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Hydrograph Return Period Recap

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	------	------	3.05	------	------	20.35	------	------	47.71	Existing Drainage
2	Diversion1	1	------	1.01	------	------	6.71	------	------	15.74	2-Year Karst Adjusted Flow
3	Diversion2	1	------	2.04	------	------	13.63	------	------	31.96	Excluded
4	Diversion1	1	------	1.31	------	------	8.75	------	------	20.51	10-Year Karst Adjusted Flow
5	Diversion2	1	------	1.74	------	------	11.60	------	------	27.19	Excluded
6	Diversion1	1	------	1.52	------	------	10.17	------	------	23.85	100-Year Karst Adjusted Flow
7	Diversion2	1	------	1.52	------	------	10.17	------	------	23.85	Excluded
9	SCS Runoff	------	------	7.52	------	------	31.11	------	------	64.29	Proposed Drainage
10	Diversion1	9	------	2.56	------	------	10.58	------	------	21.86	2-Year Karst Adjusted Flow
11	Diversion2	9	------	4.96	------	------	20.53	------	------	42.43	Excluded
12	Diversion1	9	------	3.46	------	------	14.31	------	------	29.57	10-Year Karst Adjusted Flow
13	Diversion2	9	------	4.06	------	------	16.80	------	------	34.71	Excluded
14	Diversion1	9	------	4.21	------	------	17.42	------	------	36.00	100-Year Karst Adjusted Flow
15	Diversion2	9	------	3.31	------	------	13.69	------	------	28.29	Excluded
17	Reservoir	15	------	3.22	------	------	20.63	------	------	43.19	As-built Routing
18	Reservoir	15	------	0.82	------	------	15.68	------	------	40.39	1994 Design Routing
20	Reservoir	10	------	0.26	------	------	2.76	------	------	10.73	2-Year Karst Routing
21	Reservoir	12	------	0.39	------	------	4.98	------	------	16.30	10-Year Karst Routing
22	Reservoir	14	------	0.48	------	------	6.90	------	------	21.29	100-Year Karst Routing

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	3.05	6	732	25,795	---	-----	-----	Existing Drainage
2	Diversion1	1.01	6	732	8,512	1	-----	-----	2-Year Karst Adjusted Flow
3	Diversion2	2.04	6	732	17,283	1	-----	-----	Excluded
4	Diversion1	1.31	6	732	11,092	1	-----	-----	10-Year Karst Adjusted Flow
5	Diversion2	1.74	6	732	14,703	1	-----	-----	Excluded
6	Diversion1	1.52	6	732	12,898	1	-----	-----	100-Year Karst Adjusted Flow
7	Diversion2	1.52	6	732	12,898	1	-----	-----	Excluded
9	SCS Runoff	7.52	6	732	43,859	---	-----	-----	Proposed Drainage
10	Diversion1	2.56	6	732	14,912	9	-----	-----	2-Year Karst Adjusted Flow
11	Diversion2	4.96	6	732	28,947	9	-----	-----	Excluded
12	Diversion1	3.46	6	732	20,175	9	-----	-----	10-Year Karst Adjusted Flow
13	Diversion2	4.06	6	732	23,684	9	-----	-----	Excluded
14	Diversion1	4.21	6	732	24,561	9	-----	-----	100-Year Karst Adjusted Flow
15	Diversion2	3.31	6	732	19,298	9	-----	-----	Excluded
17	Reservoir	3.22	6	756	43,827	15	394.01	27,219	As-built Routing
18	Reservoir	0.82	6	816	21,169	15	393.75	51,774	1994 Design Routing
20	Reservoir	0.26	6	948	14,670	10	393.37	44,738	2-Year Karst Routing
21	Reservoir	0.39	6	924	19,933	12	393.47	46,621	10-Year Karst Routing
22	Reservoir	0.48	6	918	24,319	14	393.56	48,304	100-Year Karst Routing

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

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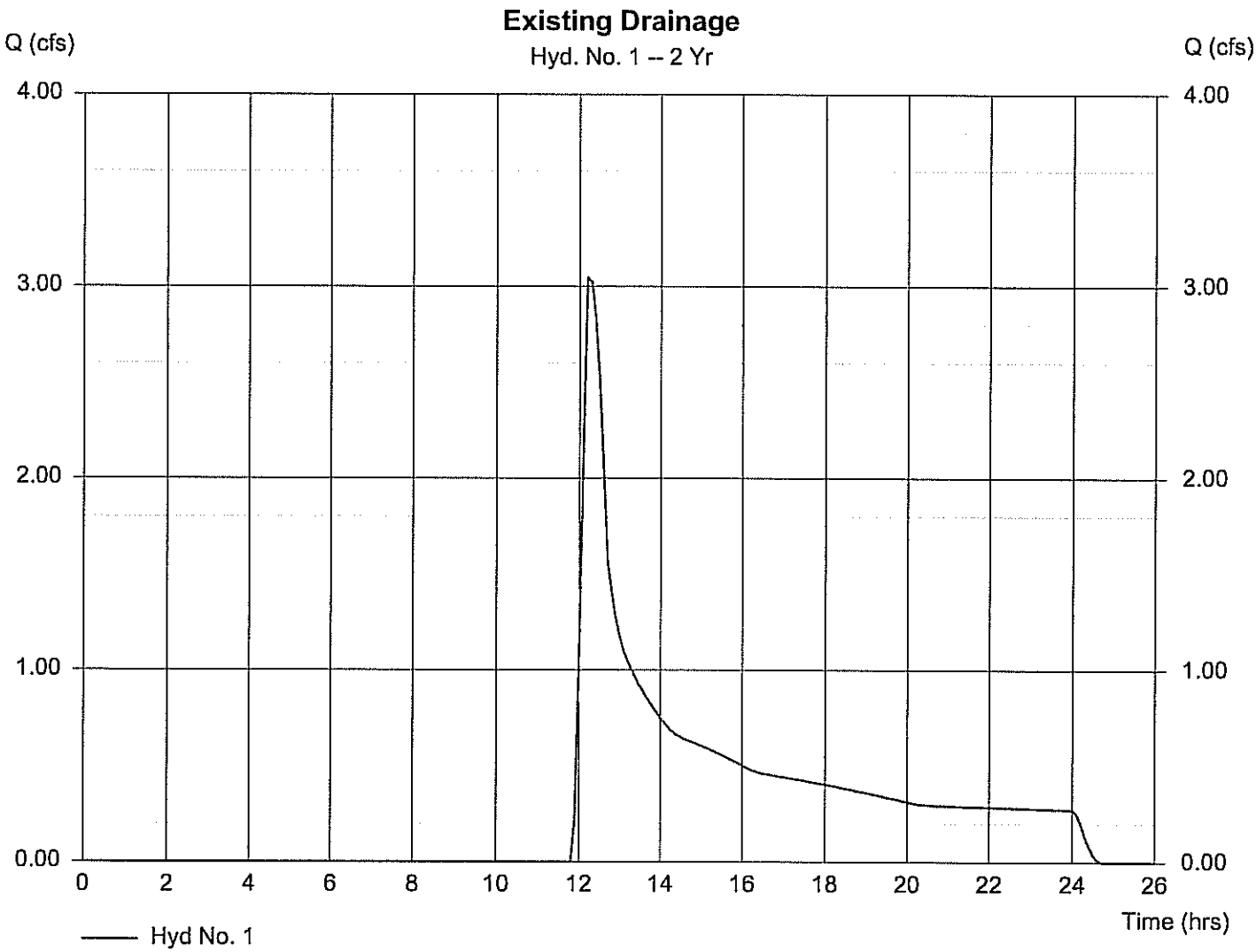
Hyd. No. 1

Existing Drainage

Hydrograph type	= SCS Runoff	Peak discharge	= 3.05 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 23.300 ac	Curve number	= 58
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.20 min
Total precip.	= 3.10 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 25,795 cuft



TR55 Tc Worksheet

Hyd. No. 1

Existing Drainage

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.240		0.011		0.011		
Flow length (ft)	=	150.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.10		0.00		0.00		
Land slope (%)	=	3.30		0.00		0.00		
Travel Time (min)	**=**	**16.41**	**+**	**0.00**	**+**	**0.00**	**=**	**16.41**
Shallow Concentrated Flow								
Flow length (ft)	=	900.00		0.00		0.00		
Watercourse slope (%)	=	3.80		0.00		0.00		
Surface description	=	Unpaved		Paved		Paved		
Average velocity (ft/s)	=	3.15		0.00		0.00		
Travel Time (min)	**=**	**4.77**	**+**	**0.00**	**+**	**0.00**	**=**	**4.77**
Channel Flow								
X sectional flow area (sqft)	=	0.00		0.00		0.00		
Wetted perimeter (ft)	=	0.00		0.00		0.00		
Channel slope (%)	=	0.00		0.00		0.00		
Manning's n-value	=	0.015		0.015		0.015		
Velocity (ft/s)	=	0.00		0.00		0.00		
Flow length (ft)	=	0.0		0.0		0.0		
Travel Time (min)	**=**	**0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... **21.20 min**

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

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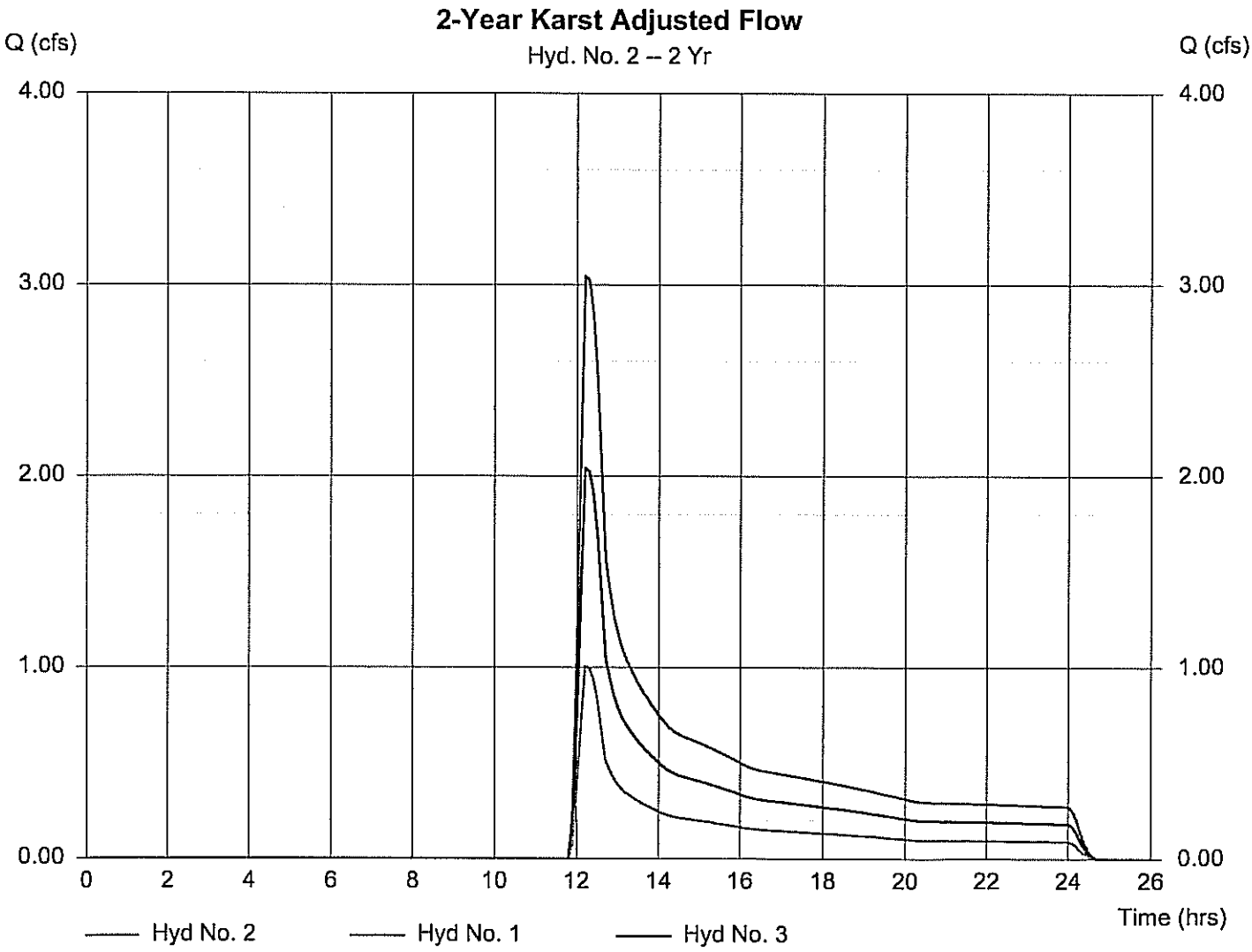
Hyd. No. 2

2-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 1.01 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 3
Diversion method	= Flow Ratio	Flow ratio	= 0.33

Hydrograph Volume = 8,512 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

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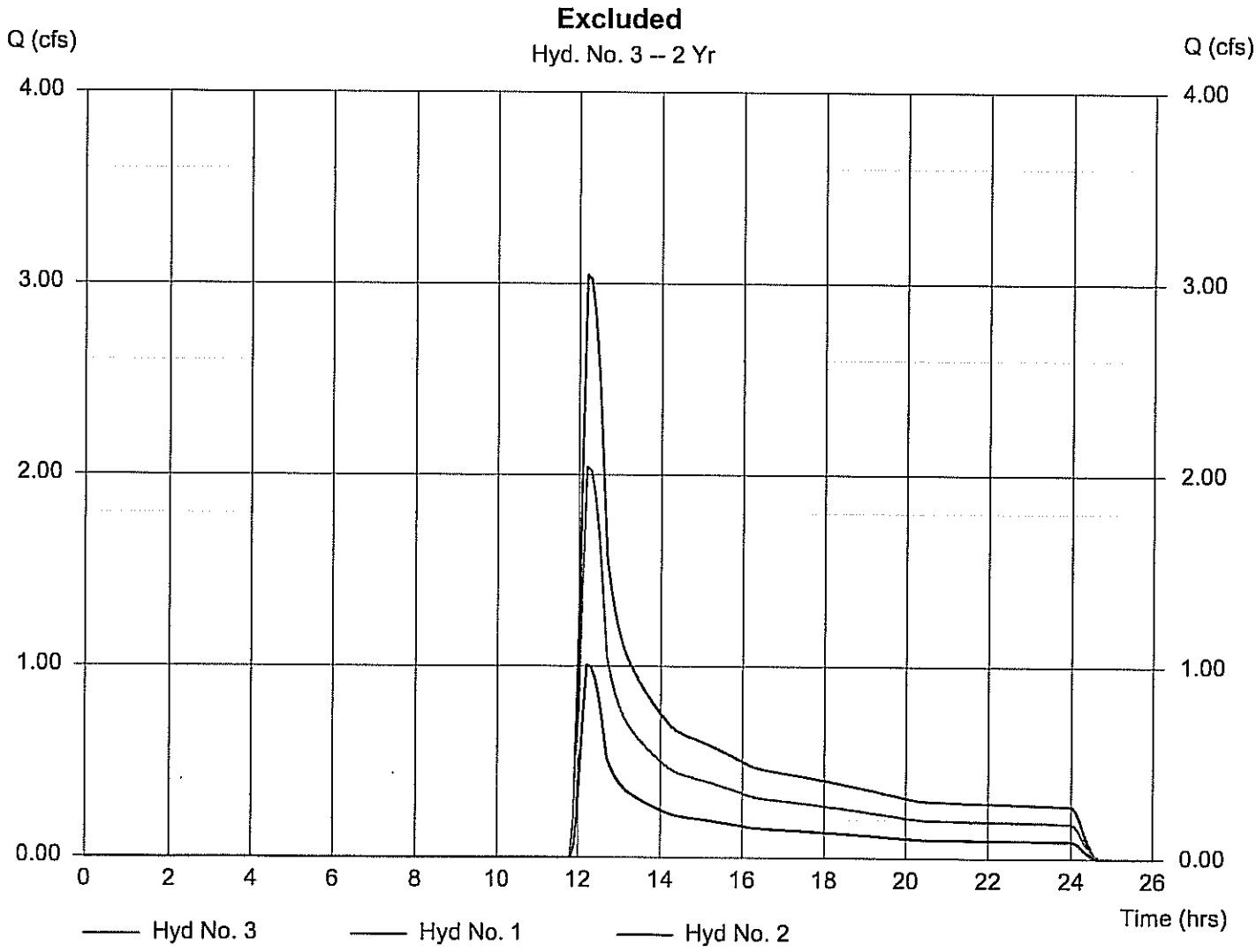
Hyd. No. 3

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 2.04 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 2
Diversion method	= Flow Ratio	Flow ratio	= 0.33

Hydrograph Volume = 17,283 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

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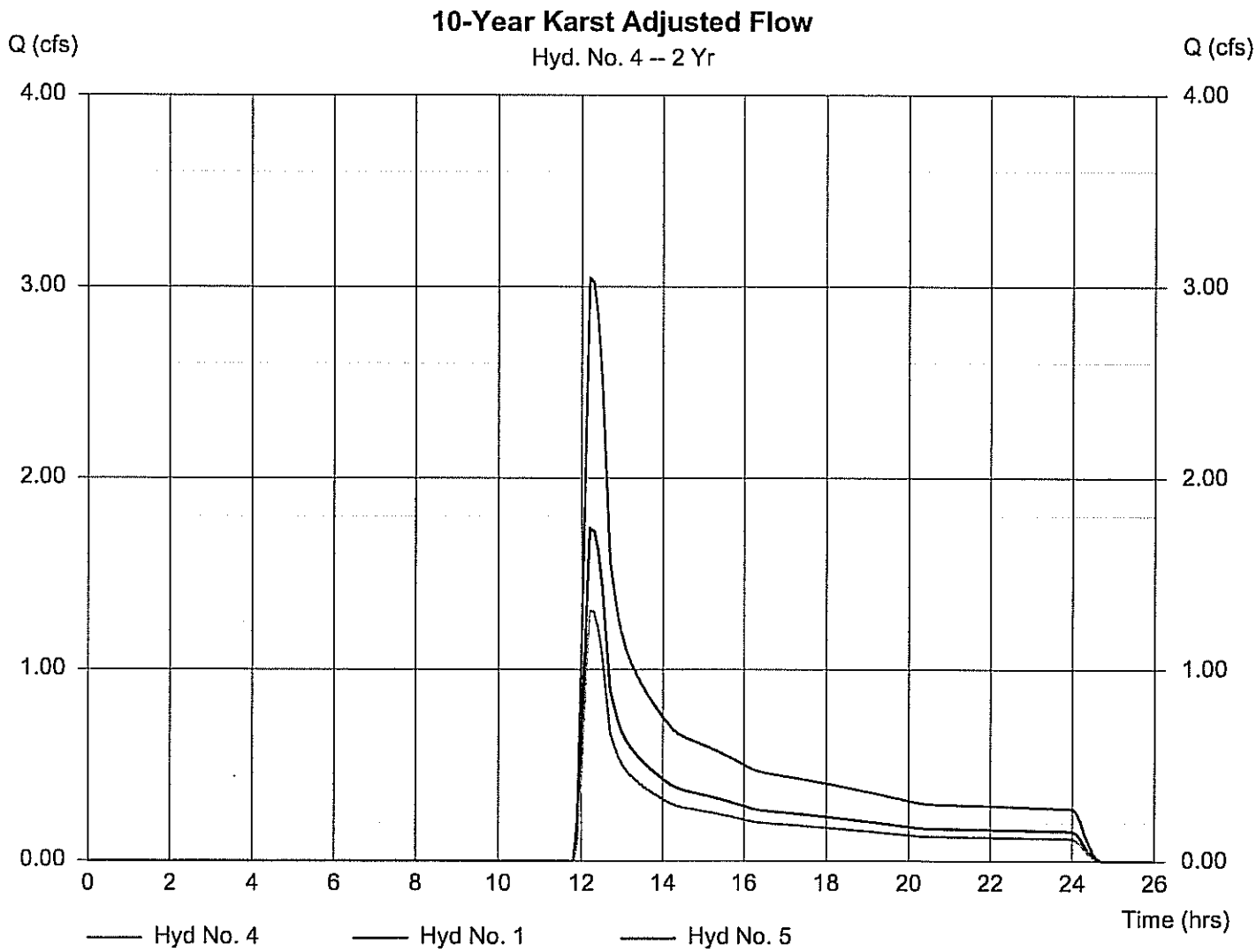
Hyd. No. 4

10-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 1.31 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 5
Diversion method	= Flow Ratio	Flow ratio	= 0.43

Hydrograph Volume = 11,092 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

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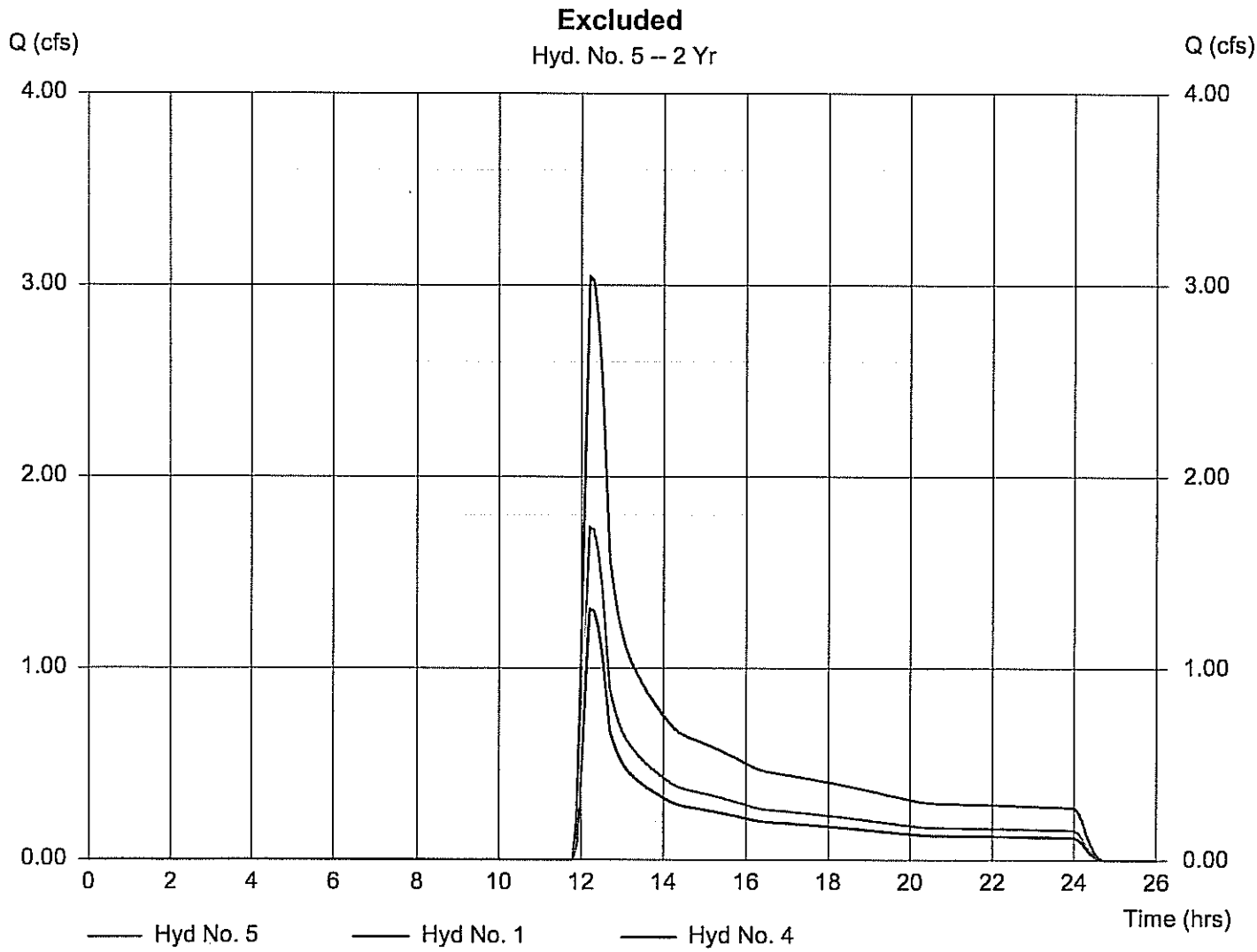
Hyd. No. 5

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 1.74 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 4
Diversion method	= Flow Ratio	Flow ratio	= 0.43

Hydrograph Volume = 14,703 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

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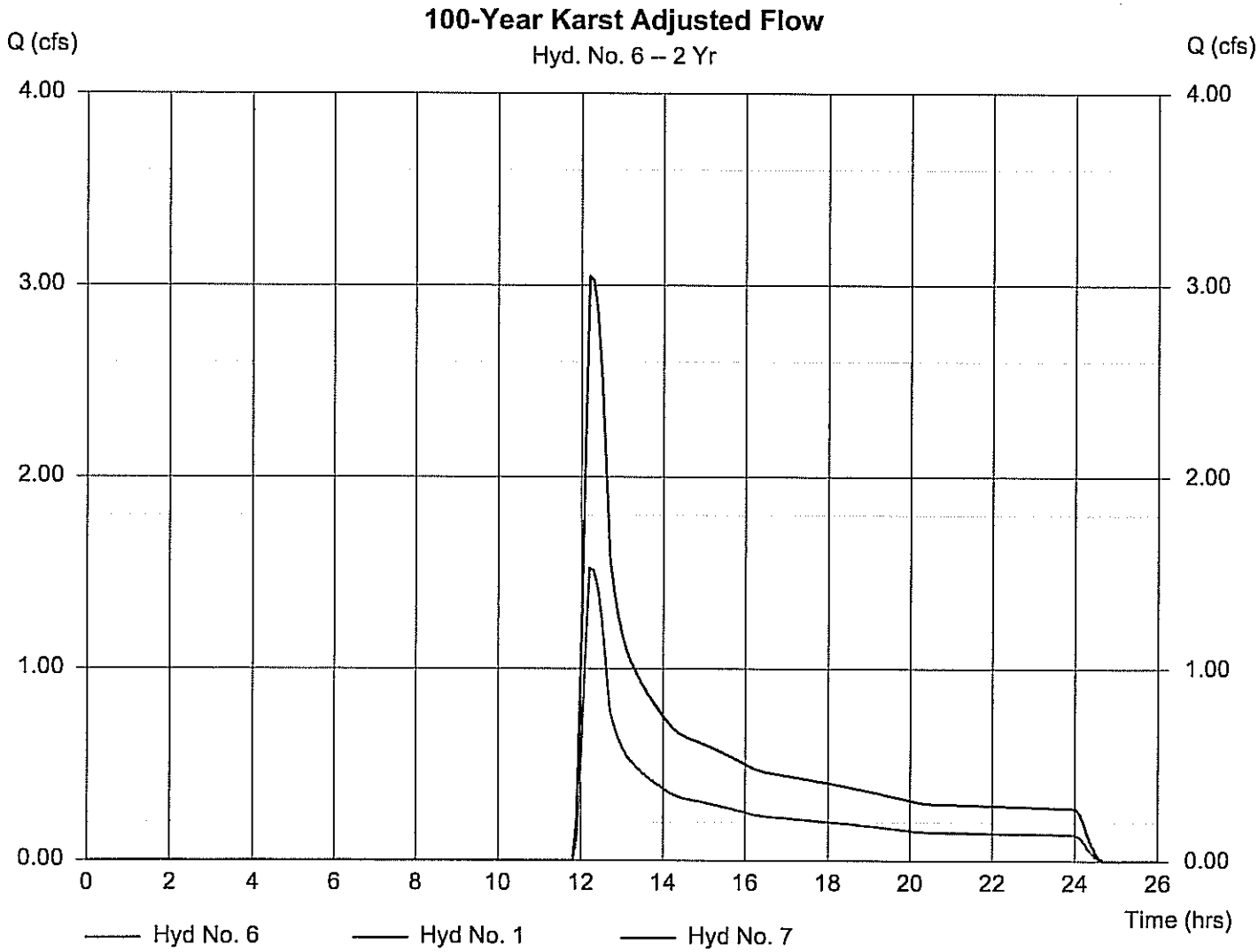
Hyd. No. 6

100-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 1.52 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 7
Diversion method	= Flow Ratio	Flow ratio	= 0.50

Hydrograph Volume = 12,898 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

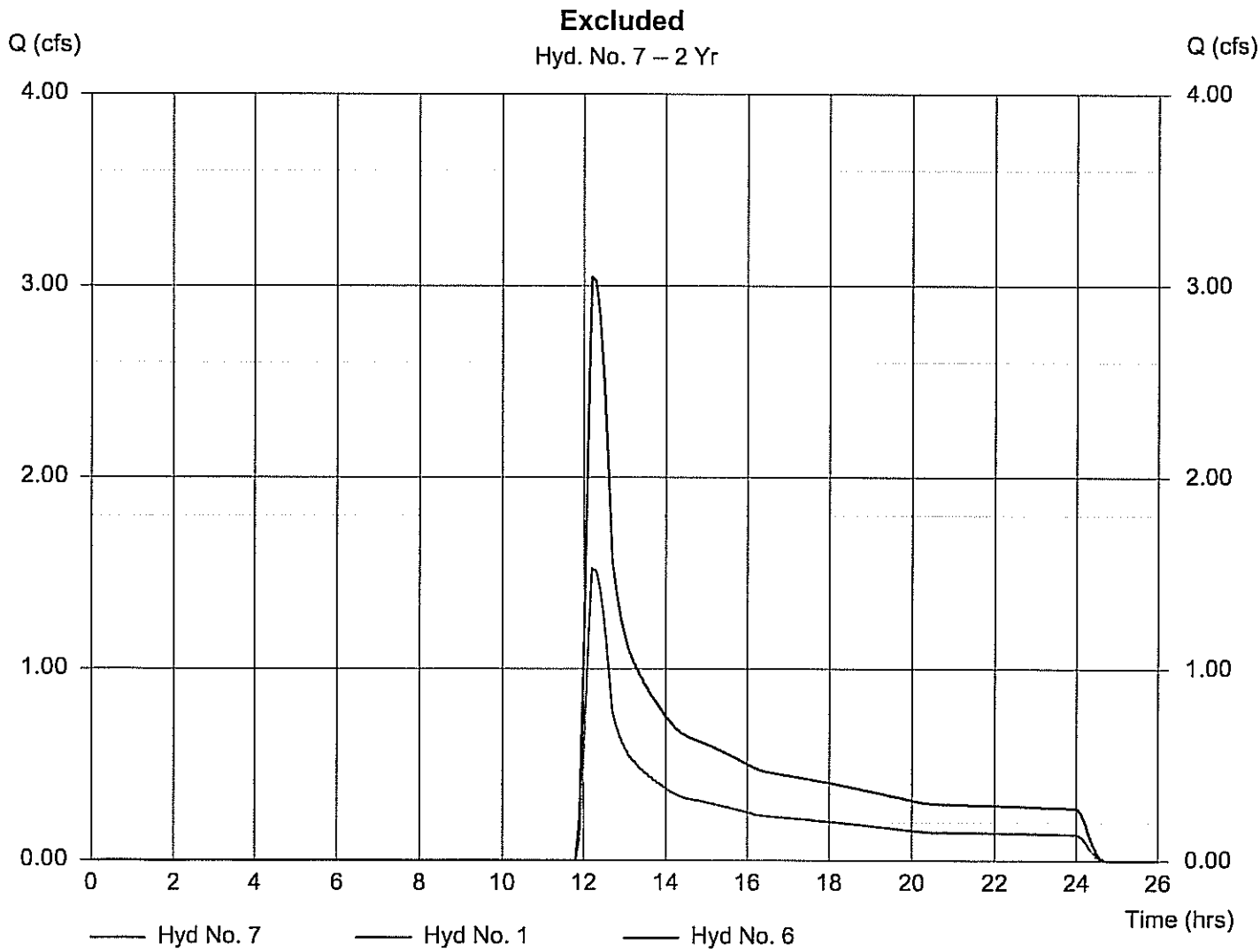
Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 7

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 1.52 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 6
Diversion method	= Flow Ratio	Flow ratio	= 0.50

Hydrograph Volume = 12,898 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

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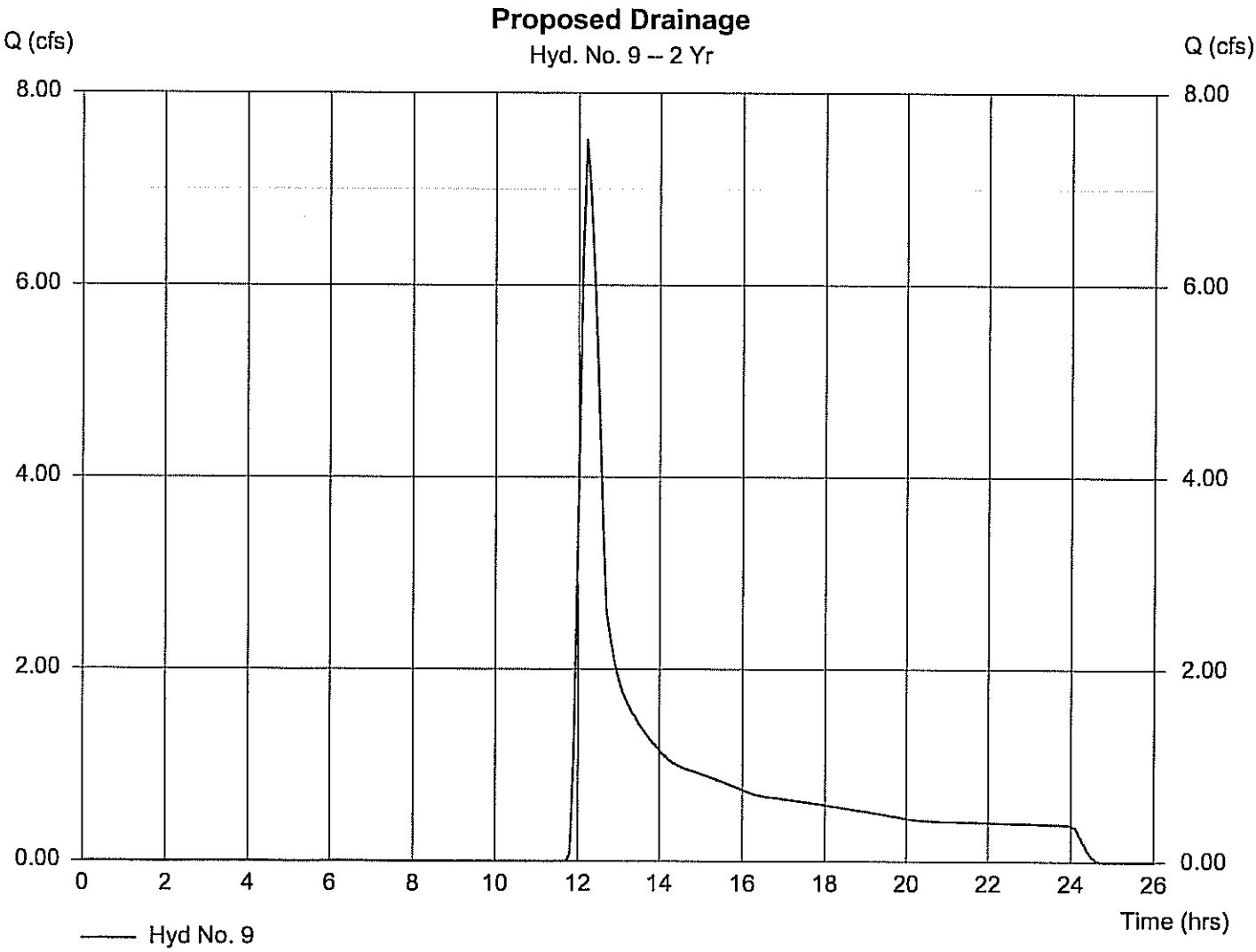
Hyd. No. 9

Proposed Drainage

Hydrograph type	= SCS Runoff	Peak discharge	= 7.52 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 25.470 ac	Curve number	= 63
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.40 min
Total precip.	= 3.10 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 43,859 cuft



TR55 Tc Worksheet

Hyd. No. 9

Proposed Drainage

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.240		0.011		0.011		
Flow length (ft)	=	150.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.10		0.00		0.00		
Land slope (%)	=	3.30		0.00		0.00		
Travel Time (min)	=	**16.41**	+	**0.00**	+	**0.00**	=	**16.41**
Shallow Concentrated Flow								
Flow length (ft)	=	900.00		0.00		0.00		
Watercourse slope (%)	=	3.50		0.00		0.00		
Surface description	=	Unpaved		Paved		Paved		
Average velocity (ft/s)	=	3.02		0.00		0.00		
Travel Time (min)	=	**4.97**	+	**0.00**	+	**0.00**	=	**4.97**
Channel Flow								
X sectional flow area (sqft)	=	0.00		0.00		0.00		
Wetted perimeter (ft)	=	0.00		0.00		0.00		
Channel slope (%)	=	0.00		0.00		0.00		
Manning's n-value	=	0.240		0.015		0.015		
Velocity (ft/s)	=	0.00		0.00		0.00		
Flow length (ft)	=	0.0		0.0		0.0		
Travel Time (min)	=	**0.00**	+	**0.00**	+	**0.00**	=	**0.00**

Total Travel Time, Tc ..... **21.40 min**

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

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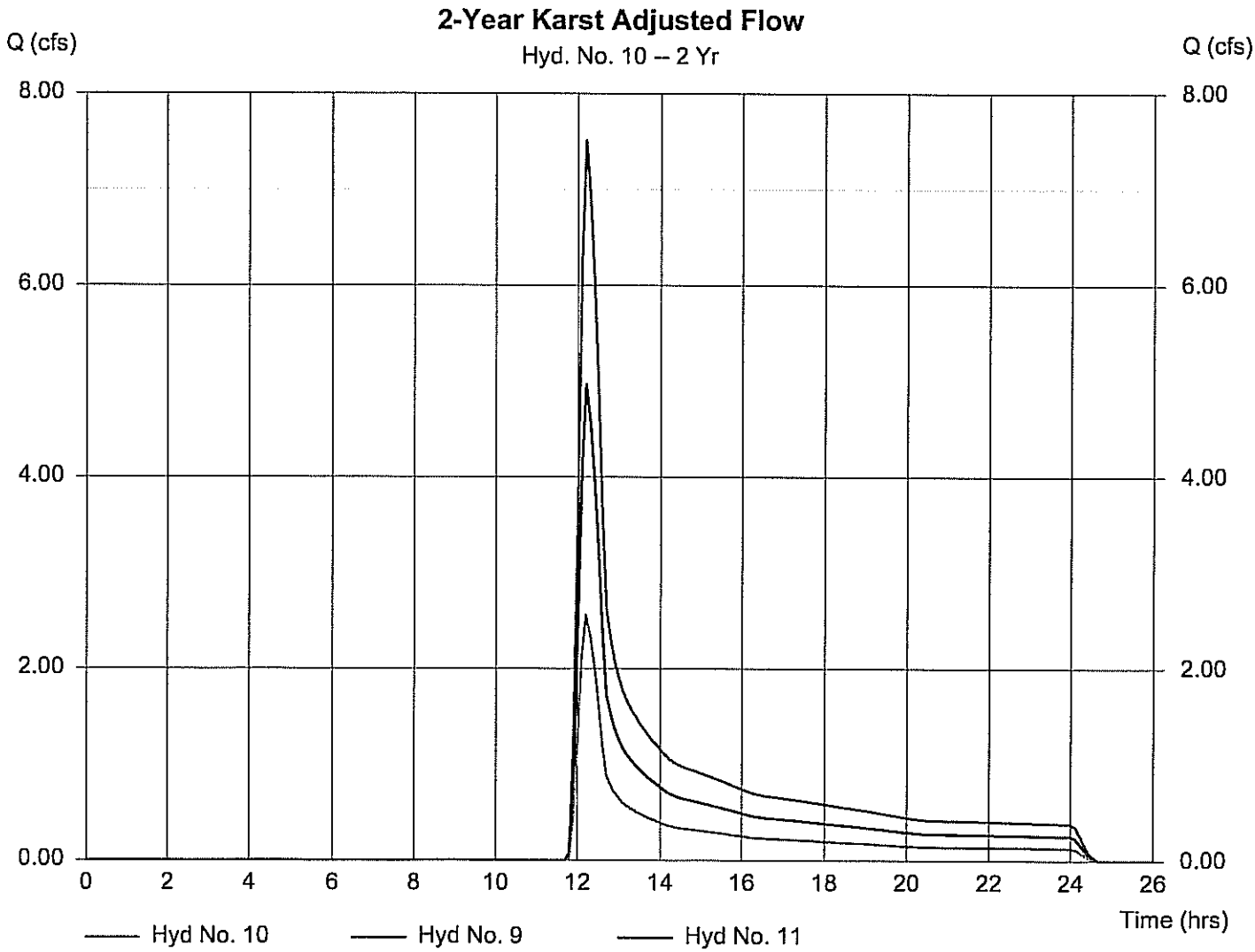
Hyd. No. 10

2-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 2.56 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 11
Diversion method	= Flow Ratio	Flow ratio	= 0.34

Hydrograph Volume = 14,912 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

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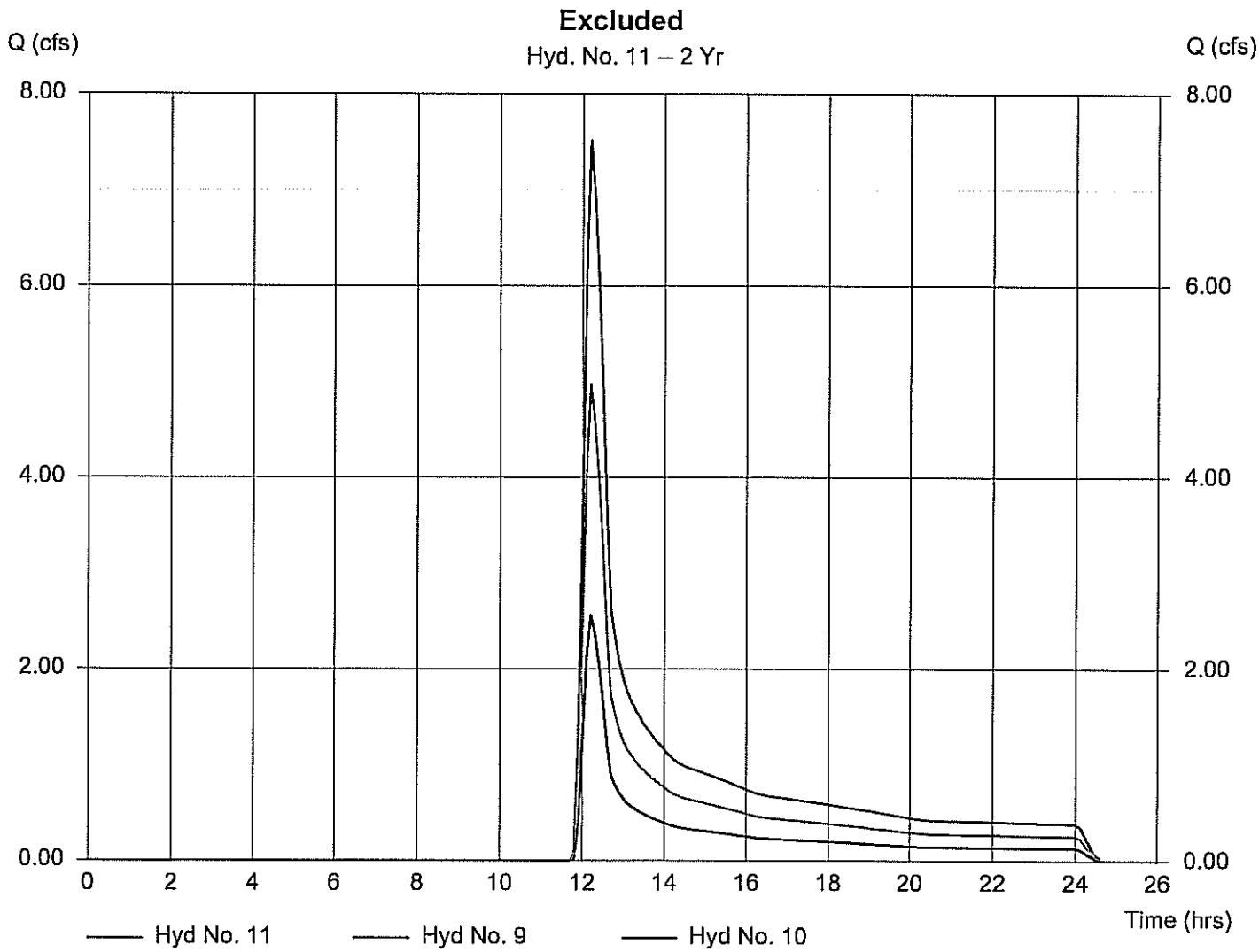
Hyd. No. 11

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 4.96 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 10
Diversion method	= Flow Ratio	Flow ratio	= 0.34

Hydrograph Volume = 28,947 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

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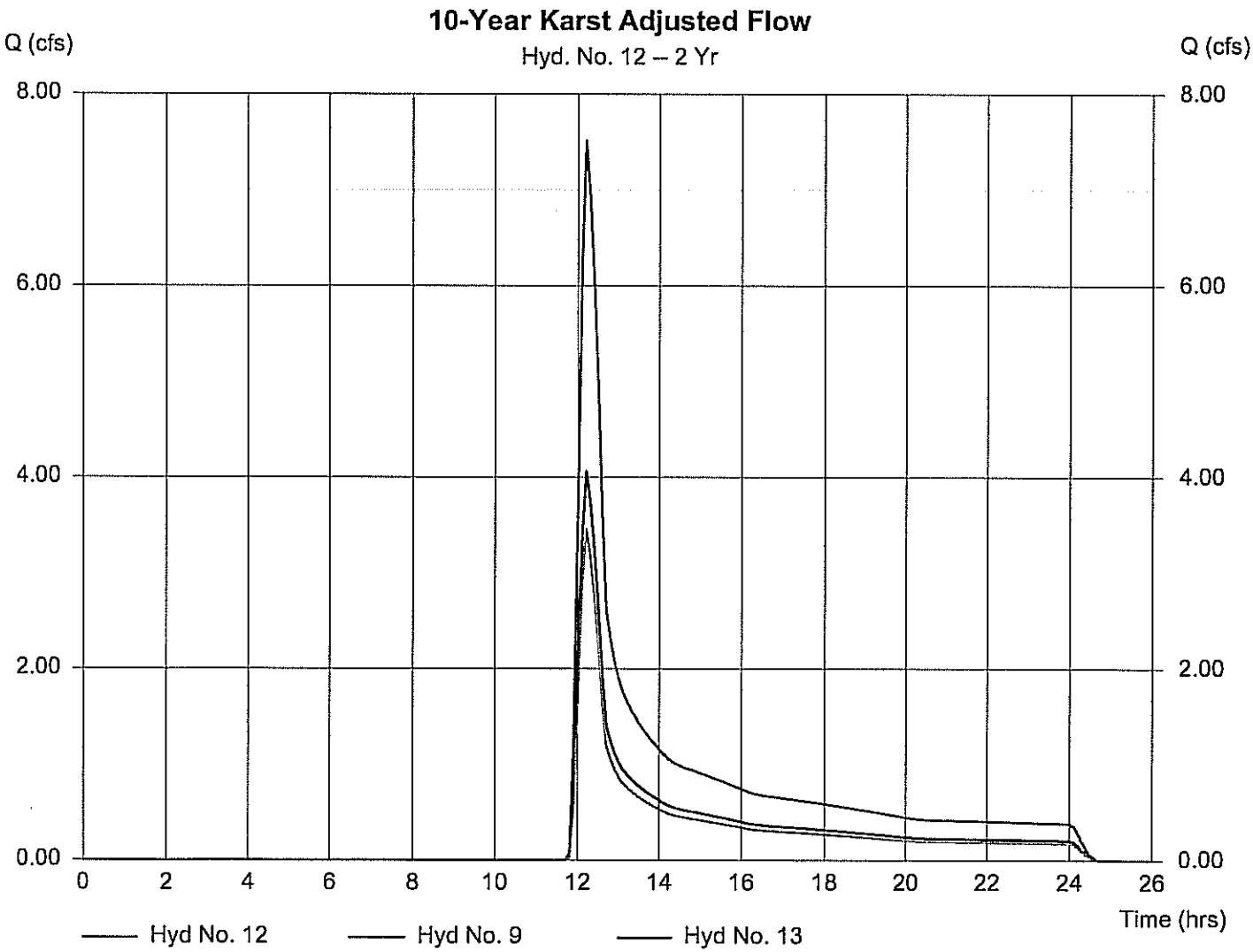
Hyd. No. 12

10-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 3.46 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 13
Diversion method	= Flow Ratio	Flow ratio	= 0.46

Hydrograph Volume = 20,175 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

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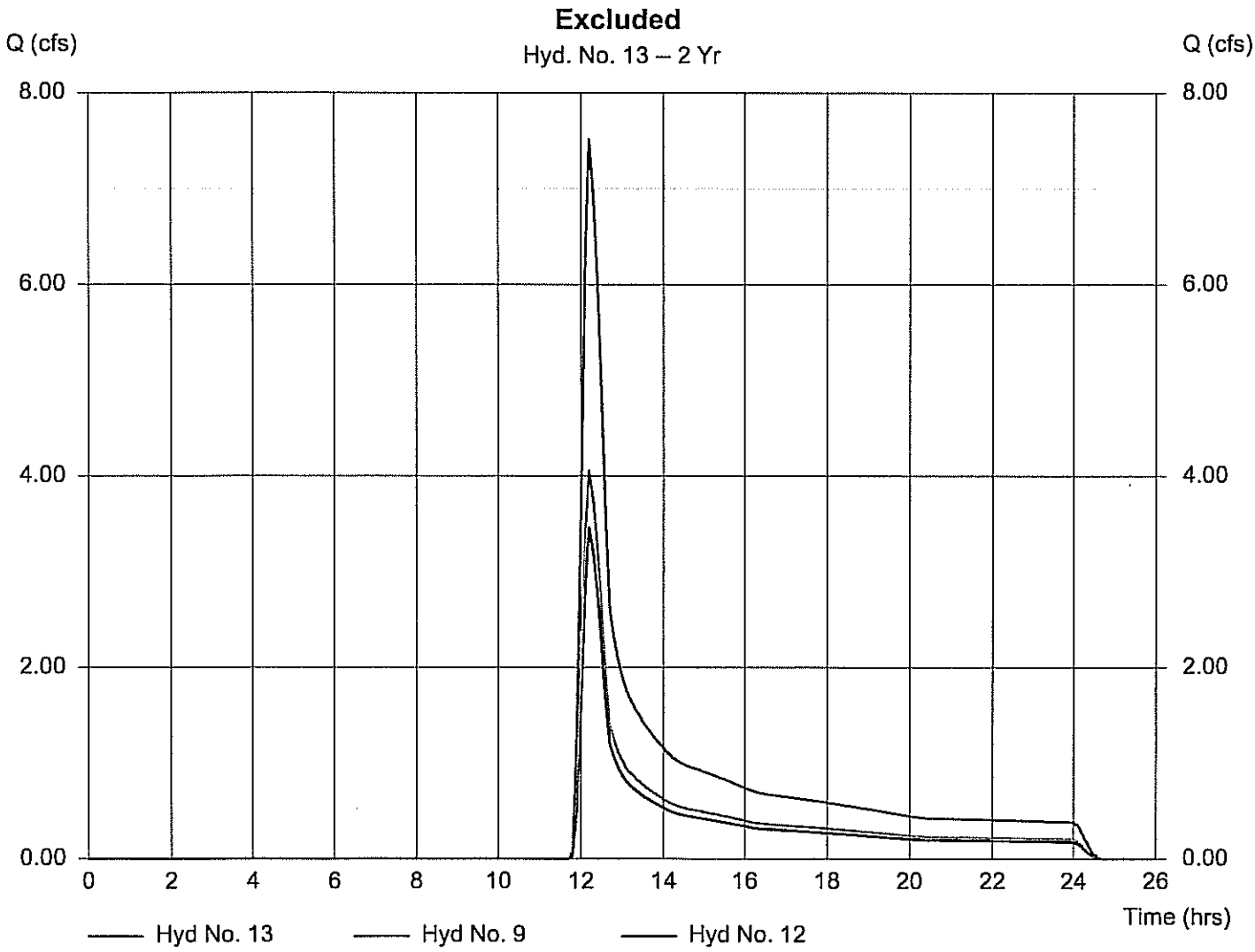
Hyd. No. 13

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 4.06 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 12
Diversion method	= Flow Ratio	Flow ratio	= 0.46

Hydrograph Volume = 23,684 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

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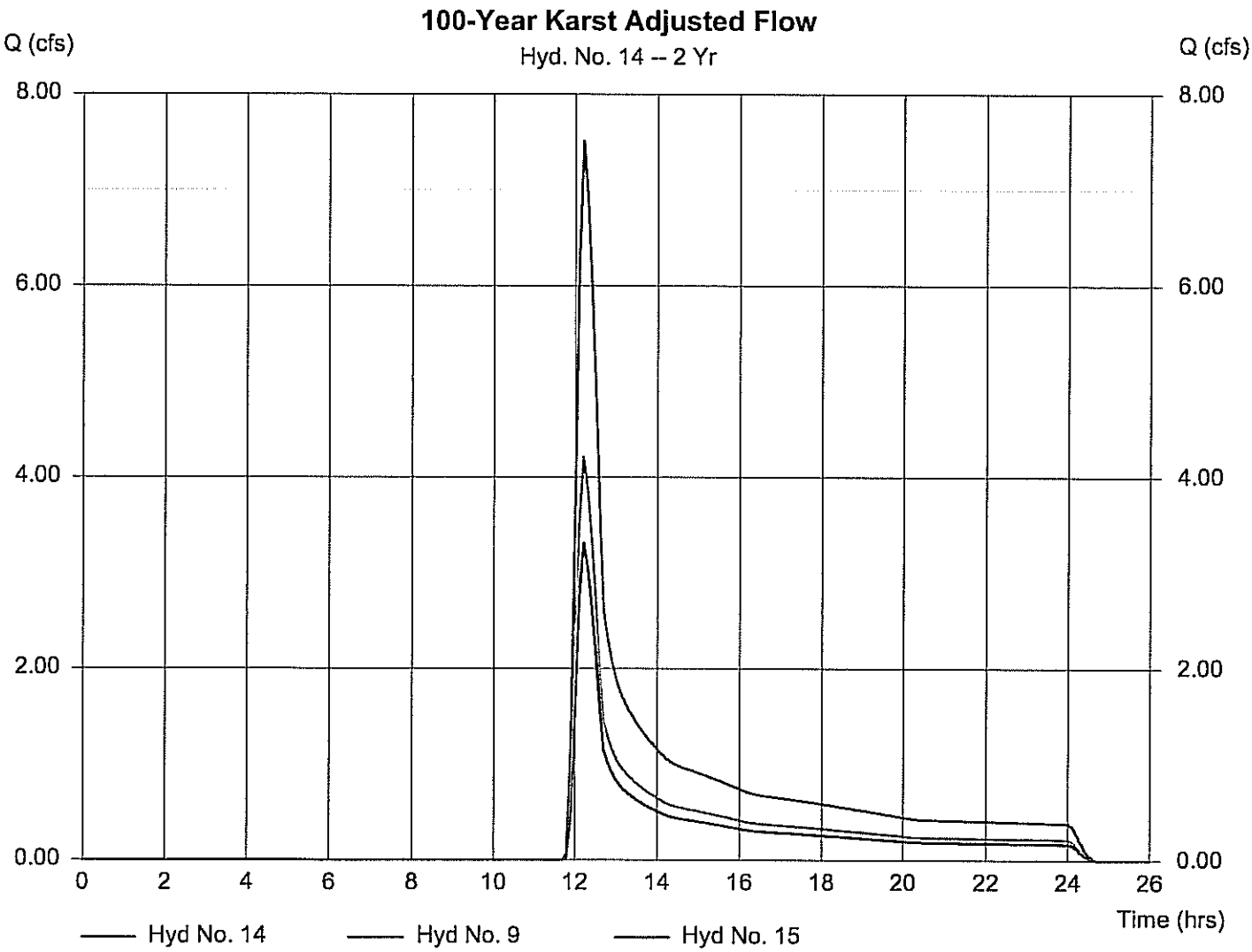
Hyd. No. 14

100-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 4.21 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 15
Diversion method	= Flow Ratio	Flow ratio	= 0.56

Hydrograph Volume = 24,561 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

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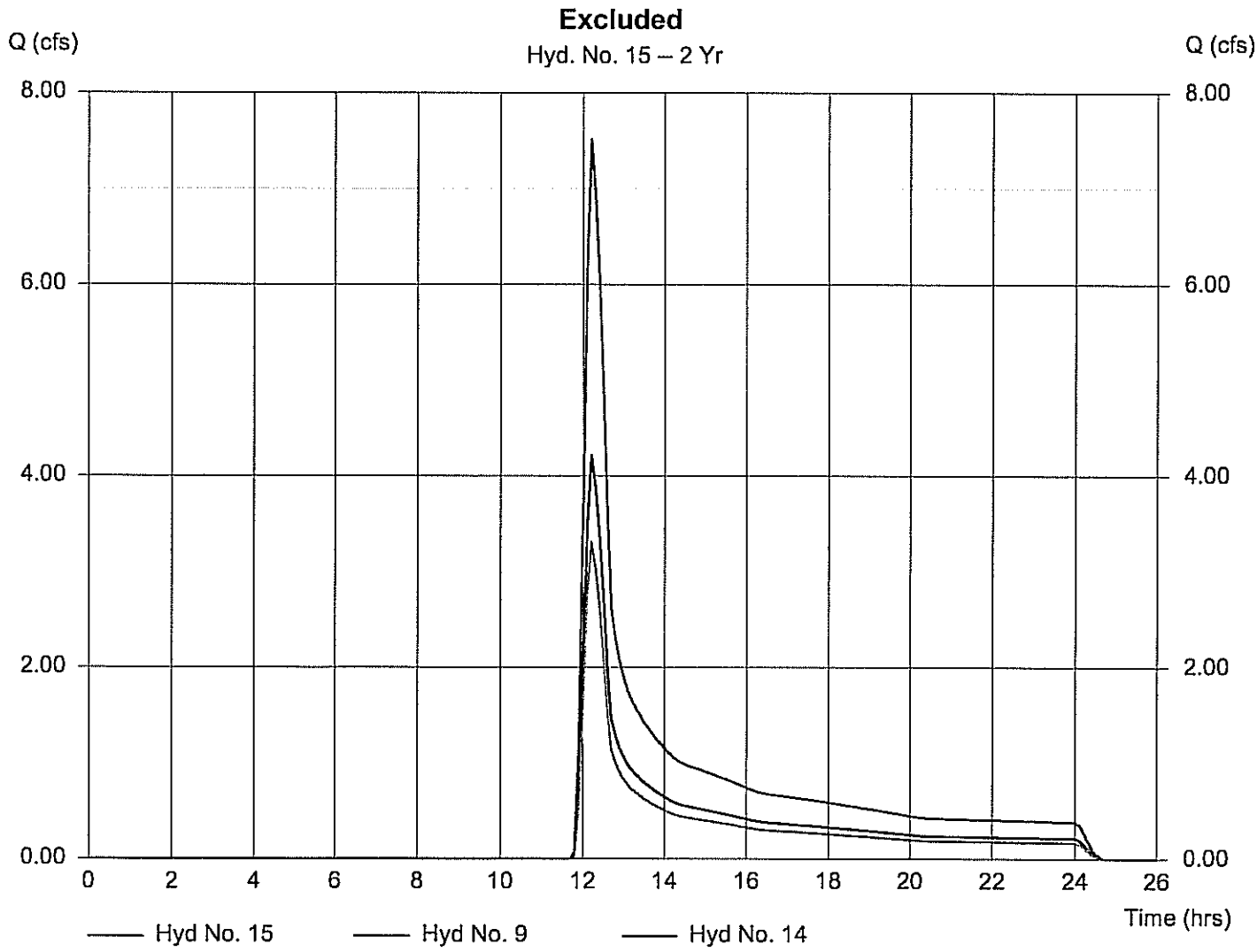
Hyd. No. 15

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 3.31 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 14
Diversion method	= Flow Ratio	Flow ratio	= 0.56

Hydrograph Volume = 19,298 cuft



Hydrograph Plot

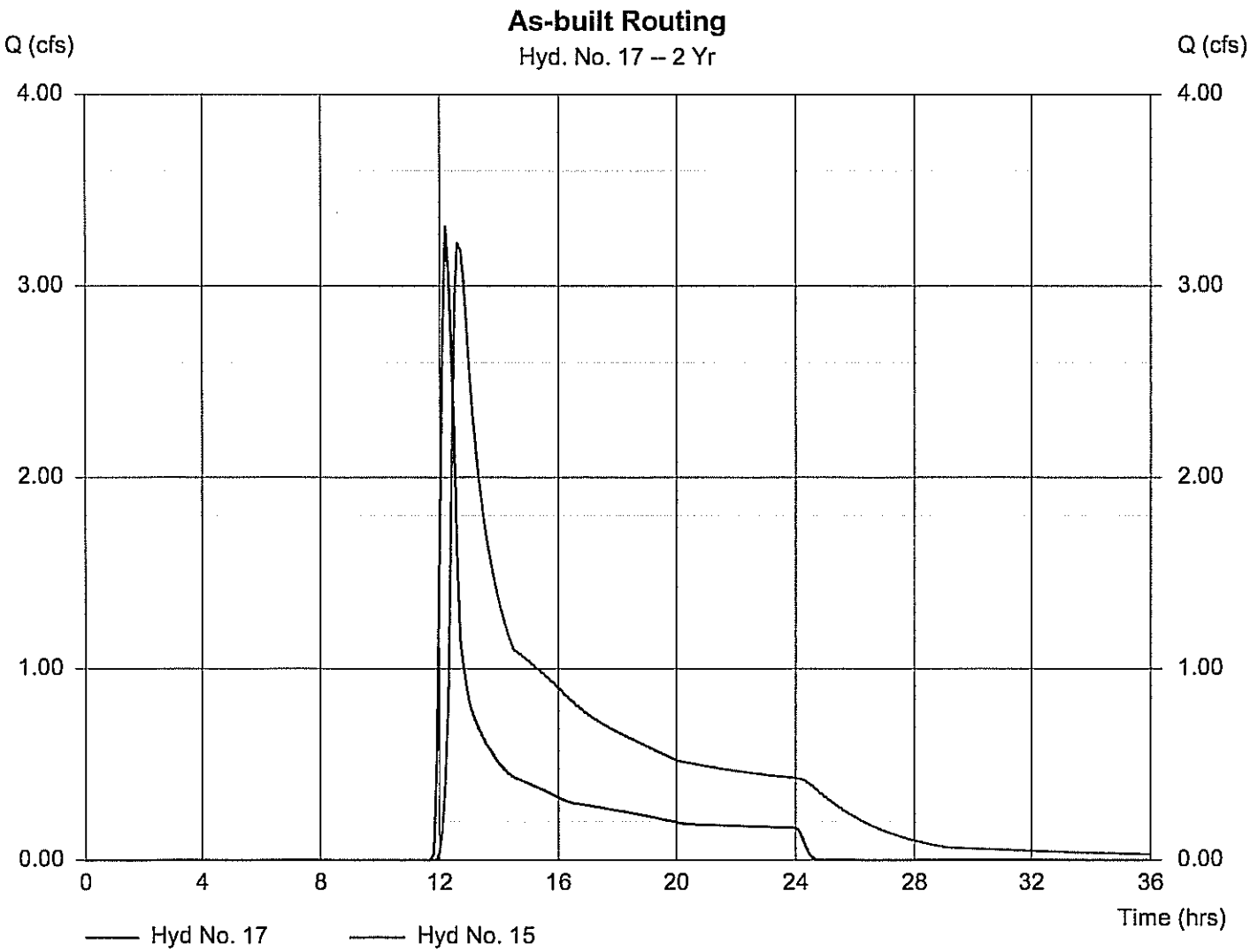
Hydraflow Hydrographs by Intelisolve | Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 17

As-built Routing

Hydrograph type	= Reservoir	Peak discharge	= 3.22 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hyd. No.	= 15	Max. Elevation	= 394.01 ft
Reservoir name	= As-Built Pond	Max. Storage	= 27,219 cuft

Storage Indication method used. Wet pond routing start elevation = 393.00 ft. | Hydrograph Volume = 43,827 cuft



Pond Report

Hydraflow Hydrographs by Intelisolve

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Pond No. 1 - As-Built Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	390.00	97	0	0
2.00	392.00	5,511	5,608	5,608
4.00	394.00	15,810	21,321	26,929
6.00	396.00	24,411	40,221	67,150
8.00	398.00	33,625	58,036	125,186

Culvert / Orifice Structures

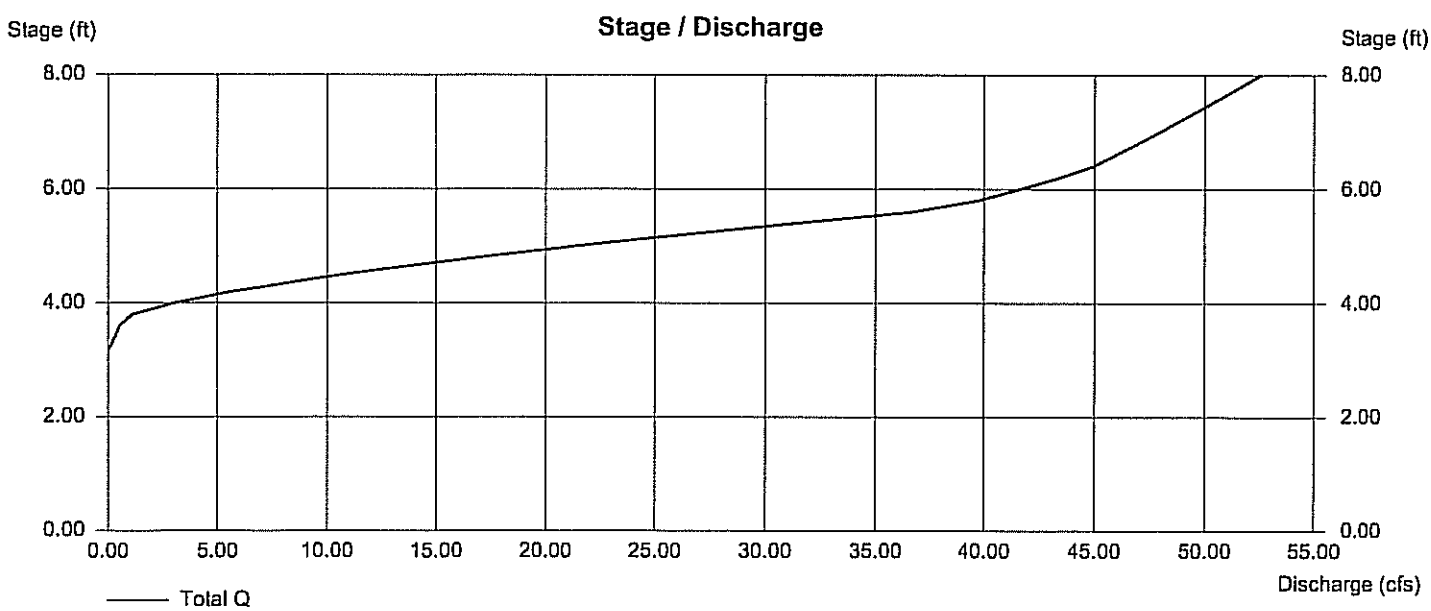
	[A]	[B]	[C]	[D]
Rise (in)	= 30.00	32.00	6.00	0.00
Span (in)	= 30.00	48.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 390.80	393.70	393.05	0.00
Length (ft)	= 60.58	0.00	0.00	0.00
Slope (%)	= 0.92	0.00	0.00	0.00
N-Value	= .013	.013	.013	.000
Orif. Coeff.	= 0.60	0.60	0.60	0.00
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 398.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Riser	—	—	---
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Plot

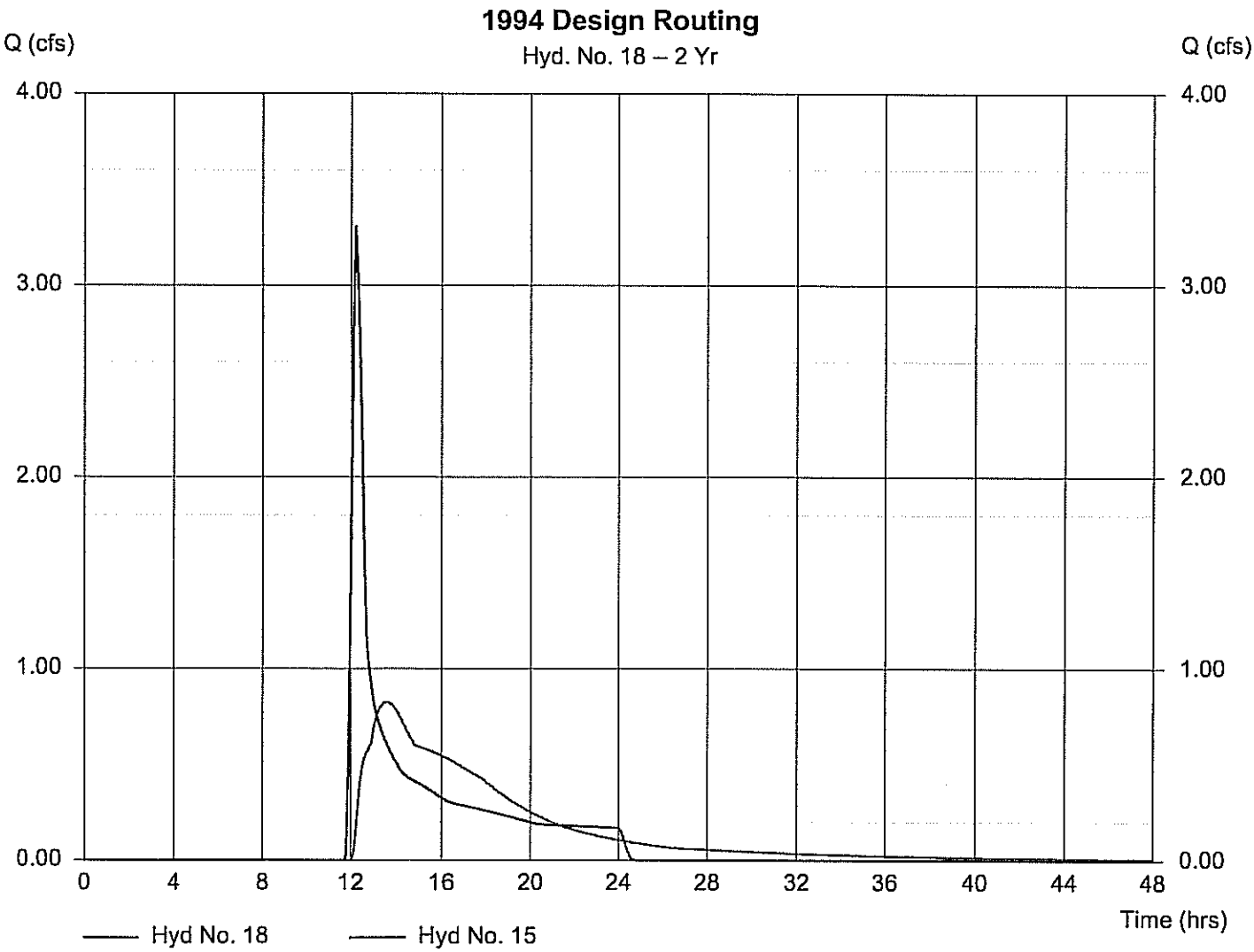
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 18

1994 Design Routing

Hydrograph type	= Reservoir	Peak discharge	= 0.82 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hyd. No.	= 15	Max. Elevation	= 393.75 ft
Reservoir name	= 1994 Proposed Pond	Max. Storage	= 51,774 cuft

Storage Indication method used. Wet pond routing start elevation = 393.00 ft. — Hydrograph Volume = 21,169 cuft



Pond Report

Hydraflow Hydrographs by Intellisolve — Thursday, Jul 26 2007, 10:58 AM

Pond No. 2 - 1994 Proposed Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	388.00	1,878	0	0
2.00	390.00	5,849	7,727	7,727
4.00	392.00	11,056	16,905	24,632
5.00	393.00	15,091	13,074	37,706
6.00	394.00	22,667	18,879	56,585
8.00	396.00	28,372	51,039	107,624
10.00	398.00	34,978	63,350	170,974

Culvert / Orifice Structures

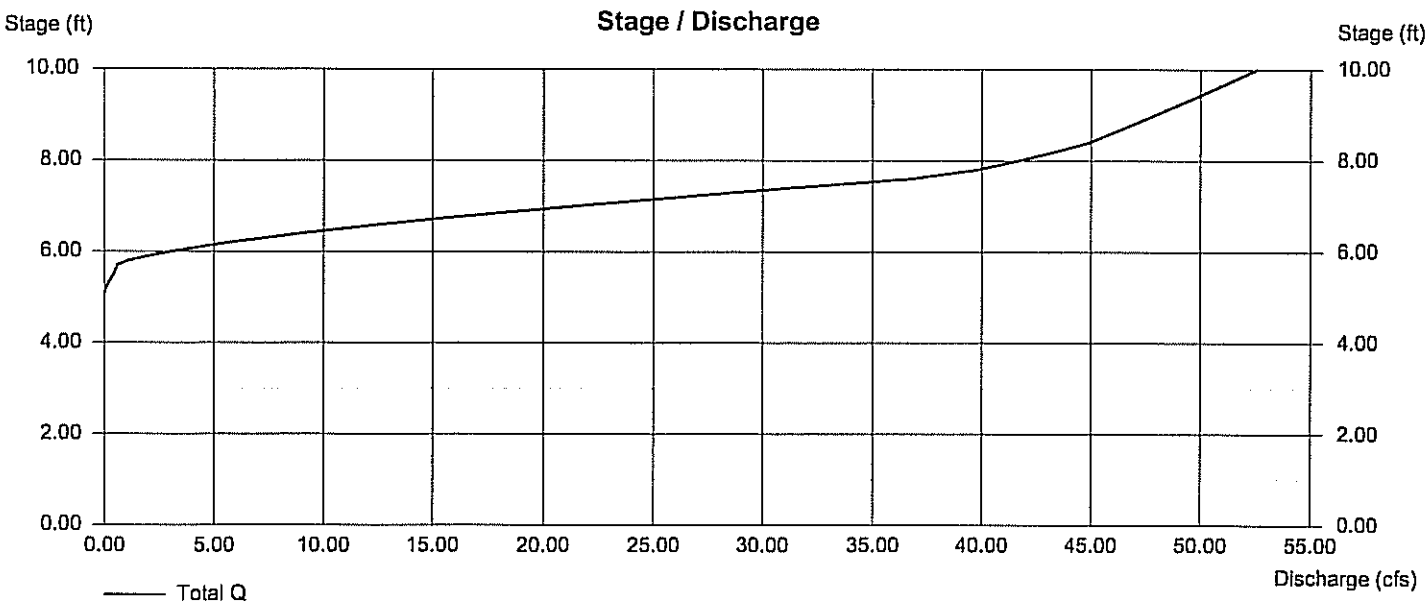
	[A]	[B]	[C]	[D]
Rise (in)	= 30.00	32.00	6.00	0.00
Span (in)	= 30.00	48.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 390.80	393.70	393.05	0.00
Length (ft)	= 60.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	0.00
N-Value	= .013	.013	.013	.000
Orif. Coeff.	= 0.60	0.60	0.60	0.00
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 398.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Plot

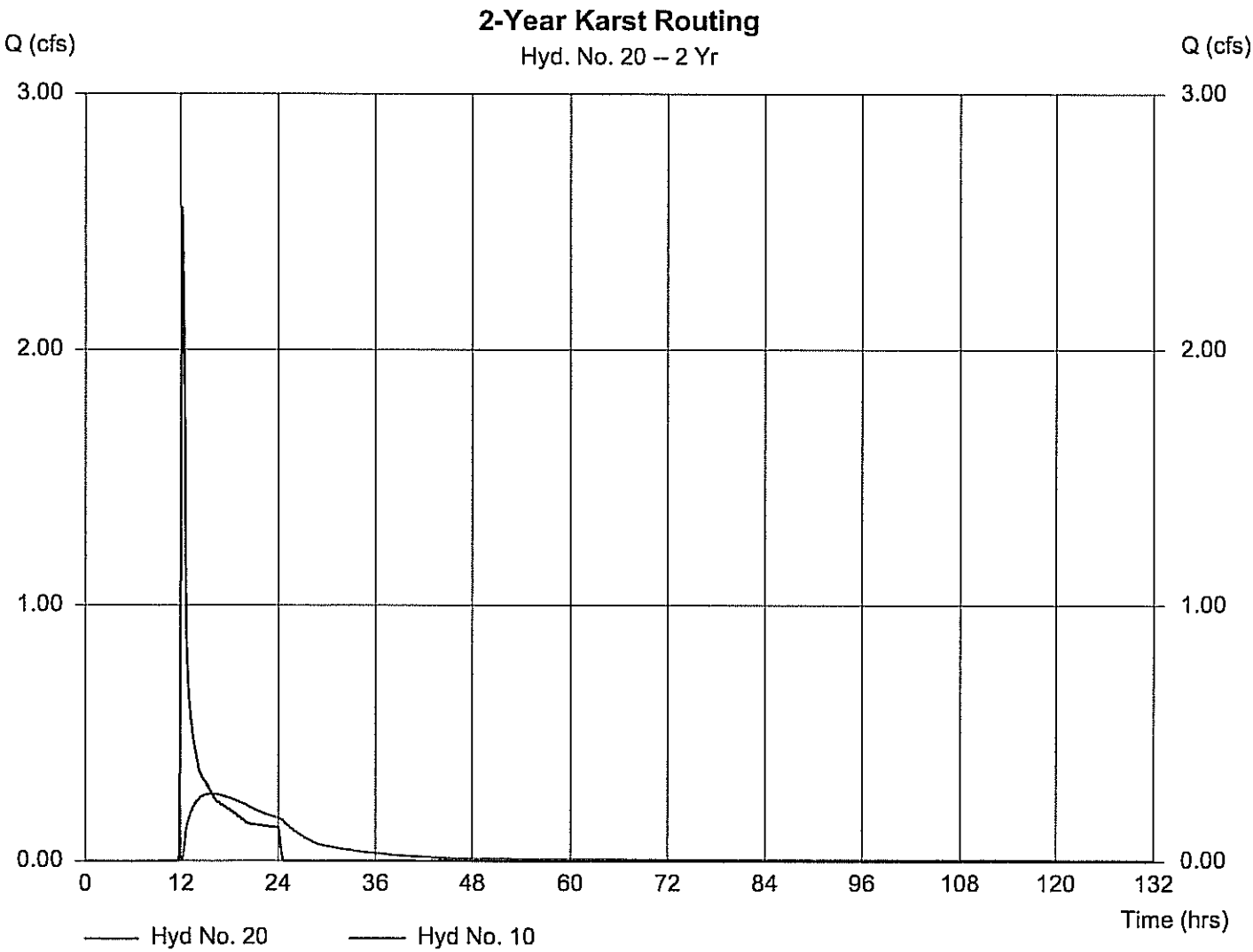
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 20

2-Year Karst Routing

Hydrograph type	= Reservoir	Peak discharge	= 0.26 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hyd. No.	= 10	Max. Elevation	= 393.37 ft
Reservoir name	= 1994 Proposed Pond	Max. Storage	= 44,738 cuft

Storage Indication method used. Wet pond routing start elevation = 393.00 ft. — Hydrograph Volume = 14,670 cuft



Pond Report

Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Pond No. 2 - 1994 Proposed Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	388.00	1,878	0	0
2.00	390.00	5,849	7,727	7,727
4.00	392.00	11,056	16,905	24,632
5.00	393.00	15,091	13,074	37,706
6.00	394.00	22,667	18,879	56,585
8.00	396.00	28,372	51,039	107,624
10.00	398.00	34,978	63,350	170,974

Culvert / Orifice Structures

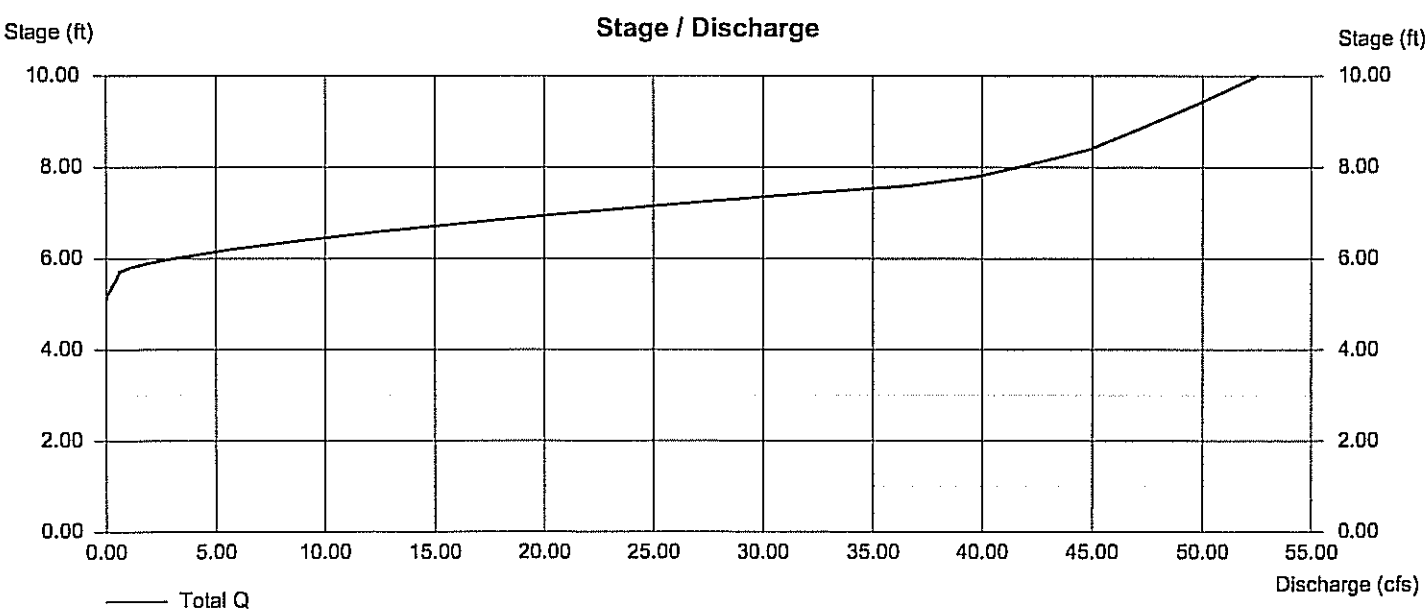
	[A]	[B]	[C]	[D]
Rise (in)	= 30.00	32.00	6.00	0.00
Span (in)	= 30.00	48.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 390.80	393.70	393.05	0.00
Length (ft)	= 60.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	0.00
N-Value	= .013	.013	.013	.000
Orif. Coeff.	= 0.60	0.60	0.60	0.00
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 398.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Riser	—	—	—
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Plot

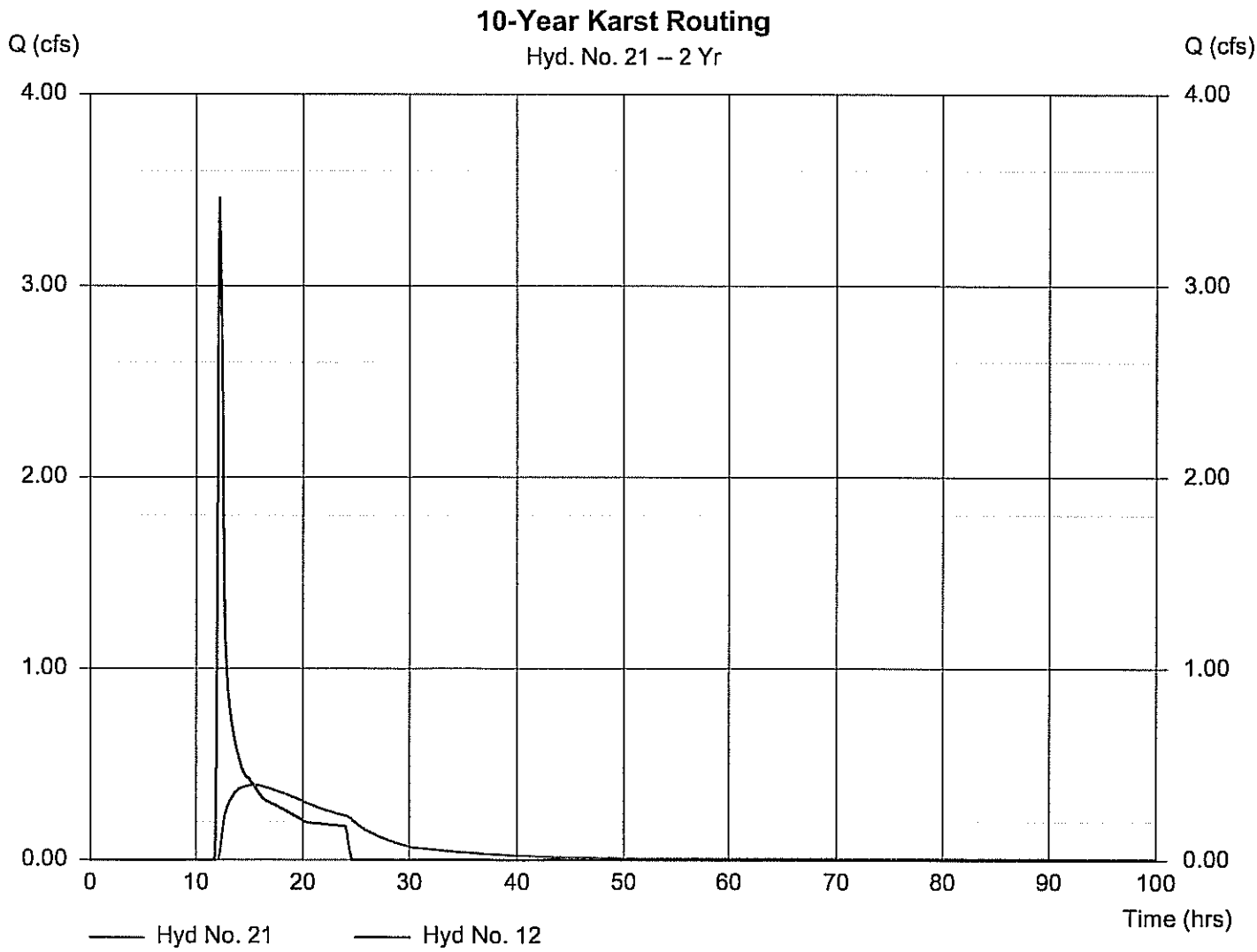
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 21

10-Year Karst Routing

Hydrograph type	= Reservoir	Peak discharge	= 0.39 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hyd. No.	= 12	Max. Elevation	= 393.47 ft
Reservoir name	= 1994 Proposed Pond	Max. Storage	= 46,621 cuft

Storage Indication method used. Wet pond routing start elevation = 393.00 ft. — Hydrograph Volume = 19,933 cuft



Pond Report

Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Pond No. 2 - 1994 Proposed Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	388.00	1,878	0	0
2.00	390.00	5,849	7,727	7,727
4.00	392.00	11,056	16,905	24,632
5.00	393.00	15,091	13,074	37,706
6.00	394.00	22,667	18,879	56,585
8.00	396.00	28,372	51,039	107,624
10.00	398.00	34,978	63,350	170,974

Culvert / Orifice Structures

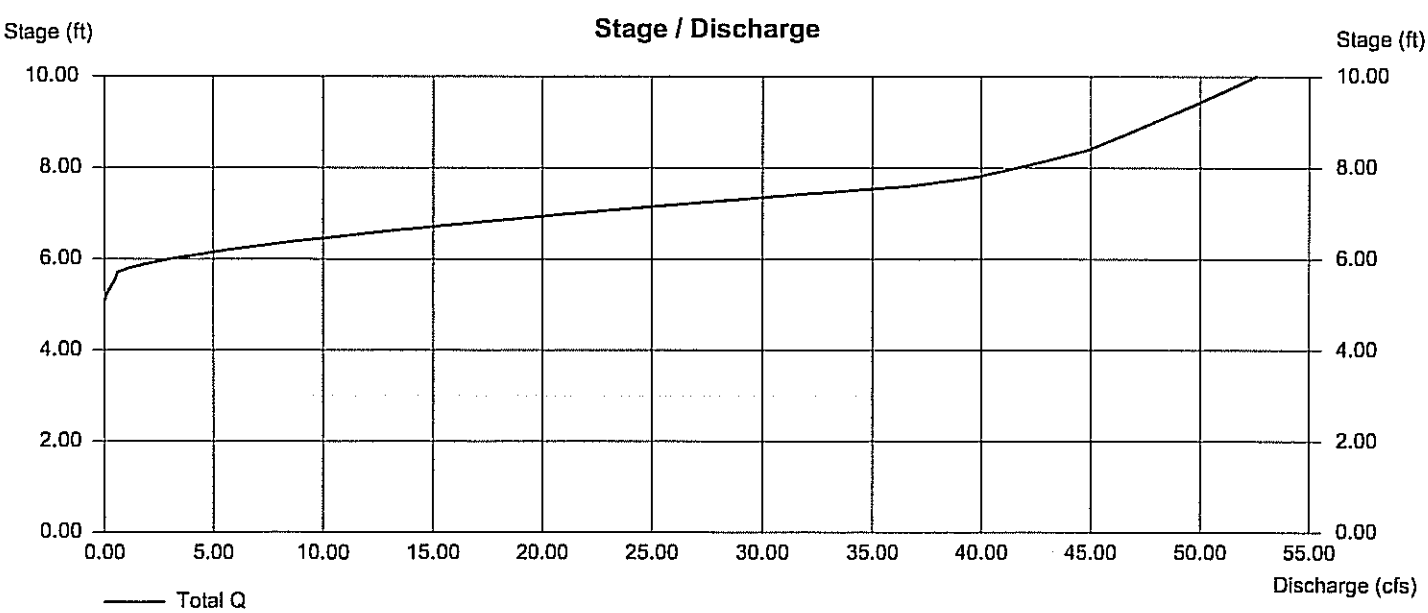
	[A]	[B]	[C]	[D]
Rise (in)	= 30.00	32.00	6.00	0.00
Span (in)	= 30.00	48.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 390.80	393.70	393.05	0.00
Length (ft)	= 60.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	0.00
N-Value	= .013	.013	.013	.000
Orif. Coeff.	= 0.60	0.60	0.60	0.00
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 398.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Riser	—	—	—
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Plot

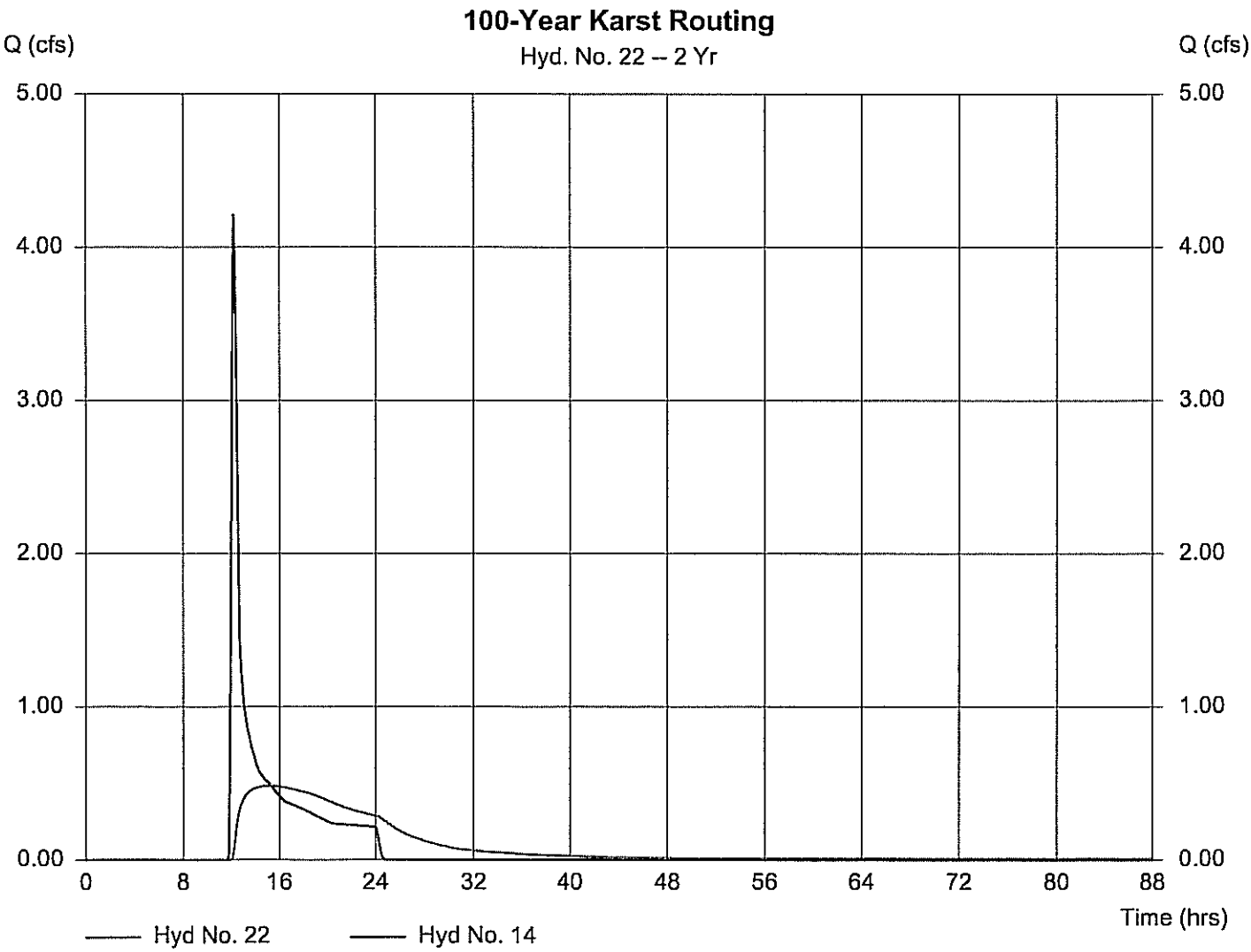
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 22

100-Year Karst Routing

Hydrograph type	= Reservoir	Peak discharge	= 0.48 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hyd. No.	= 14	Max. Elevation	= 393.56 ft
Reservoir name	= 1994 Proposed Pond	Max. Storage	= 48,304 cuft

Storage Indication method used. Wet pond routing start elevation = 393.00 ft. — Hydrograph Volume = 24,319 cuft



Pond Report

Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Pond No. 2 - 1994 Proposed Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	388.00	1,878	0	0
2.00	390.00	5,849	7,727	7,727
4.00	392.00	11,056	16,905	24,632
5.00	393.00	15,091	13,074	37,706
6.00	394.00	22,667	18,879	56,585
8.00	396.00	28,372	51,039	107,624
10.00	398.00	34,978	63,350	170,974

Culvert / Orifice Structures

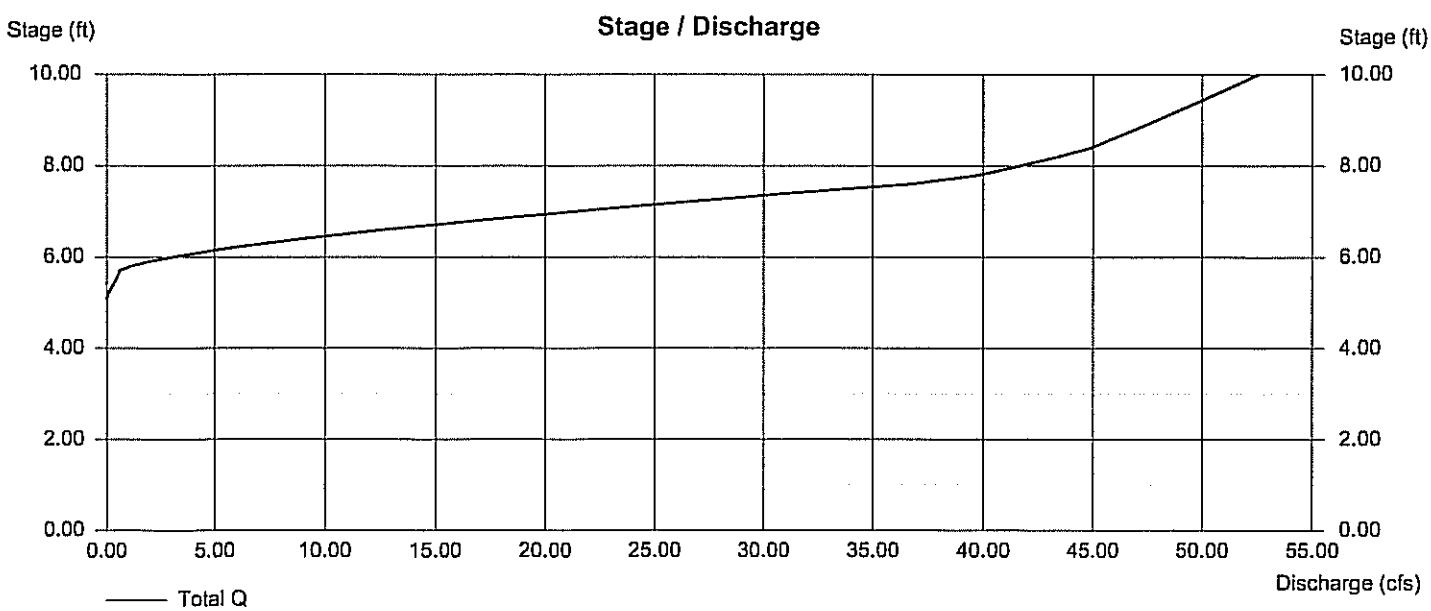
	[A]	[B]	[C]	[D]
Rise (in)	= 30.00	32.00	6.00	0.00
Span (in)	= 30.00	48.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 390.80	393.70	393.05	0.00
Length (ft)	= 60.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	0.00
N-Value	= .013	.013	.013	.000
Orif. Coeff.	= 0.60	0.60	0.60	0.00
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 398.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	20.35	6	732	96,511	---	------	------	Existing Drainage
2	Diversion1	6.71	6	732	31,849	1	------	------	2-Year Karst Adjusted Flow
3	Diversion2	13.63	6	732	64,662	1	------	------	Excluded
4	Diversion1	8.75	6	732	41,500	1	------	------	10-Year Karst Adjusted Flow
5	Diversion2	11.60	6	732	55,011	1	------	------	Excluded
6	Diversion1	10.17	6	732	48,256	1	------	------	100-Year Karst Adjusted Flow
7	Diversion2	10.17	6	732	48,256	1	------	------	Excluded
9	SCS Runoff	31.11	6	732	136,584	---	------	------	Proposed Drainage
10	Diversion1	10.58	6	732	46,438	9	------	------	2-Year Karst Adjusted Flow
11	Diversion2	20.53	6	732	90,145	9	------	------	Excluded
12	Diversion1	14.31	6	732	62,828	9	------	------	10-Year Karst Adjusted Flow
13	Diversion2	16.80	6	732	73,755	9	------	------	Excluded
14	Diversion1	17.42	6	732	76,487	9	------	------	100-Year Karst Adjusted Flow
15	Diversion2	13.69	6	732	60,097	9	------	------	Excluded
17	Reservoir	20.63	6	744	136,551	15	394.97	46,355	As-built Routing
18	Reservoir	15.68	6	750	110,214	15	394.74	75,541	1994 Design Routing
20	Reservoir	2.76	6	762	46,196	10	393.98	56,113	2-Year Karst Routing
21	Reservoir	4.98	6	756	62,586	12	394.15	60,303	10-Year Karst Routing
22	Reservoir	6.90	6	756	76,245	14	394.27	63,559	100-Year Karst Routing

NCTC.gpw	Return Period: 10 Year	Thursday, Jul 26 2007, 10:58 AM

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

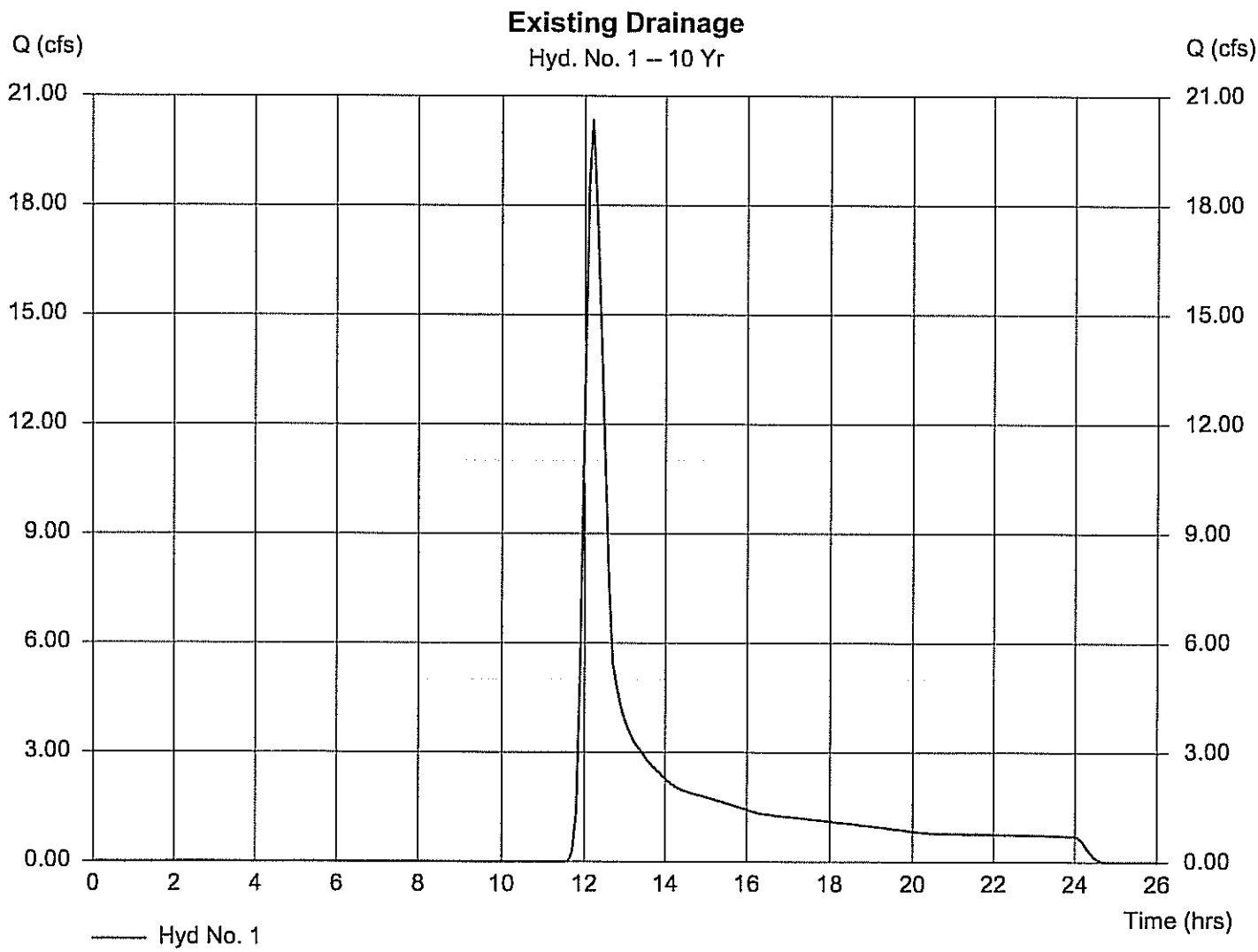
Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 1

Existing Drainage

Hydrograph type	= SCS Runoff	Peak discharge	= 20.35 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 23.300 ac	Curve number	= 58
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.20 min
Total precip.	= 4.95 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 96,511 cuft



TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve

Hyd. No. 1

Existing Drainage

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.240		0.011		0.011		
Flow length (ft)	=	150.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.10		0.00		0.00		
Land slope (%)	=	3.30		0.00		0.00		
Travel Time (min)	**=**	**16.41**	**+**	**0.00**	**+**	**0.00**	**=**	**16.41**
Shallow Concentrated Flow								
Flow length (ft)	=	900.00		0.00		0.00		
Watercourse slope (%)	=	3.80		0.00		0.00		
Surface description	=	Unpaved		Paved		Paved		
Average velocity (ft/s)	=	3.15		0.00		0.00		
Travel Time (min)	**=**	**4.77**	**+**	**0.00**	**+**	**0.00**	**=**	**4.77**
Channel Flow								
X sectional flow area (sqft)	=	0.00		0.00		0.00		
Wetted perimeter (ft)	=	0.00		0.00		0.00		
Channel slope (%)	=	0.00		0.00		0.00		
Manning's n-value	=	0.015		0.015		0.015		
Velocity (ft/s)	=	0.00		0.00		0.00		
Flow length (ft)	=	0.0		0.0		0.0		
Travel Time (min)	**=**	**0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 21.20 min

Hydrograph Plot

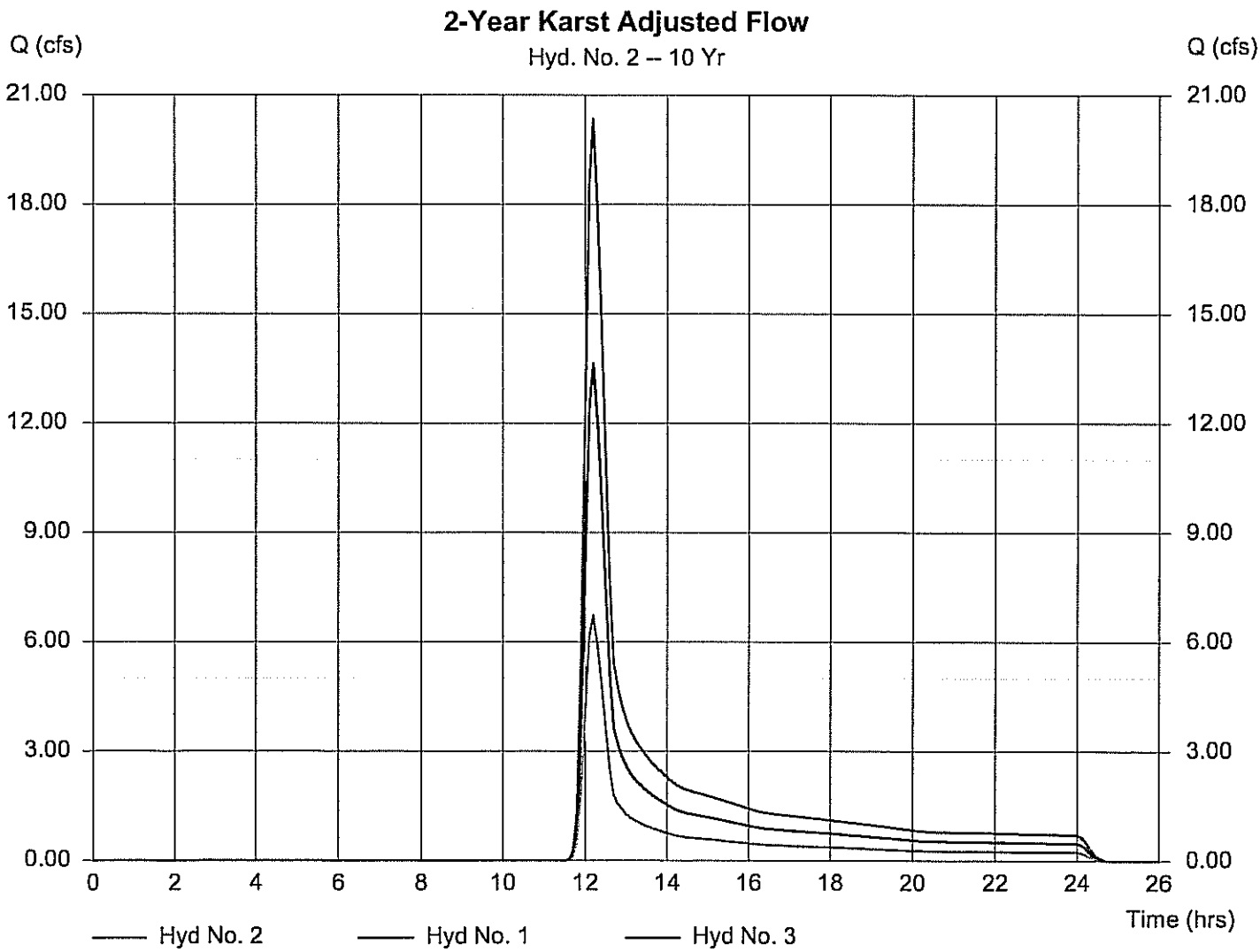
Hydraflow Hydrographs by Intellsolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 2

2-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 6.71 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 3
Diversion method	= Flow Ratio	Flow ratio	= 0.33

Hydrograph Volume = 31,849 cuft



Hydrograph Plot

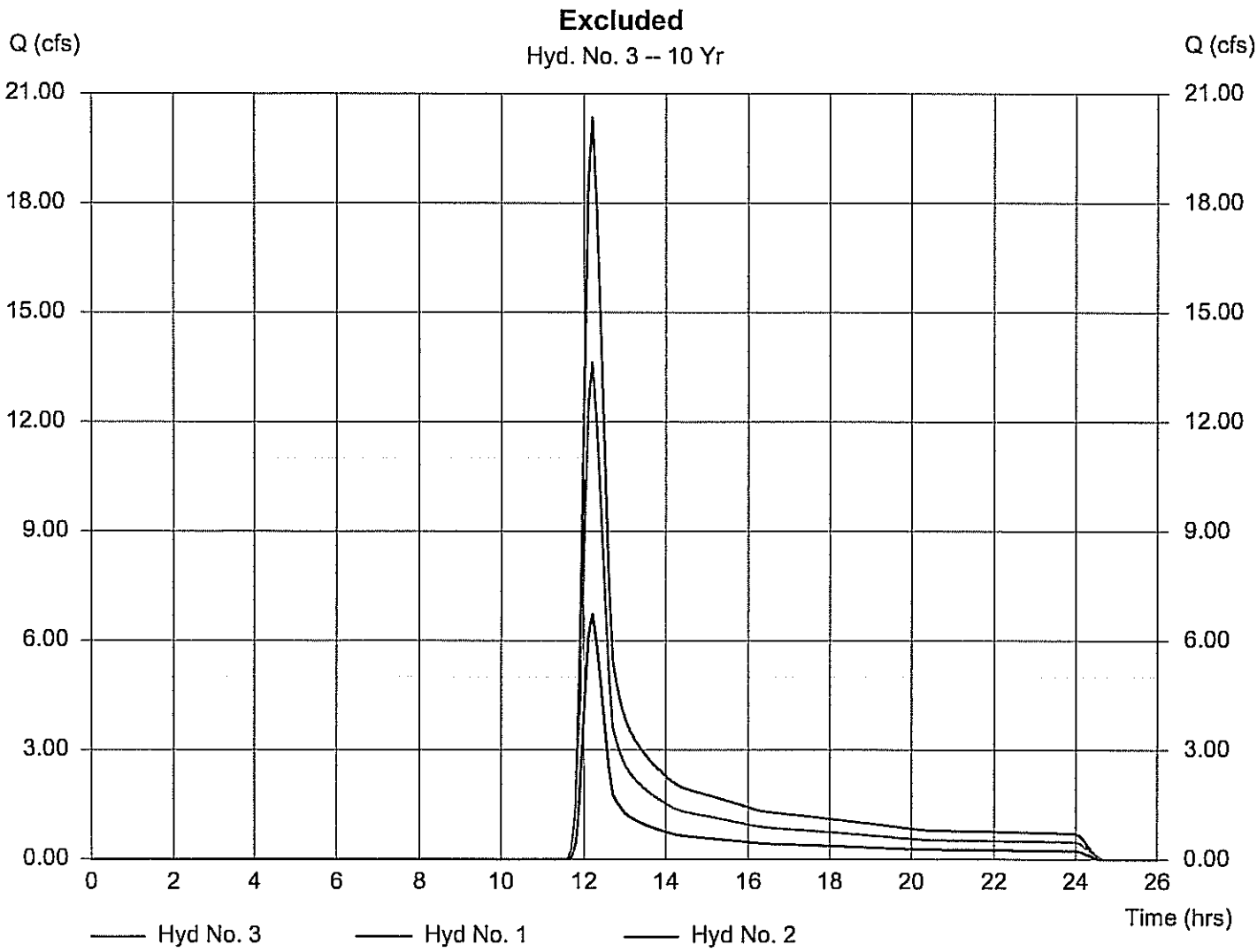
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 3

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 13.63 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 2
Diversion method	= Flow Ratio	Flow ratio	= 0.33

Hydrograph Volume = 64,662 cuft



Hydrograph Plot

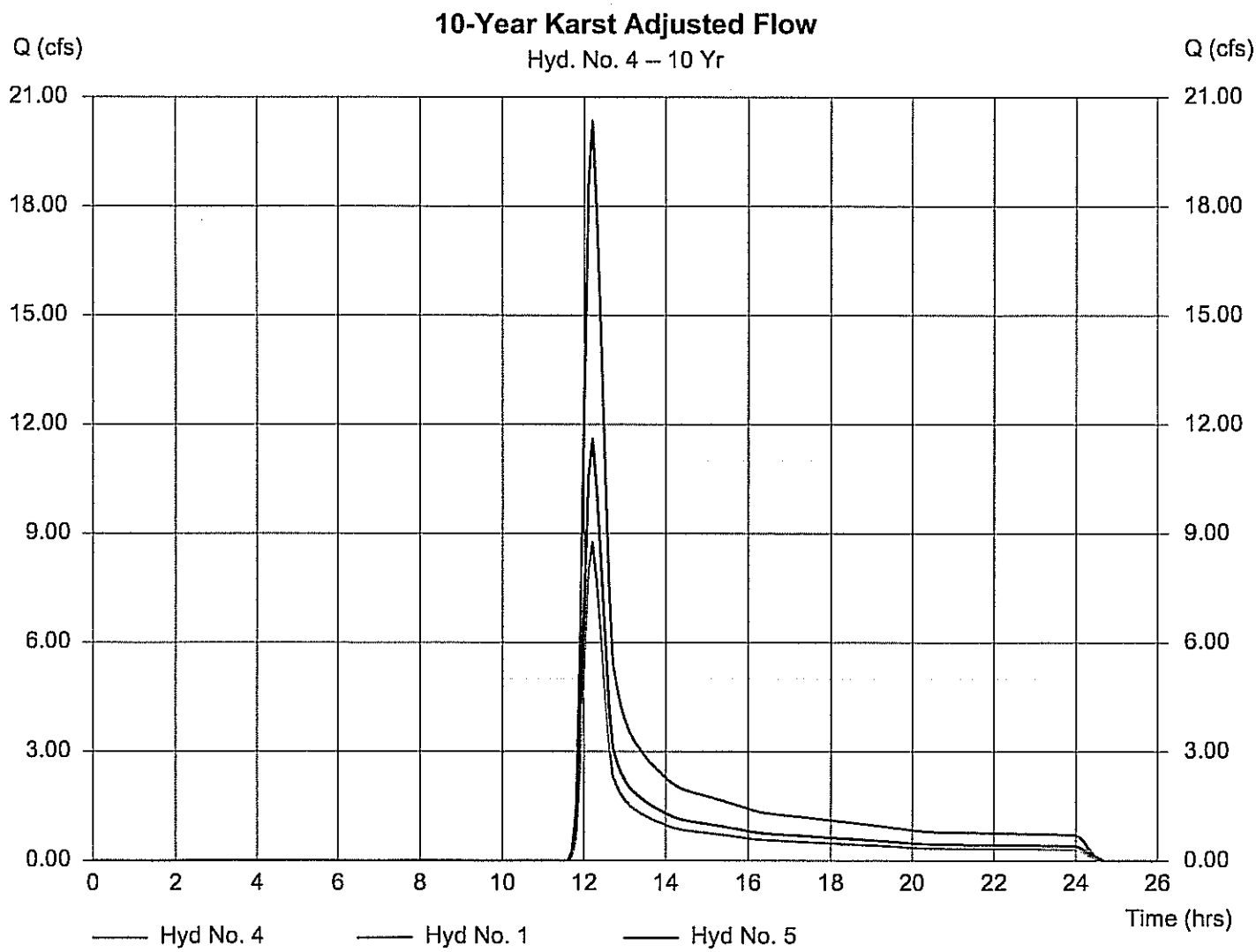
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 4

10-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 8.75 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 5
Diversion method	= Flow Ratio	Flow ratio	= 0.43

Hydrograph Volume = 41,500 cuft



Hydrograph Plot

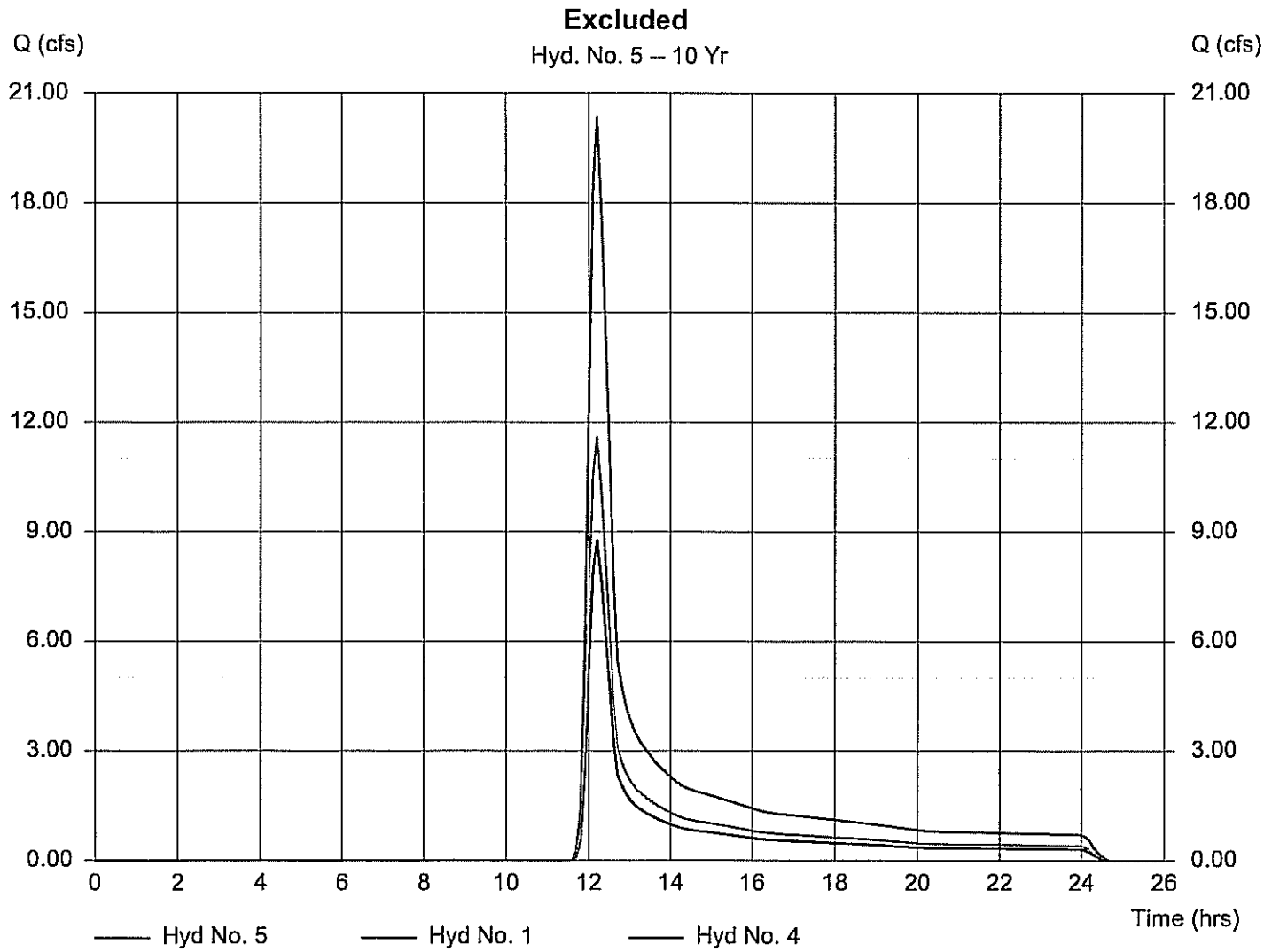
Hydraflow Hydrographs by Intelisolve | Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 5

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 11.60 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 4
Diversion method	= Flow Ratio	Flow ratio	= 0.43

Hydrograph Volume = 55,011 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

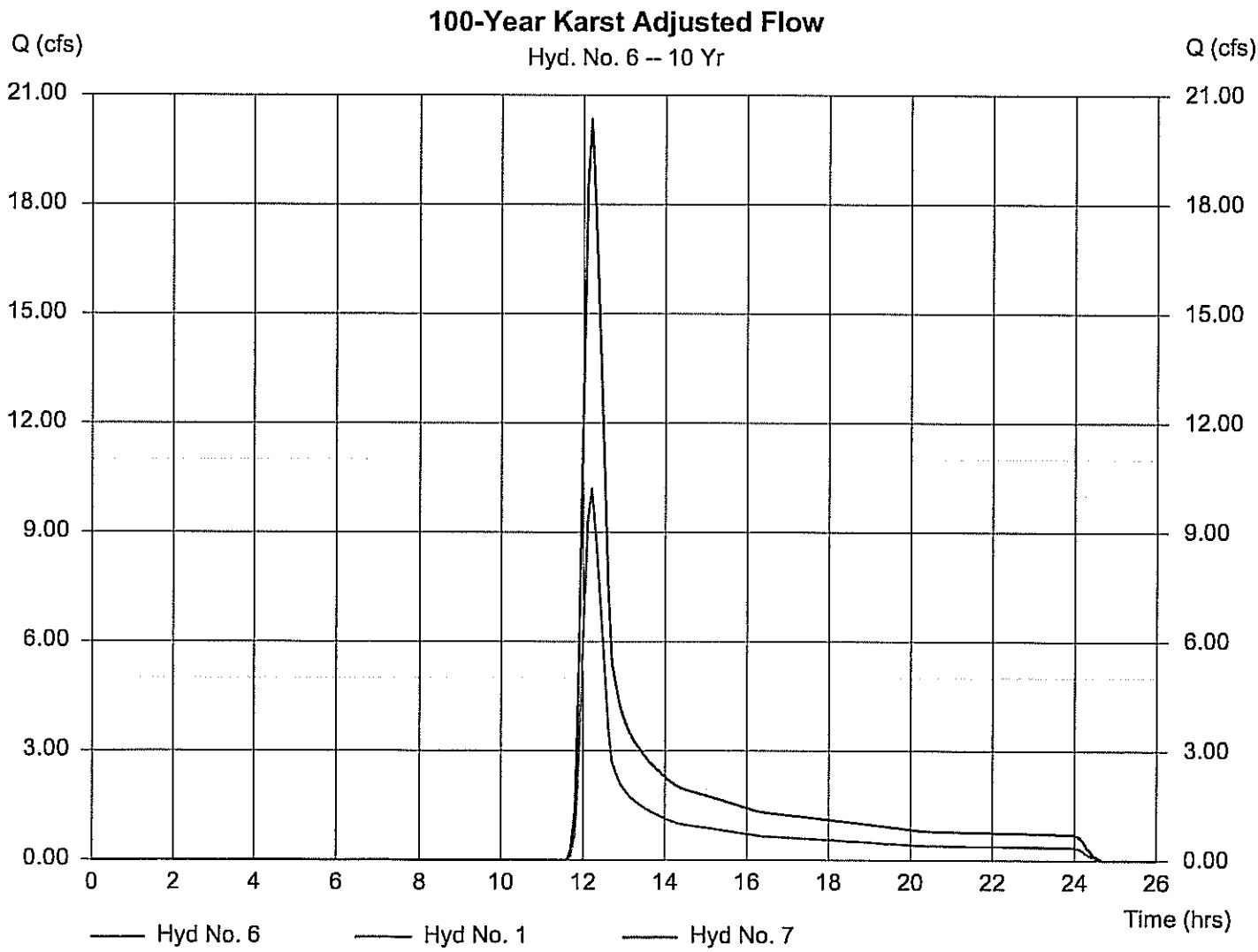
Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 6

100-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 10.17 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 7
Diversion method	= Flow Ratio	Flow ratio	= 0.50

Hydrograph Volume = 48,256 cuft



Hydrograph Plot

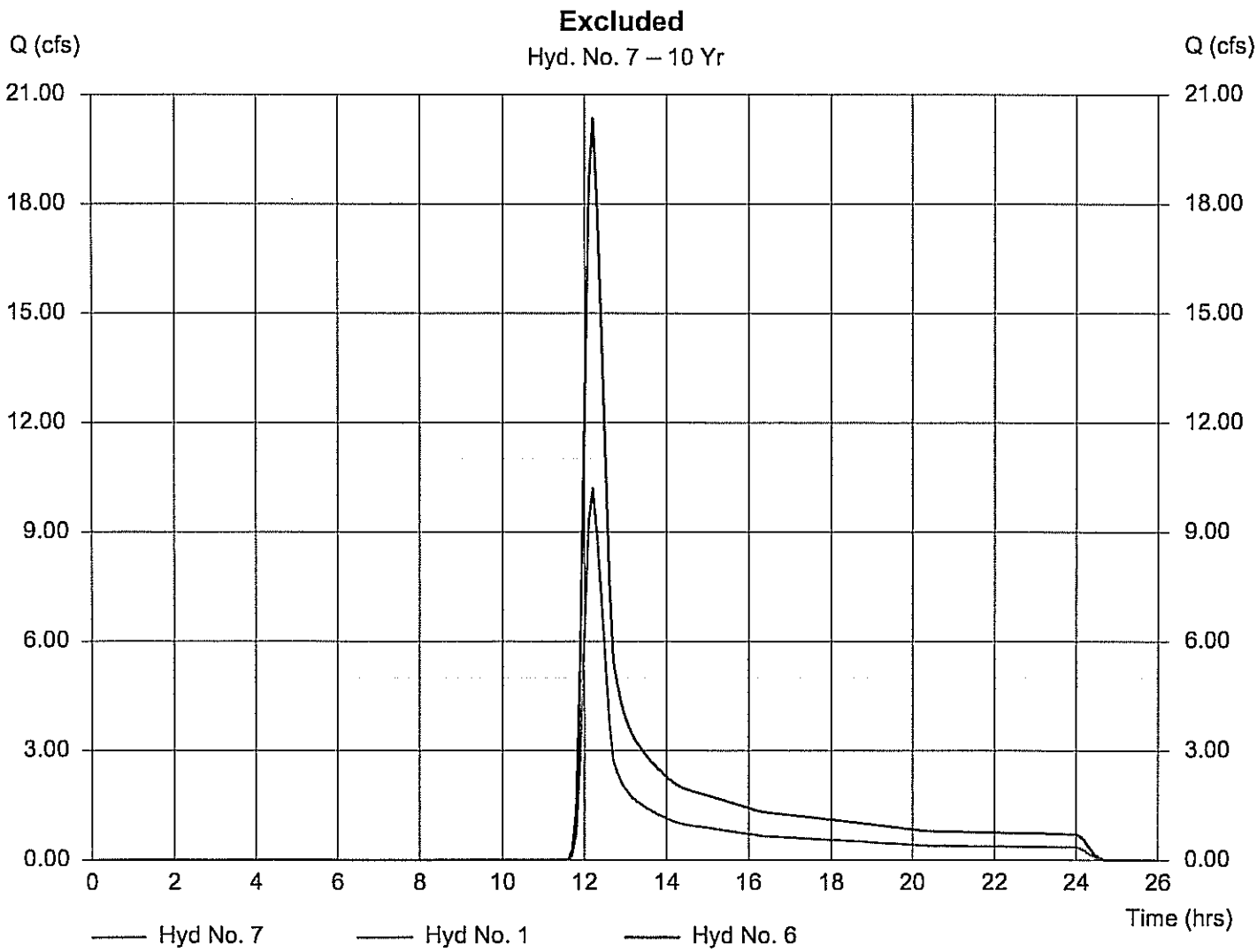
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 7

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 10.17 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 6
Diversion method	= Flow Ratio	Flow ratio	= 0.50

Hydrograph Volume = 48,256 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

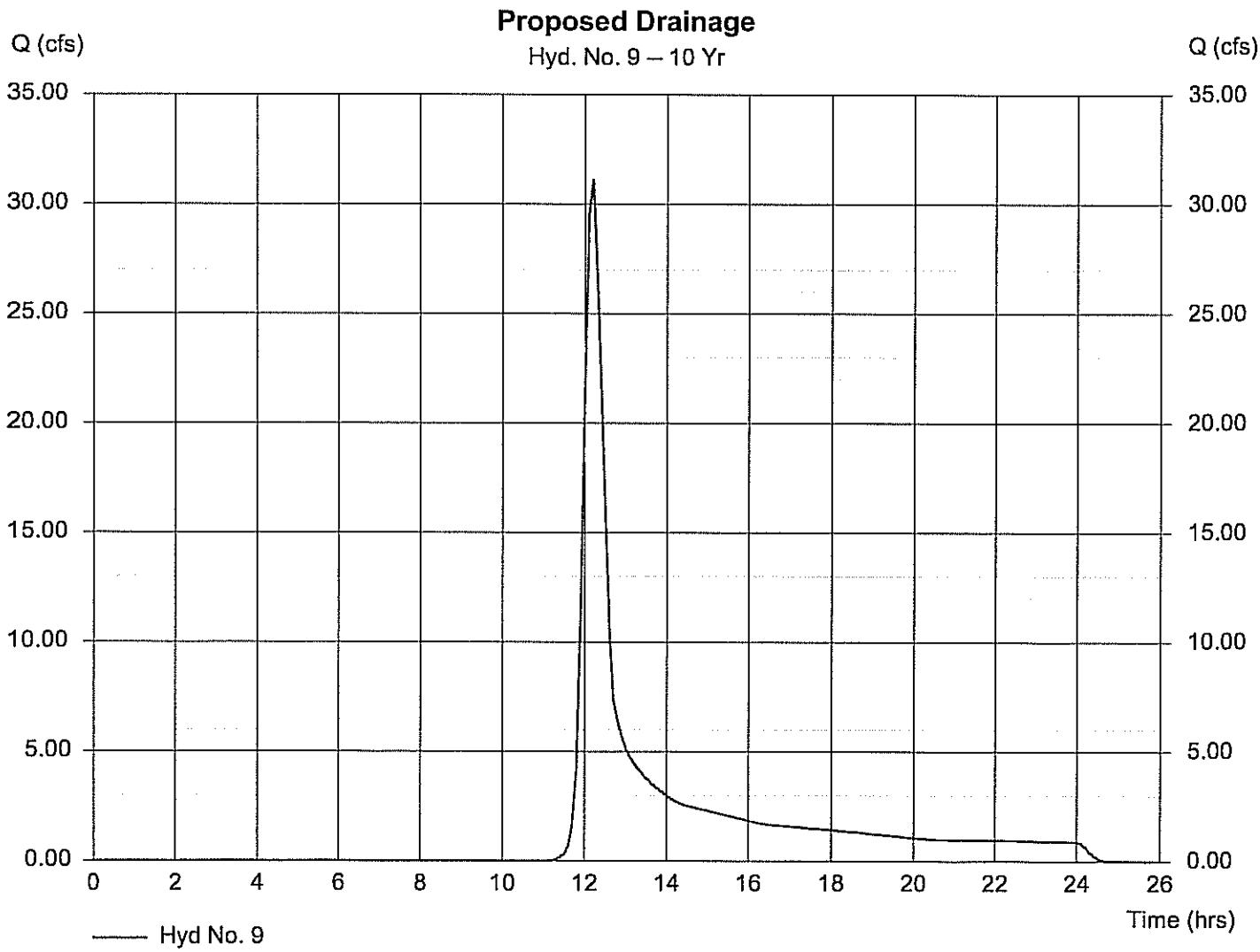
Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 9

Proposed Drainage

Hydrograph type	= SCS Runoff	Peak discharge	= 31.11 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 25.470 ac	Curve number	= 63
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.40 min
Total precip.	= 4.95 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 136,584 cuft



TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve

Hyd. No. 9

Proposed Drainage

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.240		0.011		0.011		
Flow length (ft)	=	150.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.10		0.00		0.00		
Land slope (%)	=	3.30		0.00		0.00		
Travel Time (min)	=	**16.41**	+	**0.00**	+	**0.00**	=	**16.41**
Shallow Concentrated Flow								
Flow length (ft)	=	900.00		0.00		0.00		
Watercourse slope (%)	=	3.50		0.00		0.00		
Surface description	=	Unpaved		Paved		Paved		
Average velocity (ft/s)	=	3.02		0.00		0.00		
Travel Time (min)	=	**4.97**	+	**0.00**	+	**0.00**	=	**4.97**
Channel Flow								
X sectional flow area (sqft)	=	0.00		0.00		0.00		
Wetted perimeter (ft)	=	0.00		0.00		0.00		
Channel slope (%)	=	0.00		0.00		0.00		
Manning's n-value	=	0.240		0.015		0.015		
Velocity (ft/s)	=	0.00		0.00		0.00		
Flow length (ft)	=	0.0		0.0		0.0		
Travel Time (min)	=	**0.00**	+	**0.00**	+	**0.00**	=	**0.00**

Total Travel Time, Tc ..... 21.40 min

Hydrograph Plot

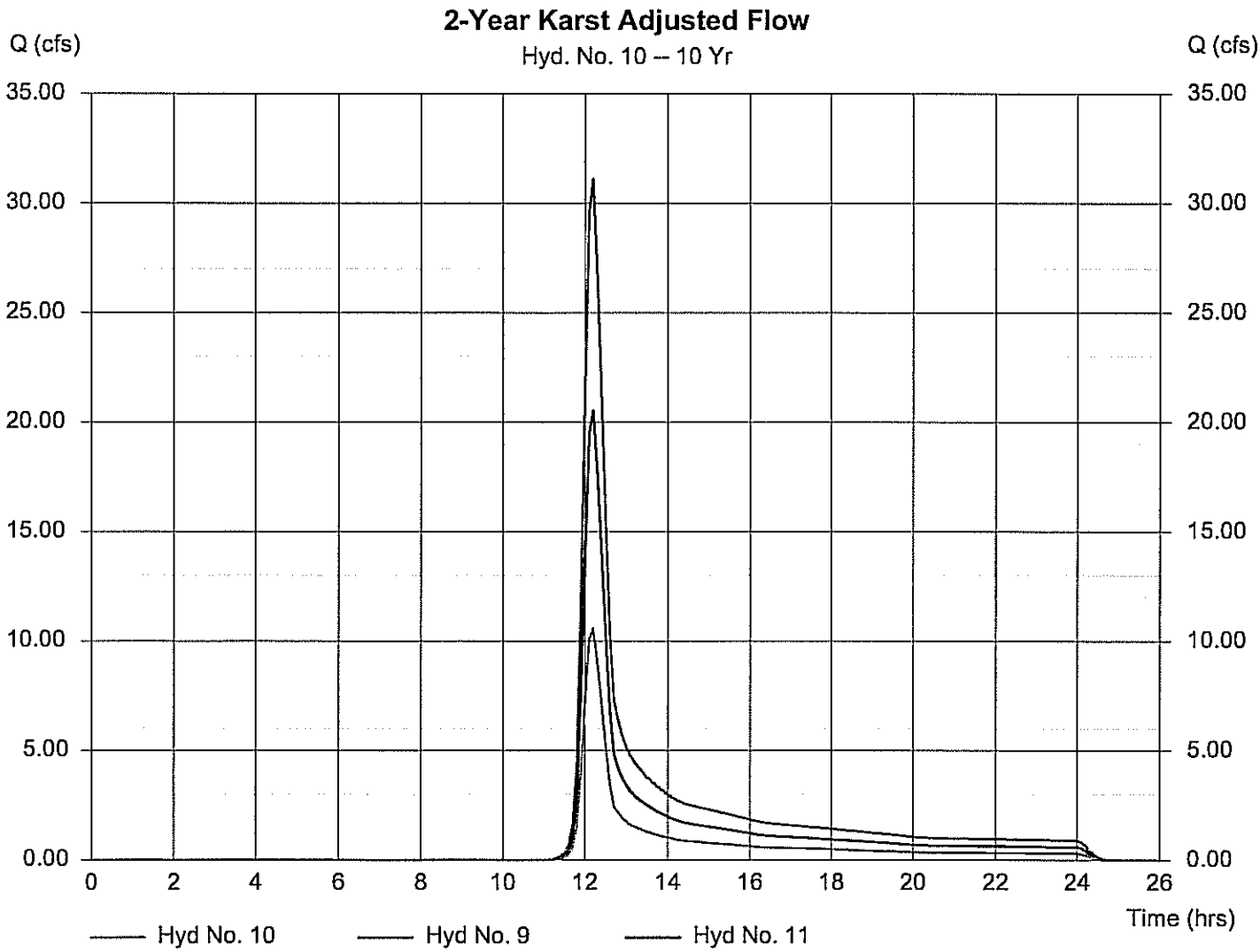
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 10

2-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 10.58 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 11
Diversion method	= Flow Ratio	Flow ratio	= 0.34

Hydrograph Volume = 46,438 cuft



Hydrograph Plot

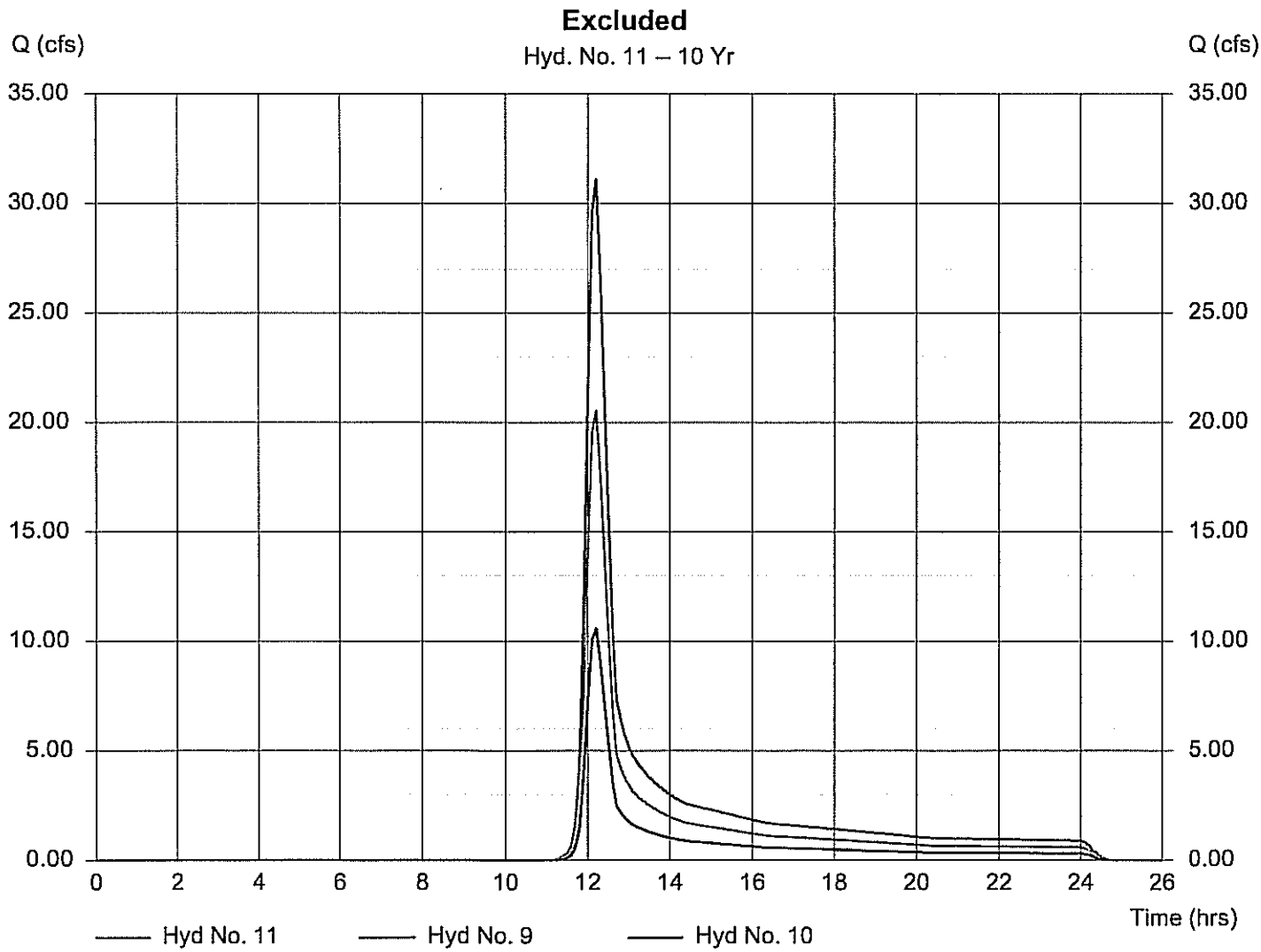
Hydraflow Hydrographs by Intelisolve | Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 11

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 20.53 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 10
Diversion method	= Flow Ratio	Flow ratio	= 0.34

Hydrograph Volume = 90,145 cuft



Hydrograph Plot

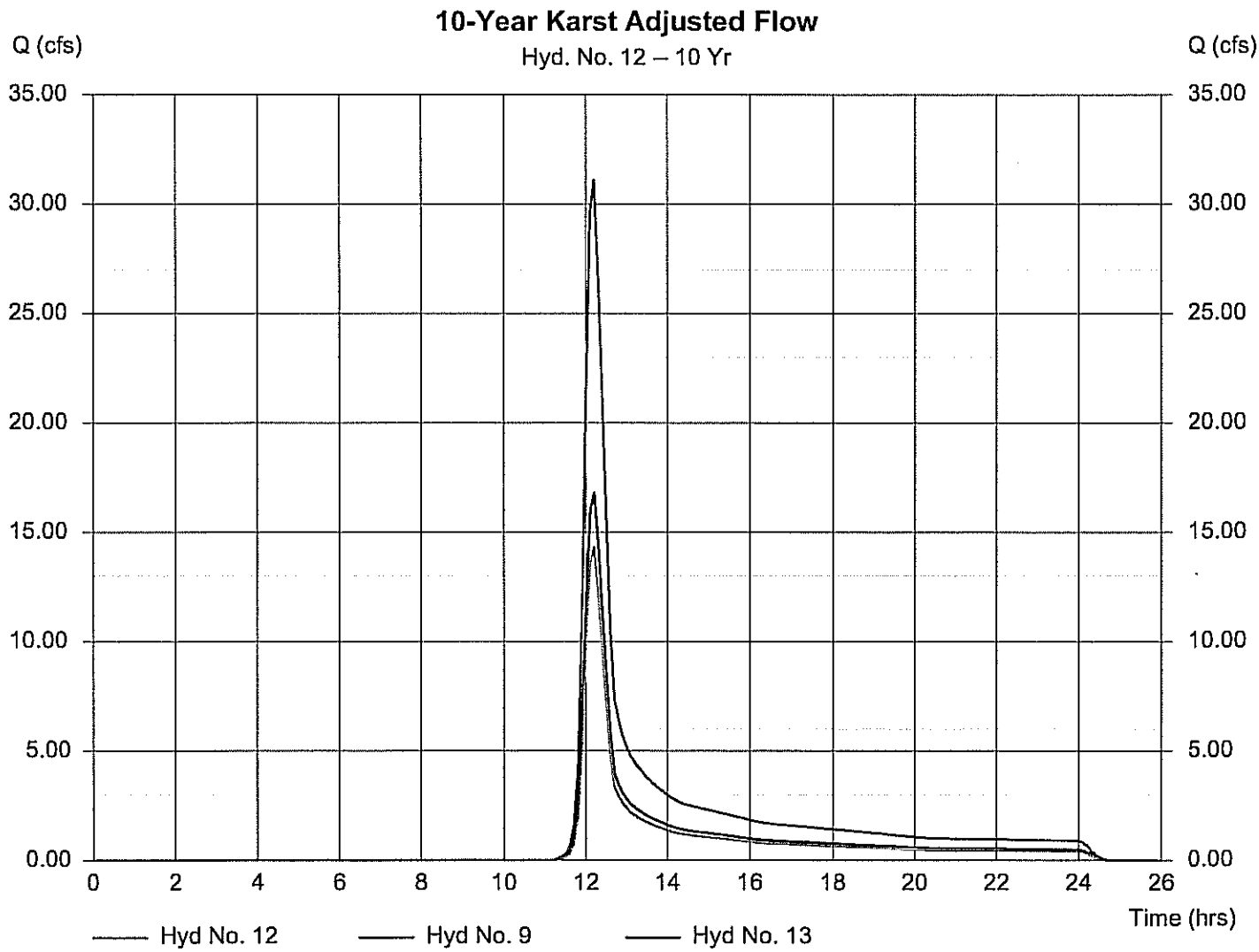
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 12

10-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 14.31 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 13
Diversion method	= Flow Ratio	Flow ratio	= 0.46

Hydrograph Volume = 62,828 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

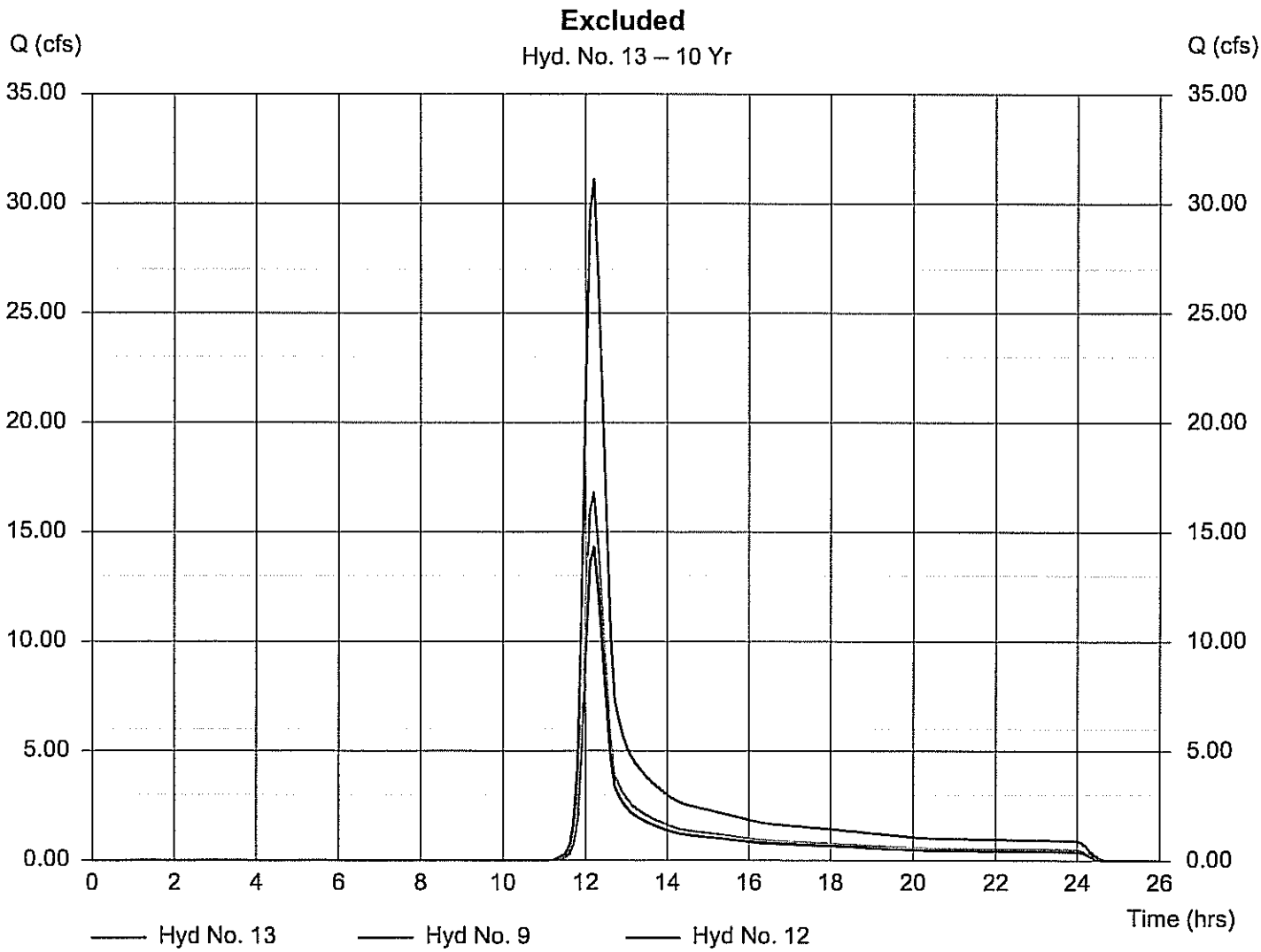
Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 13

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 16.80 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 12
Diversion method	= Flow Ratio	Flow ratio	= 0.46

Hydrograph Volume = 73,755 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

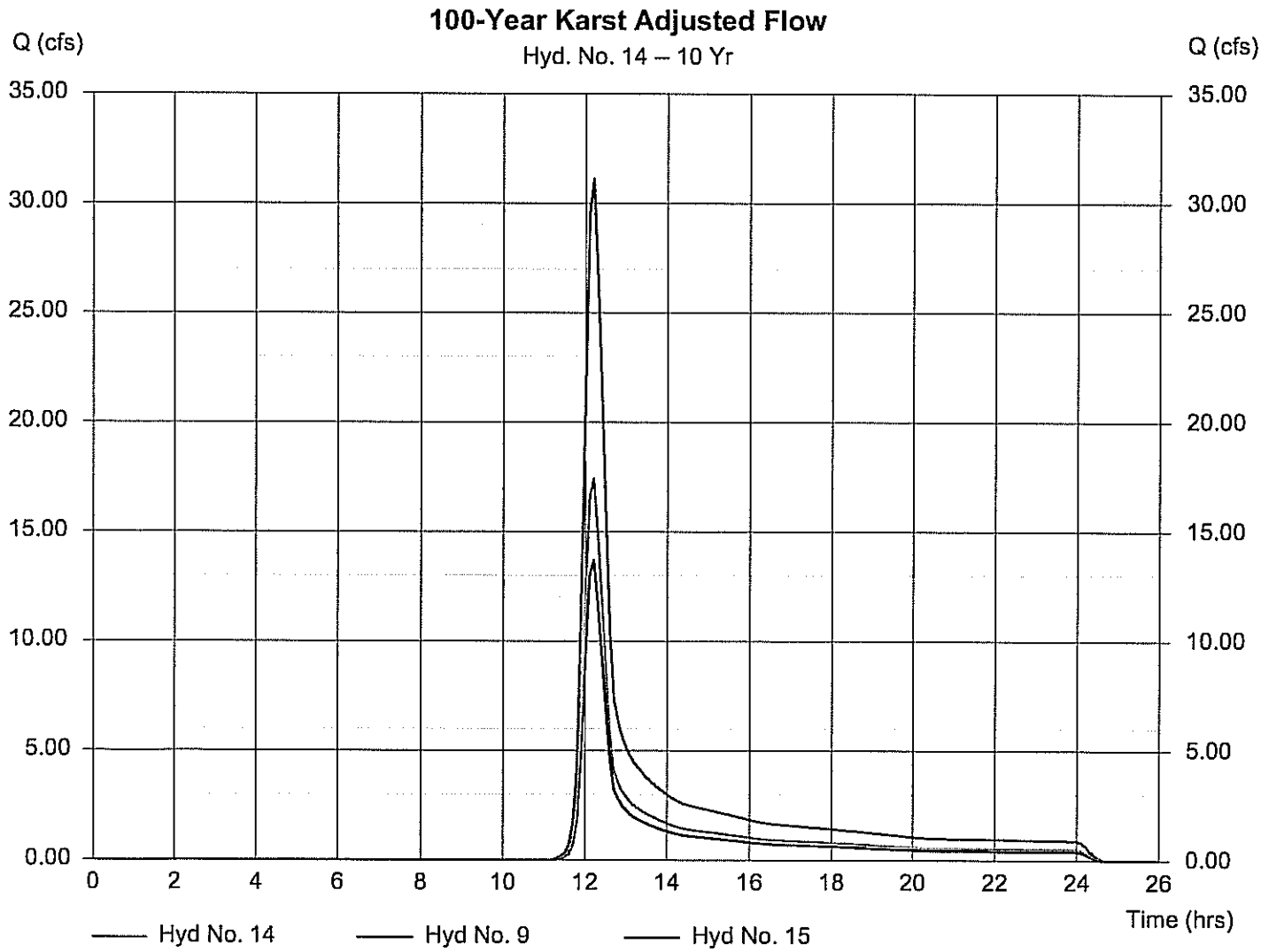
Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 14

100-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 17.42 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 15
Diversion method	= Flow Ratio	Flow ratio	= 0.56

Hydrograph Volume = 76,487 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

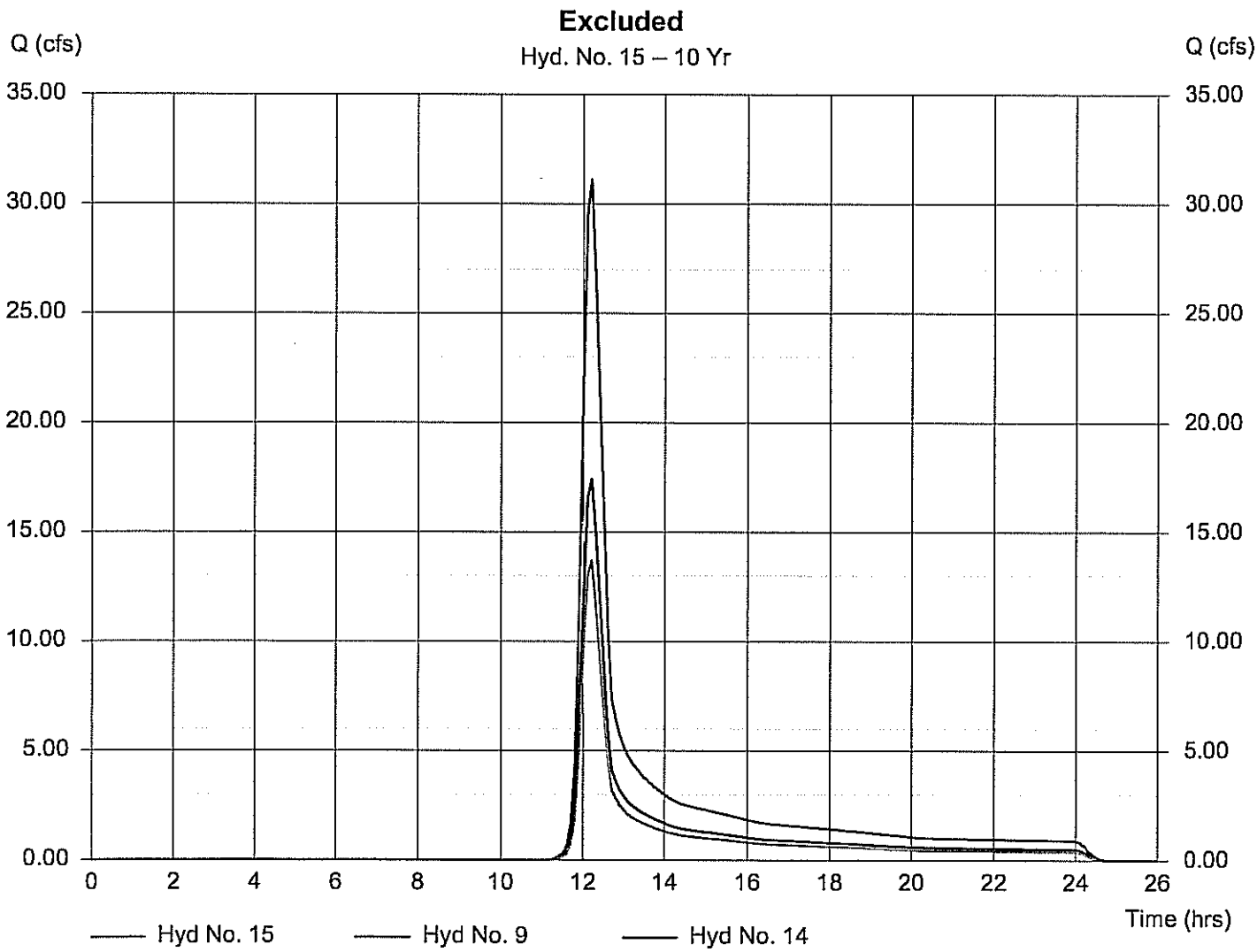
Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 15

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 13.69 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 14
Diversion method	= Flow Ratio	Flow ratio	= 0.56

Hydrograph Volume = 60,097 cuft



Hydrograph Plot

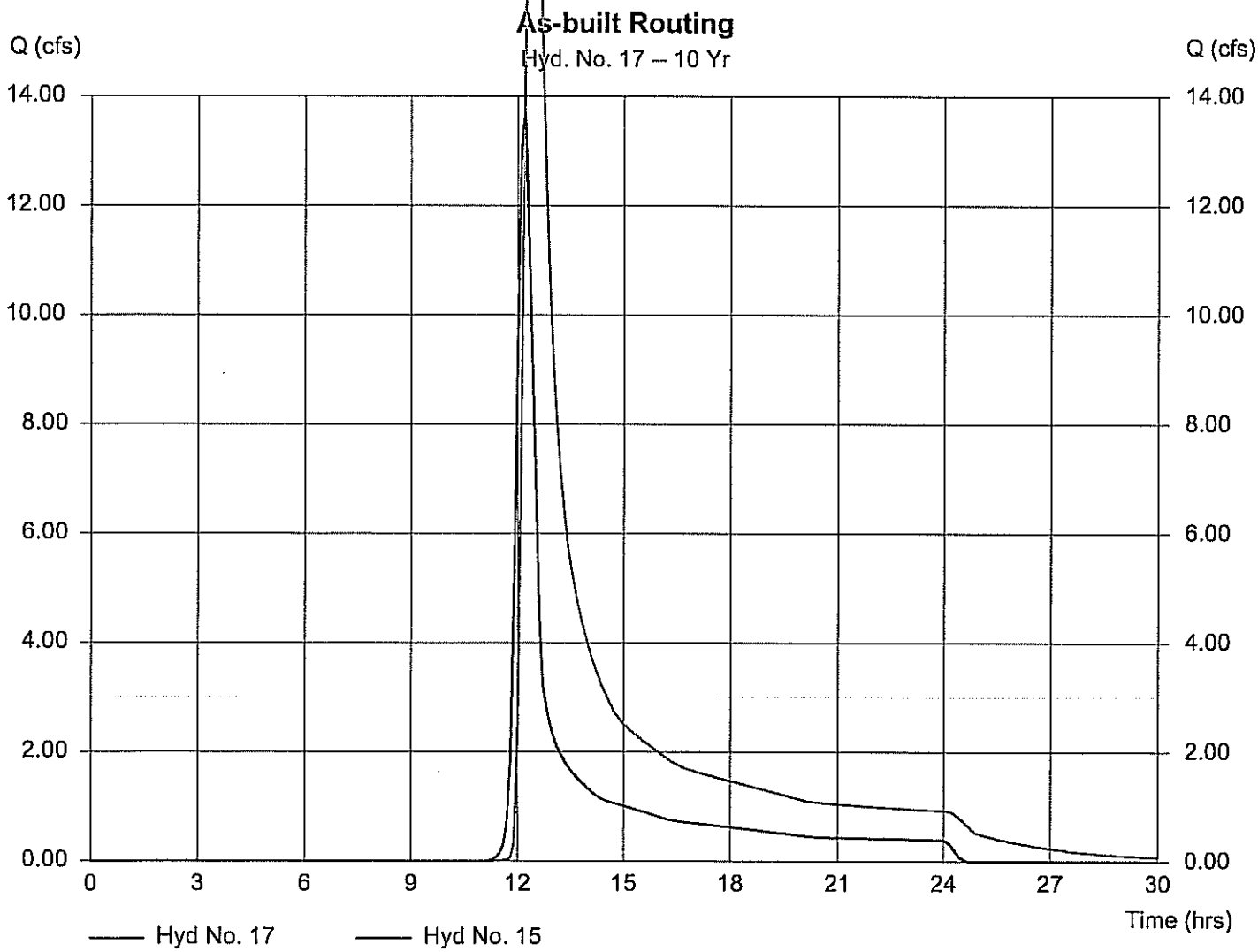
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 17

As-built Routing

Hydrograph type	= Reservoir	Peak discharge	= 20.63 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hyd. No.	= 15	Max. Elevation	= 394.97 ft
Reservoir name	= As-Built Pond	Max. Storage	= 46,355 cuft

Storage Indication method used. Wet pond routing start elevation = 393.00 ft. — Hydrograph Volume = 136,551 cuft



Pond Report

Hydraflow Hydrographs by Intellisolve — Thursday, Jul 26 2007, 10:58 AM

Pond No. 1 - As-Built Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	390.00	97	0	0
2.00	392.00	5,511	5,608	5,608
4.00	394.00	15,810	21,321	26,929
6.00	396.00	24,411	40,221	67,150
8.00	398.00	33,625	58,036	125,186

Culvert / Orifice Structures

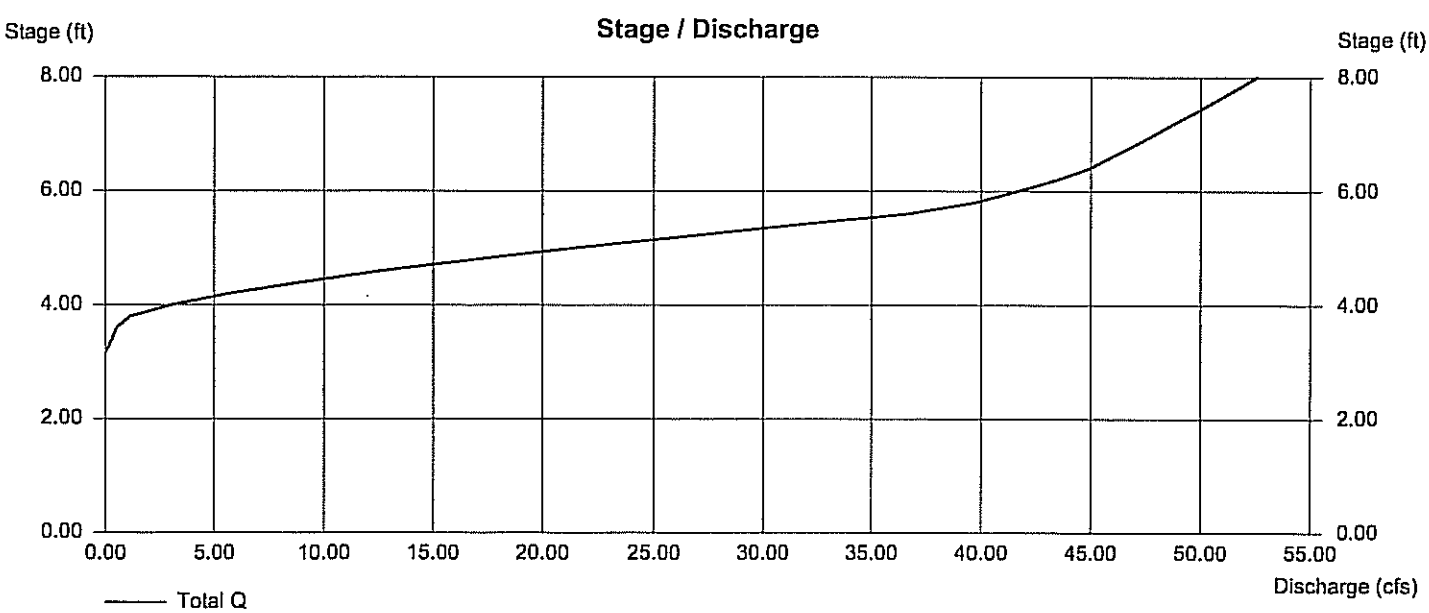
	[A]	[B]	[C]	[D]
Rise (in)	= 30.00	32.00	6.00	0.00
Span (in)	= 30.00	48.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 390.80	393.70	393.05	0.00
Length (ft)	= 60.58	0.00	0.00	0.00
Slope (%)	= 0.92	0.00	0.00	0.00
N-Value	= .013	.013	.013	.000
Orif. Coeff.	= 0.60	0.60	0.60	0.00
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 398.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Plot

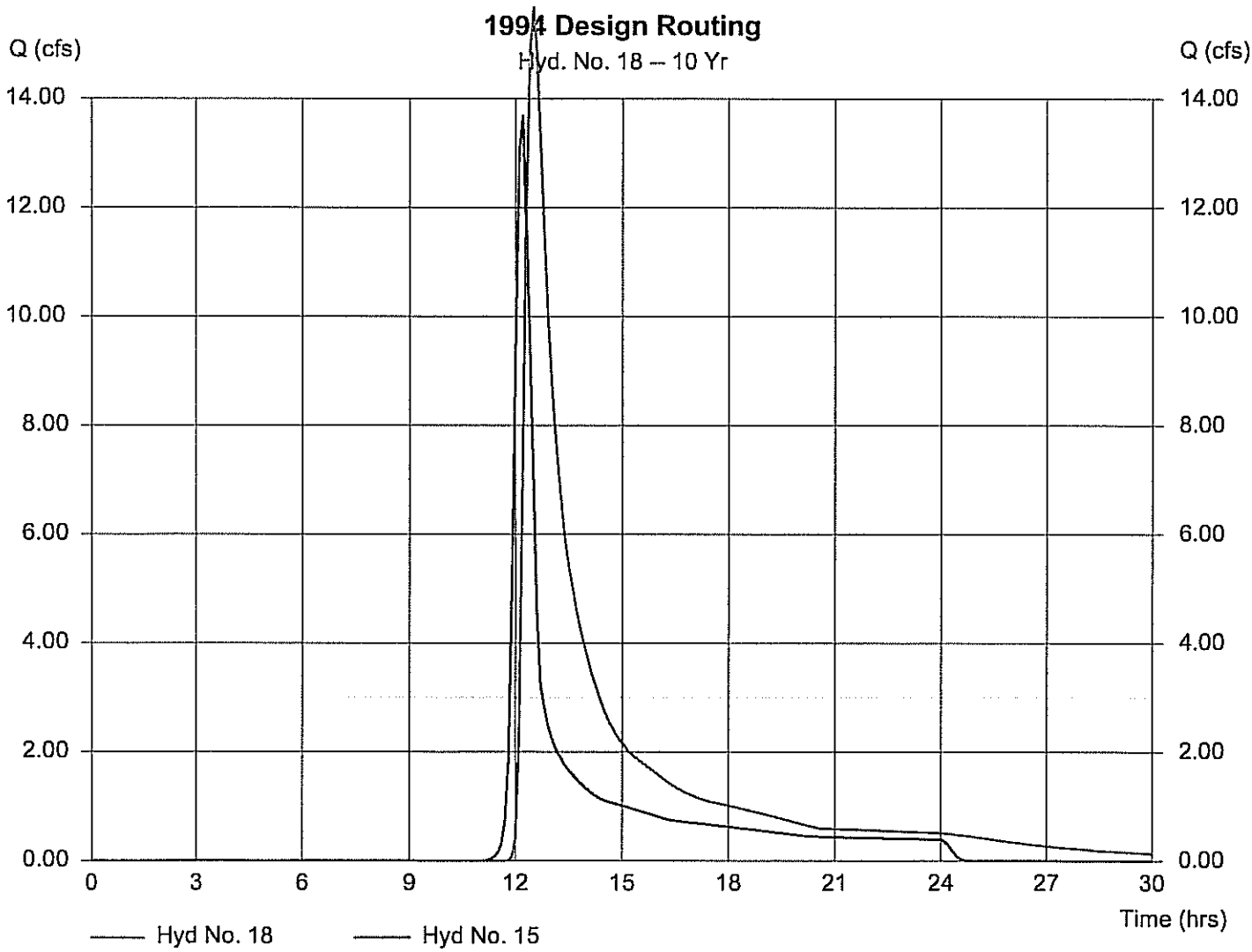
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 18

1994 Design Routing

Hydrograph type	= Reservoir	Peak discharge	= 15.68 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hyd. No.	= 15	Max. Elevation	= 394.74 ft
Reservoir name	= 1994 Proposed Pond	Max. Storage	= 75,541 cuft

Storage Indication method used. Wet pond routing start elevation = 393.00 ft. — Hydrograph Volume = 110,214 cuft



Pond Report

Hydraflow Hydrographs by Intellisolve — Thursday, Jul 26 2007, 10:58 AM

Pond No. 2 - 1994 Proposed Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	388.00	1,878	0	0
2.00	390.00	5,849	7,727	7,727
4.00	392.00	11,056	16,905	24,632
5.00	393.00	15,091	13,074	37,706
6.00	394.00	22,667	18,879	56,585
8.00	396.00	28,372	51,039	107,624
10.00	398.00	34,978	63,350	170,974

Culvert / Orifice Structures

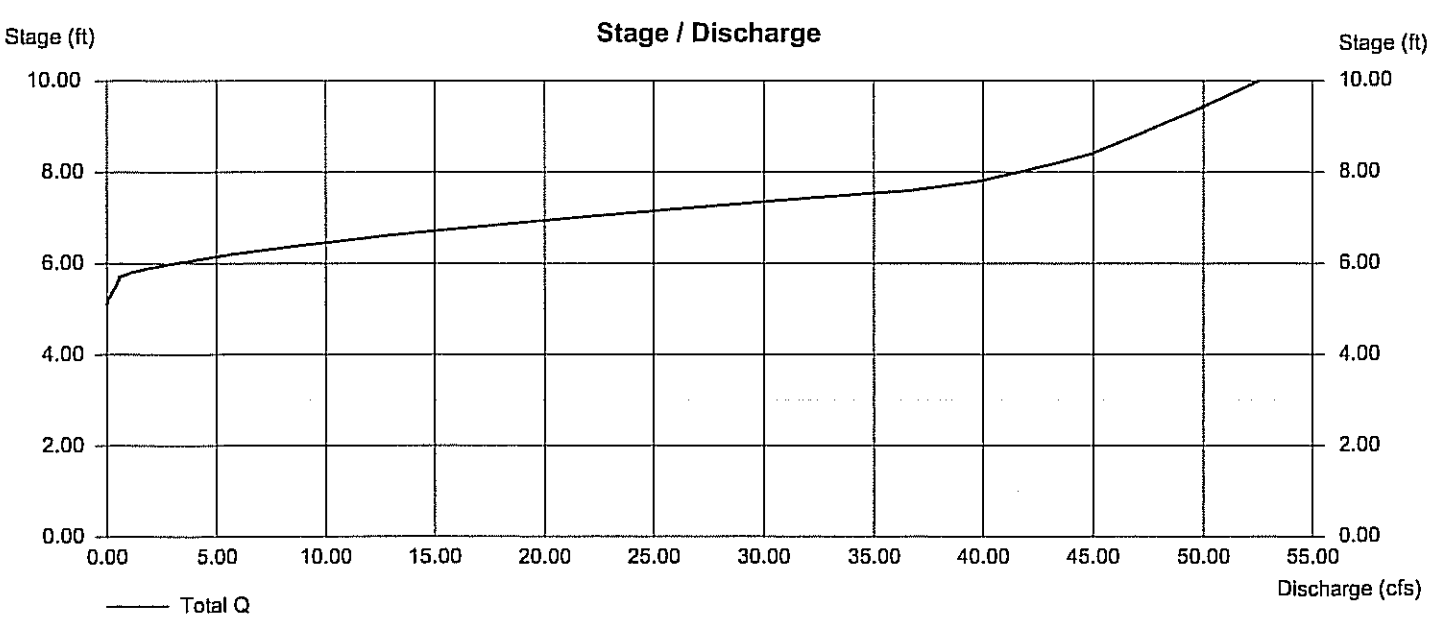
	[A]	[B]	[C]	[D]
Rise (in)	= 30.00	32.00	6.00	0.00
Span (in)	= 30.00	48.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 390.80	393.70	393.05	0.00
Length (ft)	= 60.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	0.00
N-Value	= .013	.013	.013	.000
Orif. Coeff.	= 0.60	0.60	0.60	0.00
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 398.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Riser	—	—	—
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Plot

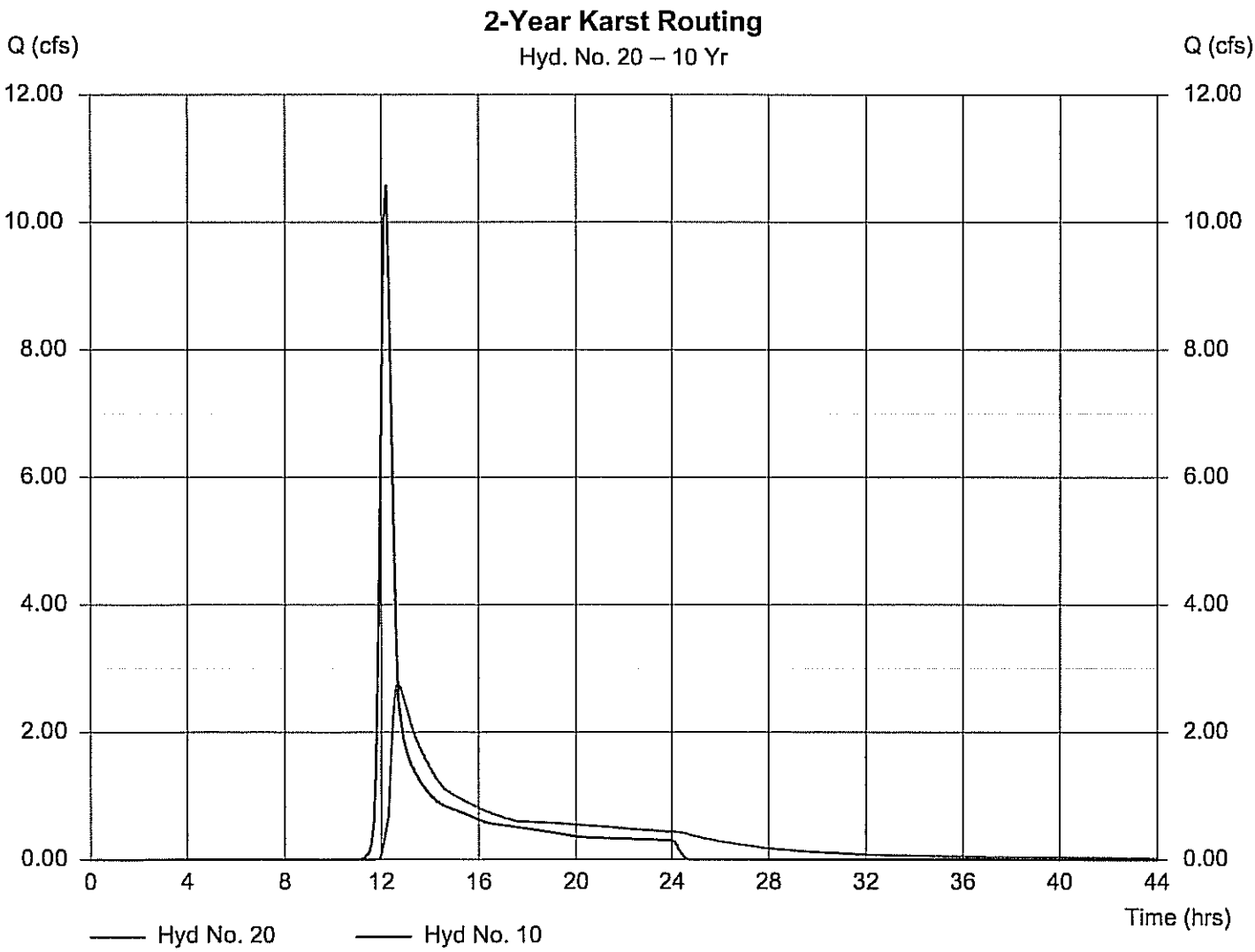
Hydraflow Hydrographs by Intellisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 20

2-Year Karst Routing

Hydrograph type	= Reservoir	Peak discharge	= 2.76 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hyd. No.	= 10	Max. Elevation	= 393.98 ft
Reservoir name	= 1994 Proposed Pond	Max. Storage	= 56,113 cuft

Storage Indication method used. Wet pond routing start elevation = 393.00 ft. — Hydrograph Volume = 46,196 cuft



Pond Report

Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Pond No. 2 - 1994 Proposed Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	388.00	1,878	0	0
2.00	390.00	5,849	7,727	7,727
4.00	392.00	11,056	16,905	24,632
5.00	393.00	15,091	13,074	37,706
6.00	394.00	22,667	18,879	56,585
8.00	396.00	28,372	51,039	107,624
10.00	398.00	34,978	63,350	170,974

Culvert / Orifice Structures

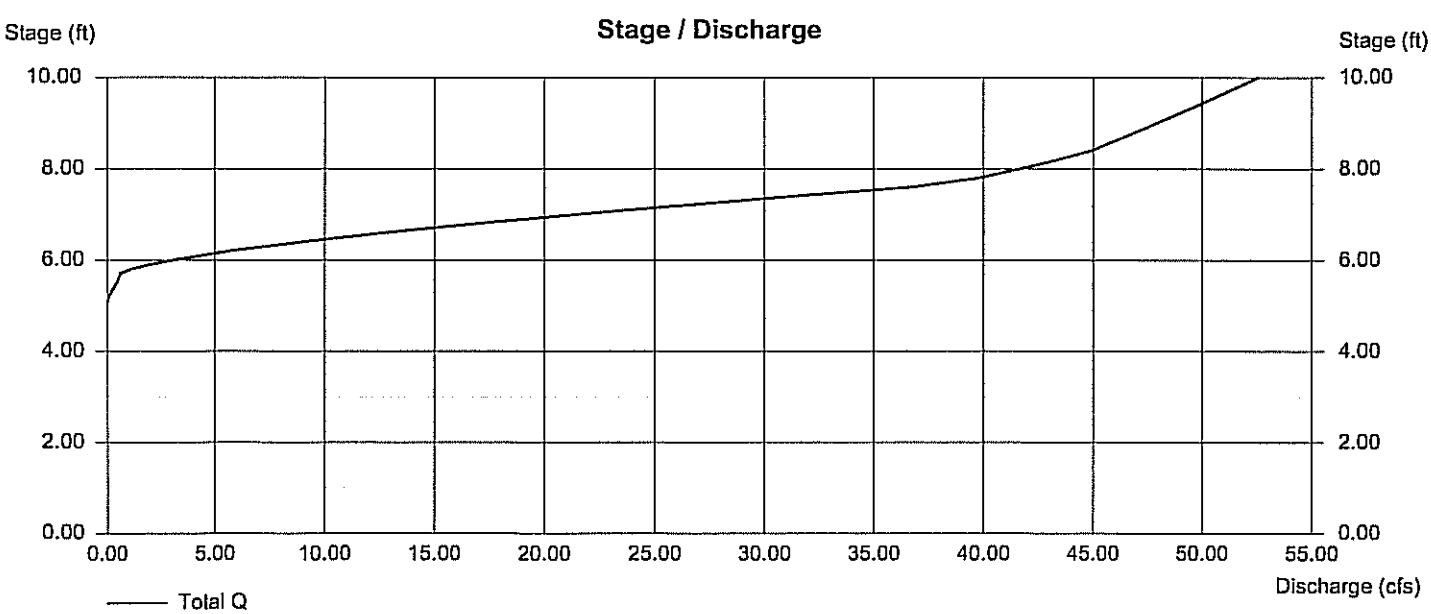
	[A]	[B]	[C]	[D]
Rise (in)	= 30.00	32.00	6.00	0.00
Span (in)	= 30.00	48.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 390.80	393.70	393.05	0.00
Length (ft)	= 60.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	0.00
N-Value	= .013	.013	.013	.000
Orif. Coeff.	= 0.60	0.60	0.60	0.00
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 398.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Plot

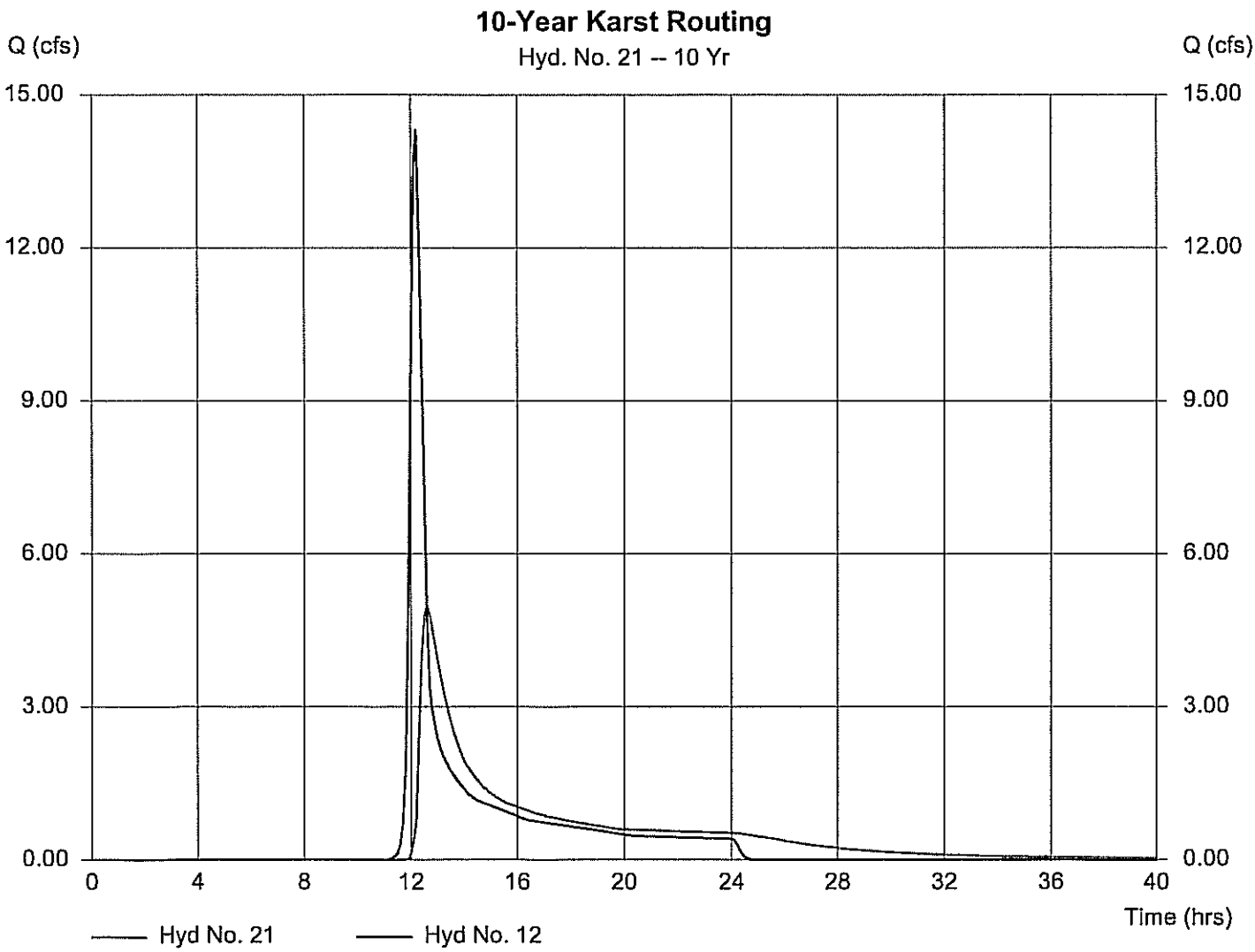
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 21

10-Year Karst Routing

Hydrograph type	= Reservoir	Peak discharge	= 4.98 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hyd. No.	= 12	Max. Elevation	= 394.15 ft
Reservoir name	= 1994 Proposed Pond	Max. Storage	= 60,303 cuft

Storage Indication method used. Wet pond routing start elevation = 393.00 ft. — Hydrograph Volume = 62,586 cuft



Pond Report

Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Pond No. 2 - 1994 Proposed Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	388.00	1,878	0	0
2.00	390.00	5,849	7,727	7,727
4.00	392.00	11,056	16,905	24,632
5.00	393.00	15,091	13,074	37,706
6.00	394.00	22,667	18,879	56,585
8.00	396.00	28,372	51,039	107,624
10.00	398.00	34,978	63,350	170,974

Culvert / Orifice Structures

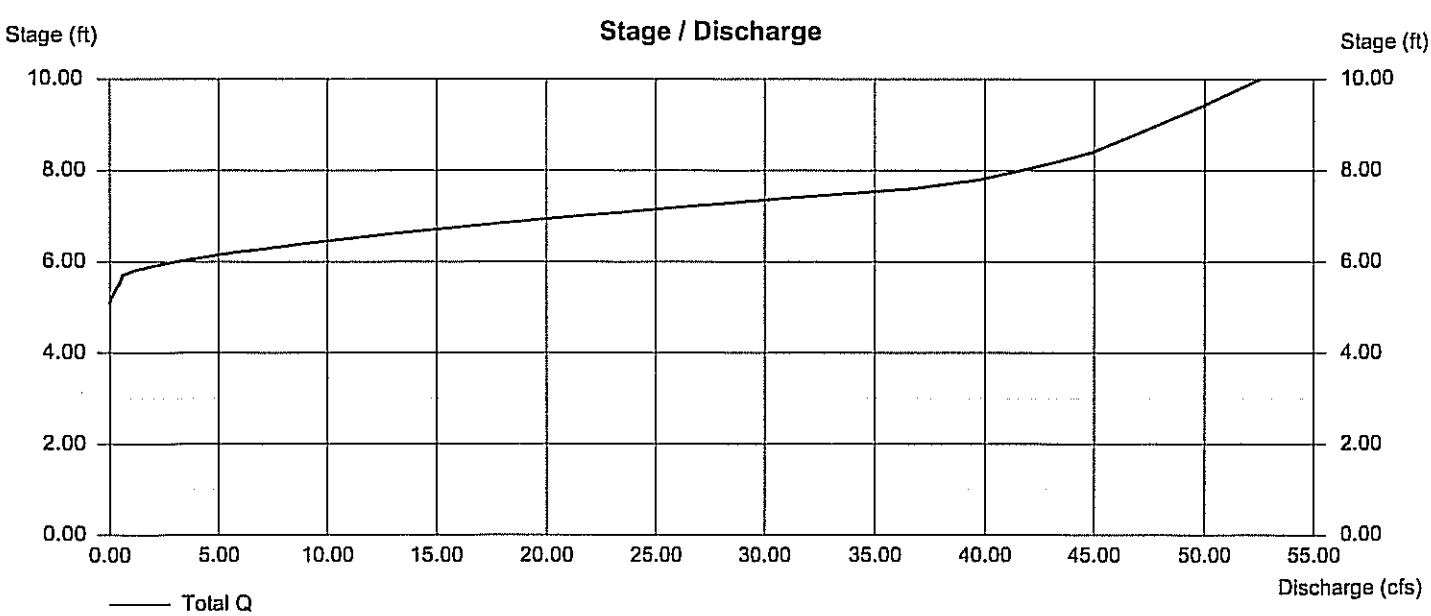
	[A]	[B]	[C]	[D]
Rise (in)	= 30.00	32.00	6.00	0.00
Span (in)	= 30.00	48.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 390.80	393.70	393.05	0.00
Length (ft)	= 60.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	0.00
N-Value	= .013	.013	.013	.000
Orif. Coeff.	= 0.60	0.60	0.60	0.00
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 398.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Plot

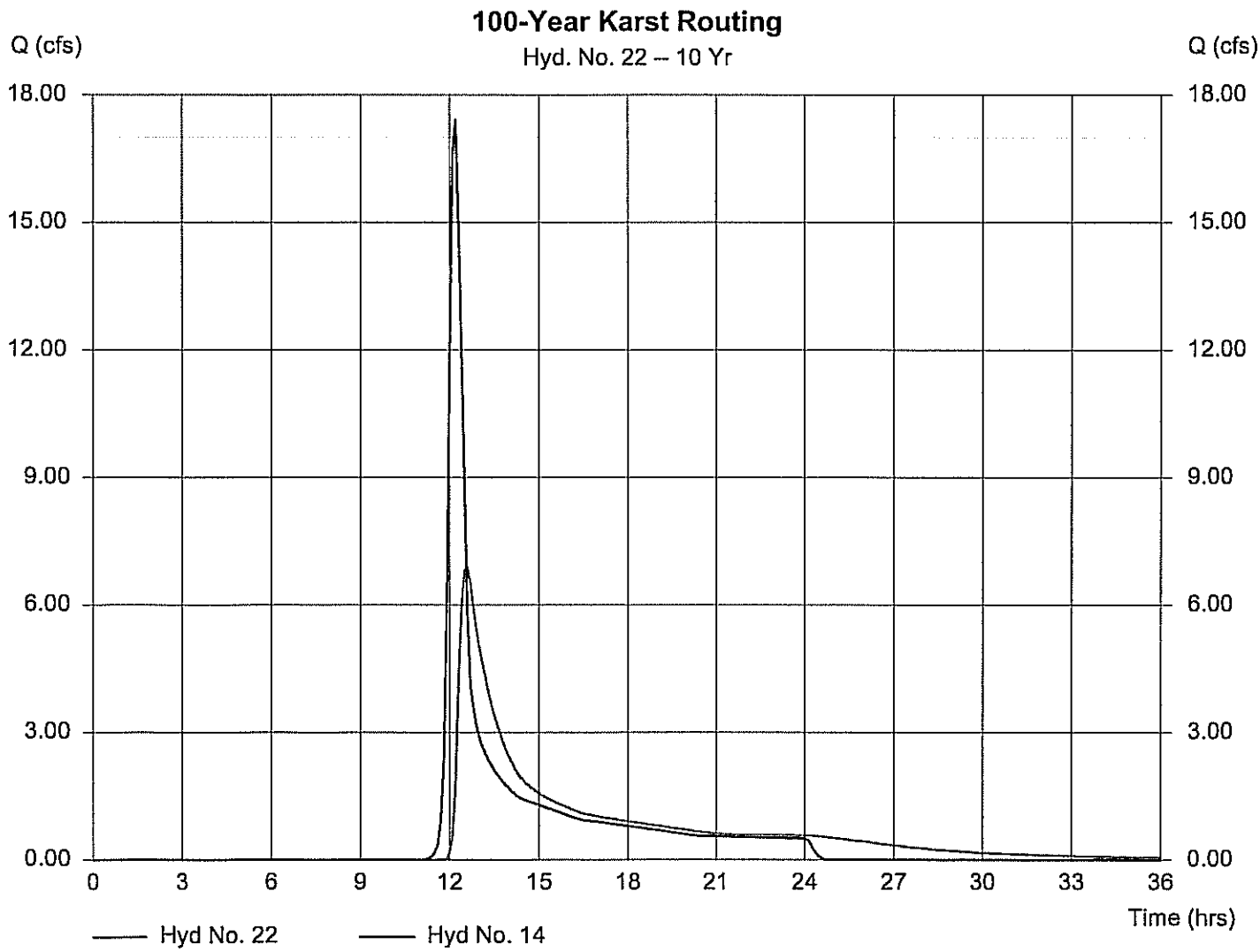
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 22

100-Year Karst Routing

Hydrograph type	= Reservoir	Peak discharge	= 6.90 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hyd. No.	= 14	Max. Elevation	= 394.27 ft
Reservoir name	= 1994 Proposed Pond	Max. Storage	= 63,559 cuft

Storage Indication method used. Wet pond routing start elevation = 393.00 ft. — Hydrograph Volume = 76,245 cuft



Pond Report

Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Pond No. 2 - 1994 Proposed Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	388.00	1,878	0	0
2.00	390.00	5,849	7,727	7,727
4.00	392.00	11,056	16,905	24,632
5.00	393.00	15,091	13,074	37,706
6.00	394.00	22,667	18,879	56,585
8.00	396.00	28,372	51,039	107,624
10.00	398.00	34,978	63,350	170,974

Culvert / Orifice Structures

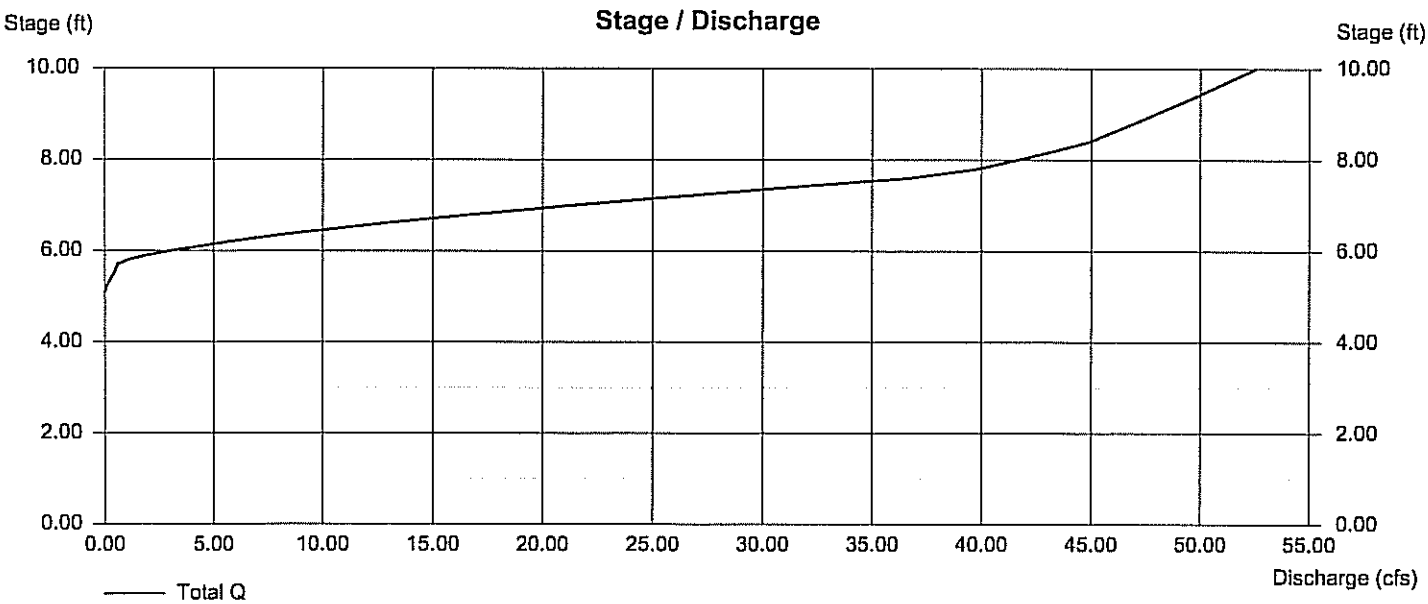
	[A]	[B]	[C]	[D]
Rise (in)	= 30.00	32.00	6.00	0.00
Span (in)	= 30.00	48.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 390.80	393.70	393.05	0.00
Length (ft)	= 60.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	0.00
N-Value	= .013	.013	.013	.000
Orif. Coeff.	= 0.60	0.60	0.60	0.00
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 398.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	47.71	6	732	203,767	---	-----	-----	Existing Drainage
2	Diversion1	15.74	6	732	67,243	1	-----	-----	2-Year Karst Adjusted Flow
3	Diversion2	31.96	6	732	136,524	1	-----	-----	Excluded
4	Diversion1	20.51	6	732	87,620	1	-----	-----	10-Year Karst Adjusted Flow
5	Diversion2	27.19	6	732	116,147	1	-----	-----	Excluded
6	Diversion1	23.85	6	732	101,884	1	-----	-----	100-Year Karst Adjusted Flow
7	Diversion2	23.85	6	732	101,884	1	-----	-----	Excluded
9	SCS Runoff	64.29	6	732	268,199	---	-----	-----	Proposed Drainage
10	Diversion1	21.86	6	732	91,188	9	-----	-----	2-Year Karst Adjusted Flow
11	Diversion2	42.43	6	732	177,011	9	-----	-----	Excluded
12	Diversion1	29.57	6	732	123,371	9	-----	-----	10-Year Karst Adjusted Flow
13	Diversion2	34.71	6	732	144,827	9	-----	-----	Excluded
14	Diversion1	36.00	6	732	150,191	9	-----	-----	100-Year Karst Adjusted Flow
15	Diversion2	28.29	6	732	118,008	9	-----	-----	Excluded
17	Reservoir	43.19	6	744	268,166	15	396.18	72,338	As-built Routing
18	Reservoir	40.39	6	744	239,439	15	395.87	104,279	1994 Design Routing
20	Reservoir	10.73	6	750	90,945	10	394.49	69,204	2-Year Karst Routing
21	Reservoir	16.30	6	750	123,129	12	394.77	76,302	10-Year Karst Routing
22	Reservoir	21.29	6	744	149,949	14	394.99	81,964	100-Year Karst Routing

TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve

Hyd. No. 1

Existing Drainage

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.240		0.011		0.011		
Flow length (ft)	=	150.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.10		0.00		0.00		
Land slope (%)	=	3.30		0.00		0.00		
Travel Time (min)	**=**	**16.41**	**+**	**0.00**	**+**	**0.00**	**=**	**16.41**
Shallow Concentrated Flow								
Flow length (ft)	=	900.00		0.00		0.00		
Watercourse slope (%)	=	3.80		0.00		0.00		
Surface description	=	Unpaved		Paved		Paved		
Average velocity (ft/s)	=	3.15		0.00		0.00		
Travel Time (min)	**=**	**4.77**	**+**	**0.00**	**+**	**0.00**	**=**	**4.77**
Channel Flow								
X sectional flow area (sqft)	=	0.00		0.00		0.00		
Wetted perimeter (ft)	=	0.00		0.00		0.00		
Channel slope (%)	=	0.00		0.00		0.00		
Manning's n-value	=	0.015		0.015		0.015		
Velocity (ft/s)	=	0.00		0.00		0.00		
Flow length (ft)	=	0.0		0.0		0.0		
Travel Time (min)	**=**	**0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... **21.20 min**

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

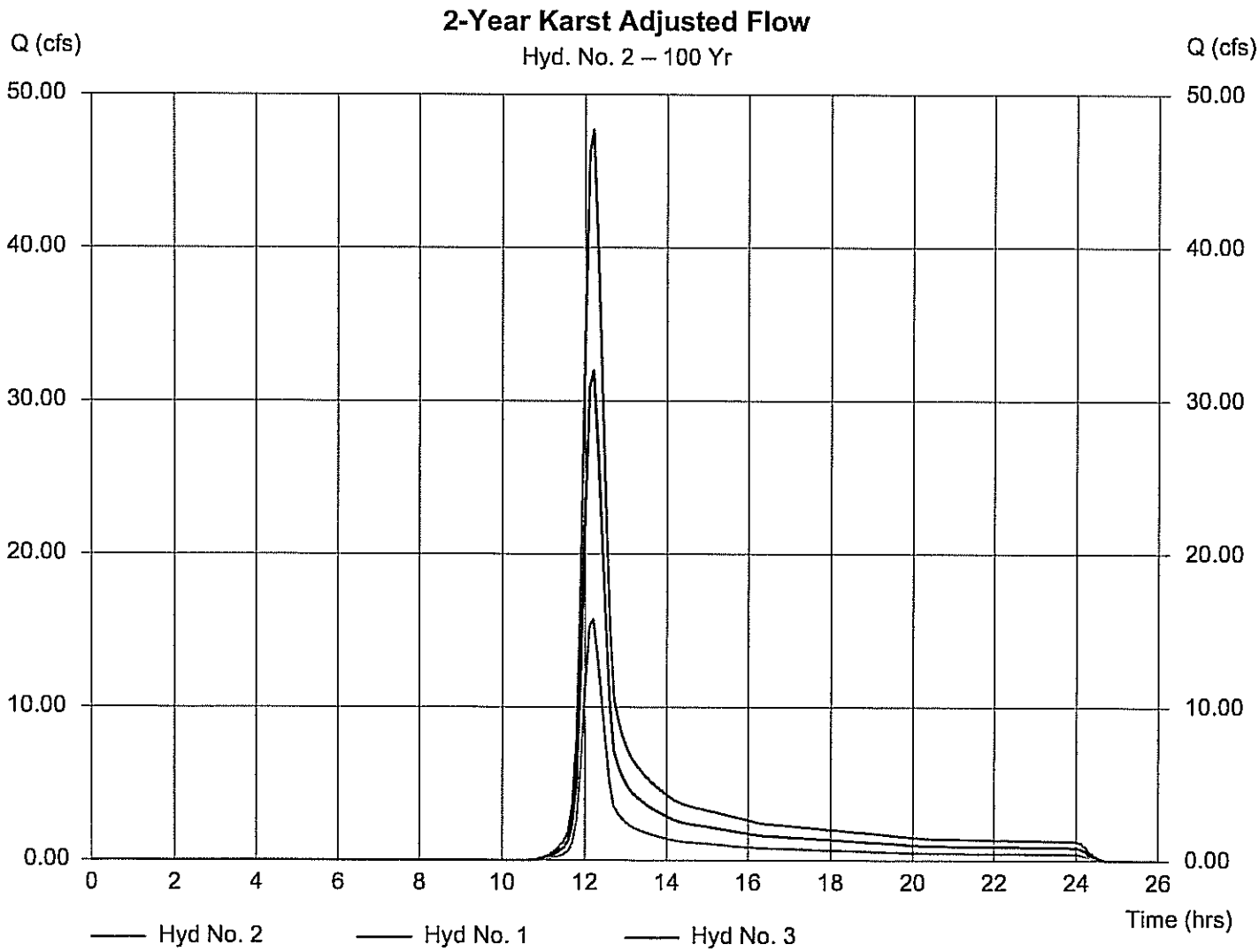
Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 2

2-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 15.74 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 3
Diversion method	= Flow Ratio	Flow ratio	= 0.33

Hydrograph Volume = 67,243 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

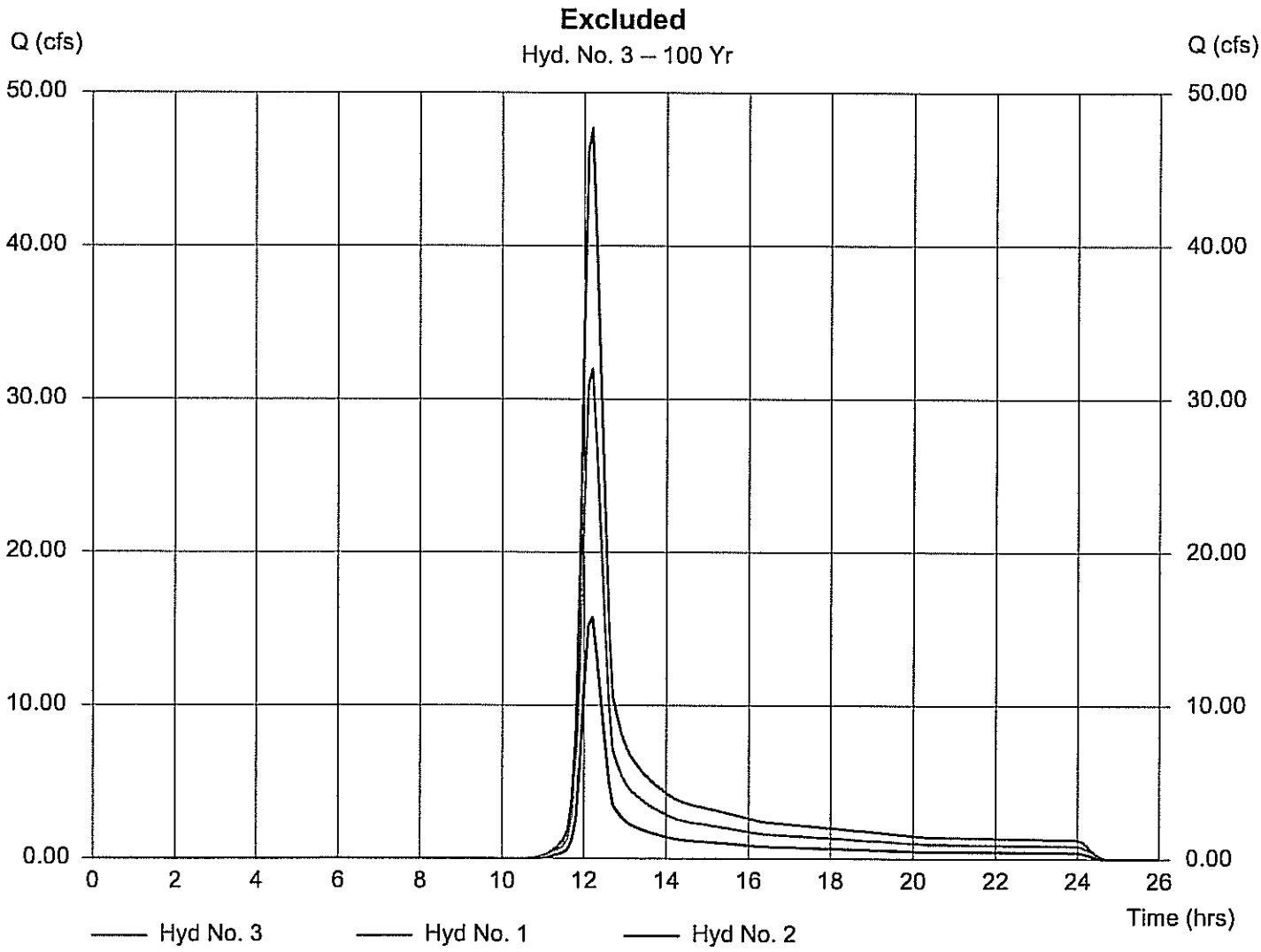
Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 3

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 31.96 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 2
Diversion method	= Flow Ratio	Flow ratio	= 0.33

Hydrograph Volume = 136,524 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

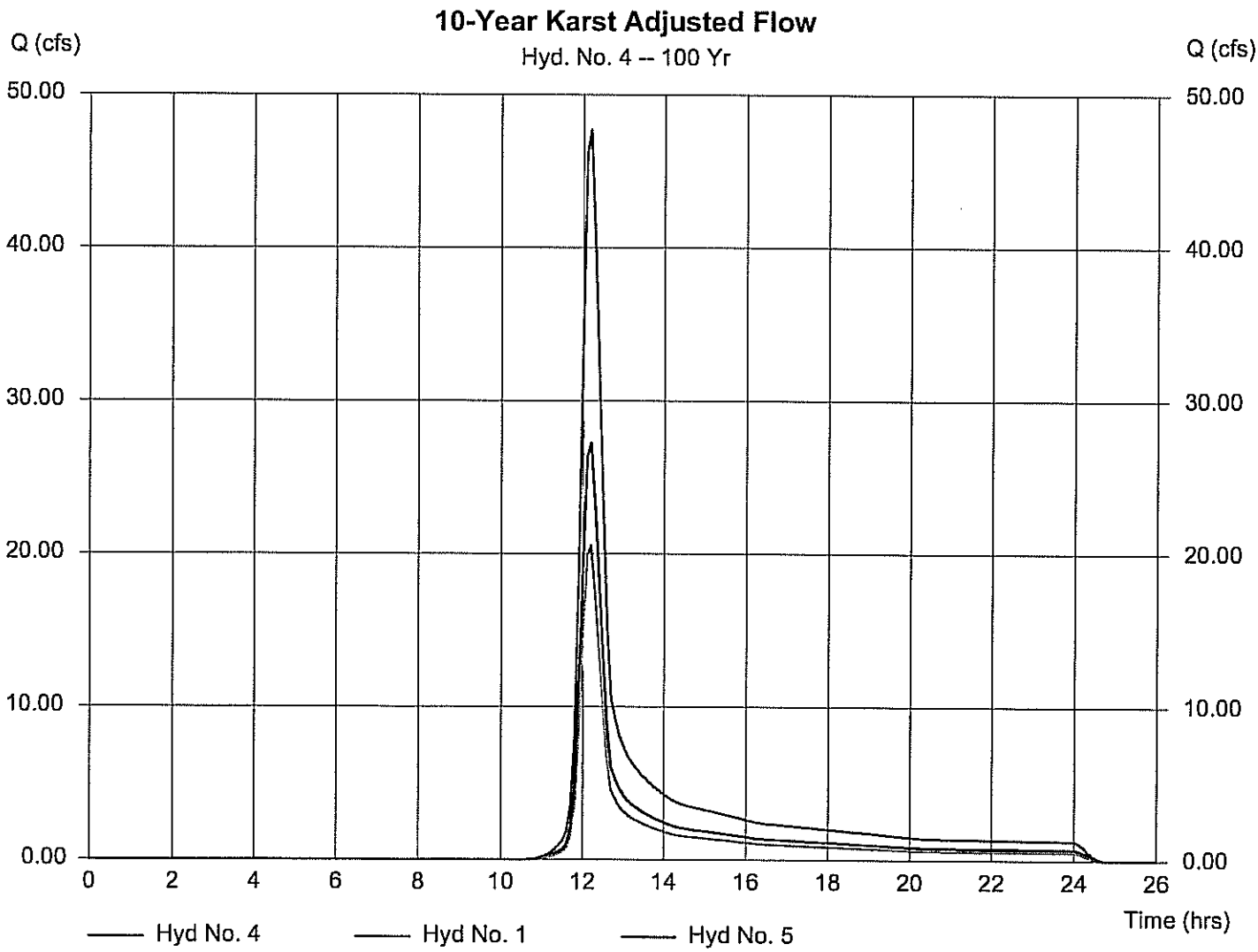
Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 4

10-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 20.51 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 5
Diversion method	= Flow Ratio	Flow ratio	= 0.43

Hydrograph Volume = 87,620 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

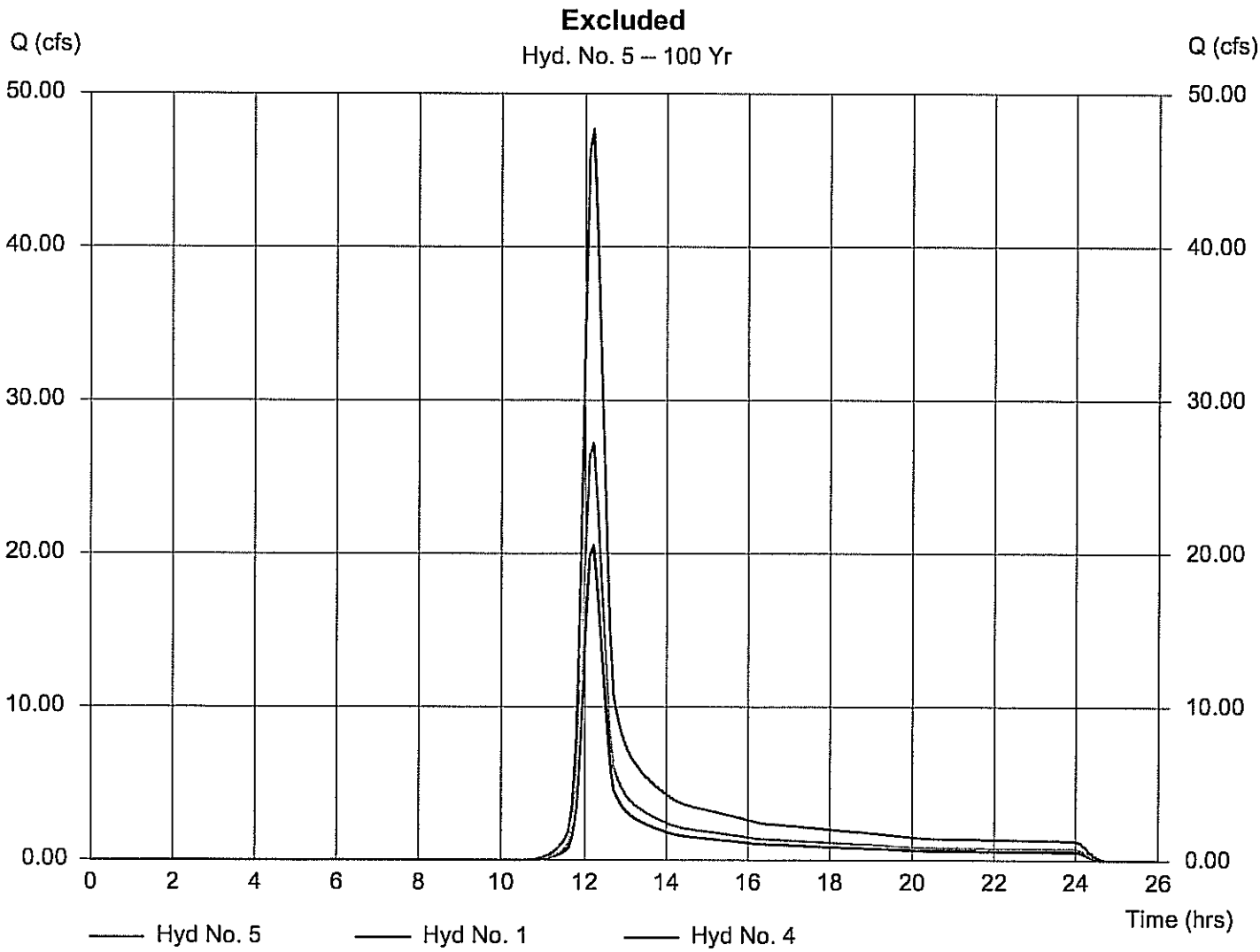
Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 5

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 27.19 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 4
Diversion method	= Flow Ratio	Flow ratio	= 0.43

Hydrograph Volume = 116,147 cuft



Hydrograph Plot

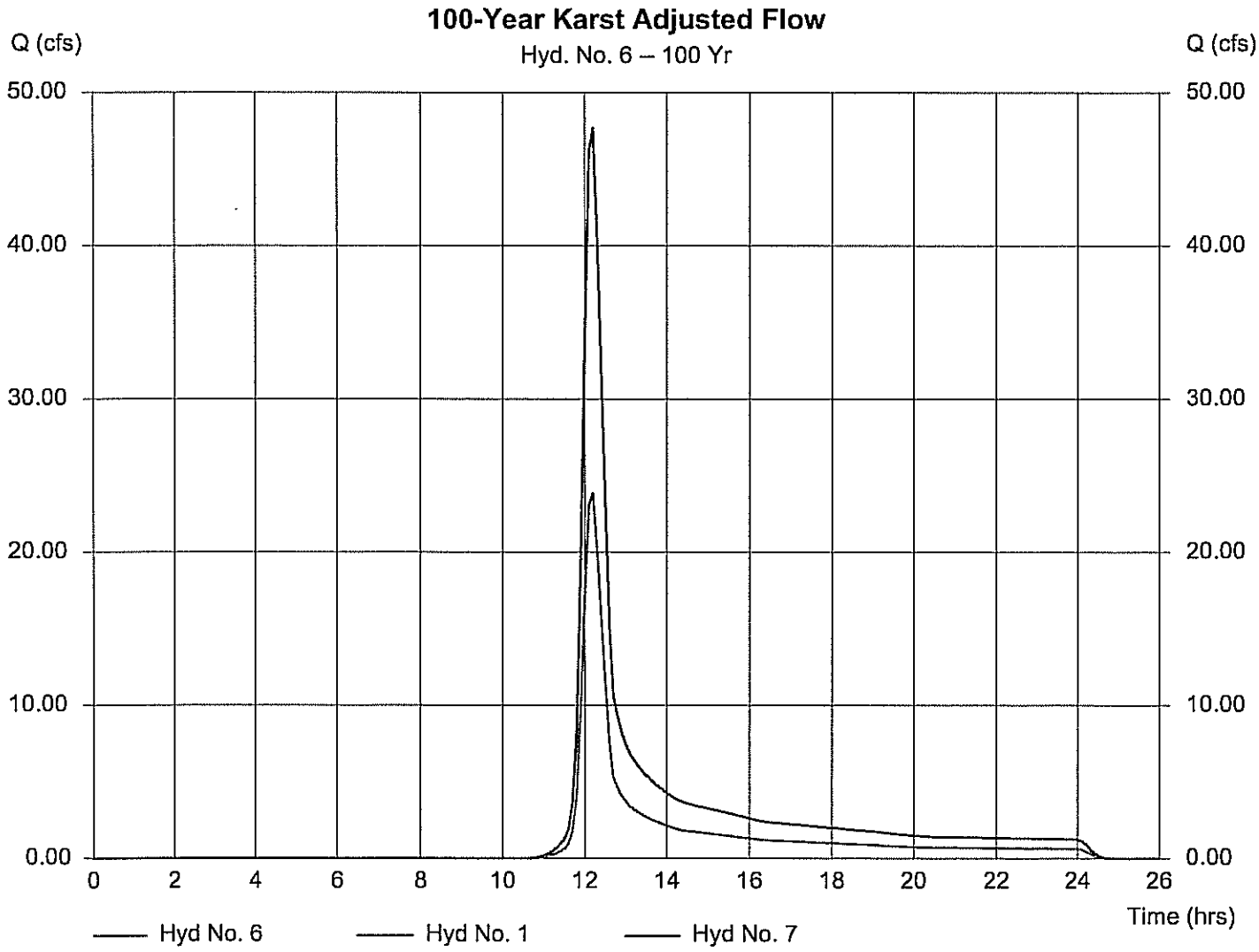
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 6

100-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 23.85 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 7
Diversion method	= Flow Ratio	Flow ratio	= 0.50

Hydrograph Volume = 101,884 cuft



Hydrograph Plot

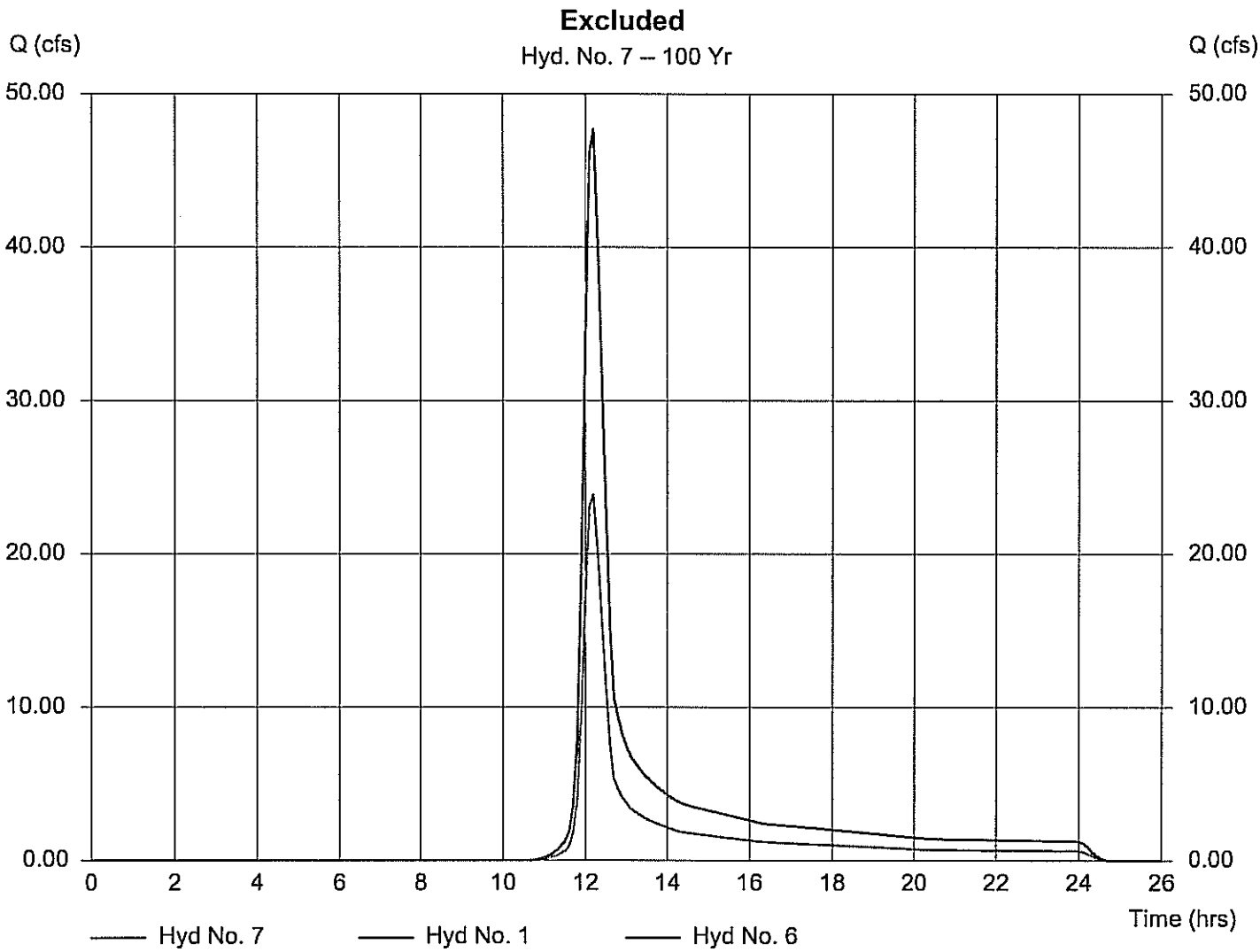
Hydraflow Hydrographs by Intelisolve | Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 7

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 23.85 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hydrograph	= 1	2nd diverted hyd.	= 6
Diversion method	= Flow Ratio	Flow ratio	= 0.50

Hydrograph Volume = 101,884 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

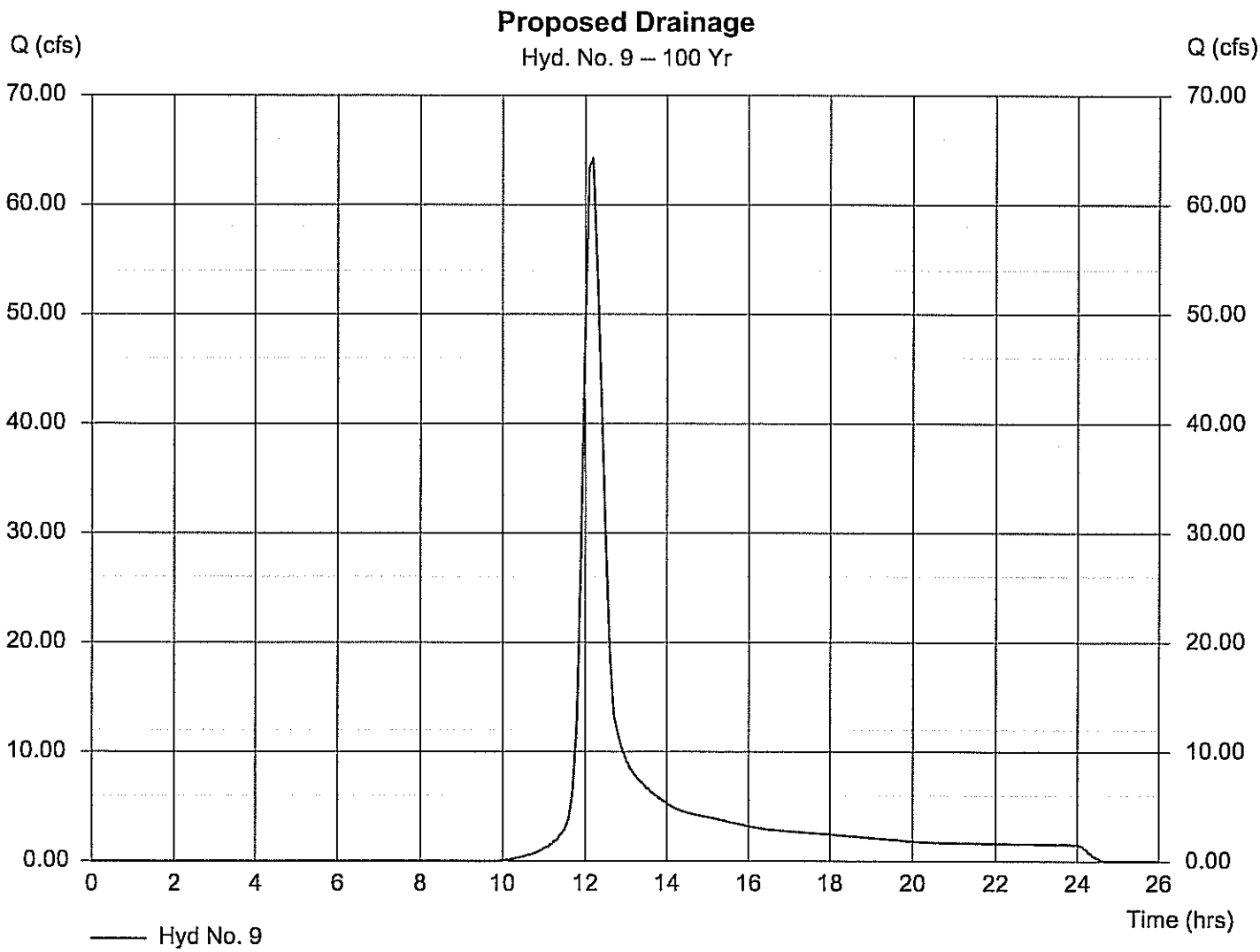
Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 9

Proposed Drainage

Hydrograph type	= SCS Runoff	Peak discharge	= 64.29 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 25.470 ac	Curve number	= 63
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.40 min
Total precip.	= 7.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 268,199 cuft



TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve

Hyd. No. 9

Proposed Drainage

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.240		0.011		0.011		
Flow length (ft)	=	150.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.10		0.00		0.00		
Land slope (%)	=	3.30		0.00		0.00		
Travel Time (min)	=	**16.41**	+	**0.00**	+	**0.00**	=	**16.41**
Shallow Concentrated Flow								
Flow length (ft)	=	900.00		0.00		0.00		
Watercourse slope (%)	=	3.50		0.00		0.00		
Surface description	=	Unpaved		Paved		Paved		
Average velocity (ft/s)	=	3.02		0.00		0.00		
Travel Time (min)	=	**4.97**	+	**0.00**	+	**0.00**	=	**4.97**
Channel Flow								
X sectional flow area (sqft)	=	0.00		0.00		0.00		
Wetted perimeter (ft)	=	0.00		0.00		0.00		
Channel slope (%)	=	0.00		0.00		0.00		
Manning's n-value	=	0.240		0.015		0.015		
Velocity (ft/s)	=	0.00		0.00		0.00		
Flow length (ft)	=	0.0		0.0		0.0		
Travel Time (min)	=	**0.00**	+	**0.00**	+	**0.00**	=	**0.00**

Total Travel Time, Tc ..... 21.40 min

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

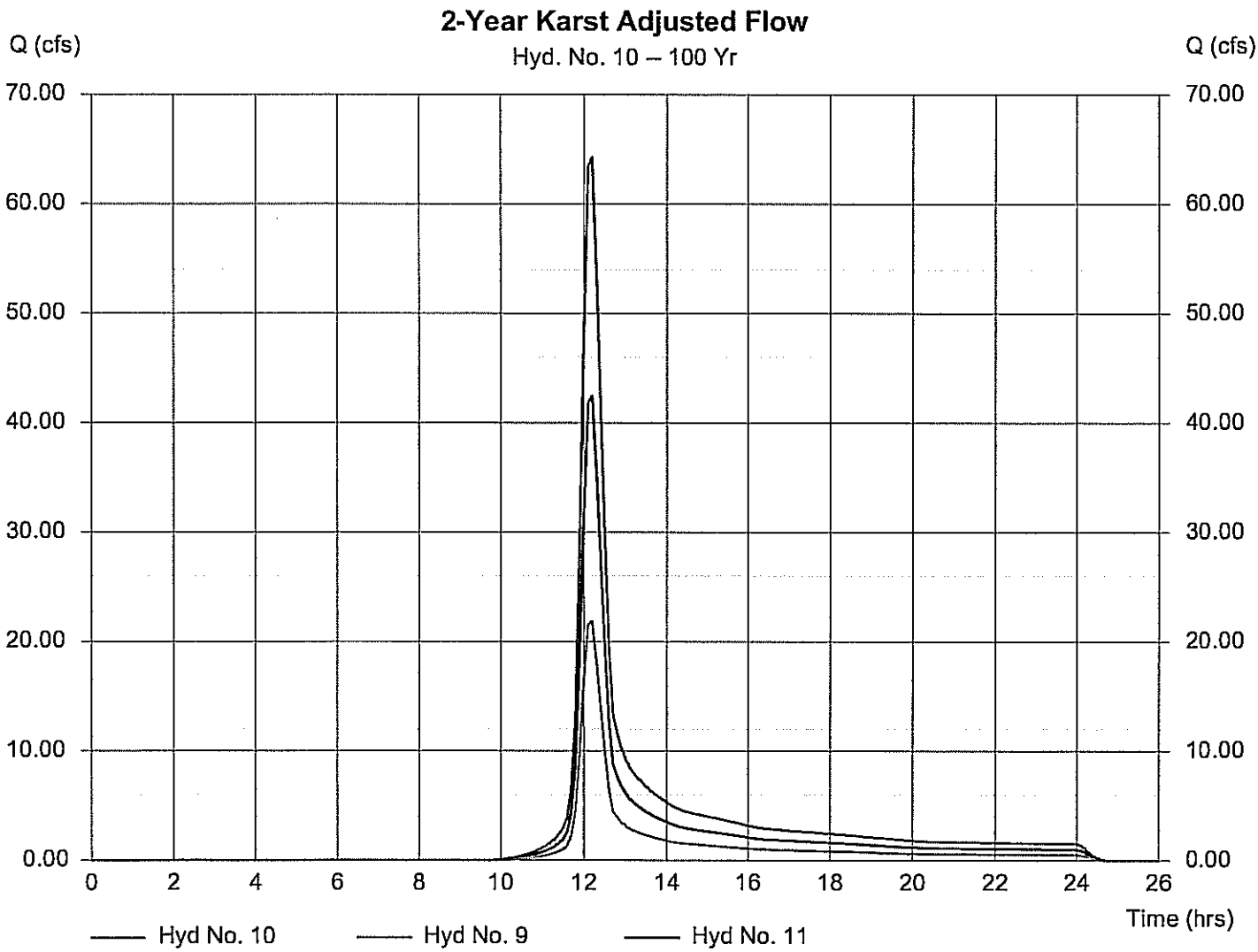
Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 10

2-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 21.86 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 11
Diversion method	= Flow Ratio	Flow ratio	= 0.34

Hydrograph Volume = 91,188 cuft



Hydrograph Plot

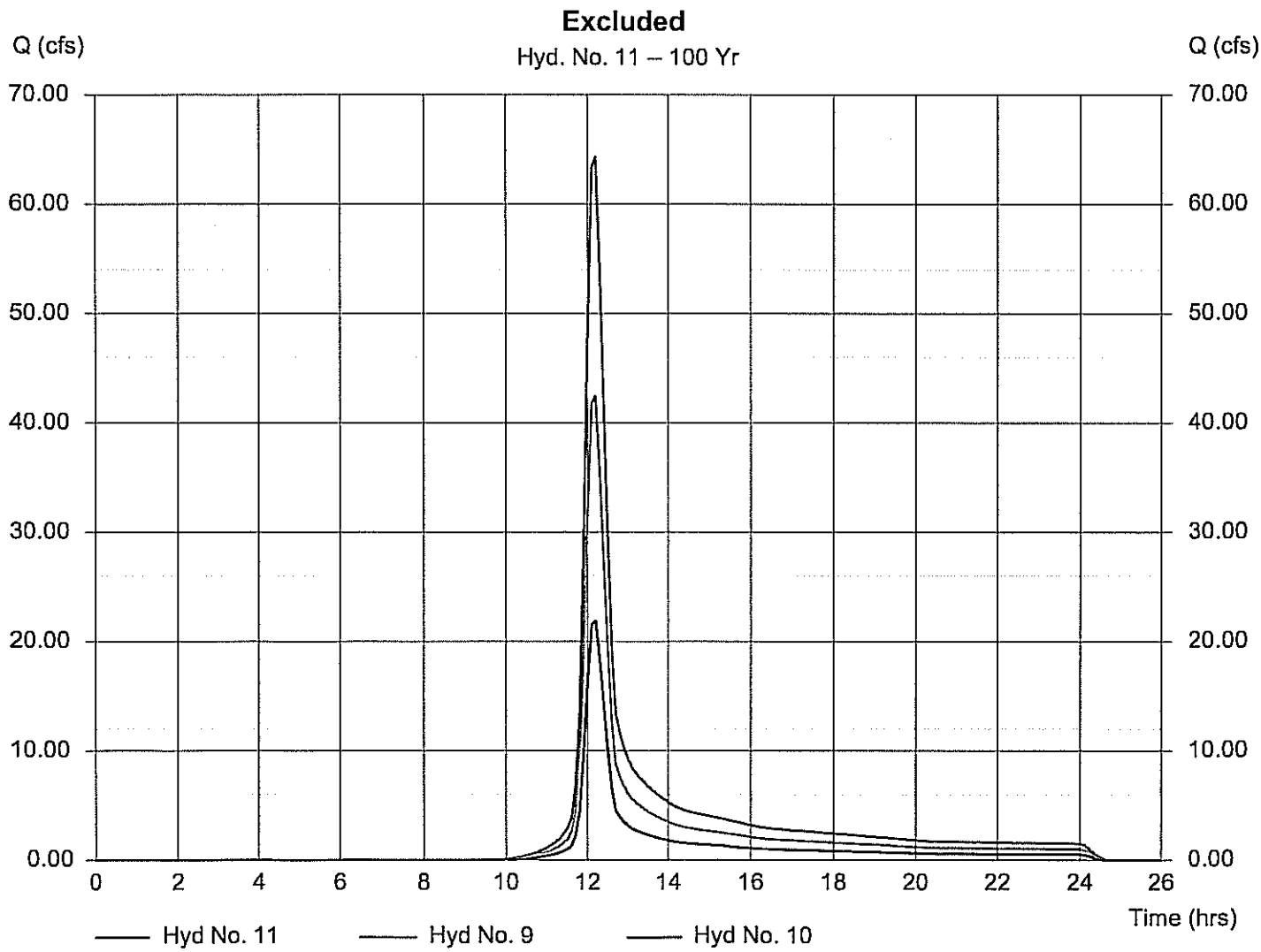
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 11

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 42.43 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 10
Diversion method	= Flow Ratio	Flow ratio	= 0.34

Hydrograph Volume = 177,011 cuft



Hydrograph Plot

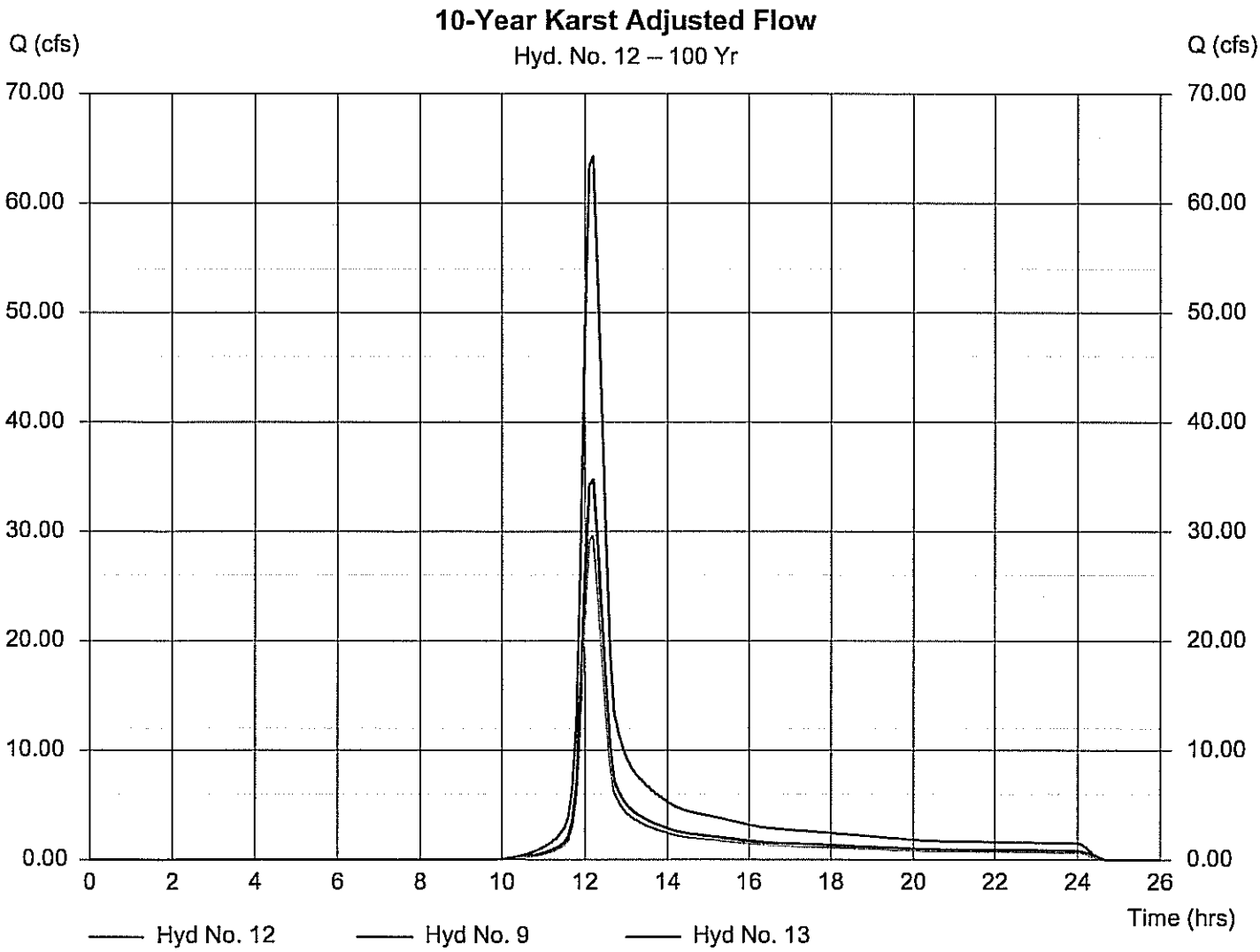
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 12

10-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 29.57 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 13
Diversion method	= Flow Ratio	Flow ratio	= 0.46

Hydrograph Volume = 123,371 cuft



Hydrograph Plot

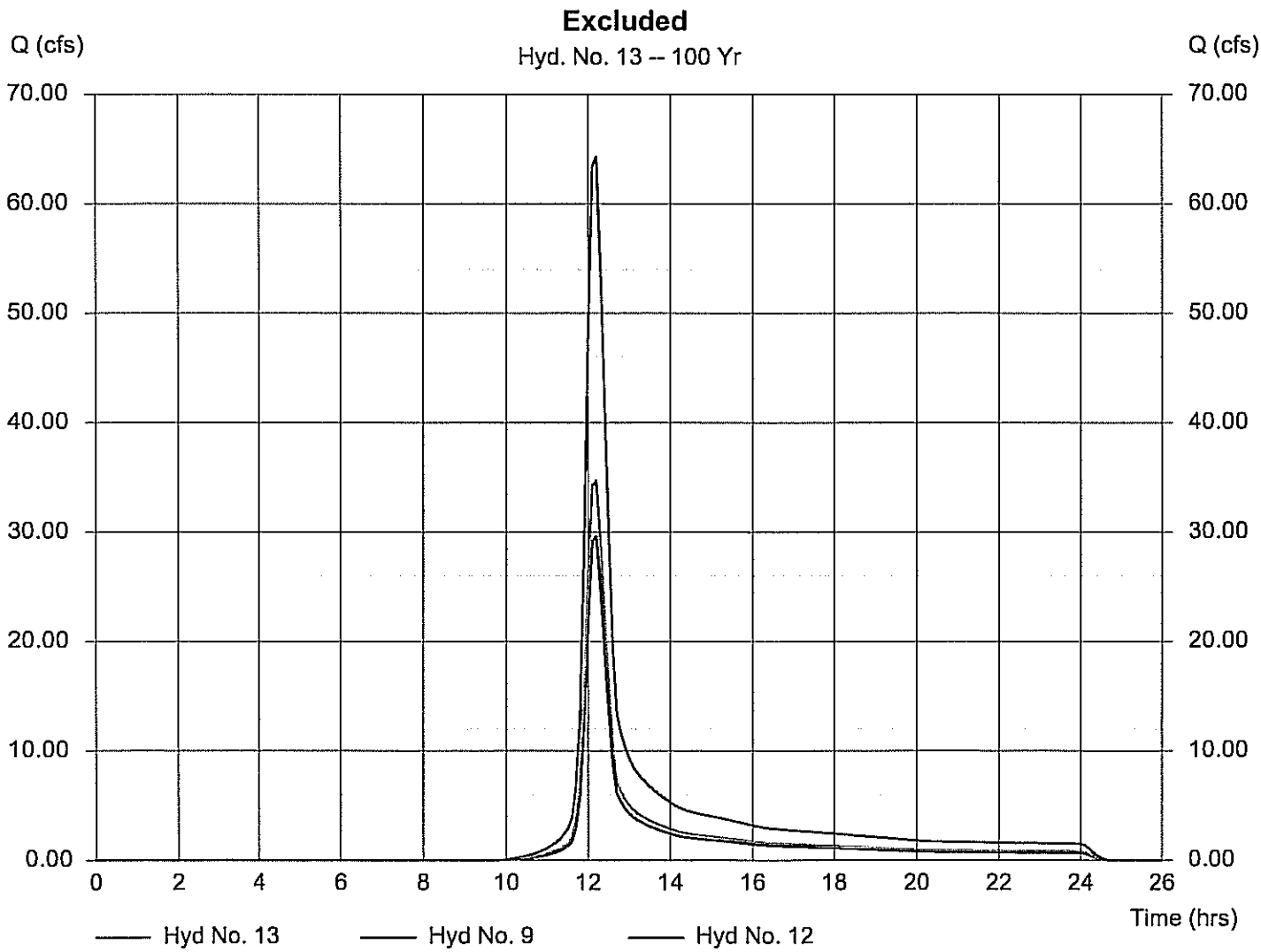
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 13

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 34.71 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 12
Diversion method	= Flow Ratio	Flow ratio	= 0.46

Hydrograph Volume = 144,827 cuft



Hydrograph Plot

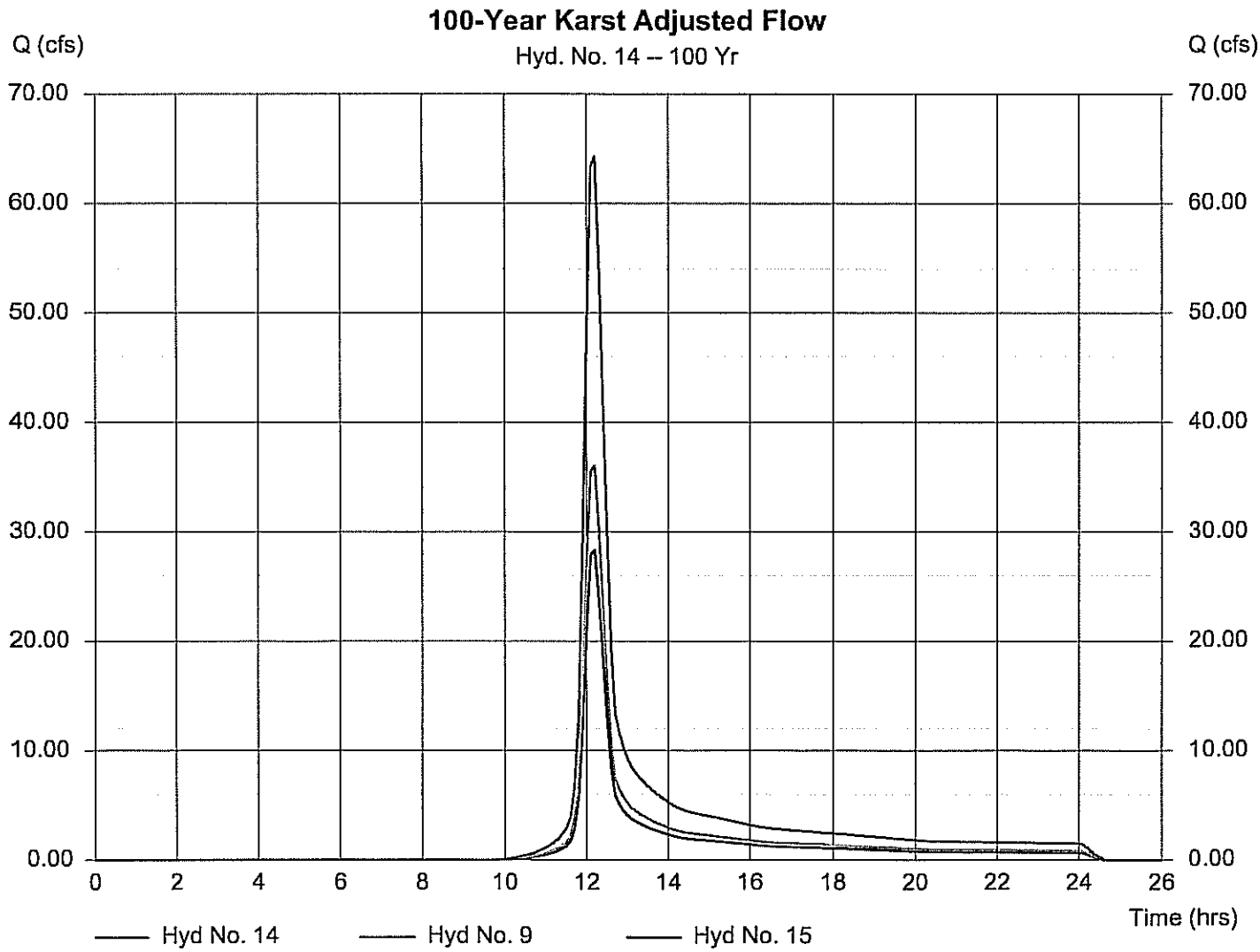
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 14

100-Year Karst Adjusted Flow

Hydrograph type	= Diversion1	Peak discharge	= 36.00 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 15
Diversion method	= Flow Ratio	Flow ratio	= 0.56

Hydrograph Volume = 150,191 cuft



Hydrograph Plot

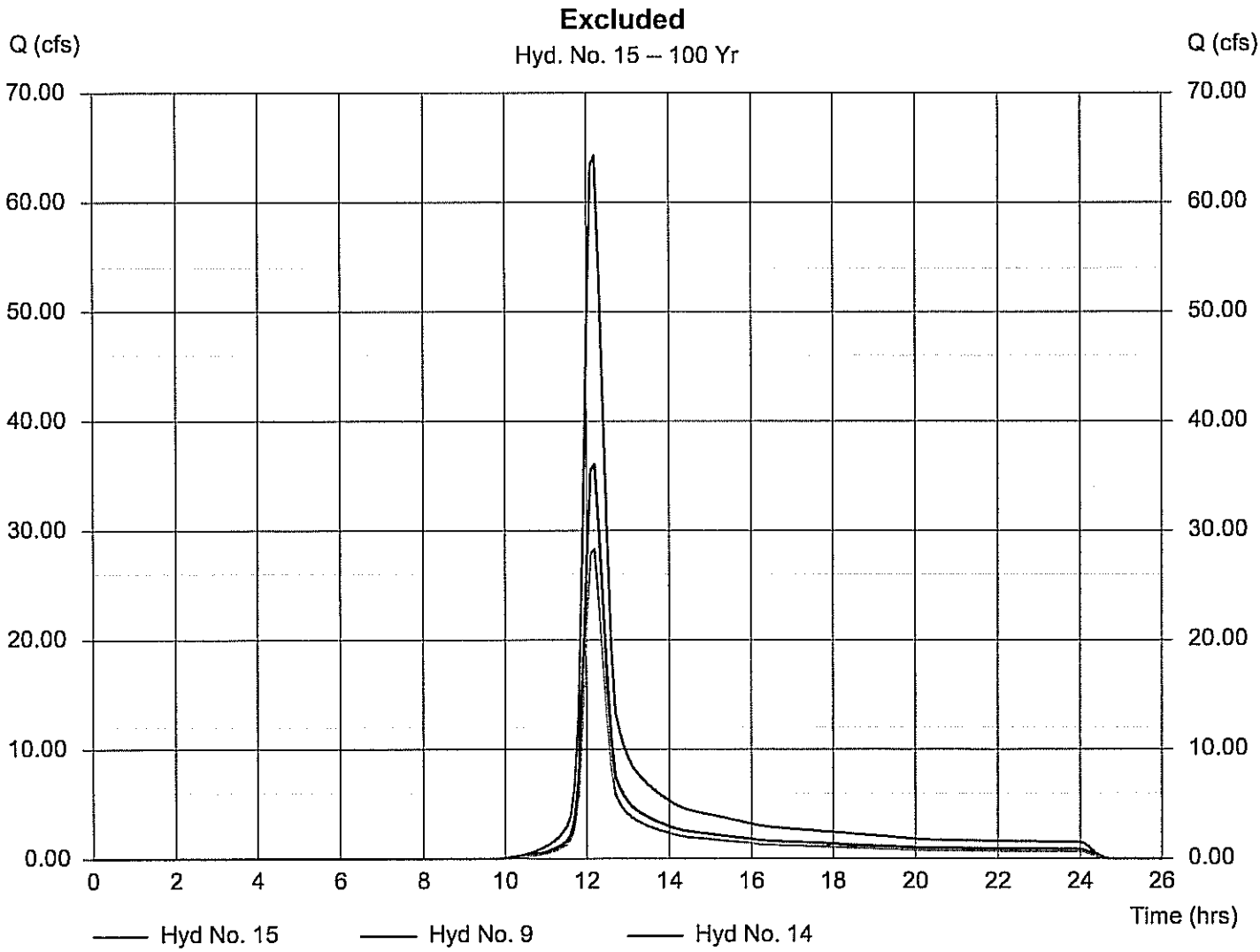
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 15

Excluded

Hydrograph type	= Diversion2	Peak discharge	= 28.29 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hydrograph	= 9	2nd diverted hyd.	= 14
Diversion method	= Flow Ratio	Flow ratio	= 0.56

Hydrograph Volume = 118,008 cuft



Hydrograph Plot

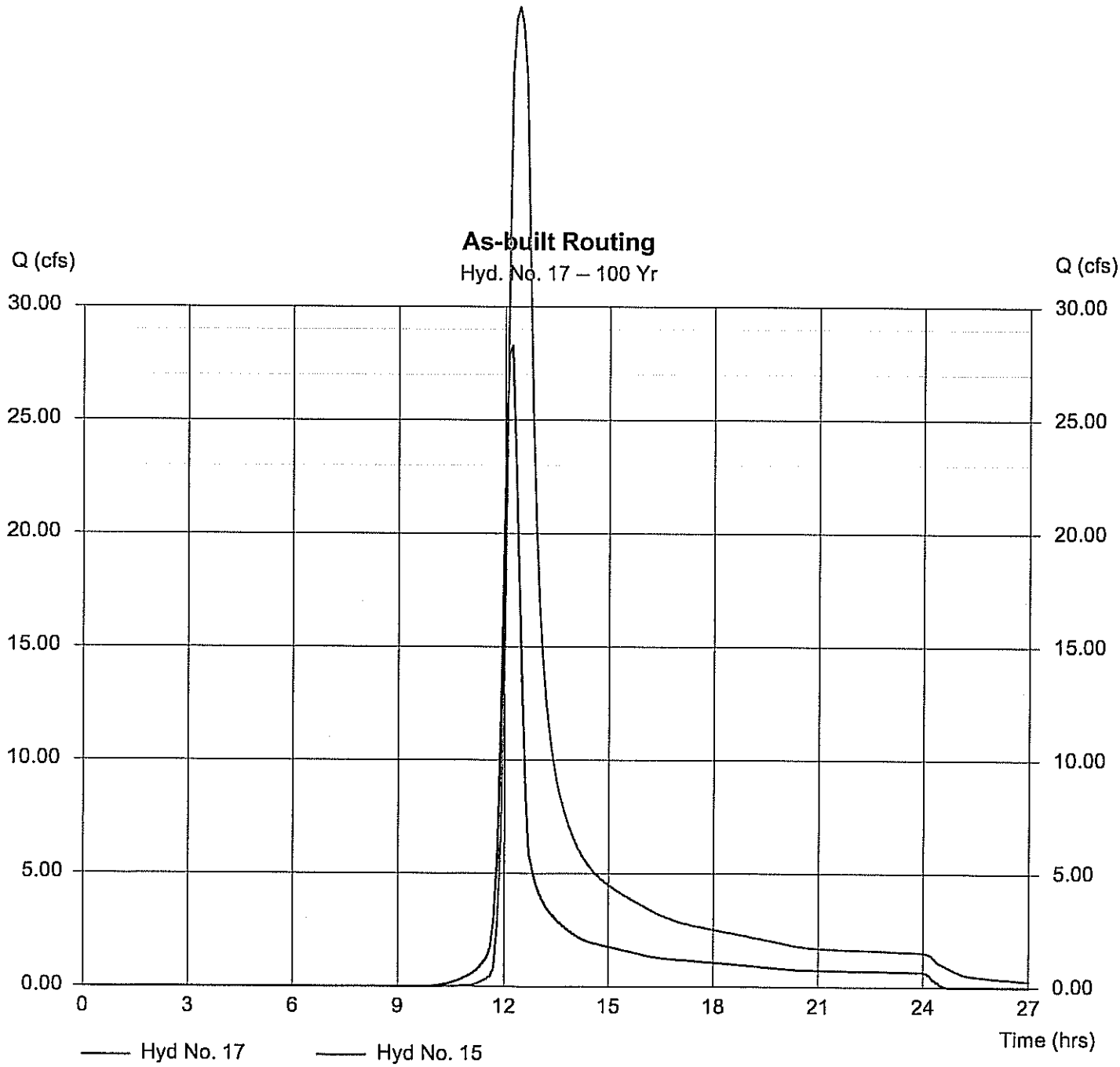
Hydraflow Hydrographs by Intellisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 17

As-built Routing

Hydrograph type	= Reservoir	Peak discharge	= 43.19 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyd. No.	= 15	Max. Elevation	= 396.18 ft
Reservoir name	= As-Built Pond	Max. Storage	= 72,338 cuft

Storage Indication method used. Wet pond routing start elevation = 393.00 ft. — Hydrograph Volume = 268,166 cuft



Pond Report

Hydraflow Hydrographs by Intelisolve

Thursday, Jul 26 2007, 10:58 AM

Pond No. 1 - As-Built Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	390.00	97	0	0
2.00	392.00	5,511	5,608	5,608
4.00	394.00	15,810	21,321	26,929
6.00	396.00	24,411	40,221	67,150
8.00	398.00	33,625	58,036	125,186

Culvert / Orifice Structures

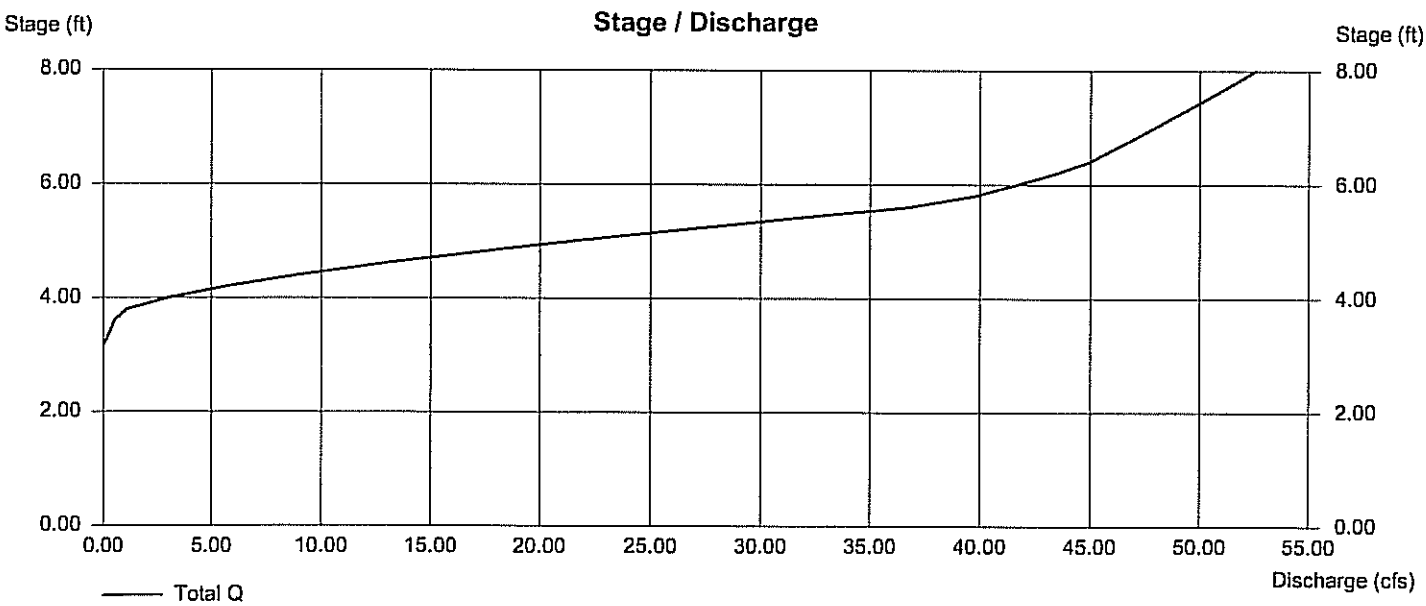
	[A]	[B]	[C]	[D]
Rise (in)	= 30.00	32.00	6.00	0.00
Span (in)	= 30.00	48.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 390.80	393.70	393.05	0.00
Length (ft)	= 60.58	0.00	0.00	0.00
Slope (%)	= 0.92	0.00	0.00	0.00
N-Value	= .013	.013	.013	.000
Orif. Coeff.	= 0.60	0.60	0.60	0.00
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 398.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Plot

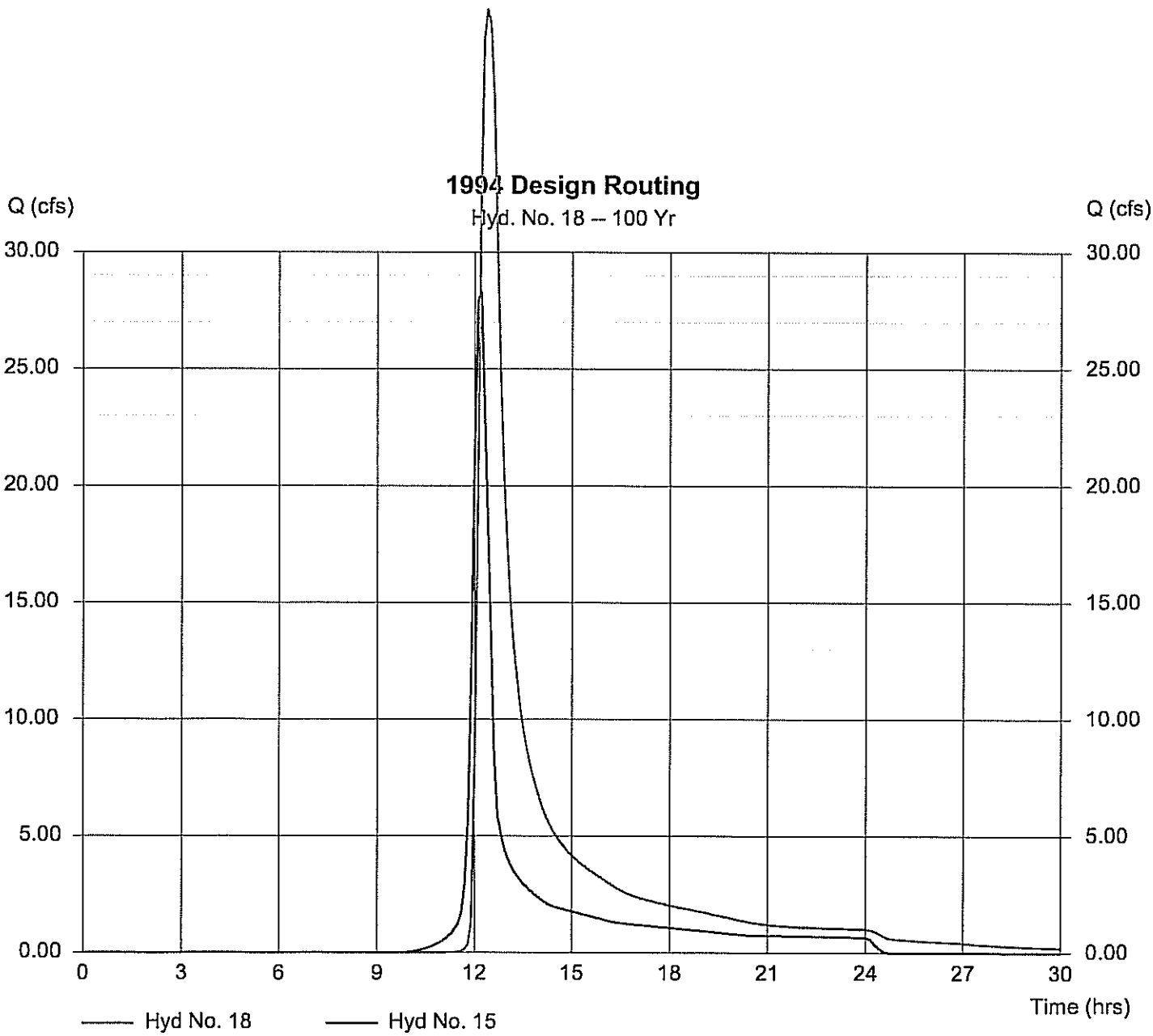
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 18

1994 Design Routing

Hydrograph type	= Reservoir	Peak discharge	= 40.39 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyd. No.	= 15	Max. Elevation	= 395.87 ft
Reservoir name	= 1994 Proposed Pond	Max. Storage	= 104,279 cuft

Storage Indication method used. Wet pond routing start elevation = 393.00 ft. — Hydrograph Volume = 239,439 cuft



Pond Report

Hydraflow Hydrographs by Intelisolve

Thursday, Jul 26 2007, 10:58 AM

Pond No. 2 - 1994 Proposed Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	388.00	1,878	0	0
2.00	390.00	5,849	7,727	7,727
4.00	392.00	11,056	16,905	24,632
5.00	393.00	15,091	13,074	37,706
6.00	394.00	22,667	18,879	56,585
8.00	396.00	28,372	51,039	107,624
10.00	398.00	34,978	63,350	170,974

Culvert / Orifice Structures

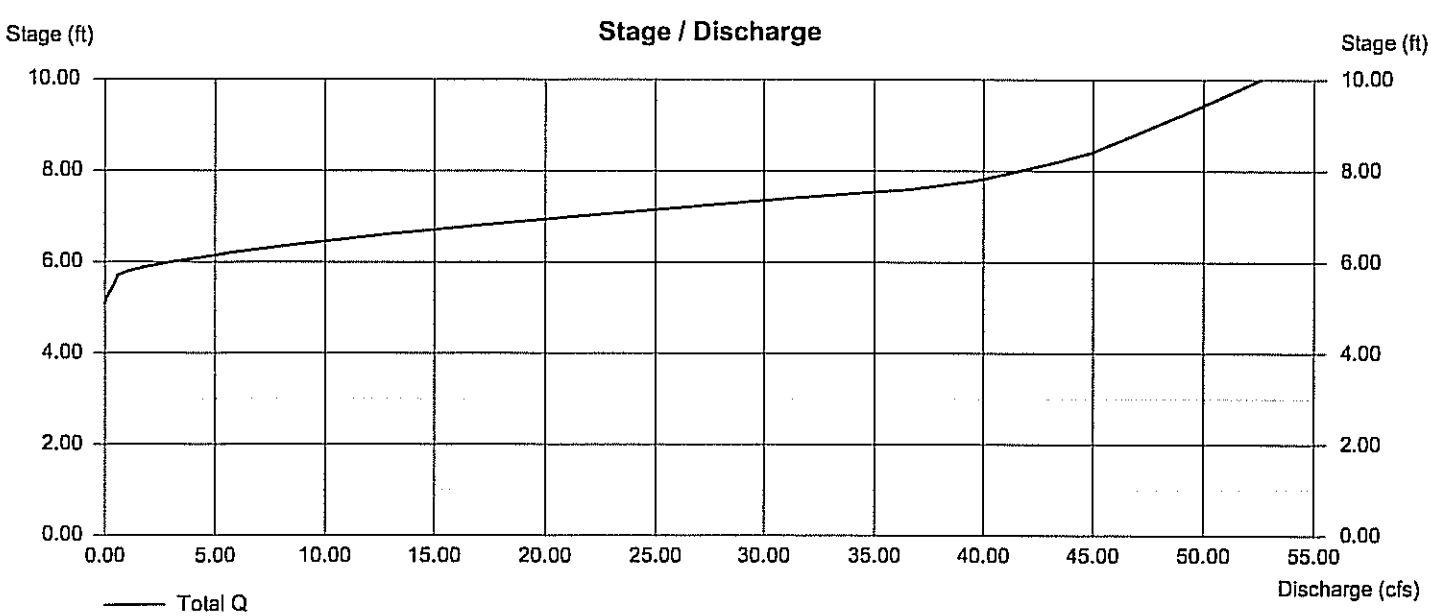
	[A]	[B]	[C]	[D]
Rise (in)	= 30.00	32.00	6.00	0.00
Span (in)	= 30.00	48.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 390.80	393.70	393.05	0.00
Length (ft)	= 60.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	0.00
N-Value	= .013	.013	.013	.000
Orif. Coeff.	= 0.60	0.60	0.60	0.00
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 398.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Plot

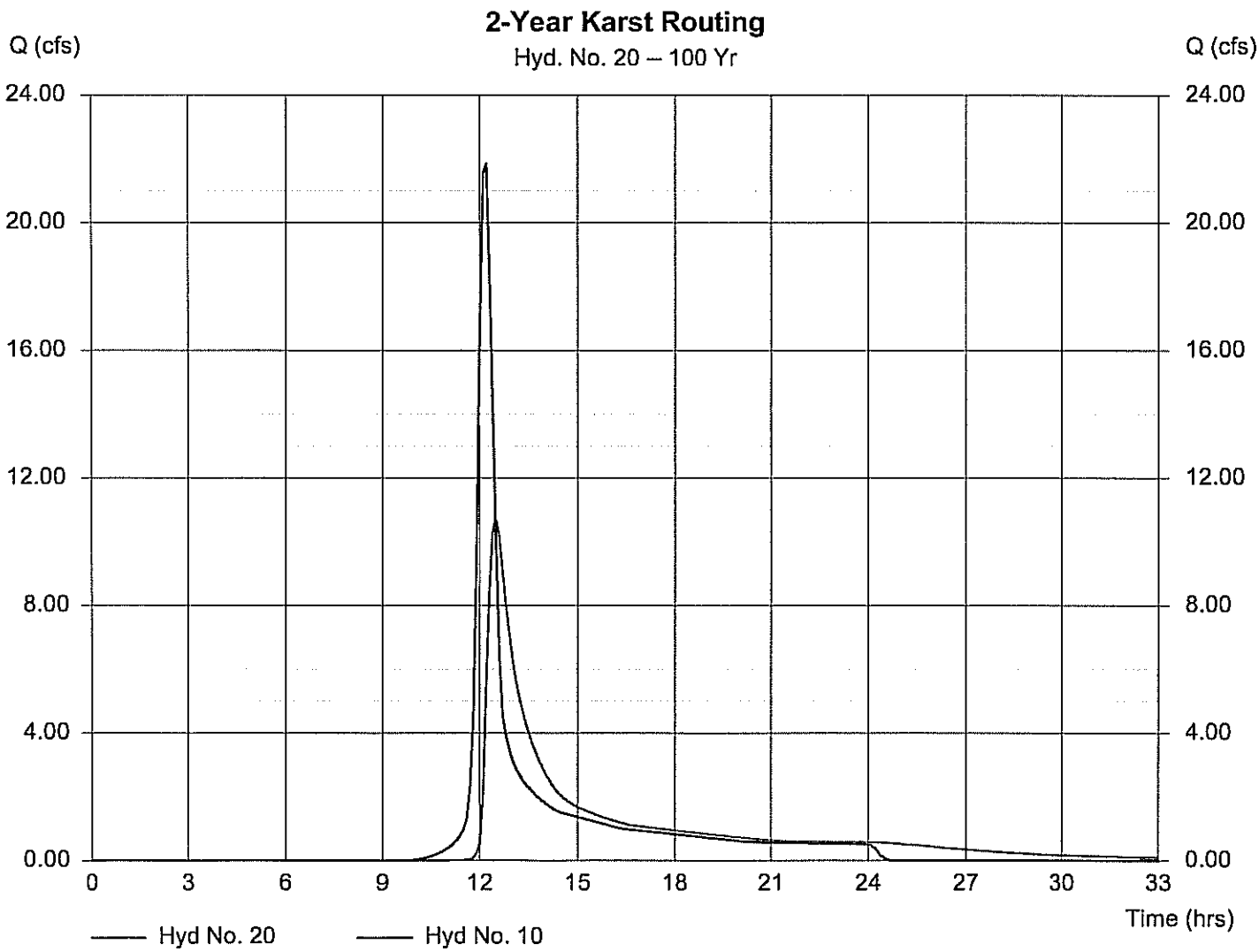
Hydraflow Hydrographs by Intellisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 20

2-Year Karst Routing

Hydrograph type	= Reservoir	Peak discharge	= 10.73 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyd. No.	= 10	Max. Elevation	= 394.49 ft
Reservoir name	= 1994 Proposed Pond	Max. Storage	= 69,204 cuft

Storage Indication method used. Wet pond routing start elevation = 393.00 ft. — Hydrograph Volume = 90,945 cuft



Pond Report

Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Pond No. 2 - 1994 Proposed Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	388.00	1,878	0	0
2.00	390.00	5,849	7,727	7,727
4.00	392.00	11,056	16,905	24,632
5.00	393.00	15,091	13,074	37,706
6.00	394.00	22,667	18,879	56,585
8.00	396.00	28,372	51,039	107,624
10.00	398.00	34,978	63,350	170,974

Culvert / Orifice Structures

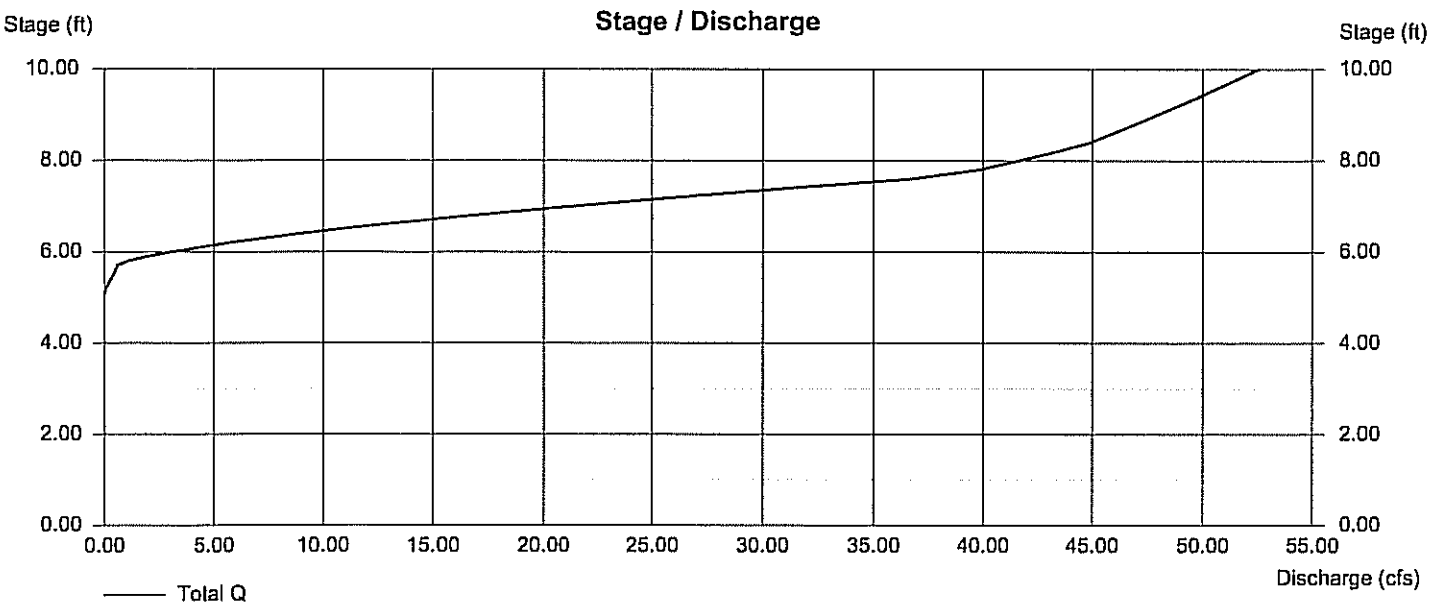
	[A]	[B]	[C]	[D]
Rise (in)	= 30.00	32.00	6.00	0.00
Span (in)	= 30.00	48.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 390.80	393.70	393.05	0.00
Length (ft)	= 60.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	0.00
N-Value	= .013	.013	.013	.000
Orif. Coeff.	= 0.60	0.60	0.60	0.00
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 398.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Plot

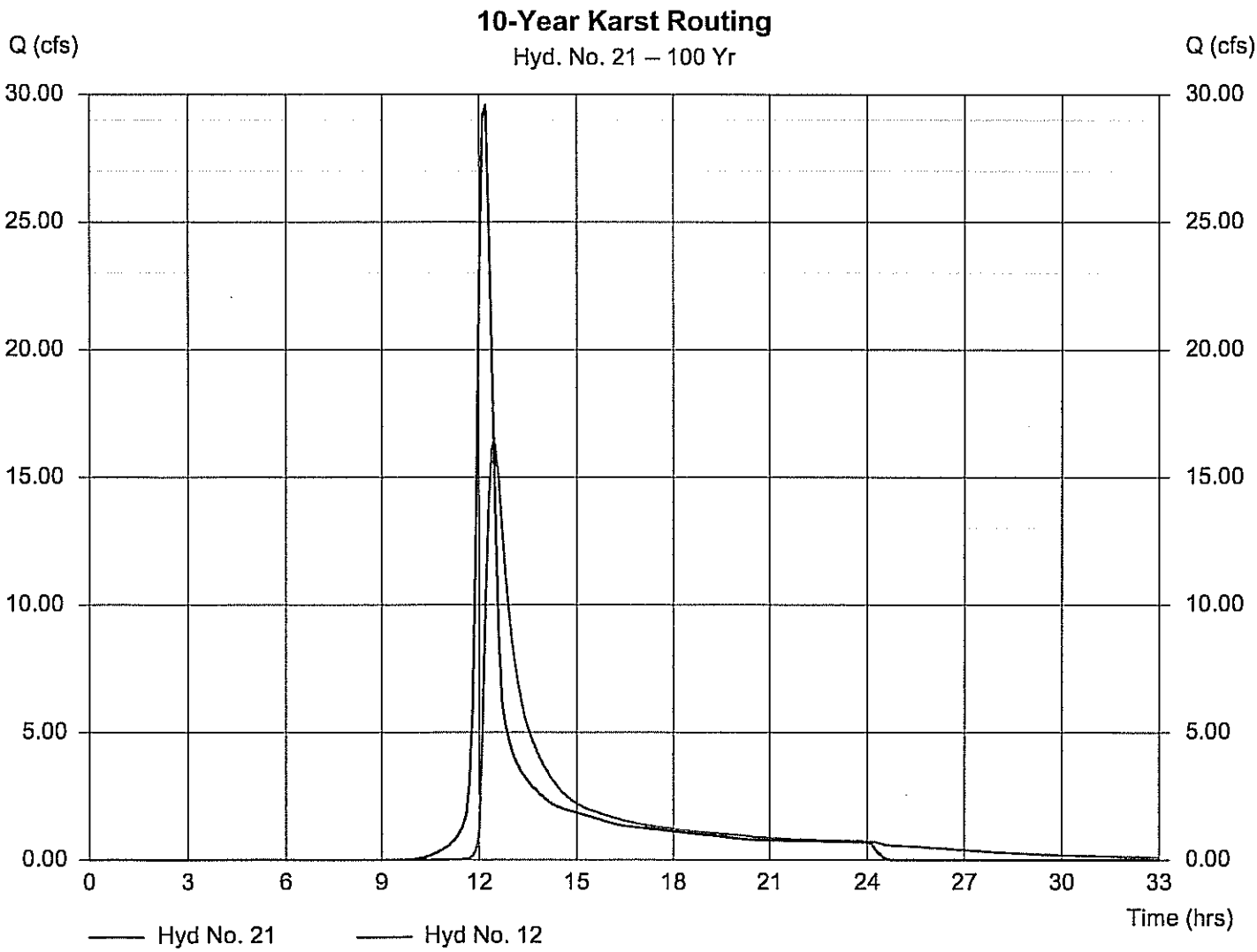
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 21

10-Year Karst Routing

Hydrograph type	= Reservoir	Peak discharge	= 16.30 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyd. No.	= 12	Max. Elevation	= 394.77 ft
Reservoir name	= 1994 Proposed Pond	Max. Storage	= 76,302 cuft

Storage Indication method used. Wet pond routing start elevation = 393.00 ft. — Hydrograph Volume = 123,129 cuft



Pond Report

Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Pond No. 2 - 1994 Proposed Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	388.00	1,878	0	0
2.00	390.00	5,849	7,727	7,727
4.00	392.00	11,056	16,905	24,632
5.00	393.00	15,091	13,074	37,706
6.00	394.00	22,667	18,879	56,585
8.00	396.00	28,372	51,039	107,624
10.00	398.00	34,978	63,350	170,974

Culvert / Orifice Structures

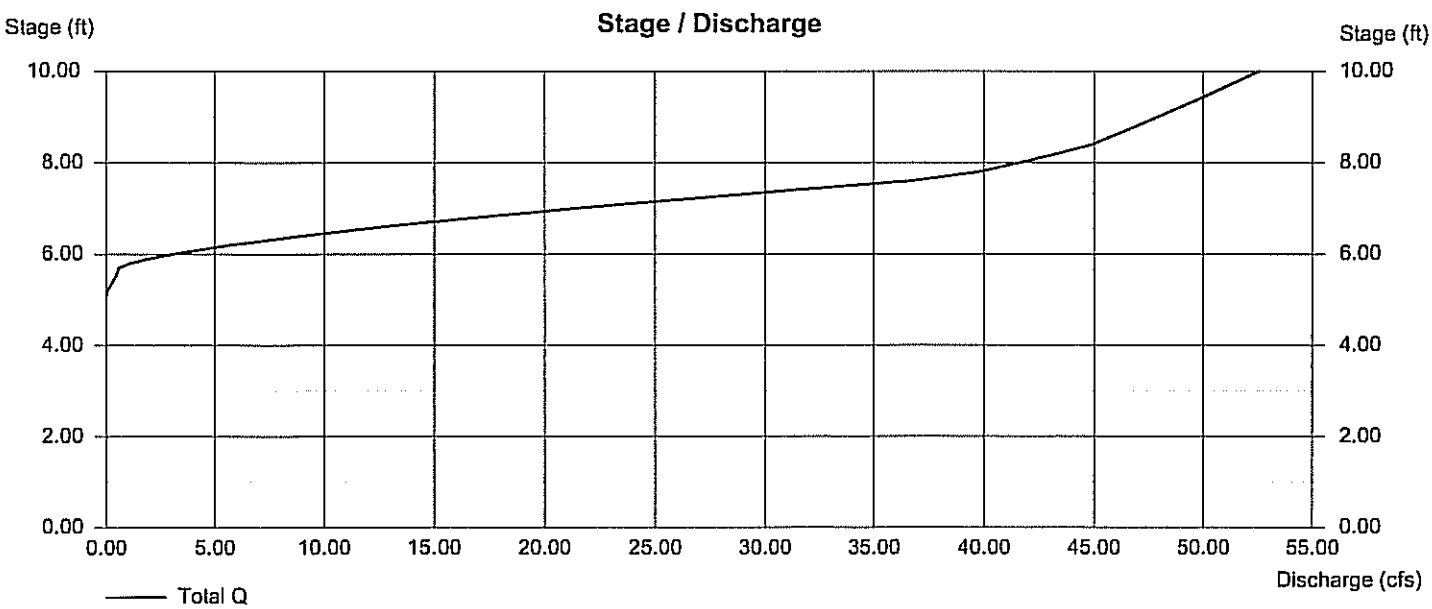
	[A]	[B]	[C]	[D]
Rise (in)	= 30.00	32.00	6.00	0.00
Span (in)	= 30.00	48.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 390.80	393.70	393.05	0.00
Length (ft)	= 60.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	0.00
N-Value	= .013	.013	.013	.000
Orif. Coeff.	= 0.60	0.60	0.60	0.00
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 398.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Plot

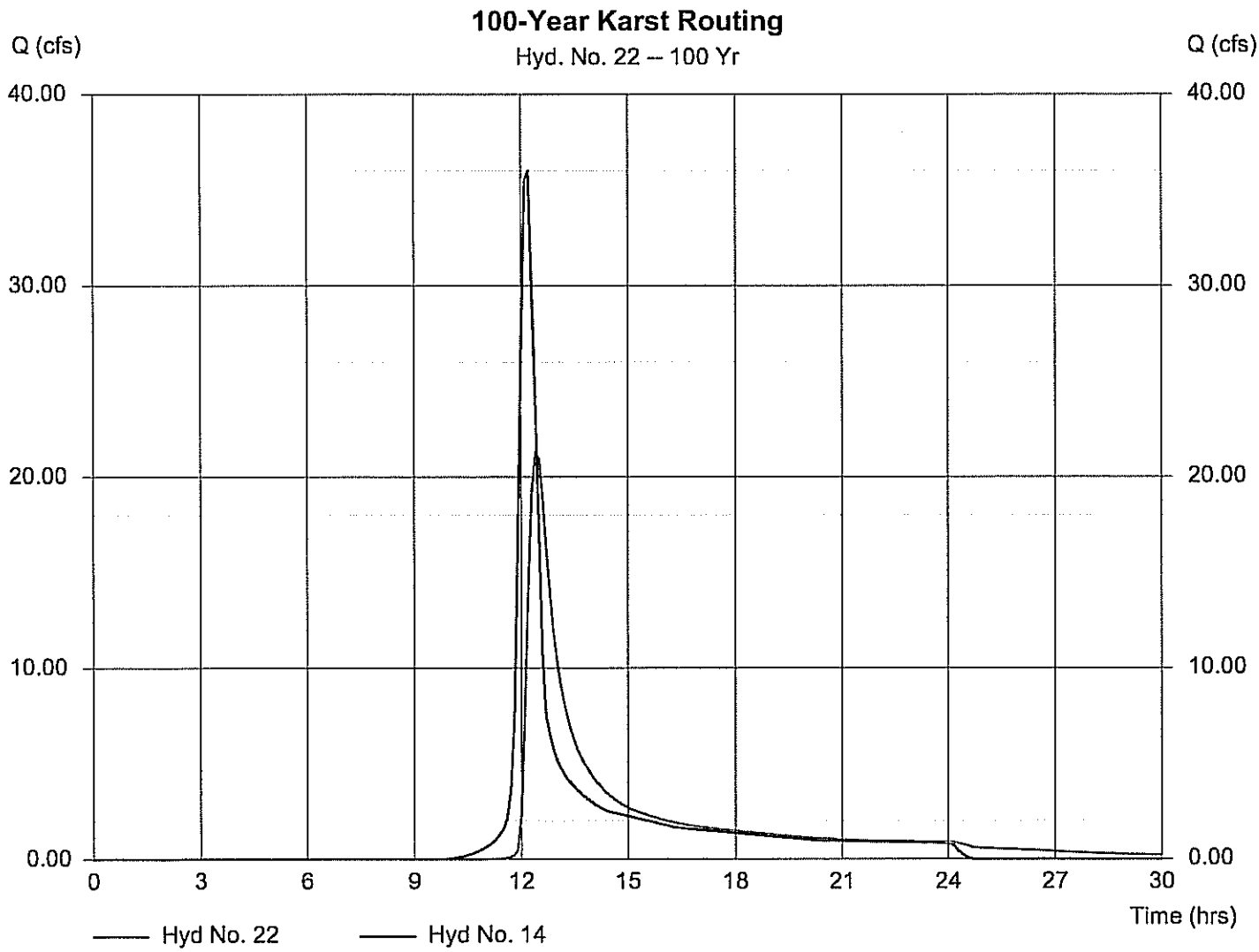
Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Hyd. No. 22

100-Year Karst Routing

Hydrograph type	= Reservoir	Peak discharge	= 21.29 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyd. No.	= 14	Max. Elevation	= 394.99 ft
Reservoir name	= 1994 Proposed Pond	Max. Storage	= 81,964 cuft

Storage Indication method used. Wet pond routing start elevation = 393.00 ft. — Hydrograph Volume = 149,949 cuft



Pond Report

Hydraflow Hydrographs by Intelisolve — Thursday, Jul 26 2007, 10:58 AM

Pond No. 2 - 1994 Proposed Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

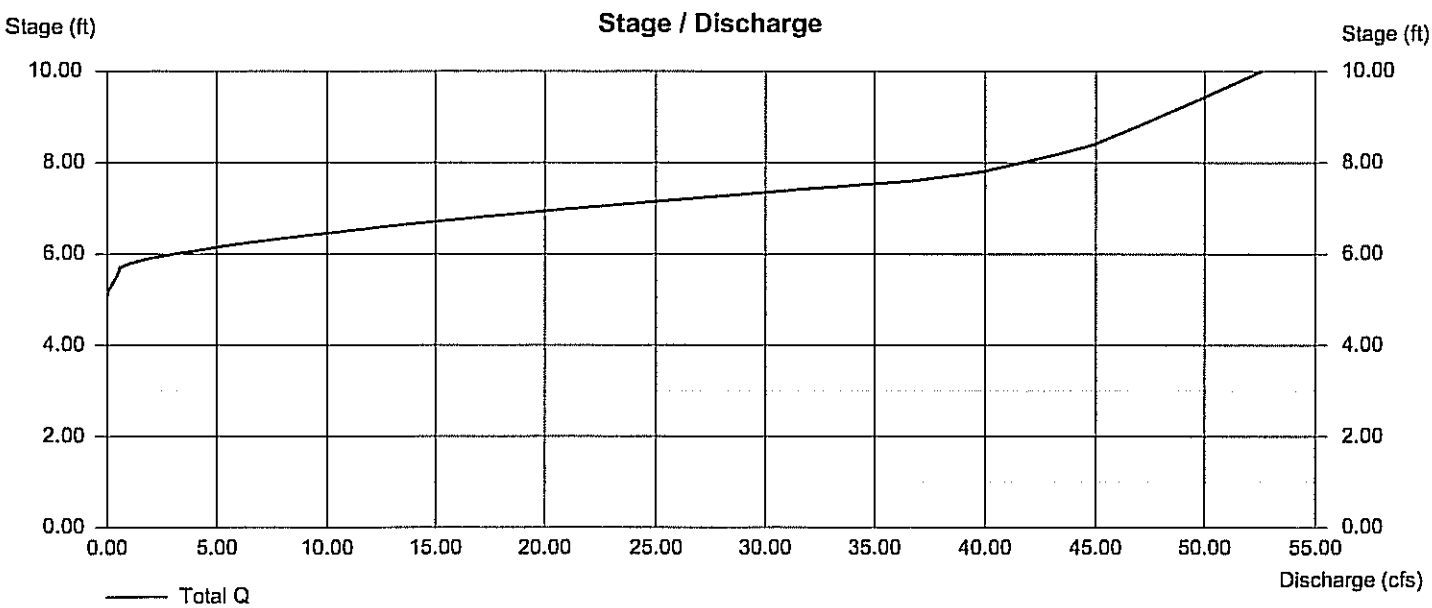
Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	388.00	1,878	0	0
2.00	390.00	5,849	7,727	7,727
4.00	392.00	11,056	16,905	24,632
5.00	393.00	15,091	13,074	37,706
6.00	394.00	22,667	18,879	56,585
8.00	396.00	28,372	51,039	107,624
10.00	398.00	34,978	63,350	170,974

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise (in)	= 30.00	32.00	6.00	0.00
Span (in)	= 30.00	48.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 390.80	393.70	393.05	0.00
Length (ft)	= 60.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	0.00
N-Value	= .013	.013	.013	.000
Orif. Coeff.	= 0.60	0.60	0.60	0.00
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 398.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.