DRAINAGE REPORT

For

MID-CONTINENT SEWAGE TREATMENT PLANT

Wichita, Kansas

August 2007

CDM

POE & ASSOCIATES, INC.
CONSULTING ENGINEERS

CITY OF WICHITA

Public Works, Engineering Division
Final Drainage Plan Submittal Checklist

Reviewer: James M. Ubert, P.E. Date: September 12, 2007

Subdivision Name: Mid-Continent Airport 6th Addition Location: E 1/2, NE 1/4, NW 1/4, S9-T28S-R1W

Total Land Area Of Ownership: 7.5 Acres

Type: ___Residential ___Commercial ✔Industrial ___Recreation ___Municipal ___Other

Applicant: City of Wichita Water Utility Contact: Jade Dundas Phone #: 316-303-8702

Engineer: CDM, Inc. / Poe & Associates, Inc. Contact: James M. Ubert, P.E. Phone # (316) 685-4114

Please check the appropriate box: I = Included; NA = Non-Applicable; R= Required prior to development
(If "NA" is checked, an explanation must be entered)

	Applicant			Engr	
Tab 1. Project Narrative	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Site Location Map, using USGS Map	✔			✔	
B. Discussion of development, existing conditions, and proposed impacts on stormwater, wetland, riparian, and flood plain	✔			✔	
C. Discussion of offsite conditions	✔			✔	
D. Summary of runoff calculations (pre/post development) No increase in peak discharge for all storm series	✔			✔	
E. Narrative description of the type and function of the permanent best management practices that are incorporated into the site design	✔			✔	
F. Copy of the plat	✔			✔	
G. Preliminary grading plan (The final grading plan shall be sealed, signed and dated prior to Engineering receiving the final sanitary sewer plans. One plan sheet and PDF shall be submitted to the Subdivision Engineer.)	✔			✔	
H. Professional Engineer seal, signature and date on cover of report	✔			✔	
I. CD of drainage plan in PDF format (one file) and one paper copy bound with this checklist included behind the cover	✔			✔	

	Applicant			Engr	
Tab 2. Existing Conditions Runoff Calculations	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Copy of applicable orthophoto showing proposed project boundaries (preferable in color)	✔			✔	
B. Runoff Method (Rational, Hydrograph Method, or other approved methods by Engineering)	✔			✔	
C. Existing topography (no greater than 2-foot contours, 1-foot recommend)	✔			✔	
D. Total Site Area and Total Impervious Area (acres)	✔			✔	
E. Benchmarks used for site control	✔			✔	
F. Streams, creeks, and waterway labeled	✔			✔	
G. Predominant soils from USDA soil surveys, and/or on site soil borings	✔			✔	
H. Location and boundaries of natural features such as wetlands, lakes, and ponds with the normal water elevation noted	✔			✔	
I. Location of existing roads, buildings, parking lots and other impervious areas.	✔			✔	

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J. Location of existing utilities (e.g., water, sewer, gas, electric) and easements	✔			✔	
K. Location of existing conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow	✔			✔	
L. Flow paths	✔			✔	
M. Location and dimensions of existing channels, bridges or culvert crossings	✔			✔	
N. Existing conditions hydrologic analysis for runoff rates, volumes and velocities showing methodologies used and supporting calculations (2, 5, 10, 25 & 100 year, 24-hour storm events) or Critical Duration	✔			✔	
O. Assumed pre-developed runoff curve numbers	✔			✔	
P. Existing time of concentrations used in calculations	✔			✔	
Q. Evaluate immediate downstream drainage capacity, not to exceed more than 0.25 miles downstream of site	✔			✔	
R. Existing structural elevations (e.g., invert of pipes, manholes, etc.)	✔			✔	
S. Cross-section data for open channels	✔			✔	
T. Ground water elevations, if applicable	✔			✔	

	Applicant			Engr	
Tab 3. Post-Development Hydrologic Analysis	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Proposed (post-development) conditions hydrologic and hydraulic analysis for runoff rates, volumes, HGL, and velocities showing the methodologies used and supporting calculations for all applicable design storms (2, 5, 10, 25 & 100 year, 24-hour storm events)	✔			✔	
B. Proposed time of concentrations used in calculations	✔			✔	
C. Assumed post-developed runoff curve numbers	✔			✔	
D. Proposed contours for detention facilities (to equal area used in outlet rating curves)	✔			✔	
E. Preliminary sizing calculations for stormwater controls including contributing drainage area, storage, and outlet configuration	✔			✔	
F. Stage-storage-discharge or outlet rating curves and inflow and outflow hydrographs for storage facilities	✔			✔	
G. Final analysis of potential upstream/downstream impact/effects of project, where necessary	✔			✔	
H. Existing and proposed structural elevations (e.g., invert of pipes, manholes, etc.)	✔			✔	
I. Design water surface elevations and normal pool elevation for ponds.	✔			✔	
J. Typical detail for outlet structures, embankments, spillways, grade control structures, conveyance channels, etc. To include height, width, elevation, and/or diameter.	✔			✔	
K. Proposed limits of clearing and grading	✔			✔	
L. Location of existing and proposed roads, buildings, parking lots and other impervious areas.	✔			✔	
M. Location of existing and proposed utilities (e.g., water, sewer) and easements	✔			✔	
N. Location of existing and proposed conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow	✔			✔	
O. Preliminary location and dimensions of proposed channel modifications, such as bridge or culvert crossings	✔			✔	

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P. Preliminary selection and location of stormwater controls	✔			✔	
Q. Emergency overflow structure's flow path	✔			✔	
R. Detention facility provides one-foot of freeboard above the HWL and emergency outfall shown (top of berm elevation shown)	✔			✔	
S. The 100-year 24-hour HWL delineated on the plan for detention pond	✔			✔	
T. Lowest opening elevations table on the plat for structures located adjacent to channels or ponds	✔			✔	
U. Stormwater Management Facilities located within a Reserve	✔			✔	
V. Maintenance responsibility of stormwater management facility shall be specified in the platters text. (e.g. HOA, Lot Owners Association, or lot)	✔			✔	
W. Off-site drainage easements or agreements required, where necessary	✔			✔	

	Applicant			Engr	
Tab 4. Floodplain Submittal	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Provide source of flood profile	✔		No changes to floodplain or floodway limits		✔
B. Nearest base flood elevations	✔		No changes to floodplain or floodway limits		✔
C. Delineation of pre-developed regulatory floodplain/floodway limits	✔		No changes to floodplain or floodway limits		✔
D. Delineation of post-developed regulatory floodplain and floodway limits	✔		No changes to floodplain or floodway limits		✔
E. Floodplain boundary determination per elevation (project limits shown)		✔	No changes to floodplain or floodway limits		✔
F. Provide source of floodway data table and discharges	✔		No changes to floodplain or floodway limits		✔
G. Provide all hydrologic and hydraulic study information for site-specific floodplain studies, unnumbered Zone A area elevation determinations and flood plain map revisions or required permits	✔		No changes to floodplain or floodway limits		✔
H. Provide regulatory floodway and four natural profile models (10,50,100, and 500-yr) for existing and future watershed conditions		✔	No changes to floodplain or floodway limits		✔
I. Location of floodplain/floodway limits and relationship of site to upstream/downstream properties (floodplain limits to be per elevation and scaled location)	✔		No changes to floodplain or floodway limits		✔
J. Flood plains and floodways located within a Reserve, where necessary	✔			✔	

	Applicant			Engr	
Tab 5. Federal, State and Local Permits (to be provided prior to construction unless otherwise specified)	**I/R**	**NA**	**Explanation / Location in Plan**	**I/R**	**NA**
A. US Army Corps of Engineers - Regulatory program permits (404 water quality certification)		✔	Not Required		✔
B. Kansas Department of Agriculture - Division of Water Resources Permits (Stream Obstruction, Channel Change, Flood Plain Fill, Levee, Water Appropriations, Dam safety permit, etc.)		✔	Not Required		✔
C. Federal Emergency Management Agency (FEMA) Letter of Map Changes (LOMA, LOMR, LOMR-f, CLOMR, etc.) Shall be included and approved when project modifies the limits of the floodway.		✔	Not Required		✔
D. Kansas Department of Transportation		✔	Highway Permit, Use of Right of Way		✔
E. Sedgwick County Right-of-way Permit		✔	Not Required		✔

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CD of Drainage Plan

DRAINAGE REPORT
MID-CONTINENT STP
Wichita, KS

TAB 1
Location and Project Narrative

The subject property is in the City of Wichita, Sedgwick County, Kansas covering an area of 7.5 acres in the currently platted Lot 1, Block 1, Mid-Continent 6th Addition. The 7.5 acre project site Parcel is a Lot Split of said Lot 1, Block 1. There are 2 existing basins that drain across this site, both into the Calfskin Creek. A USGS 7.5 minute quadrangle map and plat is included in Appendix A. All offsite drainage is generated from within the Mid-Continent Airport site in which existing conditions are used for runoff computations. The ground cover for the offsite areas is a combination of pasture, industrial and woods.

The best management practices to be implemented shall include maintaining existing vegetative strips (20 ft. wide), linear sediment barriers for ditch checks (hay bale, silt fence or other), silt fencing, and temporary earthen berms. All drainage that exits the project site leaves at 2 point sources – existing storm sewer pipes that outlet to the Cowskin Creek. Therefore all best management practices implemented shall have the purpose of controlling sediment runoff prior to reaching those points and keeping any erosion on the project site.

Table 1. Summary Table - Existing Conditions vs. Proposed Conditions Drainage

Basin	Area (Acres)	Tc (mins.)	24 Hour Rainfall Event (cfs)				
			2 Yr	5 Yr	10 Yr	25 Yr	100 Yr
E1	51.0	111.4	17.7	32.0	42.0	55.4	82.1
P1A+B	51.0	N/A	17.1	30.2	39.4	51.6	76.0
E2	30.5	114.1	9.4	17.2	22.7	30.2	45.0
P2	30.5	114.1	9.4	17.2	22.7	30.2	45.0

TAB 2
Pre-Developed Conditions (Existing Conditions)

Development
The 7.5 acre site is currently undeveloped with the basin partially developed. See attached Aerial Photo of Existing Site in Appendix D. Also attached in Appendix D is an Existing Conditions plan.

Drainage Conditions
The site was analyzed using the SCS method for curve numbers and time of concentrations. Hydraflow Hydrographs by Intellisolve was the software used. The existing conditions drainage of the Project Site is separated into 2 basins E-1 and E-2. Basin E-2 (existing conditions) will be same as P-2. There will be no change in runoff conditions for basin E-2 as part of this project.

Soil Survey
A copy of the USDA soil survey map is included in Appendix B.

Site Area
The 7.5 acre project site is currently pasture in fair condition. There are 3.7 acres of impervious area in the 51.0 acre basin.

Table 2. Existing Conditions Drainage

Basin	Area (Acres)	Tc (mins.)	24 Hour Rainfall Event (cfs)				
			2 Yr	5 Yr	10 Yr	25 Yr	100 Yr
E1	51.0	111.4	17.7	32.0	42.0	55.4	82.1
E2	30.5	114.1	9.4	17.2	22.7	30.2	45.0

TAB 3
Post-Developed Conditions Hydrologic Analysis (Proposed Conditions)

Development
The 7.5 acre site will be developed with 2.4 acres of an enclosed wastewater treatment plant and asphalt pavement access road and parking area. The remaining 5.1 acres of the site will remain un-developed.

FEMA Floodplain
The Base Flood Elevation (BFE) for the subject area varies from 1303.0 to 1303.7. The finished floor elevation of the proposed Mid-Continent STP is 1311.9 (124.5 City of Wichita Datum). See Appendix C.

Drainage Conditions
The 7.5 acre proposed developed site was evaluated with 3 sub-basins. Subbasin P1A includes 44.7 acres offsite and to the Norhteast of the Project Site, subbasin P1B includes 6.3 acres of the 7.5 acres of the Project Site, and subbasin P2 includes 30.5 acres offsite and on the Project Site. The onsite portion of the P2 basin will remain undeveloped.

Table 3. Proposed Conditions Drainage

Basin	Area (Acres)	Tc (mins.)	24 Hour Rainfall Event (cfs)				
			2 Yr	5 Yr	10 Yr	25 Yr	100 Yr
P1A	44.7	110.8	15.8	28.4	37.1	48.9	72.3
P1B	6.3	30.3	7.4	11.6	14.4	18.1	25.4
P1A+B	51.0	N/A	17.1	30.2	39.4	51.6	76.0
P2	30.5	114.1	9.4	17.2	22.7	30.2	45.0

Utilities
The proposed Project Site is an enclosed sewage treatment plant. Water utility to the site is from an on-site well. The sanitary sewer effluent outfalls to the Cowskin Creek. The sanitary sewer outfall and storm sewer are shown on the on the Road/Pavement Site Plan. See Appendix E.

Summary of Proposed Conditions
As shown in Table 4, there is no increase in the amount of runoff and there is actually a slight decrease which becomes more pronounced at the 100 year rain interval.

TAB 4 - FLOODPLAIN

FEMA Floodplain.
The FEMA map (FIRM Panels 340 & 345, Wichita, Sedgwick County, KS, February 2, 2007) of the area is attached. See Appendix C.

The Base Flood Elevation (BFE) for the subject area along Cowskin Creek varies from 1303.0 to 1303.7 (See Appendix C). The finished floor elevation of the proposed Mid-Continent STP is 1311.9 (124.5 City of Wichita Datum) (See Site Plan in Appendix E).

All fill constructed on the proposed project site is outside of the FEMA Floodway and Floodplain (Zone A).

TAB 5 – FEDERAL, STATE and LOCAL PERMITS

Federal Permits

The drainage portion of the Mid-Continent STP project does not include improvements within the Cowskin Creek. A U.S. Army Corps of Engineers permit is not needed for site or drainage improvements. All fill constructed within this project will be outside of Zone A of the Federal Emergency Management Agency and will not require a LOMR-F.

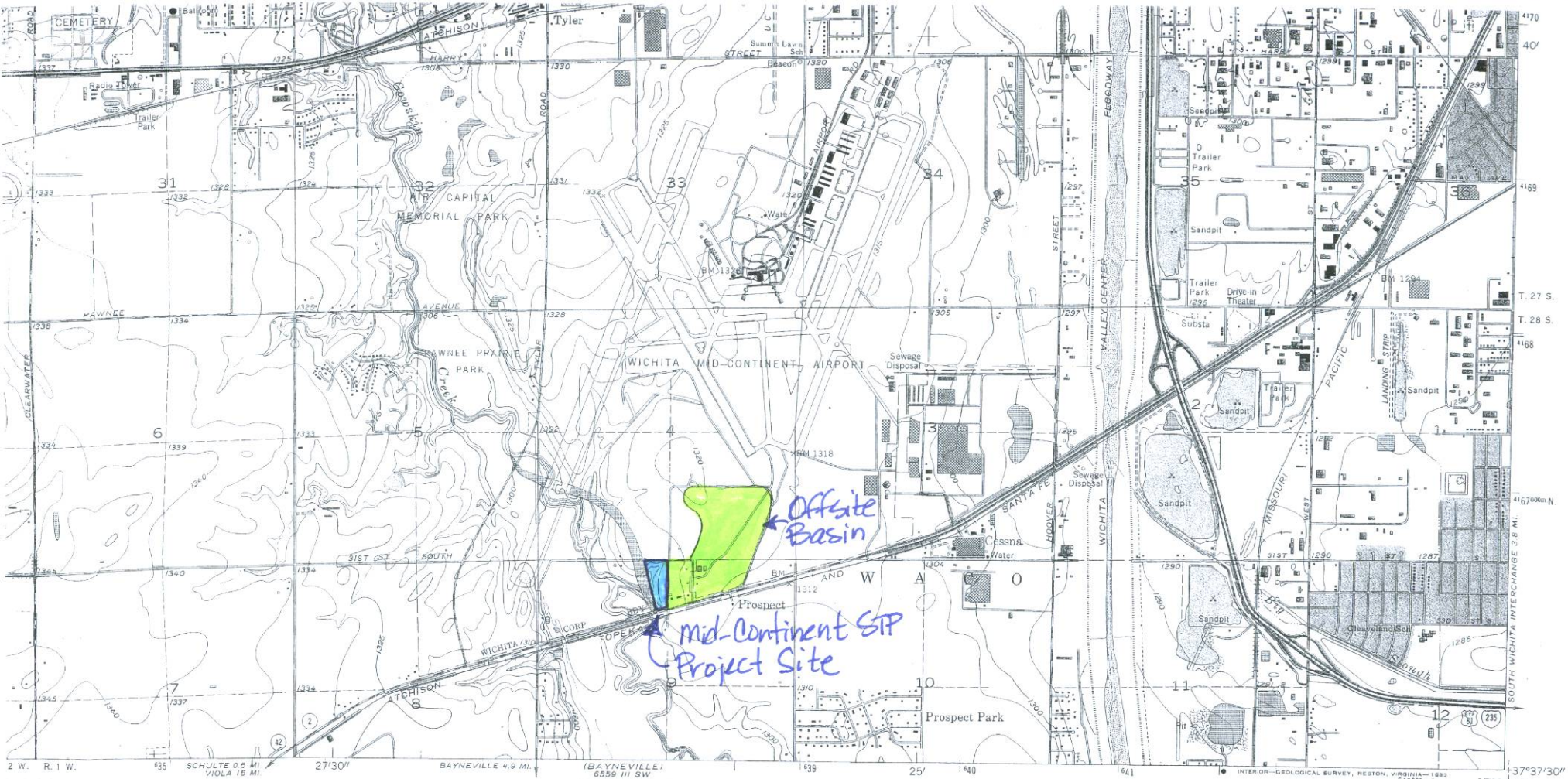
State Permits

All fill constructed within this project will be outside of Zone A of the FEMA floodplain. A Kansas Department of Agriculture Division of Water Resources permit(s) will not be needed.

Kansas Department of Transportation and Sedgwick County Permits

All site, drainage and road improvements being constructed are within the Parcel, part of a Lot Split of Lot 1, Mid-Continent 6th Addition to Wichita, Sedgwick County, KS. Access to the project site is via an existing entrance of K-42 and 31st Street South. KDOT and Sedgwick County permits are not required.

Appendix A
Quadrangle Map & Final Plat



logical Survey
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notographs
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13

SCALE 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTM GRID AND 1982 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

MN
GN
0°57' 17 MILS
7½° 133 MILS

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
AND STATE GEOLOGICAL SURVEY, LAWRENCE, KANSAS 66044
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

KANSAS
QUADRANGLE LOCATION

Revisions shown in purple compiled from aerial photographs taken 1980 and other sources
This information not field checked. Map edited 1982

Purple tint indicates extension of urban area

ROAD CLASSIFICATION

Primary highway, hard surface
Secondary highway, hard surface
Light-duty road, hard or improved surface
Unimproved road
Interstate Route
U. S. Route
State Route

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1983

WICHITA WEST, KANS.
N3737.5—W9722.5/7.5

1961

PHOTOREVISED 1982

DMA 6559 III NW—SERIES V878

738

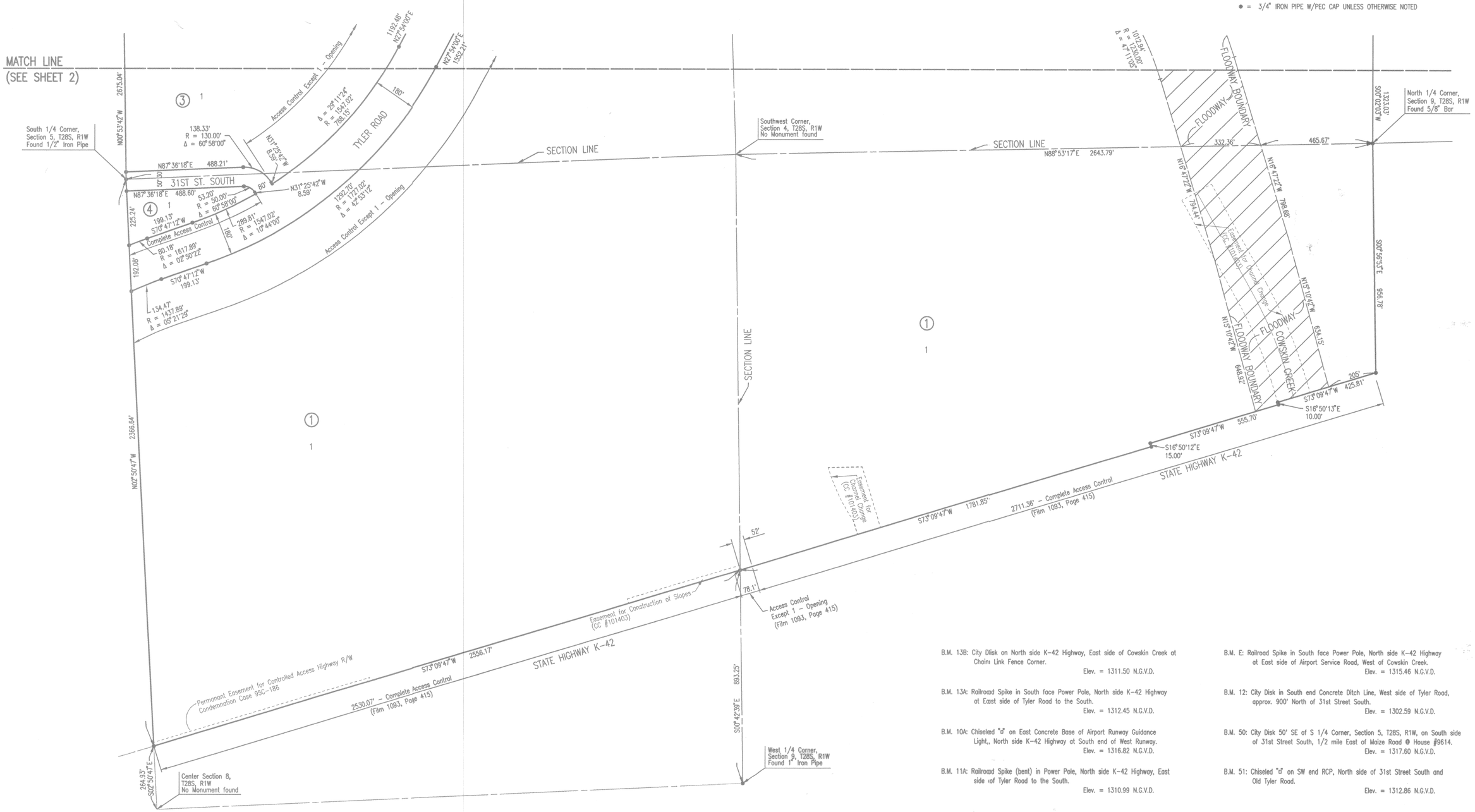
PC 123-1C

MID-CONTINENT AIRPORT 6TH ADDITION

TO WICHITA, SEDGWICK COUNTY, KANSAS

SCALE : 1" = 200'

● = 3/4" IRON PIPE W/PEC CAP UNLESS OTHERWISE NOTED



B.M. 13B: City Disk on North side K-42 Highway, East side of Cowskin Creek at Chain Link Fence Corner.
Elev. = 1311.50 N.G.V.D.

B.M. 13A: Railroad Spike in South face Power Pole, North side K-42 Highway at East side of Tyler Road to the South.
Elev. = 1312.45 N.G.V.D.

B.M. 10A: Chiseled "d" on East Concrete Base of Airport Runway Guidance Light,, North side K-42 Highway at South end of West Runway.
Elev. = 1316.82 N.G.V.D.

B.M. 11A: Railroad Spike (bent) in Power Pole, North side K-42 Highway, East side of Tyler Road to the South.
Elev. = 1310.99 N.G.V.D.

B.M. E: Railroad Spike in South face Power Pole, North side K-42 Highway at East side of Airport Service Road, West of Cowskin Creek.
Elev. = 1315.46 N.G.V.D.

B.M. 12: City Disk in South end Concrete Ditch Line, West side of Tyler Road, approx. 900' North of 31st Street South.
Elev. = 1302.59 N.G.V.D.

B.M. 50: City Disk 50' SE of S 1/4 Corner, Section 5, T28S, R1W, on South side of 31st Street South, 1/2 mile East of Maize Road @ House #9614.
Elev. = 1317.60 N.G.V.D.

B.M. 51: Chiseled "d" on SW end RCP, North side of 31st Street South and Old Tyler Road.
Elev. = 1312.86 N.G.V.D.

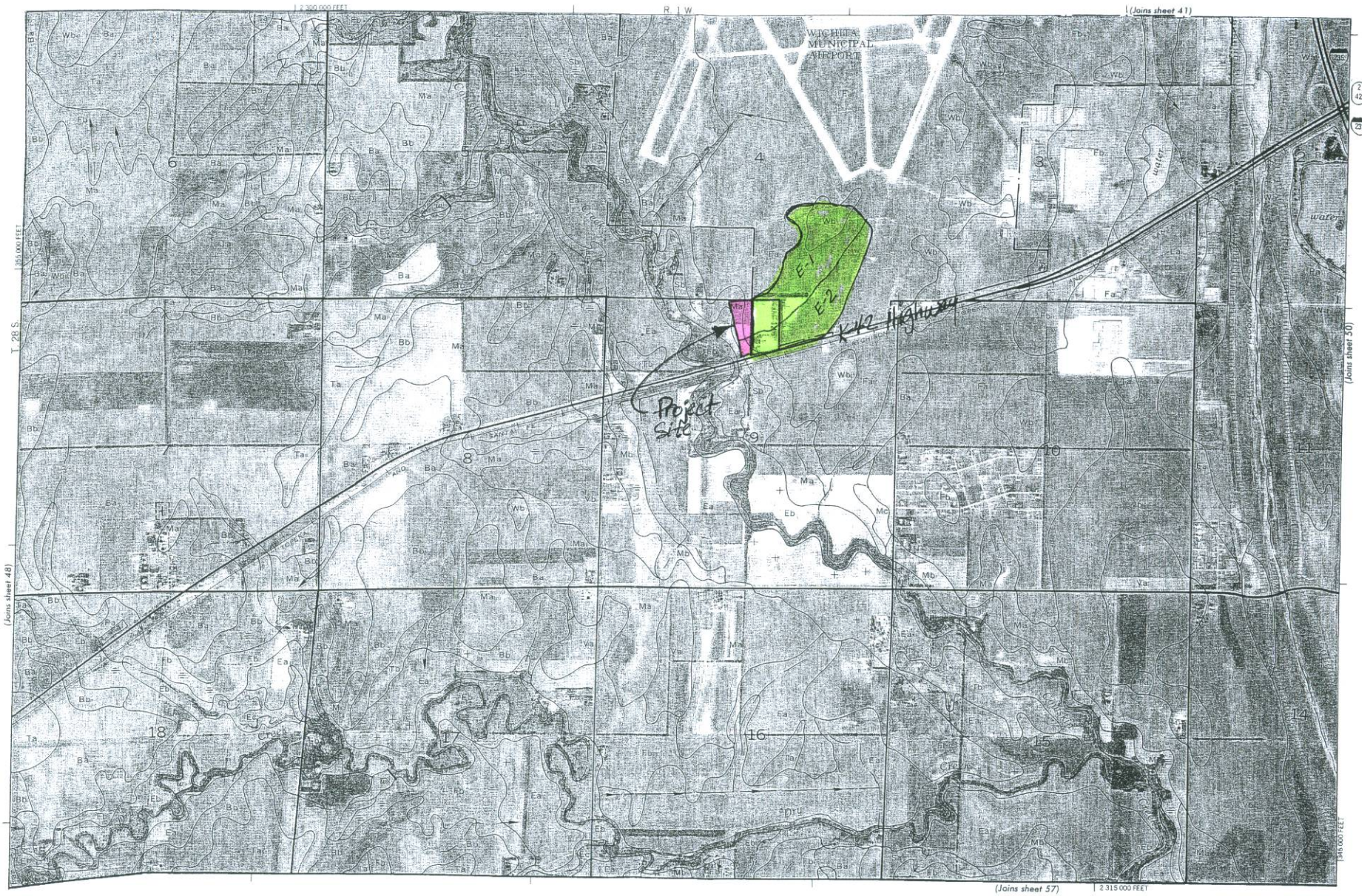
PC 123-1C

Inches

Inches

Appendix B
Soil SurveyMap

SEDGWICK COUNTY, KANSAS — SHEET NUMBER 49



WATER FEATURES
Sedgwick County, Kansas

The Water Features table gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations. 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 four hydrologic soil groups are:

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.

The months in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. The Water Features table indicates, by month, depth to the top (upper limit) and base (lower limit) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table. Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The Water Features table indicates surface water depth and the duration and frequency of ponding. Duration is expressed as very brief if less than 2 days, brief if 2 to 7 days, long if 7 to 30 days, and very long if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. None means that ponding is not probable; rare that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); occasional that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and frequent that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and frequency are estimated. Duration is expressed as extremely brief if 0.1 hour to 4 hours, very brief if 4 hours to 2 days, brief if 2 to 7 days, long if 7 to 30 days, and very long if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. None means that flooding is not probable; very rare that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); rare that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); occasional that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); frequent that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and very frequent that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

WATER FEATURES--Continued
Sedgwick County, Kansas

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
015LS:									
Ladysmith	D								
		April	0.0	2.0-3.0	---	---	None	---	None
		May	2.0-3.0	2.0-3.0	---	---	None	---	None
		June	2.0-3.0	2.0-3.0	---	---	None	---	None
079CR:									
Crete	C		---	---	---	---	---	---	---
079CT:									
Crete	C		---	---	---	---	---	---	---
079DE:									
Detroit	C								
		January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
			---	---	---	---	---	---	---
079DU:									
Drummond	D								
		January	2.0-4.0	>6.0	---	---	---	---	None
		February	2.0-4.0	>6.0	---	---	---	---	None
		March	2.0-4.0	>6.0	---	---	---	---	None
		April	2.0-4.0	>6.0	---	---	---	---	None
		November	2.0-4.0	>6.0	---	---	---	---	None
		December	2.0-4.0	>6.0	---	---	---	---	None
079FA:									
Farnum	B		---	---	---	---	---	---	---
079FE:									
Farnum	B		---	---	---	---	---	---	---
079GD:									
Geary	B		---	---	---	---	---	---	---
079KA:									
Kaski	B								
		March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
079LA:									
Ladysmith	D		---	---	---	---	---	---	---
079LB:									
Ladysmith	D		---	---	---	---	---	---	---
079SM:									
Smolan	C		---	---	---	---	---	---	---
095AD:									
Albion	B		---	---	---	---	---	---	---
095LA:									
Lincoln	A								
		January	5.0-6.0	>6.0	---	---	---	---	None
		February	5.0-6.0	>6.0	---	---	---	---	None
		March	5.0-6.0	>6.0	---	---	---	---	None
		April	5.0-6.0	>6.0	---	---	---	Very brief	Occasional
		May	5.0-6.0	>6.0	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	5.0-6.0	>6.0	---	---	---	---	None
		December	5.0-6.0	>6.0	---	---	---	---	None
095WA:									

WATER FEATURES--Continued
Sedgwick County, Kansas

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
Waldeck	C	January	2.0-4.0	>6.0	---	---	---	---	None
		February	2.0-4.0	>6.0	---	---	---	---	None
		March	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		April	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
		July	---	---	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	---	---	---	---	---	Brief	Occasional
		October	2.0-4.0	>6.0	---	---	---	---	None
		November	2.0-4.0	>6.0	---	---	---	---	None
		December	2.0-4.0	>6.0	---	---	---	---	None
191BA:									
Bethany	C		---	---	---	---	---	---	---
191BB:									
Bethany	C		---	---	---	---	---	---	---
191DR:									
Dale	B	March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
			---	---	---	---	---	---	---
Reinach	B	March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
			---	---	---	---	---	---	---
191EA:									
Elandco	B	January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
			---	---	---	---	---	---	---
191LO:									
Lesho	C	March	2.0-4.0	>6.0	---	---	---	Very brief	Occasional
		April	2.0-4.0	>6.0	---	---	---	Very brief	Occasional
		May	2.0-4.0	>6.0	---	---	---	Very brief	Occasional
		June	2.0-4.0	>6.0	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
1011:									
Albion	B		---	---	---	---	---	---	---
Shellabarger	B		---	---	---	---	---	---	---
1070:									
Avans	B		---	---	---	---	---	---	---
1071:									
Avans	B		---	---	---	---	---	---	---
1072:									
Avans	B		---	---	---	---	---	---	---
2204:									
Jamash	D		---	---	---	---	---	---	---
Piedmont	D		---	---	---	---	---	---	---
2205:									
Jamash	D		---	---	---	---	---	---	---
Piedmont	D		---	---	---	---	---	---	---
2207:									
Jamash	D		---	---	---	---	---	---	---
2381:									

WATER FEATURES--Continued
Sedgwick County, Kansas

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
Kanza	D	January	0.0-3.0	>6.0	---	---	---	Very brief	Frequent
		February	0.0-3.0	>6.0	---	---	---	Very brief	Frequent
		March	0.0-3.0	>6.0	---	---	---	Very brief	Frequent
		April	---	---	---	---	---	Very brief	Frequent
		May	---	---	---	---	---	Very brief	Frequent
		June	---	---	---	---	---	Very brief	Frequent
		July	---	---	---	---	---	Very brief	Frequent
		August	---	---	---	---	---	Very brief	Frequent
		September	---	---	---	---	---	Very brief	Frequent
		October	---	---	---	---	---	Very brief	Frequent
		November	---	---	---	---	---	Very brief	Frequent
		December	0.0-3.0	>6.0	---	---	---	Very brief	Frequent
Ninnescah	B	February	2.0	>6.0	---	---	---	---	None
		March	2.0	>6.0	---	---	---	Long	Occasional
		April	2.0	>6.0	---	---	---	Long	Occasional
		May	2.0	>6.0	---	---	---	Long	Occasional
		June	2.0	>6.0	---	---	---	Long	Occasional
		July	---	---	---	---	---	Long	Occasional
		August	---	---	---	---	---	Long	Occasional
		September	---	---	---	---	---	Long	Occasional
		October	---	---	---	---	---	Long	Occasional
2587:									
Imano	C	March	2.0-4.0	>6.0	---	---	None	Very brief	Occasional
		April	2.0-4.0	>6.0	---	---	None	Very brief	Occasional
		May	2.0-4.0	>6.0	---	---	None	Very brief	Occasional
		June	2.0-4.0	>6.0	---	---	None	Very brief	Occasional
		July	2.0-4.0	>6.0	---	---	None	Very brief	Occasional
2948:									
Nalim	B		---	---	---	---	---	---	---
3052:									
Ost	B		---	---	---	---	---	---	---
Clark	B		---	---	---	---	---	---	---
3170:									
Penalosa	C		---	---	---	---	---	---	---
3171:									
Penalosa	C		---	---	---	---	---	---	---
3535:									
Shellabarger	B		---	---	---	---	---	---	---
Nalim	B		---	---	---	---	---	---	---
3639:									
Taver	D		---	---	---	---	---	---	---
3966:									
Willowbrook	B	February	2.0-4.0	>6.0	---	---	None	---	None
		March	2.0-4.0	>6.0	---	---	None	Brief	Occasional
		April	2.0-4.0	>6.0	---	---	None	Brief	Occasional
		May	2.0-4.0	>6.0	---	---	None	Brief	Occasional
		June	2.0-4.0	>6.0	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
		October	---	---	---	---	None	Brief	Occasional
4004:									
Yaggy	C	January	2.0-4.0	>6.0	---	---	---	---	None
		February	2.0-4.0	>6.0	---	---	---	---	None
		March	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		April	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		May	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
		July	---	---	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	---	---	---	---	---	Brief	Occasional
		October	---	---	---	---	---	Brief	Occasional
		December	2.0-4.0	>6.0	---	---	---	---	None
Aa:									
Albion	B		---	---	---	---	---	---	---
Shellabarger	B		---	---	---	---	---	---	---
Ab:									
Albion	B		---	---	---	---	---	---	---

WATER FEATURES--Continued
Sedgwick County, Kansas

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
Shellabarger	B		---	---	---	---	---	---	---
Ba:									
Blanket	C		---	---	---	---	---	---	---
Bb:									
Blanket	C		---	---	---	---	---	---	---
BRR:									
Brewer	C								
		January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
			---	---	---	---	---	---	---
Ca:									
Canadian	B								
		January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
			---	---	---	---	---	---	---
Cb:									
Canadian	B								
		January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
			---	---	---	---	---	---	---
Waldeck	C								
		January	2.0-4.0	>6.0	---	---	---	---	None
		February	2.0-4.0	>6.0	---	---	---	---	None
		March	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		April	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
		July	---	---	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	---	---	---	---	---	Brief	Occasional
		October	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		November	2.0-4.0	>6.0	---	---	---	---	None
		December	2.0-4.0	>6.0	---	---	---	---	None
Cc:									
Carwile	D								
		January	0.0	>6.0	0.0-1.0	Brief	---	---	None
		February	0.0	>6.0	0.0-1.0	Brief	---	---	None
		March	0.0	>6.0	0.0-1.0	Brief	---	---	None
		April	0.0	>6.0	0.0-1.0	Brief	---	---	None
		May	---	---	0.0-	---	---	---	None
		June	---	---	0.0-	---	---	---	None
		July	---	---	0.0-	---	---	---	None
		August	---	---	0.0-	---	---	---	None
		September	---	---	0.0-	---	---	---	None
		October	0.0	>6.0	0.0-1.0	Brief	---	---	None
		November	0.0	>6.0	0.0-1.0	Brief	---	---	None
		December	0.0	>6.0	0.0-1.0	Brief	---	---	None
Cd:									
Clark	B		---	---	---	---	---	---	---
Ost	B								

WATER FEATURES--Continued
Sedgwick County, Kansas

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Map symbol and soil name	Hydrologic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
			---	---	---	---	---	---	---
Ce:									
Clime	C		---	---	---	---	---	---	---
Ea:									
Elandco	B								
		January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
			---	---	---	---	---	---	---
Eb:									
Elandco	B								
		January	---	---	---	---	---	Brief	Occasional
		February	---	---	---	---	---	Brief	Occasional
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		October	---	---	---	---	---	Brief	Occasional
		November	---	---	---	---	---	Brief	Occasional
		December	---	---	---	---	---	Brief	Occasional
Ec:									
Elandco	B								
		January	---	---	---	---	---	Brief	Frequent
		February	---	---	---	---	---	Brief	Frequent
		March	---	---	---	---	---	Brief	Frequent
		April	---	---	---	---	---	Brief	Frequent
		May	---	---	---	---	---	Brief	Frequent
		October	---	---	---	---	---	Brief	Frequent
		November	---	---	---	---	---	Brief	Frequent
		December	---	---	---	---	---	Brief	Frequent
Fa:									
Farnum	B		---	---	---	---	---	---	---
Fb:									
Farnum	B		---	---	---	---	---	---	---
Fc:									
Farnum	B		---	---	---	---	---	---	---
Ga:									
Goessel	D								
		April	2.0-3.0	>6.0	---	---	---	---	None
		May	2.0-3.0	>6.0	---	---	---	---	None
		June	2.0-3.0	>6.0	---	---	---	---	None
Gb:									
Goessel	D								
		April	2.0-3.0	>6.0	---	---	---	---	None
		May	2.0-3.0	>6.0	---	---	---	---	None
		June	2.0-3.0	>6.0	---	---	---	---	None
Ia:									
Irwin	D		---	---	---	---	---	---	---
Ib:									
Irwin	D		---	---	---	---	---	---	---
Ic:									
Irwin	D		---	---	---	---	---	---	---
INT:									
Aquolls	C								
		March	0.0	>6.0	0.0-0.8	Brief	Occasional	---	None
		April	0.0	>6.0	0.0-0.8	Brief	Occasional	---	None
		May	0.0	>6.0	0.0-0.8	Brief	Occasional	---	None
		June	0.0	>6.0	0.0-0.8	Brief	Occasional	---	None
KAA:									
Kaski	B								
		March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
La:									

WATER FEATURES--Continued
Sedgwick County, Kansas

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Map symbol and soil name	Hydrologic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
Lesho	C								
		March	2.0-4.0	>6.0	---	---	---	Very brief	Occasional
		April	2.0-4.0	>6.0	---	---	---	Very brief	Occasional
		May	2.0-4.0	>6.0	---	---	---	Very brief	Occasional
		June	2.0-4.0	>6.0	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
Lb:									
Lincoln	A								
		January	5.0-6.0	>6.0	---	---	---	---	None
		February	5.0-6.0	>6.0	---	---	---	---	None
		March	5.0-6.0	>6.0	---	---	---	---	None
		April	5.0-6.0	>6.0	---	---	---	Brief	Frequent
		May	5.0-6.0	>6.0	---	---	---	Brief	Frequent
		June	---	---	---	---	---	Brief	Frequent
		July	---	---	---	---	---	Brief	Frequent
		August	---	---	---	---	---	Brief	Frequent
		September	---	---	---	---	---	Brief	Frequent
		October	---	---	---	---	---	Brief	Frequent
		November	5.0-6.0	>6.0	---	---	---	---	None
		December	5.0-6.0	>6.0	---	---	---	---	None
M-W:									
Miscellaneous Water	---		---	---	---	---	---	---	---
Ma:									
Milan	B		---	---	---	---	---	---	---
Mb:									
Milan	B		---	---	---	---	---	---	---
Mc:									
Milan	B		---	---	---	---	---	---	---
Na:									
Naron	B		---	---	---	---	---	---	---
Oc:									
Wellsford	D		---	---	---	---	---	---	---
Od:									
Wellsford	D		---	---	---	---	---	---	---
Rock Outcrop	D		---	---	---	---	---	---	---
Pa:									
Pits	---		---	---	---	---	---	---	---
Pb:									
Plevna	D								
		January	0.0-2.0	>6.0	---	---	---	---	None
		February	0.0-2.0	>6.0	---	---	---	---	None
		March	0.0-2.0	>6.0	---	---	---	Long	Frequent
		April	0.0-2.0	>6.0	---	---	---	Long	Frequent
		May	0.0-2.0	>6.0	---	---	---	Long	Frequent
		June	0.0-2.0	>6.0	---	---	---	Long	Frequent
		July	0.0-2.0	>6.0	---	---	---	Long	Frequent
		August	0.0-2.0	>6.0	---	---	---	Long	Frequent
		September	0.0-2.0	>6.0	---	---	---	Long	Frequent
		October	0.0-2.0	>6.0	---	---	---	Long	Frequent
		November	0.0-2.0	>6.0	---	---	---	---	None
		December	0.0-2.0	>6.0	---	---	---	---	None
Pc:									
Pratt	A		---	---	---	---	---	---	---
Pd:									
Pratt	A		---	---	---	---	---	---	---
Tivoli	A		---	---	---	---	---	---	---
Ra:									
Renfrow	D		---	---	---	---	---	---	---
Rb:									
Renfrow	D		---	---	---	---	---	---	---
Rc:									
Renfrow	D		---	---	---	---	---	---	---
Wellsford	D		---	---	---	---	---	---	---
Rd:									
Rosehill	D		---	---	---	---	---	---	---
Sa:									
Shellabarger	B								

WATER FEATURES--Continued
Sedgwick County, Kansas

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
Sb:			---	---	---	---	---	---	---
Shellabarger	B		---	---	---	---	---	---	---
Sc:									
Shellabarger	B		---	---	---	---	---	---	---
Ta:									
Tabler	D		---	---	---	---	---	---	---
Tb:									
Tabler	D		---	---	---	---	---	---	---
Drummond	D		---	---	---	---	---	---	---
		January	2.0-6.0	>6.0	---	---	---	---	None
		February	2.0-6.0	>6.0	---	---	---	---	None
		March	2.0-6.0	>6.0	---	---	---	---	None
		April	2.0-6.0	>6.0	---	---	---	---	None
		November	2.0-6.0	>6.0	---	---	---	---	None
		December	2.0-6.0	>6.0	---	---	---	---	None
Ua:									
Urban Land	---		---	---	---	---	---	---	---
Canadian	B		---	---	---	---	---	---	---
Ub:									
Urban Land	---		---	---	---	---	---	---	---
Elandco	B		---	---	---	---	---	---	---
Uc:									
Urban Land	---		---	---	---	---	---	---	---
Farnum	B		---	---	---	---	---	---	---
Ud:									
Urban Land	---		---	---	---	---	---	---	---
Irwin	D		---	---	---	---	---	---	---
Ue:									
Urban Land	---		---	---	---	---	---	---	---
Tabler	D		---	---	---	---	---	---	---
Va:									
Vanoss	B		---	---	---	---	---	---	---
Vb:									
Vanoss	B		---	---	---	---	---	---	---
Vc:									
Vanoss	B		---	---	---	---	---	---	---
Vd:									
Vanoss	B		---	---	---	---	---	---	---
Ve:									
Vernon	D		---	---	---	---	---	---	---
Vf:									
Vernon	D		---	---	---	---	---	---	---
W:									
Water	---		---	---	---	---	---	---	---
Wa:									
Waldeck	C								
		January	2.0-4.0	>6.0	---	---	---	---	None
		February	2.0-4.0	>6.0	---	---	---	---	None
		March	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		April	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
		July	---	---	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	---	---	---	---	---	Brief	Occasional
		October	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		November	2.0-4.0	>6.0	---	---	---	---	None
		December	2.0-4.0	>6.0	---	---	---	---	None
Wb:									

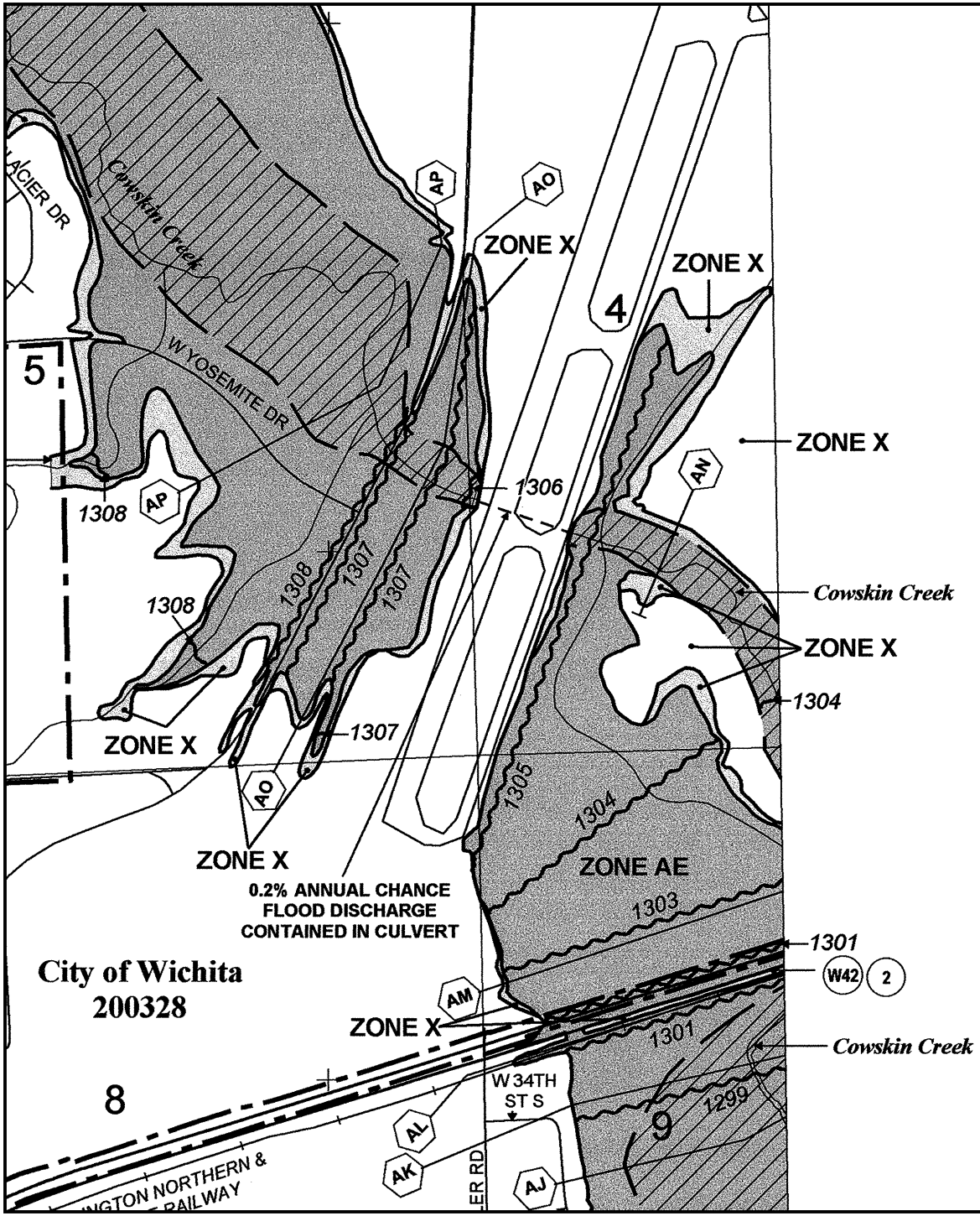
WATER FEATURES--Continued
Sedgwick County, Kansas

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
Waurika----------	D								
		January	0.5-1.0	1.0-2.0	---	---	---	---	None
		February	0.5-1.0	1.0-2.0	---	---	---	---	None
		March	0.5-1.0	1.0-2.0	---	---	---	---	None
		April	0.5-1.0	1.0-2.0	---	---	---	---	None
		May	0.5-1.0	1.0-2.0	---	---	---	---	None
		November	0.5-1.0	1.0-2.0	---	---	---	---	None
		December	0.5-1.0	1.0-2.0	---	---	---	---	None

Appendix C

FEMA Flood Insurance Rate Map



MAP SCALE 1" = 1000'

500 0 1000 2000 FEE

300 0 300 600

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0340E

FIRM

FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS
AND INCORPORATED AREAS

PANEL 340 OF 700

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

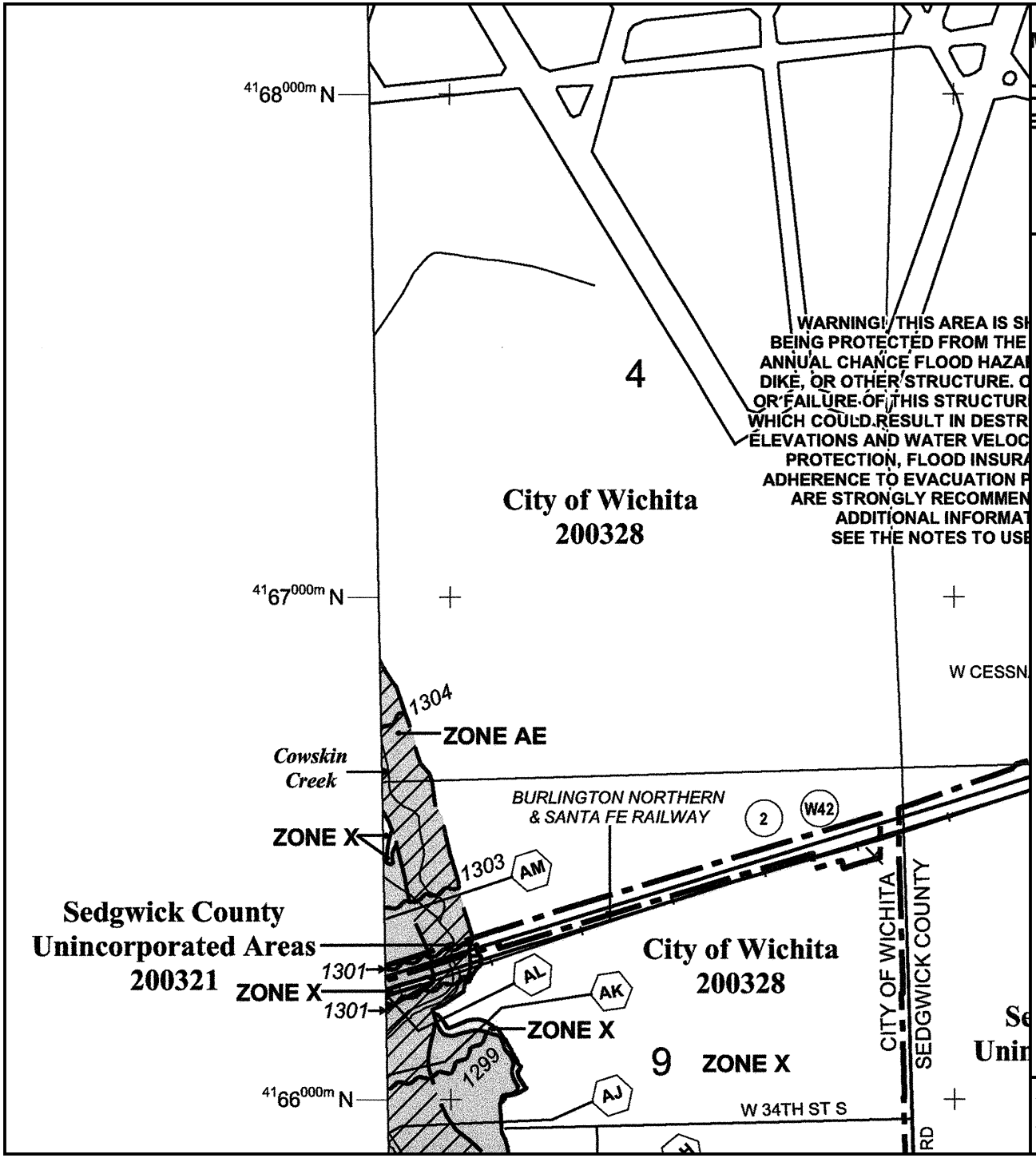
COMMUNITY	NUMBER	PANEL	SUFFIX
SEDGWICK COUNTY	200321	0340	E
WICHITA, CITY OF	200328	0340	E

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
20173C0340E

EFFECTIVE DATE
FEBRUARY 2, 2007

Federal Emergency Management Agency



MAP SCALE 1" = 1000'

1000 2000 FEET

0 300 600 METERS

PANEL 0345E

FIRM

FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS AND INCORPORATED AREAS

PANEL 345 OF 700

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SEDGWICK COUNTY	200321	0345	E
WICHITA, CITY OF	200328	0345	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
20173C0345E

EFFECTIVE DATE
FEBRUARY 2, 2007

Federal Emergency Management Agency

Appendix D
Existing Conditions

Mid-Continent STP Plant - Wichita, KS
Watershed
SCS CN Calculations

Basin	Area (Acres)	CN (composite)	CN for Subarea #1		CN for Subarea #2		CN for Subarea #3	
Existing								
Pre-Project								
Conditions								
E1	51							
			5.2	Acres	38.9	Acres	6.9	Acres
			88	CN (Industrial, Soil B)	69	CN (Pasture, Fair, Soil B)	65	CN (Woods, Fair, Soil B)
			9.0	CNsubarea1	52.6	CNsubarea1	8.8	CNsubarea1
		70.4						
E2	30.5							
			1	Acres	29.5	Acres		Acres
			88	CN (Industrial, Soil B)	69	CN (Pasture, Fair, Soil B)		CN
			2.9	CNsubarea1	66.7	CNsubarea2		CNsubarea3
		69.6						

Mid-Continent STP Plant
Time of Concentration
SCS Lag Method

Watershed Name	Area Acre(s)	CN	Length (ft)	Max. Elev. (ft)	Min. Elev. (ft.)	Watershed Slope (Y)%	S	Lag (hrs)	Calculated Tc (min.)	Tc (min.)
E1	51.0	70.4	2845	135.5	114	0.76	4.20	1.11	111.38	111.38
E2	30.5	69.6	3020	133	108	0.83	4.37	1.14	114.06	114.06
P1A	44.7	70.6	2845	135.5	114	0.76	4.16	1.11	110.78	110.78
P1B	6.3	78.2	925	124	114	1.08	2.79	0.30	30.35	30.35
P2	30.5	69.6	3020	133	108	0.83	4.37	1.14	114.06	114.06

S=(1000/CN)-10
Lag = (l^0.8(S+1)^0.7)/(1900Y^0.5)
TC = Lag / 0.6

MARKHURD

4060110.01

NOTE

HORIZONTAL AND VERTICAL CONTROL FURNISHED BY POE & ASSOC. OF KS.
MAP ACCURACY IS RELATED DIRECTLY TO THE CONTROL FURNISHED.
THIS MAP HAS BEEN DESIGNED TO MEET NATIONAL MAP ACCURACY STANDARDS AT ITS ORIGINAL BASIC SCALE OF 1"=40' AND CONTOUR INTERVAL OF 1 FT.
MARKHURD'S LIABILITY FOR ANY INACCURACIES FOUND IN THIS MAP SHALL BE LIMITED TO THE CORRECTION OF ANY SUCH INACCURACIES FOUND DUE TO THE PHOTOGRAMMETRIC PROCESS, AND SHALL NOT EXCEED THE CONTRACT VALUE OF THE MAP. IT IS THE RESPONSIBILITY OF THE MAP USER TO ASCERTAIN WHETHER OR NOT THE ABOVE SCALE, CONTOUR INTERVAL AND ACCURACY ARE SATISFACTORY FOR WHATEVER PURPOSE THE MAP IS TO BE USED.

LEGEND

- RAILROAD TRACKS
- ROAD
- ROAD UNDER-CONSTRUCTION
- DRIVEWAY
- TRAIL
- SHOULDER
- DRAIN OR SHORELINE
- SWAMP
- FENCE
- GUARD RAIL
- WALL
- SIDEWALK
- PIPELINE
- FOUNDATION OR SLAB
- WOODS OUTLINE
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- INDEX DEPRESSION CONTOUR
- INTERMEDIATE DEPRESSION
- APPROXIMATE CONTOUR
- UNDER CONSTRUCTION OUTLINE
- UNIDENTIFIED OBJECT

- CULVERT
- END OF CULVERT
- CATCH BASIN
- HYDRANT
- MANHOLE
- UTILITY POLE
- FLAG POLE
- RAILROAD CROSSING SIGN
- RADIO, TV TOWERS
- 96 HORIZONTAL CONTROL POINT
- 135.26 VERTICAL CONTROL POINT
- SWAMP SYMBOL
- COMMERCIAL SIGN
- TREE

BENCHMARKS:

1. COW BM – NW Cor. of bridge on sidewalk. 250.0 +/– ft. North of Yosemite
Elev. 121.47 ft (COW Datum) (1308.87 MSL Datum)

2. COW BM – Woodchuck and K42 Highway. NW of center of K42 Highway.
2 ft. West of 1/4 Section Corner Iron.
Elev.=124.07 ft (COW Datum) (1311.47 ft MSL Datum)

LEGEND

- Power Pole
- Fire Hydrant
- No Parking Sign (unless noted)
- Gas Meter
- Sewer Clean Out
- Water Valve
- Water Meter
- ARV Air Release Valve
- Light Pole
- Guy Anchor
- Manhole
- Parking Meter
- Electrical Vault
- Telephone Manhole
- Roof Drain
- Gas Line
- OHP Overhead Power Line
- E Underground Power Cable
- SS Sanitary Sewer
- T Underground Telephone Cable
- W Water Line
- FM Force Main

SCALE: 1"=40'

0 20 40 60 80 120

CONTOUR INTERVAL = 1 FOOT

TOPOGRAPHY BY PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHS TAKEN ON JAN 23, 2006.

INDEPENDENT HORIZONTAL DATUM.
VERTICAL DATUM IS CITY OF WICHITA.
GRID SHOWN AT A 200 FOOT INTERVAL.

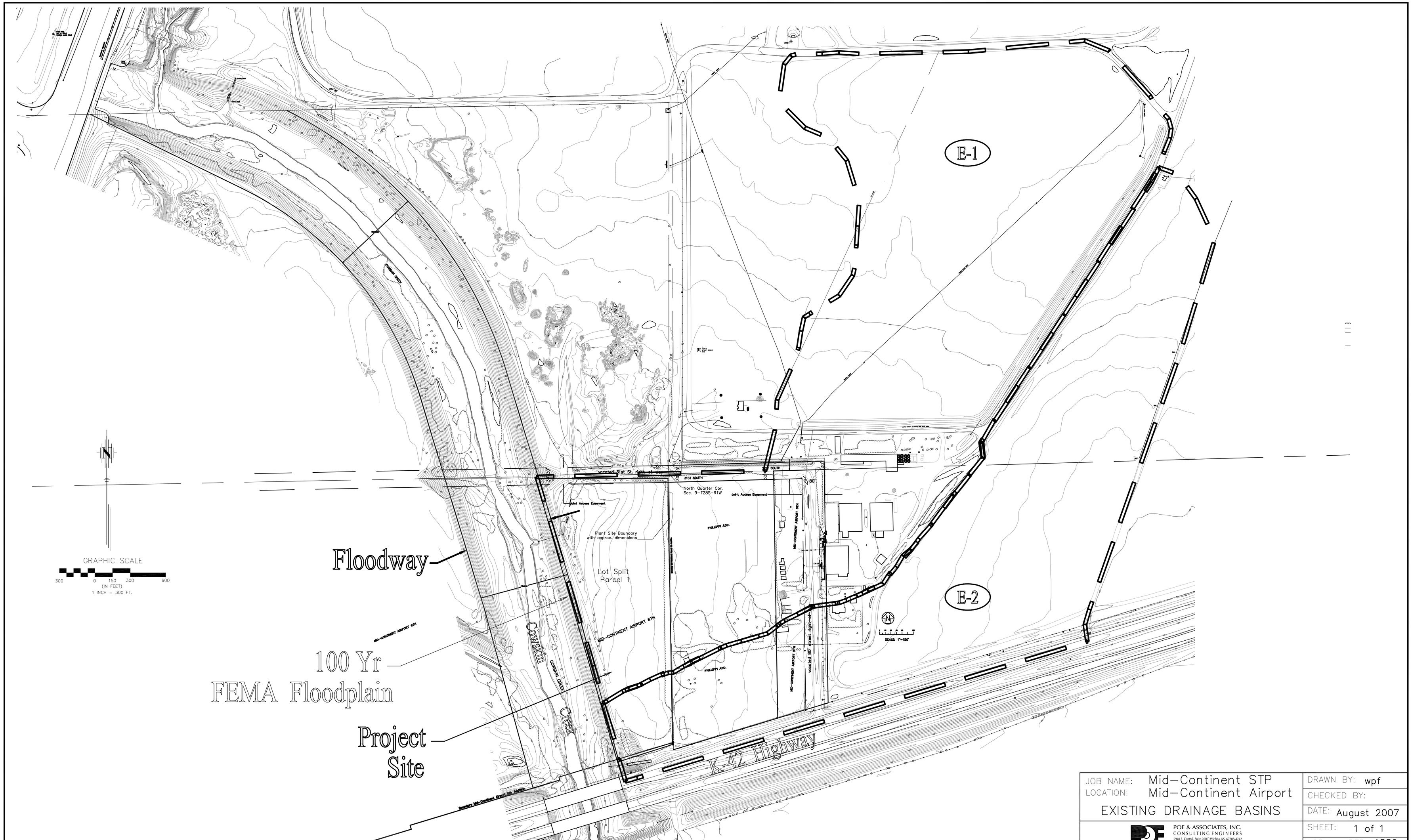
NOTES:

The location of underground utilities in the vicinity of the area surveyed were requested to be marked through the "One Call" system. The location of underground utilities shown on this drawing are from observed surface evidence, marks made in the field by the utility owners and from record information.
The utility companies contacted by the One Call system:
Ticket No. 6056843, 6056856, 6056886 and 6082407
Cox Communications
Westar Energy
Aquila
Wichita Water
Kansas Gas Service
SBC
Wichita Airport Authority
Telcove

Only those easements and rights-of-way shown on the Mid-Continent Airport 6th Addition Plat have been shown on this Topographic Survey.

POE & ASSOCIATES, INC.
CONSULTING ENGINEERS
5960 E Central, Suite 200 Wichita, KS 67208-4212
Phone 316/685-8114 FAX 316/685-8444

PS 18 TO CCPS



JOB NAME: Mid–Continent STP LOCATION: Mid–Continent Airport	DRAWN BY: wpf
EXISTING DRAINAGE BASINS	CHECKED BY:
	DATE: August 2007
POE & ASSOCIATES, INC. CONSULTING ENGINEERS 5940 E. Central, Suite 200 ▯ Wichita, KS 67208-4242 Phone 316/685-4114 ▯ FAX 316/685-4444	SHEET: 1 of 1
	JOB NUMBER: 1859


E-1
E-2
Floodway
100 Yr
FEMA Floodplain
Project
Site
Lot Split
Parcel 1
Creek
K-42 Highway

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

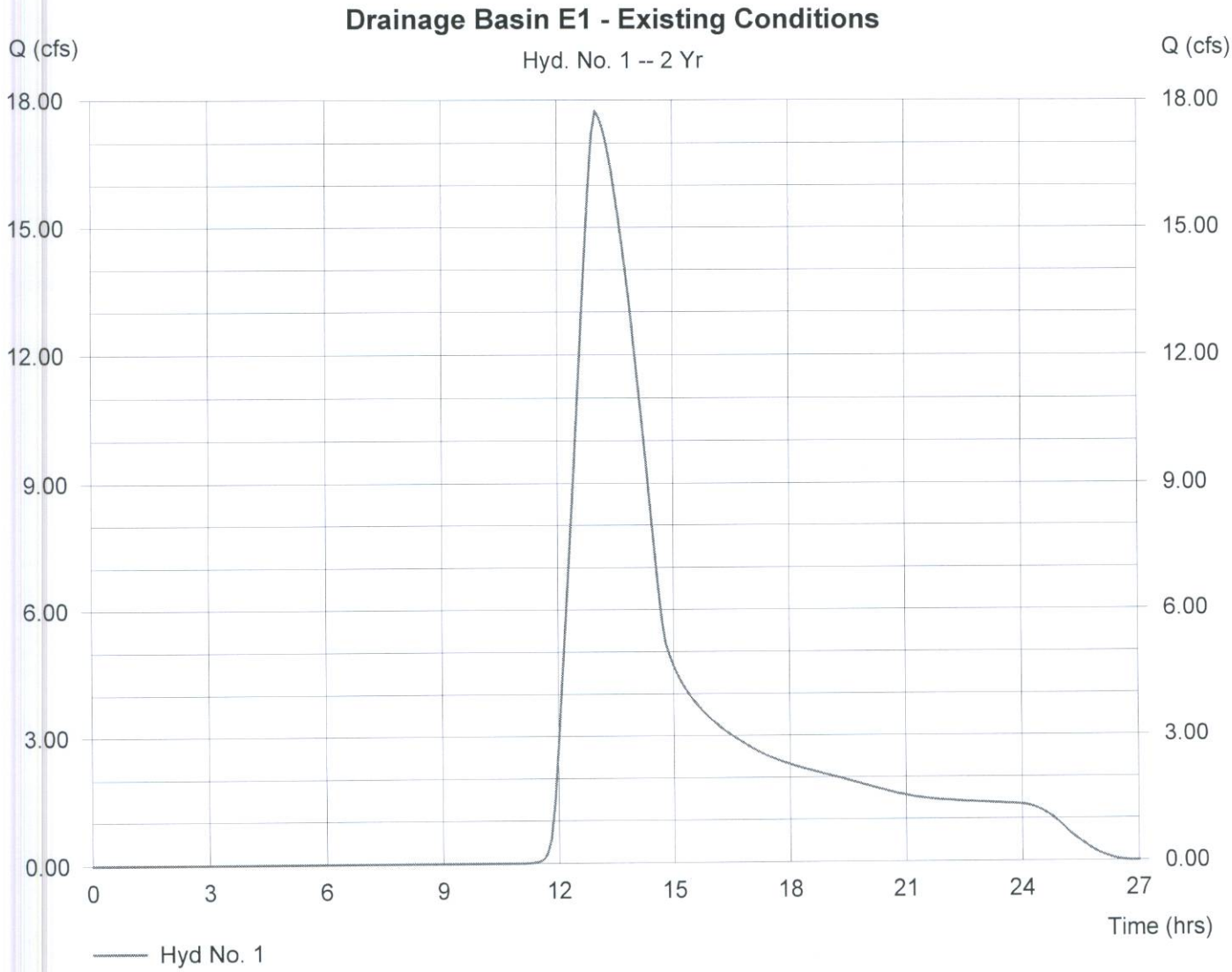
Monday, Sep 17 2007, 8:49 AM

Hyd. No. 1

Drainage Basin E1 - Existing Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 17.74 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 51.000 ac	Curve number	= 70.4
Basin Slope	= 0.8 %	Hydraulic length	= 2845 ft
Tc method	= LAG	Time of conc. (Tc)	= 111.29 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 4.593 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

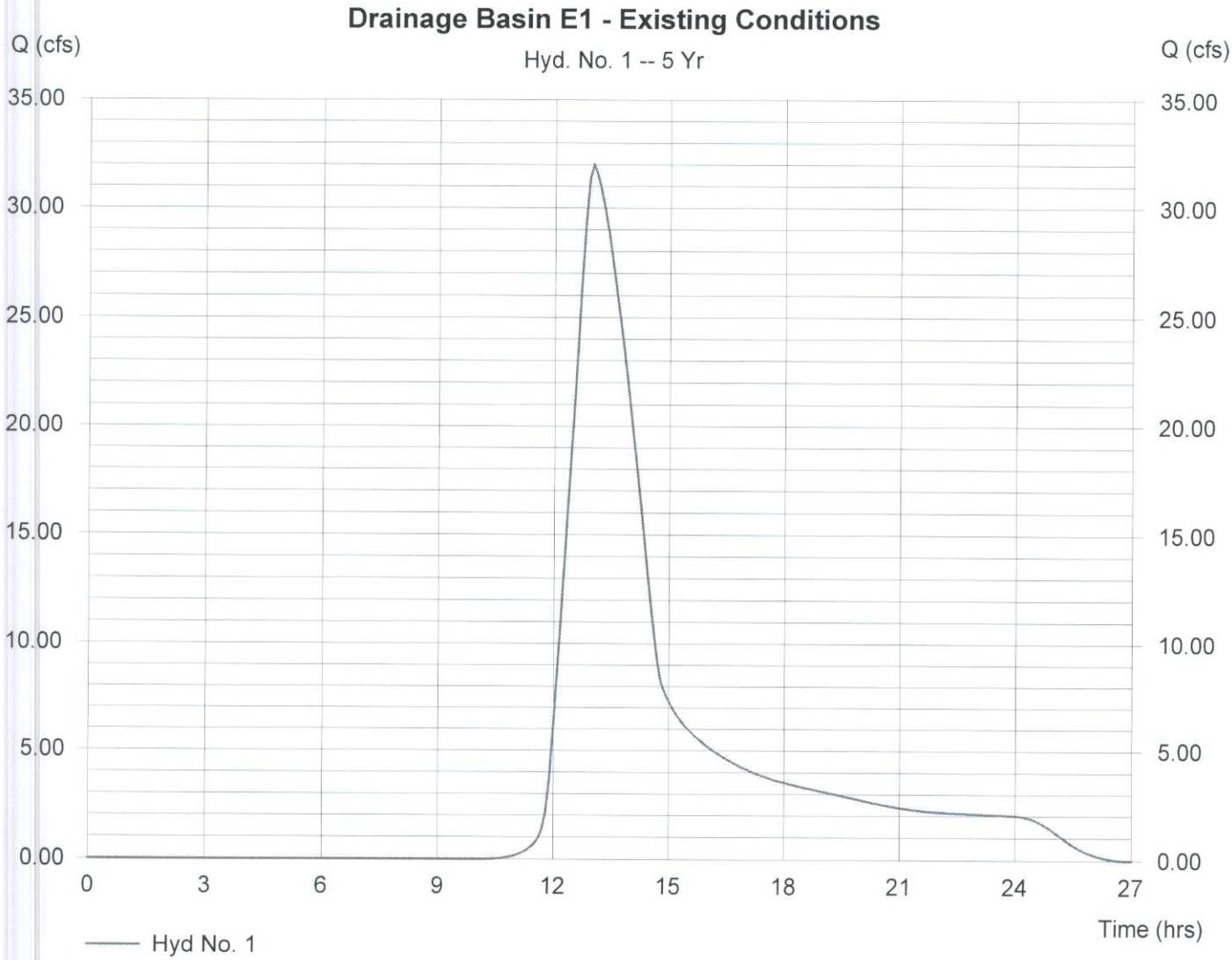
Monday, Sep 17 2007, 8:49 AM

Hyd. No. 1

Drainage Basin E1 - Existing Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 32.03 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Drainage area	= 51.000 ac	Curve number	= 70.4
Basin Slope	= 0.8 %	Hydraulic length	= 2845 ft
Tc method	= LAG	Time of conc. (Tc)	= 111.29 min
Total precip.	= 4.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 7.760 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

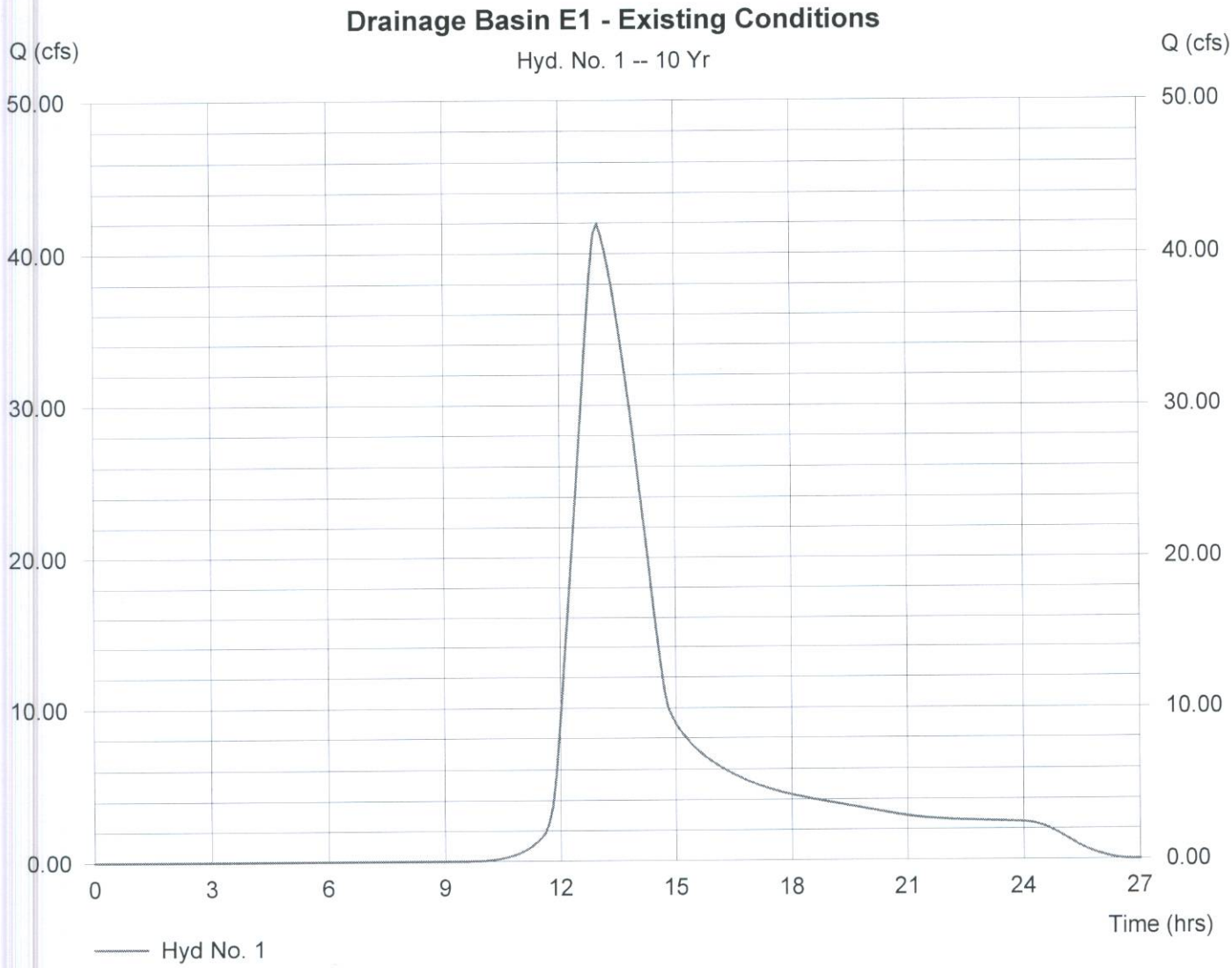
Monday, Sep 17 2007, 8:49 AM

Hyd. No. 1

Drainage Basin E1 - Existing Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 41.97 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 51.000 ac	Curve number	= 70.4
Basin Slope	= 0.8 %	Hydraulic length	= 2845 ft
Tc method	= LAG	Time of conc. (Tc)	= 111.29 min
Total precip.	= 5.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 9.965 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

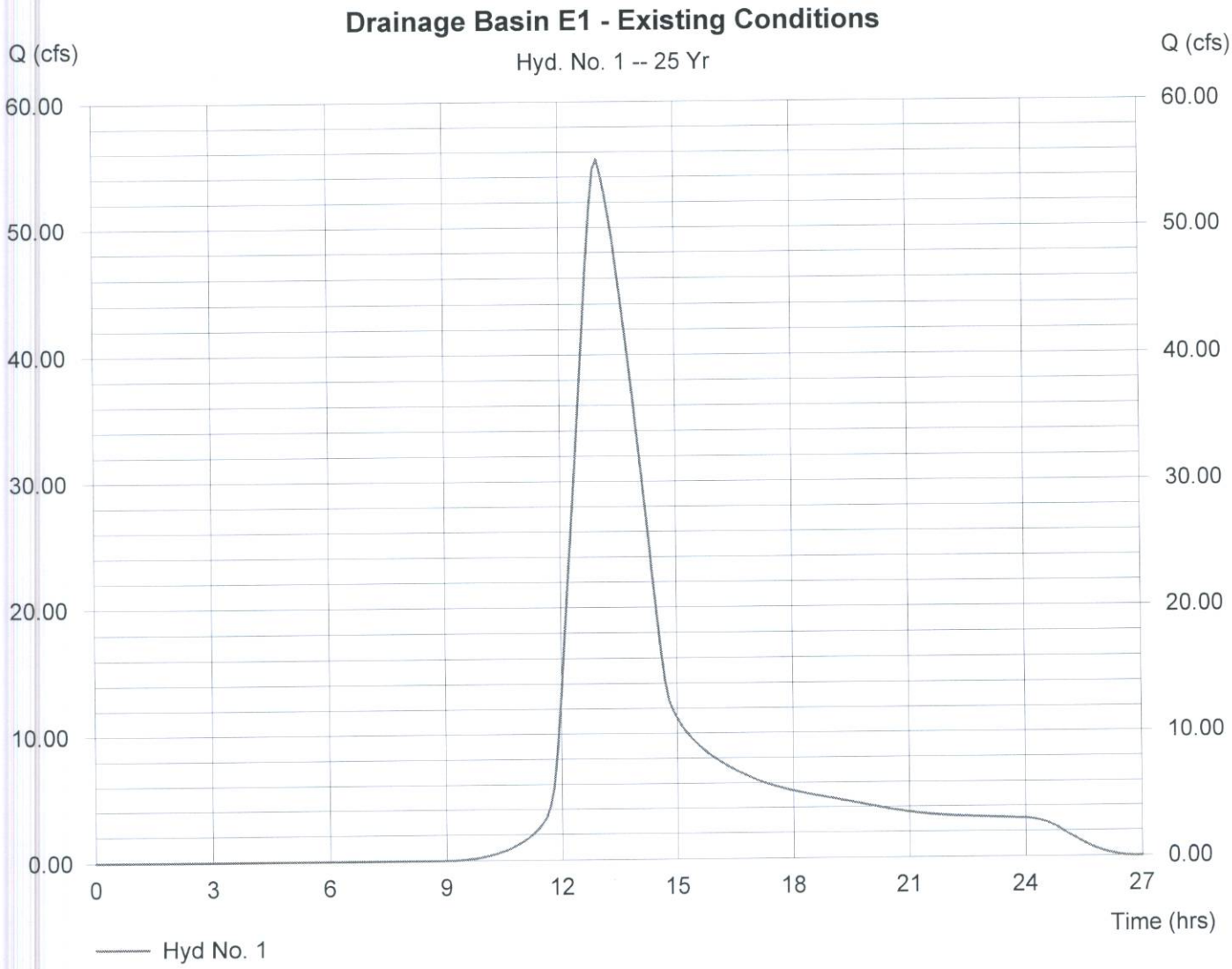
Monday, Sep 17 2007, 8:49 AM

Hyd. No. 1

Drainage Basin E1 - Existing Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 55.40 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Drainage area	= 51.000 ac	Curve number	= 70.4
Basin Slope	= 0.8 %	Hydraulic length	= 2845 ft
Tc method	= LAG	Time of conc. (Tc)	= 111.29 min
Total precip.	= 6.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 12.958 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

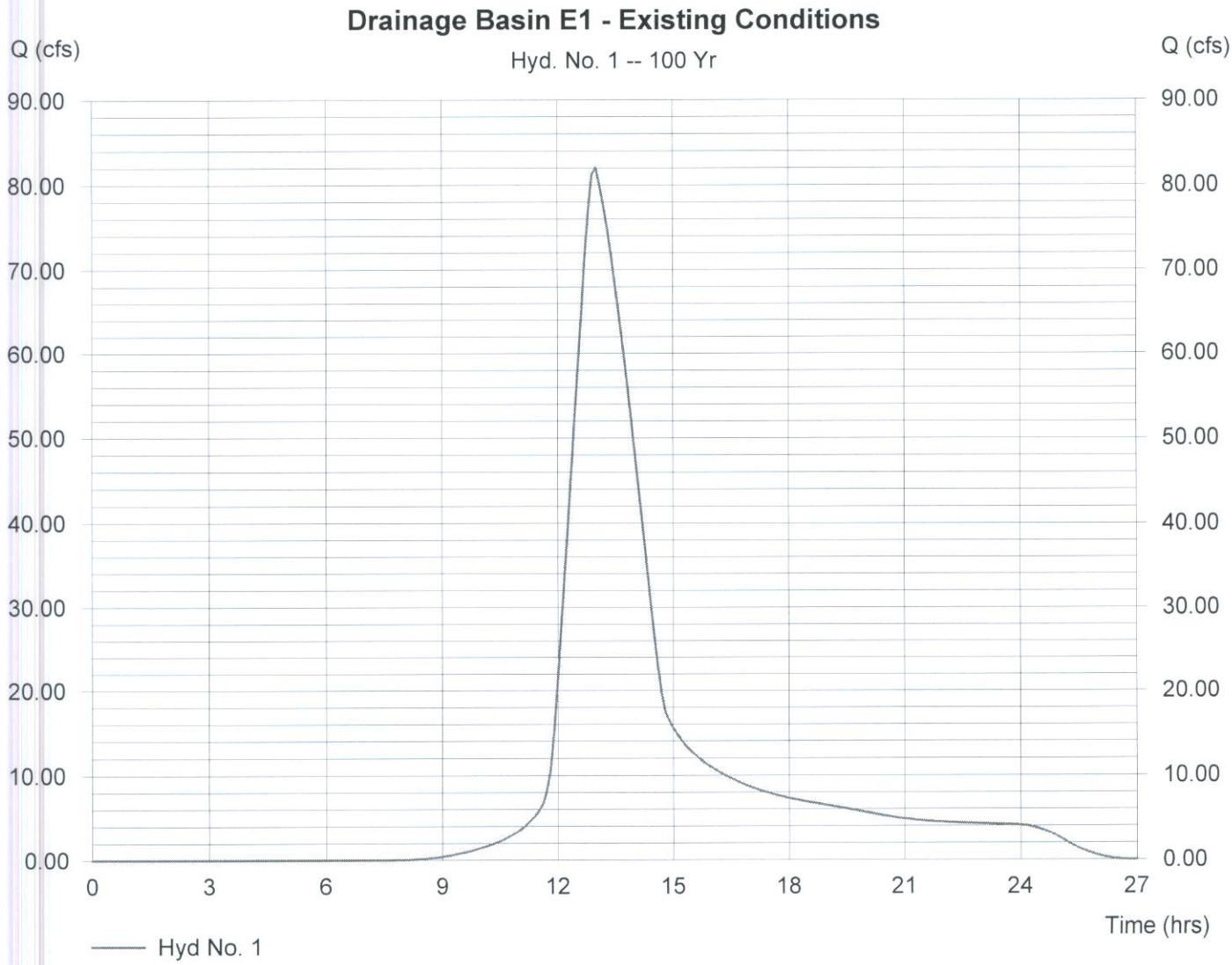
Monday, Sep 17 2007, 8:50 AM

Hyd. No. 1

Drainage Basin E1 - Existing Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 82.05 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 51.000 ac	Curve number	= 70.4
Basin Slope	= 0.8 %	Hydraulic length	= 2845 ft
Tc method	= LAG	Time of conc. (Tc)	= 111.29 min
Total precip.	= 8.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 18.951 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

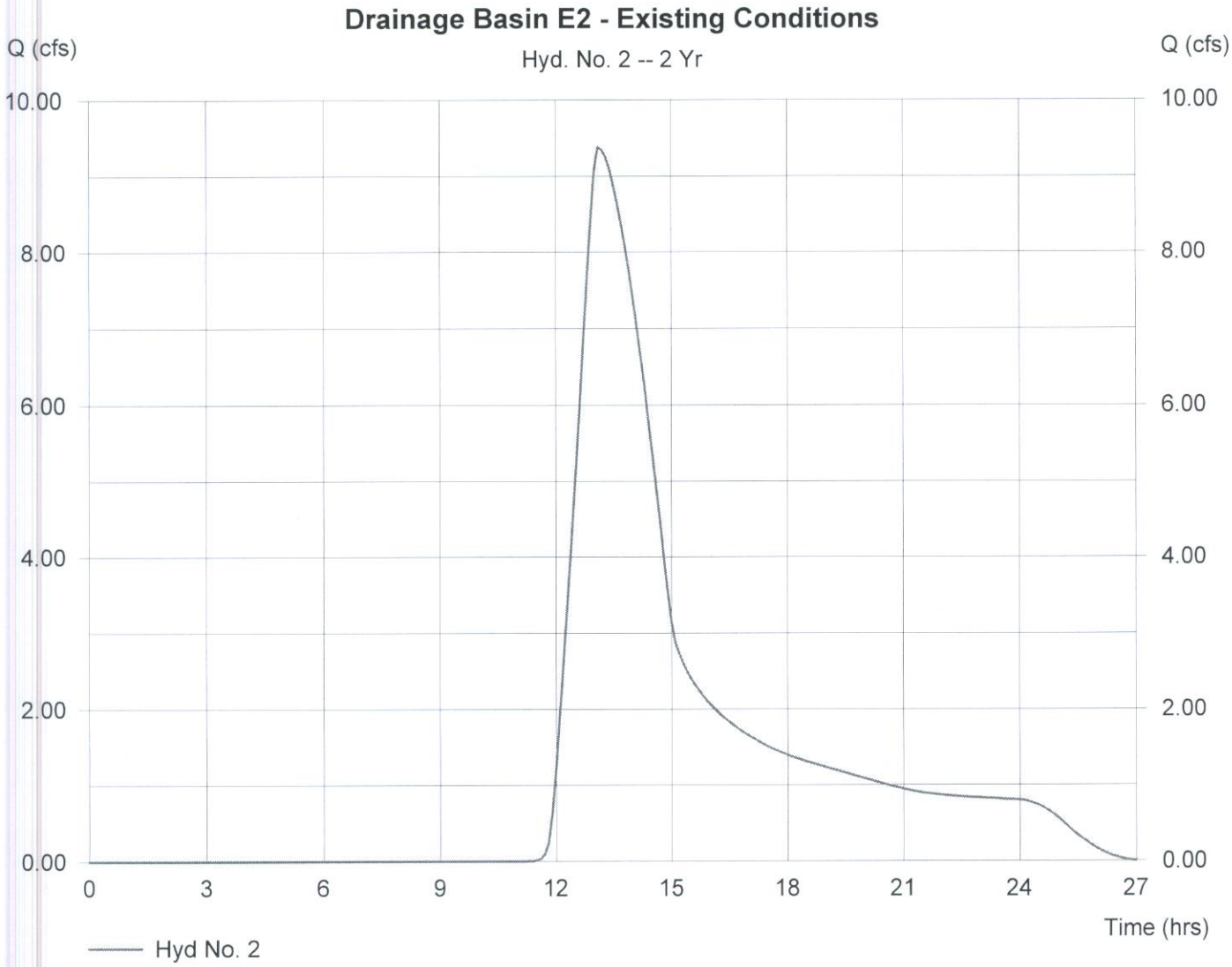
Monday, Sep 17 2007, 8:49 AM

Hyd. No. 2

Drainage Basin E2 - Existing Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 9.39 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 30.500 ac	Curve number	= 69.6
Basin Slope	= 0.8 %	Hydraulic length	= 3020 ft
Tc method	= LAG	Time of conc. (Tc)	= 114.14 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 2.663 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

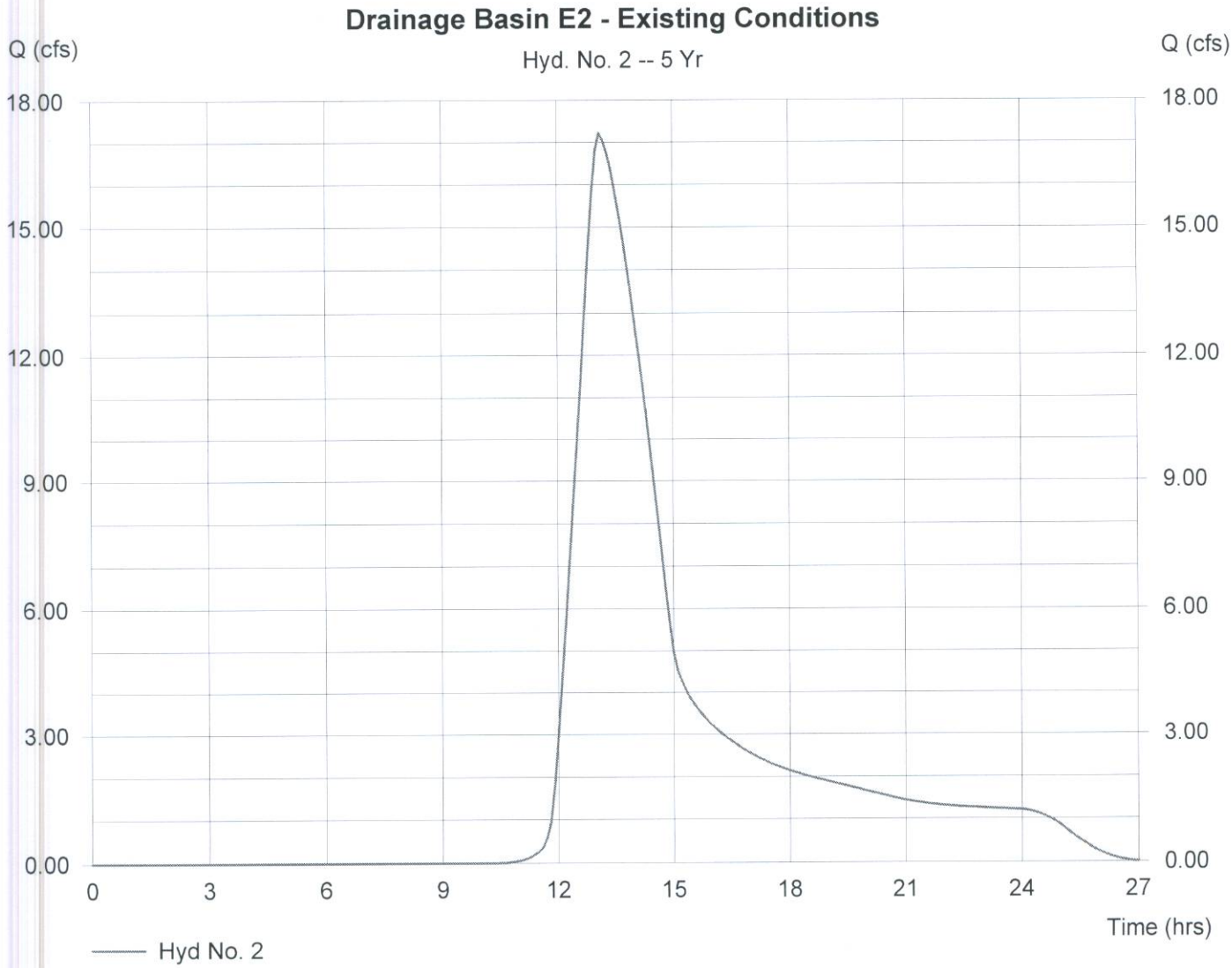
Monday, Sep 17 2007, 8:49 AM

Hyd. No. 2

Drainage Basin E2 - Existing Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 17.22 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Drainage area	= 30.500 ac	Curve number	= 69.6
Basin Slope	= 0.8 %	Hydraulic length	= 3020 ft
Tc method	= LAG	Time of conc. (Tc)	= 114.14 min
Total precip.	= 4.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 4.541 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

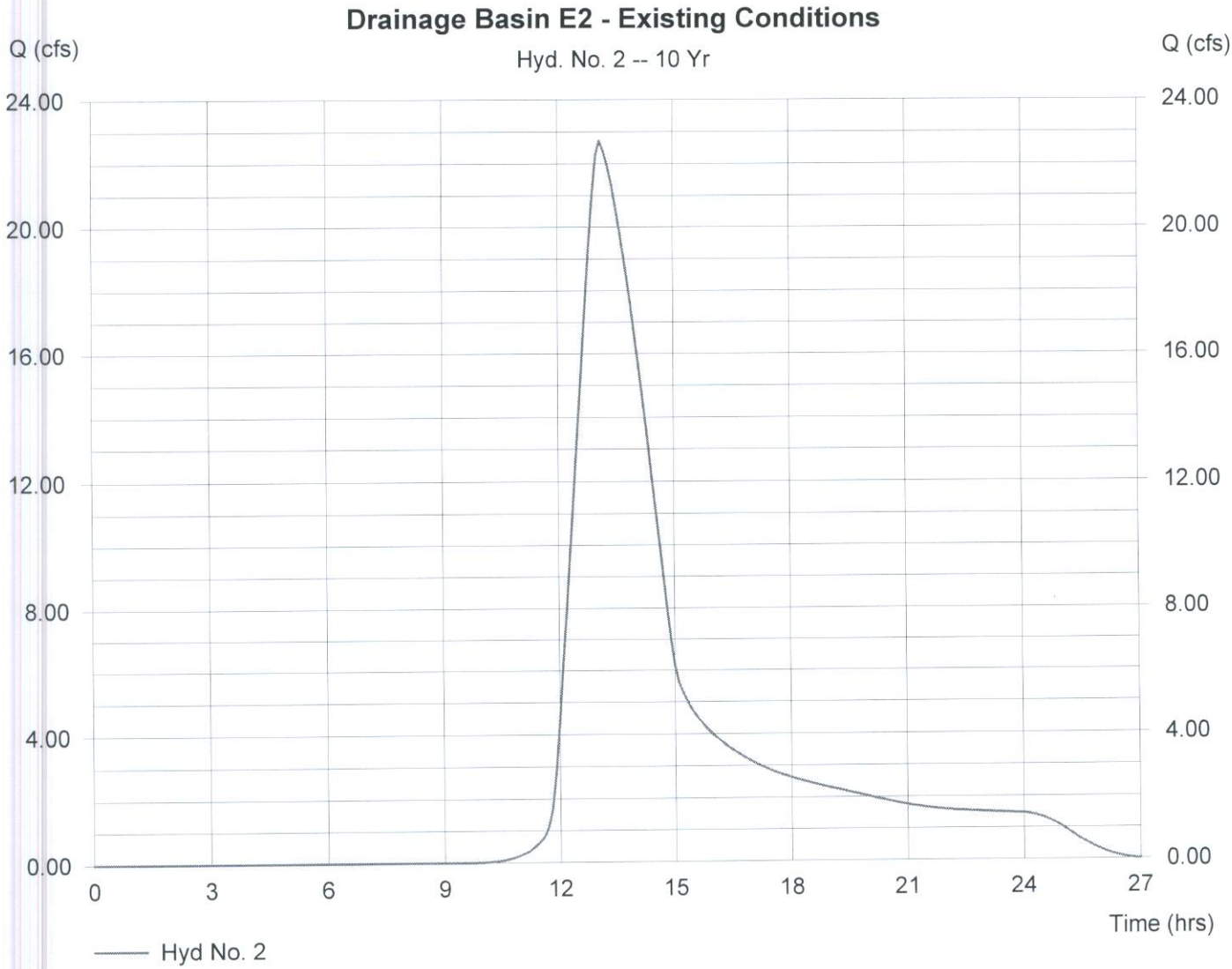
Monday, Sep 17 2007, 8:49 AM

Hyd. No. 2

Drainage Basin E2 - Existing Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 22.72 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 30.500 ac	Curve number	= 69.6
Basin Slope	= 0.8 %	Hydraulic length	= 3020 ft
Tc method	= LAG	Time of conc. (Tc)	= 114.14 min
Total precip.	= 5.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 5.855 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

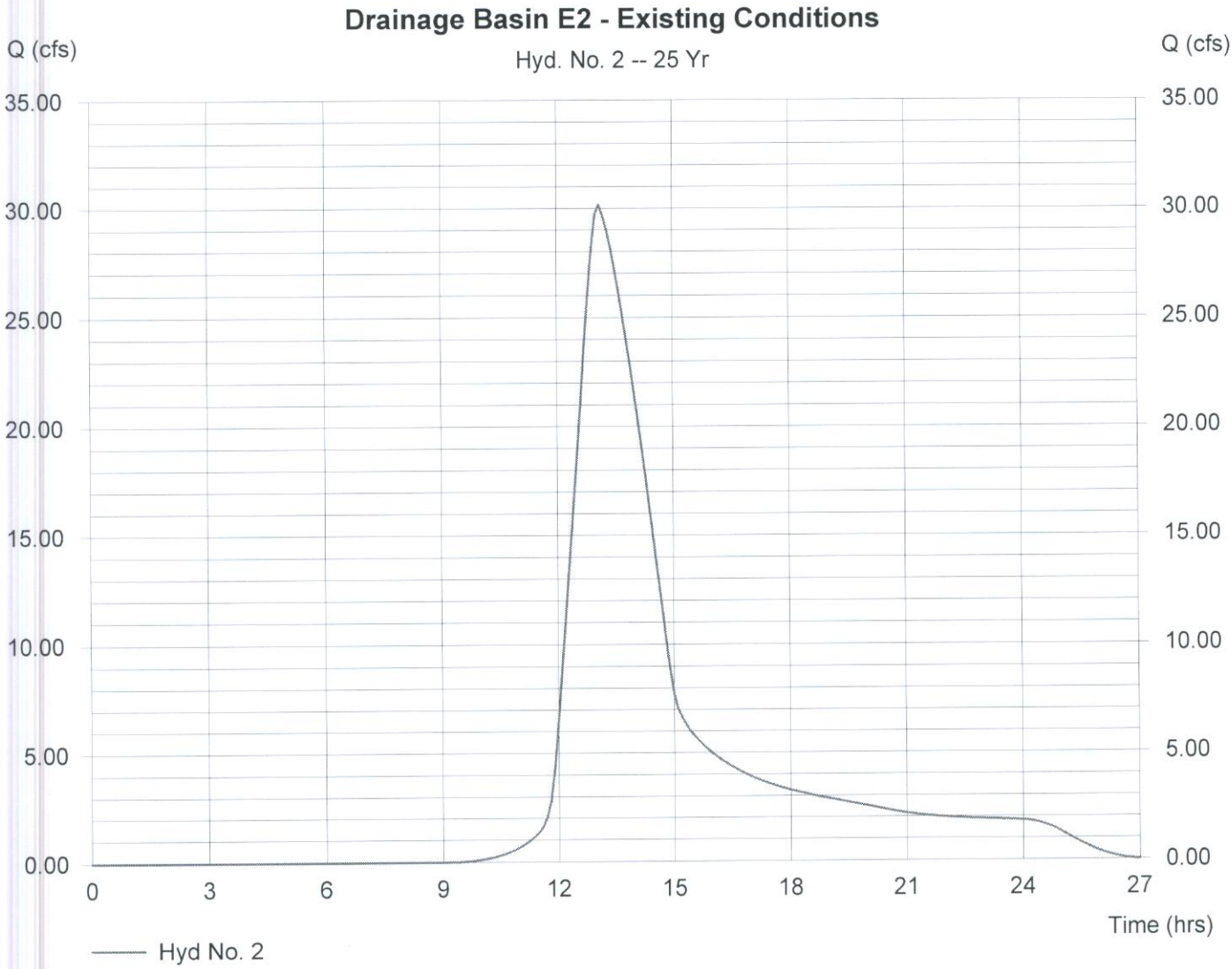
Monday, Sep 17 2007, 8:49 AM

Hyd. No. 2

Drainage Basin E2 - Existing Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 30.17 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Drainage area	= 30.500 ac	Curve number	= 69.6
Basin Slope	= 0.8 %	Hydraulic length	= 3020 ft
Tc method	= LAG	Time of conc. (Tc)	= 114.14 min
Total precip.	= 6.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 7.641 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

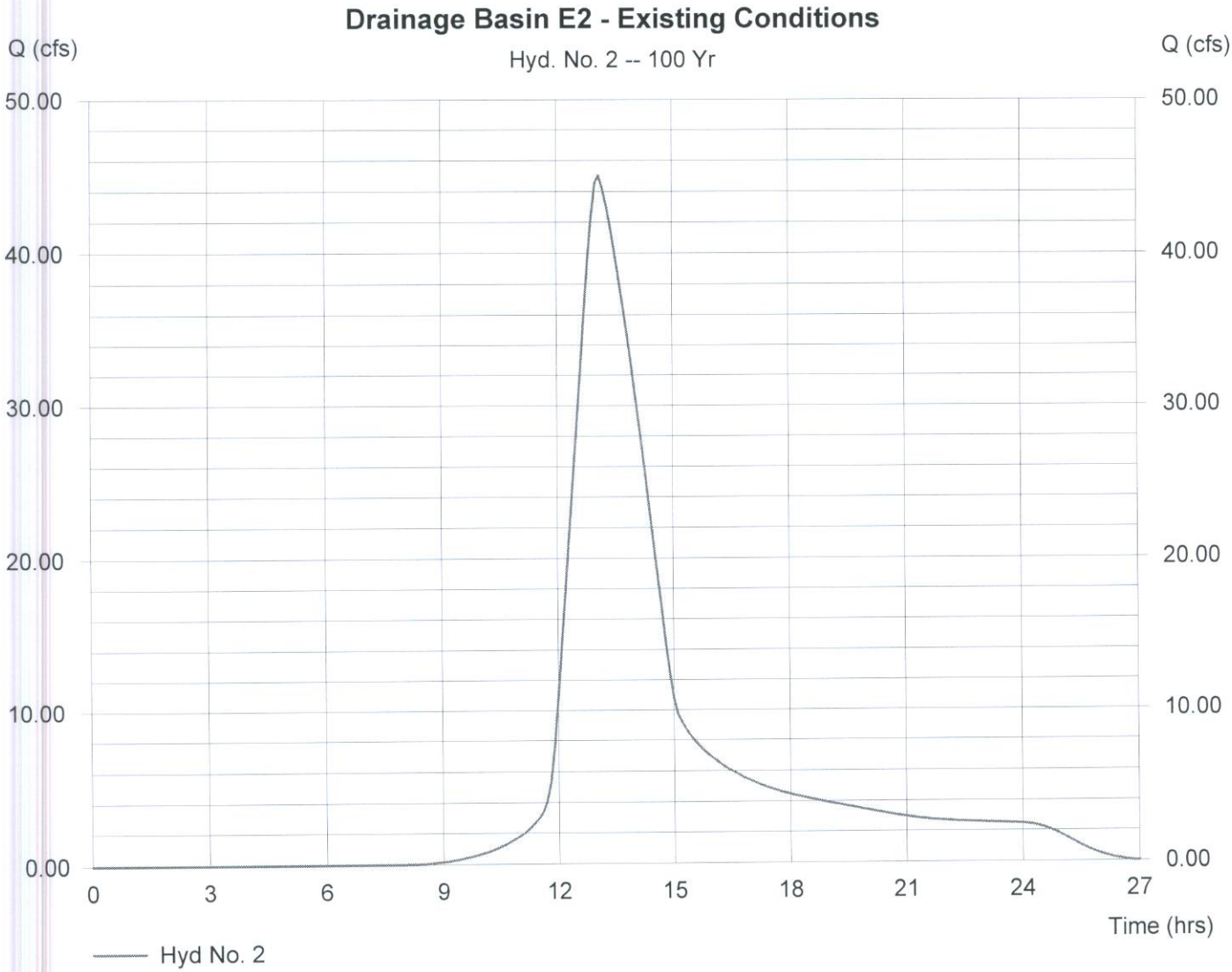
Monday, Sep 17 2007, 8:49 AM

Hyd. No. 2

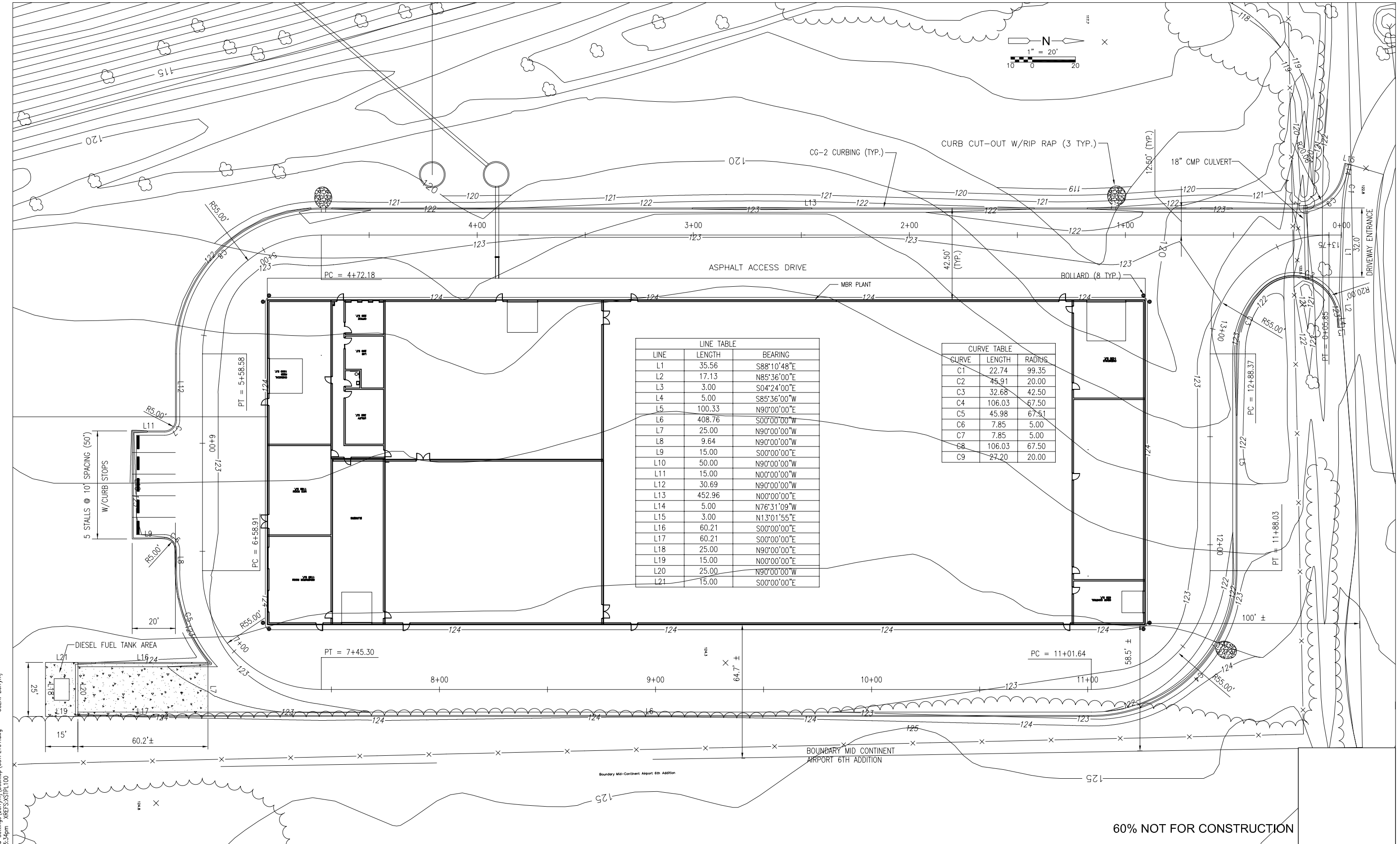
Drainage Basin E2 - Existing Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 45.03 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 30.500 ac	Curve number	= 69.6
Basin Slope	= 0.8 %	Hydraulic length	= 3020 ft
Tc method	= LAG	Time of conc. (Tc)	= 114.14 min
Total precip.	= 8.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 11.230 acft



Appendix E
Proposed Conditions



LINE TABLE		
LINE	LENGTH	BEARING
L1	35.56	S88°10'48"E
L2	17.13	N85°36'00"E
L3	3.00	S04°24'00"E
L4	5.00	S85°36'00"W
L5	100.33	N90°00'00"E
L6	408.76	S00°00'00"W
L7	25.00	N90°00'00"W
L8	9.64	N90°00'00"W
L9	15.00	S00°00'00"E
L10	50.00	N90°00'00"W
L11	15.00	N00°00'00"W
L12	30.69	N90°00'00"W
L13	452.96	N00°00'00"E
L14	5.00	N76°31'09"W
L15	3.00	N13°01'55"E
L16	60.21	S00°00'00"E
L17	60.21	S00°00'00"E
L18	25.00	N90°00'00"E
L19	15.00	N00°00'00"E
L20	25.00	N90°00'00"W
L21	15.00	S00°00'00"E

CURVE TABLE		
CURVE	LENGTH	RADIUS
C1	22.74	99.35
C2	45.91	20.00
C3	32.68	42.50
C4	106.03	67.50
C5	45.98	67.51
C6	7.85	5.00
C7	7.85	5.00
C8	106.03	67.50
C9	27.20	20.00

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: MAR
DRAWN BY: WLB
SHEET CHK'D BY:
CROSS CHK'D BY:
APPROVED BY:
DATE: July 2007

CDM Camp Dresser & McKee Inc.
consulting engineering construction operations
345 Riverview, Suite 520
Wichita, Kansas 67203
Tel: 316-660-6700
Fax: 316-264-3025

DuBOIS CONSULTANTS, INC.
QUALITY THAT ENDURES
5737 SWOPE PARKWAY
KANSAS CITY, MISSOURI 64130
WWW.DUBCON.COM

MID-CONTINENT WATER QUALITY RECLAMATION FACILITY
CITY OF WICHITA, KANSAS

WICHITA WATER UTILITIES

MBR FACILITY
ROAD/PAVEMENT SITE PLAN

PROJECT NO. 2395-46935
FILE NAME: CSTPL100

SHEET NO.

OF ?

DWG: C:\Documents and Settings\berrymj\Desktop\CSTPL101.dwg USER: Berrymj
DATE: Aug 23, 2007 3:34pm XREFS:XSTPL100

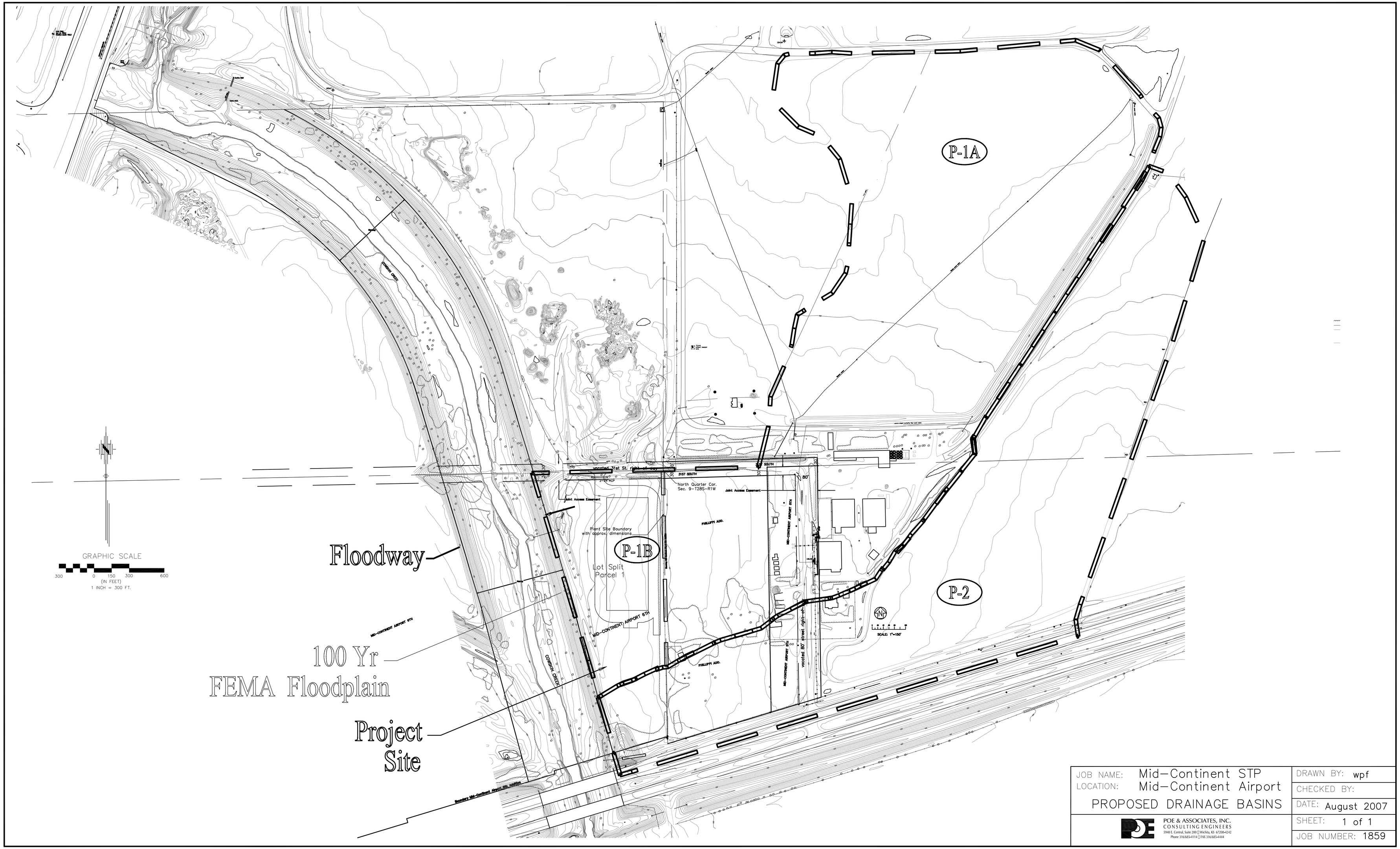
Mid-Continent STP Plant - Wichita, KS
Watershed
SCS CN Calculations

Basin	Area	CN	CN for Subarea #1		CN for Subarea #2		CN for Subarea #3	
	(Acres)	(composite)						
Proposed								
Post-Project								
Conditions								
P1A	44.7							
			5.2	Acres	32.6	Acres	6.9	Acres
			88	CN (Industrial, Soil B)	69	CN (Pasture, Fair, Soil B)	65	CN (Woods, Fair, Soil B)
			10.2	CNsubarea1	50.3	CNsubarea1	10.0	CNsubarea1
		70.6						
P1B	6.3							
			2.4	Acres	3.9	Acres		Acres
			98	CN (Pavmt & Rooftop)	69	CN (Pasture, Fair, Soil B)		CN
			37.3	CNsubarea1	42.7	CNsubarea1		CNsubarea1
		80.0						
P2	30.5							
			1	Acres	29.5	Acres		Acres
			88	CN (Industrial, Soil B)	69	CN (Pasture, Fair, Soil B)		CN
			2.9	CNsubarea1	66.7	CNsubarea2		CNsubarea3
		69.6						

Mid-Continent STP Plant
Time of Concentration
SCS Lag Method

Watershed Name	Area Acre(s)	CN	Length (ft)	Max. Elev. (ft)	Min. Elev. (ft.)	Watershed Slope (Y)%	S	Lag (hrs)	Calculated Tc (min.)	Tc (min.)
E1	51.0	70.4	2845	135.5	114	0.76	4.20	1.11	111.38	111.38
E2	30.5	69.6	3020	133	108	0.83	4.37	1.14	114.06	114.06
P1A	44.7	70.6	2845	135.5	114	0.76	4.16	1.11	110.78	110.78
P1B	6.3	78.2	925	124	114	1.08	2.79	0.30	30.35	30.35
P2	30.5	69.6	3020	133	108	0.83	4.37	1.14	114.06	114.06

S=(1000/CN)-10
Lag = (l^0.8(S+1)^0.7)/(1900Y^0.5)
TC = Lag / 0.6



JOB NAME: Mid–Continent STP LOCATION: Mid–Continent Airport	DRAWN BY: wpf
PROPOSED DRAINAGE BASINS	CHECKED BY:
	DATE: August 2007
POE & ASSOCIATES, INC. CONSULTING ENGINEERS 5940 E. Central, Suite 200 ▯ Wichita, KS 67208-4242 Phone 316/685-4114 ▯ FAX 316/685-4444	SHEET: 1 of 1
	JOB NUMBER: 1859

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

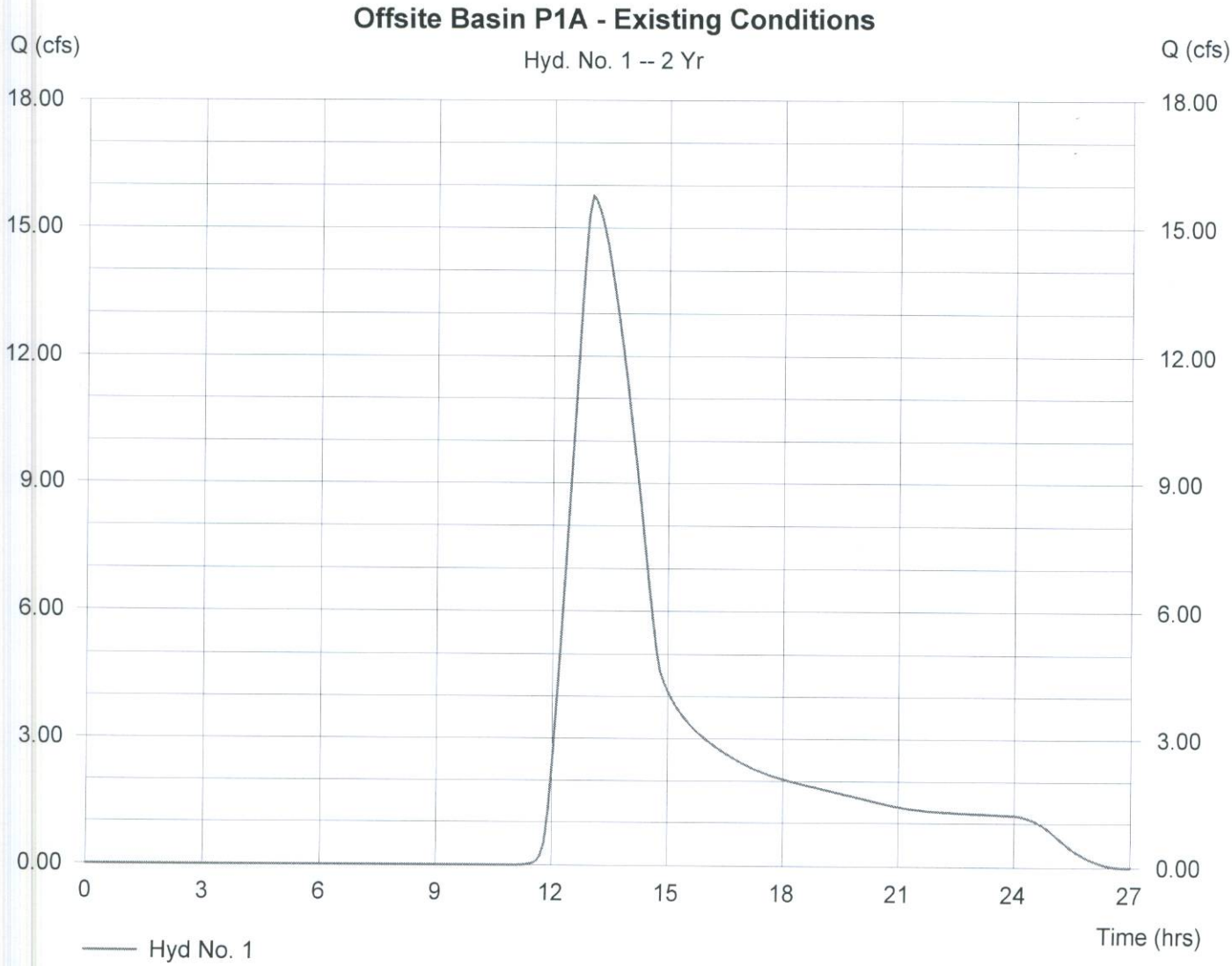
Monday, Sep 17 2007, 8:59 AM

Hyd. No. 1

Offsite Basin P1A - Existing Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 15.76 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 44.700 ac	Curve number	= 70.6
Basin Slope	= 0.8 %	Hydraulic length	= 2850 ft
Tc method	= LAG	Time of conc. (Tc)	= 110.84 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 4.068 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

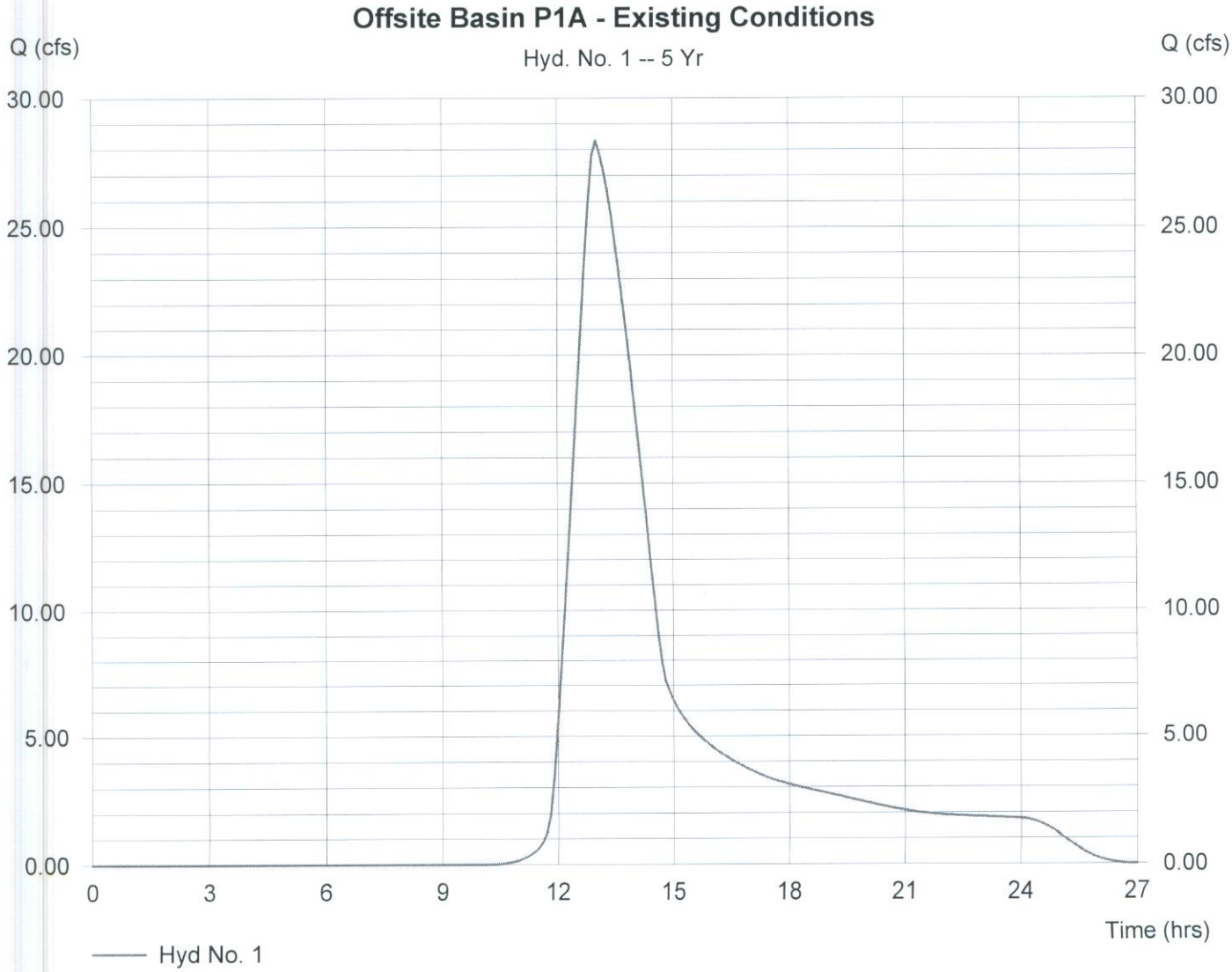
Monday, Sep 17 2007, 8:59 AM

Hyd. No. 1

Offsite Basin P1A - Existing Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 28.35 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Drainage area	= 44.700 ac	Curve number	= 70.6
Basin Slope	= 0.8 %	Hydraulic length	= 2850 ft
Tc method	= LAG	Time of conc. (Tc)	= 110.84 min
Total precip.	= 4.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 6.857 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

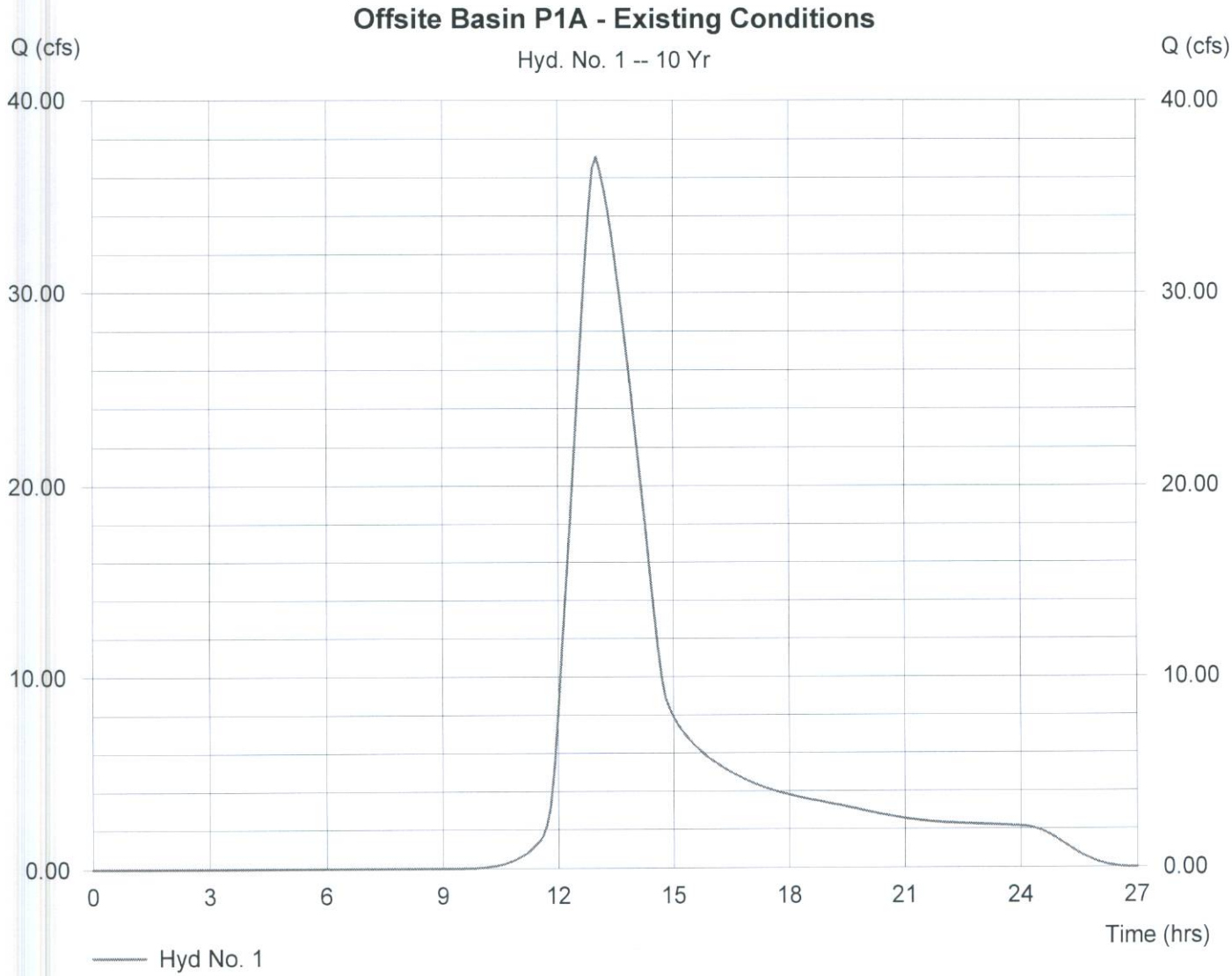
Monday, Sep 17 2007, 8:59 AM

Hyd. No. 1

Offsite Basin P1A - Existing Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 37.10 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 44.700 ac	Curve number	= 70.6
Basin Slope	= 0.8 %	Hydraulic length	= 2850 ft
Tc method	= LAG	Time of conc. (Tc)	= 110.84 min
Total precip.	= 5.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 8.798 acft



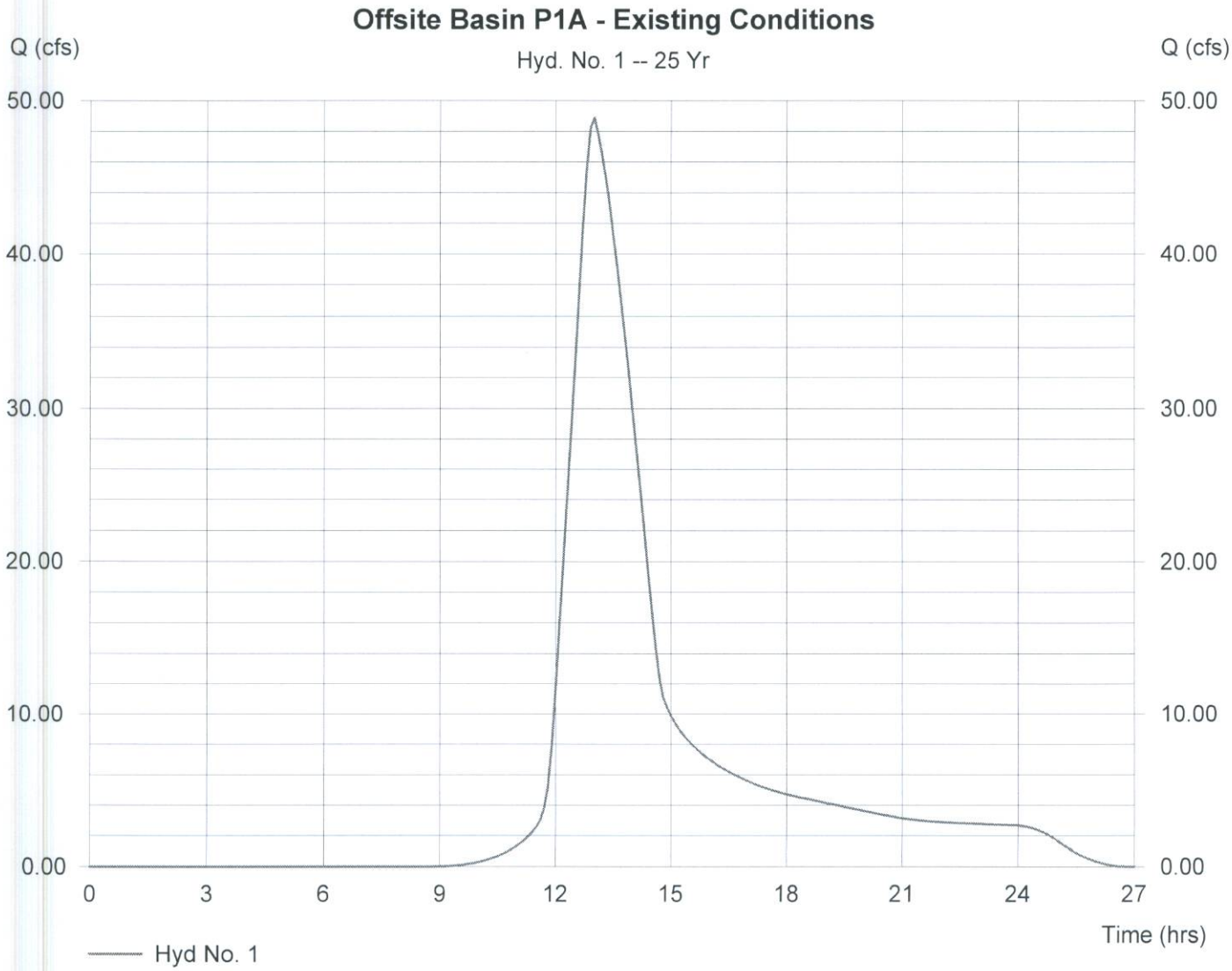
Hydrograph Plot

Hyd. No. 1

Offsite Basin P1A - Existing Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 48.90 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Drainage area	= 44.700 ac	Curve number	= 70.6
Basin Slope	= 0.8 %	Hydraulic length	= 2850 ft
Tc method	= LAG	Time of conc. (Tc)	= 110.84 min
Total precip.	= 6.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 11.429 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

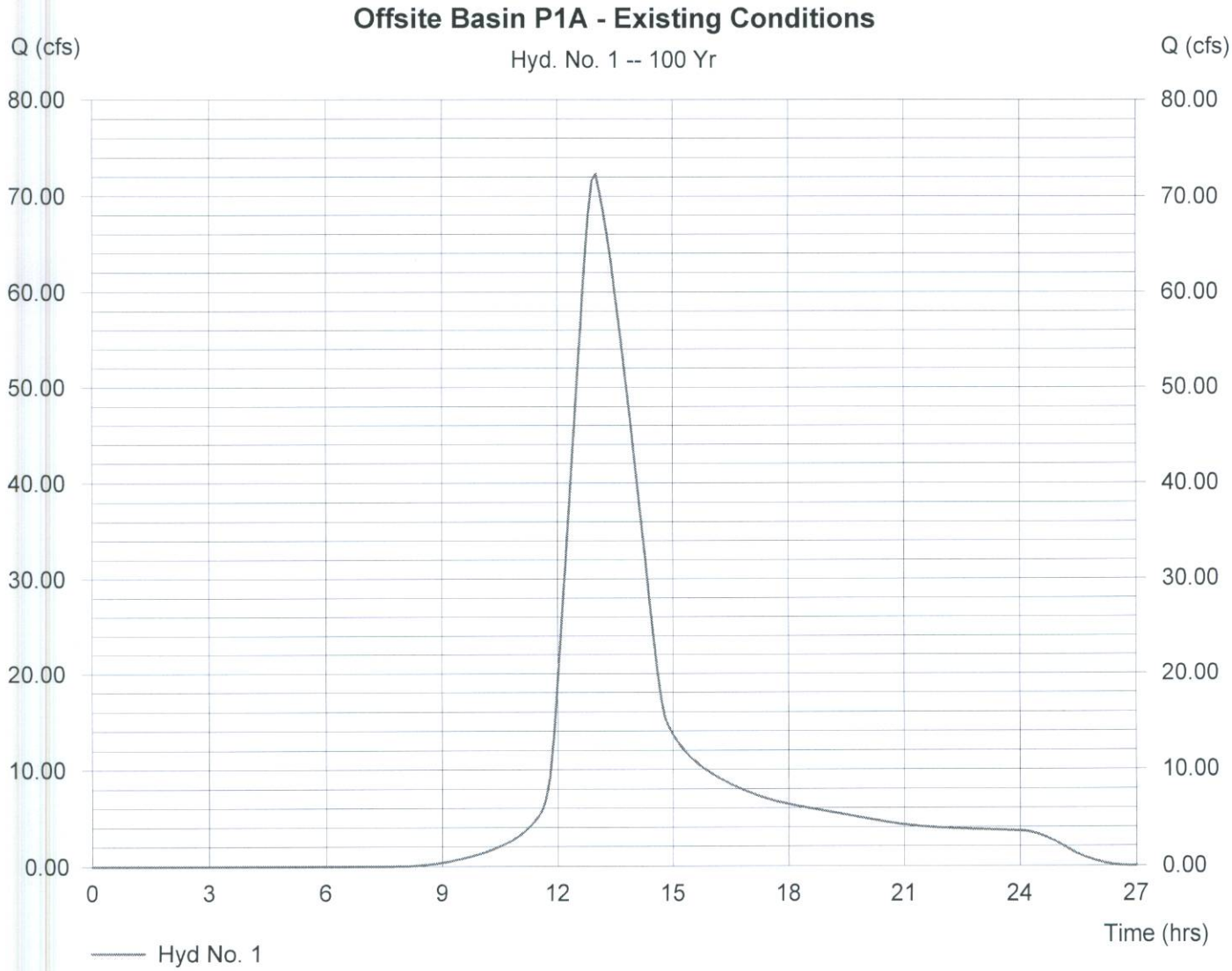
Monday, Sep 17 2007, 8:59 AM

Hyd. No. 1

Offsite Basin P1A - Existing Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 72.31 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 44.700 ac	Curve number	= 70.6
Basin Slope	= 0.8 %	Hydraulic length	= 2850 ft
Tc method	= LAG	Time of conc. (Tc)	= 110.84 min
Total precip.	= 8.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 16.694 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

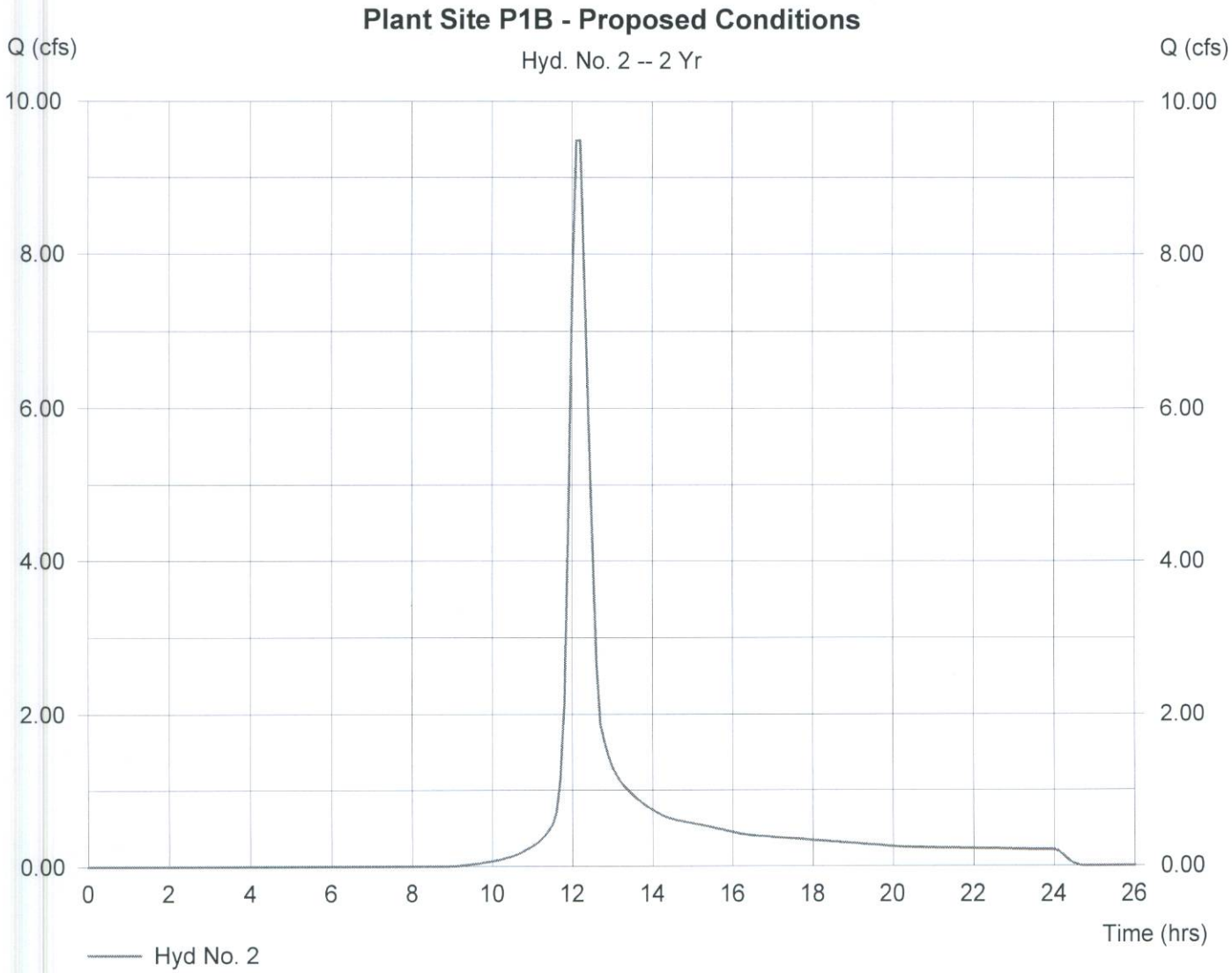
Monday, Sep 17 2007, 9:4 AM

Hyd. No. 2

Plant Site P1B - Proposed Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 9.50 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 6.300 ac	Curve number	= 80
Basin Slope	= 1.1 %	Hydraulic length	= 925 ft
Tc method	= LAG	Time of conc. (Tc)	= 28.52 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 0.901 acft



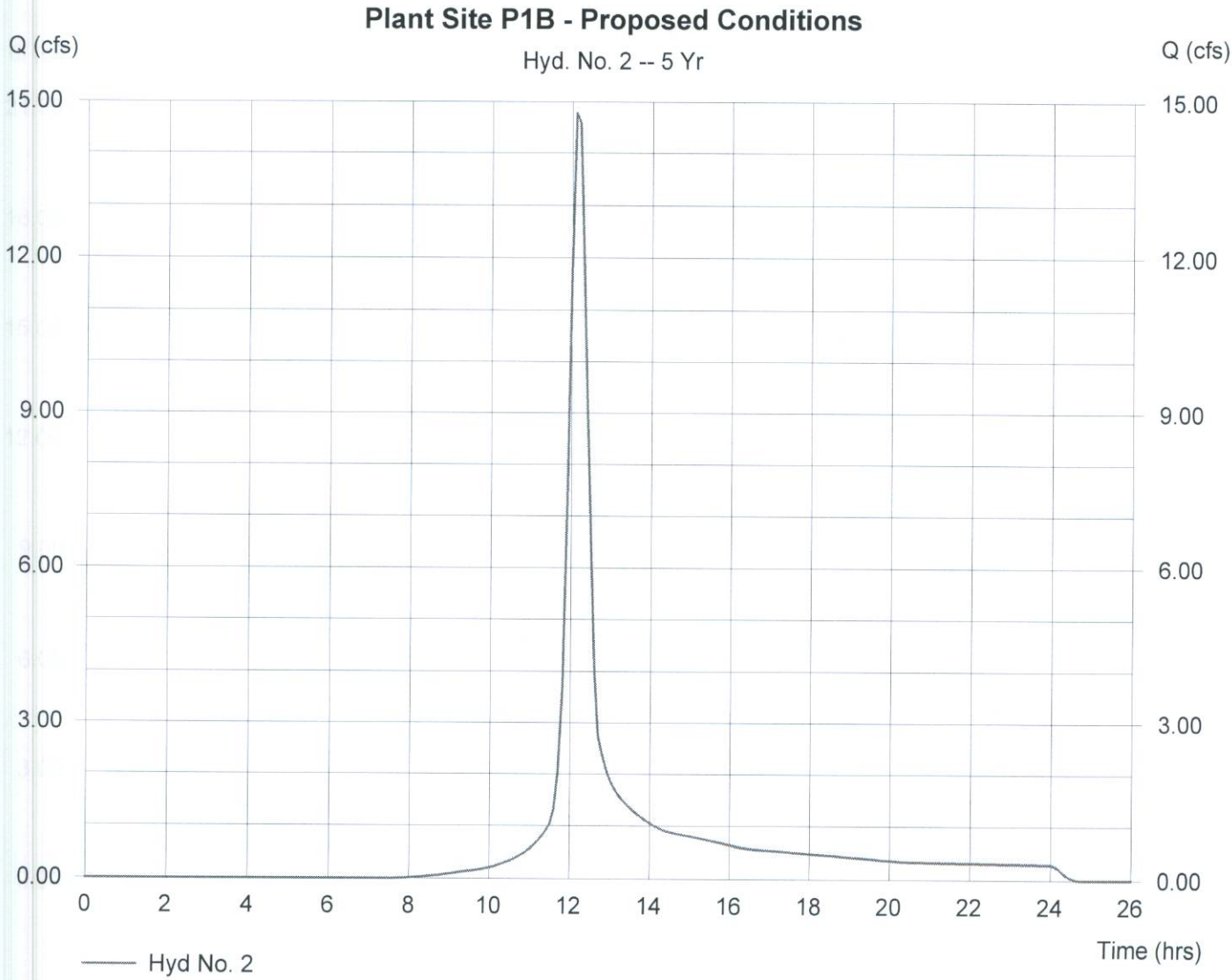
Hydrograph Plot

Hyd. No. 2

Plant Site P1B - Proposed Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 14.78 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Drainage area	= 6.300 ac	Curve number	= 80
Basin Slope	= 1.1 %	Hydraulic length	= 925 ft
Tc method	= LAG	Time of conc. (Tc)	= 28.52 min
Total precip.	= 4.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 1.382 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

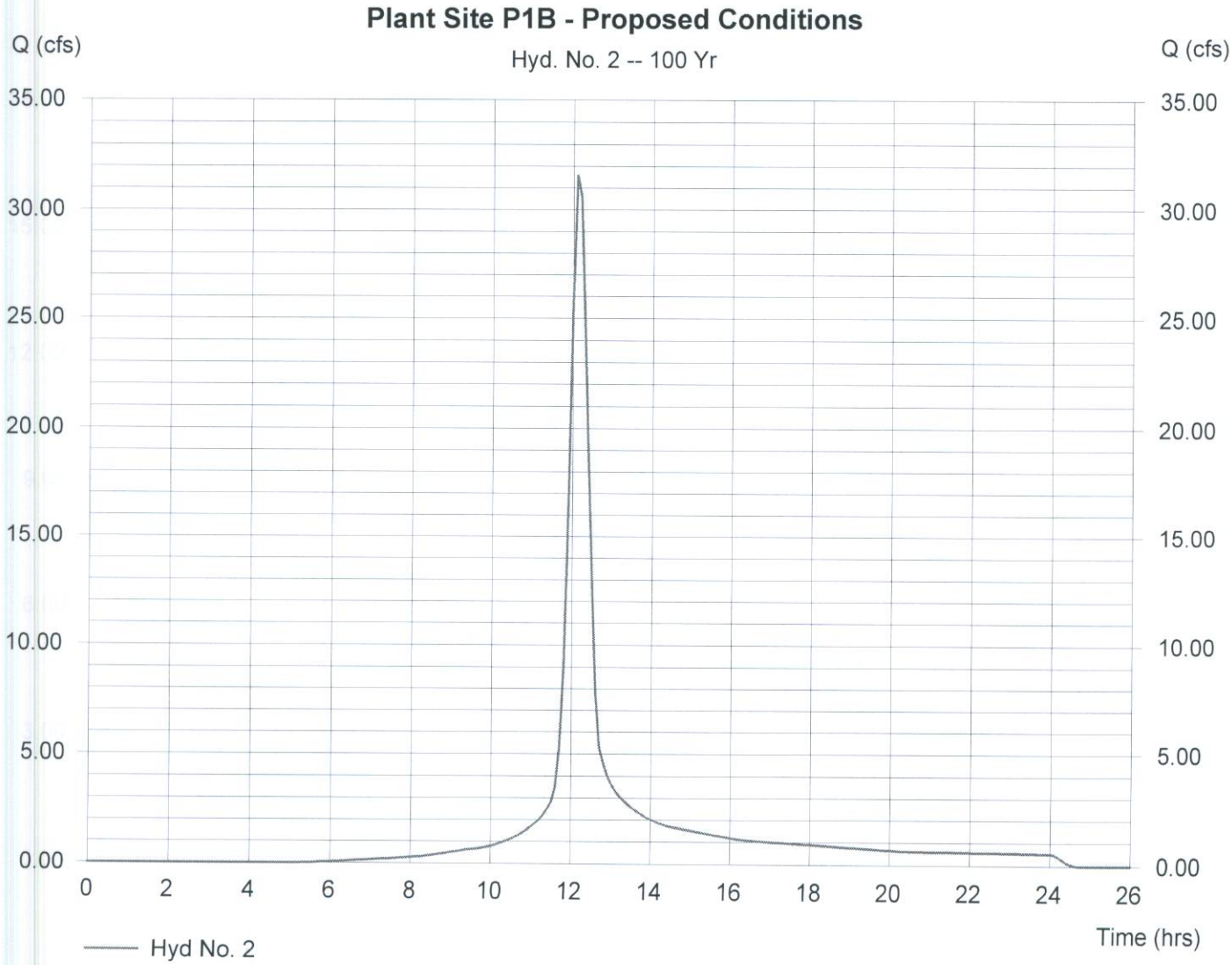
Monday, Sep 17 2007, 9:4 AM

Hyd. No. 2

Plant Site P1B - Proposed Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 31.57 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 6.300 ac	Curve number	= 80
Basin Slope	= 1.1 %	Hydraulic length	= 925 ft
Tc method	= LAG	Time of conc. (Tc)	= 28.52 min
Total precip.	= 8.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 2.953 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

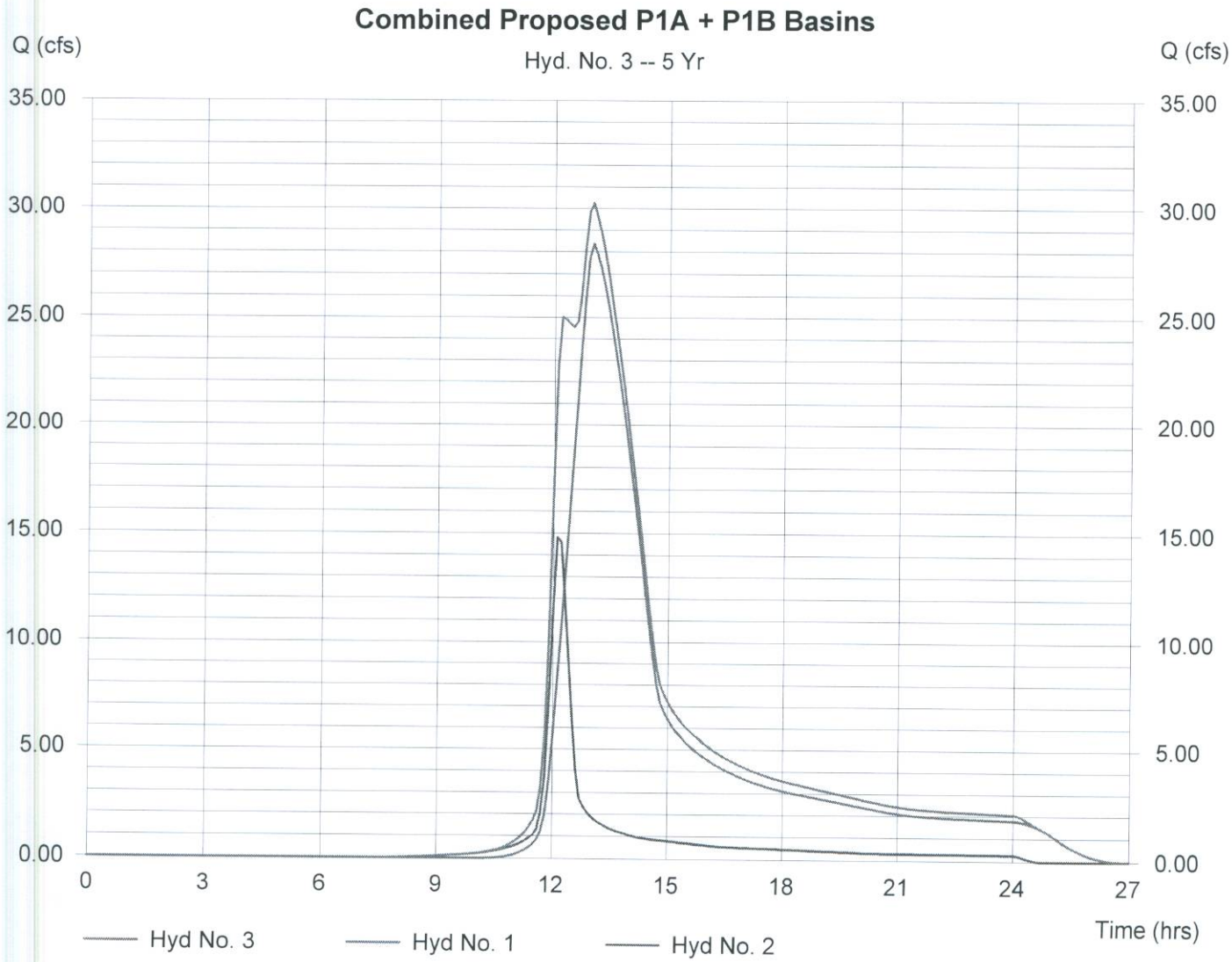
Monday, Sep 17 2007, 9:5 AM

Hyd. No. 3

Combined Proposed P1A + P1B Basins

Hydrograph type	= Combine	Peak discharge	= 30.24 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Inflow hyds.	= 1, 2		

Hydrograph Volume = 8.239 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

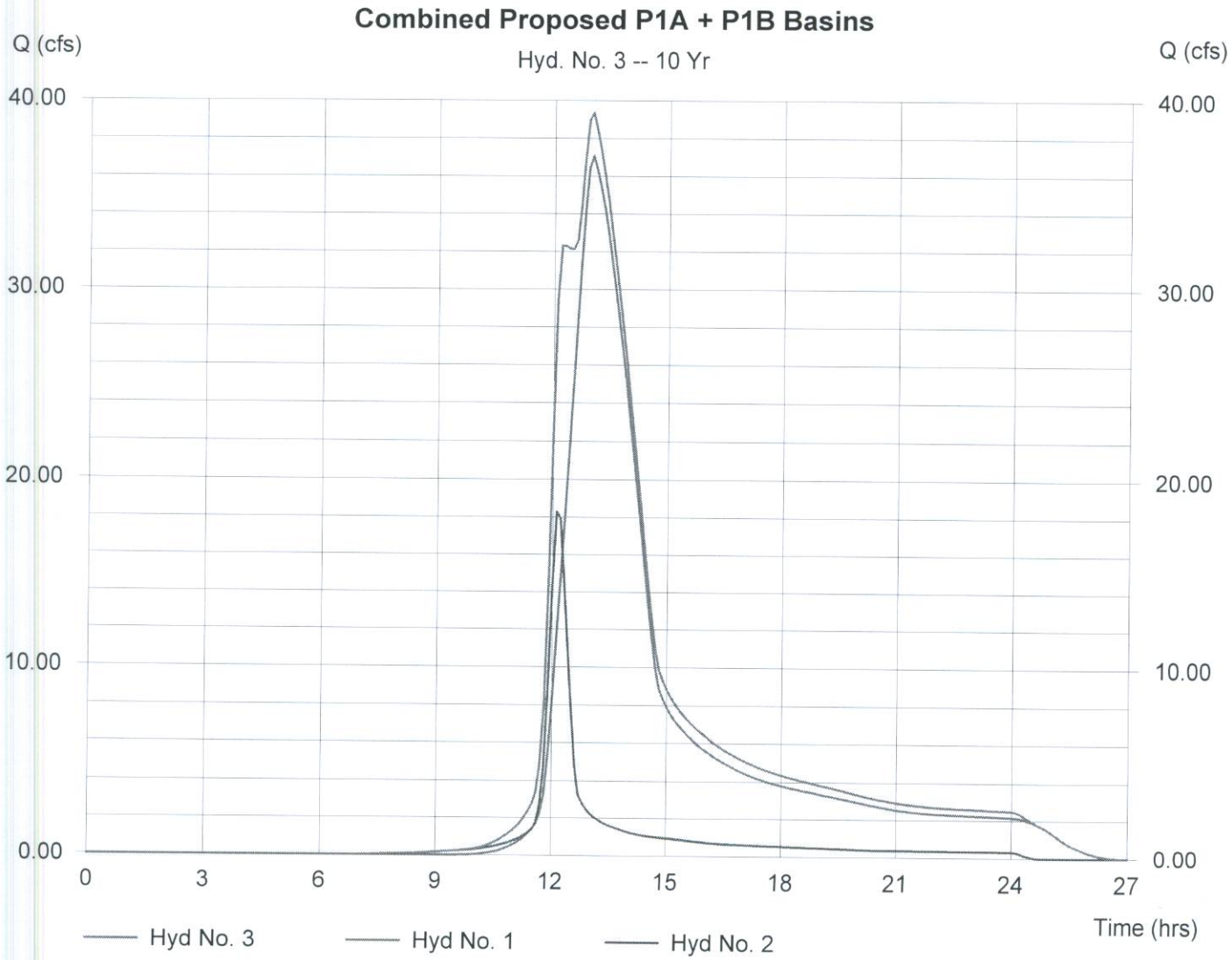
Monday, Sep 17 2007, 9:5 AM

Hyd. No. 3

Combined Proposed P1A + P1B Basins

Hydrograph type	= Combine	Peak discharge	= 39.36 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hyds.	= 1, 2		

Hydrograph Volume = 10.501 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Sep 17 2007, 9:5 AM

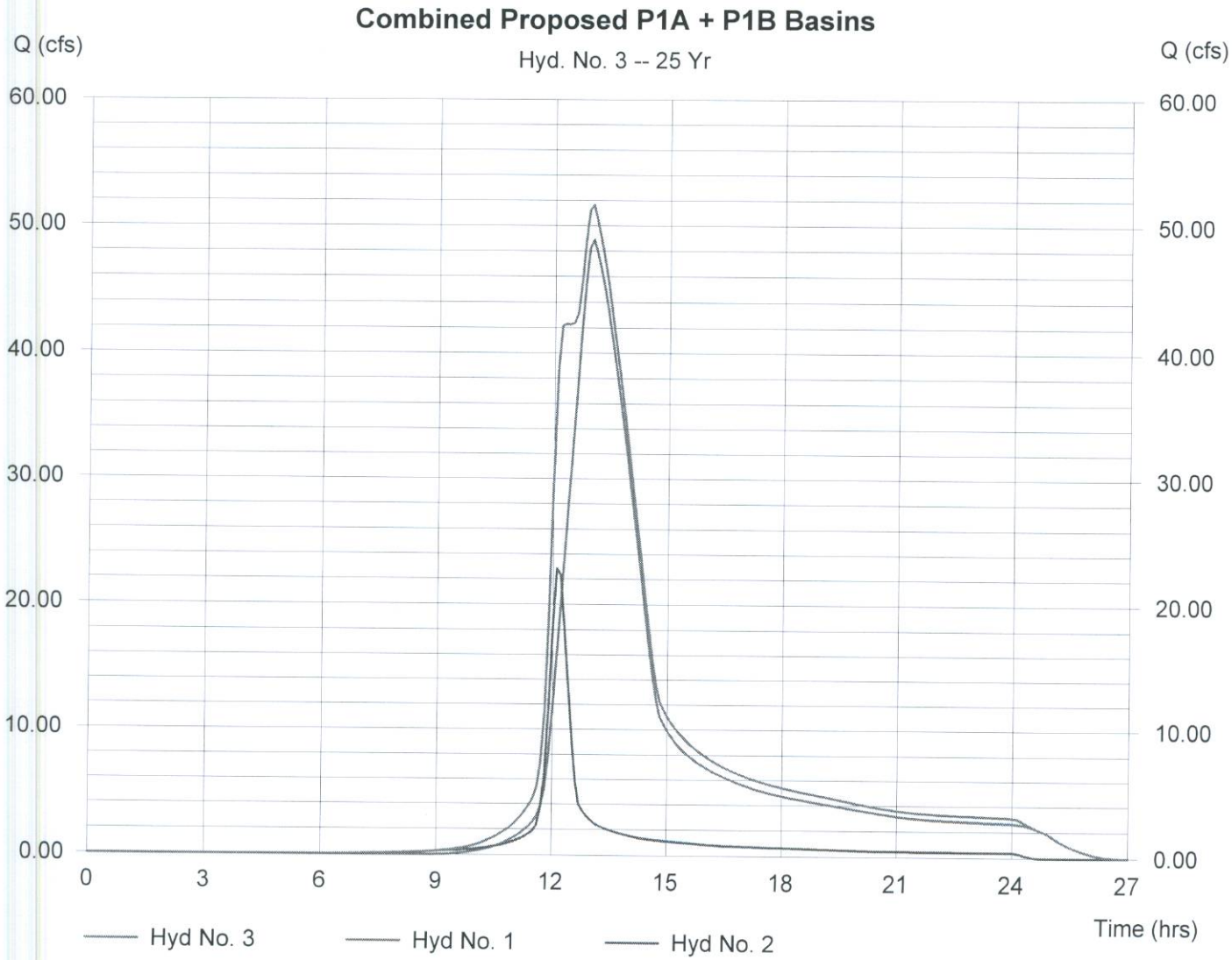
Hyd. No. 3

Combined Proposed P1A + P1B Basins

Hydrograph type = Combine
Storm frequency = 25 yrs
Inflow hyds. = 1, 2

Peak discharge = 51.64 cfs
Time interval = 6 min

Hydrograph Volume = 13.556 acft



Hydrograph Plot

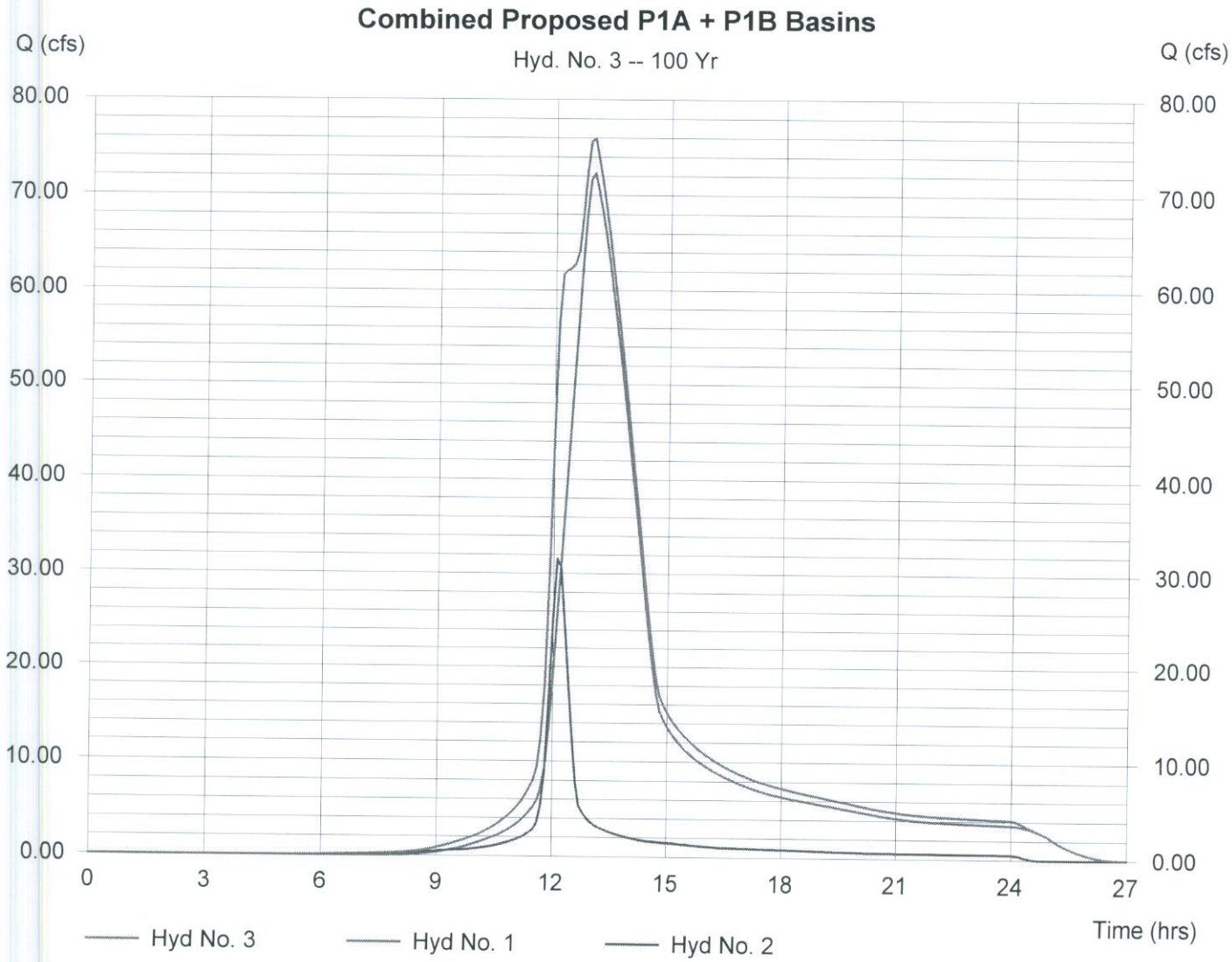
Hydraflow Hydrographs by Intelisolve | Monday, Sep 17 2007, 9:5 AM

Hyd. No. 3

Combined Proposed P1A + P1B Basins

Hydrograph type	= Combine	Peak discharge	= 75.96 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyds.	= 1, 2		

Hydrograph Volume = 19.647 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

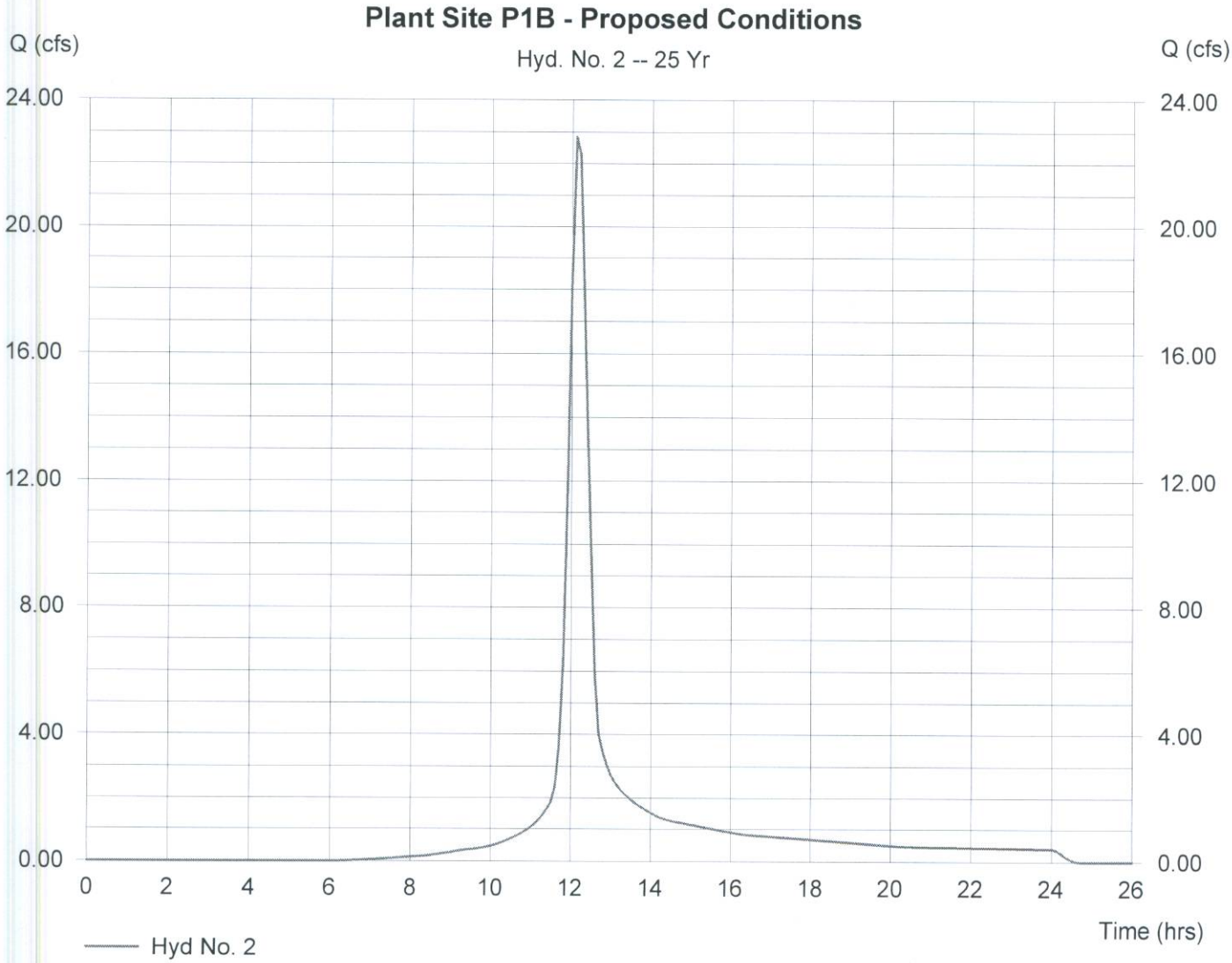
Monday, Sep 17 2007, 9:4 AM

Hyd. No. 2

Plant Site P1B - Proposed Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 22.84 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Drainage area	= 6.300 ac	Curve number	= 80
Basin Slope	= 1.1 %	Hydraulic length	= 925 ft
Tc method	= LAG	Time of conc. (Tc)	= 28.52 min
Total precip.	= 6.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 2.128 acft



Appendix F
Pipe Sizing

PIPE SIZING

Hydraflow Stormsewers was used to analyze the proposed culvert just south of 31st Street South under the entrance to the Project Site. A 33" RCP was selected as the size that would accommodate the 24 hour design storm event (5 year rainfall). Due to height restrictions, it is recommended that 2-24" RCPs be used. The open area of 2 – 24" RCPs is 6.28 square feet while the open area of a 33" RCP is square feet. Therefore using 2-24" RCPs will be more conservative and practical since a 33" RCP is a size that is not normally kept in inventory and would be a special order.

Hydraflow Plan View

Project file: New.stm	IDF file: SedgCo.IDF	No. Lines: 1	09-18-2007

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1		28.40	33 c	60.0	120.00	121.00	1.667	121.74	122.74	0.80	End

Project File: New.stm	IDF File: SedgCo.IDF	Total No. Lines: 1	Run Date: 09-18-2007

NOTES: c = circular; e = elliptical; b = box; Return period = 5 Yrs.; * Indicates surcharge condition.

Hydraflow Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)		Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)		
	(in)	(cfs)									(ft)											(K)	(ft)
1	33	28.40	120.00	121.74	1.74	3.95	7.18	0.80	122.54	0.547	60.0	121.00	122.74	1.74**	3.95	7.18	0.80	123.54	0.547	0.547	N/A	1.00	0.80

Project File: New.stm | IDF File: SedgCo.IDF | Total number of lines: 1 | Run Date: 09-18-2007

NOTES: Initial tailwater elevation = 121.7375 (ft) , * Normal depth assumed., ** Critical depth assumed., i Under inlet control.