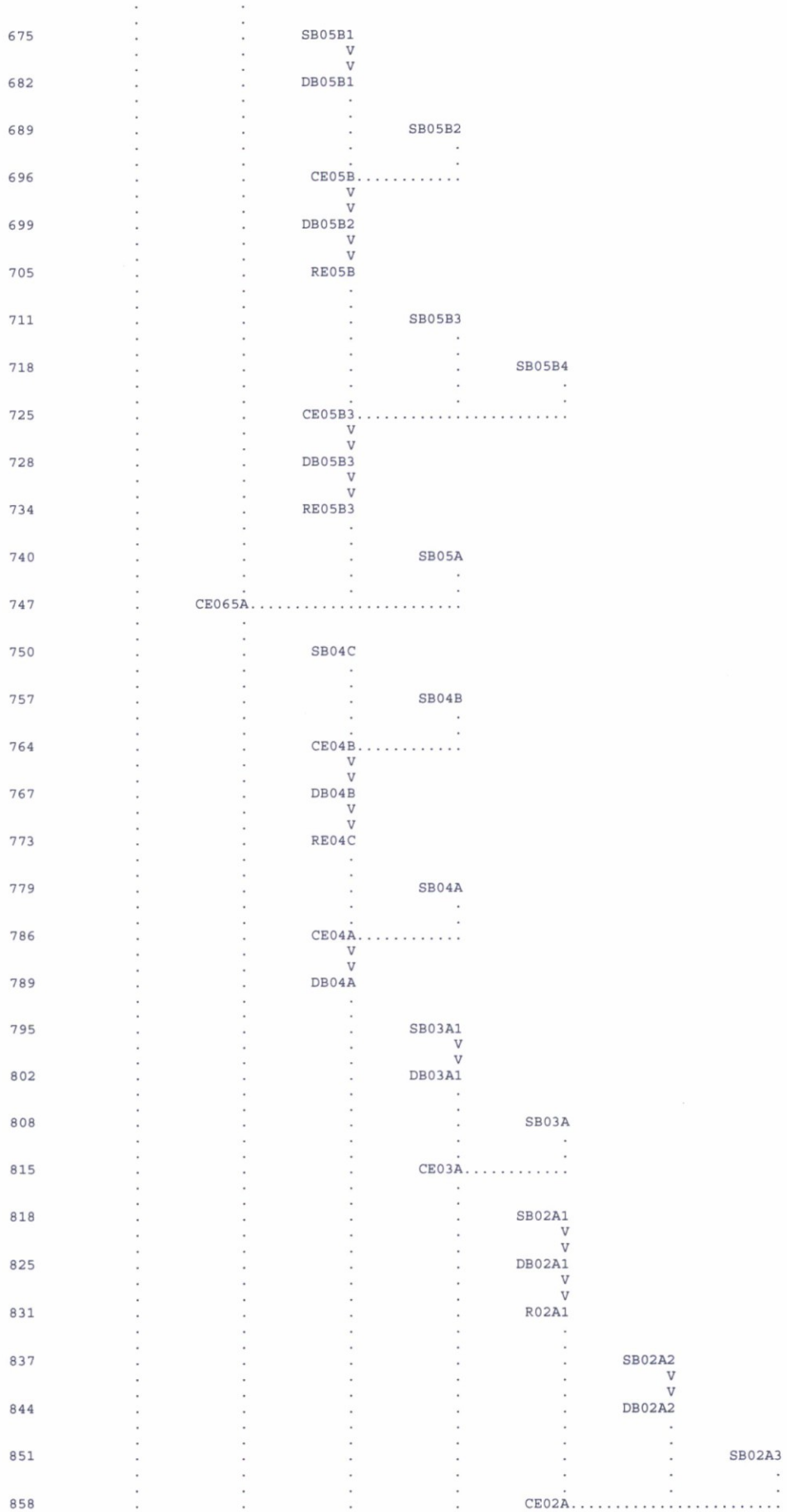
   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

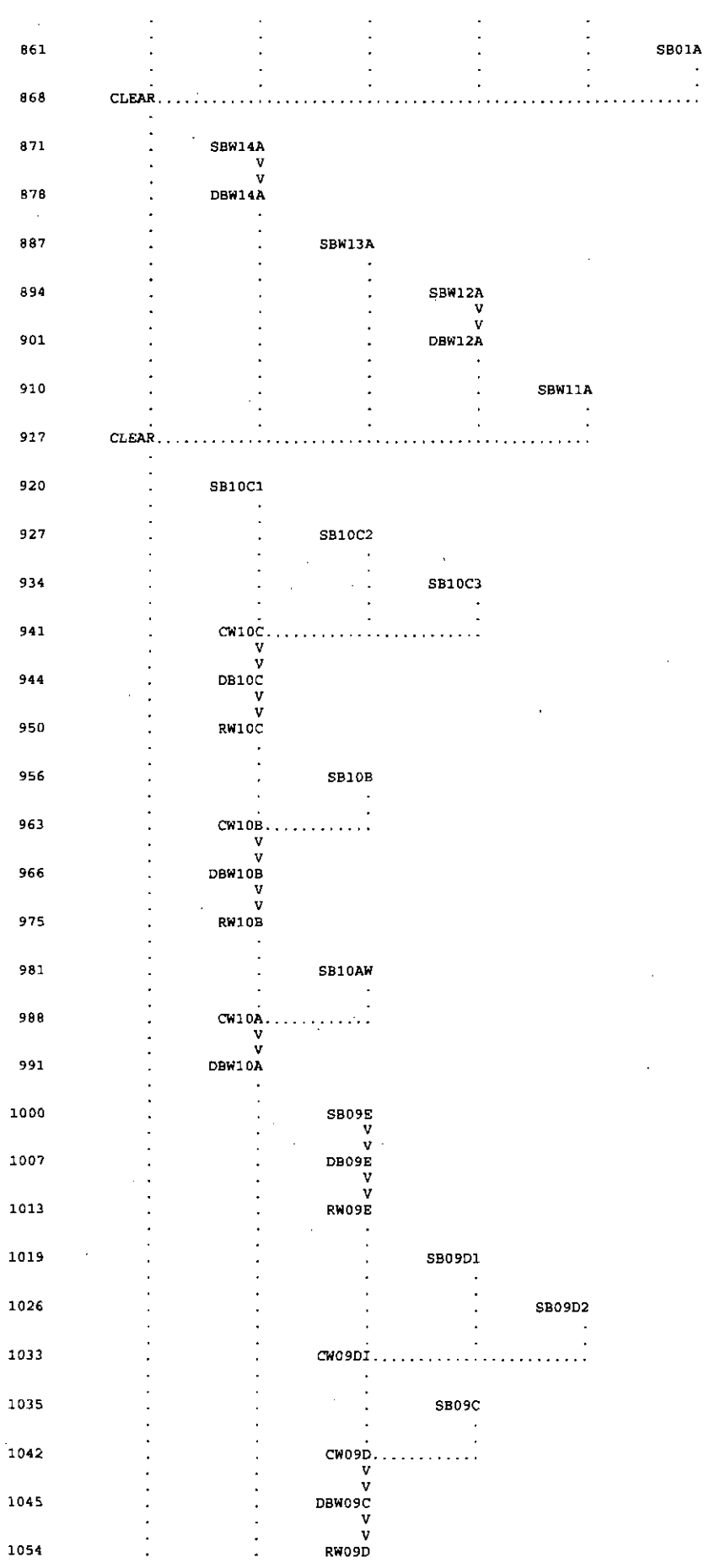
    23      SBE29A
              V
              V
    34      DBE29A
              .
              .
    43        .      SBE28A
              .         V
              .         V
    50        .      DBE28A
              .         .
              .         .
    59        .         .      SBE27A
              .         .           V
              .         .           V
    66        .         .      DBE27A
```

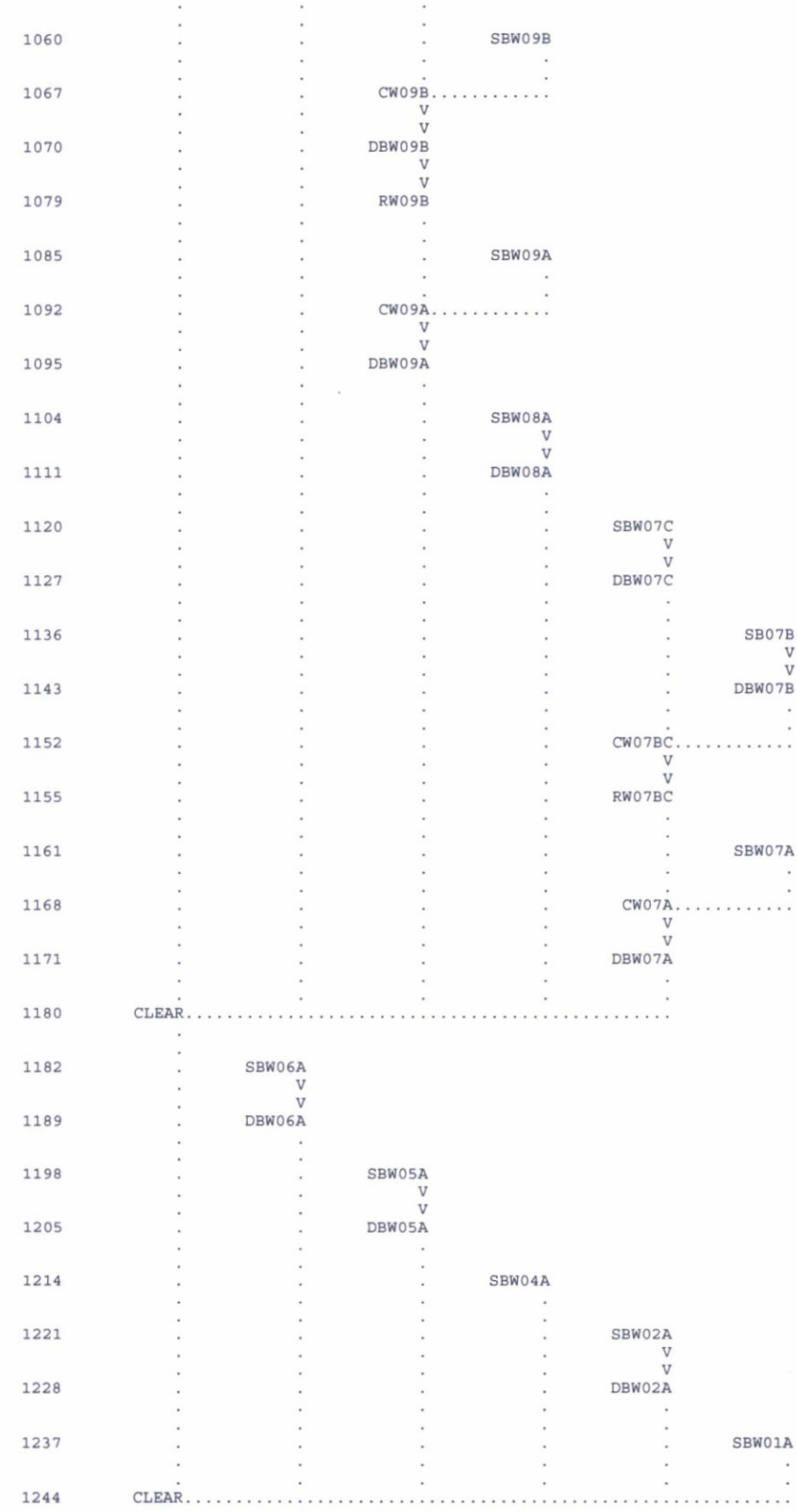

75
SBE26A
82
DBE26A
91
SBE25C
98
DBE25C
107
RE25C
113
SBE25B
120
CE25B
123
DBE25B
132
RE25B
138
SBE25A
145
CE25A
148
DBE25A
157
CLEAR
160
SBE24D
167
DBE24D
176
RE24D
182
SBE24C
189
CE24C
192
DBE24C
201
RE24C
207
SBE24B
214
CE24B
217
DBE24B
226
RE24B
232
SBE24A
239
CE24A
242
DBE24A
251
SBE23D
258
DBE23D
267
RE23D
273
SBE23E
280
DBE23E


289 RE23E
295 SBE23C
302 CE23C
305 DBE23C
314 RE23C
320 SBE23B
327 CE23B
330 RE23B
336 CE23AI
339 RE23BD
345 SBE23A
352 CE23A
355 DBE23A
364 CLEAR
366 SBE22A
373 DBE22A
382 SBE21A
389 SBE20A
396 SBE19A
403 SBE18A
410 DBE18A
419 CLEAR
422 SB17B
429 DBE17B
438 RE17B
444 SBE17A
451 CE17A
454 DBE17A
463 SBE16A
470 SBE13A
477 DBE13A
486 SBE12A


493 DBE12A
502 SB11B
509 DB11B
515 RE11B
521 SB11A
528 SB11A1
535 CE11A
538 CLEAR
541 SB10A
548 SB09A
555 SB08A
562 CLEAR
565 SB06D1
572 SB06D2
579 CE06D
582 DB06D1
588 SB06C1
595 CE06CD
598 DB06C1
604 SB06C2
611 SB06C3
618 CE06C
621 DB06C2
627 CE06CI
630 RE06C
636 SB06B1
643 CE06CI
646 RE06B
652 SB06B
659 SB06A
666 DB06A
672 CE06A


675
SB05B1
682
DB05B1
689
SB05B2
696
CE05B
699
DB05B2
705
RE05B
711
SB05B3
718
SB05B4
725
CE05B3
728
DB05B3
734
RE05B3
740
SB05A
747
CE065A
750
SB04C
757
SB04B
764
CE04B
767
DB04B
773
RE04C
779
SB04A
786
CE04A
789
DB04A
795
SB03A1
802
DB03A1
808
SB03A
815
CE03A
818
SB02A1
825
DB02A1
831
R02A1
837
SB02A2
844
DB02A2
851
SB02A3
858
CE02A


861 SB01A
868 CLEAR
871 SBW14A
878 DBW14A
887 SBW13A
894 SBW12A
901 DBW12A
910 SBW11A
917 CLEAR
920 SB10C1
927 SB10C2
934 SB10C3
941 CW10C
944 DB10C
950 RW10C
956 SB10B
963 CW10B
966 DBW10B
975 RW10B
981 SB10AW
988 CW10A
991 DBW10A
1000 SB09E
1007 DB09E
1013 RW09E
1019 SB09D1
1026 SB09D2
1033 CW09DI
1035 SB09C
1042 CW09D
1045 DBW09C
1054 RW09D



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN   1998               *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   07MAY18  TIME  09:27:22   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
                          SERENO CANYON (PHASE 4) - DEVELOPED CONDITIONS
                          STORM EVENT: 10-YR, 6-HOUR
                          05/04/2018
                          PREPARED BY: SLATER HANIFAN GROUP
                         ********************************************************************************
                         ********************************************************************************
                          Flood Control District of Maricopa County
                          Sereno Canyon Developed Conditions
                          10 YEAR
                          6 Hour  Storm
                          Unit Hydrograph: Clark
                          09/18/2012
                          Sereno Canyon-Developed Conditions
                          10-Year, 6-Hour Storm Event
                          Prepared By: JE Fuller Hydrology and Geomorphology
                          Modeled By: Brian Schalk P.E., CFM and Nathan Logan P.E., CFM
                          Submitted To: City of Scottsdale
                         ********************************************************************************
                         ********************************************************************************

  21 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                      NMIN          1  MINUTES IN COMPUTATION INTERVAL
                      IDATE     1DEC11  STARTING DATE
                      ITIME       0000  STARTING TIME
                         NQ       2000  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE    2DEC11  ENDING DATE
                      NDTIME       0919  ENDING TIME
                      ICENT          19  CENTURY MARK

                    COMPUTATION INTERVAL     0.02 HOURS
                        TOTAL TIME BASE    33.32 HOURS

           ENGLISH UNITS
                DRAINAGE AREA         SQUARE MILES
                PRECIPITATION DEPTH   INCHES
                LENGTH, ELEVATION     FEET
                FLOW                  CUBIC FEET PER SECOND
                STORAGE VOLUME        ACRE-FEET
                SURFACE AREA          ACRES
                TEMPERATURE           DEGREES FAHRENHEIT
          WARNING EXCESS AT PONDING LESS THAN ZERO FOR PERIOD. EXCESS SET TO ZERO
          WARNING EXCESS AT PONDING LESS THAN ZERO FOR PERIOD. EXCESS SET TO ZERO
1
                                                  RUNOFF SUMMARY
                                              FLOW IN CUBIC FEET PER SECOND
                                            TIME IN HOURS,  AREA IN SQUARE MILES

                                    PEAK    TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD      BASIN     MAXIMUM     TIME OF
          OPERATION      STATION    FLOW     PEAK                                            AREA      STAGE     MAX STAGE
+                                                          6-HOUR     24-HOUR     72-HOUR

          HYDROGRAPH AT
+                        SBE29A      18.     4.08          2.          0.          0.        0.01
          ROUTED TO
+                        DBE29A       4.     4.53          1.          0.          0.        0.01
+                                                                                                      4.05        4.53

          HYDROGRAPH AT
+                        SBE28A      19.     4.05          1.          0.          0.        0.01
          ROUTED TO
+                        DBE28A       0.     0.00          0.          0.          0.        0.01
+                                                                                                      4.41        6.50

          HYDROGRAPH AT
+                        SBE27A       3.     4.02          0.          0.          0.        0.00
          ROUTED TO
+                        DBE27A       0.     0.00          0.          0.          0.        0.00
+                                                                                                      2.42        6.10

          HYDROGRAPH AT
+                        SBE26A      14.     4.05          1.          0.          0.        0.01
          ROUTED TO
+                        DBE26A       0.     0.00          0.          0.          0.        0.01
+                                                                                                      4.41        6.68

          HYDROGRAPH AT
+                        SBE25C       9.     4.03          1.          0.          0.        0.00
          ROUTED TO
+                        DBE25C       1.     4.40          0.          0.          0.        0.00
+                                                                                                      3.11        4.40

          ROUTED TO
```

+		RE25C	1.	4.50	0.	0.	0.	0.00	
+									2687.07 4.50
	HYDROGRAPH AT								
+		SBE25B	8.	4.05	1.	0.	0.	0.01	
	2 COMBINED AT								
+		CE25B	8.	4.05	1.	0.	0.	0.01	
	ROUTED TO								
+		DBE25B	0.	5.17	0.	0.	0.	0.01	
+									2.84 5.20
	ROUTED TO								
+		RE25B	0.	5.33	0.	0.	0.	0.01	
+									2676.17 5.37
	HYDROGRAPH AT								
+		SBE25A	6.	4.02	0.	0.	0.	0.00	
	2 COMBINED AT								
+		CE25A	6.	4.02	0.	0.	0.	0.01	
	ROUTED TO								
+		DBE25A	0.	7.10	0.	0.	0.	0.01	
+									3.31 7.18
	5 COMBINED AT								
+		CLEAR	4.	4.53	1.	0.	0.	0.05	
	HYDROGRAPH AT								
+		SBE24D	17.	4.03	1.	0.	0.	0.01	
	ROUTED TO								
+		DBE24D	1.	4.43	0.	0.	0.	0.01	
+									3.11 4.43
	ROUTED TO								
+		RE24D	1.	4.57	0.	0.	0.	0.01	
+									2721.16 4.57
	HYDROGRAPH AT								
+		SBE24C	21.	4.07	2.	0.	0.	0.01	
	2 COMBINED AT								
+		CE24C	21.	4.07	2.	0.	0.	0.02	
	ROUTED TO								
+		DBE24C	5.	4.50	1.	0.	0.	0.02	
+									3.35 4.50
	ROUTED TO								
+		RE24C	5.	4.60	1.	0.	0.	0.02	
+									2701.34 4.60
	HYDROGRAPH AT								
+		SBE24B	7.	4.05	1.	0.	0.	0.00	
	2 COMBINED AT								
+		CE24B	7.	4.05	1.	0.	0.	0.03	
	ROUTED TO								
+		DBE24B	1.	5.48	0.	0.	0.	0.03	
+									3.08 5.52
	ROUTED TO								
+		RE24B	1.	5.72	0.	0.	0.	0.03	
+									2687.19 5.72
	HYDROGRAPH AT								
+		SBE24A	10.	4.05	1.	0.	0.	0.01	
	2 COMBINED AT								
+		CE24A	10.	4.05	1.	0.	0.	0.04	
	ROUTED TO								
+		DBE24A	1.	6.35	0.	0.	0.	0.04	
+									3.57 6.37
	HYDROGRAPH AT								
+		SBE23D	49.	4.08	5.	1.	1.	0.04	
	ROUTED TO								
+		DBE23D	0.	0.00	0.	0.	0.	0.04	
+									6.47 6.98
	ROUTED TO								
+		RE23D	0.	0.25	0.	0.	0.	0.04	
+									2684.00 0.27
	HYDROGRAPH AT								
+		SBE23E	7.	4.03	1.	0.	0.	0.00	
	ROUTED TO								
+		DBE23E	0.	0.00	0.	0.	0.	0.00	
+									2.63 6.35

+	ROUTED TO	RE23E	0.	0.42	0.	0.	0.	0.00	
+									2711.00 0.43
+	HYDROGRAPH AT	SBE23C	65.	4.08	6.	1.	1.	0.05	
+	2 COMBINED AT	CE23C	65.	4.08	6.	1.	1.	0.06	
+	ROUTED TO	DBE23C	17.	4.52	2.	0.	0.	0.06	
+									5.80 4.52
+	ROUTED TO	RE23C	16.	4.58	2.	0.	0.	0.06	
+									2690.88 4.58
+	HYDROGRAPH AT	SBE23B	7.	4.03	1.	0.	0.	0.00	
+	2 COMBINED AT	CE23B	17.	4.58	2.	1.	0.	0.06	
+	ROUTED TO	RE23B	17.	4.58	2.	1.	0.	0.06	
+									2684.51 4.58
+	2 COMBINED AT	CE23AI	17.	4.58	2.	1.	0.	0.10	
+	ROUTED TO	RE23BD	16.	4.62	2.	1.	0.	0.10	
+									2679.62 4.62
+	HYDROGRAPH AT	SBE23A	9.	4.03	1.	0.	0.	0.01	
+	2 COMBINED AT	CE23A	17.	4.60	3.	1.	1.	0.11	
+	ROUTED TO	DBE23A	0.	0.00	0.	0.	0.	0.11	
+									5.77 33.32
+	3 COMBINED AT	CLEAR	4.	4.53	1.	0.	0.	0.20	
+	HYDROGRAPH AT	SBE22A	10.	4.05	1.	0.	0.	0.01	
+	ROUTED TO	DBE22A	0.	0.00	0.	0.	0.	0.01	
+									3.79 6.37
+	HYDROGRAPH AT	SBE21A	2.	4.02	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SBE20A	2.	4.00	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SBE19A	2.	4.00	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SBE18A	2.	4.02	0.	0.	0.	0.00	
+	ROUTED TO	DBE18A	0.	0.00	0.	0.	0.	0.00	
+									1.47 5.05
+	6 COMBINED AT	CLEAR	6.	4.00	1.	0.	0.	0.21	
+	HYDROGRAPH AT	SB17B	27.	4.03	2.	1.	0.	0.02	
+	ROUTED TO	DBE17B	0.	0.00	0.	0.	0.	0.02	
+									4.91 6.53
+	ROUTED TO	RE17B	0.	0.57	0.	0.	0.	0.02	
+									2736.00 0.70
+	HYDROGRAPH AT	SBE17A	27.	4.05	2.	1.	0.	0.02	
+	2 COMBINED AT	CE17A	27.	4.05	2.	1.	0.	0.03	
+	ROUTED TO	DBE17A	0.	0.00	0.	0.	0.	0.03	
+									4.39 7.17

	HYDROGRAPH AT								
+		SBE16A	2.	4.02	0.	0.	0.	0.00	
	HYDROGRAPH AT								
+		SBE13A	6.	4.02	0.	0.	0.	0.00	
	ROUTED TO								
+		DBE13A	0.	0.00	0.	0.	0.	0.00	
+									3.96 6.20
	HYDROGRAPH AT								
+		SBE12A	4.	4.02	0.	0.	0.	0.00	
	ROUTED TO								
+		DBE12A	0.	0.00	0.	0.	0.	0.00	
+									2.58 6.20
	HYDROGRAPH AT								
+		SB11B	11.	4.12	1.	0.	0.	0.01	
	ROUTED TO								
+		DB11B	9.	4.30	1.	0.	0.	0.01	
+									2778.70 4.30
	ROUTED TO								
+		RE11B	9.	4.38	1.	0.	0.	0.01	
+									2762.74 4.38
	HYDROGRAPH AT								
+		SB11A	5.	4.12	1.	0.	0.	0.01	
	HYDROGRAPH AT								
+		SB11A1	3.	4.07	0.	0.	0.	0.00	
	3 COMBINED AT								
+		CE11A	15.	4.23	2.	1.	0.	0.02	
	6 COMBINED AT								
+		CLEAR	18.	4.05	4.	1.	1.	0.27	
	HYDROGRAPH AT								
+		SB10A	2.	4.03	0.	0.	0.	0.00	
	HYDROGRAPH AT								
+		SB09A	1.	4.05	0.	0.	0.	0.00	
	HYDROGRAPH AT								
+		SB08A	1.	4.03	0.	0.	0.	0.00	
	4 COMBINED AT								
+		CLEAR	22.	4.05	4.	1.	1.	0.28	
	HYDROGRAPH AT								
+		SB06D1	4.	4.10	0.	0.	0.	0.00	
	HYDROGRAPH AT								
+		SB06D2	12.	4.05	1.	0.	0.	0.01	
	2 COMBINED AT								
+		CE06D	15.	4.07	2.	0.	0.	0.01	
	ROUTED TO								
+		DB06D1	9.	4.28	2.	0.	0.	0.01	
+									2797.05 4.28
	HYDROGRAPH AT								
+		SB06C1	16.	4.10	2.	1.	0.	0.01	
	2 COMBINED AT								
+		CE06CD	24.	4.13	4.	1.	1.	0.03	
	ROUTED TO								
+		DB06C1	22.	4.27	4.	1.	1.	0.03	
+									2793.86 4.27
	HYDROGRAPH AT								
+		SB06C2	8.	4.25	2.	0.	0.	0.02	
	HYDROGRAPH AT								
+		SB06C3	8.	4.03	1.	0.	0.	0.00	
	2 COMBINED AT								
+		CE06C	14.	4.07	2.	1.	0.	0.02	
	ROUTED TO								
+		DB06C2	11.	4.27	2.	1.	0.	0.02	
+									2789.80 4.27
	2 COMBINED AT								
+		CE06CI	33.	4.27	6.	2.	1.	0.05	
	ROUTED TO								
+		RE06C	33.	4.30	6.	2.	1.	0.05	
+									2784.68 4.30
	HYDROGRAPH AT								

+		SB06B1	3.	4.07	0.	0.	0.	0.00	
+	2 COMBINED AT	CE06CI	35.	4.28	6.	2.	1.	0.06	
+	ROUTED TO	RE06B	34.	4.37	6.	2.	1.	0.06	2758.50 4.37
+	HYDROGRAPH AT	SB06B	2.	4.22	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SB06A	11.	4.02	1.	0.	0.	0.01	
+	ROUTED TO	DB06A	8.	4.10	1.	0.	0.	0.01	2754.40 4.10
+	3 COMBINED AT	CE06A	39.	4.32	7.	2.	1.	0.07	
+	HYDROGRAPH AT	SB05B1	7.	4.10	1.	0.	0.	0.01	
+	ROUTED TO	DB05B1	6.	4.15	1.	0.	0.	0.01	2811.71 4.15
+	HYDROGRAPH AT	SB05B2	4.	4.13	1.	0.	0.	0.01	
+	2 COMBINED AT	CE05B	10.	4.15	1.	0.	0.	0.01	
+	ROUTED TO	DB05B2	10.	4.15	1.	0.	0.	0.01	2801.57 4.15
+	ROUTED TO	RE05B	9.	4.28	1.	0.	0.	0.01	2757.32 4.28
+	HYDROGRAPH AT	SB05B3	6.	4.05	1.	0.	0.	0.00	
+	HYDROGRAPH AT	SB05B4	5.	4.07	0.	0.	0.	0.00	
+	3 COMBINED AT	CE05B3	15.	4.15	2.	1.	0.	0.02	
+	ROUTED TO	DB05B3	15.	4.15	2.	1.	0.	0.02	2782.08 4.15
+	ROUTED TO	RE05B3	14.	4.25	2.	1.	0.	0.02	2757.40 4.25
+	HYDROGRAPH AT	SB05A	2.	4.22	0.	0.	0.	0.00	
+	3 COMBINED AT	CE065A	55.	4.30	10.	2.	2.	0.09	
+	HYDROGRAPH AT	SB04C	1.	4.10	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SB04B	15.	4.05	1.	0.	0.	0.01	
+	2 COMBINED AT	CE04B	17.	4.05	2.	0.	0.	0.01	
+	ROUTED TO	DB04B	13.	4.15	2.	0.	0.	0.01	2757.04 4.15
+	ROUTED TO	RE04C	13.	4.20	2.	0.	0.	0.01	2750.60 4.20
+	HYDROGRAPH AT	SB04A	13.	4.03	1.	0.	0.	0.01	
+	2 COMBINED AT	CE04A	23.	4.07	3.	1.	0.	0.02	
+	ROUTED TO	DB04A	17.	4.27	3.	1.	0.	0.02	2741.00 4.27
+	HYDROGRAPH AT	SB03A1	1.	4.17	0.	0.	0.	0.00	

+	ROUTED TO	DB03A1	1.	4.52	0.	0.	0.	0.00	
+									2750.21 4.53
+	HYDROGRAPH AT	SB03A	3.	4.08	0.	0.	0.	0.00	
+	2 COMBINED AT	CE03A	3.	4.08	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SB02A1	28.	4.25	5.	1.	1.	0.06	
+	ROUTED TO	DB02A1	28.	4.33	5.	1.	1.	0.06	
+									2791.25 4.33
+	ROUTED TO	R02A1	28.	4.37	5.	1.	1.	0.06	
+									2750.89 4.37
+	HYDROGRAPH AT	SB02A2	4.	4.03	0.	0.	0.	0.00	
+	ROUTED TO	DB02A2	0.	0.00	0.	0.	0.	0.00	
+									2763.27 6.35
+	HYDROGRAPH AT	SB02A3	2.	4.12	0.	0.	0.	0.00	
+	3 COMBINED AT	CE02A	29.	4.35	5.	1.	1.	0.06	
+	HYDROGRAPH AT	SB01A	59.	4.27	10.	3.	2.	0.12	
+	6 COMBINED AT	CLEAR	179.	4.30	33.	8.	6.	0.58	
+	HYDROGRAPH AT	SBW14A	16.	4.03	1.	0.	0.	0.01	
+	ROUTED TO	DBW14A	2.	4.35	0.	0.	0.	0.01	
+									2.81 4.35
+	HYDROGRAPH AT	SBW13A	2.	4.00	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SBW12A	30.	4.03	2.	0.	0.	0.02	
+	ROUTED TO	DBW12A	1.	4.55	0.	0.	0.	0.02	
+									4.57 4.55
+	HYDROGRAPH AT	SBW11A	2.	4.00	0.	0.	0.	0.00	
+	5 COMBINED AT	CLEAR	181.	4.30	33.	8.	6.	0.61	
+	HYDROGRAPH AT	SB10C1	12.	4.05	1.	0.	0.	0.01	
+	HYDROGRAPH AT	SB10C2	10.	4.07	1.	0.	0.	0.01	
+	HYDROGRAPH AT	SB10C3	4.	4.10	0.	0.	0.	0.00	
+	3 COMBINED AT	CW10C	26.	4.07	3.	1.	0.	0.02	
+	ROUTED TO	DB10C	22.	4.15	3.	1.	0.	0.02	
+									2768.52 4.15
+	ROUTED TO	RW10C	21.	4.23	3.	1.	0.	0.02	
+									2753.18 4.23
+	HYDROGRAPH AT	SB10B	13.	4.05	1.	0.	0.	0.01	
+	2 COMBINED AT	CW10B	29.	4.18	4.	1.	1.	0.03	
+	ROUTED TO	DBW10B	20.	4.42	2.	0.	0.	0.03	
+									7.44 4.42
+	ROUTED TO	RW10B	18.	4.48	2.	0.	0.	0.03	
+									2723.47 4.48

+	HYDROGRAPH AT	SB10AW	46.	4.05	4.	1.	1.	0.03	
+	2 COMBINED AT	CW10A	46.	4.05	6.	1.	1.	0.06	
+	ROUTED TO	DBW10A	9.	4.87	2.	0.	0.	0.06	5.17 4.87
+	HYDROGRAPH AT	SB09E	3.	4.12	0.	0.	0.	0.00	
+	ROUTED TO	DB09E	3.	4.33	0.	0.	0.	0.00	2826.86 4.33
+	ROUTED TO	RW09E	2.	4.47	0.	0.	0.	0.00	2800.99 4.45
+	HYDROGRAPH AT	SB09D1	15.	4.03	1.	0.	0.	0.01	
+	HYDROGRAPH AT	SB09D2	6.	4.07	1.	0.	0.	0.00	
+	3 COMBINED AT	CW09DI	21.	4.03	2.	1.	0.	0.02	
+	HYDROGRAPH AT	SB09C	19.	4.22	3.	1.	1.	0.04	
+	2 COMBINED AT	CW09D	34.	4.08	5.	1.	1.	0.05	
+	ROUTED TO	DBW09C	10.	4.90	2.	0.	0.	0.05	3.76 4.90
+	ROUTED TO	RW09D	10.	4.95	2.	0.	0.	0.05	2779.44 4.93
+	HYDROGRAPH AT	SBW09B	10.	4.02	1.	0.	0.	0.00	
+	2 COMBINED AT	CW09B	10.	4.93	2.	1.	0.	0.06	
+	ROUTED TO	DBW09B	10.	5.07	2.	0.	0.	0.06	4.24 5.07
+	ROUTED TO	RW09B	9.	5.25	2.	0.	0.	0.06	2763.34 5.25
+	HYDROGRAPH AT	SBW09A	11.	4.05	1.	0.	0.	0.01	
+	2 COMBINED AT	CW09A	11.	4.05	2.	1.	0.	0.07	
+	ROUTED TO	DBW09A	9.	5.28	2.	0.	0.	0.07	4.69 5.28
+	HYDROGRAPH AT	SBW08A	16.	4.03	1.	0.	0.	0.01	
+	ROUTED TO	DBW08A	0.	4.90	0.	0.	0.	0.01	3.34 4.92
+	HYDROGRAPH AT	SBW07C	5.	4.07	0.	0.	0.	0.00	
+	ROUTED TO	DBW07C	2.	4.42	0.	0.	0.	0.00	3.87 4.42
+	HYDROGRAPH AT	SB07B	5.	4.13	1.	0.	0.	0.01	
+	ROUTED TO	DBW07B	2.	4.73	0.	0.	0.	0.01	3.82 4.73
+	2 COMBINED AT	CW07BC	3.	4.67	0.	0.	0.	0.01	
+	ROUTED TO	RW07BC	2.	4.82	0.	0.	0.	0.01	2793.27 4.82

+	HYDROGRAPH AT	SBW07A	17.	4.05	2.	0.	0.	0.01	
+	2 COMBINED AT	CW07A	17.	4.05	2.	1.	0.	0.03	
+	ROUTED TO	DBW07A	2.	5.35	0.	0.	0.	0.03	4.07 5.35
+	5 COMBINED AT	CLEAR	181.	4.30	37.	9.	7.	0.77	
+	HYDROGRAPH AT	SBW06A	7.	4.03	0.	0.	0.	0.00	
+	ROUTED TO	DBW06A	0.	0.00	0.	0.	0.	0.00	3.30 6.15
+	HYDROGRAPH AT	SBW05A	16.	4.03	1.	0.	0.	0.01	
+	ROUTED TO	DBW05A	0.	5.67	0.	0.	0.	0.01	4.50 5.68
+	HYDROGRAPH AT	SBW04A	4.	4.02	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SBW02A	7.	4.08	1.	0.	0.	0.01	
+	ROUTED TO	DBW02A	3.	4.40	0.	0.	0.	0.01	4.49 4.40
+	HYDROGRAPH AT	SBW01A	2.	4.07	0.	0.	0.	0.00	
+	6 COMBINED AT	CLEAR	184.	4.32	37.	10.	7.	0.79	

*** NORMAL END OF HEC-1 ***

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

Project: SERENO CANYON PHASE 4
Project No.: TOL1702.000
Location: SCOTTSDALE, AZ

HEC-1 Results - Proposed Conditions 10-yr, 6-hr

HEC-1 ID		Existing Condition Peak Discharge (A)	Developed Condition Peak Discharge (B)	(B) – (A)
Ex.Cond.	Prop.Cond.	[cfs]	[cfs]	[cfs]
CE01A	SB01A	92	59	-33
CE04A	DB04A	19	17	-2
CE065A	CE065A	46	55	9
CE11A	CE11A	22	15	-7
CE17A	DBE17A	25	0	-25
CE23A	DBE23A	62	0	-62
CE24A	DBE24A	26	1	-25
CE25A	DBE25A	11	0	-11
CW07A	DBW07A	17	2	-15
CW09A	DBW09A	43	9	-34
CW10A	DBW10A	48	9	-39
SBE02A	CE02A	31	29	-2
SBE03A	CE03A	6	3	-3
SBE08A	SB08A	1	1	0
SBE09A	SB09A	3	1	-2
SBE10A	SB10A	1	2	1
SBE12A	DBE12A	2	0	-2
SBE13A	DBE13A	3	0	-3
SBE16A	SBE16A	1	2	1
SBE18A	DBE18A	1	0	-1
SBE19A	SBE19A	1	2	1
SBE20A	SBE20A	1	2	1
SBE21A	SBE21A	1	2	1
SBE26A	DBE26A	7	0	-7
SBE27A	DBE27A	2	0	-2
SBE28A	DBE28A	10	0	-10
SBE29A	DBE29A	13	4	-9
SBW01A	SBW01A	2	2	0
SBW02A	DBW02A	6	3	-3
SBW04A	SBW04A	2	4	2
SBW05A	DBW05A	9	0	-9
SBW06A	DBW06A	4	0	-4
SBW08A	DBW08A	9	0	-9
SBW11A	SBW11A	2	2	0
SBW12A	DBW12A	18	1	-17
SBW13A	SBW13A	1	2	1
SBW14A	DBW14A	11	2	-9

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1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *             JUN   1998                *
 *           VERSION 4.1                 *
 *                                       *
 *  RUN DATE   07MAY18  TIME  09:26:59   *
 *                                       *
 *****************************************
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2-Year 6-Hour Model

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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
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X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX           XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
   1          ID        SERENO CANYON (PHASE 4) - DEVELOPED CONDITIONS
   2          ID        STORM EVENT: 2-YR, 6-HOUR
   3          ID        05/04/2018
   4          ID        PREPARED BY: SLATER HANIFAN GROUP
   5          ID       ********************************************************************************
   6          ID       ********************************************************************************
   7          ID        Flood Control District of Maricopa County
   8          ID        Sereno Canyon Developed Conditions
   9          ID        2 YEAR
  10          ID        6 Hour  Storm
  11          ID        Unit Hydrograph: Clark
  12          ID        09/18/2012
  13          ID        Sereno Canyon-Developed Conditions
  14          ID        2-Year, 6-Hour Storm Event
  15          ID        Prepared By: JE Fuller Hydrology and Geomorphology
  16          ID        Modeled By: Brian Schalk P.E., CFM and Nathan Logan P.E., CFM
  17          ID        Submitted To: City of Scottsdale
  18          ID       ********************************************************************************
  19          ID       ********************************************************************************
  20          IT       1 01DEC11       0    2000
  21          IO       5
  22          IN      15
              *DIAGRAM
              *
              *
  23          KK  SBE29A   BASIN
  24          KM        SBE29A Basin Runoff
  25          BA   0.015
  26          PB   1.421
  27          PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
  28          PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
  29          PC   0.962   0.972   0.983   0.991   1.000
  30          LG    0.20    0.25    6.00    0.23      10
  31          UC   0.300   0.306
  32          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
  33          UA     100
              *
  34          KK  DBE29A STORAGE
  35          KM    Retention Basin Storage/Outflow rating curve for Basin DBE29A
  36          RS       1    STOR       0
  37          SV    0.01    0.05    0.10    0.15    0.20    0.26    0.32    0.38    0.45    0.51
  38          SV    0.59    0.66    0.74    0.83    0.92    0.97
  39          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.49
  40          SQ    3.46    8.43   14.56   21.75   29.86   33.07
  41          SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
  42          SE    4.00    4.40    4.80    5.20    5.60    5.80
              *
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1 HEC-1 INPUT PAGE 2

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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  43          KK  SBE28A   BASIN
  44          KM        SBE28A Basin Runoff
  45          BA   0.013
  46          LG    0.29    0.25    6.00    0.20      17
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 47          UC   0.198   0.217
 48          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 49          UA     100
             *

 50          KK  DBE28A STORAGE
 51          KM    Retention Basin Storage/Outflow rating curve for Basin DBE28A
 52          RS       1    STOR       0
 53          SV    0.01    0.07    0.13    0.21    0.28    0.36    0.45    0.54    0.64    0.74
 54          SV    0.84    0.95    1.08
 55          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 56          SQ    6.93   19.60   36.01
 57          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 58          SE    5.00    5.50    6.00
             *

 59          KK  SBE27A   BASIN
 60          KM        SBE27A Basin Runoff
 61          BA   0.002
 62          LG    0.30    0.25    6.00    0.22      15
 63          UC   0.121   0.162
 64          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 65          UA     100
             *

 66          KK  DBE27A STORAGE
 67          KM    Retention Basin Storage/Outflow rating curve for Basin DBE27A
 68          RS       1    STOR       0
 69          SV    0.01    0.01    0.02    0.03    0.04    0.06    0.07    0.08    0.10    0.11
 70          SV    0.12    0.14    0.16    0.17    0.19    0.21
 71          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 72          SQ    0.01    0.96    2.64    4.81    7.38   10.29
 73          SE    0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
 74          SE    3.00    3.30    3.60    3.90    4.20    4.50
             *

 75          KK  SBE26A   BASIN
 76          KM        SBE26A Basin Runoff
 77          BA   0.010
 78          LG    0.26    0.25    6.00    0.20      31
 79          UC   0.196   0.267
 80          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 81          UA     100
             *

1                                        HEC-1 INPUT                                        PAGE  3

LINE        ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 82          KK  DBE26A STORAGE
 83          KM    Retention Basin Storage/Outflow rating curve for Basin DBE26A
 84          RS       1    STOR       0
 85          SV    0.01    0.06    0.12    0.19    0.26    0.33    0.41    0.49    0.58    0.67
 86          SV    0.76    0.87    0.98    1.11
 87          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 88          SQ    0.01    5.94   16.80   30.86
 89          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 90          SE    5.00    5.50    6.00    6.50
             *

 91          KK  SBE25C   BASIN
 92          KM        SBE25C Basin Runoff
 93          BA   0.005
 94          LG    0.27    0.25    6.00    0.18      17
 95          UC   0.144   0.162
 96          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 97          UA     100
             *

 98          KK  DBE25C STORAGE
 99          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25C
100          RS       1    STOR       0
101          SV    0.01    0.02    0.05    0.07    0.10    0.13    0.16    0.19    0.22    0.25
102          SV    0.28    0.31    0.35    0.39    0.43    0.47    0.47
103          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
104          SQ    2.87    8.53   15.86   24.66   34.72   45.79   47.52
105          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
106          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
             *

107          KK   RE25C   ROUTE
108          KM        Route runoff from SBE25C through Basin SBE25B
109          RS       1    FLOW
110          RC   0.060   0.060   0.060     709  0.0268 2694.40
111          RX    0.00   21.00   53.00   58.00   63.00   70.00   90.00   99.00
112          RY  2694.3 2691.90 2688.00 2687.00 2687.00 2689.00 2693.30 2694.40
             *

113          KK  SBE25B   BASIN
114          KM        SBE25B Basin Runoff
115          BA   0.006
116          LG    0.29    0.25    6.00    0.21      20
117          UC   0.183   0.252
118          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
119          UA     100
             *
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          120          KK   CE25B COMBINE
          121          KM        Combine Route RE25C and Basin SBE25B
          122          HC       2
                       *
1                                        HEC-1 INPUT                                                    PAGE  4

        LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          123          KK  DBE25B STORAGE
          124          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25B
          125          RS       1    STOR       0
          126          SV    0.01    0.05    0.09    0.14    0.19    0.25    0.30    0.36    0.42    0.49
          127          SV    0.55    0.62    0.70    0.78    0.84
          128          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.68    7.93
          129          SQ   16.80   27.91   40.62   54.86   56.70
          130          SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
          131          SE    4.00    4.40    4.80    5.20    5.50
                       *
          132          KK   RE25B   ROUTE
          133          KM        Route runoff from CE25B through Basin SBE25A
          134          RS       1    FLOW
          135          RC   0.060   0.060   0.060     412  0.0279 2680.70
          136          RX    0.00   16.00   29.00   32.00   32.10   36.00   47.00   67.00
          137          RY  2680.3 2678.70 2677.10 2676.00 2676.00 2676.90 2678.00 2680.70
                       *
          138          KK  SBE25A   BASIN
          139          KM        SBE25A Basin Runoff
          140          BA   0.003
          141          LG    0.25    0.25    6.00    0.20      38
          142          UC   0.122   0.156
          143          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          144          UA     100
                       *
          145          KK   CE25A COMBINE
          146          KM        Combine Route RE25B and Basin SBE25A
          147          HC       2
                       *
          148          KK  DBE25A STORAGE
          149          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25A
          150          RS       1    STOR       0
          151          SV    0.01    0.02    0.04    0.06    0.08    0.10    0.12    0.14    0.16    0.18
          152          SV    0.21    0.23    0.26    0.29    0.31    0.34    0.37    0.39
          153          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          154          SQ    0.01    0.01    1.12    5.87   13.22   22.40   33.27   41.15
          155          SE    0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
          156          SE    3.00    3.30    3.60    3.90    4.20    4.50    4.80    5.00
                       *
          157          KK   CLEAR COMBINE
          158          KM        Clear Hydrograph Stack
          159          HC       5
                       *
1                                        HEC-1 INPUT                                                    PAGE  5

        LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          160          KK  SBE24D   BASIN
          161          KM        SBE24D Basin Runoff
          162          BA   0.010
          163          LG    0.30    0.25    6.00    0.19       6
          164          UC   0.172   0.159
          165          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          166          UA     100
                       *
          167          KK  DBE24D STORAGE
          168          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24D
          169          RS       1    STOR       0
          170          SV    0.01    0.06    0.13    0.20    0.28    0.36    0.44    0.53    0.63    0.73
          171          SV    0.83
          172          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    5.94   16.80   30.86
          173          SQ   47.52
          174          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
          175          SE    5.00
                       *
          176          KK   RE24D   ROUTE
          177          KM        Route runoff from basin SBE24D through Basin SBE24C
          178          RS       1    FLOW
          179          RC   0.060   0.060   0.060     634  0.0252 2725.50
          180          RX    0.00   16.00   24.00   27.00   31.00   34.00   44.00   60.00
          181          RY  2725.5 2723.20 2721.80 2721.00 2721.00 2722.00 2723.00 2726.10
                       *
          182          KK  SBE24C   BASIN
          183          KM        SBE24C Basin Runoff
          184          BA   0.015
          185          LG    0.28    0.25    6.00    0.19      17
          186          UC   0.221   0.259
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187          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
188          UA     100
             *

189          KK   CE24C COMBINE
190          KM        Combine RE24D and SBE24C
191          HC        2
             *

192          KK  DBE24C STORAGE
193          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24C
194          RS        1    STOR        0
195          SV    0.01    0.08    0.17    0.25    0.35    0.45    0.55    0.66    0.77    0.89
196          SV    1.02    1.15    1.17
197          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.63   10.24   23.43
198          SQ   39.87   59.15   61.38
199          SE    0.10    0.50    0.90    1.40    1.80    2.30    2.70    3.20    3.60    4.10
200          SE    4.50    5.00    5.00
             *
1                                          HEC-1 INPUT                                          PAGE  6

        LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

201          KK   RE24C   ROUTE
202          KM        Route flow from CE24C through Basin SBE24B
203          RS        1    FLOW
204          RC   0.060   0.060   0.060     624  0.0232 2706.80
205          RX   10.00   25.00   45.00   49.00   55.00   62.00   75.00  103.00
206          RY  2706.8 2705.20 2702.10 2701.00 2701.00 2702.00 2703.30 2706.70
             *

207          KK  SBE24B   BASIN
208          KM        SBE24B Basin Runoff
209          BA   0.005
210          LG    0.28    0.25    6.00    0.18      15
211          UC   0.182   0.278
212          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
213          UA     100
             *

214          KK   CE24B COMBINE
215          KM        Combine RE24C and SBE24B
216          HC        2
             *

217          KK  DBE24B STORAGE
218          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24B
219          RS        1    STOR        0
220          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.43    0.51    0.60    0.70
221          SV    0.80    0.91    1.02    1.15    1.20
222          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.63   10.24   23.43
223          SQ   39.87   59.15   80.76   73.24   73.24
224          SE    0.10    0.50    0.90    1.40    1.80    2.30    2.70    3.20    3.60    4.10
225          SE    4.50    5.00    5.40    5.90    6.00
             *

226          KK   RE24B   ROUTE
227          KM        Route flow from CE24B through Basin SBE24A
228          RS        1    FLOW
229          RC   0.060   0.060   0.060     873  0.0229 2690.20
230          RX    0.00   10.00   16.00   23.00   27.00   35.00   49.00   67.00
231          RY  2689.8 2688.70 2687.90 2687.00 2687.00 2687.90 2688.80 2690.20
             *

232          KK  SBE24A   BASIN
233          KM        SBE24A Basin Runoff
234          BA   0.007
235          LG    0.27    0.25    6.00    0.20      29
236          UC   0.188   0.260
237          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
238          UA     100
             *
1                                          HEC-1 INPUT                                          PAGE  7

        LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

239          KK   CE24A COMBINE
240          KM        Combine RE24B and SBE24A
241          HC        2
             *

242          KK  DBE24A STORAGE
243          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24A
244          RS        1    STOR        0
245          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.44    0.52    0.62    0.71
246          SV    0.82    0.93
247          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    6.93   19.60
248          SQ   36.01   55.44
249          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
250          SE    5.00    5.50
             *

251          KK  SBE23D   BASIN
252          KM        SBE23D Basin Runoff
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          527          UA     100
                       *

          528          KK  SB11A1   BASIN
          529          KM        SB11A1 Basin Runoff
          530          BA   0.003
          531          LG    0.18    0.25    6.00   0.251      15
          532          UC   0.216   0.340
          533          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          534          UA     100
                       *

          535          KK   CE11A COMBINE
          536          KM        Combine flow from RE11B, SB11A and SB11A1
          537          HC       3
                       *

          538          KK   CLEAR COMBINE
          539          KM        Clear Hydrograph Stack
          540          HC       6
                       *

          541          KK   SB10A   BASIN
          542          KM        SB10A Basin Runoff
          543          BA   0.001
          544          LG    0.10    0.25    6.00   0.284
          545          UC   0.167   0.157
          546          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          547          UA     100
                       *

          548          KK   SB09A   BASIN
          549          KM        SB09A Basin Runoff
          550          BA   0.001
          551          LG    0.10    0.25    6.00   0.284
          552          UC   0.195   0.282
          553          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          554          UA     100
                       *

          555          KK   SB08A   BASIN
          556          KM        SB08A Basin Runoff
          557          BA   0.001
          558          LG    0.10    0.25    6.00   0.284
          559          UC   0.177   0.212
          560          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          561          UA     100
                       *
1                                                HEC-1 INPUT                                                PAGE 15

        LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          562          KK   CLEAR COMBINE
          563          KM        Clear Hydrograph Stack
          564          HC       4
                       *
                       *

          565          KK  SB06D1   BASIN
          566          KM        SB06D1 Basin Runoff
          567          BA   0.004
          568          LG    0.10    0.25    6.00   0.276      24
          569          UC   0.281   0.533
          570          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          571          UA     100
                       *

          572          KK  SB06D2   BASIN
          573          KM        SB06D2 Basin Runoff
          574          BA   0.009
          575          LG    0.25    0.25    6.00   0.216      30
          576          UC   0.189   0.255
          577          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          578          UA     100
                       *

          579          KK   CE06D COMBINE
          580          KM        Combine flow from SB06D1 and SB06D2
          581          HC       2
                       *

          582          KK  DB06D1 STORAGE
          583          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06D
          584          RS       1    STOR       0
          585          SV    0.01    0.12    0.26    0.44    0.64    0.64
          586          SQ    0.01       3       9      12      15      31
          587          SE    2795    2796    2797    2798    2799  2799.3
                       *

          588          KK  SB06C1   BASIN
          589          KM        SB06C1 Basin Runoff
          590          BA   0.015
          591          LG    0.10    0.25    6.00   0.272      40
          592          UC   0.307   0.428
          593          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
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          594          UA     100
                       *

          595          KK  CE06CD COMBINE
          596          KM        Combine flow from DB06D1 and SB06C1
          597          HC       2
                       *
1                                                HEC-1 INPUT                                                PAGE 16

        LINE           ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          598          KK  DB06C1 STORAGE
          599          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06C
          600          RS       1    STOR       0
          601          SV    0.01    0.10    0.23    0.41
          602          SQ    0.01       9      24      41
          603          SE    2792    2793    2794    2795
                       *

          604          KK  SB06C2   BASIN
          605          KM        SB06C2 Basin Runoff
          606          BA   0.020
          607          LG    0.10    0.25    6.00   0.284
          608          UC   0.575   1.087
          609          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          610          UA     100
                       *

          611          KK  SB06C3   BASIN
          612          KM        SB06C3 Basin Runoff
          613          BA   0.005
          614          LG    0.25    0.25    6.00   0.216      30
          615          UC   0.151   0.181
          616          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          617          UA     100
                       *

          618          KK   CE06C COMBINE
          619          KM        Combine flow from SB06C2 and SB06C3
          620          HC       2
                       *

          621          KK  DB06C2 STORAGE
          622          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06C
          623          RS       1    STOR       0
          624          SV    0.01    0.08    0.19    0.32    0.49
          625          SQ    0.01       4      13      20      22
          626          SE    2788    2789    2790    2791    2792
                       *

          627          KK  CE06CI COMBINE
          628          KM        Combine flow from DB06C2 and DB06C1
          629          HC       2
                       *

          630          KK   RE06C   ROUTE
          631          KM        Route flow from CE06CI through Basin SBE06B
          632          RS       1    FLOW
          633          RC   0.060   0.060   0.060     591  0.0431 2786.60
          634          RX    0.00    6.00   16.00   26.00   36.00   40.00   41.00   44.00
          635          RY  2786.6 2786.00 2785.00 2784.00 2784.00 2785.00 2785.50 2786.40
                       *
1                                                HEC-1 INPUT                                                PAGE 17

        LINE           ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          636          KK  SB06B1   BASIN
          637          KM        SB06B1 Basin Runoff
          638          BA   0.003
          639          LG    0.18    0.25    6.00   0.251      15
          640          UC   0.227   0.383
          641          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          642          UA     100
                       *

          643          KK  CE06CI COMBINE
          644          KM        Combine flow from SB06B1 and RE06C
          645          HC       2
                       *

          646          KK   RE06B   ROUTE
          647          KM        Route flow from CE06CI through Basin SB06B
          648          RS       1    FLOW
          649          RC   0.060   0.060   0.060     814  0.0319 2761.00
          650          RX    0.00   21.00   55.00   63.00   82.00   92.00  104.00  113.00
          651          RY  2761.0 2758.90 2758.50 2758.00 2758.00 2758.50 2759.70 2760.80
                       *

          652          KK   SB06B   BASIN
          653          KM        SB06B Basin Runoff
          654          BA   0.004
          655          LG    0.10    0.25    6.00   0.284
          656          UC   0.491   1.248
          657          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
          658          UA     100
                       *

          659          KK   SB06A   BASIN
          660          KM        SB06A Basin Runoff
          661          BA   0.006
          662          LG    0.25    0.25    6.00   0.216      30
          663          UC   0.135   0.136
          664          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          665          UA     100
                       *

          666          KK   DB06A STORAGE
          667          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06A
          668          RS       1    STOR       0
          669          SV    0.01    0.02    0.08    0.16    0.26
          670          SQ    0.01       1       6      11      14
          671          SE  2752.5    2753    2754    2755    2756
                       *

          672          KK   CE06A COMBINE
          673          KM        Combine flow from DB06A, SB06B and RE06B
          674          HC       3
                       *
1                                                HEC-1 INPUT                                                PAGE 18

        LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          675          KK  SB05B1   BASIN
          676          KM        SB05B1 Basin Runoff
          677          BA   0.007
          678          LG    0.10    0.25    6.00   0.284
          679          UC   0.314   0.379
          680          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          681          UA     100
                       *

          682          KK  DB05B1 STORAGE
          683          KM    Retention Basin Storage/Outflow rating curve for Basin DBE05B
          684          KM    Outlet control structure
          685          RS       1    STOR       0
          686          SV    0.01    0.02    0.06    0.11
          687          SQ    0.01    0.01       9      13
          688          SE    2810    2811    2812    2813
                       *

          689          KK  SB05B2   BASIN
          690          KM        SB05B2 Basin Runoff
          691          BA   0.006
          692          LG    0.10    0.25    6.00   0.284
          693          UC   0.373   0.655
          694          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          695          UA     100
                       *

          696          KK   CE05B COMBINE
          697          KM        Combine flow from DB05B1 and Basin SBE05B2
          698          HC       2
                       *

          699          KK  DB05B2 STORAGE
          700          KM    Retention Basin Storage/Outflow rating curve for Basin DBE05B
          701          RS       1    STOR       0
          702          SV    0.01    0.01    0.02   0.044
          703          SQ    0.01    0.01      18      24
          704          SE    2800    2801    2802    2803
                       *

          705          KK   RE05B   ROUTE
          706          KM        Route flow from SBE05B through SBE05A
          707          RS       1    FLOW
          708          RC   0.060   0.060   0.060     907  0.0435 2760.30
          709          RX    0.00   11.00   26.00   40.00   47.00   56.00   76.00   89.00
          710          RY  2760.1 2759.00 2757.70 2757.00 2757.00 2757.40 2758.80 2760.30
                       *

          711          KK  SB05B3   BASIN
          712          KM        SB05B3 Basin Runoff
          713          BA   0.004
          714          LG    0.25    0.25    6.00   0.216      30
          715          UC   0.167   0.272
          716          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1                                                HEC-1 INPUT                                                PAGE 19

        LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

          717          UA     100
                       *

          718          KK  SB05B4   BASIN
          719          KM        SB05B4 Basin Runoff
          720          BA   0.004
          721          LG    0.18    0.25    6.00   0.251      15
          722          UC   0.218   0.271
          723          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
 724          UA     100
              *

 725          KK  CE05B3 COMBINE
 726          KM        Combine flow from SB05B4, SB05B3 and RE05B
 727          HC       3
              *

 728          KK  DB05B3 STORAGE
 729          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06A
 730          RS       1    STOR       0
 731          SV    0.01    0.01    0.03   0.084
 732          SQ    0.01       8      25      36
 733          SE    2782    2783    2784    2785
              *

 734          KK  RE05B3   ROUTE
 735          KM        Route flow from DB05B3 through SBE05A
 736          RS       1    FLOW
 737          RC   0.060   0.060   0.060     907  0.0435 2760.30
 738          RX    0.00   11.00   26.00   40.00   47.00   56.00   76.00   89.00
 739          RY  2760.1 2759.00 2757.70 2757.00 2757.00 2757.40 2758.80 2760.30
              *

 740          KK   SB05A   BASIN
 741          KM        SB05A Basin Runoff
 742          BA   0.004
 743          LG    0.10    0.25    6.00   0.284
 744          UC   0.474   1.240
 745          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 746          UA     100
              *

 747          KK  CE065A COMBINE
 748          KM        Combine flow from SB05A, RE05B3 and CE06A
 749          HC       3
              *

 750          KK   SB04C   BASIN
 751          KM        SB04C Basin Runoff
 752          BA   0.002
 753          LG    0.10    0.25    6.00   0.269      10
 754          UC   0.298   0.652
 755          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 756          UA     100
              *
1                                      HEC-1 INPUT                                          PAGE 20

        LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 757          KK   SB04B   BASIN
 758          KM        SB04B Basin Runoff
 759          BA   0.011
 760          LG    0.25    0.25    6.00   0.216      30
 761          UC   0.196   0.270
 762          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 763          UA     100
              *

 764          KK   CE04B COMBINE
 765          KM        Combine flow from SB04C and SB04B
 766          HC       2
              *

 767          KK   DB04B STORAGE
 768          KM    Retention Basin Storage/Outflow rating curve for Basin DBE04C
 769          RS       1    STOR       0
 770          SV    0.01    0.06    0.15   0.261  0.0262
 771          SQ    0.01       5      13      21      27
 772          SE    2755    2756    2757    2758  2758.2
              *

 773          KK   RE04C   ROUTE
 774          KM        Route flow from DB04B into SBE04A
 775          RS       1    FLOW
 776          RC   0.060   0.060   0.060     455  0.0363 2755.00
 777          RX    0.00   17.00   22.00   27.00   32.00   44.00   61.00   88.00
 778          RY  2755.0 2753.00 2751.90 2750.00 2750.00 2751.90 2753.20 2754.90
              *

 779          KK   SB04A   BASIN
 780          KM        SB04A Basin Runoff
 781          BA   0.008
 782          LG    0.25    0.25    6.00   0.216      30
 783          UC   0.162   0.186
 784          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 785          UA     100
              *

 786          KK   CE04A COMBINE
 787          KM        Combine Flows from RE04C and SB04A
 788          HC       2
              *

 789          KK  DBE04A STORAGE
```

```
          790          KM    Retention Basin Storage/Outflow rating curve for Basin DB04A
          791          RS       1    STOR       0
          792          SV    0.01    0.05    0.16    0.30    0.47    0.67
          793          SQ    0.01       2      10      17      22      28
          794          SE  2738.5    2739    2740    2741    2742    2743
                       *
1                                        HEC-1 INPUT                                                PAGE 21

        LINE           ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          795          KK  SB03A1   BASIN
          796          KM        SB03A1 Basin Runoff
          797          BA   0.002
          798          LG    0.10    0.25    6.00   0.284
          799          UC   0.394   1.048
          800          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          801          UA     100
                       *

          802          KK  DB03A1 STORAGE
          803          KM    Retention Basin Storage/Outflow rating curve for Basin DBE03A1
          804          RS       1    STOR       0
          805          SV    0.01    0.07    0.16    0.27    0.40
          806          SQ    0.01       3       7      13      20
          807          SE    2750    2751    2752    2753    2754
                       *

          808          KK   SB03A   BASIN
          809          KM        SB03A Basin Runoff
          810          BA   0.003
          811          LG    0.10    0.25    6.00   0.284
          812          UC   0.266   0.340
          813          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          814          UA     100
                       *

          815          KK   CE03A COMBINE
          816          KM        Combine Flows from DB03A and SB03A
          817          HC       2
                       *

          818          KK  SB02A1   BASIN
          819          KM        SB02A1 Basin Runoff
          820          BA   0.059
          821          LG    0.10    0.25    6.00   0.284
          822          UC   0.641   0.881
          823          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          824          UA     100
                       *

          825          KK  DB02A1 STORAGE
          826          KM    Retention Basin Storage/Outflow rating curve for Basin DB02A1
          827          RS       1    STOR       0
          828          SV    0.01    0.04    0.14    0.25    0.26
          829          SQ    0.01       6      21      48      70
          830          SE  2789.5    2790    2791    2792    2793
                       *

          831          KK   R02A1   ROUTE
          832          KM        Route flow from SB02A1 into SB02A3
          833          RS       1    FLOW
          834          RC   0.060   0.060   0.060     455  0.0363 2755.00
          835          RX    0.00   17.00   22.00   27.00   32.00   44.00   61.00   88.00
          836          RY  2755.0 2753.00 2751.90 2750.00 2750.00 2751.90 2753.20 2754.90
                       *
1                                        HEC-1 INPUT                                                PAGE 22

        LINE           ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          837          KK  SB02A2   BASIN
          838          KM        SB02A2 Basin Runoff
          839          BA   0.003
          840          LG    0.25    0.25    6.00   0.216      30
          841          UC   0.154   0.265
          842          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          843          UA     100
                       *

          844          KK  DB02A2 STORAGE
          845          KM    Retention Basin Storage/Outflow rating curve for Basin DB02A2
          846          KM    Outlet control structure
          847          RS       1    STOR       0
          848          SV    0.01    0.14    0.32    0.53
          849          SQ    0.01    0.01    0.01       4
          850          SE    2762    2763    2764    2765
                       *

          851          KK  SB02A3   BASIN
          852          KM        SB02A3 Basin Runoff
          853          BA   0.003
          854          LG    0.10    0.25    6.00   0.284
          855          UC   0.337   0.629
          856          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          857          UA     100
```

```
                *
          858   KK  CE02A COMBINE
          859   KM       Combine Flows from R02A1, DB02A2 and SB02A3
          860   HC     3
                *
          861   KK  SB01A   BASIN
          862   KM       SB01A Basin Runoff
          863   BA  0.119
          864   LG   0.10    0.25    6.00    0.28       1
          865   UC  0.709   0.830
          866   UA     0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          867   UA   100
                *
          868   KK  CLEAR COMBINE
          869   KM       Clear Hydrograph Stack
          870   HC     6
                *
          871   KK  SBW14A   BASIN
          872   KM       SBW14A Basin Runoff
          873   BA  0.009
          874   LG   0.28    0.25    6.00    0.20       4
          875   UC  0.167   0.137
          876   UA     0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          877   UA   100
                *
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     LINE     ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          878   KK  DBW14A STORAGE
          879   KM   Retention Basin Storage/Outflow rating curve for Basin DBW14A
          880   RS      1    STOR       0
          881   SV   0.01    0.04    0.07    0.11    0.15    0.19    0.23    0.28    0.32    0.37
          882   SV   0.42    0.47    0.52    0.58    0.63    0.70
          883   SQ   0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.84
          884   SQ   2.97    6.04    9.74   13.95   18.64   23.76
          885   SE   0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
          886   SE   3.00    3.30    3.60    3.90    4.20    4.50
                *
          887   KK  SBW13A   BASIN
          888   KM       SBW13A Basin Runoff
          889   BA  0.001
          890   LG   0.30    0.25    6.00    0.18       5
          891   UC  0.084   0.092
          892   UA     0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          893   UA   100
                *
          894   KK  SBW12A   BASIN
          895   KM       SBW12A Basin Runoff
          896   BA  0.017
          897   LG   0.29    0.25    6.00    0.19      13
          898   UC  0.172   0.141
          899   UA     0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          900   UA   100
                *
          901   KK  DBW12A STORAGE
          902   KM   Retention Basin Storage/Outflow rating curve for Basin DBW12A
          903   RS      1    STOR       0
          904   SV   0.01    0.08    0.16    0.24    0.33    0.43    0.53    0.64    0.75    0.87
          905   SV   0.99    1.13    1.27    1.43
          906   SQ   0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          907   SQ   5.94   16.80   30.86   47.52
          908   SE   0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
          909   SE   5.00    5.50    6.00    6.50
                *
          910   KK  SBW11A   BASIN
          911   KM       SBW11A Basin Runoff
          912   BA  0.001
          913   LG   0.30    0.25    6.00    0.18       5
          914   UC  0.072   0.062
          915   UA     0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          916   UA   100
                *
1                                        HEC-1 INPUT                                        PAGE 24

     LINE     ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          917   KK  CLEAR COMBINE
          918   KM       Clear Hydrograph Stack
          919   HC     5
                *
          920   KK  SB10C1   BASIN
          921   KM       SB10C1 Basin Runoff
          922   BA  0.009
          923   LG   0.25    0.25    6.00   0.216      30
```

```
924          UC   0.201   0.283
925          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
926          UA     100
             *

927          KK  SB10C2   BASIN
928          KM        SB10C2 Basin Runoff
929          BA   0.008
930          LG    0.25    0.25    6.00   0.216      30
931          UC   0.214   0.312
932          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
933          UA     100
             *

934          KK  SB10C3   BASIN
935          KM        SB10C3 Basin Runoff
936          BA   0.004
937          LG    0.10    0.25    6.00   0.254      20
938          UC   0.319   0.503
939          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
940          UA     100
             *

941          KK   CW10C COMBINE
942          KM        Combine flow from SB10C1, SB10C2 and SB10C3
943          HC       3
             *

944          KK   DB10C STORAGE
945          KM    Retention Basin Storage/Outflow rating curve for Basin DB10C
946          RS       1    STOR       0
947          SV    0.01    0.15    0.34    0.57    0.83
948          SQ    0.01      10      33      47      65
949          SE    2767    2768    2769    2770    2771
             *

950          KK   RW10C   ROUTE
951          KM        Route flow from SBW10C through Basin SBW10B
952          RS       2    FLOW
953          RC   0.060   0.060   0.060     952  0.0310 2757.80
954          RX    0.00   34.00   47.00   62.00   62.10   68.00   73.00   78.00
955          RY  2757.8 2754.40 2754.00 2752.10 2752.00 2753.70 2755.70 2757.50
             *
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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

956          KK   SB10B   BASIN
957          KM        SB10B Basin Runoff
958          BA   0.009
959          LG    0.26    0.25    6.00   0.195      33
960          UC   0.186   0.259
961          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
962          UA     100
             *

963          KK   CW10B COMBINE
964          KM        Combine flow from RW10C and SBW10B
965          HC       2
             *

966          KK  DBW10B STORAGE
967          KM    Retention Basin Storage/Outflow rating curve for Basin DBW10B
968          RS       1    STOR       0
969          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.44    0.53    0.62    0.73
970          SV    0.84    0.95    1.08    1.22    1.30
971          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
972          SQ    0.01    0.01    0.01    2.27   12.37
973          SE    0.10    0.60    1.20    1.80    2.40    3.00    3.60    4.20    4.80    5.40
974          SE    6.00    6.60    7.20    7.80    8.20
             *

975          KK   RW10B   ROUTE
976          KM        Route flow from CE10WB through Basin SBW10A
977          RS       1    FLOW
978          RC   0.060   0.060   0.060     653  0.0276 2732.00
979          RX    0.00   68.00   75.00   79.00   86.00   92.00  106.00  150.00
980          RY  2732.0 2728.10 2721.10 2726.10 2726.00 2726.60 2727.00 2732.00
             *

981          KK  SB10AW   BASIN
982          KM        SB10AW Basin Runoff
983          BA   0.029
984          LG    0.26    0.25    6.00   0.189      28
985          UC   0.224   0.207
986          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
987          UA     100
             *

988          KK   CW10A COMBINE
989          KM        Combine flow from RW10B and SBW10A
990          HC       2
             *

991          KK  DBW10A STORAGE
```

```
 992          KM    Retention Basin Storage/Outflow rating curve for Basin DBW10A
 993          RS       1    STOR       0
 994          SV    0.01    0.20    0.41    0.63    0.87    1.12    1.40    1.69    2.00    2.33
 995          SV    2.68    3.07    3.50    3.98    4.15
 996          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   14.68
 997          SQ   56.00  113.58  182.88  189.00  189.00
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 998          SE    0.10    0.60    1.20    1.80    2.40    3.00    3.60    4.20    4.80    5.40
 999          SE    6.00    6.60    7.20    7.80    8.00
              *

1000          KK   SB09E   BASIN
1001          KM        SB09E Basin Runoff
1002          BA   0.005
1003          LG    0.10    0.25    6.00   0.284
1004          UC   0.354   0.607
1005          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1006          UA     100
              *

1007          KK   DB09E STORAGE
1008          KM    Retention Basin Storage/Outflow rating curve for Basin DB09E
1009          RS       1    STOR       0
1010          SV    0.01    0.06    0.14    0.24    0.37    0.52
1011          SQ    0.01       3       9      13      16      19
1012          SE    2826    2827    2828    2829    2830    2831
              *

1013          KK   RW09E   ROUTE
1014          KM        Route flow from SBW09E through Basin SBW09D
1015          RS       1    FLOW
1016          RC   0.060   0.060   0.060     985  0.0442 2805.10
1017          RX    0.00   10.00   12.00   14.00   17.00   23.00   29.00   48.00
1018          RY  2805.3 2803.10 2802.10 2800.70 2800.70 2802.00 2802.90 2805.10
              *

1019          KK   SB09D1   BASIN
1020          KM        SB09D1 Basin Runoff
1021          BA   0.009
1022          LG    0.24    0.25    6.00   0.216      30
1023          UC   0.155   0.173
1024          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1025          UA     100
              *

1026          KK   SB09D2   BASIN
1027          KM        SB09D2 Basin Runoff
1028          BA   0.005
1029          LG    0.25    0.25    6.00   0.216      30
1030          UC   0.199   0.377
1031          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1032          UA     100
              *

1033          KK   CW09DI COMBINE
1034          HC       3
              *
1                                    HEC-1 INPUT                                          PAGE 27

LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1035          KK   SB09C   BASIN
1036          KM        SB09C Basin Runoff
1037          BA   0.036
1038          LG    0.10    0.25    6.00   0.284
1039          UC   0.575   0.801
1040          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1041          UA     100
              *

1042          KK   CW09D COMBINE
1043          KM        Combine flow from CW09DI and SBW09C
1044          HC       2
              *

1045          KK   DBW09C STORAGE
1046          KM    Retention Basin Storage/Outflow rating curve for Basin DBW09C
1047          RS       1    STOR       0
1048          SV    0.01    0.21    0.43    0.66    0.90    1.16    1.44    1.73    2.05    2.41
1049          SV    2.79
1050          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   19.80   56.00
1051          SQ  102.88
1052          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1053          SE    5.00
              *

1054          KK   RW09D   ROUTE
1055          KM        Route flow from CW09D through Basin SBW09B
1056          RS       1    FLOW
1057          RC   0.060   0.060   0.060     367  0.0368 2782.10
1058          RX    0.00   11.00   27.00   31.00   38.00   42.00   73.00   90.00
1059          RY  2782.1 2780.10 2780.00 2779.00 2779.00 2779.50 2780.90 2781.30
```

```
                *
1060            KK  SBW09B   BASIN
1061            KM        SBW09B Basin Runoff
1062            BA   0.005
1063            LG    0.27    0.25    6.00    0.20      29
1064            UC   0.125   0.129
1065            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1066            UA     100
                *

1067            KK  CW09B COMBINE
1068            KM        Combine flow from RW09D and SBW09B
1069            HC       2
                *

1070            KK  DBW09B STORAGE
1071            KM    Retention Basin Storage/Outflow rating curve for Basin DBW09B
1072            RS       1    STOR       0
1073            SV    0.01    0.05    0.10    0.15    0.21    0.27    0.34    0.40    0.48    0.55
1074            SV    0.63    0.72
1075            SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   20.79
1076            SQ   58.80  108.02
1                                          HEC-1 INPUT                                          PAGE 28

LINE            ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1077            SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1078            SE    5.00    5.50
                *

1079            KK   RW09B   ROUTE
1080            KM        Route flow from CW09B through Basin SBW09A
1081            RS       1    FLOW
1082            RC   0.060   0.060   0.060    1036  0.0415 2765.60
1083            RX    0.00    8.00   49.00   58.00   67.00   72.00   85.00  104.00
1084            RY  2764.9 2764.80 2764.00 2763.00 2763.00 2764.00 2765.10 2765.60
                *

1085            KK  SBW09A   BASIN
1086            KM        SBW09A Basin Runoff
1087            BA   0.008
1088            LG    0.27    0.25    6.00    0.20      24
1089            UC   0.185   0.266
1090            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1091            UA     100
                *

1092            KK   CW09A COMBINE
1093            KM        Combine flow from RW09B and SBW09A
1094            HC       2
                *

1095            KK  DBW09A STORAGE
1096            KM    Retention Basin Storage/Outflow rating curve for Basin DBW09A
1097            RS       1    STOR       0
1098            SV    0.01    0.04    0.08    0.12    0.17    0.21    0.26    0.32    0.37    0.43
1099            SV    0.50    0.57    0.64
1100            SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1101            SQ   22.77   64.40  118.31
1102            SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1103            SE    5.00    5.50    6.00
                *

1104            KK  SBW08A   BASIN
1105            KM        SBW08A Basin Runoff
1106            BA   0.009
1107            LG    0.27    0.25    6.00    0.18      21
1108            UC   0.150   0.160
1109            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1110            UA     100
                *

1111            KK  DBW08A STORAGE
1112            KM    Retention Basin Storage/Outflow rating curve for Basin DBW08A
1113            RS       1    STOR       0
1114            SV    0.01    0.04    0.09    0.14    0.18    0.24    0.29    0.34    0.40    0.46
1115            SV    0.52    0.58    0.65    0.71    0.79    0.86    0.87
1116            SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1117            SQ    0.01    1.09    5.33   11.85   20.01   29.39   30.86
1118            SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1119            SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
                *
1                                          HEC-1 INPUT                                          PAGE 29

LINE            ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1120            KK  SBW07C   BASIN
1121            KM        SBW07C Basin Runoff
1122            BA   0.005
1123            LG    0.21    0.25    6.00    0.23       3
1124            UC   0.248   0.372
1125            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1126            UA     100
                *
```

```
1127          KK  DBW07C STORAGE
1128          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07C
1129          RS       1    STOR       0
1130          SV    0.01    0.01    0.02    0.03    0.04    0.05    0.07    0.08    0.09    0.11
1131          SV    0.12    0.14    0.16    0.18    0.20    0.22    0.22
1132          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1133          SQ    0.01    0.55    2.66    5.93   10.00   14.69   15.43
1134          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1135          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
              *

1136          KK   SB07B   BASIN
1137          KM        SB07B Basin Runoff
1138          BA   0.007
1139          LG    0.10    0.25    6.00   0.284
1140          UC   0.381   0.639
1141          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1142          UA     100
              *

1143          KK  DBW07B STORAGE
1144          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07B
1145          RS       1    STOR       0
1146          SV    0.01    0.01    0.03    0.04    0.05    0.07    0.09    0.10    0.12    0.14
1147          SV    0.17    0.19    0.21    0.24    0.27    0.29    0.30
1148          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1149          SQ    0.01    0.55    2.66    5.93   10.00   14.69   15.43
1150          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1151          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
              *

1152          KK  CW07BC COMBINE
1153          KM        Combine flow from SBW07C andSBW07B
1154          HC       2
              *

1155          KK  RW07BC   ROUTE
1156          KM        Route flow from CW07BC through SBW07A
1157          RS       1    FLOW
1158          RC   0.060   0.060   0.060    1452  0.0465 2800.10
1159          RX    0.00    6.00   20.00   26.00   29.00   38.00   50.00   68.00
1160          RY  2800.1 2799.00 2796.00 2793.00 2793.00 2796.00 2797.00 2798.40
              *
```



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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1161          KK  SBW07A   BASIN
1162          KM        SBW07A Basin Runoff
1163          BA   0.013
1164          LG    0.28    0.25    6.00    0.20      22
1165          UC   0.207   0.293
1166          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1167          UA     100
              *

1168          KK   CW07A COMBINE
1169          KM        Combine flow from RW07BC and SBW07A
1170          HC       2
              *

1171          KK  DBW07A STORAGE
1172          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07A
1173          RS       1    STOR       0
1174          SV    0.01    0.09    0.18    0.28    0.39    0.50    0.62    0.74    0.88    1.01
1175          SV    1.16    1.32
1176          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   10.89
1177          SQ   30.80   56.58
1178          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1179          SE    5.00    5.50
              *

1180          KK   CLEAR COMBINE
1181          HC       5
              *

1182          KK  SBW06A   BASIN
1183          KM        SBW06A Basin Runoff
1184          BA   0.004
1185          LG    0.29    0.25    6.00    0.18      11
1186          UC   0.136   0.173
1187          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1188          UA     100
              *

1189          KK  DBW06A STORAGE
1190          KM    Retention Basin Storage/Outflow rating curve for Basin DBW06A
1191          RS       1    STOR       0
1192          SV    0.01    0.02    0.03    0.05    0.07    0.09    0.11    0.14    0.16    0.19
1193          SV    0.21    0.24    0.28    0.31    0.34    0.38    0.39
1194          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1195          SQ    0.01    0.55    2.66    5.93   10.00   14.69   15.43
1196          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1197          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
```

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                    *
1                                        HEC-1 INPUT                                                    PAGE 31

          LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


          1198      KK  SBW05A   BASIN
          1199      KM        SBW05A Basin Runoff
          1200      BA   0.010
          1201      LG    0.29    0.25    6.00    0.19      11
          1202      UC   0.172   0.200
          1203      UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1204      UA     100
                    *

          1205      KK  DBW05A STORAGE
          1206      KM    Retention Basin Storage/Outflow rating curve for Basin DBW05A
          1207      RS       1    STOR       0
          1208      SV    0.01    0.05    0.09    0.15    0.20    0.26    0.32    0.38    0.45    0.52
          1209      SV    0.59    0.67    0.76
          1210      SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          1211      SQ    5.94   16.80   30.86
          1212      SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
          1213      SE    5.00    5.50    6.00
                    *

          1214      KK  SBW04A   BASIN
          1215      KM        SBW04A Basin Runoff
          1216      BA   0.002
          1217      LG    0.30    0.25    6.00    0.18       5
          1218      UC   0.108   0.128
          1219      UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1220      UA     100
                    *

          1221      KK  SBW02A   BASIN
          1222      KM        SBW02A Basin Runoff
          1223      BA   0.007
          1224      LG    0.18    0.25    6.00    0.24       2
          1225      UC   0.281   0.387
          1226      UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1227      UA     100
                    *

          1228      KK  DBW02A STORAGE
          1229      KM    Retention Basin Storage/Outflow rating curve for Basin DBW02A
          1230      RS       1    STOR       0
          1231      SV    0.01    0.01    0.03    0.05    0.06    0.08    0.10    0.12    0.14    0.16
          1232      SV    0.18    0.20    0.22    0.25    0.27
          1233      SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          1234      SQ    0.01    2.20    6.04   11.07   15.43
          1235      SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
          1236      SE    4.00    4.40    4.80    5.20    5.50
                    *
1                                        HEC-1 INPUT                                                    PAGE 32

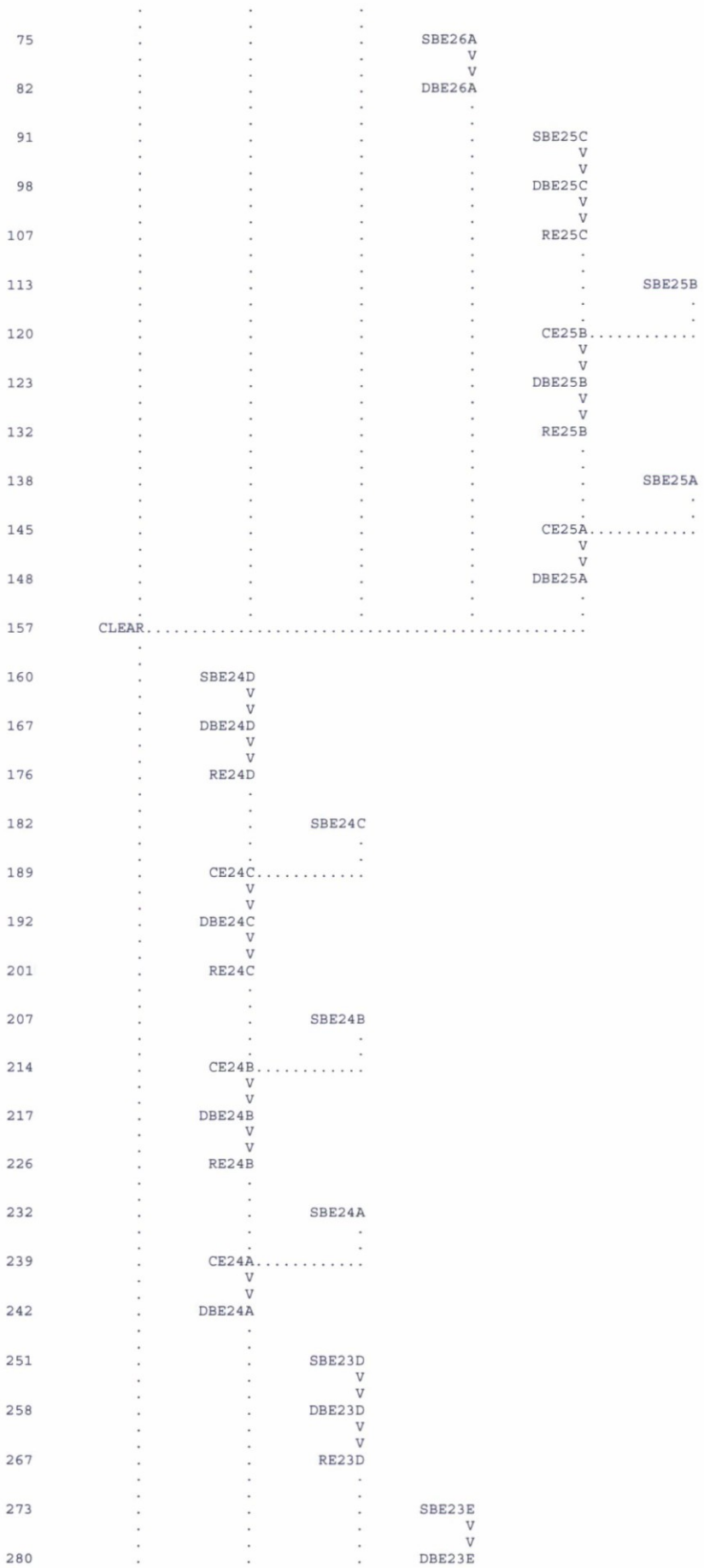
          LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

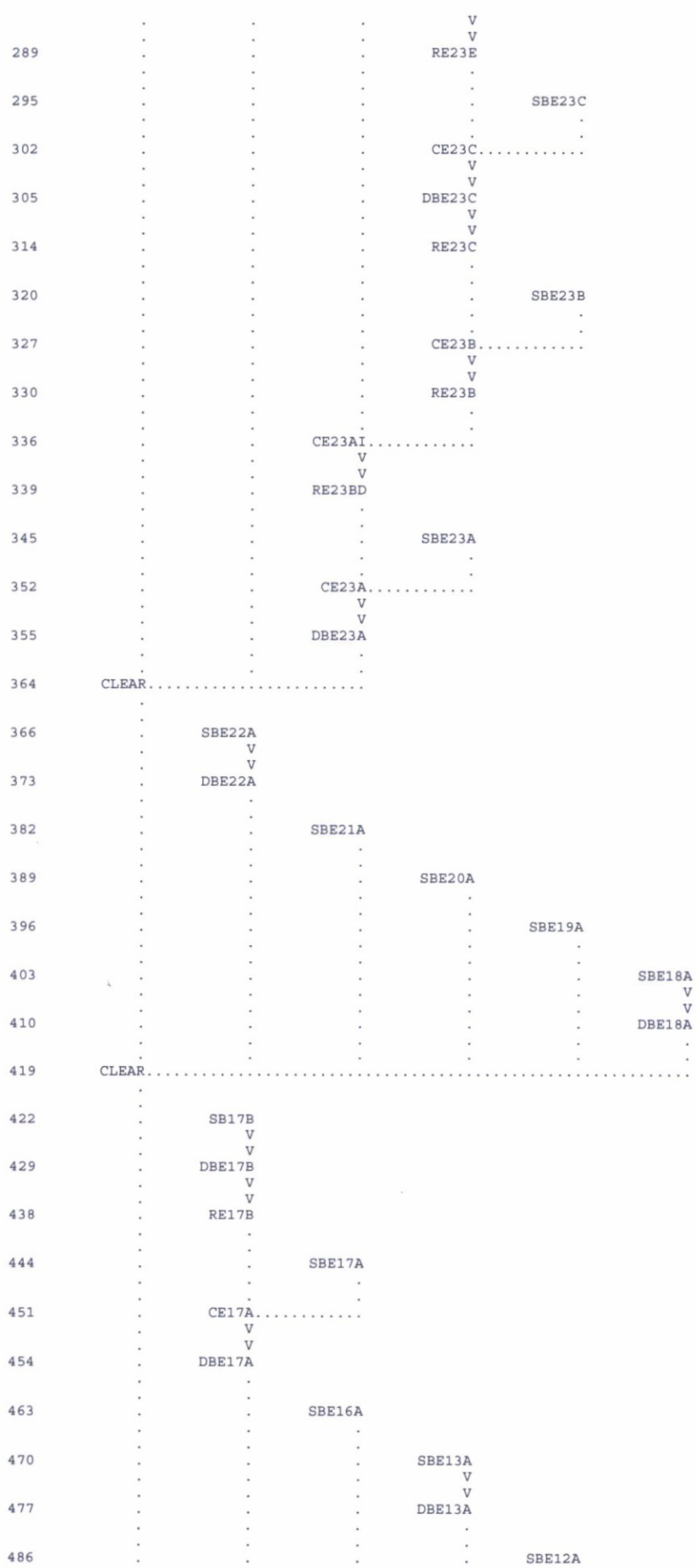

          1237      KK  SBW01A   BASIN
          1238      KM        SBW01A Basin Runoff
          1239      BA   0.002
          1240      LG    0.14    0.25    6.00    0.26       1
          1241      UC   0.220   0.316
          1242      UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1243      UA     100
                    *

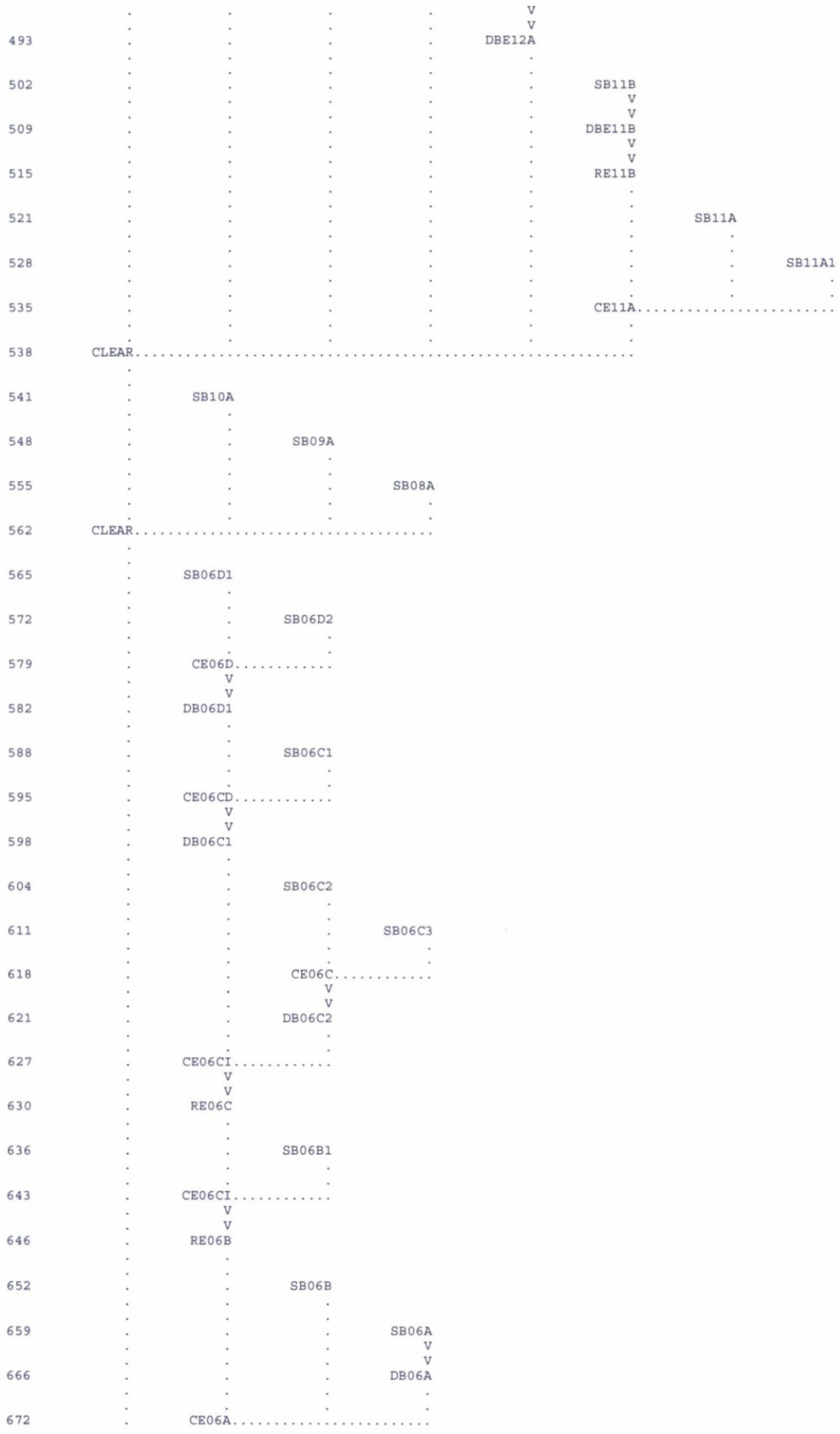
          1244      KK   CLEAR COMBINE
          1245      KM        Clear Hydrograph Stack
          1246      HC        6
                    *
          1247      ZZ
1
               SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING           (--->) DIVERSION OR PUMP FLOW

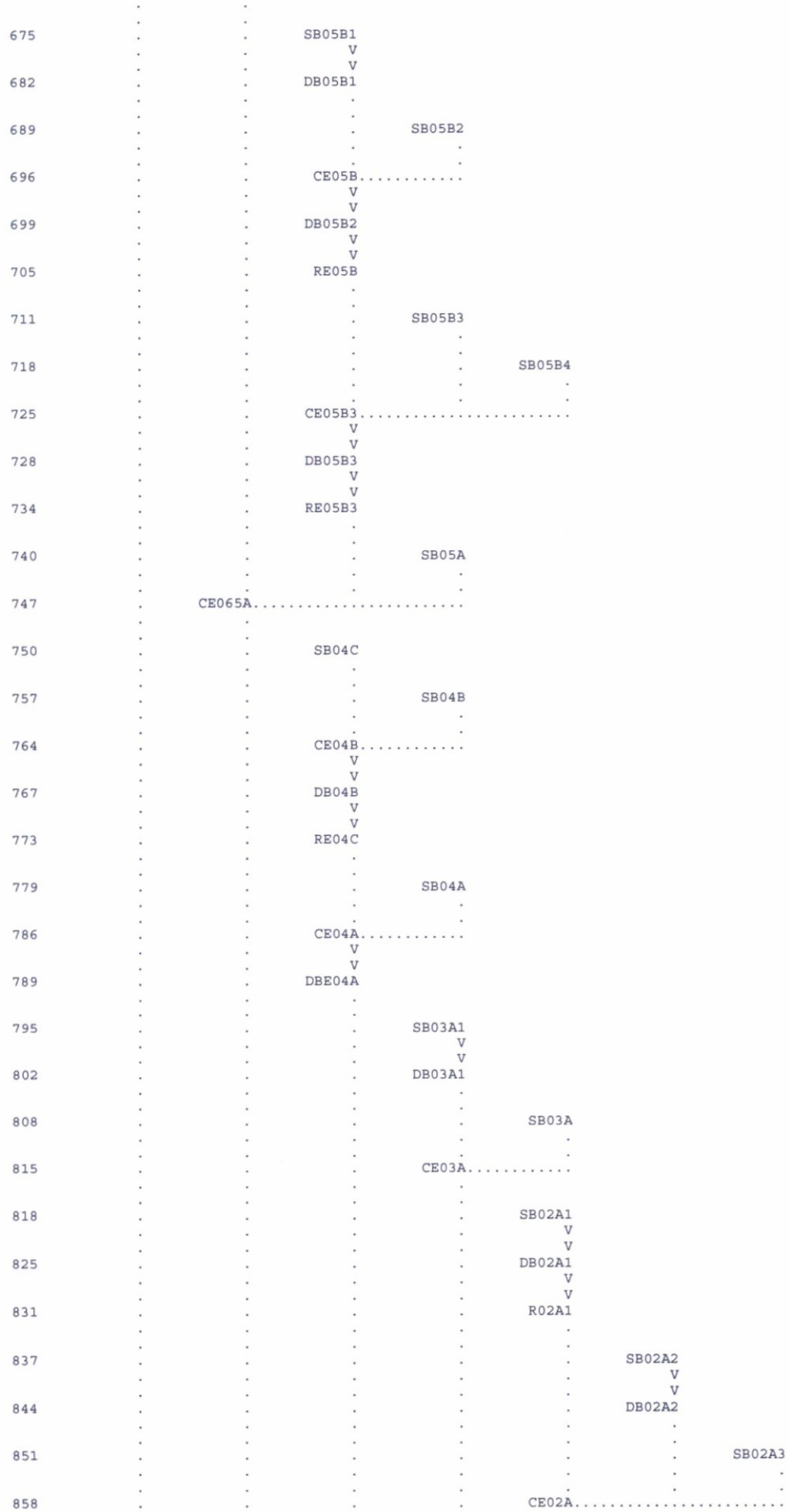
   NO.      (.) CONNECTOR         (<---) RETURN OF DIVERTED OR PUMPED FLOW

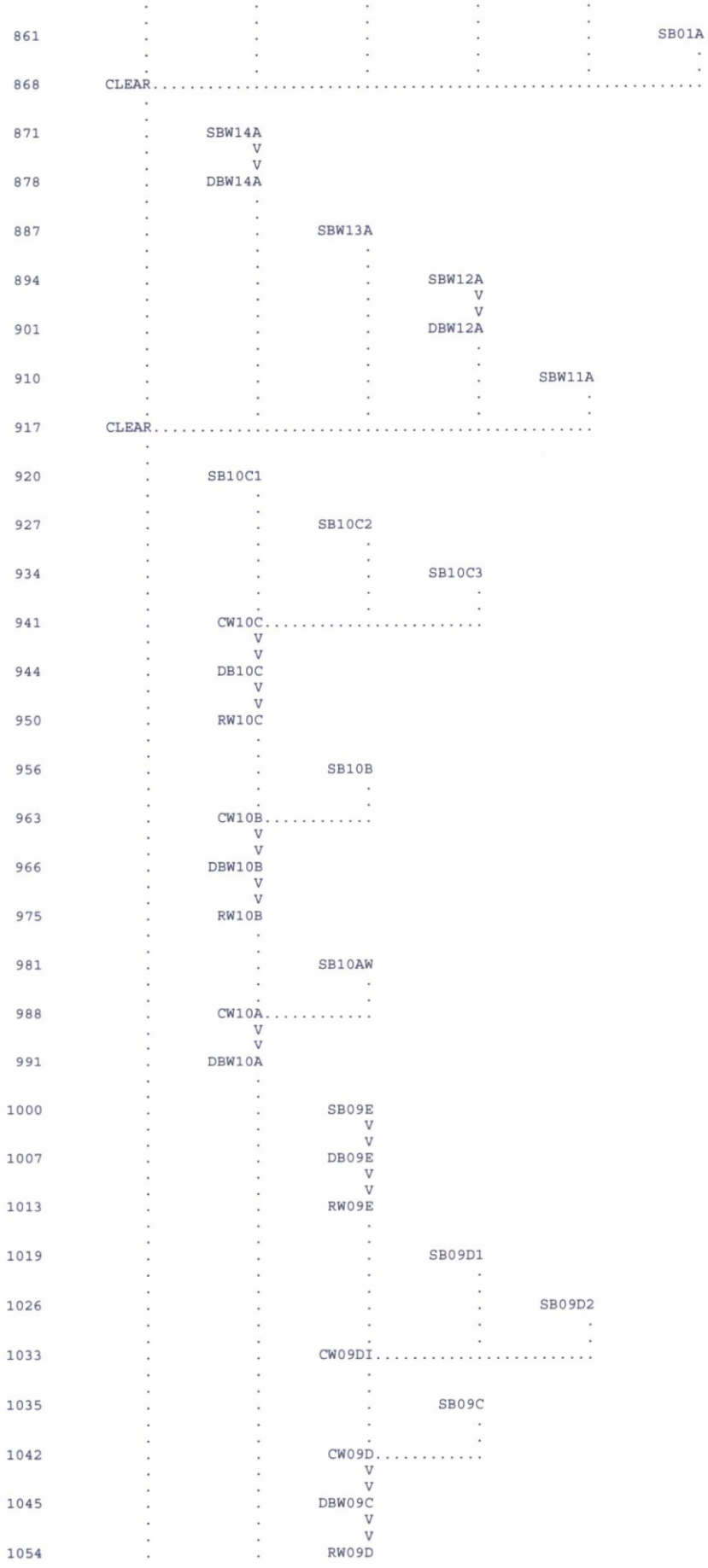
    23      SBE29A
              V
              V
    34      DBE29A
              .
              .
    43        .       SBE28A
              .         V
              .         V
    50        .       DBE28A
              .         .
              .         .
    59        .         .       SBE27A
              .         .         V
              .         .         V
    66        .         .       DBE27A
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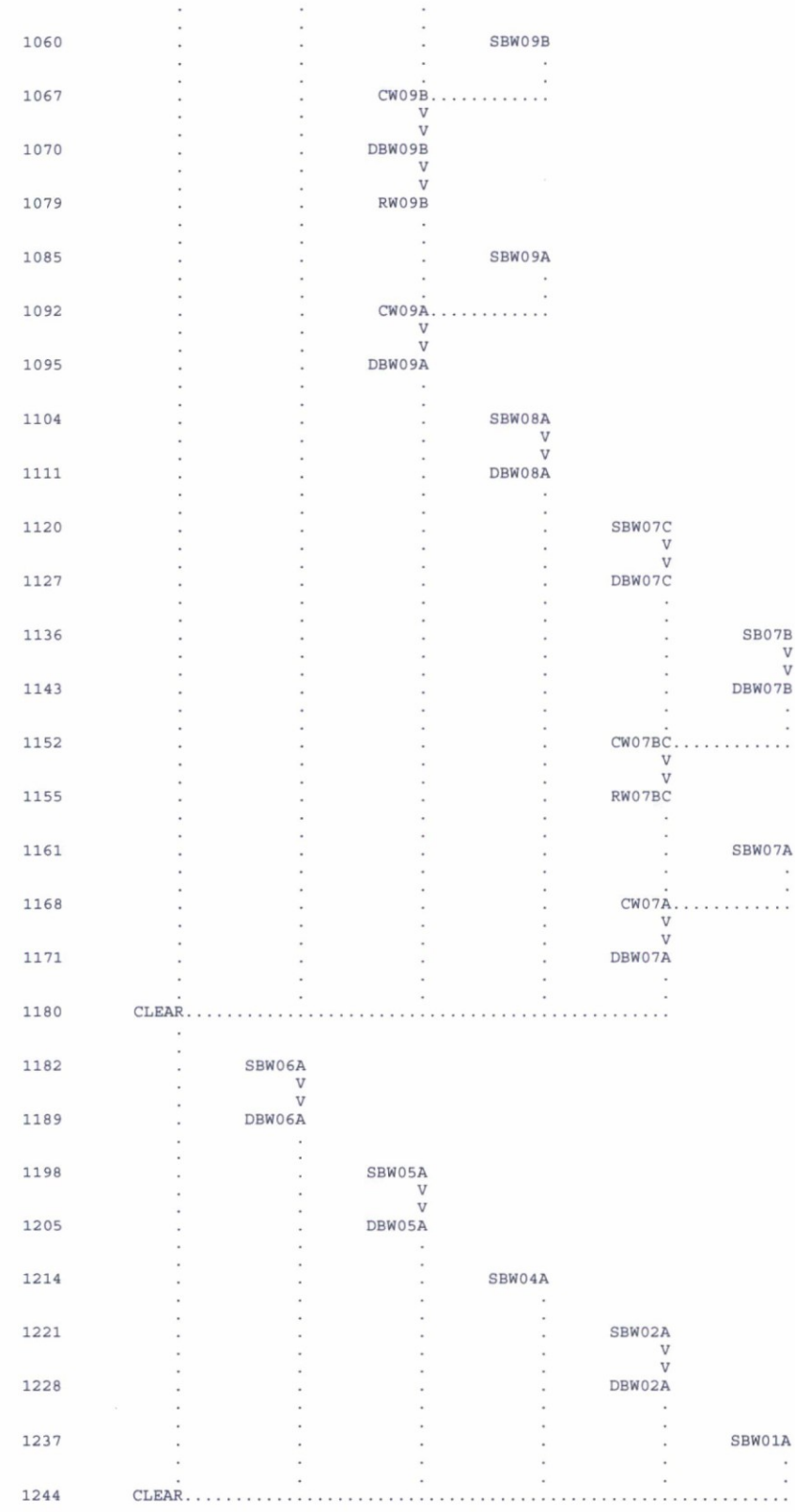

75 SBE26A
82 DBE26A
91 SBE25C
98 DBE25C
107 RE25C
113 SBE25B
120 CE25B
123 DBE25B
132 RE25B
138 SBE25A
145 CE25A
148 DBE25A
157 CLEAR
160 SBE24D
167 DBE24D
176 RE24D
182 SBE24C
189 CE24C
192 DBE24C
201 RE24C
207 SBE24B
214 CE24B
217 DBE24B
226 RE24B
232 SBE24A
239 CE24A
242 DBE24A
251 SBE23D
258 DBE23D
267 RE23D
273 SBE23E
280 DBE23E


289 RE23E
295 SBE23C
302 CE23C
305 DBE23C
314 RE23C
320 SBE23B
327 CE23B
330 RE23B
336 CE23AI
339 RE23BD
345 SBE23A
352 CE23A
355 DBE23A
364 CLEAR
366 SBE22A
373 DBE22A
382 SBE21A
389 SBE20A
396 SBE19A
403 SBE18A
410 DBE18A
419 CLEAR
422 SB17B
429 DBE17B
438 RE17B
444 SBE17A
451 CE17A
454 DBE17A
463 SBE16A
470 SBE13A
477 DBE13A
486 SBE12A


493 DBE12A
502 SB11B
509 DBE11B
515 RE11B
521 SB11A
528 SB11A1
535 CE11A
538 CLEAR
541 SB10A
548 SB09A
555 SB08A
562 CLEAR
565 SB06D1
572 SB06D2
579 CE06D
582 DB06D1
588 SB06C1
595 CE06CD
598 DB06C1
604 SB06C2
611 SB06C3
618 CE06C
621 DB06C2
627 CE06CI
630 RE06C
636 SB06B1
643 CE06CI
646 RE06B
652 SB06B
659 SB06A
666 DB06A
672 CE06A


675 SB05B1
682 DB05B1
689 SB05B2
696 CE05B
699 DB05B2
705 RE05B
711 SB05B3
718 SB05B4
725 CE05B3
728 DB05B3
734 RE05B3
740 SB05A
747 CE065A
750 SB04C
757 SB04B
764 CE04B
767 DB04B
773 RE04C
779 SB04A
786 CE04A
789 DBE04A
795 SB03A1
802 DB03A1
808 SB03A
815 CE03A
818 SB02A1
825 DB02A1
831 R02A1
837 SB02A2
844 DB02A2
851 SB02A3
858 CE02A


861 SB01A
868 CLEAR
871 SBW14A
878 DBW14A
887 SBW13A
894 SBW12A
901 DBW12A
910 SBW11A
917 CLEAR
920 SB10C1
927 SB10C2
934 SB10C3
941 CW10C
944 DB10C
950 RW10C
956 SB10B
963 CW10B
966 DBW10B
975 RW10B
981 SB10AW
988 CW10A
991 DBW10A
1000 SB09E
1007 DB09E
1013 RW09E
1019 SB09D1
1026 SB09D2
1033 CW09DI
1035 SB09C
1042 CW09D
1045 DBW09C
1054 RW09D



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN   1998               *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   07MAY18  TIME  09:26:59   *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
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                          SERENO CANYON (PHASE 4) - DEVELOPED CONDITIONS
                          STORM EVENT: 2-YR, 6-HOUR
                          05/04/2018
                          PREPARED BY: SLATER HANIFAN GROUP
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                          Flood Control District of Maricopa County
                          Sereno Canyon Developed Conditions
                          2 YEAR
                          6 Hour  Storm
                          Unit Hydrograph: Clark
                          09/18/2012
                          Sereno Canyon-Developed Conditions
                          2-Year, 6-Hour Storm Event
                          Prepared By: JE Fuller Hydrology and Geomorphology
                          Modeled By: Brian Schalk P.E., CFM and Nathan Logan P.E., CFM
                          Submitted To: City of Scottsdale
                         ********************************************************************************
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  21 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                      NMIN          1  MINUTES IN COMPUTATION INTERVAL
                      IDATE     1DEC11  STARTING DATE
                      ITIME       0000  STARTING TIME
                         NQ       2000  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE    2DEC11  ENDING DATE
                      NDTIME       0919  ENDING TIME
                      ICENT          19  CENTURY MARK

                    COMPUTATION INTERVAL     0.02 HOURS
                        TOTAL TIME BASE    33.32 HOURS

           ENGLISH UNITS
                DRAINAGE AREA         SQUARE MILES
                PRECIPITATION DEPTH   INCHES
                LENGTH, ELEVATION     FEET
                FLOW                  CUBIC FEET PER SECOND
                STORAGE VOLUME        ACRE-FEET
                SURFACE AREA          ACRES
                TEMPERATURE           DEGREES FAHRENHEIT
1
                                                RUNOFF SUMMARY
                                           FLOW IN CUBIC FEET PER SECOND
                                         TIME IN HOURS,  AREA IN SQUARE MILES

                                    PEAK    TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD       BASIN     MAXIMUM     TIME OF
           OPERATION      STATION   FLOW     PEAK                                            AREA      STAGE     MAX STAGE
+                                                        6-HOUR     24-HOUR     72-HOUR
           HYDROGRAPH AT
+                          SBE29A      8.     4.12          1.          0.          0.       0.01
           ROUTED TO
+                          DBE29A      0.     0.00          0.          0.          0.       0.01
+                                                                                                      2.89        6.60
           HYDROGRAPH AT
+                          SBE28A     10.     4.07          1.          0.          0.       0.01
           ROUTED TO
+                          DBE28A      0.     0.00          0.          0.          0.       0.01
+                                                                                                      2.66        6.50
           HYDROGRAPH AT
+                          SBE27A      2.     4.03          0.          0.          0.       0.00
           ROUTED TO
+                          DBE27A      0.     0.00          0.          0.          0.       0.00
+                                                                                                      1.37        5.70
           HYDROGRAPH AT
+                          SBE26A      8.     4.07          1.          0.          0.       0.01
           ROUTED TO
+                          DBE26A      0.     0.00          0.          0.          0.       0.01
+                                                                                                      2.80        6.68
           HYDROGRAPH AT
+                          SBE25C      5.     4.03          0.          0.          0.       0.00
           ROUTED TO
+                          DBE25C      0.     0.00          0.          0.          0.       0.00
+                                                                                                      1.93        6.22
           ROUTED TO
+                           RE25C      0.     0.25          0.          0.          0.       0.00
+                                                                                                   2687.00        0.15
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	HYDROGRAPH AT								
+		SBE25B	4.	4.07	0.	0.	0.	0.01		
	2 COMBINED AT								
+		CE25B	4.	4.07	0.	0.	0.	0.01		
	ROUTED TO								
+		DBE25B	0.	0.00	0.	0.	0.	0.01		
+									1.59	7.40
	ROUTED TO								
+		RE25B	0.	0.65	0.	0.	0.	0.01		
+									2676.01	0.42
	HYDROGRAPH AT								
+		SBE25A	3.	4.03	0.	0.	0.	0.00		
	2 COMBINED AT								
+		CE25A	3.	4.03	0.	0.	0.	0.01		
	ROUTED TO								
+		DBE25A	0.	0.00	0.	0.	0.	0.01		
+									1.90	6.88
	5 COMBINED AT								
+		CLEAR	0.	0.00	0.	0.	0.	0.05		
	HYDROGRAPH AT								
+		SBE24D	8.	4.05	0.	0.	0.	0.01		
	ROUTED TO								
+		DBE24D	0.	0.00	0.	0.	0.	0.01		
+									1.75	6.18
	ROUTED TO								
+		RE24D	0.	0.47	0.	0.	0.	0.01		
+									2721.00	0.27
	HYDROGRAPH AT								
+		SBE24C	10.	4.08	1.	0.	0.	0.01		
	2 COMBINED AT								
+		CE24C	10.	4.08	1.	0.	0.	0.02		
	ROUTED TO								
+		DBE24C	0.	0.00	0.	0.	0.	0.02		
+									2.35	7.45
	ROUTED TO								
+		RE24C	0.	0.40	0.	0.	0.	0.02		
+									2701.00	0.45
	HYDROGRAPH AT								
+		SBE24B	3.	4.07	0.	0.	0.	0.00		
	2 COMBINED AT								
+		CE24B	3.	4.07	0.	0.	0.	0.03		
	ROUTED TO								
+		DBE24B	0.	0.00	0.	0.	0.	0.03		
+									1.05	7.53
	ROUTED TO								
+		RE24B	0.	0.65	0.	0.	0.	0.03		
+									2687.00	0.88
	HYDROGRAPH AT								
+		SBE24A	5.	4.07	1.	0.	0.	0.01		
	2 COMBINED AT								
+		CE24A	5.	4.07	1.	0.	0.	0.04		
	ROUTED TO								
+		DBE24A	0.	0.00	0.	0.	0.	0.04		
+									1.93	7.47
	HYDROGRAPH AT								
+		SBE23D	23.	4.12	2.	1.	0.	0.04		
	ROUTED TO								
+		DBE23D	0.	0.00	0.	0.	0.	0.04		
+									4.29	7.05
	ROUTED TO								
+		RE23D	0.	0.25	0.	0.	0.	0.04		
+									2684.00	0.27
	HYDROGRAPH AT								
+		SBE23E	4.	4.05	0.	0.	0.	0.00		
	ROUTED TO								
+		DBE23E	0.	0.00	0.	0.	0.	0.00		
+									1.49	6.33
	ROUTED TO									

+		RE23E	0.	0.42	0.	0.	0.	0.00	
+									2711.00 0.43
	HYDROGRAPH AT								
+		SBE23C	31.	4.12	3.	1.	1.	0.05	
	2 COMBINED AT								
+		CE23C	31.	4.12	3.	1.	1.	0.06	
	ROUTED TO								
+		DBE23C	0.	0.00	0.	0.	0.	0.06	
+									4.19 7.77
	ROUTED TO								
+		RE23C	0.	0.73	0.	0.	0.	0.06	
+									2690.01 0.65
	HYDROGRAPH AT								
+		SBE23B	4.	4.03	0.	0.	0.	0.00	
	2 COMBINED AT								
+		CE23B	4.	4.03	0.	0.	0.	0.06	
	ROUTED TO								
+		RE23B	4.	4.05	0.	0.	0.	0.06	
+									2684.22 4.05
	2 COMBINED AT								
+		CE23AI	4.	4.05	0.	0.	0.	0.10	
	ROUTED TO								
+		RE23BD	3.	4.08	0.	0.	0.	0.10	
+									2679.22 4.08
	HYDROGRAPH AT								
+		SBE23A	5.	4.05	0.	0.	0.	0.01	
	2 COMBINED AT								
+		CE23A	8.	4.07	1.	0.	0.	0.11	
	ROUTED TO								
+		DBE23A	0.	0.00	0.	0.	0.	0.11	
+									1.93 33.32
	3 COMBINED AT								
+		CLEAR	0.	0.00	0.	0.	0.	0.20	
	HYDROGRAPH AT								
+		SBE22A	5.	4.07	0.	0.	0.	0.01	
	ROUTED TO								
+		DBE22A	0.	0.00	0.	0.	0.	0.01	
+									2.31 6.35
	HYDROGRAPH AT								
+		SBE21A	1.	4.02	0.	0.	0.	0.00	
	HYDROGRAPH AT								
+		SBE20A	1.	4.02	0.	0.	0.	0.00	
	HYDROGRAPH AT								
+		SBE19A	1.	4.02	0.	0.	0.	0.00	
	HYDROGRAPH AT								
+		SBE18A	1.	4.02	0.	0.	0.	0.00	
	ROUTED TO								
+		DBE18A	0.	0.00	0.	0.	0.	0.00	
+									0.89 4.82
	6 COMBINED AT								
+		CLEAR	3.	4.02	0.	0.	0.	0.21	
	HYDROGRAPH AT								
+		SB17B	13.	4.07	1.	0.	0.	0.02	
	ROUTED TO								
+		DBE17B	0.	0.00	0.	0.	0.	0.02	
+									3.15 6.63
	ROUTED TO								
+		RE17B	0.	0.57	0.	0.	0.	0.02	
+									2736.00 0.70
	HYDROGRAPH AT								
+		SBE17A	14.	4.07	1.	0.	0.	0.02	
	2 COMBINED AT								
+		CE17A	14.	4.07	1.	0.	0.	0.03	
	ROUTED TO								
+		DBE17A	0.	0.00	0.	0.	0.	0.03	
+									2.94 7.37
	HYDROGRAPH AT								
+		SBE16A	1.	4.03	0.	0.	0.	0.00	

+	HYDROGRAPH AT	SBE13A	3.	4.03	0.	0.	0.	0.00	
+	ROUTED TO	DBE13A	0.	0.00	0.	0.	0.	0.00	2.61 6.18
+	HYDROGRAPH AT	SBE12A	2.	4.02	0.	0.	0.	0.00	
+	ROUTED TO	DBE12A	0.	0.00	0.	0.	0.	0.00	1.53 6.18
+	HYDROGRAPH AT	SB11B	5.	4.15	1.	0.	0.	0.01	
+	ROUTED TO	DBE11B	5.	4.32	1.	0.	0.	0.01	2778.08 4.32
+	ROUTED TO	RE11B	4.	4.42	1.	0.	0.	0.01	2762.52 4.42
+	HYDROGRAPH AT	SB11A	2.	4.15	0.	0.	0.	0.01	
+	HYDROGRAPH AT	SB11A1	2.	4.08	0.	0.	0.	0.00	
+	3 COMBINED AT	CE11A	7.	4.30	1.	0.	0.	0.02	
+	6 COMBINED AT	CLEAR	8.	4.05	2.	0.	0.	0.27	
+	HYDROGRAPH AT	SB10A	1.	4.05	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SB09A	1.	4.07	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SB08A	1.	4.05	0.	0.	0.	0.00	
+	4 COMBINED AT	CLEAR	10.	4.05	2.	1.	0.	0.28	
+	HYDROGRAPH AT	SB06D1	2.	4.12	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SB06D2	7.	4.07	1.	0.	0.	0.01	
+	2 COMBINED AT	CE06D	8.	4.07	1.	0.	0.	0.01	
+	ROUTED TO	DB06D1	5.	4.30	1.	0.	0.	0.01	2796.32 4.30
+	HYDROGRAPH AT	SB06C1	9.	4.12	1.	0.	0.	0.01	
+	2 COMBINED AT	CE06CD	13.	4.18	2.	1.	0.	0.03	
+	ROUTED TO	DB06C1	12.	4.32	2.	1.	0.	0.03	2793.19 4.32
+	HYDROGRAPH AT	SB06C2	3.	4.33	1.	0.	0.	0.02	
+	HYDROGRAPH AT	SB06C3	4.	4.05	0.	0.	0.	0.00	
+	2 COMBINED AT	CE06C	6.	4.07	1.	0.	0.	0.02	
+	ROUTED TO	DB06C2	5.	4.30	1.	0.	0.	0.02	2789.11 4.30
+	2 COMBINED AT	CE06CI	17.	4.32	3.	1.	1.	0.05	
+	ROUTED TO	RE06C	17.	4.37	3.	1.	1.	0.05	2784.46 4.37
+	HYDROGRAPH AT	SB06B1	2.	4.08	0.	0.	0.	0.00	

+	2 COMBINED AT	CE06CI	18.	4.35	4.	1.	1.	0.06	
+	ROUTED TO	RE06B	17.	4.45	4.	1.	1.	0.06	
+									2758.35 4.43
+	HYDROGRAPH AT	SB06B	1.	4.28	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SB06A	6.	4.03	0.	0.	0.	0.01	
+	ROUTED TO	DB06A	5.	4.10	0.	0.	0.	0.01	
+									2753.70 4.10
+	3 COMBINED AT	CE06A	19.	4.40	4.	1.	1.	0.07	
+	HYDROGRAPH AT	SB05B1	3.	4.12	0.	0.	0.	0.01	
+	ROUTED TO	DB05B1	3.	4.22	0.	0.	0.	0.01	
+									2811.29 4.22
+	HYDROGRAPH AT	SB05B2	2.	4.18	0.	0.	0.	0.01	
+	2 COMBINED AT	CE05B	4.	4.20	1.	0.	0.	0.01	
+	ROUTED TO	DB05B2	4.	4.22	0.	0.	0.	0.01	
+									2801.24 4.22
+	ROUTED TO	RE05B	3.	4.38	0.	0.	0.	0.01	
+									2757.20 4.38
+	HYDROGRAPH AT	SB05B3	3.	4.05	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SB05B4	3.	4.08	0.	0.	0.	0.00	
+	3 COMBINED AT	CE05B3	6.	4.30	1.	0.	0.	0.02	
+	ROUTED TO	DB05B3	6.	4.30	1.	0.	0.	0.02	
+									2782.00 0.00
+	ROUTED TO	RE05B3	6.	4.37	1.	0.	0.	0.02	
+									2757.25 4.37
+	HYDROGRAPH AT	SB05A	1.	4.28	0.	0.	0.	0.00	
+	3 COMBINED AT	CE065A	26.	4.38	5.	1.	1.	0.09	
+	HYDROGRAPH AT	SB04C	1.	4.13	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SB04B	8.	4.07	1.	0.	0.	0.01	
+	2 COMBINED AT	CE04B	9.	4.07	1.	0.	0.	0.01	
+	ROUTED TO	DB04B	7.	4.18	1.	0.	0.	0.01	
+									2756.25 4.18
+	ROUTED TO	RE04C	7.	4.22	1.	0.	0.	0.01	
+									2750.42 4.22
+	HYDROGRAPH AT	SB04A	7.	4.05	1.	0.	0.	0.01	
+	2 COMBINED AT	CE04A	12.	4.08	2.	0.	0.	0.02	
+	ROUTED TO	DBE04A	10.	4.27	1.	0.	0.	0.02	
+									2739.97 4.27
+	HYDROGRAPH AT	SB03A1	0.	4.22	0.	0.	0.	0.00	
+	ROUTED TO	DB03A1	0.	4.78	0.	0.	0.	0.00	

+								2750.07	4.80
+	HYDROGRAPH AT	SB03A	1.	4.10	0.	0.	0.	0.00	
+	2 COMBINED AT	CE03A	1.	4.10	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SB02A1	12.	4.33	2.	1.	0.	0.06	
+	ROUTED TO	DB02A1	11.	4.45	2.	1.	0.	0.06	
+								2790.35	4.45
+	ROUTED TO	R02A1	11.	4.48	2.	1.	0.	0.06	
+								2750.56	4.48
+	HYDROGRAPH AT	SB02A2	2.	4.05	0.	0.	0.	0.00	
+	ROUTED TO	DB02A2	0.	0.00	0.	0.	0.	0.00	
+								2762.74	6.23
+	HYDROGRAPH AT	SB02A3	1.	4.15	0.	0.	0.	0.00	
+	3 COMBINED AT	CE02A	12.	4.47	3.	1.	0.	0.06	
+	HYDROGRAPH AT	SB01A	24.	4.35	5.	1.	1.	0.12	
+	6 COMBINED AT	CLEAR	79.	4.37	16.	4.	3.	0.58	
+	HYDROGRAPH AT	SBW14A	8.	4.05	0.	0.	0.	0.01	
+	ROUTED TO	DBW14A	0.	0.00	0.	0.	0.	0.01	
+								1.62	6.08
+	HYDROGRAPH AT	SBW13A	1.	4.02	0.	0.	0.	0.00	
+	HYDROGRAPH AT	SBW12A	15.	4.05	1.	0.	0.	0.02	
+	ROUTED TO	DBW12A	0.	0.00	0.	0.	0.	0.02	
+								2.75	6.35
+	HYDROGRAPH AT	SBW11A	1.	4.00	0.	0.	0.	0.00	
+	5 COMBINED AT	CLEAR	79.	4.37	16.	4.	3.	0.61	
+	HYDROGRAPH AT	SB10C1	6.	4.07	1.	0.	0.	0.01	
+	HYDROGRAPH AT	SB10C2	5.	4.08	1.	0.	0.	0.01	
+	HYDROGRAPH AT	SB10C3	2.	4.13	0.	0.	0.	0.00	
+	3 COMBINED AT	CW10C	13.	4.08	2.	0.	0.	0.02	
+	ROUTED TO	DB10C	10.	4.22	2.	0.	0.	0.02	
+								2768.02	4.22
+	ROUTED TO	RW10C	10.	4.32	2.	0.	0.	0.02	
+								2752.91	4.32
+	HYDROGRAPH AT	SB10B	7.	4.07	1.	0.	0.	0.01	
+	2 COMBINED AT	CW10B	14.	4.25	2.	1.	0.	0.03	
+	ROUTED TO	DBW10B	0.	6.52	0.	0.	0.	0.03	
+								7.25	6.55
+	ROUTED TO	RW10B	0.	6.67	0.	0.	0.	0.03	
+								2721.39	6.70
	HYDROGRAPH AT								

+		SB10AW	24.	4.07	2.	1.	0.	0.03	
+	2 COMBINED AT	CW10A	24.	4.07	2.	1.	0.	0.06	
+	ROUTED TO	DBW10A	0.	0.00	0.	0.	0.	0.06	
+									2.96 13.78
+	HYDROGRAPH AT	SB09E	1.	4.17	0.	0.	0.	0.00	
+	ROUTED TO	DB09E	1.	4.42	0.	0.	0.	0.00	
+									2826.35 4.43
+	ROUTED TO	RW09E	1.	4.62	0.	0.	0.	0.00	
+									2800.85 4.62
+	HYDROGRAPH AT	SB09D1	8.	4.05	1.	0.	0.	0.01	
+	HYDROGRAPH AT	SB09D2	3.	4.08	0.	0.	0.	0.00	
+	3 COMBINED AT	CW09DI	11.	4.05	1.	0.	0.	0.02	
+	HYDROGRAPH AT	SB09C	8.	4.28	1.	0.	0.	0.04	
+	2 COMBINED AT	CW09D	15.	4.08	3.	1.	1.	0.05	
+	ROUTED TO	DBW09C	0.	0.00	0.	0.	0.	0.05	
+									2.85 8.48
+	ROUTED TO	RW09D	0.	0.25	0.	0.	0.	0.05	
+									2779.00 0.18
+	HYDROGRAPH AT	SBW09B	5.	4.03	0.	0.	0.	0.00	
+	2 COMBINED AT	CW09B	5.	4.03	0.	0.	0.	0.06	
+	ROUTED TO	DBW09B	0.	0.00	0.	0.	0.	0.06	
+									1.80 6.75
+	ROUTED TO	RW09B	0.	0.53	0.	0.	0.	0.06	
+									2763.00 0.33
+	HYDROGRAPH AT	SBW09A	6.	4.07	1.	0.	0.	0.01	
+	2 COMBINED AT	CW09A	6.	4.07	1.	0.	0.	0.07	
+	ROUTED TO	DBW09A	0.	0.00	0.	0.	0.	0.07	
+									3.13 7.50
+	HYDROGRAPH AT	SBW08A	8.	4.03	1.	0.	0.	0.01	
+	ROUTED TO	DBW08A	0.	0.00	0.	0.	0.	0.01	
+									2.05 6.35
+	HYDROGRAPH AT	SBW07C	2.	4.10	0.	0.	0.	0.00	
+	ROUTED TO	DBW07C	0.	0.00	0.	0.	0.	0.00	
+									3.01 6.03
+	HYDROGRAPH AT	SB07B	2.	4.18	0.	0.	0.	0.01	
+	ROUTED TO	DBW07B	0.	0.00	0.	0.	0.	0.01	
+									3.02 7.40
+	2 COMBINED AT	CW07BC	0.	0.00	0.	0.	0.	0.01	
+	ROUTED TO	RW07BC	0.	0.98	0.	0.	0.	0.01	
+									2793.00 0.58
	HYDROGRAPH AT								

+		SBW07A	9.	4.07	1.	0.	0.	0.01	
	2 COMBINED AT								
+		CW07A	9.	4.07	1.	0.	0.	0.03	
	ROUTED TO								
+		DBW07A	0.	0.00	0.	0.	0.	0.03	
+									2.31 33.32
	5 COMBINED AT								
+		CLEAR	79.	4.37	16.	4.	3.	0.77	
	HYDROGRAPH AT								
+		SBW06A	3.	4.03	0.	0.	0.	0.00	
	ROUTED TO								
+		DBW06A	0.	0.00	0.	0.	0.	0.00	
+									1.95 6.12
	HYDROGRAPH AT								
+		SBW05A	8.	4.05	1.	0.	0.	0.01	
	ROUTED TO								
+		DBW05A	0.	0.00	0.	0.	0.	0.01	
+									2.58 6.32
	HYDROGRAPH AT								
+		SBW04A	2.	4.03	0.	0.	0.	0.00	
	HYDROGRAPH AT								
+		SBW02A	3.	4.12	0.	0.	0.	0.01	
	ROUTED TO								
+		DBW02A	0.	0.00	0.	0.	0.	0.01	
+									3.46 6.12
	HYDROGRAPH AT								
+		SBW01A	1.	4.08	0.	0.	0.	0.00	
	6 COMBINED AT								
+		CLEAR	80.	4.35	17.	4.	3.	0.79	

*** NORMAL END OF HEC-1 ***

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

Project: SERENO CANYON PHASE 4
Project No.: TOL1702.000
Location: SCOTTSDALE, AZ

HEC-1 Results - Proposed Conditions 2-yr, 6-hr

HEC-1 ID		Existing Condition Peak Discharge (A)	Developed Condition Peak Discharge (B)	(B) – (A)
Ex.Cond.	Prop.Cond.	[cfs]	[cfs]	[cfs]
CE01A	SB01A	42	24	-18
CE04A	DBE04A	8	10	2
CE065A	CE065A	19	26	7
CE11A	CE11A	9	7	-2
CE17A	DBE17A	11	0	-11
CE23A	DBE23A	26	0	-26
CE24A	DBE24A	11	0	-11
CE25A	DBE25A	5	0	-5
CW07A	DBW07A	7	0	-7
CW09A	DBW09A	18	0	-18
CW10A	DBW10A	20	0	-20
SBE02A	CE02A	13	12	-1
SBE03A	CE03A	3	1	-2
SBE08A	SB08A	1	1	0
SBE09A	SB09A	1	1	0
SBE10A	SB10A	1	1	0
SBE12A	DBE12A	1	0	-1
SBE13A	DBE13A	1	0	-1
SBE16A	SBE16A	0	1	1
SBE18A	DBE18A	1	0	-1
SBE19A	SBE19A	1	1	0
SBE20A	SBE20A	1	1	0
SBE21A	SBE21A	1	1	0
SBE26A	DBE26A	3	0	-3
SBE27A	DBE27A	1	0	-1
SBE28A	DBE28A	4	0	-4
SBE29A	DBE29A	6	0	-6
SBW01A	SBW01A	1	1	0
SBW02A	DBW02A	3	0	-3
SBW04A	SBW04A	1	2	1
SBW05A	DBW05A	4	0	-4
SBW06A	DBW06A	2	0	-2
SBW08A	DBW08A	4	0	-4
SBW11A	SBW11A	1	1	0
SBW12A	DBW12A	8	0	-8
SBW13A	SBW13A	1	1	0
SBW14A	DBW14A	5	0	-5

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

Project: SERENO CANYON PHASE 4
Project No.: TOL1702.000
Location: SCOTTSDALE, AZ

Stage-Storage Calculation - Average End Area Method

DB10C

Elevation (ft)	Depth (ft)	Area (ft^2)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
2767	0	5826.28	0	0.00
2768	1	7398.43	0.15	0.15
2769	2	9027.13	0.19	0.34
2770	3	10712.37	0.23	0.57
2771	**4**	**12454.17**	**0.27**	**0.833**

DB09E x

Elevation (ft)	Depth (ft)	Area (ft^2)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
2826	0	2189.86	0	0.00
2827	1	3019.17	0.06	0.06
2828	2	3947.82	0.08	0.14
2829	3	4973.69	0.10	0.24
2830	4	6097.62	0.13	0.37
2831	**5**	**7332.13**	**0.15**	**0.523**

DB11B

Elevation (ft)	Depth (ft)	Area (ft^2)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
2777.5	0	3896.77	0	0.00
2778	0.5	4291.79	0.05	0.05
2779	1.5	5122.88	0.11	0.16
2780	2.5	6027.52	0.13	0.28
2781	3.5	7008.77	0.15	0.43
2782	4.5	8063.77	0.17	0.61
2783	**5.5**	**9146.72**	**0.20**	**0.803**

DB06D1

Elevation (ft)	Depth (ft)	Area (ft^2)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
2795	0	4591.68	0	0.00
2796	1	5717.29	0.12	0.12
2797	2	6901.89	0.14	0.26
2798	3	8141.79	0.17	0.44
2799	**4**	**9442.35**	**0.20**	**0.638**

DB06C1

Elevation (ft)	Depth (ft)	Area (ft^2)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
2792	0	3277.8	0	0.00
2793	1	5014.92	0.10	0.10
2794	2	6863.05	0.14	0.23
2795	**3**	**8819.56**	**0.18**	**0.412**

DB06C2

Elevation (ft)	Depth (ft)	Area (ft^2)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
2788	0	3049.89	0	0.00
2789	1	4036.76	0.08	0.08
2790	2	5170.84	0.11	0.19
2791	3	6481.98	0.13	0.32
2792	**4**	**8181.5**	**0.17**	**0.489**

DB06A x

Elevation (ft)	Depth (ft)	Area (ft^2)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
2752.5	0	1865.51	0	0.00
2753	0.5	2167.24	0.02	0.02
2754	1.5	2991.85	0.06	0.08
2755	2.5	3907.64	0.08	0.16
2756	**3.5**	**4981.27**	**0.10**	**0.264**

DB05B3

Elevation (ft)	Depth (ft)	Area (ft^2)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
2782	0	43.3	0	0.00
2783	1	658.7	0.01	0.01
2784	2	1523.1	0.03	0.03
2785	**3**	**2877.9**	**0.05**	**0.084**

DB05B2

Elevation (ft)	Depth (ft)	Area (ft^2)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
2800	0	106	0	0.00
2801	1	386.19	0.01	0.01
2802	2	793.69	0.01	0.02
2803	**3**	**1329.24**	**0.02**	**0.044**

DB05B1

Elevation (ft)	Depth (ft)	Area (ft^2)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
2810	0	391.58	0	0.00
2811	1	739.48	0.01	0.01
2812	2	1211.2	0.02	0.04
2813	**3**	**1788.83**	**0.03**	**0.070**

DB04A x

Elevation (ft)	Depth (ft)	Area (ft^2)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
2738.5	0	3709.96	0	0.00
2739	0.5	4253.43	0.05	0.05
2740	1.5	5454.19	0.11	0.16
2741	2.5	6770.66	0.14	0.30
2742	3.5	8170.64	0.17	0.47
2743	**4.5**	**9565.18**	**0.20**	**0.673**

DB04B

Elevation (ft)	Depth (ft)	Area (ft^2)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
2755	0	2319.54	0	0.00
2756	1	3210.21	0.06	0.06
2757	2	4224.96	0.09	0.15
2758	**3**	**5330.13**	**0.11**	**0.258**

DB03A1

Elevation (ft)	Depth (ft)	Area (ft^2)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
2750	0	2882.64	0	0.00
2751	1	3548.31	0.07	0.07
2752	2	4271.17	0.09	0.16
2753	3	5051.23	0.11	0.27
2754	**4**	**5888.48**	**0.13**	**0.396**

DB02A2

Elevation (ft)	Depth (ft)	Area (ft^2)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
2762	0	5553.91	0	0.00
2763	1	6879.62	0.14	0.14
2764	2	8339.27	0.17	0.32
2765	**3**	**9962.57**	**0.21**	**0.527**

DB02A1

Elevation (ft)	Depth (ft)	Area (ft^2)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
2789.5	0	3129.3	0	0.00
2790	0.5	3659.87	0.04	0.04
2791	1.5	4939.9	0.10	0.14
2792	**2.5**	**4940.9**	**0.11**	**0.251**

Appendix D: Hydraulics

HEC-RAS Model Outputs

Supporting Hydraulic Documentation

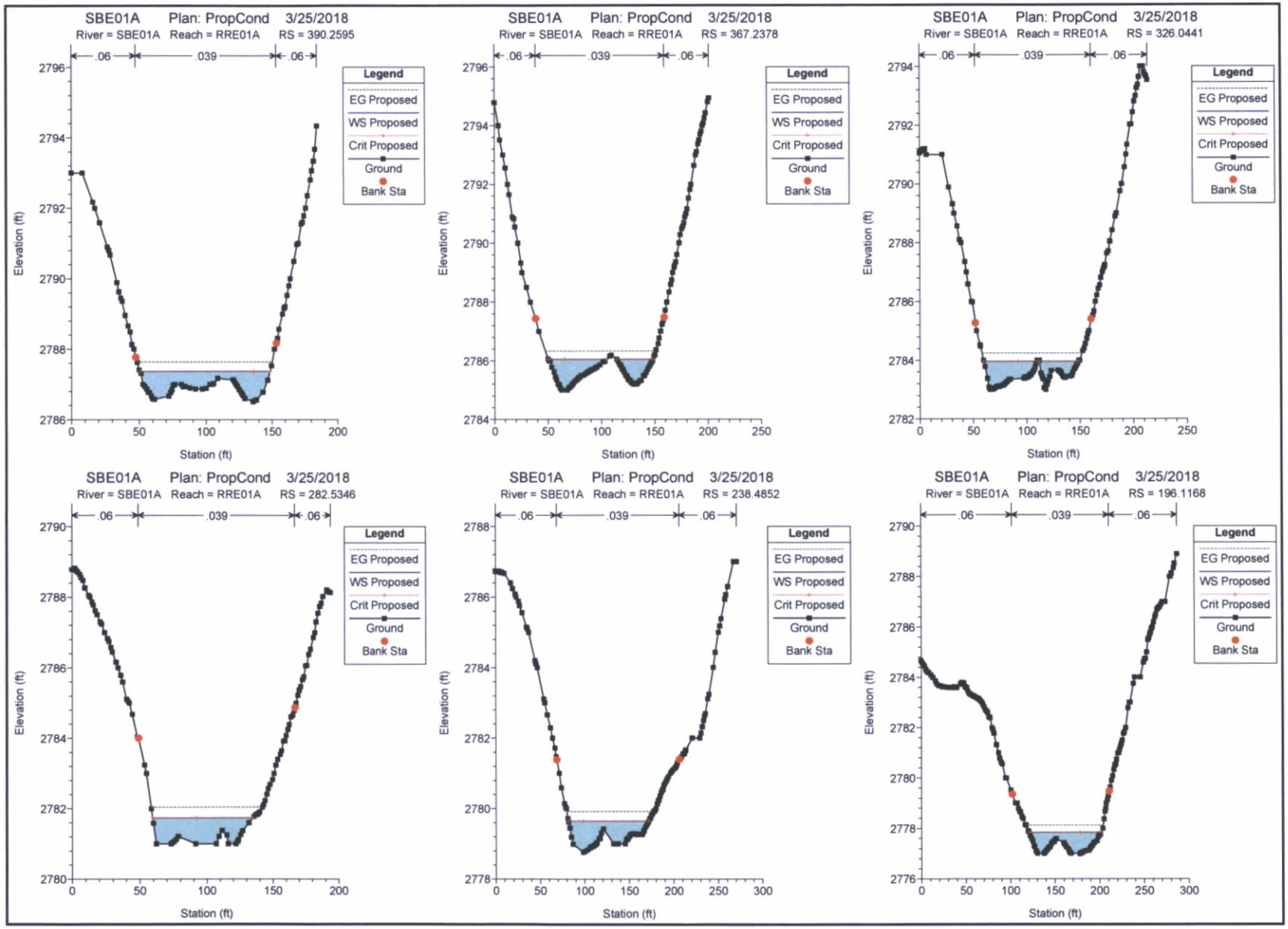
HY-8 Outputs

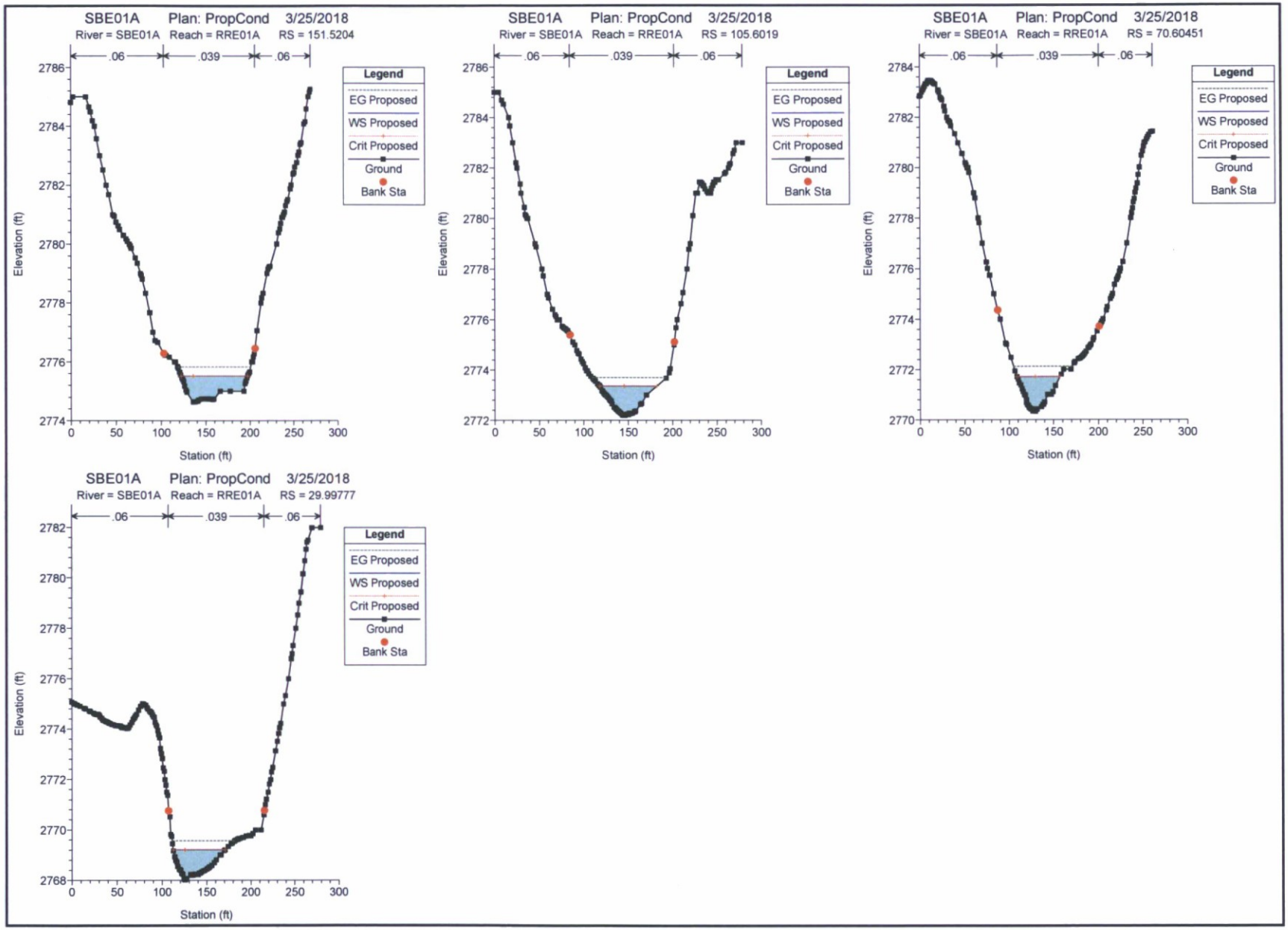
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HEC-RAS Plan: PropCond River: SBE01A Reach: RRE01A Profile: Proposed

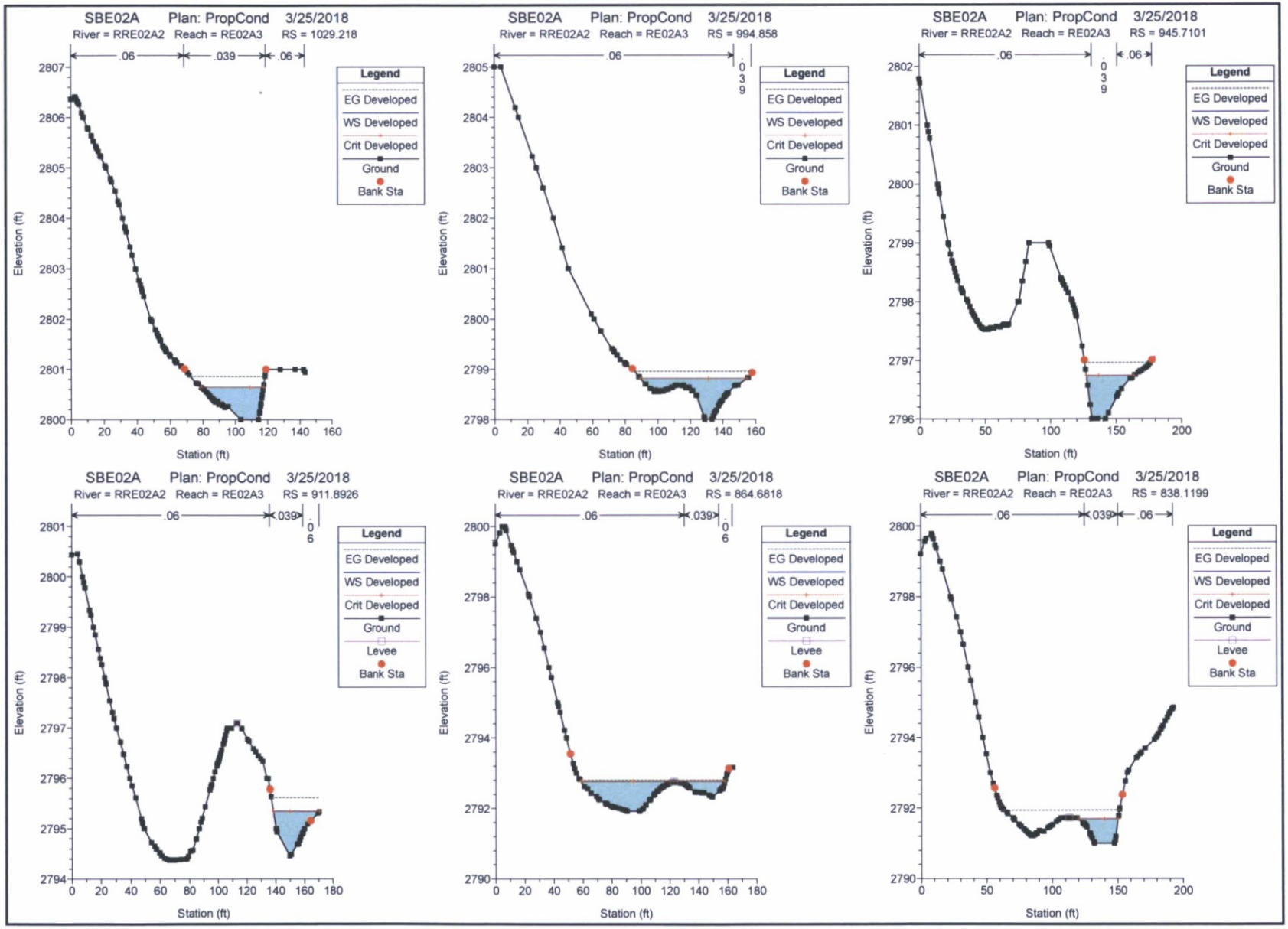
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
RRE01A	390.2595	Proposed	202.00	2786.51	2787.37	2787.37	2787.64	0.029060	4.10	49.27	98.12	1.02
RRE01A	367.2378	Proposed	202.00	2785.00	2786.06	2786.06	2786.34	0.027892	4.21	47.96	88.93	1.01
RRE01A	326.0441	Proposed	202.00	2783.00	2783.96	2783.96	2784.25	0.027775	4.26	47.47	86.10	1.01
RRE01A	282.5346	Proposed	202.00	2781.00	2781.74	2781.74	2782.05	0.026855	4.45	45.39	75.27	1.01
RRE01A	238.4852	Proposed	202.00	2778.76	2779.64	2779.64	2779.92	0.028312	4.20	48.06	90.42	1.02
RRE01A	196.1168	Proposed	202.00	2776.99	2777.84	2777.84	2778.13	0.027043	4.34	46.60	80.86	1.01
RRE01A	151.5204	Proposed	202.00	2774.63	2775.52	2775.52	2775.83	0.026883	4.45	45.38	75.36	1.01
RRE01A	105.6019	Proposed	202.00	2772.19	2773.36	2773.36	2773.70	0.025843	4.68	43.12	64.40	1.01
RRE01A	70.60451	Proposed	202.00	2770.33	2771.70	2771.70	2772.12	0.024429	5.17	39.11	48.18	1.01
RRE01A	29.99777	Proposed	202.00	2768.01	2769.21	2769.21	2769.58	0.025626	4.86	41.60	58.40	1.01

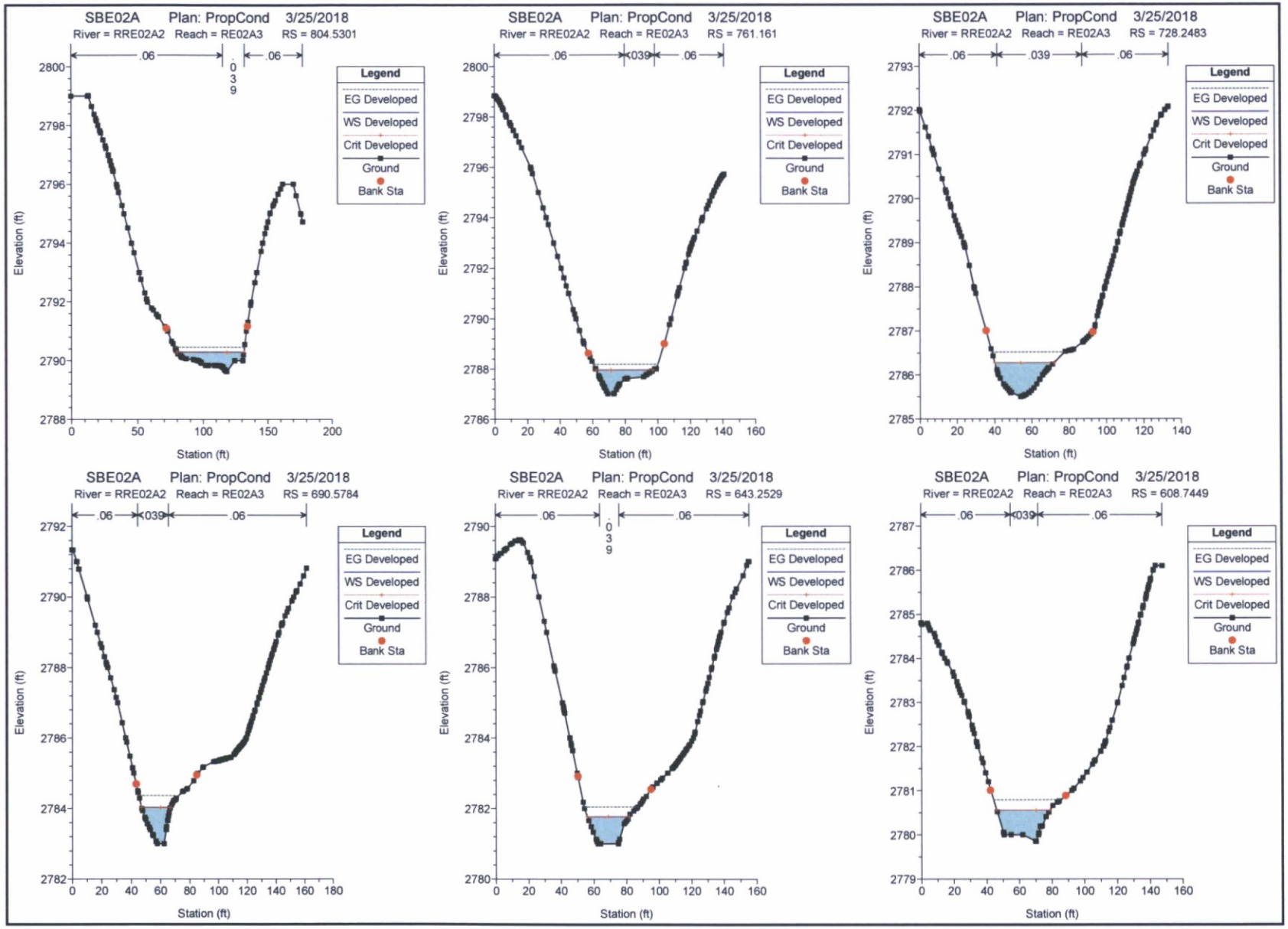

SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 390.2595
.06 .039 .06
Legend
EG Proposed
WS Proposed
Crit Proposed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 367.2378
.06 .039 .06
Legend
EG Proposed
WS Proposed
Crit Proposed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 326.0441
.06 .039 .06
Legend
EG Proposed
WS Proposed
Crit Proposed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 282.5346
.06 .039 .06
Legend
EG Proposed
WS Proposed
Crit Proposed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 238.4852
.06 .039 .06
Legend
EG Proposed
WS Proposed
Crit Proposed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 196.1168
.06 .039 .06
Legend
EG Proposed
WS Proposed
Crit Proposed
Ground
Bank Sta
Elevation (ft)
Station (ft)

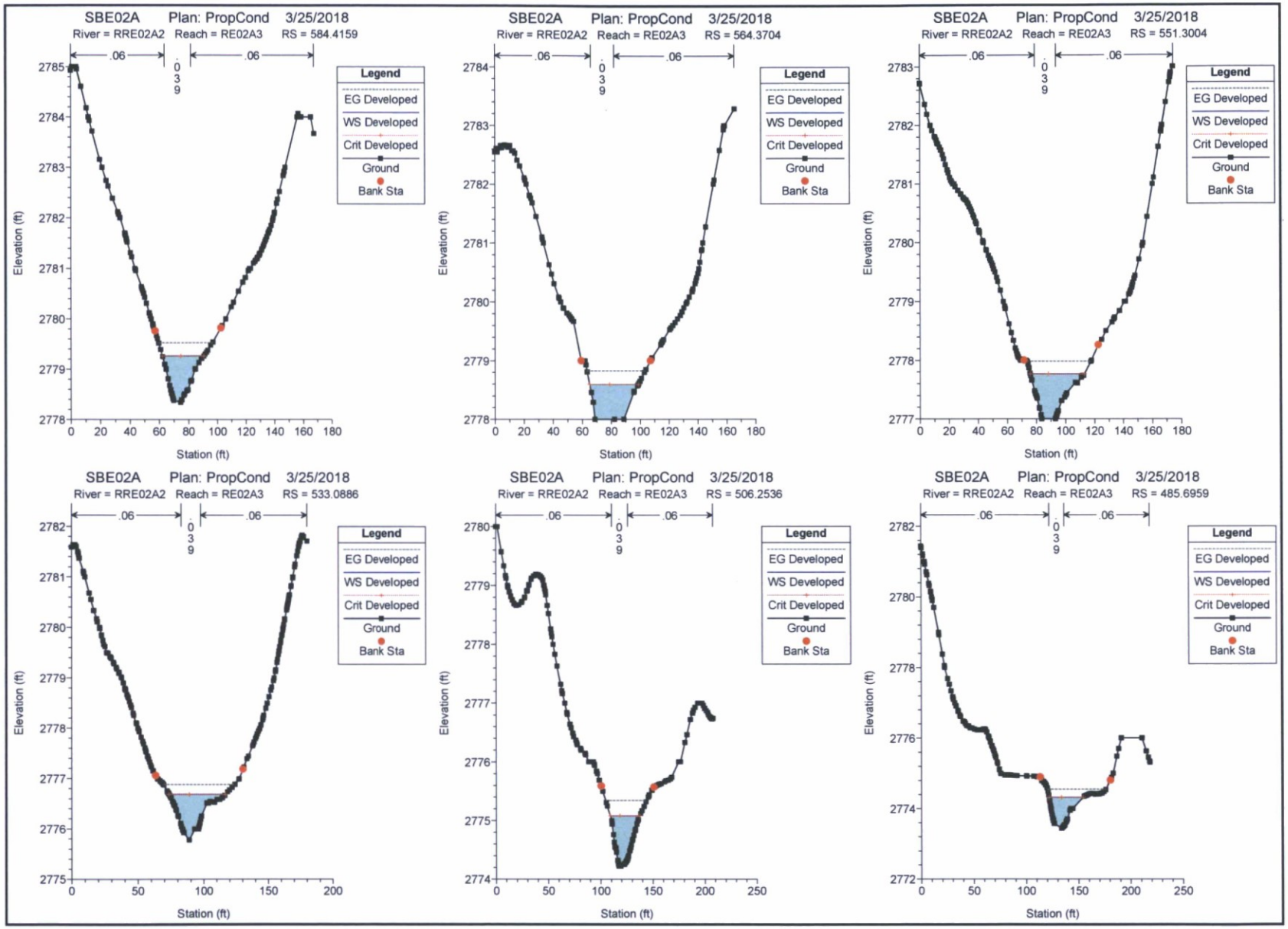

SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 151.5204
.06 .039 .06
Legend
EG Proposed
WS Proposed
Crit Proposed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 105.6019
.06 .039 .06
Legend
EG Proposed
WS Proposed
Crit Proposed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 70.60451
.06 .039 .06
Legend
EG Proposed
WS Proposed
Crit Proposed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 29.99777
.06 .039 .06
Legend
EG Proposed
WS Proposed
Crit Proposed
Ground
Bank Sta
Elevation (ft)
Station (ft)

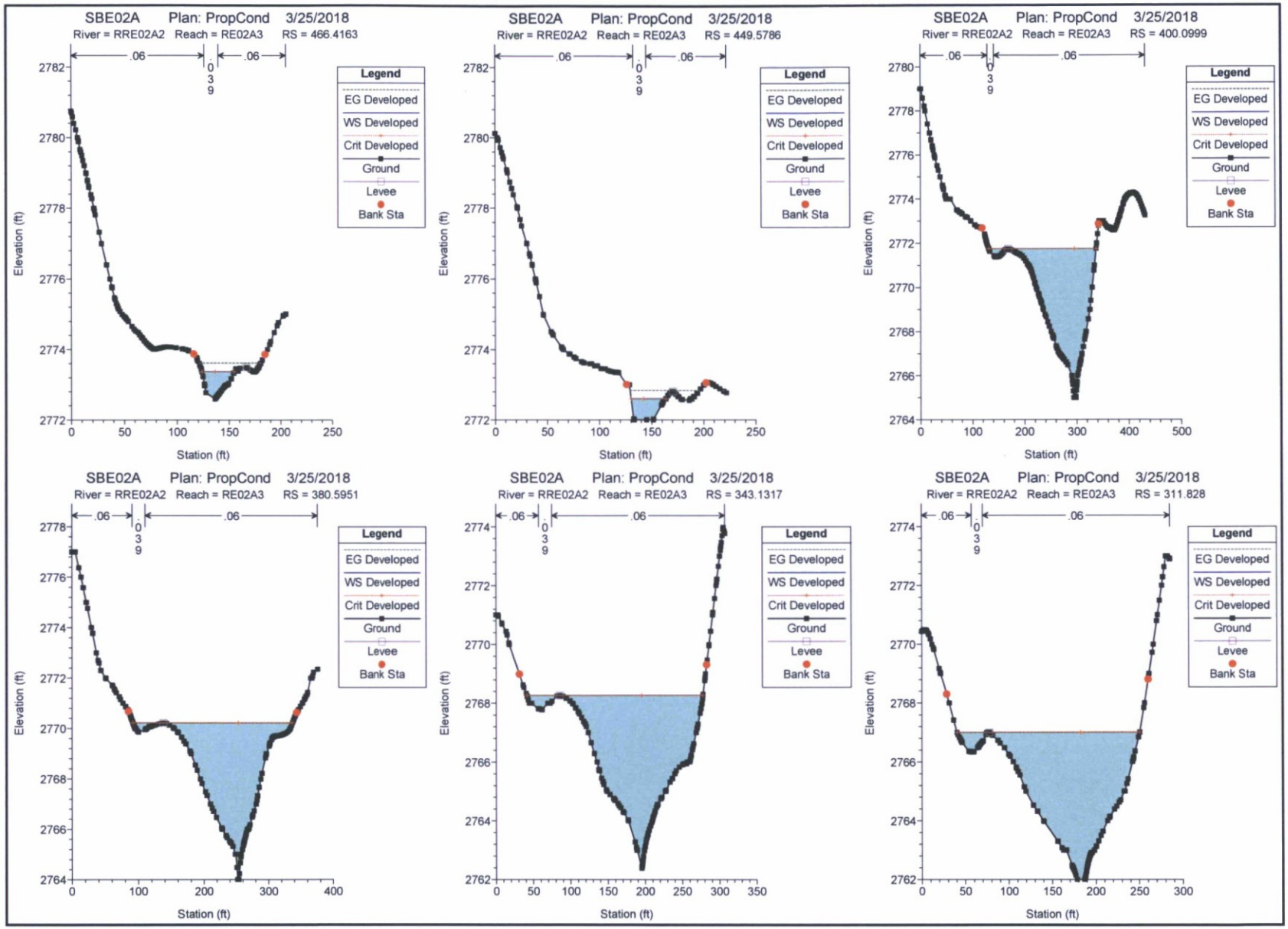
HEC-RAS Plan: PropCond River: RRE02A2 Reach: RE02A3 Profile: Developed

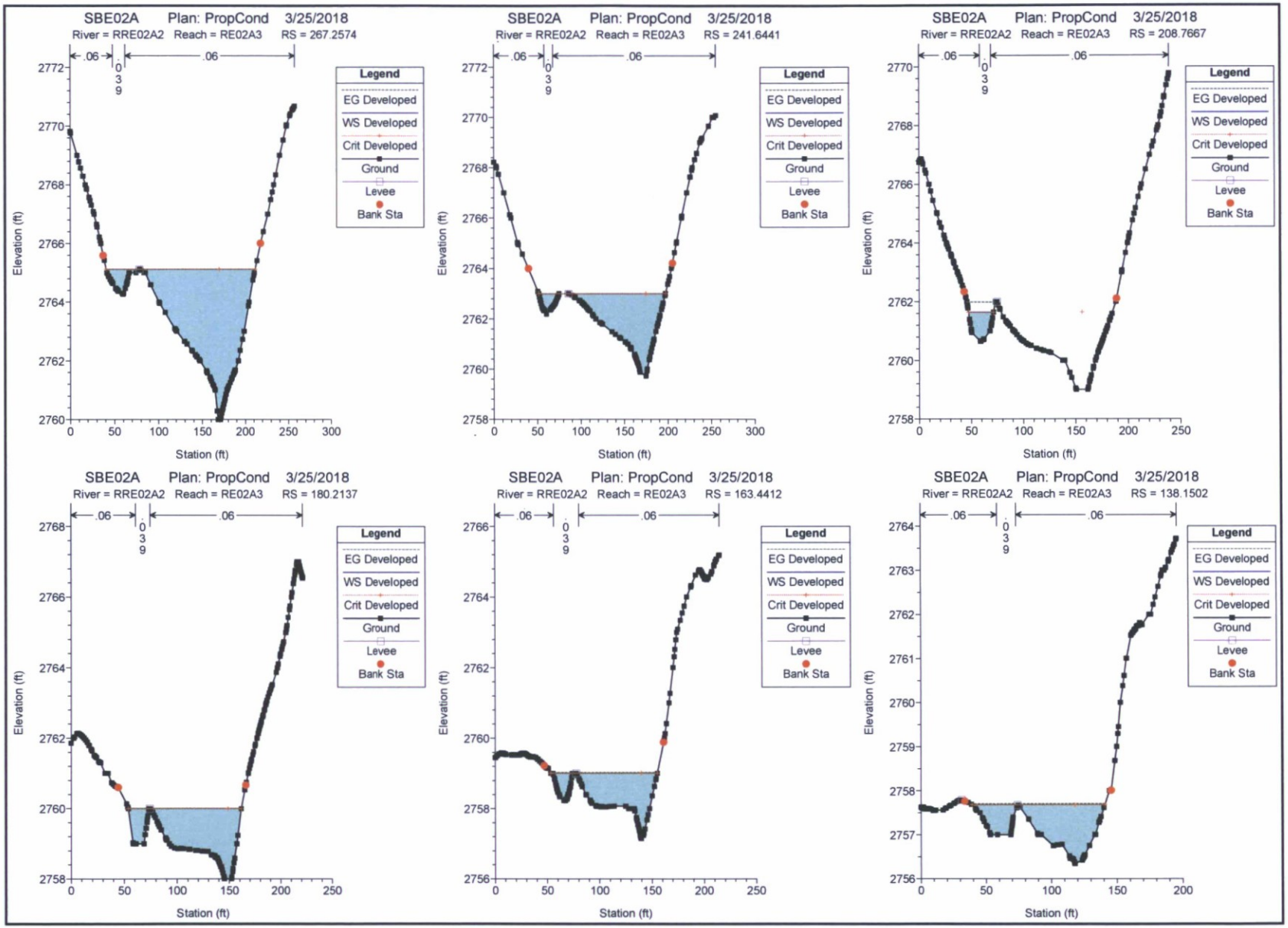
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
RE02A3	1029.218	Developed	60.00	2800.00	2800.65	2800.65	2800.86	0.029876	3.69	16.27	38.75	1.00
RE02A3	994.858	Developed	60.00	2798.00	2798.82	2798.82	2798.96	0.065523	3.00	19.97	65.58	0.96
RE02A3	945.7101	Developed	60.00	2796.00	2796.74	2796.74	2796.96	0.024186	3.76	15.94	36.41	1.00
RE02A3	911.8926	Developed	60.00	2794.46	2795.35	2795.35	2795.62	0.026868	4.21	14.73	31.89	1.00
RE02A3	864.6818	Developed	60.00	2791.92	2792.77	2792.77	2792.80	0.009161	1.45	41.33	99.54	0.40
RE02A3	838.1199	Developed	60.00	2791.00	2791.69	2791.69	2791.94	0.034821	3.99	15.05	30.65	1.00
RE02A3	804.5301	Developed	60.00	2789.63	2790.29	2790.28	2790.46	0.055328	3.26	18.42	51.67	0.96
RE02A3	761.161	Developed	60.00	2787.00	2787.96	2787.96	2788.19	0.049080	3.84	15.62	35.06	1.01
RE02A3	728.2483	Developed	60.00	2785.50	2786.28	2786.28	2786.52	0.027768	3.94	15.23	31.89	1.00
RE02A3	690.5784	Developed	60.00	2783.00	2784.03	2784.03	2784.37	0.025101	4.64	12.92	19.71	1.01
RE02A3	643.2529	Developed	60.00	2781.00	2781.77	2781.77	2782.05	0.028956	4.25	14.13	25.45	1.00
RE02A3	608.7449	Developed	60.00	2779.85	2780.56	2780.56	2780.79	0.031471	3.90	15.37	32.69	1.00
RE02A3	584.4159	Developed	60.00	2778.34	2779.26	2779.26	2779.52	0.022754	4.10	14.64	28.42	1.01
RE02A3	564.3704	Developed	60.00	2778.00	2778.60	2778.60	2778.83	0.035956	3.86	15.55	33.69	1.00
RE02A3	551.3004	Developed	60.00	2777.00	2777.77	2777.77	2777.98	0.027643	3.74	16.06	37.27	1.00
RE02A3	533.0886	Developed	60.00	2775.78	2776.69	2776.69	2776.88	0.022304	3.54	16.93	43.38	1.00
RE02A3	506.2536	Developed	60.00	2774.22	2775.08	2775.08	2775.34	0.026429	4.10	14.63	28.37	1.01
RE02A3	485.6959	Developed	60.00	2773.44	2774.32	2774.32	2774.55	0.027361	3.88	15.45	32.41	0.99
RE02A3	466.4163	Developed	60.00	2772.60	2773.38	2773.38	2773.62	0.030770	3.94	15.23	31.56	1.00
RE02A3	449.5786	Developed	60.00	2772.00	2772.60	2772.60	2772.84	0.038184	3.88	15.45	33.40	1.01
RE02A3	400.0999	Developed	80.00	2765.00	2771.75	2771.75	2771.75	0.000012	0.16	496.72	206.00	0.02
RE02A3	380.5951	Developed	80.00	2764.00	2770.23	2770.23	2770.23	0.000019	0.17	462.39	245.05	0.02
RE02A3	343.1317	Developed	80.00	2762.39	2768.27	2768.27	2768.27	0.000011	0.15	526.74	236.59	0.02
RE02A3	311.828	Developed	80.00	2762.00	2767.00	2767.00	2767.00	0.000015	0.17	460.44	210.34	0.02
RE02A3	267.2574	Developed	80.00	2760.00	2765.12	2765.12	2765.12	0.000034	0.24	334.63	170.68	0.03
RE02A3	241.6441	Developed	80.00	2759.73	2763.00	2763.00	2763.00	0.000269	0.47	171.10	145.68	0.08
RE02A3	208.7667	Developed	80.00	2759.00	2761.64	2761.64	2761.99	0.032359	4.69	17.05	24.00	0.98
RE02A3	180.2137	Developed	80.00	2758.00	2760.00	2760.00	2760.01	0.000681	0.70	113.83	107.76	0.12
RE02A3	163.4412	Developed	80.00	2757.15	2759.01	2759.01	2759.02	0.001808	1.00	80.35	102.18	0.20
RE02A3	138.1502	Developed	80.00	2756.34	2757.68	2757.68	2757.70	0.003585	1.21	66.13	101.72	0.26
RE02A3	106.4526	Developed	80.00	2755.00	2756.09	2756.09	2756.19	0.038729	2.56	31.23	114.69	0.87
RE02A3	78.27399	Developed	80.00	2754.00	2754.64	2754.60	2754.78	0.041223	3.00	26.67	69.82	0.86
RE02A3	52.40903	Developed	80.00	2752.92	2753.38	2753.38	2753.52	0.058676	3.07	26.09	92.25	1.02
RE02A3	28.76661	Developed	80.00	2751.00	2751.63	2751.58	2751.74	0.046606	2.67	29.93	93.95	0.83

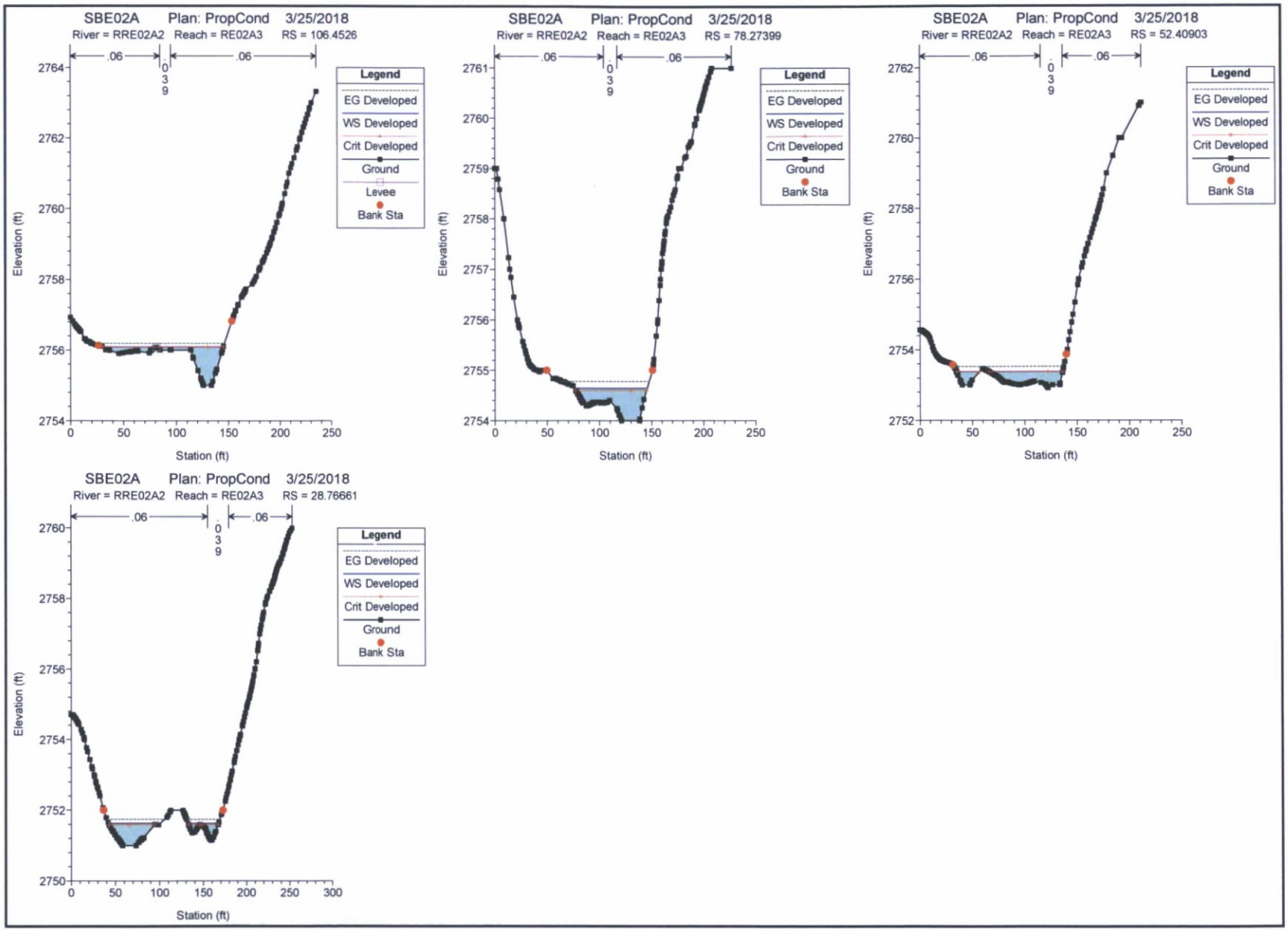

SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 1029.218
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 994.858
.06 .039
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 945.7101
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 911.8926
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 864.6818
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 838.1199
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)


SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 804.5301
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 761.161
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 728.2483
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 690.5784
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 643.2529
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 608.7449
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)


SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 584.4159
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 564.3704
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 551.3004
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River = RRE02A2 Reach = RE02A3 RS = 533.0886
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 506.2536
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 485.6959
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)


SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 466.4163
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 449.5786
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River = RRE02A2 Reach = RE02A3 RS = 400.0999
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 380.5951
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 343.1317
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 311.828
.06
.06
0
3
9
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)


SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 267.2574
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 241.6441
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 208.7667
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 180.2137
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 163.4412
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 138.1502
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)


SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 106.4526
.06
.06
0
3
9
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 78.27399
.06
.06
0
3
9
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 52.40903
.06
.06
0
3
9
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 28.76661
.06
.06
0
3
9
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)

HEC-RAS Plan: PropCond River: RRE05A Reach: RE05A Profile: Developed

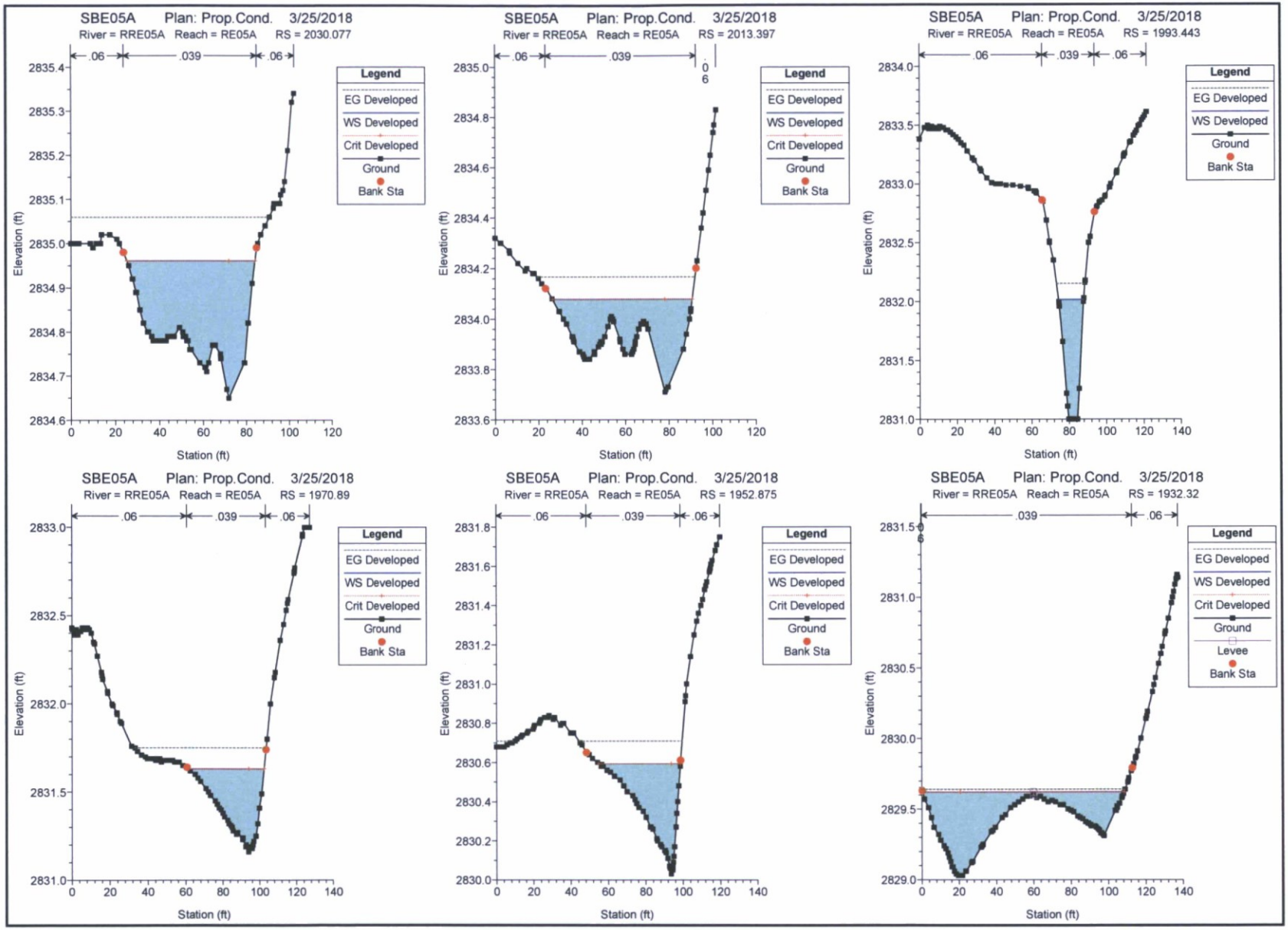
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
RE05A	2030.077	Developed	27.00	2834.65	2834.96	2834.96	2835.06	0.042256	2.52	10.73	58.87	1.04
RE05A	2013.397	Developed	27.00	2833.71	2834.08	2834.08	2834.17	0.040056	2.39	11.30	64.34	1.01
RE05A	1993.443	Developed	27.00	2831.00	2832.02		2832.15	0.010368	2.96	9.12	13.42	0.63
RE05A	1970.89	Developed	27.00	2831.16	2831.63	2831.63	2831.75	0.036063	2.77	9.75	41.18	1.00
RE05A	1952.875	Developed	27.00	2830.03	2830.59	2830.59	2830.71	0.037278	2.73	9.90	43.77	1.01
RE05A	1932.32	Developed	27.00	2829.03	2829.62	2829.62	2829.64	0.006515	1.13	23.95	107.83	0.42
RE05A	1914.318	Developed	27.00	2827.93	2828.61	2828.61	2828.63	0.004956	1.09	24.76	95.50	0.38
RE05A	1876.131	Developed	27.00	2827.08	2827.41	2827.41	2827.49	0.051438	2.24	12.08	91.72	1.09
RE05A	1856.087	Developed	27.00	2826.26	2826.50	2826.50	2826.57	0.041658	2.19	12.35	82.92	1.00
RE05A	1834.734	Developed	27.00	2824.78	2825.06	2825.06	2825.15	0.038755	2.43	11.09	59.95	1.00
RE05A	1812.881	Developed	27.00	2823.49	2823.82	2823.82	2823.93	0.040107	2.59	10.43	52.76	1.03
RE05A	1795.388	Developed	27.00	2822.65	2823.13	2823.13	2823.25	0.034611	2.76	9.78	40.26	0.99
RE05A	1786.057	Developed	27.00	2822.22	2822.72	2822.72	2822.84	0.033389	2.85	9.47	36.13	0.98
RE05A	1772.376	Developed	27.00	2821.56	2822.03	2822.03	2822.14	0.035261	2.70	10.01	43.21	0.99
RE05A	1753.942	Developed	27.00	2820.59	2821.14	2821.14	2821.23	0.038206	2.48	10.90	56.82	1.00
RE05A	1736.229	Developed	27.00	2819.34	2819.96	2819.96	2820.12	0.032362	3.19	8.47	26.62	1.00
RE05A	1721.935	Developed	27.00	2818.52	2819.34	2819.34	2819.47	0.039686	2.85	9.46	41.39	1.05
RE05A	1699.208	Developed	27.00	2816.00	2816.71	2816.71	2816.98	0.027749	4.13	6.53	12.23	1.00
RE05A	1677.488	Developed	27.00	2815.00	2815.71	2815.71	2815.96	0.028903	4.06	6.66	13.29	1.01
RE05A	1663.736	Developed	27.00	2814.00	2814.87	2814.87	2815.13	0.029261	4.15	6.51	12.67	1.02
RE05A	1646.829	Developed	27.00	2812.38	2813.54	2813.54	2813.86	0.027793	4.53	5.97	9.60	1.01
RE05A	1629.522	Developed	27.00	2811.72	2812.44	2812.44	2812.69	0.028353	4.01	6.73	13.49	1.00
RE05A	1612.588	Developed	27.00	2810.00	2811.09		2811.29	0.017839	3.59	7.52	12.45	0.81
RE05A	1596.76	Developed	27.00	2810.00	2810.68	2810.68	2810.93	0.028546	4.02	6.72	13.49	1.00
RE05A	1581.033	Developed	27.00	2809.00	2809.95	2809.95	2810.22	0.028482	4.16	6.50	12.33	1.01
RE05A	1559.571	Developed	27.00	2808.32	2808.97	2808.97	2809.17	0.030346	3.58	7.55	19.04	1.00
RE05A	1540.258	Developed	27.00	2807.00	2807.73	2807.73	2807.96	0.029260	3.78	7.15	16.09	1.00
RE05A	1517.522	Developed	27.00	2806.00	2806.61	2806.61	2806.77	0.034915	3.17	8.51	28.51	1.02
RE05A	1500.326	Developed	27.00	2805.00	2805.70	2805.70	2805.94	0.025290	3.96	6.99	20.05	0.95
RE05A	1478.489	Developed	27.00	2803.39	2804.26	2804.26	2804.44	0.025681	3.61	8.85	25.76	0.94
RE05A	1455.882	Developed	27.00	2802.08	2803.18	2803.18	2803.46	0.028032	4.25	6.35	11.43	1.01
RE05A	1438.869	Developed	27.00	2801.82	2802.57	2802.57	2802.80	0.029192	3.78	7.15	16.01	1.00
RE05A	1420.858	Developed	27.00	2801.00	2801.61	2801.61	2801.82	0.029652	3.66	7.37	17.55	1.00
RE05A	1400	Developed	27.00	2800.00	2800.54	2800.54	2800.72	0.031223	3.43	7.87	21.60	1.00
RE05A	1382.409	Developed	27.00	2799.00	2799.60	2799.60	2799.81	0.028071	3.77	7.70	20.51	0.98
RE05A	1364.183	Developed	27.00	2798.00	2798.79	2798.79	2798.94	0.025325	3.13	9.69	41.11	0.90
RE05A	1347.634	Developed	27.00	2797.45	2798.00	2798.00	2798.10	0.026997	2.77	12.18	56.06	0.90
RE05A	1326.271	Developed	27.00	2796.39	2796.86	2796.86	2796.94	0.030314	2.68	13.89	68.32	0.93

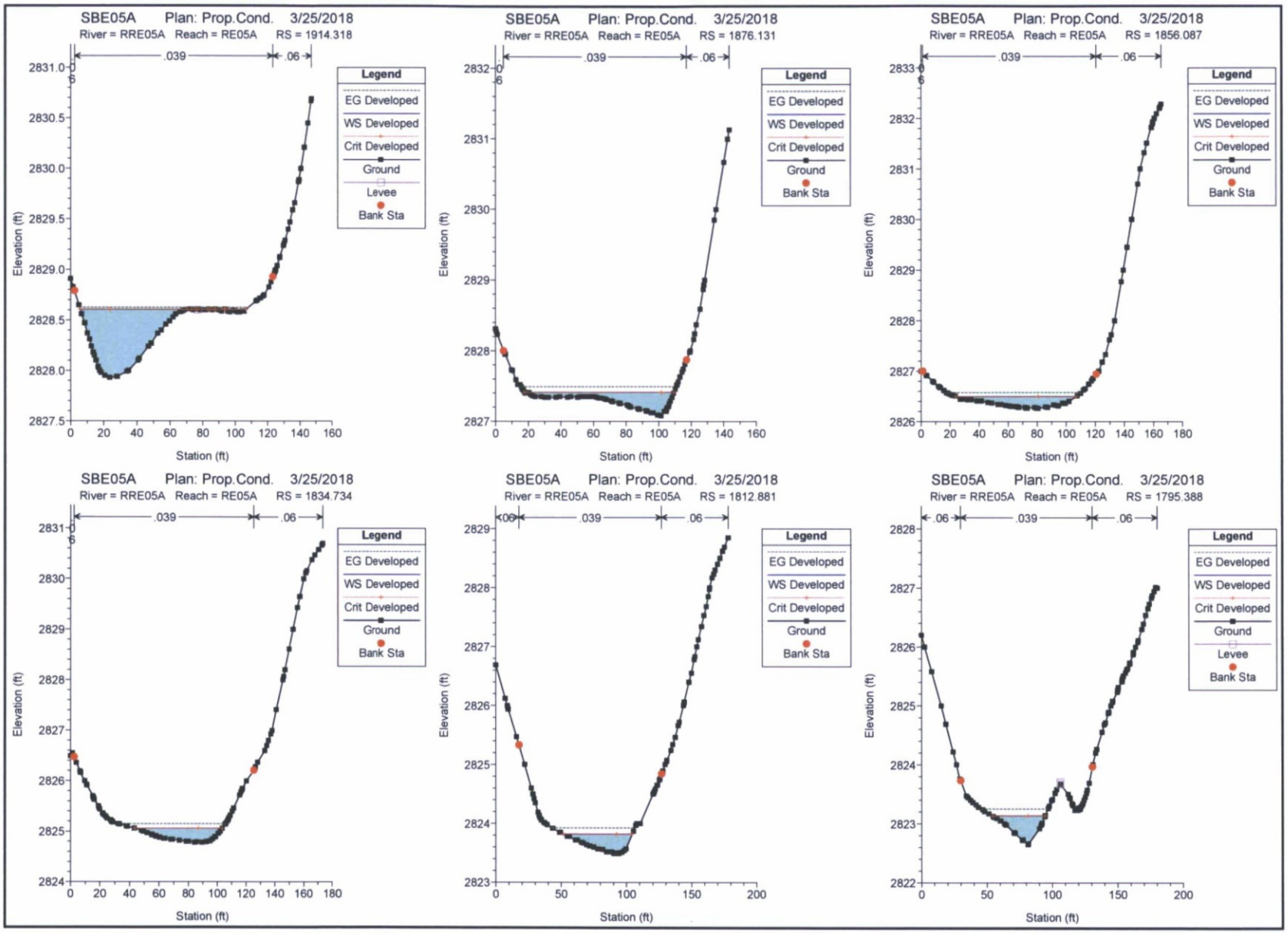
HEC-RAS Plan: PropCond River: RRE05A Reach: RE05A Profile: Developed (Continued)

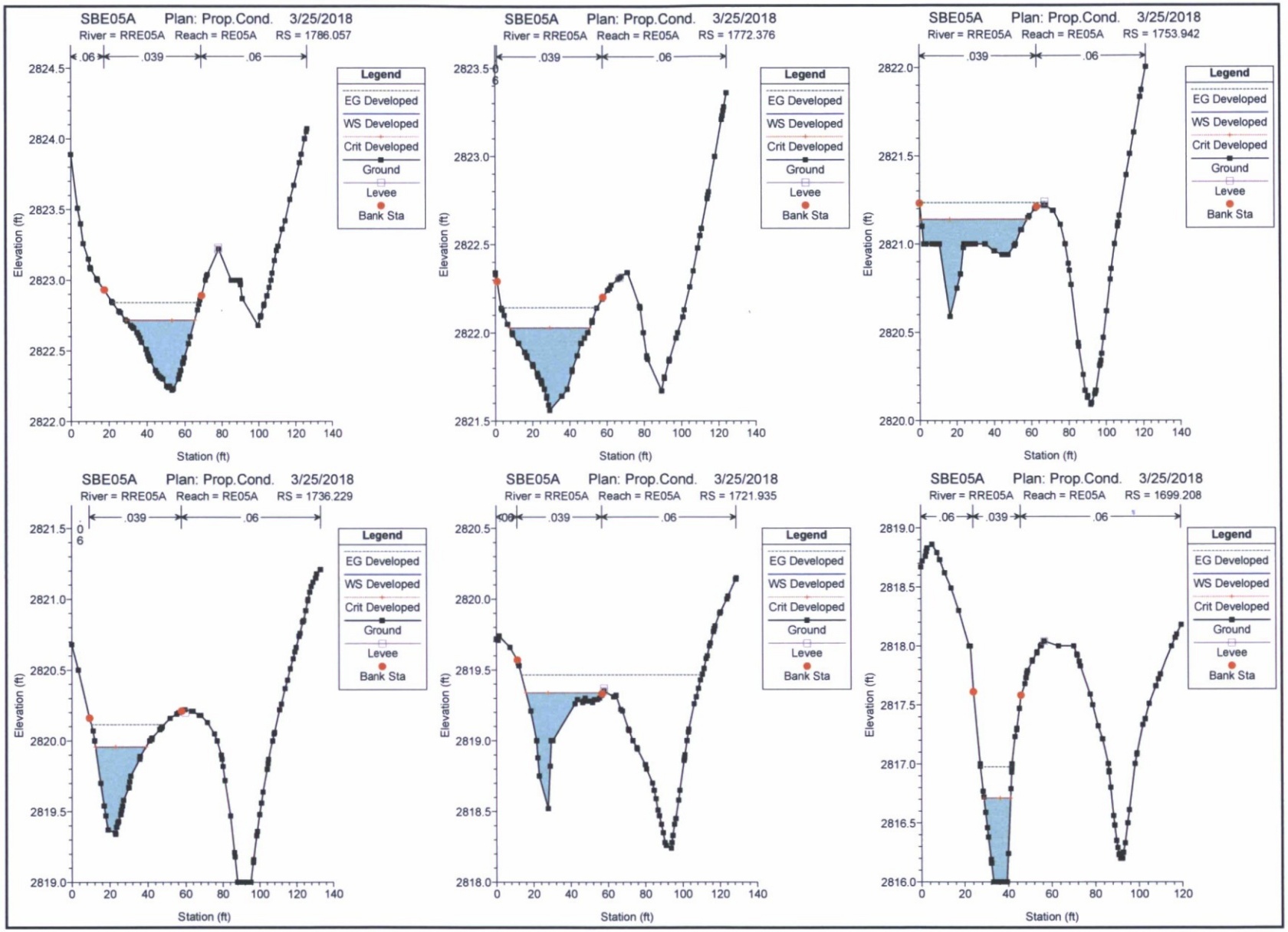
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
RE05A	1300.879	Developed	27.00	2795.00	2795.46	2795.46	2795.54	0.036097	2.29	11.79	66.28	0.96
RE05A	1278.891	Developed	27.00	2794.00	2794.43	2794.43	2794.54	0.037993	2.66	10.16	47.44	1.01
RE05A	1260.282	Developed	27.00	2793.00	2793.46	2793.46	2793.58	0.035232	2.77	9.75	40.42	0.99
RE05A	1240.093	Developed	27.00	2792.02	2792.49	2792.49	2792.60	0.036157	2.68	10.07	44.65	1.00
RE05A	1219.81	Developed	27.00	2791.12	2791.61	2791.61	2791.72	0.035480	2.71	9.97	42.99	0.99
RE05A	1196.936	Developed	27.00	2790.18	2790.60	2790.60	2790.69	0.037053	2.51	10.74	53.46	0.99
RE05A	1182.851	Developed	27.00	2787.00	2789.83	2789.83	2789.83	0.000019	0.17	156.51	149.37	0.03
RE05A	1160.708	Developed	27.00	2786.63	2788.51	2788.51	2788.51	0.000053	0.24	114.77	145.77	0.05
RE05A	1137.745	Developed	27.00	2785.80	2787.15	2787.15	2787.15	0.000190	0.36	75.82	135.65	0.08
RE05A	1119.686	Developed	27.00	2785.23	2786.02	2786.02	2786.03	0.003478	0.92	29.21	110.66	0.32
RE05A	1092.72	Developed	27.00	2784.45	2784.68	2784.68	2784.76	0.043784	2.33	11.57	73.02	1.03
RE05A	1072.903	Developed	27.00	2783.24	2783.50	2783.50	2783.60	0.039821	2.47	10.92	58.81	1.01
RE05A	1053.457	Developed	27.00	2782.14	2782.44	2782.44	2782.54	0.037575	2.58	10.49	50.92	1.00
RE05A	1032.514	Developed	27.00	2780.76	2781.22	2781.22	2781.35	0.034631	2.85	9.48	37.17	0.99
RE05A	1017.779	Developed	21.00	2780.00	2780.40	2780.40	2780.53	0.034251	2.98	7.04	25.52	1.00
RE05A	997.6763	Developed	21.00	2779.33	2779.67	2779.67	2779.80	0.034968	2.86	7.35	28.94	1.00
RE05A	976.6082	Developed	21.00	2778.35	2778.80	2778.80	2778.93	0.034199	2.92	7.20	27.03	1.00
RE05A	960.0924	Developed	21.00	2777.70	2778.08	2778.08	2778.21	0.034575	2.88	7.28	28.01	1.00
RE05A	941.7241	Developed	21.00	2776.89	2777.29	2777.29	2777.42	0.034367	2.94	7.15	26.61	1.00
RE05A	922.4426	Developed	21.00	2775.73	2776.06	2776.06	2776.18	0.038946	2.74	7.66	34.75	1.03
RE05A	899.1575	Developed	21.00	2774.50	2774.84	2774.84	2774.95	0.037088	2.64	7.95	36.80	1.00
RE05A	880.3698	Developed	21.00	2773.58	2773.89	2773.89	2774.00	0.036987	2.66	7.89	35.98	1.00
RE05A	859.8353	Developed	21.00	2772.67	2773.07	2773.07	2773.19	0.037204	2.71	7.75	34.64	1.01
RE05A	840.9258	Developed	21.00	2771.83	2772.19	2772.19	2772.27	0.036126	2.27	9.27	52.92	0.95
RE05A	824.8497	Developed	21.00	2771.00	2771.27	2771.27	2771.35	0.039637	2.31	9.07	53.80	0.99
RE05A	802.7906	Developed	21.00	2769.66	2770.04	2770.04	2770.13	0.033775	2.34	8.97	46.33	0.94
RE05A	781.2918	Developed	21.00	2768.73	2769.11	2769.11	2769.22	0.038824	2.64	7.94	37.97	1.02
RE05A	760.4289	Developed	21.00	2767.84	2768.27	2768.27	2768.40	0.034384	2.94	7.14	26.57	1.00
RE05A	738.1452	Developed	21.00	2767.00	2767.36	2767.36	2767.50	0.033618	3.01	6.97	24.58	1.00
RE05A	718.6221	Developed	21.00	2766.00	2766.40	2766.40	2766.55	0.033210	3.07	6.85	23.28	1.00
RE05A	699.2011	Developed	21.00	2765.00	2765.40	2765.40	2765.54	0.033216	3.08	6.82	23.06	1.00
RE05A	678.9603	Developed	21.00	2764.00	2764.42	2764.40	2764.56	0.027209	3.00	6.99	21.11	0.92
RE05A	655.1843	Developed	21.00	2763.20	2763.68	2763.68	2763.83	0.034365	3.05	6.89	24.27	1.01
RE05A	635.5899	Developed	21.00	2762.51	2762.92	2762.92	2763.06	0.034887	2.96	7.09	26.42	1.01
RE05A	617.7419	Developed	21.00	2761.54	2762.17	2762.17	2762.34	0.033702	3.26	6.44	20.18	1.02
RE05A	599.4559	Developed	21.00	2761.00	2761.43	2761.43	2761.61	0.031910	3.33	6.30	18.33	1.00
RE05A	574.9504	Developed	21.00	2759.99	2760.37	2760.37	2760.52	0.033213	3.08	6.82	23.03	1.00
RE05A	556.356	Developed	21.00	2759.00	2759.42	2759.42	2759.57	0.032606	3.15	6.67	21.49	1.00

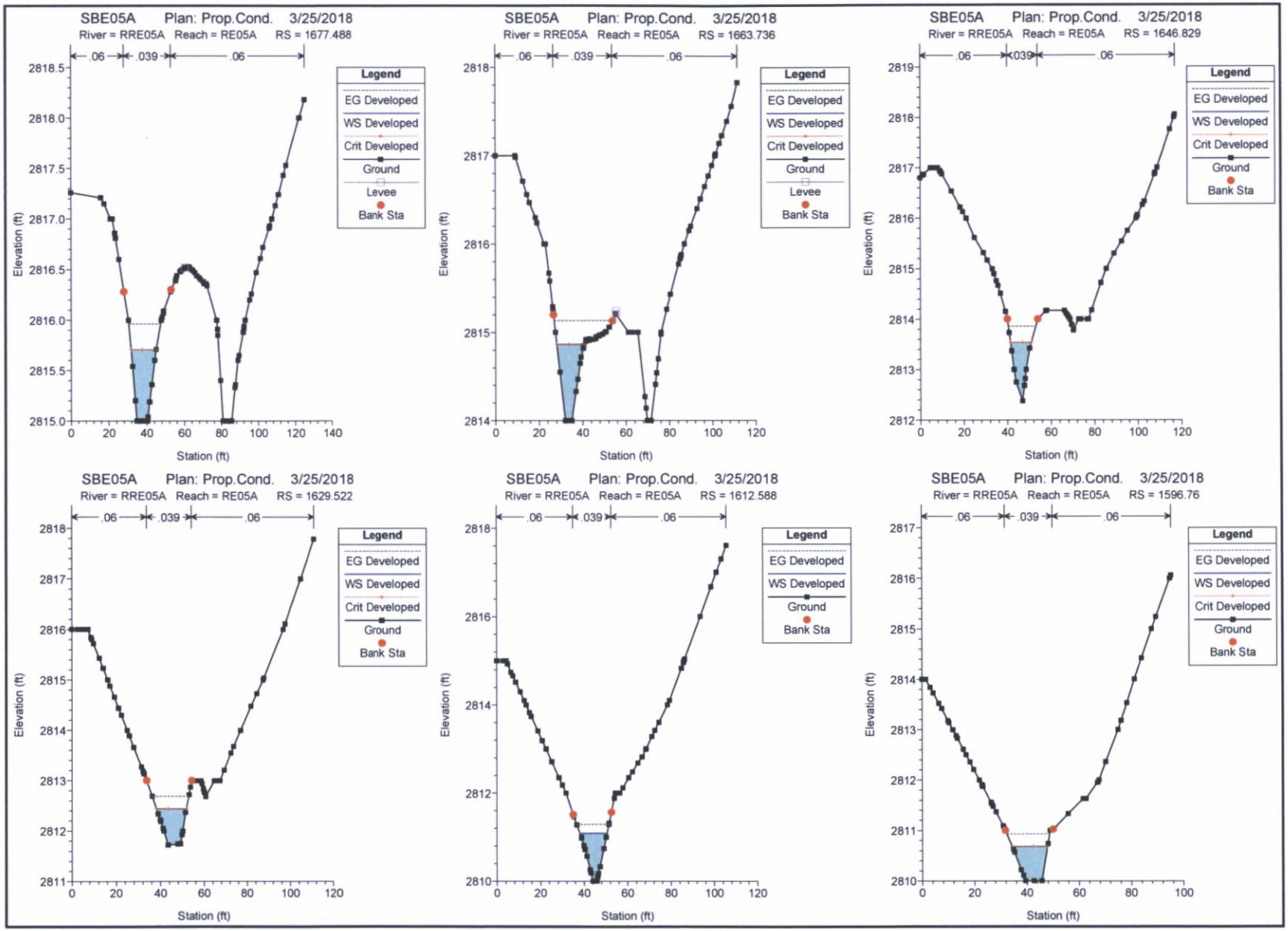
HEC-RAS Plan: PropCond River: RRE05A Reach: RE05A Profile: Developed (Continued)

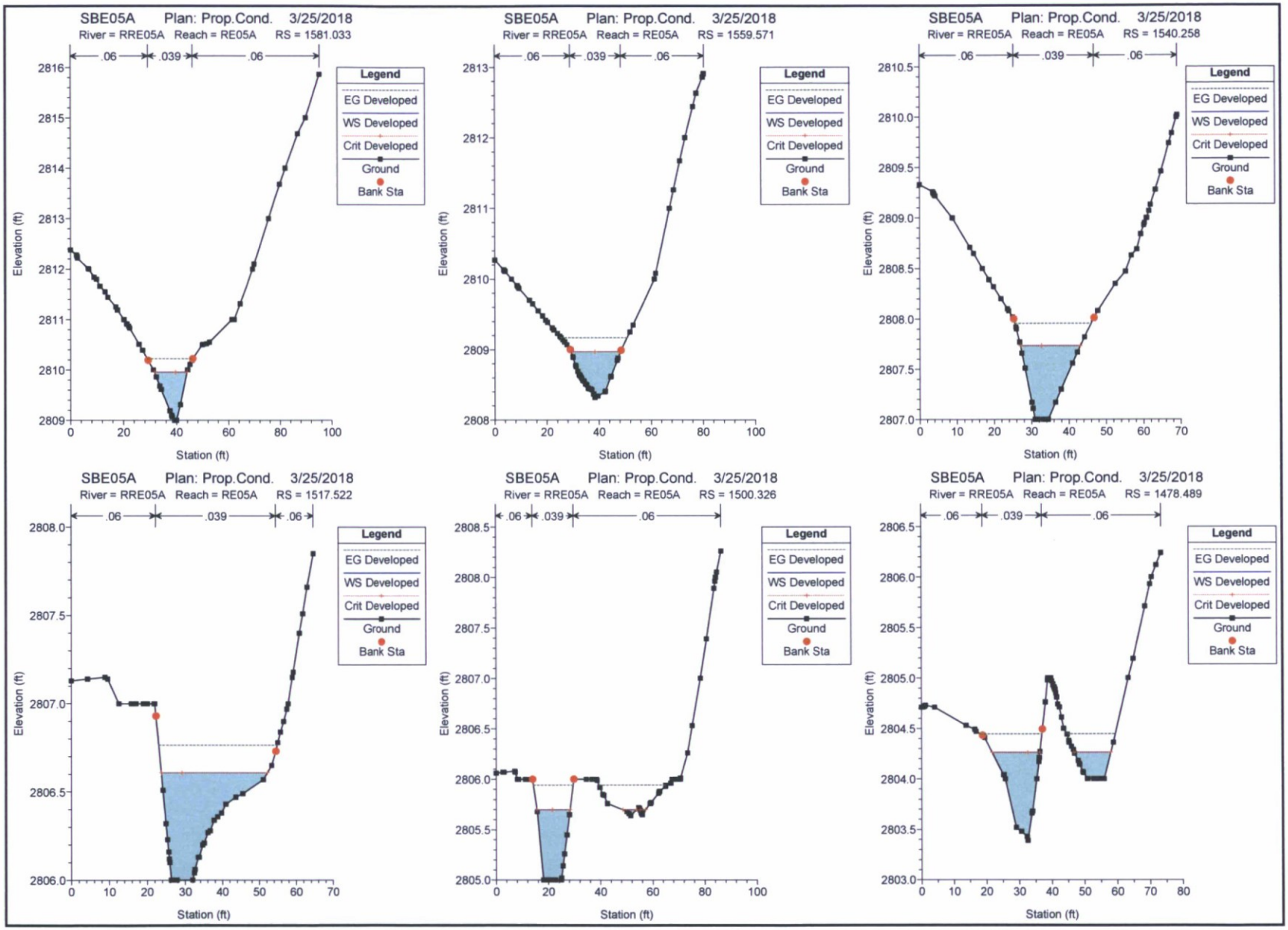
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
RE05A	542.4001	Developed	21.00	2758.40	2758.85	2758.85	2758.99	0.034881	3.03	6.93	24.93	1.01
RE05A	524.1107	Developed	21.00	2757.66	2758.13	2758.13	2758.27	0.034344	3.01	6.98	25.05	1.01
RE05A	506.3732	Developed	21.00	2756.98	2757.38	2757.38	2757.51	0.035027	2.85	7.37	29.11	1.00
RE05A	487.7664	Developed	21.00	2756.00	2756.29	2756.29	2756.41	0.035647	2.74	7.66	32.49	1.00
RE05A	465.2938	Developed	21.00	2754.81	2755.23	2755.21	2755.34	0.028253	2.63	7.99	30.37	0.90
RE05A	442.6021	Developed	21.00	2754.05	2754.51	2754.51	2754.64	0.034441	2.88	7.28	27.96	1.00
RE05A	415.7166	Developed	21.00	2753.00	2753.38	2753.38	2753.52	0.033292	3.04	6.92	23.94	1.00
RE05A	392.9352	Developed	21.00	2752.05	2752.45	2752.45	2752.57	0.035264	2.78	7.56	31.20	1.00
RE05A	372.6946	Developed	21.00	2751.00	2751.44	2751.44	2751.55	0.036526	2.70	7.79	34.51	1.00
RE05A	355.0608	Developed	21.00	2750.03	2750.58	2750.58	2750.68	0.038922	2.58	8.15	40.53	1.01
RE05A	338.2482	Developed	21.00	2749.00	2749.75	2749.75	2749.84	0.047306	2.49	8.42	50.92	1.08
RE05A	283.6252	Developed	78.00	2746.00	2747.72	2747.67	2748.01	0.021658	4.27	18.26	27.18	0.92
RE05A	263.5783	Developed	78.00	2746.00	2747.23	2747.23	2747.46	0.033170	3.78	20.62	51.03	1.05
RE05A	246.5995	Developed	78.00	2745.00	2746.44	2746.44	2746.68	0.026570	3.91	19.96	39.72	0.97
RE05A	223.052	Developed	78.00	2744.00	2745.50	2745.50	2745.77	0.027876	4.19	18.60	34.34	1.01
RE05A	200.9467	Developed	78.00	2744.00	2744.62	2744.62	2744.83	0.029842	3.73	20.92	48.68	1.00
RE05A	180.0231	Developed	78.00	2742.67	2743.95		2744.14	0.013603	3.51	22.23	31.22	0.73
RE05A	162.1025	Developed	78.00	2742.81	2743.45	2743.45	2743.65	0.030437	3.66	21.32	52.18	1.01
RE05A	141.3555	Developed	78.00	2741.75	2742.77		2742.90	0.009852	2.92	26.71	39.26	0.62
RE05A	126.5741	Developed	78.00	2741.50	2742.45	2742.40	2742.68	0.021508	3.85	20.28	35.45	0.90
RE05A	102.4123	Developed	78.00	2741.00	2741.81	2741.81	2742.09	0.027510	4.26	18.32	32.99	1.01
RE05A	81.78598	Developed	78.00	2740.00	2741.00	2741.00	2741.26	0.025809	4.10	19.00	34.46	0.97
RE05A	51.81187	Developed	78.00	2738.86	2739.76		2739.88	0.008784	2.79	27.95	40.31	0.59
RE05A	27.80642	Developed	78.00	2738.00	2739.15	2739.15	2739.52	0.025404	4.86	16.06	22.20	1.01
RE05A	4.071425	Developed	78.00	2737.00	2738.29	2738.29	2738.69	0.024808	5.06	15.41	19.64	1.01

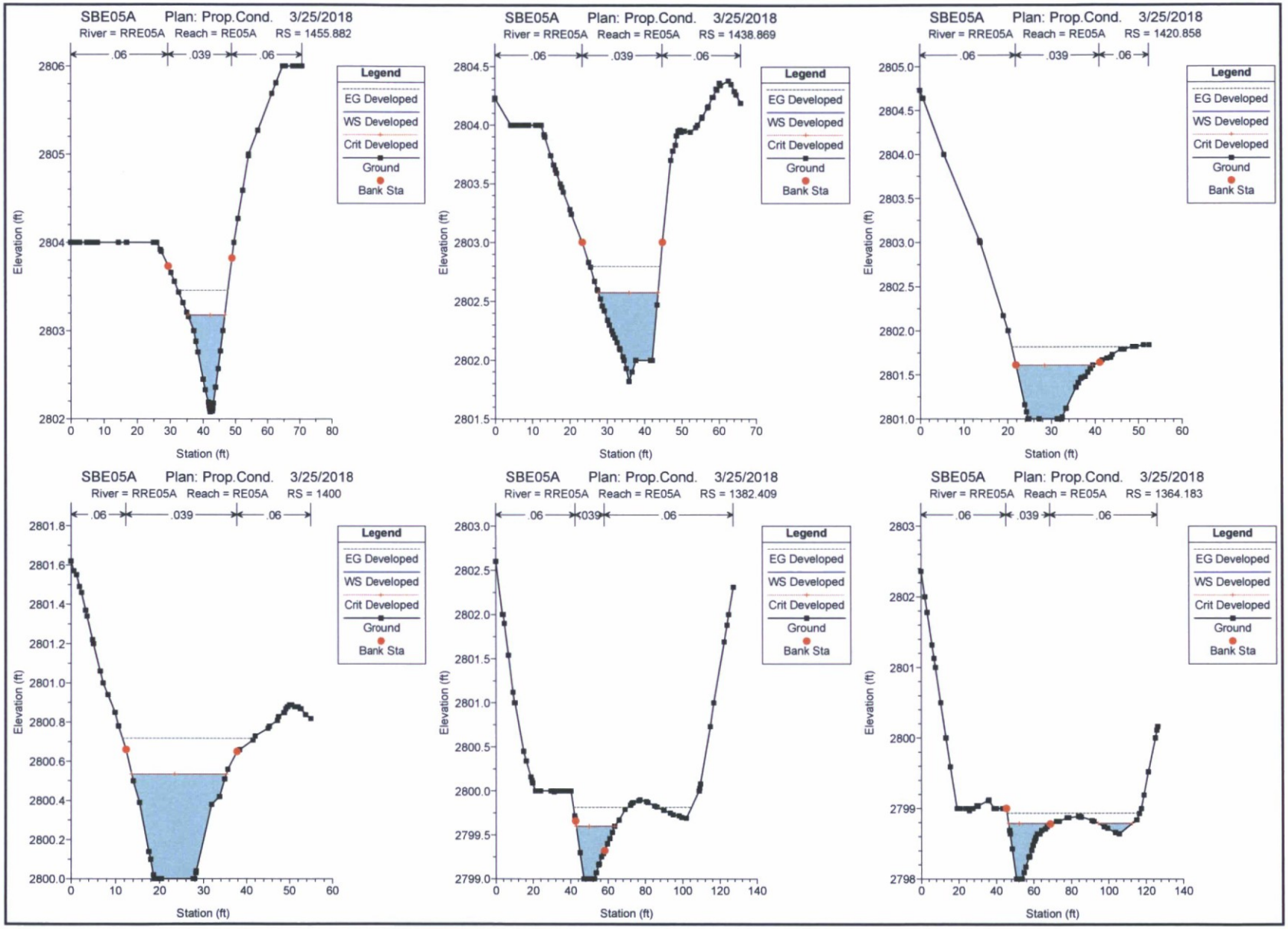

SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 2030.077
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Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 2013.397
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1993.443
.06 .039 .06
Legend
EG Developed
WS Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1970.89
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1952.875
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1932.32
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Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

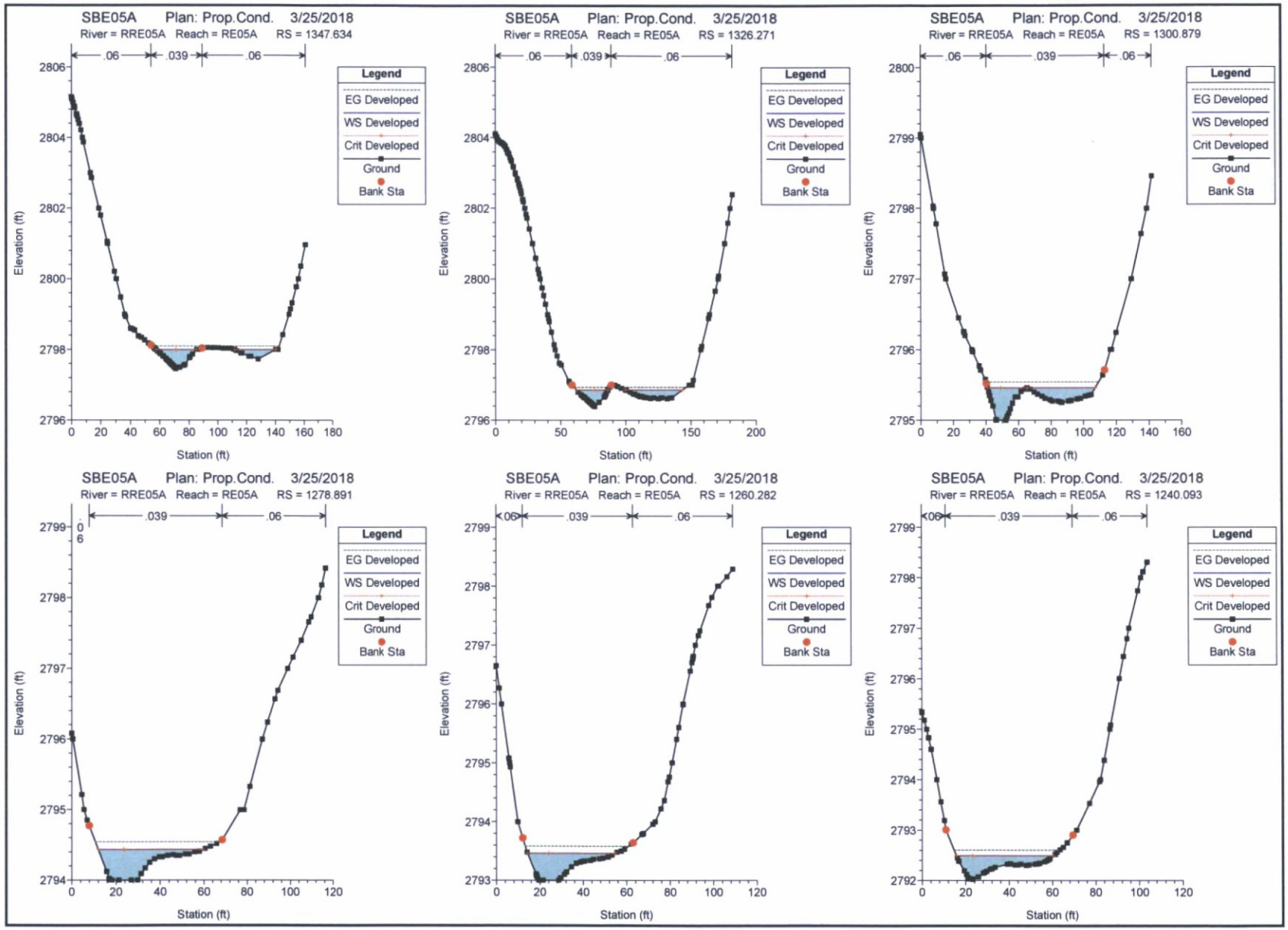

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River = RRE05A Reach = RE05A RS = 1914.318
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1876.131
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1856.087
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1834.734
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1812.881
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1795.388
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

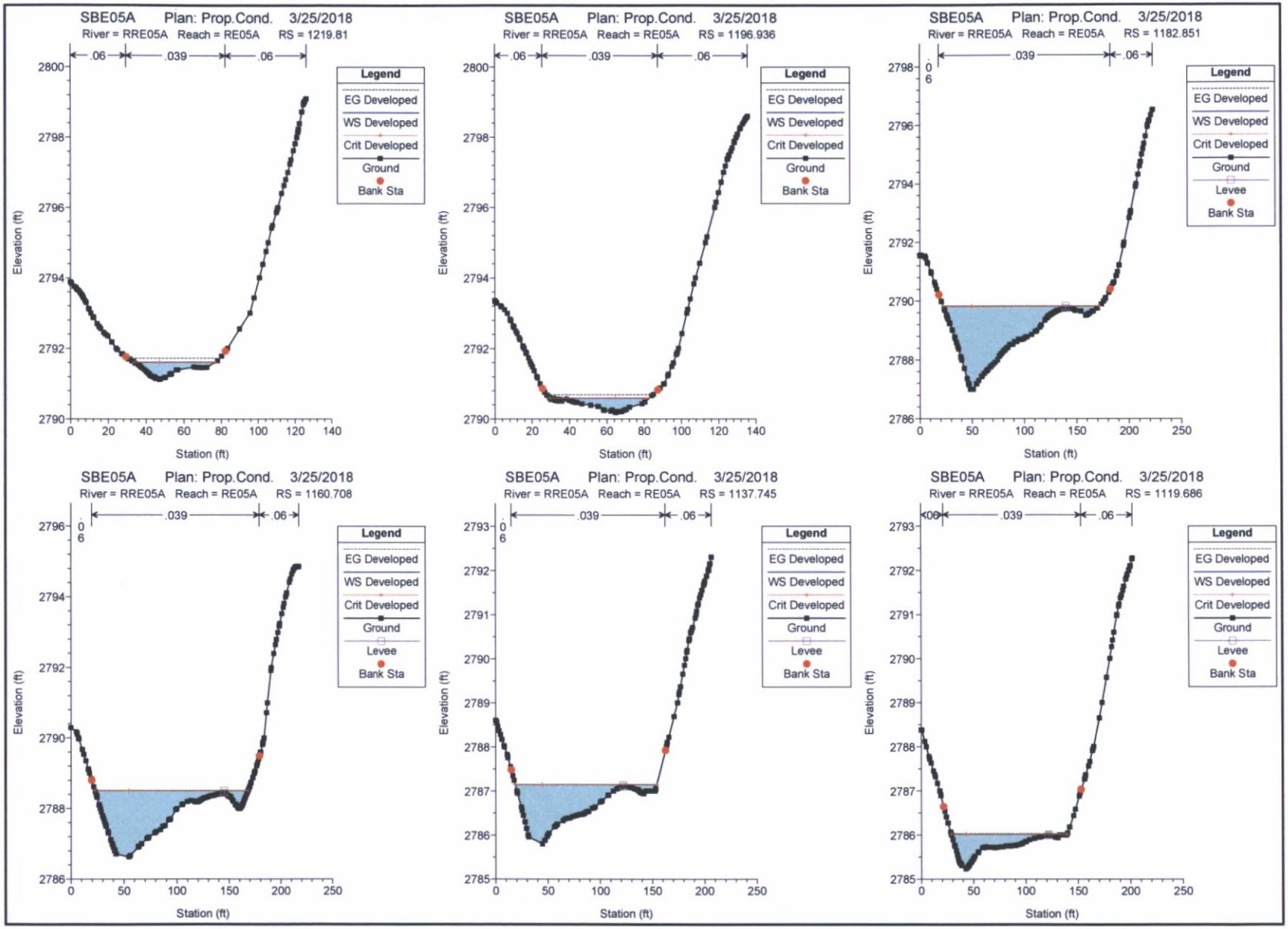

SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1786.057
.06 .039 .06
Elevation (ft)
Station (ft)
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1772.376
.039 .06
Elevation (ft)
Station (ft)
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1753.942
.039 .06
Elevation (ft)
Station (ft)
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1736.229
.039 .06
Elevation (ft)
Station (ft)
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1721.935
.039 .06
Elevation (ft)
Station (ft)
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1699.208
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Elevation (ft)
Station (ft)
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta

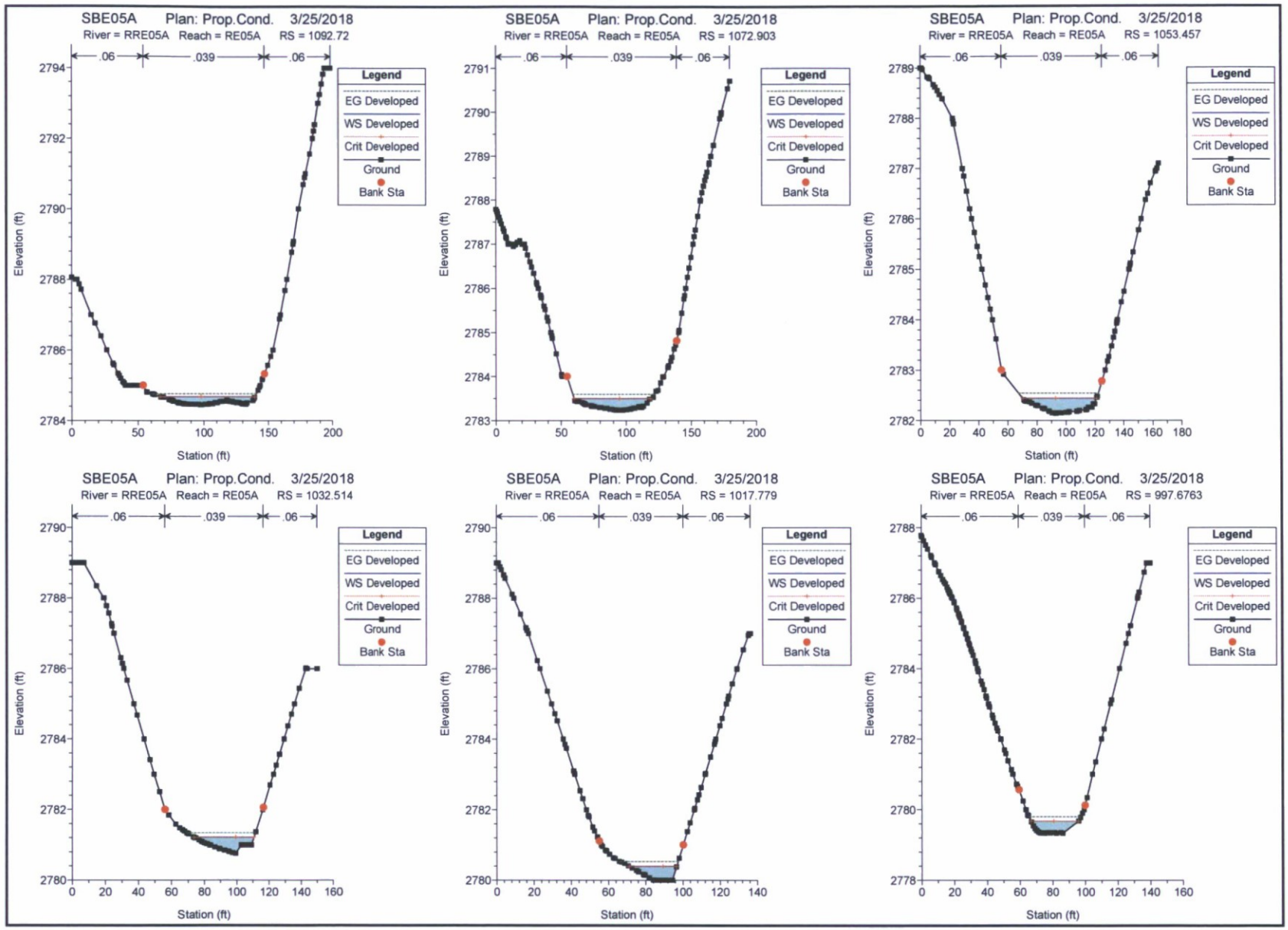

SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1677.488
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1663.736
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1646.829
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1629.522
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1612.588
.06 .039 .06
Legend
EG Developed
WS Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1596.76
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)

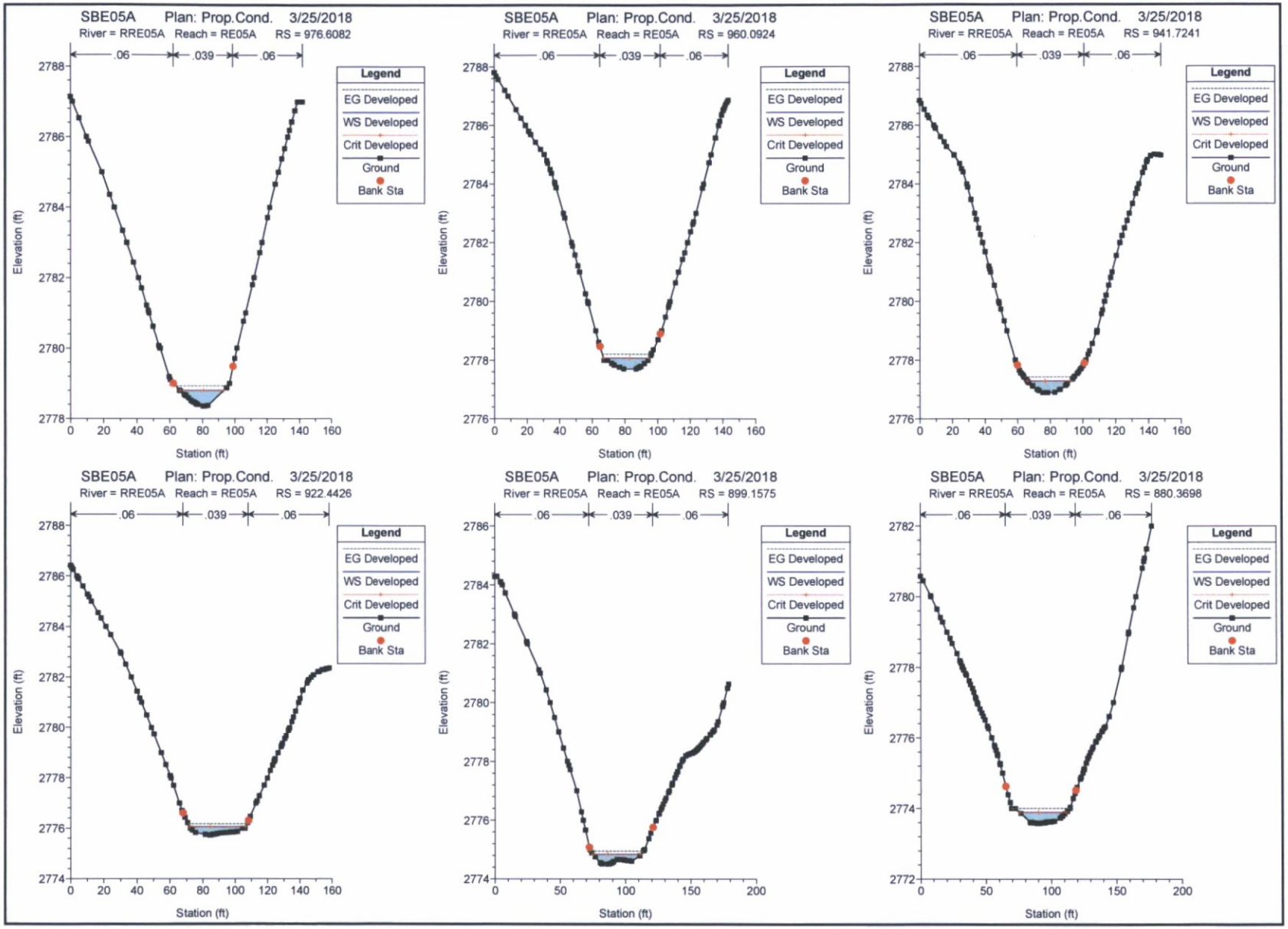

SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1581.033
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1559.571
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1540.258
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1517.522
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1500.326
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1478.489
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)

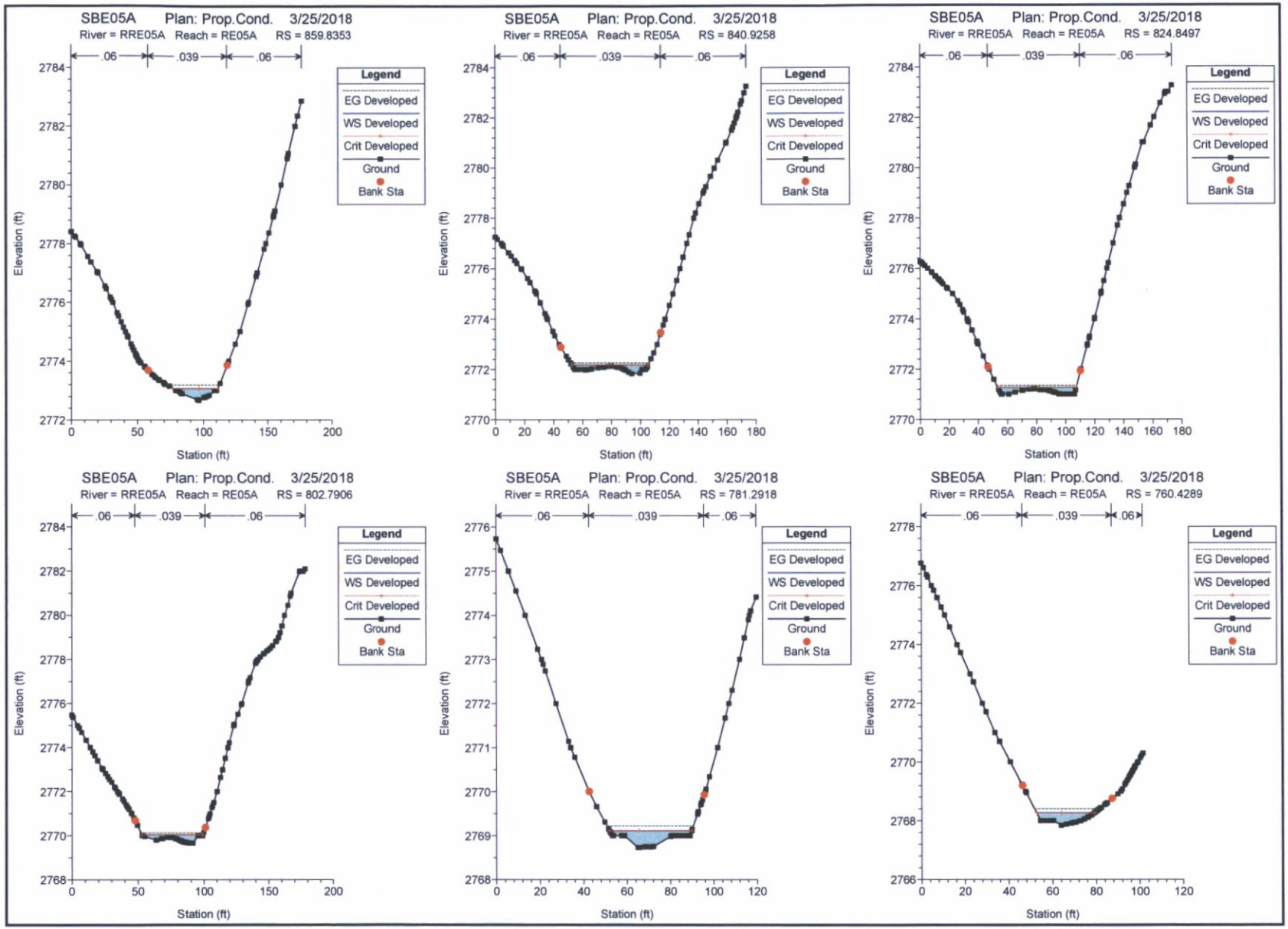

SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1455.882
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1438.869
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1420.858
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1400
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1382.409
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1364.183
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)

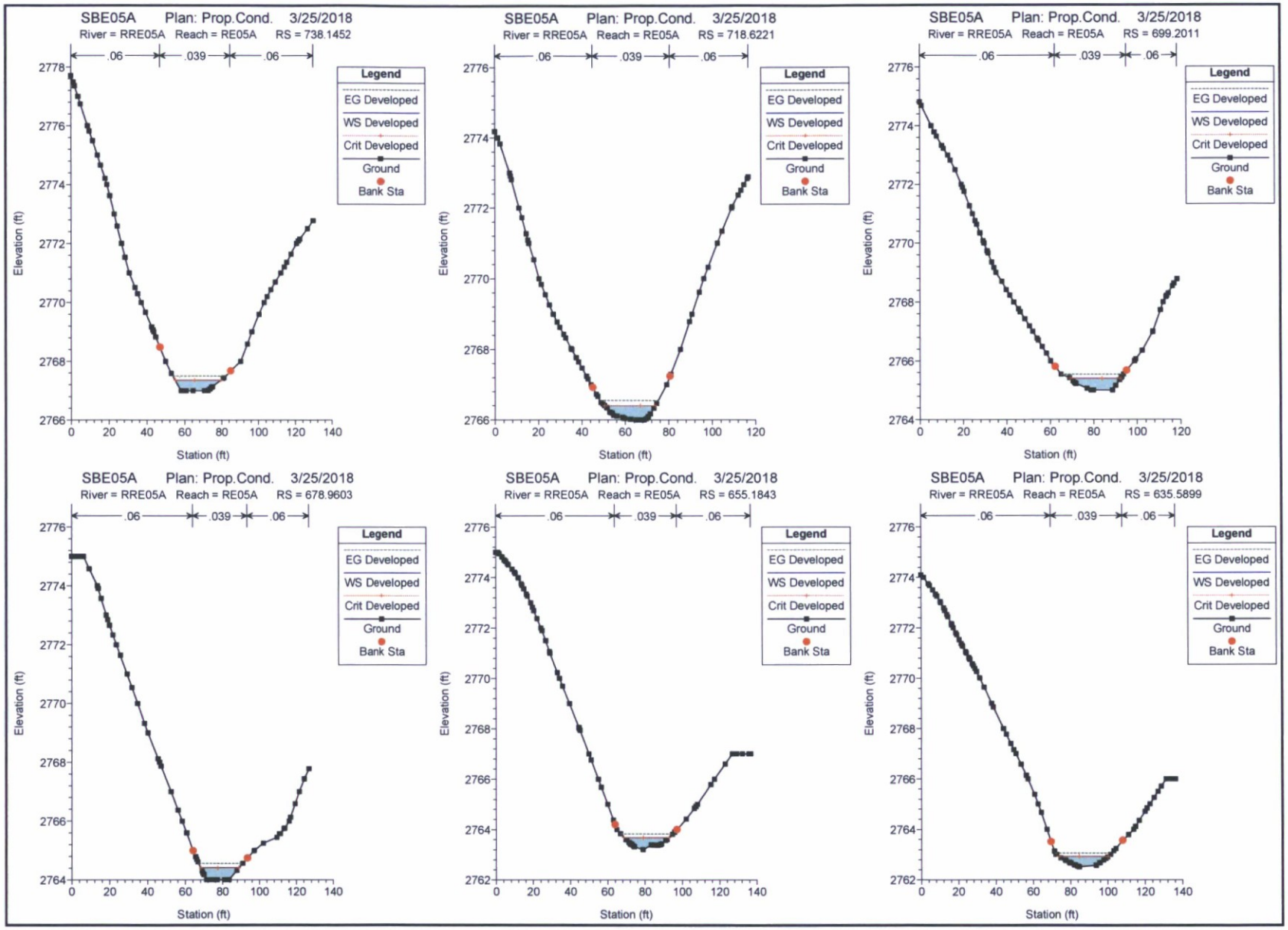

SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1347.634
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1326.271
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1300.879
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1278.891
.039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1260.282
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1240.093
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Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)

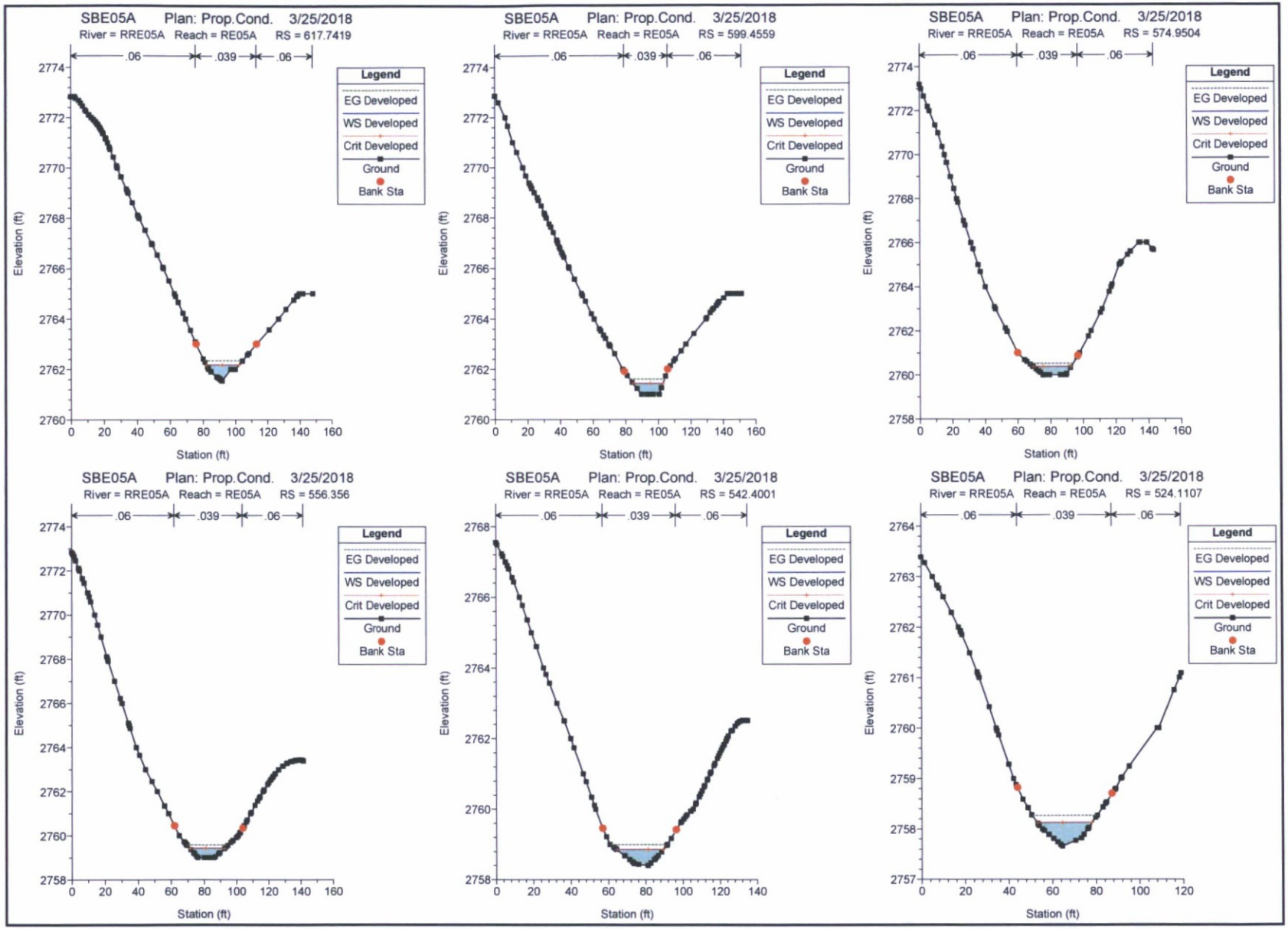

SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1219.81
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1196.936
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1182.851
.039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1160.708
.039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1137.745
.039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1119.686
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Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

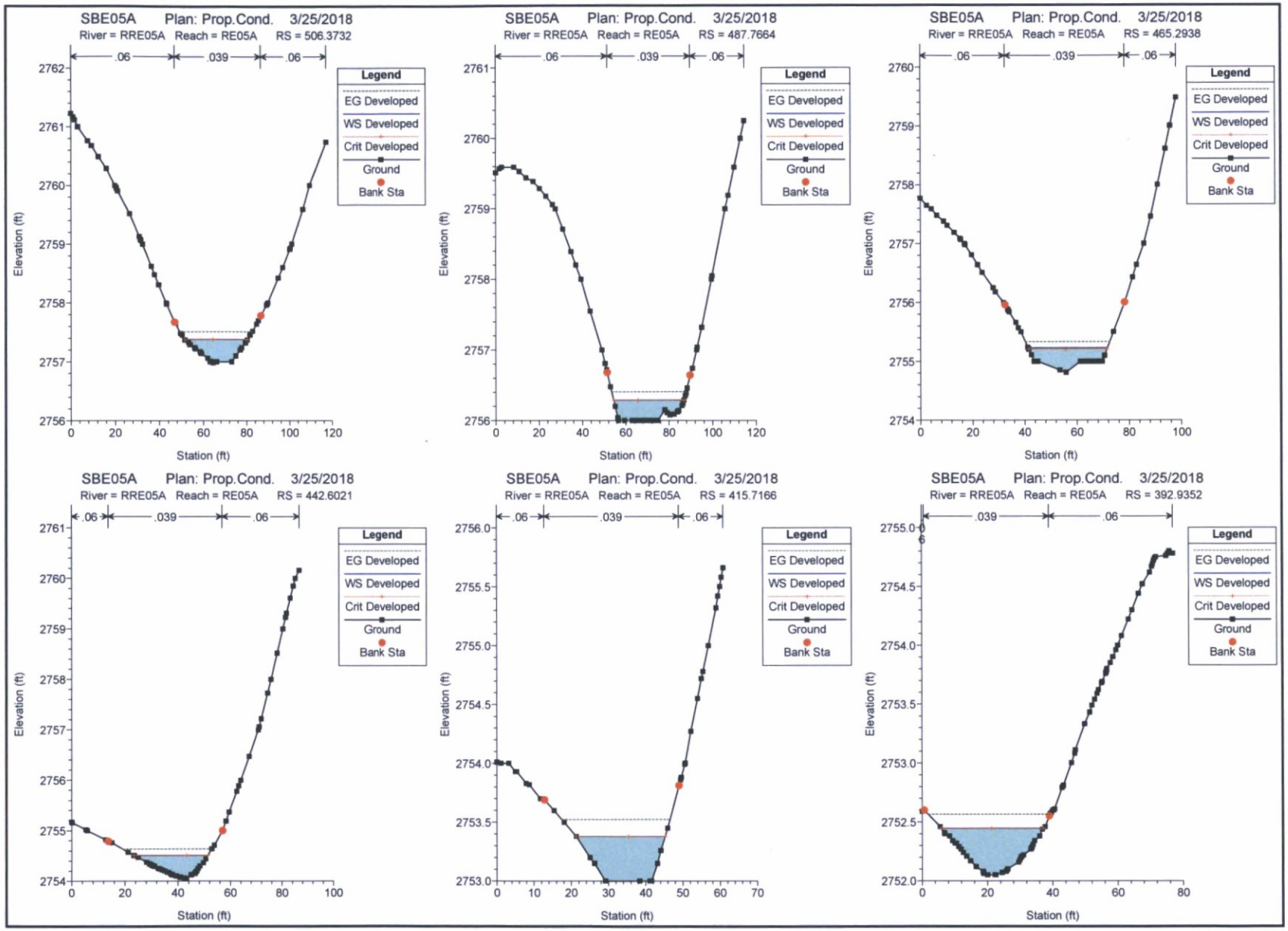

SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1092.72
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1072.903
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1053.457
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1032.514
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1017.779
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 997.6763
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)

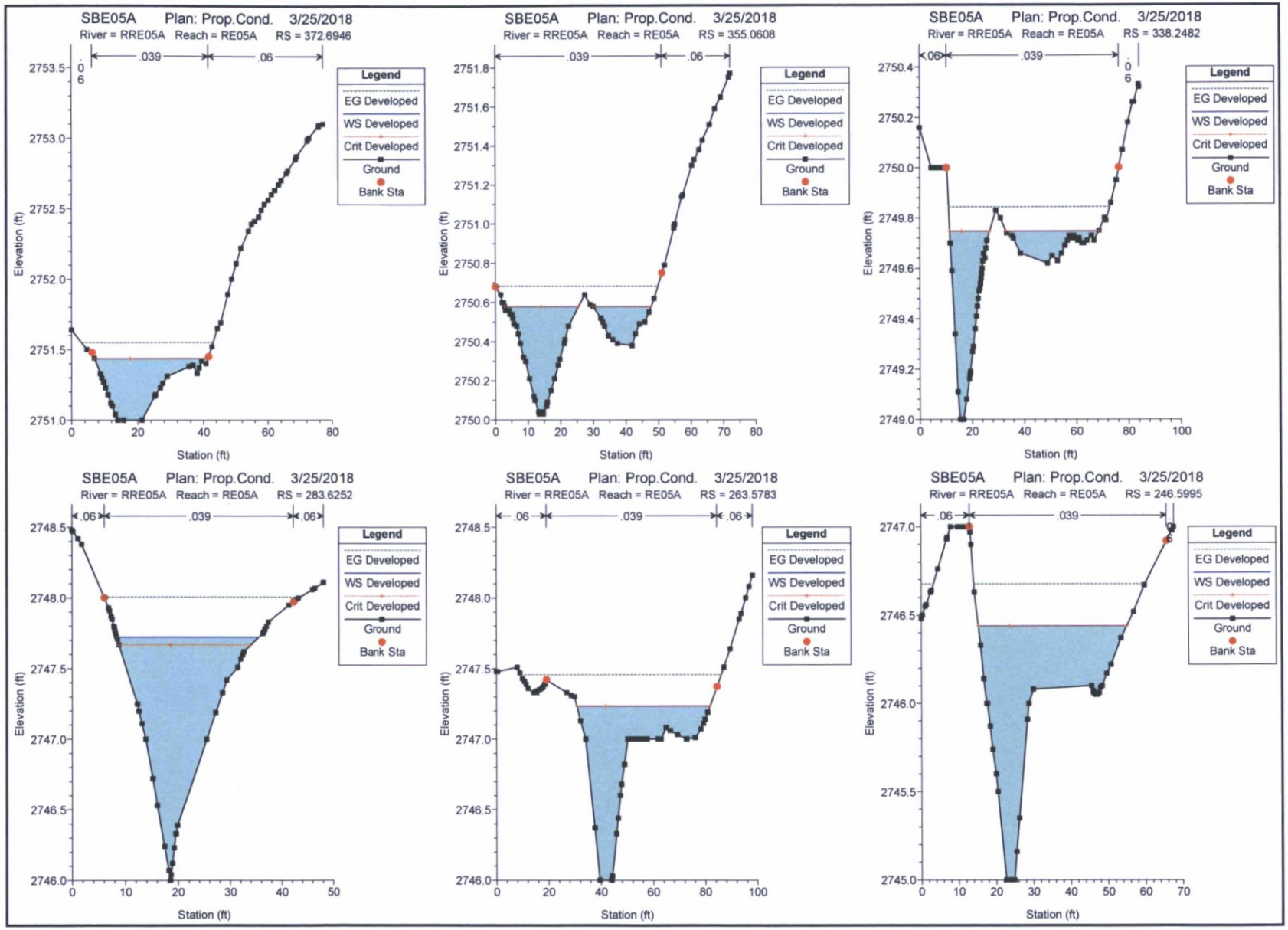

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River = RRE05A Reach = RE05A RS = 976.6082
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 960.0924
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 941.7241
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 922.4426
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 899.1575
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 880.3698
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Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)

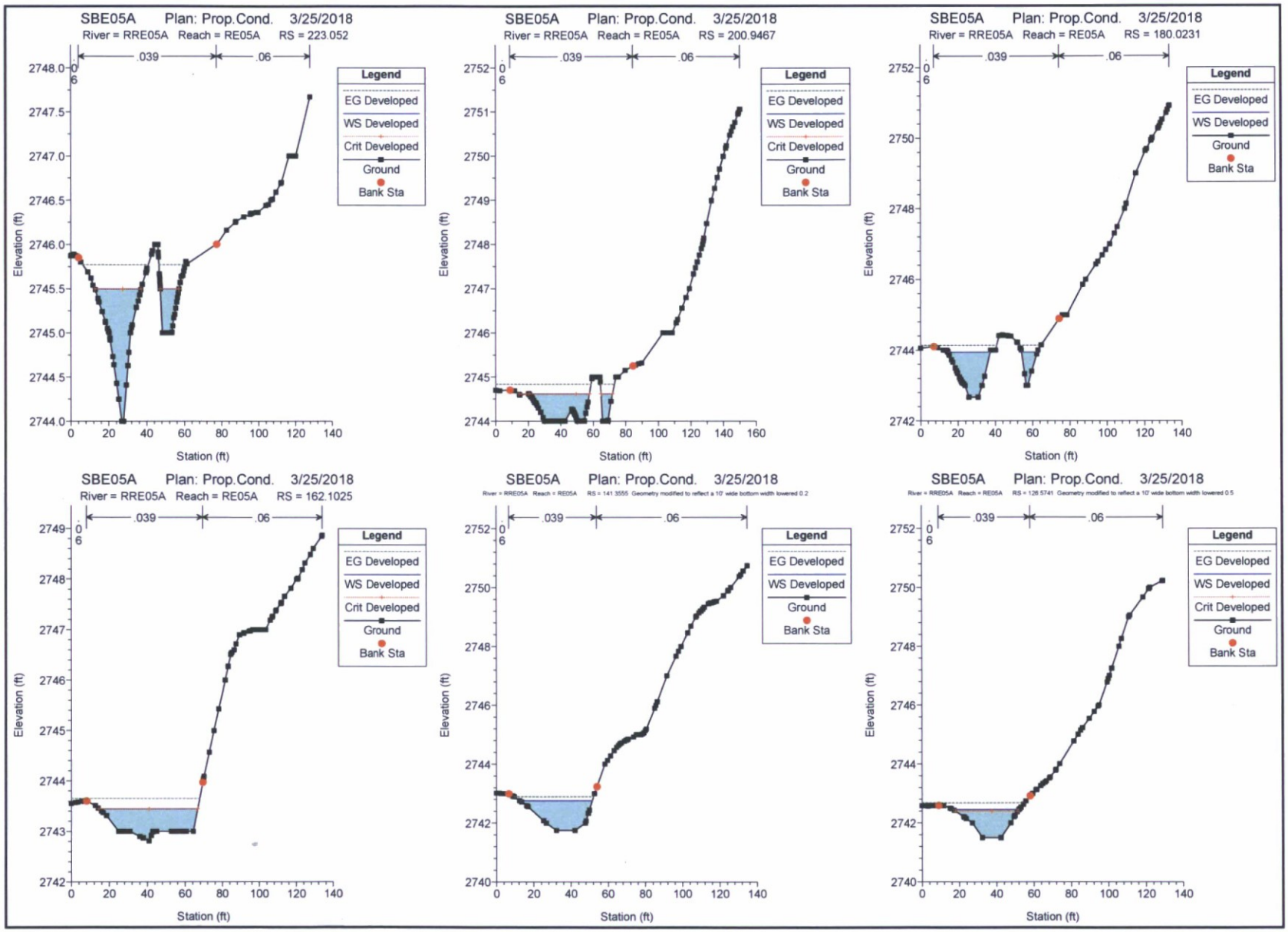

SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 859.8353
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 840.9258
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 824.8497
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 802.7906
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 781.2918
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 760.4289
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)

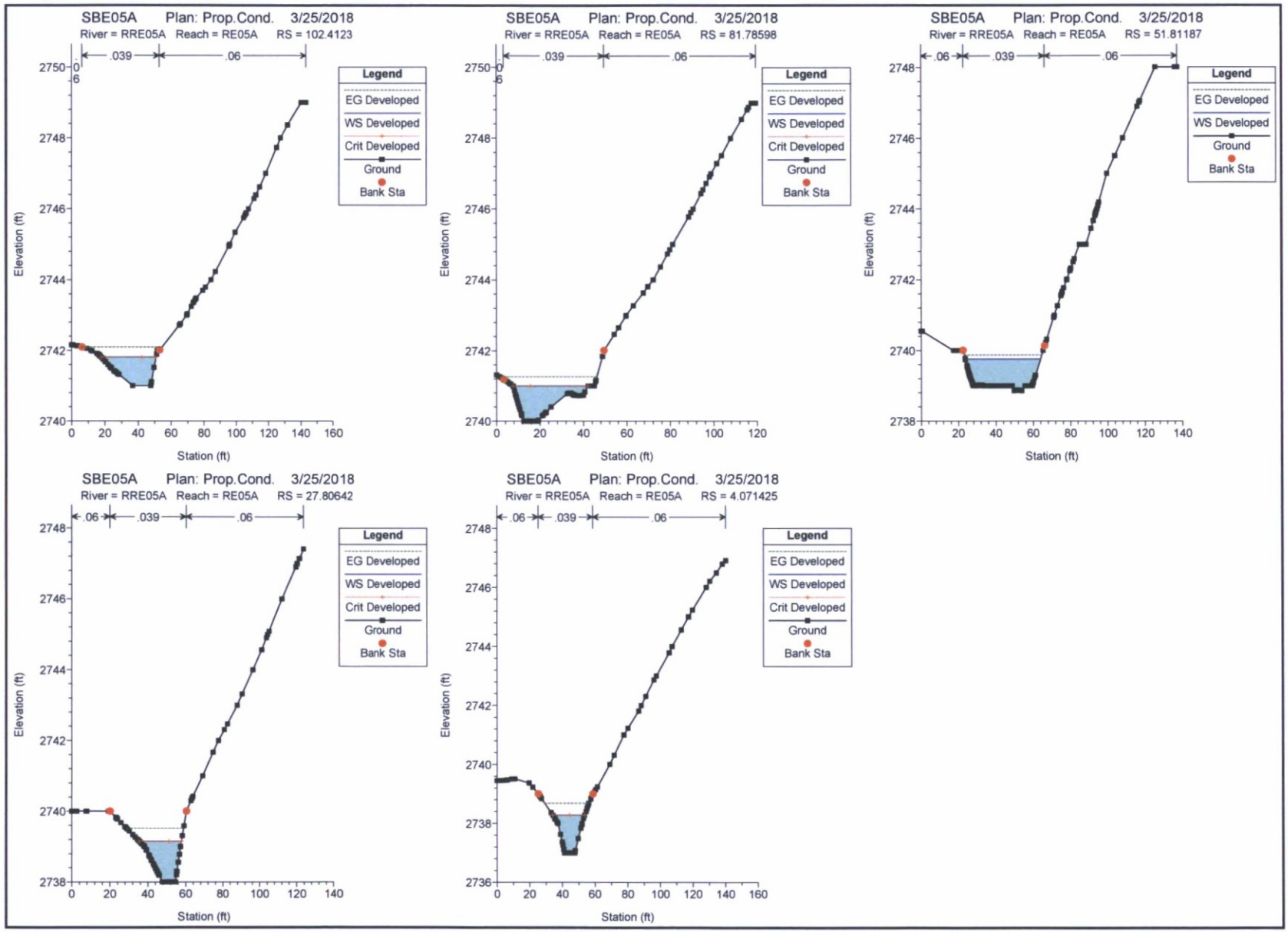

SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 738.1452
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 718.6221
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 699.2011
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 678.9603
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 655.1843
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 635.5899
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)


SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 617.7419
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 599.4559
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 574.9504
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 556.356
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 542.4001
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 524.1107
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)


SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 506.3732
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 487.7664
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 465.2938
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 442.6021
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 415.7166
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 392.9352
.039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)


SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 372.6946
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 355.0608
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 338.2482
.06
.039
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 283.6252
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 263.5783
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 246.5995
.06
.039
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)


SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 223.052
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 200.9467
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 180.0231
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 162.1025
SBE05A Plan: Prop.Cond. 3/25/2018
SBE05A Plan: Prop.Cond. 3/25/2018
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)


SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 102.4123
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 81.78598
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 51.81187
.06
.039
.06
Legend
EG Developed
WS Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 27.80642
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 4.071425
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)

Project: Master Drainage Plan Amendment- Sereno Canyon

Stream: Various

Location: Scottsdale, Arizona

Photo E1 : Typical photo of Sandy-bottomed Wash



C□annel□□lood□lain Conditions		Mannin□s n Ad□ust□ent		n □alue
C□annel□□lood□lain Material	Concrete	$n_□$	0.012-0.018	
	□ir□ Soil		0.025-0.032	
	Coarse Sand		0.026-0.035	
	Gra□el		0.028-0.035	0.028
	Co□□le		0.030-0.050	
	Boulder		0.040-0.070	
□e□ree o□Irre□ularit□	S□oot□	n_1	0.000	
	Minor		0.001-0.005	0.001
	Moderate		0.006-0.010	
	Se□ere		0.011-0.020	
□ariations in C□annel Cross Section	Gradual	n_2	0.000	
	Alternatin□Occasionall□		0.001-0.005	
	Alternatin□□re□uentl□		0.010-0.015	
E□ects o□O□struction	Ne□li□i□le	n_3	0.000-0.004	
	Minor		0.005-0.015 □0.019□	0.005
	A□recia□le		0.020-0.030	
	Se□ere		0.040-0.060	
A□ount o□□e□etation	Ne□li□i□le	n_4	0.000-0.002 □0.001□	
	S□all		□0.001□0.002-0.010	0.005
	Mediu□		0.010-0.025	
	Lar□e		0.025-0.050	
	□er□Lar□e		0.050-0.100	
	E□tre□el□Lar□e		0.100-0.200	
Inter□ediate Su□				0.039
□e□ree o□Meanderin□	Minor	□	1	1
	A□recia□le		1.15	
	Se□ere		1.3	
$n = n_□ + n_1 + n_2 + n_3 + n_4$ □□				**0.039**

Note□ □alues in □arenticies □or □lood□lain n-□alue ad□ust□ent □actor □□en it di□ers □ro□ t□e c□annel n-□alue ad□ust□ent □actor

Project: Master Drainage Plan Amendment- Sereno Canyon

Stream: Various

Location: Scottsdale, Arizona

Photo E2 : Typical photo of Swale/Overbank



C□annel□□lood□lain Conditions		Mannin□s n Ad□ust□ent		n □alue
C□annel□□lood□lain Material	Concrete	$n_{□}$	0.012-0.018	
	□ir□ Soil		0.025-0.032	
	Coarse Sand		0.026-0.035	
	Gra□el		0.028-0.035	0.03
	Co□□le		0.030-0.050	
	Boulder		0.040-0.070	
□e□ree o□Irre□ularit□	S□oot□	n_1	0.000	
	Minor		0.001-0.005	0.005
	Moderate		0.006-0.010	
	Se□ere		0.011-0.020	
□ariations in C□annel Cross Section	Gradual	n_2	0.000	
	Alternatin□Occasionall□		0.001-0.005	
	Alternatin□□re□uentl□		0.010-0.015	
E□ects o□O□struction	Ne□li□i□le	n_3	0.000-0.004	
	Minor		0.005-0.015 □0.019□	0.01
	A□□recia□le		0.020-0.030	
	Se□ere		0.040-0.060	
A□ount o□□e□etation	Ne□li□i□le	n_4	0.000-0.002 □0.001□	
	S□all		□0.001□0.002-0.010	
	Mediu□		0.010-0.025	0.015
	Lar□e		0.025-0.050	
	□er□Lar□e		0.050-0.100	
	E□tre□el□Lar□e		0.100-0.200	
Inter□ediate Su□				0.06
□e□ree o□Meanderin□	Minor	□	1	1
	A□□recia□le		1.15	
	Se□ere		1.3	
n□□n□□n$_1$□n$_2$□n$_3$□n$_4$□□				**0.060**

Note□ □alues in □arenticies □or □lood□lain n-□alue ad□ust□ent □actor □□en it di□□ers □ro□ t□e c□annel n-□alue ad□ust□ent □actor

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

Project: SERENO CANYON PHASE 4
Project No.: TOL1702.000
Location: SCOTTSDALE, AZ

Culvert Outlet Summary

Culvert ID	Culvert Size
DB10C	2 - 30-inch RCP
DB09E	1 - 18-inch RCP
DB11B	1 - 30-inch RCP
DB06D1	1 - 18-inch RCP
DB06C1	2 - 24-inch RCP
DB06C2	1 - 24-inch RCP
DB06A	1 - 18-inch RCP
DB05B3	2 - 24-inch RCP
DB05B2	1 - 30-inch RCP
DB05B1	1 - 18-inch RCP
DB04A	1 - 24-inch RCP
DB04B	1 - 24-inch RCP
DB03A1	1 - 18-inch RCP
DB02A2	2 - 18-inch RCP
DB02A1	2 - 30-inch RCP

Please note that all HY-8 Output summary tables with outlet control values showing a * simply indicates that the Full Flow Headwater Depth is below the inlet invert elevation

HY-8 Analysis Results

Culvert Summary Table - Culvert 1

Culvert Crossing: DB10C

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	2767.00	0.00	0.0	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
4.70	4.70	2767.68	0.68	0.0*	1-S2n	0.38	0.50	0.39	0.31	4.60	2.99
9.40	9.40	2767.97	0.97	0.0*	1-S2n	0.53	0.71	0.55	0.49	5.65	3.85
14.10	14.10	2768.21	1.21	0.0*	1-S2n	0.65	0.88	0.68	0.63	6.32	4.45
18.80	18.80	2768.44	1.44	0.15	1-S2n	0.76	1.02	0.79	0.77	6.84	4.91
23.50	23.50	2768.66	1.66	0.35	1-S2n	0.85	1.15	0.89	0.89	7.26	5.29
28.20	28.20	2768.86	1.86	0.56	1-S2n	0.94	1.26	0.98	1.01	7.62	5.61
32.90	32.90	2769.04	2.04	0.76	1-S2n	1.02	1.37	1.07	1.12	7.93	5.89
37.60	37.60	2769.22	2.22	0.99	1-S2n	1.10	1.47	1.16	1.22	8.20	6.14
42.30	42.30	2769.40	2.40	1.22	1-S2n	1.18	1.56	1.24	1.33	8.44	6.37
47.00	47.00	2769.59	2.59	1.46	5-S2n	1.26	1.65	1.32	1.43	8.67	6.58

HY-8 Analysis Results

Culvert Summary Table - Culvert 1

Culvert Crossing: DB09E

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	2826.00	0.00	0.0	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
1.50	1.50	2826.61	0.61	0.0*	1-S2n	0.25	0.45	0.25	0.15	7.37	1.82
3.00	3.00	2826.92	0.92	0.0*	1-S2n	0.36	0.66	0.38	0.22	8.35	2.32
4.50	4.50	2827.19	1.19	0.0*	1-S2n	0.44	0.81	0.47	0.28	9.21	2.65
6.00	6.00	2827.44	1.44	0.0*	1-S2n	0.51	0.94	0.55	0.33	9.81	2.91
7.50	7.50	2827.70	1.70	0.0*	5-S2n	0.58	1.06	0.64	0.37	10.17	3.13
9.00	9.00	2828.01	2.01	0.24	5-S2n	0.64	1.16	0.70	0.41	10.69	3.31
10.50	10.50	2828.37	2.37	0.62	5-S2n	0.70	1.24	0.78	0.45	10.99	3.47
12.00	12.00	2828.79	2.79	1.03	5-S2n	0.75	1.31	0.84	0.48	11.34	3.62
13.50	13.50	2829.28	3.28	1.49	5-S2n	0.81	1.37	0.91	0.51	11.69	3.75
15.00	15.00	2829.83	3.83	2.00	5-S2n	0.86	1.41	0.97	0.54	12.00	3.87

HY-8 Analysis Results

Culvert Summary Table - Culvert 1

Culvert Crossing: DB11B

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	2777.50	0.00	0.0	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
4.10	4.10	2778.40	0.90	0.0*	1-S2n	0.46	0.66	0.46	0.32	6.29	2.04
8.20	8.20	2778.82	1.32	0.04	1-S2n	0.66	0.95	0.69	0.47	7.20	2.53
12.30	12.30	2779.20	1.70	0.38	1-S2n	0.81	1.18	0.86	0.59	7.96	2.86
16.40	16.40	2779.53	2.03	0.73	1-S2n	0.95	1.36	1.01	0.68	8.53	3.11
20.50	20.50	2779.85	2.35	1.10	1-S2n	1.07	1.54	1.15	0.77	9.00	3.31
24.60	24.60	2780.17	2.67	1.50	5-S2n	1.19	1.69	1.28	0.84	9.39	3.49
28.70	28.70	2780.53	3.03	1.93	5-S2n	1.30	1.82	1.41	0.91	9.74	3.64
32.80	32.80	2780.93	3.43	2.67	5-S2n	1.41	1.95	1.53	0.98	10.07	3.78
36.90	36.90	2781.39	3.89	3.11	5-S2n	1.53	2.06	1.65	1.03	10.40	3.90
41.00	41.00	2781.91	4.41	3.58	5-S2n	1.64	2.15	1.77	1.09	10.70	4.02

HY-8 Analysis Results

Culvert Summary Table - Culvert 1

Culvert Crossing: DB06D1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	2795.00	0.00	0.0	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
3.10	3.10	2795.96	0.96	0.0*	1-S2n	0.54	0.67	0.54	0.63	5.28	0.99
6.20	6.20	2796.49	1.49	0.61	1-S2n	0.80	0.96	0.82	0.99	6.09	1.25
9.30	9.30	2797.10	2.10	1.70	5-S2n	1.05	1.18	1.05	1.31	6.85	1.42
12.40	12.40	2798.08	2.94	3.08	4-FFf	1.50	1.33	1.50	1.61	7.02	1.54
15.50	14.29	2799.06	3.59	4.16	4-FFf	1.50	1.39	1.50	1.89	8.09	1.64
18.60	14.42	2799.13	3.64	4.49	4-FFf	1.50	1.39	1.50	2.15	8.16	1.73
21.70	14.52	2799.19	3.67	4.80	4-FFf	1.50	1.39	1.50	2.42	8.22	1.80
24.80	14.61	2799.24	3.71	5.10	4-FFf	1.50	1.39	1.50	2.67	8.27	1.86
27.90	14.69	2799.28	3.74	5.39	4-FFf	1.50	1.40	1.50	2.92	8.31	1.91
31.00	14.76	2799.32	3.76	5.67	4-FFf	1.50	1.40	1.50	3.17	8.35	1.96

HY-8 Analysis Results

Culvert Summary Table - Culvert 1

Culvert Crossing: DB06C1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	2792.00	0.00	0.0	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
4.70	4.70	2792.72	0.72	0.0*	1-S2n	0.38	0.53	0.38	0.31	5.38	2.99
9.40	9.40	2793.06	1.06	0.0*	1-S2n	0.55	0.76	0.55	0.49	6.55	3.85
14.10	14.10	2793.36	1.36	0.0*	1-S2n	0.67	0.94	0.67	0.63	7.32	4.45
18.80	18.80	2793.63	1.63	0.0*	1-S2n	0.79	1.09	0.79	0.77	7.92	4.91
23.50	23.50	2793.88	1.88	0.0*	1-S2n	0.89	1.23	0.92	0.89	8.08	5.29
28.20	28.20	2794.14	2.14	0.34	5-S2n	0.99	1.35	1.02	1.01	8.43	5.61
32.90	32.90	2794.43	2.43	0.81	5-S2n	1.09	1.46	1.09	1.12	9.13	5.89
37.60	37.60	2794.75	2.75	1.55	5-S2n	1.18	1.56	1.22	1.22	9.06	6.14
42.30	41.42	2795.04	3.04	1.96	5-S2n	1.26	1.63	1.31	1.33	9.23	6.37
47.00	42.53	2795.14	3.14	2.09	5-S2n	1.29	1.65	1.29	1.43	9.65	6.58

HY-8 Analysis Results

Culvert Summary Table - Culvert 1

Culvert Crossing: DB06C2

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	2788.00	0.00	0.0	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
2.20	2.20	2788.70	0.70	0.0*	1-S2n	0.43	0.51	0.43	0.20	4.23	2.25
4.40	4.40	2789.02	1.02	0.0*	1-S2n	0.62	0.73	0.62	0.30	5.14	2.92
6.60	6.60	2789.32	1.32	0.12	1-S2n	0.77	0.91	0.77	0.39	5.76	3.39
8.80	8.80	2789.57	1.57	0.43	1-S2n	0.90	1.06	0.90	0.47	6.21	3.76
11.00	11.00	2789.81	1.81	0.77	1-S2n	1.03	1.19	1.03	0.54	6.56	4.08
13.20	13.20	2790.04	2.04	1.14	5-S2n	1.15	1.30	1.15	0.61	6.85	4.35
15.40	15.40	2790.30	2.30	1.55	5-S2n	1.27	1.41	1.27	0.67	7.07	4.59
17.60	17.60	2790.58	2.58	2.24	5-S2n	1.41	1.51	1.45	0.73	7.03	4.80
19.80	19.80	2790.91	2.91	2.68	5-S2n	1.57	1.60	1.57	0.79	7.32	4.99
22.00	22.00	2791.27	3.27~	3.08	7-M2c	2.00	1.67	1.67	0.85	7.83	5.17

HY-8 Analysis Results

Culvert Summary Table - Culvert 1

Culvert Crossing: DB06A

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	2752.50	0.00	0.0	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
1.60	1.60	2753.14	0.64	0.0*	1-S2n	0.31	0.47	0.31	0.16	5.96	1.99
3.20	3.20	2753.47	0.97	0.0*	1-S2n	0.44	0.68	0.46	0.25	6.75	2.59
4.80	4.80	2753.75	1.25	0.10	1-S2n	0.54	0.84	0.57	0.32	7.44	3.01
6.40	6.40	2754.02	1.52	0.43	5-S2n	0.63	0.97	0.68	0.38	7.96	3.35
8.00	8.00	2754.31	1.81	0.81	5-S2n	0.72	1.09	0.78	0.44	8.39	3.64
9.60	9.60	2754.66	2.16	1.37	5-S2n	0.80	1.20	0.87	0.49	8.76	3.88
11.20	11.20	2755.07	2.57	1.79	5-S2n	0.88	1.28	0.96	0.55	9.09	4.10
12.80	12.80	2755.56	3.06	2.25	5-S2n	0.97	1.34	1.05	0.60	9.41	4.30
14.40	14.12	2756.02	3.52	2.67	5-S2n	1.04	1.38	1.13	0.64	9.66	4.48
16.00	14.27	2756.07	3.57	2.71	5-S2n	1.05	1.39	1.14	0.69	9.68	4.65

HY-8 Analysis Results

Culvert Summary Table - Culvert 1

Culvert Crossing: DB05B3

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	2782.00	0.00	0.0	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
3.60	3.60	2782.63	0.63	0.0*	1-S2n	0.39	0.46	0.39	0.27	4.08	2.71
7.20	7.20	2782.91	0.91	0.0*	1-S2n	0.55	0.66	0.56	0.41	4.77	3.50
10.80	10.80	2783.16	1.16	0.0*	1-S2n	0.68	0.82	0.70	0.53	5.37	4.05
14.40	14.40	2783.39	1.39	0.20	1-S2n	0.79	0.95	0.81	0.64	5.80	4.48
18.00	18.00	2783.59	1.59	0.45	1-S2n	0.90	1.07	0.93	0.74	6.12	4.84
21.60	21.60	2783.78	1.78	0.72	1-S2n	1.00	1.17	1.00	0.84	6.67	5.14
25.20	25.20	2783.98	1.98	1.02	1-S2n	1.10	1.27	1.10	0.93	6.92	5.41
28.80	28.80	2784.18	2.18	1.33	5-S2n	1.19	1.36	1.19	1.02	7.13	5.65
32.40	32.40	2784.40	2.40	1.67	5-S2n	1.30	1.45	1.33	1.10	7.07	5.87
36.00	36.00	2784.64	2.64	2.28	5-S2n	1.40	1.53	1.40	1.19	7.44	6.06

HY-8 Analysis Results

Culvert Summary Table - Culvert 1

Culvert Crossing: DB05B2

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	2800.00	0.00	0.0	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
2.40	2.40	2800.69	0.69	0.0*	1-S2n	0.47	0.50	0.47	0.53	3.62	0.90
4.80	4.80	2800.99	0.99	0.0*	1-JS1t	0.67	0.72	0.84	0.84	3.22	1.15
7.20	7.20	2801.23	1.23	0.21	1-JS1t	0.82	0.89	1.10	1.10	3.35	1.31
9.00	9.00	2801.41	1.41	0.46	1-JS1t	0.93	1.00	1.28	1.28	3.43	1.40
12.00	12.00	2801.69	1.69	0.88	1-JS1t	1.08	1.16	1.57	1.57	3.59	1.53
14.40	14.40	2801.89	1.89	1.23	1-S2n	1.20	1.28	1.20	1.79	5.95	1.61
16.80	16.80	2802.08	2.08	1.60	1-S2n	1.32	1.38	1.32	2.00	6.18	1.68
19.20	19.20	2802.26	2.26	1.99	1-S2n	1.44	1.48	1.44	2.21	6.37	1.74
21.60	21.60	2802.56	2.44	2.56	1-S1t	1.55	1.58	2.41	2.41	4.40	1.79
24.00	24.00	2802.82	2.63	2.82	3-M1f	1.67	1.66	2.50	2.61	4.89	1.84

HY-8 Analysis Results

Culvert Summary Table - Culvert 1

Culvert Crossing: DB05B1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	2810.00	0.00	0.0	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
1.40	1.40	2810.60	0.60	0.0*	1-S2n	0.27	0.44	0.28	0.38	6.07	0.74
2.80	2.80	2810.89	0.89	0.0*	1-S2n	0.39	0.63	0.39	0.59	7.56	0.95
4.20	4.20	2811.15	1.15	0.0*	1-S2n	0.47	0.78	0.49	0.77	8.19	1.10
5.60	5.60	2811.38	1.38	0.0*	1-S2n	0.55	0.91	0.57	0.93	8.80	1.21
7.00	7.00	2811.62	1.62	0.0*	5-S2n	0.63	1.02	0.65	1.08	9.31	1.30
8.40	8.40	2811.89	1.89	0.0*	5-S2n	0.69	1.12	0.72	1.22	9.71	1.37
9.80	9.80	2812.20	2.20	0.0*	5-S2n	0.76	1.21	0.76	1.36	10.57	1.44
11.20	11.20	2812.57	2.57	0.0*	5-S2n	0.82	1.28	0.86	1.49	10.42	1.50
12.60	12.60	2812.99	2.99	0.0*	5-S2n	0.89	1.34	0.89	1.63	11.20	1.55
14.00	14.00	2813.47	3.47	0.48	5-S2n	0.95	1.38	0.95	1.75	11.45	1.60

HY-8 Analysis Results

Culvert Summary Table - Culvert 1

Culvert Crossing: DB04A

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	2738.50	0.00	0.0	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
4.10	4.10	2739.39	0.89	0.0*	1-S2n	0.36	0.66	0.39	0.75	8.10	1.09
8.20	8.20	2739.79	1.29	0.0*	1-S2n	0.51	0.95	0.57	1.20	9.41	1.36
12.30	12.30	2740.18	1.68	0.28	1-S2n	0.63	1.18	0.72	1.60	10.15	1.54
16.40	16.40	2740.51	2.01	0.78	1-S2n	0.73	1.36	0.85	1.96	10.73	1.67
20.50	20.50	2740.82	2.32	1.31	1-S2n	0.82	1.54	0.97	2.32	11.22	1.77
24.60	24.60	2741.14	2.64	1.87	5-S2n	0.90	1.69	1.08	2.65	11.67	1.85
28.70	28.70	2741.50	3.00	2.45	5-JS1f	0.98	1.82	2.50	2.98	5.85	1.92
32.80	32.80	2741.90	3.40	3.08	5-JS1f	1.06	1.95	2.50	3.31	6.68	1.98
36.90	36.90	2742.36	3.86	3.75	5-S1f	1.13	2.06	2.50	3.63	7.52	2.03
41.00	41.00	2742.88	4.38	2.44	5-JS1f	1.20	2.15	2.50	3.94	8.35	2.08

HY-8 Analysis Results

Culvert Summary Table - Culvert 1

Culvert Crossing: DB04B

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	2755.00	0.00	0.0	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
2.70	2.70	2755.73	0.73	0.04	1-S2n	0.47	0.53	0.47	0.22	4.03	2.43
5.40	5.40	2756.05	1.05	0.31	1-S2n	0.67	0.76	0.67	0.34	4.91	3.15
8.10	8.10	2756.32	1.32	0.54	1-S2n	0.83	0.94	0.83	0.44	5.50	3.65
10.80	10.80	2756.58	1.58	0.77	1-S2n	0.97	1.10	0.97	0.53	5.95	4.05
13.50	13.50	2756.81	1.81	1.00	1-S2n	1.09	1.24	1.09	0.62	6.31	4.38
16.20	16.20	2757.03	2.03	1.23	1-S2n	1.22	1.36	1.25	0.69	6.37	4.67
18.90	18.90	2757.24	2.24	1.48	1-S2n	1.33	1.47	1.37	0.77	6.63	4.92
21.60	21.60	2757.44	2.44	1.75	1-S2n	1.45	1.58	1.49	0.84	6.84	5.14
24.30	24.30	2757.66	2.66	2.03	5-S2n	1.57	1.67	1.57	0.91	7.25	5.35
27.00	27.00	2757.89	2.89	2.32	5-S2n	1.70	1.77	1.70	0.98	7.40	5.53

HY-8 Analysis Results

Culvert Summary Table - Culvert 1

Culvert Crossing: DB03A1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	2750.00	0.00	0.0	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
0.20	0.20	2750.23	0.23	0.0*	1-S2n	0.13	0.16	0.13	0.05	3.09	0.88
0.40	0.40	2750.32	0.32	0.0*	1-S2n	0.18	0.23	0.18	0.07	3.38	1.16
0.60	0.60	2750.39	0.39	0.0*	1-S2n	0.21	0.28	0.22	0.09	3.65	1.36
0.80	0.80	2750.45	0.45	0.0*	1-S2n	0.25	0.33	0.25	0.11	4.09	1.52
1.00	1.00	2750.51	0.51	0.0*	1-S2n	0.27	0.37	0.27	0.12	4.41	1.66
1.20	1.20	2750.56	0.56	0.0*	1-S2n	0.30	0.41	0.30	0.13	4.61	1.78
1.40	1.40	2750.60	0.60	0.0*	1-S2n	0.32	0.44	0.32	0.15	4.81	1.89
1.60	1.60	2750.65	0.65	0.0*	1-S2n	0.35	0.47	0.35	0.16	5.01	1.99
1.80	1.80	2750.69	0.69	0.0*	1-S2n	0.37	0.50	0.37	0.17	5.17	2.08
2.00	2.00	2750.73	0.73	0.0*	1-S2n	0.39	0.53	0.39	0.18	5.34	2.17

HY-8 Analysis Results

Culvert Summary Table - Culvert 1

Culvert Crossing: DB02A2

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	2762.00	0.00	0.0	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
0.80	0.80	2762.31	0.31	0.0*	1-S2n	0.15	0.23	0.15	0.12	4.22	1.16
1.60	1.60	2762.45	0.45	0.0*	1-S2n	0.21	0.33	0.21	0.19	5.00	1.49
2.40	2.40	2762.55	0.55	0.0*	1-S2n	0.26	0.41	0.26	0.24	5.62	1.71
3.20	3.20	2762.64	0.64	0.0*	1-S2n	0.30	0.47	0.30	0.28	6.10	1.88
4.00	4.00	2762.72	0.72	0.0*	1-S2n	0.34	0.53	0.35	0.32	6.13	2.02
4.80	4.80	2762.81	0.81	0.0*	1-S2n	0.37	0.58	0.39	0.35	6.43	2.14
5.60	5.60	2762.89	0.89	0.0*	1-S2n	0.40	0.63	0.42	0.38	6.66	2.25
6.40	6.40	2762.97	0.97	0.0*	1-S2n	0.43	0.68	0.45	0.41	6.89	2.34
7.20	7.20	2763.05	1.05	0.0*	1-S2n	0.46	0.72	0.48	0.44	7.07	2.43
8.00	8.00	2763.12	1.12	0.0*	1-S2n	0.48	0.77	0.51	0.46	7.23	2.51

HY-8 Analysis Results

Culvert Summary Table - Culvert 1

Culvert Crossing: DB02A1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	2789.50	0.00	0.0	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
6.90	6.90	2790.31	0.81	0.0*	1-S2n	0.34	0.61	0.36	0.35	7.80	3.04
13.80	13.80	2790.67	1.17	0.0*	1-S2n	0.48	0.87	0.51	0.52	9.37	3.77
20.70	20.70	2791.00	1.50	0.0*	1-S2n	0.59	1.07	0.59	0.64	11.38	4.25
27.60	27.60	2791.30	1.80	0.0*	1-S2n	0.68	1.25	0.74	0.75	10.97	4.62
34.50	34.50	2791.57	2.07	0.0*	1-S2n	0.76	1.40	0.84	0.84	11.54	4.92
41.40	41.40	2791.84	2.34	0.0*	1-S2n	0.84	1.54	0.93	0.92	12.03	5.18
48.30	48.30	2792.11	2.61	0.0*	5-S2n	0.91	1.67	1.02	1.00	12.47	5.40
55.20	55.20	2792.40	2.90	0.31	5-S2n	0.98	1.79	1.10	1.06	12.82	5.60
62.10	62.10	2792.73	3.23	0.99	5-S2n	1.04	1.90	1.18	1.13	13.13	5.78
69.00	68.15	2793.04	3.54	1.30	5-S2n	1.10	1.98	1.25	1.19	13.40	5.95

Appendix E: Maps

Sereno Canyon Soils Data Map (from approved Master Drainage Report)

Sereno Canyon Existing Conditions HEC-1 Schematic (from approved Master Drainage Report)

Map A: Sereno Canyon Phase 4 – Proposed Conditions Land Use Map

Map B: Sereno Canyon Phase 4 – Proposed Conditions Hydrology Map

Map C: Sereno Canyon Phase 4 – Proposed Development Layout

Map D: Sereno Canyon Phase 4 – Proposed Conditions HEC-1 Schematic

Map E: Sereno Canyon Phase 4 – Proposed Conditions HEC-RAS Cross Sections and Floodplains

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