WATSON DRAINAGE SYSTEM PRE-DESIGN

FCD 2012C003

VOLUME I

HYDROLOGY MEMORANDUM

Prepared For:

Flood Control District of Maricopa County

Prepared By:

Dibble Engineering

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JE FULLER HYDROLOGY & GEOMORPHOLOGY, INC.

OLSSON ASSOCIATES

March 2013

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Memorandum

To:	Gary Wesch, P.E., Project Manager	**Date:**	March 1, 2013
Copy:	John Holmes, CFM	**Client Project:**	Watson Drainage Pre-Design
From:	Kevin Roberts, P.E.	**Project #:**	FCD: 2012C003 / DE: 101206
	Justin Beeler, P.E., CFM		
Subject:	Watson Drainage System Pre-Design: Hydrology Memorandum (Task 3.0) (REVISED)		

Overview:

The purpose of the Watson Drainage System Pre-Design (Pre-Design) project is to provide the initial design steps for the Town of Buckeye regional drainage improvements, as recommended in the Buckeye Area Drainage Master Plan (ADMP). The Watson Drainage System extends from upstream of the Roosevelt Irrigation District (RID) canal to the Gila River between Miller Road and Rainbow Road. The ADMP identified a Recommended Plan for regional drainage improvements to alleviate existing flooding hazards, provide conveyance for runoff accumulation along irrigation canals, and provide drainage outfalls for local developments. The Watson Drainage System is one of the drainage systems recommended in the ADMP. The study area is located within the Town of Buckeye and unincorporated Maricopa County. It is bounded by I-10 and Buckeye FRS No. 2 and 3 to the north, Miller Road to the west, Dean Road to the east and the Gila River to the south.

The Pre-Design project will refine and firmly establish the project alignment and drainage features, determine design constraints, resolve unknowns, and clearly establish the final design criteria for the project. The project tasks include collection of field data, identification of potential major utility conflicts, refinement of hydrologic and hydraulic models, development of preliminary plans and refinement of project costs.

The hydrologic models developed for the ADMP Recommended Plan were completed in July 2010. Along with data collection and field reconnaissance, updating the ADMP hydrology models based on current standards and land use is one of the first tasks for the Pre-Design project. A number of revisions to the hydrology were specified in the Scope of Work to be performed by the Consultant.

Scope Requirements:

The scope of work outlines a number of directs tasks for updating the hydrology models. These tasks are listed below.

- Extract and review the HEC-1 models from the Buckeye ADMP for the Watson Watershed
- Edit and update the future conditions model to reflect the diversion of the White Tanks FRS #4 outfall channel to a different outfall
- Update the model land uses based on the Buckeye General Plan
- Update the model rainfall based on NOAA 14 precipitation data
- Update the model to include retention (100-year, 2-hour volume) for all areas anticipated to experience future development

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- Use the FCDMC Drainage Design Management System (DDMSW) version 4.6.0 to prepare the updated models

This Hydrology Technical Memorandum has been prepared to document the completion of the hydrology updates for the Watson Pre-Design scope of work.

Hydrology Model Review:

The FCDMC hydrology staff prepared a technical memorandum dated February 15, 2012 which was broken into two sections entitled, respectively, (Section 1) *Comparison of Peak Flows* and (Section 2) *Update of the Buckeye ADMP Recommended Plan Hydrology*. The memo was updated and redistributed on July 16, 2012. The memo states that the purpose for Section 1 was to "report the results and conclusions from a comparison of peak flows, from three HEC-1 models, at concentration points proximate to four proposed detention basins, hydrograph combination points and at the channel outlet to the Gila River". The purpose for Section 2 was to "summarize the process used to develop the base hydrology HEC-1 model from the Buckeye ADMP Recommended Hydrology for project-specific changes. These changes include an update to NOAA 14 rainfall estimates and a change in methodology used to calculate one of the rainfall loss parameters".

Section 1 documented the overall impacts to the model results caused by the change to the adopted NOAA 14 rainfall data, the differences in the methodology utilized to calculate XKSAT in the latest version of the DDMSW software, and also identified a discrepancy in the number of hydrographs combined at one location in the model.

Section 2 provides further detail regarding the differences in how the latest DDMSW model establishes various model parameters and what anticipated impacts these changes would have on the model results.

The FCDMC memo was helpful in understanding the effect of the various model updates and the use of DDMSW version 4.6.0 on the model results. The DDMSW models provided by FCDMC for the 6-hour and 24-hour models were used as the starting point for the model revisions for the Pre-Design hydrology task. A copy of the memo prepared by FCDMC is attached with this technical memo.

As a sub consultant to Dibble for the Watson Pre-Design project, J.E. Fuller performmed an independent review of the draft hydrology technical memorandum. Their findings were used to refine the memorandum and hydrology model for the project. A copy of the memo (8/29/12) prepared by J.E. Fuller is attached with this memo.

Dibble Engineering Model Updates:

The current version of the DDMSW program along with a recent patch from FCDMC (version 4.6.3) was used for all model revisions. The FCDMC project hydrology reviewer provided DDMSW models from the Buckeye ADMP Recommended Plan which were imported and used as a starting point for the model updates. These DDMSW models included the same customized land use and soils database information that was used in the development of the Buckeye ADMP recommended plan models. Further development of the base alternative DDMSW model and the default land use parameters may occur as the alternatives and recommended plan models develop. The descriptions included below have been prepared to clarify the steps that were taken to address the scope of work items for the hydrology updates.

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Step 1 – Revise ADMP model to Watson watershed

The Buckeye ADMP watershed was over 96 square miles, and the initial HEC-1 model included several square miles of study area beyond the boundary for the Watson watershed, which is approximately 22.8 square miles. The first step was to isolate and utilize only the model data that contributed to the Watson drainage system. This also included the removal of the White Tanks #4 outfall hydrograph input, which, subsequent to the ADMP, was routed to a different outfall. These changes were initially done using the DDMSW text editor program, Program File Editor (PFE). The modified file was then imported into DDMSW. However, it was identified early on that a "model network" was never established within the DDMSW model. Therefore, the next step performed was to create a model network within DDMSW along with corresponding "KM Comment" records, in order to create a new draft version of the model that matched the original model configuration. Creating a model network within DDMSW is useful on projects involving various changes and iterations to the input file, as will be the case on the Watson Pre-Design project. Before this could be done, the DDMSW database had to be updated with the necessary routes, diversions, and storage routines so they could be referenced using the model network tool within DDMSW. The White Tanks FRS #4 hydrograph was not included in the newly developed model network, which served to remove that hydrograph from the model. Various adjustments were made to remove route sections and adjust hydrograph combine steps to account for this change. Once the model network was setup and a draft model was created, the schematic diagram and input file were reviewed for consistency with the original HEC-1 model.

Step 2 – Update the model land use to match the Buckeye General Plan

The Town of Buckeye provided a shapefile that was prepared with land use boundaries and descriptions from the 2007 Buckeye General Plan. The shapefile data requires a special field that corresponds with an existing land use default code in order to interface with DDMSW. FCDMC hydrology staff was consulted in the efforts to correlate the land use designations established by the Town of Buckeye with an existing land use code within DDMSW. A second shapefile for the subbasins within the Watson watershed was used along with the updated land use shapefile in order to update the subbasin information within DDMSW for the Buckeye General Plan land use.

The Town of Buckeye requested staff from W.C. Scoutten to review the land use code assignments and provide feedback for the hydrology update. Three new custom land use codes were prepared to reflect the customized loss parameters for the Town of Buckeye land use codes for Low Density Residential (134), Regional Commercial (234), and Mixed use (218). The parameters for the new codes were based on a customized weighting of existing FCDMC land use codes provided by W.C. Scoutten. The customizations to the land use codes were reviewed and accepted by FCDMC and updated within the DDMSW land use database.

Table 1 below shows the DDMSW land use codes that were assigned to the various Town of Buckeye land use types that fall within the Watson watershed. A map showing the Buckeye General Land Use and the Watson subbasins is attached with this memo as **Figure 1**.

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Table 1: Land Use Codes

TOB LU CODE	TOB LU DESCRIPTION	ASSIGNED FCDMC LU CODE	ASSIGNED FCDMC LU DESCRIPTION
VLDR	Very Low Density Residential (<=1 du/ac)	120	Estate Residential (1/5 du/ac - 1 du/ac)
LDR	Low Density Residential (1-3 du/ac)	134*	*(80%)* Large Lot Residential - (1-2 du/ac) *(20%)* Med Density Residential – (3-6 du/ac)
MDR	Medium Density Residential (3-6 du/ac)	150	Small Lot Residential - Single Family (4-6 du/ac)
NC	Community Commercial	210	Specialty Commercial (<=50,000 sq. ft.)
RC	Regional Commercial	234*	*(33%)* Neighborhood Commercial *(33%)* Community Commercial *(33%)* Regional Commercial
VCMU	Mixed Use	218*	*(50%)* Specialty Commercial *(50%)* High Density Residential (10-15 du/ac)
I	Industrial	320	Industrial
DO	City Center	550	Public Facilities (comm centers, libraries, sub-stations)
GC	Government Center	550	Public Facilities (comm centers, libraries, sub-stations)
BP	Business Park	810	Business Park (enclosed industrial, office or retail)

*Customized Land Use Code based on W.C. Scoutten input on TOB Land Use descriptions.

Step 3 – Update the model rainfall based on NOAA 14 precipitation data

The DDMSW model provided by FCDMC was previously updated for the NOAA 14 rainfall. However, after discussions with the FCDMC hydrology staff, a decision was made to update the rainfall based on a different project shapefile that described the only the Watson watershed instead of the overall Buckeye ADMP watershed in order to accurately describe the rainfall for this project. The Watson watershed boundary shapefile was then imported to DDMSW in order to reassign new NOAA 14 precipitation values based on the Watson watershed.

Step 4 – Update the retention based on future development

The Buckeye ADMP Recommended Plan hydrology model did account for retention for proposed development. However, the ADMP model was based on different land use parameters with different c-values than those found in the Buckeye General Plan land use. Therefore, the retention for proposed development within each subbasin was reestablished based on the Buckeye General Plan land use and new storage volumes were determined for each subbasin. The 100-year, 2-hour storage volume criteria established by the County and the Town of Buckeye was accounted for using diversion records within the ADMP HEC-1 models. This methodology of using diversion records was also used for the Watson Pre-Design model update.

Several drainage reports were obtained from the Town of Buckeye for the developments in the study area. The developments are currently in different phases of construction from completely built-out, to partially

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constructed, to completely ungraded and undeveloped land. Through discussions with FCDMC staff, it was decided that a system should be developed to account for the known retention volumes for developed sites with drainage reports available while also accounting for storage from developments in different phases of development in other ways. The following steps were taken to account for storage within each subbasin:

1. In locations where development has occurred and construction is completed and where a drainage report is available to obtain a storage volume provided, 80% of the storage volume reported in the development drainage report was applied to the appropriate subbasin in the Pre-Design HEC-1 model. In some locations where a subdivision boundary crosses a subbasin boundary, the volume was applied to each subbasin according to an area weighted calculation.
2. For areas where drainage reports are available, and partial development has occurred, retention volumes were calculated using the report specified C-value and the updated NOAA 14 rainfall values. A factor of 80% of this calculated volume was applied to that subbasin. This assumes that when development resumes, the developer will comply with the most recently adopted requirements.
3. For locations where a development is planned and a drainage report was obtained, but no construction has yet occurred, the volume provided specified in the report was NOT be used. Instead. a new volume was calculated using the report specified development area and C-value, but using the updated NOAA 14 rainfall. A factor of 80% of this calculated volume was applied to that subbasin.
4. For locations where development has occurred but no drainage report is available, a new volume was calculated using a graphical determination of the development area and the C-value that corresponds with the Town of Buckeye Land Use along with the updated NOAA 14 rainfall. A factor of 80% of the calculated volume was applied to that subbasin.
5. For locations where no development is currently identified and the land has not yet been developed, a new volume was calculated using the Buckeye planned land use C-value with the updated NOAA 14 rainfall. A factor of 80% of this calculated volume was applied to that subbasin.

The drainage reports collected have been reviewed to determine the total subdivision area, the c-values used, and the total required and provided storage volumes. This information was used along with graphical boundaries of the subdivisions in relationship to the hydrology subbasin boundaries to extract information necessary to compile storage volumes for the various options presented above. The combined volumes from these scenarios are used within the HEC-1 model to account for existing and future storage within the watershed. Tables from the spreadsheets used to capture and calculate the storage values from these scenarios are attached with this memo.

The Buckeye ADMP hydrology model accounted for limited retention in subbasins 10E, 24, & 26. This modeling decision to reduce the amount of residential storage was based on perceived requirements at the time of construction or other field observations. There are differences in the calculated storage volumes for subbasins 10E and 26 due to differences in c-values used for this analysis along with new information regarding existing storage within subbasin 10E. In locations where a difference greater than 30% occurs between the storage volume used in the ADMP and the Pre-Design model occur, a short explanation is included in the attached Storage Volume Calculation table (**Table 2A**).

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Model Assumptions:

Most tasks outlined in the scope did not require significant assumptions or application of engineering judgment. One exception, however, was the task of assigning DDMSW default codes to the Town of Buckeye land uses. Input was sought from FCDMC hydrology staff and the Town of Buckeye. The Town of Buckeye requested staff from W.C. Scoutten to review the land use code assignments and provide feedback for the hydrology update. The customizations made to the land use codes were reviewed and accepted by FCDMC and updated within the DDMSW land use database. Land use c-values were assigned based on their correlation with Table 3.2 in the FCDMC drainage manual and using the average values between the Min & Max values provided.

Model Results:

The model results reports prepared within DDMSW for the 6-hour and 24-hour storms are attached with this memo. Based on a comparison between the 6-hour and 24-hour models for the HEC-1 ID points referenced for the Watson drainage system design flows, the 24-hour model predicts higher peak flows than the 6-hour model fairly consistently. A table comparing the updated model results from the 6 & 24-hour models along with the FCDMC corrected ADMP calculated values is attached to this memo (**Table 6**). Electronic copies of the DDMSW and HEC-1 models are also provided with this hydrology technical memo.

A comparison table of the updated Watson Pre-Design hydrology model results with the FCDMC corrected Buckeye ADMP model results has been attached with this memo (**Table 3**). The ADMP model contained several truncated unit hydrographs (UI cards) which were corrected as part of the Watson Pre-Design update. This change resulted in differences in discharge and volume quantities. For this hydrology memo, a comparison with the corrected ADMP can be made between subbasin runoff values due to changes in land use (rainfall was updated to NOAA 14 in the FCDMC corrected model), however, a more detailed comparison at combination points and channel design discharges is not valid until the master plan detention basins and channels have been redesigned and evaluated based on the new discharge rates and volumes. This update will come later as part of the Alternatives Analysis phase of the project. Tables showing these comparisons are attached with this memo. **Table 3** compares the peak flow rates between the FCDMC corrected ADMP and Pre-Design models. **Tables 4** & **Table 5** compare the runoff volumes between the 6-hour and 24-hour corrected ADMP and Pre-Design models, respectively.

A Base Alternative Hydrology Update map has been prepared and attached with this memo as **Figure 2**. The map illustrates the base alternative channel alignments and detention basin locations.

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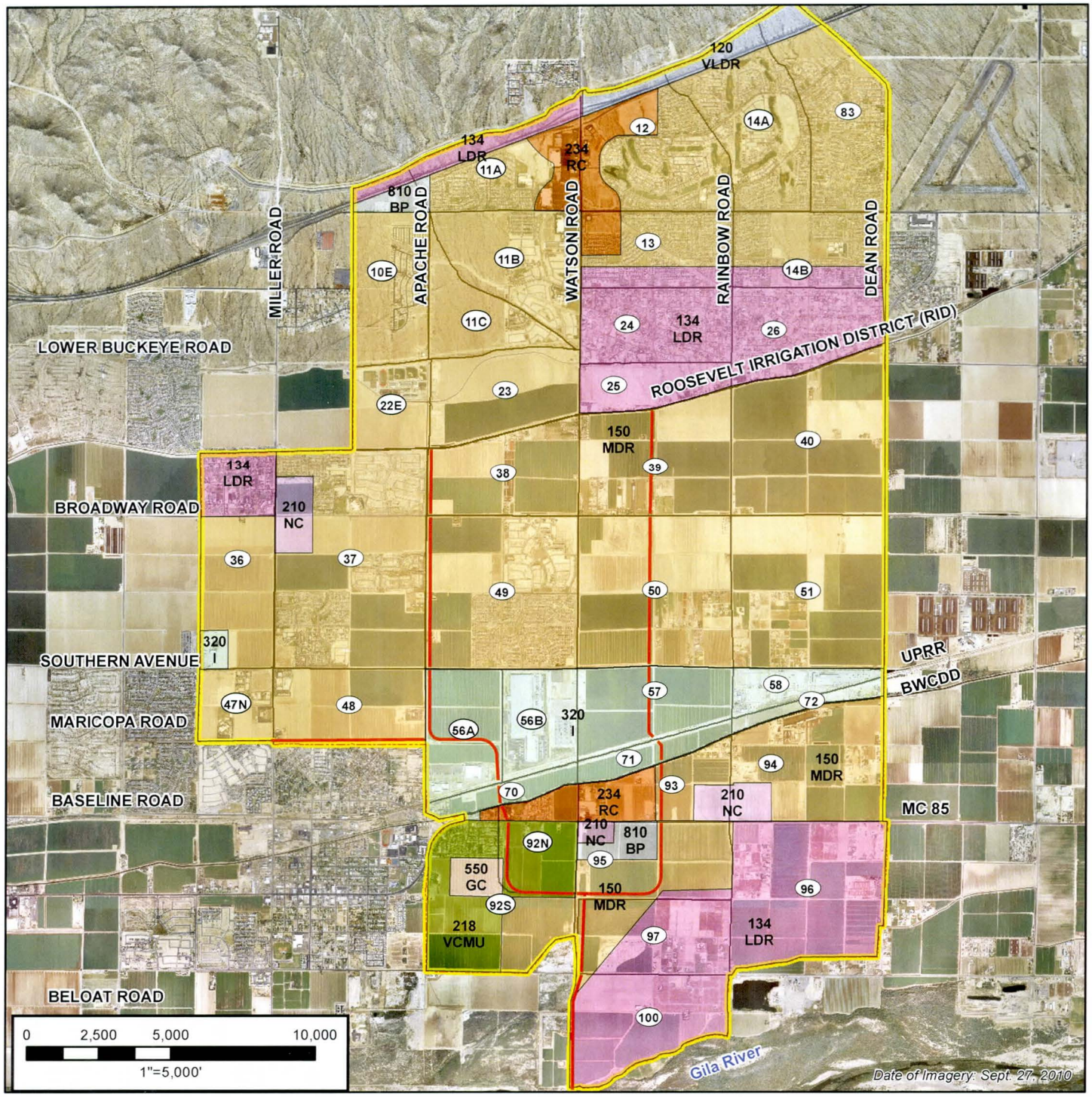
ARIZONA, U.S.A.
Expires 03/31/15

Land Use, C-Values, Retention Calculations & Base Alternative Hydrology Update Map



TOWN OF BUCKEYE GENERAL PLAN LAND USE MAP

Legend

- (48) Watson Subbasins
- Watson Pre-Design Channels

Town of Buckeye Land Use

FCDMC CODE, TOB CODE, TOB DESC

- 120, VLDR, Very Low Density Residential
- 134, LDR, Low Density Residential
- 150, MDR, Medium Density Residential
- 210, NC, Community Commercial
- 218, VCMU, Mixed Use
- 234, RC, Regional Commercial
- 320, I, Industrial
- 550, DO, City Center
- 550, GC, Government Center
- 810, BP, Business Park

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Watson Drainage System Pre-Design Hydrology Memorandum

FIGURE 1

Table 3.2
RUNOFF COEFFICIENTS FOR MARICOPA COUNTY

Land Use Code	Land Use Category	Runoff Coefficients by Storm Frequency[1, 2]							
		2-10 Year		25 Year		50 Year		100 Year	
		min	max	min	max	min	max	min	max
VLDR	Very Low Density Residential[3, 4]	0.33	0.42	0.36	0.46	0.40	0.50	0.41	0.53
LDR	Low Density Residential[3, 4]	0.42	0.48	0.46	0.53	0.50	0.58	0.53	0.60
MDR	Medium Density Residential[3, 4]	0.48	0.65	0.53	0.72	0.58	0.78	0.60	0.82
MFR	Multiple Family Residential[3, 4]	0.65	0.75	0.72	0.83	0.78	0.90	0.82	0.94
I1	Industrial 1[3]	0.60	0.70	0.66	0.77	0.72	0.84	0.75	0.88
I2	Industrial 2[3]	0.70	0.80	0.77	0.88	0.84	0.95	0.88	0.95
C1	Commercial 1[3]	0.55	0.65	0.61	0.72	0.66	0.78	0.69	0.81
C2	Commercial 2[3]	0.75	0.85	0.83	0.94	0.90	0.95	0.94	0.95
P	Pavement and Rooftops	0.75	0.85	0.83	0.94	0.90	0.95	0.94	0.95
GR	Gravel Roadways & Shoulders	0.60	0.70	0.66	0.77	0.72	0.84	0.75	0.88
AG	Agricultural	0.10	0.20	0.11	0.22	0.12	0.24	0.13	0.25
LPC1	Lawns/Parks/Cemeteries (s<5)	0.10	0.25	0.11	0.28	0.12	0.30	0.13	0.31
LPC2	Lawns/Parks/Cemeteries (s>5)	0.25	0.40	0.28	0.44	0.30	0.48	0.31	0.50
DL1	Desert Landscaping 1	0.55	0.85	0.61	0.94	0.66	0.95	0.69	0.95
DL2	Desert Landscaping 2	0.30	0.40	0.33	0.44	0.36	0.48	0.38	0.50
NDR	Undeveloped Desert Rangeland	0.30	0.40	0.33	0.44	0.36	0.48	0.38	0.50
NHS	Hillslopes, Sonoran Desert	0.40	0.55	0.44	0.61	0.48	0.66	0.50	0.69
NMT	Mountain Terrain	0.55	0.80	0.61	0.88	0.66	0.95	0.69	0.95

Notes:

1. Runoff coefficients for 25-, 50- and 100-Year storm frequencies were derived using adjustment factors of 1.10, 1.20 and 1.25, respectively, applied to the 2-10 Year values with an upper limit of 0.95.

2. The ranges of runoff coefficients shown for urban land uses were derived from lot coverage standards specified in the zoning ordinances for Maricopa County.

3. Runoff coefficients for urban land uses are for lot coverage only and do not include the adjacent street and right-of-way, or alleys.

4, Values are based on the NDR terrain class. Values should be increased for NHS and NMT terrain classes by the difference between NHS (or NMT) and the NDR C values, up to a maximum of 0.95. Engineering judgement should be used.

5. Maricopa County has adopted specific values of C for each land use and storm frequency in the Drainage Policies and Standards for Maricopa County, Arizona (Maricopa County, 2007). These are the standard default values. The engineer/hydrologist may develop a computed composite value of C based on actual land uses, but must fully document the computations and assumptions and submit them to Maricopa County for approval. Many jurisdictions in Maricopa County may have adopted specific C coefficient values and procedures. The user should check with the appropriate agency before proceeding.

Watson Pre-Design Hydrology
Rational Method Volume Calculation
Table 1B: FCDMC C-Value Determination

FCDMC LU CODE	FCDMC LU Description	*Min C	*Max C	Average C Used
120	Residential-Estate Residential (1/5 du per acre to 1 du per acre)	*0.41*	*0.53*	**0.47**
134	Residential-LDR CUSTOM 80% LLR (130) & 20% MDR (140)	*0.53*	*0.6*	**0.565**
150	Residential-Small Lot Residential - Single Family (4-6 du per acre)	*0.53*	*0.6*	**0.565**
210	Commercial-Specialty Commercial (<=50,000 sq. ft.)	*0.94*	*0.95*	**0.945**
234	Commercial-RC CUSTOM 33% (220), 33% (230), & 33% (240)	*0.69*	*0.81*	**0.75**
218	Mixed Use-Mixed Use CUSTOM 50% (210) & 50% HDR (180)	*0.75*	*0.88*	**0.815**
320	Industrial-Industrial	*0.75*	*0.88*	**0.815**
550	Institutional-Public Facilities (comm centers, libraries, sub-stations)	*0.69*	*0.81*	**0.75**
810	Office-Business Park (enclosed industrial, office or retail)	*0.69*	*0.81*	**0.75**

*Uses FCDMC Hydrology Manual Table 3.2 Rational Method C-values as guide to determine Min & Max C-values

Watson Drainage System Pre-Design
Hydrology Technical Memorandum
Table 2: Subbasin 100 Year, 2 Hour Volume Calculation

Subbasin	NOAA 14 100Y-2Hr Precip.	Subbasin Area	Completed Development, w/ Report			Partial Development, w/ Report				Development not completed, w/ Report				Completed Development, w/ No Report				Existing Undeveloped Area						
			Area with Dev+Rpt	Vol from Rept	80% of Rpt Vol	Dev. Area in Subbasin	Average C-Value	Rational Calc Vol.	80% of Calc Vol	Dev. Area in Subbasin	Average C-Value	Rational Calc Vol.	80% of Calc Vol	Dev. Area in Subbasin	Average C-Value	Rational Calc Vol.	80% of Calc Vol	Area used for Rat. Calc.	Planned Land Use Type	Land Use Code	LUCODE C-VALUE	Rational Calc Vol.	80% of Calc Vol	Combined 80% Volume
	(In.)	(ac.)	(ac.)	(ac-ft)	(ac-ft)	(ac.)		(ac-ft)	(ac-ft)	(ac.)		(ac-ft)	(ac-ft)	(ac.)		(ac-ft)	(ac-ft)	(ac.)				(ac-ft)	(ac-ft)	(ac-ft)
12	2.327	471.33	248.95	68.76	55.01	11.90	0.50	1.15	0.92				0.00	158.49	0.81	24.89	19.92	52.00	VLDR	120	0.530	5.34	4.28	**80.12**
13	2.327	320.82	305.52	95.02	76.02				0.00	11.90	0.90	2.08	1.66				0.00	3.41	RC	234	0.810	0.54	0.43	**78.11**
23	2.327	335.26			0.00				0.00	264.46	0.65	33.33	26.67				0.00	70.80	MDR	150	0.600	8.24	6.59	**33.26**
24	2.327	313.08			0.00				0.00				0.00				0.00	313.08					0.00	**0.30**
25	2.327	175.50			0.00				0.00	63.55	0.63	7.76	6.21				0.00	111.95	LDR	134	0.600	13.02	10.42	**16.63**
26	2.327	335.66			0.00				0.00				0.00	37.89	0.60	4.41	3.53	297.77					0.00	**3.53**
36	2.327	437.65			0.00				0.00	176.00	0.70	23.83	19.06	130.78	0.60	15.22	12.17	130.87	MDR	150	0.600	15.23	12.18	**43.42**
37	2.327	909.55	65.85	11.74	9.40	79.39	0.65	10.01	8.01	375.00	0.68	49.09	39.27	166.66	0.60	19.39	15.51	222.65	MDR	150	0.600	25.91	20.72	**92.91**
38	2.327	346.87			0.00				0.00	141.92	0.65	17.80	14.24				0.00	204.95	MDR	150	0.600	23.85	19.08	**33.31**
39	2.327	464.24			0.00				0.00	36.73	0.69	4.91	3.93				0.00	427.52	MDR	150	0.600	49.74	39.79	**43.72**
40	2.327	624.74			0.00				0.00	340.83	0.67	43.95	35.16				0.00	283.91	MDR	150	0.600	33.03	26.43	**61.59**
48	2.327	319.85			0.00				0.00	239.00	0.65	30.12	24.10				0.00	80.85	MDR	150	0.600	9.41	7.53	**31.63**
49	2.327	645.99	221.00	46.21	36.96	163.00	0.63	19.91	15.93	163.78	0.66	20.96	16.77				0.00	98.21	MDR	150	0.600	11.43	9.14	**78.81**
50	2.327	641.19			0.00				0.00	327.51	0.63	40.01	32.01				0.00	313.68	MDR	150	0.600	36.50	29.20	**61.21**
51	2.327	642.56			0.00				0.00	73.47	0.82	11.68	9.35				0.00	569.09	MDR	150	0.600	66.21	52.97	**62.32**
57	2.327	312.70			0.00				0.00	260.00	0.50	25.21	20.17				0.00	52.70	I	320	0.880	8.99	7.19	**27.36**
58	2.327	121.45			0.00				0.00				0.00				0.00	121.45	I	320	0.880	20.73	16.58	**16.58**
70	2.327	90.00			0.00				0.00				0.00				0.00	90.00	I	320	0.880	15.36	12.29	**12.29**
71	2.327	99.42			0.00				0.00				0.00				0.00	99.42	I	320	0.880	16.97	13.57	**13.57**
72	2.327	54.80			0.00				0.00				0.00				0.00	54.80	I	320	0.880	9.35	7.48	**7.48**
83	2.327	432.15	317.91	46.92	37.53				0.00				0.00				0.00	114.24	MDR	150	0.600	13.29	10.63	**48.17**
93	2.327	241.55			0.00				0.00				0.00				0.00	241.55	Varies	Varies	0.695	32.54	26.03	**26.03**
94	2.327	460.48			0.00				0.00				0.00				0.00	460.48	Varies	Varies	0.601	53.68	42.94	**42.94**
95	2.327	334.16			0.00				0.00	83.00	0.62	9.98	7.98				0.00	251.16	Varies	Varies	0.624	30.37	24.30	**32.28**
96	2.327	585.11			0.00				0.00				0.00				0.00	585.11	LDR	134	0.600	68.08	54.46	**54.46**
97	2.327	320.17			0.00				0.00				0.00				0.00	320.17	Varies	Varies	0.565	35.08	28.06	**28.06**
100	2.327	372.25			0.00	77.00	0.61	9.15	7.32				0.00				0.00	295.25	LDR	134	0.600	34.35	27.48	**34.80**
10E	2.327	378.79	125.00	18.96	15.17				0.00				0.00	26.65	0.60	3.10	2.48	227.14	MDR	150	0.600	26.43	21.14	**38.79**
11A	2.327	365.56	178.42	55.87	44.69				0.00				0.00				0.00	187.14	LDR	134	0.600	21.77	17.42	**62.11**
11B	2.327	371.64	189.52	36.22	28.98				0.00	101.02	0.65	12.73	10.19	22.06	0.60	2.57	2.05	59.04	MDR	150	0.600	6.87	5.50	**46.71**
11C	2.327	219.62	48.48	9.27	7.41				0.00	154.32	0.65	19.45	15.56				0.00	16.82	MDR	150	0.600	1.96	1.57	**24.54**
14A	2.327	443.11	265.64	45.11	36.08				0.00				0.00				0.00	177.47	VLDR	120	0.530	18.24	14.59	**50.68**
14B	2.327	320.98	234.21	67.23	53.78				0.00				0.00				0.00	86.76	MDR	150	0.600	10.10	8.08	**61.86**
22E	2.327	183.15			0.00				0.00	112.44	0.65	14.17	11.34				0.00	70.71	MDR	150	0.600	8.23	6.58	**17.92**
47N	2.327	148.85			0.00	24.98	0.70	3.38	2.71				0.00				0.00	123.87	MDR	150	0.600	14.41	11.53	**14.24**
56A	2.327	262.77			0.00				0.00	159.2	0.65	20.07	16.05				0.00	103.57	I	320	0.880	17.67	14.14	**30.19**
56B	2.327	213.47			0.00				0.00				0.00				0.00	213.47	I	320	0.880	36.43	29.14	**29.14**
92N	2.327	209.19			0.00				0.00				0.00				0.00	209.19	Varies	Varies	0.797	32.32	25.85	**25.85**
92S	2.327	439.82			0.00				0.00				0.00	64.51	0.88	11.01	8.81	375.31	Varies	Varies	0.737	53.64	42.91	**51.72**

Watson Drainage System Pre-Design
Hydrology Technical Memorandum
Table 2A: Storage Volumes Used - Watson Pre-Design vs Buckeye ADMP

Subbasin	Subbasin Area	Combined 80% Volume	ADMP VOL COMPARISON					Reason for > 30% difference
			CORR. ADMP VOLS.	ADMP AVG C-VALUE	Vol Diff	Increase or Decrease?	Vol Diff	
	(ac.)	(ac-ft)	(ac-ft)		(ac-ft)		(ac-ft)	
12	471.33	**80.12**	57.4	0.633	22.72	Increase	28%	More detailed report data applied
13	320.82	**78.11**	41.1	0.666	37.01	Increase	47%	More detailed report data applied
23	335.26	**33.26**	47.2	0.732	13.94	Decrease	30%	Lower C-value + Rainfall difference
24	313.08	**0.30**	0.3	0.005	0.00	Decrease	0%	Volume coded to match ADMP
25	175.50	**16.63**	26.9	0.797	10.27	Decrease	38%	Lower C-value + Rainfall difference
26	335.66	**3.53**	1.6	0.025	1.93	Increase	55%	Higher C-value used for undeveloped area
36	437.65	**43.42**	30.4	0.361	13.02	Increase	30%	Higher C-value used
37	909.55	**92.91**	110	0.629	17.09	Decrease	16%	
38	346.87	**33.31**	36.8	0.552	3.49	Decrease	9%	
39	464.24	**43.72**	47.5	0.532	3.78	Decrease	8%	
40	624.74	**61.59**	66.3	0.552	4.71	Decrease	7%	
48	319.85	**31.63**	35.1	0.570	3.47	Decrease	10%	
49	645.99	**78.81**	85.6	0.689	6.79	Decrease	8%	
50	641.19	**61.21**	63.8	0.517	2.59	Decrease	4%	
51	642.56	**62.32**	61.5	0.498	0.82	Increase	1%	
57	312.70	**27.36**	43.7	0.727	16.34	Decrease	37%	More detailed report data applied, low report C-value used
58	121.45	**16.58**	10.6	0.454	5.98	Increase	36%	Higher c-value for Industrial land use applied
70	90.00	**12.29**	9.4	0.543	2.89	Increase	23%	
71	99.42	**13.57**	13.3	0.695	0.27	Increase	2%	
72	54.80	**7.48**	7.1	0.674	0.38	Increase	5%	
83	432.15	**48.17**	32	0.385	16.17	Increase	34%	More detailed report data applied
93	241.55	**26.03**	28.4	0.611	2.37	Decrease	8%	
94	460.48	**42.94**	45.9	0.518	2.96	Decrease	6%	
95	334.16	**32.28**	37.5	0.583	5.22	Decrease	14%	
96	585.11	**54.46**	62.5	0.555	8.04	Decrease	13%	
97	320.17	**28.06**	33.5	0.544	5.44	Decrease	16%	
100	372.25	**34.80**	36.8	0.514	2.00	Decrease	5%	
10E	378.79	**38.79**	13.1	0.180	25.69	Increase	66%	More detailed report data applied
11A	365.56	**62.11**	57.4	0.816	4.71	Increase	8%	
11B	371.64	**46.71**	46.3	0.648	0.41	Increase	1%	
11C	219.62	**24.54**	24.7	0.585	0.16	Decrease	1%	
14A	443.11	**50.68**	54.3	0.637	3.62	Decrease	7%	
14B	320.98	**61.86**	41.7	0.675	20.16	Increase	33%	More detailed report data applied
22E	183.15	**17.92**	20.3	0.576	2.38	Decrease	12%	
47N	148.85	**14.24**	16.7	0.583	2.46	Decrease	15%	
56A	262.77	**30.19**	22.8	0.451	7.39	Increase	24%	
56B	213.47	**29.14**	27.1	0.660	2.04	Increase	7%	
92N	209.19	**25.85**	26.3	0.654	0.45	Decrease	2%	
92S	439.82	**51.72**	55.3	0.654	3.58	Decrease	6%	

Storage Volume Calcuation

Table 2B: Completed Construction with Drainage Report

	Dev Total Area (Ac)	Dev Total Storage (Ac-Ft)	Development Report Area within each Subbasin											
			49	37	10E	11A	11B	11C	12	13	14A	14B	83	TOTAL
Acacia Crossing	59.07	7.85				59.07								59.07
Buena Vista Mobile Home Park	125.00	18.96			125.00									125.00
Miller Manor - Phase 1	25.25	4.25		25.25										25.25
Miller Manor - Phase 2	14.30	1.61		14.30										14.30
Miller Manor - Phase 3	26.30	5.88		26.30										26.30
Riata West	221.00	46.21	221.00											221.00
Sundance - Phase 1 Infrastructure	430.54	189.90				44.35			106.00	164.40	9.71	106.08		430.54
Sundance - Phase 2 Infrastructure	814.13	129.87							131.04	141.12	255.93	128.13	157.91	814.13
Sundance Business Center	11.90	1.10							11.90					11.90
Sundance Towne Center	75.00	28.46				75.00								75.00
Watson Estates	238.00	45.49					189.52	48.48						238.00
WINDMILL VILLAGE	160.00	21.73											160.00	160.00
		Subbasin Area	645.99	909.55	378.79	365.56	371.64	219.62	471.33	320.82	443.11	320.98	432.15	
		Development + Report Area	221.00	65.85	125.00	178.42	189.52	48.48	248.95	305.52	265.64	234.21	317.91	

	Development Report TOTAL Diversion Volume in each subbasin										
	49	37	10E	11A	11B	11C	12	13	14A	14B	83
Acacia Crossing				7.85							
Buena Vista Mobile Home Park			18.96								
Miller Manor - Phase 1		4.25									
Miller Manor - Phase 2		1.61									
Miller Manor - Phase 3		5.88									
Riata West	46.21										
Sundance - Phase 1 Infrastructure				19.56			46.75	72.51	4.28	46.79	
Sundance - Phase 2 Infrastructure							20.90	22.51	40.83	20.44	25.19
Sundance Business Center							1.10				
Sundance Towne Center				28.46							
Watson Estates					36.22	9.27					
WINDMILL VILLAGE											21.73
Total Vols	**46.21**	**11.74**	**18.96**	**55.87**	**36.22**	**9.27**	**68.76**	**95.02**	**45.11**	**67.23**	**46.92**

Storage Volume Calcuation

Table 2C: Partial Construction with Drainage Report

Development	Dev Total Area (Ac)	37		47n		49		12		100	
		909.55		148.85		645.99		471.33		372.25	
		Dev area in Subbasin	C-Value	Dev area in Subbasin	C-Value	Dev area in Subbasin	C-Value	Dev area in Subbasin	C-Value	Dev area in Subbasin	C-Value
CRYSTAL VISTA	79.39	79.39	0.65								
Estrella Vista At Buckeye	137.45	137.45	0.65								
MILLER PARK	24.98			24.98	0.70						
SONORAN VISTA	163					163	0.63				
Sundance Business Center	11.9							11.9	0.5		
White Fence Farms	77									77	0.613
	Total	**79.39**	**0.65**	**24.98**	**0.70**	**163**	**0.63**	**11.9**	**0.5**	**77**	**0.613**

Storage Volume Calcuation

Table 2D: Non-Complete Construction with Drainage Report

	Dev Total Area (Ac)	Dev Total Storage (Ac-Ft)	Development Report Area within each Subbasin																		
			11B	11C	13	22E	23	25	36	37	38	39	40	48	49	50	51	56A	57	95	TOTAL
Anderson Parc	58.53	11.18		58.53																	58.53
Cipolla	198.19	30.20											198.19								198.19
Bentridge	63.55	10.45						63.55													63.55
Desert Moon Estates	196.81	32.43	101.02	95.79																	196.81
Monte Verde	853.00	149.59				112.44	264.46														376.90
Tyler Ranch	69.13	13.34									69.13										69.13
Apache Farms	72.79	7.70									72.79										72.79
Mystic Vista	145.00	25.48								145.00											145.00
Broadway Estates	230.00	59.02								230.00											230.00
Copper Falls	176.00	29.45							176.00												176.00
Hayden Valencia	239.00	35.84												239.00							239.00
Cotton Meadows - Phase 1-6	159.2	29.01																159.2			0.00
Cotton Meadows - Phase 7-12	92.30	14.15													92.30						92.30
Wingate - Phase 1-6	83.00	15.52																		83.00	83.00
Buckeye Industrial Rail Park	260.00	73.77																	260.00		260.00
Henry Park - Parcel 12, 15 & 16	73.47	18.79															73.47				0.00
Rainbow Ranch	142.64	23.78											142.64								142.64
San Madera	193.89	35.80									193.89										0.00
Siesta Lago Estates	36.73	5.92										36.73									36.73
Ventana Ranch	284.00	48.36														284.00					284.00
Ventana Ranch - Phase 1	43.51	6.62														43.51					43.51
Montana Vista	71.48	18.00													71.48						71.48
Shoppes at Sundance	11.90	2.82			11.90																11.90
		Subbasin Area	371.64	219.62	320.82	183.15	335.26	175.50	437.65	909.55	346.87	464.24	624.74	319.85	645.99	641.19	642.56	262.77	312.70	334.16	
		Non Constructed Development + Report Area	**101.02**	**154.32**	**11.90**	**112.44**	**264.46**	**63.55**	**176.00**	**375.00**	**141.92**	**36.73**	**340.83**	**239.00**	**163.78**	**327.51**	**73.47**	**159.2**	**260.00**	**83.00**	

	Dev Total Area (Ac)	Dev Total Storage (Ac-Ft)	C-value in report																		
			11B	11C	13	22E	23	25	36	37	38	39	40	48	49	50	51	56A	57	95	TOTAL
Anderson Parc	58.53	11.18		0.65																	0.65
Cipolla	198.19	30.20											0.68								0.68
Bentridge	63.55	10.45						0.63													0.63
Desert Moon Estates	196.81	32.43	0.65	0.65																	1.30
Monte Verde	853.00	149.59				0.65	0.65														1.30
Tyler Ranch	69.13	13.34									0.65										0.65
Apache Farms	72.79	7.70									0.65										0.65
Mystic Vista	145.00	25.48								0.70											0.70
Broadway Estates	230.00	59.02								0.65											0.65
Copper Falls	176.00	29.45							0.70												0.70
Hayden Valencia	239.00	35.84												0.65							0.65
Cotton Meadows - Phase 1-6	159.2	29.01																0.65			0.65
Cotton Meadows - Phase 7-12	92.30	14.15													0.67						0.67
Wingate - Phase 1-6	83.00	15.52																		0.62	0.62
Buckeye Industrial Rail Park	260.00	73.77																	0.50		0.50
Henry Park - Parcel 12, 15 & 16	73.47	18.79															0.82				0.82
Rainbow Ranch	142.64	23.78											0.65								0.65
San Madera	193.89	35.80									0.64										0.64
Siesta Lago Estates	36.73	5.92										0.69									0.69
Ventana Ranch	284.00	48.36														0.63					0.63
Ventana Ranch - Phase 1	43.51	6.62														0.63					0.63
Montana Vista	71.48	18.00													0.65						0.65
Shoppes at Sundance	11.90	2.82			0.90																0.90
		Avg C-Values	**0.65**	**0.65**	**0.90**	**0.65**	**0.65**	**0.63**	**0.70**	**0.68**	**0.65**	**0.69**	**0.67**	**0.65**	**0.66**	**0.63**	**0.82**	**0.65**	**0.50**	**0.62**	

Storage Volume Calcuation

Table 2E: Existing Development with No Drainage Report

	Total Subbasin Area	Development Area	NOAA 14 100Y-2Hr Precip.	TOB LU Code @ Dev	C-Value Used	Calc Vol	80% Calc Vol.
	(ac)	(ac)	(in)			(ac)	(ac)
12	471.33	158.49	2.327	234	0.81	24.89	19.92
26	335.66	37.89	2.327	134	0.6	4.41	3.53
36	437.65	130.78	2.327	134	0.6	15.22	12.17
37	909.55	166.66	2.327	150	0.6	19.39	15.51
10E	378.79	26.65	2.327	150	0.6	3.10	2.48
11B	371.64	22.06	2.327	150	0.6	2.57	2.05
92S	439.82	64.51	2.327	218	0.88	11.01	8.81

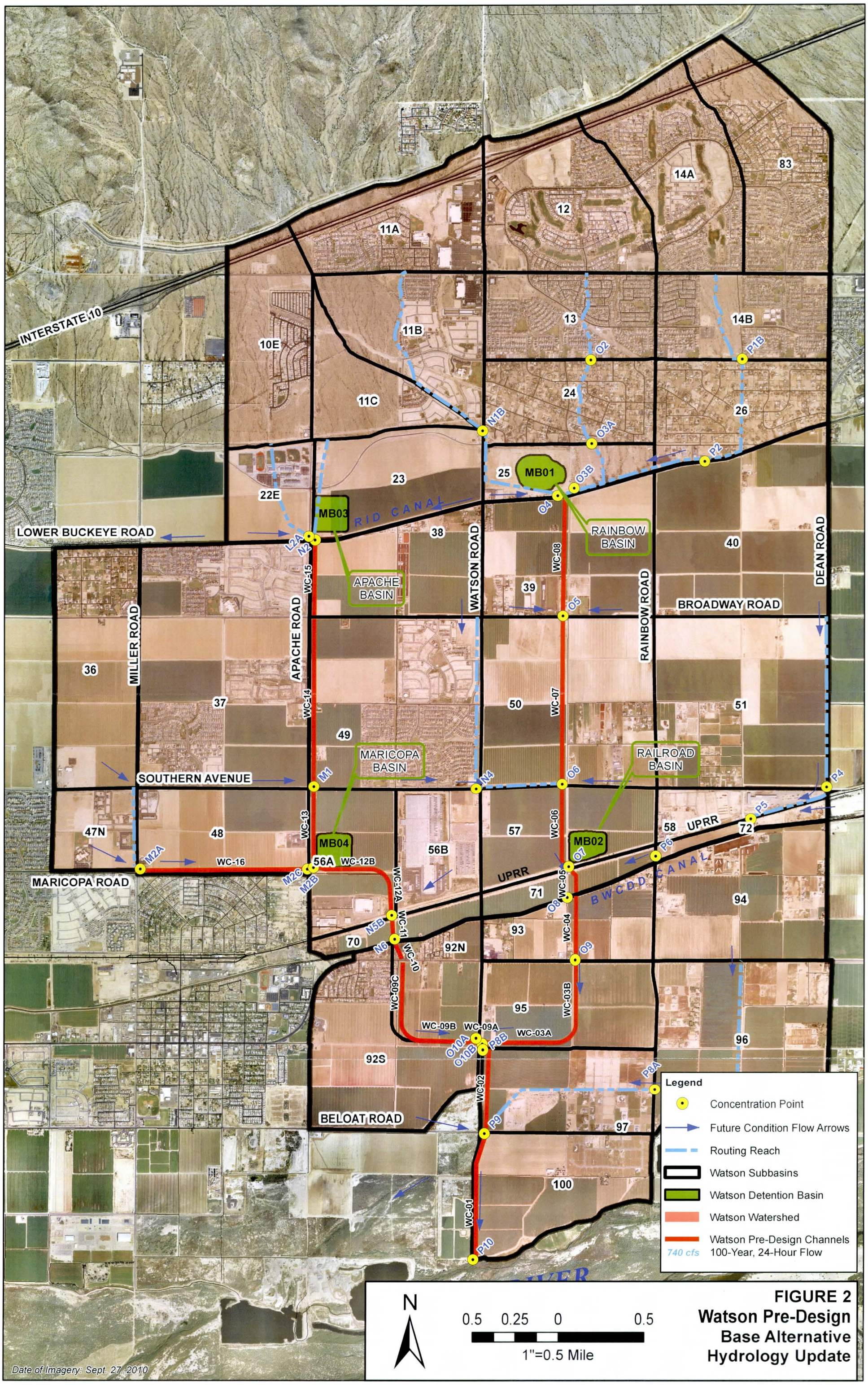

FIGURE 2
Watson Pre-Design Base Alternative Hydrology Update

DDMSW Output & HEC-1 Results

ID	Method	Duration	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
DEFAULT	NOAA14	5 MIN	0.261	0.356	0.428	0.523	0.595	0.668
	NOAA14	10 MIN	0.397	0.542	0.651	0.795	0.905	1.016
	NOAA14	15 MIN	0.492	0.672	0.807	0.986	1.122	1.260
	NOAA14	30 MIN	0.663	0.905	1.087	1.328	1.511	1.696
	NOAA14	1 HOUR	0.820	1.120	1.345	1.643	1.870	2.099
	NOAA14	2 HOUR	0.914	1.232	1.475	1.807	2.061	2.327
	NOAA14	3 HOUR	0.957	1.272	1.519	1.869	2.148	2.442
	NOAA14	6 HOUR	1.098	1.425	1.687	2.048	2.335	2.636
	NOAA14	12 HOUR	1.200	1.543	1.813	2.181	2.466	2.764
	NOAA14	24 HOUR	1.506	1.957	2.312	2.807	3.195	3.605

Area ID	Sub Basin Parameters								Rainfall Losses				
	Area (sq mi)	Length (mi)	Slope (ft/mi)	S-Graph	Lca (mi)	Lag (min)	Velocity (f/s)	Kn	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)
Major Basin ID: 01													
10E	0.592	1.41	56.9	VALLEY	0.72	31.60	3.92	0.047	0.24	0.25	4.10	0.56	35
36	0.684	1.85	36.6	VALLEY	0.93	42.90	3.80	0.048	0.25	0.25	3.95	0.58	28
22E	0.286	0.70	39.8	VALLEY	0.42	22.50	2.75	0.050	0.25	0.25	3.95	0.58	30
93	0.377	1.21	17.4	VALLEY	0.60	25.20	4.23	0.034	0.17	0.25	4.90	0.38	57
37	1.421	2.36	30.1	VALLEY	1.18	52.30	3.97	0.047	0.24	0.25	4.10	0.56	34
94	0.719	1.30	22.4	VALLEY	0.65	35.20	3.25	0.047	0.24	0.15	7.30	0.13	35
38	0.542	1.40	20.7	VALLEY	0.70	40.20	3.07	0.050	0.25	0.25	3.95	0.58	30
95	0.522	1.66	7.8	VALLEY	0.83	47.30	3.09	0.043	0.21	0.15	8.00	0.11	42
11A	0.571	0.57	84.0	VALLEY	0.33	13.80	3.63	0.042	0.22	0.25	5.60	0.27	41
39	0.725	1.63	25.2	VALLEY	0.82	43.50	3.29	0.050	0.25	0.25	4.30	0.49	30
96	0.914	1.32	4.5	VALLEY	0.66	51.30	2.26	0.050	0.29	0.15	7.30	0.13	18
11B	0.581	1.39	41.8	VALLEY	0.62	33.50	3.65	0.050	0.25	0.25	4.30	0.49	30
40	0.976	1.83	31.3	VALLEY	0.91	45.40	3.54	0.050	0.25	0.25	4.20	0.52	30
97	0.500	1.32	6.1	VALLEY	0.66	48.50	2.40	0.050	0.28	0.17	6.80	0.16	22
11C	0.343	0.99	54.3	VALLEY	0.31	21.50	4.05	0.050	0.25	0.25	3.95	0.58	30
12	0.736	0.96	83.0	VALLEY	0.41	18.30	4.61	0.042	0.21	0.25	4.65	0.40	41
13	0.501	0.52	71.2	VALLEY	0.26	13.50	3.40	0.045	0.24	0.25	5.10	0.33	34
48	0.500	1.10	16.5	VALLEY	0.55	34.20	2.83	0.049	0.24	0.25	4.35	0.48	32
100	0.582	1.70	18.8	VALLEY	0.85	47.40	3.15	0.050	0.29	0.23	6.20	0.20	18
14A	0.692	1.33	67.9	VALLEY	0.71	31.60	3.70	0.050	0.26	0.25	4.35	0.47	27
49	1.009	1.96	23.5	VALLEY	0.98	50.60	3.41	0.050	0.25	0.25	3.95	0.58	30
14B	0.502	0.59	54.1	VALLEY	0.30	17.50	2.97	0.050	0.26	0.25	4.15	0.53	27
50	1.002	1.98	26.7	VALLEY	0.99	49.80	3.50	0.050	0.25	0.25	4.20	0.52	30
51	1.004	1.96	23.0	VALLEY	0.98	50.90	3.39	0.050	0.25	0.25	4.40	0.46	30
56A	0.411	1.19	30.3	VALLEY	0.59	13.20	7.95	0.020	0.15	0.25	3.95	0.62	55
47N	0.233	0.93	21.6	VALLEY	0.69	33.90	2.41	0.050	0.25	0.25	3.95	0.58	30
56B	0.334	0.73	43.7	VALLEY	0.37	8.50	7.52	0.020	0.15	0.25	4.00	0.61	55
57	0.489	0.68	19.1	VALLEY	0.34	9.40	6.35	0.020	0.15	0.25	4.25	0.55	55
23	0.524	1.32	15.9	VALLEY	0.66	40.40	2.88	0.050	0.25	0.25	3.95	0.58	30
58	0.190	0.50	16.0	VALLEY	0.25	7.70	5.70	0.020	0.15	0.25	4.30	0.53	55
24	0.489	0.53	56.2	VALLEY	0.27	16.00	2.92	0.050	0.29	0.25	4.60	0.40	18
25	0.274	1.05	10.5	VALLEY	0.52	36.60	2.52	0.050	0.29	0.25	4.15	0.53	18
26	0.524	0.76	39.3	VALLEY	0.38	22.40	2.99	0.050	0.29	0.25	4.00	0.56	18
92N	0.327	0.86	32.6	VALLEY	0.54	17.20	4.40	0.031	0.16	0.15	8.40	0.10	68
83	0.675	1.72	64.7	VALLEY	0.93	39.00	3.88	0.050	0.25	0.25	5.40	0.27	28

Area ID	Sub Basin Parameters								Rainfall Losses				
	Area (sq mi)	Length (mi)	Slope (ft/mi)	S-Graph	Lca (mi)	Lag (min)	Velocity (f/s)	Kn	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)
Major Basin ID: 01													
92S	0.687	1.31	26.0	VALLEY	0.70	27.70	4.15	0.037	0.19	0.15	8.80	0.08	56
70	0.141	0.68	1.5	VALLEY	0.34	15.30	3.92	0.020	0.15	0.25	4.45	0.48	55
71	0.155	0.34	14.4	VALLEY	0.17	5.90	5.09	0.020	0.15	0.25	4.80	0.39	55
72	0.086	0.13	7.7	VALLEY	0.06	3.10	3.70	0.020	0.15	0.25	4.45	0.48	55

Diversion ID/ DT Card ID	Maximum Volume (ac-ft)	Maximum Diversion (cfs)		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
100-O	35		**Inflow (cfs)**		10,000								
100RET			**Diversion (cfs)**		10,000								
10E-O	39		**Inflow (cfs)**		10,000								
10ERET			**Diversion (cfs)**		10,000								
11A-O	62		**Inflow (cfs)**		10,000								
11ARET			**Diversion (cfs)**		10,000								
11B-O	47		**Inflow (cfs)**		10,000								
11BRET			**Diversion (cfs)**		10,000								
11C-O	25		**Inflow (cfs)**		10,000								
11CRET			**Diversion (cfs)**		10,000								
12-O	80		**Inflow (cfs)**		10,000								
12RET			**Diversion (cfs)**		10,000								
13-O	78		**Inflow (cfs)**		10,000								
13RET			**Diversion (cfs)**		10,000								
14A-O	51		**Inflow (cfs)**		10,000								
14ARET			**Diversion (cfs)**		10,000								
14B-O	62		**Inflow (cfs)**		10,000								
14BRET			**Diversion (cfs)**		10,000								
22E-O	18		**Inflow (cfs)**		10,000								
22ERET			**Diversion (cfs)**		10,000								
23-O	33		**Inflow (cfs)**		10,000								
23RET			**Diversion (cfs)**		10,000								
24-O	-		**Inflow (cfs)**		10,000								
24RET			**Diversion (cfs)**		10,000								
25-O	17		**Inflow (cfs)**		10,000								
25RET			**Diversion (cfs)**		10,000								

Diversion ID/ DT Card ID	Maximum Volume (ac-ft)	Maximum Diversion (cfs)		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
26-O	4		Inflow (cfs)		10,000								
26RET			Diversion (cfs)		10,000								
36-O	43		Inflow (cfs)		10,000								
36RET			Diversion (cfs)		10,000								
37-O	93		Inflow (cfs)		10,000								
37RET			Diversion (cfs)		10,000								
38-O	33		Inflow (cfs)		10,000								
38RET			Diversion (cfs)		10,000								
39-O	44		Inflow (cfs)		10,000								
39RET			Diversion (cfs)		10,000								
40-O	62		Inflow (cfs)		10,000								
40RET			Diversion (cfs)		10,000								
47N-O	14		Inflow (cfs)		10,000								
47NRET			Diversion (cfs)		10,000								
48-O	32		Inflow (cfs)		10,000								
48RET			Diversion (cfs)		10,000								
49-O	79		Inflow (cfs)		10,000								
49RET			Diversion (cfs)		10,000								
50-O	61		Inflow (cfs)		10,000								
50RET			Diversion (cfs)		10,000								
51-O	62		Inflow (cfs)		10,000								
51RET			Diversion (cfs)		10,000								
56A-O	30		Inflow (cfs)		10,000								
56ARET			Diversion (cfs)		10,000								

Diversion ID/ DT Card ID	Maximum Volume (ac-ft)	Maximum Diversion (cfs)		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
56B-O	29		**Inflow (cfs)**		10,000								
56BRET			**Diversion (cfs)**		10,000								
57-O	27		**Inflow (cfs)**		10,000								
57RET			**Diversion (cfs)**		10,000								
58-O	17		**Inflow (cfs)**		10,000								
58RET			**Diversion (cfs)**		10,000								
70-O	12		**Inflow (cfs)**		10,000								
70RET			**Diversion (cfs)**		10,000								
71-O	14		**Inflow (cfs)**		10,000								
71RET			**Diversion (cfs)**		10,000								
72-O	8		**Inflow (cfs)**		10,000								
72RET			**Diversion (cfs)**		10,000								
83-O	48		**Inflow (cfs)**		10,000								
83RET			**Diversion (cfs)**		10,000								
93-O	26		**Inflow (cfs)**		10,000								
93RET			**Diversion (cfs)**		10,000								
94-O	43		**Inflow (cfs)**		10,000								
94RET			**Diversion (cfs)**		10,000								
95-O	32		**Inflow (cfs)**		10,000								
95RET			**Diversion (cfs)**		10,000								
96-O	55		**Inflow (cfs)**		10,000								
96RET			**Diversion (cfs)**		10,000								
97-O	28		**Inflow (cfs)**		10,000								
97RET			**Diversion (cfs)**		10,000								
92N-O	26		**Inflow (cfs)**		10,000								
92NRET			**Diversion (cfs)**		10,000								

Diversion ID/ DT Card ID	Maximum Volume (ac-ft)	Maximum Diversion (cfs)		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
92S-O	52		**Inflow (cfs)**		10,000								
92SRET			**Diversion (cfs)**		10,000								
CKMB01			**Inflow (cfs)**										
DIMB01			**Diversion (cfs)**										
CKMB02			**Inflow (cfs)**										
DIMB02			**Diversion (cfs)**										
CKMB03			**Inflow (cfs)**										
DIMB03			**Diversion (cfs)**										
CKMB04			**Inflow (cfs)**										
DIMB04			**Diversion (cfs)**										
MB01			**Inflow (cfs)**		266	267	1,065	10,000					
DIMB01			**Diversion (cfs)**			1	799	9,734					
MB02			**Inflow (cfs)**		251	252	1,027	10,000					
DIMB02			**Diversion (cfs)**			1	776	9,749					
MB03			**Inflow (cfs)**		105	106	1,042	10,000					
DIMB03			**Diversion (cfs)**			1	937	9,895					
MB04			**Inflow (cfs)**		156	157	713	10,000					
DIMB04			**Diversion (cfs)**			1	557	9,844					

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															
94-P8A	0.030	0.030	0.030	6,356.60	0.0080	-	X:	-	2.00	10.00	18.00	54.50	62.50	70.50	72.50
							Y:	4.50	4.00	2.00	-	-	2.00	4.00	4.50
L1AL2A	0.030	0.030	0.030	3,239.80	0.0080	-	X:	-	2.00	10.00	18.00	44.70	52.70	60.70	62.70
							Y:	4.50	4.00	2.00	-	-	2.00	4.00	4.50
L3-M2A	0.030	0.030	0.030	2,443.00	0.0074	-	X:	-	2.00	10.00	18.00	47.00	55.00	63.00	65.00
							Y:	4.50	4.00	2.00	-	-	2.00	4.00	4.50
N1A-1B	0.030	0.030	0.030	6,236.10	0.0090	-	X:	-	2.00	10.00	18.00	27.90	35.90	43.90	45.90
							Y:	4.50	4.00	2.00	-	-	2.00	4.00	4.50
N1BO4	0.030	0.030	0.030	3,958.80	0.0030	-	X:	-	2.00	10.00	18.00	24.40	32.40	40.40	42.40
							Y:	4.50	4.00	2.00	-	-	2.00	4.00	4.50
N1C-N2	0.030	0.030	0.030	3,029.50	0.0100	-	X:	-	2.00	10.00	18.00	32.30	40.30	48.30	50.30
							Y:	4.50	4.00	2.00	-	-	2.00	4.00	4.50
N3-N4	0.030	0.030	0.030	5,206.40	0.0087	-	X:	-	2.00	10.00	18.00	34.00	42.00	50.00	52.00
							Y:	4.50	4.00	2.00	-	-	2.00	4.00	4.50
N4-O6	0.030	0.030	0.030	2,653.50	0.0010	-	X:	-	2.00	10.00	18.00	66.90	74.90	82.90	84.90
							Y:	4.50	4.00	2.00	-	-	2.00	4.00	4.50
O1-O2	0.030	0.030	0.030	2,743.80	0.0130	-	X:	-	2.00	10.20	18.40	39.70	47.90	56.10	58.10
							Y:	4.60	4.10	2.05	-	-	2.05	4.10	4.60
O2-O3A	0.030	0.030	0.030	2,815.00	0.0110	-	X:	-	2.00	10.10	18.10	35.50	43.50	51.60	53.60
							Y:	4.53	4.03	2.02	-	-	2.02	4.03	4.53
O3AO3B	0.030	0.030	0.030	2,510.20	0.0020	-	X:	-	2.00	10.00	18.00	74.30	82.30	90.30	92.30
							Y:	4.50	4.00	2.00	-	-	2.00	4.00	4.50
P1AP1B	0.030	0.030	0.030	3,128.60	0.0100	-	X:	-	2.00	10.00	18.00	22.00	30.00	38.00	40.00
							Y:	4.50	4.00	2.00	-	-	2.00	4.00	4.50
P1B-P2	0.030	0.030	0.030	4,031.60	0.0070	-	X:	-	2.00	10.00	18.00	45.90	53.90	61.90	63.90
							Y:	4.50	4.00	2.00	-	-	2.00	4.00	4.50
P2-O4	0.030	0.030	0.030	4,430.20	0.0010	-	X:	-	2.00	10.00	18.00	85.30	93.30	101.30	103.30
							Y:	4.50	4.00	2.00	-	-	2.00	4.00	4.50
P3-P4	0.030	0.030	0.030	5,240.90	0.0080	-	X:	-	2.00	10.00	18.00	22.00	30.00	38.00	40.00
							Y:	4.50	4.00	2.00	-	-	2.00	4.00	4.50
P4-P5	0.030	0.030	0.030	2,651.50	0.0080	-	X:	-	2.00	10.00	18.00	37.10	45.10	53.10	55.10
							Y:	4.50	4.00	2.00	-	-	2.00	4.00	4.50

Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
P8A-P9	0.030	0.030	0.030	5,738.60	0.0010	-	X:	-	2.00	10.00	18.00	175.30	183.30	191.30	193.30
							Y:	4.50	4.00	2.00	-	-	2.00	4.00	4.50
WC-01	0.045	0.045	0.045	3,981.40	0.0005	-	X:	-	18.00	49.00	80.10	141.50	172.50	203.60	221.60
							Y:	9.19	8.87	4.43	-	-	4.43	8.87	9.19
WC-02	0.045	0.045	0.045	2,526.40	0.0012	-	X:	-	18.00	43.90	69.90	120.30	146.30	172.20	190.20
							Y:	7.73	7.41	3.71	-	-	3.71	7.41	7.73
WC-03A	0.045	0.045	0.045	2,805.00	0.0011	-	X:	-	18.00	44.10	70.10	119.20	145.30	171.40	189.40
							Y:	7.77	7.45	3.72	-	-	3.72	7.45	7.77
WC-03B	0.045	0.045	0.045	2,119.30	0.0047	-	X:	-	18.00	38.00	57.90	95.10	115.00	135.00	153.00
							Y:	6.02	5.70	2.85	-	-	2.85	5.70	6.02
WC-04	0.045	0.045	0.045	1,931.80	0.0078	-	X:	-	18.00	36.30	54.60	88.30	106.60	125.00	143.00
							Y:	5.55	5.23	2.62	-	-	2.62	5.23	5.55
WC-05	0.045	0.045	0.045	689.70	0.0072	-	X:	-	2.00	14.10	26.20	36.70	48.80	61.00	63.00
							Y:	3.78	3.46	1.73	-	-	1.73	3.46	3.78
WC-06	0.045	0.045	0.045	2,495.30	0.0079	-	X:	-	18.00	34.50	51.00	77.70	94.20	110.70	128.70
							Y:	5.04	4.72	2.36	-	-	2.36	4.72	5.04
WC-07	0.045	0.045	0.045	5,074.00	0.0088	-	X:	-	18.00	32.70	47.30	67.00	81.70	96.30	114.30
							Y:	4.51	4.19	2.10	-	-	2.10	4.19	4.51
WC-08	0.045	0.045	0.045	3,579.00	0.0094	-	X:	-	18.00	29.80	41.70	52.00	63.90	75.70	93.70
							Y:	3.71	3.39	1.69	-	-	1.69	3.39	3.71
WC-09A	0.045	0.045	0.045	261.10	0.0029	-	X:	-	18.00	36.20	54.30	81.40	99.60	117.70	135.70
							Y:	5.51	5.19	2.60	-	-	2.60	5.19	5.51
WC-09B	0.045	0.045	0.045	2,129.60	0.0020	-	X:	-	18.00	37.40	56.90	85.90	105.30	124.70	142.70
							Y:	5.87	5.55	2.78	-	-	2.78	5.55	5.87
WC-09C	0.045	0.045	0.045	2,360.60	0.0070	-	X:	-	18.00	33.80	49.50	72.60	88.30	104.10	122.10
							Y:	4.82	4.50	2.25	-	-	2.25	4.50	4.82
WC-10	0.045	0.045	0.045	502.00	0.0030	-	X:	-	2.00	17.70	33.40	56.30	72.00	87.70	89.70
							Y:	4.80	4.48	2.24	-	-	2.24	4.48	4.80
WC-11	0.045	0.045	0.045	599.90	0.0036	-	X:	-	2.00	20.20	38.40	66.60	84.80	103.00	105.00
							Y:	5.51	5.19	2.60	-	-	2.60	5.19	5.51
WC-12A	0.045	0.045	0.045	1,504.70	0.0092	-	X:	-	18.00	28.60	39.20	46.40	57.00	67.60	85.60
							Y:	3.35	3.03	1.51	-	-	1.51	3.03	3.35
WC-12B	0.045	0.045	0.045	2,136.10	0.0024	-	X:	-	18.00	30.70	43.30	52.60	65.20	77.90	95.90
							Y:	3.93	3.61	1.81	-	-	1.81	3.61	3.93

Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
WC-13	0.045	0.045	0.045	2,091.80	0.0086	-	X:	-	18.00	31.70	45.50	61.60	75.30	89.00	91.00
							Y:	4.25	3.93	1.96	-	-	1.96	3.93	4.25
WC-14	0.045	0.045	0.045	5,179.00	0.0089	-	X:	-	18.00	27.80	37.60	43.10	52.90	62.70	64.70
							Y:	3.12	2.80	1.40	-	-	1.40	2.80	3.12
WC-15	0.045	0.045	0.045	2,232.20	0.0098	-	X:	-	18.00	27.70	37.40	42.80	52.40	62.10	64.10
							Y:	3.09	2.77	1.38	-	-	1.38	2.77	3.09
WC-16	0.045	0.045	0.045	4,718.10	0.0011	-	X:	-	18.00	40.90	63.80	100.50	123.40	146.30	148.30
							Y:	6.87	6.55	3.27	-	-	3.27	6.55	6.87
WT-01	0.030	0.030	0.030	2,579.90	0.0005	-	X:	-	2.00	26.70	51.40	95.40	120.10	144.80	146.80
							Y:	7.38	7.06	3.53	-	-	3.53	7.06	7.38

Storage Basin ID: SSMB01

Elevation Top of Dam: -NA-
Length of Dam: -NA-
Discharge Coefficient: -NA-
Weir Coefficient: -NA-

	1	2	3	4	5	6	7	8	9	10
Volume (ac-ft)		1.00	1.70	5.40	15.60	31.70	52.60	77.00	103.00	103.10
Discharge (cfs)		8	14	19	23	27	30	33	36	36
Elevation (ft)	990.0	992.0	993.0	994.0	995.0	996.0	997.0	998.0	999.0	1,100.0

	11	12	13	14.	15	16	17	18	19	20
Volume (ac-ft)	-	-	-	-	-	-	-	-	-	-
Discharge (cfs)	-	-	-	-	-	-	-	-	-	-
Elevation (ft)	-	-	-	-	-	-	-	-	-	-

	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Peak Volume (ac-ft)						19.63
Peak Stage (ft)						995.25

Storage Basin ID: SSMB02

Elevation Top of Dam: -NA-
Length of Dam: -NA-
Discharge Coefficient: -NA-
Weir Coefficient: -NA-

	1	2	3	4	5	6	7	8	9	10
Volume (ac-ft)		0.60	2.70	7.20	14.90	25.90	39.70	55.90	79.70	79.80
Discharge (cfs)		2	8	14	19	23	27	30	33	33
Elevation (ft)	884.0	885.0	886.0	887.0	888.0	889.0	890.0	891.0	892.0	1,100.0

	11	12	13	14.	15	16	17	18	19	20
Volume (ac-ft)	-	-	-	-	-	-	-	-	-	-
Discharge (cfs)	-	-	-	-	-	-	-	-	-	-
Elevation (ft)	-	-	-	-	-	-	-	-	-	-

	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Peak Volume (ac-ft)						25.90
Peak Stage (ft)						889.00

Storage Basin ID: SSMB03

Elevation Top of Dam: -NA-
Length of Dam: -NA-
Discharge Coefficient: -NA-
Weir Coefficient: -NA-

	1	2	3	4	5	6	7	8	9	10
Volume (ac-ft)		0.50	2.30	6.40	13.70	25.20	40.70	40.80		
Discharge (cfs)		2	8	14	19	23	27	27		
Elevation (ft)	991.0	992.0	993.0	994.0	995.0	996.0	997.0	1,100.0	-	-

	11	12	13	14.	15	16	17	18	19	20
Volume (ac-ft)	-	-	-	-	-	-	-	-	-	-
Discharge (cfs)	-	-	-	-	-	-	-	-	-	-
Elevation (ft)	-	-	-	-	-	-	-	-	-	-

	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Peak Volume (ac-ft)						5.03
Peak Stage (ft)						993.67

Storage Basin ID: SSMB04

			1	2	3	4	5	6	7	8	9	10
Elevation Top of Dam:	-NA-	**Volume (ac-ft)**		1.10	4.00	9.70	19.00	32.10	48.50	67.40	67.50	
Length of Dam:	-NA-	**Discharge (cfs)**		2	8	14	19	23	27	30	30	
Discharge Coefficient:	-NA-	**Elevation (ft)**	895.0	896.0	897.0	898.0	899.0	900.0	901.0	902.0	1,100.0	-
Weir Coefficient:	-NA-											

	11	12	13	14.	15	16	17	18	19	20
Volume (ac-ft)	-	-	-	-	-	-	-	-	-	-
Discharge (cfs)	-	-	-	-	-	-	-	-	-	-
Elevation (ft)	-	-	-	-	-	-	-	-	-	-

	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Peak Volume (ac-ft)						17.14
Peak Stage (ft)						898.80

ID	Type	Area (sq mi)	Discharge cfs 2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin 01								
12	Hydrograph	0.740	0	0	0	0	0	1,157
12RET	Diversion	0.740	0	0	0	0	0	1,157
12-O	Hydrograph	0.740	0	0	0	0	0	0
O1-O2	Routed	0.740	0	0	0	0	0	0
13	Hydrograph	0.500	0	0	0	0	0	909
13RET	Diversion	0.500	0	0	0	0	0	909
13-O	Hydrograph	0.500	0	0	0	0	0	0
O2	Combined	1.240	0	0	0	0	0	0
O2-O3A	Routed	1.240	0	0	0	0	0	0
24	Hydrograph	0.490	0	0	0	0	0	731
24RET	Diversion	0.490	0	0	0	0	0	5
24-O	Hydrograph	0.490	0	0	0	0	0	731
O3A	Combined	1.730	0	0	0	0	0	615
O3AO3B	Routed	1.730	0	0	0	0	0	566
25	Hydrograph	0.270	0	0	0	0	0	236
25RET	Diversion	0.270	0	0	0	0	0	236
25-O	Hydrograph	0.270	0	0	0	0	0	6
O3B	Combined	2.000	0	0	0	0	0	566
14A	Hydrograph	0.690	0	0	0	0	0	720
14ARET	Diversion	0.690	0	0	0	0	0	720
14A-O	Hydrograph	0.690	0	0	0	0	0	2
P1AP1B	Routed	0.690	0	0	0	0	0	1
83	Hydrograph	0.680	0	0	0	0	0	701
83RET	Diversion	0.680	0	0	0	0	0	701
83-O	Hydrograph	0.680	0	0	0	0	0	174
14B	Hydrograph	0.500	0	0	0	0	0	719
14BRET	Diversion	0.500	0	0	0	0	0	719
14B-O	Hydrograph	0.500	0	0	0	0	0	0
P1B	Combined	1.870	0	0	0	0	0	178
P1B-P2	Routed	1.870	0	0	0	0	0	54
26	Hydrograph	0.520	0	0	0	0	0	606
26RET	Diversion	0.520	0	0	0	0	0	92
26-O	Hydrograph	0.520	0	0	0	0	0	606
P2	Combined	2.390	0	0	0	0	0	463
P2-O4	Routed	2.390	0	0	0	0	0	359
11A	Hydrograph	0.570	0	0	0	0	0	1,067
11ARET	Diversion	0.570	0	0	0	0	0	1,067
11A-O	Hydrograph	0.570	0	0	0	0	0	0
N1A-1B	Routed	0.570	0	0	0	0	0	0
11B	Hydrograph	0.580	0	0	0	0	0	596
11BRET	Diversion	0.580	0	0	0	0	0	596
11B-O	Hydrograph	0.580	0	0	0	0	0	0
N1B	Combined	1.150	0	0	0	0	0	0
N1BO4	Routed	1.150	0	0	0	0	0	0
O4	Combined	5.550	0	0	0	0	0	569
DIMB01	Diversion	5.550	0	0	0	0	0	219
MB01	Hydrograph	5.550	0	0	0	0	0	266
RTMB01	Hydrograph	5.550	0	0	0	0	0	219
SSMB01	Routed	5.550	0	0	0	0	0	20
&MB01	Combined	5.550	0	0	0	0	0	286
WC-08	Routed	5.550	0	0	0	0	0	285
39	Hydrograph	0.730	0	0	0	0	0	623
39RET	Diversion	0.730	0	0	0	0	0	623
39-O	Hydrograph	0.730	0	0	0	0	0	229
O5	Combined	6.270	0	0	0	0	0	285
WC-07	Routed	6.270	0	0	0	0	0	282
38	Hydrograph	0.540	0	0	0	0	0	473
38RET	Diversion	0.540	0	0	0	0	0	473
38-O	Hydrograph	0.540	0	0	0	0	0	98
N3-N4	Routed	0.540	0	0	0	0	0	52
49	Hydrograph	1.010	0	0	0	0	0	743
49RET	Diversion	1.010	0	0	0	0	0	743
49-O	Hydrograph	1.010	0	0	0	0	0	0
N4	Combined	1.550	0	0	0	0	0	54
N4-O6	Routed	1.550	0	0	0	0	0	25

ID	Type	Area (sq mi)	Discharge cfs 2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
50	Hydrograph	1.000	0	0	0	0	0	769
50RET	Diversion	1.000	0	0	0	0	0	769
50-O	Hydrograph	1.000	0	0	0	0	0	218
O6	Combined	8.820	0	0	0	0	0	282
WC-06	Routed	8.820	0	0	0	0	0	278
57	Hydrograph	0.490	0	0	0	0	0	998
57RET	Diversion	0.490	0	0	0	0	0	932
57-O	Hydrograph	0.490	0	0	0	0	0	944
O7	Combined	9.310	0	0	0	0	0	320
DIMB02	Diversion	9.310	0	0	0	0	0	69
MB02	Hydrograph	9.310	0	0	0	0	0	251
RTMB02	Hydrograph	9.310	0	0	0	0	0	69
SSMB02	Routed	9.310	0	0	0	0	0	9
&MB02	Combined	9.310	0	0	0	0	0	260
WC-05	Routed	9.310	0	0	0	0	0	260
40	Hydrograph	0.980	0	0	0	0	0	797
40RET	Diversion	0.980	0	0	0	0	0	797
40-O	Hydrograph	0.980	0	0	0	0	0	200
P3-P4	Routed	0.980	0	0	0	0	0	190
51	Hydrograph	1.000	0	0	0	0	0	783
51RET	Diversion	1.000	0	0	0	0	0	783
51-O	Hydrograph	1.000	0	0	0	0	0	281
P4	Combined	1.980	0	0	0	0	0	186
P4-P5	Routed	1.980	0	0	0	0	0	156
58	Hydrograph	0.190	0	0	0	0	0	420
58RET	Diversion	0.190	0	0	0	0	0	420
58-O	Hydrograph	0.190	0	0	0	0	0	24
P5	Combined	2.170	0	0	0	0	0	147
72	Hydrograph	0.090	0	0	0	0	0	181
72RET	Diversion	0.090	0	0	0	0	0	181
72-O	Hydrograph	0.090	0	0	0	0	0	1
P6	Combined	2.260	0	0	0	0	0	147
WT-01	Routed	2.260	0	0	0	0	0	108
71	Hydrograph	0.160	0	0	0	0	0	362
71RET	Diversion	0.160	0	0	0	0	0	362
71-O	Hydrograph	0.160	0	0	0	0	0	50
O8	Combined	11.720	0	0	0	0	0	281
WC-04	Routed	11.720	0	0	0	0	0	258
93	Hydrograph	0.380	0	0	0	0	0	554
93RET	Diversion	0.380	0	0	0	0	0	554
93-O	Hydrograph	0.380	0	0	0	0	0	346
O9	Combined	12.100	0	0	0	0	0	356
WC-03B	Routed	12.100	0	0	0	0	0	330
WC-03A	Routed	12.100	0	0	0	0	0	311
95	Hydrograph	0.520	0	0	0	0	0	576
95RET	Diversion	0.520	0	0	0	0	0	576
95-O	Hydrograph	0.520	0	0	0	0	0	477
P8B	Combined	12.620	0	0	0	0	0	481
10E	Hydrograph	0.590	0	0	0	0	0	625
10ERET	Diversion	0.590	0	0	0	0	0	625
10E-O	Hydrograph	0.590	0	0	0	0	0	138
L1AL2A	Routed	0.590	0	0	0	0	0	75
22E	Hydrograph	0.290	0	0	0	0	0	362
22ERET	Diversion	0.290	0	0	0	0	0	362
22E-O	Hydrograph	0.290	0	0	0	0	0	47
L2A	Combined	0.880	0	0	0	0	0	87
11C	Hydrograph	0.340	0	0	0	0	0	440
11CRET	Diversion	0.340	0	0	0	0	0	440
11C-O	Hydrograph	0.340	0	0	0	0	0	5
N1C-N2	Routed	0.340	0	0	0	0	0	2
23	Hydrograph	0.520	0	0	0	0	0	455
23RET	Diversion	0.520	0	0	0	0	0	455
23-O	Hydrograph	0.520	0	0	0	0	0	77
N2	Combined	1.750	0	0	0	0	0	107
DIMB03	Diversion	1.750	0	0	0	0	0	30
MB03	Hydrograph	1.750	0	0	0	0	0	69

ID	Type	Area (sq mi)	Discharge cfs 2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
RTMB03	Hydrograph	1.750	0	0	0	0	0	30
SSMB03	Routed	1.750	0	0	0	0	0	1
&MB03	Combined	1.750	0	0	0	0	0	70
WC-15	Routed	1.750	0	0	0	0	0	67
WC-14	Routed	1.750	0	0	0	0	0	62
37	Hydrograph	1.420	0	0	0	0	0	996
37RET	Diversion	1.420	0	0	0	0	0	996
37-O	Hydrograph	1.420	0	0	0	0	0	190
M1	Combined	3.170	0	0	0	0	0	93
WC-13	Routed	3.170	0	0	0	0	0	80
36	Hydrograph	0.680	0	0	0	0	0	558
36RET	Diversion	0.680	0	0	0	0	0	558
36-O	Hydrograph	0.680	0	0	0	0	0	56
L3-M2A	Routed	0.680	0	0	0	0	0	31
47N	Hydrograph	0.230	0	0	0	0	0	232
47NRET	Diversion	0.230	0	0	0	0	0	232
47N-O	Hydrograph	0.230	0	0	0	0	0	50
M2A	Combined	0.920	0	0	0	0	0	47
WC-16	Routed	0.920	0	0	0	0	0	26
48	Hydrograph	0.500	0	0	0	0	0	518
48RET	Diversion	0.500	0	0	0	0	0	518
48-O	Hydrograph	0.500	0	0	0	0	0	146
M2B	Combined	1.420	0	0	0	0	0	114
M2C	Combined	4.580	0	0	0	0	0	72
DIMB04	Diversion	4.580	0	0	0	0	0	8
MB04	Hydrograph	4.580	0	0	0	0	0	25
RTMB04	Hydrograph	4.580	0	0	0	0	0	8
SSMB04	Routed	4.580	0	0	0	0	0	0
&MB04	Combined	4.580	0	0	0	0	0	25
WC-12B	Routed	4.580	0	0	0	0	0	20
WC-12A	Routed	4.580	0	0	0	0	0	18
56A	Hydrograph	0.410	0	0	0	0	0	764
56ARET	Diversion	0.410	0	0	0	0	0	764
56A-O	Hydrograph	0.410	0	0	0	0	0	256
56B	Hydrograph	0.330	0	0	0	0	0	706
56BRET	Diversion	0.330	0	0	0	0	0	706
56B-O	Hydrograph	0.330	0	0	0	0	0	44
N5B	Combined	5.330	0	0	0	0	0	395
WC-11	Routed	5.330	0	0	0	0	0	84
70	Hydrograph	0.140	0	0	0	0	0	258
70RET	Diversion	0.140	0	0	0	0	0	258
70-O	Hydrograph	0.140	0	0	0	0	0	33
N6	Combined	5.470	0	0	0	0	0	80
WC-10	Routed	5.470	0	0	0	0	0	73
WC-09C	Routed	5.470	0	0	0	0	0	54
WC-09B	Routed	5.470	0	0	0	0	0	38
WC-09A	Routed	5.470	0	0	0	0	0	37
92N	Hydrograph	0.330	0	0	0	0	0	634
92NRET	Diversion	0.330	0	0	0	0	0	628
92N-O	Hydrograph	0.330	0	0	0	0	0	455
O10A	Combined	5.800	0	0	0	0	0	281
O10B	Combined	18.420	0	0	0	0	0	477
WC-02	Routed	18.420	0	0	0	0	0	453
DET6	Hydrograph	0.160	0	0	0	0	0	188
DRAN6	Hydrograph	0.750	0	0	0	0	0	703
TOBINF	Combined	0.910	0	0	0	0	0	881
92S	Hydrograph	0.690	0	0	0	0	0	1,065
92SRET	Diversion	0.690	0	0	0	0	0	1,065
92S-O	Hydrograph	0.690	0	0	0	0	0	795
TOB92S	Combined	1.600	0	0	0	0	0	881
94	Hydrograph	0.720	0	0	0	0	0	927
94RET	Diversion	0.720	0	0	0	0	0	927
94-O	Hydrograph	0.720	0	0	0	0	0	772
94-P8A	Routed	0.720	0	0	0	0	0	507
96	Hydrograph	0.910	0	0	0	0	0	872
96RET	Diversion	0.910	0	0	0	0	0	872

ID	Type	Area (sq mi)	Discharge cfs 2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
96-O	Hydrograph	0.910	0	0	0	0	0	607
P8A	Combined	1.630	0	0	0	0	0	845
P8A-P9	Routed	1.630	0	0	0	0	0	519
97	Hydrograph	0.500	0	0	0	0	0	488
97RET	Diversion	0.500	0	0	0	0	0	488
97-O	Hydrograph	0.500	0	0	0	0	0	353
P9	Combined	22.150	0	0	0	0	0	891
WC-01	Routed	22.150	0	0	0	0	0	753
100	Hydrograph	0.580	0	0	0	0	0	526
100RET	Diversion	0.580	0	0	0	0	0	526
100-O	Hydrograph	0.580	0	0	0	0	0	254
P10	Combined	22.730	0	0	0	0	0	753

ID	Type	Area (sq mi)	Discharge cfs 2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin 01								
12	Hydrograph	0.740	0	0	0	0	0	1,156
12RET	Diversion	0.740	0	0	0	0	0	1,156
12-O	Hydrograph	0.740	0	0	0	0	0	0
O1-O2	Routed	0.740	0	0	0	0	0	0
13	Hydrograph	0.500	0	0	0	0	0	919
13RET	Diversion	0.500	0	0	0	0	0	919
13-O	Hydrograph	0.500	0	0	0	0	0	0
O2	Combined	1.240	0	0	0	0	0	0
O2-O3A	Routed	1.240	0	0	0	0	0	0
24	Hydrograph	0.490	0	0	0	0	0	746
24RET	Diversion	0.490	0	0	0	0	0	2
24-O	Hydrograph	0.490	0	0	0	0	0	746
O3A	Combined	1.730	0	0	0	0	0	739
O3AO3B	Routed	1.730	0	0	0	0	0	671
25	Hydrograph	0.270	0	0	0	0	0	235
25RET	Diversion	0.270	0	0	0	0	0	235
25-O	Hydrograph	0.270	0	0	0	0	0	18
O3B	Combined	2.000	0	0	0	0	0	671
14A	Hydrograph	0.690	0	0	0	0	0	712
14ARET	Diversion	0.690	0	0	0	0	0	712
14A-O	Hydrograph	0.690	0	0	0	0	0	31
P1AP1B	Routed	0.690	0	0	0	0	0	24
83	Hydrograph	0.680	0	0	0	0	0	672
83RET	Diversion	0.680	0	0	0	0	0	672
83-O	Hydrograph	0.680	0	0	0	0	0	204
14B	Hydrograph	0.500	0	0	0	0	0	729
14BRET	Diversion	0.500	0	0	0	0	0	729
14B-O	Hydrograph	0.500	0	0	0	0	0	0
P1B	Combined	1.870	0	0	0	0	0	204
P1B-P2	Routed	1.870	0	0	0	0	0	103
26	Hydrograph	0.520	0	0	0	0	0	621
26RET	Diversion	0.520	0	0	0	0	0	9
26-O	Hydrograph	0.520	0	0	0	0	0	621
P2	Combined	2.390	0	0	0	0	0	610
P2-O4	Routed	2.390	0	0	0	0	0	479
11A	Hydrograph	0.570	0	0	0	0	0	1,075
11ARET	Diversion	0.570	0	0	0	0	0	1,075
11A-O	Hydrograph	0.570	0	0	0	0	0	6
N1A-1B	Routed	0.570	0	0	0	0	0	6
11B	Hydrograph	0.580	0	0	0	0	0	586
11BRET	Diversion	0.580	0	0	0	0	0	586
11B-O	Hydrograph	0.580	0	0	0	0	0	12
N1B	Combined	1.150	0	0	0	0	0	11
N1BO4	Routed	1.150	0	0	0	0	0	11
O4	Combined	5.550	0	0	0	0	0	767
DIMB01	Diversion	5.550	0	0	0	0	0	501
MB01	Hydrograph	5.550	0	0	0	0	0	266
RTMB01	Hydrograph	5.550	0	0	0	0	0	501
SSMB01	Routed	5.550	0	0	0	0	0	24
&MB01	Combined	5.550	0	0	0	0	0	290
WC-08	Routed	5.550	0	0	0	0	0	290
39	Hydrograph	0.730	0	0	0	0	0	610
39RET	Diversion	0.730	0	0	0	0	0	610
39-O	Hydrograph	0.730	0	0	0	0	0	339
O5	Combined	6.270	0	0	0	0	0	549
WC-07	Routed	6.270	0	0	0	0	0	450
38	Hydrograph	0.540	0	0	0	0	0	465
38RET	Diversion	0.540	0	0	0	0	0	465
38-O	Hydrograph	0.540	0	0	0	0	0	214
N3-N4	Routed	0.540	0	0	0	0	0	109
49	Hydrograph	1.010	0	0	0	0	0	737
49RET	Diversion	1.010	0	0	0	0	0	737
49-O	Hydrograph	1.010	0	0	0	0	0	21
N4	Combined	1.550	0	0	0	0	0	109
N4-O6	Routed	1.550	0	0	0	0	0	74

ID	Type	Area (sq mi)	Discharge cfs 2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
50	Hydrograph	1.000	0	0	0	0	0	758
50RET	Diversion	1.000	0	0	0	0	0	758
50-O	Hydrograph	1.000	0	0	0	0	0	402
O6	Combined	8.820	0	0	0	0	0	688
WC-06	Routed	8.820	0	0	0	0	0	636
57	Hydrograph	0.490	0	0	0	0	0	1,008
57RET	Diversion	0.490	0	0	0	0	0	755
57-O	Hydrograph	0.490	0	0	0	0	0	947
O7	Combined	9.310	0	0	0	0	0	906
DIMB02	Diversion	9.310	0	0	0	0	0	655
MB02	Hydrograph	9.310	0	0	0	0	0	251
RTMB02	Hydrograph	9.310	0	0	0	0	0	655
SSMB02	Routed	9.310	0	0	0	0	0	23
&MB02	Combined	9.310	0	0	0	0	0	274
WC-05	Routed	9.310	0	0	0	0	0	274
40	Hydrograph	0.980	0	0	0	0	0	787
40RET	Diversion	0.980	0	0	0	0	0	787
40-O	Hydrograph	0.980	0	0	0	0	0	326
P3-P4	Routed	0.980	0	0	0	0	0	328
51	Hydrograph	1.000	0	0	0	0	0	765
51RET	Diversion	1.000	0	0	0	0	0	765
51-O	Hydrograph	1.000	0	0	0	0	0	394
P4	Combined	1.980	0	0	0	0	0	527
P4-P5	Routed	1.980	0	0	0	0	0	460
58	Hydrograph	0.190	0	0	0	0	0	416
58RET	Diversion	0.190	0	0	0	0	0	416
58-O	Hydrograph	0.190	0	0	0	0	0	72
P5	Combined	2.170	0	0	0	0	0	470
72	Hydrograph	0.090	0	0	0	0	0	175
72RET	Diversion	0.090	0	0	0	0	0	175
72-O	Hydrograph	0.090	0	0	0	0	0	9
P6	Combined	2.260	0	0	0	0	0	474
WT-01	Routed	2.260	0	0	0	0	0	360
71	Hydrograph	0.160	0	0	0	0	0	357
71RET	Diversion	0.160	0	0	0	0	0	357
71-O	Hydrograph	0.160	0	0	0	0	0	69
O8	Combined	11.720	0	0	0	0	0	502
WC-04	Routed	11.720	0	0	0	0	0	494
93	Hydrograph	0.380	0	0	0	0	0	527
93RET	Diversion	0.380	0	0	0	0	0	527
93-O	Hydrograph	0.380	0	0	0	0	0	422
O9	Combined	12.100	0	0	0	0	0	582
WC-03B	Routed	12.100	0	0	0	0	0	500
WC-03A	Routed	12.100	0	0	0	0	0	485
95	Hydrograph	0.520	0	0	0	0	0	532
95RET	Diversion	0.520	0	0	0	0	0	532
95-O	Hydrograph	0.520	0	0	0	0	0	483
P8B	Combined	12.620	0	0	0	0	0	692
10E	Hydrograph	0.590	0	0	0	0	0	615
10ERET	Diversion	0.590	0	0	0	0	0	615
10E-O	Hydrograph	0.590	0	0	0	0	0	241
L1AL2A	Routed	0.590	0	0	0	0	0	149
22E	Hydrograph	0.290	0	0	0	0	0	358
22ERET	Diversion	0.290	0	0	0	0	0	358
22E-O	Hydrograph	0.290	0	0	0	0	0	130
L2A	Combined	0.880	0	0	0	0	0	179
11C	Hydrograph	0.340	0	0	0	0	0	437
11CRET	Diversion	0.340	0	0	0	0	0	437
11C-O	Hydrograph	0.340	0	0	0	0	0	22
N1C-N2	Routed	0.340	0	0	0	0	0	15
23	Hydrograph	0.520	0	0	0	0	0	448
23RET	Diversion	0.520	0	0	0	0	0	448
23-O	Hydrograph	0.520	0	0	0	0	0	161
N2	Combined	1.750	0	0	0	0	0	293
DIMB03	Diversion	1.750	0	0	0	0	0	188
MB03	Hydrograph	1.750	0	0	0	0	0	105

ID	Type	Area (sq mi)	Discharge cfs 2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
RTMB03	Hydrograph	1.750	0	0	0	0	0	188
SSMB03	Routed	1.750	0	0	0	0	0	12
&MB03	Combined	1.750	0	0	0	0	0	117
WC-15	Routed	1.750	0	0	0	0	0	117
WC-14	Routed	1.750	0	0	0	0	0	116
37	Hydrograph	1.420	0	0	0	0	0	1,031
37RET	Diversion	1.420	0	0	0	0	0	1,031
37-O	Hydrograph	1.420	0	0	0	0	0	453
M1	Combined	3.170	0	0	0	0	0	536
WC-13	Routed	3.170	0	0	0	0	0	462
36	Hydrograph	0.680	0	0	0	0	0	553
36RET	Diversion	0.680	0	0	0	0	0	553
36-O	Hydrograph	0.680	0	0	0	0	0	184
L3-M2A	Routed	0.680	0	0	0	0	0	105
47N	Hydrograph	0.230	0	0	0	0	0	225
47NRET	Diversion	0.230	0	0	0	0	0	225
47N-O	Hydrograph	0.230	0	0	0	0	0	107
M2A	Combined	0.920	0	0	0	0	0	125
WC-16	Routed	0.920	0	0	0	0	0	84
48	Hydrograph	0.500	0	0	0	0	0	505
48RET	Diversion	0.500	0	0	0	0	0	505
48-O	Hydrograph	0.500	0	0	0	0	0	245
M2B	Combined	1.420	0	0	0	0	0	242
M2C	Combined	4.580	0	0	0	0	0	500
DIMB04	Diversion	4.580	0	0	0	0	0	344
MB04	Hydrograph	4.580	0	0	0	0	0	156
RTMB04	Hydrograph	4.580	0	0	0	0	0	344
SSMB04	Routed	4.580	0	0	0	0	0	18
&MB04	Combined	4.580	0	0	0	0	0	174
WC-12B	Routed	4.580	0	0	0	0	0	174
WC-12A	Routed	4.580	0	0	0	0	0	174
56A	Hydrograph	0.410	0	0	0	0	0	761
56ARET	Diversion	0.410	0	0	0	0	0	761
56A-O	Hydrograph	0.410	0	0	0	0	0	392
56B	Hydrograph	0.330	0	0	0	0	0	708
56BRET	Diversion	0.330	0	0	0	0	0	708
56B-O	Hydrograph	0.330	0	0	0	0	0	125
N5B	Combined	5.330	0	0	0	0	0	459
WC-11	Routed	5.330	0	0	0	0	0	370
70	Hydrograph	0.140	0	0	0	0	0	248
70RET	Diversion	0.140	0	0	0	0	0	248
70-O	Hydrograph	0.140	0	0	0	0	0	65
N6	Combined	5.470	0	0	0	0	0	383
WC-10	Routed	5.470	0	0	0	0	0	372
WC-09C	Routed	5.470	0	0	0	0	0	273
WC-09B	Routed	5.470	0	0	0	0	0	212
WC-09A	Routed	5.470	0	0	0	0	0	212
92N	Hydrograph	0.330	0	0	0	0	0	609
92NRET	Diversion	0.330	0	0	0	0	0	598
92N-O	Hydrograph	0.330	0	0	0	0	0	524
O10A	Combined	5.800	0	0	0	0	0	509
O10B	Combined	18.420	0	0	0	0	0	785
WC-02	Routed	18.420	0	0	0	0	0	726
DET24	Hydrograph	0.160	0	0	0	0	0	153
DRAN24	Hydrograph	0.750	0	0	0	0	0	535
TOBINF	Combined	0.910	0	0	0	0	0	659
92S	Hydrograph	0.690	0	0	0	0	0	1,004
92SRET	Diversion	0.690	0	0	0	0	0	990
92S-O	Hydrograph	0.690	0	0	0	0	0	907
TOB92S	Combined	1.600	0	0	0	0	0	919
94	Hydrograph	0.720	0	0	0	0	0	875
94RET	Diversion	0.720	0	0	0	0	0	875
94-O	Hydrograph	0.720	0	0	0	0	0	712
94-P8A	Routed	0.720	0	0	0	0	0	521
96	Hydrograph	0.910	0	0	0	0	0	833
96RET	Diversion	0.910	0	0	0	0	0	833

ID	Type	Area (sq mi)	Discharge cfs 2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
96-O	Hydrograph	0.910	0	0	0	0	0	559
P8A	Combined	1.630	0	0	0	0	0	963
P8A-P9	Routed	1.630	0	0	0	0	0	597
97	Hydrograph	0.500	0	0	0	0	0	463
97RET	Diversion	0.500	0	0	0	0	0	463
97-O	Hydrograph	0.500	0	0	0	0	0	369
P9	Combined	22.150	0	0	0	0	0	1,006
WC-01	Routed	22.150	0	0	0	0	0	961
100	Hydrograph	0.580	0	0	0	0	0	506
100RET	Diversion	0.580	0	0	0	0	0	506
100-O	Hydrograph	0.580	0	0	0	0	0	279
P10	Combined	22.730	0	0	0	0	0	979

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1*****************************************                    ****************************************
 *                                       *                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                    *   U.S. ARMY CORPS OF ENGINEERS       *
 *              JUN   1998               *                    *   HYDROLOGIC ENGINEERING CENTER      *
 *           VERSION 4.1                 *                    *         609 SECOND STREET            *
 *                                       *                    *      DAVIS, CALIFORNIA 95616         *
 *  RUN DATE   04MAR13  TIME  13:55:10   *                    *          (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        FCDMC
    2           ID        WATSON PRE-DESIGN 24 - Watson Pre-Design 24 Hour Update
    3           ID        100 YEAR
    4           ID        24 Hour Storm
    5           ID        Unit Hydrograph: S-Graph
    6           ID        Storm: Multiple
    7           ID        03/04/2013
    8           IT       5       0       0    2000
    9           IN      15
   10           IO       5
                *DIAGRAM
                *
   11           JD   3.605  0.0001
   12           PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
   13           PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
   14           PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
   15           PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
   16           PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
   17           PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
   18           PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
   19           PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
   20           PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
   21           PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000
   22           JD   3.587     1.0
   23           JD   3.515     5.0
   24           JD   3.425    10.0
   25           JD   3.309    20.0
   26           JD   3.245    30.0
                *

   27           KK      12   BASIN
   28           KM        S-GRAPH TYPE=PHOENIX VALLEY
   29           BA   0.736
   30           LG    0.21    0.25    4.65    0.40      41
   31           UI       0     184     629     977    1548    1073     687     298     165      59
   32           UI      42       0       0       0       0       0       0       0       0       0
   33           UI       0       0       0       0       0       0       0       0       0       0
   34           UI       0       0       0       0       0       0       0       0       0       0
   35           UI       0       0       0       0       0       0       0       0       0       0
                *

   36           KK    12-O  DIVERT
   37           KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
   38           DT   12RET    80.1     0.0
   39           DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
   40           DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
                *

   41           KK   O1-O2   ROUTE
   42           KM        ROUTE SUBBASIN 12 TO 02
   43           RS       1    FLOW
   44           RC   0.030   0.030   0.030    2744  0.0130    0.00
   45           RX    0.00    2.00   10.20   18.40   39.70   47.90   56.10   58.10
   46           RY    4.60    4.10    2.05    0.00    0.00    2.05    4.10    4.60
                *
1                                                HEC-1 INPUT                                                PAGE  2

  LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
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 47          KK      13   BASIN
 48          KM         S-GRAPH TYPE=PHOENIX VALLEY
 49          BA   0.501
 50          LG    0.24    0.25    5.10    0.33      34
 51          UI       0     249     746    1336     897     410     159      42      38       0
 52          UI       0       0       0       0       0       0       0       0       0       0
 53          UI       0       0       0       0       0       0       0       0       0       0
 54          UI       0       0       0       0       0       0       0       0       0       0
 55          UI       0       0       0       0       0       0       0       0       0       0
             *

 56          KK    13-O  DIVERT
 57          DT   13RET    78.1     0.0
 58          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 59          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
             *

 60          KK      O2 COMBINE
 61          KM         COMBINE ROUTED HYDROGRAPH FROM O1 WITH RUNOFF FROM 13 @ O2
 62          HC       2
             *

 63          KK  O2-O3A   ROUTE
 64          KM         ROUTE HYDROGRAPH FROM O2 TO O3A
 65          RS       1    FLOW
 66          RC   0.030   0.030   0.030    2815  0.0110    0.00
 67          RX    0.00    2.00   10.10   18.10   35.50   43.50   51.60   53.60
 68          RY    4.53    4.03    2.02    0.00    0.00    2.02    4.03    4.53
             *

 69          KK      24   BASIN
 70          KM         S-GRAPH TYPE=PHOENIX VALLEY
 71          BA   0.489
 72          LG    0.29    0.25    4.60    0.40      18
 73          UI       0     167     532     929    1035     618     283     131      43      32
 74          UI       0       0       0       0       0       0       0       0       0       0
 75          UI       0       0       0       0       0       0       0       0       0       0
 76          UI       0       0       0       0       0       0       0       0       0       0
 77          UI       0       0       0       0       0       0       0       0       0       0
             *

 78          KK    24-O  DIVERT
 79          KM         DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
 80          DT   24RET     0.3     0.0
 81          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 82          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
             *

 83          KK     O3A COMBINE
 84          KM         COMBINE ROUTED HYDROGRAPH FROM O2 WITH RUNOFF FROM 24 @ O3
 85          HC       2
             *
1                                          HEC-1 INPUT                                          PAGE  3

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

 86          KK  O3AO3B   ROUTE
 87          KM         ROUTE HYDROGRAPH FROM O3A TO O3B
 88          RS       2    FLOW
 89          RC   0.030   0.030   0.030    2510  0.0020    0.00
 90          RX    0.00    2.00   10.00   18.00   74.30   82.30   90.30   92.30
 91          RY    4.50    4.00    2.00    0.00    0.00    2.00    4.00    4.50
             *

 92          KK      25   BASIN
 93          KM         S-GRAPH TYPE=PHOENIX VALLEY
 94          BA   0.274
 95          LG    0.29    0.25    4.15    0.53      18
 96          UI       0      25      43     101     133     161     202     293     284     220
 97          UI     180     144     112      67      44      36      25      14       8       8
 98          UI       8       8       0       0       0       0       0       0       0       0
 99          UI       0       0       0       0       0       0       0       0       0       0
100          UI       0       0       0       0       0       0       0       0       0       0
             *

101          KK    25-O  DIVERT
102          KM         DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
103          DT   25RET    16.6     0.0
104          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
105          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
             *

106          KK     O3B COMBINE
107          KM         COMBINE O3A WITH SUBBASIN 25
108          HC       2
             *

109          KK     14A   BASIN
110          KM         S-GRAPH TYPE=PHOENIX VALLEY
111          BA   0.692
112          LG    0.26    0.25    4.35    0.47      27
113          UI       0      74     170     336     433     551     815     825     621     486
114          UI     375     247     129     106      74      29      23      23      23       0
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115          UI       0       0       0       0       0       0       0       0       0       0
116          UI       0       0       0       0       0       0       0       0       0       0
117          UI       0       0       0       0       0       0       0       0       0       0
             *

118          KK   14A-O  DIVERT
119          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
120          DT  14ARET    50.7     0.0
121          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
122          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
             *
1                                        HEC-1 INPUT                                          PAGE  4

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

123          KK  P1AP1B   ROUTE
124          KM        ROUTE HYDROGRAPH FROM P1A TO P1B
125          RS       2    FLOW
126          RC   0.030   0.030   0.030    3129  0.0100    0.00
127          RX    0.00    2.00   10.00   18.00   22.00   30.00   38.00   40.00
128          RY    4.50    4.00    2.00    0.00    0.00    2.00    4.00    4.50
             *

129          KK      83   BASIN
130          KM        S-GRAPH TYPE=PHOENIX VALLEY
131          BA   0.675
132          LG    0.25    0.25    5.40    0.27      28
133          UI       0      58      86     221     295     353     430     581     723     570
134          UI     470     382     310     240     138     100      83      58      36      18
135          UI      18      18      18      18       0       0       0       0       0       0
136          UI       0       0       0       0       0       0       0       0       0       0
137          UI       0       0       0       0       0       0       0       0       0       0
             *

138          KK    83-O  DIVERT
139          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
140          DT   83RET    48.2     0.0
141          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
142          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
             *

143          KK     14B   BASIN
144          KM        S-GRAPH TYPE=PHOENIX VALLEY
145          BA   0.502
146          LG    0.26    0.25    4.15    0.53      27
147          UI       0     140     465     742    1087     703     419     173      86      30
148          UI      30       0       0       0       0       0       0       0       0       0
149          UI       0       0       0       0       0       0       0       0       0       0
150          UI       0       0       0       0       0       0       0       0       0       0
151          UI       0       0       0       0       0       0       0       0       0       0
             *

152          KK   14B-O  DIVERT
153          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
154          DT  14BRET    61.9     0.0
155          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
156          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
             *

157          KK     P1B COMBINE
158          KM        COMBINE ROUTED HYDROGRAPH FROM P1A WITH RUNOFF FROM 14B @ P1B
159          HC       3
             *
1                                        HEC-1 INPUT                                          PAGE  5

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

160          KK  P1B-P2   ROUTE
161          KM        ROUTE HYDROGRAPH FROM P1B TO P2
162          RS       2    FLOW
163          RC   0.030   0.030   0.030    4032  0.0070    0.00
164          RX    0.00    2.00   10.00   18.00   45.90   53.90   61.90   63.90
165          RY    4.50    4.00    2.00    0.00    0.00    2.00    4.00    4.50
             *

166          KK      26   BASIN
167          KM        S-GRAPH TYPE=PHOENIX VALLEY
168          BA   0.524
169          LG    0.29    0.25    4.00    0.56      18
170          UI       0      79     309     467     698     901     625     437     248     132
171          UI      79      25      24      24       0       0       0       0       0       0
172          UI       0       0       0       0       0       0       0       0       0       0
173          UI       0       0       0       0       0       0       0       0       0       0
174          UI       0       0       0       0       0       0       0       0       0       0
             *

175          KK    26-O  DIVERT
176          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
177          DT   26RET     3.5     0.0
178          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
179          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
             *

180          KK      P2 COMBINE
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 181          KM        COMBINE ROUTED HYDROGRAPH FROM P1B WITH RUNOFF FROM 26 @ P2
 182          HC       2
              *

 183          KK   P2-O4   ROUTE
 184          RS       5    FLOW
 185          RC   0.030   0.030   0.030    4430  0.0010    0.00
 186          RX    0.00    2.00   10.00   18.00   85.30   93.30  101.30  103.30
 187          RY    4.50    4.00    2.00    0.00    0.00    2.00    4.00    4.50
              *

 188          KK     11A   BASIN
 189          KM        S-GRAPH TYPE=PHOENIX VALLEY
 190          BA   0.571
 191          LG    0.22    0.25    5.60    0.27      41
 192          UI       0     269     817    1481    1045     506     190      59      43       0
 193          UI       0       0       0       0       0       0       0       0       0       0
 194          UI       0       0       0       0       0       0       0       0       0       0
 195          UI       0       0       0       0       0       0       0       0       0       0
 196          UI       0       0       0       0       0       0       0       0       0       0
              *
1                                          HEC-1 INPUT                                          PAGE  6

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

 197          KK   11A-O  DIVERT
 198          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
 199          DT  11ARET    62.1     0.0
 200          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 201          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
              *

 202          KK  N1A-1B   ROUTE
 203          KM        ROUTE HYDROGRAPH FROM N1A TO N1B
 204          RS       3    FLOW
 205          RC   0.030   0.030   0.030    6236  0.0090    0.00
 206          RX    0.00    2.00   10.00   18.00   27.90   35.90   43.90   45.90
 207          RY    4.50    4.00    2.00    0.00    0.00    2.00    4.00    4.50
              *

 208          KK     11B   BASIN
 209          KM        S-GRAPH TYPE=PHOENIX VALLEY
 210          BA   0.581
 211          LG    0.25    0.25    4.30    0.49      30
 212          UI       0      58     120     254     329     409     563     712     544     436
 213          UI     341     262     149     100      75      58      18      18      18      18
 214          UI      18       0       0       0       0       0       0       0       0       0
 215          UI       0       0       0       0       0       0       0       0       0       0
 216          UI       0       0       0       0       0       0       0       0       0       0
              *

 217          KK   11B-O  DIVERT
 218          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
 219          DT  11BRET    46.7     0.0
 220          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 221          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
              *

 222          KK     N1B COMBINE
 223          KM        COMBINE ROUTED HYDROGRAPH FROM N1A WITH RUNOFF FROM 11B @ N1B
 224          HC       2
              *

 225          KK   N1BO4   ROUTE
 226          KM        ROUTE N1B TO O4
 227          RS       3    FLOW
 228          RC   0.030   0.030   0.030    3959  0.0030    0.00
 229          RX    0.00    2.00   10.00   18.00   24.40   32.40   40.40   42.40
 230          RY    4.50    4.00    2.00    0.00    0.00    2.00    4.00    4.50
              *

 231          KK      O4 COMBINE
 232          KM        COMBINE O3B, P2, AND N1BO4
 233          HC       3
              *
1                                          HEC-1 INPUT                                          PAGE  7

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

 234          KK    MB01  DIVERT
 235          KM        RAINBOW BASIN
 236          KM        ADD MASTER PLAN BASIN 1 LOCATED HALF MILE WEST OF WATSON RD & N OF RID
 237          KM        DIVERSION REPRESENTS SPILLWAY FLOW INTO BASIN
 238          DT  DIMB01     0.0     0.0
 239          DI     0.0   266.0   267.0  1065.0 10000.0     0.0     0.0     0.0     0.0     0.0
 240          DQ     0.0     0.0     1.0   799.0  9734.0     0.0     0.0     0.0     0.0     0.0
              *

 241          KK  RTMB01RETRIEVE
 242          KM        RETRIEVE FLOW FROM MAJOR BASIN MB01
 243          DR  DIMB01
              *

 244          KK  SSMB01 STORAGE
```

```
245          KM        LAST SE RECORDED ADDED FOR MODELING PURPOSES
246          KO
247          RS       1    STOR
248          SV            1.00     1.70     5.40    15.60    31.70    52.60    77.00   103.00   103.10
249          SQ            8.00    14.00    19.00    23.00    27.00    30.00    33.00    36.00    36.00
250          SE  990.00  992.00  993.00  994.00  995.00  996.00  997.00  998.00  999.00 1100.00
             *

251          KK   &MB01 COMBINE
252          KM        COMBINE STAGE STORAGE FROM MB01 WITH RUNOFF FROM MB01 DIVERSION
253          HC       2
             *

254          KK   WC-08   ROUTE
255          KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
256          KM        ROUTE FROM RID CANAL SOUTH TO BROADWAY ROAD
257          RS       3    FLOW
258          RC   0.045   0.045   0.045    3579  0.0094    0.00
259          RX    0.00   18.00   29.80   41.70   52.00   63.90   75.70   93.70
260          RY    3.71    3.39    1.69    0.00    0.00    1.69    3.39    3.71
             *

261          KK      39   BASIN
262          KM        S-GRAPH TYPE=PHOENIX VALLEY
263          BA   0.725
264          LG    0.25    0.25    4.30    0.49      30
265          UI       0      56      56     196     260     314     369     444     603     698
266          UI     546     459     383     318     261     183     106      94      72      56
267          UI      35      17      17      17      17      17       0       0       0       0
268          UI       0       0       0       0       0       0       0       0       0       0
269          UI       0       0       0       0       0       0       0       0       0       0
             *

270          KK    39-O  DIVERT
271          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
272          DT   39RET    43.7     0.0
273          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
274          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
             *
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

275          KK      O5 COMBINE
276          KM        COMBINE MCWD02 WITH BASIN 39
277          HC       2
             *

278          KK   WC-07   ROUTE
279          KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
280          KM        ROUTE FROM O5 AT BROADWAY ROAD TO O6 AT NW CORNER OF RAINBOW & SOUTHERN
281          RS       3    FLOW
282          RC   0.045   0.045   0.045    5074  0.0088    0.00
283          RX    0.00   18.00   32.70   47.30   67.00   81.70   96.30  114.30
284          RY    4.51    4.19    2.10    0.00    0.00    2.10    4.19    4.51
             *

285          KK      38   BASIN
286          KM        S-GRAPH TYPE=PHOENIX VALLEY
287          BA   0.542
288          LG    0.25    0.25    3.95    0.58      30
289          UI       0      45      61     167     225     268     325     414     571     473
290          UI     385     319     260     209     142      80      75      49      45      14
291          UI      14      14      14      14      14       0       0       0       0       0
292          UI       0       0       0       0       0       0       0       0       0       0
293          UI       0       0       0       0       0       0       0       0       0       0
             *

294          KK    38-O  DIVERT
295          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
296          DT   38RET    33.3     0.0
297          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
298          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
             *

299          KK   N3-N4   ROUTE
300          KM        ROUTE HYDROGRAPH FROM N3 TO N4
301          RS       2    FLOW
302          RC   0.030   0.030   0.030    5206  0.0087    0.00
303          RX    0.00    2.00   10.00   18.00   34.00   42.00   50.00   52.00
304          RY    4.50    4.00    2.00    0.00    0.00    2.00    4.00    4.50
             *

305          KK      49   BASIN
306          KM        S-GRAPH TYPE=PHOENIX VALLEY
307          BA   1.009
308          LG    0.25    0.25    3.95    0.58      30
309          UI       0      67      67     170     274     337     389     448     525     686
310          UI     846     729     606     529     448     383     325     250     161     118
311          UI     110      80      67      50      21      21      21      21      21      21
312          UI      21       0       0       0       0       0       0       0       0       0
313          UI       0       0       0       0       0       0       0       0       0       0
             *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 314          KK    49-O  DIVERT
 315          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
 316          DT   49RET    78.8     0.0
 317          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 318          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
              *

 319          KK      N4 COMBINE
 320          KM        COMBINE ROUTED HYDROGRAPH FROM N3 WITH RUNOFF FROM 49 @ N4
 321          HC       2
              *

 322          KK   N4-O6   ROUTE
 323          KM        ROUTE N4 TO O6
 324          RS       3    FLOW
 325          RC   0.030   0.030   0.030    2654  0.0010    0.00
 326          RX    0.00    2.00   10.00   18.00   66.90   74.90   82.90   84.90
 327          RY    4.50    4.00    2.00    0.00    0.00    2.00    4.00    4.50
              *

 328          KK      50   BASIN
 329          KM        S-GRAPH TYPE=PHOENIX VALLEY
 330          BA   1.002
 331          LG    0.25    0.25    4.20    0.52      30
 332          UI       0      68      68     178     281     344     397     461     539     714
 333          UI     862     709     595     519     436     372     314     227     142     116
 334          UI     110      68      68      33      21      21      21      21      21      21
 335          UI       0       0       0       0       0       0       0       0       0       0
 336          UI       0       0       0       0       0       0       0       0       0       0
              *

 337          KK    50-O  DIVERT
 338          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
 339          DT   50RET    61.2     0.0
 340          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 341          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
              *

 342          KK      O6 COMBINE
 343          KM        COMBINE MCWD03 WITH ROUTE N4-O6 AND SUBBASIN 50. OUTFALLS INTO MB02
 344          HC       3
              *

 345          KK   WC-O6   ROUTE
 346          KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
 347          KM        ROUTE FROM O6 AT SOUTHERN AVENUE TO O7 AT UPRR
 348          RS       2    FLOW
 349          RC   0.045   0.045   0.045    2495  0.0079    0.00
 350          RX    0.00   18.00   34.50   51.00   77.70   94.20  110.70  128.70
 351          RY    5.04    4.72    2.36    0.00    0.00    2.36    4.72    5.04
              *
1                                          HEC-1 INPUT                                          PAGE 10

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

 352          KK      57   BASIN
 353          KM        S-GRAPH TYPE=PHOENIX VALLEY
 354          BA   0.489
 355          LG    0.15    0.25    4.25    0.55      55
 356          UI       0     513    1610    1209     343      78       0       0       0       0
 357          UI       0       0       0       0       0       0       0       0       0       0
 358          UI       0       0       0       0       0       0       0       0       0       0
 359          UI       0       0       0       0       0       0       0       0       0       0
 360          UI       0       0       0       0       0       0       0       0       0       0
              *

 361          KK    57-O  DIVERT
 362          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
 363          DT   57RET    27.4     0.0
 364          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 365          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
              *

 366          KK      O7 COMBINE
 367          KM        COMBINE O6 (MCWD03) AND SUBBASIN 57 BEFORE CROSSING RAILROAD
 368          HC       2
              *

 369          KK    MB02  DIVERT
 370          KM
 371          KM        ADD MASTER PLAN BASIN 2 LOCATED HALF MILE EAST OF WATSON RD & N OF UPRR
 372          KM        DIVERSION REPRESENTS SPILLWAY FLOW INTO BASIN
 373          DT  DIMB02     0.0     0.0
 374          DI     0.0   251.0   252.0  1027.0 10000.0     0.0     0.0     0.0     0.0     0.0
 375          DQ     0.0     0.0     1.0   776.0  9749.0     0.0     0.0     0.0     0.0     0.0
              *

 376          KK  RTMB02RETRIEVE
 377          KM        RETRIEVE FLOW FROM MAJOR BASIN MB02
 378          DR  DIMB02
              *
```

```
KK  SSMB02 STORAGE
KM        LAST SE RECORDED ADDED FOR MODELING PURPOSES
KO
RS       1    STOR
SV            0.60    2.70    7.20   14.90   25.90   39.70   55.90   79.70   79.80
SQ            2.00    8.00   14.00   19.00   23.00   27.00   30.00   33.00   33.00
SE  884.00  885.00  886.00  887.00  888.00  889.00  890.00  891.00  892.00 1100.00
*

KK   &MB02 COMBINE
KM        COMBINE STAGE STORAGE FROM MB02 WITH RUNOFF FROM MB02 DIVERSION
HC       2
*
```

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

KK   WC-05   ROUTE
KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
KM        ROUTE FROM O7 AT AT UPRR TO THE BWCDD CANAL AT 08
KM        MC04 WILL COMBINE WITH WHITE TANKS CHANNEL ALONG BWCDD CANAL
RS       1    FLOW
RC   0.045   0.045   0.045     690  0.0072    0.00
RX    0.00    2.00   14.10   26.20   36.70   48.80   61.00   63.00
RY    3.78    3.46    1.73    0.00    0.00    1.73    3.46    3.78
*

KK      40   BASIN
KM        S-GRAPH TYPE=PHOENIX VALLEY
BA   0.976
LG    0.25    0.25    4.20    0.52      30
UI       0      72      72     234     324     393     456     543     702     912
UI     771     635     543     452     377     306     192     128     119      82
UI      72      37      22      22      22      22      22      22       0       0
UI       0       0       0       0       0       0       0       0       0       0
UI       0       0       0       0       0       0       0       0       0       0
*

KK    40-O  DIVERT
KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
DT   40RET    61.6     0.0
DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
*

KK   P3-P4   ROUTE
KM        ROUTE HYDROGRAPH FROM P3 TO P4
RS      15    FLOW
RC   0.030   0.030   0.030    5241  0.0080    0.00
RX    0.00    2.00   10.00   18.00   22.00   30.00   38.00   40.00
RY    4.50    4.00    2.00    0.00    0.00    2.00    4.00    4.50
*

KK      51   BASIN
KM        S-GRAPH TYPE=PHOENIX VALLEY
BA   1.004
LG    0.25    0.25    4.40    0.46      30
UI       0      66      66     166     270     332     382     440     516     664
UI     839     730     606     529     449     384     326     258     167     117
UI     109      84      66      55      20      20      20      20      20      20
UI      20       0       0       0       0       0       0       0       0       0
UI       0       0       0       0       0       0       0       0       0       0
*

KK    51-O  DIVERT
KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
DT   51RET    62.3     0.0
DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
*
```

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

KK      P4 COMBINE
KM        COMBINE RUNOFF FROM SUBBASINS 40 & 51
HC       2
*

KK   P4-P5   ROUTE
KM        ROUTE P4 TO P5
RS       1    FLOW
RC   0.030   0.030   0.030    2652  0.0080    0.00
RX    0.00    2.00   10.00   18.00   37.10   45.10   53.10   55.10
RY    4.50    4.00    2.00    0.00    0.00    2.00    4.00    4.50
*

KK      58   BASIN
KM        S-GRAPH TYPE=PHOENIX VALLEY
BA   0.190
LG    0.15    0.25    4.30    0.53      55
UI       0     292     789     319      56       0       0       0       0       0
UI       0       0       0       0       0       0       0       0       0       0
UI       0       0       0       0       0       0       0       0       0       0
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 447          UI       0       0       0       0       0       0       0       0       0       0
 448          UI       0       0       0       0       0       0       0       0       0       0
              *

 449          KK    58-O  DIVERT
 450          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
 451          DT   58RET    16.6     0.0
 452          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 453          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
              *

 454          KK      P5 COMBINE
 455          KM        COMBINE RUNOFF FROM P4 AND SUBBASIN 58
 456          HC       2
              *

 457          KK      72   BASIN
 458          KM        S-GRAPH TYPE=PHOENIX VALLEY
 459          BA   0.086
 460          LG    0.15    0.25    4.45    0.48      55
 461          UI       0     590       0       0       0       0       0       0       0       0
 462          UI       0       0       0       0       0       0       0       0       0       0
 463          UI       0       0       0       0       0       0       0       0       0       0
 464          UI       0       0       0       0       0       0       0       0       0       0
 465          UI       0       0       0       0       0       0       0       0       0       0
              *

 466          KK    72-O  DIVERT
 467          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
 468          DT   72RET     7.5     0.0
 469          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 470          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
              *
1                                          HEC-1 INPUT                                          PAGE 13

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

 471          KK      P6 COMBINE
 472          KM        COMBINE POINT UPSTREAM OF BWCDD CANAL CROSSING
 473          KM        COMBINES RUNOFF FROM CONCENTRATION POINT P5 AND SUBBASIN 72
 474          HC       2
              *

 475          KK   WT-01   ROUTE
 476          KM        MASTER PLAN CHANNEL - WHITE TANKS CHANNEL SYSTEM
 477          KM        ROUTE ALONG BWCDD CANAL FROM P6 TO 08
 478          RS       3    FLOW
 479          RC   0.030   0.030   0.030    2580  0.0005    0.00
 480          RX    0.00    2.00   26.70   51.40   95.40  120.10  144.80  146.80
 481          RY    7.38    7.06    3.53    0.00    0.00    3.53    7.06    7.38
              *

 482          KK      71   BASIN
 483          KM        S-GRAPH TYPE=PHOENIX VALLEY
 484          BA   0.155
 485          LG    0.15    0.25    4.80    0.39      55
 486          UI       0     405     687      94       0       0       0       0       0       0
 487          UI       0       0       0       0       0       0       0       0       0       0
 488          UI       0       0       0       0       0       0       0       0       0       0
 489          UI       0       0       0       0       0       0       0       0       0       0
 490          UI       0       0       0       0       0       0       0       0       0       0
              *

 491          KK    71-O  DIVERT
 492          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
 493          DT   71RET    13.6     0.0
 494          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 495          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
              *

 496          KK      O8 COMBINE
 497          KM        COMBINE POINT UPSTREAM OF BWCDD CANAL CROSSING
 498          KM        COMBINES RTS MCWD04 & MCWT02 W/SUBBASIN 71 BEFORE BWCDD CROSSING
 499          HC       3
              *

 500          KK   WC-04   ROUTE
 501          KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
 502          KM        ROUTE FROM BWCDD CANAL TO MC 85 AT O9
 503          RS       1    FLOW
 504          RC   0.045   0.045   0.045    1932  0.0078    0.00
 505          RX    0.00   18.00   36.30   54.60   88.30  106.60  125.00  143.00
 506          RY    5.55    5.23    2.62    0.00    0.00    2.62    5.23    5.55
              *

 507          KK      93   BASIN
 508          KM        S-GRAPH TYPE=PHOENIX VALLEY
 509          BA   0.377
 510          LG    0.17    0.25    4.90    0.38      57
 511          UI       0      50     168     273     367     578     497     363     264     149
 512          UI      85      54      25      15      15      15       0       0       0       0
1                                          HEC-1 INPUT                                          PAGE 14

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
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513          UI       0       0       0       0       0       0       0       0       0       0
514          UI       0       0       0       0       0       0       0       0       0       0
515          UI       0       0       0       0       0       0       0       0       0       0
             *

516          KK    93-O  DIVERT
517          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
518          DT   93RET    26.0     0.0
519          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
520          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
             *

521          KK      O9 COMBINE
522          KM        COMBINE ROUTED HYDROGRAPH FROM O8 WITH RUNOFF FROM 93 @ O9
523          HC       2
             *

524          KK  WC-03B   ROUTE
525          KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
526          KM        ROUTE FROM MC 85 AT 09 TO SOUTH AND WEST AT WATSON ROAD
527          RS       1    FLOW
528          RC   0.045   0.045   0.045    2119  0.0047    0.00
529          RX    0.00   18.00   38.00   57.90   95.10  115.00  135.00  153.00
530          RY    6.02    5.70    2.85    0.00    0.00    2.85    5.70    6.02
             *

531          KK  WC-03A   ROUTE
532          KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
533          KM        ROUTE FROM MC 85 AT 09 TO SOUTH AND WEST AT WATSON ROAD
534          RS       3    FLOW
535          RC   0.045   0.045   0.045    2805  0.0011    0.00
536          RX    0.00   18.00   44.10   70.10  119.20  145.30  171.40  189.40
537          RY    7.77    7.45    3.72    0.00    0.00    3.72    7.45    7.77
             *

538          KK      95   BASIN
539          KM        S-GRAPH TYPE=PHOENIX VALLEY
540          BA   0.522
541          LG    0.21    0.15    8.00    0.11      42
542          UI       0      37      37     110     161     196     226     267     324     445
543          UI     438     350     301     254     214     180     133      83      64      60
544          UI      37      37      15      11      11      11      11      11      11       0
545          UI       0       0       0       0       0       0       0       0       0       0
546          UI       0       0       0       0       0       0       0       0       0       0
             *

547          KK    95-O  DIVERT
548          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
549          DT   95RET    32.3     0.0
550          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
551          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
             *
1                                        HEC-1 INPUT                                          PAGE 15

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


552          KK     P8B COMBINE
553          KM        COMBINE MCWD06 WITH SUBBASIN 95
554          HC       2
             *
555          KM        ******** BEGIN WEST SEGMENT OF WATSON DRAIN SYSTEM **********

556          KK     10E   BASIN
557          KM        ORIGINAL ADMS BASIN DIVIDED FOR ADMP RECOMMENDED PLAN MODELING PURPOSES
558          KM        S-GRAPH TYPE=PHOENIX VALLEY
559          BA   0.592
560          LG    0.24    0.25    4.10    0.56      35
561          UI       0      63     145     288     371     472     697     706     531     416
562          UI     321     212     110      91      63      25      19      19      19       0
563          UI       0       0       0       0       0       0       0       0       0       0
564          UI       0       0       0       0       0       0       0       0       0       0
565          UI       0       0       0       0       0       0       0       0       0       0
             *

566          KK   10E-O  DIVERT
567          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
568          DT  10ERET    38.8     0.0
569          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
570          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
             *

571          KK  L1AL2A   ROUTE
572          KM        ROUTE SUBBASIN 10E TO L2A
573          RS       1    FLOW
574          RC   0.030   0.030   0.030    3240  0.0080    0.00
575          RX    0.00    2.00   10.00   18.00   44.70   52.70   60.70   62.70
576          RY    4.50    4.00    2.00    0.00    0.00    2.00    4.00    4.50
             *

577          KK     22E   BASIN
578          KM        ORIGINAL ADMS BASIN DIVIDED FOR ADMP RECOMMENDED PLAN MODELING PURPOSES
579          KM        S-GRAPH TYPE=PHOENIX VALLEY
580          BA   0.286
581          LG    0.25    0.25    3.95    0.58      30
582          UI       0      43     167     253     376     492     342     240     139      72
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 583          UI      44      15      13      13       0       0       0       0       0       0
 584          UI       0       0       0       0       0       0       0       0       0       0
 585          UI       0       0       0       0       0       0       0       0       0       0
 586          UI       0       0       0       0       0       0       0       0       0       0
              *

 587          KK   22E-O  DIVERT
 588          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
 589          DT  22ERET    17.9     0.0
 590          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 591          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
              *
1                                        HEC-1 INPUT                                          PAGE 16

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


 592          KK     L2A COMBINE
 593          KM        COMBINE 10E WITH 22E
 594          HC       2
              *

 595          KK     11C   BASIN
 596          KM        S-GRAPH TYPE=PHOENIX VALLEY
 597          BA   0.343
 598          LG    0.25    0.25    3.95    0.58      30
 599          UI       0      55     221     330     513     584     394     268     129      75
 600          UI      39      16      16       0       0       0       0       0       0       0
 601          UI       0       0       0       0       0       0       0       0       0       0
 602          UI       0       0       0       0       0       0       0       0       0       0
 603          UI       0       0       0       0       0       0       0       0       0       0
              *

 604          KK   11C-O  DIVERT
 605          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
 606          DT  11CRET    24.5     0.0
 607          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 608          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
              *

 609          KK  N1C-N2   ROUTE
 610          KM        ROUTE HYDROGRAPH FROM N1C TO N2
 611          RS       1    FLOW
 612          RC   0.030   0.030   0.030    3030  0.0100    0.00
 613          RX    0.00    2.00   10.00   18.00   32.30   40.30   48.30   50.30
 614          RY    4.50    4.00    2.00    0.00    0.00    2.00    4.00    4.50
              *

 615          KK      23   BASIN
 616          KM        S-GRAPH TYPE=PHOENIX VALLEY
 617          BA   0.524
 618          LG    0.25    0.25    3.95    0.58      30
 619          UI       0      44      58     160     216     257     311     394     547     461
 620          UI     373     310     253     205     141      79      72      50      44      15
 621          UI      13      13      13      13      13       0       0       0       0       0
 622          UI       0       0       0       0       0       0       0       0       0       0
 623          UI       0       0       0       0       0       0       0       0       0       0
              *

 624          KK    23-O  DIVERT
 625          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
 626          DT   23RET    33.3     0.0
 627          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 628          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
              *
1                                        HEC-1 INPUT                                          PAGE 17

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


 629          KK      N2 COMBINE
 630          KM        COMBINE ROUTED HYDROGRAPH FROM N1C AND N1B WITH RUNOFF FROM 23 @ N2
 631          HC       3
              *

 632          KK    MB03  DIVERT
 633          KM        APACHE BASIN
 634          KM        ADD MASTER PLAN BASIN 3 AT NE CORNER OF APACHE AND THE RID CANAL
 635          KM        DIVERSION REPRESENTS SPILLWAY FLOW INTO BASIN
 636          DT  DIMB03     0.0     0.0
 637          DI     0.0   105.0   106.0  1042.0 10000.0     0.0     0.0     0.0     0.0     0.0
 638          DQ     0.0     0.0     1.0   937.0  9895.0     0.0     0.0     0.0     0.0     0.0
              *

 639          KK  RTMB03RETRIEVE
 640          KM        RETRIEVE FLOW FROM MAJOR BASIN MB03
 641          DR  DIMB03
              *

 642          KK  SSMB03 STORAGE
 643          KM        LAST SE RECORDED ADDED FOR MODELING PURPOSES
 644          KO
 645          RS       1    STOR
 646          SV            0.50    2.30    6.40   13.70   25.20   40.70   40.80
 647          SQ            2.00    8.00   14.00   19.00   23.00   27.00   27.00
 648          SE  991.00  992.00  993.00  994.00  995.00  996.00  997.00 1100.00
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649             KK   &MB03 COMBINE
650             KM        COMBINE STAGE STORAGE FROM MB03 WITH RUNOFF FROM MB03 DIVERSION
651             HC       2
                *

652             KK   WC-15   ROUTE
653             KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
654             KM        ROUTE ALONG APACHE ROAD FROM RID CANAL TO BROADWAY ROAD
655             RS       2    FLOW
656             RC   0.045   0.045   0.045    2232  0.0098    0.00
657             RX    0.00   18.00   27.70   37.40   42.80   52.40   62.10   64.10
658             RY    3.09    2.77    1.38    0.00    0.00    1.38    2.77    3.09
                *

659             KK   WC-14   ROUTE
660             KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
661             KM        ROUTE ALONG APACHE ROAD FROM BROADWAY ROAD TO APACHE RD CROSSING
662             KM        CROSSING IS 1/4 MILE NORTH OF SOUTHERN AVENUE
663             RS       5    FLOW
664             RC   0.045   0.045   0.045    5179  0.0089    0.00
665             RX    0.00   18.00   27.80   37.60   43.10   52.90   62.70   64.70
666             RY    3.12    2.80    1.40    0.00    0.00    1.40    2.80    3.12
                *
1                                        HEC-1 INPUT                                          PAGE 18

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


667             KK      37   BASIN
668             KM        S-GRAPH TYPE=PHOENIX VALLEY
669             BA   1.421
670             LG    0.24    0.25    4.10    0.56      34
671             UI       0      91      91     216     360     449     517     591     688     842
672             UI    1126    1077     878     760     660     562     479     404     291     178
673             UI     156     149      91      91      53      28      28      28      28      28
674             UI      28      28       0       0       0       0       0       0       0       0
675             UI       0       0       0       0       0       0       0       0       0       0
                *

676             KK    37-O  DIVERT
677             KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
678             DT   37RET    92.9     0.0
679             DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
680             DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
                *

681             KK      M1 COMBINE
682             KM        COMBINE MCWD08 WITH SUBBASIN 37
683             HC       2
                *

684             KK   WC-13   ROUTE
685             KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
686             KM        ROUTE ALONG APACHE ROAD SOUTHERN AVENUE TO MARICOPA ROAD
687             RS       2    FLOW
688             RC   0.045   0.045   0.045    2092  0.0086    0.00
689             RX    0.00   18.00   31.70   45.50   61.60   75.30   89.00   91.00
690             RY    4.25    3.93    1.96    0.00    0.00    1.96    3.93    4.25
                *

691             KK      36   BASIN
692             KM        S-GRAPH TYPE=PHOENIX VALLEY
693             BA   0.684
694             LG    0.25    0.25    3.95    0.58      28
695             UI       0      54      57     189     253     303     359     434     598     653
696             UI     509     429     355     294     239     159      95      88      61      54
697             UI      23      16      16      16      16      16       0       0       0       0
698             UI       0       0       0       0       0       0       0       0       0       0
699             UI       0       0       0       0       0       0       0       0       0       0
                *

700             KK    36-O  DIVERT
701             KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
702             DT   36RET    43.4     0.0
703             DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
704             DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
                *
1                                        HEC-1 INPUT                                          PAGE 19

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


705             KK  L3-M2A   ROUTE
706             KM        ROUTE SUBBASIN 36 AT L3 TO COMBINE POINT M2A
707             RS       1    FLOW
708             RC   0.030   0.030   0.030    2443  0.0074    0.00
709             RX    0.00    2.00   10.00   18.00   47.00   55.00   63.00   65.00
710             RY    4.50    4.00    2.00    0.00    0.00    2.00    4.00    4.50
                *

711             KK     47N   BASIN
712             KM        ORIGINAL ADMS BASIN DIVIDED FOR ADMP RECOMMENDED PLAN MODELING PURPOSES
713             KM        S-GRAPH TYPE=PHOENIX VALLEY
714             BA   0.233
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715          LG    0.25    0.25    3.95    0.58      30
716          UI       0      23      46     100     129     160     217     284     220     177
717          UI     139     108      66      40      32      23      10       7       7       7
718          UI       7       0       0       0       0       0       0       0       0       0
719          UI       0       0       0       0       0       0       0       0       0       0
720          UI       0       0       0       0       0       0       0       0       0       0
             *

721          KK   47N-O  DIVERT
722          DT  47NRET    14.2     0.0
723          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
724          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
             *

725          KK     M2A COMBINE
726          KM        COMBINE ROUTE L3-M2A WITH SUBBASIN 47N
727          HC       2
             *

728          KK   WC-16   ROUTE
729          KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
730          KM        ROUTE ALONG MARICOPA ROAD FROM MILLER ROAD TO APACHE ROAD
731          RS       6    FLOW
732          RC   0.045   0.045   0.045    4718  0.0011    0.00
733          RX    0.00   18.00   40.90   63.80  100.50  123.40  146.30  148.30
734          RY    6.87    6.55    3.27    0.00    0.00    3.27    6.55    6.87
             *

735          KK      48   BASIN
736          KM        S-GRAPH TYPE=PHOENIX VALLEY
737          BA   0.500
738          LG    0.24    0.25    4.35    0.48      32
739          UI       0      49      97     210     273     338     448     610     477     383
740          UI     302     236     150      86      72      49      25      15      15      15
741          UI      15       0       0       0       0       0       0       0       0       0
742          UI       0       0       0       0       0       0       0       0       0       0
743          UI       0       0       0       0       0       0       0       0       0       0
             *
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

744          KK    48-O  DIVERT
745          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
746          DT   48RET    31.6     0.0
747          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
748          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
             *

749          KK     M2B COMBINE
750          KM        COMBINE ROUTE MCWD11 WITH SUBBASIN 48
751          HC       2
             *

752          KK     M2C COMBINE
753          KM        COMBINE MCWD10 WITH M2B FOR MASTER BASIN MB04 INFLOW
754          HC       2
             *

755          KK    MB04  DIVERT
756          KM        MARICOPA BASIN
757          KM        ADD MASTER PLAN BASIN 4 AT NW CORNER OF MARICOPA ROAD AND APACHE ROAD
758          KM        DIVERSION REPRESENTS SPILLWAY FLOW INTO BASIN
759          DT  DIMB04     0.0     0.0
760          DI     0.0   156.0   157.0   713.0 10000.0     0.0     0.0     0.0     0.0     0.0
761          DQ     0.0     0.0     1.0   557.0  9844.0     0.0     0.0     0.0     0.0     0.0
             *

762          KK  RTMB04RETRIEVE
763          KM        RETRIEVE FLOW FROM MAJOR BASIN MB04
764          DR  DIMB04
             *

765          KK  SSMB04 STORAGE
766          KM        LAST SE RECORDED ADDED FOR MODELING PURPOSES
767          KO
768          RS       1    STOR
769          SV            1.10    4.00    9.70   19.00   32.10   48.50   67.40   67.50
770          SQ            2.00    8.00   14.00   19.00   23.00   27.00   30.00   30.00
771          SE  895.00  896.00  897.00  898.00  899.00  900.00  901.00  902.00 1100.00
             *

772          KK   &MB04 COMBINE
773          KM        COMBINE STAGE STORAGE FROM MB04 WITH RUNOFF FROM MB04 DIVERSION
774          HC       2
             *

775          KK  WC-12B   ROUTE
776          KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
777          KM        ROUTE FROM MARICOPA ROAD AND APACHE ROAD TO 239TH AVE AND UPRR
778          RS       3    FLOW
779          RC   0.045   0.045   0.045    2136  0.0024    0.00
780          RX    0.00   18.00   30.70   43.30   52.60   65.20   77.90   95.90
781          RY    3.93    3.61    1.81    0.00    0.00    1.81    3.61    3.93
             *
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1                                          HEC-1 INPUT                                                    PAGE 21

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

   782          KK  WC-12A   ROUTE
   783          KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
   784          KM        ROUTE FROM MARICOPA ROAD AND APACHE ROAD TO 239TH AVE AND UPRR
   785          RS       1    FLOW
   786          RC   0.045   0.045   0.045    1505  0.0092    0.00
   787          RX    0.00   18.00   28.60   39.20   46.40   57.00   67.60   85.60
   788          RY    3.35    3.03    1.51    0.00    0.00    1.51    3.03    3.35
                *

   789          KK     56A   BASIN
   790          KM        S-GRAPH TYPE=PHOENIX VALLEY
   791          BA   0.411
   792          LG    0.15    0.25    3.95    0.62      55
   793          UI       0     215     638    1124     719     309     118      32       0       0
   794          UI       0       0       0       0       0       0       0       0       0       0
   795          UI       0       0       0       0       0       0       0       0       0       0
   796          UI       0       0       0       0       0       0       0       0       0       0
   797          UI       0       0       0       0       0       0       0       0       0       0
                *

   798          KK   56A-O  DIVERT
   799          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
   800          DT  56ARET    30.2     0.0
   801          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
   802          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
                *

   803          KK     56B   BASIN
   804          KM        S-GRAPH TYPE=PHOENIX VALLEY
   805          BA   0.334
   806          LG    0.15    0.25    4.00    0.61      55
   807          UI       0     425    1260     706     152      41       0       0       0       0
   808          UI       0       0       0       0       0       0       0       0       0       0
   809          UI       0       0       0       0       0       0       0       0       0       0
   810          UI       0       0       0       0       0       0       0       0       0       0
   811          UI       0       0       0       0       0       0       0       0       0       0
                *

   812          KK   56B-O  DIVERT
   813          DT  56BRET    29.1     0.0
   814          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
   815          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
                *

   816          KK     N5B COMBINE
   817          KM        COMBINE MCWD12 WITH SUBBASINS 56A AND 56B
   818          HC       3
                *
1                                          HEC-1 INPUT                                                    PAGE 22

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

   819          KK   WC-11   ROUTE
   820          KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
   821          KM        ROUTE ALONG 239TH AVE FROM UPRR TO BWCDD
   822          RS       1    FLOW
   823          RC   0.045   0.045   0.045     600  0.0036    0.00
   824          RX    0.00    2.00   20.20   38.40   66.60   84.80  103.00  105.00
   825          RY    5.51    5.19    2.60    0.00    0.00    2.60    5.19    5.51
                *

   826          KK      70   BASIN
   827          KM        S-GRAPH TYPE=PHOENIX VALLEY
   828          BA   0.141
   829          LG    0.15    0.25    4.45    0.48      55
   830          UI       0      53     166     304     285     167      66      30      10      10
   831          UI       0       0       0       0       0       0       0       0       0       0
   832          UI       0       0       0       0       0       0       0       0       0       0
   833          UI       0       0       0       0       0       0       0       0       0       0
   834          UI       0       0       0       0       0       0       0       0       0       0
                *

   835          KK    70-O  DIVERT
   836          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
   837          DT   70RET    12.3     0.0
   838          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
   839          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
                *

   840          KK      N6 COMBINE
   841          KM        COMBINE STORAGE HYDROGRAPH FROM N5A AND N5B WITH RUNOFF FROM 70 @ N6
   842          HC       2
                *

   843          KK   WC-10   ROUTE
   844          KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
   845          KM        ROUTE FROM BWCDD CANAL TO WATSON ROAD
   846          RS       1    FLOW
   847          RC   0.045   0.045   0.045     502  0.0030    0.00
   848          RX    0.00    2.00   17.70   33.40   56.30   72.00   87.70   89.70
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849          RY    4.80    4.48    2.24    0.00    0.00    2.24    4.48    4.80
             *

850          KK  WC-09C   ROUTE
851          KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
852          RS       2    FLOW
853          RC   0.045   0.045   0.045    2361  0.0070    0.00
854          RX    0.00   18.00   33.80   49.50   72.60   88.30  104.10  122.10
855          RY    4.82    4.50    2.25    0.00    0.00    2.25    4.50    4.82
             *
1                                        HEC-1 INPUT                                                    PAGE 23

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

856          KK  WC-09B   ROUTE
857          KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
858          RS       2    FLOW
859          RC   0.045   0.045   0.045    2130  0.0020    0.00
860          RX    0.00   18.00   37.40   56.90   85.90  105.30  124.70  142.70
861          RY    5.87    5.55    2.78    0.00    0.00    2.78    5.55    5.87
             *

862          KK  WC-09A   ROUTE
863          KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
864          RS       1    FLOW
865          RC   0.045   0.045   0.045     261  0.0029    0.00
866          RX    0.00   18.00   36.20   54.30   81.40   99.60  117.70  135.70
867          RY    5.51    5.19    2.60    0.00    0.00    2.60    5.19    5.51
             *

868          KK     92N   BASIN
869          KM        ORIGINAL ADMS BASIN DIVIDED FOR ADMP RECOMMENDED PLAN MODELING PURPOSES
870          KM        S-GRAPH TYPE=PHOENIX VALLEY
871          BA   0.327
872          LG    0.16    0.15    8.40    0.10      68
873          UI       0      95     313     505     712     451     258     104      50      20
874          UI      20       0       0       0       0       0       0       0       0       0
875          UI       0       0       0       0       0       0       0       0       0       0
876          UI       0       0       0       0       0       0       0       0       0       0
877          UI       0       0       0       0       0       0       0       0       0       0
             *

878          KK   92N-O  DIVERT
879          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
880          DT  92NRET    25.9     0.0
881          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
882          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
             *

883          KK    010A COMBINE
884          KM        COMBINE MASTER PLAN CHANNEL MCWD15 AND SUBBASIN 92N
885          KM        COMBINE MASTER PLAN CHANNEL P8B AND 010A
886          HC       2
             *

887          KK    010B COMBINE
888          HC       2
             *

889          KK   WC-02   ROUTE
890          KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
891          KM        ROUTE ALONG WATSON ROAD FROM 010B TO BELOAT ROAD
892          RS       3    FLOW
893          RC   0.045   0.045   0.045    2526  0.0012    0.00
894          RX    0.00   18.00   43.90   69.90  120.30  146.30  172.20  190.20
895          RY    7.73    7.41    3.71    0.00    0.00    3.71    7.41    7.73
             *
1                                        HEC-1 INPUT                                                    PAGE 24

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

896          KK   DET24   HYDRO
897          IN      15
898          BA     .16
899          QI       0       0       0       0       0       1       1       1       1       1
900          QI       1       1       1       1       2       2       2       2       2       2
901          QI       2       2       2       2       2       2       2       2       2       2
902          QI       2       2       2       2       2       2       2       2       2       2
903          QI       2       2       2       2       2       2       2       2       2       2
904          QI       2       2       2       2       2       2       2       2       2       2
905          QI       2       2       2       2       2       2       2       2       2       2
906          QI       2       2       2       2       2       2       2       2       2       2
907          QI       3       3       3       3       3       3       3       3       3       3
908          QI       3       3       3       3       3       3       3       3       3       3
909          QI       3       3       3       3       3       3       4       4       4       4
910          QI       4       4       4       4       4       4       4       4       4       4
911          QI       5       5       5       5       5       5       5       6       6       6
912          QI       7       7       8       8       9       9      10      11      12      14
913          QI      20      32      46      72     109     140     153     146     135     140
914          QI     124      93      69      52      42      35      30      26      23      20
915          QI      18      16      14      13      12      12      11      10      10       9
916          QI       9       8       8       8       8       7       7       7       6       6
917          QI       6       6       6       6       6       6       5       5       5       5
918          QI       5       5       5       5       5       5       5       5       5       5
```

```
 919          QI       5       5       5       4       4       4       4       4       4       4
 920          QI       4       4       4       4       4       4       4       4       4       4
 921          QI       3       3       3       3       3       3       3       3       3       3
 922          QI       3       3       3       3       3       3       3       3       3       3
 923          QI       3       3       3       3       3       3       3       2       2       2
 924          QI       2       2       2       2       2       2       2       2       2       2
 925          QI       2       2       2       2       2       2       2       2       2       2
 926          QI       2       2       2       2       2       2       2       2       2       2
 927          QI       2       2       2       2       2       2       2       2       2       2
 928          QI       2       2       2       1       1       1       1       1       0       0
 929          QI       0       0       0       0       0       0       0       0       0       0
 930          QI       0       0       0       0       0       0       0       0       0       0
 931          QI       0       0       0       0       0       0       0       0       0       0
 932          QI  0.0001  0.0001  0.0001  0.0001  0.0001  0.0001  0.0001  0.0001  0.0001  0.0001
              *
 933          IN      15
              *

 934          KK  DRAN24   HYDRO
 935          IN      15
 936          BA     .75
 937          QI       0       0       0       0       0       0       0       0       0       0
 938          QI       0       0       1       1       1       1       1       1       1       1
 939          QI       2       2       2       2       2       2       2       2       2       3
 940          QI       3       3       3       3       3       3       3       3       3       3
 941          QI       3       4       4       4       4       4       4       4       4       4
 942          QI       4       4       4       4       4       5       5       5       5       5
 943          QI       5       5       5       6       6       6       6       6       6       6
 944          QI       6       6       6       6       6       6       7       7       7       7
 945          QI       7       7       7       7       7       7       8       8       8       8
 946          QI       8       8       8       8       8       8       8       8       8       8
```



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

 947          QI       8       8       8       8       8       8       9       9       9       9
 948          QI       9       9       9       9       9       9       9       9       9      10
 949          QI      10      10      10      10      10      10      10      10      10      11
 950          QI      11      11      11      11      12      12      12      13      13      14
 951          QI      15      16      19      25      36      54      79     172     256     400
 952          QI     535     424     313     233     178     142     119     101      89      80
 953          QI      71      63      58      53      49      45      42      39      37      35
 954          QI      33      32      30      29      28      27      26      25      24      23
 955          QI      22      22      21      21      20      20      20      19      19      19
 956          QI      18      18      18      17      17      17      17      17      17      17
 957          QI      17      16      16      16      16      16      15      15      15      14
 958          QI      14      14      14      14      14      14      14      14      13      13
 959          QI      13      13      12      12      12      12      11      11      11      11
 960          QI      11      11      11      11      11      11      11      11      11      11
 961          QI      11      11      11      10      10      10      10       9       9       9
 962          QI       9       9       9       8       8       8       8       8       8       8
 963          QI       8       8       8       8       8       8       8       8       8       8
 964          QI       8       8       8       8       8       8       8       8       8       8
 965          QI       8       8       8       8       8       8       8       8       8       8
 966          QI       8       8       7       7       6       5       5       4       4       4
 967          QI       3       3       2       2       2       1       1       1       1       1
 968          QI       0       0       0       0       0       0       0       0       0       0
 969          QI       0       0       0       0       0       0       0       0       0       0
 970          QI       0       0       0       0       0       0       0       0       0       0
 971          QI       0       0       0       0       0       0       0       0       0       0
 972          QI       0       0       0       0       0       0       0       0       0       0
 973          QI       0       0       0       0       0       0       0       0       0       0
 974          QI       0       0       0       0       0       0       0       0       0       0
 975          QI       0       0       0       0       0       0       0       0       0       0
 976          QI       0       0       0       0       0       0       0       0       0       0
 977          QI       0       0       0       0       0       1       2       3       6       9
 978          QI      11      13      15      17      19      20      21      22      24      25
 979          QI      26      28      28      29      29      29      29      29      28      28
 980          QI      28      28      28      27      27      27      27      27      26      26
 981          QI      26      26      25      24      23      22      20      19      17      16
 982          QI      14      13      12      11       9       8       7       6       5       4
 983          QI       4       4       4       3       3       2       2       2       1       1
 984          QI       1       1       1       0       0       0       0       0       0       0
 985          QI       0       0       0       0       0       0       0       0       0       0
 986          QI       0       0       0       0       0       0       0       0       0       0
 987          QI  0.0001  0.0001  0.0001  0.0001  0.0001  0.0001  0.0001  0.0001  0.0001  0.0001
              *
 988          IN      15
              *

 989          KK  TOBINF COMBINE
 990          HC       2     .91
              *

 991          KK     92S   BASIN
 992          KM        ORIGINAL ADMS BASIN DIVIDED FOR ADMP RECOMMENDED PLAN MODELING PURPOSES
 993          KM        S-GRAPH TYPE=PHOENIX VALLEY
 994          BA   0.687
 995          LG    0.19    0.15    8.80    0.08      56
 996          UI       0      84     238     425     552     787     987     718     544     399
```



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

 997          UI     219     141      90      48      26      26      26       0       0       0
 998          UI       0       0       0       0       0       0       0       0       0       0
```

```
 999          UI       0       0       0       0       0       0       0       0       0       0
1000          UI       0       0       0       0       0       0       0       0       0       0
              *

1001          KK   92S-O  DIVERT
1002          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
1003          DT  92SRET    51.7     0.0
1004          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
1005          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
              *

1006          KK  TOB92S COMBINE
1007          HC       2
              *

1008          KK      94   BASIN
1009          KM        S-GRAPH TYPE=PHOENIX VALLEY
1010          BA   0.719
1011          LG    0.24    0.15    7.30    0.13      35
1012          UI       0      69     129     286     373     458     589     846     707     563
1013          UI     449     356     254     139     114      74      56      21      21      21
1014          UI      21      21       0       0       0       0       0       0       0       0
1015          UI       0       0       0       0       0       0       0       0       0       0
1016          UI       0       0       0       0       0       0       0       0       0       0
              *

1017          KK    94-O  DIVERT
1018          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
1019          DT   94RET    42.9     0.0
1020          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
1021          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
              *

1022          KK  94-P8A   ROUTE
1023          KM        ROUTE SUBBASIN 94 TO P8A AT RAINBOW ROAD
1024          RS       3    FLOW
1025          RC   0.030   0.030   0.030    6357  0.0080    0.00
1026          RX    0.00    2.00   10.00   18.00   54.50   62.50   70.50   72.50
1027          RY    4.50    4.00    2.00    0.00    0.00    2.00    4.00    4.50
              *

1028          KK      96   BASIN
1029          KM        S-GRAPH TYPE=PHOENIX VALLEY
1030          BA   0.914
1031          LG    0.29    0.15    7.30    0.13      18
1032          UI       0      60      60     148     241     298     343     395     461     582
1033          UI     759     672     555     484     413     355     299     247     160     106
1034          UI     100      82      60      58      18      18      18      18      18      18
1035          UI      18       0       0       0       0       0       0       0       0       0
1036          UI       0       0       0       0       0       0       0       0       0       0
              *
```



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

1037          KK    96-O  DIVERT
1038          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
1039          DT   96RET    54.5     0.0
1040          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
1041          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
              *

1042          KK     P8A COMBINE
1043          KM        COMBINE ROUTE 94-P8A AND SUBBASIN 96 AT P8A
1044          HC       2
              *

1045          KK  P8A-P9   ROUTE
1046          KM        ROUTE P8A TO P9 - ONE MILE TO WEST FROM RAINBOW ROAD TO WATSON ROAD
1047          RS       6    FLOW
1048          RC   0.030   0.030   0.030    5739  0.0010    0.00
1049          RX    0.00    2.00   10.00   18.00  175.30  183.30  191.30  193.30
1050          RY    4.50    4.00    2.00    0.00    0.00    2.00    4.00    4.50
              *

1051          KK      97   BASIN
1052          KM        S-GRAPH TYPE=PHOENIX VALLEY
1053          BA   0.500
1054          LG    0.28    0.17    6.80    0.16      22
1055          UI       0      35      35      97     147     180     207     243     288     389
1056          UI     433     344     292     252     211     178     146      96      61      57
1057          UI      45      35      27      11      11      11      11      11      11       0
1058          UI       0       0       0       0       0       0       0       0       0       0
1059          UI       0       0       0       0       0       0       0       0       0       0
              *

1060          KK    97-O  DIVERT
1061          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
1062          DT   97RET    28.1     0.0
1063          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
1064          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
              *

1065          KK      P9 COMBINE
1066          KM        COMBINE WC-02 WITH SUBBASINS 92S AND 97 AND COMBINE POINT P8A
```

```
1067          HC       4
              *

1068          KK   WC-01   ROUTE
1069          KM        MASTER PLAN CHANNEL - WATSON DRAIN SYSTEM
1070          KM        ROUTE ALONG WATSON ROAD FROM BELOAT ROAD TO THE ARLINGTON CANAL
1071          RS       6    FLOW
1072          RC   0.045   0.045   0.045    3981  0.0005    0.00
1073          RX    0.00   18.00   49.00   80.10  141.50  172.50  203.60  221.60
1074          RY    9.19    8.87    4.43    0.00    0.00    4.43    8.87    9.19
              *
1                                          HEC-1 INPUT                                                PAGE 28

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


1075          KK     100   BASIN
1076          KM        S-GRAPH TYPE=PHOENIX VALLEY
1077          BA   0.582
1078          LG    0.29    0.23    6.20    0.20      18
1079          UI       0      41      41     122     178     218     251     297     359     493
1080          UI     490     392     335     284     239     201     151      94      72      68
1081          UI      42      41      18      13      13      13      13      13      13       0
1082          UI       0       0       0       0       0       0       0       0       0       0
1083          UI       0       0       0       0       0       0       0       0       0       0
              *

1084          KK   100-O  DIVERT
1085          KM        DIVERT RETENTION OUT OF MODEL DUE TO FUTURE CONDITIONS DEVELOPMENT
1086          DT  100RET    34.8     0.0
1087          DI     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
1088          DQ     0.0 10000.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
              *

1089          KK     P10 COMBINE
1090          KM        COMBINE ROUTED HYDROGRAPH FROM P9 WITH RUNOFF FROM 100 @ P10
1091          HC       2
              *
1092          KM        END WATSON CHANNEL SYSTEM
1093          ZZ
1
              SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

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

  27          12
               .
               .
  38           .------->   12RET
  36        12-O
               V
               V
  41       O1-O2
               .
               .
  47           .          13
               .           .
               .           .
  57           .           .------->   13RET
  56           .        13-O
               .           .
               .           .
  60          O2............
               V
               V
  63      O2-O3A
               .
               .
  69           .          24
               .           .
               .           .
  80           .           .------->   24RET
  78           .        24-O
               .           .
               .           .
  83         O3A............
               V
               V
  86      O3AO3B
               .
               .
  92           .          25
               .           .
               .           .
 103           .           .------->   25RET
 101           .        25-O
               .           .
               .           .
 106         O3B............
               .
               .
 109           .         14A
               .           .
               .           .
```

```
120          .          .-------> 14ARET
118          .      14A-O
             .          V
             .          V
123          .     P1AP1B
             .          .
             .          .
129          .          .         83
             .          .          .
             .          .          .
140          .          .          .------->  83RET
138          .          .       83-O
             .          .          .
             .          .          .
143          .          .          .        14B
             .          .          .          .
             .          .          .          .
154          .          .          .          .-------> 14BRET
152          .          .          .      14B-O
             .          .          .          .
             .          .          .          .
157          .        P1B.......................
             .          V
             .          V
160          .     P1B-P2
             .          .
             .          .
166          .          .         26
             .          .          .
             .          .          .
177          .          .          .------->  26RET
175          .          .       26-O
             .          .          .
             .          .          .
180          .         P2............
             .          V
             .          V
183          .      P2-O4
             .          .
             .          .
188          .          .        11A
             .          .          .
             .          .          .
199          .          .          .-------> 11ARET
197          .          .      11A-O
             .          .          V
             .          .          V
202          .          .     N1A-1B
             .          .          .
             .          .          .
208          .          .          .        11B
             .          .          .          .
             .          .          .          .
219          .          .          .          .-------> 11BRET
217          .          .          .      11B-O
             .          .          .          .
             .          .          .          .
222          .          .        N1B............
             .          .          V
             .          .          V
225          .          .      N1BO4
             .          .          .
             .          .          .
231        O4.......................
             .
             .
238          .-------> DIMB01
234       MB01
             .
             .
243          .          .<-------  DIMB01
241          .     RTMB01
             .          V
             .          V
244          .     SSMB01
             .          .
             .          .
251      &MB01............
            V
            V
254      WC-08
             .
             .
261          .         39
             .          .
             .          .
272          .          .------->  39RET
270          .       39-O
             .          .
             .          .
275        O5............
            V
            V
278      WC-07
             .
             .
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285          .          38
             .           .
             .           .
296          .           .-------->   38RET
294          .        38-O
             .           V
             .           V
299          .       N3-N4
             .           .
             .           .
305          .           .          49
             .           .           .
             .           .           .
316          .           .           .-------->   49RET
314          .           .        49-O
             .           .           .
             .           .           .
319          .          N4............
             .           V
             .           V
322          .       N4-O6
             .           .
             .           .
328          .           .          50
             .           .           .
             .           .           .
339          .           .           .-------->   50RET
337          .           .        50-O
             .           .           .
             .           .           .
342         O6........................
             V
             V
345       WC-06
             .
             .
352          .          57
             .           .
             .           .
363          .           .-------->   57RET
361          .        57-O
             .           .
             .           .
366         O7............
             .
             .
373          .-------->  DIMB02
369        MB02
             .
             .
378          .           .<--------  DIMB02
376          .      RTMB02
             .           V
             .           V
379          .      SSMB02
             .           .
             .           .
386       &MB02............
             V
             V
389       WC-05
             .
             .
397          .          40
             .           .
             .           .
408          .           .-------->   40RET
406          .        40-O
             .           V
             .           V
411          .       P3-P4
             .           .
             .           .
417          .           .          51
             .           .           .
             .           .           .
428          .           .           .-------->   51RET
426          .           .        51-O
             .           .           .
             .           .           .
431          .          P4............
             .           V
             .           V
434          .       P4-P5
             .           .
             .           .
440          .           .          58
             .           .           .
             .           .           .
451          .           .           .-------->   58RET
449          .           .        58-O
             .           .           .
             .           .           .
454          .          P5............
             .           .
             .           .
```

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457          .           .          72
             .           .           .
             .           .           .
468          .           .           .-------->   72RET
466          .           .        72-O
             .           .           .
             .           .           .
471          .          P6............
             .           V
             .           V
475          .       WT-01
             .           .
             .           .
482          .           .          71
             .           .           .
             .           .           .
493          .           .           .-------->   71RET
491          .           .        71-O
             .           .           .
             .           .           .
496         O8........................
             V
             V
500       WC-04
             .
             .
507          .          93
             .           .
             .           .
518          .           .-------->   93RET
516          .        93-O
             .           .
             .           .
521         O9............
             V
             V
524      WC-03B
             V
             V
531      WC-03A
             .
             .
538          .          95
             .           .
             .           .
549          .           .-------->   95RET
547          .        95-O
             .           .
             .           .
552        P8B............
             .
             .
556          .         10E
             .           .
             .           .
568          .           .-------->  10ERET
566          .       10E-O
             .           V
             .           V
571          .      L1AL2A
             .           .
             .           .
577          .           .         22E
             .           .           .
             .           .           .
589          .           .           .-------->  22ERET
587          .           .       22E-O
             .           .           .
             .           .           .
592          .         L2A............
             .           .
             .           .
595          .           .         11C
             .           .           .
             .           .           .
606          .           .           .-------->  11CRET
604          .           .       11C-O
             .           .           V
             .           .           V
609          .           .      N1C-N2
             .           .           .
             .           .           .
615          .           .           .          23
             .           .           .           .
             .           .           .           .
626          .           .           .           .-------->   23RET
624          .           .           .        23-O
             .           .           .           .
             .           .           .           .
629          .          N2........................
             .           .
             .           .
636          .           .-------->  DIMB03
632          .        MB03
             .           .
             .           .
```

```
641          .          .          .<-------  DIMB03
639          .          .      RTMB03
             .          .          V
             .          .          V
642          .          .      SSMB03
             .          .          .
             .          .          .
649          .      &MB03............
             .          V
             .          V
652          .      WC-15
             .          V
             .          V
659          .      WC-14
             .          .
             .          .
667          .          .         37
             .          .          .
             .          .          .
678          .          .          .------->   37RET
676          .          .       37-O
             .          .          .
             .          .          .
681          .         M1............
             .          V
             .          V
684          .      WC-13
             .          .
             .          .
691          .          .         36
             .          .          .
             .          .          .
702          .          .          .------->   36RET
700          .          .       36-O
             .          .          V
             .          .          V
705          .          .      L3-M2A
             .          .          .
             .          .          .
711          .          .          .         47N
             .          .          .          .
             .          .          .          .
722          .          .          .          .------->  47NRET
721          .          .          .       47N-O
             .          .          .          .
             .          .          .          .
725          .          .        M2A............
             .          .          V
             .          .          V
728          .          .      WC-16
             .          .          .
             .          .          .
735          .          .          .          48
             .          .          .          .
             .          .          .          .
746          .          .          .          .------->   48RET
744          .          .          .        48-O
             .          .          .          .
             .          .          .          .
749          .          .        M2B............
             .          .          .
             .          .          .
752          .        M2C............
             .          .
             .          .
759          .          .------->  DIMB04
755          .       MB04
             .          .
             .          .
764          .          .          .<-------  DIMB04
762          .          .      RTMB04
             .          .          V
             .          .          V
765          .          .      SSMB04
             .          .          .
             .          .          .
772          .      &MB04............
             .          V
             .          V
775          .     WC-12B
             .          V
             .          V
782          .     WC-12A
             .          .
             .          .
789          .          .        56A
             .          .          .
             .          .          .
800          .          .          .------->  56ARET
798          .          .      56A-O
             .          .          .
             .          .          .
803          .          .          .         56B
             .          .          .          .
             .          .          .          .
813          .          .          .          .------->  56BRET
```

```
 812          .          .          .      56B-O
              .          .          .          .
              .          .          .          .
 816          .        N5B.......................
              .          V
              .          V
 819          .      WC-11
              .          .
              .          .
 826          .          .         70
              .          .          .
              .          .          .
 837          .          .          .------->   70RET
 835          .          .       70-O
              .          .          .
              .          .          .
 840          .         N6............
              .          V
              .          V
 843          .      WC-10
              .          V
              .          V
 850          .     WC-09C
              .          V
              .          V
 856          .     WC-09B
              .          V
              .          V
 862          .     WC-09A
              .          .
              .          .
 868          .          .        92N
              .          .          .
              .          .          .
 880          .          .          .------->  92NRET
 878          .          .      92N-O
              .          .          .
              .          .          .
 883          .       O10A............
              .          .
              .          .
 887       O10B............
              V
              V
 889      WC-02
              .
              .
 896          .      DET24
              .          .
              .          .
 934          .          .     DRAN24
              .          .          .
              .          .          .
 989          .     TOBINF............
              .          .
              .          .
 991          .          .        92S
              .          .          .
              .          .          .
1003          .          .          .------->  92SRET
1001          .          .      92S-O
              .          .          .
              .          .          .
1006          .     TOB92S............
              .          .
              .          .
1008          .          .         94
              .          .          .
              .          .          .
1019          .          .          .------->   94RET
1017          .          .       94-O
              .          .          V
              .          .          V
1022          .          .     94-P8A
              .          .          .
              .          .          .
1028          .          .          .         96
              .          .          .          .
              .          .          .          .
1039          .          .          .          .------->   96RET
1037          .          .          .       96-O
              .          .          .          .
              .          .          .          .
1042          .          .        P8A............
              .          .          V
              .          .          V
1045          .          .     P8A-P9
              .          .          .
              .          .          .
1051          .          .          .         97
              .          .          .          .
              .          .          .          .
1062          .          .          .          .------->   97RET
1060          .          .          .       97-O
              .          .          .          .
              .          .          .          .
```

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1065          P9.................................
               V
               V
1068        WC-01
               .
               .
1075           .         100
               .           .
               .           .
1086           .           .-------> 100RET
1084           .       100-O
               .           .
               .           .
1089          P10............
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN   1998              *
*           VERSION 4.1                *
*                                      *
*  RUN DATE   04MAR13  TIME  13:55:10  *
*                                      *
****************************************
```

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

FCDMC
WATSON PRE-DESIGN 24 - Watson Pre-Design 24 Hour Update
100 YEAR
24 Hour Storm
Unit Hydrograph: S-Graph
Storm: Multiple
03/04/2013

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

    IT          HYDROGRAPH TIME DATA
                       NMIN           5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1    0  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ        2000  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      7    0  ENDING DATE
                     NDTIME        2235  ENDING TIME
                      ICENT          19  CENTURY MARK

                 COMPUTATION INTERVAL    0.08 HOURS
                      TOTAL TIME BASE  166.58 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

 11 JD          INDEX STORM NO. 1
                       STRM        3.61  PRECIPITATION DEPTH
                       TRDA        0.00  TRANSPOSITION DRAINAGE AREA

 12 PI            PRECIPITATION PATTERN
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.01      0.00      0.01
                     0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.03      0.03
                     0.03      0.09      0.09      0.09      0.01      0.01      0.01      0.01      0.01      0.01
                     0.01      0.01      0.01      0.01      0.01      0.01      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
```

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                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00

22 JD        INDEX STORM NO. 2
                STRM        3.59  PRECIPITATION DEPTH
                TRDA        1.00  TRANSPOSITION DRAINAGE AREA

 0 PI          PRECIPITATION PATTERN
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.01      0.00      0.01
                0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.03      0.03
                0.03      0.09      0.09      0.09      0.01      0.01      0.01      0.01      0.01      0.01
                0.01      0.01      0.01      0.01      0.01      0.01      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00

23 JD        INDEX STORM NO. 3
                STRM        3.52  PRECIPITATION DEPTH
                TRDA        5.00  TRANSPOSITION DRAINAGE AREA

 0 PI          PRECIPITATION PATTERN
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.01      0.00      0.01
                0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.03      0.03
                0.03      0.09      0.09      0.09      0.01      0.01      0.01      0.01      0.01      0.01
                0.01      0.01      0.01      0.01      0.01      0.01      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00

24 JD        INDEX STORM NO. 4
                STRM        3.42  PRECIPITATION DEPTH
                TRDA       10.00  TRANSPOSITION DRAINAGE AREA

 0 PI          PRECIPITATION PATTERN
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.01      0.00      0.01
                0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.03      0.03
                0.03      0.09      0.09      0.09      0.01      0.01      0.01      0.01      0.01      0.01
                0.01      0.01      0.01      0.01      0.01      0.01      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
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                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00

 25 JD        INDEX STORM NO. 5
                    STRM        3.31  PRECIPITATION DEPTH
                    TRDA       20.00  TRANSPOSITION DRAINAGE AREA

  0 PI          PRECIPITATION PATTERN
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.01      0.00      0.01
                0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.03      0.03
                0.03      0.09      0.09      0.09      0.01      0.01      0.01      0.01      0.01      0.01
                0.01      0.01      0.01      0.01      0.01      0.01      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00

 26 JD        INDEX STORM NO. 6
                    STRM        3.24  PRECIPITATION DEPTH
                    TRDA       30.00  TRANSPOSITION DRAINAGE AREA

  0 PI          PRECIPITATION PATTERN
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.01      0.00      0.01
                0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.01      0.03      0.03
                0.03      0.09      0.09      0.09      0.01      0.01      0.01      0.01      0.01      0.01
                0.01      0.01      0.01      0.01      0.01      0.01      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 244 KK     *   SSMB01   *      STORAGE
            *            *
            **************

 246 KO       OUTPUT CONTROL VARIABLES
                  IPRNT           5  PRINT CONTROL
                  IPLOT           0  PLOT CONTROL
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                    QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 379 KK     *    SSMB02  *      STORAGE
            *            *
            **************

 381 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 642 KK     *    SSMB03  *      STORAGE
            *            *
            **************

 644 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 765 KK     *    SSMB04  *      STORAGE
            *            *
            **************

 767 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
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
+                          12     1156.   12.25         125.         40.         13.       0.74

        DIVERSION TO
+                       12RET     1156.   12.25         125.         40.         13.       0.74

        HYDROGRAPH AT
+                        12-O        0.    0.00           0.          0.          0.       0.74

        ROUTED TO
+                       O1-O2        0.    0.00           0.          0.          0.       0.74

        HYDROGRAPH AT
+                          13      919.   12.17          81.         25.          8.       0.50

        DIVERSION TO
+                       13RET      919.   12.17          81.         25.          8.       0.50

        HYDROGRAPH AT
+                        13-O        0.    0.00           0.          0.          0.       0.50

        2 COMBINED AT
+                          O2        0.    0.00           0.          0.          0.       1.24

        ROUTED TO
+                      O2-O3A        0.    0.00           0.          0.          0.       1.24

        HYDROGRAPH AT
+                          24      746.   12.17          63.         18.          6.       0.49

        DIVERSION TO
+                       24RET        2.    1.08           1.          0.          0.       0.49

        HYDROGRAPH AT
+                        24-O      746.   12.17          63.         18.          6.       0.49

        2 COMBINED AT
+                         O3A      739.   12.17          63.         18.          6.       1.73
```

ROUTED TO	O3AO3B	671.	12.33	63.	18.	6.	1.73
HYDROGRAPH AT	25	235.	12.58	33.	10.	3.	0.27
DIVERSION TO	25RET	235.	12.58	32.	8.	3.	0.27
HYDROGRAPH AT	25-O	18.	13.42	4.	1.	0.	0.27
2 COMBINED AT	O3B	671.	12.33	65.	19.	6.	2.00
HYDROGRAPH AT	14A	712.	12.50	98.	30.	10.	0.69
DIVERSION TO	14ARET	712.	12.50	95.	26.	9.	0.69
HYDROGRAPH AT	14A-O	31.	13.58	12.	4.	1.	0.69
ROUTED TO	P1AP1B	24.	14.00	12.	4.	1.	0.69
HYDROGRAPH AT	83	672.	12.58	106.	32.	11.	0.68
DIVERSION TO	83RET	672.	12.58	91.	24.	8.	0.68
HYDROGRAPH AT	83-O	204.	13.08	25.	8.	3.	0.68
HYDROGRAPH AT	14B	729.	12.25	69.	21.	7.	0.50
DIVERSION TO	14BRET	729.	12.25	69.	21.	7.	0.50
HYDROGRAPH AT	14B-O	0.	0.00	0.	0.	0.	0.50
3 COMBINED AT	P1B	204.	13.08	36.	12.	4.	1.87
ROUTED TO	P1B-P2	103.	13.42	32.	11.	4.	1.87
HYDROGRAPH AT	26	621.	12.33	63.	18.	6.	0.52
DIVERSION TO	26RET	9.	10.67	5.	2.	1.	0.52
HYDROGRAPH AT	26-O	621.	12.33	62.	17.	6.	0.52
2 COMBINED AT	P2	610.	12.33	87.	27.	9.	2.39
ROUTED TO	P2-O4	479.	12.67	85.	27.	9.	2.39
HYDROGRAPH AT	11A	1075.	12.17	102.	32.	11.	0.57
DIVERSION TO	11ARET	1075.	12.17	102.	31.	10.	0.57
HYDROGRAPH AT	11A-O	6.	22.00	3.	1.	0.	0.57
ROUTED TO	N1A-1B	6.	23.92	3.	1.	0.	0.57
HYDROGRAPH AT	11B	586.	12.50	85.	26.	9.	0.58
DIVERSION TO	11BRET	586.	12.50	85.	24.	8.	0.58
HYDROGRAPH AT	11B-O	12.	15.33	8.	3.	1.	0.58
2 COMBINED AT	N1B	11.	15.33	8.	3.	1.	1.15
ROUTED TO	N1BO4	11.	24.25	7.	3.	1.	1.15
3 COMBINED AT	O4	767.	12.50	141.	46.	15.	5.55

+	DIVERSION TO	DIMB01	501.	12.50	46.	11.	4.	5.55
+	HYDROGRAPH AT	MB01	266.	12.17	95.	34.	12.	5.55
+	HYDROGRAPH AT	RTMB01	501.	12.50	46.	11.	4.	5.55
+	ROUTED TO	SSMB01	24.	13.00	23.	11.	4.	5.55
+	2 COMBINED AT	&MB01	290.	13.00	117.	46.	15.	5.55
+	ROUTED TO	WC-08	290.	13.00	116.	46.	15.	5.55
+	HYDROGRAPH AT	39	610.	12.67	106.	33.	11.	0.73
+	DIVERSION TO	39RET	610.	12.67	81.	22.	7.	0.73
+	HYDROGRAPH AT	39-O	339.	13.00	36.	11.	4.	0.73
+	2 COMBINED AT	O5	549.	13.08	144.	54.	18.	6.27
+	ROUTED TO	WC-07	450.	13.25	142.	54.	18.	6.27
+	HYDROGRAPH AT	38	465.	12.58	77.	24.	8.	0.54
+	DIVERSION TO	38RET	465.	12.58	62.	17.	6.	0.54
+	HYDROGRAPH AT	38-O	214.	13.00	23.	7.	2.	0.54
+	ROUTED TO	N3-N4	109.	13.33	22.	7.	2.	0.54
+	HYDROGRAPH AT	49	737.	12.75	143.	44.	15.	1.01
+	DIVERSION TO	49RET	737.	12.75	143.	40.	13.	1.01
+	HYDROGRAPH AT	49-O	21.	15.58	14.	5.	2.	1.01
+	2 COMBINED AT	N4	109.	13.33	32.	12.	4.	1.55
+	ROUTED TO	N4-O6	74.	13.75	28.	11.	4.	1.55
+	HYDROGRAPH AT	50	758.	12.75	145.	45.	15.	1.00
+	DIVERSION TO	50RET	758.	12.75	114.	31.	10.	1.00
+	HYDROGRAPH AT	50-O	402.	13.17	46.	14.	5.	1.00
+	3 COMBINED AT	O6	688.	13.33	186.	71.	24.	8.82
+	ROUTED TO	WC-06	636.	13.42	186.	71.	24.	8.82
+	HYDROGRAPH AT	57	1008.	12.08	92.	31.	10.	0.49
+	DIVERSION TO	57RET	755.	12.00	47.	14.	5.	0.49
+	HYDROGRAPH AT	57-O	947.	12.17	59.	17.	6.	0.49
+	2 COMBINED AT	O7	906.	12.17	229.	85.	28.	9.31
+	DIVERSION TO	DIMB02	655.	12.17	57.	14.	5.	9.31
+	HYDROGRAPH AT	MB02	251.	12.08	173.	71.	24.	9.31
+	HYDROGRAPH AT	RTMB02	655.	12.17	57.	14.	5.	9.31

ROUTED TO	SSMB02	23.	14.33	21.	14.	5.	9.31
2 COMBINED AT	&MB02	274.	14.33	192.	84.	28.	9.31
ROUTED TO	WC-05	274.	14.33	192.	84.	28.	9.31
HYDROGRAPH AT	40	787.	12.67	141.	43.	15.	0.98
DIVERSION TO	40RET	787.	12.67	115.	31.	10.	0.98
HYDROGRAPH AT	40-O	326.	13.17	41.	12.	4.	0.98
ROUTED TO	P3-P4	328.	13.42	41.	12.	4.	0.98
HYDROGRAPH AT	51	765.	12.75	148.	45.	15.	1.00
DIVERSION TO	51RET	765.	12.75	116.	31.	10.	1.00
HYDROGRAPH AT	51-O	394.	13.17	48.	14.	5.	1.00
2 COMBINED AT	P4	527.	13.42	85.	26.	9.	1.98
ROUTED TO	P4-P5	460.	13.50	83.	26.	9.	1.98
HYDROGRAPH AT	58	416.	12.08	36.	12.	4.	0.19
DIVERSION TO	58RET	416.	12.08	30.	8.	3.	0.19
HYDROGRAPH AT	58-O	72.	12.25	11.	4.	1.	0.19
2 COMBINED AT	P5	470.	13.50	90.	29.	10.	2.17
HYDROGRAPH AT	72	175.	12.08	15.	5.	2.	0.09
DIVERSION TO	72RET	175.	12.08	14.	4.	1.	0.09
HYDROGRAPH AT	72-O	9.	12.67	3.	1.	0.	0.09
2 COMBINED AT	P6	474.	13.50	92.	30.	10.	2.26
ROUTED TO	WT-01	360.	13.75	91.	30.	10.	2.26
HYDROGRAPH AT	71	357.	12.08	30.	10.	3.	0.16
DIVERSION TO	71RET	357.	12.08	25.	7.	2.	0.16
HYDROGRAPH AT	71-O	69.	12.17	10.	3.	1.	0.16
3 COMBINED AT	O8	502.	14.00	260.	107.	36.	11.72
ROUTED TO	WC-04	494.	14.08	258.	107.	36.	11.72
HYDROGRAPH AT	93	527.	12.33	75.	25.	8.	0.38
DIVERSION TO	93RET	527.	12.33	46.	13.	4.	0.38
HYDROGRAPH AT	93-O	422.	12.42	40.	12.	4.	0.38
2 COMBINED AT	O9	582.	12.50	291.	116.	39.	12.10
ROUTED TO	WC-03B	500.	14.25	289.	116.	39.	12.10
ROUTED TO	WC-03A	485.	14.58	284.	116.	39.	12.10

+	HYDROGRAPH AT	95	532.	12.67	106.	33.	11.	0.52
+	DIVERSION TO	95RET	532.	12.67	58.	16.	5.	0.52
+	HYDROGRAPH AT	95-O	483.	12.83	59.	16.	5.	0.52
+	2 COMBINED AT	P8B	692.	12.92	332.	129.	43.	12.62
+	HYDROGRAPH AT	10E	615.	12.50	90.	28.	9.	0.59
+	DIVERSION TO	10ERET	615.	12.50	72.	20.	7.	0.59
+	HYDROGRAPH AT	10E-O	241.	12.83	29.	9.	3.	0.59
+	ROUTED TO	L1AL2A	149.	13.00	28.	9.	3.	0.59
+	HYDROGRAPH AT	22E	358.	12.33	41.	13.	4.	0.29
+	DIVERSION TO	22ERET	358.	12.33	33.	9.	3.	0.29
+	HYDROGRAPH AT	22E-O	130.	12.58	12.	4.	1.	0.29
+	2 COMBINED AT	L2A	179.	12.92	39.	12.	4.	0.88
+	HYDROGRAPH AT	11C	437.	12.33	48.	15.	5.	0.34
+	DIVERSION TO	11CRET	437.	12.33	46.	12.	4.	0.34
+	HYDROGRAPH AT	11C-O	22.	13.00	8.	3.	1.	0.34
+	ROUTED TO	N1C-N2	15.	13.50	7.	3.	1.	0.34
+	HYDROGRAPH AT	23	448.	12.58	74.	23.	8.	0.52
+	DIVERSION TO	23RET	448.	12.58	62.	17.	6.	0.52
+	HYDROGRAPH AT	23-O	161.	13.08	20.	6.	2.	0.52
+	3 COMBINED AT	N2	293.	13.08	63.	20.	7.	1.75
+	DIVERSION TO	DIMB03	188.	13.08	12.	3.	1.	1.75
+	HYDROGRAPH AT	MB03	105.	12.92	51.	17.	6.	1.75
+	HYDROGRAPH AT	RTMB03	188.	13.08	12.	3.	1.	1.75
+	ROUTED TO	SSMB03	12.	13.58	9.	3.	1.	1.75
+	2 COMBINED AT	&MB03	117.	13.58	60.	20.	7.	1.75
+	ROUTED TO	WC-15	117.	13.58	59.	20.	7.	1.75
+	ROUTED TO	WC-14	116.	13.83	58.	20.	7.	1.75
+	HYDROGRAPH AT	37	1031.	12.75	212.	66.	22.	1.42
+	DIVERSION TO	37RET	1031.	12.75	171.	47.	16.	1.42
+	HYDROGRAPH AT	37-O	453.	13.33	65.	20.	7.	1.42
+	2 COMBINED AT	M1	536.	13.33	117.	38.	13.	3.17
+	ROUTED TO	WC-13	462.	13.50	116.	38.	13.	3.17

HYDROGRAPH AT	36	553.	12.67	94.	29.	10.	0.68
DIVERSION TO	36RET	553.	12.67	81.	22.	7.	0.68
HYDROGRAPH AT	36-O	184.	13.17	23.	7.	2.	0.68
ROUTED TO	L3-M2A	105.	13.42	22.	7.	2.	0.68
HYDROGRAPH AT	47N	225.	12.50	33.	10.	3.	0.23
DIVERSION TO	47NRET	225.	12.50	26.	7.	2.	0.23
HYDROGRAPH AT	47N-O	107.	12.83	10.	3.	1.	0.23
2 COMBINED AT	M2A	125.	13.33	32.	10.	3.	0.92
ROUTED TO	WC-16	84.	14.17	30.	10.	3.	0.92
HYDROGRAPH AT	48	505.	12.50	75.	23.	8.	0.50
DIVERSION TO	48RET	505.	12.50	59.	16.	5.	0.50
HYDROGRAPH AT	48-O	245.	12.83	25.	7.	2.	0.50
2 COMBINED AT	M2B	242.	12.83	51.	17.	6.	1.42
2 COMBINED AT	M2C	500.	13.50	157.	53.	18.	4.58
DIVERSION TO	DIMB04	344.	13.50	40.	10.	3.	4.58
HYDROGRAPH AT	MB04	156.	12.83	116.	43.	14.	4.58
HYDROGRAPH AT	RTMB04	344.	13.50	40.	10.	3.	4.58
ROUTED TO	SSMB04	18.	15.00	17.	10.	3.	4.58
2 COMBINED AT	&MB04	174.	15.00	131.	53.	18.	4.58
ROUTED TO	WC-12B	174.	15.17	130.	53.	18.	4.58
ROUTED TO	WC-12A	174.	15.17	129.	53.	18.	4.58
HYDROGRAPH AT	56A	761.	12.17	77.	25.	8.	0.41
DIVERSION TO	56ARET	761.	12.17	54.	15.	5.	0.41
HYDROGRAPH AT	56A-O	392.	12.33	34.	10.	3.	0.41
HYDROGRAPH AT	56B	708.	12.08	63.	21.	7.	0.33
DIVERSION TO	56BRET	708.	12.08	53.	15.	5.	0.33
HYDROGRAPH AT	56B-O	125.	12.33	19.	6.	2.	0.33
3 COMBINED AT	N5B	459.	12.33	163.	67.	23.	5.33
ROUTED TO	WC-11	370.	12.42	163.	67.	23.	5.33
HYDROGRAPH AT	70	248.	12.17	27.	9.	3.	0.14
DIVERSION TO	70RET	248.	12.17	22.	6.	2.	0.14
HYDROGRAPH AT	70-O	65.	12.42	9.	3.	1.	0.14

+	2 COMBINED AT N6	383.	12.42	170.	69.	23.	5.47
+	ROUTED TO WC-10	372.	12.42	169.	69.	23.	5.47
+	ROUTED TO WC-09C	273.	12.58	167.	69.	23.	5.47
+	ROUTED TO WC-09B	212.	14.58	165.	69.	23.	5.47
+	ROUTED TO WC-09A	212.	14.58	165.	69.	23.	5.47
+	HYDROGRAPH AT 92N	609.	12.25	77.	26.	9.	0.33
+	DIVERSION TO 92NRET	598.	12.17	45.	13.	4.	0.33
+	HYDROGRAPH AT 92N-O	524.	12.33	43.	12.	4.	0.33
+	2 COMBINED AT O10A	509.	12.33	195.	80.	27.	5.80
+	2 COMBINED AT O10B	785.	12.92	455.	182.	61.	18.42
+	ROUTED TO WC-02	726.	13.25	453.	182.	61.	18.42
+	HYDROGRAPH AT DET24	153.	36.50	65.	21.	9.	0.16
+	HYDROGRAPH AT DRAN24	535.	37.50	151.	51.	22.	0.75
+	2 COMBINED AT TOBINF	659.	37.50	214.	72.	30.	0.91
+	HYDROGRAPH AT 92S	1004.	12.42	155.	50.	17.	0.69
+	DIVERSION TO 92SRET	990.	12.33	93.	26.	9.	0.69
+	HYDROGRAPH AT 92S-O	907.	12.50	82.	24.	8.	0.69
+	2 COMBINED AT TOB92S	919.	12.50	214.	72.	38.	1.60
+	HYDROGRAPH AT 94	875.	12.50	137.	41.	14.	0.72
+	DIVERSION TO 94RET	875.	12.50	79.	22.	7.	0.72
+	HYDROGRAPH AT 94-O	712.	12.67	71.	20.	7.	0.72
+	ROUTED TO 94-P8A	521.	12.92	69.	20.	7.	0.72
+	HYDROGRAPH AT 96	833.	12.75	153.	43.	14.	0.91
+	DIVERSION TO 96RET	833.	12.75	105.	27.	9.	0.91
+	HYDROGRAPH AT 96-O	559.	13.08	57.	16.	5.	0.91
+	2 COMBINED AT P8A	963.	13.08	123.	35.	12.	1.63
+	ROUTED TO P8A-P9	597.	13.67	116.	35.	12.	1.63
+	HYDROGRAPH AT 97	463.	12.75	83.	24.	8.	0.50
+	DIVERSION TO 97RET	463.	12.75	53.	14.	5.	0.50
+	HYDROGRAPH AT 97-O	369.	12.92	35.	10.	3.	0.50
+	4 COMBINED AT P9	1006.	13.75	606.	244.	106.	22.15
+	ROUTED TO WC-01	961.	14.17	593.	242.	106.	22.15

```
          HYDROGRAPH AT
+                      100      506.   12.67        87.        25.        8.      0.58
          DIVERSION TO
+                   100RET      506.   12.67        67.        18.        6.      0.58
          HYDROGRAPH AT
+                    100-O      279.   13.08        25.         7.        2.      0.58
          2 COMBINED AT
+                      P10      979.   14.17       605.       245.      107.     22.73


*** NORMAL END OF HEC-1 ***
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Supporting Documents

- ***FCDMC Hydrology Memo***
- ***J.E. Fuller Review Memo***

Section 2 – DDMSW Update of the Buckeye ADMP Recommended Plan Hydrology

The purpose of this document is to summarize the process undergone to update the Buckeye Area Drainage Master Plan recommended design model.

The recommended design report was submitted to the Flood Control District of Maricopa County by Dibble Engineering in June 2009 under FCD contract number 2004C058. The models which have been updated were retrieved from the Recommended Plan Hydrology CD submitted with said report. The CD contains detailed back-up data and electronic HEC-1 and Drainage Design Management System (DDMSW) models. The recommended design was approved as the most current and accurate model as it relates to the present request for a hydrologic model of the Watson drain area. Both the 100 year 6-hour and 100 year 24-hour storm models were originally constructed in the DDMSW version 3.5.2 and submitted by Dibble Engineering.

These models were imported into the latest version of DDMSW (4.6.0) and updated within DDMSW 4.6.0. The original modeler had made changes to the sub-basins named 10, 22, 32, 44, 45A, 46, 47, 55, 63, and 92 by dividing them into additional basins with a name convention such as 10E and 10W. The divided basins enumerated above were deleted from the sub-basin table but their land use and soil data remained in the default tables. Therefore, sub-basin data existed for sub-basins which were no longer a part of the major basin. They were removed from the soil and land use default tables to allow for the update to the sub-basins.

Having deleted the superfluous sub-basin default data, the sub-basin parameters were then updated, resulting in recalculated XKSAT values for some sub-basins. After the updating, it was observed that the peak flows for some sub-basins in DDMSW 4.6.0 are different from the peak flows in DDMSW 3.5.2 (see attached Excel table for differences). The following comparison is based on 100-year and 24-hour storm. The overall average change in peak flows is about 1.5%. Peak flows stay within 5% for 94 out of 131 sub-basins. Peak flows stay within 2% for 83 out of 131 sub-basins. Peak flows increase more than 10% for 12 out of 131 sub-basins. Peak flows increase more than 5% for 19 out of 131 sub-basins. Peak flows decrease more than 5% for 16 out of 131 sub-basins.

It was found that several factors may contribute to the peak flow differences. The factors are UI cards and XKSAT. Considering the 100-year 24-hour storm, for the 17 sub-basins out of 19 sub-basins with more than 5% increase in peak flows, the major factor is due to the differences in UI cards. Both UI and XKSAT differences contribute to peak flow differences for 2 sub-basins out of these 19 sub-basins. It was found that all these 19 sub-basins have 1 line of UI cards in Buckeye ADMS under DDMSW 3.5.2. Using only 1 line of UI cards is incorrect. Since there is no change in UI card computation between version 4.6.0 and version 3.5.2, there should be more than one line of UI card in 3.5.2. When we imported the project back to DDMSW 3.5.2, we got more than one line of UI cards after we updated the model. It is believed that the Buckeye ADMS under 3.5.2 may have been developed under an incorrect selection of NMIN for the draft model and the HEC-1 input file structure was never updated after a correct NMIN was used. It is possible that the software users entered UI cards manually outside DDMSW.

Among these 19 sub-basins with more than 5% increase in peak flows, one of them is affected by a change in XKSAT computation related to the threshold of XKSAT for sand and loamy sand. The correct threshold is 1.2 in/hr. In version 3.5.2, the threshold was 0.4 in/hr. In version 4.6.0, the

threshold is changed to 1.2 in/hr. For this particular sub-basin (Area ID=23), the peak flow increases 10.5% as a result of this bug fix in DDMSW 4.6.0.

Among these 19 sub-basins with more than 5% increase in peak flows, four of them are affected by a change in XKSAT computation related to soils with XKSAT =0. Soils with this value of XKSAT typically represent some special soil types such as water, levee, and highways, which should not make a big difference in the result because of limited area for these soils. In version 3.5.2, if there is a soil type with XKSAT=0, because log zero is undefined, the soil record with XKSAT=0 is excluded from the log-based averaging process. In version 4.6.0, soils with XKSAT=0 are not excluded. However, 0.01 is assigned to XKSAT such that log can be taken on XKSAT. As a result, the final XKSAT should decrease, therefore, the peak flow should increase.

Among the 16 sub-basins with more than 5% decrease in peak flows, 15 sub-basins are due to the threshold change from 0.4 to 1.2 in/hr for XKSAT adjustment based on vegetative cover.

It should be mentioned that some minor change (second decimal) is observed for many sub-basins' XKSAT. This is due to a rounding difference in Ck value (the vegetation cover factor) between version 4.6.0 and version 3.5.2. In version 3.5.2, Ck was rounded to one decimal place. In version 4.6.0, Ck was rounded to two decimal places.

After investigation, it was concluded that the changes to the model through the current version of DDMSW allow a more accurate modeling of an area basin. The modifications to the sub-basin parameters having been affected and checked, updates to the rainfall data were made. It is expected that once NOAA14 is used within DDMSW 4.6.0, more changes will occur in the peak flow results.

A shapefile was created encompassing the Buckeye ADMP study area, imported to DDMSW and utilized to calculate new rainfall depth data for return intervals and rainfall durations from NOAA 14. This shapefile is included in the file folder data attached to this document. Please find also attached four DDMSW model zip files. They include updated sub-basin parameter models and updated sub-basin parameters with updated rainfall for both the 6 and 24-hour storms. HEC-1 input and output data can be found for each in corresponding folders. Also, attached is an excel spreadsheet from which these conclusions were made and a spreadsheet showing the design flows or the highest flows of the 6 and 24-hour models with the sub-basin and rainfall updates.

August 29, 2012

Brian Fry, PE, CFM
JE Fuller Hydrology and Geomorphology, Inc.
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Phoenix, AZ 85027

RE: Watson Drainage Pre-Design Hydrology Review #1

This Memorandum summarizes the review of the Watson Drainage System Pre-Design: Hydrology Memorandum (Task 3.0) with supporting electronic files and Watson Drainage System Pre-Design: Data Collection Memorandum (Task 2.4). This review focused on the Land Use category cross referencing between Town of Buckeye (TOB) and Flood Control District of Maricopa County (FCDMC). In addition, a summary review was conducted of the Runoff Coefficients or "C-values" used in determining the project future development retention volumes and the impacts of road imperviousness on the "C-value" within each land use category.

TOB land use categories compared to FCDMC land use categories:

For an overview comparison of the land use data within the Watson Watershed, shape file Landuse_TOB.shp was clipped using SUBBASINS_WATSON.shp. Based on this review, consider eliminating the following land use categories outside of the Watson Watershed;

- CMP (Master Planned Community),
- HDR (High Density Residential),
- MHD (Medium High Density Residential),
- OFF (Professional Office Employment, and
- OS (Open Space).

Based on a comparison of the descriptions for the Town of Buckeye Land Use categories included in the Data Collection Memorandum, consider the following changes;

- TOB Land Use MDR from FCDMC 170 to 150 (more consistent alignment of dwelling units per acre)
- TOB Land Use LDR from FCDMC 160 to 140 (more consistent alignment of dwelling units per acre)
- TOB Land Use VCMU from FCDMC 300 to 190. Runoff Coefficient and HEC-1 Runoff Parameters are similar so either category would probably work.

"C-values" used in determining the project future development retention volumes

The following Table highlights several instances where the "C-values" used in the Developed Condition retention volume calculation differ from the "C-values" in Table 3.2 from DDM for Maricopa County – Hydrology.

Table 1: Comparison of "C-values" used to determine future retention volumes

TOB LU Description	Assigned FCDMC LU Code	Watson Drainage System Runoff Coefficients (100 Year)			Table 3.2 Runoff Coefficients for Maricopa County (100 Year)		
		min	max	average	min	max	average
BP	810	0.69	0.81	0.75	0.69	0.81	0.75
DO	550	0.69	0.81	0.75	0.69	0.81	0.75
GC	550	0.69	0.81	0.75	0.69	0.81	0.75
I	320	0.75	0.88	0.82	0.75	0.88	0.82
LDR	160	0.53	0.70	0.62	0.53	0.6	0.57
MDR	170	0.6	0.80	0.70	0.6	0.82	0.71
NC	230	0.94	0.95	0.95	0.94	0.95	0.95
RC	240	0.69	0.81	0.75	0.69	0.81	0.75
VCMU	300	0.75	0.88	0.82	0.75	0.88	0.82
VLDR	120	0.45	0.65	0.55	0.41	0.53	0.47

"C-values" should be consistent or additional documentation should be added to the memorandum that discusses the differences.

Impacts of road imperviousness on the total land use area

Note 3 in Table 3.2 Runoff Coefficients for Maricopa County states "Runoff coefficients for urban land uses are for lot coverage only and do not include the adjacent street and right-of-way, or alleys." Based on this note a quick calculation of the percent of roadway area within a designated land use category was conducted. The roadway area is based on the roadway line work from *Street Map North America* and clipped at the land use boundaries within the Watson

Watershed. Assuming a 25 ft. wide pavement section the roadway area within a land use areas was determined. The percentages of roadways with in a land use category range from 1.2% in LU Code 230 (community commercial) to 11.8% in LU Code 550 (City Center). See Table 1 below for all categories/LU codes.

Table 2: Comparison of roadway pavement impact on Land Use Categories

TOB LU Code	TOB LU Description	FCDMC LU Code	% Road per LU code within Watershed	Current "C-values" (100 Year)	Revised "C-values" (100 Year)
BP	Business Park	810	2.20%	0.75	0.75
DO	City Center	550	11.80%	0.75	0.77
GC	Government Center	550	3.30%	0.75	0.76
I	Industrial	320	2.00%	0.82	0.82
LDR	Low Density Residential	160	3.50%	0.62	0.63
MDR	Medium Density Residential	170	1.80%	0.70	0.70
NC	Community Commercial	230	1.20%	0.95	0.95
RC	Regional Commercial	240	4.80%	0.75	0.76
VCMU	Mixed Use	300	2.70%	0.82	0.82
VLDR	Very Low Density Residential	120	3.80%	0.55	0.57

For most categories, the inclusion of roadway area into land use imperviousness or "C-values" has negligible impact on over all "C-value" within these land use categories. For land use category DO and VLDR the potential impact is slightly more. Consider including the roadway imperviousness area in these land use category calculations.

Please let me know if you have any questions or need some additional information.

Sincerely,

JE Fuller/Hydrology & Geomorphology, Inc.

Jon Ahern, P.E.

Attachments: None

Registered Professional Engineer (Civil)
CERTIFICATE NO.
34141
JON T.
AHERN
Date Signed 8-29-12
ARIZONA, U. S. A.
Expires 9/30/2014

Results Summary Tables

- Table 3: ADMP Vs. Pre-Design Discharge Comparison
- Table 4: ADMP Vs. Pre-Design 6-HR Volume Comparison
- Table 5: ADMP Vs. Pre-Design 24-HR Volume Comparison
- Table 6: Channel Design Flow Summary

Table 3: FCDMC Corrected ADMP Vs. Pre-Design Discharge Comparison

Watson Subbasins	Post Reten ID	ADMP 100YR, 6HR STORM		ADMP 100YR, 24HR STORM		WATSON 100YR, 6HR STORM				WATSON 100YR, 24HR STORM			
		"A"	"B"	"C"	"D"	"E"	"F"	"A" - "E"	"B" - "F"	"G"	"H"	"C" - "G"	"D" - "H"
		SUBBASIN Q (cfs)	POST RETEN Q (cfs)	SUBBASIN Q (cfs)	POST RETEN Q (cfs)	SUBBASIN Q (cfs)	POST RETEN Q (cfs)	SUBBASIN DIFFERENCE	POST RETEN DIFFERENCE	SUBBASIN Q (cfs)	POST RETEN Q (cfs)	SUBBASIN DIFFERENCE	POST RETEN DIFFERENCE
12	12-O	1195	168	1026	41	1157	0	38	168	1156	0	-130	41
13	13-O	1152	175	895	33	909	0	243	175	919	0	-24	33
23	23-O	548	0	427	0	455	77	93	-77	448	161	-21	-161
24	24-O	912	912	705	705	731	731	181	181	746	746	-41	-41
25	25-O	300	0	233	0	236	6	64	-6	235	18	-2	-18
26	26-O	750	750	581	581	606	606	144	144	621	621	-40	-40
36	36-O	633	439	523	397	558	56	75	383	553	184	-30	213
37	37-O	962	25	929	19	996	190	-34	-165	1031	453	-102	-434
38	38-O	565	170	444	39	473	98	92	72	465	214	-21	-175
39	39-O	694	257	582	125	623	229	71	28	610	339	-28	-214
40	40-O	838	176	749	108	797	200	41	-24	787	326	-38	-218
48	48-O	621	213	483	60	518	146	103	67	505	245	-22	-185
49	49-O	781	0	700	2	743	0	38	0	737	21	-37	-19
50	50-O	805	235	721	203	769	218	36	17	758	402	-37	-199
51	51-O	814	299	729	301	783	281	31	18	765	394	-36	-93
57	57-O	1263	196	971	66	998	944	265	-748	1008	947	-37	-881
58	58-O	522	442	402	369	420	24	102	418	416	72	-14	297
70	70-O	309	218	240	168	258	33	51	185	248	65	-8	103
71	71-O	447	125	346	58	362	50	85	75	357	69	-11	-11
72	72-O	221	23	170	9	181	1	40	22	175	9	-5	0
83	83-O	810	708	669	598	701	174	109	534	672	204	-3	394
93	93-O	723	614	564	475	554	346	169	268	527	422	37	53
94	94-O	963	647	808	584	927	772	36	-125	875	712	-67	-128
95	95-O	602	399	483	293	576	477	26	-78	532	483	-49	-190
96	96-O	909	376	796	319	872	607	37	-231	833	559	-37	-240
97	97-O	563	354	448	223	488	353	75	1	463	369	-15	-146
100	100-O	587	302	479	98	526	254	61	48	506	279	-27	-181
10E	10E-O	687	687	551	551	625	138	62	549	615	241	-64	310
11A	11A-O	1274	0	1030	2	1067	0	207	0	1075	6	-45	-4
11B	11B-O	698	12	560	7	596	0	102	12	586	12	-26	-5
11C	11C-O	547	71	419	8	440	5	107	66	437	22	-18	-14
14A	14A-O	815	4	680	5	720	2	95	2	712	31	-32	-26
14B	14B-O	919	0	705	2	719	0	200	0	729	0	-24	2
22E	22E-O	447	68	344	10	362	47	85	21	358	130	-14	-120
47N	47N-O	303	68	234	18	232	50	71	18	225	107	9	-89
56A	56A-O	644	476	495	365	764	256	-120	220	761	392	-266	-27
56B	56B-O	892	395	685	190	706	44	186	351	708	125	-23	65
92N	92N-O	884	729	692	567	634	455	250	274	609	524	83	43
92S	92S-O	1268	851	1057	772	1065	795	203	56	1004	907	53	-135

Table 4: FCDMC Corrected ADMP Vs. Pre-Design 6-HR Volume Comparison

Watson Subbasins	Post Reten ID	Stor Div ID	ADMP PEAK 100YR, 6HR STORM		WATSON 100YR, 6HR STORM		6HR VOLUME COMPARISON			
			"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"*
			SUBBASIN 'V'	STOR 'V'	Subbasin	STOR 'V'	=A - C	=B - D	=E/A	=F/B
			(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)	Subbasin Diff	Reten Diff	Subbasin % change	Retention % change
12	12-O	12RET	62.8	57.17	63.72	63.72	-0.92	-6.55	-1%	-11%
13	13-O	13RET	46.61	41.1	41.68	41.68	4.93	-0.58	11%	-1%
23	23-O	23RET	41.21	41.21	36.67	33.3	4.54	7.91	11%	19%
24	24-O	24RET	34.04	0.3	31.72	0.3	2.32	0	7%	0%
25	25-O	25RET	20.24	20.24	16.28	16.08	3.96	4.16	20%	21%
26	26-O	26RET	33.72	1.6	30.35	3.5	3.37	-1.9	10%	-119%
36	36-O	36RET	50.17	30.4	46.3	43.4	3.87	-13	8%	-43%
37	37-O	37RET	101.19	99.97	102.21	92.61	-1.02	7.36	-1%	7%
38	38-O	38RET	42.51	36.72	37.94	33.3	4.57	3.42	11%	9%
39	39-O	39RET	56.6	47.5	52.62	43.7	3.98	3.8	7%	8%
40	40-O	40RET	73.32	65.92	69.73	61.6	3.59	4.32	5%	7%
48	48-O	48RET	41.59	35.1	37.68	31.6	3.91	3.5	9%	10%
49	49-O	49RET	73.95	73.95	70.1	70.1	3.85	3.85	5%	5%
50	50-O	50RET	74.99	63.8	71.48	61.2	3.51	2.6	5%	4%
51	51-O	51RET	77.07	61.5	74.01	62.3	3.06	-0.8	4%	-1%
57	57-O	57RET	50.06	43.7	46.69	27.4	3.37	16.3	7%	37%
58	58-O	58RET	19.5	10.6	18.29	16.6	1.21	-6	6%	-57%
70	70-O	70RET	14.75	9.4	13.9	12.3	0.85	-2.9	6%	-31%
71	71-O	71RET	16.32	13.3	15.46	13.6	0.86	-0.3	5%	-2%
72	72-O	72RET	7.98	7.1	7.53	7.47	0.45	-0.37	6%	-5%
83	83-O	83RET	60.95	32	54.62	48.2	6.33	-16.2	10%	-51%
93	93-O	93RET	43.22	28.4	38.58	26	4.64	2.4	11%	8%
94	94-O	94RET	72.46	45.9	71.16	42.9	1.3	3	2%	7%
95	95-O	95RET	55.76	37.5	54.86	32.3	0.9	5.2	2%	14%
96	96-O	96RET	82.46	62.5	79.2	54.5	3.26	8	4%	13%
97	97-O	97RET	47.22	33.5	42.91	28.1	4.31	5.4	9%	16%
100	100-O	100RET	47.11	36.8	44.82	34.8	2.29	2	5%	5%
10E	10E-O	10ERET	45.44	13.1	44.49	38.8	0.95	-25.7	2%	-196%
11A	11A-O	11ARET	54.09	54.09	52.27	52.27	1.82	1.82	3%	3%
11B	11B-O	11BRET	46.5	45.72	42.41	42.41	4.09	3.31	9%	7%
11C	11C-O	11CRET	26.97	24.7	23.98	23.8	2.99	0.9	11%	4%
14A	14A-O	14ARET	52.7	52.61	48.75	48.67	3.95	3.94	7%	7%
14B	14B-O	14BRET	39.93	39.93	34.28	34.28	5.65	5.65	14%	14%
22E	22E-O	22ERET	22.57	20.3	20.11	17.9	2.46	2.4	11%	12%
47N	47N-O	47NRET	19.23	16.7	16.44	14.2	2.79	2.5	15%	15%
56A	56A-O	56ARET	36.55	22.8	38.75	30.2	-2.2	-7.4	-6%	-32%
56B	56B-O	56BRET	34.26	27.1	31.82	29.1	2.44	-2	7%	-7%
92N	92N-O	92NRET	43.14	26.3	39.76	25.9	3.38	0.4	8%	2%
92S	92S-O	92SRET	84.4	55.3	79.56	51.7	4.84	3.6	6%	7%
									Avg = 0.07	

**Column "H" represent the change in the estimated development storage volume between the ADMP and the Watson Pre-Design. Negative values indicate an increase in storage from the ADMP value.*

The yellow highlighted cells indicate subbasins with a large change in storage volume. Storage volumes were re-evaluated for the Watson Pre-Design hydrology update.

Table 5: FCDMC Corrected ADMP Vs. Pre-Design 24-HR Volume Comparison

Watson Subbasins	Post Reten ID	Stor Div ID	ADMP PEAK 100YR, 24HR STORM		WATSON 100YR, 24HR STORM		24HR VOLUME COMPARISON			
			"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"*
			SUBBASIN 'V'	STOR 'V'	Subbasin	STOR 'V'	=A - C	=B - D	=E/A	=F/B
			(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)	Subbasin Diff	Reten Diff	Subbasin % change	Retention % change
12	12-O	12RET	69.27	57.4	78.84	78.84	-9.57	-21.44	-14%	-37%
13	13-O	13RET	50.22	41.1	49.84	49.84	0.38	-8.74	1%	-21%
23	23-O	23RET	43.72	43.72	45.64	33.3	-1.92	10.42	-4%	24%
24	24-O	24RET	32.67	0.3	36.33	0.3	-3.66	0	-11%	0%
25	25-O	25RET	20.71	20.71	19.22	16.6	1.49	4.11	7%	20%
26	26-O	26RET	32.26	1.6	36.33	3.5	-4.07	-1.9	-13%	-119%
36	36-O	36RET	53.85	30.4	57.46	43.4	-3.61	-13	-7%	-43%
37	37-O	37RET	118.74	110	131.95	92.9	-13.21	17.1	-11%	16%
38	38-O	38RET	45.24	36.8	47.24	33.3	-2	3.5	-4%	10%
39	39-O	39RET	61.82	47.5	64.58	43.7	-2.76	3.8	-4%	8%
40	40-O	40RET	82.53	66.3	86.39	61.6	-3.86	4.7	-5%	7%
48	48-O	48RET	44.39	35.1	46.25	31.6	-1.86	3.5	-4%	10%
49	49-O	49RET	83.88	83.27	87.88	78.8	-4	4.47	-5%	5%
50	50-O	50RET	84.63	63.8	88.59	61.2	-3.96	2.6	-5%	4%
51	51-O	51RET	86.46	61.5	90.42	62.3	-3.96	-0.8	-5%	-1%
57	57-O	57RET	58.49	43.7	60.65	27.4	-2.16	16.3	-4%	37%
58	58-O	58RET	22.87	10.6	23.61	16.6	-0.74	-6	-3%	-57%
70	70-O	70RET	17.29	9.4	17.82	12.3	-0.53	-2.9	-3%	-31%
71	71-O	71RET	19.04	13.3	19.62	13.6	-0.58	-0.3	-3%	-2%
72	72-O	72RET	9.37	7.1	9.64	7.5	-0.27	-0.4	-3%	-6%
83	83-O	83RET	65.6	32	63.19	48.2	2.41	-16.2	4%	-51%
93	93-O	93RET	51.68	28.4	49.33	26	2.35	2.4	5%	8%
94	94-O	94RET	75.27	45.9	82.13	42.9	-6.86	3	-9%	7%
95	95-O	95RET	58.77	37.5	64.77	32.3	-6	5.2	-10%	14%
96	96-O	96RET	80.45	62.5	85.28	54.5	-4.83	8	-6%	13%
97	97-O	97RET	46.57	33.5	47.18	28.1	-0.61	5.4	-1%	16%
100	100-O	100RET	44.61	36.8	48.96	34.8	-4.35	2	-10%	5%
10E	10E-O	10ERET	48.26	13.1	56.02	38.8	-7.76	-25.7	-16%	-196%
11A	11A-O	11ARET	58.23	57.33	63.37	62.1	-5.14	-4.77	-9%	-8%
11B	11B-O	11BRET	49.8	46.3	51.96	46.7	-2.16	-0.4	-4%	-1%
11C	11C-O	11CRET	28.54	24.7	29.73	24.5	-1.19	0.2	-4%	1%
14A	14A-O	14ARET	56.45	54.3	59	50.7	-2.55	3.6	-5%	7%
14B	14B-O	14BRET	42.22	41.52	41.97	41.97	0.25	-0.45	1%	-1%
22E	22E-O	22ERET	23.9	20.3	24.88	17.9	-0.98	2.4	-4%	12%
47N	47N-O	47NRET	20.8	16.7	20.3	14.2	0.5	2.5	2%	15%
56A	56A-O	56ARET	40.71	22.8	50.57	30.2	-9.86	-7.4	-24%	-32%
56B	56B-O	56BRET	40.12	27.1	41.47	29.1	-1.35	-2	-3%	-7%
92N	92N-O	92NRET	52.64	26.3	50.66	25.9	1.98	0.4	4%	2%
92S	92S-O	92SRET	98.56	55.3	98.33	51.7	0.23	3.6	0%	7%
									Avg = -0.05	

**Column "H" represent the change in the estimated development storage volume between the ADMP and the Watson Pre-Design. Negative values indicate an increase in storage from the ADMP value.*

The yellow highlighted cells indicate subbasins with a large change in storage volume. Storage volumes were re-evaluated for the Watson Pre-Design hydrology update.

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Table 6: Channel Design Flow Summary

CHANNEL HEC-1 ROUTE ID	UPSTREAM HEC-1 ID	ADMP DESIGN FLOW (CFS)	WATSON PRE-DESIGN 100Y, 6HR FLOW (CFS)	WATSON PRE-DESIGN 100Y, 24HR FLOW (CFS)	ROUNDED DESIGN FLOW (24 HR) (CFS)	HIGH FLOW STORM DURATION	Change from ADMP Design Flow Rate (+/-/=)
WC-08	&MB01	292	286	290	**290**	24 HR	DECREASE
WC-07	O5	415	285	549	**550**	24 HR	INCREASE
WC-06	O6	544	282	688	**690**	24 HR	INCREASE
WC-05	&MB02	272	260	274	**270**	24 HR	INCREASE
WC-04	O8	1,419	281	502	**500**	24 HR	DECREASE
WC-03B	O9	1,425	356	582	**580**	24 HR	DECREASE
WC-03A	O9	1,425	356	582	**580**	24 HR	DECREASE
WC-15	&MB03	124	70	117	**120**	24 HR	DECREASE
WC-14	&MB03	124	70	117	**120**	24 HR	DECREASE
WC-13	M1	124	93	536	**540**	24 HR	INCREASE
WC-16	M2A	332	47	125	**130**	24 HR	DECREASE
WC-12B	&MB04	168	25	174	**170**	24 HR	INCREASE
WC-12A	&MB04	168	25	174	**170**	24 HR	INCREASE
WC-11	N5B	595	395	459	**460**	24 HR	DECREASE
WC-10	N6	398	80	383	**380**	24 HR	DECREASE
WC-09C	N6	398	80	383	**380**	24 HR	DECREASE
WC-09B	N6	398	80	383	**380**	24 HR	DECREASE
WC-09A	N6	398	80	383	**380**	24 HR	DECREASE
WC-02	O10B	1,500	477	785	**790**	24 HR	DECREASE
WC-01	P9	1,121	891	1,006	**1,010**	24 HR	DECREASE