| ENERCON | CALCULATION COVER SHEET | TXUT-001-FSAR 2.4.3-CALC-011 |
|---|---|---|
| | | REV. 3 |
| | | PAGE NO. 1 of 47 |

| | | |
|---|---|---|
| Title: | Probable Maximum Precipitation Calculation for Comanche Peak Nuclear Power Plant Units 3 and 4 using HMR 51 & HMR 52. | Client: Luminant<br>Project: MITS116 – Luminant COLA |

| Item | Cover Sheet Items | Yes | No |
|---|---|---|---|
| 1 | Does this calculation contain any open assumptions that require confirmation? (If **YES**, identify the assumptions)_____ | | X |
| 2 | Does this calculation serve as an "Alternate Calculation"? (If **YES**, identify the design verified calculation.)<br>**Design Verified Calculation No.**_____ | | X |
| 3 | Does this calculation supersede an existing calculation? (If **YES**, identify the superseded calculation.)<br>**Superseded Calculation No.**_____ | | X |

**Scope of Revision:** The calculation was revised to utilize the HEC-HMS model, which is described in detail in calculation TXUT-001-FSAR 2.4.3-CALC-012, Rev. 3. Erroneous reaches have been removed from the HEC-HMS model and the basins have been configured to represent the conditions of the watershed. Some minor editorial changes have also been addressed.

**Revision Impact on Results:** The Runoff estimates using HEC-HMS at the junction of Paluxy River and Squaw Creek increased due to the revision. The critical storm centers for the overall watershed remain the same. However, the critical temporal distribution for the Paluxy River watershed was revised to the two-thirds distribution.

| | | | |
|---|---|---|---|
| **Study Calculation** | ☐ | **Final Calculation** | ☒ |
| **Safety-Related** | ☒ | **Non-safety-Related** | ☐ |

***(Print Name and Sign)***

| | | |
|---|---|---|
| **Originator: Suraj A. Balan** | SABalan | **Date:** 12/10/2010 |
| **Design Verifier: Bryan D. Cline** | Bryan D. Cline | **Date: 12/10/2010** |
| **Approver: Pat Brunette** | Pat Brunette | **Date:** 12/10/2010 |
| **Joe Mancinelli** | JMancinelli | 12/10/2010 |

## CALCULATION REVISION STATUS

| REVISION | DATE | DESCRIPTION |
|---|---|---|
| 0 | August 04, 2008 | Original Calculation |
| 1 | August 14, 2009 | Revision 1 – The revised calculation accounts for updated Snyder's unit hydrograph coefficients. |
| 2 | June 24, 2010 | Included PMP computation within the Squaw Creek Reservoir watershed (Basin 1 only) and also utilized revised HEC-HMS Model from Calc 012. |
| 3 | December 10, 2010 | Revised to utilize HEC-HMS Model from Calc 012, Rev 3. |

## PAGE REVISION STATUS

| PAGE NO. | REVISION | PAGE NO. | REVISION |
|---|---|---|---|
| All | 3 | | |

## APPENDIX REVISION STATUS

| APPENDIX NO. | PAGE NO. | REVISION NO. | APPENDIX NO. | PAGE NO. | REVISION NO. |
|---|---|---|---|---|---|
| A | All | 2 | | | |

**Calculation Design Verification Plan:**

Apply CSP Number 3.01, Revision 6, Section 4.5.a, Design Review Method and to include at a minimum:

1. Review the changes due to Revision 3 and determine if the calculation provides a reasonable estimate of the PMP.
2. Review the design methodology and determine if it is appropriate and correctly applied and is accurate.

***(Print Name and Sign for Approval – mark "N/A" if not required)***

| | |
|---|---|
| **Approver:** **Pat Brunette** Pat Brunette<br>**Joe Mancinelli** JMancinelli | **Date:** 12/10/2010 |

**Calculation Design Verification Summary:**

I have reviewed the Comanche Peak PMP calculation Revision 3 and have made the following conclusions:

1. The Revision 3 calculation methodology, assumptions and inputs applied are reasonable and are in accordance with CSP Number 3.01 Revision 6.
2. The guidelines for the Comanche Peak PMP calculation are appropriate and applicable for the determination of the resulting water surface elevation.
3. The methodology applied to this set of calculations is appropriate and has been applied correctly.
4. The calculation provides a reasonable estimate of the PMP and the summary of calculations has been independently verified.
5. The Originator has addressed the recommendations given during the review process.

**Based on the above summary, the calculation is determined to be acceptable.**

***(Print Name and Sign)***

| | |
|---|---|
| **Design Verifier: Bryan D. Cline** Bryan D. Cline | **Date: 12/10/2010** |
| **Others:** | **Date:** |

| ENERCON | CALCULATION<br>DESIGN VERIFICATION<br>CHECKLIST | TXUT-001-FSAR 2.4.3-CALC-011<br>REV. 3<br>PAGE NO. 4 of 47 |
|---|---|---|

| Item | Cover Sheet Items | Yes | No | N/A |
|---|---|---|---|---|
| 1 | Design Inputs - Were the design inputs correctly selected, referenced (latest revision), consistent with the design basis and incorporated in the calculation? | X | | |
| 2 | Assumptions – Were the assumptions reasonable and adequately described, justified and/or verified, and documented? | X | | |
| 3 | Quality Assurance – Were the appropriate QA classification and requirements assigned to the calculation? | X | | |
| 4 | Codes, Standard and Regulatory Requirements – Were the applicable codes, standards and regulatory requirements, including issue and addenda, properly identified and their requirements satisfied? | X | | |
| 5 | Construction and Operating Experience – Have applicable construction and operating experience been considered? | | | X |
| 6 | Interfaces – Have the design interface requirements been satisfied, including interactions with other calculations? | X | | |
| 7 | Methods – Was the calculation methodology appropriate and properly applied to satisfy the calculation objective? | X | | |
| 8 | Design Outputs – Was the conclusion of the calculation clearly stated, did it correspond directly with the objectives and are the results reasonable compared to the inputs? | X | | |
| 9 | Radiation Exposure – Has the calculation properly considered radiation exposure to the public and plant personnel? | | | X |
| 10 | Acceptance Criteria – Are the acceptance criteria incorporated in the calculation sufficient to allow verification that the design requirements have been satisfactorily accomplished? | X | | |
| 11 | Computer Software – Is a computer program or software used, and if so, are the requirements of CSP 3.02 met? | X | | |

COMMENTS:

| *(Print Name and Sign)* | |
|---|---|
| **Design Verifier: Bryan D. Cline** Bryan D. Cline | **Date: 12/10/2010** |
| **Others:** | **Date:** |

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## 1.0 Purpose and Scope

The purpose of this calculation is to determine the 72-hour Probable Maximum Precipitation (PMP) distributions using Hydrometeorological Report (HMR) 51 (Reference 2) and HMR 52 (Reference 3) for the Comanche Peak Nuclear Power Plant (CPNPP) Units 3 and 4. The PMP distributions are used as input to determine the Probable Maximum Flood (PMF).

## 2.0 Summary of Results and Conclusions

The PMP distributions are calculated for the following scenarios:

- Overall PMP for storm centers within the Squaw Creek watershed
- Overall PMP for storm centers within the Paluxy River watershed
- Squaw Creek Reservoir PMP for storm centers within the Squaw Creek watershed

The Squaw Creek and Paluxy River watersheds are shown in Figure 7-1. The critical storm center within the Paluxy River watershed (Basin 4) results in the maximum PMP for the overall watershed (Basins 1, 2, 3 and 4 combined) at the confluence of Paluxy River and Squaw Creek. Additionally, when the storm center was kept in the Squaw Creek watershed (Basin 1), it resulted in a higher PMP for the Squaw Creek watershed. A higher PMP for the Squaw Creek watershed can result in a higher water surface elevation at CPNPP Units 3 and 4. The PMP for the critical storm center and each basin for the above mentioned scenarios was analyzed individually to determine the resulting peak runoff and the water surface elevation.

Table 2-1 summarizes the 6-hour incremental PMP estimates in inches (in.). The PMP estimates for different trial centers are presented in Section 7.0, Table 7-8.

Table 2-1. 6-Hour Incremental PMP Estimates

| 6-hour increment (hour from 0) | Overall PMP (with storm center in Paluxy River watershed) (in.) | Overall PMP (with storm center in Squaw Creek watershed) (in.) | Squaw Creek Reservoir PMP (Basin 1 Only) (in.) |
|---|---|---|---|
| 6 | 0.60 | 0.59 | 0.61 |
| 12 | 0.72 | 0.72 | 0.74 |
| 18 | 0.92 | 0.91 | 0.94 |
| 24 | 1.25 | 1.24 | 1.28 |
| 30 | 1.97 | 1.96 | 2.02 |
| 36 | 4.64 | 5.10 | 5.01 |
| 42 | 18.18 | 21.10 | 24.93 |
| 48 | 2.77 | 2.82 | 2.87 |
| 54 | 1.52 | 1.52 | 1.57 |
| 60 | 1.06 | 1.05 | 1.08 |
| 66 | 0.81 | 0.80 | 0.82 |
| 72 | 0.65 | 0.65 | 0.66 |
| Total | 35.08 | 38.46 | 42.53 |

The storm rainfall total for the Overall PMP is 35.08 in. for a 450 square mile (sq. mi.) storm, centered near the overall watershed centroid with an orientation of 172 degrees. The storm rainfall total for the Overall PMP is 38.46 in. for a 700 sq. mi. storm, centered near the Squaw Creek watershed centroid with an orientation of 145 degrees. The storm rainfall total for the Squaw Creek Reservoir PMP (Basin 1 Only) is 42.53 in. for a 100 sq. mi. storm, centered near the Squaw Creek watershed centroid with an orientation of 181 degrees. The critical storm centers for the Paluxy River and the Squaw Creek are indicated as PR Y and SC X, respectively, as shown in Figure 7-1. The two-thirds peaking temporal distribution with the storm center at PR Y is the critical distribution for the Paluxy River watershed. The two-thirds peaking temporal distribution with the storm center at SC X is the critical distribution for the Squaw Creek watershed.

## 3.0 References

1. Autodesk, AutoCAD Civil 3D 2009 software.

2. National Oceanic and Atmospheric Administration, "Hydrometeorological Report No. 51, Probable Maximum Precipitation Estimates, United States East of the 105th Meridian," Prepared by Louis C. Scheriner and John T. Riedel, Hydrometeorological Branch, Office of Hydrology, National Weather Services, Washington D.C. 1978, Reprinted August 1980.

3. National Oceanic and Atmospheric Administration, National Weather Service, Hydrometeorological Report No. 52, Application of Probable Maximum Precipitation Estimates – United States East of the 105th Meridian, August 1982.

4. U.S. Army Corps of Engineers, Hydrologic Engineering Center, Generalized Computer Program, HMR 52, Probable Maximum Storm (Eastern United States), User's Manual, CPD-46, Revised April 1987.

5. U.S. Army Corps of Engineers, Hydrologic Engineering Center, Generalized Computer Program, HMR 52, Probable Maximum Storm, Revised April 1991.

6. U.S. Army Corps of Engineers, Hydrologic Engineering Center, Hydrologic Modeling System, HEC-HMS computer software, version 3.4.

7. U.S. Geological Survey, Geospatial Data Gateway Website, http://datagateway.nrcs.usda.gov/gatewayhome.html, accessed December 27, 2007.

8. ESRI ArcGIS, Release 9.2, Copyright 1999-2006.

9. Enercon Calculation, "TXUT-001-FSAR 2.4.3 CALC-012, Rev. 3 MITS004 – Probable Maximum Flood Calculation for Comanche Peak Nuclear Power Plant Units 3 and 4 (HEC-HMS & HEC-RAS)."

10. Squaw Creek Dam TX04627 Breach Analysis, April 2008, Prepared for TXU by Freese and Nichols Inc.

11. U.S. Nuclear Regulatory Commission, "Design Basis Floods for Nuclear Power Plants," Regulatory Guide 1.59, August 1977.

12. American Nuclear Society, "American National Standard for Determining Design Basis Flooding at Power Reactor Sites," ANSI/ANS-2.8-1992, American Nuclear Society, La Grange Park, Illinois, July 28, 1992.
13. U.S. Nuclear Regulatory Commission, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants," Regulatory Guide 1.70, November 1978.
14. U.S. Nuclear Regulatory Commission, "Flood Protection for Nuclear Power Plants," Regulatory Guide 1.102, September 1976.
15. U.S. Nuclear Regulatory Commission, "Combined License Applications for Nuclear Power Plants," Regulatory Guide 1.206, June 2007.
16. U.S. Nuclear Regulatory Commission, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," NUREG-0800, May 2007.
17. U.S. Nuclear Regulatory Commission, "Early Site Permits; Standard design Certifications; and Combined Licenses for Nuclear Power Plants," 10 CFR Part 52, August 2007.
18. U.S. Nuclear Regulatory Commission, "Industry Guidelines for Combined License Applicants under 10 CFR Part 52," NEI 04-05, October 2005.
19. Texas Utilities Services Inc., Comanche Peak Stream Electric Station CPSES 1980-1982, Units 1 and 2, "Safe Shutdown Impoundment Dam, Design Calculations and Calculations Check," Volume 1, by Freese and Nichols.
20. Texas Utilities Services Inc., Comanche Peak Stream Electric Station CPSES 1980-1982, Units 1 and 2, "Safe Shutdown Impoundment Dam, Design Calculations and Calculations Check," Volume 2, by Freese and Nichols.

## 4.0 Assumptions

None.

## 5.0 Design Inputs

Drainage basin location is the input needed for HMR 51. The CPNPP Units 3 and 4 locations from the USGS Hill City, TX Quadrangle NAD83 (Reference 7) are as follows:
32° 18' 10" N
97° 47' 30" W

Input to the HMR 52 software includes the coordinates defining the drainage basins shown in Figure 7-1. The drainage area boundaries shown in the Dam Breach Analysis (Reference 10) were digitized in AutoCAD (Reference 1). The drainage basin coordinates for the digitized sub-basin shapes were input to HMR 52 (Reference 5). HMR 52 determines the basin area using the X, Y coordinates input. The digitized image was not inserted to scale, hence the basin areas were adjusted by utilizing a scale factor. A scale factor of 0.05827 was applied in HMR 52 (Reference 5) to adjust the X, Y coordinates to represent the actual drainage areas for the sub-basins. The watershed shape and areas were also compared by

superimposing the United States Geological Survey's (USGS) topographical map on AutoCAD drawing. USGS topographic maps were obtained from the USDA's Geospatial Data Gateway (Reference 7), and the drainage basin boundaries were mapped using ArcGIS software (Reference 8). The drainage areas reported for the sub-basins in the Dam Breach Analysis (Reference 10) were verified to be an acceptable representation for the watershed. The drainage area coordinates for the sub-basins and overall watershed are provided in Tables 7-3 through 7-7.

HMR 51 resulted in all-season PMP estimates, which are then used as input for the HMR 52. The basin and sub-basin geometry, preferred storm orientation, HMR 51 PMP estimates, storm center, and isohyet A ratio were included as input data into the HMR 52 software.

## 6.0 Methodology

Reference to and compliance with the following listed design guides were considered in evaluating the PMP for CPNPP Units 3 and 4 using HMR 51 & HMR 52. All other procedures, instructions and design guides listed in Section 5.4 of Project Planning Document (PPD No. TXUT-001, Rev. 3) are not specifically applicable in evaluating the PMP.

- U.S. Nuclear Regulatory Commission, "Standard Review Plan," NUREG-0800, March 2007, (Reference 16).
- U.S. Nuclear Regulatory Commission, "Design Basis Floods for Nuclear Power Plants, Alternative Methods of Estimating Probable Maximum Floods," Regulatory Guide 1.59, August 1977, (Reference 11).
- American Nuclear Society, "Determining Design Basis Flooding at Power Reactor Sites," ANSI/ANS-2.8-1992, July 28, 1992, (Reference 12).
- U.S. Nuclear Regulatory Commission, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants," Regulatory Guide 1.70, November 1978, (Reference 13).
- U.S. Nuclear Regulatory Commission, "Flood Protection for Nuclear Power Plants," Regulatory Guide 1.102, September 1976, (Reference 14).
- U.S. Nuclear Regulatory Commission, "Combined License Applications for Nuclear Power Plants (LWR Edition)," Regulatory Guide 1.206, June 2007, (Reference 15).
- U.S. Nuclear Regulatory Commission, "Early Site Permits; Standard design Certifications; and Combined Licenses for Nuclear Power Plants," 10 CFR Part 52, August 2007 (Reference 17).
- U.S. Nuclear Regulatory Commission, "Industry Guidelines for Combined License Applicants under 10 CFR Part 52," NEI 04-05, October 2005, (Reference 18).

The Regulatory Guide 1.59 (Reference 11) indicates use of ANSI N170-1976 "Standards for Determining Design Basis Flooding at Power Reactor Sites," (Reference 12). ANSI/ANS-2.8-1992 was issued to supersede ANSI N170-1976. Although ANSI/ANS-2.8-1992 has been withdrawn, a replacement standard has not been issued by the American Nuclear Society as of June 2010. The NRC NUREG-0800, March 2007 (Reference 16), includes ANSI/ANS-2.8-1992 as a historical technical reference.

HMR 52 applies to areas in the United States east of the 105th Meridian. The HMR 52 software iterates to achieve the optimal storm area size that maximizes precipitation. The resulting storm area size may differ from the actual drainage area of the basin. The HMR 52 software also iterates to achieve the optimal storm orientation that maximizes precipitation. As identified by HMR 52 guidance (Reference 3), when the optimal storm orientation differs from the preferred storm orientation by more than 40 degrees, a reduction to the precipitation should be made. This reduction occurs automatically within the HMR 52 software.

An antecedent storm equal to 40 percent of the PMP precedes the PMP storm with a 3-day dry period between the storms, as described in Nuclear Regulatory Commission (NRC) Regulatory Guide 1.59 (Reference 11) and ANSI/ANS-2.8-1992 (Reference 12), and was considered for the PMF analysis. HMR 52 guidance provides a stepwise approach to determine spatial and temporal distribution of the all-season PMP estimates derived from HMR 51 for incremental durations less than or equal to 6 hours (hr.). HMR 52 provides a recommended elliptical isohyetal pattern (Reference 3, Figure 5) to be used. The critical PMP storm was determined through several iterations of storm center locations within Squaw Creek and Paluxy River watersheds. In addition, HMR 52 recommends a temporal distribution that includes arranging the individual 6-hour increments such that they decrease progressively to either side of the greatest 6-hr. increment. Furthermore, the four greatest 6-hr. increments should be placed at any position except within the first 24-hr. period. The temporal distributions used herein are explained in Section 7.0

Complete descriptions of the HMR 52 process and the HMR 52 software are provided in the HMR 52 guidance (Reference 3) and HMR 52 software user's manual (Reference 4).

HEC-HMS 3.4, HMR 52, AutoCAD Civil 3D 2009 and ESRI ArcGIS Release 9.2 software have been verified and validated in accordance with CSP 3.02, Revision 5. The verification and validation documents are maintained by Enercon as part of the Quality Assurance program.

## 7.0 Calculations

Scenarios

The CPNPP Units 3 and 4 are located just upstream of Squaw Creek Dam, which is located upstream of the confluence of Squaw Creek and Paluxy River shown in Figure 7-1. Therefore, the critical PMP resulting in the PMF for the site may be one of the following:

- Overall PMP with critical storm center within the Squaw Creek watershed
- Overall PMP with critical storm center within the Paluxy River watershed
- Squaw Creek Reservoir PMP with critical storm center within the Squaw Creek watershed

Drainage Areas

The CPNPP Units 3 and 4 are located within the Squaw Creek watershed. Squaw Creek is a tributary of the Paluxy River, and in turn the Paluxy River is a tributary of the Brazos River.

The Squaw Creek and Paluxy River watersheds are divided into four basins, as shown in Figure 7-1. Basins 1 and 2 represent the Squaw Creek watershed, and Basins 3 and 4 represent the Paluxy River watershed. The area upstream of the Squaw Creek Reservoir is steeper and has different basin properties compared to the area around and within the Squaw Creek Reservoir. Due to the variation of slope, Basin 1 has been further subdivided into three sub-basins 1a, 1b and 1c. Basin 1a represents the drainage area above Squaw Creek Reservoir, Basin 1b represents the contributing area adjacent to Squaw Creek Reservoir, and Basin 1c represents Squaw Creek

Reservoir. Basin 2 represents the Squaw Creek watershed downstream of the dam to the confluence of the Paluxy River. Basin 3 represents the Paluxy River watershed from the confluence of Squaw Creek to the city of Glen Rose. Basin 4 represents the drainage area north of Glen Rose. The general drainage pattern is to the southeast and ultimately drains into the Brazos River.

The watershed areas were obtained from the Dam Breach Analysis (Reference 10). The area for the Squaw Creek watershed was also similar to that used in Texas Utilities Services Inc., Comanche Peak Steam Electric Station Units 1 and 2 CPSES SSI Dam Design Calculation and Calculation Check, Volume 1 and 2 (Reference 19 and Reference 20), hereafter referred as the SSI Dam Design Calculation. Figure 7-1 illustrates the watershed sub-basins and boundaries. The drainage areas are shown in Table 7-1.

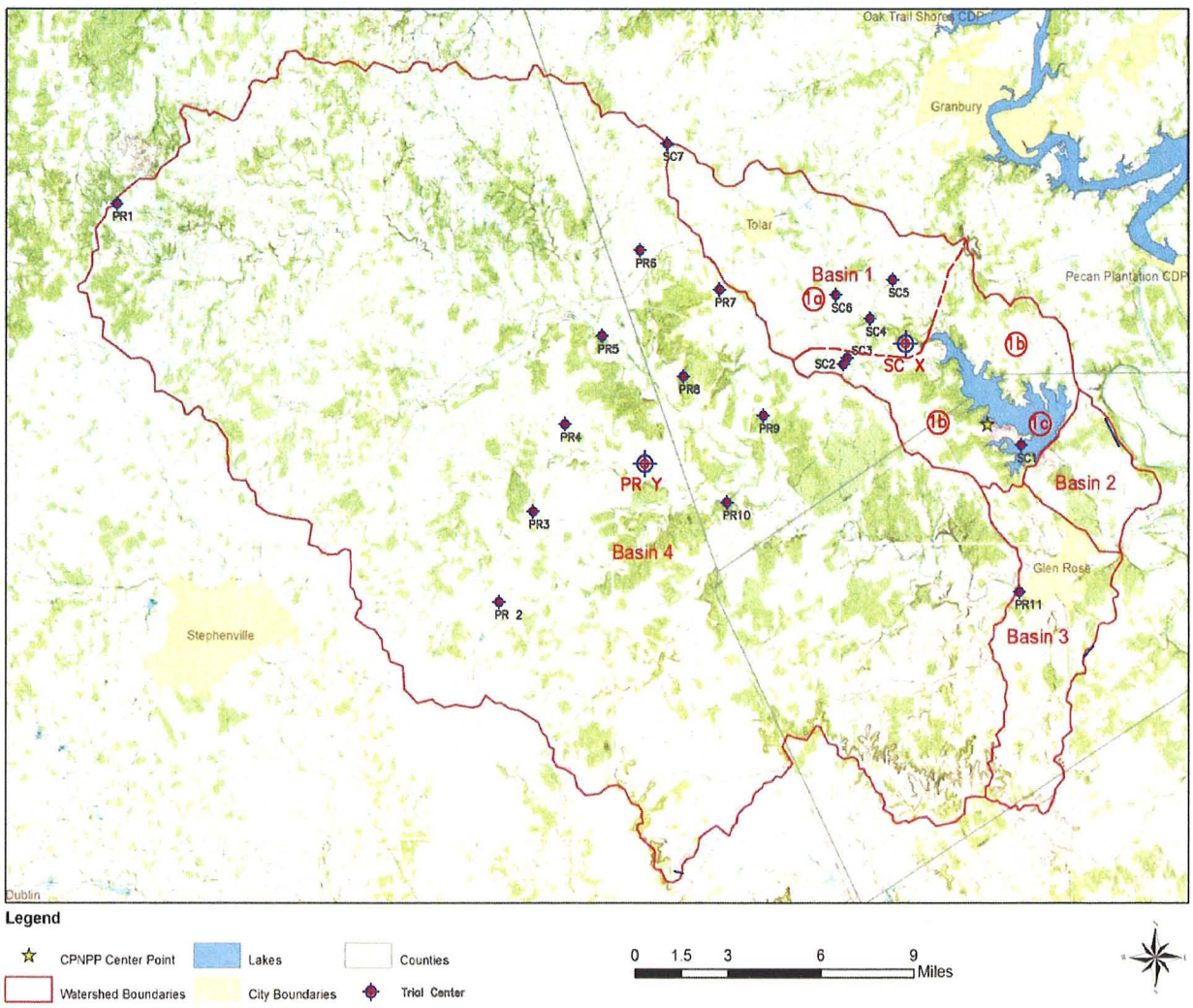


Figure 7-1. Drainage Basin Map with Storm Centers

Table 7-1. Watershed Drainage Areas

| Watershed | Drainage Area (sq. mi.) |
|---|---|
| Basin 1 | 64.2 |
| Basin 2 | 10.65 |
| Basin 3 | 24.3 |
| Basin 4 | 410.0 |

PMP Estimates – HMR 51 and HMR 52

HMR 51 applies to areas in the United States east of the 105th Meridian. The all-season PMP estimates for drainage areas from 10 to 20,000 sq. mi. for durations from 6 to 72 hours are obtained using HMR 51 PMP charts (Reference 2, Figures 18-47) and are shown in Table 7-2. An example of a PMP estimate employing Reference 2, Figure 18 with a basin area of 10 sq. mi. and for duration of 6 hours is shown in Figure 7-2. The CPNPP location is used to determine the PMP estimates in Table 7-2; linear interpolation between contours was used (Reference 2 Figure 19-47).

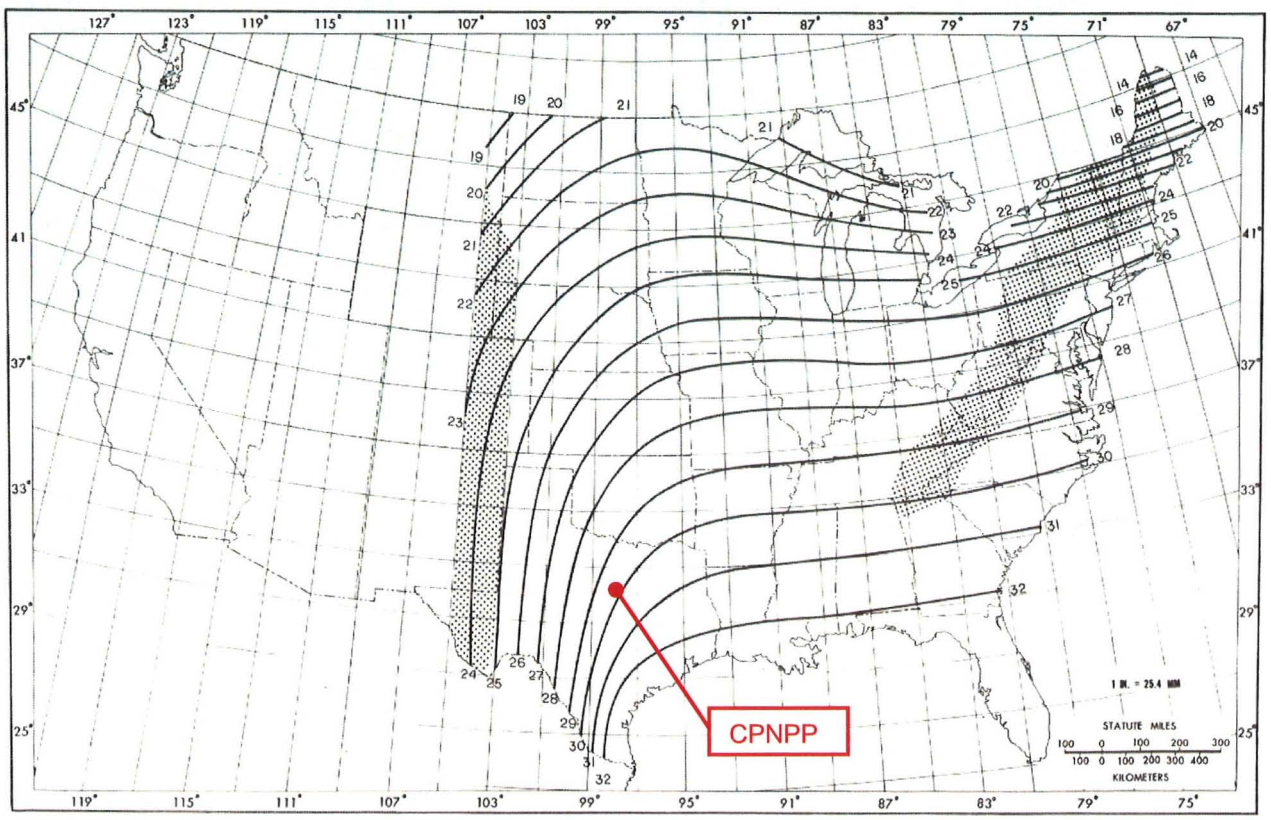


Figure 7-2. All-Season PMP (inch) for 6 hr. 10 sq. mi Basin

Table 7-2. Depth Area Duration PMP Values (inches)

| | | duration (hr.) | | | | |
|---|---|---|---|---|---|---|
| | | 6 | 12 | 24 | 48 | 72 |
| | 10 | 29.7 | 35.3 | 40.0 | 45.0 | 48.0 |
| area | 200 | 22.2 | 26.8 | 32.0 | 36.0 | 39.6 |
| sq. mi. | 1000 | 15.9 | 20.7 | 25.8 | 30.0 | 33.4 |
| | 5000 | 9.3 | 13.1 | 17.8 | 22.0 | 25.0 |
| | 10000 | 7.1 | 10.3 | 14.4 | 18.5 | 21.0 |
| | 20000 | 5.1 | 8.3 | 11.5 | 15.0 | 17.8 |

USGS topographic maps were obtained from the USDA's Geospatial Data Gateway (Reference 7), and the drainage basin boundaries were mapped using ArcGIS software (Reference 8). The drainage basin coordinates are shown in Table 7-3. HMR 52 determines the basin area using the X, Y coordinates specified in Tables 7-3 through 7-7. The coordinates are provided in counter-clockwise order to describe the Paluxy River and Squaw Creek watersheds. The coordinates were drawn in AutoCAD (Reference 1), and line segments between each set of coordinates were connected with a continuous AutoCAD polyline. The last coordinate was connected to the first coordinate to describe the complete watershed. The CPNPP location as described in Section 5.0 corresponds to X, Y coordinate of 326 feet (ft.) and 215 ft. respectively in AutoCAD (Reference 1).

Table 7-3. Basin 1 Drainage Basin Coordinates

| Basin 1 | | Basin 1 | |
|---|---|---|---|
| X (ft.) | Y(ft.) | X (ft.) | Y(ft.) |
| 352.79 | 439.49 | 377.46 | 249.82 |
| 330.08 | 425.42 | 398.65 | 273.83 |
| 309.24 | 374.54 | 380.84 | 307.02 |
| 294.79 | 331.20 | 385.89 | 320.85 |
| 305.63 | 266.57 | 375.51 | 358.76 |
| 288.78 | 244.31 | 379.90 | 370.70 |
| 298.06 | 211.25 | 370.35 | 385.48 |
| 296.58 | 200.39 | 371.38 | 393.09 |
| 308.64 | 181.51 | 365.40 | 396.82 |
| 318.80 | 185.02 | 356.46 | 395.52 |
| 322.02 | 180.91 | 349.53 | 405.43 |
| 356.16 | 177.00 | 353.98 | 411.90 |
| 364.98 | 179.72 | 353.13 | 420.90 |
| 366.54 | 181.01 | 356.42 | 429.53 |
| 386.16 | 198.56 | 352.83 | 441.22 |
| 392.28 | 228.19 | | |

Table 7-4. Basin 2 Drainage Basin Coordinates

| Basin2 | | Basin2 | |
|---|---|---|---|
| X (ft.) | Y(ft.) | X (ft.) | Y(ft.) |
| 367.42 | 181.89 | 331.83 | 122.14 |
| 364.98 | 179.72 | 340.98 | 122.91 |
| 356.16 | 177.00 | 349.67 | 115.82 |
| 322.02 | 180.58 | 353.27 | 123.27 |
| 318.79 | 183.71 | 349.84 | 135.16 |
| 308.87 | 181.13 | 354.39 | 137.78 |
| 307.93 | 169.52 | 357.02 | 149.00 |
| 308.46 | 141.75 | 364.94 | 163.23 |
| 303.88 | 128.54 | 364.65 | 170.54 |
| 308.51 | 116.39 | 367.19 | 172.22 |
| 315.41 | 121.11 | | |

Table 7-5. Basin 3 Drainage Basin Coordinates

| Basin3 | | Basin3 | |
|---|---|---|---|
| X (ft.) | Y(ft.) | X (ft.) | Y(ft.) |
| 296.69 | 200.58 | 200.78 | 92.18 |
| 291.69 | 192.59 | 217.93 | 92.91 |
| 285.04 | 188.09 | 233.49 | 104.32 |
| 281.37 | 177.77 | 243.97 | 104.64 |
| 281.37 | 167.45 | 247.19 | 101.71 |
| 275.37 | 160.46 | 253.98 | 106.79 |
| 260.06 | 154.76 | 261.76 | 105.33 |
| 251.89 | 154.76 | 272.19 | 107.43 |
| 246.63 | 153.56 | 277.06 | 101.45 |
| 240.75 | 156.62 | 287.20 | 107.36 |
| 230.63 | 153.31 | 290.72 | 107.36 |
| 225.36 | 145.58 | 294.55 | 114.21 |
| 219.86 | 135.17 | 306.52 | 114.52 |
| 200.07 | 125.34 | 308.51 | 116.39 |
| 164.07 | 115.41 | 303.88 | 128.54 |
| 168.68 | 94.86 | 308.46 | 141.75 |
| 175.89 | 88.63 | 307.93 | 169.52 |
| 172.76 | 82.92 | 308.87 | 181.13 |
| 198.29 | 85.08 | | |

Table 7-6. Basin 4 Drainage Basin Coordinates

| Basin 4 | | Basin 4 | | Basin 4 | |
|---|---|---|---|---|---|
| X (ft.) | Y(ft.) | X (ft.) | Y(ft.) | X (ft.) | Y(ft.) |
| 352.83 | 441.55 | 85.17 | 547.94 | 126.58 | 225.30 |
| 348.27 | 481.91 | 76.93 | 530.64 | 133.09 | 225.30 |
| 349.06 | 512.52 | 85.92 | 505.20 | 136.39 | 213.74 |
| 345.02 | 515.46 | 75.56 | 501.21 | 145.99 | 213.23 |
| 347.40 | 523.63 | 77.81 | 486.11 | 138.58 | 195.37 |
| 339.30 | 523.40 | 82.63 | 484.73 | 143.21 | 187.20 |
| 323.65 | 550.24 | 84.80 | 480.07 | 127.17 | 150.20 |
| 325.81 | 562.78 | 70.55 | 471.39 | 137.74 | 138.83 |
| 317.65 | 565.85 | 66.09 | 460.51 | 139.10 | 127.70 |
| 314.81 | 571.38 | 56.79 | 459.91 | 151.01 | 120.25 |
| 317.41 | 574.39 | 57.55 | 445.42 | 157.40 | 124.31 |
| 315.60 | 579.23 | 49.52 | 431.26 | 164.07 | 115.41 |
| 306.50 | 582.39 | 51.04 | 423.96 | 200.07 | 125.34 |
| 302.11 | 600.03 | 40.80 | 416.89 | 219.86 | 135.17 |
| 295.40 | 600.45 | 40.05 | 406.78 | 230.63 | 153.31 |
| 295.40 | 611.99 | 54.76 | 378.07 | 240.75 | 156.62 |
| 289.69 | 617.28 | 61.58 | 377.45 | 246.73 | 153.56 |
| 284.22 | 639.95 | 65.82 | 347.05 | 251.89 | 154.76 |
| 279.71 | 643.97 | 47.95 | 304.18 | 260.06 | 154.76 |
| 267.30 | 640.65 | 62.30 | 290.43 | 275.37 | 160.46 |
| 258.73 | 651.35 | 35.02 | 242.80 | 281.37 | 167.45 |
| 236.42 | 648.71 | 36.56 | 238.08 | 281.37 | 177.77 |
| 226.97 | 677.81 | 46.93 | 239.96 | 285.03 | 188.09 |
| 213.99 | 664.96 | 55.09 | 236.18 | 291.70 | 192.59 |
| 161.34 | 685.28 | 63.69 | 238.71 | 296.69 | 200.58 |
| 123.53 | 676.86 | 73.84 | 233.34 | 298.06 | 211.24 |
| 111.32 | 664.03 | 72.72 | 225.26 | 288.52 | 244.00 |
| 96.22 | 593.06 | 84.03 | 226.56 | 305.69 | 264.84 |
| 102.62 | 588.70 | 92.24 | 224.02 | 294.79 | 331.20 |
| 97.35 | 567.83 | 97.83 | 224.87 | 330.09 | 425.42 |
| 81.49 | 554.59 | 121.92 | 215.42 | | |

Table 7-7. Overall Watershed Drainage Basin Coordinates

| Overall | | Overall | | Overall | |
|---|---|---|---|---|---|
| X (ft.) | Y(ft.) | X (ft.) | Y(ft.) | X (ft.) | Y(ft.) |
| 352.83 | 441.55 | 82.63 | 484.73 | 198.29 | 85.08 |
| 348.27 | 481.91 | 84.80 | 480.07 | 200.78 | 92.18 |
| 349.06 | 512.52 | 66.09 | 460.51 | 217.93 | 92.91 |
| 345.02 | 515.46 | 56.79 | 459.91 | 233.49 | 104.32 |
| 347.40 | 523.63 | 57.55 | 445.42 | 243.97 | 104.64 |
| 339.30 | 523.40 | 49.52 | 431.26 | 277.06 | 101.45 |
| 323.65 | 550.24 | 51.04 | 423.96 | 294.55 | 114.21 |
| 325.81 | 562.78 | 40.80 | 416.89 | 315.41 | 121.11 |
| 317.65 | 565.85 | 40.05 | 406.78 | 331.83 | 122.14 |
| 314.81 | 571.38 | 54.76 | 378.07 | 340.98 | 122.91 |
| 317.41 | 574.39 | 65.82 | 347.05 | 349.67 | 115.82 |
| 315.60 | 579.23 | 47.95 | 304.18 | 353.27 | 123.27 |
| 306.50 | 582.39 | 62.30 | 290.43 | 349.84 | 135.16 |
| 302.11 | 600.03 | 35.02 | 242.80 | 354.39 | 137.78 |
| 295.40 | 600.45 | 36.56 | 238.08 | 367.19 | 172.22 |
| 295.40 | 611.99 | 63.69 | 238.71 | 367.42 | 181.89 |
| 289.69 | 617.28 | 73.84 | 233.34 | 386.16 | 198.56 |
| 284.22 | 639.95 | 72.72 | 225.26 | 392.28 | 228.19 |
| 279.71 | 643.97 | 84.03 | 226.56 | 377.46 | 249.82 |
| 267.30 | 640.65 | 121.92 | 215.42 | 398.65 | 273.83 |
| 258.73 | 651.35 | 126.58 | 225.30 | 380.84 | 307.02 |
| 236.42 | 648.71 | 133.09 | 225.30 | 385.89 | 320.85 |
| 226.97 | 677.81 | 136.39 | 213.74 | 375.51 | 358.76 |
| 213.99 | 664.96 | 145.99 | 213.23 | 379.90 | 370.70 |
| 161.34 | 685.28 | 138.58 | 195.37 | 370.35 | 385.48 |
| 123.53 | 676.86 | 143.21 | 187.20 | 371.38 | 393.09 |
| 111.32 | 664.03 | 127.17 | 150.20 | 365.40 | 396.82 |
| 96.22 | 593.06 | 137.74 | 138.83 | 356.46 | 395.52 |
| 102.62 | 588.70 | 151.01 | 120.25 | 349.53 | 405.43 |
| 85.17 | 547.94 | 157.40 | 124.31 | 353.98 | 411.90 |
| 76.93 | 530.64 | 164.07 | 115.41 | 353.13 | 420.90 |
| 85.92 | 505.20 | 168.68 | 94.86 | 356.42 | 429.53 |
| 75.56 | 501.21 | 175.89 | 88.63 | | |
| 77.81 | 486.11 | 486.11 | 172.76 | | |

HMR 52 (Reference 4, Figure 3) was used to determine the preferred orientation of 215 degrees for the storm. HMR 52 (Reference 5) software iterates to achieve the optimal storm orientation that maximizes precipitation. As identified by HMR 52 guidance (Reference 3), when the optimal storm orientation differs from the preferred storm orientation by more than 40 degrees, a reduction to the precipitation should be made. This reduction occurs automatically within the HMR 52 software. The optimal storm orientation calculated by HMR 52 software is 172 degrees and 145 degrees for storm centers at PR Y and SC X, respectively. HMR 52 (Reference 4, Figure 8) was used to determine the 1-hr. to 6-hr. precipitation ratio of 0.308 for isohyet A of a 20,000 sq. mi. storm.

Determining the critical storm center is an iterative process of computing the hourly PMP and rainfall runoff for several storm centers. The trial centers are shown in Figure 7-1. The HMR 52 (Reference 5) and HEC-HMS (Reference 6) analysis indicates that the trial centers PR Y and SC X result in the maximum rainfall runoff estimates for the overall watershed and the Squaw Creek watershed (Basin 1), respectively.

The PMP obtained for each storm center is analyzed to calculate the runoff using HEC-HMS (Reference 6). The HEC-HMS model and inputs are described in detail within a separate Enercon Calculation entitled "TXUT-001-FSAR 2.4.3-CALC-012, MITS004 – Probable Maximum Flood Calculation for Comanche Peak Nuclear Power Plant Units 3 and 4 (HEC-HMS & HEC-RAS)" (Reference 9), hereafter referred to as the Enercon PMF Calculation. The trial centers PR Y and SC X result in the maximum runoff and are used as critical storm centers. The storm center SC2 results in the greatest rainfall estimates for the Squaw Creek watershed. However, due to the location of storm centers and flood routing, the storm center SC X, with just slightly less cumulative rainfall, results in higher runoff at the CPNPP Units 3 and 4, for the overall PMP scenario, as indicated in Table 7-8. The runoff estimates to determine the critical storm center that are presented in Table 7-8 utilize the default HMR 52 (Reference 5) temporal distribution.

Table 7-8. Critical Storm Center Determination

| Overall PMP (with storm center in Paluxy River watershed - Basin 4) | | | Overall PMP (with storm center in Squaw Creek watershed – Basin 1) | | | Squaw Creek Reservoir PMP (Basin 1 only with storm center in Squaw Creek watershed) | | |
|---|---|---|---|---|---|---|---|---|
| Storm center | HMR 52 PMP estimates (in.) | Runoff estimates using HEC-HMS (at junction of Paluxy & Squaw Creek) (cfs) | Storm center | HMR 52 PMP estimates (Basin 1) (in.) | Runoff estimates using HEC-HMS (Basin 1) (cfs) | Storm center | HMR 52 PMP estimates | Runoff estimates using HEC-HMS (Basin 1) (cfs) |
| PR1 | 31.11 | 790,990 | SC1 | 36.49 | 199,651 | SC1 | 40.21 | 280,473 |
| PR2 | 31.22 | 827,914 | SC2 | 38.53 | 228,315 | SC2 | 40.76 | 287,660 |
| PR3 | 33.79 | 929,135 | SC3 | 38.44 | 228,206 | SC3 | 40.96 | 296,615 |
| PR4 | 34.86 | 1,004,226 | SC4 | 38.39 | 228,345 | SC4 | 42.52 | 318,617 |
| PR5 | 34.77 | 967,120 | SC5 | 36.80 | 205,177 | SC5 | 41.91 | 310,408 |
| PR6 | 33.49 | 886,102 | SC6 | 38.27 | 227,096 | SC6 | 42.24 | 314,562 |
| PR7 | 33.37 | 879,593 | SC7 | 34.47 | 175,811 | SC7 | 38.31 | 247,013 |
| PR8 | 34.77 | 965,308 | **SC X** | **38.46** | **229,006** | **SC X** | **42.53** | **318,715** |
| PR9 | 34.56 | 952,961 | | | | | | |
| PR10 | 35.06 | 960,319 | | | | | | |
| PR11 | 33.03 | 841,548 | | | | | | |
| **PR Y** | **35.08** | **1,008,423** | | | | | | |

The critical temporal distribution of the PMP for each storm center is determined by watershed rainfall runoff analysis using HEC-HMS (Reference 6). In order to reduce the number of distributions for evaluation, four distributions were chosen that bracket the range of possible hyetographs. The four temporal distributions are one-third peaking event, center peaking event, two-thirds peaking event, and end peaking event. Results are summarized in Tables 7-9, 7-10 and 7-11, which show the runoff obtained using the four distributions for the Paluxy River and Squaw Creek watersheds.

The analysis (Table 7-8 and Table 7-9) shows that storm center PR Y and two-thirds temporal distribution is the critical storm distribution for the Paluxy River watershed, resulting in higher runoff at the confluence of the Squaw Creek and the Paluxy River watersheds. Therefore, the Overall PMP center distribution of the HMR 52 estimates obtained at PR Y was used as the critical PMP for Basin 3 and Basin 4 in the HEC-HMS rainfall runoff analysis.

Similarly, the analysis (Table 7-8 and 7-10) shows that the storm center SC X and two-thirds temporal distribution for the overall basin with the storm center at SC X produces the highest peak outflow from the Squaw Creek Reservoir for an overall PMP within the Squaw Creek watershed. The corresponding overall PMP two-third temporal distribution for Basin 2 was used as the critical PMP for Basin 2 in the HEC-HMS rainfall-runoff analysis.

Finally, the analysis (Table 7-8 and 7-11) shows that the storm center SC X and two-thirds temporal distribution for the Squaw Creek Reservoir PMP (Basin 1 only) results in the higher outflow from the Squaw Creek Reservoir, which will result in the higher water surface elevation for the Squaw Creek Reservoir, and it was chosen as the critical storm distribution. Therefore, the Squaw Creek Reservoir PMP two-third temporal distribution for Basin 1 was used as the critical PMP for Basin 1 in the HEC-HMS rainfall runoff analysis.

Table 7-9. Rainfall-Runoff Analysis for Paluxy River Watershed (Basin 3 & 4) Using HEC-HMS and Overall PMP with Four Temporal Distributions at the Critical Storm Center **PR Y**

| Peak flow at junction of Paluxy River & Squaw Creek for Overall PMP with Storm Center at PR Y | | | | |
|---|---|---|---|---|
| Temporal Distribution | One-Third (cfs) | Center (cfs) | Two- Thirds (cfs) | End (cfs) |
| Peak Outflow | 1,005,374 | 1,007,977 | 1,009,245 | 551,522 |

Table 7-10. Rainfall-Runoff Analysis for Squaw Creek Reservoir Watershed (Basin 1) Using HEC-HMS and Overall PMP with Four Temporal Distributions at the Critical Storm Center **SC X**

| Peak flow at Squaw Creek Reservoir watershed (Basin 1) for Overall PMP with Storm Center at SC X | | | | | | | |
|---|---|---|---|---|---|---|---|
| One-Third | | Center | | Two-Thirds | | End | |
| Peak Inflow (cfs) | Peak Outflow (cfs) | Peak Inflow (cfs) | Peak Outflow (cfs) | Peak Inflow (cfs) | Peak Outflow (cfs) | Peak Inflow (cfs) | Peak Outflow (cfs) |
| 229,006 | 156,510 | 229,006 | 158,721 | 229,006 | 159,772 | 189,555 | 115,483 |

Table 7-11. Rainfall-Runoff Analysis for Squaw Creek Reservoir Watershed (Basin 1) Using HEC-HMS and Squaw Creek Reservoir PMP with Four Temporal Distributions at the Critical Storm Center **SC X**

| Peak flow at Squaw Creek Reservoir for Squaw Creek Reservoir PMP with Storm Center at SC X | | | | | | | |
|---|---|---|---|---|---|---|---|
| One-Third | | Center | | Two-Thirds | | End | |
| Peak Inflow (cfs) | Peak Outflow (cfs) | Peak Inflow (cfs) | Peak Outflow (cfs) | Peak Inflow (cfs) | Peak Outflow (cfs) | Peak Inflow (cfs) | Peak Outflow (cfs) |
| 318,715 | 202,597 | 318,715 | 205,079 | 318,715 | 206,224 | 237,173 | 118,878 |

Table 7-12 shows the hourly cumulative Overall PMP for the default HMR 52 (Reference 5) temporal distribution with the critical storm center at PR Y for each sub-basin. Table 7-13 shows the hourly cumulative Overall PMP for the default HMR 52 (Reference 5) temporal distribution with the critical storm center at SC X for each sub-basin. Table 7-14 shows the hourly cumulative Squaw Creek Reservoir PMP for the default HMR 52 (Reference 5) temporal distribution with the critical storm center at SC X for the Squaw Creek Reservoir watershed (Basin 1 Only).

The runoff estimates to determine the critical storm center that are presented in Table 7-8 utilize the default HMR 52 (Reference 5) temporal distribution.

The four temporal distributions discussed above were selected in accordance with HMR guidelines; they are tabulated and plotted below. The distributions for the Paluxy River watershed (Basin 3 & 4), using the Overall PMP with the storm center at PR Y are shown in Tables 7-15 through 7-22 and the corresponding figures are shown in Figures 7-3 through 7-10, respectively.

The temporal distributions for the Squaw Creek watershed (Basin 1 and Basin 2), using the Overall PMP with the storm center at SC X are shown in Tables 7-23 through 7-30, and the corresponding figures are shown in Figures 7-11 through 7-18.

Similarly, the temporal distributions for the Squaw Creek Reservoir PMP with the storm center at SC X are shown in Tables 7-31 through 7-34, and the corresponding figures are shown in Figures 7-19 through 7-22.

Cumulative mass curves comparing all four temporal distributions are provided in Figure 7-23 (Basin 4) and 7-24 (Basin 3) for the Overall PMP with the storm center at PR Y in the Paluxy River watershed. Cumulative mass curves comparing all four temporal distributions are provided in Figure 7-25 (Basin 1) and Figure 7-26 (Basin 2) for the Overall PMP with the storm center at SC X in the Squaw Creek watershed. Cumulative mass curves comparing all four temporal distributions are provided in Figure 7-27 for the Squaw Creek Reservoir PMP with the storm center at SC X in the Squaw Creek watershed.

Table 7-12. Sub-basin Hourly Cumulative PMP - Overall PMP with Critical Storm Center at PR Y

| Time (hr.) | Overall (in.) | Basin 1 (in.) | Basin 2 (in.) | Basin 3 (in.) | Basin 4 (in.) | Time (hr.) | Overall (in.) | Basin 1 (in.) | Basin 2 (in.) | Basin 3 (in.) | Basin 4 (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01:00 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 37:00 | 11.49 | 10.71 | 10.81 | 11.52 | 11.63 |
| 02:00 | 0.20 | 0.19 | 0.19 | 0.20 | 0.20 | 38:00 | 13.60 | 12.60 | 12.69 | 13.51 | 13.79 |
| 03:00 | 0.30 | 0.29 | 0.29 | 0.30 | 0.30 | 39:00 | 16.76 | 15.31 | 15.39 | 16.51 | 17.04 |
| 04:00 | 0.40 | 0.38 | 0.38 | 0.40 | 0.40 | 40:00 | 23.70 | 20.47 | 20.56 | 23.37 | 24.31 |
| 05:00 | 0.50 | 0.48 | 0.48 | 0.51 | 0.50 | 41:00 | 26.39 | 22.82 | 22.90 | 25.90 | 27.07 |
| 06:00 | 0.59 | 0.57 | 0.58 | 0.61 | 0.60 | 42:00 | 28.27 | 24.51 | 24.58 | 27.67 | 28.99 |
| 07:00 | 0.71 | 0.69 | 0.69 | 0.73 | 0.72 | 43:00 | 28.82 | 25.03 | 25.11 | 28.23 | 29.54 |
| 08:00 | 0.83 | 0.80 | 0.81 | 0.85 | 0.84 | 44:00 | 29.33 | 25.51 | 25.59 | 28.74 | 30.06 |
| 09:00 | 0.95 | 0.92 | 0.92 | 0.98 | 0.96 | 45:00 | 29.80 | 25.95 | 26.04 | 29.21 | 30.53 |
| 10:00 | 1.07 | 1.03 | 1.04 | 1.10 | 1.08 | 46:00 | 30.23 | 26.37 | 26.46 | 29.66 | 30.97 |
| 11:00 | 1.19 | 1.15 | 1.16 | 1.22 | 1.21 | 47:00 | 30.64 | 26.76 | 26.86 | 30.07 | 31.38 |
| 12:00 | 1.31 | 1.26 | 1.27 | 1.34 | 1.33 | 48:00 | 31.03 | 27.13 | 27.24 | 30.47 | 31.77 |
| 13:00 | 1.47 | 1.41 | 1.42 | 1.50 | 1.48 | 49:00 | 31.29 | 27.37 | 27.48 | 30.73 | 32.03 |
| 14:00 | 1.62 | 1.55 | 1.57 | 1.65 | 1.63 | 50:00 | 31.54 | 27.61 | 27.73 | 30.99 | 32.28 |
| 15:00 | 1.77 | 1.70 | 1.71 | 1.81 | 1.79 | 51:00 | 31.79 | 27.86 | 27.97 | 31.24 | 32.54 |
| 16:00 | 1.93 | 1.84 | 1.86 | 1.96 | 1.94 | 52:00 | 32.05 | 28.10 | 28.22 | 31.50 | 32.80 |
| 17:00 | 2.08 | 1.99 | 2.01 | 2.12 | 2.10 | 53:00 | 32.30 | 28.34 | 28.46 | 31.76 | 33.05 |
| 18:00 | 2.23 | 2.13 | 2.15 | 2.27 | 2.25 | 54:00 | 32.56 | 28.58 | 28.71 | 32.02 | 33.31 |
| 19:00 | 2.44 | 2.33 | 2.36 | 2.49 | 2.46 | 55:00 | 32.73 | 28.75 | 28.88 | 32.20 | 33.49 |
| 20:00 | 2.65 | 2.53 | 2.56 | 2.70 | 2.67 | 56:00 | 32.91 | 28.92 | 29.05 | 32.38 | 33.66 |
| 21:00 | 2.86 | 2.72 | 2.76 | 2.91 | 2.88 | 57:00 | 33.08 | 29.09 | 29.22 | 32.56 | 33.84 |
| 22:00 | 3.06 | 2.92 | 2.96 | 3.12 | 3.09 | 58:00 | 33.26 | 29.25 | 29.39 | 32.74 | 34.02 |
| 23:00 | 3.27 | 3.12 | 3.16 | 3.33 | 3.30 | 59:00 | 33.44 | 29.42 | 29.56 | 32.92 | 34.19 |
| 24:00 | 3.48 | 3.32 | 3.36 | 3.55 | 3.51 | 60:00 | 33.61 | 29.59 | 29.73 | 33.10 | 34.37 |
| 25:00 | 3.77 | 3.60 | 3.64 | 3.84 | 3.80 | 61:00 | 33.75 | 29.72 | 29.86 | 33.23 | 34.51 |
| 26:00 | 4.07 | 3.89 | 3.93 | 4.15 | 4.11 | 62:00 | 33.88 | 29.85 | 29.99 | 33.37 | 34.64 |
| 27:00 | 4.39 | 4.19 | 4.24 | 4.47 | 4.43 | 63:00 | 34.02 | 29.97 | 30.12 | 33.51 | 34.78 |
| 28:00 | 4.72 | 4.50 | 4.56 | 4.81 | 4.76 | 64:00 | 34.15 | 30.10 | 30.25 | 33.64 | 34.91 |
| 29:00 | 5.07 | 4.84 | 4.90 | 5.17 | 5.12 | 65:00 | 34.29 | 30.23 | 30.38 | 33.78 | 35.05 |
| 30:00 | 5.45 | 5.19 | 5.26 | 5.55 | 5.49 | 66:00 | 34.42 | 30.36 | 30.51 | 33.92 | 35.19 |
| 31:00 | 6.04 | 5.75 | 5.82 | 6.15 | 6.09 | 67:00 | 34.53 | 30.46 | 30.61 | 34.03 | 35.30 |
| 32:00 | 6.68 | 6.34 | 6.41 | 6.79 | 6.74 | 68:00 | 34.64 | 30.57 | 30.72 | 34.14 | 35.41 |
| 33:00 | 7.39 | 6.98 | 7.07 | 7.50 | 7.46 | 69:00 | 34.75 | 30.67 | 30.82 | 34.25 | 35.52 |
| 34:00 | 8.18 | 7.70 | 7.79 | 8.29 | 8.27 | 70:00 | 34.86 | 30.77 | 30.93 | 34.36 | 35.63 |
| 35:00 | 9.08 | 8.52 | 8.61 | 9.18 | 9.18 | 71:00 | 34.97 | 30.88 | 31.03 | 34.47 | 35.74 |
| 36:00 | 10.09 | 9.44 | 9.54 | 10.17 | 10.21 | 72:00 | 35.08 | 30.98 | 31.14 | 34.58 | 35.85 |

Table 7-13. Sub-basin Hourly Cumulative PMP - Overall PMP with Critical Storm Center at SC X

| Time (hr.) | Overall (in.) | Basin 1 (in.) | Basin 2 (in.) | Basin 3 (in.) | Basin 4 (in.) | Time (hr.) | Overall (in.) | Basin 1 (in.) | Basin 2 (in.) | Basin 3 (in.) | Basin 4 (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01:00 | 0.10 | 0.10 | 0.10 | 0.09 | 0.10 | 37:00 | 11.05 | 12.16 | 11.60 | 10.36 | 10.92 |
| 02:00 | 0.19 | 0.20 | 0.20 | 0.18 | 0.19 | 38:00 | 13.01 | 14.68 | 13.72 | 12.09 | 12.80 |
| 03:00 | 0.29 | 0.30 | 0.30 | 0.27 | 0.29 | 39:00 | 15.82 | 18.39 | 16.82 | 14.50 | 15.48 |
| 04:00 | 0.38 | 0.40 | 0.40 | 0.36 | 0.38 | 40:00 | 21.26 | 26.17 | 23.23 | 18.75 | 20.60 |
| 05:00 | 0.48 | 0.50 | 0.50 | 0.46 | 0.48 | 41:00 | 23.70 | 29.38 | 25.90 | 20.87 | 22.93 |
| 06:00 | 0.57 | 0.59 | 0.59 | 0.55 | 0.57 | 42:00 | 25.45 | 31.62 | 27.79 | 22.42 | 24.62 |
| 07:00 | 0.69 | 0.71 | 0.71 | 0.66 | 0.69 | 43:00 | 25.98 | 32.19 | 28.35 | 22.93 | 25.14 |
| 08:00 | 0.80 | 0.83 | 0.83 | 0.77 | 0.80 | 44:00 | 26.48 | 32.71 | 28.86 | 23.40 | 25.63 |
| 09:00 | 0.92 | 0.95 | 0.95 | 0.88 | 0.92 | 45:00 | 26.93 | 33.19 | 29.32 | 23.83 | 26.08 |
| 10:00 | 1.03 | 1.07 | 1.07 | 0.99 | 1.03 | 46:00 | 27.35 | 33.63 | 29.76 | 24.23 | 26.50 |
| 11:00 | 1.15 | 1.19 | 1.19 | 1.10 | 1.15 | 47:00 | 27.75 | 34.05 | 30.17 | 24.61 | 26.89 |
| 12:00 | 1.26 | 1.31 | 1.31 | 1.21 | 1.26 | 48:00 | 28.12 | 34.44 | 30.56 | 24.97 | 27.27 |
| 13:00 | 1.41 | 1.47 | 1.47 | 1.35 | 1.41 | 49:00 | 28.37 | 34.69 | 30.81 | 25.20 | 27.51 |
| 14:00 | 1.55 | 1.62 | 1.62 | 1.49 | 1.55 | 50:00 | 28.61 | 34.95 | 31.06 | 25.44 | 27.76 |
| 15:00 | 1.70 | 1.77 | 1.77 | 1.63 | 1.70 | 51:00 | 28.86 | 35.20 | 31.32 | 25.67 | 28.00 |
| 16:00 | 1.84 | 1.92 | 1.92 | 1.77 | 1.84 | 52:00 | 29.10 | 35.45 | 31.57 | 25.90 | 28.24 |
| 17:00 | 1.99 | 2.07 | 2.07 | 1.91 | 1.99 | 53:00 | 29.35 | 35.70 | 31.82 | 26.14 | 28.49 |
| 18:00 | 2.14 | 2.23 | 2.23 | 2.05 | 2.14 | 54:00 | 29.59 | 35.96 | 32.08 | 26.37 | 28.73 |
| 19:00 | 2.34 | 2.43 | 2.43 | 2.24 | 2.34 | 55:00 | 29.76 | 36.13 | 32.25 | 26.53 | 28.90 |
| 20:00 | 2.54 | 2.64 | 2.64 | 2.43 | 2.53 | 56:00 | 29.93 | 36.31 | 32.43 | 26.70 | 29.07 |
| 21:00 | 2.74 | 2.85 | 2.85 | 2.62 | 2.73 | 57:00 | 30.10 | 36.48 | 32.60 | 26.86 | 29.24 |
| 22:00 | 2.94 | 3.05 | 3.05 | 2.81 | 2.93 | 58:00 | 30.27 | 36.66 | 32.78 | 27.02 | 29.40 |
| 23:00 | 3.14 | 3.26 | 3.26 | 3.00 | 3.13 | 59:00 | 30.44 | 36.83 | 32.95 | 27.18 | 29.57 |
| 24:00 | 3.34 | 3.47 | 3.47 | 3.19 | 3.33 | 60:00 | 30.61 | 37.01 | 33.13 | 27.34 | 29.74 |
| 25:00 | 3.62 | 3.76 | 3.76 | 3.46 | 3.61 | 61:00 | 30.74 | 37.14 | 33.26 | 27.47 | 29.87 |
| 26:00 | 3.91 | 4.06 | 4.06 | 3.74 | 3.90 | 62:00 | 30.86 | 37.28 | 33.39 | 27.59 | 30.00 |
| 27:00 | 4.21 | 4.37 | 4.38 | 4.03 | 4.20 | 63:00 | 30.99 | 37.41 | 33.53 | 27.71 | 30.13 |
| 28:00 | 4.53 | 4.70 | 4.71 | 4.34 | 4.52 | 64:00 | 31.12 | 37.54 | 33.66 | 27.84 | 30.26 |
| 29:00 | 4.87 | 5.06 | 5.06 | 4.66 | 4.86 | 65:00 | 31.25 | 37.68 | 33.80 | 27.96 | 30.39 |
| 30:00 | 5.23 | 5.43 | 5.43 | 5.00 | 5.22 | 66:00 | 31.38 | 37.81 | 33.93 | 28.08 | 30.51 |
| 31:00 | 5.81 | 6.06 | 6.03 | 5.54 | 5.79 | 67:00 | 31.48 | 37.92 | 34.04 | 28.18 | 30.62 |
| 32:00 | 6.43 | 6.75 | 6.69 | 6.13 | 6.40 | 68:00 | 31.59 | 38.03 | 34.15 | 28.28 | 30.72 |
| 33:00 | 7.12 | 7.52 | 7.42 | 6.77 | 7.08 | 69:00 | 31.69 | 38.14 | 34.25 | 28.38 | 30.83 |
| 34:00 | 7.89 | 8.40 | 8.23 | 7.48 | 7.84 | 70:00 | 31.80 | 38.24 | 34.36 | 28.48 | 30.93 |
| 35:00 | 8.75 | 9.39 | 9.15 | 8.27 | 8.68 | 71:00 | 31.90 | 38.35 | 34.47 | 28.58 | 31.03 |
| 36:00 | 9.73 | 10.53 | 10.18 | 9.16 | 9.64 | 72:00 | 32.00 | 38.46 | 34.58 | 28.68 | 31.14 |

Table 7-14. Hourly Cumulative PMP - Squaw Creek Reservoir PMP with Critical Storm Center at SC X.

| Time (hr.) | Basin 1 (in.) | Time (hr.) | Basin 1 (in.) | Time (hr.) | Basin 1 (in.) |
|---|---|---|---|---|---|
| 01:00 | 0.10 | 25:00 | 3.86 | 49:00 | 38.65 |
| 02:00 | 0.20 | 26:00 | 4.17 | 50:00 | 38.91 |
| 03:00 | 0.30 | 27:00 | 4.49 | 51:00 | 39.18 |
| 04:00 | 0.40 | 28:00 | 4.84 | 52:00 | 39.44 |
| 05:00 | 0.51 | 29:00 | 5.20 | 53:00 | 39.70 |
| 06:00 | 0.61 | 30:00 | 5.58 | 54:00 | 39.96 |
| 07:00 | 0.73 | 31:00 | 6.21 | 55:00 | 40.14 |
| 08:00 | 0.85 | 32:00 | 6.90 | 56:00 | 40.32 |
| 09:00 | 0.98 | 33:00 | 7.66 | 57:00 | 40.50 |
| 10:00 | 1.10 | 34:00 | 8.52 | 58:00 | 40.68 |
| 11:00 | 1.22 | 35:00 | 9.49 | 59:00 | 40.86 |
| 12:00 | 1.34 | 36:00 | 10.59 | 60:00 | 41.04 |
| 13:00 | 1.50 | 37:00 | 12.10 | 61:00 | 41.18 |
| 14:00 | 1.66 | 38:00 | 14.43 | 62:00 | 41.31 |
| 15:00 | 1.81 | 39:00 | 18.27 | 63:00 | 41.45 |
| 16:00 | 1.97 | 40:00 | 30.38 | 64:00 | 41.59 |
| 17:00 | 2.12 | 41:00 | 33.49 | 65:00 | 41.72 |
| 18:00 | 2.28 | 42:00 | 35.53 | 66:00 | 41.86 |
| 19:00 | 2.49 | 43:00 | 36.11 | 67:00 | 41.97 |
| 20:00 | 2.71 | 44:00 | 36.63 | 68:00 | 42.08 |
| 21:00 | 2.92 | 45:00 | 37.12 | 69:00 | 42.19 |
| 22:00 | 3.13 | 46:00 | 37.57 | 70:00 | 42.30 |
| 23:00 | 3.35 | 47:00 | 37.99 | 71:00 | 42.42 |
| 24:00 | 3.56 | 48:00 | 38.39 | 72:00 | 42.53 |

Table 7-15. One-Third Peaking Temporal Distribution (Basin 4) – Overall PMP with Storm Center at PR Y

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.1000 | 25 | 2.7580 | 49 | 0.1540 |
| 2 | 0.1000 | 26 | 1.9150 | 50 | 0.1540 |
| 3 | 0.2100 | 27 | 0.5580 | 51 | 0.1360 |
| 4 | 0.2100 | 28 | 0.5120 | 52 | 0.1360 |
| 5 | 0.2100 | 29 | 0.4720 | 53 | 0.1360 |
| **6** | **0.2100** | **30** | **0.4390** | **54** | **0.1360** |
| 7 | 0.2100 | 31 | 0.4130 | 55 | 0.1360 |
| 8 | 0.2100 | 32 | 0.3930 | 56 | 0.1360 |
| 9 | 0.2930 | 33 | 0.2560 | 57 | 0.1210 |
| 10 | 0.3050 | 34 | 0.2560 | 58 | 0.1210 |
| 11 | 0.3190 | 35 | 0.2560 | 59 | 0.1210 |
| **12** | **0.3350** | **36** | **0.2560** | **60** | **0.1210** |
| 13 | 0.3540 | 37 | 0.2560 | 61 | 0.1210 |
| 14 | 0.3750 | 38 | 0.2560 | 62 | 0.1210 |
| 15 | 0.6020 | 39 | 0.1770 | 63 | 0.1100 |
| 16 | 0.6510 | 40 | 0.1770 | 64 | 0.1100 |
| 17 | 0.7180 | 41 | 0.1770 | 65 | 0.1100 |
| **18** | **0.8040** | **42** | **0.1770** | **66** | **0.1100** |
| 19 | 0.9090 | 43 | 0.1770 | 67 | 0.1100 |
| 20 | 1.0320 | 44 | 0.1770 | 68 | 0.1100 |
| 21 | 1.4260 | 45 | 0.1540 | 69 | 0.1000 |
| 22 | 2.1610 | 46 | 0.1540 | 70 | 0.1000 |
| 23 | 3.2460 | 47 | 0.1540 | 71 | 0.1000 |
| **24** | **7.2720** | **48** | **0.1540** | **72** | **0.1000** |

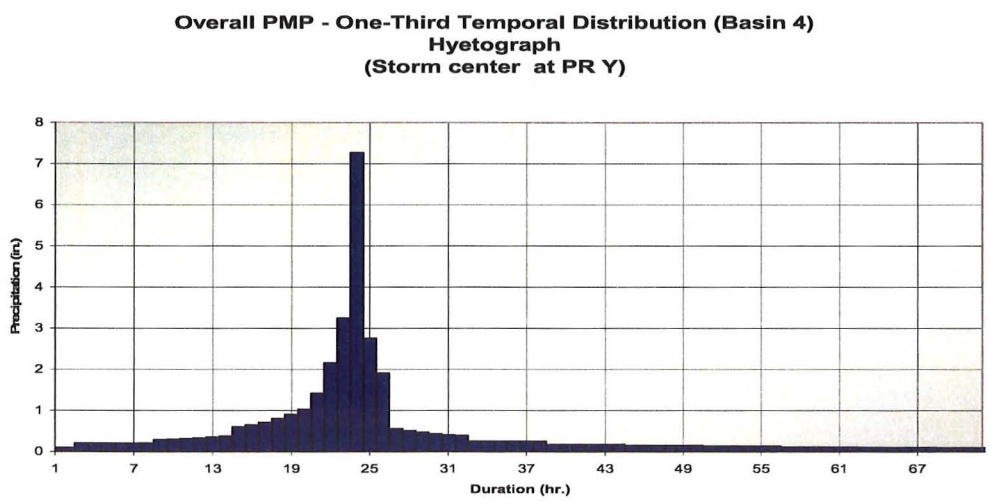


Figure 7-3. One-Third Peaking Temporal Distribution (Basin 4) – Overall PMP with Storm Center at PR Y

Table 7-16. Center Peaking Temporal Distribution (Basin 4) – Overall PMP with Storm Center at PR Y

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.1000 | 25 | 0.3540 | 49 | 0.2560 |
| 2 | 0.1000 | 26 | 0.3750 | 50 | 0.2560 |
| 3 | 0.1210 | 27 | 0.6020 | 51 | 0.1770 |
| 4 | 0.1210 | 28 | 0.6510 | 52 | 0.1770 |
| 5 | 0.1210 | 29 | 0.7180 | 53 | 0.1770 |
| **6** | **0.1210** | **30** | **0.8040** | **54** | **0.1770** |
| 7 | 0.1210 | 31 | 0.9090 | 55 | 0.1770 |
| 8 | 0.1210 | 32 | 1.0320 | 56 | 0.1770 |
| 9 | 0.1540 | 33 | 1.4260 | 57 | 0.1360 |
| 10 | 0.1540 | 34 | 2.1610 | 58 | 0.1360 |
| 11 | 0.1540 | 35 | 3.2460 | 59 | 0.1360 |
| **12** | **0.1540** | **36** | **7.2720** | **60** | **0.1360** |
| 13 | 0.1540 | 37 | 2.7580 | 61 | 0.1360 |
| 14 | 0.1540 | 38 | 1.9150 | 62 | 0.1360 |
| 15 | 0.2100 | 39 | 0.5580 | 63 | 0.1100 |
| 16 | 0.2100 | 40 | 0.5120 | 64 | 0.1100 |
| 17 | 0.2100 | 41 | 0.4720 | 65 | 0.1100 |
| **18** | **0.2100** | **42** | **0.4390** | **66** | **0.1100** |
| 19 | 0.2100 | 43 | 0.4130 | 67 | 0.1100 |
| 20 | 0.2100 | 44 | 0.3930 | 68 | 0.1100 |
| 21 | 0.2930 | 45 | 0.2560 | 69 | 0.1000 |
| 22 | 0.3050 | 46 | 0.2560 | 70 | 0.1000 |
| 23 | 0.3190 | 47 | 0.2560 | 71 | 0.1000 |
| **24** | **0.3350** | **48** | **0.2560** | **72** | **0.1000** |

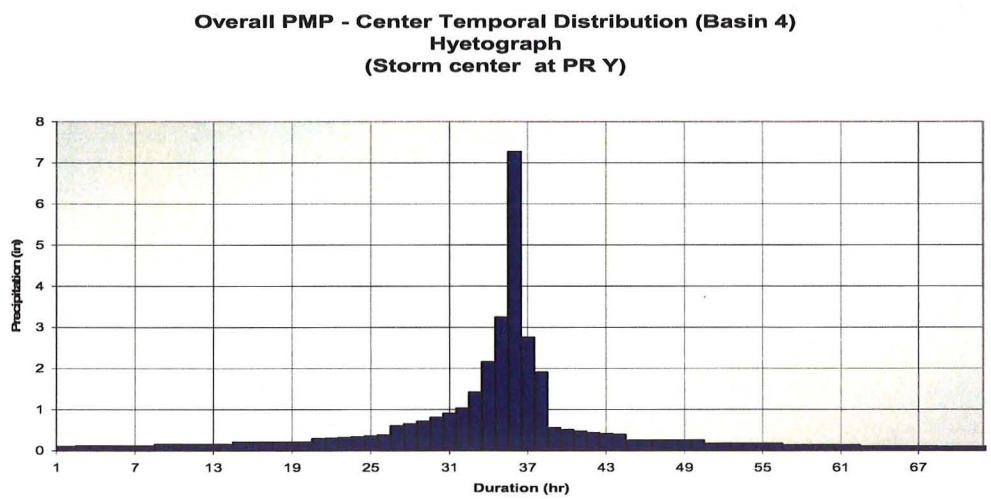


Figure 7-4. Center Peaking Temporal Distribution (Basin 4) – Overall PMP with Storm Center at PR Y

Table 7-17. Two-Thirds Peaking Temporal Distribution (Basin 4) – Overall PMP with Storm Center at PR Y

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.1000 | 25 | 0.1540 | 49 | 2.7580 |
| 2 | 0.1000 | 26 | 0.1540 | 50 | 1.9150 |
| 3 | 0.1000 | 27 | 0.2100 | 51 | 0.5580 |
| 4 | 0.1000 | 28 | 0.2100 | 52 | 0.5120 |
| 5 | 0.1000 | 29 | 0.2100 | 53 | 0.4720 |
| **6** | **0.1000** | **30** | **0.2100** | **54** | **0.4390** |
| 7 | 0.1100 | 31 | 0.2100 | 55 | 0.4130 |
| 8 | 0.1100 | 32 | 0.2100 | 56 | 0.3930 |
| 9 | 0.1100 | 33 | 0.2930 | 57 | 0.2560 |
| 10 | 0.1100 | 34 | 0.3050 | 58 | 0.2560 |
| 11 | 0.1100 | 35 | 0.3190 | 59 | 0.2560 |
| **12** | **0.1100** | **36** | **0.3350** | **60** | **0.2560** |
| 13 | 0.1210 | 37 | 0.3540 | 61 | 0.2560 |
| 14 | 0.1210 | 38 | 0.3750 | 62 | 0.2560 |
| 15 | 0.1210 | 39 | 0.6020 | 63 | 0.1770 |
| 16 | 0.1210 | 40 | 0.6510 | 64 | 0.1770 |
| 17 | 0.1210 | 41 | 0.7180 | 65 | 0.1770 |
| **18** | **0.1210** | **42** | **0.8040** | **66** | **0.1770** |
| 19 | 0.1360 | 43 | 0.9090 | 67 | 0.1770 |
| 20 | 0.1360 | 44 | 1.0320 | 68 | 0.1770 |
| 21 | 0.1540 | 45 | 1.4260 | 69 | 0.1360 |
| 22 | 0.1540 | 46 | 2.1610 | 70 | 0.1360 |
| 23 | 0.1540 | 47 | 3.2460 | 71 | 0.1360 |
| **24** | **0.1540** | **48** | **7.2720** | **72** | **0.1360** |

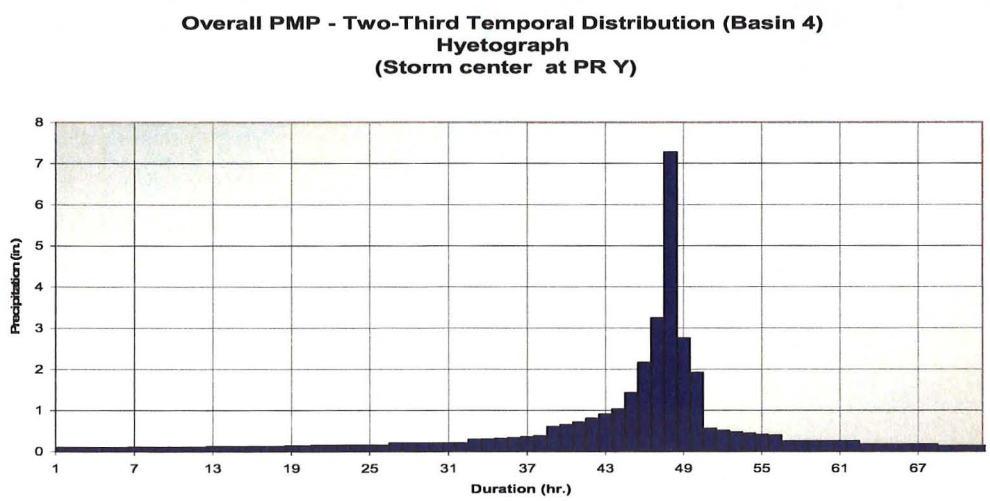


Figure 7-5. Two-Thirds Peaking Temporal Distribution (Basin 4) – Overall PMP with Storm Center at PR Y

Table 7-18. End Peaking Temporal Distribution (Basin 4) – Overall PMP with Storm Center at PR Y

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.1000 | 25 | 0.1540 | 49 | 0.2930 |
| 2 | 0.1000 | 26 | 0.1540 | 50 | 0.3050 |
| 3 | 0.1000 | 27 | 0.1540 | 51 | 0.3190 |
| 4 | 0.1000 | 28 | 0.1540 | 52 | 0.3350 |
| 5 | 0.1000 | 29 | 0.1540 | 53 | 0.3540 |
| **6** | **0.1000** | **30** | **0.1540** | **54** | **0.3750** |
| 7 | 0.1100 | 31 | 0.1770 | 55 | 0.3930 |
| 8 | 0.1100 | 32 | 0.1770 | 56 | 0.4130 |
| 9 | 0.1100 | 33 | 0.1770 | 57 | 0.4390 |
| 10 | 0.1100 | 34 | 0.1770 | 58 | 0.4720 |
| 11 | 0.1100 | 35 | 0.1770 | 59 | 0.5120 |
| **12** | **0.1100** | **36** | **0.1770** | **60** | **0.5580** |
| 13 | 0.1210 | 37 | 0.2100 | 61 | 0.6020 |
| 14 | 0.1210 | 38 | 0.2100 | 62 | 0.6510 |
| 15 | 0.1210 | 39 | 0.2100 | 63 | 0.7180 |
| 16 | 0.1210 | 40 | 0.2100 | 64 | 0.8040 |
| 17 | 0.1210 | 41 | 0.2100 | 65 | 0.9090 |
| **18** | **0.1210** | **42** | **0.2100** | **66** | **1.0320** |
| 19 | 0.1360 | 43 | 0.2560 | 67 | 1.4260 |
| 20 | 0.1360 | 44 | 0.2560 | 68 | 1.9150 |
| 21 | 0.1360 | 45 | 0.2560 | 69 | 2.1610 |
| 22 | 0.1360 | 46 | 0.2560 | 70 | 2.7580 |
| 23 | 0.1360 | 47 | 0.2560 | 71 | 3.2460 |
| **24** | **0.1360** | **48** | **0.2560** | **72** | **7.2720** |

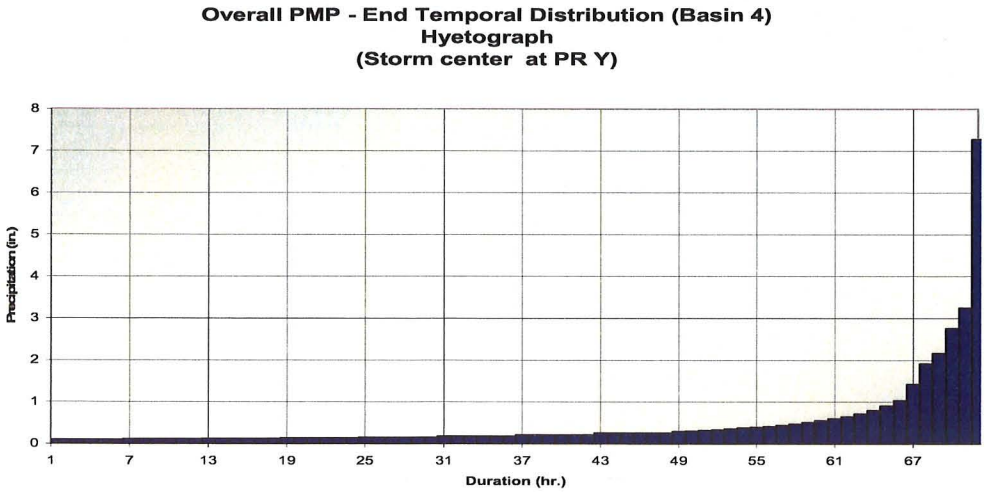


Figure 7-6. End Peaking Temporal Distribution (Basin 4) – Overall PMP with Storm Center at PR Y

Table 7-19. One-Third Peaking Temporal Distribution (Basin 3) – Overall PMP with Storm Center at PR Y

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.1010 | 25 | 2.5370 | 49 | 0.1550 |
| 2 | 0.1010 | 26 | 1.7680 | 50 | 0.1550 |
| 3 | 0.2120 | 27 | 0.5570 | 51 | 0.1370 |
| 4 | 0.2120 | 28 | 0.5120 | 52 | 0.1370 |
| 5 | 0.2120 | 29 | 0.4740 | 53 | 0.1370 |
| **6** | **0.2120** | **30** | **0.4420** | **54** | **0.1370** |
| 7 | 0.2120 | 31 | 0.4160 | 55 | 0.1370 |
| 8 | 0.2120 | 32 | 0.3960 | 56 | 0.1370 |
| 9 | 0.2970 | 33 | 0.2590 | 57 | 0.1230 |
| 10 | 0.3080 | 34 | 0.2590 | 58 | 0.1230 |
| 11 | 0.3220 | 35 | 0.2590 | 59 | 0.1230 |
| **12** | **0.3380** | **36** | **0.2590** | **60** | **0.1230** |
| 13 | 0.3570 | 37 | 0.2590 | 61 | 0.1230 |
| 14 | 0.3780 | 38 | 0.2590 | 62 | 0.1230 |
| 15 | 0.5990 | 39 | 0.1790 | 63 | 0.1110 |
| 16 | 0.6460 | 40 | 0.1790 | 64 | 0.1110 |
| 17 | 0.7090 | 41 | 0.1790 | 65 | 0.1110 |
| **18** | **0.7890** | **42** | **0.1790** | **66** | **0.1110** |
| 19 | 0.8860 | 43 | 0.1790 | 67 | 0.1110 |
| 20 | 0.9990 | 44 | 0.1790 | 68 | 0.1110 |
| 21 | 1.3420 | 45 | 0.1550 | 69 | 0.1010 |
| 22 | 1.9920 | 46 | 0.1550 | 70 | 0.1010 |
| 23 | 3.0050 | 47 | 0.1550 | 71 | 0.1010 |
| **24** | **6.8520** | **48** | **0.1550** | **72** | **0.1010** |

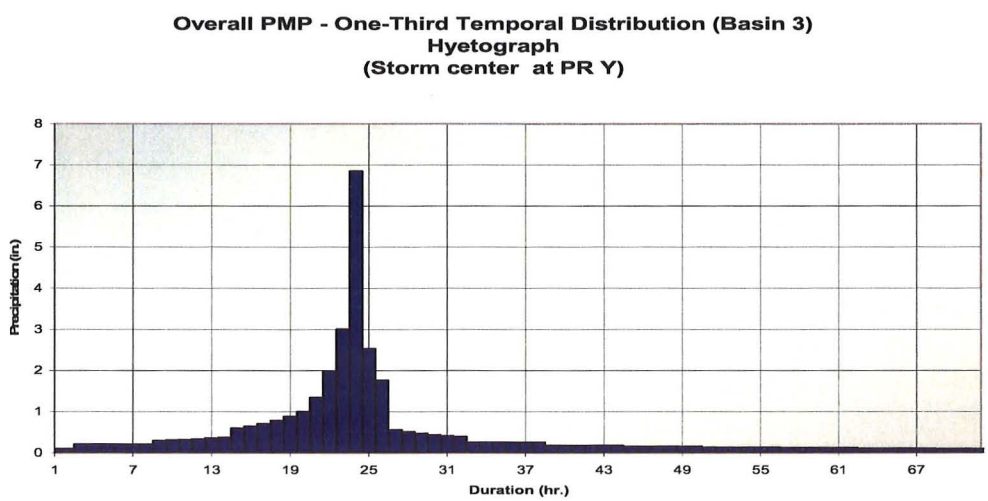


Figure 7-7. One-Third Peaking Temporal Distribution (Basin 3) – Overall PMP with Storm Center at PR Y

Table 7-20. Center Peaking Temporal Distribution (Basin 3) – Overall PMP with Storm Center at PR Y

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.1010 | 25 | 0.3570 | 49 | 0.2590 |
| 2 | 0.1010 | 26 | 0.3780 | 50 | 0.2590 |
| 3 | 0.1230 | 27 | 0.5990 | 51 | 0.1790 |
| 4 | 0.1230 | 28 | 0.6460 | 52 | 0.1790 |
| 5 | 0.1230 | 29 | 0.7090 | 53 | 0.1790 |
| **6** | **0.1230** | **30** | **0.7890** | **54** | **0.1790** |
| 7 | 0.1230 | 31 | 0.8860 | 55 | 0.1790 |
| 8 | 0.1230 | 32 | 0.9990 | 56 | 0.1790 |
| 9 | 0.1550 | 33 | 1.3420 | 57 | 0.1370 |
| 10 | 0.1550 | 34 | 1.9920 | 58 | 0.1370 |
| 11 | 0.1550 | 35 | 3.0050 | 59 | 0.1370 |
| **12** | **0.1550** | **36** | **6.8520** | **60** | **0.1370** |
| 13 | 0.1550 | 37 | 2.5370 | 61 | 0.1370 |
| 14 | 0.1550 | 38 | 1.7680 | 62 | 0.1370 |
| 15 | 0.2120 | 39 | 0.5570 | 63 | 0.1110 |
| 16 | 0.2120 | 40 | 0.5120 | 64 | 0.1110 |
| 17 | 0.2120 | 41 | 0.4740 | 65 | 0.1110 |
| **18** | **0.2120** | **42** | **0.4420** | **66** | **0.1110** |
| 19 | 0.2120 | 43 | 0.4160 | 67 | 0.1110 |
| 20 | 0.2120 | 44 | 0.3960 | 68 | 0.1110 |
| 21 | 0.2970 | 45 | 0.2590 | 69 | 0.1010 |
| 22 | 0.3080 | 46 | 0.2590 | 70 | 0.1010 |
| 23 | 0.3220 | 47 | 0.2590 | 71 | 0.1010 |
| **24** | **0.3380** | **48** | **0.2590** | **72** | **0.1010** |

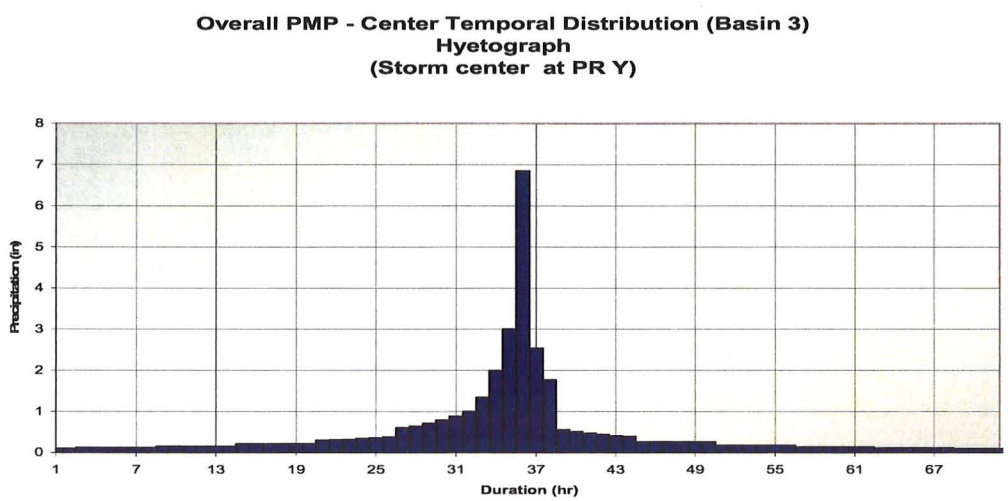


Figure 7-8. Center Peaking Temporal Distribution (Basin 3) – Overall PMP with Storm Center at PR Y

Table 7-21. Two-Thirds Peaking Temporal Distribution (Basin 3) – Overall PMP with Storm Center at PR Y

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.1010 | 25 | 0.1550 | 49 | 2.5370 |
| 2 | 0.1010 | 26 | 0.1550 | 50 | 1.7680 |
| 3 | 0.1010 | 27 | 0.2120 | 51 | 0.5570 |
| 4 | 0.1010 | 28 | 0.2120 | 52 | 0.5120 |
| 5 | 0.1010 | 29 | 0.2120 | 53 | 0.4740 |
| **6** | **0.1010** | **30** | **0.2120** | **54** | **0.4420** |
| 7 | 0.1110 | 31 | 0.2120 | 55 | 0.4160 |
| 8 | 0.1110 | 32 | 0.2120 | 56 | 0.3960 |
| 9 | 0.1110 | 33 | 0.2970 | 57 | 0.2590 |
| 10 | 0.1110 | 34 | 0.3080 | 58 | 0.2590 |
| 11 | 0.1110 | 35 | 0.3220 | 59 | 0.2590 |
| **12** | **0.1110** | **36** | **0.3380** | **60** | **0.2590** |
| 13 | 0.1230 | 37 | 0.3570 | 61 | 0.2590 |
| 14 | 0.1230 | 38 | 0.3780 | 62 | 0.2590 |
| 15 | 0.1230 | 39 | 0.5990 | 63 | 0.1790 |
| 16 | 0.1230 | 40 | 0.6460 | 64 | 0.1790 |
| 17 | 0.1230 | 41 | 0.7090 | 65 | 0.1790 |
| **18** | **0.1230** | **42** | **0.7890** | **66** | **0.1790** |
| 19 | 0.1370 | 43 | 0.8860 | 67 | 0.1790 |
| 20 | 0.1370 | 44 | 0.9990 | 68 | 0.1790 |
| 21 | 0.1550 | 45 | 1.3420 | 69 | 0.1370 |
| 22 | 0.1550 | 46 | 1.9920 | 70 | 0.1370 |
| 23 | 0.1550 | 47 | 3.0050 | 71 | 0.1370 |
| **24** | **0.1550** | **48** | **6.8520** | **72** | **0.1370** |

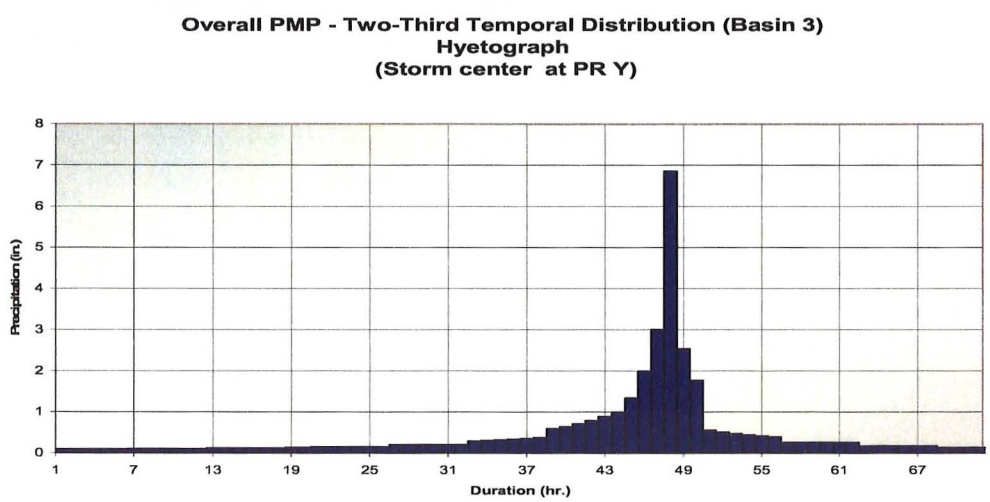


Figure 7-9. Two-Thirds Peaking Temporal Distribution (Basin 3) – Overall PMP with Storm Center at PR Y

Table 7-22. End Peaking Temporal Distribution (Basin 3) – Overall PMP with Storm Center at PR Y

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.1010 | 25 | 0.1550 | 49 | 0.2970 |
| 2 | 0.1010 | 26 | 0.1550 | 50 | 0.3080 |
| 3 | 0.1010 | 27 | 0.1550 | 51 | 0.3220 |
| 4 | 0.1010 | 28 | 0.1550 | 52 | 0.3380 |
| 5 | 0.1010 | 29 | 0.1550 | 53 | 0.3570 |
| **6** | **0.1010** | **30** | **0.1550** | **54** | **0.3780** |
| 7 | 0.1110 | 31 | 0.1790 | 55 | 0.3960 |
| 8 | 0.1110 | 32 | 0.1790 | 56 | 0.4160 |
| 9 | 0.1110 | 33 | 0.1790 | 57 | 0.4420 |
| 10 | 0.1110 | 34 | 0.1790 | 58 | 0.4740 |
| 11 | 0.1110 | 35 | 0.1790 | 59 | 0.5120 |
| **12** | **0.1110** | **36** | **0.1790** | **60** | **0.5570** |
| 13 | 0.1230 | 37 | 0.2120 | 61 | 0.5990 |
| 14 | 0.1230 | 38 | 0.2120 | 62 | 0.6460 |
| 15 | 0.1230 | 39 | 0.2120 | 63 | 0.7090 |
| 16 | 0.1230 | 40 | 0.2120 | 64 | 0.7890 |
| 17 | 0.1230 | 41 | 0.2120 | 65 | 0.8860 |
| **18** | **0.1230** | **42** | **0.2120** | **66** | **0.9990** |
| 19 | 0.1370 | 43 | 0.2590 | 67 | 1.3420 |
| 20 | 0.1370 | 44 | 0.2590 | 68 | 1.7680 |
| 21 | 0.1370 | 45 | 0.2590 | 69 | 1.9920 |
| 22 | 0.1370 | 46 | 0.2590 | 70 | 2.5370 |
| 23 | 0.1370 | 47 | 0.2590 | 71 | 3.0050 |
| **24** | **0.1370** | **48** | **0.2590** | **72** | **6.8520** |

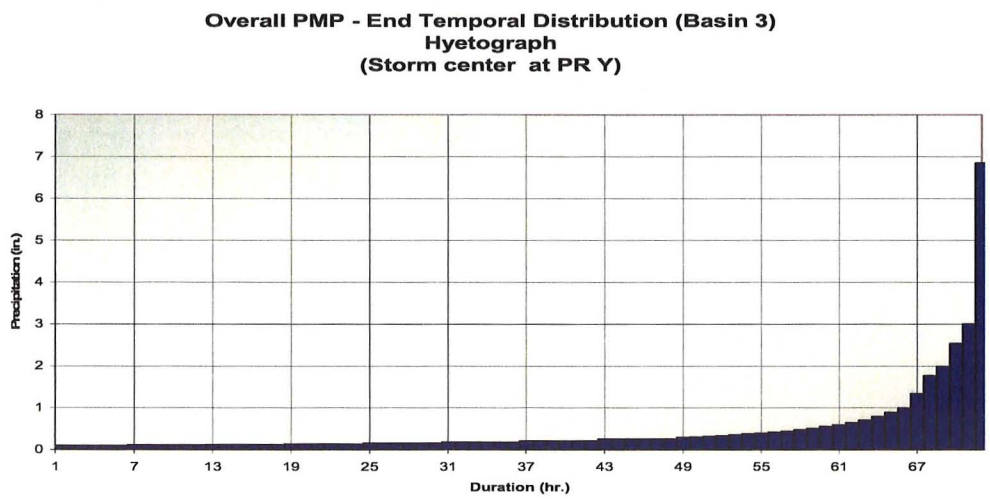


Figure 7-10. End Peaking Temporal Distribution (Basin 3) – Overall PMP with Storm Center at PR Y

Table 7-23. One-Third Peaking Temporal Distribution (Basin 1) – Overall PMP with Storm Center at SC X

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.0990 | 25 | 3.2050 | 49 | 0.1520 |
| 2 | 0.0990 | 26 | 2.2360 | 50 | 0.1520 |
| 3 | 0.2070 | 27 | 0.5760 | 51 | 0.1340 |
| 4 | 0.2070 | 28 | 0.5230 | 52 | 0.1340 |
| 5 | 0.2070 | 29 | 0.4780 | 53 | 0.1340 |
| **6** | **0.2070** | **30** | **0.4410** | **54** | **0.1340** |
| 7 | 0.2070 | 31 | 0.4130 | 55 | 0.1340 |
| 8 | 0.2070 | 32 | 0.3930 | 56 | 0.1340 |
| 9 | 0.2900 | 33 | 0.2530 | 57 | 0.1200 |
| 10 | 0.3010 | 34 | 0.2530 | 58 | 0.1200 |
| 11 | 0.3140 | 35 | 0.2530 | 59 | 0.1200 |
| **12** | **0.3310** | **36** | **0.2530** | **60** | **0.1200** |
| 13 | 0.3510 | 37 | 0.2530 | 61 | 0.1200 |
| 14 | 0.3730 | 38 | 0.2530 | 62 | 0.1200 |
| 15 | 0.6300 | 39 | 0.1750 | 63 | 0.1080 |
| 16 | 0.6910 | 40 | 0.1750 | 64 | 0.1080 |
| 17 | 0.7720 | 41 | 0.1750 | 65 | 0.1080 |
| **18** | **0.8740** | **42** | **0.1750** | **66** | **0.1080** |
| 19 | 0.9960 | 43 | 0.1750 | 67 | 0.1080 |
| 20 | 1.1370 | 44 | 0.1750 | 68 | 0.1080 |
| 21 | 1.6270 | 45 | 0.1520 | 69 | 0.0990 |
| 22 | 2.5230 | 46 | 0.1520 | 70 | 0.0990 |
| 23 | 3.7160 | 47 | 0.1520 | 71 | 0.0990 |
| **24** | **7.7800** | **48** | **0.1520** | **72** | **0.0990** |

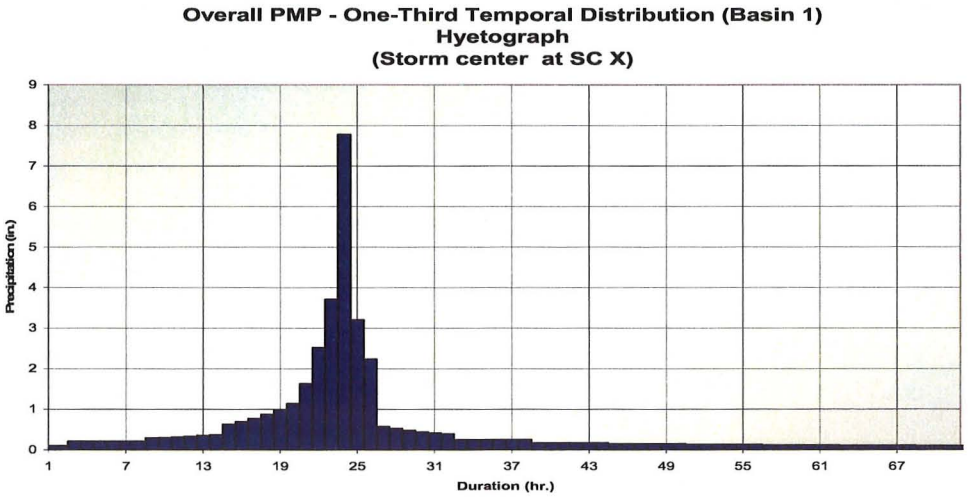


Figure 7-11. One-Third Peaking Temporal Distribution (Basin 1) – Overall PMP with Storm Center at SC X

Table 7-24. Center Peaking Temporal Distribution (Basin 1) – Overall PMP with Storm Center at SC X

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.0990 | 25 | 0.3510 | 49 | 0.2530 |
| 2 | 0.0990 | 26 | 0.3730 | 50 | 0.2530 |
| 3 | 0.1200 | 27 | 0.6300 | 51 | 0.1750 |
| 4 | 0.1200 | 28 | 0.6910 | 52 | 0.1750 |
| 5 | 0.1200 | 29 | 0.7720 | 53 | 0.1750 |
| **6** | **0.1200** | **30** | **0.8740** | **54** | **0.1750** |
| 7 | 0.1200 | 31 | 0.9960 | 55 | 0.1750 |
| 8 | 0.1200 | 32 | 1.1370 | 56 | 0.1750 |
| 9 | 0.1520 | 33 | 1.6270 | 57 | 0.1340 |
| 10 | 0.1520 | 34 | 2.5230 | 58 | 0.1340 |
| 11 | 0.1520 | 35 | 3.7160 | 59 | 0.1340 |
| **12** | **0.1520** | **36** | **7.7800** | **60** | **0.1340** |
| 13 | 0.1520 | 37 | 3.2050 | 61 | 0.1340 |
| 14 | 0.1520 | 38 | 2.2360 | 62 | 0.1340 |
| 15 | 0.2070 | 39 | 0.5760 | 63 | 0.1080 |
| 16 | 0.2070 | 40 | 0.5230 | 64 | 0.1080 |
| 17 | 0.2070 | 41 | 0.4780 | 65 | 0.1080 |
| **18** | **0.2070** | **42** | **0.4410** | **66** | **0.1080** |
| 19 | 0.2070 | 43 | 0.4130 | 67 | 0.1080 |
| 20 | 0.2070 | 44 | 0.3930 | 68 | 0.1080 |
| 21 | 0.2900 | 45 | 0.2530 | 69 | 0.0990 |
| 22 | 0.3010 | 46 | 0.2530 | 70 | 0.0990 |
| 23 | 0.3140 | 47 | 0.2530 | 71 | 0.0990 |
| **24** | **0.3310** | **48** | **0.2530** | **72** | **0.0990** |

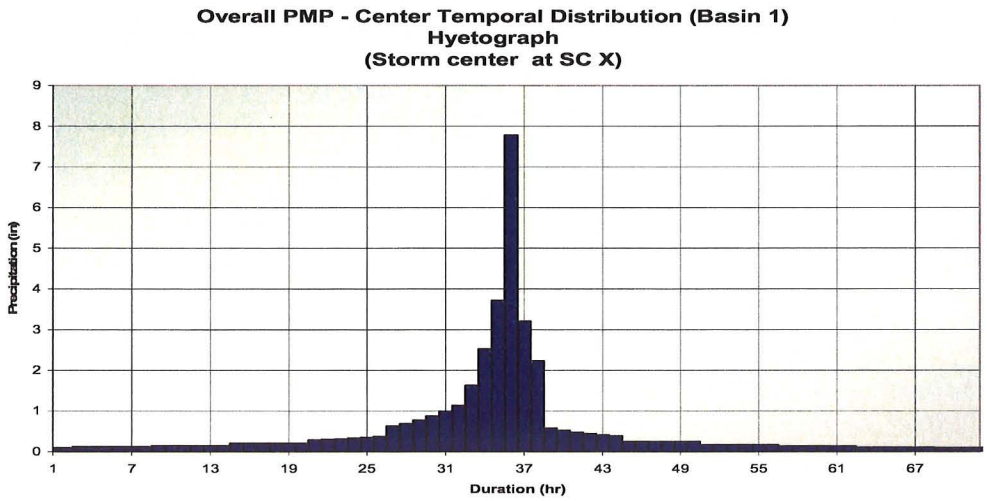


Figure 7-12. Center Peaking Temporal Distribution (Basin 1) – Overall PMP with Storm Center at SC X

Table 7-25. Two-Thirds Peaking Temporal Distribution (Basin 1) – Overall PMP with Storm Center at SC X

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.0990 | 25 | 0.1520 | 49 | 3.2050 |
| 2 | 0.0990 | 26 | 0.1520 | 50 | 2.2360 |
| 3 | 0.0990 | 27 | 0.2070 | 51 | 0.5760 |
| 4 | 0.0990 | 28 | 0.2070 | 52 | 0.5230 |
| 5 | 0.0990 | 29 | 0.2070 | 53 | 0.4780 |
| **6** | **0.0990** | **30** | **0.2070** | **54** | **0.4410** |
| 7 | 0.1080 | 31 | 0.2070 | 55 | 0.4130 |
| 8 | 0.1080 | 32 | 0.2070 | 56 | 0.3930 |
| 9 | 0.1080 | 33 | 0.2900 | 57 | 0.2530 |
| 10 | 0.1080 | 34 | 0.3010 | 58 | 0.2530 |
| 11 | 0.1080 | 35 | 0.3140 | 59 | 0.2530 |
| **12** | **0.1080** | **36** | **0.3310** | **60** | **0.2530** |
| 13 | 0.1200 | 37 | 0.3510 | 61 | 0.2530 |
| 14 | 0.1200 | 38 | 0.3730 | 62 | 0.2530 |
| 15 | 0.1200 | 39 | 0.6300 | 63 | 0.1750 |
| 16 | 0.1200 | 40 | 0.6910 | 64 | 0.1750 |
| 17 | 0.1200 | 41 | 0.7720 | 65 | 0.1750 |
| **18** | **0.1200** | **42** | **0.8740** | **66** | **0.1750** |
| 19 | 0.1340 | 43 | 0.9960 | 67 | 0.1750 |
| 20 | 0.1340 | 44 | 1.1370 | 68 | 0.1750 |
| 21 | 0.1520 | 45 | 1.6270 | 69 | 0.1340 |
| 22 | 0.1520 | 46 | 2.5230 | 70 | 0.1340 |
| 23 | 0.1520 | 47 | 3.7160 | 71 | 0.1340 |
| **24** | **0.1520** | **48** | **7.7800** | **72** | **0.1340** |

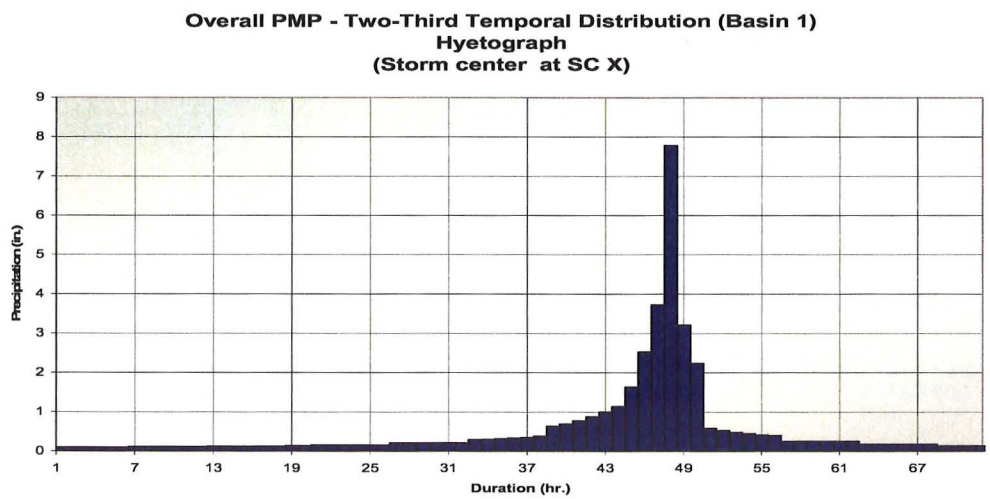


Figure 7-13. Two-Thirds Peaking Temporal Distribution (Basin 1) – Overall PMP with Storm Center at SC X

Table 7-26. End Peaking Temporal Distribution (Basin 1) – Overall PMP with Storm Center at SC X

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.0990 | 25 | 0.1520 | 49 | 0.2900 |
| 2 | 0.0990 | 26 | 0.1520 | 50 | 0.3010 |
| 3 | 0.0990 | 27 | 0.1520 | 51 | 0.3140 |
| 4 | 0.0990 | 28 | 0.1520 | 52 | 0.3310 |
| 5 | 0.0990 | 29 | 0.1520 | 53 | 0.3510 |
| **6** | **0.0990** | **30** | **0.1520** | **54** | **0.3730** |
| 7 | 0.1080 | 31 | 0.1750 | 55 | 0.3930 |
| 8 | 0.1080 | 32 | 0.1750 | 56 | 0.4130 |
| 9 | 0.1080 | 33 | 0.1750 | 57 | 0.4410 |
| 10 | 0.1080 | 34 | 0.1750 | 58 | 0.4780 |
| 11 | 0.1080 | 35 | 0.1750 | 59 | 0.5230 |
| **12** | **0.1080** | **36** | **0.1750** | **60** | **0.5760** |
| 13 | 0.1200 | 37 | 0.2070 | 61 | 0.6300 |
| 14 | 0.1200 | 38 | 0.2070 | 62 | 0.6910 |
| 15 | 0.1200 | 39 | 0.2070 | 63 | 0.7720 |
| 16 | 0.1200 | 40 | 0.2070 | 64 | 0.8740 |
| 17 | 0.1200 | 41 | 0.2070 | 65 | 0.9960 |
| **18** | **0.1200** | **42** | **0.2070** | **66** | **1.1370** |
| 19 | 0.1340 | 43 | 0.2530 | 67 | 1.6270 |
| 20 | 0.1340 | 44 | 0.2530 | 68 | 2.2360 |
| 21 | 0.1340 | 45 | 0.2530 | 69 | 2.5230 |
| 22 | 0.1340 | 46 | 0.2530 | 70 | 3.2050 |
| 23 | 0.1340 | 47 | 0.2530 | 71 | 3.7160 |
| **24** | **0.1340** | **48** | **0.2530** | **72** | **7.7800** |

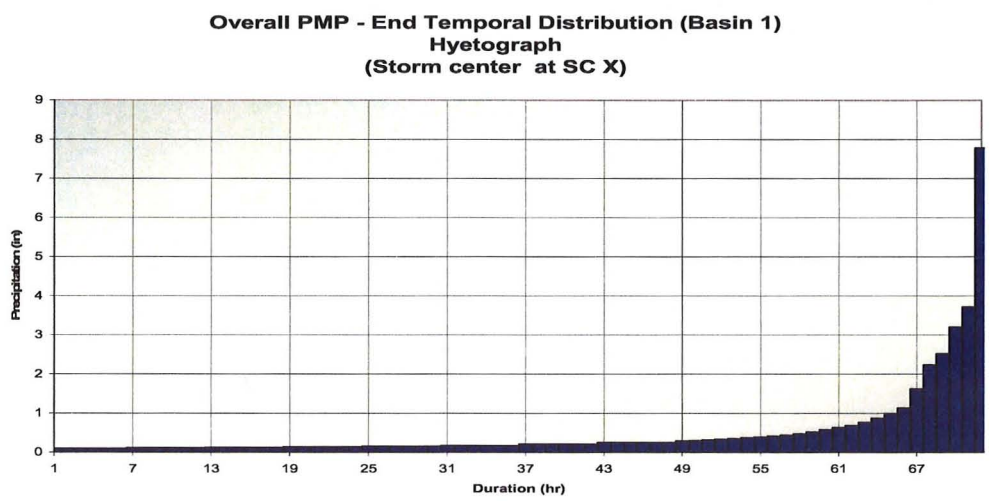


Figure 7-14. End Peaking Temporal Distribution (Basin 1) – Overall PMP with Storm Center at SC X

Table 7-27. One-Third Peaking Temporal Distribution (Basin 2) – Overall PMP with Storm Center at SC X

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.0990 | 25 | 2.6670 | 49 | 0.1520 |
| 2 | 0.0990 | 26 | 1.8890 | 50 | 0.1520 |
| 3 | 0.2070 | 27 | 0.5570 | 51 | 0.1340 |
| 4 | 0.2070 | 28 | 0.5090 | 52 | 0.1340 |
| 5 | 0.2070 | 29 | 0.4680 | 53 | 0.1340 |
| **6** | **0.2070** | **30** | **0.4350** | **54** | **0.1340** |
| 7 | 0.2070 | 31 | 0.4090 | 55 | 0.1340 |
| 8 | 0.2070 | 32 | 0.3900 | 56 | 0.1340 |
| 9 | 0.2900 | 33 | 0.2530 | 57 | 0.1200 |
| 10 | 0.3020 | 34 | 0.2530 | 58 | 0.1200 |
| 11 | 0.3150 | 35 | 0.2530 | 59 | 0.1200 |
| **12** | **0.3320** | **36** | **0.2530** | **60** | **0.1200** |
| 13 | 0.3500 | 37 | 0.2530 | 61 | 0.1200 |
| 14 | 0.3710 | 38 | 0.2530 | 62 | 0.1200 |
| 15 | 0.6040 | 39 | 0.1750 | 63 | 0.1080 |
| 16 | 0.6570 | 40 | 0.1750 | 64 | 0.1080 |
| 17 | 0.7270 | 41 | 0.1750 | 65 | 0.1080 |
| **18** | **0.8130** | **42** | **0.1750** | **66** | **0.1080** |
| 19 | 0.9160 | 43 | 0.1750 | 67 | 0.1080 |
| 20 | 1.0360 | 44 | 0.1750 | 68 | 0.1080 |
| 21 | 1.4170 | 45 | 0.1520 | 69 | 0.0990 |
| 22 | 2.1200 | 46 | 0.1520 | 70 | 0.0990 |
| 23 | 3.1010 | 47 | 0.1520 | 71 | 0.0990 |
| **24** | **6.4150** | **48** | **0.1520** | **72** | **0.0990** |

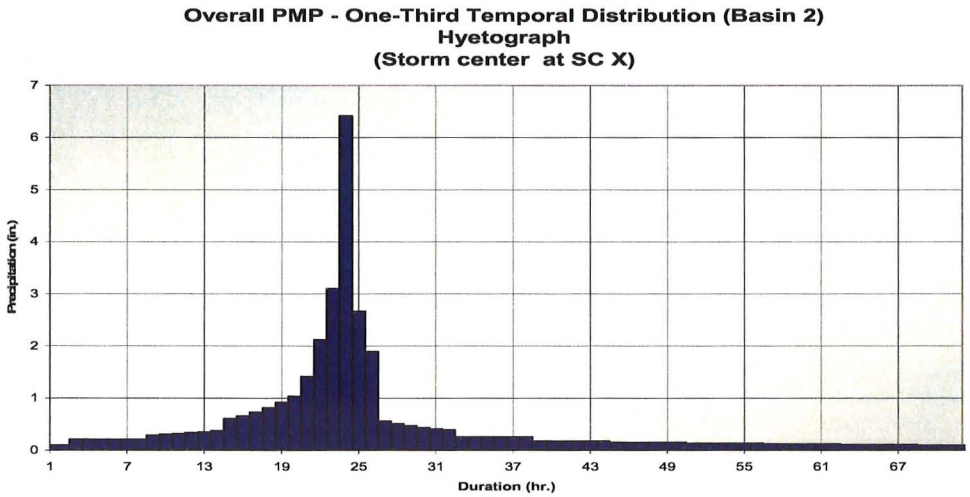


Figure 7-15. One-Third Peaking Temporal Distribution (Basin 2) – Overall PMP with Storm Center at SC X

Table 7-28. Center Peaking Temporal Distribution (Basin 2) – Overall PMP with Storm Center at SC X

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.0990 | 25 | 0.3500 | 49 | 0.2530 |
| 2 | 0.0990 | 26 | 0.3710 | 50 | 0.2530 |
| 3 | 0.1200 | 27 | 0.6040 | 51 | 0.1750 |
| 4 | 0.1200 | 28 | 0.6570 | 52 | 0.1750 |
| 5 | 0.1200 | 29 | 0.7270 | 53 | 0.1750 |
| **6** | **0.1200** | **30** | **0.8130** | **54** | **0.1750** |
| 7 | 0.1200 | 31 | 0.9160 | 55 | 0.1750 |
| 8 | 0.1200 | 32 | 1.0360 | 56 | 0.1750 |
| 9 | 0.1520 | 33 | 1.4170 | 57 | 0.1340 |
| 10 | 0.1520 | 34 | 2.1200 | 58 | 0.1340 |
| 11 | 0.1520 | 35 | 3.1010 | 59 | 0.1340 |
| **12** | **0.1520** | **36** | **6.4150** | **60** | **0.1340** |
| 13 | 0.1520 | 37 | 2.6670 | 61 | 0.1340 |
| 14 | 0.1520 | 38 | 1.8890 | 62 | 0.1340 |
| 15 | 0.2070 | 39 | 0.5570 | 63 | 0.1080 |
| 16 | 0.2070 | 40 | 0.5090 | 64 | 0.1080 |
| 17 | 0.2070 | 41 | 0.4680 | 65 | 0.1080 |
| **18** | **0.2070** | **42** | **0.4350** | **66** | **0.1080** |
| 19 | 0.2070 | 43 | 0.4090 | 67 | 0.1080 |
| 20 | 0.2070 | 44 | 0.3900 | 68 | 0.1080 |
| 21 | 0.2900 | 45 | 0.2530 | 69 | 0.0990 |
| 22 | 0.3020 | 46 | 0.2530 | 70 | 0.0990 |
| 23 | 0.3150 | 47 | 0.2530 | 71 | 0.0990 |
| **24** | **0.3320** | **48** | **0.2530** | **72** | **0.0990** |

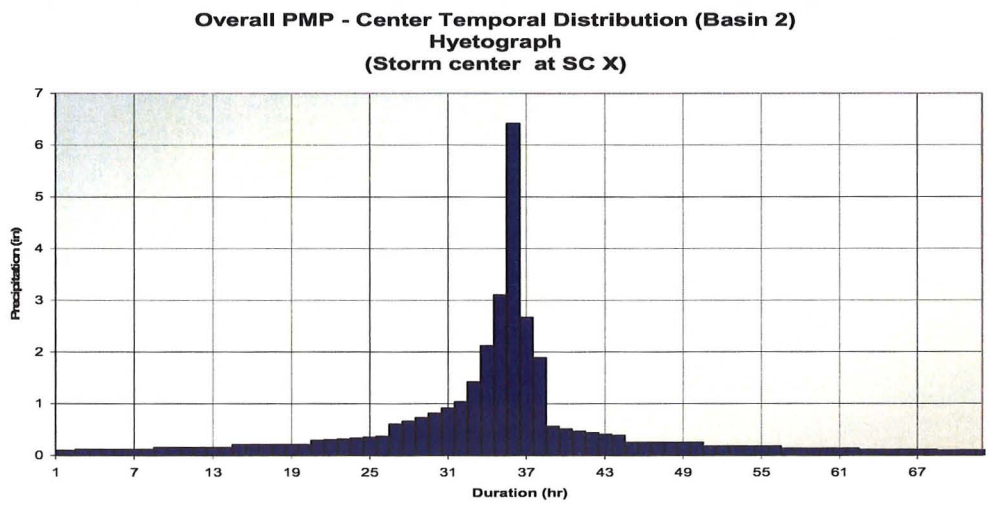


Figure 7-16. Center Peaking Temporal Distribution (Basin 2) – Overall PMP with Storm Center at SC X

Table 7-29. Two-Thirds Peaking Temporal Distribution (Basin 2) – Overall PMP with Storm Center at SC X

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.0990 | 25 | 0.1520 | 49 | 2.6670 |
| 2 | 0.0990 | 26 | 0.1520 | 50 | 1.8890 |
| 3 | 0.0990 | 27 | 0.2070 | 51 | 0.5570 |
| 4 | 0.0990 | 28 | 0.2070 | 52 | 0.5090 |
| 5 | 0.0990 | 29 | 0.2070 | 53 | 0.4680 |
| **6** | **0.0990** | **30** | **0.2070** | **54** | **0.4350** |
| 7 | 0.1080 | 31 | 0.2070 | 55 | 0.4090 |
| 8 | 0.1080 | 32 | 0.2070 | 56 | 0.3900 |
| 9 | 0.1080 | 33 | 0.2900 | 57 | 0.2530 |
| 10 | 0.1080 | 34 | 0.3020 | 58 | 0.2530 |
| 11 | 0.1080 | 35 | 0.3150 | 59 | 0.2530 |
| **12** | **0.1080** | **36** | **0.3320** | **60** | **0.2530** |
| 13 | 0.1200 | 37 | 0.3500 | 61 | 0.2530 |
| 14 | 0.1200 | 38 | 0.3710 | 62 | 0.2530 |
| 15 | 0.1200 | 39 | 0.6040 | 63 | 0.1750 |
| 16 | 0.1200 | 40 | 0.6570 | 64 | 0.1750 |
| 17 | 0.1200 | 41 | 0.7270 | 65 | 0.1750 |
| **18** | **0.1200** | **42** | **0.8130** | **66** | **0.1750** |
| 19 | 0.1340 | 43 | 0.9160 | 67 | 0.1750 |
| 20 | 0.1340 | 44 | 1.0360 | 68 | 0.1750 |
| 21 | 0.1520 | 45 | 1.4170 | 69 | 0.1340 |
| 22 | 0.1520 | 46 | 2.1200 | 70 | 0.1340 |
| 23 | 0.1520 | 47 | 3.1010 | 71 | 0.1340 |
| **24** | **0.1520** | **48** | **6.4150** | **72** | **0.1340** |

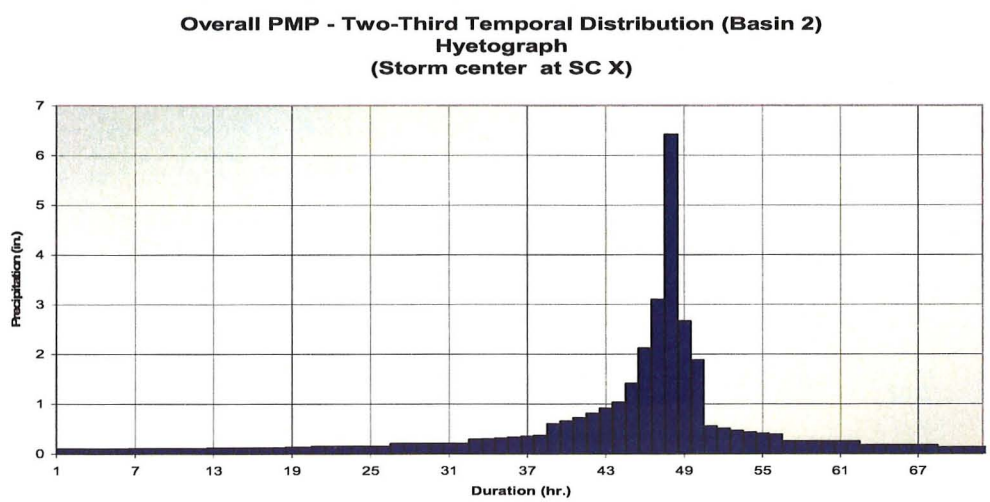


Figure 7-17. Two-Thirds Peaking Temporal Distribution (Basin 2) – Overall PMP with Storm Center at SC X

Table 7-30. End Peaking Temporal Distribution (Basin 2) – Overall PMP with Storm Center at SC X

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.0990 | 25 | 0.1520 | 49 | 0.2900 |
| 2 | 0.0990 | 26 | 0.1520 | 50 | 0.3020 |
| 3 | 0.0990 | 27 | 0.1520 | 51 | 0.3150 |
| 4 | 0.0990 | 28 | 0.1520 | 52 | 0.3320 |
| 5 | 0.0990 | 29 | 0.1520 | 53 | 0.3500 |
| **6** | **0.0990** | **30** | **0.1520** | **54** | **0.3710** |
| 7 | 0.1080 | 31 | 0.1750 | 55 | 0.3900 |
| 8 | 0.1080 | 32 | 0.1750 | 56 | 0.4090 |
| 9 | 0.1080 | 33 | 0.1750 | 57 | 0.4350 |
| 10 | 0.1080 | 34 | 0.1750 | 58 | 0.4680 |
| 11 | 0.1080 | 35 | 0.1750 | 59 | 0.5090 |
| **12** | **0.1080** | **36** | **0.1750** | **60** | **0.5570** |
| 13 | 0.1200 | 37 | 0.2070 | 61 | 0.6040 |
| 14 | 0.1200 | 38 | 0.2070 | 62 | 0.6570 |
| 15 | 0.1200 | 39 | 0.2070 | 63 | 0.7270 |
| 16 | 0.1200 | 40 | 0.2070 | 64 | 0.8130 |
| 17 | 0.1200 | 41 | 0.2070 | 65 | 0.9160 |
| **18** | **0.1200** | **42** | **0.2070** | **66** | **1.0360** |
| 19 | 0.1340 | 43 | 0.2530 | 67 | 1.4170 |
| 20 | 0.1340 | 44 | 0.2530 | 68 | 1.8890 |
| 21 | 0.1340 | 45 | 0.2530 | 69 | 2.1200 |
| 22 | 0.1340 | 46 | 0.2530 | 70 | 2.6670 |
| 23 | 0.1340 | 47 | 0.2530 | 71 | 3.1010 |
| **24** | **0.1340** | **48** | **0.2530** | **72** | **6.4150** |

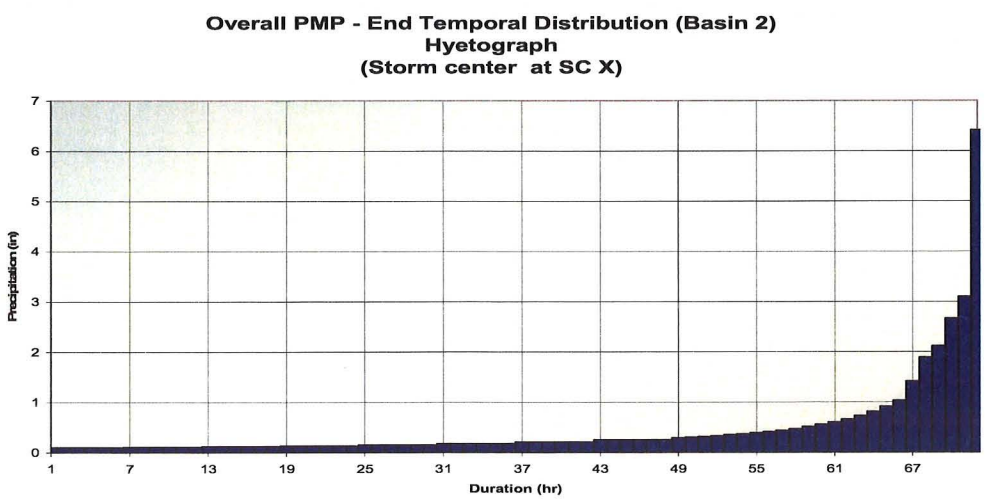


Figure 7-18. End Peaking Temporal Distribution (Basin 2) – Overall PMP with Storm Center at SC X

Table 7-31. One-Third Peaking Temporal Distribution (Basin 1) – Squaw Creek Reservoir PMP with Storm Center at SC X

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.1010 | 25 | 3.1160 | 49 | 0.1560 |
| 2 | 0.1010 | 26 | 2.0310 | 50 | 0.1560 |
| 3 | 0.2130 | 27 | 0.5800 | 51 | 0.1370 |
| 4 | 0.2130 | 28 | 0.5280 | 52 | 0.1370 |
| 5 | 0.2130 | 29 | 0.4850 | 53 | 0.1370 |
| **6** | **0.2130** | **30** | **0.4500** | **54** | **0.1370** |
| 7 | 0.2130 | 31 | 0.4220 | 55 | 0.1370 |
| 8 | 0.2130 | 32 | 0.4020 | 56 | 0.1370 |
| 9 | 0.2990 | 33 | 0.2610 | 57 | 0.1230 |
| 10 | 0.3110 | 34 | 0.2610 | 58 | 0.1230 |
| 11 | 0.3250 | 35 | 0.2610 | 59 | 0.1230 |
| **12** | **0.3420** | **36** | **0.2610** | **60** | **0.1230** |
| 13 | 0.3610 | 37 | 0.2610 | 61 | 0.1230 |
| 14 | 0.3830 | 38 | 0.2610 | 62 | 0.1230 |
| 15 | 0.6310 | 39 | 0.1800 | 63 | 0.1110 |
| 16 | 0.6890 | 40 | 0.1800 | 64 | 0.1110 |
| 17 | 0.7640 | 41 | 0.1800 | 65 | 0.1110 |
| **18** | **0.8580** | **42** | **0.1800** | **66** | **0.1110** |
| 19 | 0.9700 | 43 | 0.1800 | 67 | 0.1110 |
| 20 | 1.1000 | 44 | 0.1800 | 68 | 0.1110 |
| 21 | 1.5070 | 45 | 0.1560 | 69 | 0.1010 |
| 22 | 2.3290 | 46 | 0.1560 | 70 | 0.1010 |
| 23 | 3.8410 | 47 | 0.1560 | 71 | 0.1010 |
| **24** | **12.1100** | **48** | **0.1560** | **72** | **0.1010** |

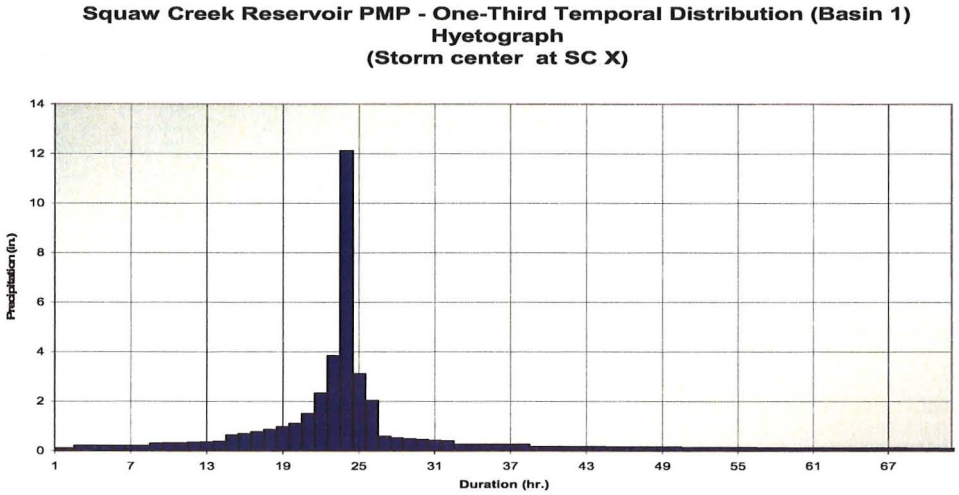


Figure 7-19. One-Third Peaking Temporal Distribution (Basin 1) – Squaw Creek Reservoir PMP with Storm Center at SC X

Table 7-32. Center Peaking Temporal Distribution (Basin 1) – Squaw Creek Reservoir PMP with Storm Center at SC X

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.1010 | 25 | 0.3610 | 49 | 0.2610 |
| 2 | 0.1010 | 26 | 0.3830 | 50 | 0.2610 |
| 3 | 0.1230 | 27 | 0.6310 | 51 | 0.1800 |
| 4 | 0.1230 | 28 | 0.6890 | 52 | 0.1800 |
| 5 | 0.1230 | 29 | 0.7640 | 53 | 0.1800 |
| **6** | **0.1230** | **30** | **0.8580** | **54** | **0.1800** |
| 7 | 0.1230 | 31 | 0.9700 | 55 | 0.1800 |
| 8 | 0.1230 | 32 | 1.1000 | 56 | 0.1800 |
| 9 | 0.1560 | 33 | 1.5070 | 57 | 0.1370 |
| 10 | 0.1560 | 34 | 2.3290 | 58 | 0.1370 |
| 11 | 0.1560 | 35 | 3.8410 | 59 | 0.1370 |
| **12** | **0.1560** | **36** | **12.1100** | **60** | **0.1370** |
| 13 | 0.1560 | 37 | 3.1160 | 61 | 0.1370 |
| 14 | 0.1560 | 38 | 2.0310 | 62 | 0.1370 |
| 15 | 0.2130 | 39 | 0.5800 | 63 | 0.1110 |
| 16 | 0.2130 | 40 | 0.5280 | 64 | 0.1110 |
| 17 | 0.2130 | 41 | 0.4850 | 65 | 0.1110 |
| **18** | **0.2130** | **42** | **0.4500** | **66** | **0.1110** |
| 19 | 0.2130 | 43 | 0.4220 | 67 | 0.1110 |
| 20 | 0.2130 | 44 | 0.4020 | 68 | 0.1110 |
| 21 | 0.2990 | 45 | 0.2610 | 69 | 0.1010 |
| 22 | 0.3110 | 46 | 0.2610 | 70 | 0.1010 |
| 23 | 0.3250 | 47 | 0.2610 | 71 | 0.1010 |
| **24** | **0.3420** | **48** | **0.2610** | **72** | **0.1010** |

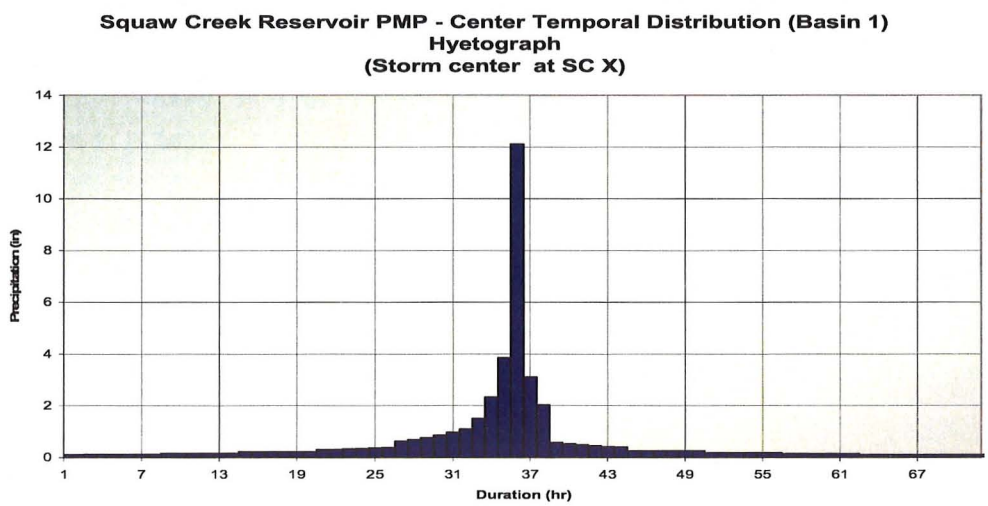


Figure 7-20. Center Peaking Temporal Distribution (Basin 1) – Squaw Creek Reservoir PMP with Storm Center at SC X

Table 7-33. Two-Thirds Peaking Temporal Distribution – Squaw Creek Reservoir PMP with Storm Center at SC X

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | | | | |
| 1 | 0.1010 | 25 | 0.1560 | 49 | 3.1160 |
| 2 | 0.1010 | 26 | 0.1560 | 50 | 2.0310 |
| 3 | 0.1010 | 27 | 0.2130 | 51 | 0.5800 |
| 4 | 0.1010 | 28 | 0.2130 | 52 | 0.5280 |
| 5 | 0.1010 | 29 | 0.2130 | 53 | 0.4850 |
| **6** | **0.1010** | **30** | **0.2130** | **54** | **0.4500** |
| 7 | 0.1110 | 31 | 0.2130 | 55 | 0.4220 |
| 8 | 0.1110 | 32 | 0.2130 | 56 | 0.4020 |
| 9 | 0.1110 | 33 | 0.2990 | 57 | 0.2610 |
| 10 | 0.1110 | 34 | 0.3110 | 58 | 0.2610 |
| 11 | 0.1110 | 35 | 0.3250 | 59 | 0.2610 |
| **12** | **0.1110** | **36** | **0.3420** | **60** | **0.2610** |
| 13 | 0.1230 | 37 | 0.3610 | 61 | 0.2610 |
| 14 | 0.1230 | 38 | 0.3830 | 62 | 0.2610 |
| 15 | 0.1230 | 39 | 0.6310 | 63 | 0.1800 |
| 16 | 0.1230 | 40 | 0.6890 | 64 | 0.1800 |
| 17 | 0.1230 | 41 | 0.7640 | 65 | 0.1800 |
| **18** | **0.1230** | **42** | **0.8580** | **66** | **0.1800** |
| 19 | 0.1370 | 43 | 0.9700 | 67 | 0.1800 |
| 20 | 0.1370 | 44 | 1.1000 | 68 | 0.1800 |
| 21 | 0.1560 | 45 | 1.5070 | 69 | 0.1370 |
| 22 | 0.1560 | 46 | 2.3290 | 70 | 0.1370 |
| 23 | 0.1560 | 47 | 3.8410 | 71 | 0.1370 |
| **24** | **0.1560** | **48** | **12.1100** | **72** | **0.1370** |

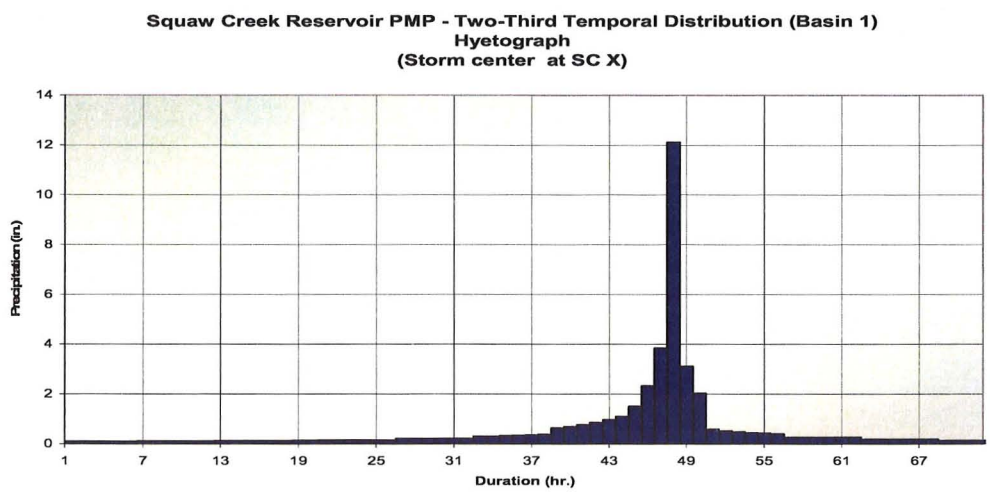


Figure 7-21. Two-Thirds Peaking Temporal Distribution (Basin 1) – Squaw Creek Reservoir PMP with Storm Center at SC X

Table 7-34. End Peaking Temporal Distribution (Basin 1) – Squaw Creek Reservoir PMP with Storm Center at SC X

| Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) | Duration (hr.) | Incremental Depth (in.) |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0.1010 | 25 | 0.1560 | 49 | 0.2990 |
| 2 | 0.1010 | 26 | 0.1560 | 50 | 0.3110 |
| 3 | 0.1010 | 27 | 0.1560 | 51 | 0.3250 |
| 4 | 0.1010 | 28 | 0.1560 | 52 | 0.3420 |
| 5 | 0.1010 | 29 | 0.1560 | 53 | 0.3610 |
| **6** | **0.1010** | **30** | **0.1560** | **54** | **0.3830** |
| 7 | 0.1110 | 31 | 0.1800 | 55 | 0.4020 |
| 8 | 0.1110 | 32 | 0.1800 | 56 | 0.4220 |
| 9 | 0.1110 | 33 | 0.1800 | 57 | 0.4500 |
| 10 | 0.1110 | 34 | 0.1800 | 58 | 0.4850 |
| 11 | 0.1110 | 35 | 0.1800 | 59 | 0.5280 |
| **12** | **0.1110** | **36** | **0.1800** | **60** | **0.5800** |
| 13 | 0.1230 | 37 | 0.2130 | 61 | 0.6310 |
| 14 | 0.1230 | 38 | 0.2130 | 62 | 0.6890 |
| 15 | 0.1230 | 39 | 0.2130 | 63 | 0.7640 |
| 16 | 0.1230 | 40 | 0.2130 | 64 | 0.8580 |
| 17 | 0.1230 | 41 | 0.2130 | 65 | 0.9700 |
| **18** | **0.1230** | **42** | **0.2130** | **66** | **1.1000** |
| 19 | 0.1370 | 43 | 0.2610 | 67 | 1.5070 |
| 20 | 0.1370 | 44 | 0.2610 | 68 | 2.0310 |
| 21 | 0.1370 | 45 | 0.2610 | 69 | 2.3290 |
| 22 | 0.1370 | 46 | 0.2610 | 70 | 3.1160 |
| 23 | 0.1370 | 47 | 0.2610 | 71 | 3.8410 |
| **24** | **0.1370** | **48** | **0.2610** | **72** | **12.1100** |

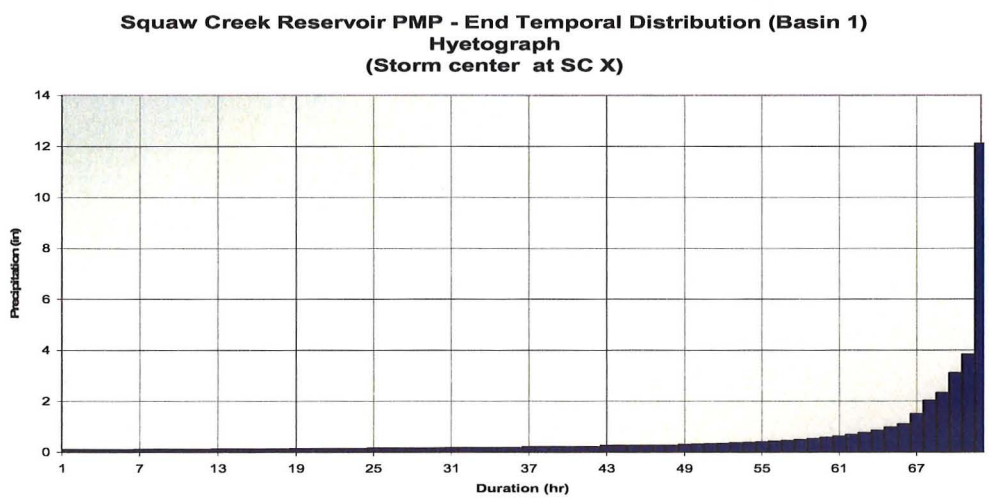


Figure 7-22. End Peaking Temporal Distribution (Basin 1) – Squaw Creek Reservoir PMP with Storm Center at SC X

**Mass Curves for Overall PMP (Basin 4)**
**with Storm Center at PR Y**

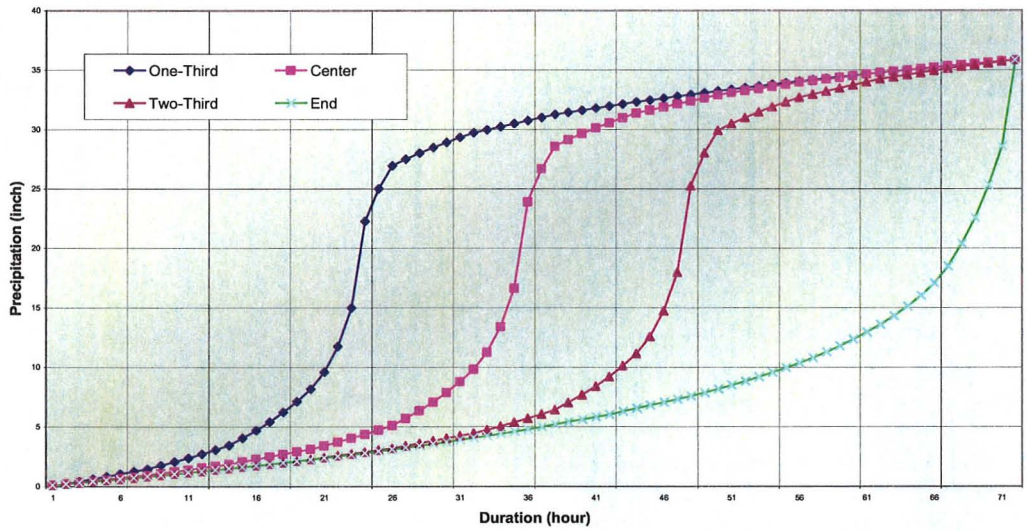


Figure 7-23. Mass Curves for Overall PMP with Storm Center at PR Y (Basin 4)

**Mass Curves for Overall PMP (Basin 3)**
**with Storm Center at PR Y**

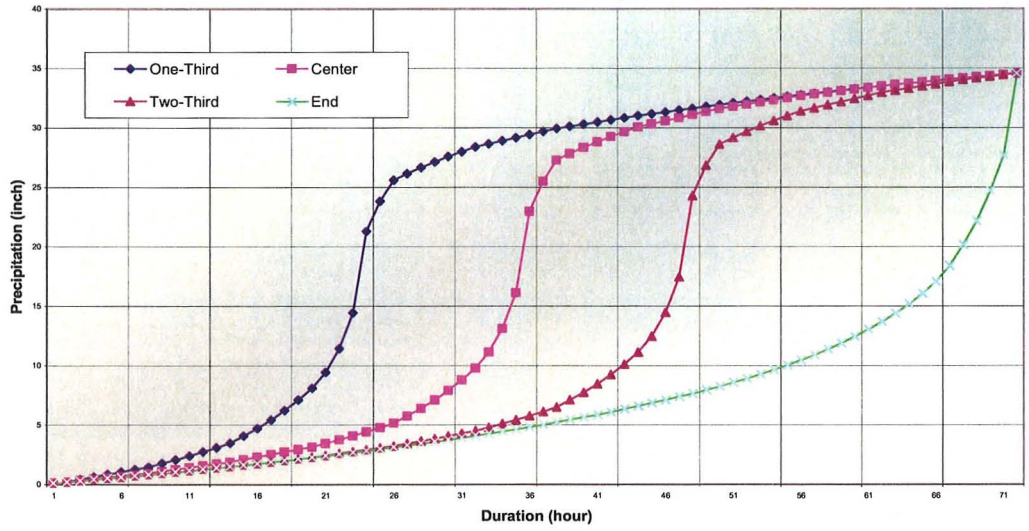


Figure 7-24. Mass Curves for Overall PMP with Storm Center at PR Y (Basin 3)

**Mass Curves for Overall PMP (Basin 1)**
**with Storm Center at SC X**

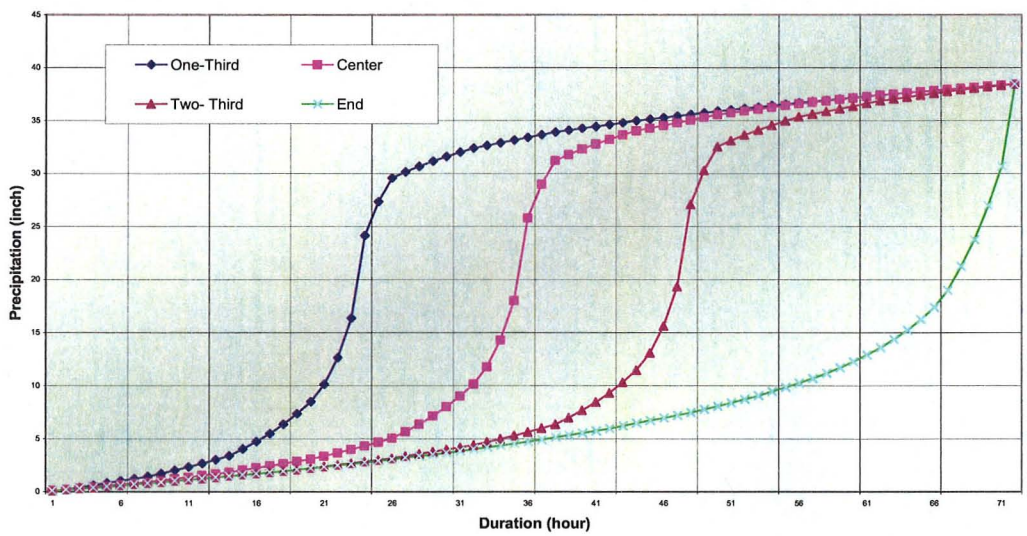


Figure 7-25. Mass Curves for Overall PMP with Storm Center at SC X (Basin 1)

**Mass Curves for Overall PMP (Basin 2)**
**with Storm Center at SC X**

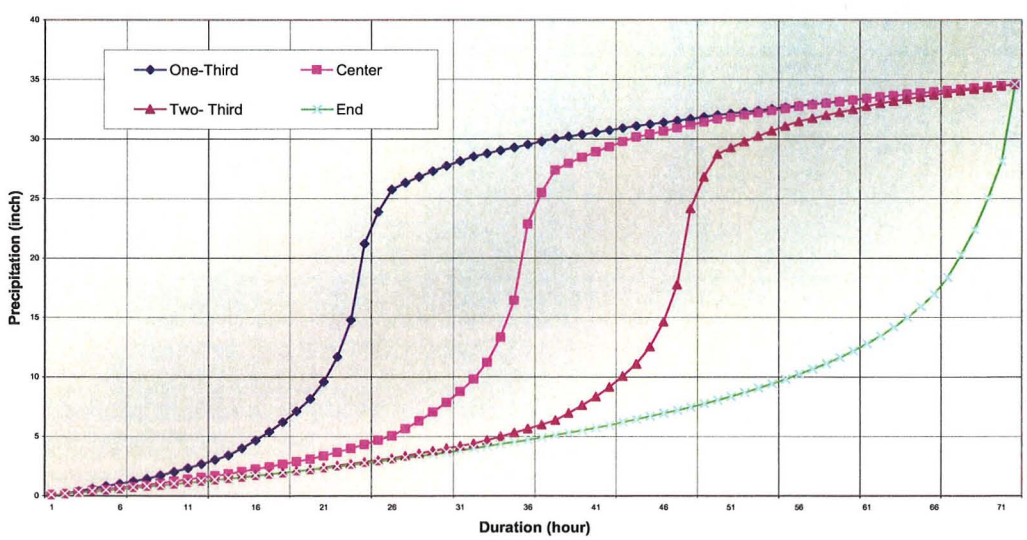


Figure 7-26. Mass Curves for Overall PMP with Storm Center at SC X (Basin 2)

**Mass Curves for Squaw Creek Reservoir PMP (Basin 1)**
**with Storm Center at SC X**

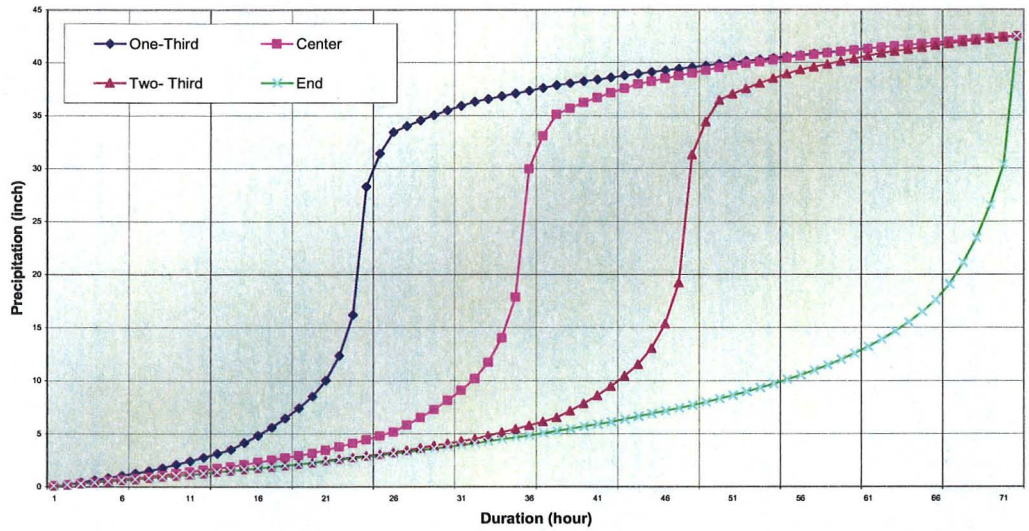


Figure 7-27. Mass Curves for the Squaw Creek Reservoir PMP with Storm Center at SC X (Basin 1)

## 8.0 Appendices

Appendix A contains the resulting HMR 52 software output file. The output file also includes the input data.