DRAINAGE PLAN

BROAD STREET INDUSTRIAL PARK

TO

WICHITA, SEDGWICK COUNTY, KANSAS

PREPARED BY

Baughman
ENGINEERING | SURVEYING | PLANNING
LANDSCAPE ARCHITECTURE

28 MAY 2008

ENGINEERING | SURVEYING | PLANNING
LANDSCAPE ARCHITECTURE

DRAINAGE PLAN
BROAD STREET INDUSTRIAL PARK

FINAL REPORT

Prepared by Baughman Company, P.A.
28 May 2008

By N. Brent Wooten, P.E.
Trevor R. Kurth, P.E.
Nicholas H. Jefferson, P.E.

REPORT CONTENTS

City of Wichita Subdivision Checklist

Project Narrative
Existing Conditions
Proposed Conditions
Offsite Conditions

Existing Conditions Runoff Calculations
Drainage Methods & Standards
Site Characteristics
Existing Conditions Hydrologic Analysis
Downstream Drainage Capacity

Post-Development Hydrologic Analysis
Drainage Methods & Standards
Detention Facilities
Detention Summary
Discharge Points Summary
Potential Upstream/Downstream Impacts

Floodplain Submittal
Source of Floodplain Information

Federal, State, & Local Permitting
US Army Corps of Engineers
Kansas Dept of Agriculture – DWR Permitting
FEMA
Kansas Dept of Transportation
Sedgwick County ROW

Exhibits
Exhibit 1: Site Location Map
Exhibit 2: Aerial Photo Exhibit with Topography
Exhibit 3: Plat – Half Scale
Exhibit 4: Drainage & Grading Plan – Half Scale
Exhibit 5: Floodplain Location (FIRM)

Appendices: Supporting Calculations
Appendix A: USGS Soils Survey
Appendix B: HydraFlow Hydrographs Routing
Appendix C: HydraFlow Express

Plan Sheets
Drainage Plan 1:120 Scale

EXISTING CONDITIONS

The site is located south of MacArthur Street along the east bank of the Wichita-Valley Center Flood Control Ditch. The property is accessed by Broad Street and is bordered along the east by the Mopac Railroad. The site is currently a borrow pit and construction rock crushing operation. There is an existing building located at the northeast portion of the property. There are also three existing ponds located on the property. The northeast pond accepts semi-developed offsite runoff from the north. The west pond accepts offsite runoff from the west and conveys it to the east and into the existing east pond via a 24" RCP. The east pond and northeast pond discharge to the east and into the Railroad ROW. The overall runoff from the site and offsite is then conveyed to the east under the railroad via a 5'x7' RCBC. There does not appear to be any drainage problems in this area. The site location is depicted on the USGS Quadrangle Sheet as Exhibit 1. The aerial photograph with existing topography can be seen as Exhibit 2.

There is no FEMA SFHA located on the property as of this report.

PROPOSED CONDITIONS

The proposed Broad Street Industrial Park will consist of 2 lots with associated streets, utilities, and drainage systems. This development is expected to over-excavate and re-configure the existing ponds and outlets. This development will convey its developed runoff to the ponds via storm water sewer, channels, flumes, or other approved methods. These systems are not expected to be constructed until the site develops, and at that time, lot splits are expected to divide the platted 2 lots. Upon the lot splits, the drainage exhibits will need to follow the overall drainage plan and direct the developed runoff to the proposed pond systems.

The proposed ponds are expected to be surface water ponds and will continue to drain to the RCBC located under the railroad to the east. The northeast pond and west pond will continue to convey offsite runoff through this site. The ponds' maintenance will be the responsibility of the owner and will be located in a drainage easement. Although the ponds sizes and outlets are final, the locations of the ponds may change depending on the sites development plans.

There is an existing building/shop located on Lot 2. This building is expected to remain and has a finished floor elevation of a 1286.5.

There is no FEMA SFHA located on this property as of this report. There is a FEMA Zone A located inside the levee to the west.

For a half scale copy of the Plat, see Exhibit 3.

OFFSITE CONDITIONS

The site is relatively flat, but generally drains to the north and east. There is an existing 5'x 7' RCBC which drains this site as well as offsite runoff from the north and west. This box conveys runoff under the adjacent railroad property to the east and into an open agricultural field.

There is approximately 28 acres of runoff draining from the west which dissects this site. This drainage appears to flow adjacent to the levee and then encroach the subject property and into the existing west pond. This drainage accounts for approximately 60cfs of runoff in the 100-year storm event. There is runoff from the north encroaching the property and into the north east pond. This area, approximately 28 acres, drains 87cfs of runoff during the 100-year storm event. This area will continue to be conveyed through the northeast pond.

EXISTING CONDITIONS RUNOFF CALCULATIONS

DRAINAGE METHODS & STANDARDS

The following methods and standards, although not a complete list, were used in calculating the existing conditions runoff values.

- Ø STORM SERIES
  - 24-hour; 2-yr, 5-yr, 10-yr, 25-yr, 100-yr Storm Events Modeled
  - 2-yr Rainfall Depth = 3.5 in
  - 5-yr Rainfall Depth = 4.5 in
  - 10-yr Rainfall Depth = 5.3 in
  - 25-yr Rainfall Depth = 6.1 in
  - 100-yr Rainfall Depth = 7.9 in

- Ø FLOW DATA
  - Existing Conditions modeled in HydraFlow Hydrographs
  - Areas per USGS Quadrangle Sheet, Aerial Photos, and Site Visits
  - HydraFlow Hydrograph software for existing offsite flows
  - Runoff Coefficient: CN = 84 (Type D Soils, Open Space – Good Condition)
  - Time of Concentration: Lag Method (15 min minimum)

SITE CHARACTERISTICS

The current site is a construction yard with rock crushing and excavation pits. The site has relatively little ground cover and 3 existing ponds. These ponds are surface water ponds and have no controlled outlets. There is an existing building on the property along the east edge adjacent to the railroad. The site is located to the east and adjacent to the Wichita-Valley Center Flood Control Ditch. The overall site drains to an existing RCBC under the railroad.
The Aerial Exhibit can be seen as Exhibit 2.

EXISTING CONDITIONS HYDROLOGIC ANALYSIS

The site was analyzed for pre-development conditions using the hydrograph method for the 2, 5, 10, 25, and 100-year storm events. A curve number of 84 was used for existing conditions assuming undeveloped agricultural land use (open space – good condition) with Types D soils. The site, as of this report, is more likely to have higher curve number due to the fact that no ground cover is present. However, the existing conditions that this site should adhere to should be the conditions before any heavy construction operations have occurred. The time of concentration was calculated using the Lag Method with a minimum time of concentration of 15 minutes. The existing pond was not modeled for its detention value. These ponds are constantly changing shape and location and were not originally designed for detention values. Also, the topography used in this plan was performed by others (owner). The topography of the property, being a borrow pit as well as an excavation/haul operation, is constantly being changed.

DOWNSTREAM DRAINAGE CAPACITY

The site drains to the east and then under the adjacent railroad ROW via a RCBC. This drainage then drains to the south and east, in an open agricultural field, and eventually under West Street. The RCBC is the only drainage structure which drains this site.

There are no openings in the adjacent levee for this site to utilize. There is offsite runoff from the west and north which this site currently accepts.

POST-DEVELOPMENT HYDROLOGIC ANALYSIS

DRAINAGE METHODS & STANDARDS

The following methods and standards, although not a complete list, were used in developing the drainage and grading plans.

Ø STORM SERIES
- 24-hour; 2-yr, 5-yr, 10-yr, 25-yr, 100-yr Storm Events Modeled
- HydraFlow Hydrographs software for existing flows
- SCS Curve Number; CN = 93 (Type D Soils, Industrial)
- Time of Concentration; Lag method, minimum Tc = 15min

Ø GRADING CONSTRAINTS
- Match grades along site perimeter
- Emergency Overflows for 24-hr, 100-yr Storm Event

Ø POND ROUTING / GRADING
- HydraFlow Hydrographs software utilized for pond routing

DETENTION FACILITIES

There are three (3) detention ponds proposed in this subdivision. This can be seen on the half-scale Drainage & Grading Plan as Exhibits 4. The ponds are described in more detail below.

Ø WEST POND

The existing West Pond will be re-graded and re-worked. This pond will continue to accept offsite runoff from the west as well as 24 acres of developed site runoff. The pond will have a static water surface elevation of a 1280.0 and a corresponding 100-year water surface elevation of a 1283.8. The pond will discharge to the east and into the East Pond via a 36" RCP. This pond is expected to have 5:1 sideslopes and will be approximately 8-10' in depth. The ponds outer west bank will be located approximately 250' from the base of the adjacent levee (City of Wichita requests at least 200' of open space from the base of the levee).

Ø EAST POND

The proposed East Pond will be located just east of the west pond and just south of the existing building. The existing pond will be re-worked and will have 5:1 sideslopes and is expected to be at least 8' in depth. This pond will receive developed runoff from the south as well as the west ponds discharge. This pond will have a static water surface of a 1280.0 and a corresponding 100-year water surface of a 1283.7. This pond will discharge via a 10' broad crested weir section at the northeast corner of the pond. The pond was modeled using both the existing 5'x7' RCBC and the overflow weir. The RCBC is the controlling outlet structure.

Ø NORTHEAST POND

The proposed North East Pond will be located where the existing pond is currently located. This pond will be over-excavated and

expanded to allow for adequate site detention. This pond accepts offsite runoff from the north as well as developed runoff from the northern portion of the site. Once re-worked, this pond will have a static water surface elevation of a 1280.5 and a 100-year water surface elevation of a 1283.4. This pond will discharge via a 10' broadcrested weir section at its static elevation. This is similar to the current pond outlet. Currently, the pond drains via a ditch section which conveys the runoff to the RCBC. After development, the weir section will discharge into a ditch section of comparable dimensions and ultimately discharge into the 5'x7' RCBC.

DETENTION SUMMARY

Detention will be provided on the proposed site to limit the developed runoff to less than or equal to the existing conditions. The following tables represents the pond systems inflow and outflow for the 24-hour, 100-yr storm event.

POND

POND	INFLOW	OUTFLOW	100-yr WSE	OUTLET
West Pond	156 cfs	51 cfs	1283.8	36" RCP
East Pond	179 cfs	65 cfs	1283.7	5'x7' RCBC
North East Pond	250 cfs	128 cfs	1283.4	5'x7' RCBC

DISCHARGE POINTS SUMMARY

The site ultimately drains to the east and under the railroad via a 5'x7' RCBC. The box discharges to the east and into open space agricultural land.

POTENTIAL UPSTREAM/DOWNSTREAM IMPACTS

There does not appear to be any negative drainage impacts with the development of this property. The ponds will over-detain runoff to the existing box culvert. The proposed ponds will accept and detain all offsite runoff from the north and west as well as detain developed runoff. With the re-grading of the ponds, there should be better conveyance and storage with the proposed ponds than with the existing ponds. Currently, water stands in the ditch sections north the property. With minor re-grading to drain to the northeast pond, this should be minimized. The RCBC under the railroad is expected to flow approximately half of the open end area height once the site is developed.

SOURCE OF FLOODPLAIN INFORMATION

There is no FEMA SFHA located on this property as of this report. The adjacent Wichita-Valley Center Flood Control Ditch, located to the west, is covered with a FEMA Zone A Floodplain boundary. This SFHA is located approximately 350 ' off the proposed property and appears to be contained in the levee system. The location of the property, on FEMA FIRM Panel 485 of 700 for Sedgwick County, Kansas, effective date February 2, 2007 is attached as Exhibit 5.

FEDERAL, STATE, & LOCAL PERMITTING

US ARMY CORPS OF ENGINEERS
We do not expect any USACOE permitting at this time.

KANSAS DEPT OF AGRICULTURE – DWR PERMITTING
We do not expect any DWR permitting at this time.

FEMA
No FEMA SFHA exists on this property and we do not expect any FEMA permitting at this time.

KANSAS DEPT OF TRANSPORTATION
There does not appear to be any KDOT permitting needed on the proposed project.

SEDGWICK COUNTY ROW
There does not appear to be any additional discharge into the county ROW. No permit is expected at this time.

EXHIBIT 1: Site Location Map

EXHIBIT 2: Aerial Photo Exhibit with Topography

EXHIBIT 3: Plat – Half Scale

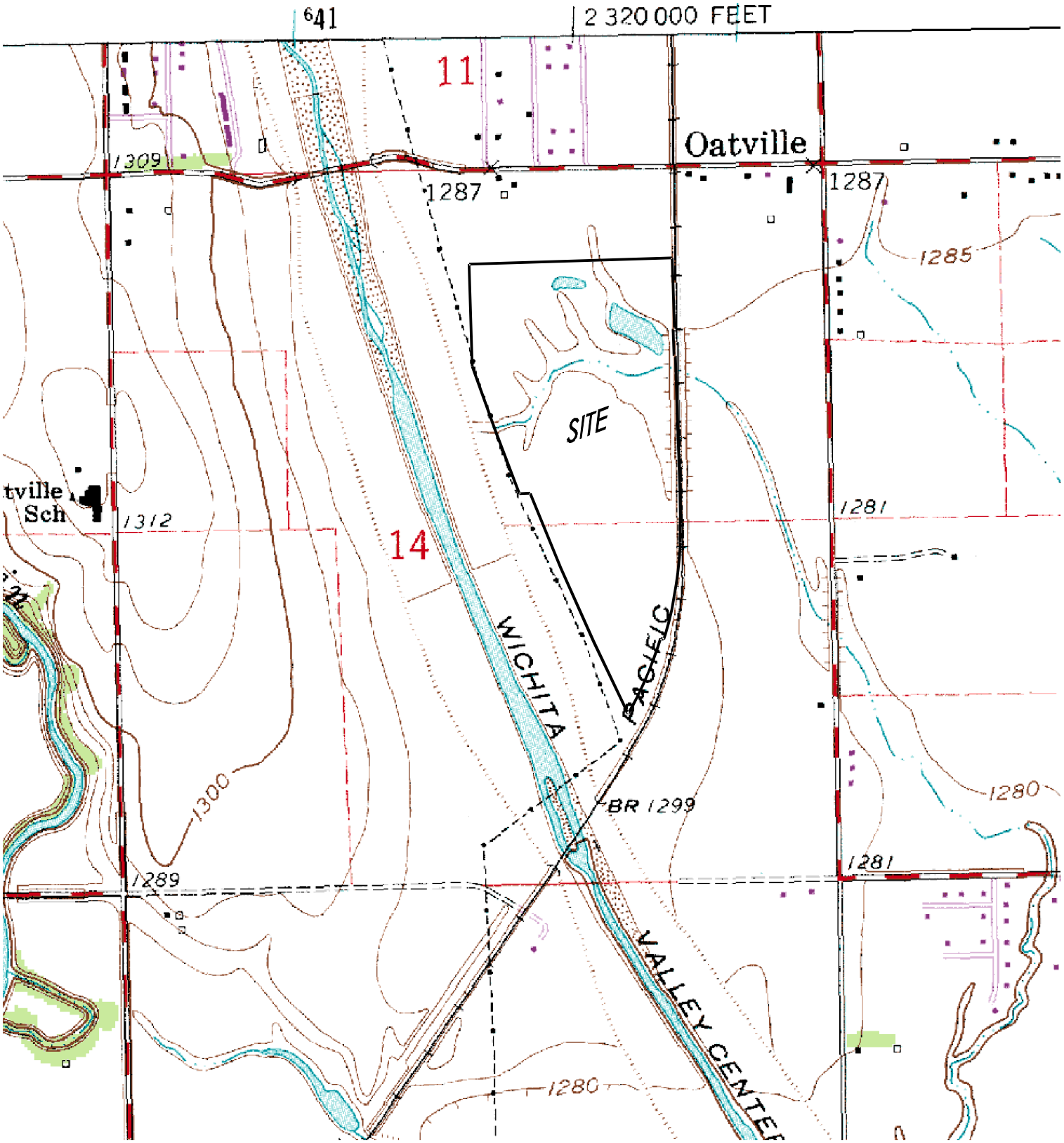
EXHIBIT 4: Drainage & Grading Plan – Half Scale

EXHIBIT 5: Floodplain Location (FIRM)

SITE LOCATION

BROAD STREET INDUSTRIAL PARK

WICHITA, SEDGWICK COUNTY, KANSAS



0 500 1000

DATE OF PREPARATION: 28 MAY 2008

EXHIBIT 1

BROAD STREET INDUSTRIAL PARK

28 MAY 2008

Baughman Company, P.A.
315 Elm St. Wichita, KS 67211 P 316-262-7271 F 316-262-0149
Baughman ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

AERIAL EXHIBIT

BROAD STREET INDUSTRIAL PARK

WICHITA, SEDGWICK COUNTY, KANSAS

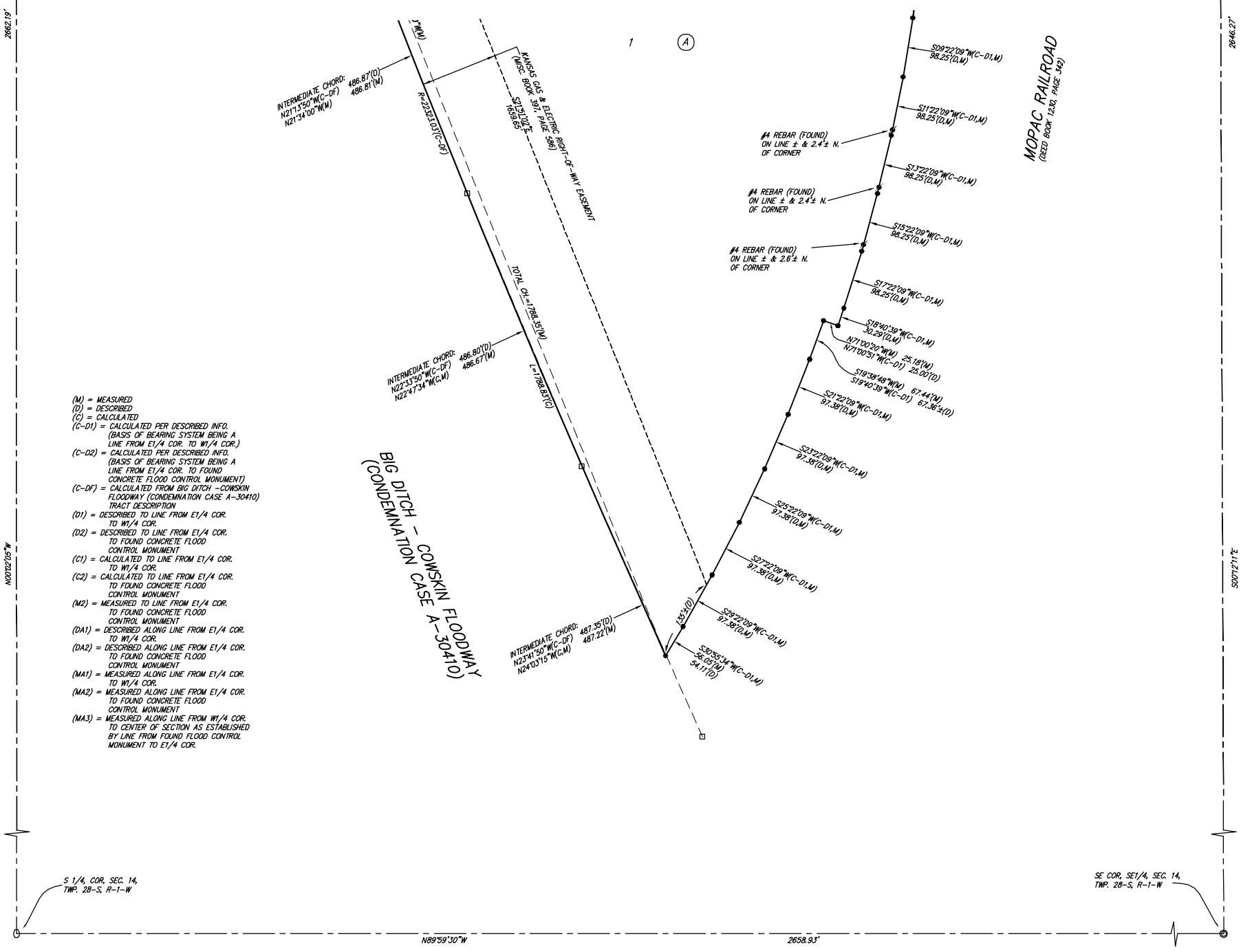
0 250 500

DATE OF PREPARATION: 26 MAY 2008
TOPOGRAPHY PROVIDED BY OWNER

EXHIBIT 3
BROAD STREET INDUSTRIAL PARK
28 MAY 2008

Baughman Company, P.A.
315 Ellis St. Wichita, KS 67211 P 316-262-7271 F 316-262-0149
Baughman ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

BROAD STREET INDUSTRIAL PARK
WICHITA, SEDGWICK COUNTY, KANSAS



(M) = MEASURED
(D) = DESCRIBED
(C) = CALCULATED
(C-D1) = CALCULATED PER DESCRIBED INFO. (BASIS OF BEARING SYSTEM BEING A LINE FROM E1/4 COR. TO W1/4 COR.)
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State of Kansas)
Sedgwick County) SS

We, Baughman Company, P.A., Surveyors in aforesaid county and state do hereby certify that we have surveyed and platted "BROAD STREET INDUSTRIAL PARK", Wichita, Sedgwick County, Kansas and that the accompanying plat is a true and correct exhibit of the property surveyed, described as Lot 1, Block 1, The Broad Street Addition to Sedgwick County, Kansas. together with a tract of land in the NE of Sec. 14, Twp. 28-S, R-1-W of the 6th P.M., Sedgwick County, Kansas, described as follows: that part of the NE1/4 of said Sec. 14 lying west of the Missouri Pacific Railroad right-of-way (as established in Deed Book 964, Page 39 and Deed Book 1230, Page 340), except the north 933.00 feet thereof; except that part platted as The Broad Street Addition; and except that part taken for the Wichita-Valley Center Floodway Condemned by Case A-30410, and together with that part of the W1/2 of the SE1/4 of Sec. 14, Twp. 28-S, R-1-W of the 6th P.M., Sedgwick County, Kansas lying east of the Wichita-Valley Center Flood Control right-of-way per Condemnation Case A-30410 and west of the Missouri Pacific Railroad right-of-way as established by the deed filed in Book 1230, Page 344, together with that part of the E1/2 of the SE1/4 of Sec. 14, Twp. 28-S, R-1-W of the 6th P.M., Sedgwick County, Kansas lying west of the Missouri Pacific Railroad right-of-way as established by deed filed in Book Misc. 1230, Page 342.

Existing public easements and dedications being vacated by virtue of K.S.A. 12-512(b).

Baughman Company, P.A.

_____, Surveyor
Michael G. Conrey

Know all men by these presents that we, the undersigned, have caused the land in the surveyors certificate to be platted into Lots, and a Block, to be known as "BROAD STREET INDUSTRIAL PARK", Wichita, Sedgwick County, Kansas. The utility easements are hereby granted as indicated for the construction and maintenance of all public utilities. The drainage easements are hereby granted as indicated for drainage purposes. The Minimum Building Pad Elevations for the lowest opening to the structures shall be as indicated on the face of the plat.

James K. Snook Trust Agreement
dated September 22, 1997

_____, Trustee
James K. Snook

State of Kansas)
Sedgwick County) SS

The foregoing instrument acknowledged before me, this_____day of_____, 2008, by James K. Snook, Trustee of the James K. Snook Trust Agreement dated September 22, 1997, on behalf of the trust.

_____, Notary Public

My App't. Exp._____

This plat of "BROAD STREET INDUSTRIAL PARK", Wichita, Sedgwick County, Kansas has been submitted to and approved by the Wichita-Sedgwick County Metropolitan Area Planning Commission, Wichita, Kansas.

Dated this _____ day of _____, 2008.
Wichita-Sedgwick County Metropolitan Area Planning Commission

_____, Chair
M. S. Mitchell

_____, Secretary
John L. Schlegel

This plat approved and all dedications shown hereon accepted by the City Council of the City of Wichita, Kansas, this_____day of_____, 2008.

_____, Mayor
Carl Brewer

_____, City Clerk
Karen Sublett

We the undersigned holders of a mortgage on the above described property, do hereby consent to this plat of "BROAD STREET INDUSTRIAL PARK", Wichita, Sedgwick County, Kansas.

Intrust Bank, N.A.

_____, _____
(Title)

State of Kansas)
Sedgwick County) SS

The foregoing instrument acknowledged before me, this_____day of_____, 2008, by_____, _____(Title) of Intrust Bank, N.A., on behalf of the bank.

_____, Notary Public

My App't. Exp._____

Reviewed in accordance with K.S.A. 58-2005 on this_____day of_____, 2008.

_____
Tricia L. Robello, L.S. #1246
Deputy County Surveyor
Sedgwick County, Kansas

Entered on transfer record this_____day of_____, 2008.

_____, County Clerk
Don Brace

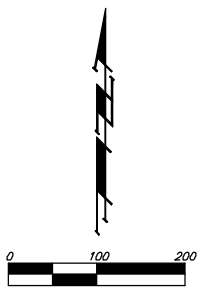
State of Kansas)
Sedgwick County) SS

This is to certify that this plat has been filed for record in the office of the Register of Deeds, this_____day of_____, 2008 at_____o'clock___M; and is duly recorded.

_____, Register of Deeds
Bill Meek

_____, Deputy
Tonya Buckingham

BENCHMARK:
WEST ST. AND MACARTHUR
COW BENCH MARK. NE CORNER OF INTERSECTION
41.50 FT. NORTH OF CENTERLINE
52.20 FT. EAST OF CENTERLINE
67.00 FT NE OF SECTION CORNER
13.10 FT NE OF POLE
ELEV.=1286.86 (NGVD29)



MINIMUM BUILDING PAD ELEVATIONS FOR LOWEST OPENING TO THE STRUCTURES		
LOT	BLOCK	ELEVATION NGVD29
1	A	1286.0
2	A	1286.0

● = #4 REBAR W/ "BAUGHMAN" CAP (SET)
⌀ = #4 REBAR (FOUND)
◉ = #4 REBAR W/ "TTLSI" CAP (FOUND)
□ = R/W MONUMENT (FLOOD CONTROL)
⊠ = 1" IRON (FOUND)
○ = #4 REBAR W/ "BAUGHMAN" CAP (FOUND)
△ = 3/4" IRON (FOUND)
◎ = #5 REBAR IN THIMBLE (FOUND)
⌑ = #5 REBAR (FOUND)
⬯ = STONE W/ 3/4" IRON (FOUND)
⌀ = #4 REBAR W/ "MOERING" CAP (FOUND)

NOTE:
A drainage plan has been developed for this subdivision and is on file with the City of Wichita, Kansas. Drainage intent shall remain as depicted or as modified with the approval of the City Engineer of the City of Wichita, Kansas. No obstructions which impede the flow of this drainage plan shall be allowed.

BROAD STREET INDUSTRIAL PARK

PAGE 1 OF 2

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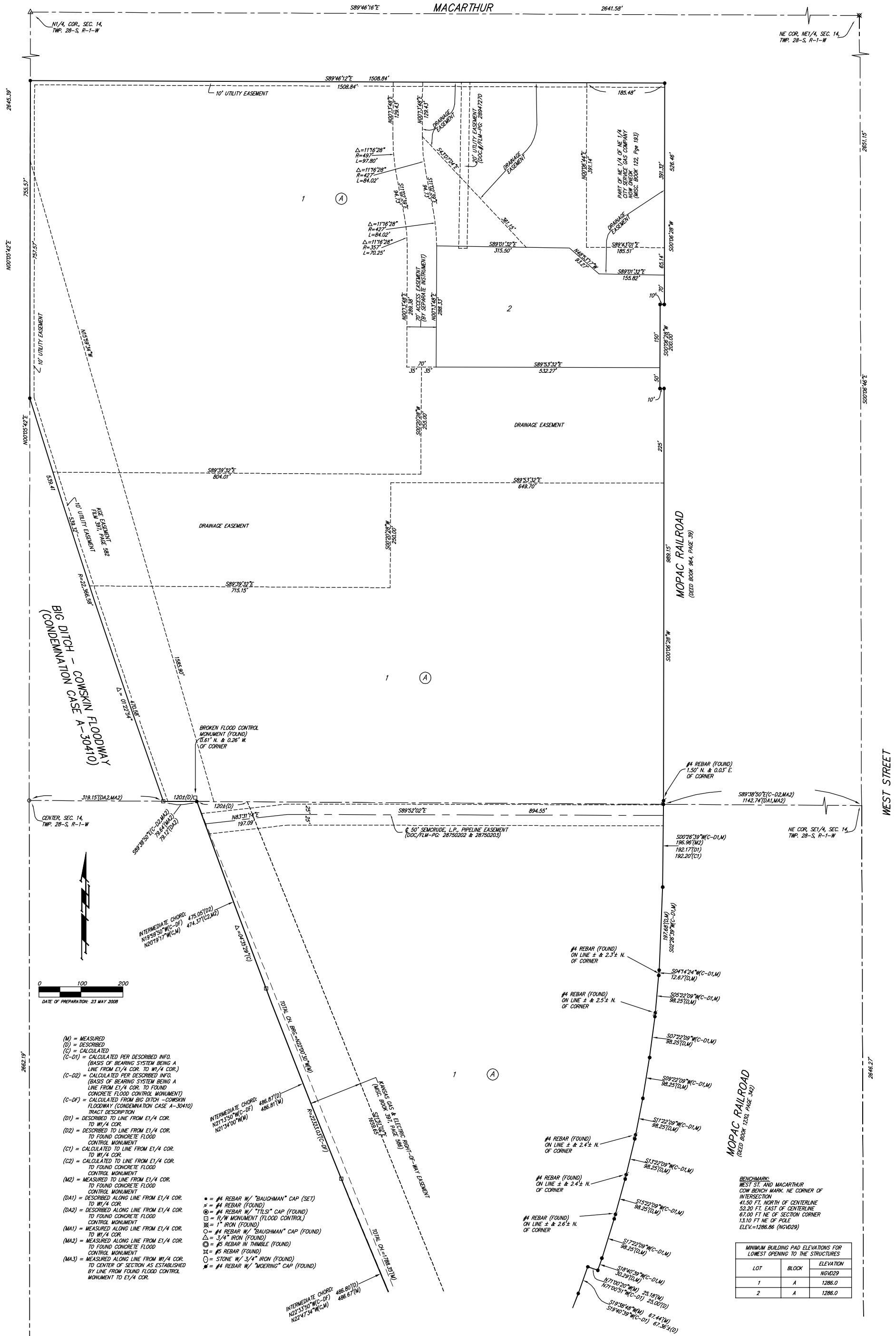
315 Ellis St. Wichita, KS 67211 P 316-262-7271 F 316-262-0149
Baughman ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

F:/PLAT/BERGKAMPINDUSTRIALPARK/DWG/BERGKAMP-IND-PARK-F.DWG-RKR

BROAD STREET INDUSTRIAL PARK
WICHITA, SEDGWICK COUNTY, KANSAS



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2	A	1286.0

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BROAD STREET INDUSTRIAL PARK

PAGE 2 OF 2

23 MAY 2008

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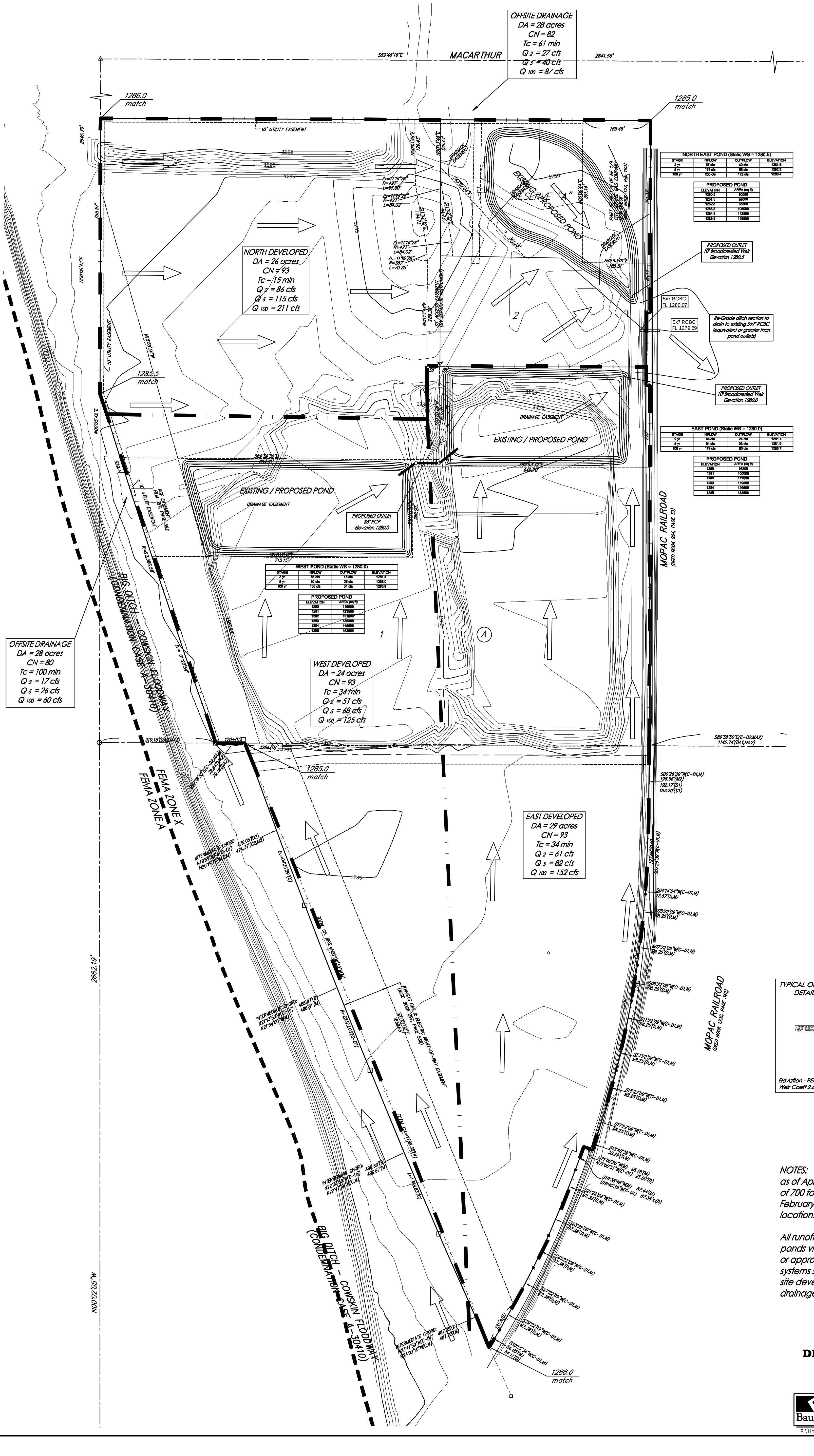
315 Ellis St. Wichita, KS 67211 P 316-262-7271 F 316-262-0149
Baughman ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

F:/PLAT/BERGKAMP/INDUSTRIALPARK/DWG/BERGKAMP-IND-PARK-F.DWG-RKR

DRAINAGE & GRADING PLAN
BROAD STREET INDUSTRIAL PARK
WICHITA, SEDGWICK COUNTY, KANSAS



NORTH EAST POND (Static WS = 1280.5)			
STAGE	INFLOW	OUTFLOW	ELEVATION
2 yr	97 cfs	40 cfs	1281.8
5 yr	131 cfs	58 cfs	1282.2
100 yr	250 cfs	128 cfs	1283.4

PROPOSED POND	
ELEVATION	AREA (sq ft)
1280.5	80000
1281.5	92000
1282.5	98800
1283.5	105000
1284.5	112500
1285.5	119600

EAST POND (Static WS = 1280.0)			
STAGE	INFLOW	OUTFLOW	ELEVATION
2 yr	86 cfs	24 cfs	1281.4
5 yr	91 cfs	33 cfs	1281.9
100 yr	179 cfs	65 cfs	1283.7

PROPOSED POND	
ELEVATION	AREA (sq ft)
1280	98300
1281	105000
1282	112000
1283	119500
1284	126500
1285	133500

WEST POND (Static WS = 1280.0)			
STAGE	INFLOW	OUTFLOW	ELEVATION
2 yr	58 cfs	15 cfs	1281.5
5 yr	80 cfs	25 cfs	1282.0
100 yr	156 cfs	51 cfs	1283.8

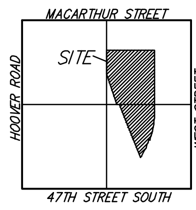
PROPOSED POND	
ELEVATION	AREA (sq ft)
1280	116800
1281	123500
1282	131000
1283	138300
1284	145800
1285	153500

BENCHMARK:
WEST ST. AND MACARTHUR
COW BENCH MARK. NE CORNER OF INTERSECTION
41.50 FT. NORTH OF CENTERLINE
52.20 FT. EAST OF CENTERLINE
67.00 FT NE OF SECTION CORNER
13.10 FT NE OF POLE
ELEV.=1286.86 (NGVD29)

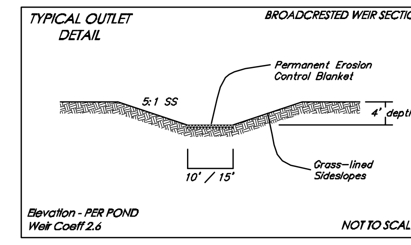
MINIMUM BUILDING PAD ELEVATIONS FOR LOWEST OPENING TO THE STRUCTURES		
LOT	BLOCK	ELEVATION NGVD29
1	A	1286.0
2	A	1286.0

(M) = MEASURED
(D) = DESCRIBED
(C) = CALCULATED
(C-D1) = CALCULATED PER DESCRIBED INFO. (BASIS OF BEARING SYSTEM BEING A LINE FROM E1/4 COR. TO W1/4 COR.)
(C-D2) = CALCULATED PER DESCRIBED INFO. (BASIS OF BEARING SYSTEM BEING A LINE FROM E1/4 COR. TO FOUND CONCRETE FLOOD CONTROL MONUMENT)
(C-DF) = CALCULATED FROM BIG DITCH –COWSKIN FLOODWAY (CONDEMNATION CASE A-30410) TRACT DESCRIPTION
(D1) = DESCRIBED TO LINE FROM E1/4 COR. TO W1/4 COR.
(D2) = DESCRIBED TO LINE FROM E1/4 COR. TO FOUND CONCRETE FLOOD CONTROL MONUMENT
(C1) = CALCULATED TO LINE FROM E1/4 COR. TO W1/4 COR.
(C2) = CALCULATED TO LINE FROM E1/4 COR. TO FOUND CONCRETE FLOOD CONTROL MONUMENT
(M2) = MEASURED TO LINE FROM E1/4 COR. TO FOUND CONCRETE FLOOD CONTROL MONUMENT
(DA1) = DESCRIBED ALONG LINE FROM E1/4 COR. TO W1/4 COR.
(DA2) = DESCRIBED ALONG LINE FROM E1/4 COR. TO FOUND CONCRETE FLOOD CONTROL MONUMENT
(MA1) = MEASURED ALONG LINE FROM E1/4 COR. TO W1/4 COR.
(MA2) = MEASURED ALONG LINE FROM E1/4 COR. TO FOUND CONCRETE FLOOD CONTROL MONUMENT
(MA3) = MEASURED ALONG LINE FROM W1/4 COR. TO CENTER OF SECTION AS ESTABLISHED BY LINE FROM FOUND FLOOD CONTROL MONUMENT TO E1/4 COR.

● = #4 REBAR W/ "BAUGHMAN" CAP (SET)
= #4 REBAR (FOUND)
◉ = #4 REBAR W/ "TTLSI" CAP (FOUND)
⊡ = R/W MONUMENT (FLOOD CONTROL)
⊠ = 1" IRON (FOUND)
○ = #4 REBAR W/ "BAUGHMAN" CAP (FOUND)
△ = 3/4" IRON (FOUND)
◎ = #5 REBAR IN THIMBLE (FOUND)
= #5 REBAR (FOUND)
= STONE W/ 3/4" IRON (FOUND)
= #4 REBAR W/ "MOERING" CAP (FOUND)



VICINITY MAP
SEC. 14, T28S, R1W



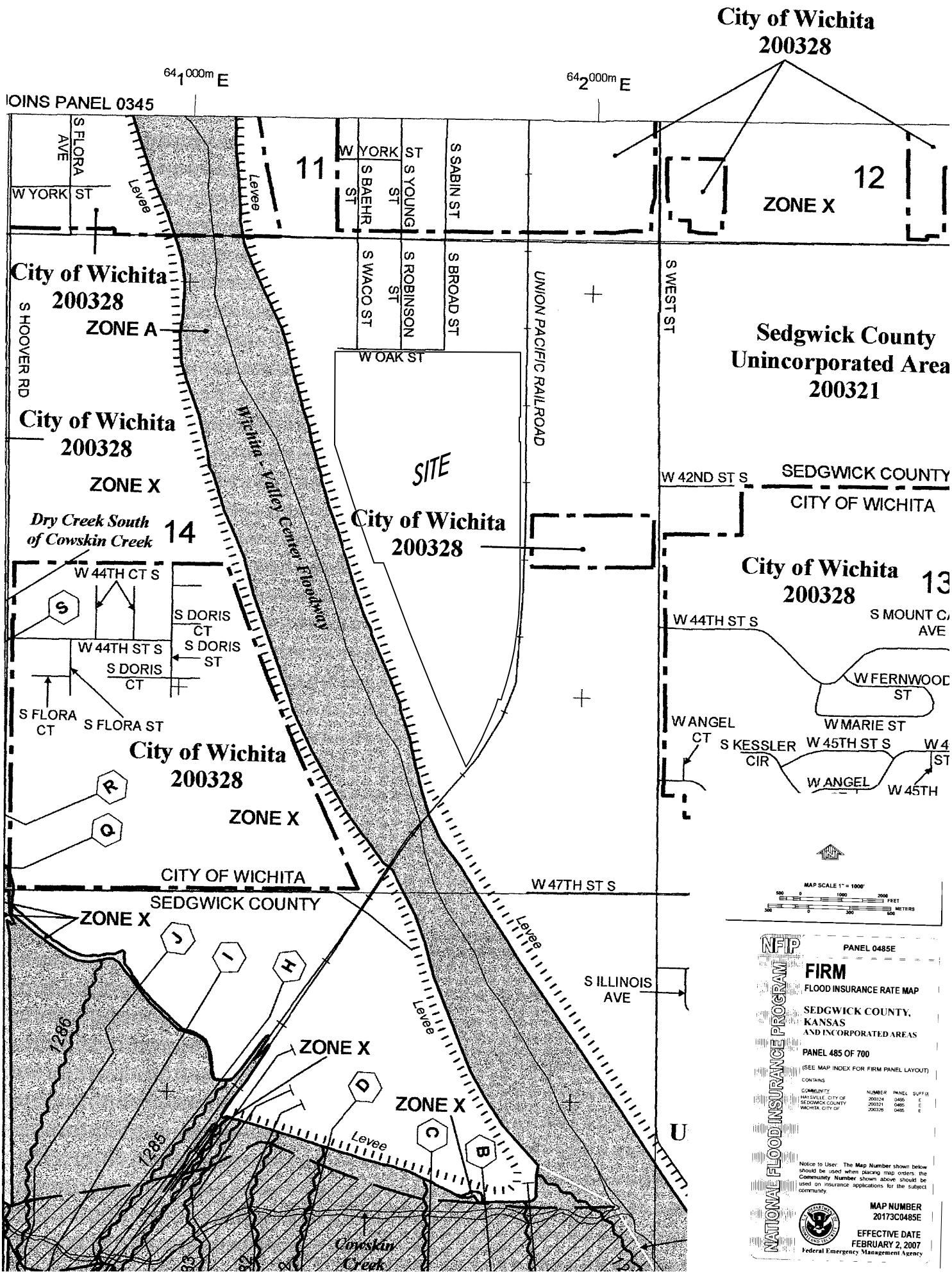
NOTES: No FEMA SFHA exists on this property as of April 18, 2008 per FEMA FIRM Panel 485 of 700 for Sedgwick County, Kansas, effective February 2, 2007. Zone A Boundary scaled per location.

All runoff to be directed to the proposed ponds via stormwater sewer, channels, flumes, or approved equivalent. These conveyences systems shall be designed/sized/located upon site development and shall follow the overall drainage pattern as depicted herein.

DRAINAGE & GRADING PLAN
BROAD STREET INDUSTRIAL PARK
28 MAY 2008

Baughman Company, P.A.
315 Ellis St. Wichita, KS 67211 P 316-262-7271 F 316-262-0149
Baughman ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

F:\HYDRO\Projects\Bergkamp Industrial\BERGKAMP-IND-PARK-F_drain-grade.dwg

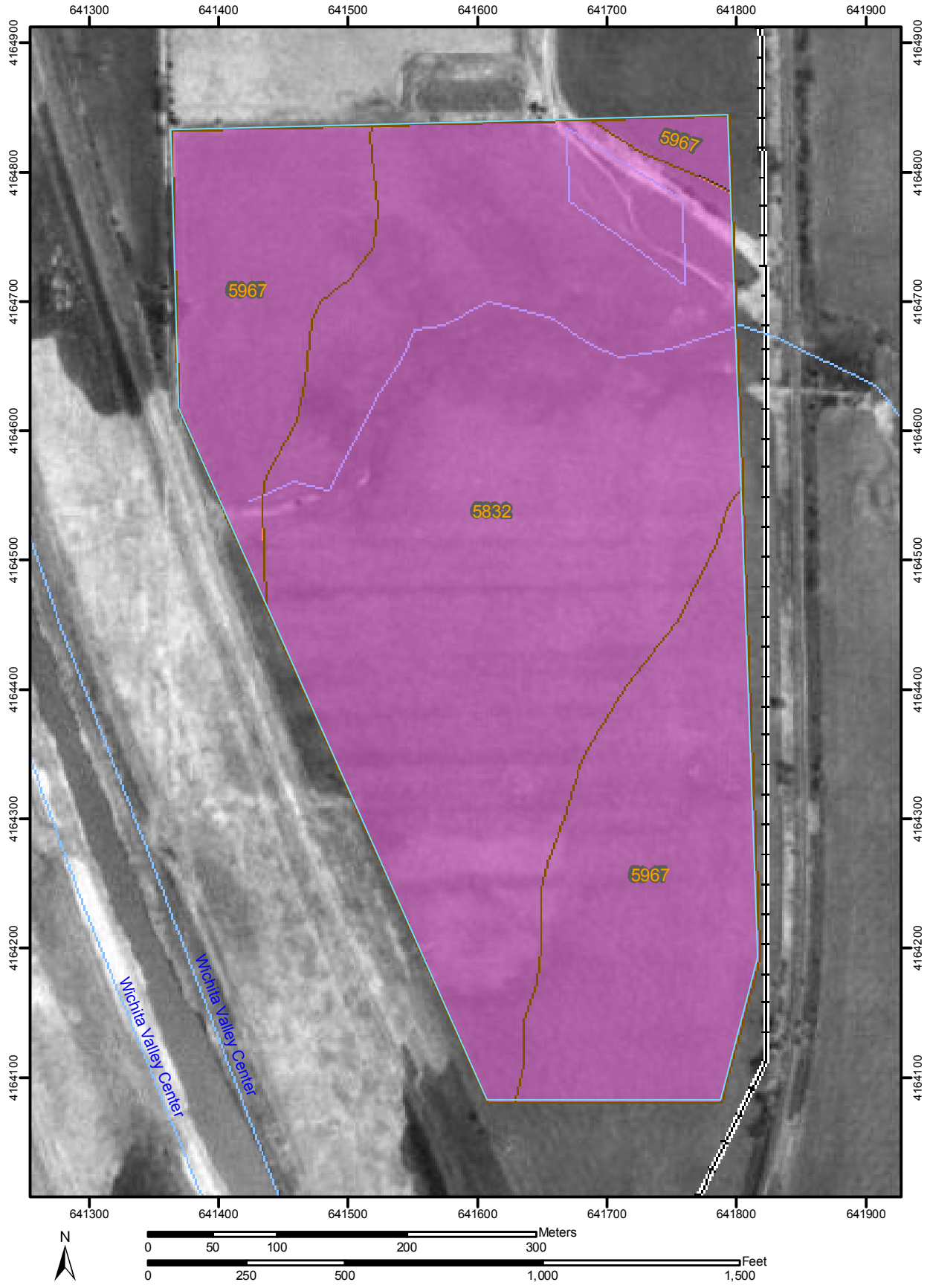

City of Wichita
200328
64 1 000m E
64 2 000m E
JOINS PANEL 0345
S FLORA AVE
W YORK ST
Levee
11
W YORK ST
S BAEHR ST
S YOUNG ST
S SABIN ST
12
ZONE X
City of Wichita
200328
ZONE A
S HOOVER RD
S WACO ST
S ROBINSON ST
S BROAD ST
W OAK ST
UNION PACIFIC RAILROAD
S WEST ST
Sedgwick County
Unincorporated Area
200321
City of Wichita
200328
ZONE X
Wichita - Valley Center Floodway
SITE
W 42ND ST S
SEDGWICK COUNTY
CITY OF WICHITA
Dry Creek South
of Cowskin Creek
14
City of Wichita
200328
City of Wichita
200328
13
W 44TH CT S
S
S DORIS CT
W 44TH ST S
S DORIS ST
S DORIS CT
W 44TH ST S
S MOUNT C
AVE
W FERNWOOD
ST
W MARIE ST
S FLORA CT
S FLORA ST
W ANGEL CT
S KESSLER CIR
W 45TH ST S
W ANGEL
W 45TH
City of Wichita
200328
R
Q
ZONE X
CITY OF WICHITA
SEDGWICK COUNTY
W 47TH ST S
ZONE X
J
I
H
S ILLINOIS AVE
Levee
1285
ZONE X
D
ZONE X
C
B
U
Levee
1285
Cowskin Creek
MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS
NFIP
PANEL 0485E
FIRM
FLOOD INSURANCE RATE MAP
SEDGWICK COUNTY, KANSAS
AND INCORPORATED AREAS
PANEL 485 OF 700
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS
COMMUNITY NUMBER PANEL SUFFIX
HAYSVILLE, CITY OF 200324 0485 E
SEDGWICK COUNTY 200321 0485 E
WICHITA, CITY OF 200328 0485 E
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
20173C0485E
EFFECTIVE DATE
FEBRUARY 2, 2007
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM

APPENDIX A: USGS Soils Survey

APPENDIX B: HydraFlow Hydrographs Routing
- Existing & Proposed Conditions

APPENDIX C: HydraFlow Express
- Existing 5 ’x7 ’RCBC

USGS Soils Survey


641300
641400
641500
641600
641700
641800
641900
4164900
4164800
4164700
4164600
4164500
4164400
4164300
4164200
4164100
5967
5967
5832
5967
Wichita Valley Center
Wichita Valley Center
N
Meters
0
50
100
200
300
Feet
0
250
500
1,000
1,500

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Soil Ratings
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

Municipalities
- Cities
- Urban Areas

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails

Roads
- Interstate Highways
- US Routes
- State Highways
- Local Roads
- Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 14N

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

Soil Survey Area: Sedgwick County, Kansas
Survey Area Data: Version 4, Dec 29, 2007

Date(s) aerial images were photographed: 3/20/1996; 3/31/1996

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

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Sedgwick County, Kansas				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
5832	Punkin-Taver complex, 0 to 1 percent slopes	D	43.0	65.3%
5967	Tabler silty clay loam, 0 to 1 percent slopes	D	22.9	34.7%
Totals for Area of Interest (AOI)			65.8	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie.

The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

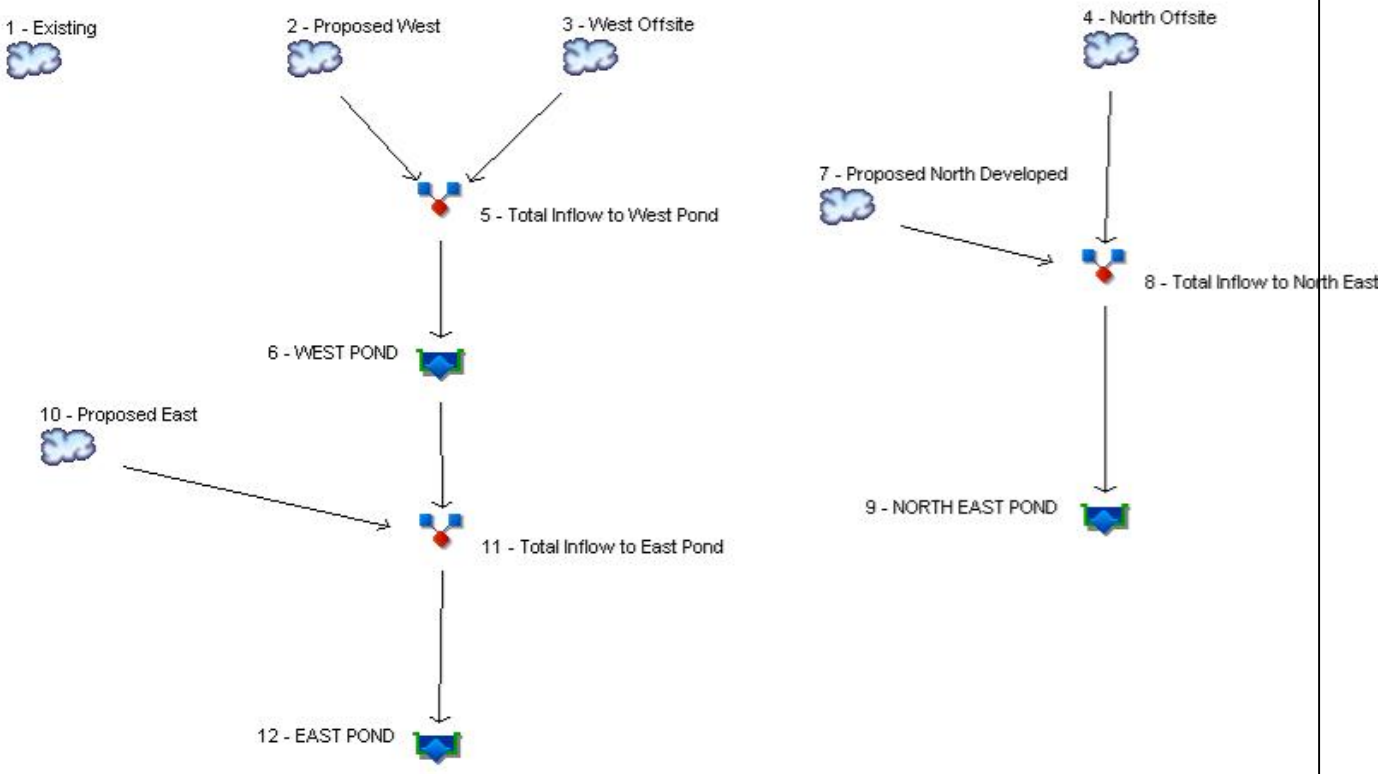
Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

HydraFlow Hydrographs Routing

Existing & Proposed Conditions

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	Existing
2	SCS Runoff	Proposed West
3	SCS Runoff	West Offsite
4	SCS Runoff	North Offsite
5	Combine	Total Inflow to West Pond
6	Reservoir	WEST POND
7	SCS Runoff	Proposed North Developed
8	Combine	Total Inflow to North East Pond
9	Reservoir	NORTH EAST POND
10	SCS Runoff	Proposed East
11	Combine	Total Inflow to East Pond
12	Reservoir	EAST POND

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.02

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-------	-------	99.15	-------	144.47	181.60	219.01	-------	303.43	Existing
2	SCS Runoff	-------	-------	50.81	-------	67.95	81.57	95.12	-------	125.39	Proposed West
3	SCS Runoff	-------	-------	17.28	-------	26.46	34.10	41.90	-------	59.74	West Offsite
4	SCS Runoff	-------	-------	26.83	-------	40.01	50.86	61.86	-------	86.90	North Offsite
5	Combine	2, 3,	-------	58.46	-------	80.33	97.99	115.72	-------	155.73	Total Inflow to West Pond
6	Reservoir	5	-------	15.41	-------	24.78	32.27	39.24	-------	51.18	WEST POND
7	SCS Runoff	-------	-------	86.14	-------	114.83	137.61	160.27	-------	210.91	Proposed North Developed
8	Combine	4, 7	-------	96.82	-------	131.64	159.59	187.56	-------	250.42	Total Inflow to North East Pond
9	Reservoir	8	-------	39.39	-------	58.27	74.31	90.30	-------	127.59	NORTH EAST POND
10	SCS Runoff	-------	-------	61.40	-------	82.11	98.56	114.93	-------	151.51	Proposed East
11	Combine	6, 10	-------	65.69	-------	90.60	111.07	131.93	-------	178.95	Total Inflow to East Pond
12	Reservoir	11	-------	23.58	-------	33.24	41.19	49.10	-------	64.73	EAST POND

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

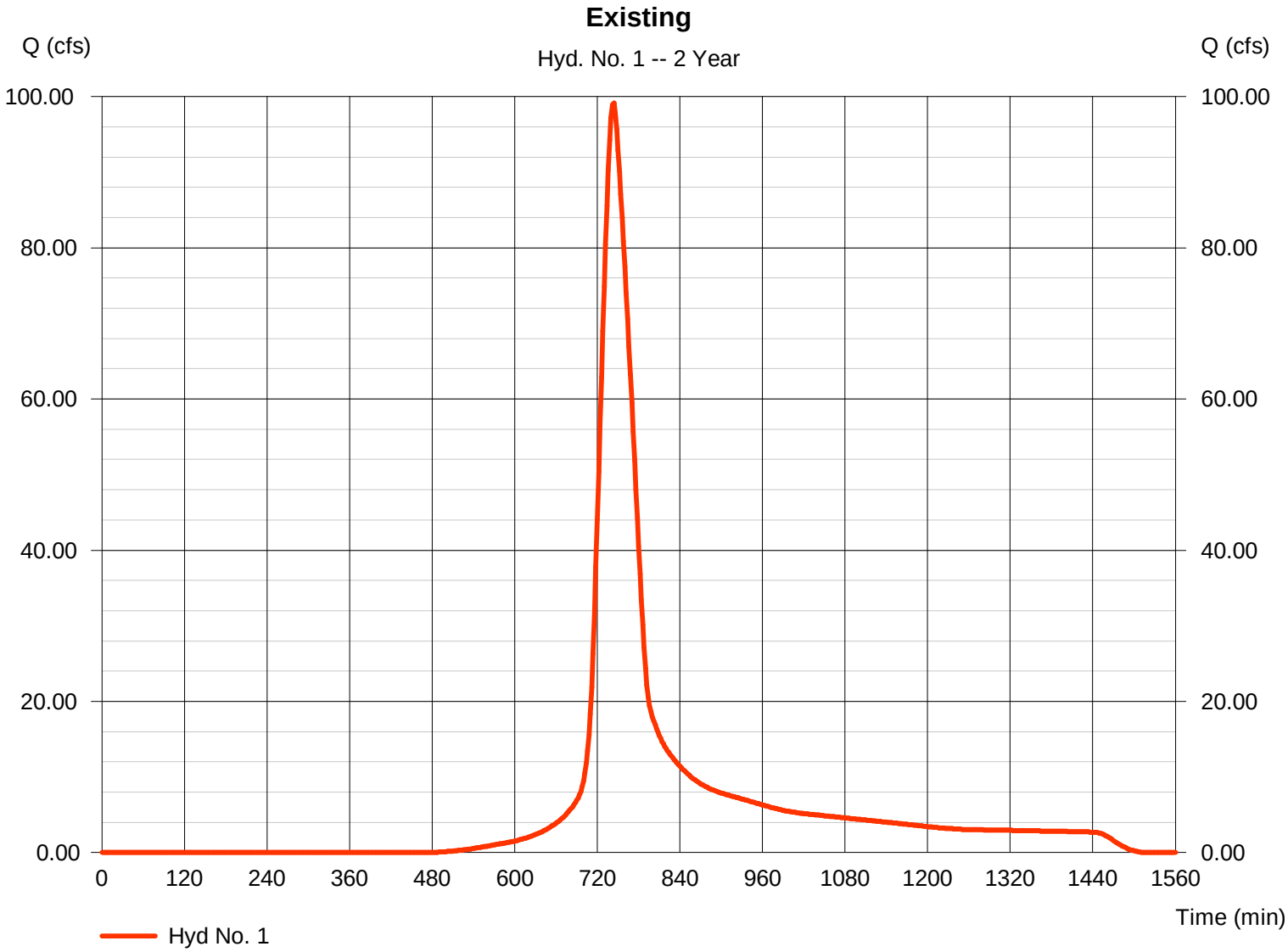
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	99.15	2	744	562,351	----	------	------	Existing
2	SCS Runoff	50.81	2	734	235,555	----	------	------	Proposed West
3	SCS Runoff	17.28	2	774	166,320	----	------	------	West Offsite
4	SCS Runoff	26.83	2	752	182,377	----	------	------	North Offsite
5	Combine	58.46	2	736	401,875	2, 3,	------	------	Total Inflow to West Pond
6	Reservoir	15.41	2	826	396,829	5	1281.54	188,488	WEST POND
7	SCS Runoff	86.14	2	722	251,665	----	------	------	Proposed North Developed
8	Combine	96.82	2	722	434,042	4, 7	------	------	Total Inflow to North East Pond
9	Reservoir	39.39	2	740	434,032	8	1281.82	115,381	NORTH EAST POND
10	SCS Runoff	61.40	2	734	284,629	----	------	------	Proposed East
11	Combine	65.69	2	736	681,458	6, 10	------	------	Total Inflow to East Pond
12	Reservoir	23.58	2	772	680,753	11	1281.39	143,596	EAST POND

Hydrograph Report

Hyd. No. 1

Existing

Hydrograph type	=	SCS Runoff	Peak discharge	=	99.15 cfs
Storm frequency	=	2 yrs	Time to peak	=	744 min
Time interval	=	2 min	Hyd. volume	=	562,351 cuft
Drainage area	=	80.000 ac	Curve number	=	84
Basin Slope	=	1.0 %	Hydraulic length	=	2000 ft
Tc method	=	LAG	Time of conc. (Tc)	=	48.65 min
Total precip.	=	3.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

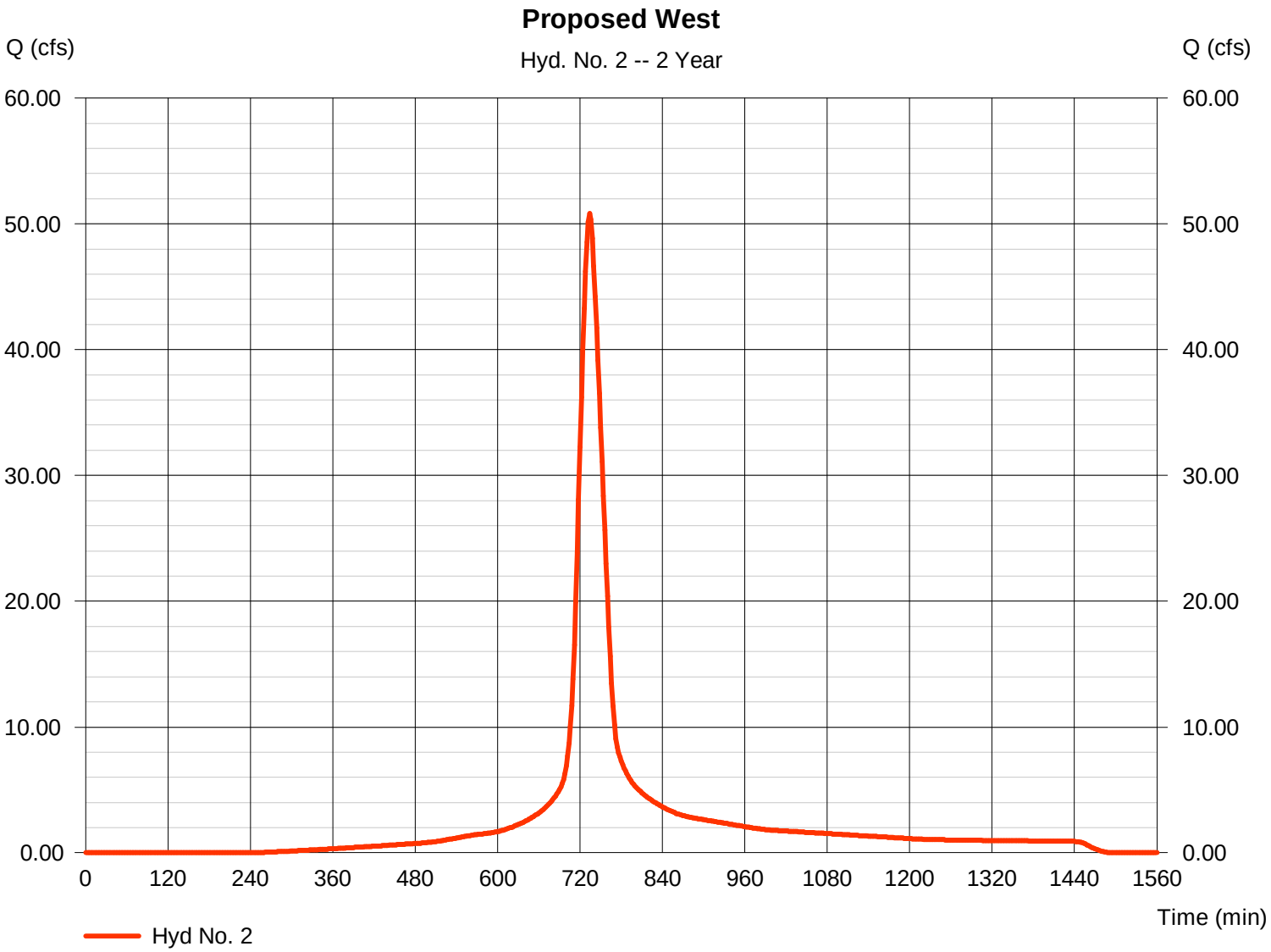


Hydrograph Report

Hyd. No. 2

Proposed West

Hydrograph type	=	SCS Runoff	Peak discharge	=	50.81 cfs
Storm frequency	=	2 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	235,555 cuft
Drainage area	=	24.000 ac	Curve number	=	93
Basin Slope	=	1.0 %	Hydraulic length	=	2000 ft
Tc method	=	LAG	Time of conc. (Tc)	=	34.16 min
Total precip.	=	3.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

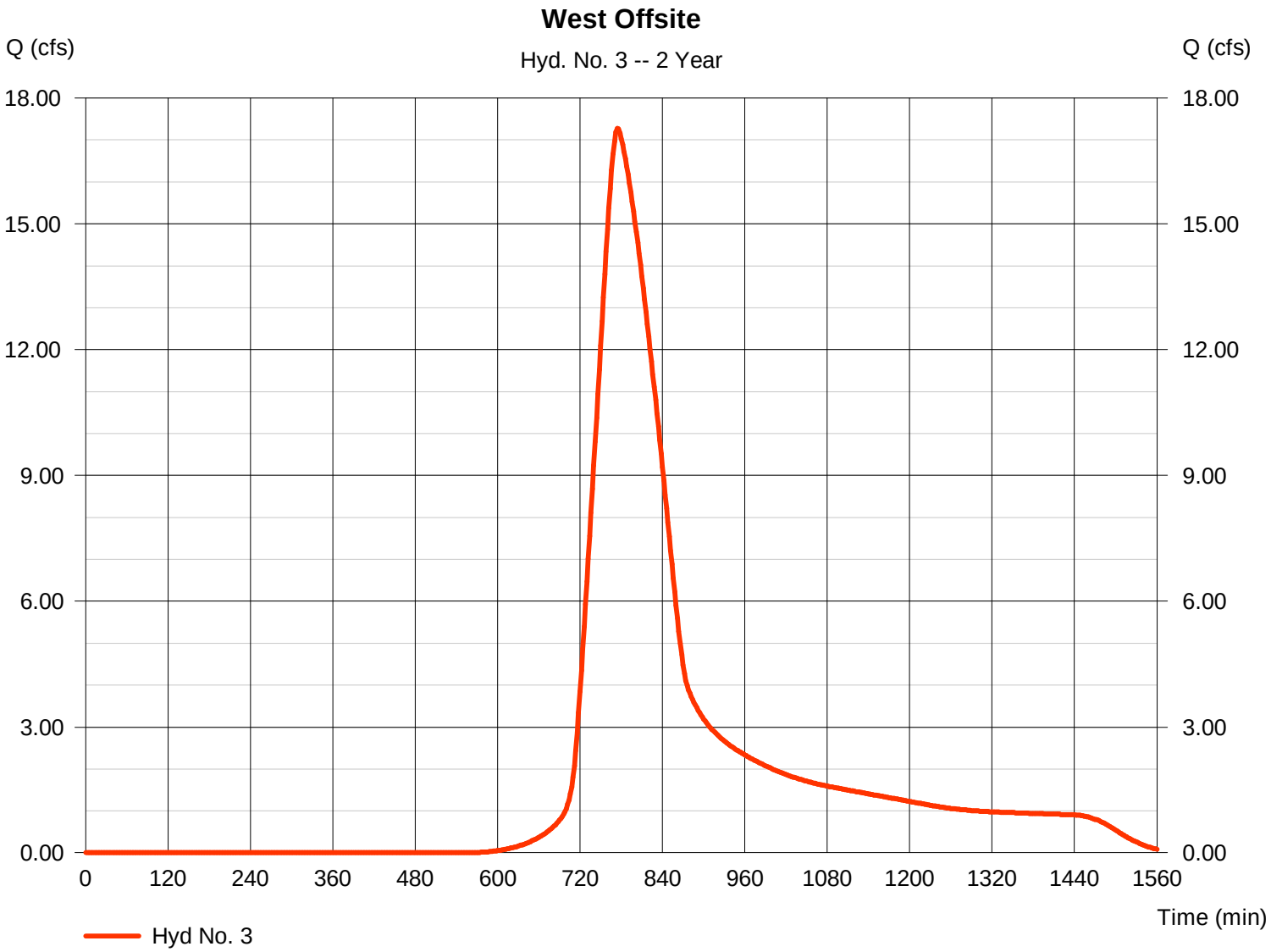


Hydrograph Report

Hyd. No. 3

West Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	17.28 cfs
Storm frequency	=	2 yrs	Time to peak	=	774 min
Time interval	=	2 min	Hyd. volume	=	166,320 cuft
Drainage area	=	28.000 ac	Curve number	=	80
Basin Slope	=	0.5 %	Hydraulic length	=	2700 ft
Tc method	=	LAG	Time of conc. (Tc)	=	99.67 min
Total precip.	=	3.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

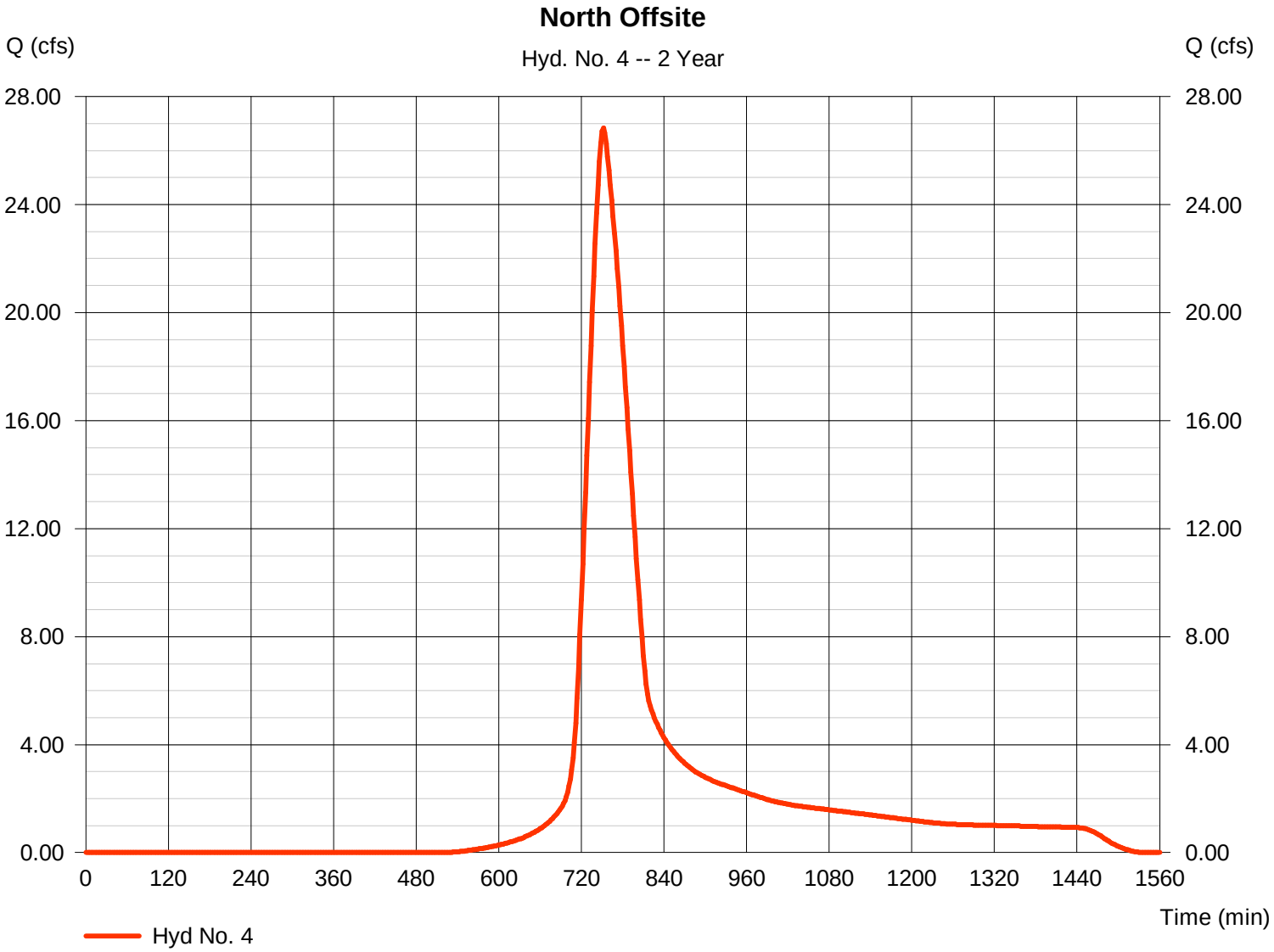


Hydrograph Report

Hyd. No. 4

North Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	26.83 cfs
Storm frequency	=	2 yrs	Time to peak	=	752 min
Time interval	=	2 min	Hyd. volume	=	182,377 cuft
Drainage area	=	28.000 ac	Curve number	=	82
Basin Slope	=	0.5 %	Hydraulic length	=	1600 ft
Tc method	=	LAG	Time of conc. (Tc)	=	61.53 min
Total precip.	=	3.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

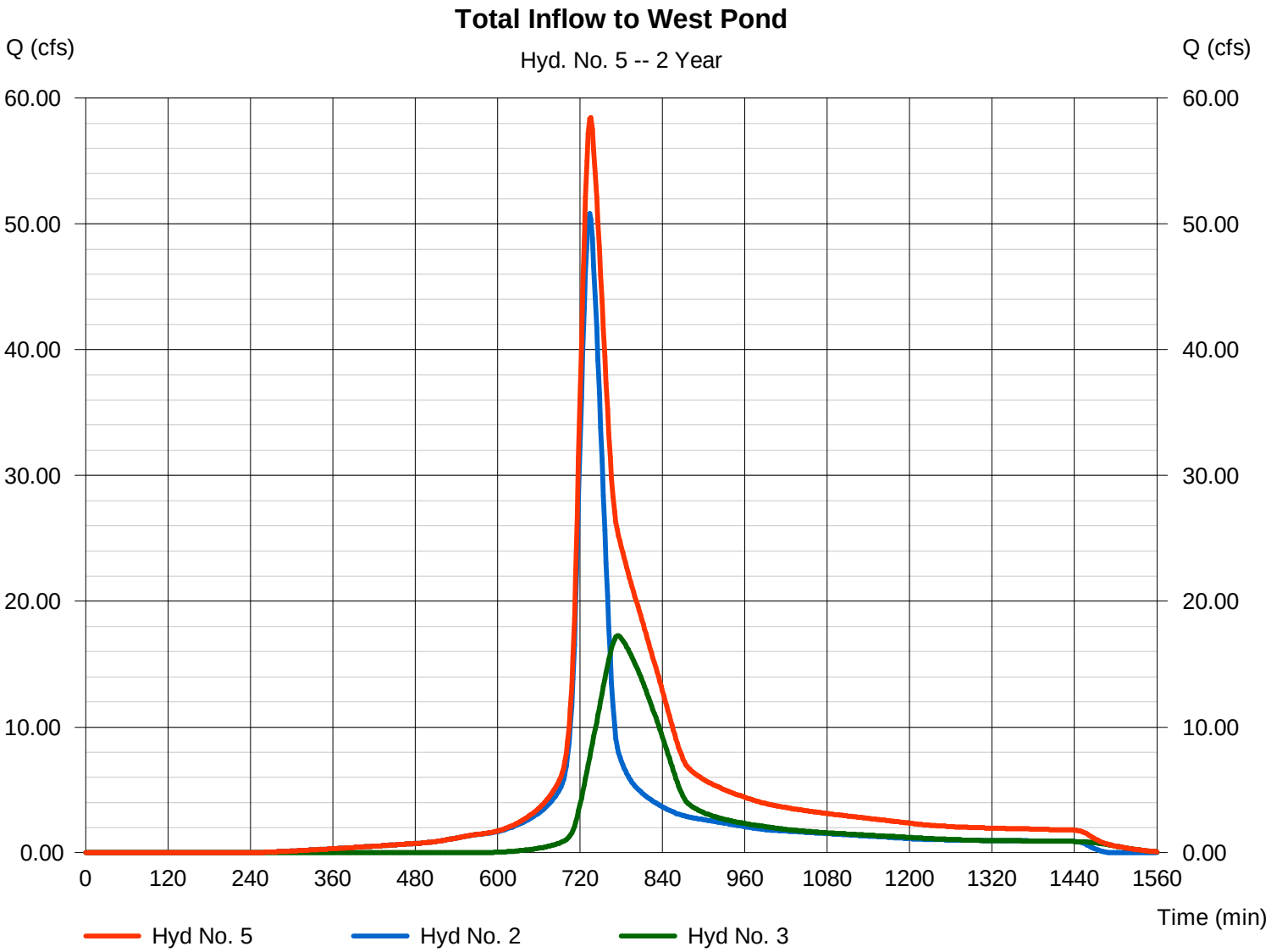


Hydrograph Report

Hyd. No. 5

Total Inflow to West Pond

Hydrograph type	= Combine	Peak discharge	= 58.46 cfs
Storm frequency	= 2 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 401,875 cuft
Inflow hyds.	= 2, 3	Contrib. drain. area	= 52.000 ac



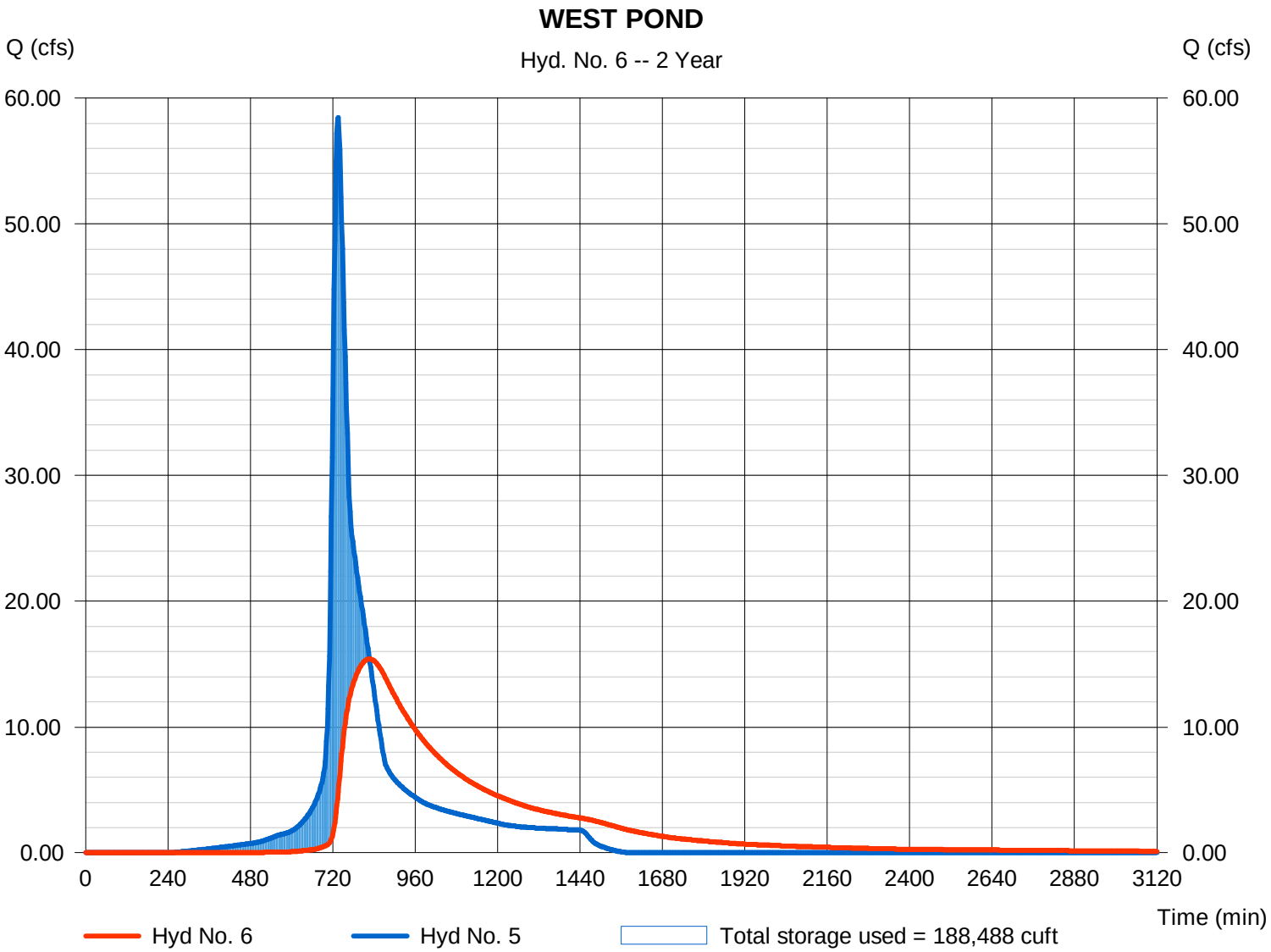
Hydrograph Report

Hyd. No. 6

WEST POND

Hydrograph type	=	Reservoir	Peak discharge	=	15.41 cfs
Storm frequency	=	2 yrs	Time to peak	=	826 min
Time interval	=	2 min	Hyd. volume	=	396,829 cuft
Inflow hyd. No.	=	5 - Total Inflow to West Pond	Max. Elevation	=	1281.54 ft
Reservoir name	=	Proposed West Pond	Max. Storage	=	188,488 cuft

Storage Indication method used.



Pond No. 2 - Proposed West Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1280.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1280.00	116,800	0	0
1.00	1281.00	123,500	120,122	120,122
2.00	1282.00	131,000	127,219	247,341
3.00	1283.00	138,300	134,620	381,961
4.00	1284.00	145,800	142,019	523,981
5.00	1285.00	153,500	149,619	673,599
6.00	1286.00	160,000	156,723	830,322

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 36.00	0.00	0.00	0.00
Span (in)	= 36.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1280.00	0.00	0.00	0.00
Length (ft)	= 100.00	0.00	0.00	0.00
Slope (%)	= 1.30	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

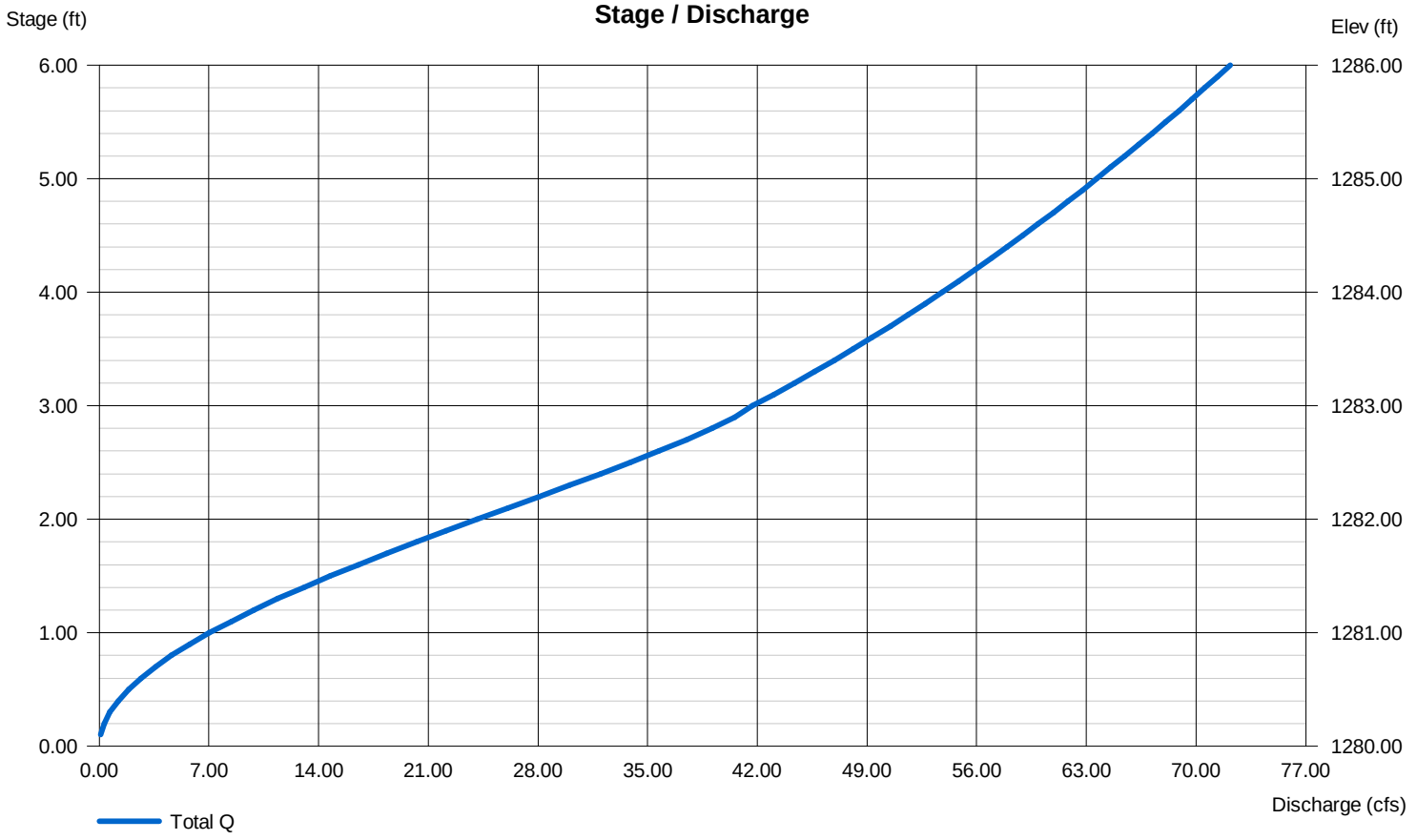
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.

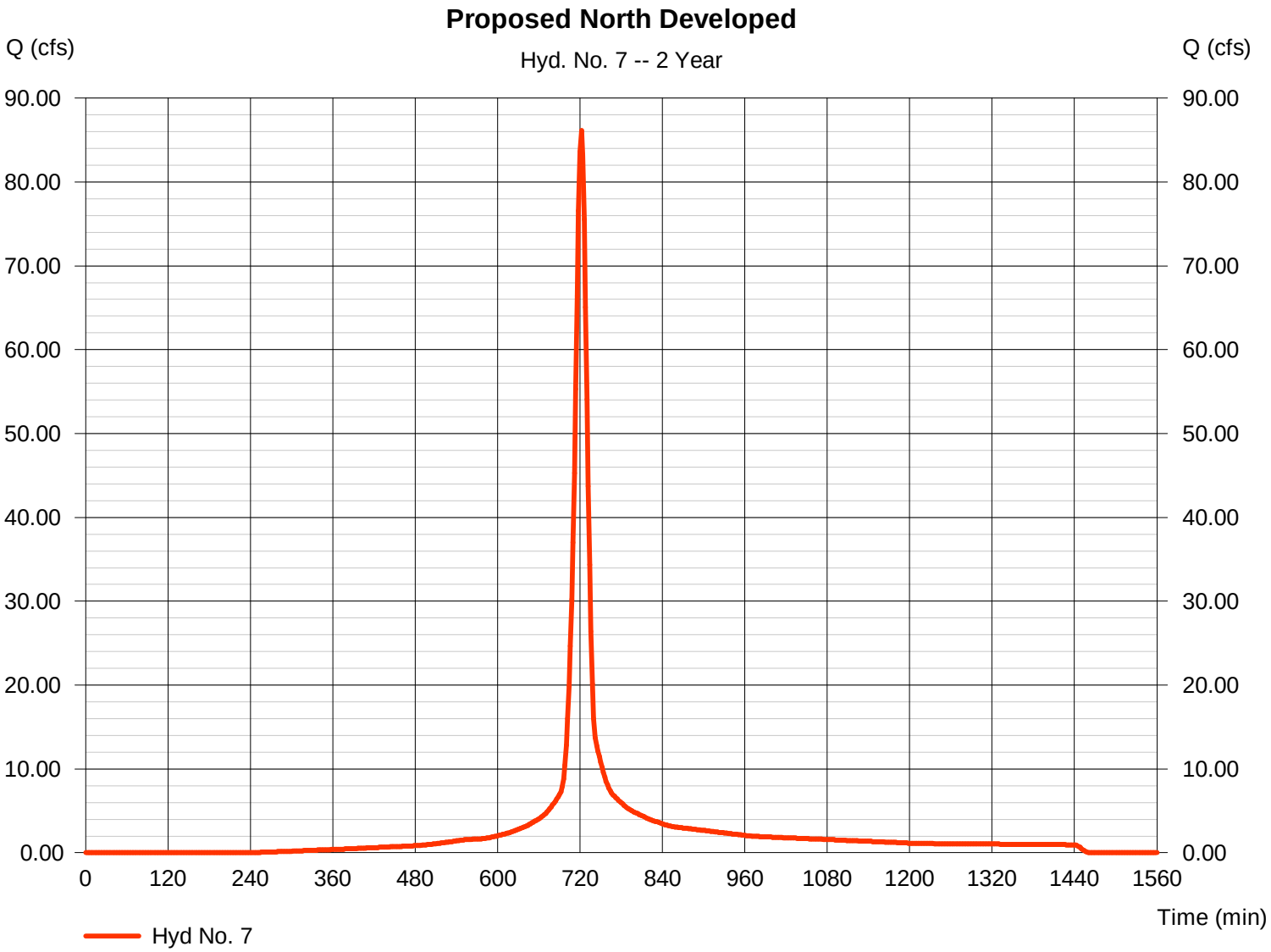


Hydrograph Report

Hyd. No. 7

Proposed North Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	86.14 cfs
Storm frequency	=	2 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	251,665 cuft
Drainage area	=	26.000 ac	Curve number	=	93
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	3.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

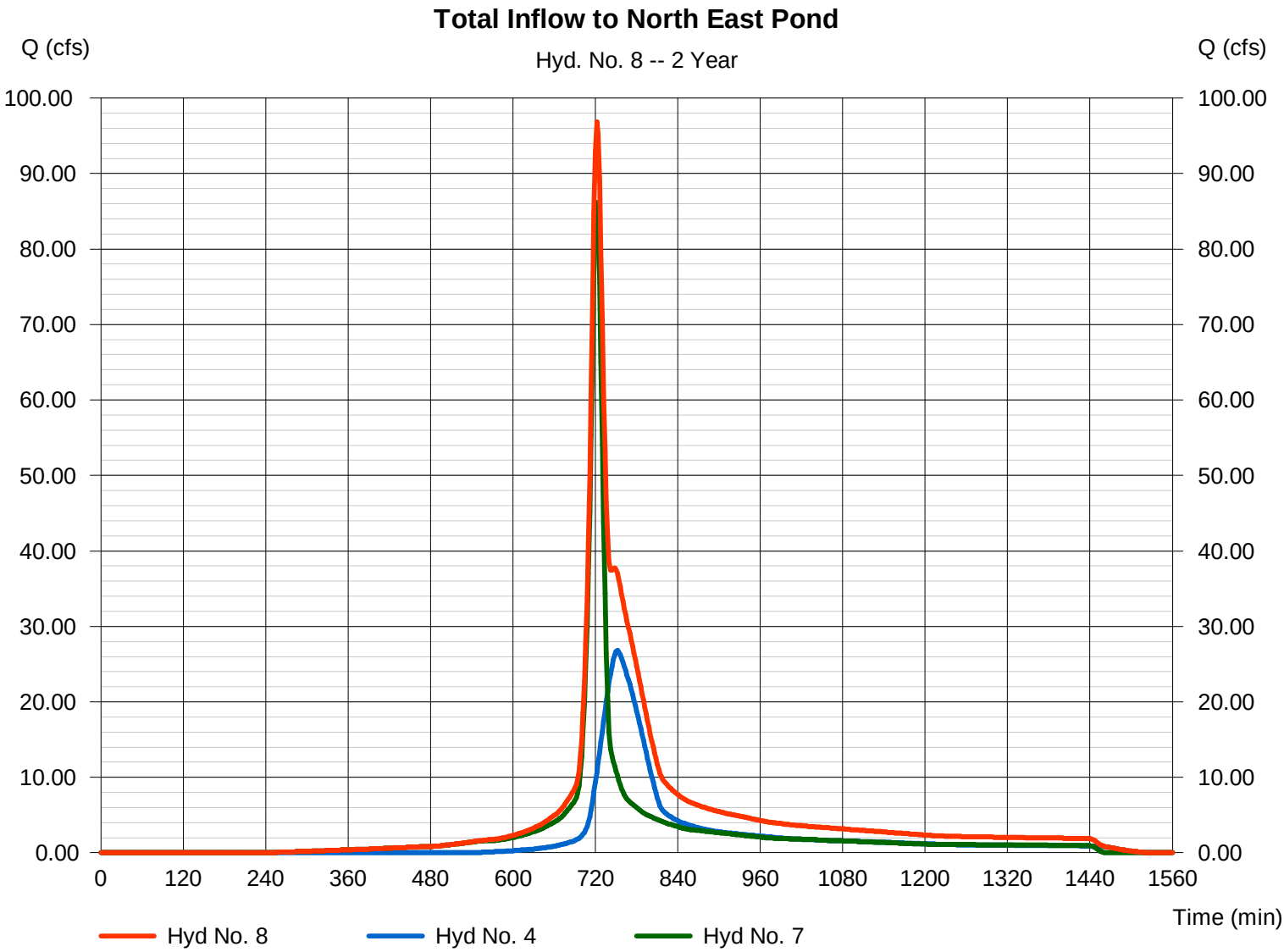


Hydrograph Report

Hyd. No. 8

Total Inflow to North East Pond

Hydrograph type	= Combine	Peak discharge	= 96.82 cfs
Storm frequency	= 2 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 434,042 cuft
Inflow hyds.	= 4, 7	Contrib. drain. area	= 54.000 ac



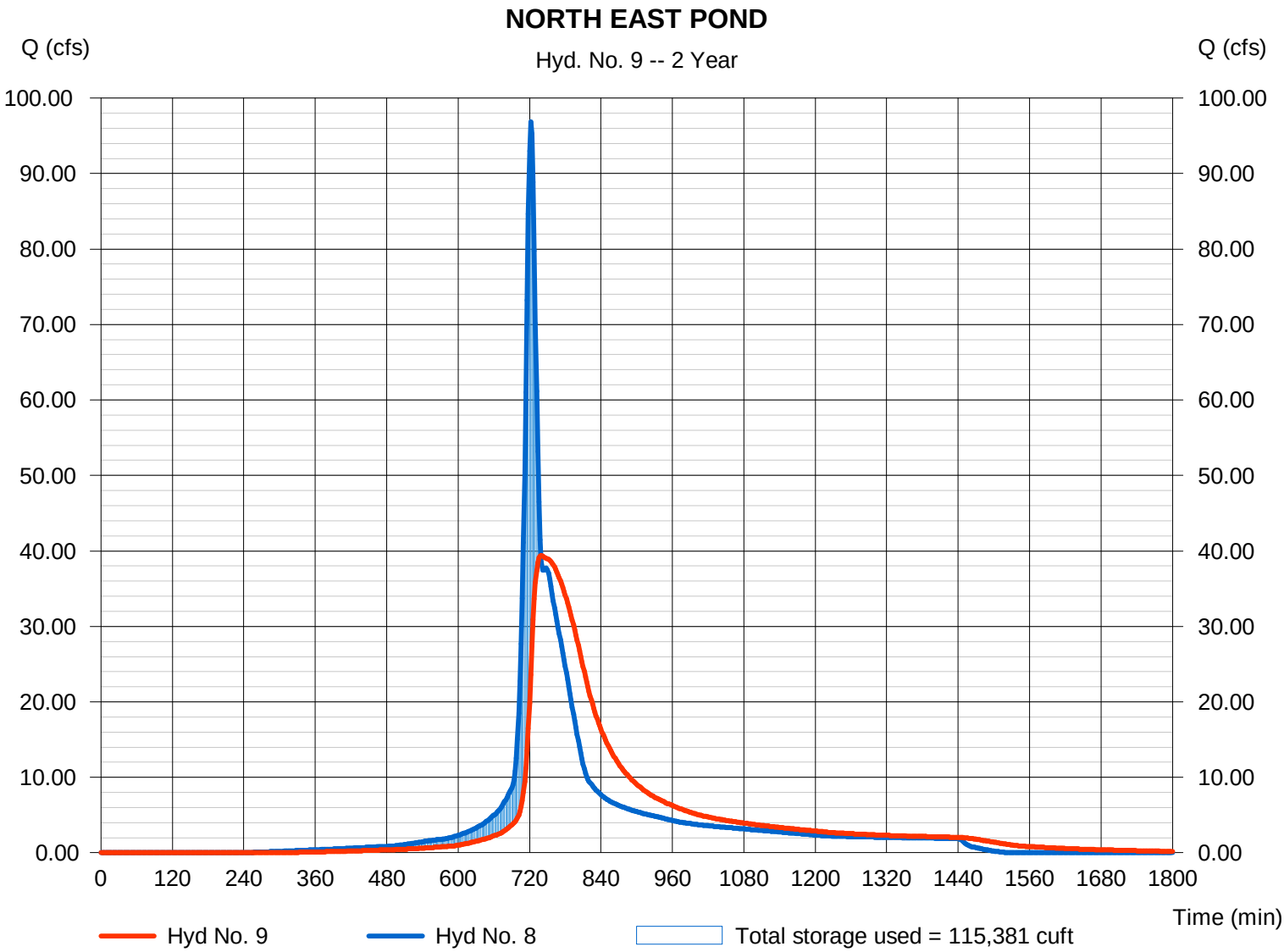
Hydrograph Report

Hyd. No. 9

NORTH EAST POND

Hydrograph type	=	Reservoir	Peak discharge	=	39.39 cfs
Storm frequency	=	2 yrs	Time to peak	=	740 min
Time interval	=	2 min	Hyd. volume	=	434,032 cuft
Inflow hyd. No.	=	8 - Total Inflow to North East Pond	Max. Elevation	=	1281.82 ft
Reservoir name	=	Existing NE Pond	Max. Storage	=	115,381 cuft

Storage Indication method used.



Pond No. 1 - Existing NE Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1280.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1280.50	80,000	0	0
1.10	1281.60	92,000	94,512	94,512
2.10	1282.60	98,800	95,370	189,882
3.10	1283.60	105,000	101,874	291,756
4.10	1284.60	112,500	108,718	400,474
4.50	1285.00	119,600	46,411	446,885

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

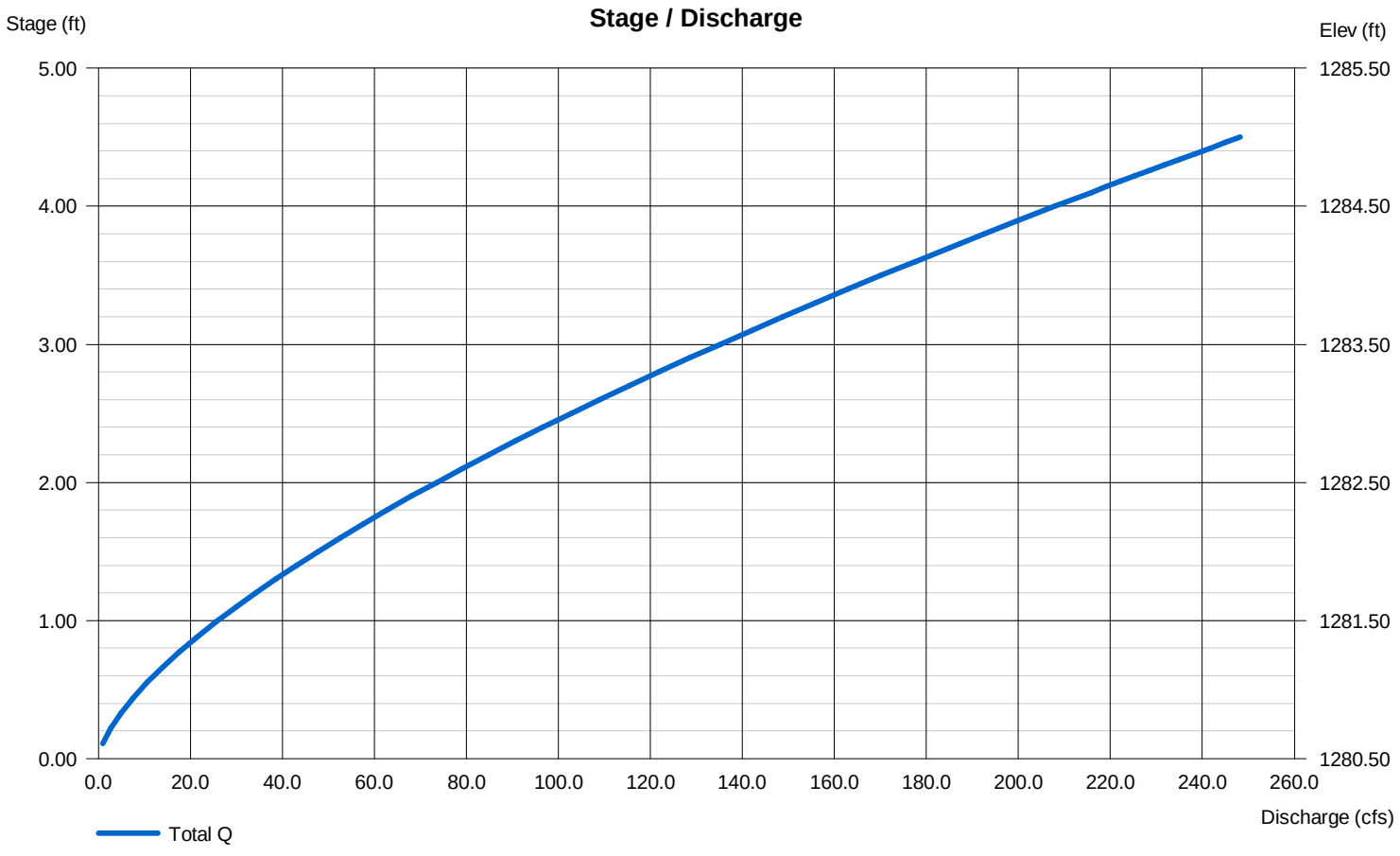
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.00	0.00	0.00
Crest El. (ft)	= 1280.50	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.

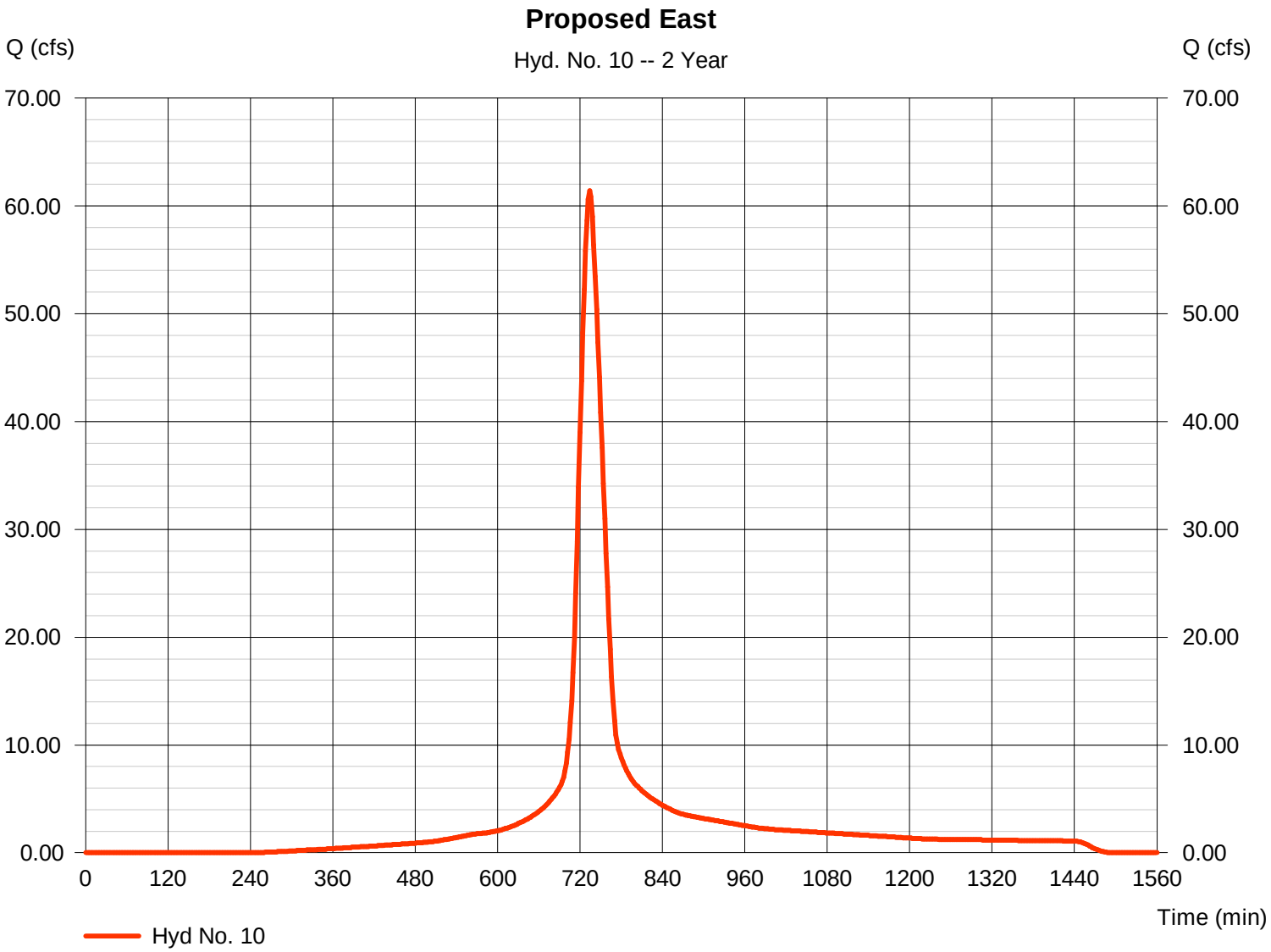


Hydrograph Report

Hyd. No. 10

Proposed East

Hydrograph type	=	SCS Runoff	Peak discharge	=	61.40 cfs
Storm frequency	=	2 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	284,629 cuft
Drainage area	=	29.000 ac	Curve number	=	93
Basin Slope	=	1.0 %	Hydraulic length	=	2000 ft
Tc method	=	LAG	Time of conc. (Tc)	=	34.16 min
Total precip.	=	3.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

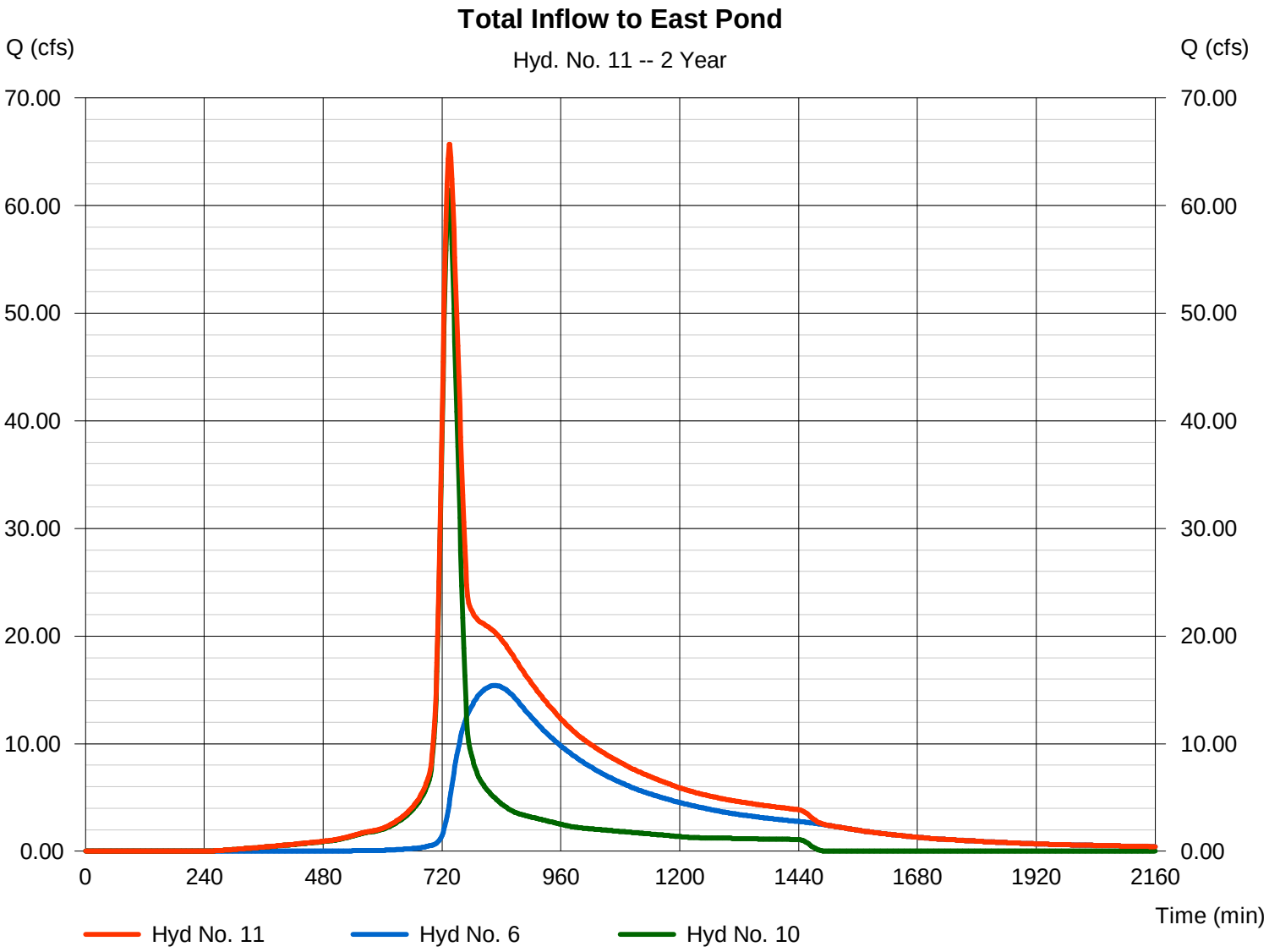


Hydrograph Report

Hyd. No. 11

Total Inflow to East Pond

Hydrograph type	= Combine	Peak discharge	= 65.69 cfs
Storm frequency	= 2 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 681,458 cuft
Inflow hyds.	= 6, 10	Contrib. drain. area	= 29.000 ac



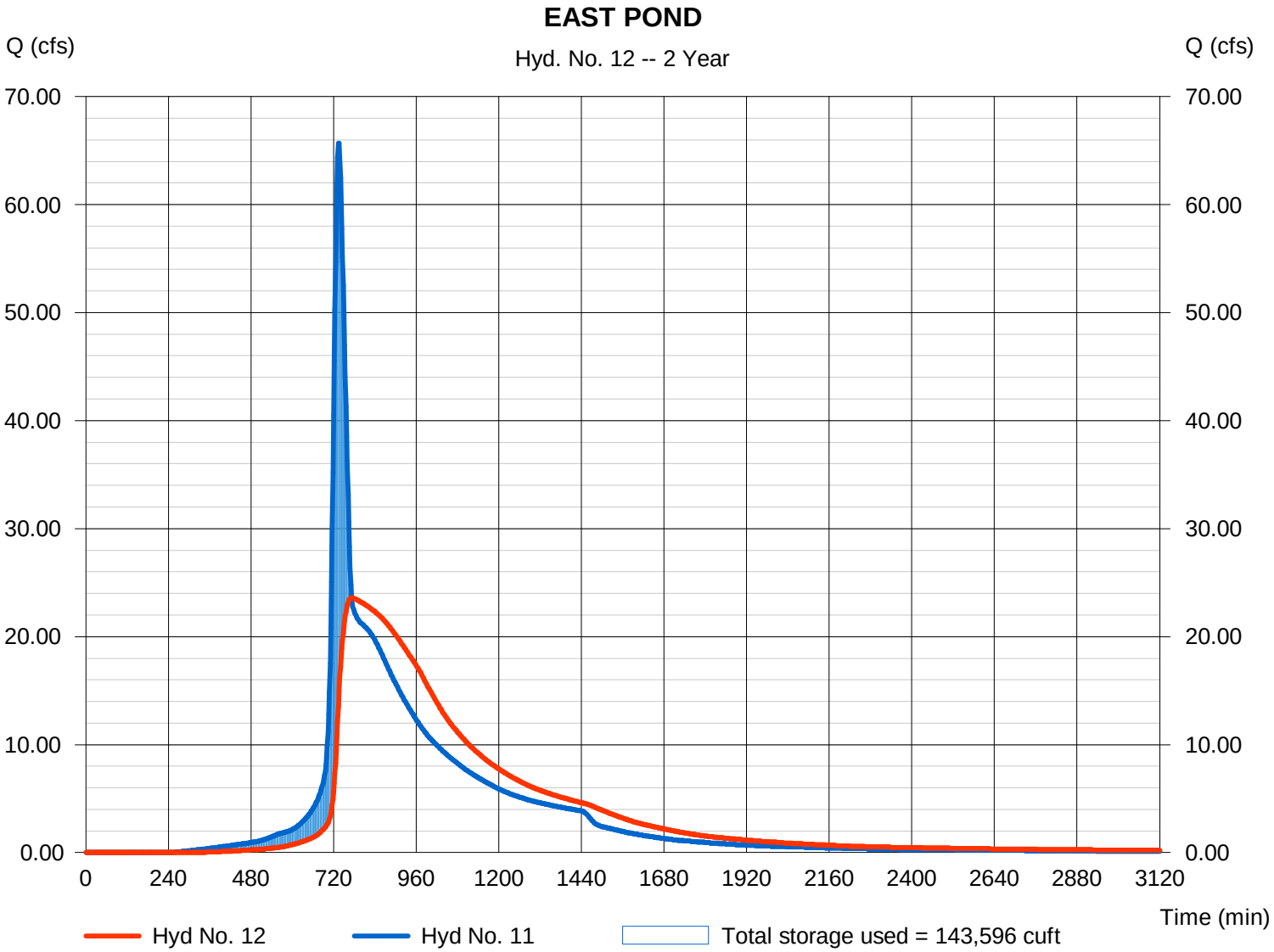
Hydrograph Report

Hyd. No. 12

EAST POND

Hydrograph type	=	Reservoir	Peak discharge	=	23.58 cfs
Storm frequency	=	2 yrs	Time to peak	=	772 min
Time interval	=	2 min	Hyd. volume	=	680,753 cuft
Inflow hyd. No.	=	11 - Total Inflow to East Pond	Max. Elevation	=	1281.39 ft
Reservoir name	=	Proposed East Pond	Max. Storage	=	143,596 cuft

Storage Indication method used.



Pond No. 3 - Proposed East Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1280.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1280.00	98,300	0	0
1.00	1281.00	105,000	101,621	101,621
2.00	1282.00	112,000	108,470	210,092
3.00	1283.00	119,500	115,718	325,810
4.00	1284.00	126,500	122,971	448,781
5.00	1285.00	133,500	129,971	578,752
6.00	1286.00	135,000	134,236	712,988

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 84.00	0.00	0.00	0.00
Span (in)	= 60.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1280.00	0.00	0.00	0.00
Length (ft)	= 30.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

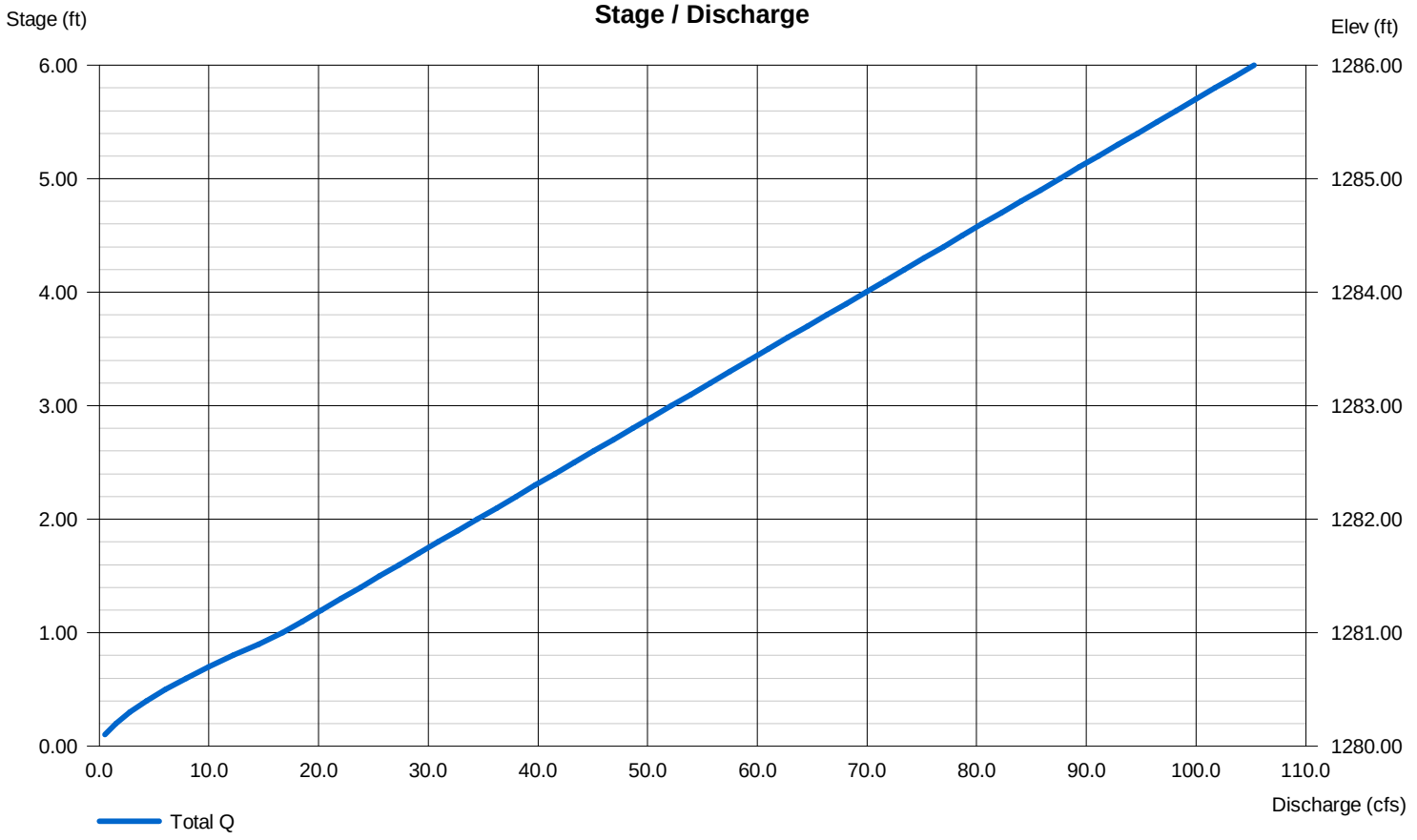
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	0.00	0.00	0.00
Crest El. (ft)	= 1280.00	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

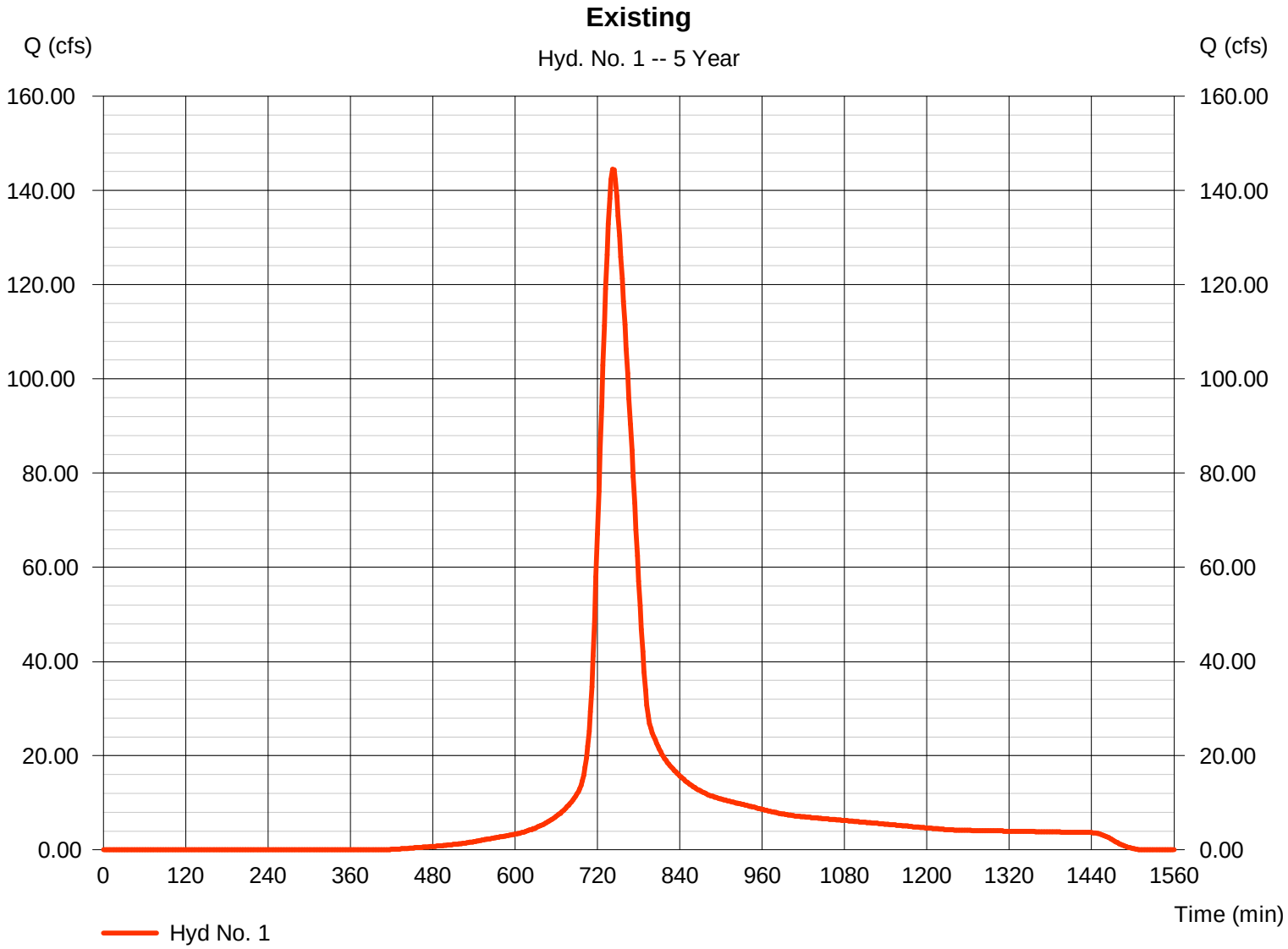
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	144.47	2	742	817,935	----	------	------	Existing
2	SCS Runoff	67.95	2	734	319,354	----	------	------	Proposed West
3	SCS Runoff	26.46	2	774	250,191	----	------	------	West Offsite
4	SCS Runoff	40.01	2	752	269,693	----	------	------	North Offsite
5	Combine	80.33	2	736	569,545	2, 3,	------	------	Total Inflow to West Pond
6	Reservoir	24.78	2	818	564,387	5	1282.03	251,892	WEST POND
7	SCS Runoff	114.83	2	722	341,195	----	------	------	Proposed North Developed
8	Combine	131.64	2	722	610,888	4, 7	------	------	Total Inflow to North East Pond
9	Reservoir	58.27	2	738	610,878	8	1282.21	152,942	NORTH EAST POND
10	SCS Runoff	82.11	2	734	385,886	----	------	------	Proposed East
11	Combine	90.60	2	736	950,273	6, 10	------	------	Total Inflow to East Pond
12	Reservoir	33.24	2	792	949,551	11	1281.93	202,665	EAST POND

Hydrograph Report

Hyd. No. 1

Existing

Hydrograph type	=	SCS Runoff	Peak discharge	=	144.47 cfs
Storm frequency	=	5 yrs	Time to peak	=	742 min
Time interval	=	2 min	Hyd. volume	=	817,935 cuft
Drainage area	=	80.000 ac	Curve number	=	84
Basin Slope	=	1.0 %	Hydraulic length	=	2000 ft
Tc method	=	LAG	Time of conc. (Tc)	=	48.65 min
Total precip.	=	4.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

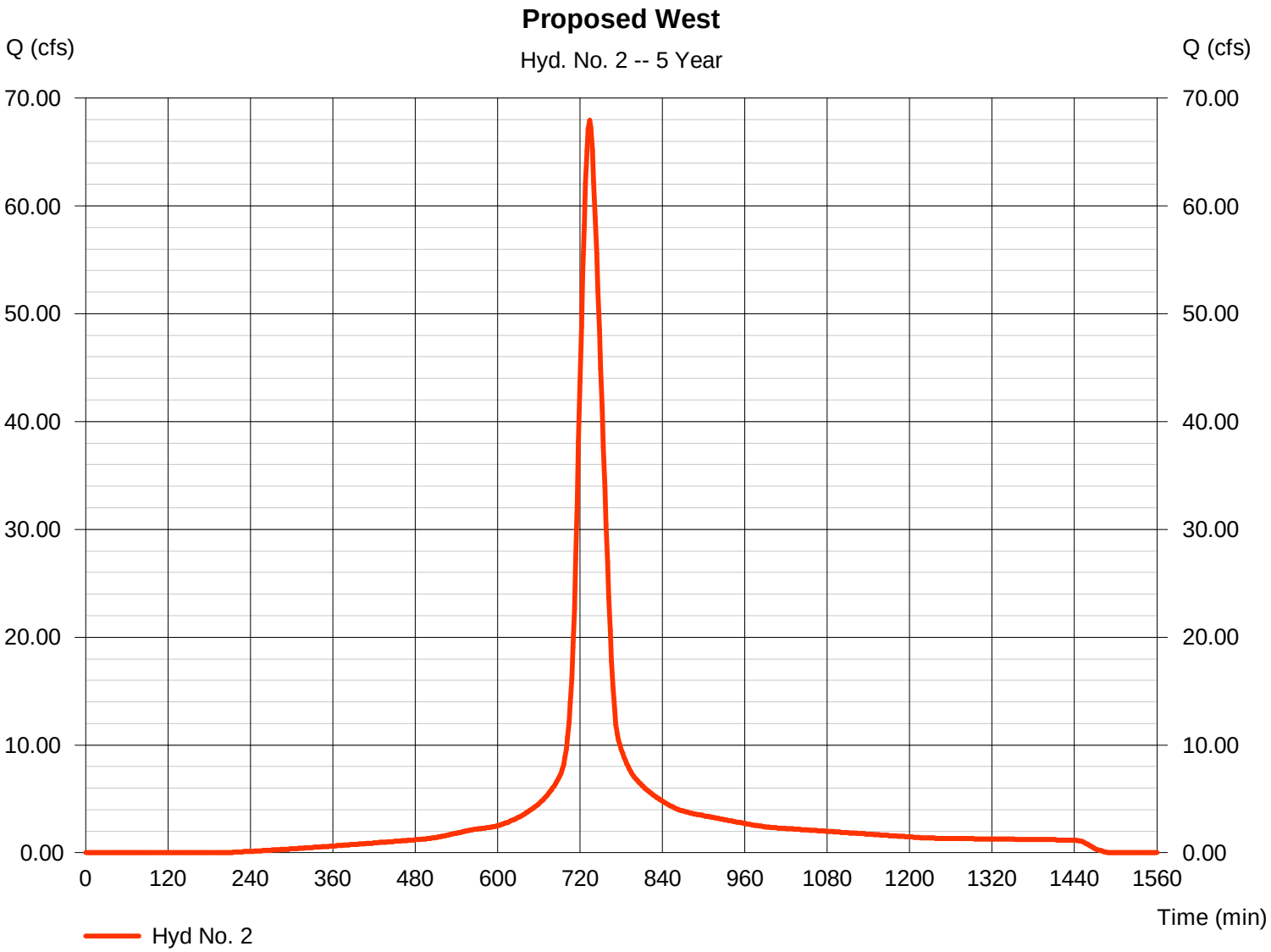


Hydrograph Report

Hyd. No. 2

Proposed West

Hydrograph type	=	SCS Runoff	Peak discharge	=	67.95 cfs
Storm frequency	=	5 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	319,354 cuft
Drainage area	=	24.000 ac	Curve number	=	93
Basin Slope	=	1.0 %	Hydraulic length	=	2000 ft
Tc method	=	LAG	Time of conc. (Tc)	=	34.16 min
Total precip.	=	4.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

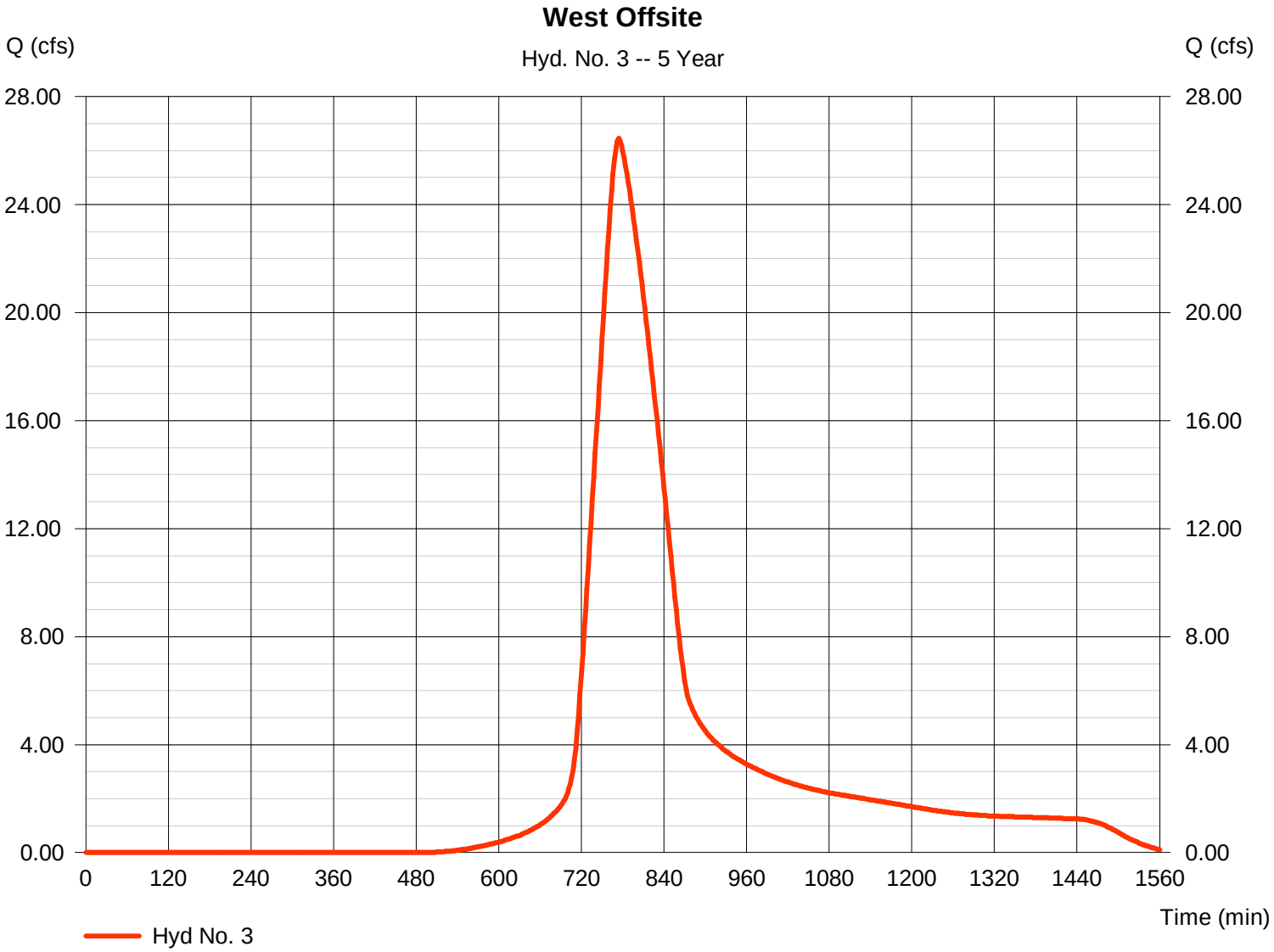


Hydrograph Report

Hyd. No. 3

West Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	26.46 cfs
Storm frequency	=	5 yrs	Time to peak	=	774 min
Time interval	=	2 min	Hyd. volume	=	250,191 cuft
Drainage area	=	28.000 ac	Curve number	=	80
Basin Slope	=	0.5 %	Hydraulic length	=	2700 ft
Tc method	=	LAG	Time of conc. (Tc)	=	99.67 min
Total precip.	=	4.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

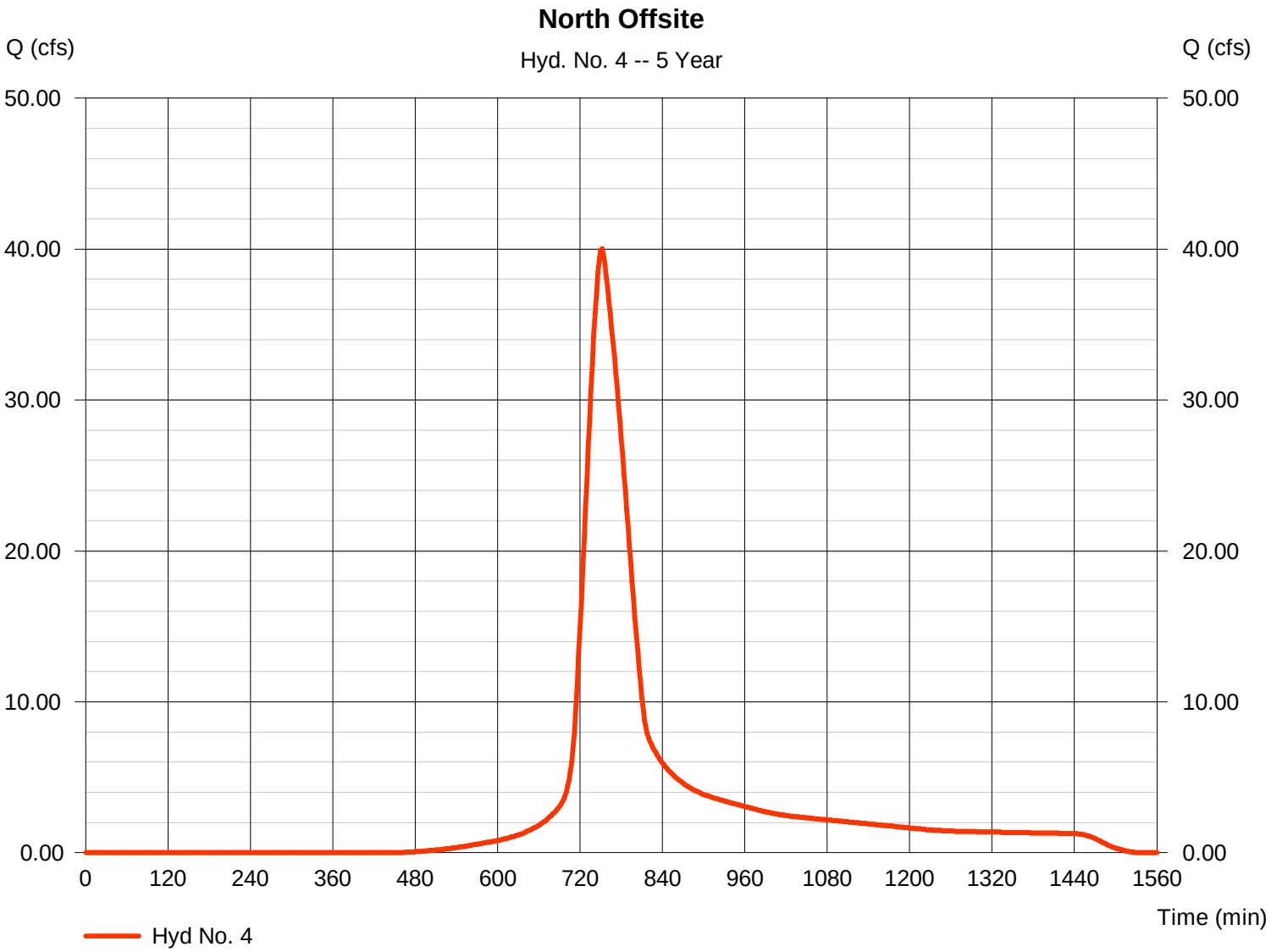


Hydrograph Report

Hyd. No. 4

North Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	40.01 cfs
Storm frequency	=	5 yrs	Time to peak	=	752 min
Time interval	=	2 min	Hyd. volume	=	269,693 cuft
Drainage area	=	28.000 ac	Curve number	=	82
Basin Slope	=	0.5 %	Hydraulic length	=	1600 ft
Tc method	=	LAG	Time of conc. (Tc)	=	61.53 min
Total precip.	=	4.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

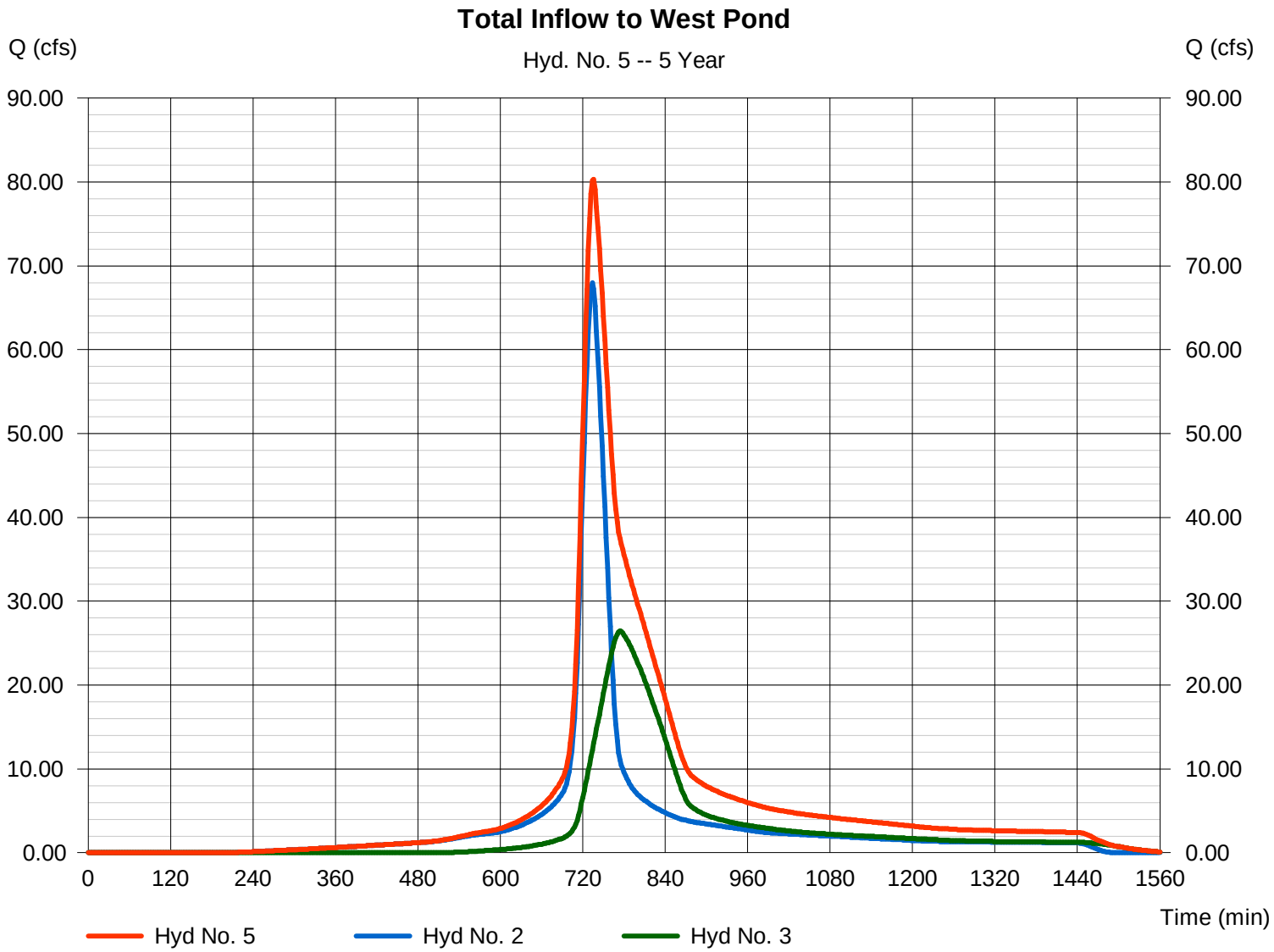


Hydrograph Report

Hyd. No. 5

Total Inflow to West Pond

Hydrograph type	= Combine	Peak discharge	= 80.33 cfs
Storm frequency	= 5 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 569,545 cuft
Inflow hyds.	= 2, 3	Contrib. drain. area	= 52.000 ac



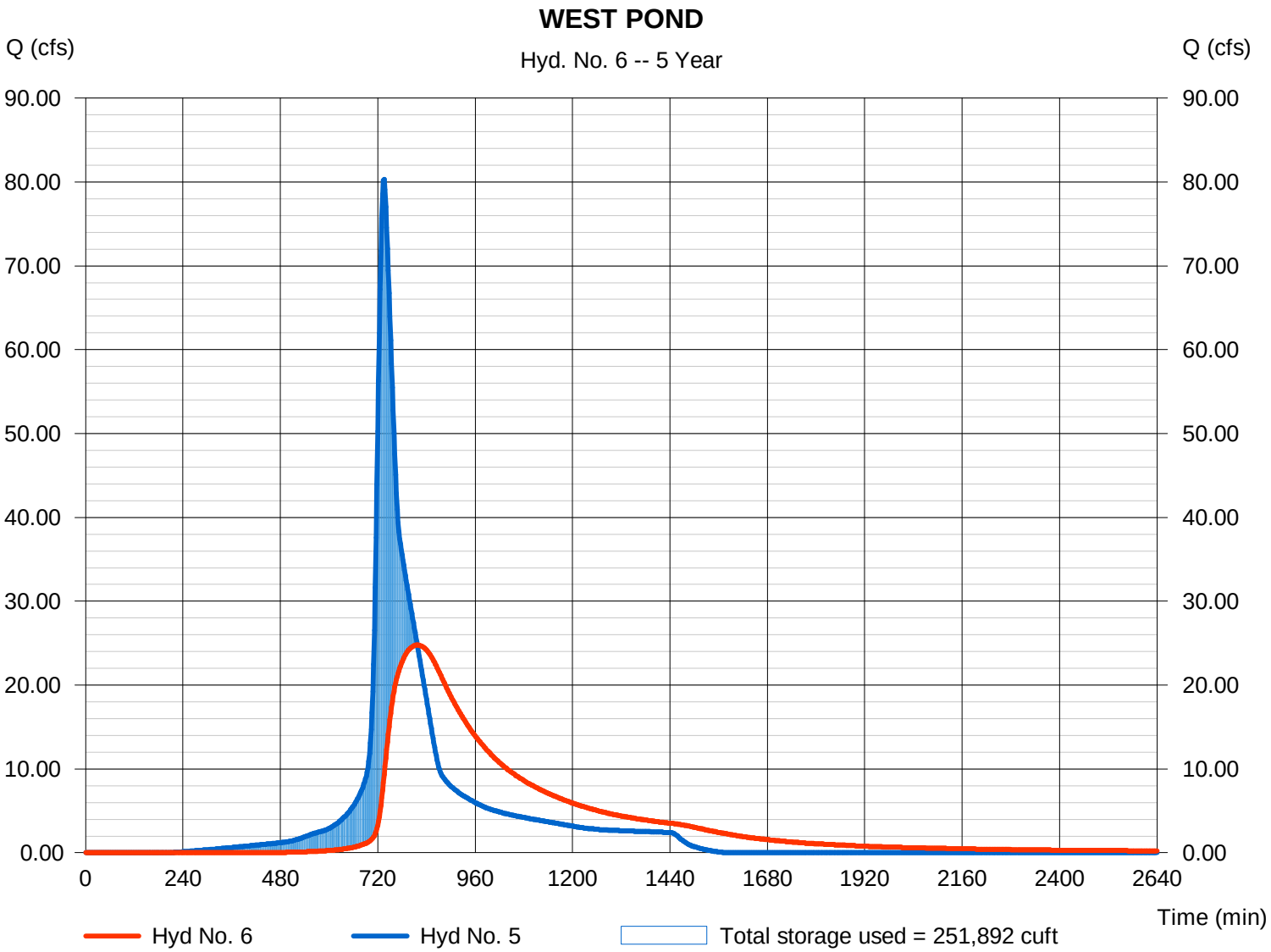
Hydrograph Report

Hyd. No. 6

WEST POND

Hydrograph type	=	Reservoir	Peak discharge	=	24.78 cfs
Storm frequency	=	5 yrs	Time to peak	=	818 min
Time interval	=	2 min	Hyd. volume	=	564,387 cuft
Inflow hyd. No.	=	5 - Total Inflow to West Pond	Max. Elevation	=	1282.03 ft
Reservoir name	=	Proposed West Pond	Max. Storage	=	251,892 cuft

Storage Indication method used.



Pond No. 2 - Proposed West Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1280.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1280.00	116,800	0	0
1.00	1281.00	123,500	120,122	120,122
2.00	1282.00	131,000	127,219	247,341
3.00	1283.00	138,300	134,620	381,961
4.00	1284.00	145,800	142,019	523,981
5.00	1285.00	153,500	149,619	673,599
6.00	1286.00	160,000	156,723	830,322

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 36.00	0.00	0.00	0.00
Span (in)	= 36.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1280.00	0.00	0.00	0.00
Length (ft)	= 100.00	0.00	0.00	0.00
Slope (%)	= 1.30	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

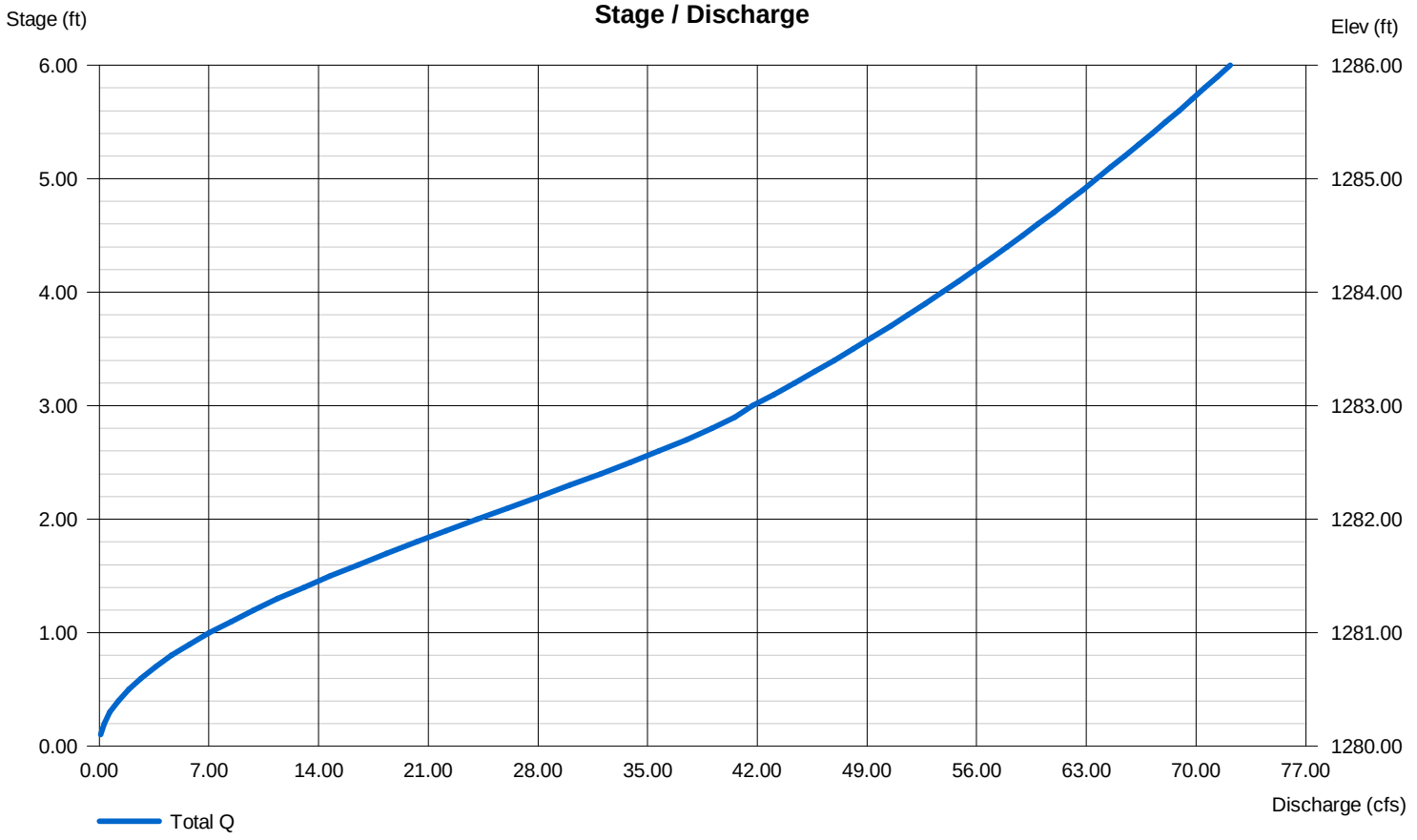
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.

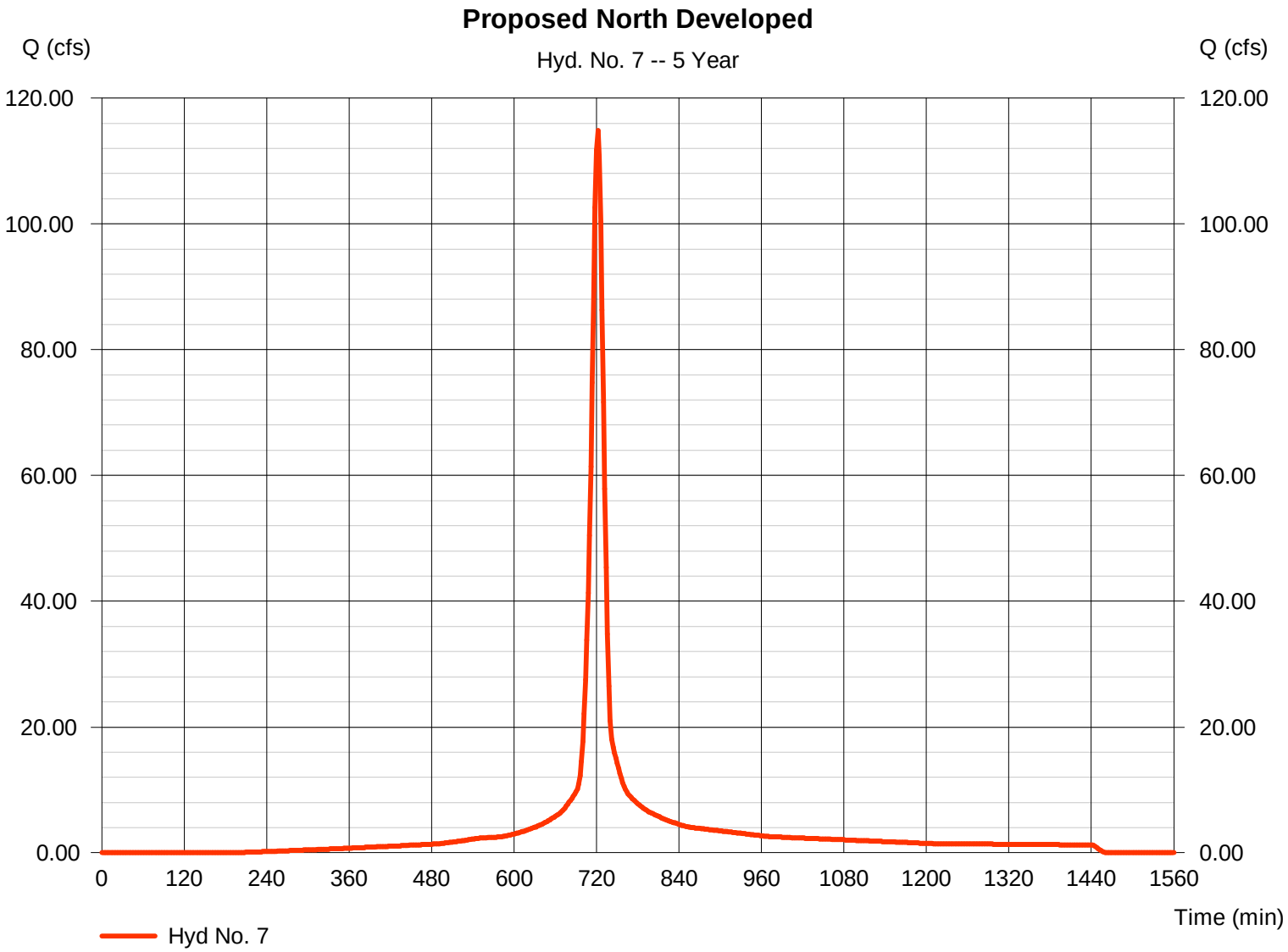


Hydrograph Report

Hyd. No. 7

Proposed North Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	114.83 cfs
Storm frequency	=	5 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	341,195 cuft
Drainage area	=	26.000 ac	Curve number	=	93
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	4.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

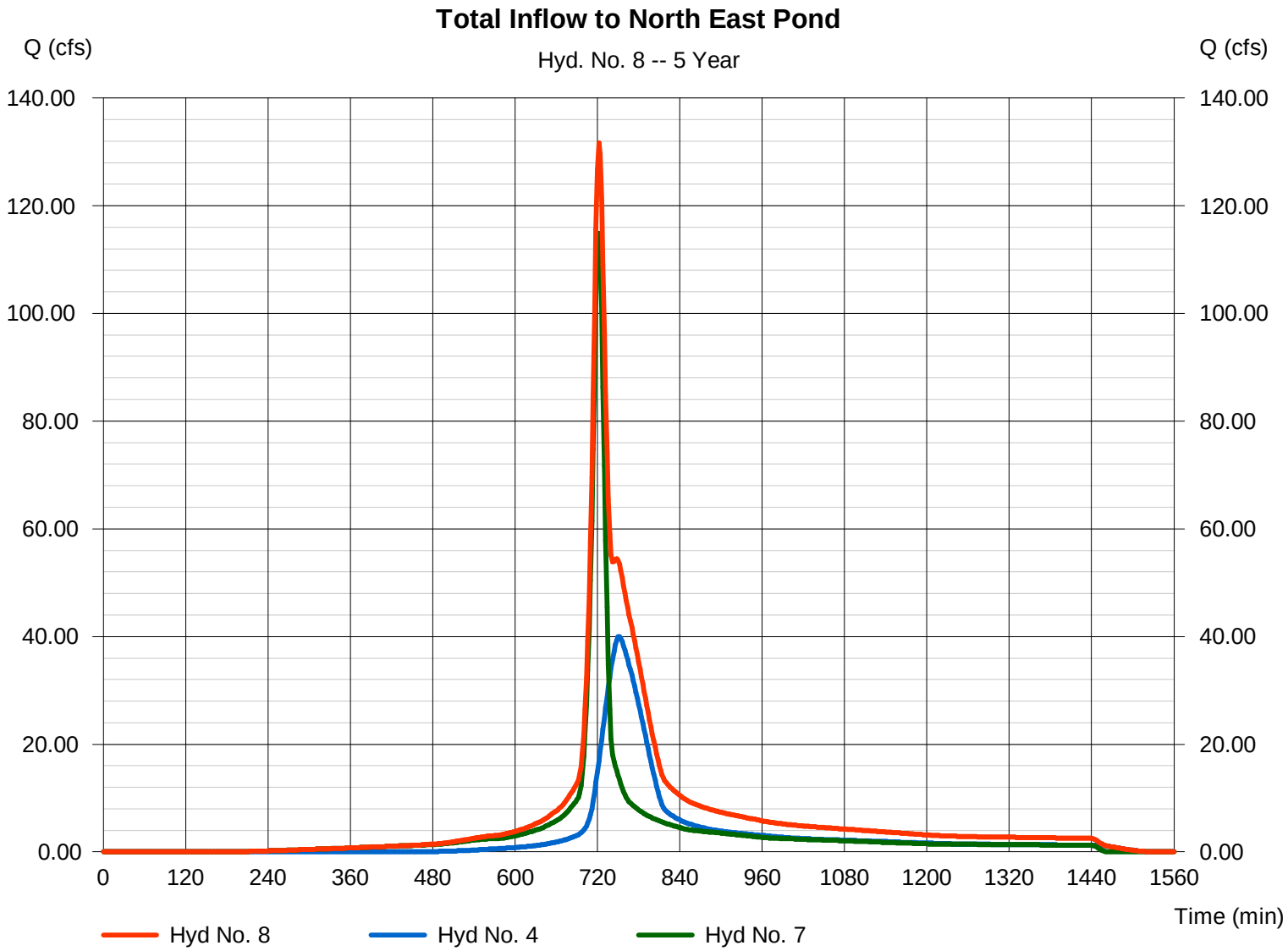


Hydrograph Report

Hyd. No. 8

Total Inflow to North East Pond

Hydrograph type	= Combine	Peak discharge	= 131.64 cfs
Storm frequency	= 5 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 610,888 cuft
Inflow hyds.	= 4, 7	Contrib. drain. area	= 54.000 ac



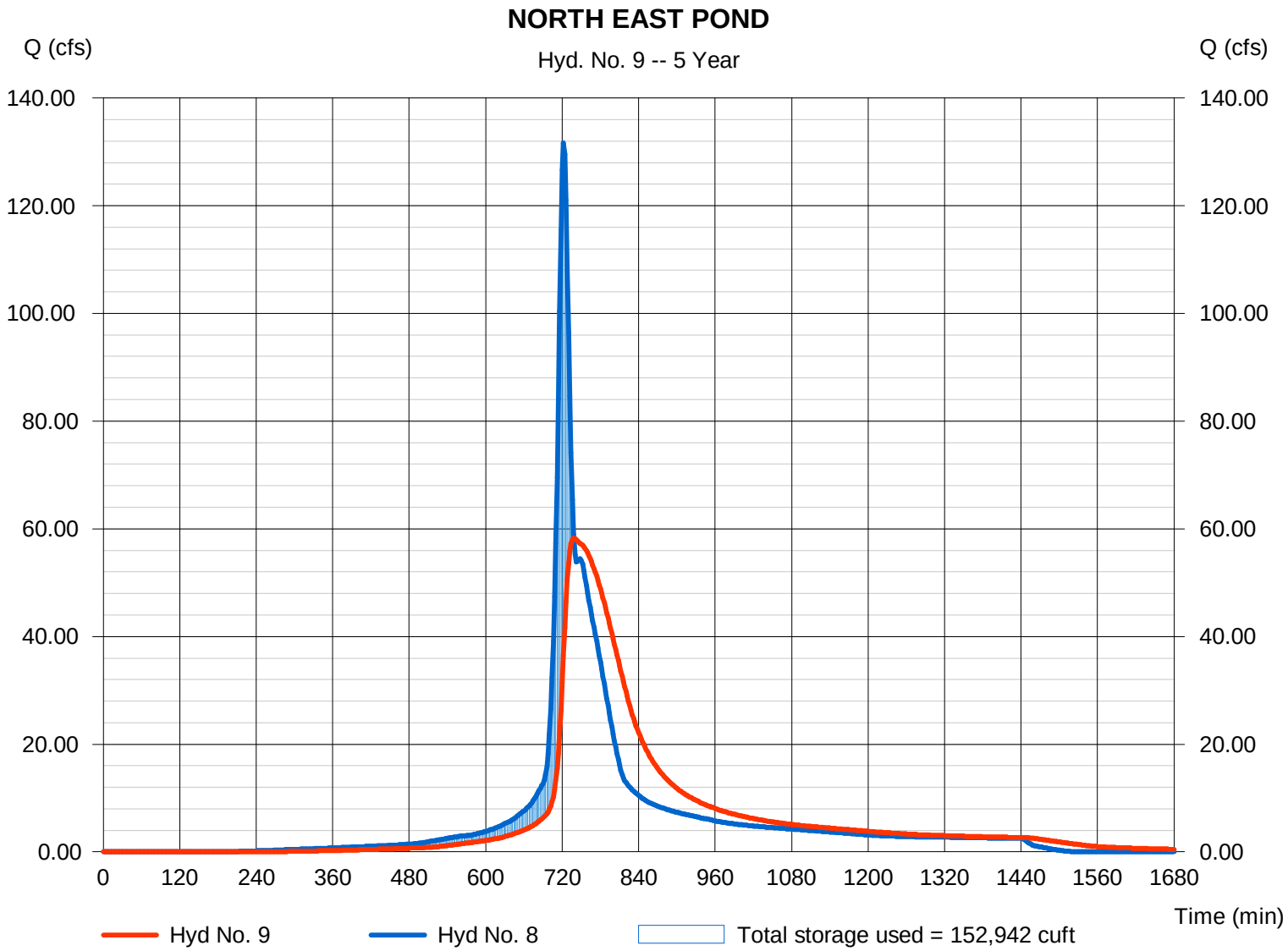
Hydrograph Report

Hyd. No. 9

NORTH EAST POND

Hydrograph type	=	Reservoir	Peak discharge	=	58.27 cfs
Storm frequency	=	5 yrs	Time to peak	=	738 min
Time interval	=	2 min	Hyd. volume	=	610,878 cuft
Inflow hyd. No.	=	8 - Total Inflow to North East Pond	Max. Elevation	=	1282.21 ft
Reservoir name	=	Existing NE Pond	Max. Storage	=	152,942 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Existing NE Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1280.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1280.50	80,000	0	0
1.10	1281.60	92,000	94,512	94,512
2.10	1282.60	98,800	95,370	189,882
3.10	1283.60	105,000	101,874	291,756
4.10	1284.60	112,500	108,718	400,474
4.50	1285.00	119,600	46,411	446,885

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

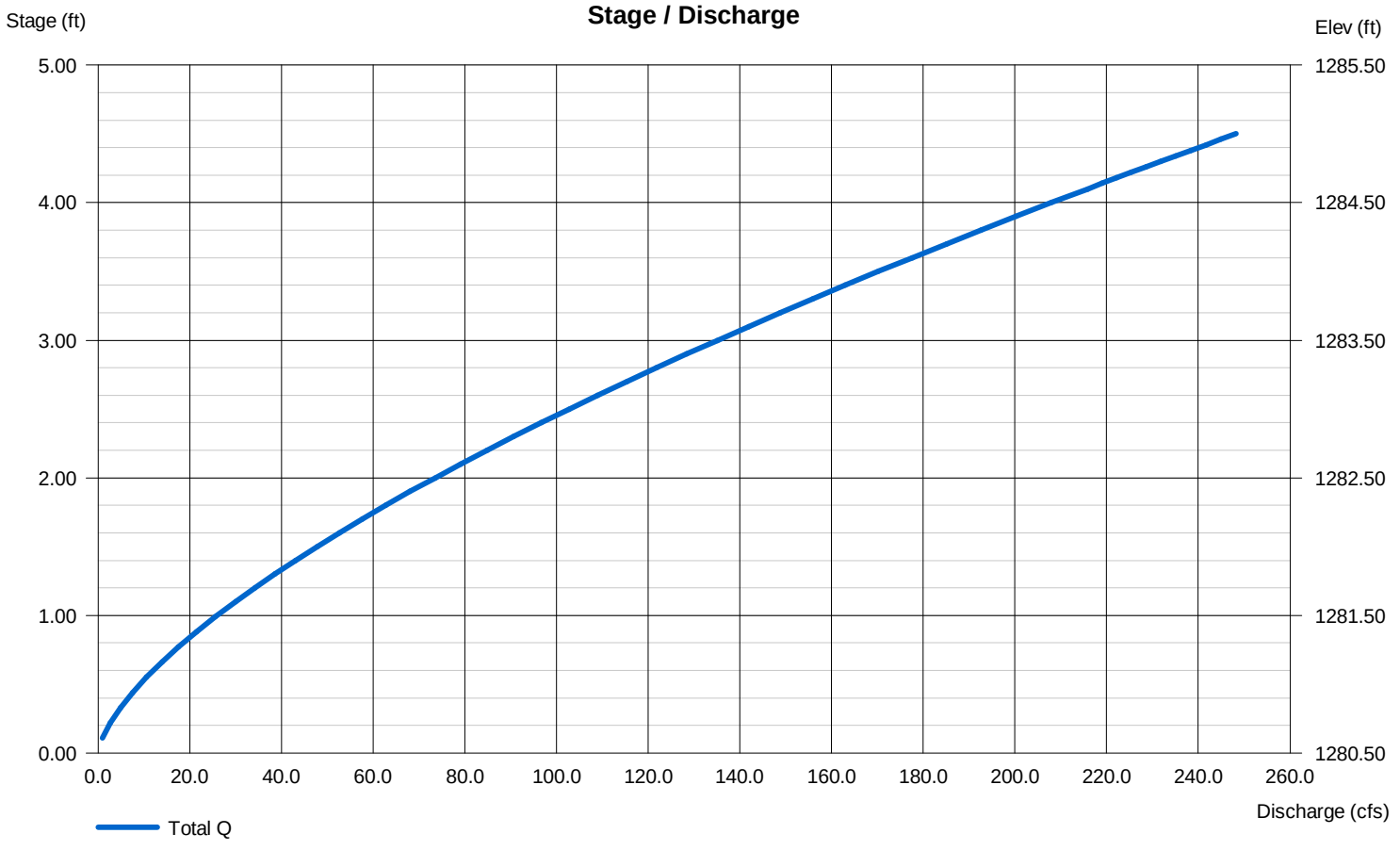
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.00	0.00	0.00
Crest El. (ft)	= 1280.50	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.

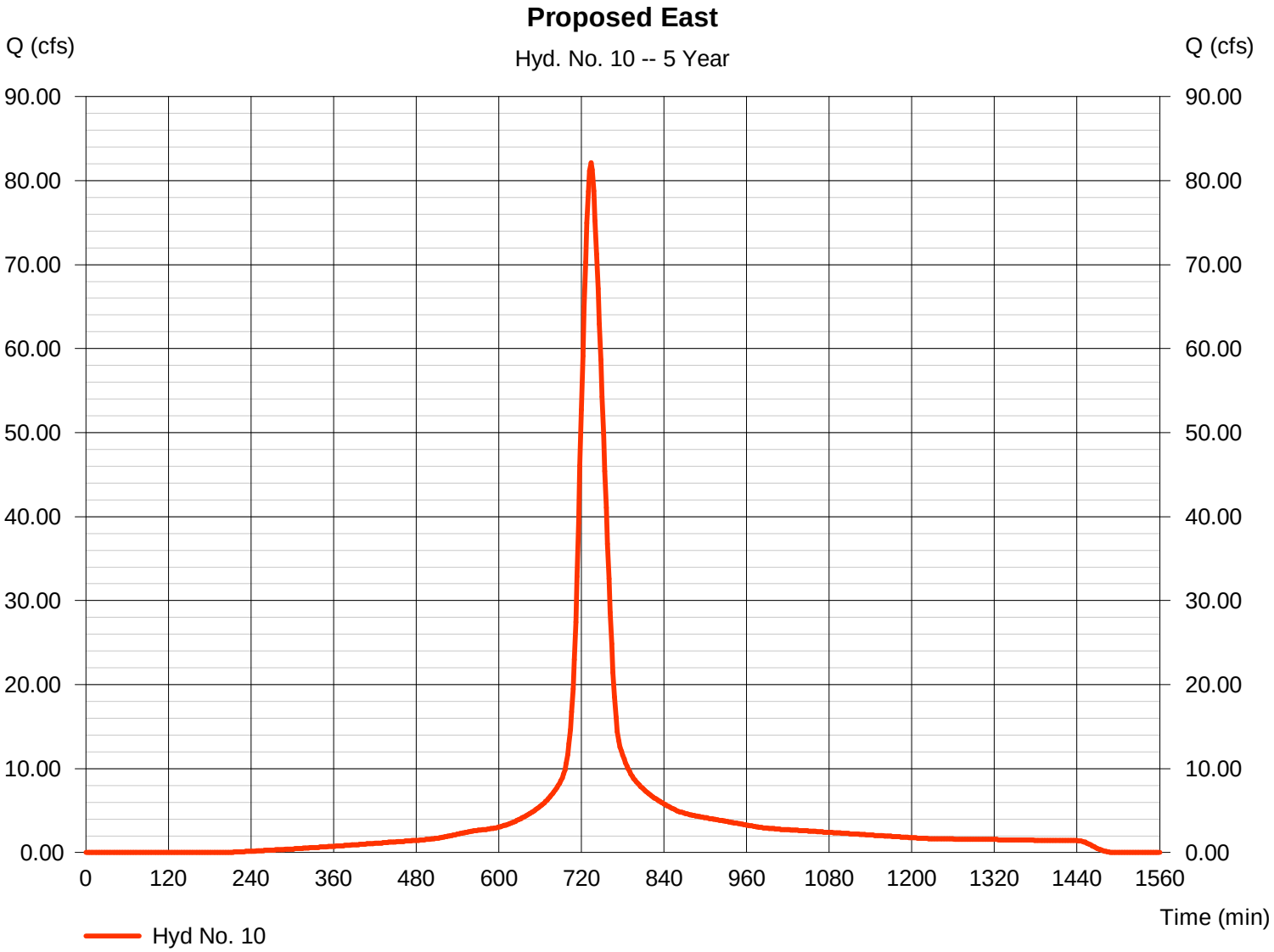


Hydrograph Report

Hyd. No. 10

Proposed East

Hydrograph type	=	SCS Runoff	Peak discharge	=	82.11 cfs
Storm frequency	=	5 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	385,886 cuft
Drainage area	=	29.000 ac	Curve number	=	93
Basin Slope	=	1.0 %	Hydraulic length	=	2000 ft
Tc method	=	LAG	Time of conc. (Tc)	=	34.16 min
Total precip.	=	4.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

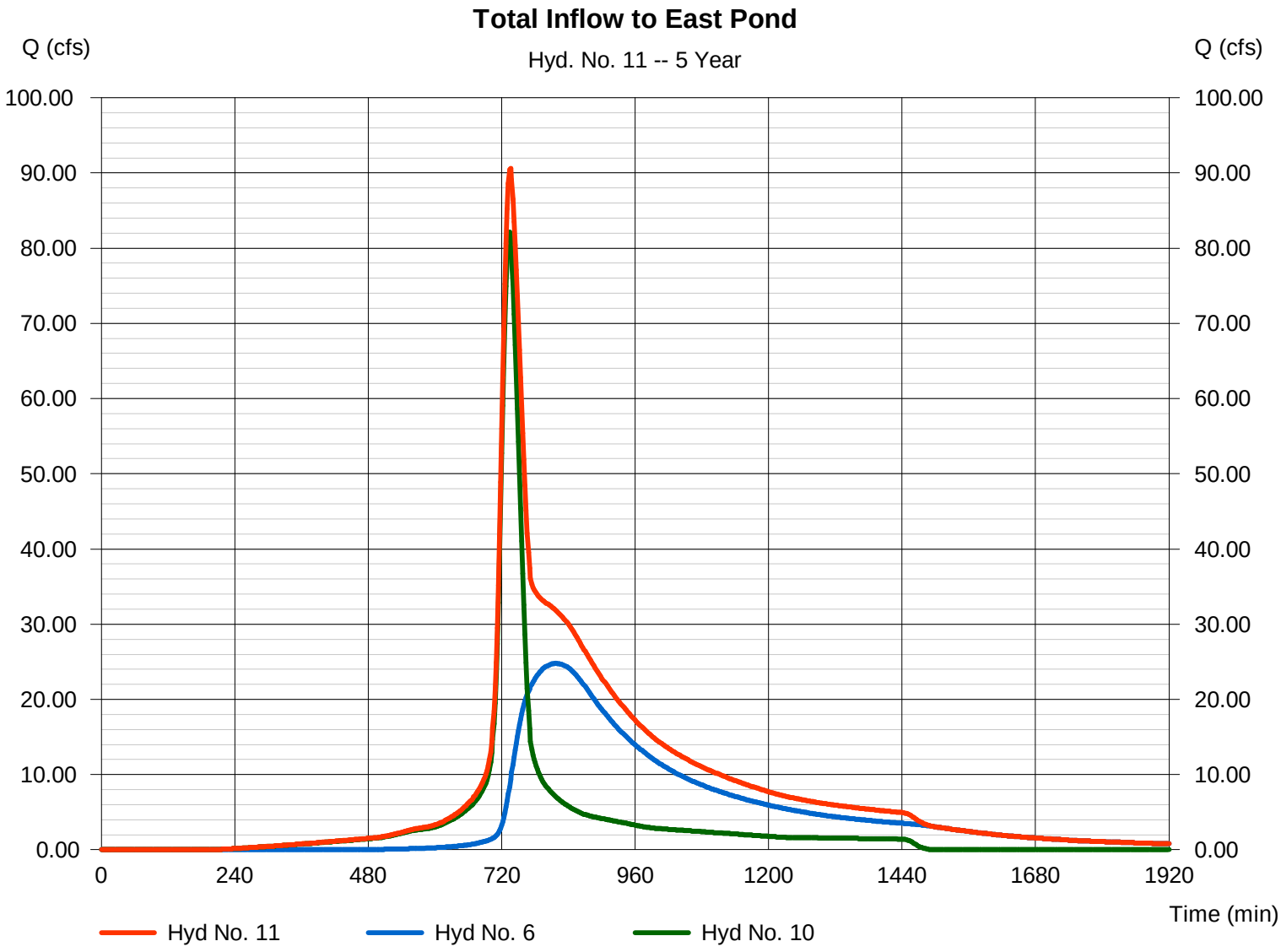


Hydrograph Report

Hyd. No. 11

Total Inflow to East Pond

Hydrograph type	= Combine	Peak discharge	= 90.60 cfs
Storm frequency	= 5 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 950,273 cuft
Inflow hyds.	= 6, 10	Contrib. drain. area	= 29.000 ac



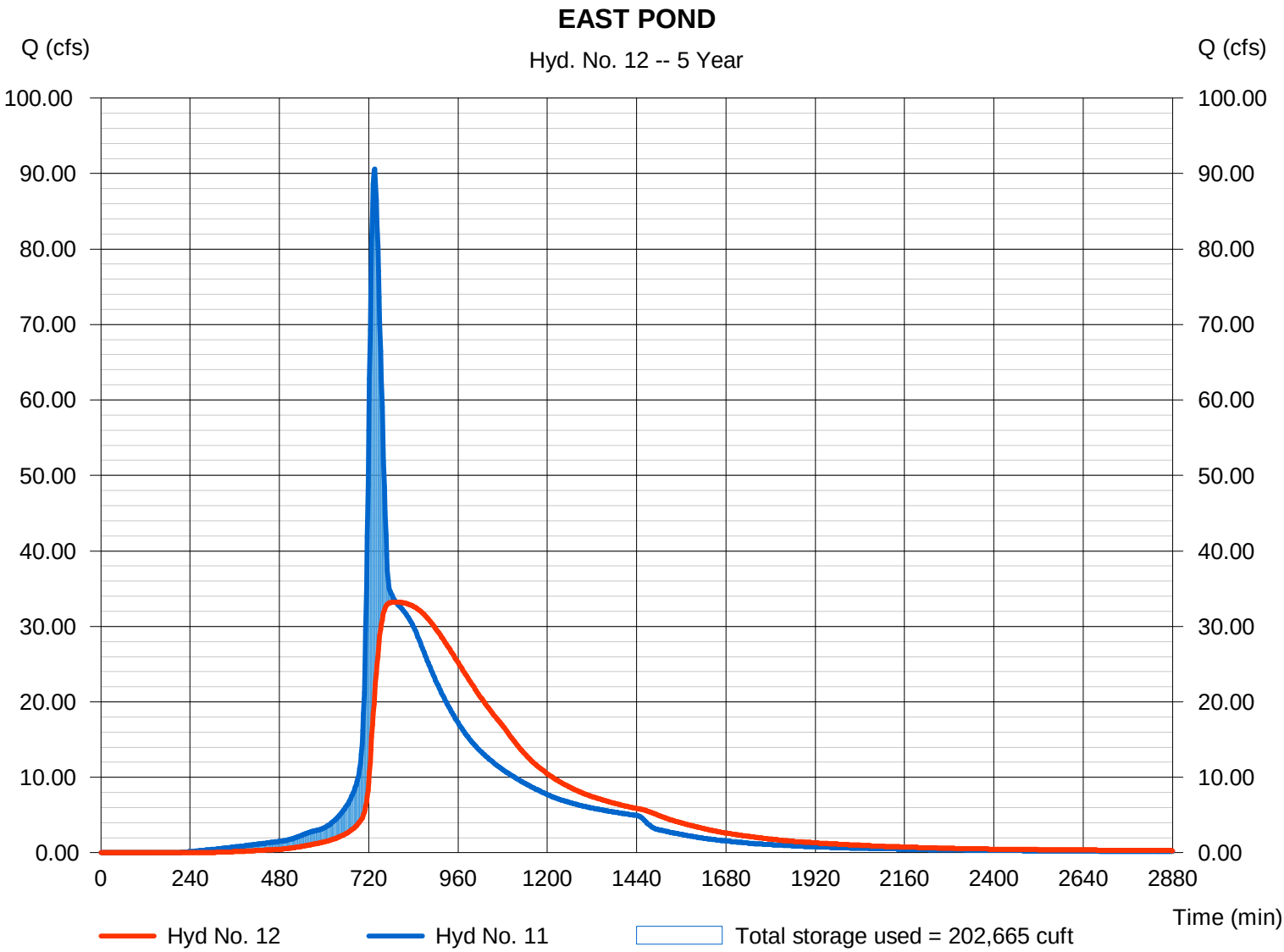
Hydrograph Report

Hyd. No. 12

EAST POND

Hydrograph type	=	Reservoir	Peak discharge	=	33.24 cfs
Storm frequency	=	5 yrs	Time to peak	=	792 min
Time interval	=	2 min	Hyd. volume	=	949,551 cuft
Inflow hyd. No.	=	11 - Total Inflow to East Pond	Max. Elevation	=	1281.93 ft
Reservoir name	=	Proposed East Pond	Max. Storage	=	202,665 cuft

Storage Indication method used.



Pond Report

Pond No. 3 - Proposed East Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1280.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1280.00	98,300	0	0
1.00	1281.00	105,000	101,621	101,621
2.00	1282.00	112,000	108,470	210,092
3.00	1283.00	119,500	115,718	325,810
4.00	1284.00	126,500	122,971	448,781
5.00	1285.00	133,500	129,971	578,752
6.00	1286.00	135,000	134,236	712,988

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 84.00	0.00	0.00	0.00
Span (in)	= 60.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1280.00	0.00	0.00	0.00
Length (ft)	= 30.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

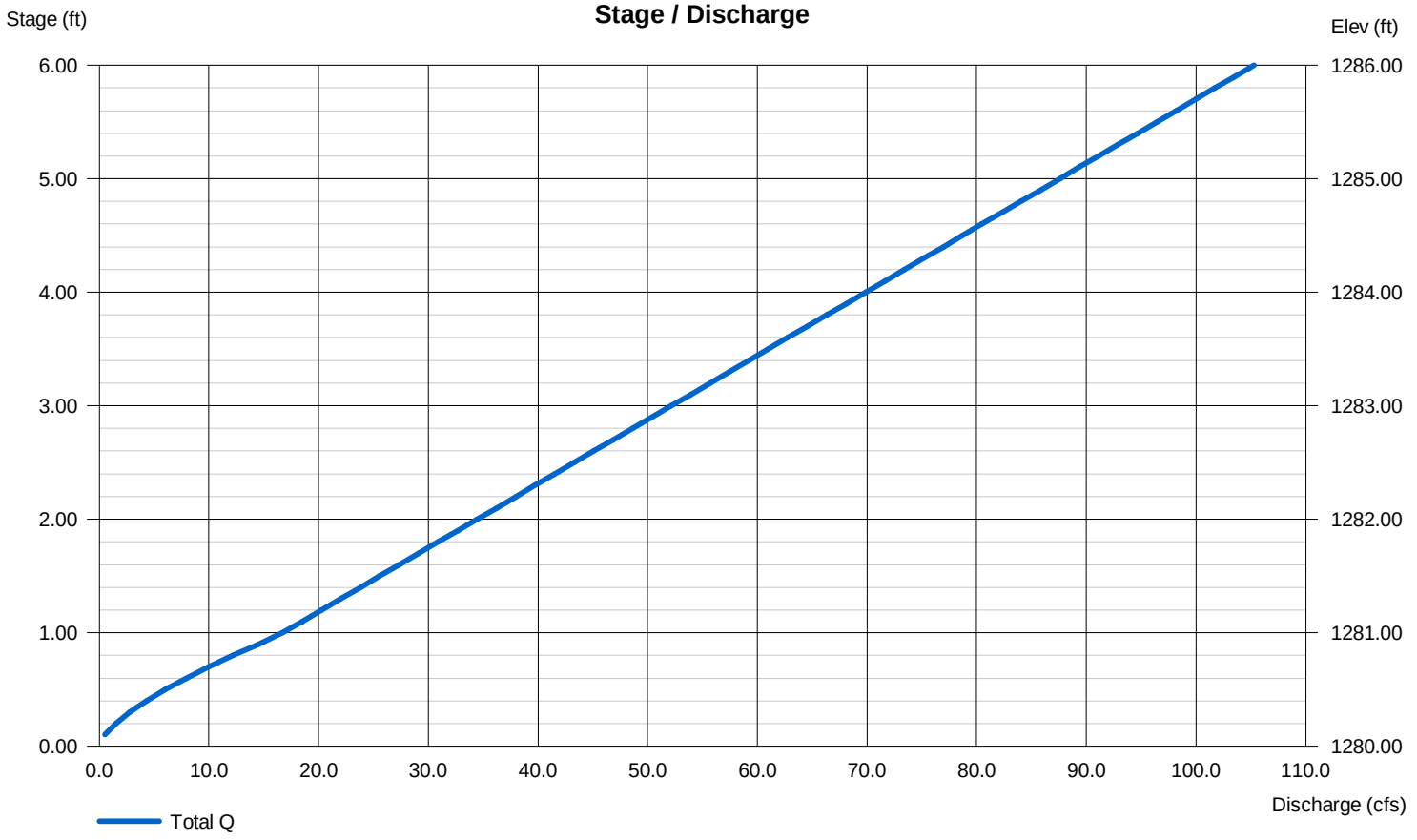
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	0.00	0.00	0.00
Crest El. (ft)	= 1280.00	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

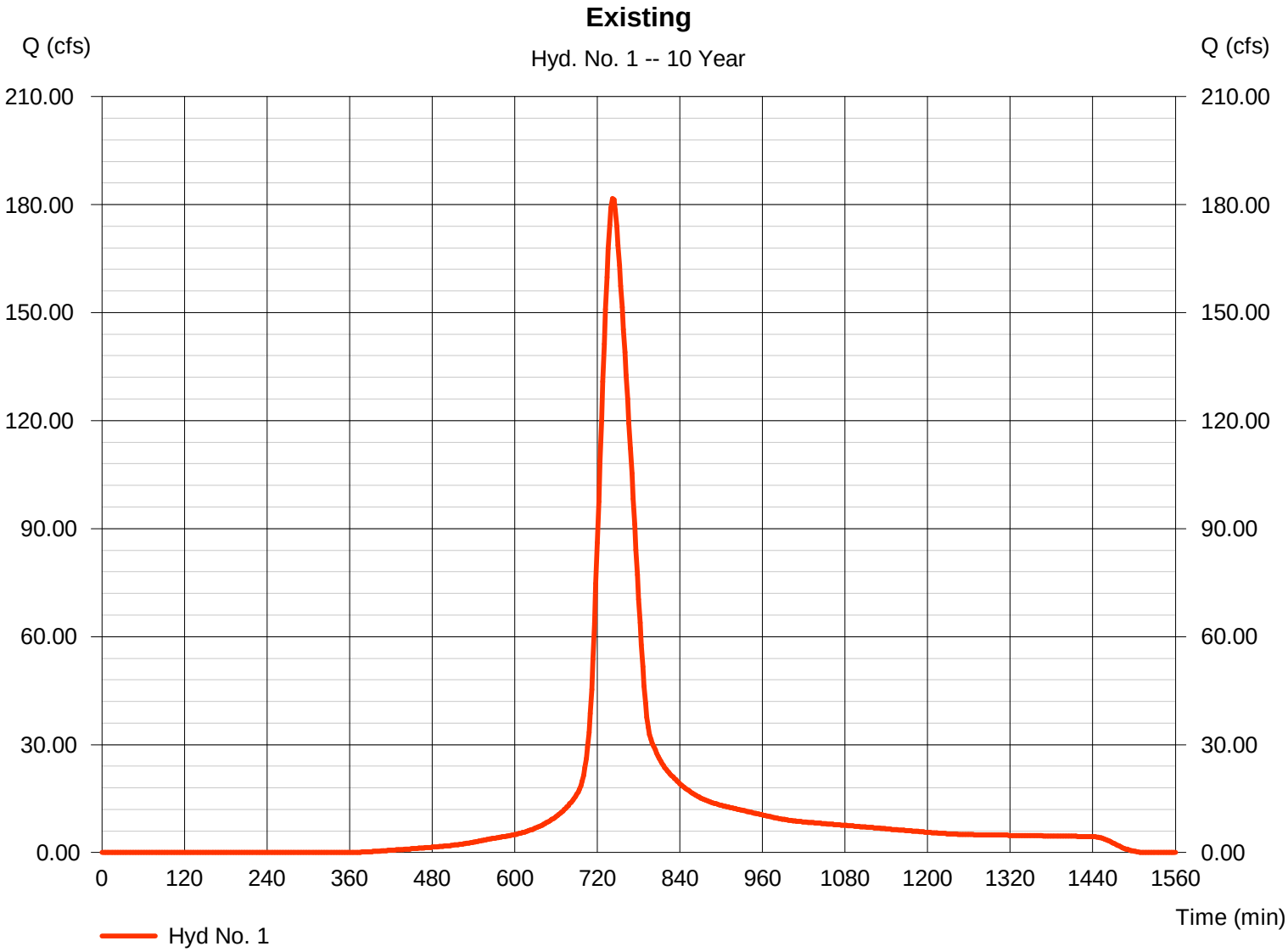
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	181.60	2	742	1,029,750	----	------	------	Existing
2	SCS Runoff	81.57	2	734	386,961	----	------	------	Proposed West
3	SCS Runoff	34.10	2	774	320,793	----	------	------	West Offsite
4	SCS Runoff	50.86	2	752	342,606	----	------	------	North Offsite
5	Combine	97.99	2	736	707,754	2, 3,	------	------	Total Inflow to West Pond
6	Reservoir	32.27	2	814	702,531	5	1282.42	303,212	WEST POND
7	SCS Runoff	137.61	2	722	413,426	----	------	------	Proposed North Developed
8	Combine	159.59	2	722	756,033	4, 7	------	------	Total Inflow to North East Pond
9	Reservoir	74.31	2	738	756,023	8	1282.51	181,677	NORTH EAST POND
10	SCS Runoff	98.56	2	734	467,579	----	------	------	Proposed East
11	Combine	111.07	2	736	1,170,113	6, 10	------	------	Total Inflow to East Pond
12	Reservoir	41.19	2	810	1,169,381	11	1282.38	254,113	EAST POND

Hydrograph Report

Hyd. No. 1

Existing

Hydrograph type	=	SCS Runoff	Peak discharge	=	181.60 cfs
Storm frequency	=	10 yrs	Time to peak	=	742 min
Time interval	=	2 min	Hyd. volume	=	1,029,750 cuft
Drainage area	=	80.000 ac	Curve number	=	84
Basin Slope	=	1.0 %	Hydraulic length	=	2000 ft
Tc method	=	LAG	Time of conc. (Tc)	=	48.65 min
Total precip.	=	5.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

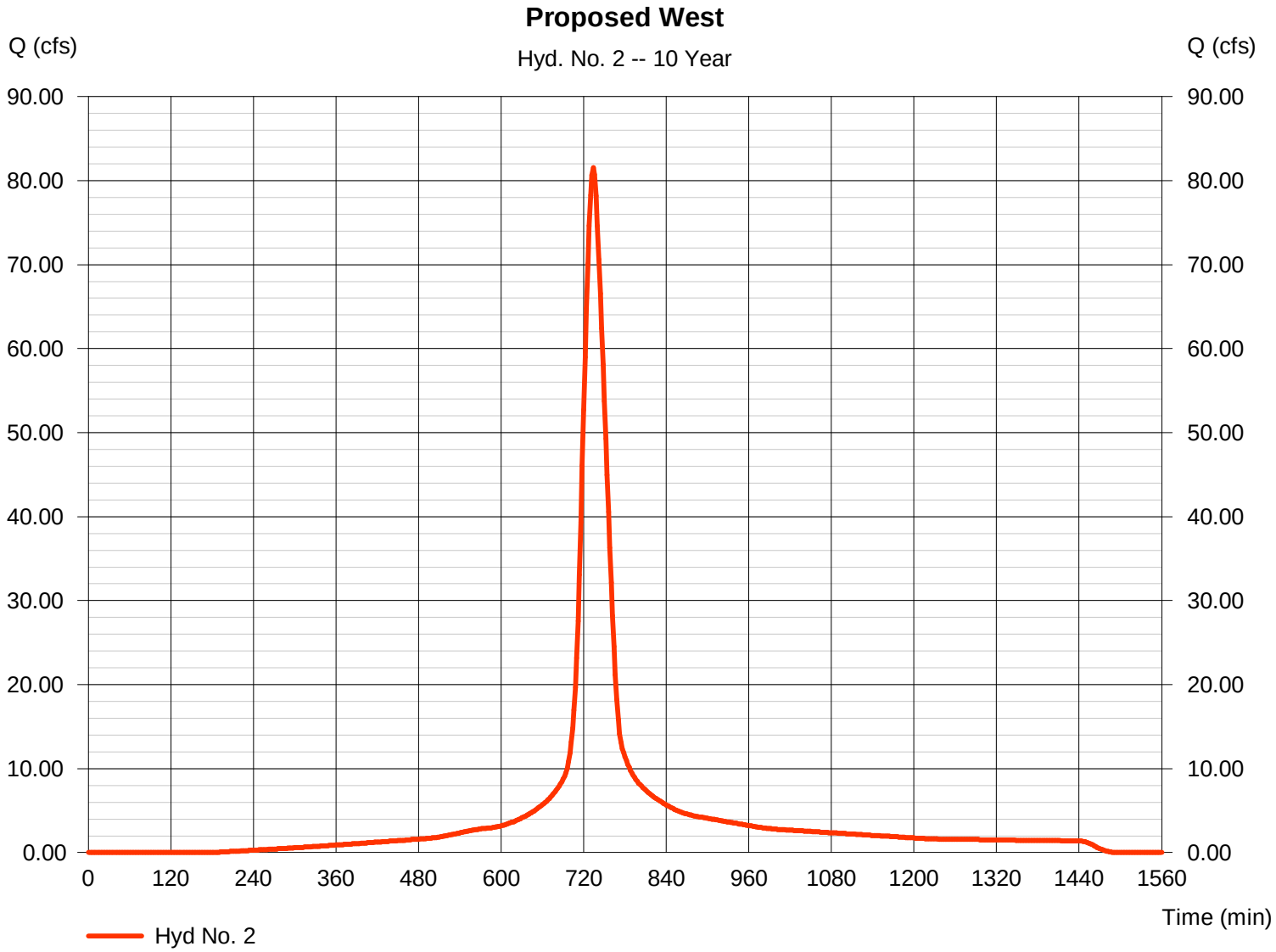


Hydrograph Report

Hyd. No. 2

Proposed West

Hydrograph type	=	SCS Runoff	Peak discharge	=	81.57 cfs
Storm frequency	=	10 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	386,961 cuft
Drainage area	=	24.000 ac	Curve number	=	93
Basin Slope	=	1.0 %	Hydraulic length	=	2000 ft
Tc method	=	LAG	Time of conc. (Tc)	=	34.16 min
Total precip.	=	5.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

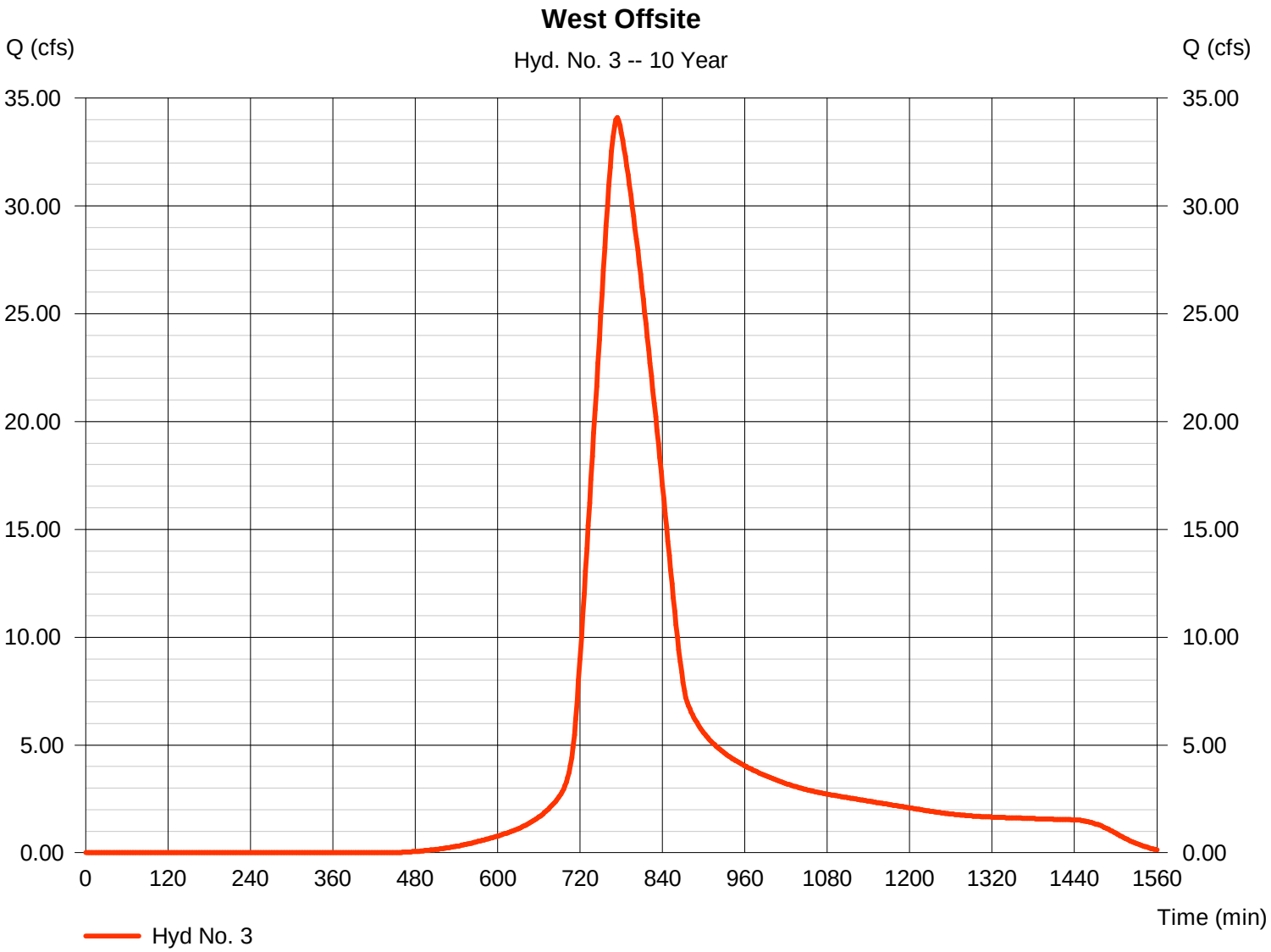


Hydrograph Report

Hyd. No. 3

West Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	34.10 cfs
Storm frequency	=	10 yrs	Time to peak	=	774 min
Time interval	=	2 min	Hyd. volume	=	320,793 cuft
Drainage area	=	28.000 ac	Curve number	=	80
Basin Slope	=	0.5 %	Hydraulic length	=	2700 ft
Tc method	=	LAG	Time of conc. (Tc)	=	99.67 min
Total precip.	=	5.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

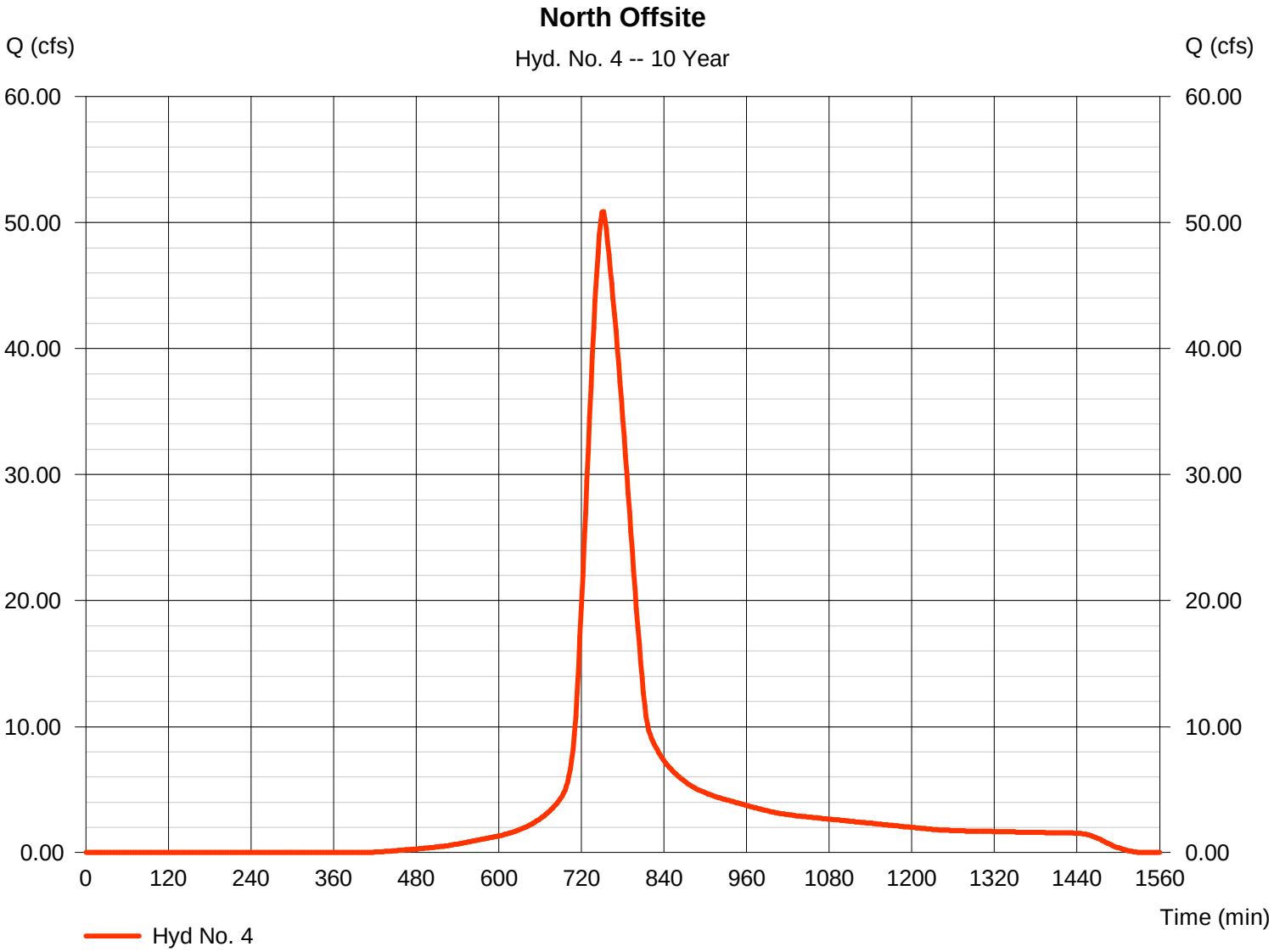


Hydrograph Report

Hyd. No. 4

North Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	50.86 cfs
Storm frequency	=	10 yrs	Time to peak	=	752 min
Time interval	=	2 min	Hyd. volume	=	342,606 cuft
Drainage area	=	28.000 ac	Curve number	=	82
Basin Slope	=	0.5 %	Hydraulic length	=	1600 ft
Tc method	=	LAG	Time of conc. (Tc)	=	61.53 min
Total precip.	=	5.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

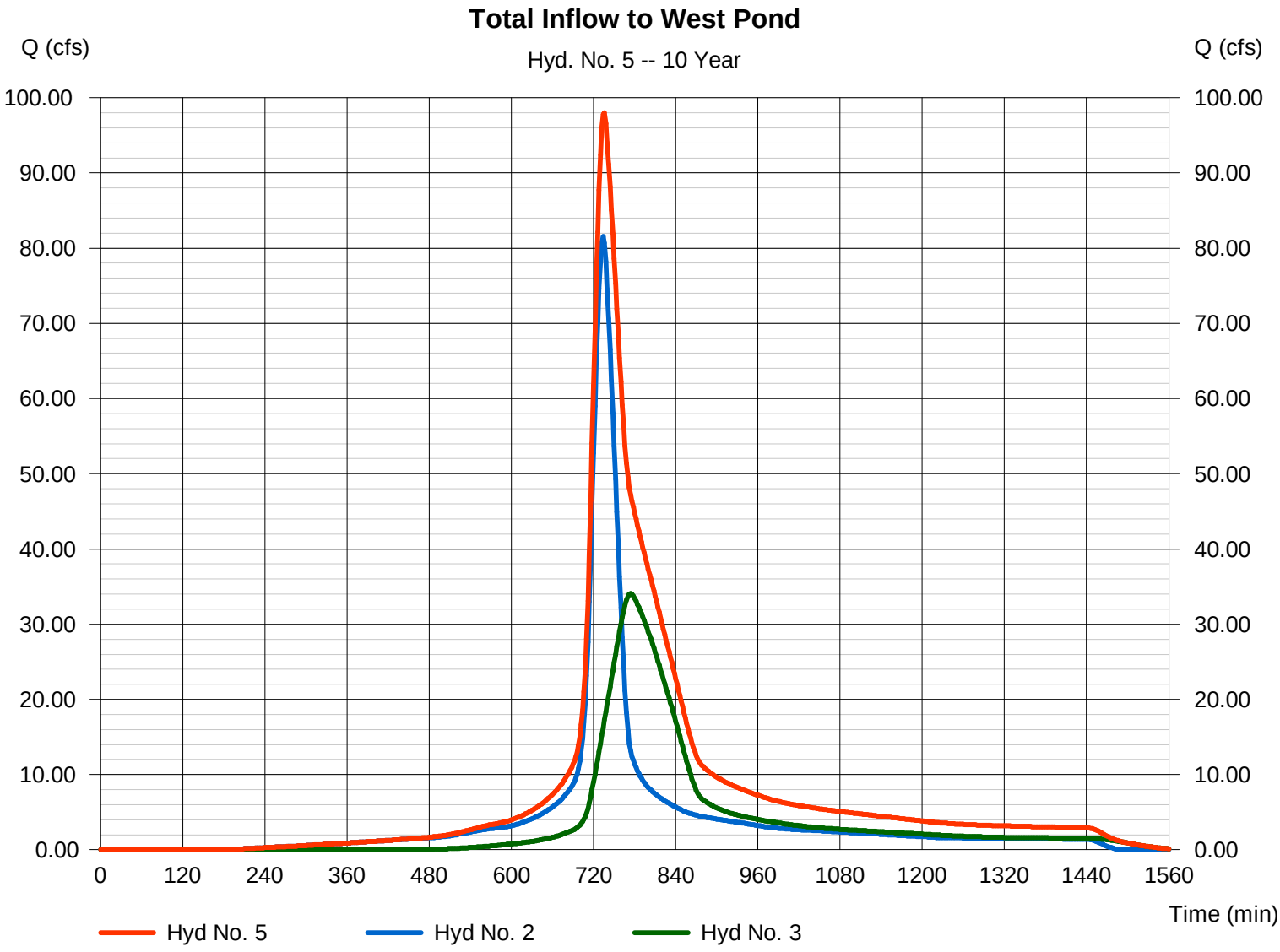


Hydrograph Report

Hyd. No. 5

Total Inflow to West Pond

Hydrograph type	= Combine	Peak discharge	= 97.99 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 707,754 cuft
Inflow hyds.	= 2, 3	Contrib. drain. area	= 52.000 ac



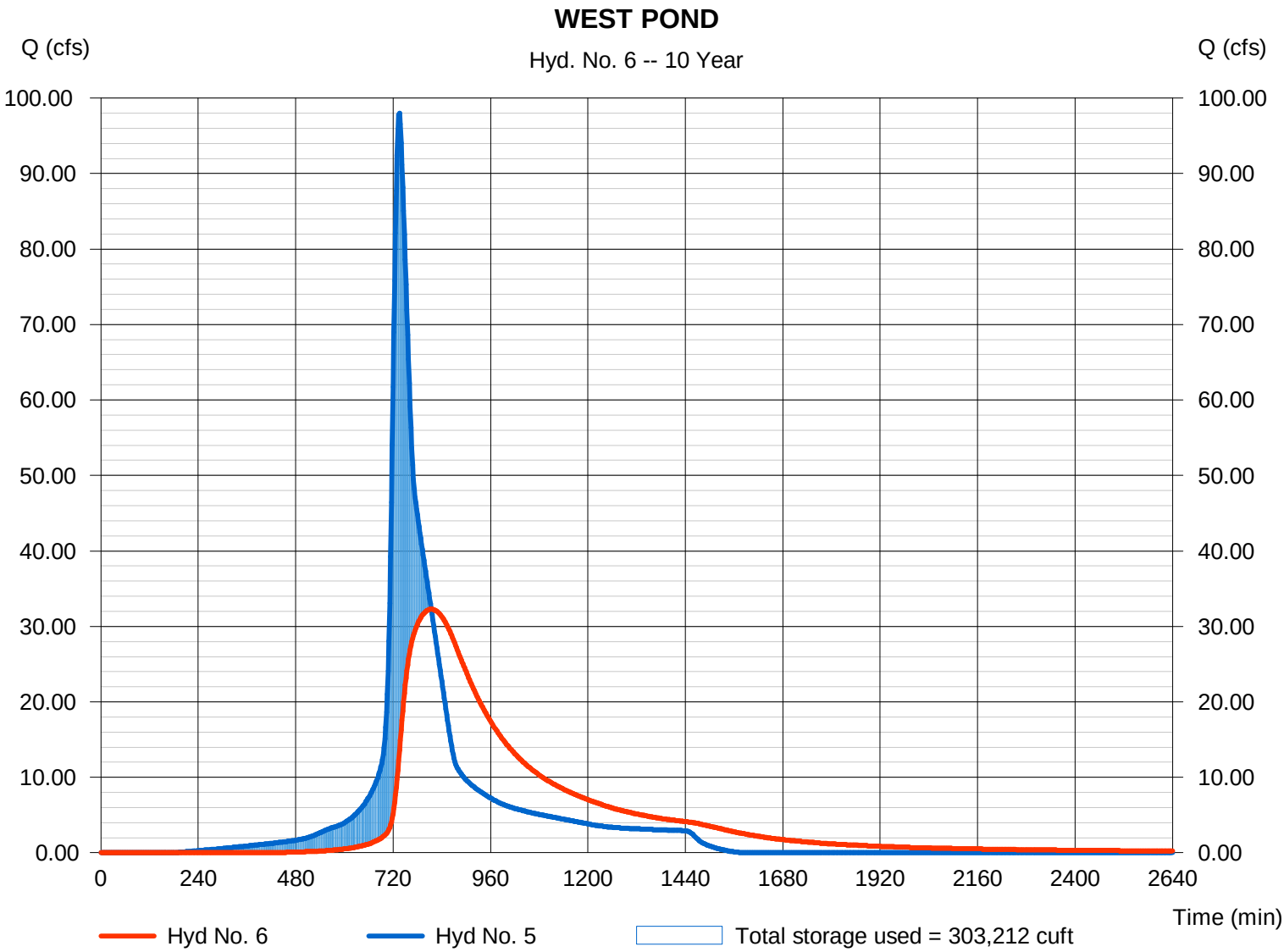
Hydrograph Report

Hyd. No. 6

WEST POND

Hydrograph type	=	Reservoir	Peak discharge	=	32.27 cfs
Storm frequency	=	10 yrs	Time to peak	=	814 min
Time interval	=	2 min	Hyd. volume	=	702,531 cuft
Inflow hyd. No.	=	5 - Total Inflow to West Pond	Max. Elevation	=	1282.42 ft
Reservoir name	=	Proposed West Pond	Max. Storage	=	303,212 cuft

Storage Indication method used.



Pond No. 2 - Proposed West Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1280.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1280.00	116,800	0	0
1.00	1281.00	123,500	120,122	120,122
2.00	1282.00	131,000	127,219	247,341
3.00	1283.00	138,300	134,620	381,961
4.00	1284.00	145,800	142,019	523,981
5.00	1285.00	153,500	149,619	673,599
6.00	1286.00	160,000	156,723	830,322

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 36.00	0.00	0.00	0.00
Span (in)	= 36.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1280.00	0.00	0.00	0.00
Length (ft)	= 100.00	0.00	0.00	0.00
Slope (%)	= 1.30	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

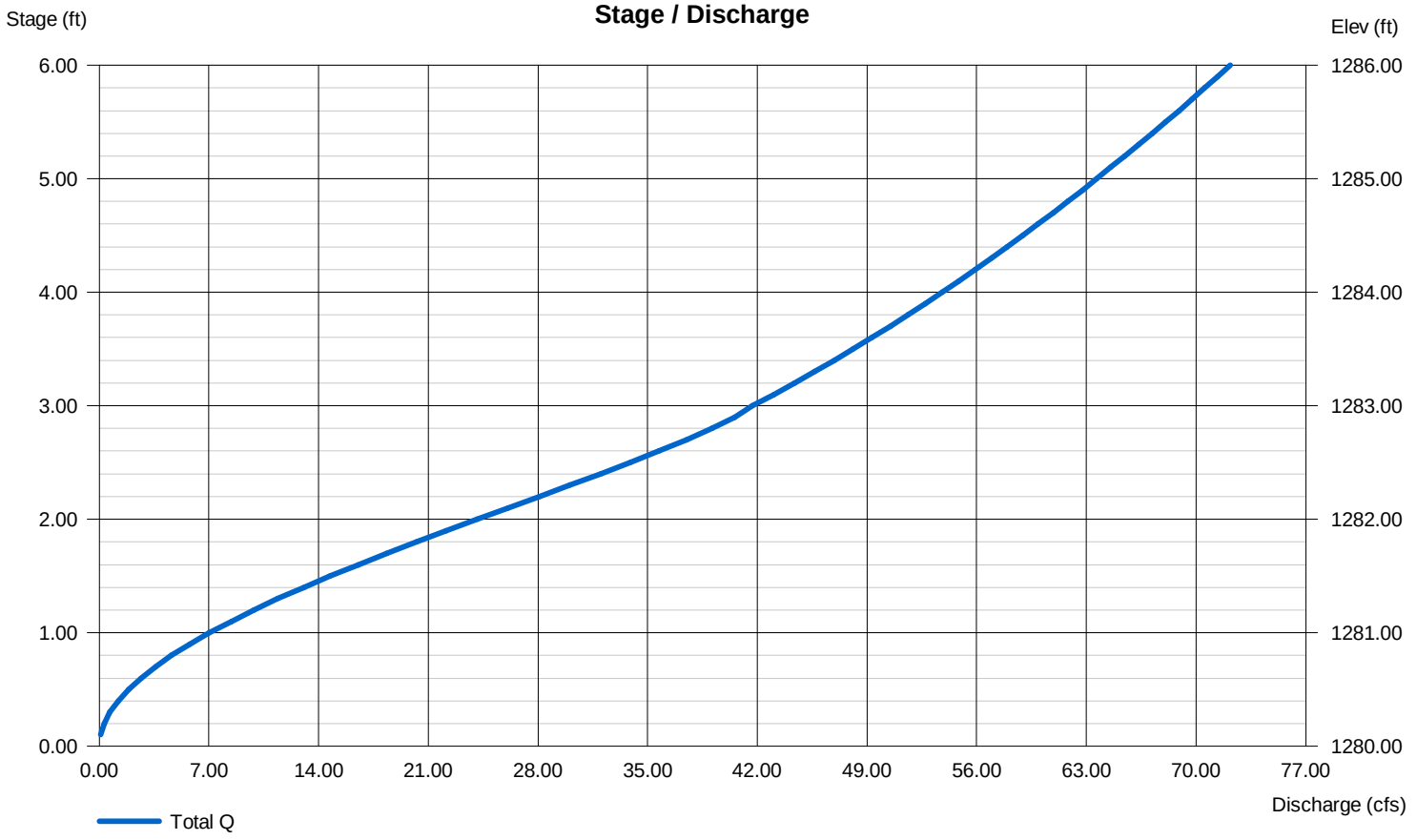
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.

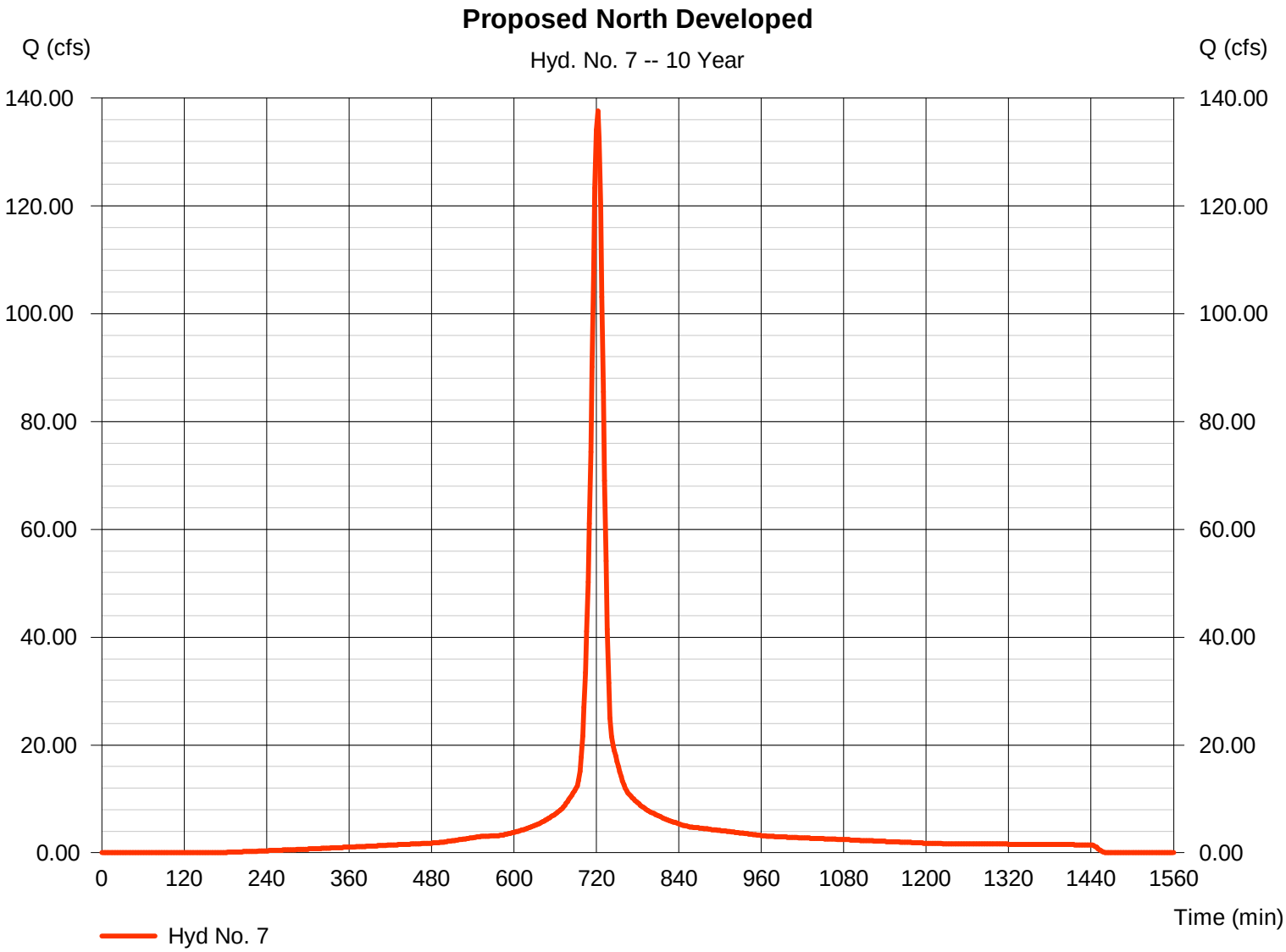


Hydrograph Report

Hyd. No. 7

Proposed North Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	137.61 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	413,426 cuft
Drainage area	=	26.000 ac	Curve number	=	93
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	5.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

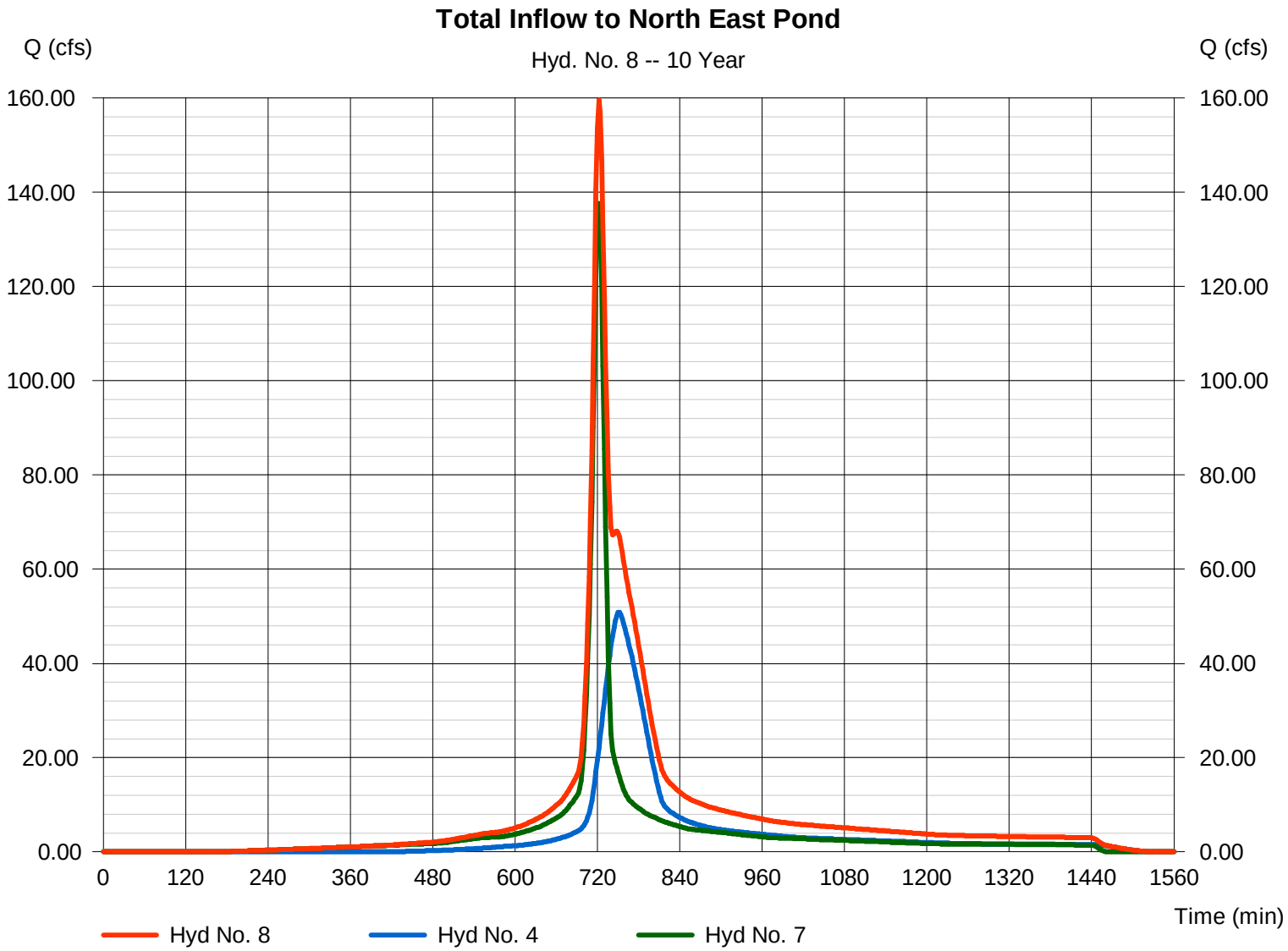


Hydrograph Report

Hyd. No. 8

Total Inflow to North East Pond

Hydrograph type	= Combine	Peak discharge	= 159.59 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 756,033 cuft
Inflow hyds.	= 4, 7	Contrib. drain. area	= 54.000 ac



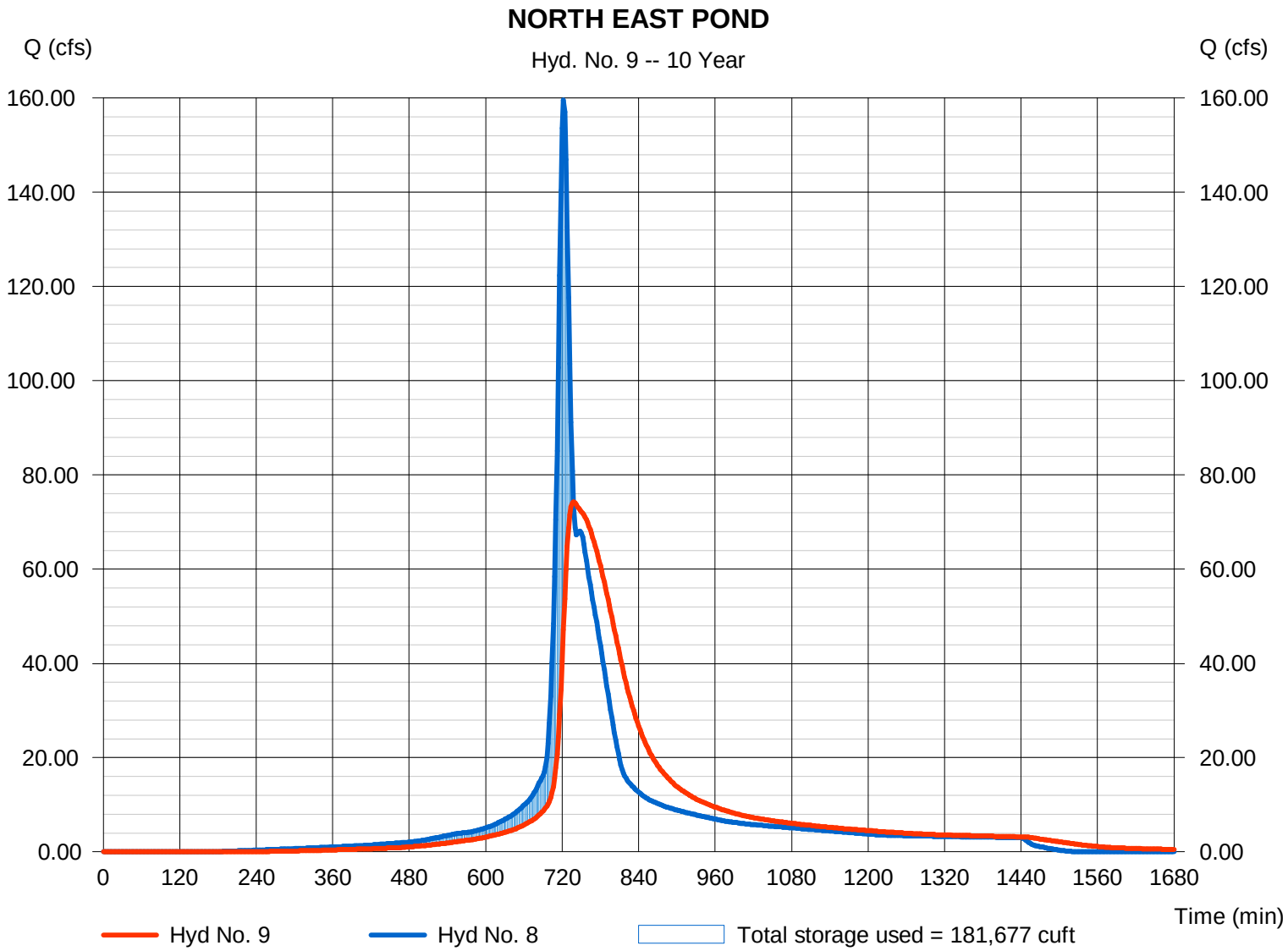
Hydrograph Report

Hyd. No. 9

NORTH EAST POND

Hydrograph type	=	Reservoir	Peak discharge	=	74.31 cfs
Storm frequency	=	10 yrs	Time to peak	=	738 min
Time interval	=	2 min	Hyd. volume	=	756,023 cuft
Inflow hyd. No.	=	8 - Total Inflow to North East Pond	Max. Elevation	=	1282.51 ft
Reservoir name	=	Existing NE Pond	Max. Storage	=	181,677 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Existing NE Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1280.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1280.50	80,000	0	0
1.10	1281.60	92,000	94,512	94,512
2.10	1282.60	98,800	95,370	189,882
3.10	1283.60	105,000	101,874	291,756
4.10	1284.60	112,500	108,718	400,474
4.50	1285.00	119,600	46,411	446,885

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

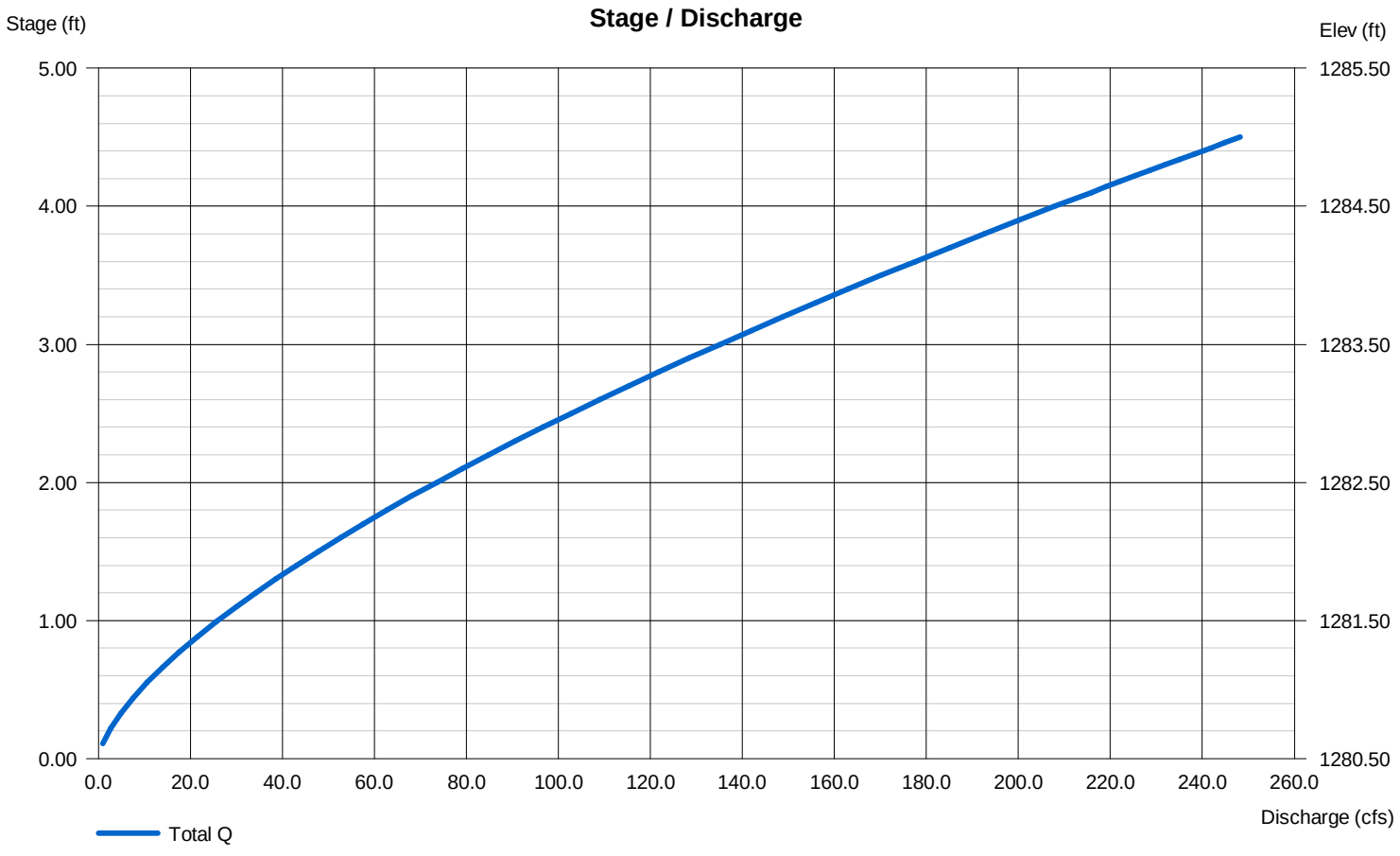
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.00	0.00	0.00
Crest El. (ft)	= 1280.50	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.

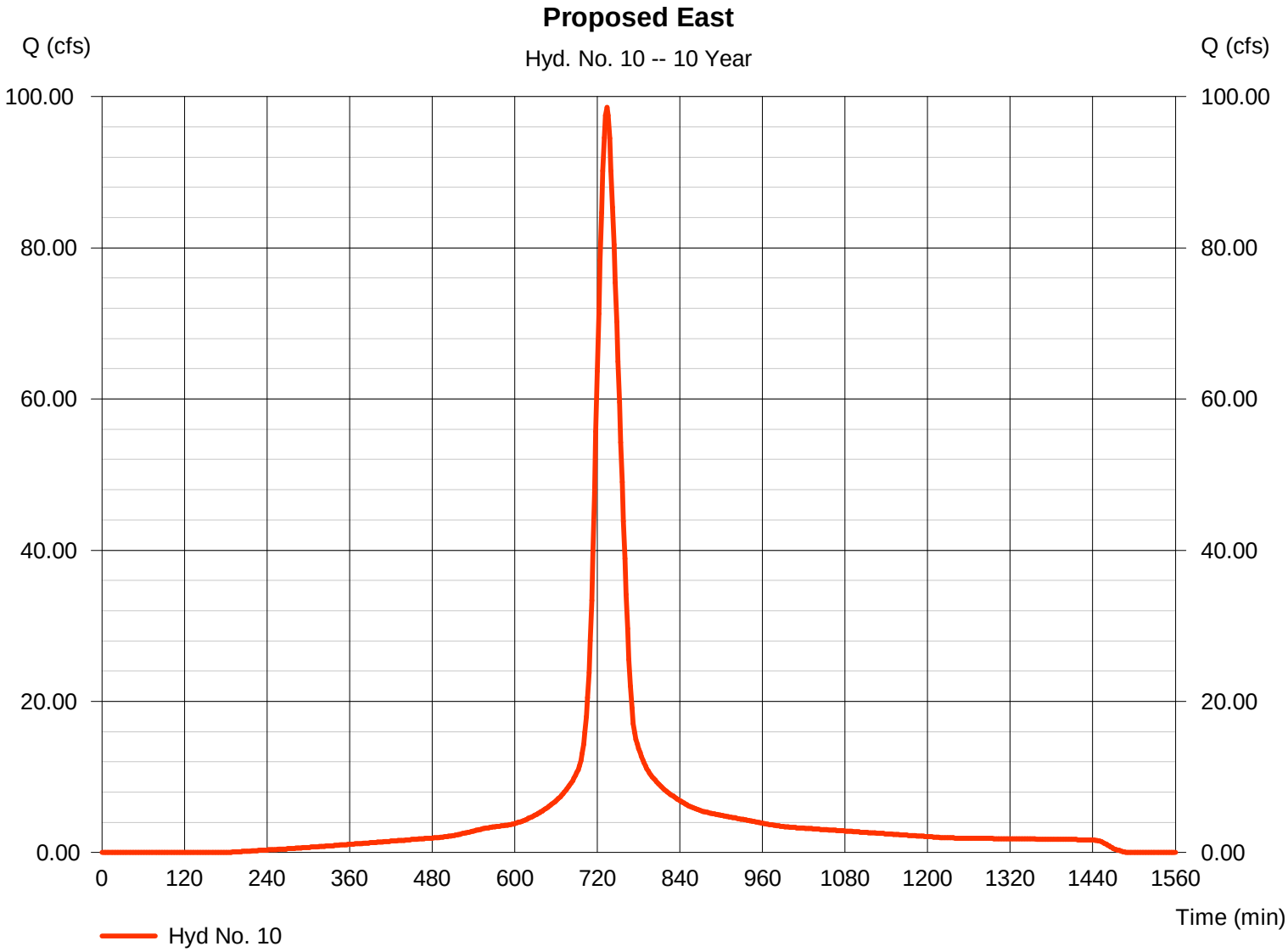


Hydrograph Report

Hyd. No. 10

Proposed East

Hydrograph type	=	SCS Runoff	Peak discharge	=	98.56 cfs
Storm frequency	=	10 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	467,579 cuft
Drainage area	=	29.000 ac	Curve number	=	93
Basin Slope	=	1.0 %	Hydraulic length	=	2000 ft
Tc method	=	LAG	Time of conc. (Tc)	=	34.16 min
Total precip.	=	5.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

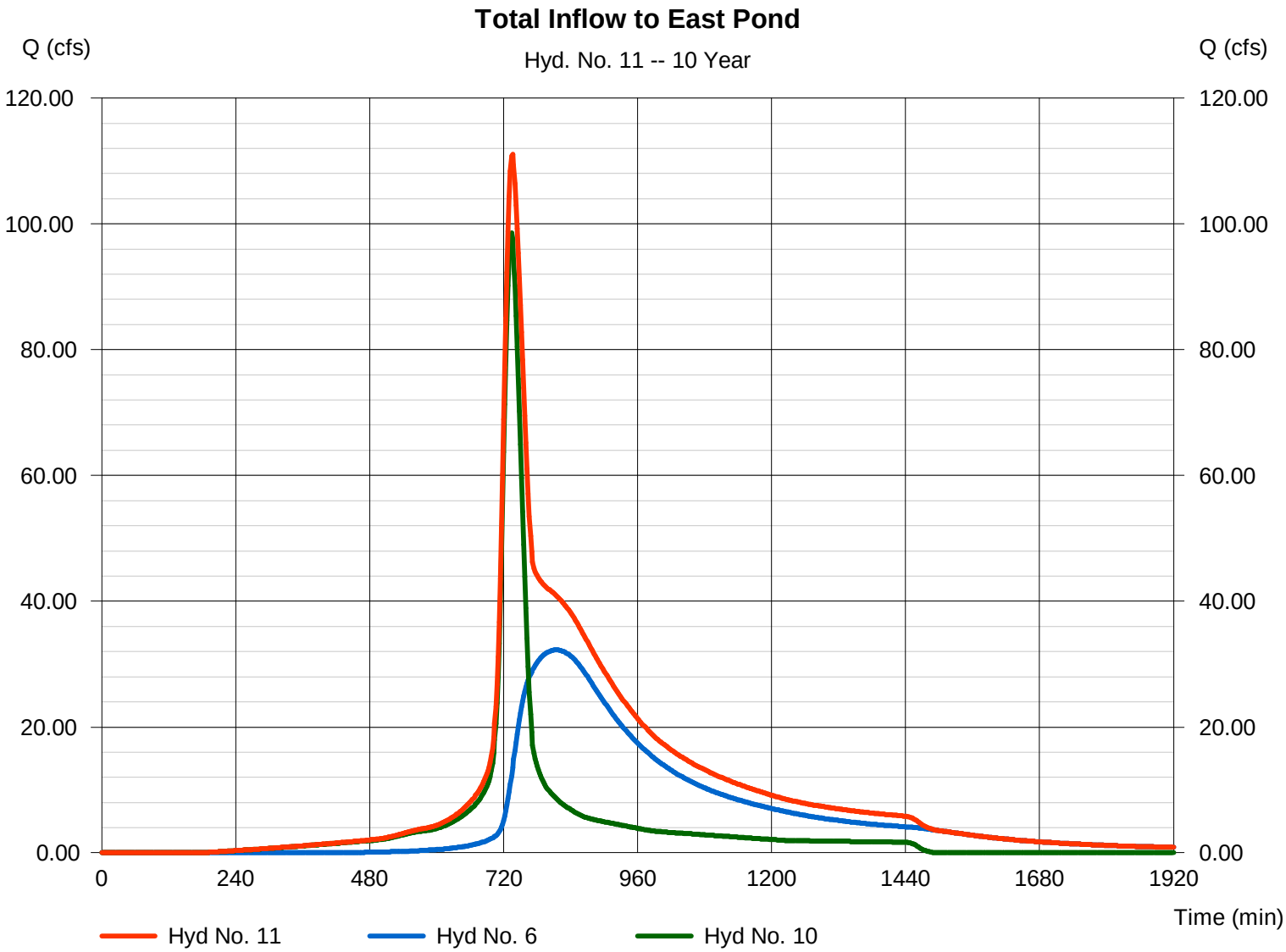


Hydrograph Report

Hyd. No. 11

Total Inflow to East Pond

Hydrograph type	= Combine	Peak discharge	= 111.07 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1,170,113 cuft
Inflow hyds.	= 6, 10	Contrib. drain. area	= 29.000 ac



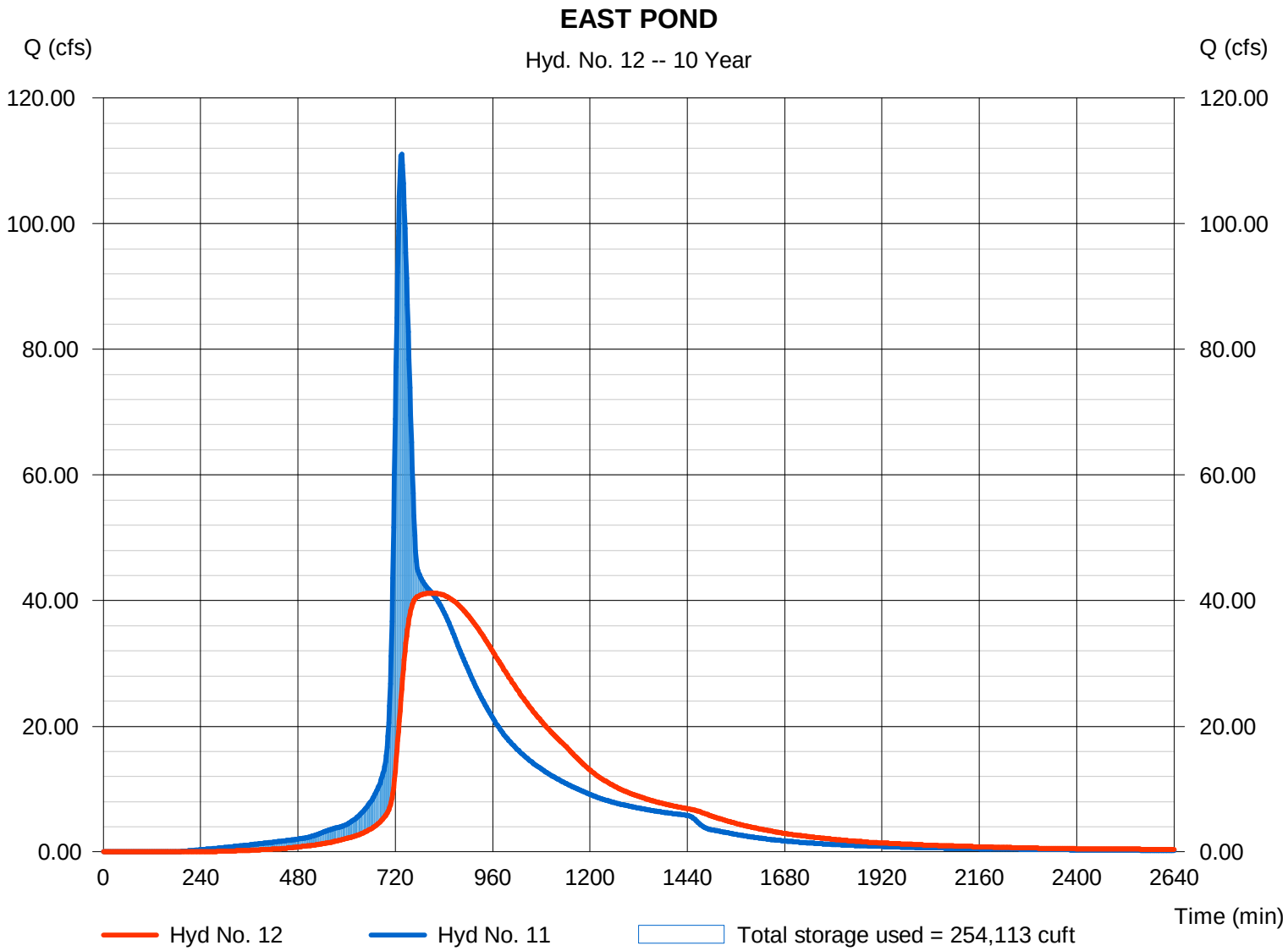
Hydrograph Report

Hyd. No. 12

EAST POND

Hydrograph type	=	Reservoir	Peak discharge	=	41.19 cfs
Storm frequency	=	10 yrs	Time to peak	=	810 min
Time interval	=	2 min	Hyd. volume	=	1,169,381 cuft
Inflow hyd. No.	=	11 - Total Inflow to East Pond	Max. Elevation	=	1282.38 ft
Reservoir name	=	Proposed East Pond	Max. Storage	=	254,113 cuft

Storage Indication method used.



Pond Report

Pond No. 3 - Proposed East Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1280.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1280.00	98,300	0	0
1.00	1281.00	105,000	101,621	101,621
2.00	1282.00	112,000	108,470	210,092
3.00	1283.00	119,500	115,718	325,810
4.00	1284.00	126,500	122,971	448,781
5.00	1285.00	133,500	129,971	578,752
6.00	1286.00	135,000	134,236	712,988

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 84.00	0.00	0.00	0.00
Span (in)	= 60.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1280.00	0.00	0.00	0.00
Length (ft)	= 30.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

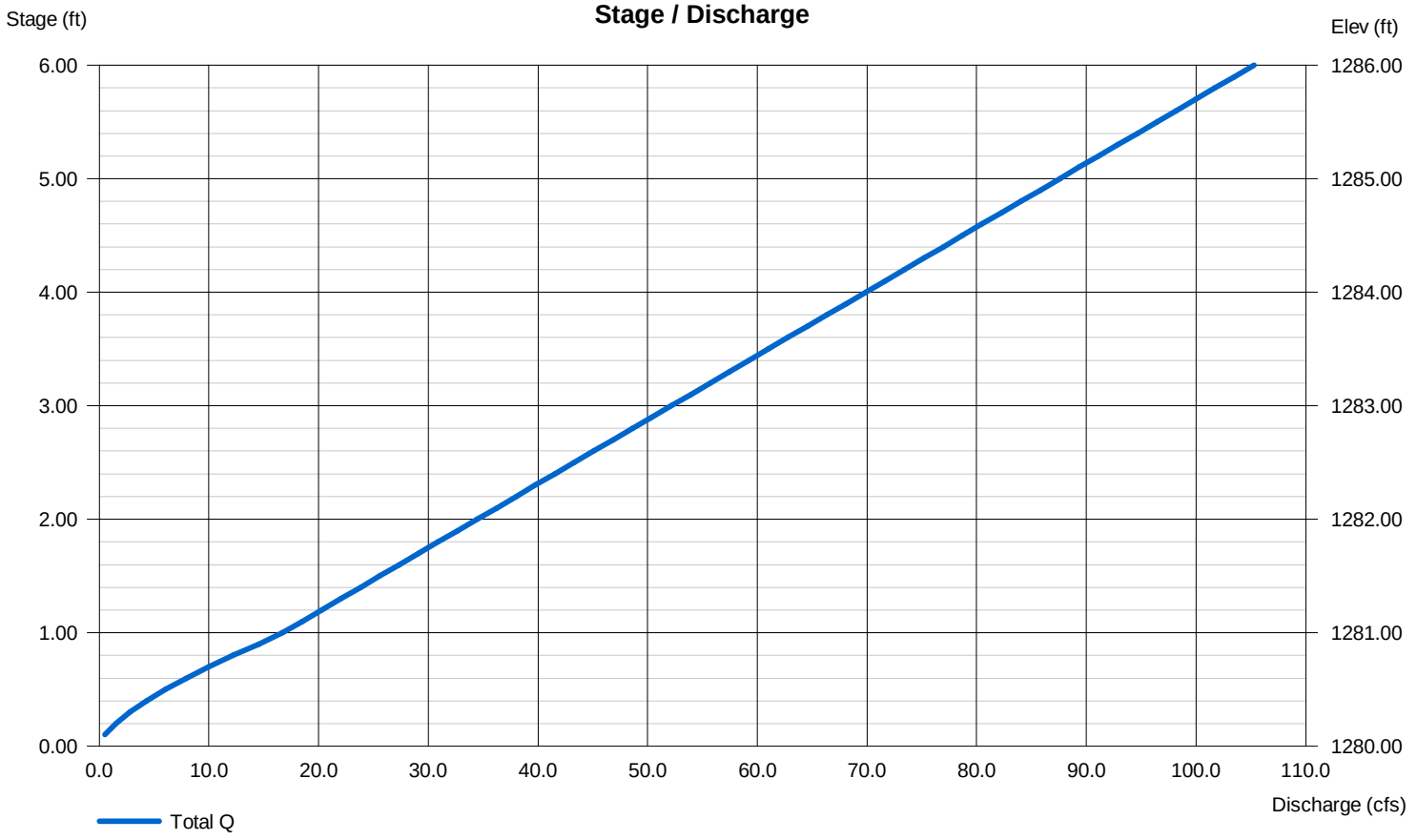
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	0.00	0.00	0.00
Crest El. (ft)	= 1280.00	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

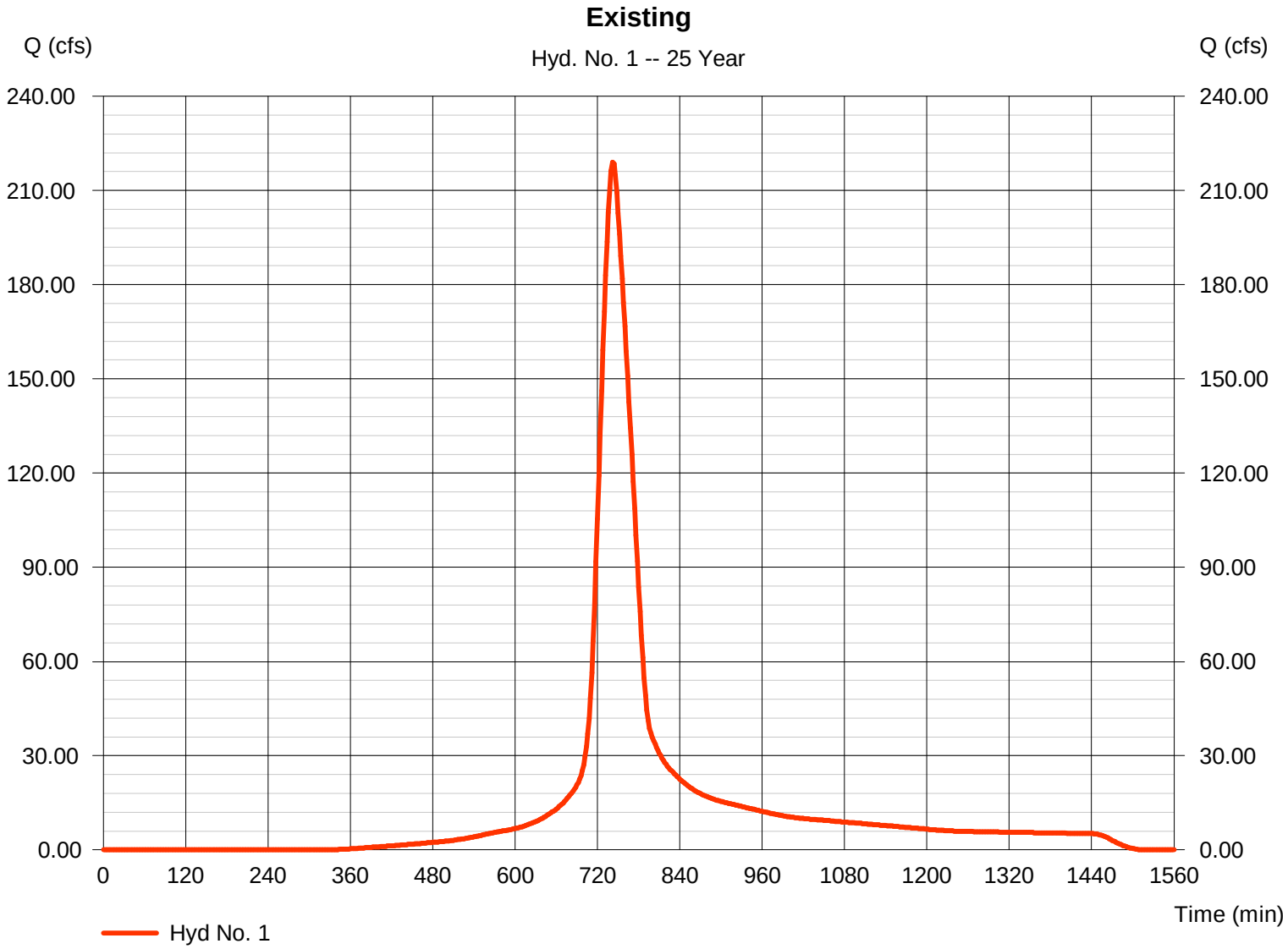
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	219.01	2	742	1,245,869	----	------	------	Existing
2	SCS Runoff	95.12	2	734	454,879	----	------	------	Proposed West
3	SCS Runoff	41.90	2	774	393,510	----	------	------	West Offsite
4	SCS Runoff	61.86	2	752	417,338	----	------	------	North Offsite
5	Combine	115.72	2	736	848,389	2, 3,	------	------	Total Inflow to West Pond
6	Reservoir	39.24	2	814	843,113	5	1282.81	356,165	WEST POND
7	SCS Runoff	160.27	2	722	485,988	----	------	------	Proposed North Developed
8	Combine	187.56	2	722	903,326	4, 7	------	------	Total Inflow to North East Pond
9	Reservoir	90.30	2	738	903,316	8	1282.80	209,589	NORTH EAST POND
10	SCS Runoff	114.93	2	734	549,645	----	------	------	Proposed East
11	Combine	131.93	2	736	1,392,758	6, 10	------	------	Total Inflow to East Pond
12	Reservoir	49.10	2	816	1,392,020	11	1282.83	305,742	EAST POND

Hydrograph Report

Hyd. No. 1

Existing

Hydrograph type	=	SCS Runoff	Peak discharge	=	219.01 cfs
Storm frequency	=	25 yrs	Time to peak	=	742 min
Time interval	=	2 min	Hyd. volume	=	1,245,869 cuft
Drainage area	=	80.000 ac	Curve number	=	84
Basin Slope	=	1.0 %	Hydraulic length	=	2000 ft
Tc method	=	LAG	Time of conc. (Tc)	=	48.65 min
Total precip.	=	6.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

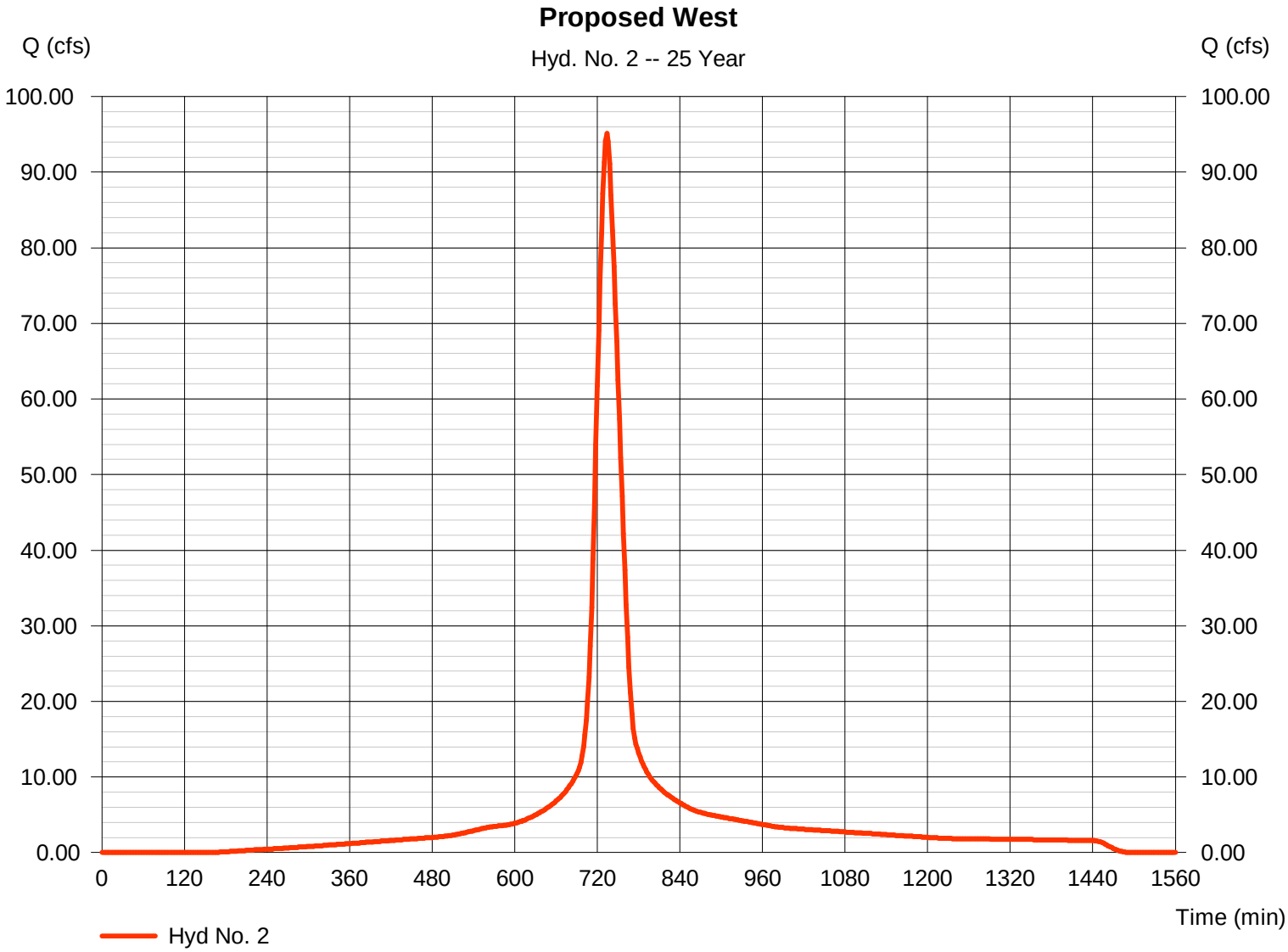


Hydrograph Report

Hyd. No. 2

Proposed West

Hydrograph type	=	SCS Runoff	Peak discharge	=	95.12 cfs
Storm frequency	=	25 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	454,879 cuft
Drainage area	=	24.000 ac	Curve number	=	93
Basin Slope	=	1.0 %	Hydraulic length	=	2000 ft
Tc method	=	LAG	Time of conc. (Tc)	=	34.16 min
Total precip.	=	6.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

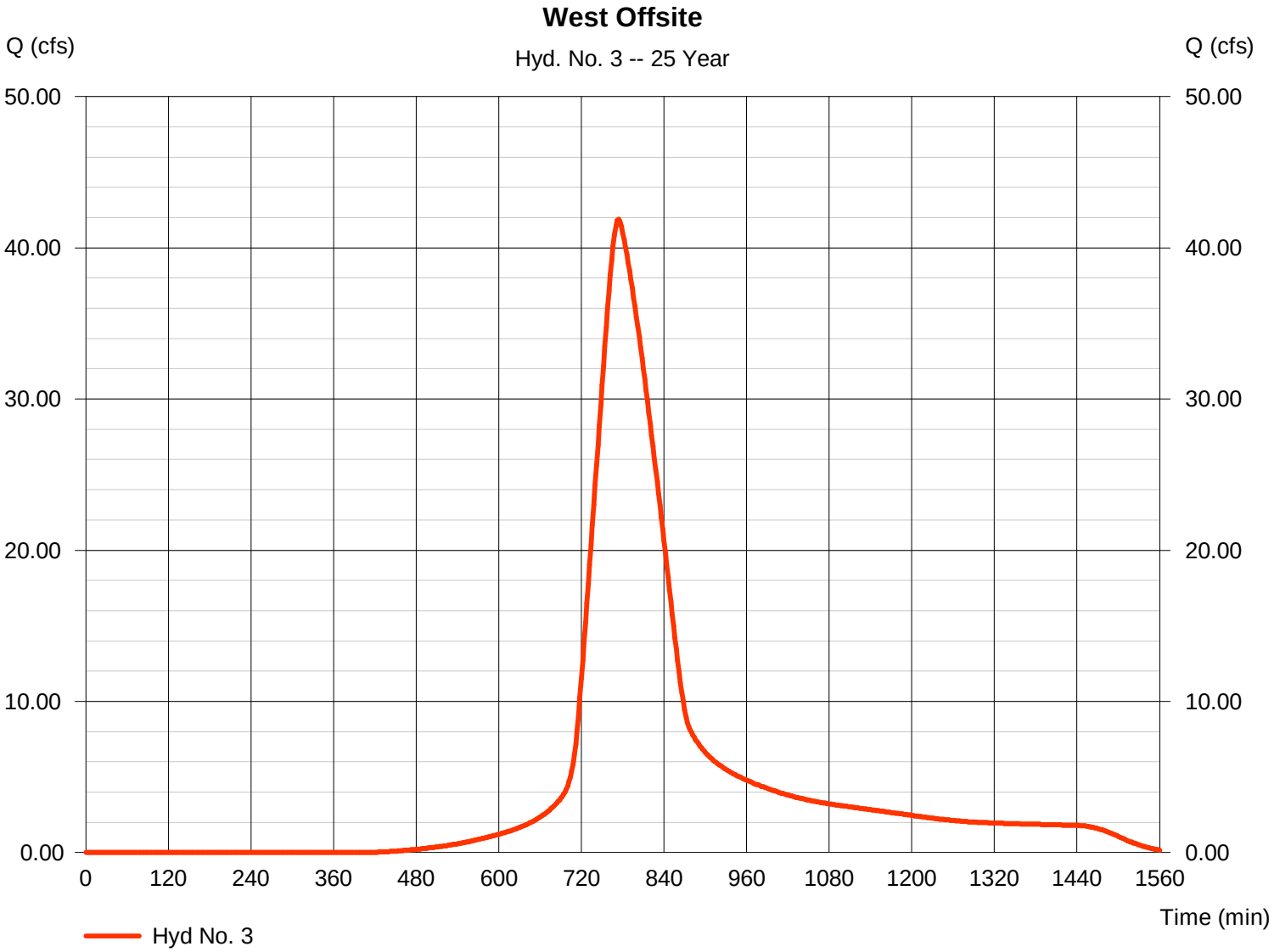


Hydrograph Report

Hyd. No. 3

West Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	41.90 cfs
Storm frequency	=	25 yrs	Time to peak	=	774 min
Time interval	=	2 min	Hyd. volume	=	393,510 cuft
Drainage area	=	28.000 ac	Curve number	=	80
Basin Slope	=	0.5 %	Hydraulic length	=	2700 ft
Tc method	=	LAG	Time of conc. (Tc)	=	99.67 min
Total precip.	=	6.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

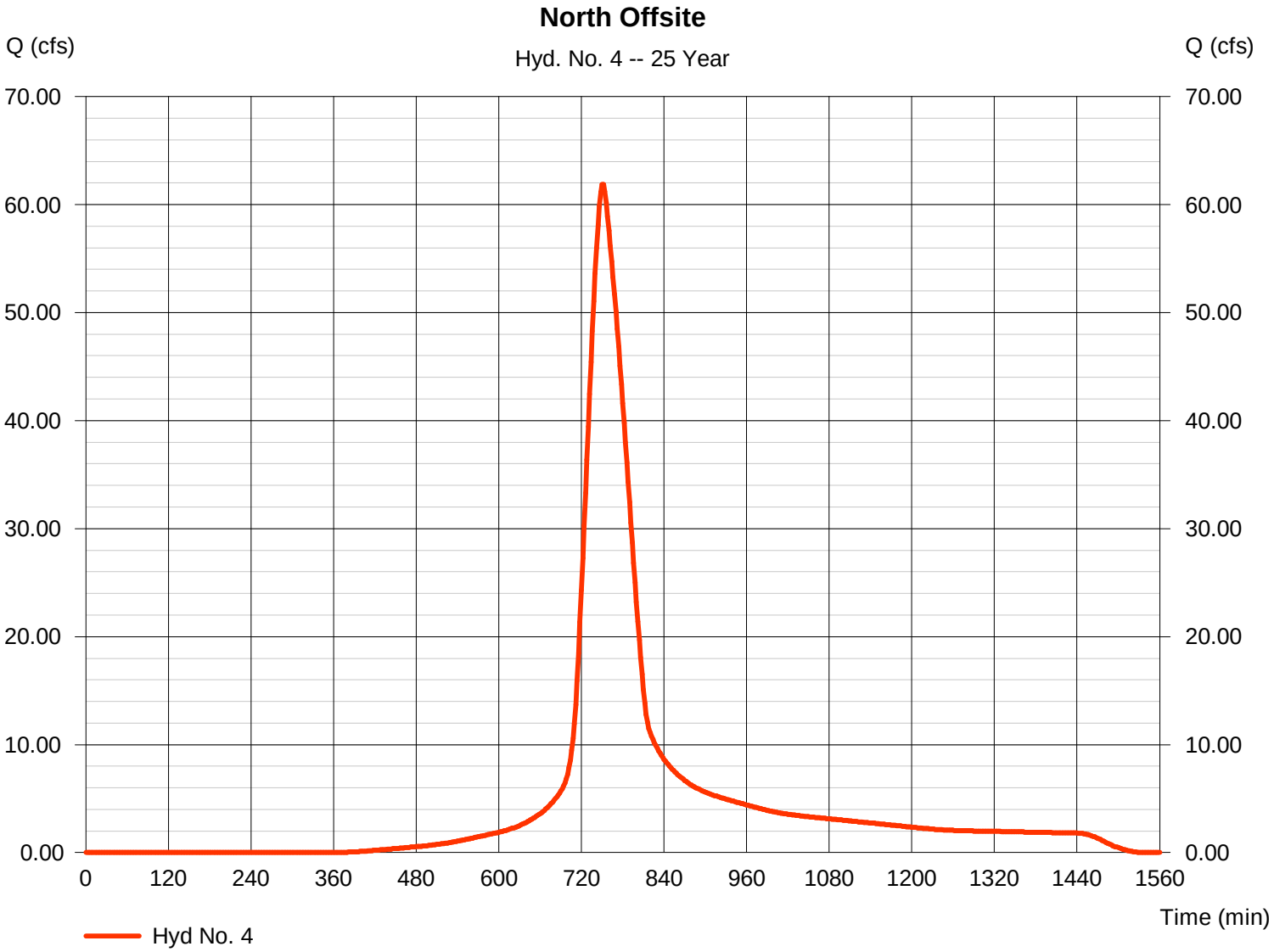


Hydrograph Report

Hyd. No. 4

North Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	61.86 cfs
Storm frequency	=	25 yrs	Time to peak	=	752 min
Time interval	=	2 min	Hyd. volume	=	417,338 cuft
Drainage area	=	28.000 ac	Curve number	=	82
Basin Slope	=	0.5 %	Hydraulic length	=	1600 ft
Tc method	=	LAG	Time of conc. (Tc)	=	61.53 min
Total precip.	=	6.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

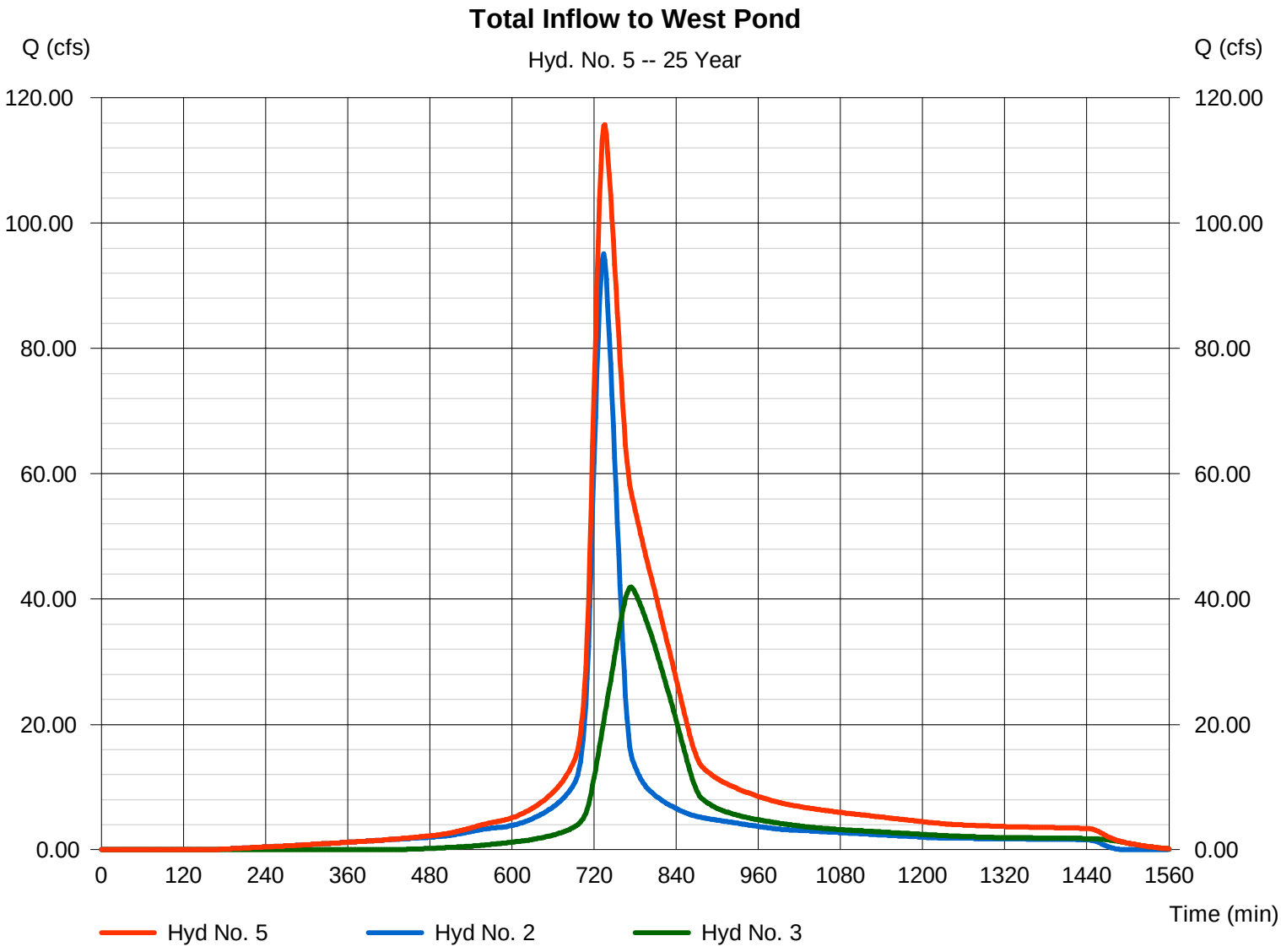


Hydrograph Report

Hyd. No. 5

Total Inflow to West Pond

Hydrograph type	= Combine	Peak discharge	= 115.72 cfs
Storm frequency	= 25 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 848,389 cuft
Inflow hyds.	= 2, 3	Contrib. drain. area	= 52.000 ac



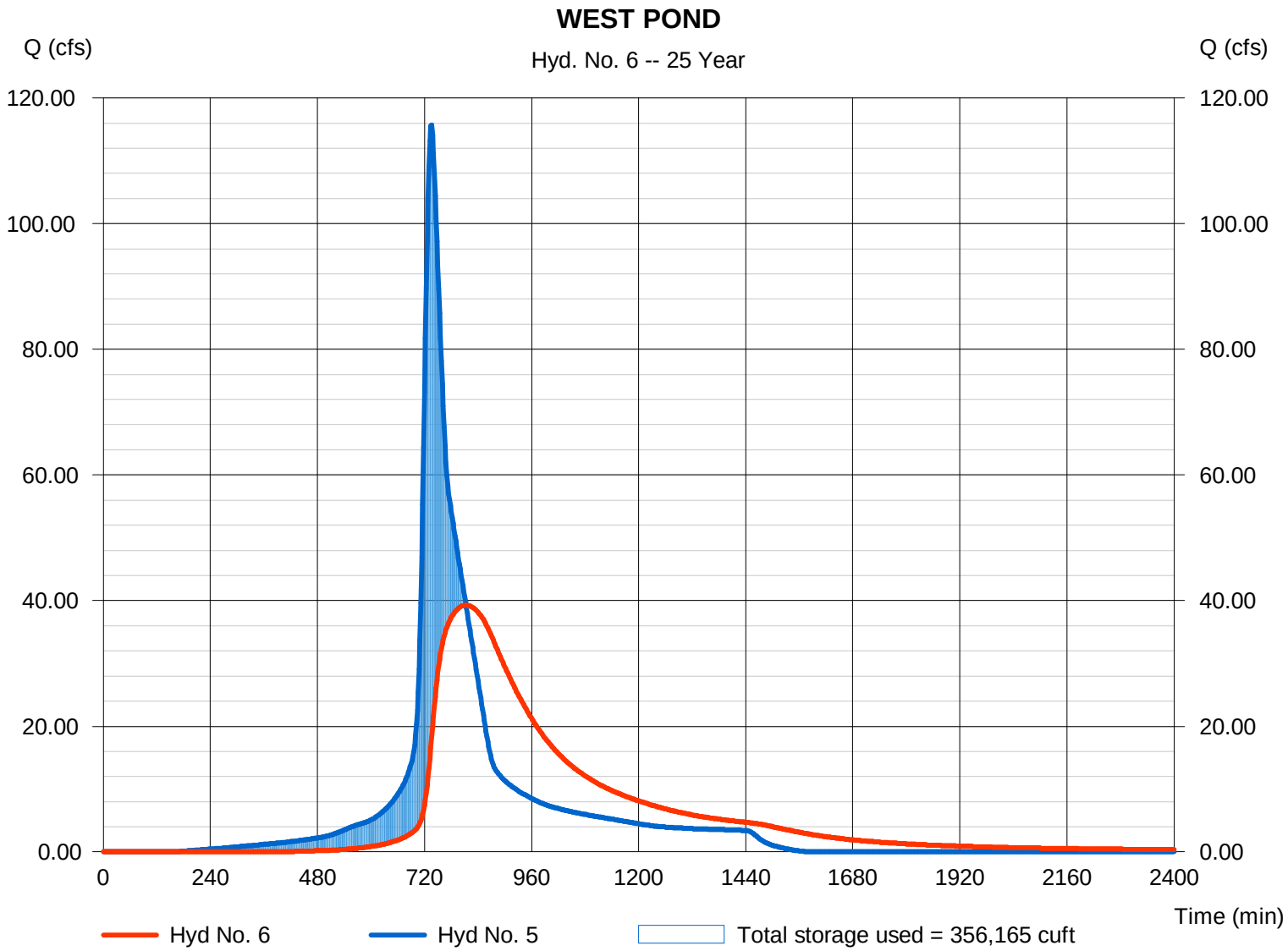
Hydrograph Report

Hyd. No. 6

WEST POND

Hydrograph type	=	Reservoir	Peak discharge	=	39.24 cfs
Storm frequency	=	25 yrs	Time to peak	=	814 min
Time interval	=	2 min	Hyd. volume	=	843,113 cuft
Inflow hyd. No.	=	5 - Total Inflow to West Pond	Max. Elevation	=	1282.81 ft
Reservoir name	=	Proposed West Pond	Max. Storage	=	356,165 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.02 — Monday, May 26, 2008

Pond No. 2 - Proposed West Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1280.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1280.00	116,800	0	0
1.00	1281.00	123,500	120,122	120,122
2.00	1282.00	131,000	127,219	247,341
3.00	1283.00	138,300	134,620	381,961
4.00	1284.00	145,800	142,019	523,981
5.00	1285.00	153,500	149,619	673,599
6.00	1286.00	160,000	156,723	830,322

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 36.00	0.00	0.00	0.00
Span (in)	= 36.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1280.00	0.00	0.00	0.00
Length (ft)	= 100.00	0.00	0.00	0.00
Slope (%)	= 1.30	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

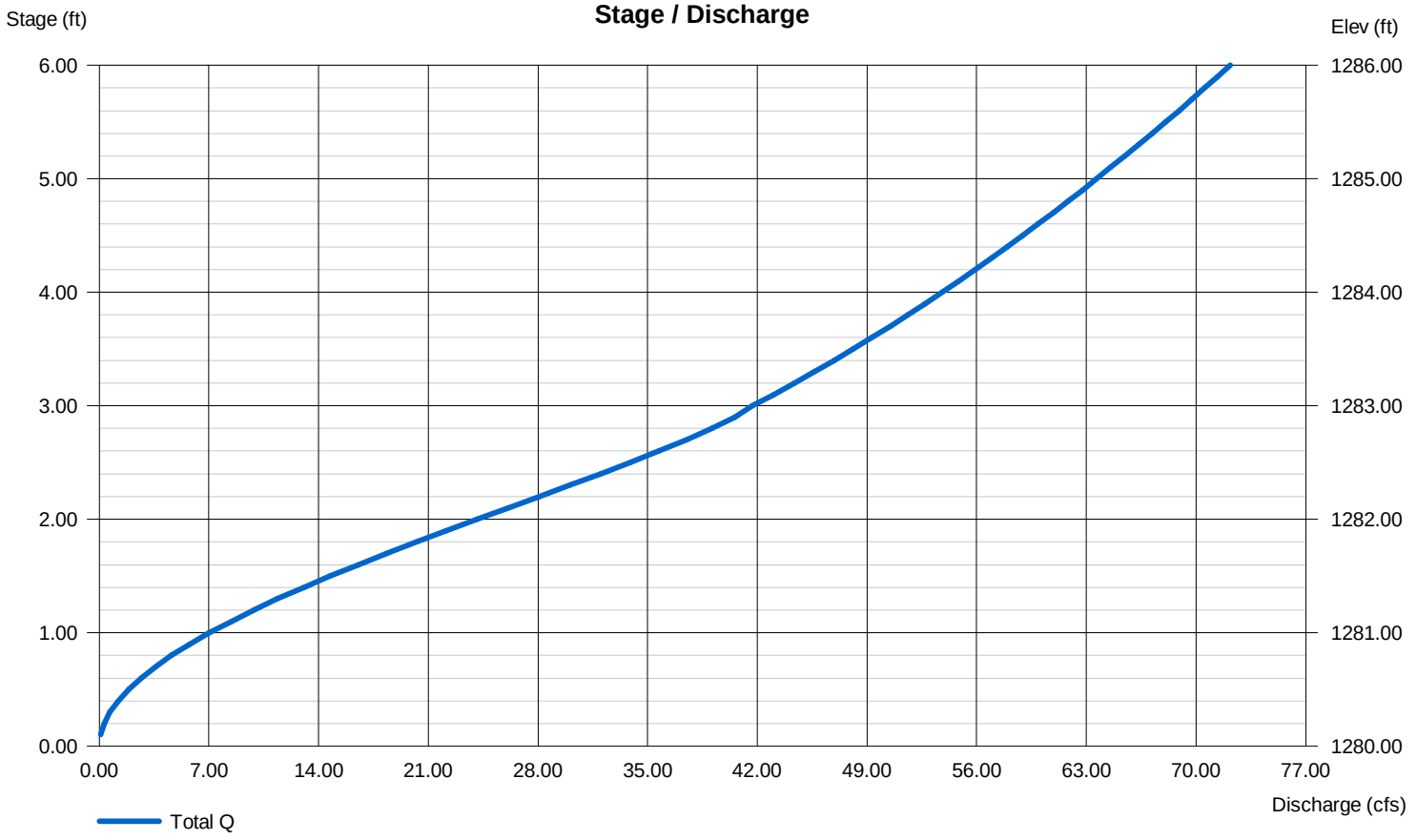
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.

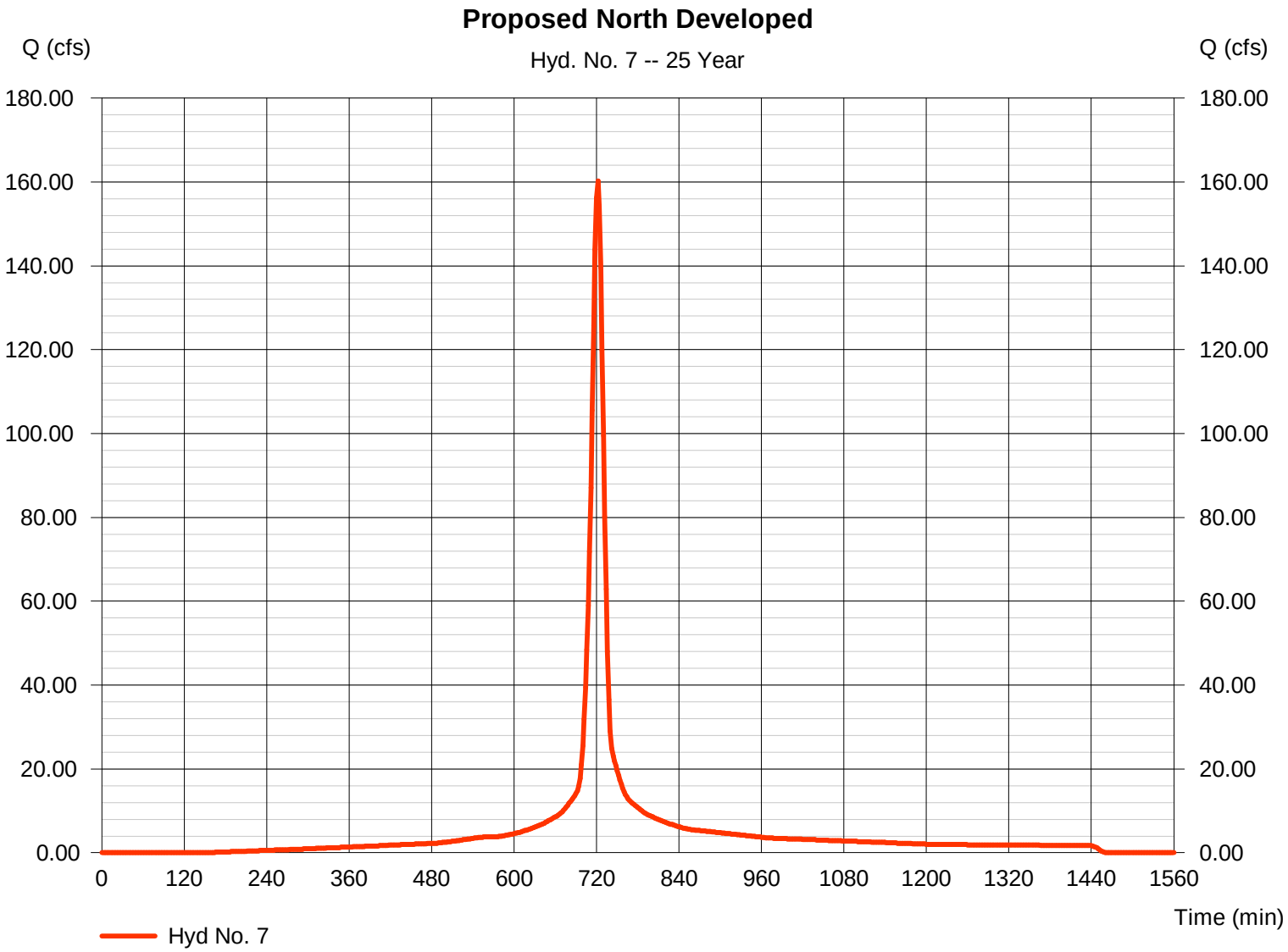


Hydrograph Report

Hyd. No. 7

Proposed North Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	160.27 cfs
Storm frequency	=	25 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	485,988 cuft
Drainage area	=	26.000 ac	Curve number	=	93
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	6.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

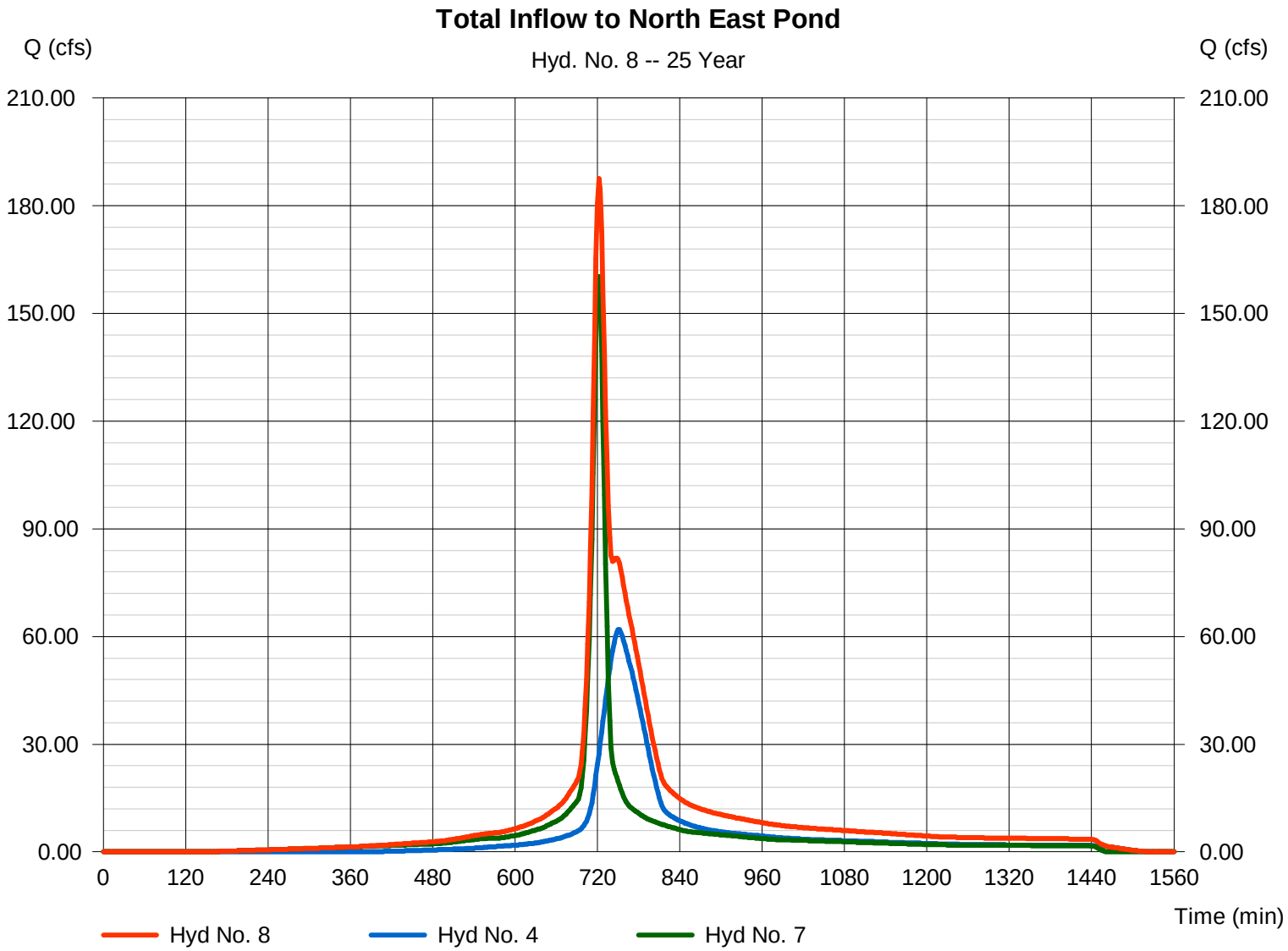


Hydrograph Report

Hyd. No. 8

Total Inflow to North East Pond

Hydrograph type	= Combine	Peak discharge	= 187.56 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 903,326 cuft
Inflow hyds.	= 4, 7	Contrib. drain. area	= 54.000 ac



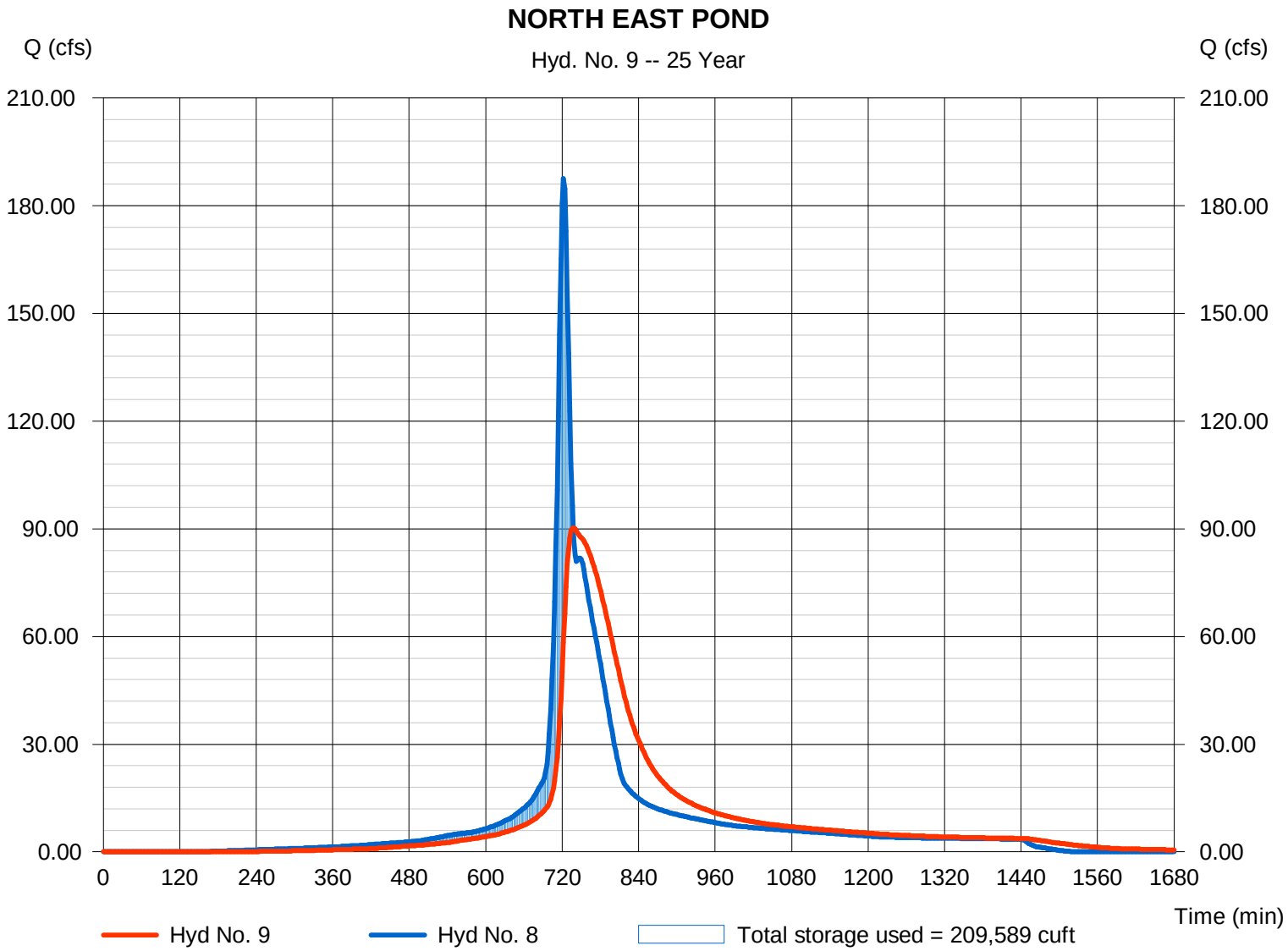
Hydrograph Report

Hyd. No. 9

NORTH EAST POND

Hydrograph type	=	Reservoir	Peak discharge	=	90.30 cfs
Storm frequency	=	25 yrs	Time to peak	=	738 min
Time interval	=	2 min	Hyd. volume	=	903,316 cuft
Inflow hyd. No.	=	8 - Total Inflow to North East Pond	Max. Elevation	=	1282.80 ft
Reservoir name	=	Existing NE Pond	Max. Storage	=	209,589 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.02 — Monday, May 26, 2008

Pond No. 1 - Existing NE Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1280.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1280.50	80,000	0	0
1.10	1281.60	92,000	94,512	94,512
2.10	1282.60	98,800	95,370	189,882
3.10	1283.60	105,000	101,874	291,756
4.10	1284.60	112,500	108,718	400,474
4.50	1285.00	119,600	46,411	446,885

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

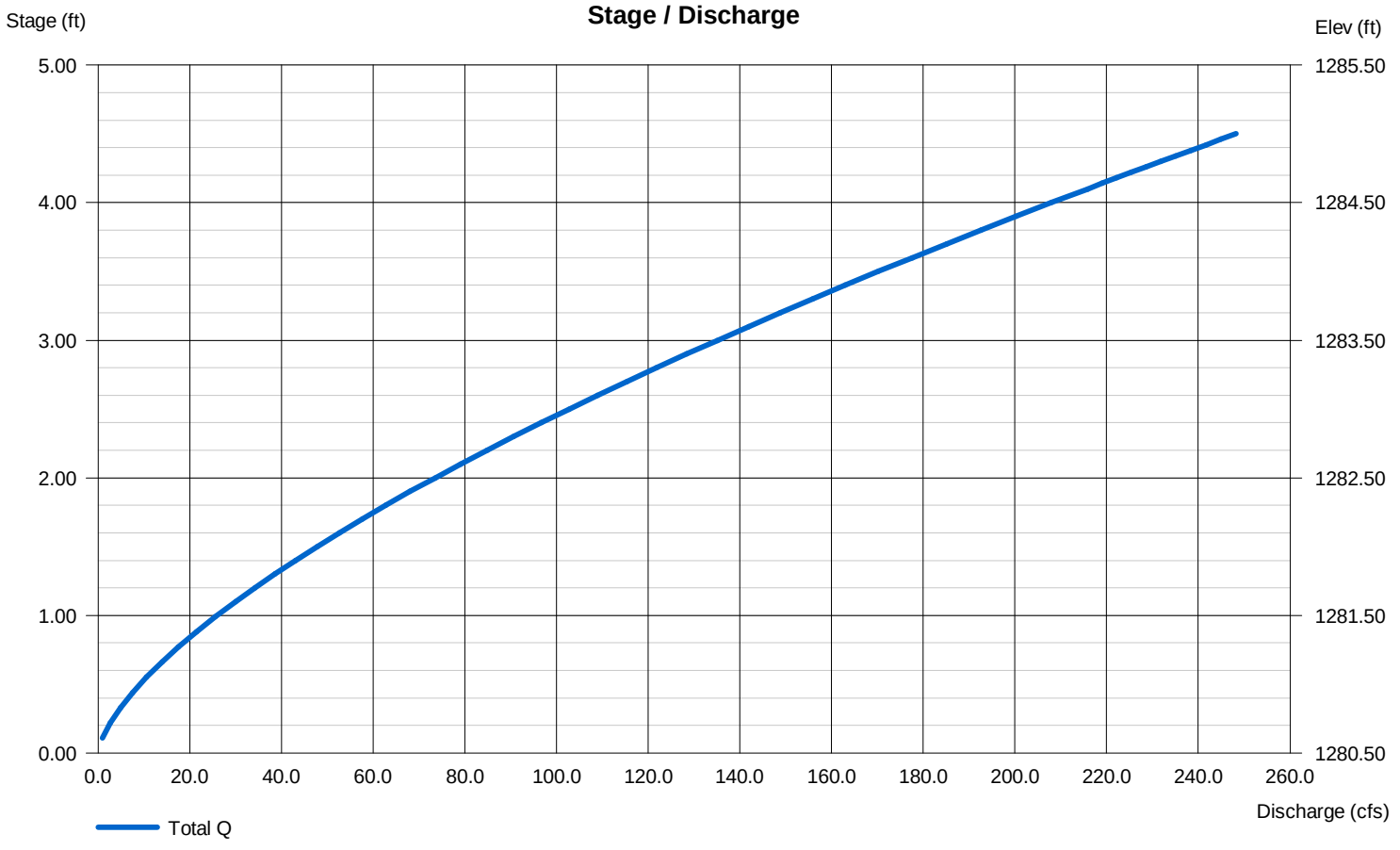
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.00	0.00	0.00
Crest El. (ft)	= 1280.50	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.

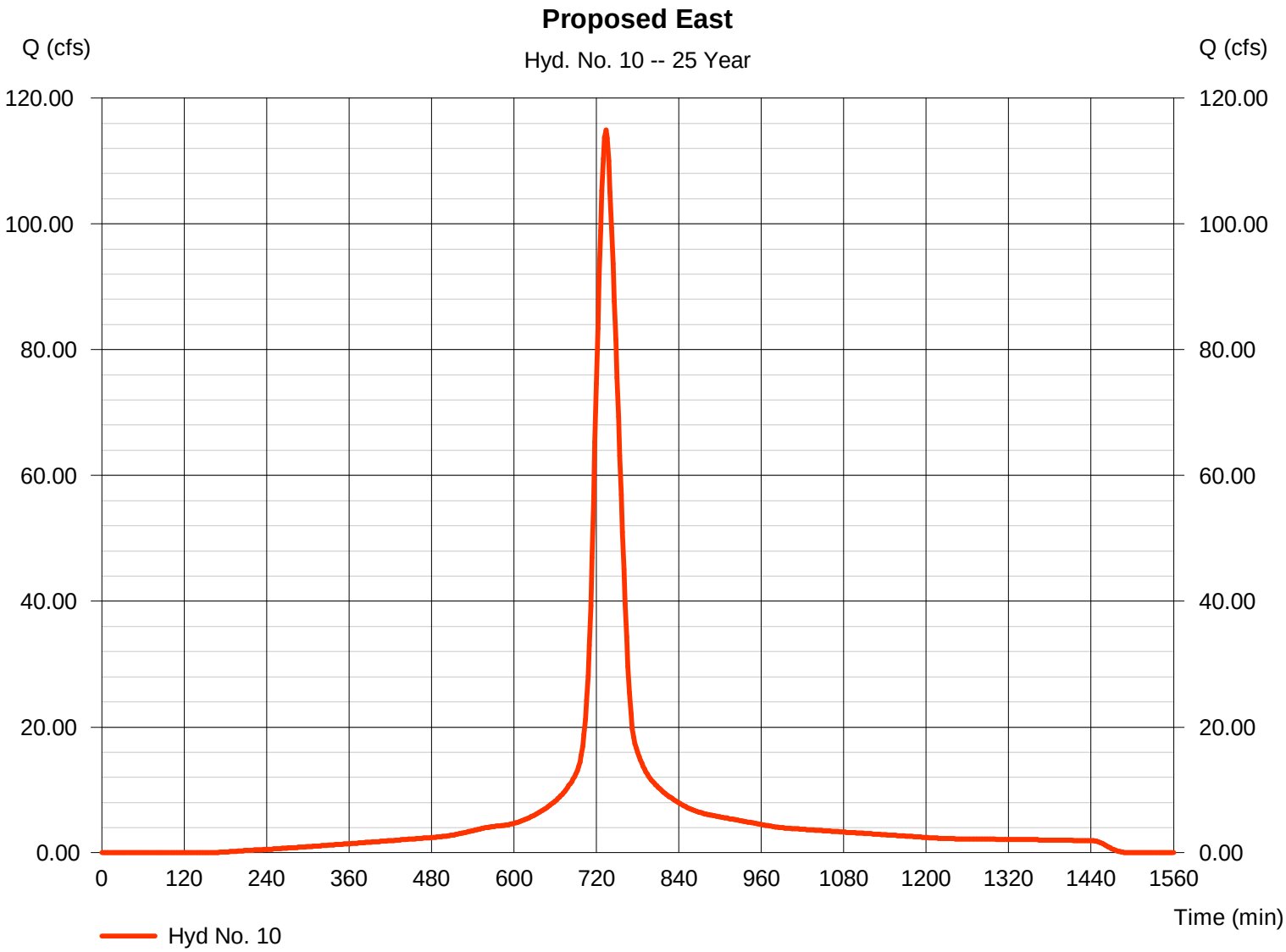


Hydrograph Report

Hyd. No. 10

Proposed East

Hydrograph type	=	SCS Runoff	Peak discharge	=	114.93 cfs
Storm frequency	=	25 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	549,645 cuft
Drainage area	=	29.000 ac	Curve number	=	93
Basin Slope	=	1.0 %	Hydraulic length	=	2000 ft
Tc method	=	LAG	Time of conc. (Tc)	=	34.16 min
Total precip.	=	6.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

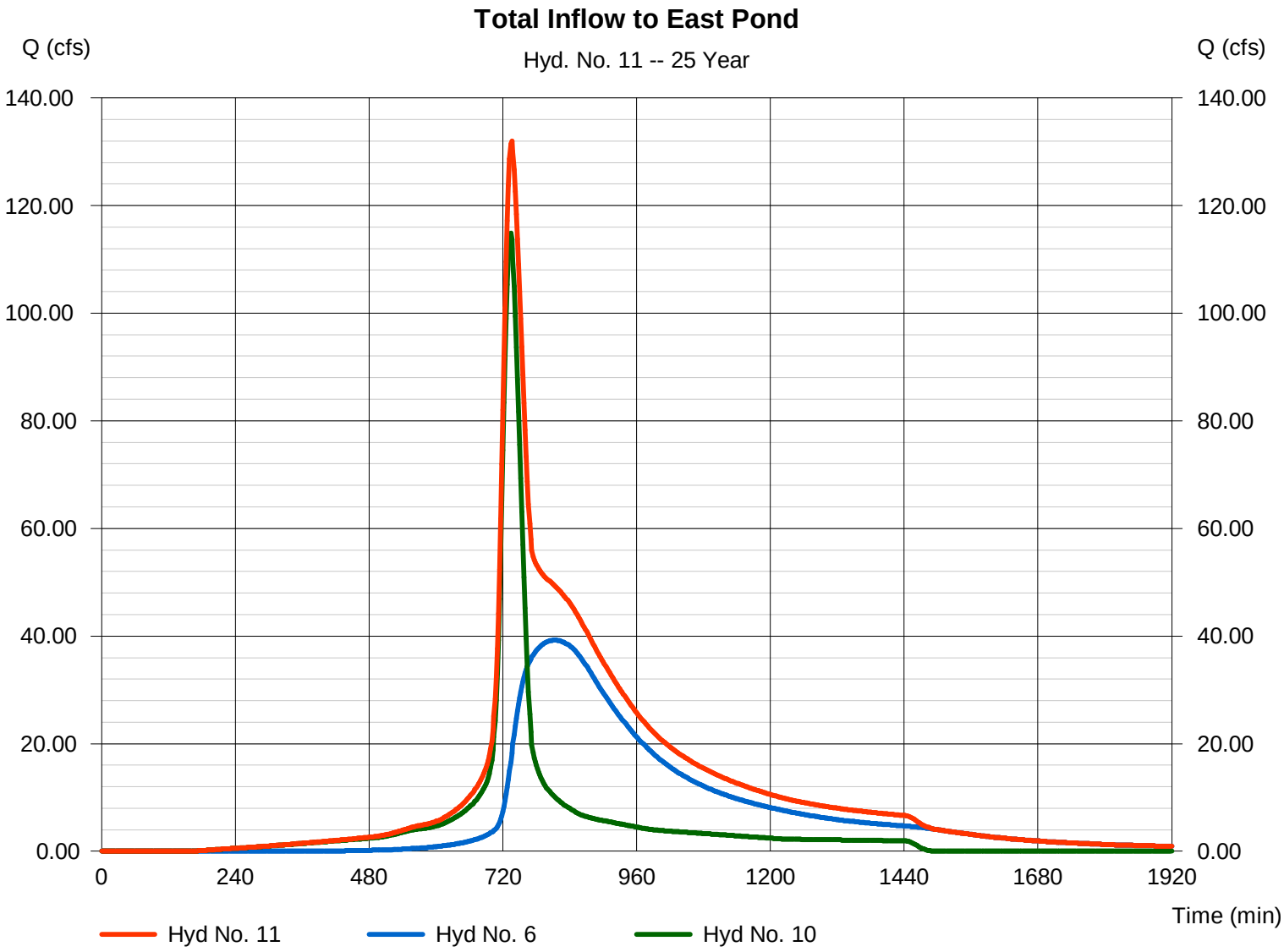


Hydrograph Report

Hyd. No. 11

Total Inflow to East Pond

Hydrograph type	= Combine	Peak discharge	= 131.93 cfs
Storm frequency	= 25 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1,392,758 cuft
Inflow hyds.	= 6, 10	Contrib. drain. area	= 29.000 ac



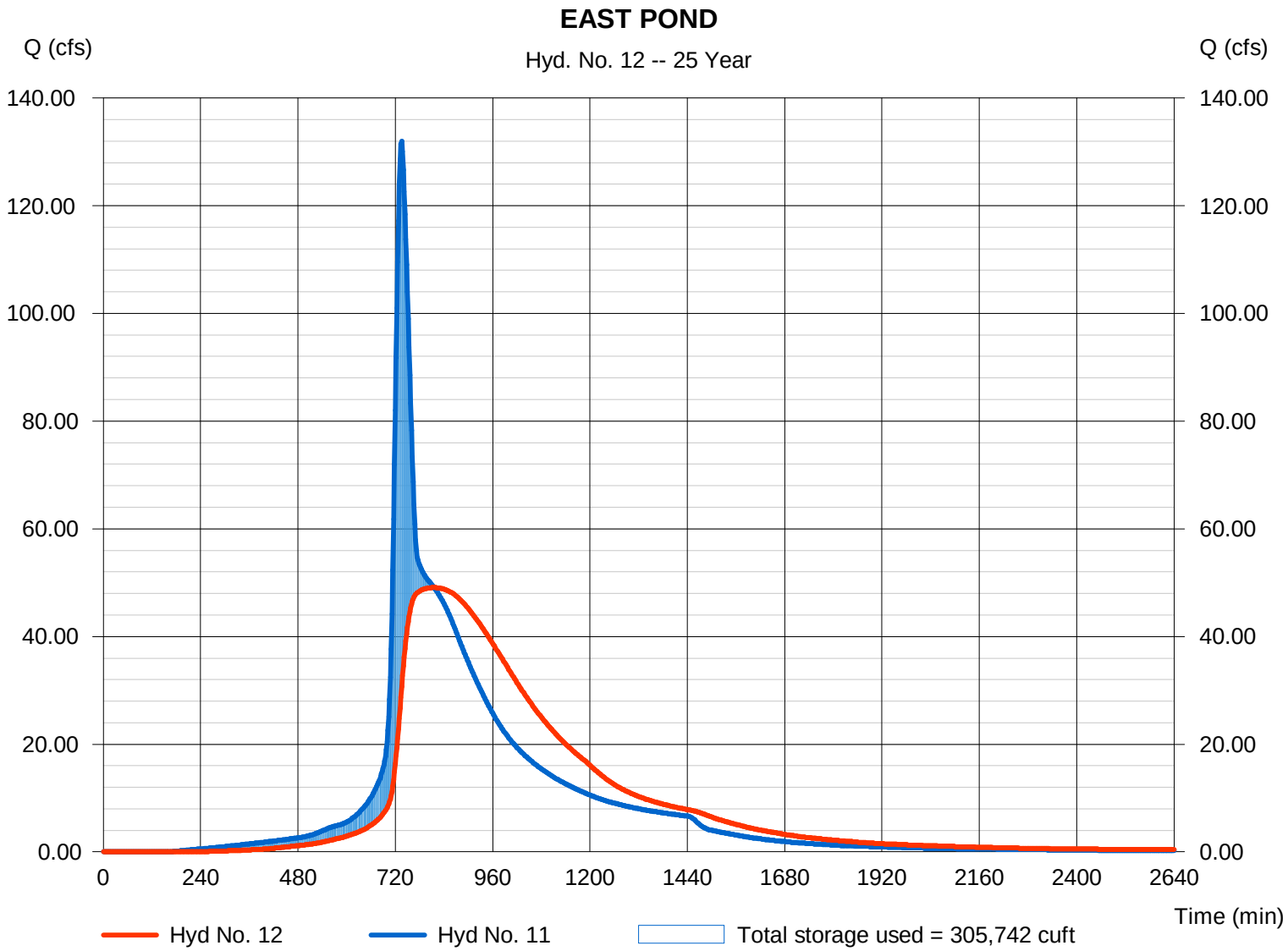
Hydrograph Report

Hyd. No. 12

EAST POND

Hydrograph type	=	Reservoir	Peak discharge	=	49.10 cfs
Storm frequency	=	25 yrs	Time to peak	=	816 min
Time interval	=	2 min	Hyd. volume	=	1,392,020 cuft
Inflow hyd. No.	=	11 - Total Inflow to East Pond	Max. Elevation	=	1282.83 ft
Reservoir name	=	Proposed East Pond	Max. Storage	=	305,742 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.02 — Monday, May 26, 2008

Pond No. 3 - Proposed East Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1280.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1280.00	98,300	0	0
1.00	1281.00	105,000	101,621	101,621
2.00	1282.00	112,000	108,470	210,092
3.00	1283.00	119,500	115,718	325,810
4.00	1284.00	126,500	122,971	448,781
5.00	1285.00	133,500	129,971	578,752
6.00	1286.00	135,000	134,236	712,988

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 84.00	0.00	0.00	0.00
Span (in)	= 60.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1280.00	0.00	0.00	0.00
Length (ft)	= 30.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

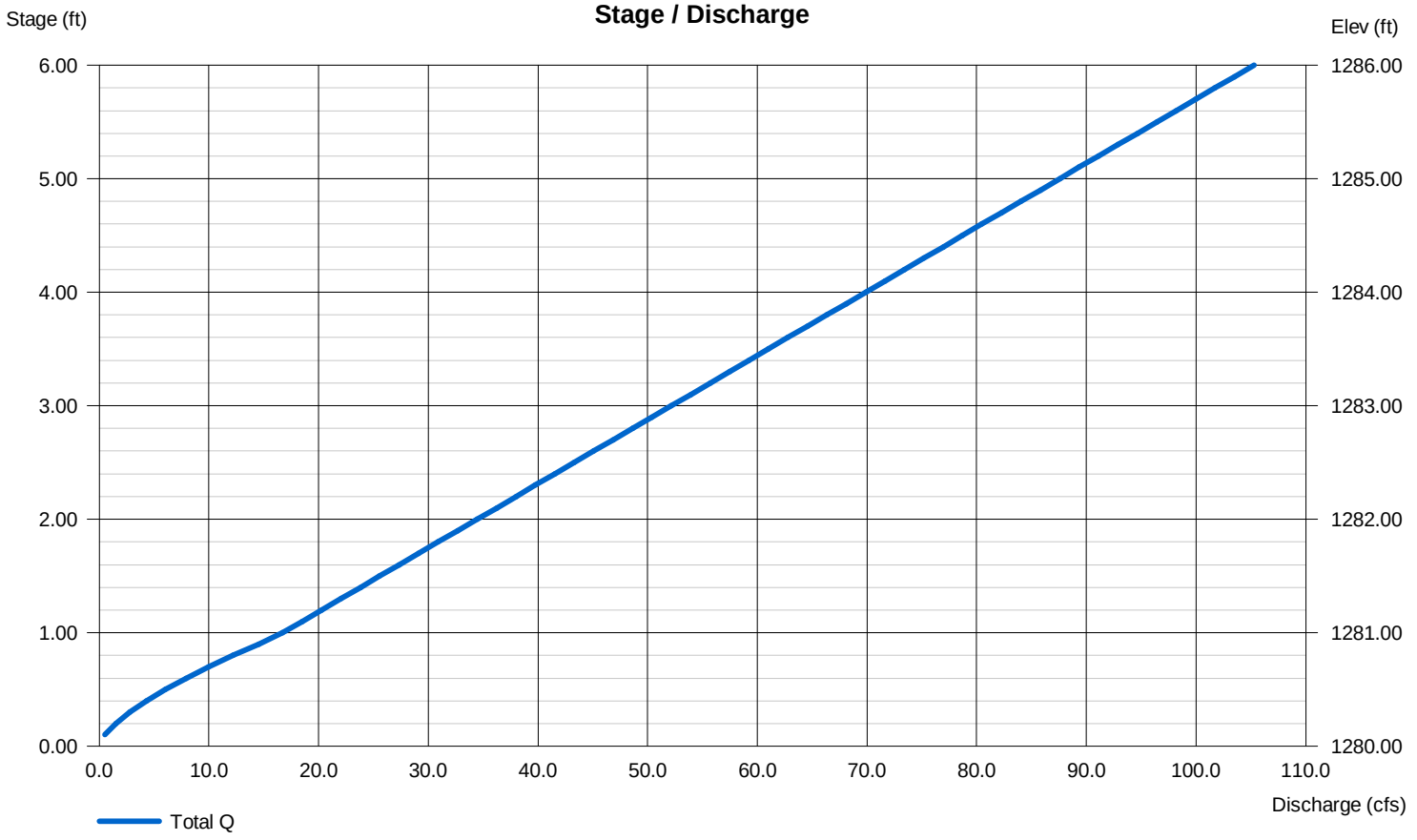
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	0.00	0.00	0.00
Crest El. (ft)	= 1280.00	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

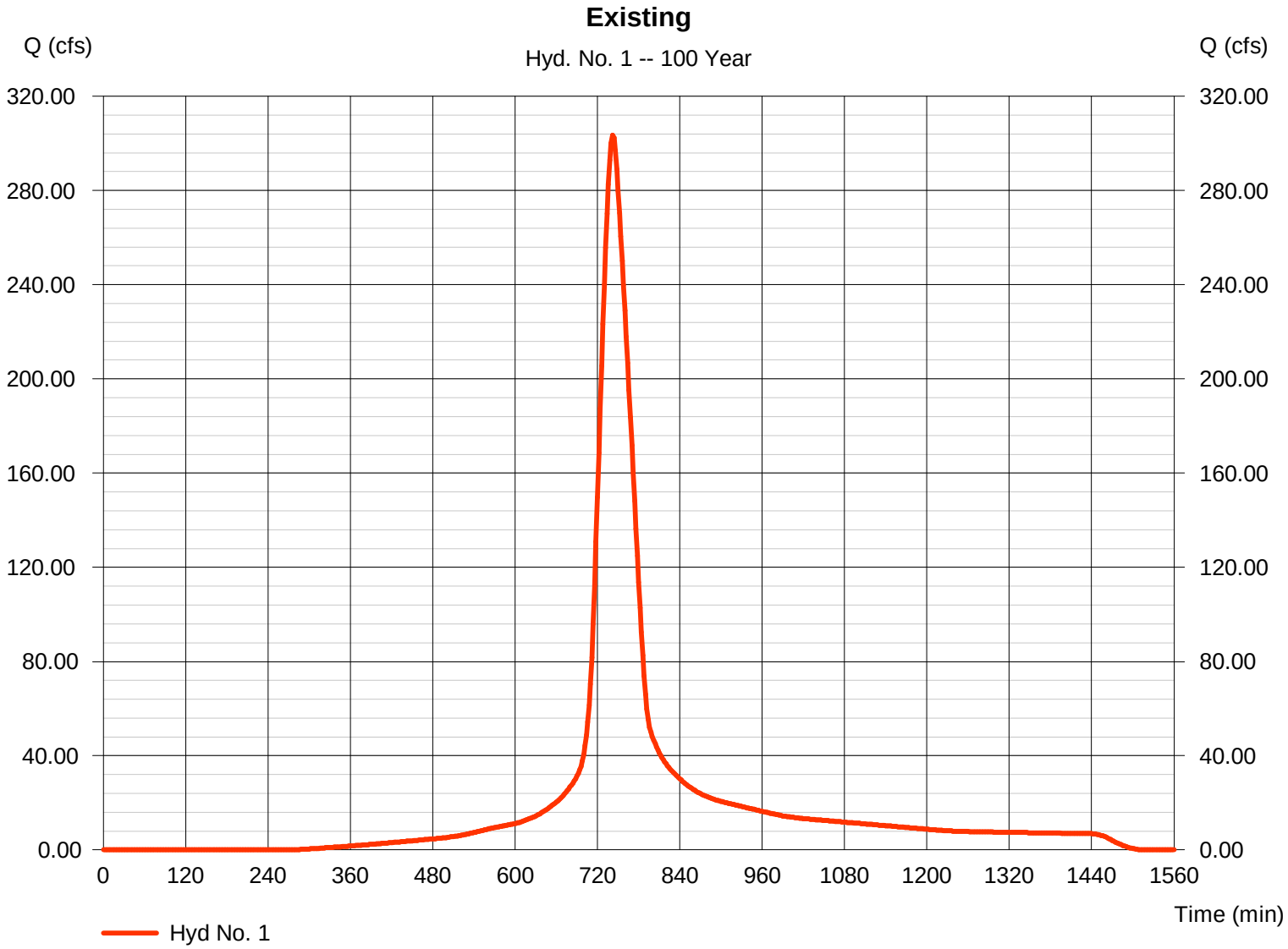
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	303.43	2	742	1,742,193	----	------	------	Existing
2	SCS Runoff	125.39	2	734	608,372	----	------	------	Proposed West
3	SCS Runoff	59.74	2	774	562,203	----	------	------	West Offsite
4	SCS Runoff	86.90	2	750	589,797	----	------	------	North Offsite
5	Combine	155.73	2	736	1,170,574	2, 3,	------	------	Total Inflow to West Pond
6	Reservoir	51.18	2	818	1,165,204	5	1283.76	490,257	WEST POND
7	SCS Runoff	210.91	2	722	649,978	----	------	------	Proposed North Developed
8	Combine	250.42	2	722	1,239,774	4, 7	------	------	Total Inflow to North East Pond
9	Reservoir	127.59	2	736	1,239,765	8	1283.39	270,152	NORTH EAST POND
10	SCS Runoff	151.51	2	734	735,115	----	------	------	Proposed East
11	Combine	178.95	2	736	1,900,320	6, 10	------	------	Total Inflow to East Pond
12	Reservoir	64.73	2	810	1,899,566	11	1283.71	413,030	EAST POND

Hydrograph Report

Hyd. No. 1

Existing

Hydrograph type	=	SCS Runoff	Peak discharge	=	303.43 cfs
Storm frequency	=	100 yrs	Time to peak	=	742 min
Time interval	=	2 min	Hyd. volume	=	1,742,193 cuft
Drainage area	=	80.000 ac	Curve number	=	84
Basin Slope	=	1.0 %	Hydraulic length	=	2000 ft
Tc method	=	LAG	Time of conc. (Tc)	=	48.65 min
Total precip.	=	7.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

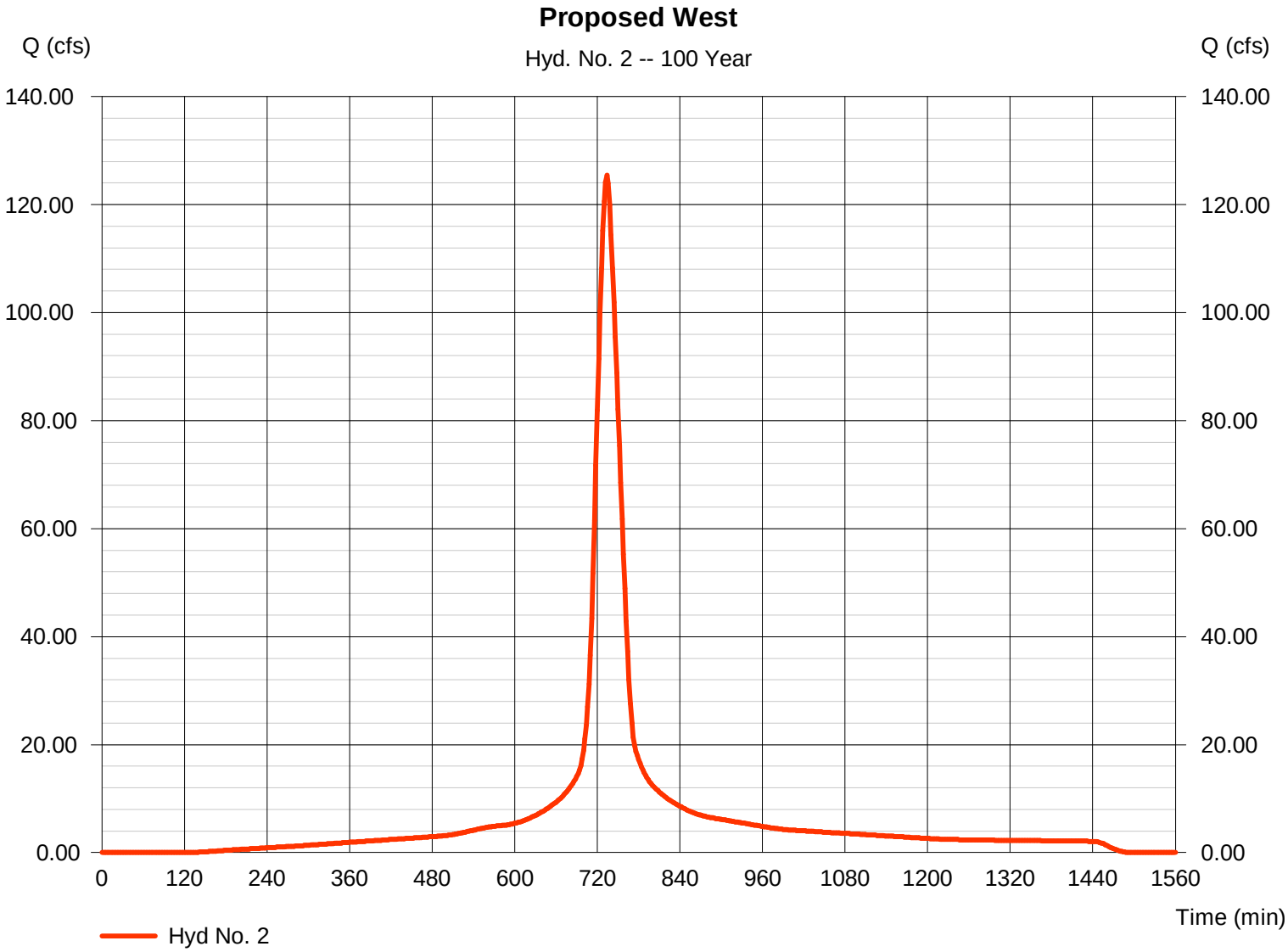


Hydrograph Report

Hyd. No. 2

Proposed West

Hydrograph type	=	SCS Runoff	Peak discharge	=	125.39 cfs
Storm frequency	=	100 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	608,372 cuft
Drainage area	=	24.000 ac	Curve number	=	93
Basin Slope	=	1.0 %	Hydraulic length	=	2000 ft
Tc method	=	LAG	Time of conc. (Tc)	=	34.16 min
Total precip.	=	7.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

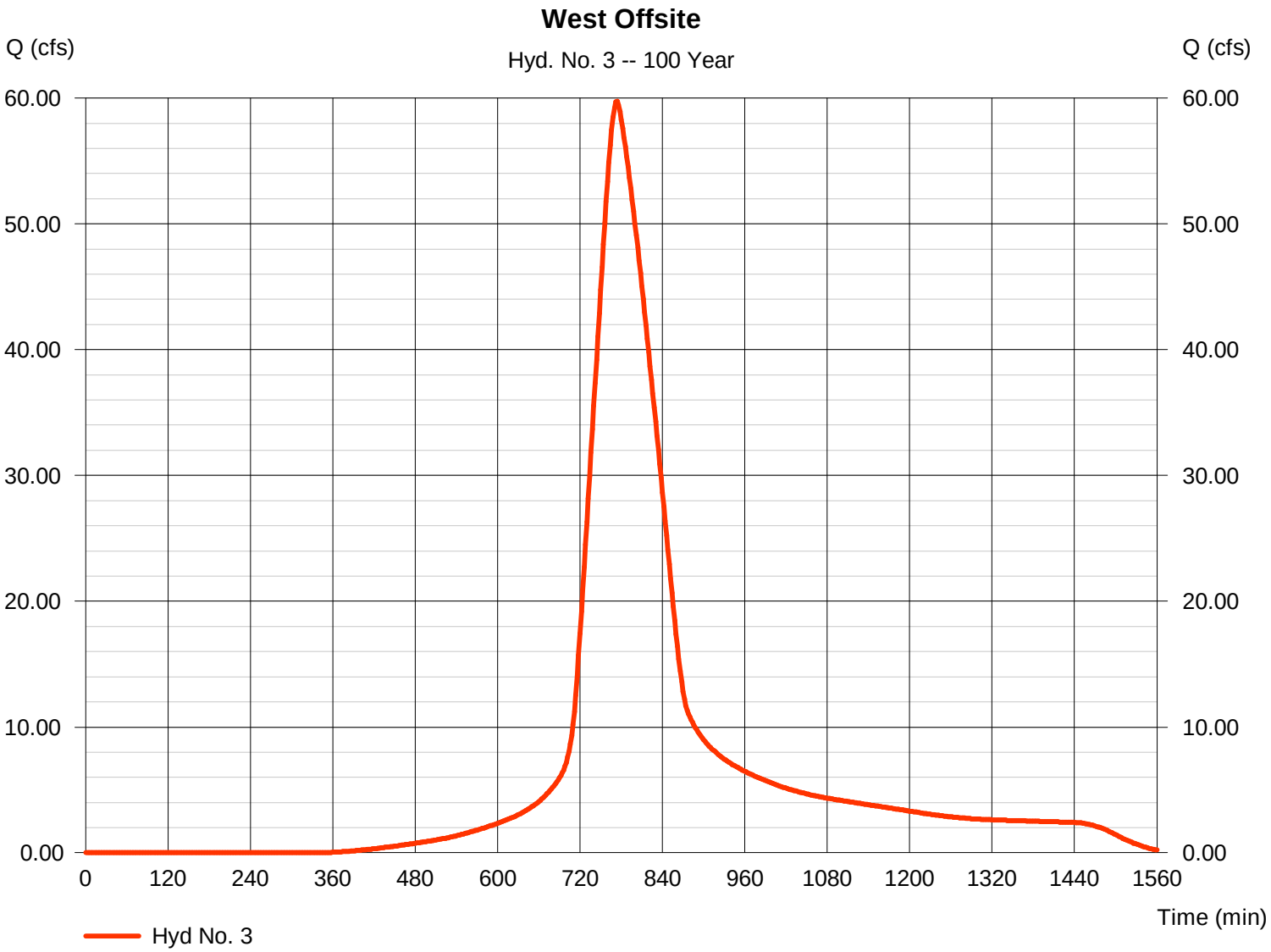


Hydrograph Report

Hyd. No. 3

West Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	59.74 cfs
Storm frequency	=	100 yrs	Time to peak	=	774 min
Time interval	=	2 min	Hyd. volume	=	562,203 cuft
Drainage area	=	28.000 ac	Curve number	=	80
Basin Slope	=	0.5 %	Hydraulic length	=	2700 ft
Tc method	=	LAG	Time of conc. (Tc)	=	99.67 min
Total precip.	=	7.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

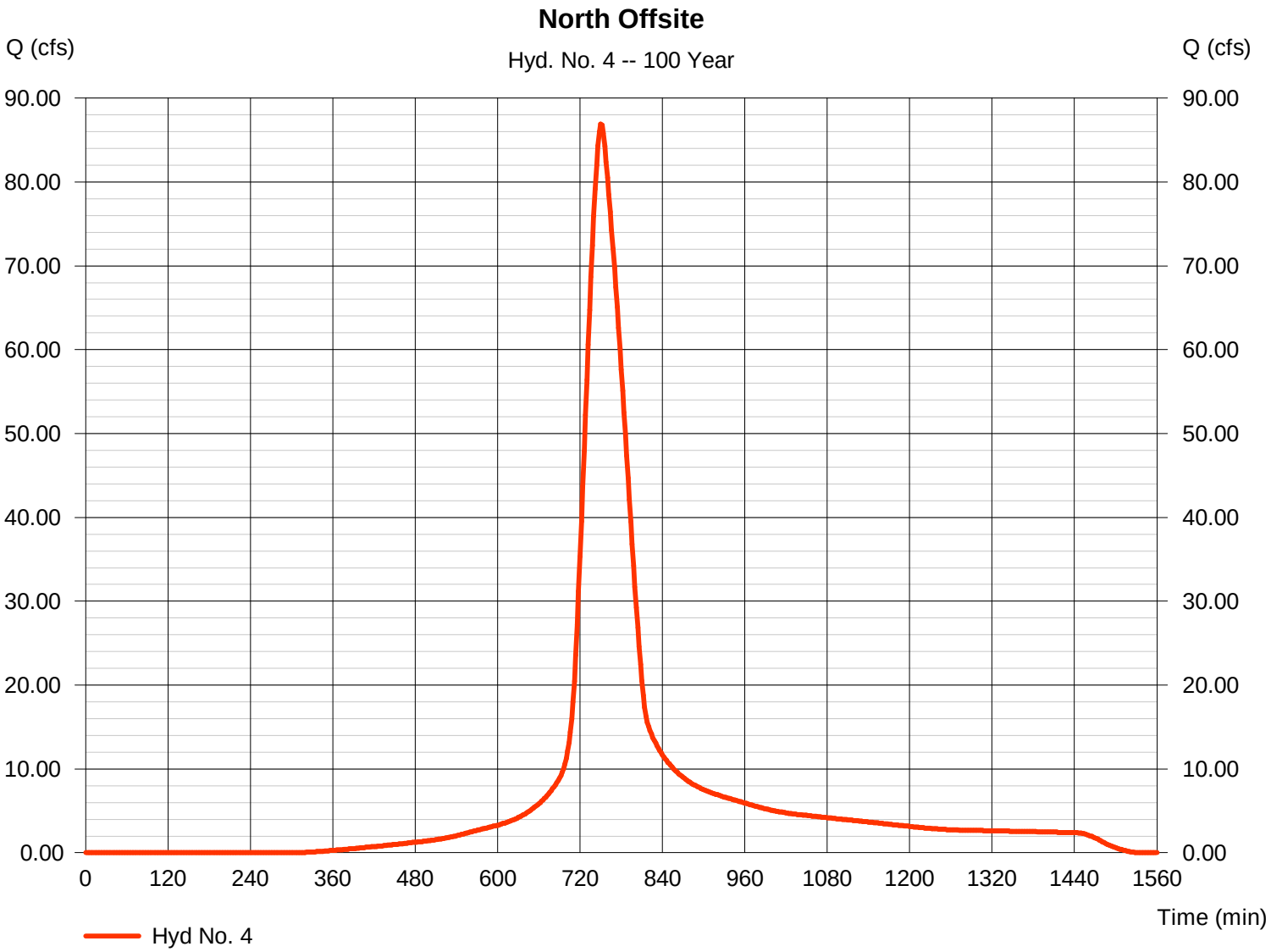


Hydrograph Report

Hyd. No. 4

North Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	86.90 cfs
Storm frequency	=	100 yrs	Time to peak	=	750 min
Time interval	=	2 min	Hyd. volume	=	589,797 cuft
Drainage area	=	28.000 ac	Curve number	=	82
Basin Slope	=	0.5 %	Hydraulic length	=	1600 ft
Tc method	=	LAG	Time of conc. (Tc)	=	61.53 min
Total precip.	=	7.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

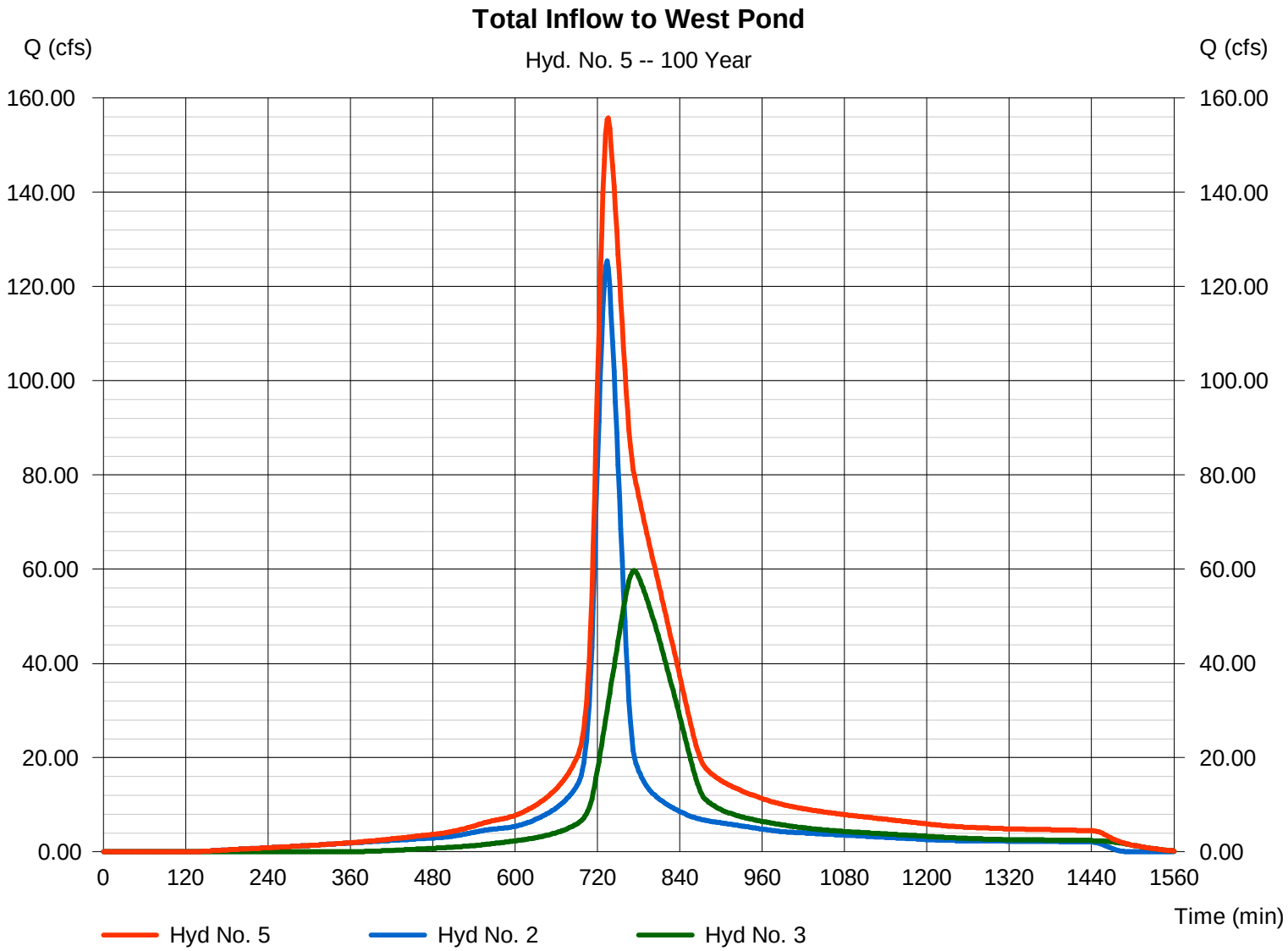


Hydrograph Report

Hyd. No. 5

Total Inflow to West Pond

Hydrograph type	= Combine	Peak discharge	= 155.73 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1,170,574 cuft
Inflow hyds.	= 2, 3	Contrib. drain. area	= 52.000 ac



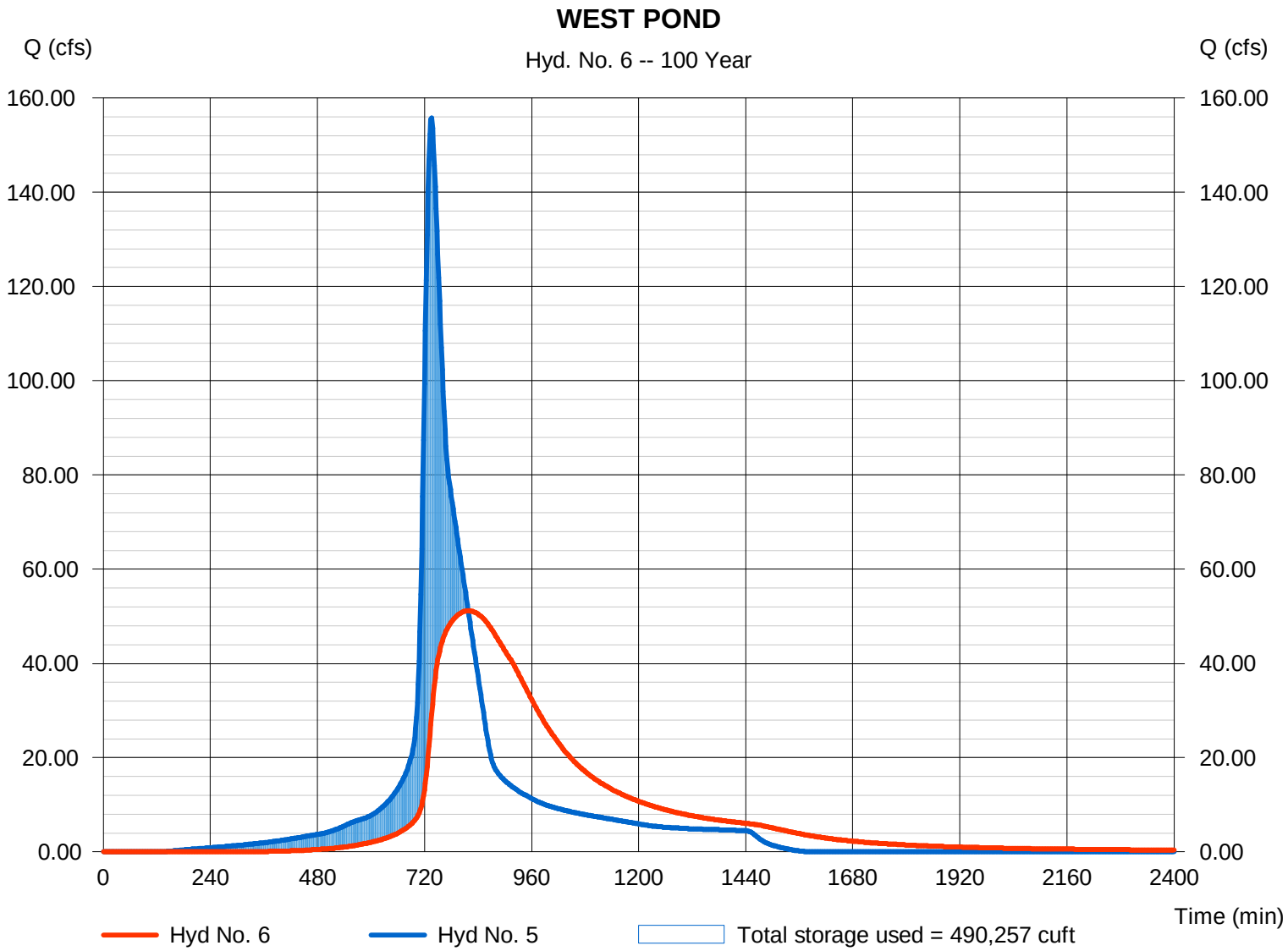
Hydrograph Report

Hyd. No. 6

WEST POND

Hydrograph type	=	Reservoir	Peak discharge	=	51.18 cfs
Storm frequency	=	100 yrs	Time to peak	=	818 min
Time interval	=	2 min	Hyd. volume	=	1,165,204 cuft
Inflow hyd. No.	=	5 - Total Inflow to West Pond	Max. Elevation	=	1283.76 ft
Reservoir name	=	Proposed West Pond	Max. Storage	=	490,257 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.02 — Monday, May 26, 2008

Pond No. 2 - Proposed West Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1280.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1280.00	116,800	0	0
1.00	1281.00	123,500	120,122	120,122
2.00	1282.00	131,000	127,219	247,341
3.00	1283.00	138,300	134,620	381,961
4.00	1284.00	145,800	142,019	523,981
5.00	1285.00	153,500	149,619	673,599
6.00	1286.00	160,000	156,723	830,322

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 36.00	0.00	0.00	0.00
Span (in)	= 36.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1280.00	0.00	0.00	0.00
Length (ft)	= 100.00	0.00	0.00	0.00
Slope (%)	= 1.30	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

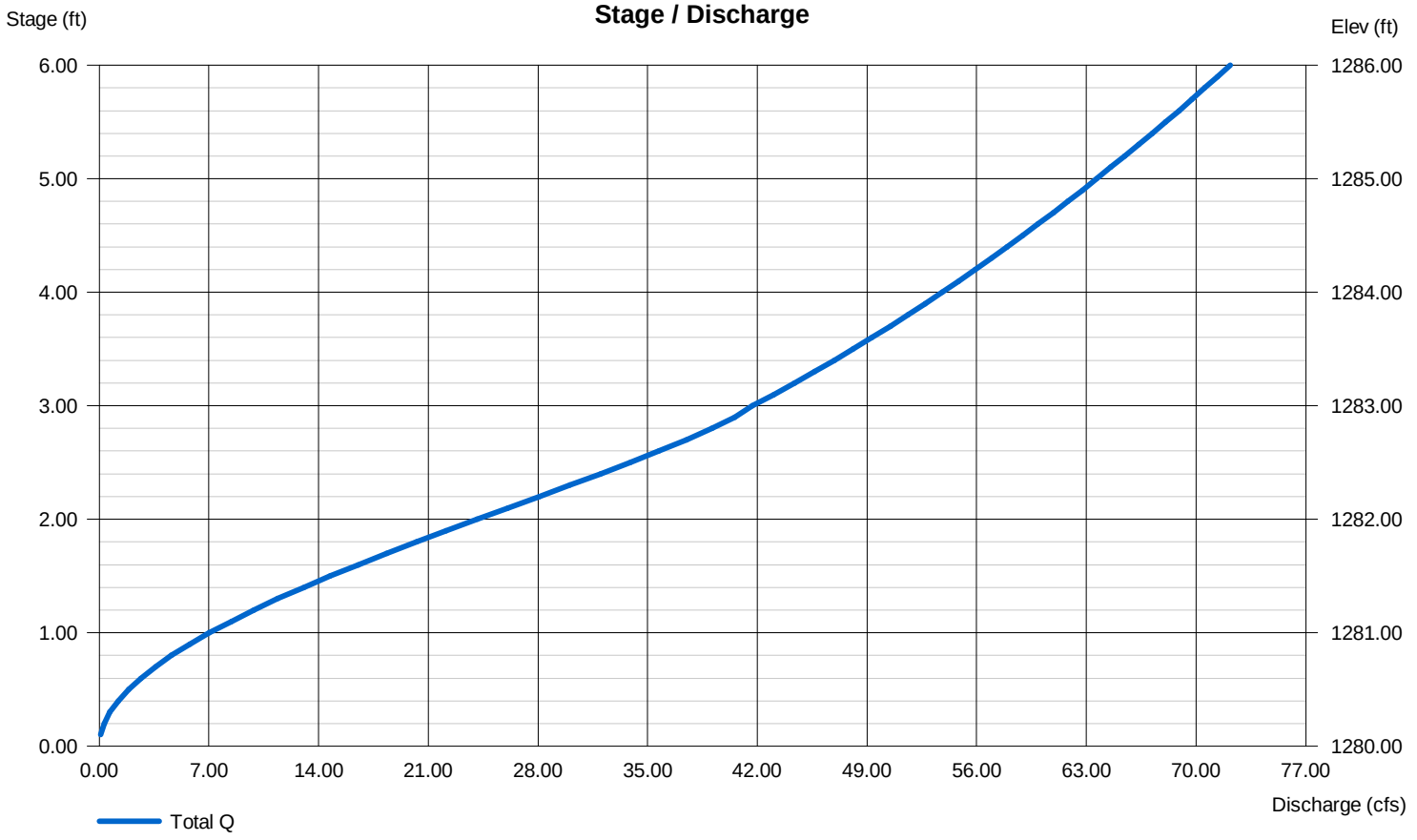
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.

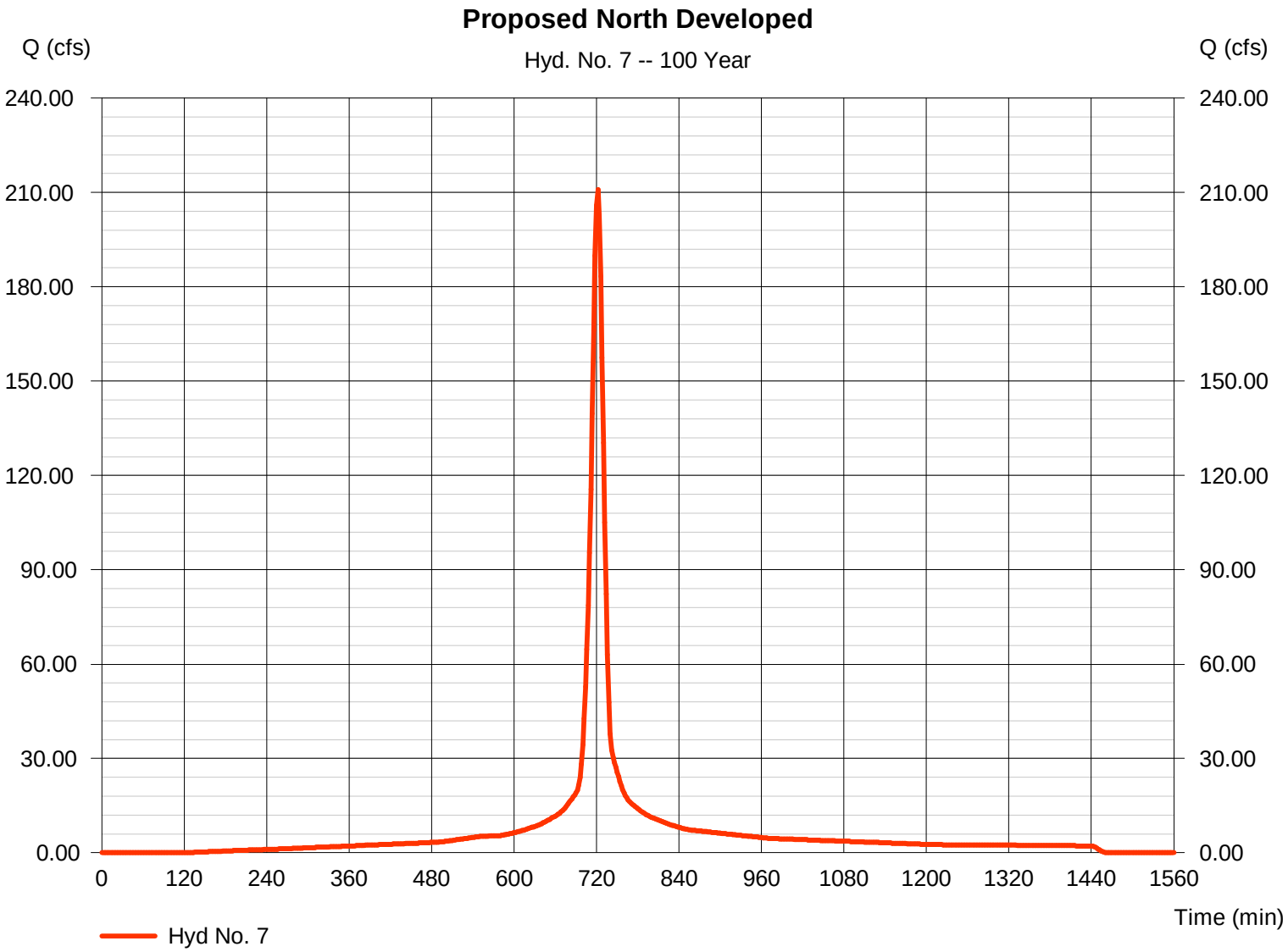


Hydrograph Report

Hyd. No. 7

Proposed North Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	210.91 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	649,978 cuft
Drainage area	=	26.000 ac	Curve number	=	93
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	7.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

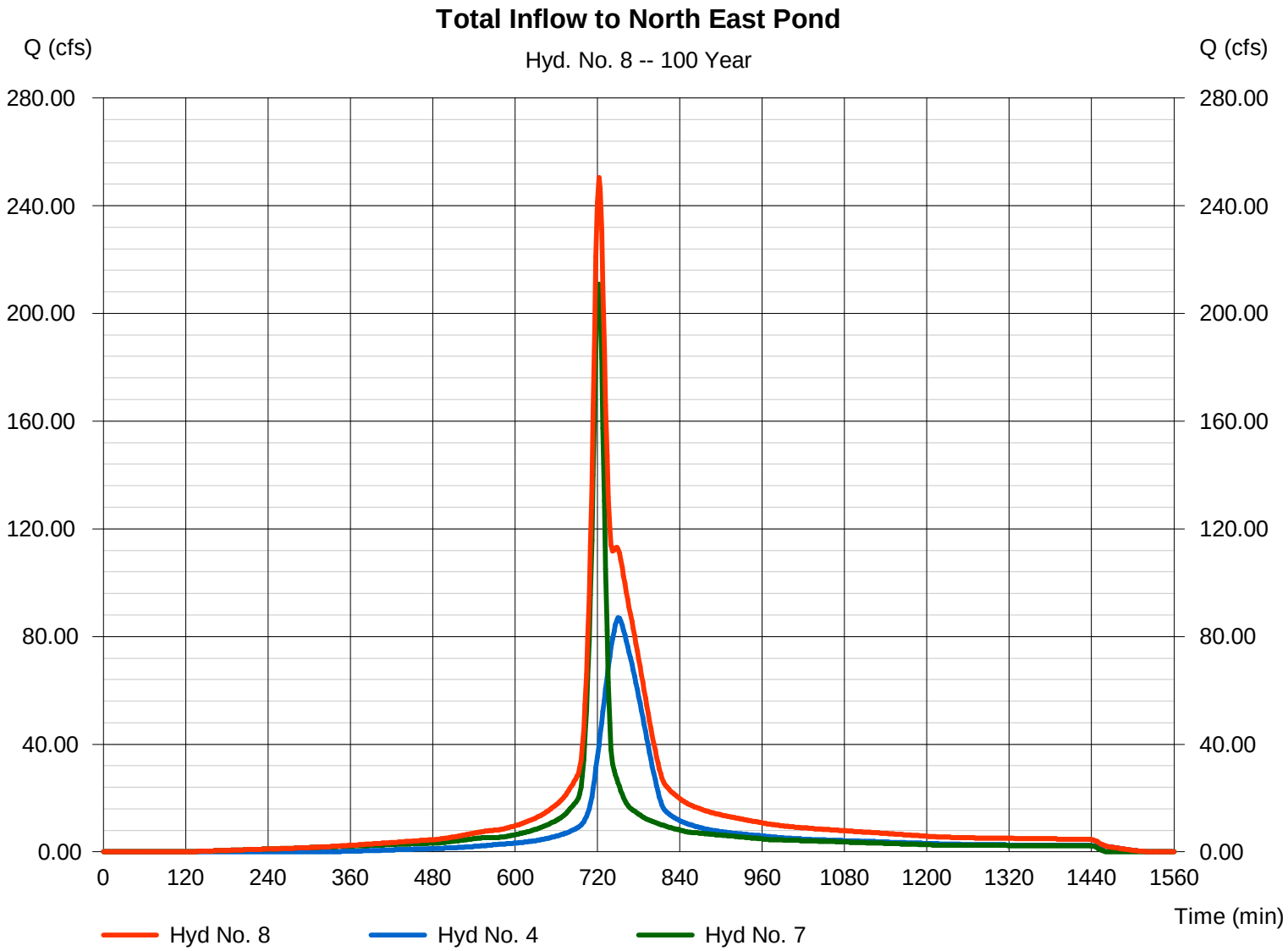


Hydrograph Report

Hyd. No. 8

Total Inflow to North East Pond

Hydrograph type	= Combine	Peak discharge	= 250.42 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 1,239,774 cuft
Inflow hyds.	= 4, 7	Contrib. drain. area	= 54.000 ac



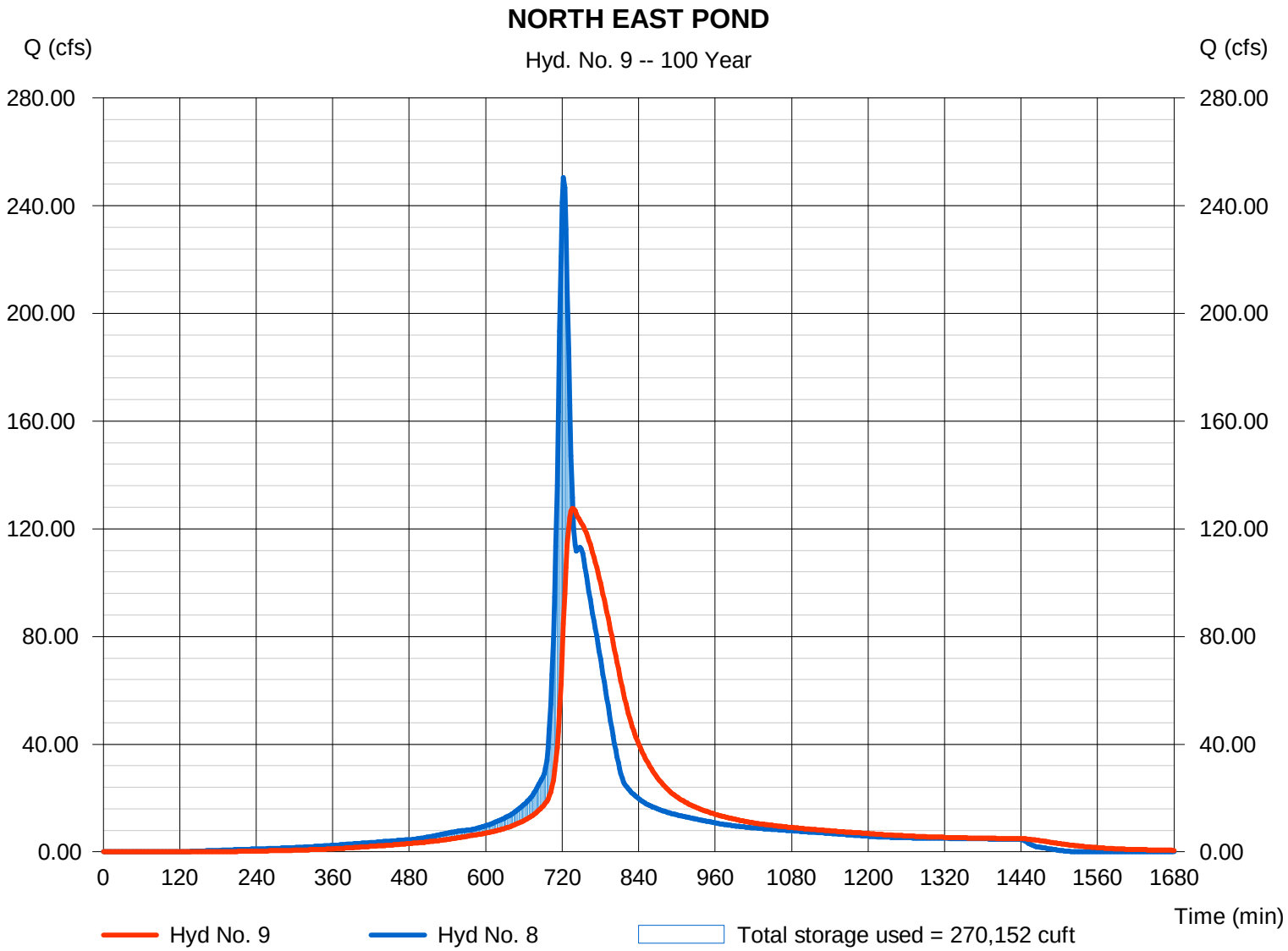
Hydrograph Report

Hyd. No. 9

NORTH EAST POND

Hydrograph type	=	Reservoir	Peak discharge	=	127.59 cfs
Storm frequency	=	100 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	1,239,765 cuft
Inflow hyd. No.	=	8 - Total Inflow to North East Pond	Max. Elevation	=	1283.39 ft
Reservoir name	=	Existing NE Pond	Max. Storage	=	270,152 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Existing NE Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1280.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1280.50	80,000	0	0
1.10	1281.60	92,000	94,512	94,512
2.10	1282.60	98,800	95,370	189,882
3.10	1283.60	105,000	101,874	291,756
4.10	1284.60	112,500	108,718	400,474
4.50	1285.00	119,600	46,411	446,885

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

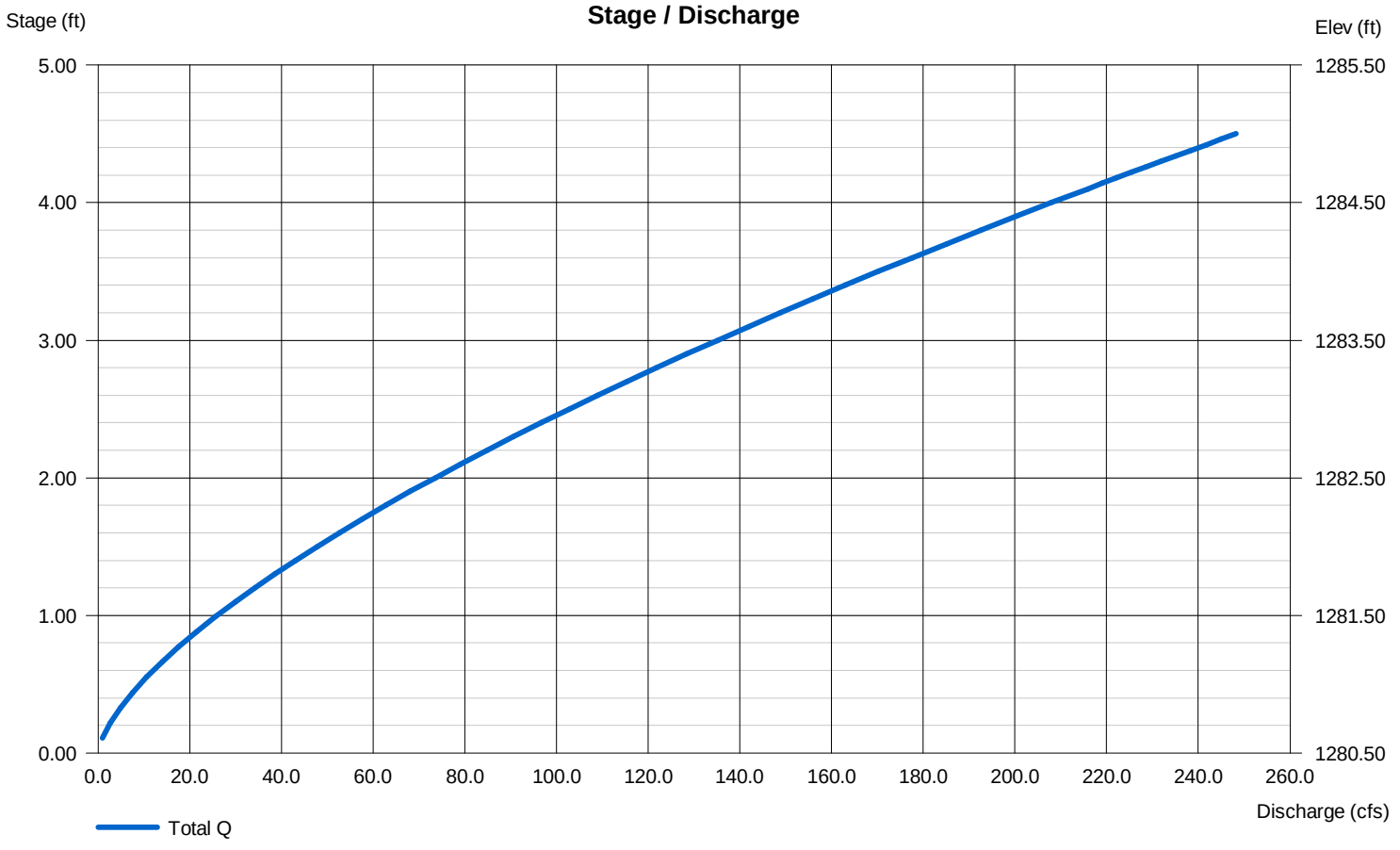
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.00	0.00	0.00
Crest El. (ft)	= 1280.50	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.

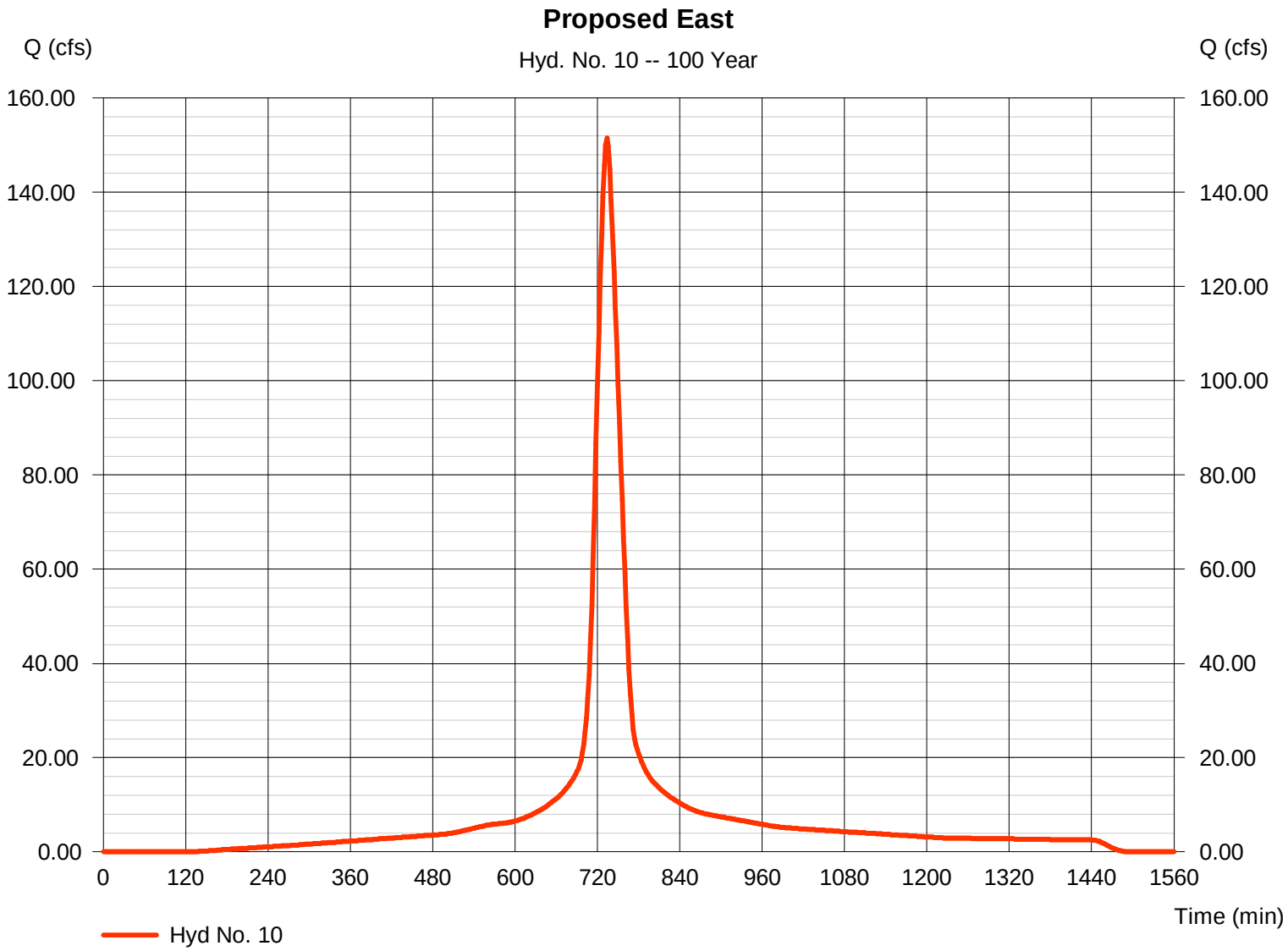


Hydrograph Report

Hyd. No. 10

Proposed East

Hydrograph type	=	SCS Runoff	Peak discharge	=	151.51 cfs
Storm frequency	=	100 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	735,115 cuft
Drainage area	=	29.000 ac	Curve number	=	93
Basin Slope	=	1.0 %	Hydraulic length	=	2000 ft
Tc method	=	LAG	Time of conc. (Tc)	=	34.16 min
Total precip.	=	7.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

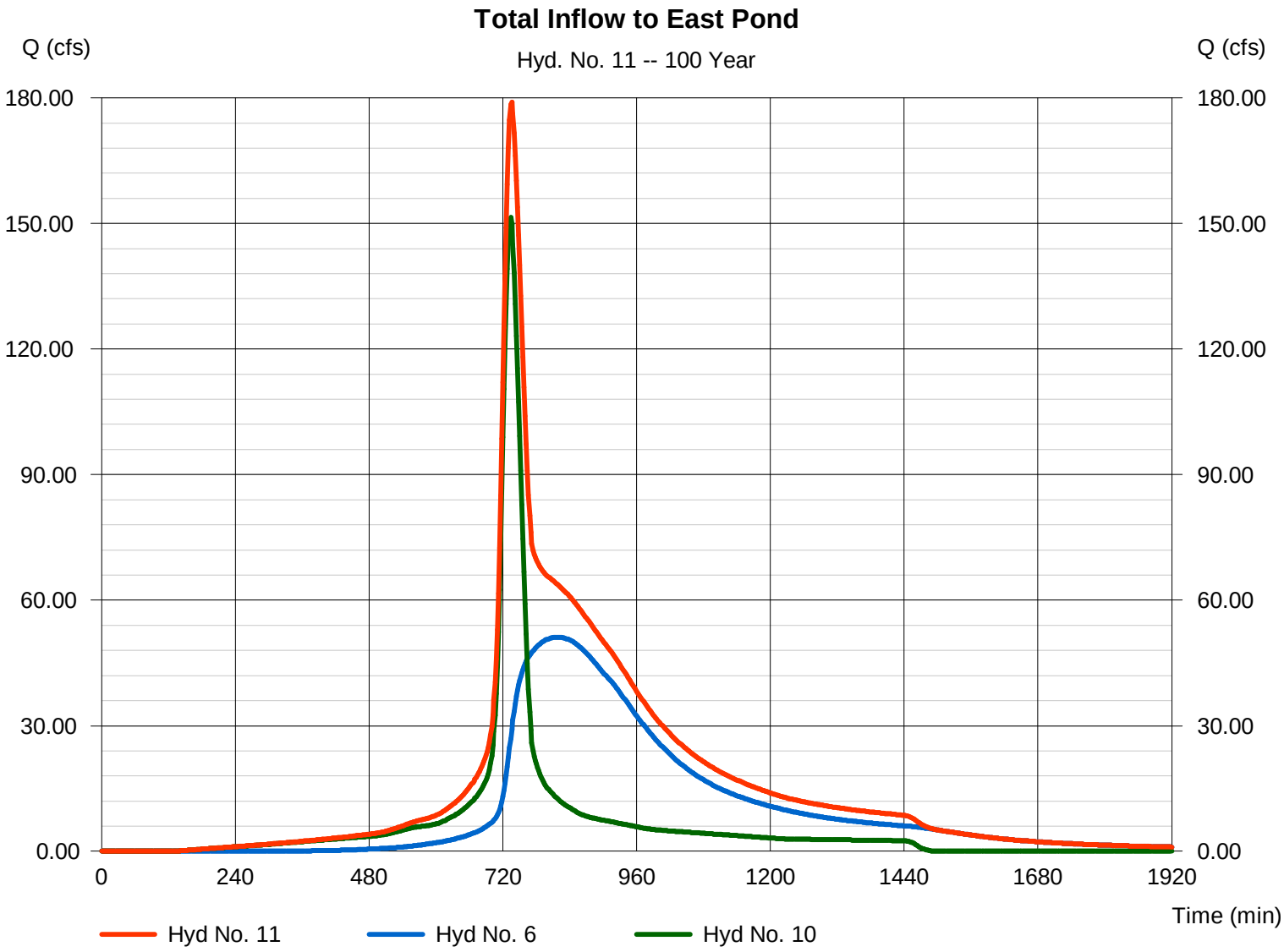


Hydrograph Report

Hyd. No. 11

Total Inflow to East Pond

Hydrograph type	= Combine	Peak discharge	= 178.95 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1,900,320 cuft
Inflow hyds.	= 6, 10	Contrib. drain. area	= 29.000 ac



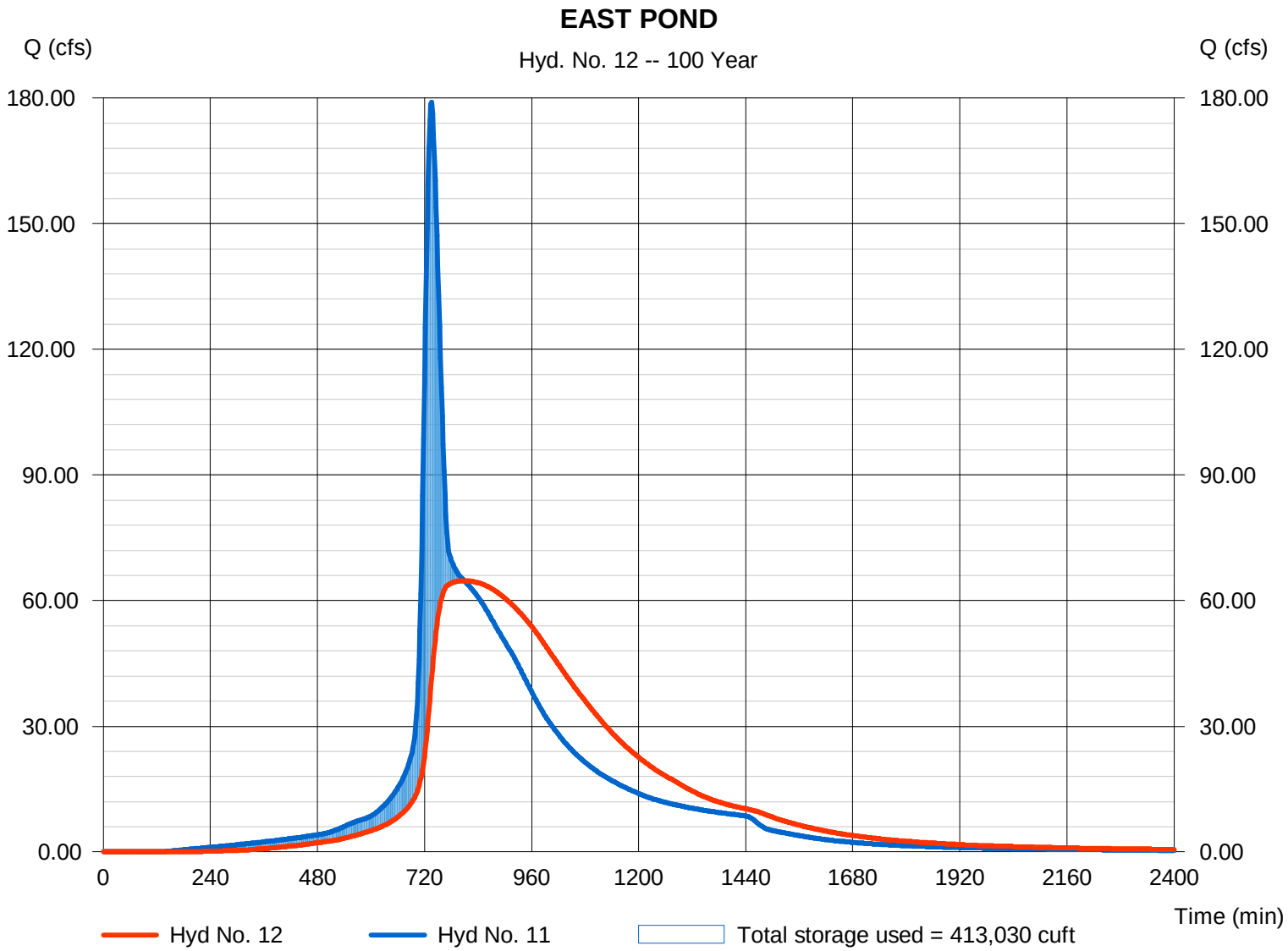
Hydrograph Report

Hyd. No. 12

EAST POND

Hydrograph type	=	Reservoir	Peak discharge	=	64.73 cfs
Storm frequency	=	100 yrs	Time to peak	=	810 min
Time interval	=	2 min	Hyd. volume	=	1,899,566 cuft
Inflow hyd. No.	=	11 - Total Inflow to East Pond	Max. Elevation	=	1283.71 ft
Reservoir name	=	Proposed East Pond	Max. Storage	=	413,030 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.02 — Monday, May 26, 2008

Pond No. 3 - Proposed East Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1280.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1280.00	98,300	0	0
1.00	1281.00	105,000	101,621	101,621
2.00	1282.00	112,000	108,470	210,092
3.00	1283.00	119,500	115,718	325,810
4.00	1284.00	126,500	122,971	448,781
5.00	1285.00	133,500	129,971	578,752
6.00	1286.00	135,000	134,236	712,988

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 84.00	0.00	0.00	0.00
Span (in)	= 60.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1280.00	0.00	0.00	0.00
Length (ft)	= 30.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

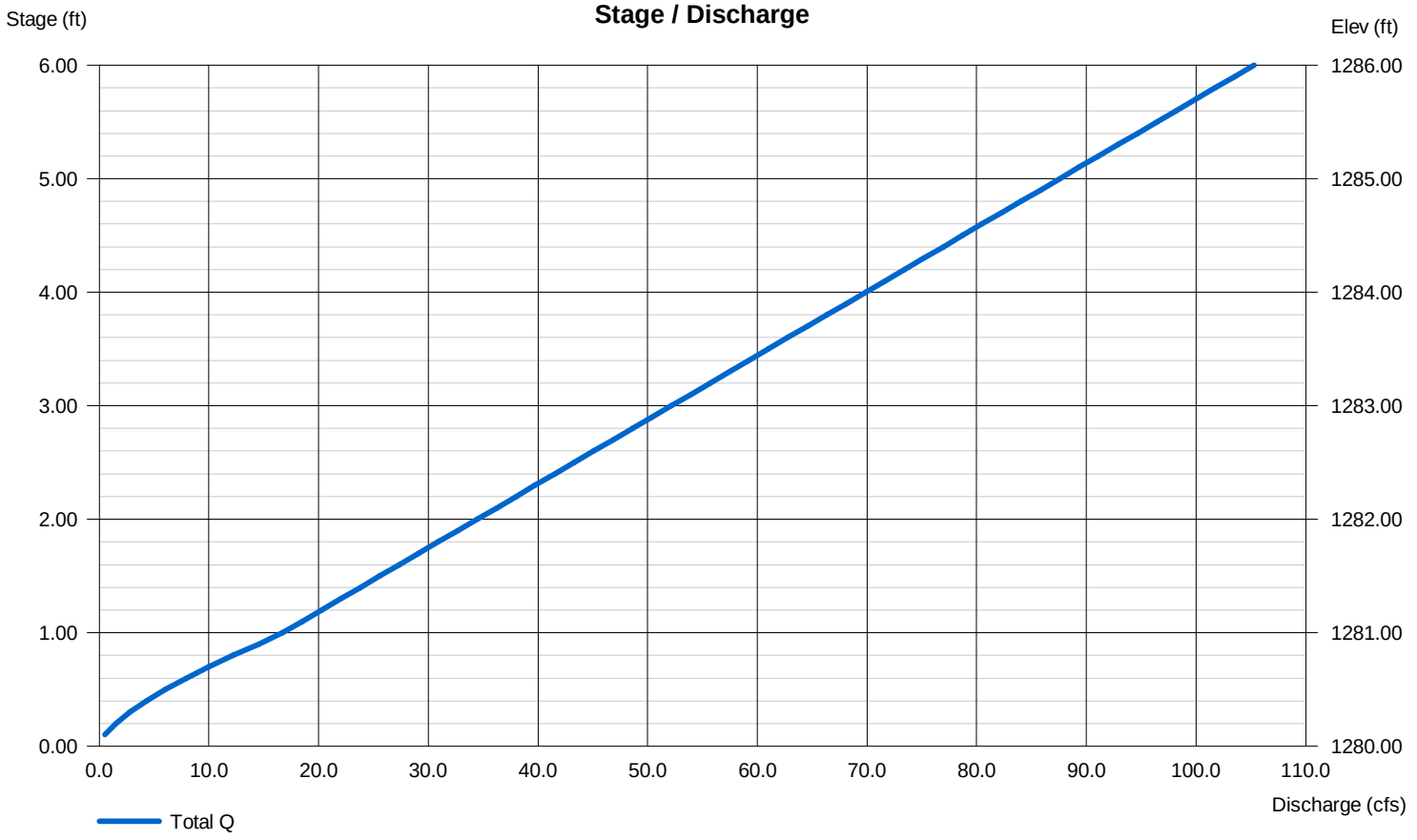
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	0.00	0.00	0.00
Crest El. (ft)	= 1280.00	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	76.3137	14.3000	0.8844	--------
3	0.0000	0.0000	0.0000	--------
5	52.6224	11.2000	0.7497	--------
10	55.1841	11.1000	0.7229	--------
25	60.7012	11.1000	0.7068	--------
50	66.9222	11.3000	0.7004	--------
100	62.2794	10.1000	0.6624	--------

File name: wichita.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.57	4.54	3.85	3.35	2.97	2.67	2.43	2.23	2.06	1.92	1.80	1.69
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.52	5.33	4.55	3.99	3.57	3.24	2.97	2.75	2.57	2.41	2.27	2.15
10	7.40	6.09	5.22	4.60	4.13	3.76	3.46	3.21	3.00	2.82	2.67	2.53
25	8.51	7.03	6.05	5.35	4.81	4.39	4.05	3.76	3.52	3.32	3.14	2.98
50	9.47	7.86	6.78	6.00	5.41	4.94	4.56	4.24	3.98	3.75	3.55	3.37
100	10.31	8.53	7.37	6.53	5.90	5.40	5.00	4.66	4.37	4.13	3.92	3.73

Tc = time in minutes. Values may exceed 60.

Precip. file name: wich_24hr.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	3.50	0.00	4.50	5.30	6.10	6.80	7.90
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

Hydraflow Table of Contents

Total Site.gpw

Hydraflow Hydrographs by Intelisolve v9.02

Monday, May 26, 2008

Watershed Model Schematic **1**

Hydrograph Return Period Recap **2**

2 - Year

Summary Report **3**

Hydrograph Reports **4**

Hydrograph No. 1, SCS Runoff, Existing 4

Hydrograph No. 2, SCS Runoff, Proposed West 5

Hydrograph No. 3, SCS Runoff, West Offsite 6

Hydrograph No. 4, SCS Runoff, North Offsite 7

Hydrograph No. 5, Combine, Total Inflow to West Pond 8

Hydrograph No. 6, Reservoir, WEST POND 9

Pond Report - Proposed West Pond 10

Hydrograph No. 7, SCS Runoff, Proposed North Developed 11

Hydrograph No. 8, Combine, Total Inflow to North East Pond 12

Hydrograph No. 9, Reservoir, NORTH EAST POND 13

Pond Report - Existing NE Pond 14

Hydrograph No. 10, SCS Runoff, Proposed East 15

Hydrograph No. 11, Combine, Total Inflow to East Pond 16

Hydrograph No. 12, Reservoir, EAST POND 17

Pond Report - Proposed East Pond 18

5 - Year

Summary Report **19**

Hydrograph Reports **20**

Hydrograph No. 1, SCS Runoff, Existing 20

Hydrograph No. 2, SCS Runoff, Proposed West 21

Hydrograph No. 3, SCS Runoff, West Offsite 22

Hydrograph No. 4, SCS Runoff, North Offsite 23

Hydrograph No. 5, Combine, Total Inflow to West Pond 24

Hydrograph No. 6, Reservoir, WEST POND 25

Pond Report - Proposed West Pond 26

Hydrograph No. 7, SCS Runoff, Proposed North Developed 27

Hydrograph No. 8, Combine, Total Inflow to North East Pond 28

Hydrograph No. 9, Reservoir, NORTH EAST POND 29

Pond Report - Existing NE Pond 30

Hydrograph No. 10, SCS Runoff, Proposed East 31

Hydrograph No. 11, Combine, Total Inflow to East Pond 32

Hydrograph No. 12, Reservoir, EAST POND 33

Pond Report - Proposed East Pond 34

10 - Year

Summary Report **35**

Hydrograph Reports **36**

Hydrograph No. 1, SCS Runoff, Existing 36

Hydrograph No. 2, SCS Runoff, Proposed West 37

Hydrograph No. 3, SCS Runoff, West Offsite 38

Hydrograph No. 4, SCS Runoff, North Offsite 39
Hydrograph No. 5, Combine, Total Inflow to West Pond 40
Hydrograph No. 6, Reservoir, WEST POND 41
Pond Report - Proposed West Pond 42
Hydrograph No. 7, SCS Runoff, Proposed North Developed 43
Hydrograph No. 8, Combine, Total Inflow to North East Pond 44
Hydrograph No. 9, Reservoir, NORTH EAST POND 45
Pond Report - Existing NE Pond 46
Hydrograph No. 10, SCS Runoff, Proposed East 47
Hydrograph No. 11, Combine, Total Inflow to East Pond 48
Hydrograph No. 12, Reservoir, EAST POND 49
Pond Report - Proposed East Pond 50

25 - Year

Summary Report 51
Hydrograph Reports 52
Hydrograph No. 1, SCS Runoff, Existing 52
Hydrograph No. 2, SCS Runoff, Proposed West 53
Hydrograph No. 3, SCS Runoff, West Offsite 54
Hydrograph No. 4, SCS Runoff, North Offsite 55
Hydrograph No. 5, Combine, Total Inflow to West Pond 56
Hydrograph No. 6, Reservoir, WEST POND 57
Pond Report - Proposed West Pond 58
Hydrograph No. 7, SCS Runoff, Proposed North Developed 59
Hydrograph No. 8, Combine, Total Inflow to North East Pond 60
Hydrograph No. 9, Reservoir, NORTH EAST POND 61
Pond Report - Existing NE Pond 62
Hydrograph No. 10, SCS Runoff, Proposed East 63
Hydrograph No. 11, Combine, Total Inflow to East Pond 64
Hydrograph No. 12, Reservoir, EAST POND 65
Pond Report - Proposed East Pond 66

100 - Year

Summary Report 67
Hydrograph Reports 68
Hydrograph No. 1, SCS Runoff, Existing 68
Hydrograph No. 2, SCS Runoff, Proposed West 69
Hydrograph No. 3, SCS Runoff, West Offsite 70
Hydrograph No. 4, SCS Runoff, North Offsite 71
Hydrograph No. 5, Combine, Total Inflow to West Pond 72
Hydrograph No. 6, Reservoir, WEST POND 73
Pond Report - Proposed West Pond 74
Hydrograph No. 7, SCS Runoff, Proposed North Developed 75
Hydrograph No. 8, Combine, Total Inflow to North East Pond 76
Hydrograph No. 9, Reservoir, NORTH EAST POND 77
Pond Report - Existing NE Pond 78
Hydrograph No. 10, SCS Runoff, Proposed East 79
Hydrograph No. 11, Combine, Total Inflow to East Pond 80
Hydrograph No. 12, Reservoir, EAST POND 81
Pond Report - Proposed East Pond 82

IDF Report 83

HydraFlow Express

Existing 5 ẋ7 ’RCBC

Culvert Report

Hydraflow Express by Intelisolve | Thursday, May 29 2008

Box Culvert

Invert Elev Dn (ft)	=	1279.69
Pipe Length (ft)	=	50.00
Slope (%)	=	0.76
Invert Elev Up (ft)	=	1280.07
Rise (in)	=	84.0
Shape	=	Box
Span (in)	=	60.0
No. Barrels	=	1
n-Value	=	0.013
Inlet Edge	=	Projecting
Coeff. K,M,c,Y,k	=	0.0145, 1.75, 0.0419, 0.64, 0.5

Embankment

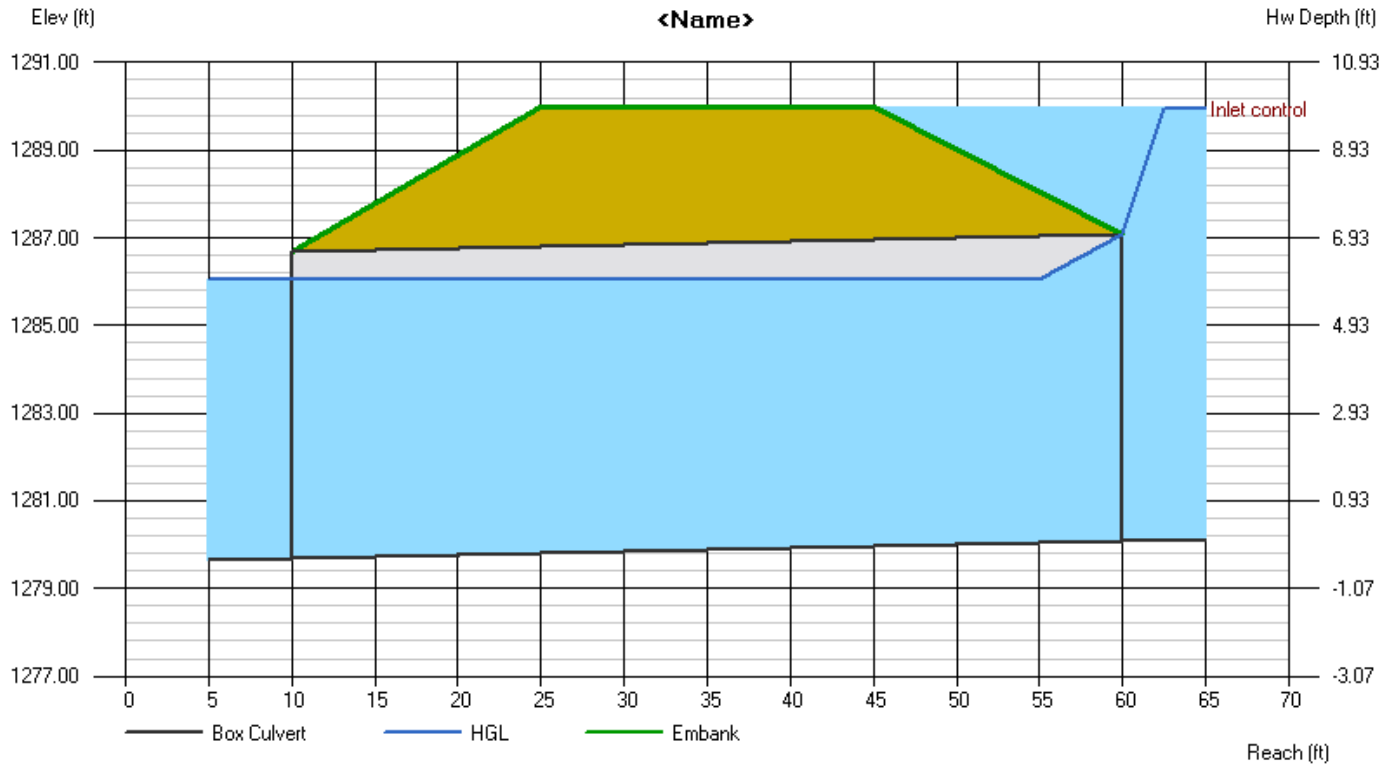
Top Elevation (ft)	=	1290.00
Top Width (ft)	=	20.00
Crest Width (ft)	=	20.00

Calculations

Qmin (cfs)	=	10.00
Qmax (cfs)	=	500.00
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	390.00
Qpipe (cfs)	=	390.00
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	12.25
Veloc Up (ft/s)	=	13.03
HGL Dn (ft)	=	1286.06
HGL Up (ft)	=	1286.06
Hw Elev (ft)	=	1289.94
Hw/D (ft)	=	1.41
Flow Regime	=	Inlet Control



DRAINAGE & GRADING PLAN Scale 1:120