Revision: 3.0
Baker Project No: 137724

Basis of Design: Civil

DP-1 Final Submission

P-165 SOF Combat Services Support Facility

Joint Expeditionary Base, Little Creek – Fort Story

Virginia Beach, VA

NAVFAC
Mid Atlantic District
Contract No: N40085-12-D-6304

Date: May 23, 2014

Prepared by

Baker

Michael Baker Jr. Inc
A Unit of Michael Baker Corporation

Contract No.: N40085-12-D-6304-0003 Revision: 3.0

Baker Project No.: 137724	Client: NAVFAC Mid Atlantic
Title: **Civil Design Analysis**	

Signatures:

	Typed Name	Signature	Date
Author	Justin M. Paske, P.E.		5/23/2014
Technical Reviewer	Jim O. Pritchard, P.E.		5/23/2014
Approver	Steven Savich, P.E.		5/23/2014

Licensed Professional Engineer's Stamp:

PASKE - Licensed Professional Engineer, Pennsylvania, License Number PE076515
PRITCHARD – Licensed Professional Engineer, PE042613E
SAVICH – Licensed Professional Engineer, Virginia License Number 042205

Contract No.: N40085-12-D-6304-0003 Revision: 3.0

Baker Project No.: 137724	Client: NAVFAC Mid Atlantic
Title: **Civil Design Analysis**	

Summary:

Summary of Design Analysis

1. SCOPE SUMMARY

   The site has been orientated to take advantage of the existing environment and infrastructure, facilitate the required needs, and provide a safe and workable solution for the users.

2. REFERENCES
   a. RFP Sections
   b. Building Codes
      i. ABA Accessibility Standard for Federal Facilities
      ii. DEPSECDEF Memorandum "Access for People with Disabilities", 31 October 2008
   c. Unified Facilities Criteria (UFC) References
      i. UFC 1-300-09N, Design Procedures
      ii. UFC 3-200-10N, General Civil/Geotechnical/Landscape Requirements
      iii. UFC 3-210-02, POV Site Circulation and Parking
      iv. UFC 3-210-10, Low Impact Development Manual
      v. UFC 3-220-01N, Geotechnical Engineering
      vi. UFC 3-230-10A, Water Supply: Water Distribution
      vii. UFC 3-240-01, Wastewater Collection
      viii. UFC 3-240-02, Domestic Wastewater Treatment
      ix. UFC 3-600-01, Fire Protection Engineering for Facilities
      x. UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings , 9 Feb 2012
      xi. UFC 4-030-01, Sustainable Development
   d. References
      i. Section 438 of the Energy Independence and Security Act (EISA), 19 Jan 2010
      ii. Penn Memo/Navy Low Impact Development (LID) Policy, 16 Nov 2007
      iii. NOAA Precipitation Data- National Climatic Data Center website: http://www.ncdc.noaa.gov/cdo-web/search
      iv. U.S. Dept. of Transportation Federal Highway Administration's Manual on Uniform Traffic Control Devices
      v. Virginia Department of Transportation (VDOT) Standard Drawings and Specifications
      vi. Virginia Stormwater Management Handbook
      vii. Virginia DEQ Stormwater Design Specification No.9 Bioretention, Version 1.9, 01 Mar 2011
      viii. 4 VAC 50-60 – Virginia Stormwater Management Program
      ix. USGBC 2009 LEED
      x. Appropriate ASTM Standards
      xi. TR-55 Manual

xii. Hampton Road Sanitary District (HRSD) Standard Construction Notes

xiii. Recommended Standards for Wastewater Facilities, 2004 Edition

The Warehouse site does not provide any parking but provides a concrete area for vehicular circulation and loading/unloading. The Warehouse site incorporates all concrete pavements.

All pavements are designed to a minimum life expectancy of 20 years with normal maintenance. The Team completed an evaluation of the pavement designs for each pavement type that were provided as part of the RFP. The proposed pavement sections were evaluated based upon loading information provided in the solicitation, and as calculated according to UFC 3-250-01 Pavement Design. The heavy duty asphalt section consists of a five-inch asphalt pavement on a 12-inch aggregate base constructed over a compacted subgrade with a minimum six-inch depth. The dumpster pad, aprons, and operation pavement at the Warehouse is eight inches of Portland cement concrete (PCC) pavement over six inches of base. Pedestrian sidewalk paving consists of four inches of PCC constructed over four inches of base. All pavement sections will be constructed on properly conditioned and compacted subgrade that has been proof rolled and deemed acceptable for use.

d. Drainage, Stormwater Management, and Low Impact Design

Drainage, stormwater management, and low impact design features will be incorporated into the final design. Multiple bio-retention areas will provide the stormwater treatment for controlling both quality and quantity.

Site grading and the on-site stormwater drainage system are designed to collect and convey stormwater runoff away from the proposed buildings and paved areas. The majority of the stormwater conveyance systems are anticipated to be overland flow and graded swales rather than underground piping. Minimal stormwater drainage piping is provided to convey water from onsite BMPs and storage to the receiving sewer lines or open drainage course. The stormwater drains are sized to convey the 10-year storm via gravity flow. The downspouts of the Administration Building are discharged to underground piping and conveyed to the BMP's. The Warehouse roof drains are also piped to adjacent BMP's. The storm sewer is designed to maintain a 3.0 feet-per-second velocity and be self-cleaning, thereby reducing maintenance costs. Overland flow paths are provided for storm events exceeding the return frequency indicated in the Solicitation and direct runoff away from the buildings, ensuring that the buildings will not flood.

Stormwater management facilities are designed in accordance with the Solicitation, with a minimum of the 95th percentile rainfall to be held on site and infiltrated through

the bioretention filters. The remaining storm events are required to be held to pre-developed release rates up to the 10-year storm frequency. Additionally, the Solicitation requires the incorporation of EISA requirements. The combination of these regulations provides both quantity and quality controls. The design utilizes bio-retention areas to serve as both the quality treatment for compliance with the EISA and COMNAVREG MIDLANT INSTRUCTIONS but also to hold the excess runoff for the 10-year storm until it can be released at pre-developed rates. The 25-year and 100-year storm events were routed to determine peak stages in the bioretention areas. Water quality, quantity and velocity requirements are met through the use of multiple bio-retention areas throughout each site. Storm water calculations are attached as an appendix to the Storm Water Pollution Prevention Plan (SWPPP)

e. Grading

As shown on the Solicitation plans, a large portion of the Administration Building site is surrounded by occupied by buildings, military equipment parking, and other paving features leaving limited areas for grading on a relatively level site. Combined with these restrictions and the proposal requirement of elevating the proposed buildings above the 100 year flood elevation, the development of the site will require the import of off-site materials. The Team will seek methods during post award design to minimize the import of off-site material. Design of the site grading maintains positive drainage away from the buildings and toward BMPs used on the site. Where drive-in doors and pedestrian entrances are located, the grading is set to accommodate safe and efficient access. Furthermore, the grading concept provides ABA-compliant routes from the ABA parking spaces to the Administration Building's main entrance. When sheet flow is not possible or practical, runoff will be collected in swales and/or inlets and directed away from buildings. Grading will be incorporated into an overall stormwater pollution prevention plan developed for the site. The site configuration dictates the use of smaller stormwater BMPs as opposed to a single large facility. This approach also allows for the stormwater features to be more easily incorporated into the overall site appearance with the use of plantings and screening to blend them with the rest of the site improvements.

f. Site Utilities

The water service for the Administration Building is sourced from the new waterline installation at the west side of the building which connects to the existing 6" fire hydrant supply. The water service for the Warehouse connects to the existing water main to the south along Gator Road. Backflow prevention devices for both buildings will be installed per the utility provider's requirements. The domestic and fire service enters

STORMWATER POLLUTION PREVENTION PLAN STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

_____ _____

Name (Operator and/or Responsible Authority) Date

Project Name and location information:	
P-165 SOF Combat Services Support Facility	Joint Expeditionary Base Little Creek – Fort Story Virginia Beach, VA

A site map must be developed and must contain, at a minimum, the following information:

1. Drainage patterns,
2. Approximate slopes after major grading activities,
3. Areas of soil disturbance,
4. Outline all areas that are not to be disturbed,
5. Location of all major structural and non-structural controls,
6. The location of expected stabilization practices,
7. Wetlands and surface waters, and
8. Locations where stormwater may discharge to a surface water or MS4.

1.0 INTRODUCTION

1.1 Project Overview and Location

This document provides the Stormwater Pollution Prevention Plan (SWPPP) and Erosion and Sediment Control Plan for the construction of a new Combat Services Support Detachment (CSSD) facility for Naval Special Warfare Group 2. The CSSD facility shall consist of an Administrative Building and a Warehouse. The project is located at Joint Expeditionary Base Little Creek - Fort Story (JEB LC-FS) West Campus in Virginia Beach, Virginia which is considered a county equivalent. The Administration Building and Warehouse are located at different sites within the base. Please refer to Appendix A for the USGS Location Map.

The Administration Building is located latitude 36°55’6.33” N, longitude 76°9’41.87” W (36.918425°, -76.161630°). The Admin Building is located to the Southeast of the intersection of Helicopter Road and Cove Road and is bordered by existing building 3859 on the North, Helicopter Road on the West, existing Building 3857 on the south and existing Building 3359 to the east. All adjacent properties are within the JEB LC-FS.

The Warehouse is located at 36°54’57.51” N, longitude 76°9’36.84” W (36.915975°, -76.160235). The site is currently a grassed area adjacent to and existing heliport. The Warehouse is located on Gator Blvd just east of the intersection with Helicopter Road. The project site is bordered by existing building 3854 on the north, Gator Blvd on the west and south and an existing heliport to the east. All adjacent properties are within the JEB LC-FS.

This SWPPP was prepared in accordance with the requirements of JEB LC-FS and General Permit Number VAR10 for Discharge of Stormwater from Construction Activities that incorporates the Virginia Stormwater Management Act and attendant regulations and conditions applicable to all Virginia Stormwater Management Program permits. The SWPPP was prepared by Michael Baker Jr., Inc. (Baker) for the design/build team of Leebcor Services, LLC (Leebcor, the contractor) and Baker (the designer). Construction is anticipated to begin in November 2014 and completed in September 2015.

1.2 Project Description

The Administration Building will provide administrative office space to 48 staff and will provide space for supporting equipment. The Administration Building will consist of a two-story building, mechanical yard, electrical yard, stormwater management facilities, utility trenching, reconfiguration of parking area, asphalt paving, concrete sidewalks, and landscaping. The disturbed area for this portion of the project is approximately 1.52 acres.

The Warehouse will provide accessible storage adjacent to shop and office space. The Warehouse will consist of a pre-fabricated structure, stormwater management facilities, dumpster enclosure, concrete paving, utility trenching, fence installation and landscaping. The disturbed area for this portion of the project is approximately 1.68 acres.

2.0 EXISTING SITE CONDITIONS

2.1 Site Characteristics

The Administrative Building site is currently a paved vehicle storage lot. Site drainage is to an existing piped storm system within the site and an existing drainage ditch to the northeast. There are no cultural resources, Air Installation Compatible Use Zone (AICUZ), explosive arcs, or Hazards to Electromagnetic Radiation to Ordnance (HERO) issues, and no known hazardous material issues associated with this site. Wetlands are located to the north east of the site. No disturbance of the wetlands is anticipated.

The Warehouse site is currently undeveloped greenfield lot. Site is sloped slightly to the south and drainage is to an existing piped system and drainage ditch along the road. There are no cultural resources AICUZ, explosive arcs, or HERO issues and no known hazardous material issues associated with this site.

2.2 Flood Insurance Rate Map

A FEMA Flood Insurance Rate Map (FIRM) was developed for the sites. The sites are located in Panel 5155310016F, and according to the FIRM, portions of both sites are located in “Other Flood Areas” Zone X , which is subject to 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood as well as “Other Areas” Zone X which is defined as areas determined to be outside the 0.2% annual chance floodplain. Please refer to Appendix C for the FEMA FIRM.

2.3 Nearest Receiving Water Bodies

The nearest receiving water body (RWB) is Little Creek for both the Administration Building and the Warehouse. This water body is labeled on the USGS Location Map in Appendix A. The watershed basin was determined using the website:
http://dswcapps.dcr.virginia.gov/htdocs/maps/HUExplorer.htm. The sites are part of the Lower Chesapeake Basin – Lynnhaven-Poquoson sub-basin (Hydrologic Unit: 02080108) Little Creek Cove is not found on the 2012 Impaired Waters – 303(d) list.

2.4 Site Soils

Site soils information was obtained from the following web site: http://websoilsurvey.nrcs.usda.gov (see Appendix D for Soils Maps of each of the sites). The same soils are found at both locations and are listed in Table 2.0.

Table 2.0 -- Hydrologic Soils Information

Soil Name	Slope	HSG Classification
Tetotum loam	0 to 2%	C
Udorthents loamy	0 to 25%	-

A geotechnical report was developed by ECS dated February 17, 2014 and copy is provided in the appendice. The ground water table was encountered at variable depths of approximately 5 to 8 feet below surface at both sites with static, 24 hour groundwater observations. Five infiltration tests were conducted at various locations. See table below for a summary of those results.

Table 2.1 – Infiltration Summary

Location	ksat (in/hr)	Depth of Boring (ft)
INF-1	7.573	3.0
INF-2	0.757	4.0
INF-3	0.406	4.5
INF-1A	3.786	5.0
INF-2A	4.733	5.0

2.5 Critical Erosion Areas

The administration building has wetlands located to the northeast of the site. This area has been designated as critical due to its vegetation which would experience serious degradation if sediment were to leave the site. Therefore, care will be taken to minimize land disturbance in this area, and sediment will be controlled on site. A National Wetlands Inventory map is provided in Appendix B. The wetlands areas have been delineated by NAVFAC personnel.

The warehouse site does not have any critical erosion areas identified.

2.6 Off-Site Areas

The site contractor shall be responsible for all permits and erosion controls associated with off-site borrow or spoil areas.

3.0 POTENTIAL POLLUTANT SOURCES

3.1 Potential Pollutants

Potential sources of sediment to stormwater runoff:

Activity	BMP/Solution
Clearing, Grading, Excavating	Silt fence, filter sock, temporary and permanent diversions and inlet protection placed as shown on drawings
Dewatering operations	Silt fence, filter sock, temporary and permanent diversions and filter bag placed as shown on drawings
Material delivery; construction vehicle traffic	Construction entrance, silt fence, filter sock, temporary and permanent diversions placed as shown on drawings

Potential pollutants and sources, other than sediment, to stormwater runoff:

Trade Name Material	Physical Description	Storm-water Pollutants	Location
Pesticides (insecticides, fungicides, herbicides, rodenticides)	Various colored to colorless liquid, powder, pellets, or grains	Chlorinated hydrocarbons, organophosphates, carbamates, arsenic	Herbicides used for noxious weed control
Fertilizer	Liquid or solid grains	Nitrogen, phosphorous	Newly seeded areas
Cleaning solvents	Colorless, blue, or yellow-green liquid	Perchloroethylene, methylene chloride, trichloroethylene, petroleum distillates	No equipment cleaning allowed in project limits
Concrete	White solid/grey liquid	Limestone, sand, pH, chromium	Dam revetment
Hydraulic oil/fluids	Brown oily petroleum hydrocarbon	Mineral oil	Leaks or broken hoses from Equipment
Gasoline	Colorless, pale brown or pink petroleum hydrocarbon	Benzene, ethyl benzene, toluene, xylene, MTBE	Secondary containment/staging area
Diesel Fuel	Clear, blue-green to yellow liquid	Petroleum distillate, oil & grease, naphthalene, xylenes	Secondary containment/staging area
Kerosene	Pale yellow liquid petroleum hydrocarbon	Coal oil, petroleum distillates	Secondary containment/staging area
Antifreeze/coolant	Clear green/yellow liquid	Ethylene glycol, propylene glycol, heavy metals (copper, lead, zinc)	Leaks or broken hoses from equipment
Sanitary toilets	Various colored liquid	Bacteria, parasites, and Viruses	Staging area

3.1 Spill Control Practices

In addition to the good housekeeping and material management, the following practices shall be followed for spill prevention and cleanup:

- Spill cleanup information shall be posted on site to inform employees about cleanup procedures and resources.
- The following clean-up equipment must be kept on-site near the material storage area: gloves, mops, rags, brooms, dust pans, sand, sawdust, liquid absorber, goggles, and trash containers.
- Appropriate spill kits sized for the project and for all vehicles to be used during construction shall be kept onsite at all times.
- All spills shall be cleaned up as soon as possible. Spills large enough to reach the storm sewers will be reported to the National Response Center at 1-800-424-8802.
- When cleaning a spill, the area should be well ventilated and the employee shall wear proper protective covering to prevent injury.
- Toxic spills must be reported to the proper authority regardless of the size of the spill.
- After a spill, the prevention plan shall be reviewed and changed to prevent further similar spills from occurring. The cause of the spill, measures to prevent it, and how to clean the spill up shall be recorded.
- The superintendent shall be the spill prevention and cleanup coordinator and is responsible for the day to day site operations.
- The superintendent also oversees the spill prevention plan and shall be responsible for educating the employees about spill prevention and cleanup procedures.
- Oil, chemical or other hazardous substance spills in excess of reportable quantities, in accordance with Part I E. of the Permit, will be reported to the Department in accordance with Part III G. of the Permit as soon as the discharge is discovered, but no later than 24 hours. A reportable quantity of oil is defined as a discharge to surface water that causes a sheen, discoloration, and/or an emulsion.
- Reports will be made to the following:

  DEQ Northern Virginia Regional Office
  Phone: (703) 583-3870
  Fax: (703) 583-3821

- For reports outside normal working hours, leave a message

  Virginia Department of Emergency Management
  Emergency Operations Center (EOC)
  Phone: 1-(800) 468-8892

4.0 EROSION AND SEDIMENT CONTOL MEASURES

This stormwater pollution prevention plan consists of Best Management Practices (BMPs) which the contractor will implement to control discharge of storm water. The BMPs are designed to prevent and/or minimize storm water exposure to pollutants as well as provide sediment and erosion control. The BMP's listed in this SWPPP are from the Virginia Erosion and Sediment Control Handbook.

4.1 Structural Practices

4.1.1 Safety Fence
A protective barrier installed to prevent public access to an erosion control measure.

4.1.2 Temporary Stone Construction Entrance
A stone pad, located at points of vehicular ingress and egress on a construction site, to reduce the soil transported onto public roads or other paved areas.

4.1.3 Construction Road Stabilization
Temporary stabilization with stone of access roads, subdivision streets, parking areas and other traffic areas immediately after grading to reduce erosion caused by vehicles during wet weather, and to prevent having to re-grade permanent roadbeds between initial grading and final stabilization.

4.1.4 Silt Fence
A temporary sediment barrier composed of posts, filter fabric and in some cases a wire support fence, placed across or at the toe of a slope or in a minor drainage way to intercept and detail sediment and decrease flow velocities from drainage areas of limited size; applicable where sheet and rill erosion or small concentrated flows may be a problem. Maximum effective life of 6 months.

4.1.5 Storm Drain Inlet Protection

The installation of various kinds of sediment trapping measures around drop inlets or curb inlet structures prior to permanent stabilization of the disturbed area; limited to drainage areas not exceeding one acre, and not intended to control large, concentrated stormwater flows.

4.1.6 Outlet Protection

Structurally lined aprons or other acceptable energy dissipating devices placed at the outlets of pipes or paved channel sections. To prevent scour at stormwater outlets, to protect the outlet structure and to minimize the potential for downstream erosion by reducing the velocity and energy of concentrated stormwater flows.

4.2 Vegetative Practices

Soil Stabilization is the most effective means to minimize erosion and offsite sediment from development sites. Stabilized soils have vegetative or other types of cover left during construction or replaced following disturbance in order to prevent wind or water.

4.2.1 Temporary Seeding

Temporary seeding is the use of quickly germinating vegetative cover on disturbed areas to stabilize soils and control erosion.

4.2.2 Permanent Seeding

Permanent seeding is use of permanent vegetative cover to stabilize soils and control erosion.

4.3 Management Strategies

Clearing and grubbing includes the proper disposal of materials and the implementation of best management practices in order to minimize exposure of soil to erosion and causing downstream sedimentation. Sites should be assessed to determine areas to be left undisturbed as well as trees or vegetated areas to be saved (see tree preservation area). These areas need to be clearly marked on plans and in the field. Land clearing activities should not begin until the site assessment and the field marking is concluded. Where possible, all stumps, roots, logs, brush, limbs, tops and other debris resulting from the clearing or thinning operation should be disposed of by processing through a chipping machine. The chips can then be utilized as mulch, as part of a site stabilization or final landscaping plan. Organic material may also be disposed of at an approved composting facility**.**

5.0 STORMWATER MANAGEMENT

5.1 Design Methodology

In order to model both the existing and proposed site conditions, as well as to estimate the approximate amount of storage that will be required by the development, the following design methods and assumptions were used:

- Hydraflow Express Extension for AutoCAD Civil 3D was used for channel and storm sewer design.

- Perform pre-and post-developed hydrologic analysis calculations for the 2- 10-, 25- and 100-year, SCS 24-hour storm events at each outfall point.

- Tributary drainage areas and point-of-interests (POI's) were delineated and developed based on topography and discharge locations for each site and include pre-development and post-development conditions.

- Time of concentration (tc) and travel times for the various tributaries in the drainage areas were estimated based on the flows generated by the 2-year, 24-hour storm.

- Weighted curve numbers were developed for each drainage area.

- Size stormwater areas to attenuate peak flows to pre-development conditions for 2 and 10 year events.

- Determine peak stages for all storm events.

Runoff calculations are performed in order to compare pre-development to post-development stormwater impacts. The methodology used for this peak discharge comparison is the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) *Urban Hydrology for Small Watersheds,* Technical Release 55 (TR-55). Points of interest are selected as inlet structures or project boundaries as the object of comparison for pre-development versus post-development conditions. The calculations and input parameters are found in the Appendix and a summary of the results are listed in the table 6.1 below.

Table 5.1 – Peak Stormwater Discharge Comparison

Site	*Point of Interest*	*Storm Event*	*Pre-Development (cfs)*	*Post-Development (cfs)*
Admin Bldg	POI-1	2-year, 24-hour	0.417	0.394
		10-year, 24-hour	0.808	0.763
	POI-2	2-year, 24-hour	0.207	0.200
		10-year, 24-hour	0.623	0.375
	POI-3	2-year, 24-hour	1.301	0.452
		10-year, 24-hour	2.726	1.016
	POI-4	2-year, 24-hour	2.058	1.129
		10-year, 24-hour	3.751	1.872
Warehouse	POI-1	2-year, 24-hour	5.033	1.295
		10-year, 24-hour	10.74	10.4
	POI-2	2-year, 24-hour	0.207	0.138
		10-year, 24-hour	0.466	0.311

The table indicates there is no increase in stormwater discharge to points of interest for all storm events.

Table 5.2 – Maximum Storm Elevation

Site	*BMP ID*	*Storm Event*	*Peak Stage (feet)*
Admin Bldg FFE 10.2	BMP3A	2-year, 24-hour	4.62
		10-year, 24-hour	6.45
		25-year, 24-hour	7.13
		100-year, 24-hour	7.57
	BMP4A	2-year, 24-hour	5.64
		10-year, 24-hour	7.69
		25-year, 24-hour	8.01
		100-year, 24-hour	8.33
	BMP4B	2-year, 24-hour	8.30
		10-year, 24-hour	8.38
		25-year, 24-hour	8.42

		100-year, 24-hour	8.50
Warehouse FFE 9.0	BMP1A	2-year, 24-hour	7.54
		10-year, 24-hour	7.72
		25-year, 24-hour	7.75
		100-year, 24-hour	7.79
	BMP1B	2-year, 24-hour	6.85
		10-year, 24-hour	6.98
		25-year, 24-hour	7.00
		100-year, 24-hour	7.02
	BMP1C	2-year, 24-hour	7.71
		10-year, 24-hour	7.88
		25-year, 24-hour	7.93
		100-year, 24-hour	8.00

6.0 WATER QUALITY

Due to the project's location and the fact that it is federally funded, this project must meet the water quality requirements of Section 438 of the Energy Independence and Security Act (EISA), Virginia DEQ /DCR's Stormwater Management Handbook and the UFC's Low Impact Development.

6.1 Section 438 EISA

Section 438 of the Energy Independence and Security Act (EISA) states that any "…project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow." Case studies have shown that the best way to meet these design objectives to the maximum extent technically feasible is by retaining on site the 95th percentile rainfall event.

Online rainfall records were taken from the NORFOLK NAS VA US station (Station GHCND: USW00013750) which is in close proximity to the project site. This rainfall precipitation data was provided by NOAA National Climatic Data Center at http://www.ncdc.noaa.gov/cdo-web/search (See Appendix F).

The 95th percentile rainfall event was calculated from these records using the method described in Part I, Section E of the EPA document Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act.
The result of the calculation produces a 95th percentile rainfall event of 1.75 inches. The volume to be retained is then calculated by multiplying the project footprint by the 95th percentile rainfall event.

The administration building requires 3,488 cubic-feet of treatment. The warehouse site requires 5,216 cubic-feet of treatment.

6.2 Virginia Water Quality Volume (WQV)

Worksheet 1 was utilized to calculate whether the proposed BMP's would remove the required pollutant load. The Virginia water quality volume requirement is based on the total impervious area of the project multiplied by 1-inch. The administration building requires 1,991 cubic-feet. The warehouse requires 2,977 cubic-feet for treatment.

6.3 Low Impact Development

Calculations are based on UFC 3-210-10 Chapter 3 and are found in the appendices. Results of the low impact development requirements indicate 47 cubic-feet is required for the Administration building and 1,236 cubic-feet is required for the warehouse.

6.4 Bio-retention Filter Areas

The more stringent of the water quality volumes is the EISA and is therefore the basis of water quality requirement for these sites. The stormwater treatment is provided in multiple bio-retention areas located throughout both sites. The stormwater BMP's at the administration building provides over 8,800 cubic-feet of treatment from its three (3) bio-retention areas. The stormwater BMP's at the warehouse provides over 11,000 cubic-feet in its three (3) bio-retention areas, both sites far exceeding the water quality requirements.

The bio-retention areas contain 3" of hardwood mulch above 24" of biosoil. Geotextile fabric is placed along the sides and above the underdrain. Beneath the biosoil is 3" of pea gravel on top of a 6" perforated underdrain pipe to ensure permeability. The pipe then rests on 6" of #52 Stone for storage. The underdrain connects to a standard VDOT inlet structure. The top of inlet structure is set above the hardwood mulch this elevation varies between bio-retention areas but ranges from 6" to 12" above the mulch layer. The inlet structure acts as the primary outlet structure for larger volume storm events. Side slopes of the bio-retention area are a maximum of 4H:1V.

7.0 SEQUENCE OF CONSTRUCTION

Installation of specific erosion control devices is required to control runoff and prevent pollution of storm water. The Contractor shall be responsible for implementing the erosion control devices in accordance with the following construction sequence prior to any earthmoving activities. The Sequence is broken into two (2) phases. The first phase occurs from pre-construction to mid-construction activities. The second phase is mid-construction through site stabilization and project closeout.

<u>Phase 1 Pre-construction-to-Construction schedule</u>

- Receive NPDES coverage and other applicable permits prior to construction activities.

- Notify Virginia DEQ plan approving authority one week prior to pre-construction meeting.
- Coordinate utility notification with Miss Utility and Hampton Road Sanitary District (HRSD) 15 days prior to starting excavation.
- Hold pre-construction meeting at least one week prior to starting construction.
- Notify Virginia DEQ plan approving authority one week prior to beginning land-disturbing activities.
- Install stabilized construction and job trailer.
- Clearing and grubbing only as necessary for installation of silt fence.
- Installation of silt fence and construction fence.
- Check all sediment controls to ensure they are working properly prior to commencing with remaining earthmoving activities.
- Begin rough grading operations. add/adjust sediment fence locations as necessary during grading activities to ensure sediment laden runoff cannot leave the project site.
- Temporarily seed as required by the seeding and mulching requirements.
- Check all sediment controls to ensure they are working properly. controls are to remain in place during the remainder of construction operations.

Phase 2 Construction-to-Site-Stabilization schedule

- Installation of permanent stormwater systems and placement of inlet protection as each inlet is installed.
- As site grades are achieved, begin construction of the building foundations/footings.
- Begin installation of utilities.
- Begin construction on building super structure and continue with construction of parking areas.
- Final grading
- Stabilize disturbed areas.
- Removal of temporary sediment & erosion control measures after entire area draining to the measure is stabilized.

- Notify Virginia DEQ plan approving authority one week prior to final inspection.
- Final inspection.
- Submit notice of termination (NOT).

8.0 INSPECTIONS & MAINTENANCE PROGRAM

Regular inspections of the construction site shall be performed by "Qualified personnel", defined as a licensed professional engineer, responsible land disturber (RLD), or other knowledgeable person who (i) holds a certificate of competence from the board in the area of project inspection; or (ii) is enrolled in the board's training program for project inspection or combined administrator and successfully completes such program within one year of enrollment. Inspections shall include the review of all disturbed areas, structural and non-structural control measures, material storage areas, and vehicular access points. Inspections are to be performed at least once every 7 calendar days. Areas that already have been stabilized or where runoff is unlikely due to frozen or snow covered ground shall be inspected at least monthly. Areas that have been permanently stabilized can be delineated in the SWPPP, thus removing the inspection requirements for those areas.

Inspections are intended to identify areas where the pollutant control measures at the site are ineffective and are allowing pollutants to enter surface waters. Receiving waters shall be inspected to ascertain whether control measures are effective in preventing significant impacts. Locations where vehicles enter or exit the site shall be inspected for evidence of offsite sediment tracking.
If as a result of the inspection, the site conditions or control measures are found to have changed, the SWPPP will be updated within a period of 7 calendar days. If control measures need to be modified to assure effectiveness or if additional measures are determined to be necessary, implementation will be completed prior to the next anticipated storm event or as soon as practicable. A report summarizing the inspections and the subsequent maintenance activities will be completed and maintained as part of the SWPPP. The inspection forms are included in Appendix E. Required elements include major observations (including information on control measure performance and incidents of noncompliance), and information on the inspecting personnel. If an inspection does not identify any incidents of non-compliance, then the certification statement contained in the inspection form will apply.

Specific maintenance programs for rock construction entrance, silt fence, erosion control blankets, top of slope berms, rock filters, stream diversion pump, riprap apron, disturbed areas, and vegetative surface stabilization are described in the attached Erosion and Sediment Control Plan Drawings and Details. All maintenance measures are the responsibility of the Contractor. Only qualified inspection personnel shall perform the inspections. An inspection checklist, such as the one found in the attached Appendix, shall be completed and signed after every inspection. Inspection records shall be kept for a period of 3 years after termination of the construction activities.

8.1 Maintenance of BMPs

Maintenance of the erosion and sediment controls, the stormwater management facilities and best management practices incorporated into this project must be maintained on a regular basis to assure their continued effectiveness. This includes repairs to all erosion and sediment controls, including cleanout of all sediment basins and stormwater management facilities at the required intervals. Those controls found to be ineffective during routine inspections shall be repaired before the next anticipated storm event or as soon as practicable.

On a daily basis, the contractor will verify that all erosion and sediment controls are in proper working order and repair or replace those damaged controls as necessary. Visual verification will be made by qualified personnel at least once per 7 calendar days, at which time any failed erosion and sediment controls will be identified in the inspection report and reported to the contractor to be dealt with within 24 hours of the noted failure.

Construction Entrance – The entrance shall be maintained in a condition that will prevent tracking or flow of mud onto public rights-of-way. This may require periodic top dressing with additional stone or the washing and reworking of existing stone as conditions demand and repair and/or cleanout of any structures used to trap sediment. All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains must be removed immediately. The use of water trucks to remove materials dropped, washed, or tracked onto roadways will not be permitted under any circumstances.

Road Stabilization – Both temporary and permanent roads and parking areas may require periodic top dressing with new gravel. Seeded areas adjacent to the roads and parking areas should be checked periodically to ensure that a vigorous stand of vegetation is maintained. Roadside ditches and other drainage structures should be checked regularly to ensure that they do not become clogged with silt or other debris.

Silt Fence - Silt fences must be inspected after each rainfall and at least daily during prolonged rainfall. Silt fence found damaged or improperly installed shall be replaced or repaired immediately. Sediment deposits shall be routinely removed when they reach approximately one-half the height of the silt fence. Any sediment deposits remaining in place after the silt fence is no longer required shall be dressed to conform with the existing grade, prepared and seeded.

Inlet Protection – The structures shall be inspected after each rain and repairs made as needed. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design depth of the trap. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode. Structures shall be removed and the area stabilized when the remaining drainage area has been properly stabilized.

Outlet Protection / Riprap Aprons - Rock aprons shall be inspected on a weekly basis and after each runoff event. Replace any displaced rock and or rebuild the apron within immediately if failure exists.

Disturbed Areas - All disturbed areas on which no construction activities are anticipated for 20 days or longer shall be temporarily seeded. These areas shall be inspected weekly and after each runoff event. Disturbed areas shall be reseeded as required to establish and maintain vegetation within 48 hours of an unsatisfactory inspection.

Grade Treatment (Surface Roughening) - Roughened areas shall be seeded and mulched within seven (7) days of last disturbance to obtain optimum seed germination and seedling growth.

Temporary & Permanent Seeding - Areas failing to establish vegetative cover adequate to prevent erosion shall be reseeded as soon as such areas are identified. Seeding performed during hot and dry summer months shall be watered at a rate of 1 inch per week.

8.2 Recycling and/or Disposal of Material

It is the contractor's responsibility for performing environmental due diligence and the determination of clean fill for all imported fill material. Anticipated construction wastes and disposal methods for this project are as follows:

Concrete – All concrete material suitable for fill operations will be incorporated into adjacent site projects within the park property. Any excess concrete material will be disposed of offsite at an approved waste site.

Soils (including sediment removed from BMP facilities) –Soil material suitable for fill operations will be incorporated into embankments within this project or at adjacent project sites within the park property that have an approved erosion and sediment control plan. Sediment taken from the erosion control facilities shall be removed from the control device, spread evenly, seeded, and mulched. Temporary erosion control facilities will be removed once permanent stabilization has been achieved. Any excess soil material removed from the site will be disposed of offsite at an approved waste site.

Rock (including rock removed from BMP facilities) - All rock material suitable for fill operations will be incorporated into adjacent site projects within the park property. Any excess rock material will be disposed of offsite at an approved waste site.

Wastes generated by construction activities (i.e. construction materials such as paints, solvents, fuels, concrete, wood, etc.) must be disposed of in accordance with ORC 3734 and ORC 3714. Hazardous and toxic substances are used on virtually all construction-sites. Good management of these substances is always needed.

APPENDIX A

USGS LOCATION MAP

SCALE 1:24 000

KILOMETERS 1 0.5 0 1 2

METERS 1000 500 0 1000 2000

MILES 1 0.5 0 1

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

MN 10° 52′ 193 MILS
GN 0° 43′ 13 MILS

UTM GRID AND 2013 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

LEEBCOR SERVICES LLC

P-165 COMBAT SERVICES SUPPORT FACILITY
Virginia Beach, VA

USGS LOCATION MAP

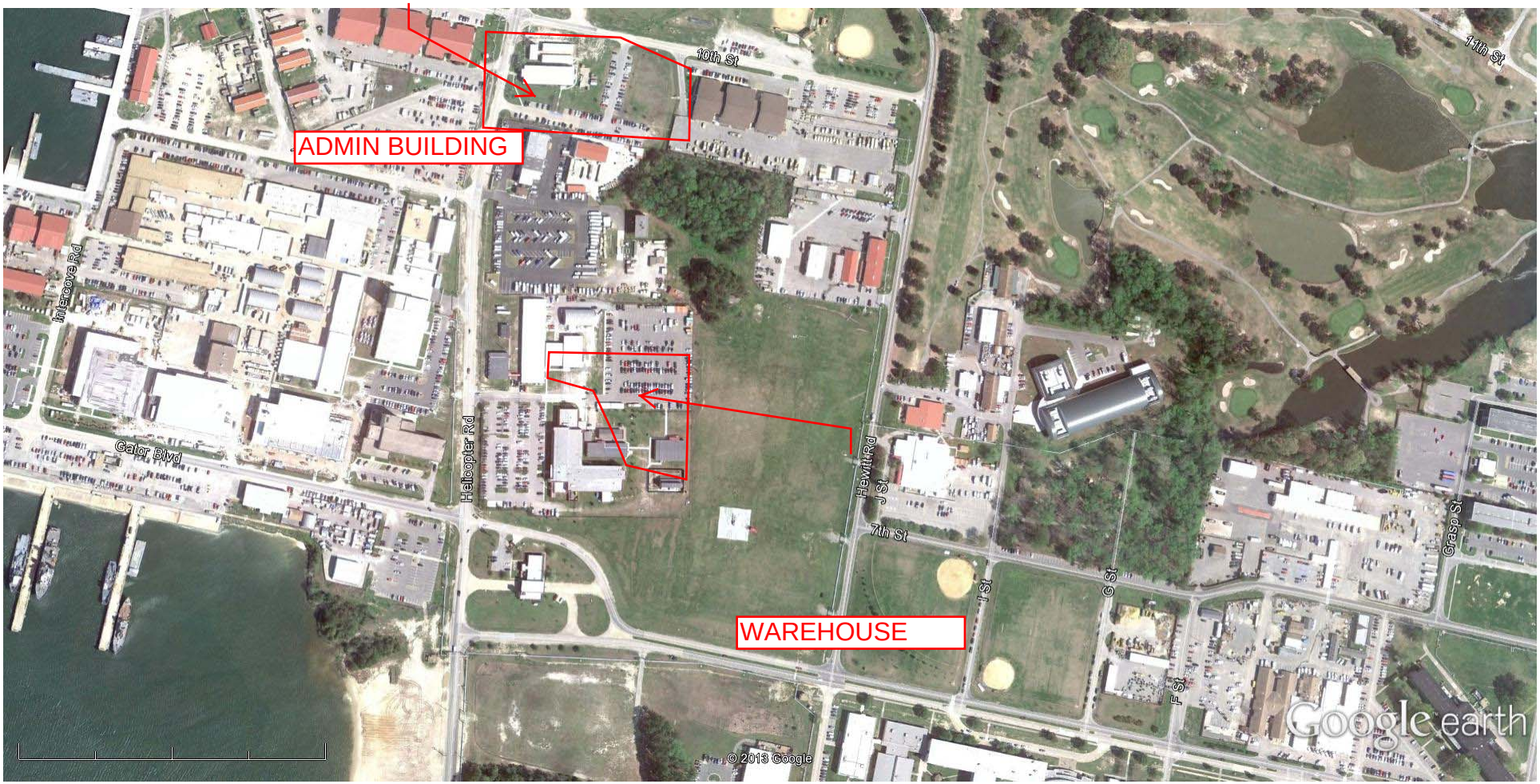
LITTLE CREEK, VA USGS QUADRANGLE MAP (2013)

Baker

MICHAEL BAKER JR., INC.
Airside Business Park
100 Airside Drive
Moon Township PA 15108
(412) 269-6300

APPENDIX B

AERIAL & NWI MAPS



Google earth

feet 2000

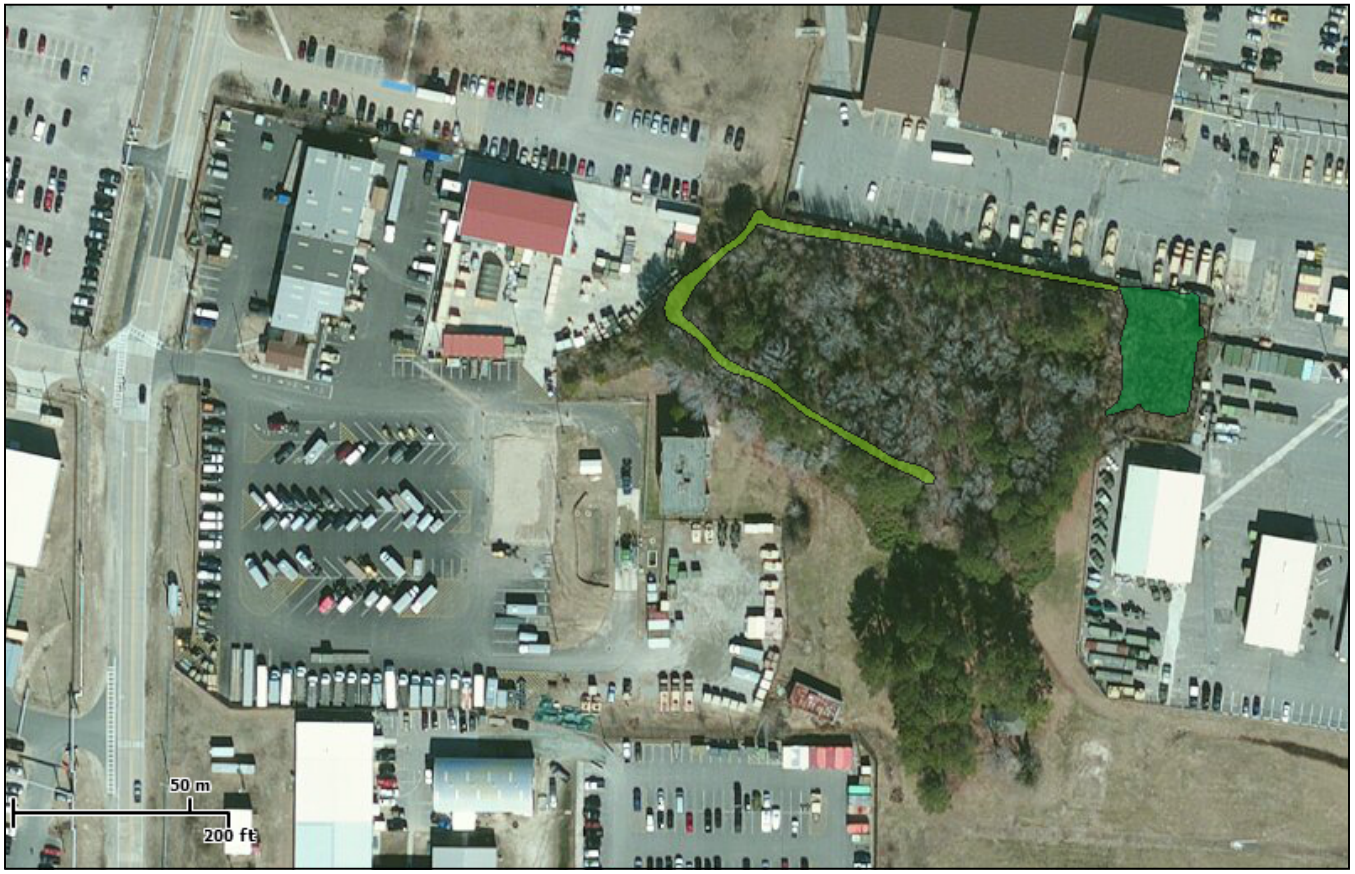
meters 900

U.S. Fish and Wildlife Service

National Wetlands Inventory

P-165 Admin

Apr 17, 2014



Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

NWI Wetland

APPENDIX C

FEMA FLOOD MAP

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

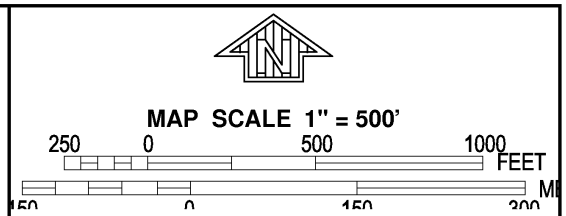
ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS



NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0016F

FIRM
FLOOD INSURANCE RATE MAP

CITY OF

VIRGINIA BEACH, VIRGINIA

INDEPENDENT CITY

PANEL 16 OF 300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
VIRGINIA BEACH, CITY OF	515531	0016	F

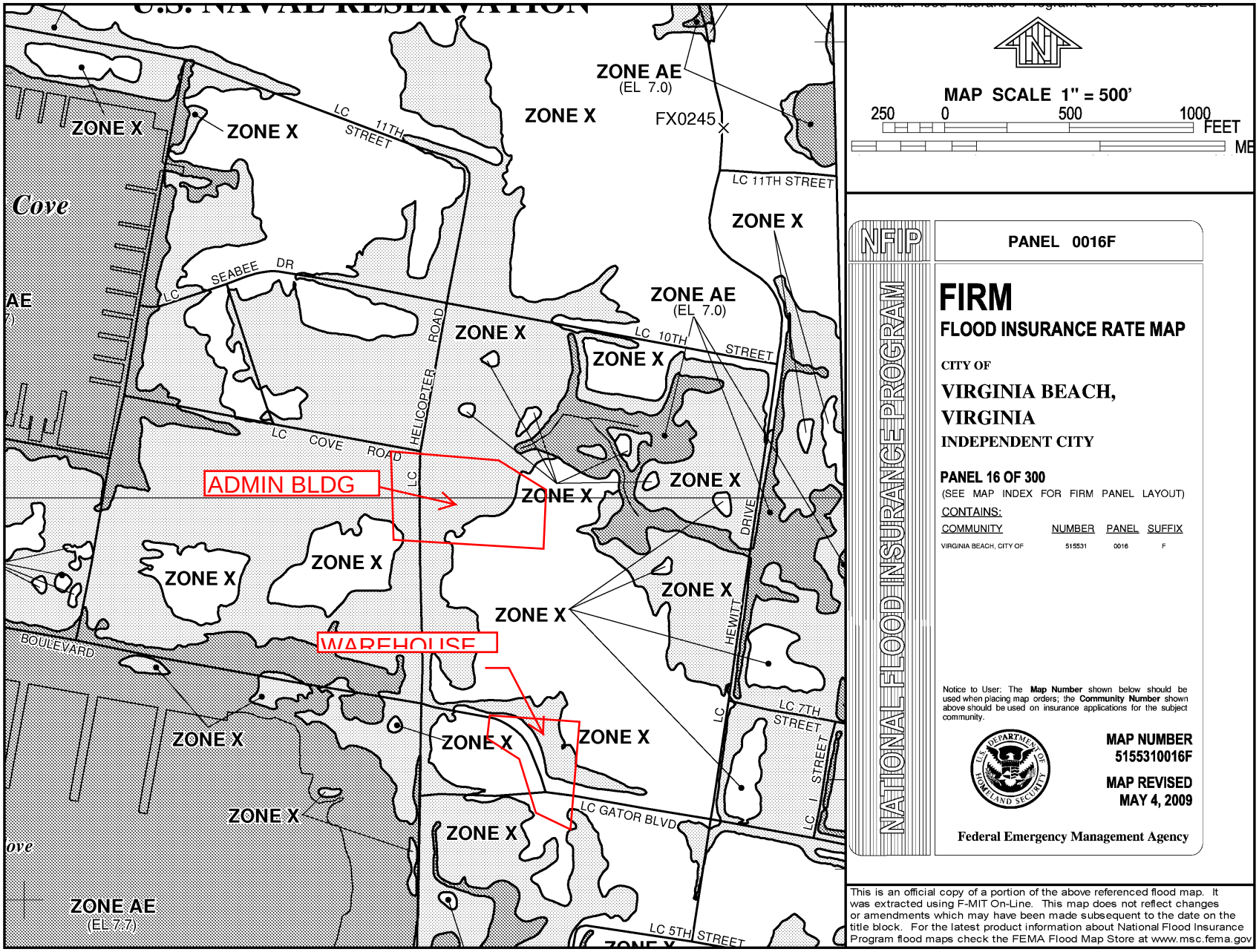
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 5155310016F

MAP REVISED MAY 4, 2009

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov


U.S. NAVAL RESERVATION
ZONE AE
(EL 7.0)
ZONE X
FX0245
LC 11TH STREET
LC 11TH STREET
Cove
SEABEE DR
LC
ZONE AE
(EL 7.0)
LC 10TH STREET
HELICOPTER ROAD
LC COVE ROAD
ADMIN BLDG
WAREHOUSE
DRIVE
HEWITT
BOULEVARD
LC 7TH STREET
LC I STREET
LC GATOR BLVD
LC 5TH STREET
ZONE AE
(EL 7.7)
MAP SCALE 1" = 500'
250 0 500 1000
FEET
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0016F
FIRM
FLOOD INSURANCE RATE MAP
CITY OF
VIRGINIA BEACH, VIRGINIA
INDEPENDENT CITY
PANEL 16 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
VIRGINIA BEACH, CITY OF 515531 0016 F
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
5155310016F
MAP REVISED
MAY 4, 2009
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

APPENDIX D

NRCS SOIL REPORT

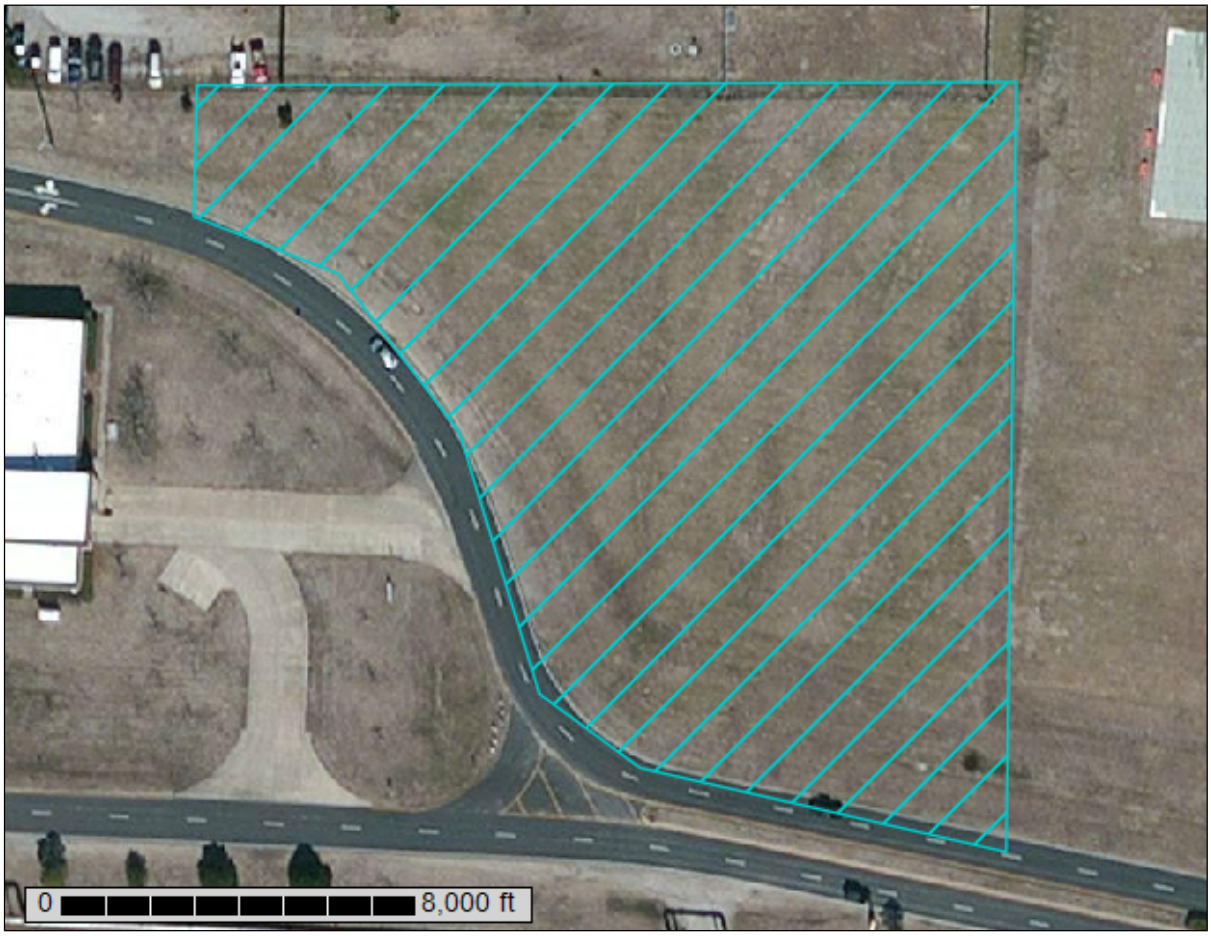
United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for City of Virginia Beach, Virginia

P-165 Warehouse



October 17, 2013

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface.....2
Soil Map.....5
Soil Map.....6
Legend.....7
Map Unit Legend.....8
Map Unit Descriptions.....8
City of Virginia Beach, Virginia.....10
36—Tetotum loam.....10
40—Udorthents, loamy.....10
References.....12

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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

Soil Survey Area: City of Virginia Beach, Virginia
Survey Area Data: Version 8, Oct 18, 2011

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 15, 2011—Jun 4, 2011

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

Map Unit Legend

City of Virginia Beach, Virginia (VA810)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
36	Tetotum loam	0.9	34.4%
40	Udorthents, loamy	1.7	65.6%
Totals for Area of Interest		**2.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

City of Virginia Beach, Virginia

36—Tetotum loam

Map Unit Setting

Mean annual precipitation: 44 to 52 inches
Mean annual air temperature: 60 to 68 degrees F
Frost-free period: 230 to 285 days

Map Unit Composition

Tetotum and similar soils: 85 percent

Description of Tetotum

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy fluviomarine deposits

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 10.0 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 2w
Hydrologic Soil Group: C

Typical profile

0 to 10 inches: Loam
10 to 58 inches: Clay loam
58 to 70 inches: Loamy sand

40—Udorthents, loamy

Map Unit Setting

Elevation: 10 to 150 feet
Mean annual precipitation: 44 to 52 inches
Mean annual air temperature: 60 to 68 degrees F
Frost-free period: 230 to 285 days

Map Unit Composition

Udorthents and similar soils: 75 percent
Minor components: 10 percent

Description of Udorthents

Properties and qualities

Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Minor Components

Nimmo

Percent of map unit: 5 percent
Landform: Depressions

Acredale

Percent of map unit: 5 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://soils.usda.gov/

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://soils.usda.gov/

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://soils.usda.gov/

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://soils.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.glti.nrcs.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://soils.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://soils.usda.gov/

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.

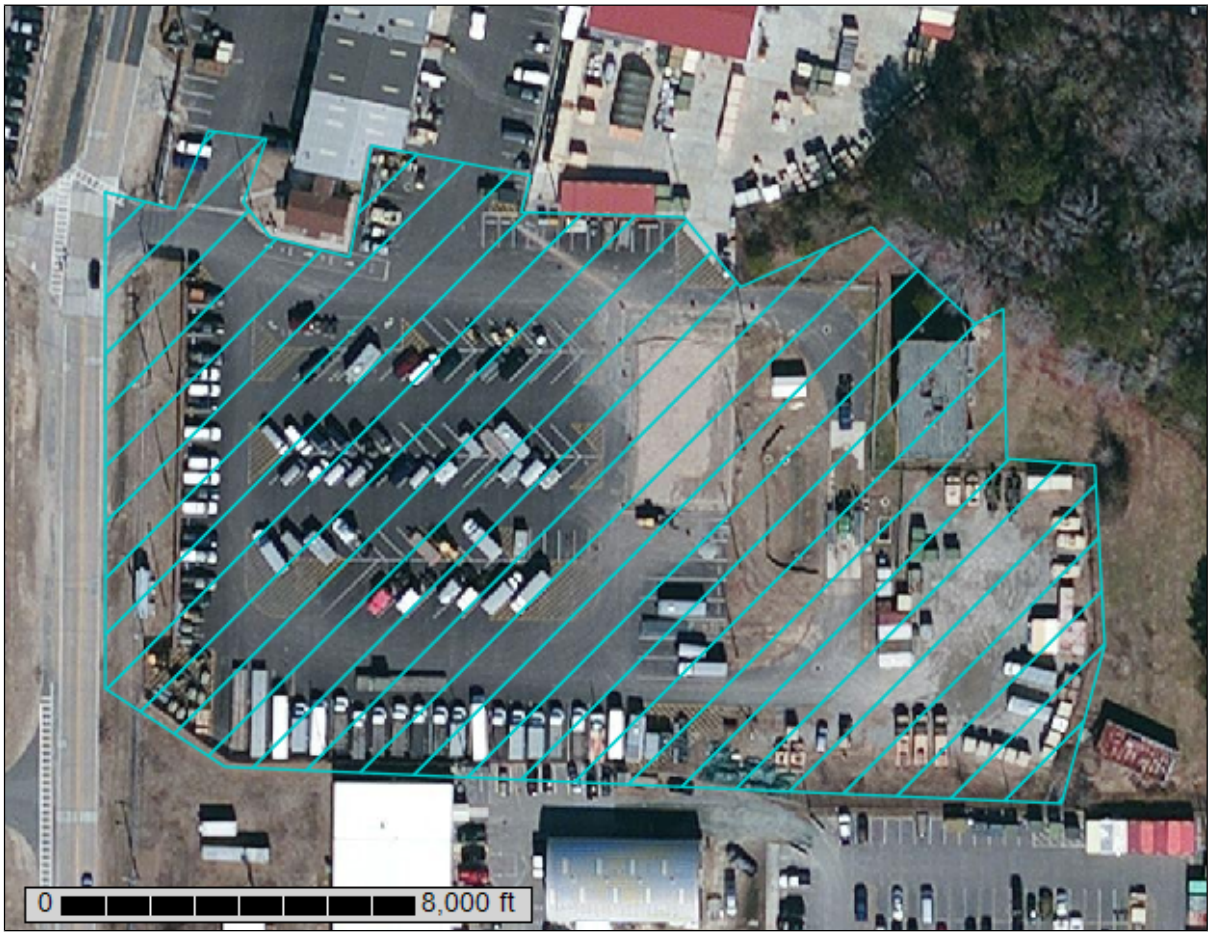
United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for City of Virginia Beach, Virginia

P-165 ADMIN BLDG



October 17, 2013

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface.....2
Soil Map.....5
Soil Map.....6
Legend.....7
Map Unit Legend.....8
Map Unit Descriptions.....8
City of Virginia Beach, Virginia.....10
36—Tetotum loam.....10
40—Udorthents, loamy.....10
References.....12

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,040 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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

Soil Survey Area: City of Virginia Beach, Virginia
Survey Area Data: Version 8, Oct 18, 2011

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 15, 2011—Jun 4, 2011

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

Map Unit Legend

City of Virginia Beach, Virginia (VA810)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
36	Tetotum loam	1.7	38.0%
40	Udorthents, loamy	2.7	62.0%
Totals for Area of Interest		**4.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

City of Virginia Beach, Virginia

36—Tetotum loam

Map Unit Setting

Mean annual precipitation: 44 to 52 inches
Mean annual air temperature: 60 to 68 degrees F
Frost-free period: 230 to 285 days

Map Unit Composition

Tetotum and similar soils: 85 percent

Description of Tetotum

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy fluviomarine deposits

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 10.0 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 2w
Hydrologic Soil Group: C

Typical profile

0 to 10 inches: Loam
10 to 58 inches: Clay loam
58 to 70 inches: Loamy sand

40—Udorthents, loamy

Map Unit Setting

Elevation: 10 to 150 feet
Mean annual precipitation: 44 to 52 inches
Mean annual air temperature: 60 to 68 degrees F
Frost-free period: 230 to 285 days

Map Unit Composition

Udorthents and similar soils: 75 percent
Minor components: 10 percent

Description of Udorthents

Properties and qualities

Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Minor Components

Nimmo

Percent of map unit: 5 percent
Landform: Depressions

Acredale

Percent of map unit: 5 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://soils.usda.gov/

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://soils.usda.gov/

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://soils.usda.gov/

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://soils.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.glti.nrcs.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://soils.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://soils.usda.gov/

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.

APPENDIX E

HYDRAFLOW RUNOFF CALCULATIONS

Project: P-165 Combat Services Support Facility
Subject: Weighted Curve Number (CN) Calculations - HYDRAFLOW ROUTINGS

Prepared By: JMP Date: 5/13/2014
Checked By: JOP Date:

Administration Building

Pre-Development Conditions

Drainage Area	*Soil Name & Hydrologic Group*	*Cover Description*	*CN*	*Area (AC)*	*Product of CN x Area*
Pre-1	Tetolum loam, C	Gravel	89	0.10	8.6
	Tetolum loam, C	Open space, Good	74	0.08	6.3
			Sum:	0.18	14.9
			Weighted CN:		***82***
Pre-2	Tetolum loam, C	Gravel	89	0.10	8.9
	Tetolum loam, C	Open space, Good	74	0.03	2.3
			Sum:	0.13	11.1
			Weighted CN:		***85***
Pre-3	Tetolum loam, C	Gravel	89	0.09	7.7
	Tetolum loam, C	Building	98	0.07	6.5
	Tetolum loam, C	Open space, Good	74	0.63	46.5
			Sum:	0.78	60.7
			Weighted CN:		***78***
Pre-4A	Tetolum loam, C	Gravel	89	0.06	5.3
	Tetolum loam, C	Asphalt Pavement	98	0.14	13.4
	Tetolum loam, C	Open space, Good	74	0.21	15.4
			Sum:	0.40	34.0
			Weighted CN:		***84***
Pre-4B	Tetolum loam, C	Gravel	89	0.06	5.1
	Tetolum loam, C	Asphalt Pavement	98	0.18	17.3
	Tetolum loam, C	Open space, Good	74	0.14	10.2
			Sum:	0.37	32.6
			Weighted CN:		***88***
			Total Site:	***1.87***	119.4
			Weighted CN:		***64***

Administration Building

Post-Development Conditions

Drainage Area	*Soil Name & Hydrologic Group*	*Cover Description*	*CN*	*Area (AC)*	*Product of CN x Area*
Post-1	Tetolum loam, C	Open Space, Good	74	0.11	8.1
	Tetolum loam, C	Asphalt Pavement	98	0.04	4.4
	Tetolum loam, C	Concrete Sidewalk	98	0.01	1.2
	Tetolum loam, C	Building	98	0.00	0.0
			Sum:	0.17	13.6
			Weighted CN:		***82***
Post-2	Tetolum loam, C	Open Space, Good	74	0.04	3.2
	Tetolum loam, C	Asphalt Pavement	98	0.03	3.2
	Tetolum loam, C	Concrete Sidewalk	98	0.00	0.0
	Tetolum loam, C	Building	98	0.00	0.0
			Sum:	0.08	6.4
			Weighted CN:		***84***
Post-3A	Tetolum loam, C	Open Space, Good	74	0.08	5.8
	Tetolum loam, C	Asphalt Pavement	98	0.03	3.0
	Tetolum loam, C	Concrete Sidewalk	98	0.00	0.0
	Tetolum loam, C	Building	98	0.00	0.0
			Sum:	0.11	8.8
			Weighted CN:		***81***
Post-3B	Tetolum loam, C	Open Space, Good	74	0.28	20.5
	Tetolum loam, C	Asphalt Pavement	98	0.00	0.0
	Tetolum loam, C	Concrete Sidewalk	98	0.00	0.0
	Tetolum loam, C	Building	98	0.00	0.0
			Sum:	0.28	20.5
			Weighted CN:		***74***
Post-4A	Tetolum loam, C	Open Space, Good	74	0.22	16.2
	Tetolum loam, C	Asphalt Pavement	98	0.04	4.2
	Tetolum loam, C	Concrete Sidewalk	98	0.04	3.5
	Tetolum loam, C	Building	98	0.13	12.9
			Sum:	0.43	36.8
			Weighted CN:		***86***
Post-4B	Tetolum loam, C	Open Space, Good	74	0.18	13.4
	Tetolum loam, C	Asphalt Pavement	98	0.17	16.4
	Tetolum loam, C	Concrete Sidewalk	98	0.04	3.6
	Tetolum loam, C	Building	98	0.09	8.5
			Sum:	0.47	41.8
			Weighted CN:		***89***
Post-4C	Tetolum loam, C	Open Space, Good	74	0.10	7.6
	Tetolum loam, C	Asphalt Pavement	98	0.14	14.0
	Tetolum loam, C	Concrete Sidewalk	98	0.03	3.0
	Tetolum loam, C	Building	98	0.07	6.5
			Sum:	0.34	31.2
			Weighted CN:		***91***
			Total Site:	***1.87***	159.1
			Weighted CN:		***85***

Warehouse

Pre-Development Conditions

Drainage Area	*Soil Name & Hydrologic Group*	*Cover Description*	*CN*	*Area (AC)*	*Product of CN x Area*
Pre-1	Tetolum loam, C	Open space, Good	74	4.44	328.5
		Concrete Pavement	98	0.00	0.0
		Concrete Sidewalk	98	0.04	3.7
		Building	98	0.10	10.1
			Sum:	4.44	342.3
			Weighted CN:		***77***
Pre-2	Tetolum loam, C	Open space, Good	74	0.15	11.1
			Sum:	0.15	11.1
			Weighted CN:		***74***
			Total Site:	***4.59***	353.4
			Weighted CN:		***77***

Post-Development Conditions

Drainage Area	*Soil Name & Hydrologic Group*	*Cover Description*	*CN*	*Area (AC)*	*Product of CN x Area*
Post-1A	Tetolum loam, C	Open Space, Good	74	1.00	74.2
	Tetolum loam, C	Concrete Pavement	98	0.11	10.5
	Tetolum loam, C	Concrete Sidewalk	98	0.04	3.7
	Tetolum loam, C	Building	98	0.22	21.4
			Sum:	1.37	109.8
			Weighted CN:		***80***
Post-1B	Tetolum loam, C	Open Space, Good	74	0.16	12.0
	Tetolum loam, C	Concrete Pavement	98	0.42	41.2
	Tetolum loam, C	Concrete Sidewalk	98	0.00	0.0
	Tetolum loam, C	Building	98	0.00	0.0
			Sum:	0.58	53.2
			Weighted CN:		***91***
Post-1C	Tetolum loam, C	Open Space, Good	74	1.12	82.9
	Tetolum loam, C	Concrete Pavement	98	0.00	0.0
	Tetolum loam, C	Concrete Sidewalk	98	0.02	2.4
	Tetolum loam, C	Building	98	0.22	21.4
			Sum:	1.36	106.7
			Weighted CN:		***78***
Post-1D	Tetolum loam, C	Open Space, Good	74	1.17	86.5
(Untreated)	Tetolum loam, C	Concrete Pavement	98	0.00	0.0
	Tetolum loam, C	Concrete Sidewalk	98	0.00	0.0
	Tetolum loam, C	Building	98	0.00	0.0
			Sum:	1.17	86.5
			Weighted CN:		***74***
Post-2	Tetolum loam, C	Open Space, Good	74	0.10	7.5
	Tetolum loam, C	Concrete Pavement	98	0.00	0.0
	Tetolum loam, C	Concrete Sidewalk	98	0.00	0.0
	Tetolum loam, C	Building	98	0.00	0.0
			Sum:	0.10	7.5
			Weighted CN:		***74***
			Total warehouse site:	***4.58***	363.8
			Warehouse Site Weighted CN:		***79***

Project: P-165 SOF Combat Services Support Facility
Subject: Rainfall Frequency, Intensity and Duration Data

Baker

Prepared By: JMP Date: 3/20/2014
Checked By: JOP Date: 3/20/2014

Rainfall Data

Source: Virgina DEQ (Formally regulated by Virginia DCR)
Title: Virginia Stormwater Management Handbook Volume II, Appendix 4B
County name: Virginia Beach (city)

Frequency	*Return period*	*Rainfall*	*Figure*
(year)	*(hour)*	*(inches)*	
1	24	3.0	-
2	24	3.8	-
5	24	5.0	-
10	24	6.0	-
25	24	7.0	-
50	24	8.0	-
100	24	9.0	-

Rainfall Intensity

Source: Virginia Department of Transportation
Title: Hydraulic Design Advisory (HAD 05-03) revised 07/25/2006
Zone: Virginia Beach (city)

Frequency	*Factors for Rainfall Intesity*		
(year)	*B*	*D*	*E*
2	61.66	11.25	0.84
5	61.78	10.75	0.79
10	56.67	10.00	0.73
25	49.63	8.25	0.67
50	40.32	6.00	0.59
100	37.86	5.25	0.56

$I_f = B / (T_c + D)^E$

Where:

I_f = Rainfall intensity for a given recurrence interval "f" in inches/hour

T_c = Watershed time of concentration (assumed equal to the storm duration), in minutes

SCS 24-Hour Storm Distribution

Distribution Type: TYPE III

Project: P-165 SOF Combat Services Support
Subject: Storage Volume Calculations - Administration Building

Prepared By: JMP Date: 5/14/2014
Checked By: JOP Date: 5/14/2014

BMP 3A:

Stage	*Elevation*	*Contour Area*	*Depth*	*Media*	*Void Ratio*	*Incremental Storage*	*Total Storage*
0	3.57	958				0	0.0
			0.5	Stone	40%	191.6	191.6
0.5	4.07	958					
			0.75	Stone	40%	287.4	479.0
1.25	4.82	958					
			2	Biosoil	25%	479	958.0
3.25	6.82	958					
			0.25	Mulch	40%	95.8	1053.8
3.5	7.07	958					
			0.5	--	100%	551.5	1605.3
4	7.57	1248					
			0.5	--	100%	702	2307.3
4.5	8.07	1560					

BMP 4A:

Stage	*Elevation*	*Contour Area*	*Depth*	*Media*	*Void Ratio*	*Incremental Storage*	*Total Storage*
0	4	3516				0	0.0
			0.5	Stone	40%	703.2	703.2
0.5	4.5	3516					
			0.75	Stone	40%	1054.8	1758.0
1.25	5.25	3516					
			2	Biosoil	25%	1758	3516.0
3.25	7.25	3516					
			0.25	Mulch	40%	351.6	3867.6
3.5	7.5	3516					
			0.5	--	100%	1890.25	5757.9
4	8	4045					
			1	--	100%	4612	10369.9
5	9	5179					

BMP 4B:

Stage	*Elevation*	*Contour Area*	*Depth*	*Media*	*Void Ratio*	*Incremental Storage*	*Total Storage*
0	4	878				0	0.0
			0.5	Stone	40%	175.6	175.6
0.5	4.5	878					
			0.75	Stone	40%	263.4	439.0
1.25	5.25	878					
			2	Biosoil	25%	439	878.0
3.25	7.25	878					
			0.25	Mulch	40%	87.8	965.8
3.5	7.5	878					
			0.5	--	100%	515.125	1480.9
4	8	1182.5					
			1	--	100%	7492.75	8973.7
5	9	13803					

Project: P-165 SOF Combat Services Support
Subject: Storage Volume Calculations - WAREHOUSE

Prepared By: JMP Date: 5/14/2014
Checked By: JOP Date: 5/14/2014

BMP 1A:

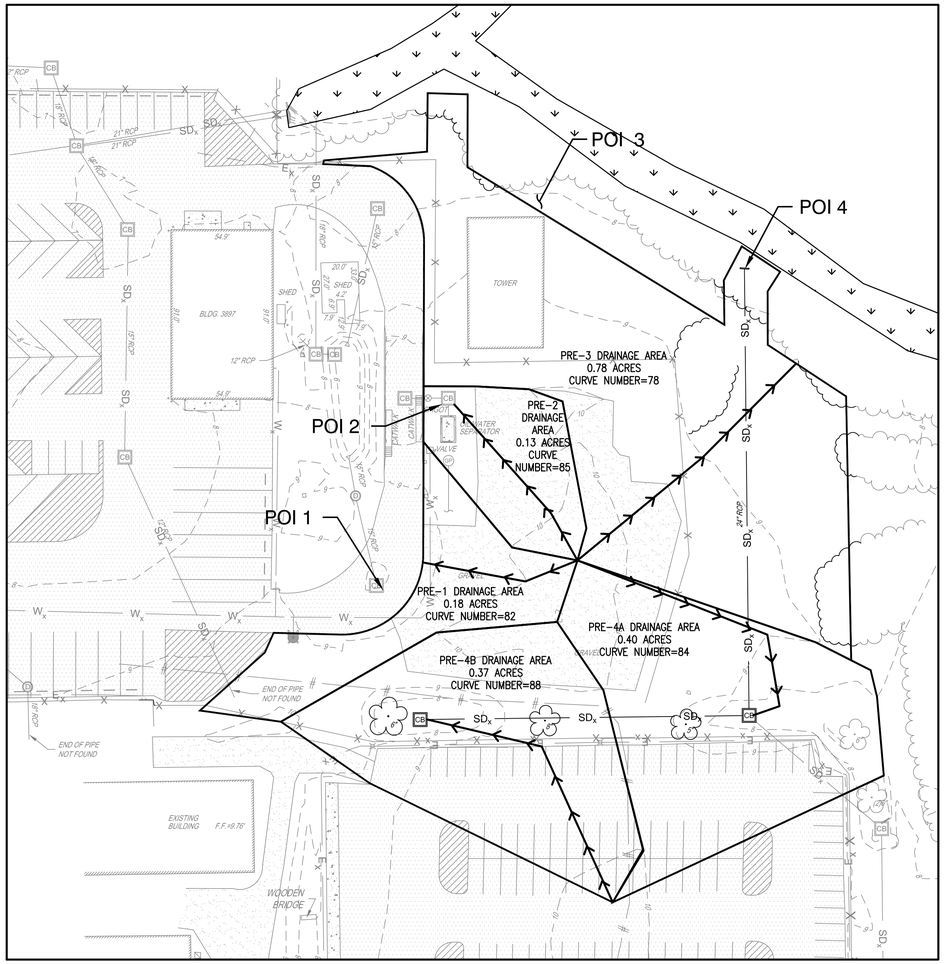
Stage	*Elevation*	*Contour Area*	*Depth*	*Media*	*Void Ratio*	*Incremental Storage*	*Total Storage*
0	3	2094				0	0.0
			0.5	Stone	40%	418.8	418.8
0.5	3.5	2094					
			0.75	Stone	40%	628.2	1047.0
1.25	4.25	2094					
			2	Bio Soil	25%	1047	2094.0
3.25	6.25	2094					
			0.25	Mulch	40%	209.4	2303.4
3.5	6.5	2094					
			0.5	--	100%	1182	3485.4
4	7	2634					
			0.25	--	100%	693.375	4178.8
4.25	7.25	2913					
			0.25	--	100%	764	4942.8
4.5	7.5	3199					
			0.12	--	100%	392.22	5335.0
4.62	7.62	3338					
			0.13	--	100%	443.885	5778.9
4.75	7.75	3491					
			0.25	--	100%	6887.25	12666.1
5	8	51607					

BMP 1B:

Stage	*Elevation*	*Contour Area*	*Depth*	*Media*	*Void Ratio*	*Incremental Storage*	*Total Storage*
0	2.5	1570				0	0.0
			0.5	Stone	40%	314	314.0
0.5	3	1570					
			0.75	Stone	40%	471	785.0
1.25	3.75	1570					
			2	Bio Soil	25%	785	1570.0
3.25	5.75	1570					
			0.25	Mulch	40%	157	1727.0
3.5	6	1570					
			0.5	--	100%	903.75	2630.8
4	6.5	2045					
			0.5	--	100%	1300.25	3931.0
4.5	7	3156					
			1	--	100%	27381.5	31312.5
5.5	8	51607					

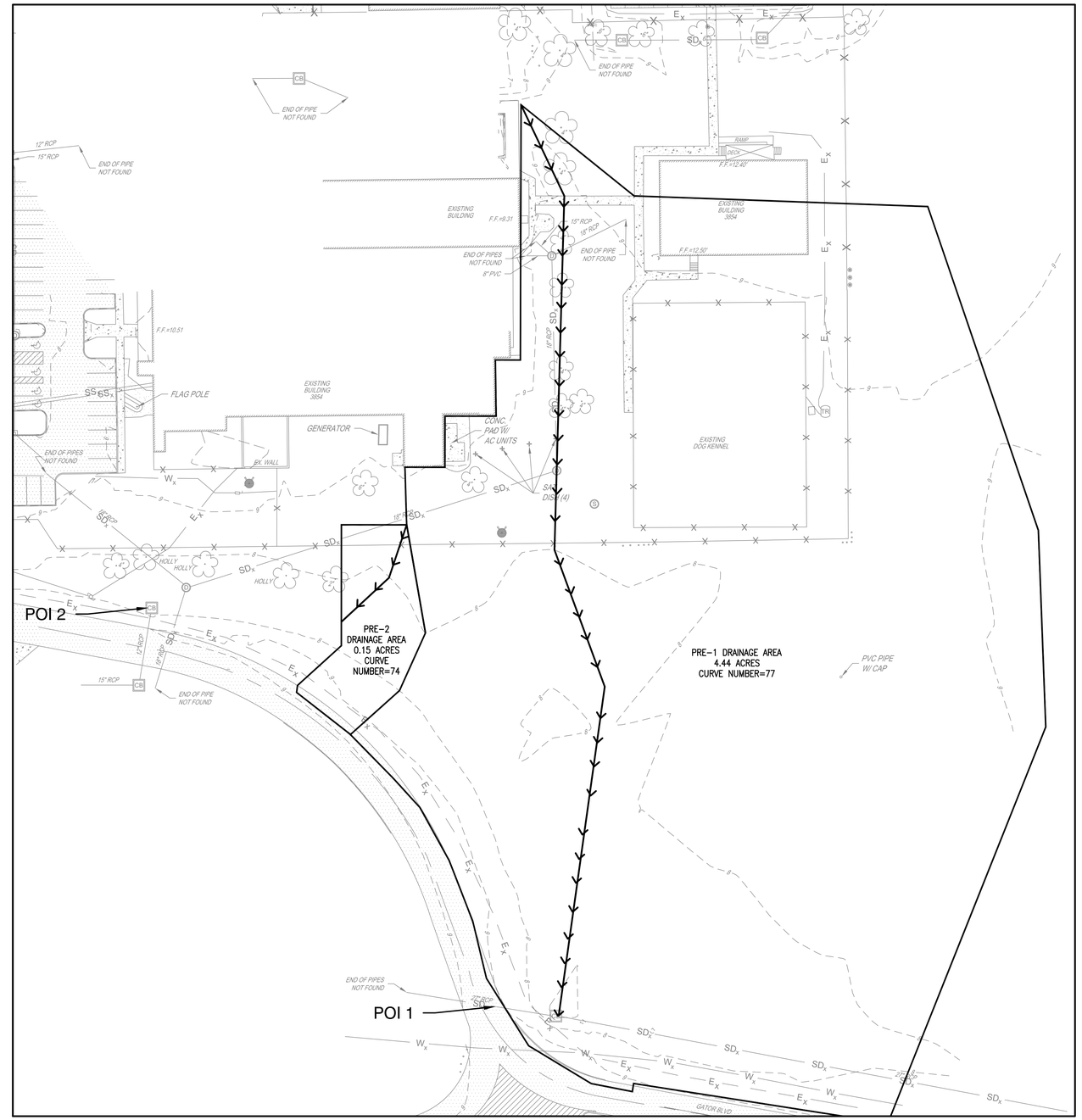
BMP 1C:

Stage	*Elevation*	*Contour Area*	*Depth*	*Media*	*Void Ratio*	*Incremental Storage*	*Total Storage*
0	3.5	2558				0	0.0
			0.5	Stone	40%	511.6	511.6
0.5	4	2558					
			0.75	Stone	40%	767.4	1279.0
1.25	4.75	2558					
			2	Bio Soil	25%	1279	2558.0
3.25	6.75	2558					
			0.25	Mulch	40%	255.8	2813.8
3.5	7	2558					
			0.5	--	100%	1488.5	4302.3
4	7.5	3396					
			0.25	--	100%	902.5	5204.8
4.25	7.75	3824					
			0.25	--	100%	1010.25	6215.1
4.5	8	4258					



ADMINISTRATION BUILDING

0 20' 40' 860'
SCALE: 1" = 40'



WAREHOUSE

0 20' 40' 860'
SCALE: 1" = 40'

NO.	DESCRIPTION	DATE	APPR.

NAVFAC

PRELIMINARY DESIGN
NOT FOR CONSTRUCTION
SEAL

LEEBCOR SERVICES, LLC
430 McLaws Circle
Suite 201
Williamsburg, VA 2318
CONTRACTOR INFO

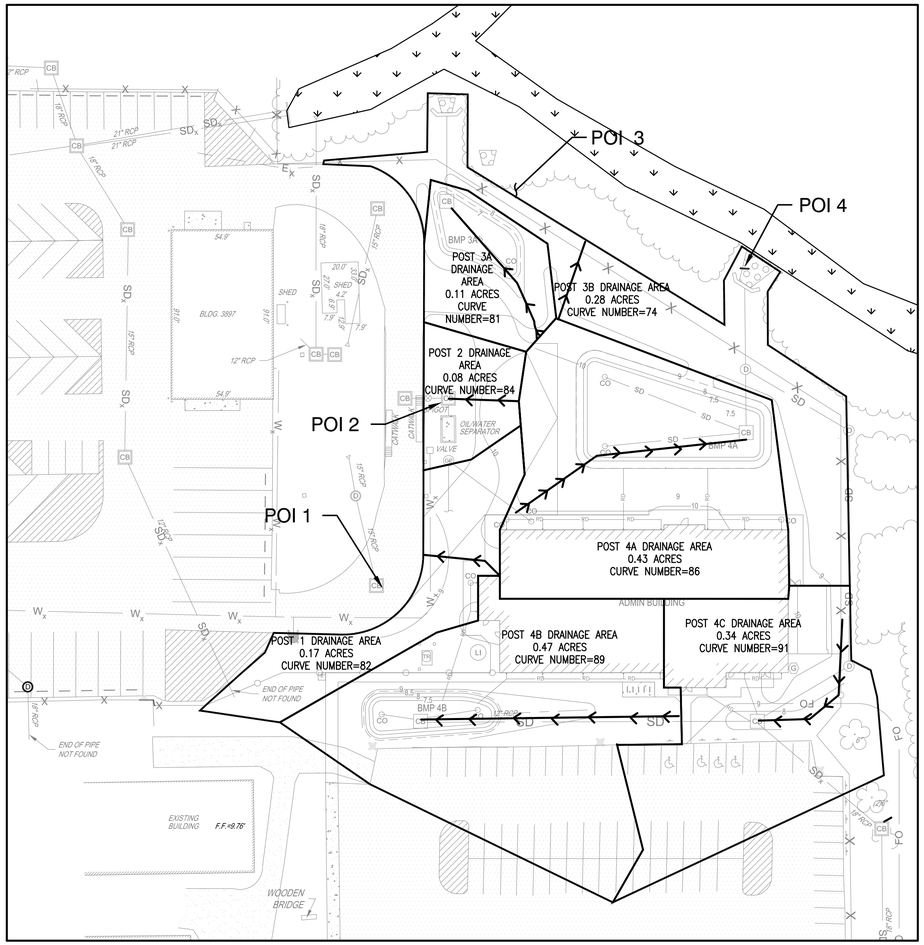
Baker
Michael Baker Jr, Inc.
100 Airside Drive
Moon Township, PA 15108
A/E INFO

APPROVED
FOR COMMANDER NAVFAC
ACTIVITY
SATISFACTORY TO DATE 06/17/14
DES DRW CHK
PM
BRANCH MANAGER
CHIEF ENG/ARCH

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID ATLANTIC
Norfolk, Va.
IPT - PWD
JOINT EXPEDITIONARY BASE LITTLE CREEK, VIRGINIA
FY2013 P-165 SOF COMBAT SERVICES SUPPORT FACILITY
HYDRAFLOW PRE-DEVELOPMENT STORMWATER

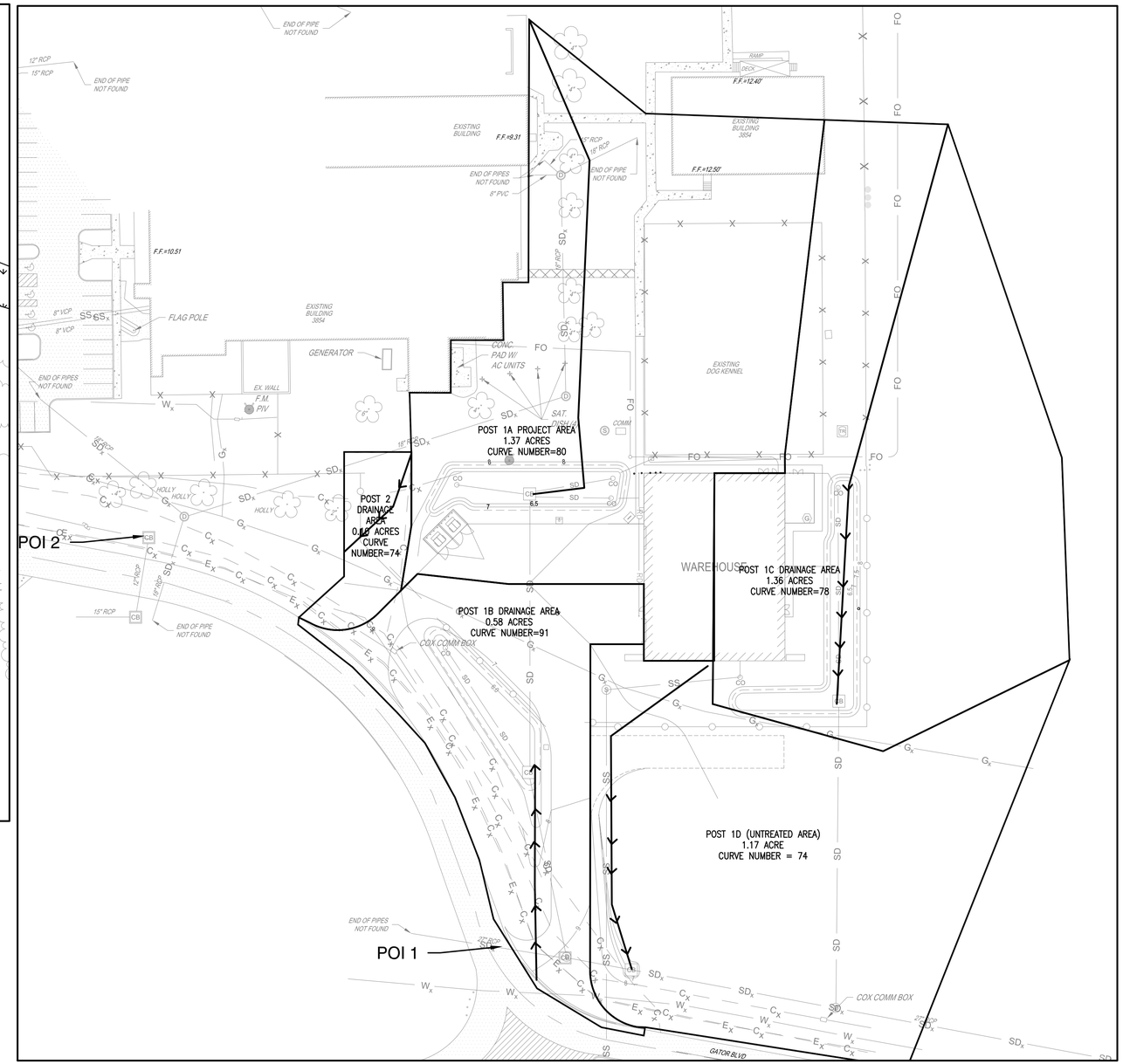
SCALE: AS NOTED
eEPROJECT NO.: XXXXXX
CONSTR. CONTR. NO.: N40085-12-D-6304
NAVFAC DRAWING NO.:
SHEET OF ##
SW101

FINAL SUBMISSION



ADMINISTRATION BUILDING

0 20' 40' 860'
SCALE: 1" = 40'



WAREHOUSE

0 20' 40' 860'
SCALE: 1" = 40'

NO.	DESCRIPTION	DATE	APPR.

NAVFAC

PRELIMINARY DESIGN
NOT FOR CONSTRUCTION
SEAL

LEEBCOR SERVICES, LLC
430 McLaws Circle
Suite 201
Williamsburg, VA 2318
CONTRACTOR INFO

Baker
Michael Baker Jr, Inc.
100 Airside Drive
Moon Township, PA 15108
A/E INFO

APPROVED
FOR COMMANDER NAVFAC
ACTIVITY
SATISFACTORY TO DATE 06/17/14
DES | DRW | CHK
PM
BRANCH MANAGER
CHIEF ENG/ARCH

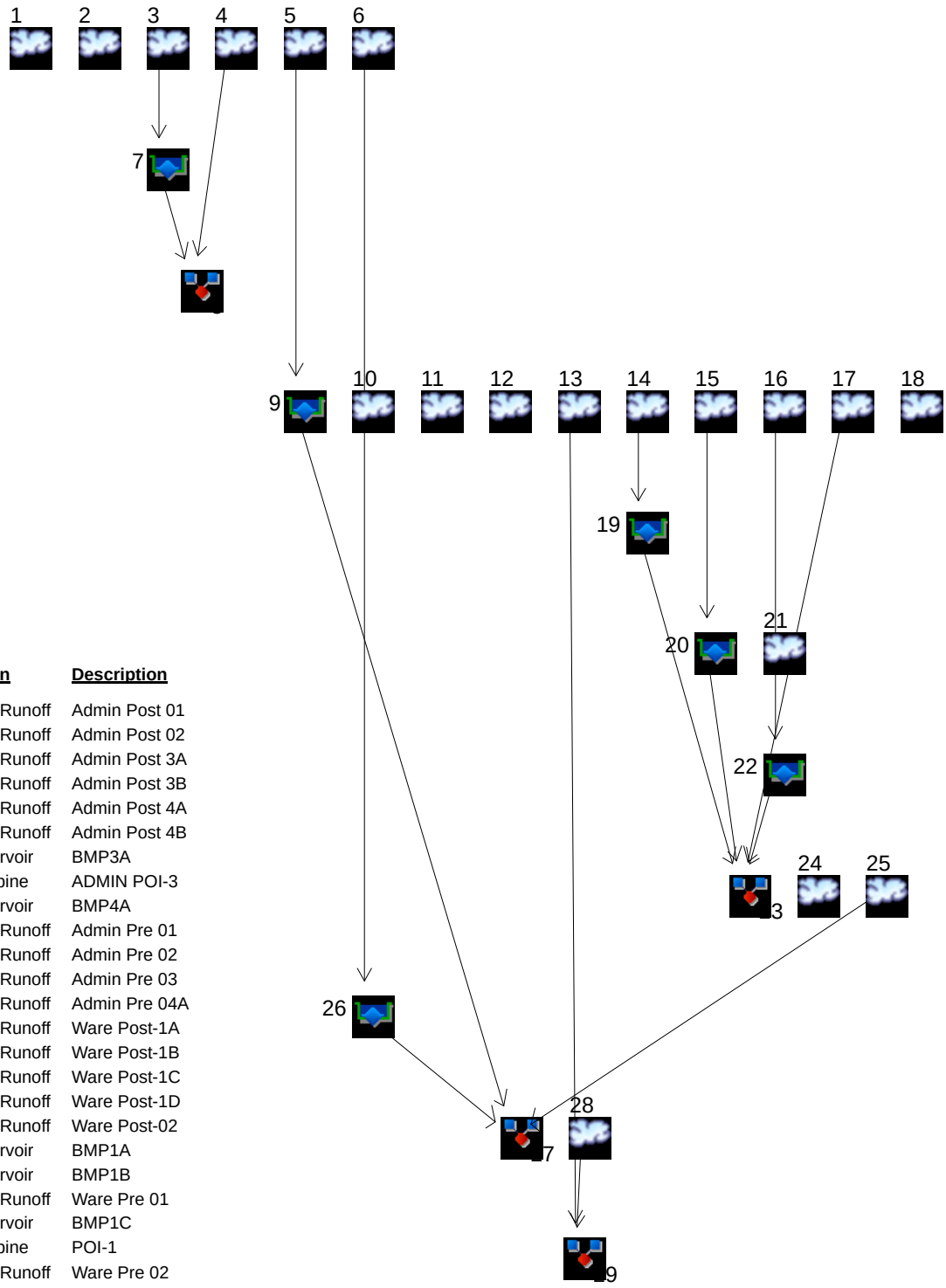
DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID ATLANTIC
Norfolk, Va.
IPT - FWD
JOINT EXPEDITIONARY BASE LITTLE CREEK, VIRGINIA
FY2013 P-165 SOF COMBAT SERVICES SUPPORT FACILITY
HYDRAFLOW POST-DEVELOPMENT STORMWATER

SCALE: AS NOTED
eEPROJECT NO.: XXXXXX
CONSTR. CONTR. NO. N40085-12-D-6304
NAVFAC DRAWING NO.
SHEET OF ##
SW201

FINAL SUBMISSION

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066



Legend

Hyd.	Origin	Description
1	SCS Runoff	Admin Post 01
2	SCS Runoff	Admin Post 02
3	SCS Runoff	Admin Post 3A
4	SCS Runoff	Admin Post 3B
5	SCS Runoff	Admin Post 4A
6	SCS Runoff	Admin Post 4B
7	Reservoir	BMP3A
8	Combine	ADMIN POI-3
9	Reservoir	BMP4A
10	SCS Runoff	Admin Pre 01
11	SCS Runoff	Admin Pre 02
12	SCS Runoff	Admin Pre 03
13	SCS Runoff	Admin Pre 04A
14	SCS Runoff	Ware Post-1A
15	SCS Runoff	Ware Post-1B
16	SCS Runoff	Ware Post-1C
17	SCS Runoff	Ware Post-1D
18	SCS Runoff	Ware Post-02
19	Reservoir	BMP1A
20	Reservoir	BMP1B
21	SCS Runoff	Ware Pre 01
22	Reservoir	BMP1C
23	Combine	POI-1
24	SCS Runoff	Ware Pre 02
25	SCS Runoff	Admin Post 4C
26	Reservoir	BMP4B
27	Combine	ADMIN POI-4
28	SCS Runoff	Admin Pre 4B
29	Combine	ADMIN PRE POI-4

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

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	------	-------	0.394	-------	-------	0.763	0.934	-------	1.274	Admin Post 01
2	SCS Runoff	------	-------	0.200	-------	-------	0.375	0.456	-------	0.615	Admin Post 02
3	SCS Runoff	------	-------	0.245	-------	-------	0.482	0.593	-------	0.813	Admin Post 3A
4	SCS Runoff	------	-------	0.452	-------	-------	1.016	1.288	-------	1.843	Admin Post 3B
5	SCS Runoff	------	-------	0.992	-------	-------	1.816	2.191	-------	2.936	Admin Post 4A
6	SCS Runoff	------	-------	1.387	-------	-------	2.421	2.886	-------	3.811	Admin Post 4B
7	Reservoir	3	-------	0.020	-------	-------	0.020	0.020	-------	0.038	BMP3A
8	Combine	4, 7	-------	0.470	-------	-------	1.036	1.308	-------	1.863	ADMIN POI-3
9	Reservoir	5	-------	0.067	-------	-------	0.067	0.067	-------	0.235	BMP4A
10	SCS Runoff	------	-------	0.417	-------	-------	0.808	0.989	-------	1.349	Admin Pre 01
11	SCS Runoff	------	-------	0.337	-------	-------	0.623	0.753	-------	1.012	Admin Pre 02
12	SCS Runoff	------	-------	1.301	-------	-------	2.726	3.399	-------	4.758	Admin Pre 03
13	SCS Runoff	------	-------	0.999	-------	-------	1.877	2.278	-------	3.077	Admin Pre 04A
14	SCS Runoff	------	-------	1.860	-------	-------	3.749	4.630	-------	6.404	Ware Post-1A
15	SCS Runoff	------	-------	1.395	-------	-------	2.380	2.822	-------	3.702	Ware Post-1B
16	SCS Runoff	------	-------	1.690	-------	-------	3.531	4.400	-------	6.155	Ware Post-1C
17	SCS Runoff	------	-------	1.195	-------	-------	2.703	3.433	-------	4.926	Ware Post-1D
18	SCS Runoff	------	-------	0.138	-------	-------	0.311	0.395	-------	0.567	Ware Post-02
19	Reservoir	14	-------	0.301	-------	-------	3.501	4.375	-------	5.428	BMP1A
20	Reservoir	15	-------	0.122	-------	-------	2.032	2.506	-------	2.935	BMP1B
21	SCS Runoff	------	-------	5.033	-------	-------	10.74	13.45	-------	18.95	Ware Pre 01
22	Reservoir	16	-------	0.197	-------	-------	3.040	4.213	-------	6.069	BMP1C
23	Combine	17, 19, 20, 22	-------	1.295	-------	-------	10.40	14.34	-------	19.04	POI-1
24	SCS Runoff	------	-------	0.207	-------	-------	0.466	0.592	-------	0.851	Ware Pre 02
25	SCS Runoff	------	-------	1.062	-------	-------	1.805	2.139	-------	2.802	Admin Post 4C
26	Reservoir	6	-------	0.025	-------	-------	0.493	1.029	-------	2.443	BMP4B
27	Combine	9, 25, 26	-------	1.129	-------	-------	1.872	2.310	-------	4.795	ADMIN POI-4
28	SCS Runoff	------	-------	1.059	-------	-------	1.874	2.242	-------	2.973	Admin Pre 4B
29	Combine	13, 28	-------	2.058	-------	-------	3.751	4.520	-------	6.049	ADMIN PRE POI-4

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.394	2	724	1,176	------	------	------	Admin Post 01
2	SCS Runoff	0.200	2	724	598	------	------	------	Admin Post 02
3	SCS Runoff	0.245	2	724	732	------	------	------	Admin Post 3A
4	SCS Runoff	0.452	2	724	1,383	------	------	------	Admin Post 3B
5	SCS Runoff	0.992	2	728	3,808	------	------	------	Admin Post 4A
6	SCS Runoff	1.387	2	724	4,216	------	------	------	Admin Post 4B
7	Reservoir	0.020	2	726	722	3	4.62	350	BMP3A
8	Combine	0.470	2	724	2,105	4, 7	------	------	ADMIN POI-3
9	Reservoir	0.067	2	722	3,798	5	5.64	2,100	BMP4A
10	SCS Runoff	0.417	2	724	1,245	------	------	------	Admin Pre 01
11	SCS Runoff	0.337	2	724	1,009	------	------	------	Admin Pre 02
12	SCS Runoff	1.301	2	728	5,048	------	------	------	Admin Pre 03
13	SCS Runoff	0.999	2	724	2,989	------	------	------	Admin Pre 04A
14	SCS Runoff	1.860	2	738	9,192	------	------	------	Ware Post-1A
15	SCS Runoff	1.395	2	730	5,802	------	------	------	Ware Post-1B
16	SCS Runoff	1.690	2	738	8,402	------	------	------	Ware Post-1C
17	SCS Runoff	1.195	2	738	6,067	------	------	------	Ware Post-1D
18	SCS Runoff	0.138	2	730	543	------	------	------	Ware Post-02
19	Reservoir	0.301	2	796	9,178	14	7.54	5,081	BMP1A
20	Reservoir	0.122	2	822	5,791	15	6.85	3,534	BMP1B
21	SCS Runoff	5.033	2	742	26,707	------	------	------	Ware Pre 01
22	Reservoir	0.197	2	846	8,389	16	7.71	5,064	BMP1C
23	Combine	1.295	2	738	29,425	17, 19, 20, 22	------	------	POI-1
24	SCS Runoff	0.207	2	730	815	------	------	------	Ware Pre 02
25	SCS Runoff	1.062	2	724	3,270	------	------	------	Admin Post 4C
26	Reservoir	0.025	2	1092	486	6	8.30	3,758	BMP4B
27	Combine	1.129	2	724	7,554	9, 25, 26	------	------	ADMIN POI-4
28	SCS Runoff	1.059	2	724	3,203	------	------	------	Admin Pre 4B
29	Combine	2.058	2	724	6,192	13, 28	------	------	ADMIN PRE POI-4

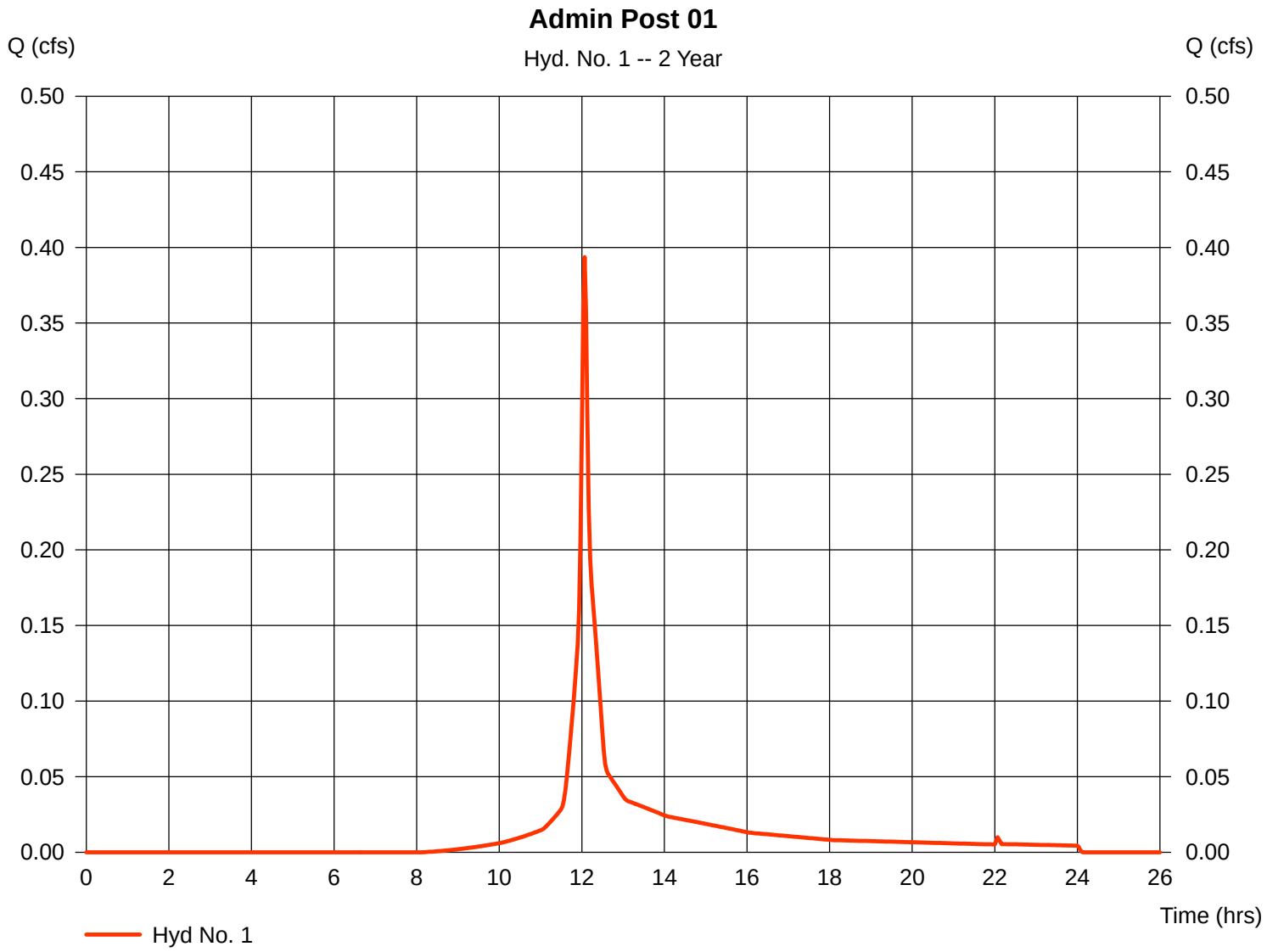
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 1

Admin Post 01

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.394 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	1,176 cuft
Drainage area	=	0.170 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.50 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



5

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No. 1

Admin Post 01

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.150		0.011		0.011		
Flow length (ft)	=	44.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.80		0.00		0.00		
Land slope (%)	=	2.20		0.00		0.00		
Travel Time (min)	**=**	**4.49**	**+**	**0.00**	**+**	**0.00**	**=**	**4.49**
Shallow Concentrated Flow								
Flow length (ft)	=	0.00		0.00		0.00		
Watercourse slope (%)	=	0.00		0.00		0.00		
Surface description	=	Paved		Paved		Paved		
Average velocity (ft/s)	=	0.00		0.00		0.00		
Travel Time (min)	**=**	**0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
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 ..... 4.50 min

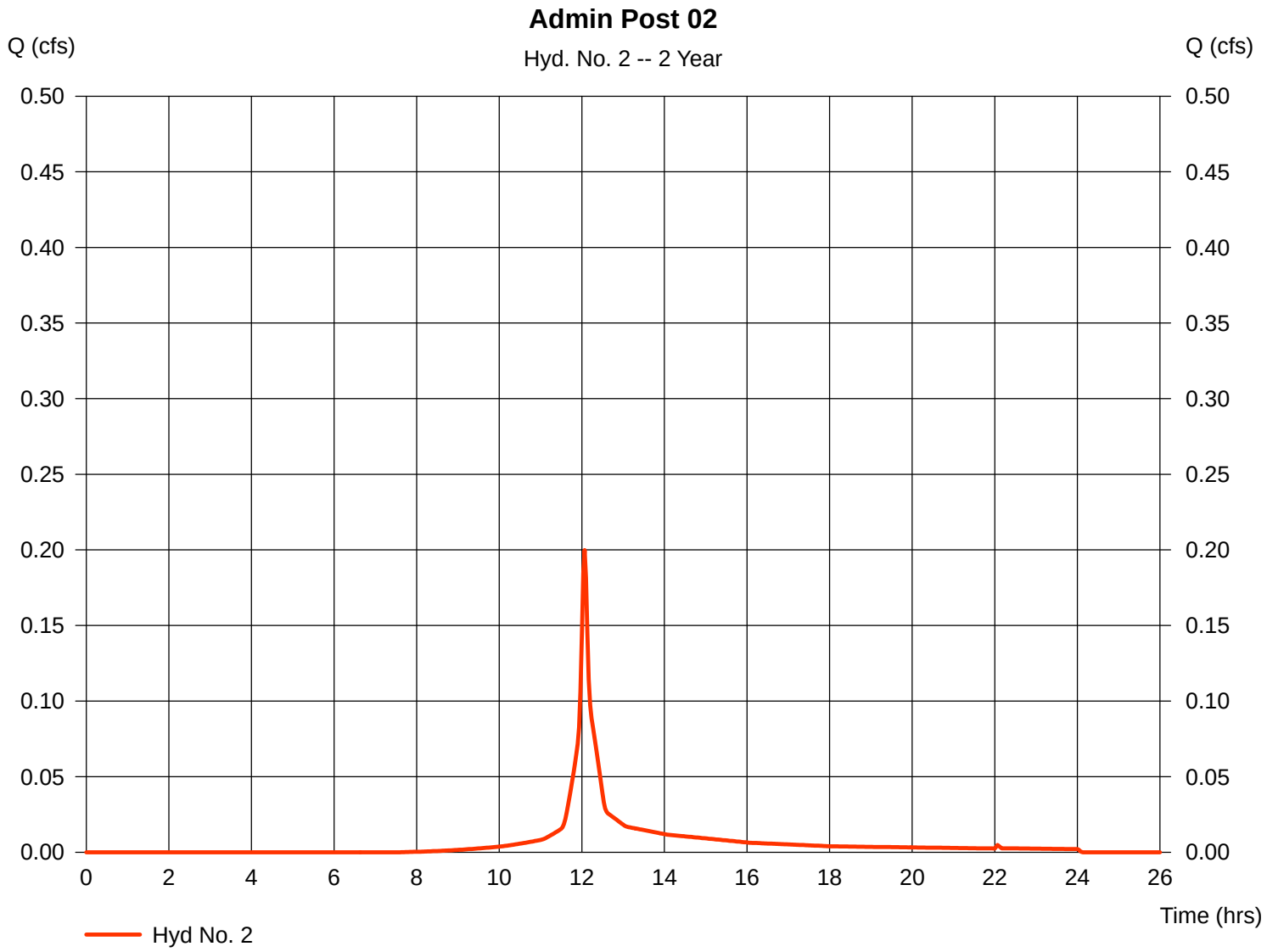
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 2

Admin Post 02

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.200 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	598 cuft
Drainage area	=	0.080 ac	Curve number	=	84
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



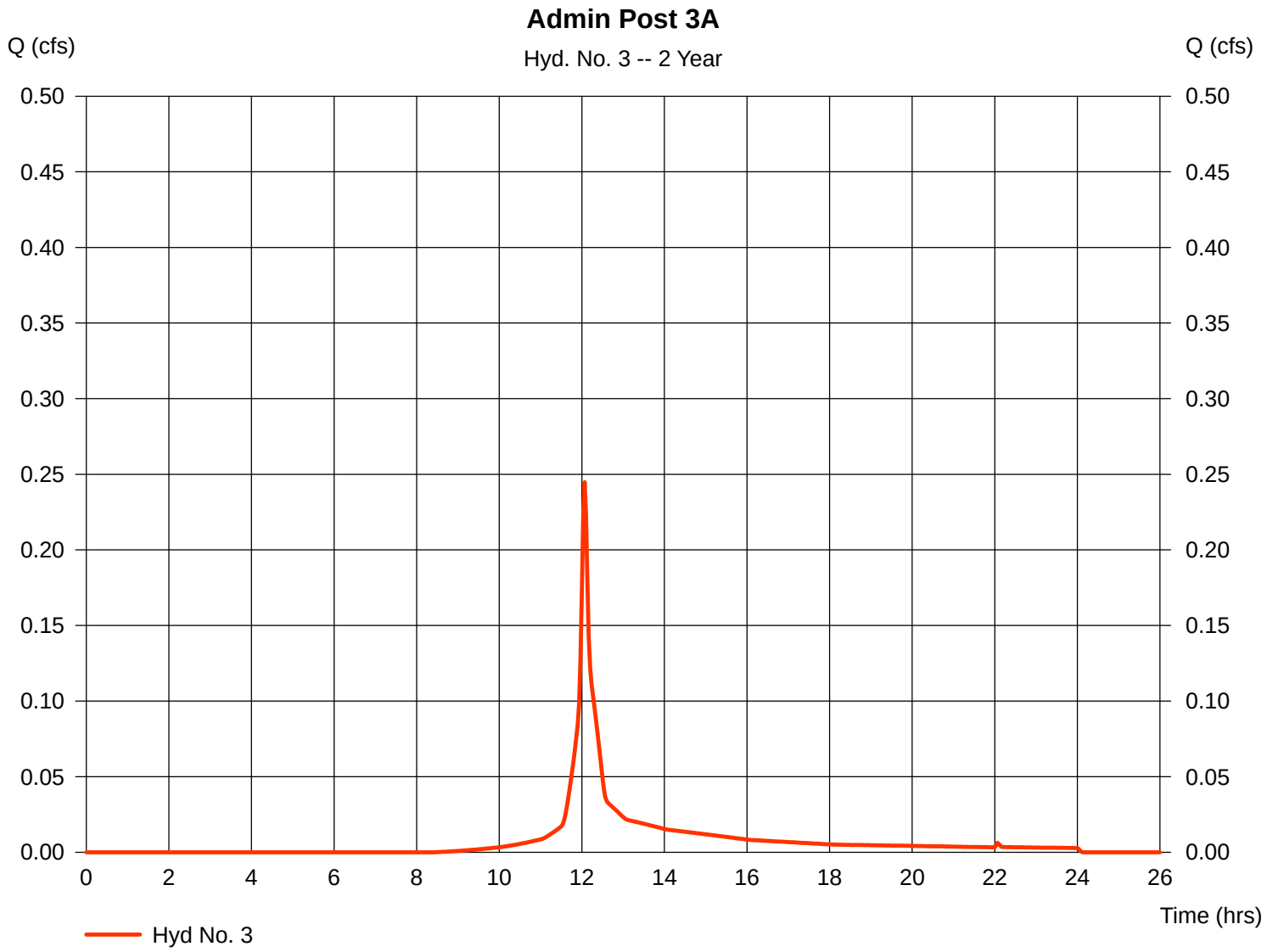
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 3

Admin Post 3A

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.245 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	732 cuft
Drainage area	=	0.110 ac	Curve number	=	81
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



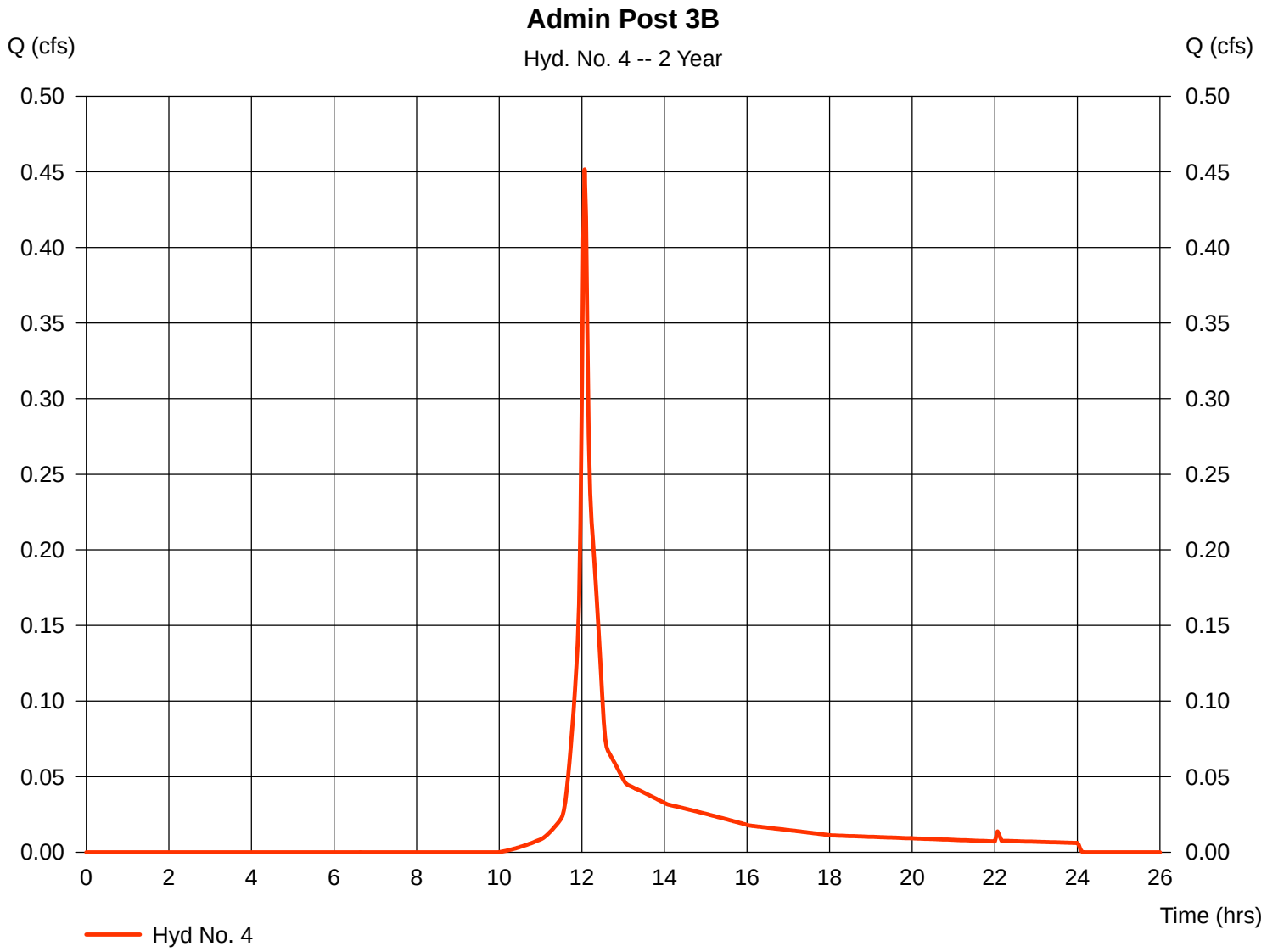
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 4

Admin Post 3B

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.452 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	1,383 cuft
Drainage area	=	0.280 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



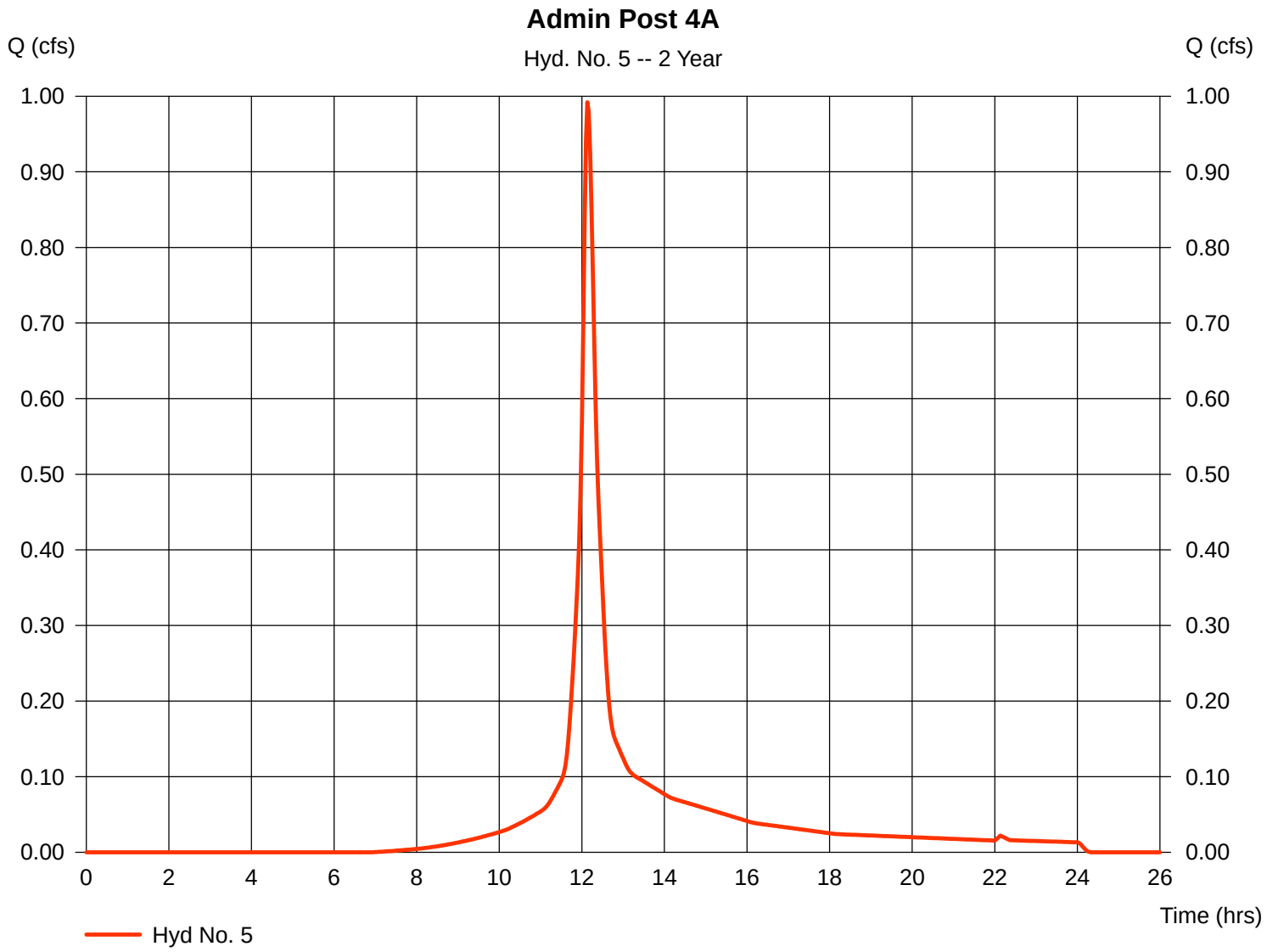
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 5

Admin Post 4A

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.992 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.13 hrs
Time interval	=	2 min	Hyd. volume	=	3,808 cuft
Drainage area	=	0.430 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.20 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



10

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No. 5

Admin Post 4A

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.150		0.011		0.011		
Flow length (ft)	=	162.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.80		0.00		0.00		
Land slope (%)	=	2.00		0.00		0.00		
Travel Time (min)	**=**	**13.23**	**+**	**0.00**	**+**	**0.00**	**=**	**13.23**
Shallow Concentrated Flow								
Flow length (ft)	=	0.00		0.00		0.00		
Watercourse slope (%)	=	0.00		0.00		0.00		
Surface description	=	Paved		Paved		Paved		
Average velocity (ft/s)	=	0.00		0.00		0.00		
Travel Time (min)	**=**	**0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
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 ..... 13.20 min

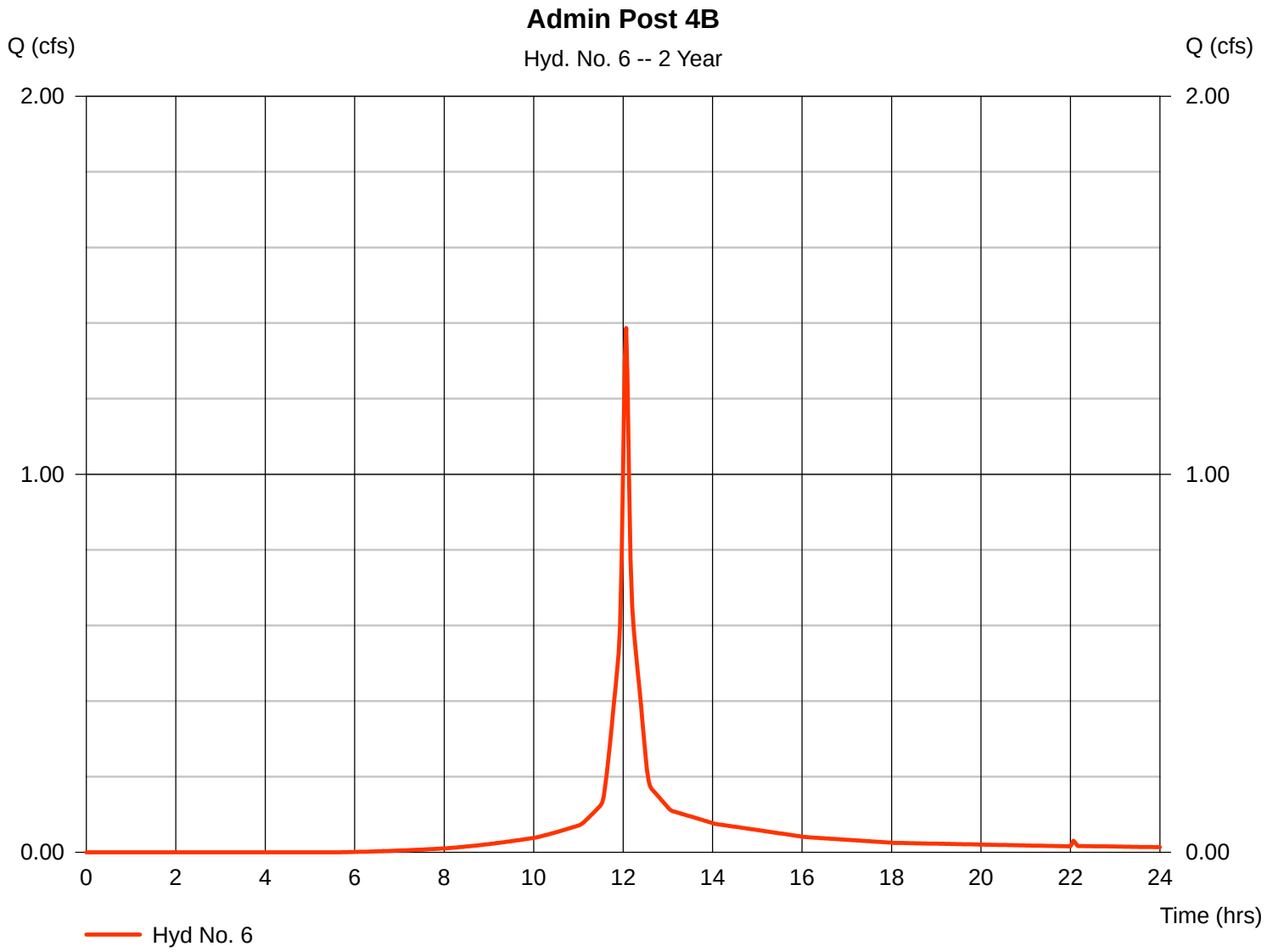
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 6

Admin Post 4B

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.387 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	4,216 cuft
Drainage area	=	0.470 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

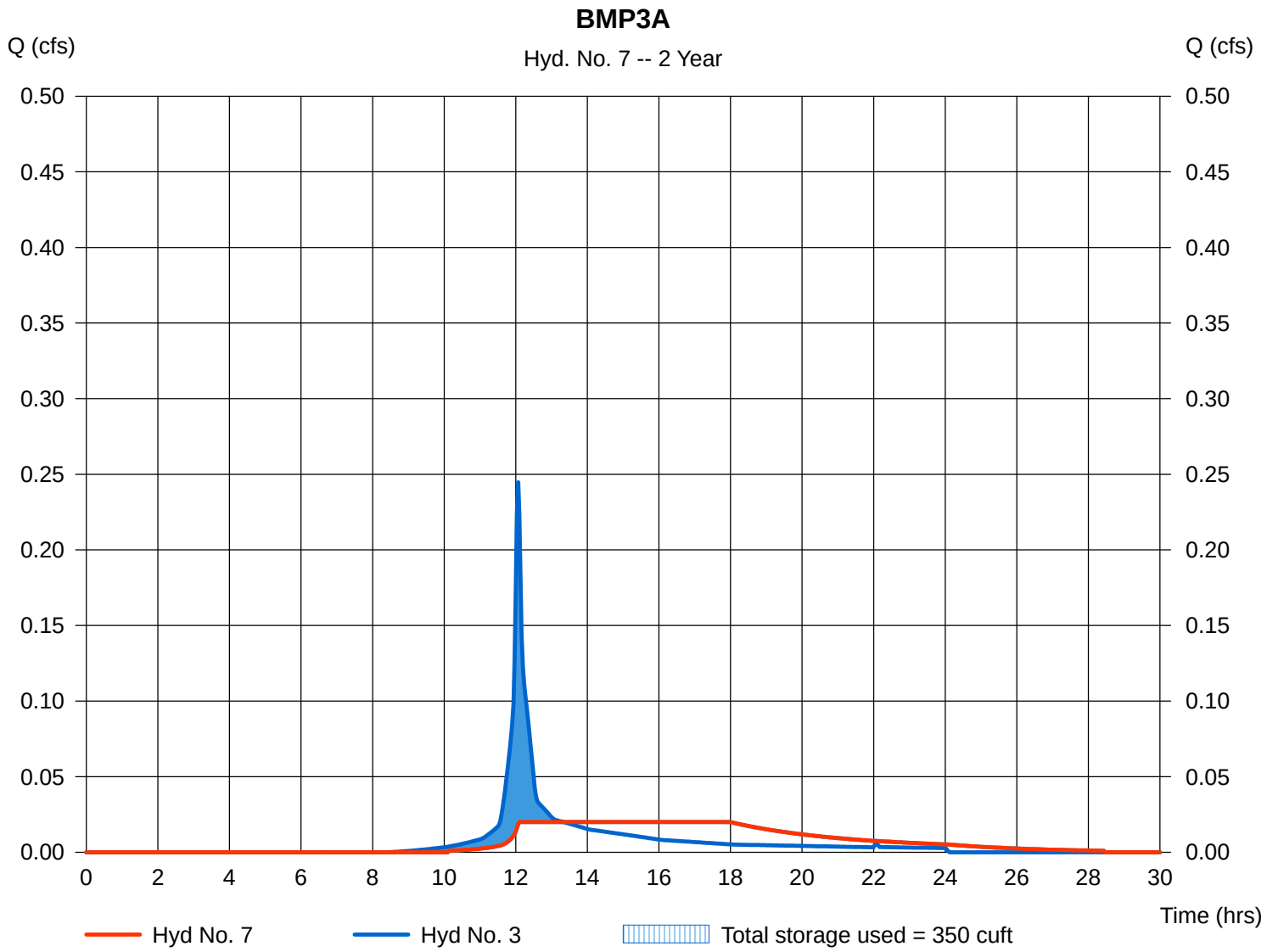
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 7

BMP3A

Hydrograph type	=	Reservoir	Peak discharge	=	0.020 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	722 cuft
Inflow hyd. No.	=	3 - Admin Post 3A	Max. Elevation	=	4.62 ft
Reservoir name	=	ADMIN-BMP3A	Max. Storage	=	350 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Pond No. 1 - ADMIN-BMP3A

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	3.57	n/a	0	0
0.50	4.07	n/a	192	192
1.50	5.07	n/a	287	479
3.25	6.82	n/a	479	958
3.50	7.07	n/a	96	1,054
4.00	7.57	n/a	552	1,605
4.50	8.07	n/a	702	2,307

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	Inactive	Inactive
Span (in)	= 6.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 4.07	0.00	0.00	0.00
Length (ft)	= 0.50	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.33	Inactive	Inactive	Inactive
Crest El. (ft)	= 7.57	7.75	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.760 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	3.57	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.05	19	3.62	0.00	---	---	---	0.00	0.00	---	---	0.000	0.002	0.002
0.10	38	3.67	0.00	---	---	---	0.00	0.00	---	---	0.000	0.004	0.004
0.15	57	3.72	0.00	---	---	---	0.00	0.00	---	---	0.000	0.006	0.006
0.20	77	3.77	0.00	---	---	---	0.00	0.00	---	---	0.000	0.008	0.008
0.25	96	3.82	0.00	---	---	---	0.00	0.00	---	---	0.000	0.010	0.010
0.30	115	3.87	0.00	---	---	---	0.00	0.00	---	---	0.000	0.012	0.012
0.35	134	3.92	0.00	---	---	---	0.00	0.00	---	---	0.000	0.014	0.014
0.40	153	3.97	0.00	---	---	---	0.00	0.00	---	---	0.000	0.016	0.016
0.45	172	4.02	0.00	---	---	---	0.00	0.00	---	---	0.000	0.018	0.018
0.50	192	4.07	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
0.60	220	4.17	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
0.70	249	4.27	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
0.80	278	4.37	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
0.90	307	4.47	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
1.00	335	4.57	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
1.10	364	4.67	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
1.20	393	4.77	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
1.30	422	4.87	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
1.40	450	4.97	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
1.50	479	5.07	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
1.68	527	5.25	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
1.85	575	5.42	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
2.03	623	5.60	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
2.20	671	5.77	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
2.38	719	5.95	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
2.55	766	6.12	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
2.73	814	6.30	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
2.90	862	6.47	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.08	910	6.65	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.25	958	6.82	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.28	968	6.85	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.30	977	6.87	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.33	987	6.90	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.35	996	6.92	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.38	1,006	6.95	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.40	1,015	6.97	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.43	1,025	7.00	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020

Continues on next page...

14

ADMIN-BMP3A

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.45	1,035	7.02	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.48	1,044	7.05	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.50	1,054	7.07	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.55	1,109	7.12	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.60	1,164	7.17	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.65	1,219	7.22	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.70	1,274	7.27	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.75	1,330	7.32	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.80	1,385	7.37	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.85	1,440	7.42	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.90	1,495	7.47	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
3.95	1,550	7.52	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
4.00	1,605	7.57	0.00	---	---	---	0.00	0.00	---	---	0.000	0.020	0.020
4.05	1,676	7.62	0.00	---	---	---	0.38	0.00	---	---	0.000	0.020	0.405
4.10	1,746	7.67	0.00	---	---	---	1.09	0.00	---	---	0.000	0.020	1.108
4.15	1,816	7.72	0.00	---	---	---	2.00	0.00	---	---	0.000	0.020	2.018
4.20	1,886	7.77	0.00	---	---	---	3.08	0.00	---	---	0.000	0.020	3.097
4.25	1,956	7.82	0.00	---	---	---	4.30	0.00	---	---	0.000	0.020	4.320
4.30	2,027	7.87	0.00	---	---	---	5.65	0.00	---	---	0.000	0.020	5.672
4.35	2,097	7.92	0.00	---	---	---	7.12	0.00	---	---	0.000	0.020	7.143
4.40	2,167	7.97	0.00	---	---	---	8.70	0.00	---	---	0.000	0.020	8.722
4.45	2,237	8.02	0.00	---	---	---	10.38	0.00	---	---	0.000	0.020	10.40
4.50	2,307	8.07	0.00	---	---	---	12.16	0.00	---	---	0.000	0.020	12.18

...End

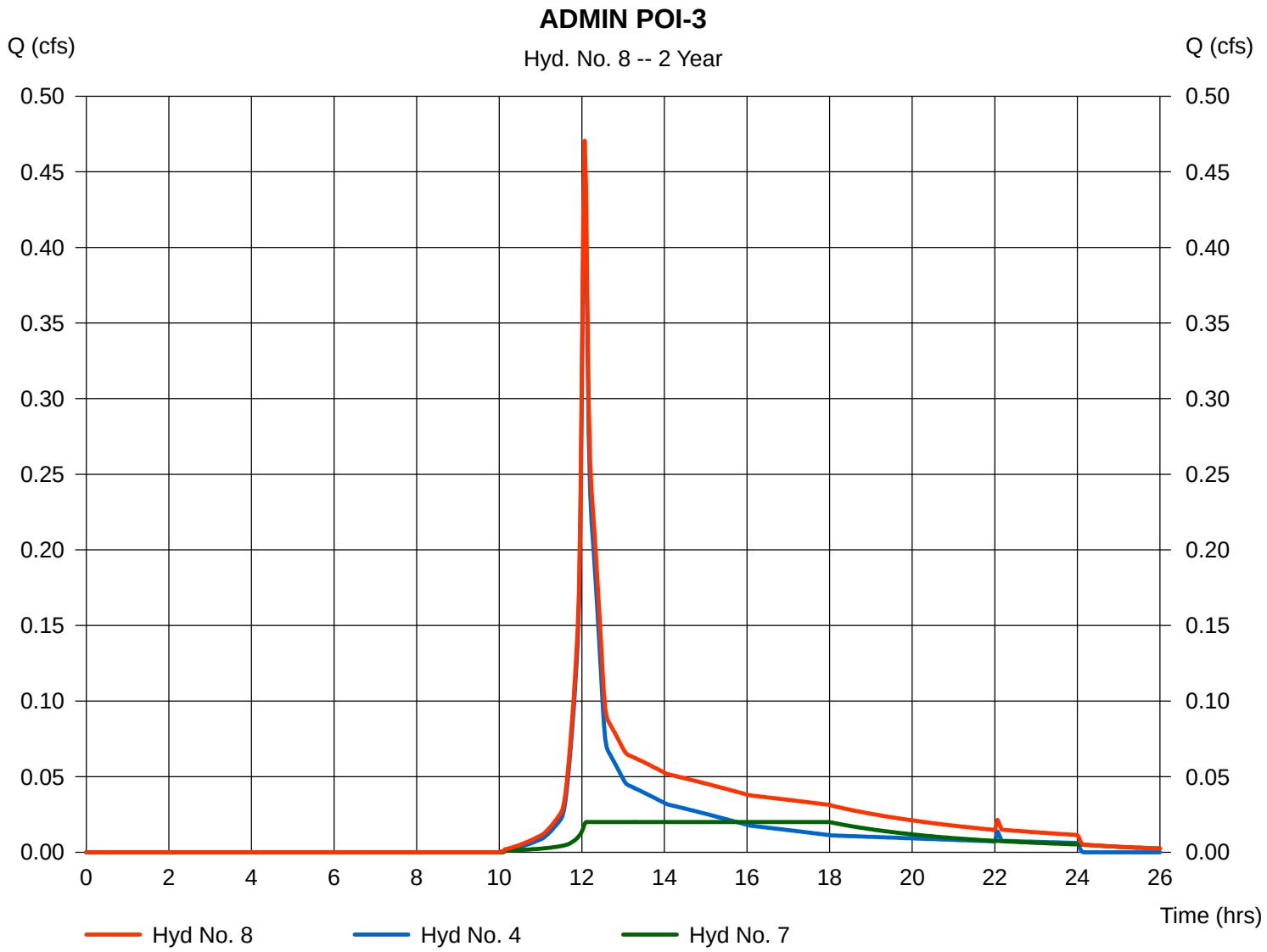
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 8

ADMIN POI-3

Hydrograph type	=	Combine	Peak discharge	=	0.470 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	2,105 cuft
Inflow hyds.	=	4, 7	Contrib. drain. area	=	0.280 ac



Hydrograph Report

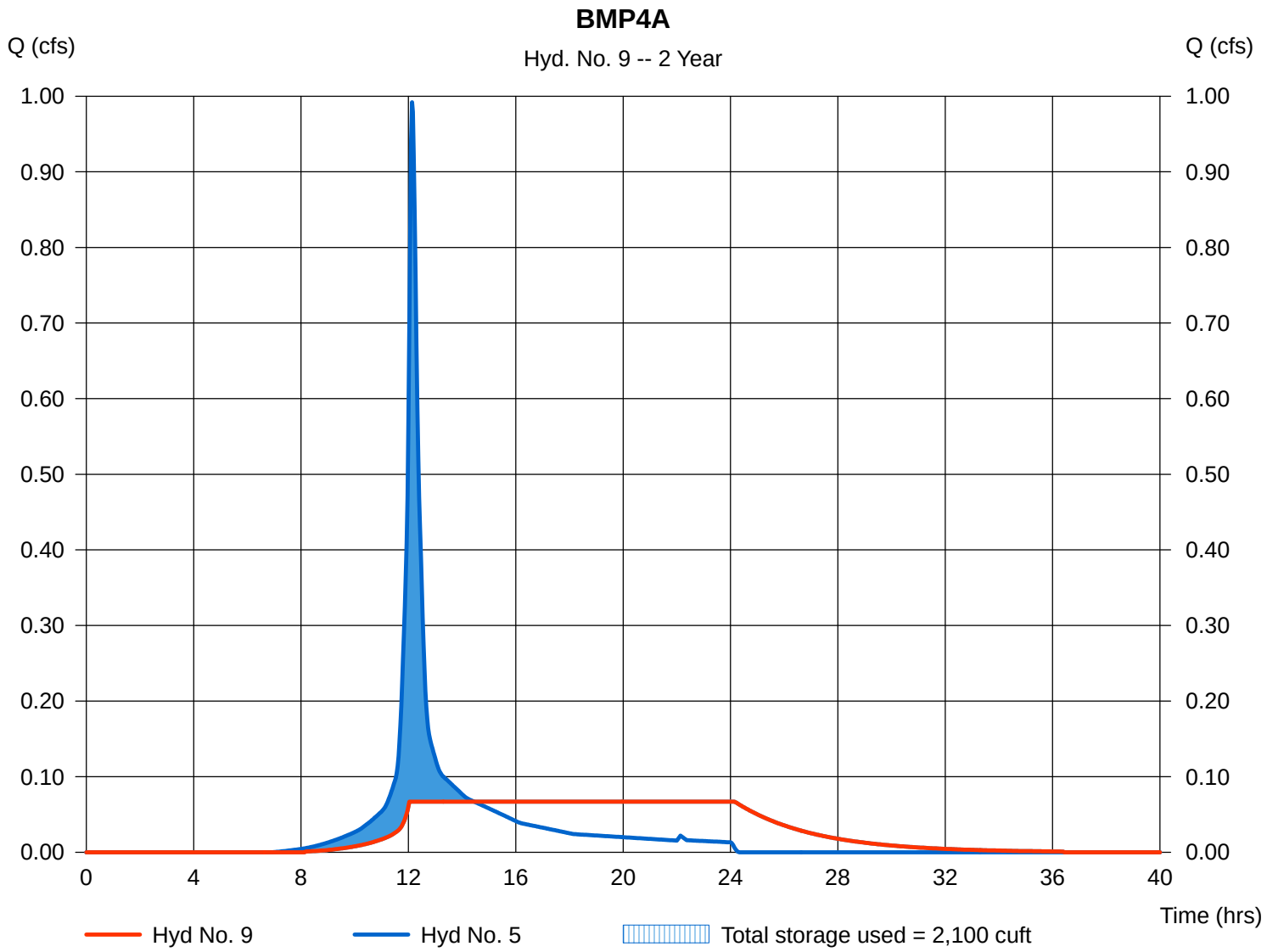
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 9

BMP4A

Hydrograph type	=	Reservoir	Peak discharge	=	0.067 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	3,798 cuft
Inflow hyd. No.	=	5 - Admin Post 4A	Max. Elevation	=	5.64 ft
Reservoir name	=	ADMIN-BMP4A	Max. Storage	=	2,100 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Pond No. 2 - ADMIN-BMP4A

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	4.00	n/a	0	0
0.50	4.50	n/a	703	703
1.25	5.25	n/a	1,055	1,758
3.25	7.25	n/a	1,758	3,516
3.50	7.50	n/a	352	3,868
4.00	8.00	n/a	1,890	5,758
5.00	9.00	n/a	4,612	10,370

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	Inactive	Inactive
Span (in)	= 6.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 4.50	0.00	0.00	0.00
Length (ft)	= 0.50	0.00	0.00	0.00
Slope (%)	= 0.03	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.33	Inactive	Inactive	Inactive
Crest El. (ft)	= 8.33	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 3.790 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	4.00	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.05	70	4.05	0.00	---	---	---	0.00	---	---	---	0.000	0.007	0.007
0.10	141	4.10	0.00	---	---	---	0.00	---	---	---	0.000	0.013	0.013
0.15	211	4.15	0.00	---	---	---	0.00	---	---	---	0.000	0.020	0.020
0.20	281	4.20	0.00	---	---	---	0.00	---	---	---	0.000	0.027	0.027
0.25	352	4.25	0.00	---	---	---	0.00	---	---	---	0.000	0.034	0.034
0.30	422	4.30	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
0.35	492	4.35	0.00	---	---	---	0.00	---	---	---	0.000	0.047	0.047
0.40	563	4.40	0.00	---	---	---	0.00	---	---	---	0.000	0.054	0.054
0.45	633	4.45	0.00	---	---	---	0.00	---	---	---	0.000	0.060	0.060
0.50	703	4.50	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
0.58	809	4.58	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
0.65	914	4.65	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
0.73	1,020	4.72	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
0.80	1,125	4.80	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
0.87	1,231	4.87	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
0.95	1,336	4.95	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
1.03	1,442	5.02	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
1.10	1,547	5.10	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
1.18	1,653	5.17	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
1.25	1,758	5.25	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
1.45	1,934	5.45	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
1.65	2,110	5.65	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
1.85	2,285	5.85	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
2.05	2,461	6.05	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
2.25	2,637	6.25	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
2.45	2,813	6.45	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
2.65	2,989	6.65	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
2.85	3,164	6.85	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.05	3,340	7.05	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.25	3,516	7.25	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.28	3,551	7.28	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.30	3,586	7.30	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.33	3,621	7.33	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.35	3,657	7.35	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.38	3,692	7.38	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.40	3,727	7.40	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.43	3,762	7.43	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067

Continues on next page...

18

ADMIN-BMP4A

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.45	3,797	7.45	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.48	3,832	7.48	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.50	3,868	7.50	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.55	4,057	7.55	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.60	4,246	7.60	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.65	4,435	7.65	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.70	4,624	7.70	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.75	4,813	7.75	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.80	5,002	7.80	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.85	5,191	7.85	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.90	5,380	7.90	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
3.95	5,569	7.95	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
4.00	5,758	8.00	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
4.10	6,219	8.10	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
4.20	6,680	8.20	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
4.30	7,142	8.30	0.00	---	---	---	0.00	---	---	---	0.000	0.067	0.067
4.40	7,603	8.40	0.00	---	---	---	0.64	---	---	---	0.000	0.067	0.704
4.50	8,064	8.50	0.00	---	---	---	2.41	---	---	---	0.000	0.067	2.478
4.60	8,525	8.60	0.00	---	---	---	4.83	---	---	---	0.000	0.067	4.893
4.70	8,986	8.70	0.00	---	---	---	7.74	---	---	---	0.000	0.067	7.809
4.80	9,448	8.80	0.00	---	---	---	11.08	---	---	---	0.000	0.067	11.15
4.90	9,909	8.90	0.00	---	---	---	14.80	---	---	---	0.000	0.067	14.87
5.00	10,370	9.00	0.00	---	---	---	18.87	---	---	---	0.000	0.067	18.93

...End

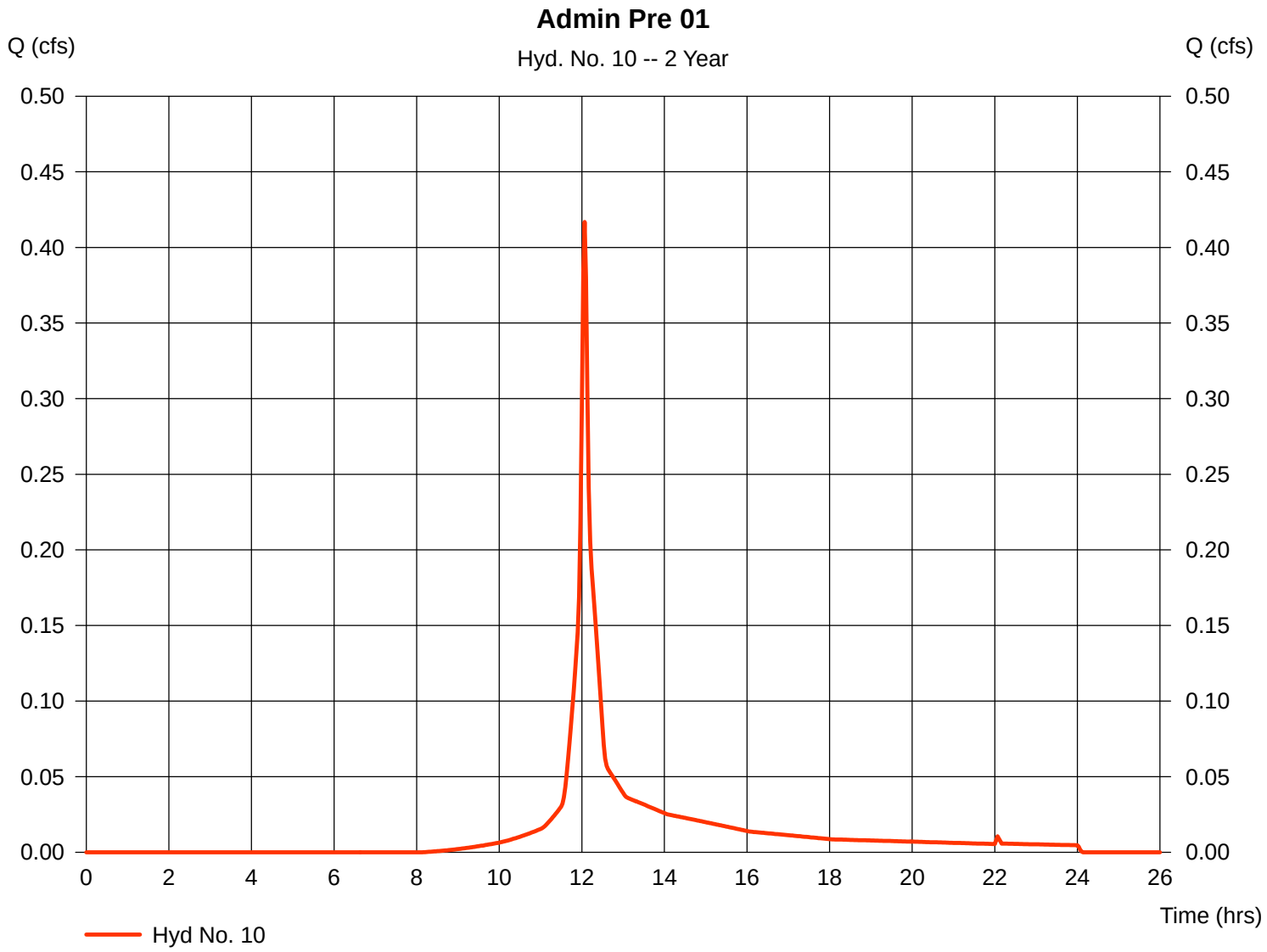
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 10

Admin Pre 01

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.417 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	1,245 cuft
Drainage area	=	0.180 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



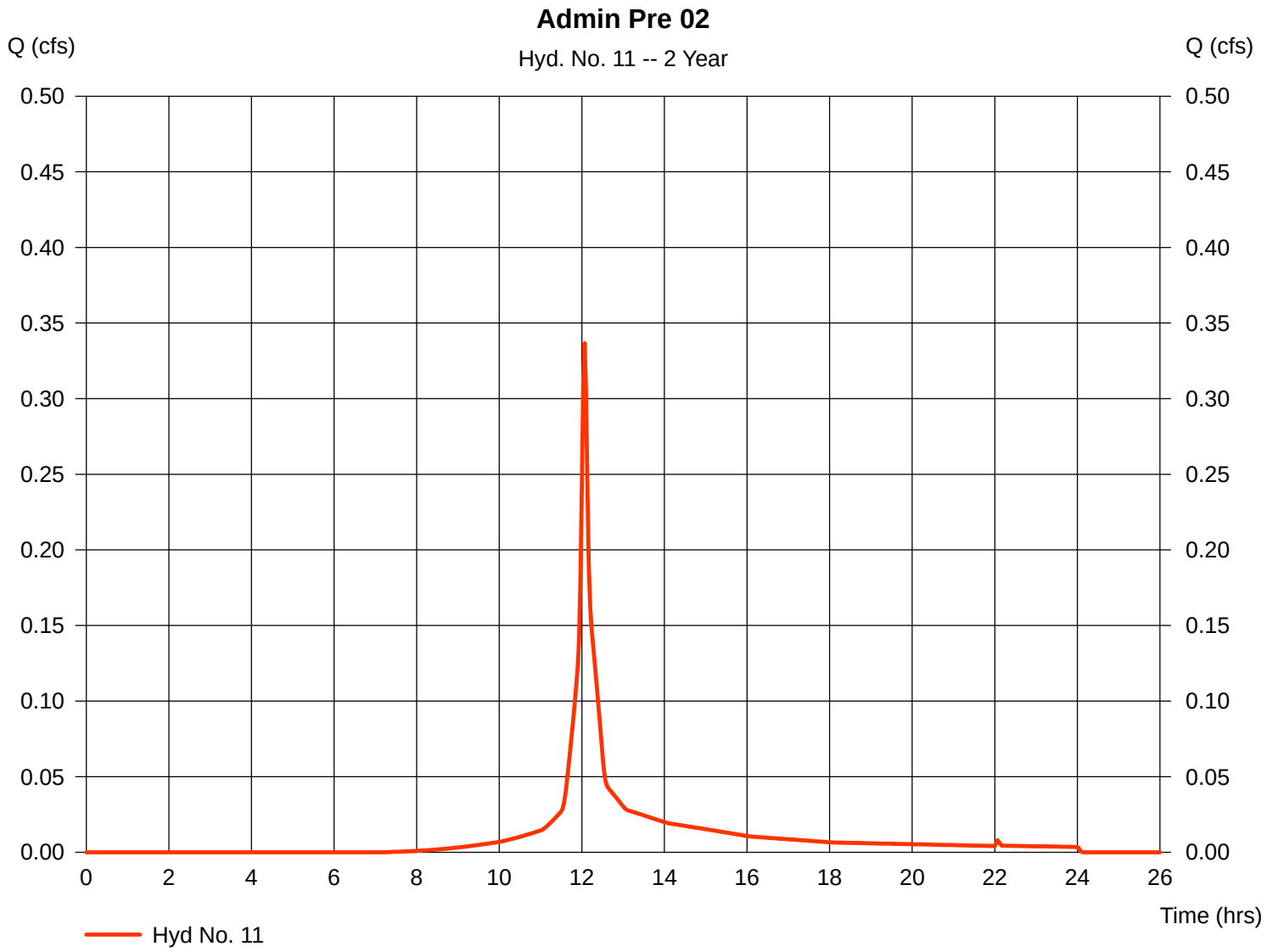
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 11

Admin Pre 02

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.337 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	1,009 cuft
Drainage area	=	0.130 ac	Curve number	=	85
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



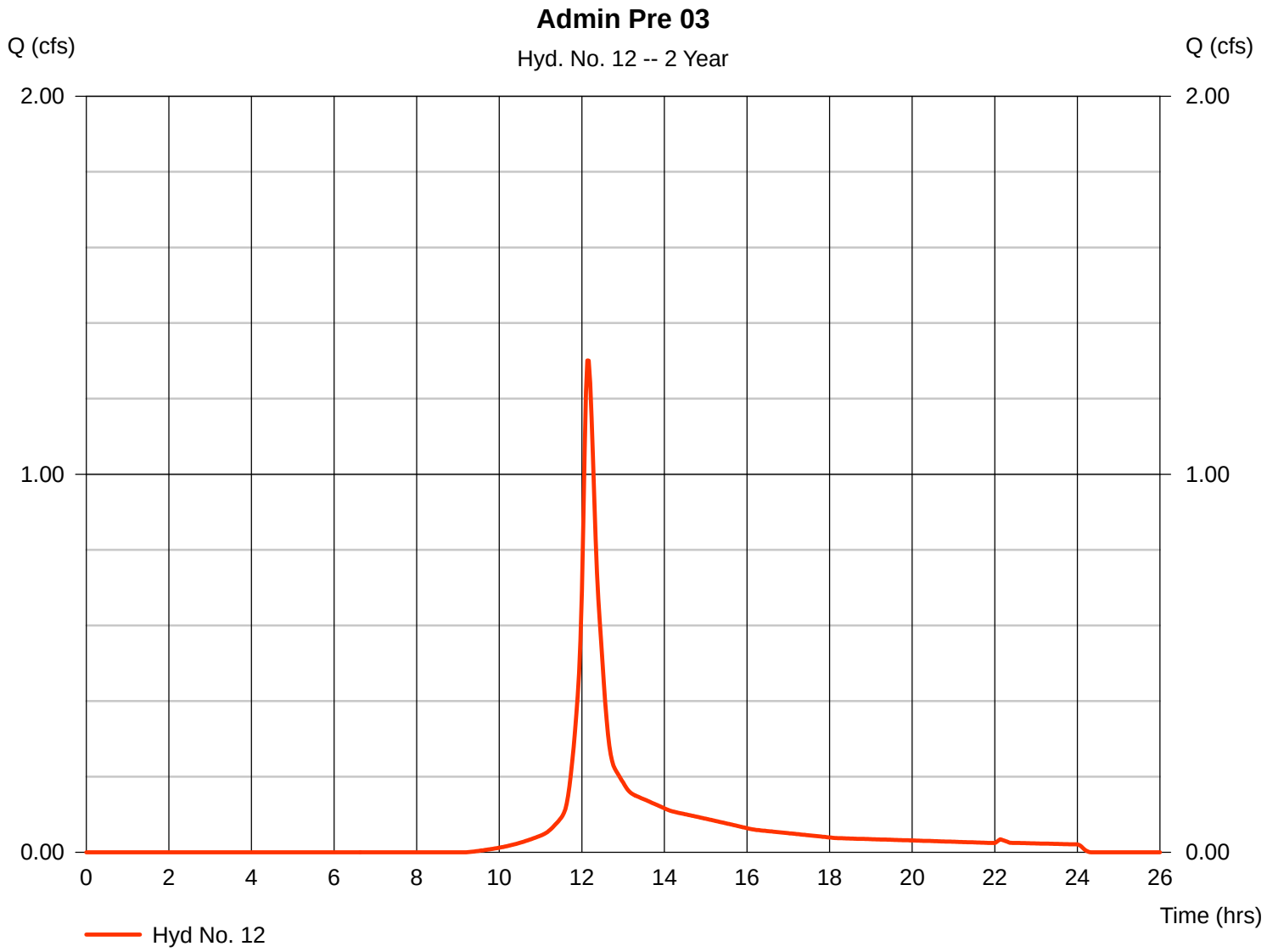
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 12

Admin Pre 03

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.301 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.13 hrs
Time interval	=	2 min	Hyd. volume	=	5,048 cuft
Drainage area	=	0.780 ac	Curve number	=	78
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.00 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



22

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No. 12

Admin Pre 03

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.130		0.011		0.011		
Flow length (ft)	=	158.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.80		0.00		0.00		
Land slope (%)	=	1.50		0.00		0.00		
Travel Time (min)	**=**	**12.97**	**+**	**0.00**	**+**	**0.00**	**=**	**12.97**
Shallow Concentrated Flow								
Flow length (ft)	=	0.00		0.00		0.00		
Watercourse slope (%)	=	0.00		0.00		0.00		
Surface description	=	Paved		Paved		Paved		
Average velocity (ft/s)	=	0.00		0.00		0.00		
Travel Time (min)	**=**	**0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
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 ..... 13.00 min

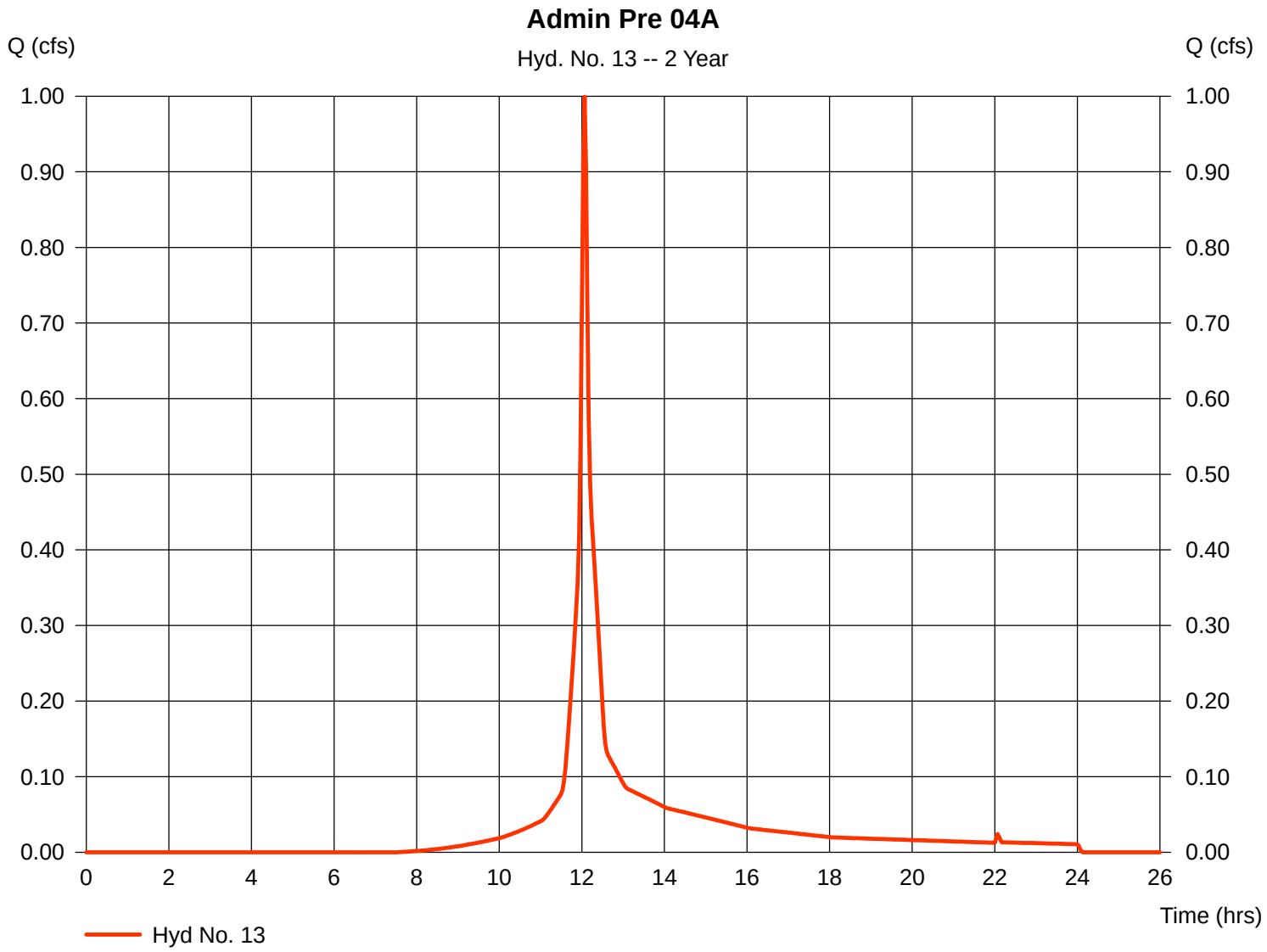
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 13

Admin Pre 04A

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.999 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	2,989 cuft
Drainage area	=	0.400 ac	Curve number	=	84
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.50 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



24

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No. 13

Admin Pre 04A

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.011		0.150		0.011		
Flow length (ft)	=	110.0		59.0		0.0		
Two-year 24-hr precip. (in)	=	3.80		3.80		0.00		
Land slope (%)	=	1.30		2.90		0.00		
Travel Time (min)	**=**	**1.43**	**+**	**5.08**	**+**	**0.00**	**=**	**6.51**
Shallow Concentrated Flow								
Flow length (ft)	=	0.00		0.00		0.00		
Watercourse slope (%)	=	0.00		0.00		0.00		
Surface description	=	Paved		Paved		Paved		
Average velocity (ft/s)	=	0.00		0.00		0.00		
Travel Time (min)	**=**	**0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
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 ..... 6.50 min

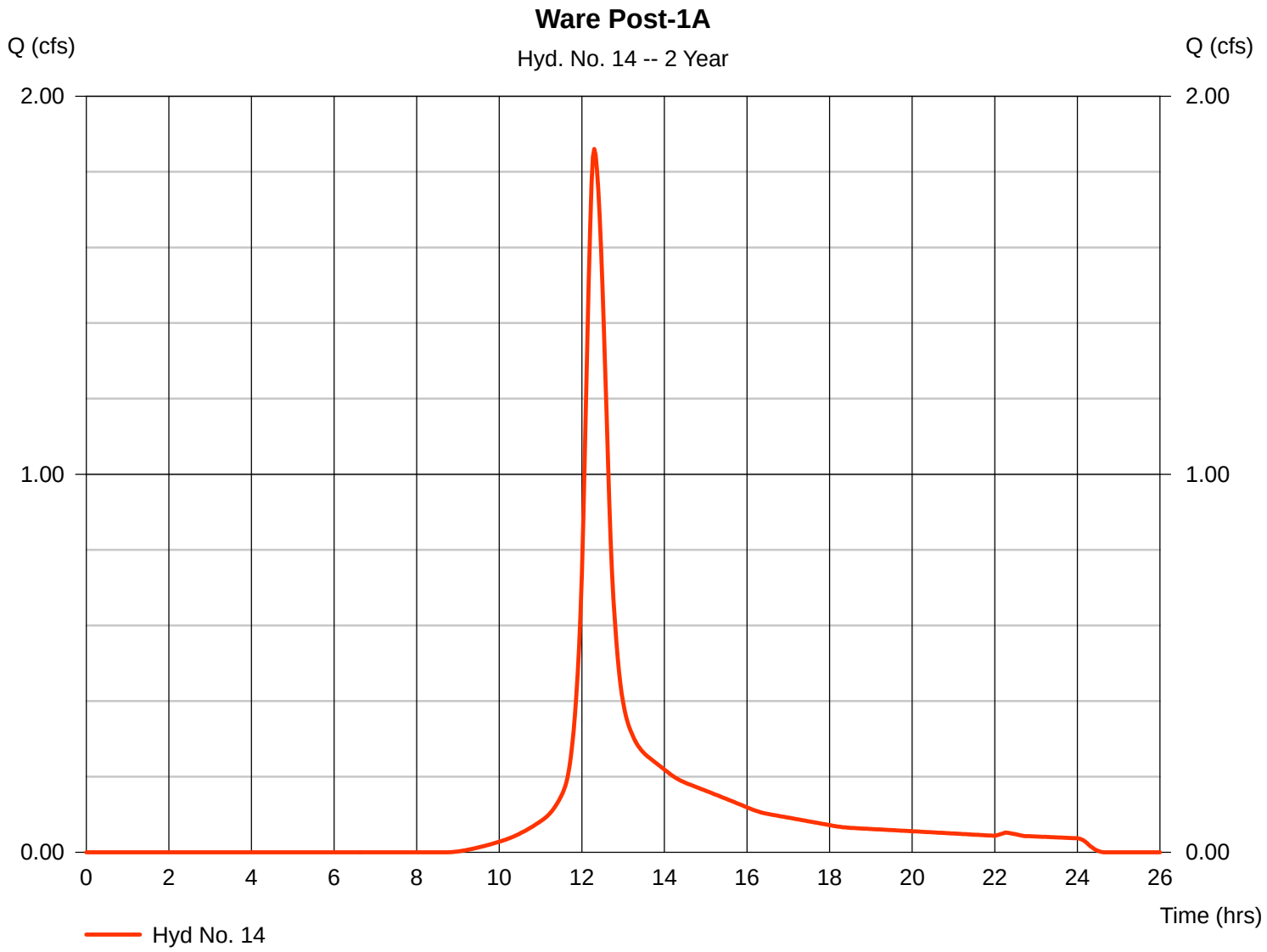
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 14

Ware Post-1A

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.860 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.30 hrs
Time interval	=	2 min	Hyd. volume	=	9,192 cuft
Drainage area	=	1.370 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	26.60 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



26

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No. 14

Ware Post-1A

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.150		0.150		0.011		
Flow length (ft)	=	150.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.80		0.00		0.00		
Land slope (%)	=	0.40		0.00		0.00		
Travel Time (min)	**=**	**23.67**	**+**	**0.00**	**+**	**0.00**	**=**	**23.67**
Shallow Concentrated Flow								
Flow length (ft)	=	177.00		0.00		0.00		
Watercourse slope (%)	=	0.40		0.00		0.00		
Surface description	=	Unpaved		Paved		Paved		
Average velocity (ft/s)	=	1.02		0.00		0.00		
Travel Time (min)	**=**	**2.89**	**+**	**0.00**	**+**	**0.00**	**=**	**2.89**
Channel Flow								
X sectional flow area (sqft)	=	0.00		0.00		0.00		
Wetted perimeter (ft)	=	0.00		0.00		0.00		
Channel slope (%)	=	1.00		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 ..... 26.60 min

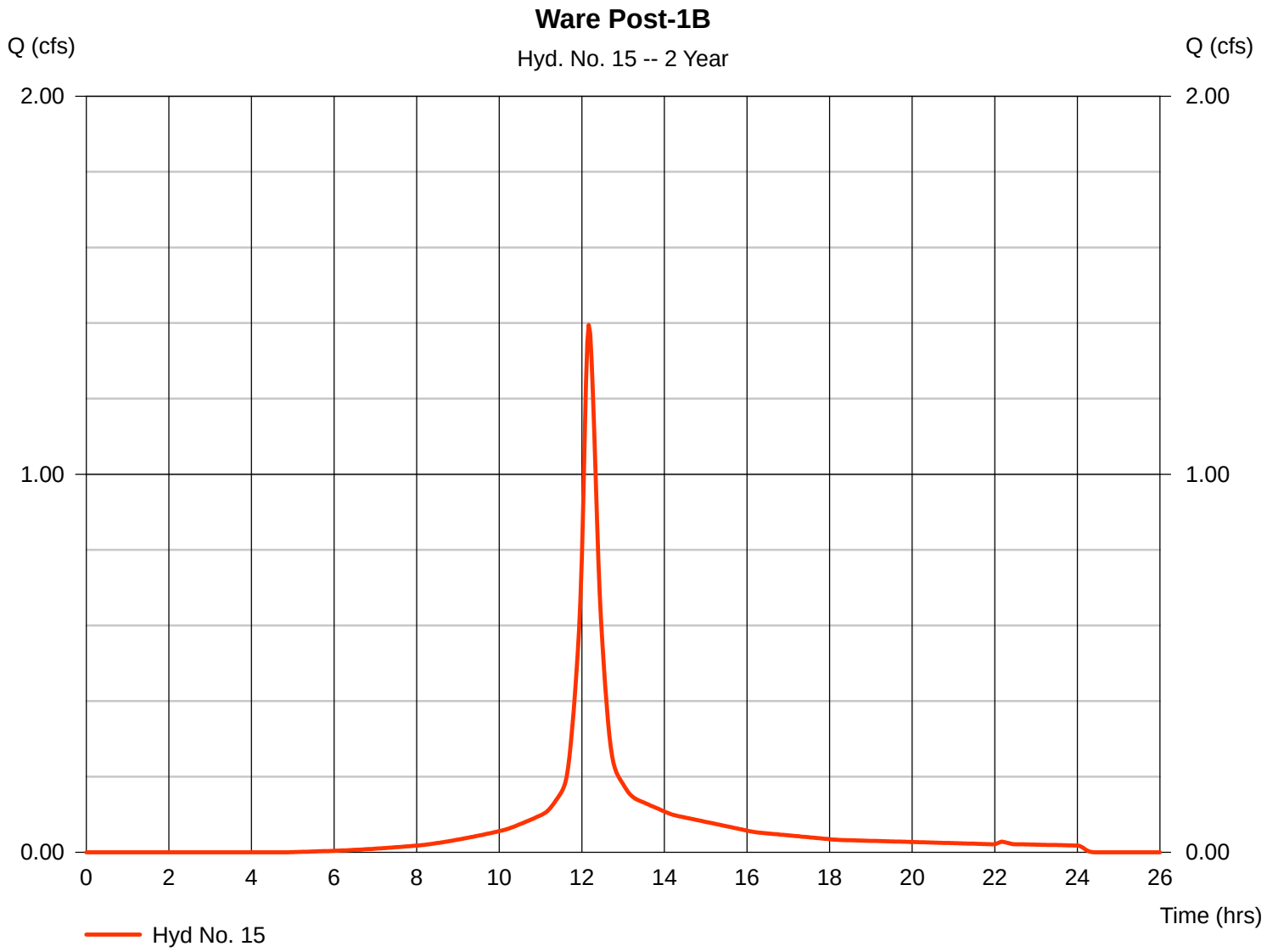
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 15

Ware Post-1B

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.395 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.17 hrs
Time interval	=	2 min	Hyd. volume	=	5,802 cuft
Drainage area	=	0.580 ac	Curve number	=	91
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.90 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



28

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No. 15

Ware Post-1B

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.150		0.011		0.011		
Flow length (ft)	=	163.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.80		0.00		0.00		
Land slope (%)	=	1.50		0.00		0.00		
Travel Time (min)	**=**	**14.91**	**+**	**0.00**	**+**	**0.00**	**=**	**14.91**
Shallow Concentrated Flow								
Flow length (ft)	=	0.00		0.00		0.00		
Watercourse slope (%)	=	0.00		0.00		0.00		
Surface description	=	Paved		Paved		Paved		
Average velocity (ft/s)	=	0.00		0.00		0.00		
Travel Time (min)	**=**	**0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
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 ..... 14.90 min

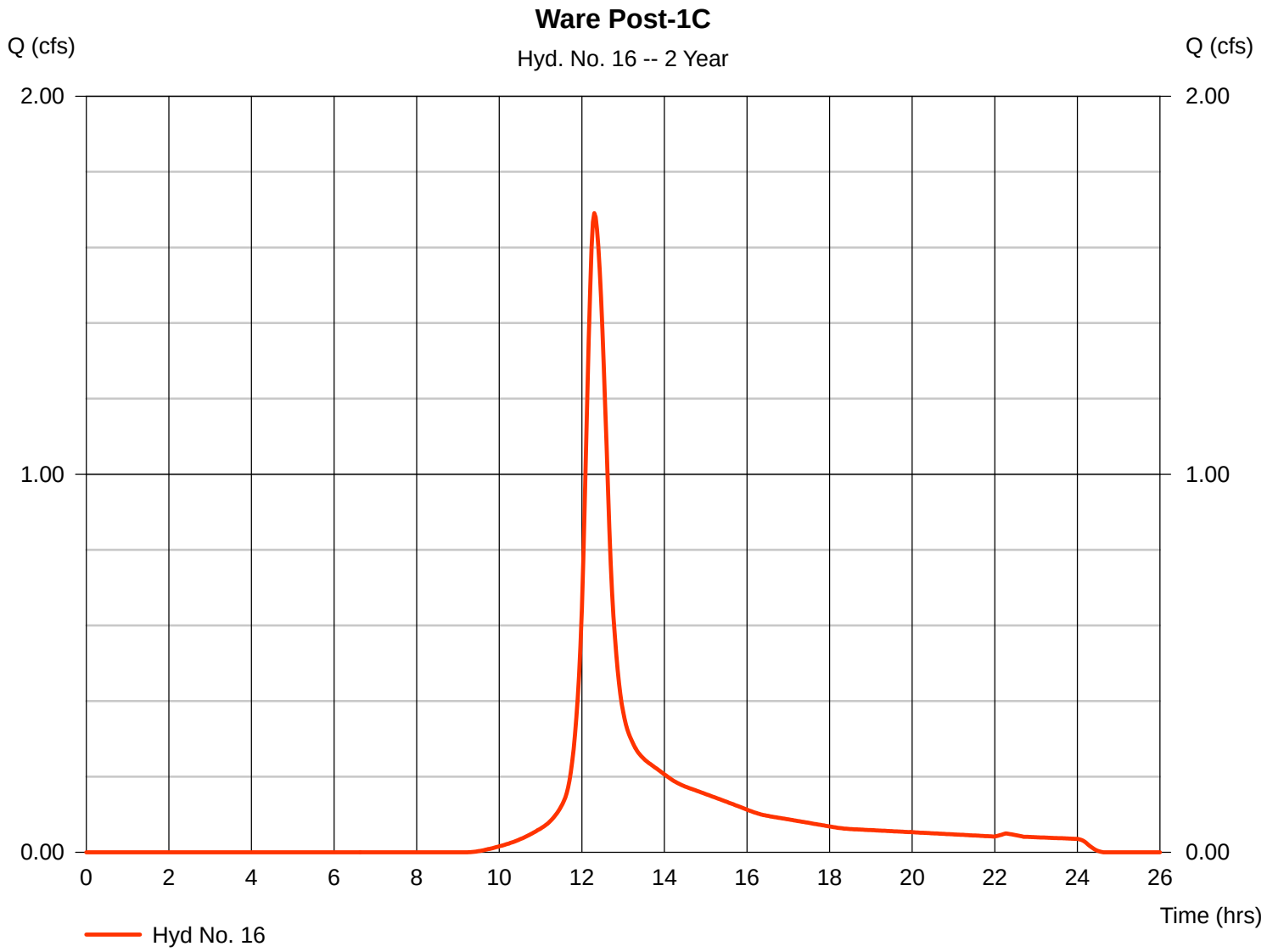
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 16

Ware Post-1C

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.690 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.30 hrs
Time interval	=	2 min	Hyd. volume	=	8,402 cuft
Drainage area	=	1.360 ac	Curve number	=	78
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.79 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



30

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No. 16

Ware Post-1C

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.150		0.011		0.011		
Flow length (ft)	=	150.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.80		0.00		0.00		
Land slope (%)	=	0.50		0.00		0.00		
Travel Time (min)	**=**	**21.65**	**+**	**0.00**	**+**	**0.00**	**=**	**21.65**
Shallow Concentrated Flow								
Flow length (ft)	=	215.00		0.00		0.00		
Watercourse slope (%)	=	0.50		0.00		0.00		
Surface description	=	Unpaved		Paved		Paved		
Average velocity (ft/s)	=	1.14		0.00		0.00		
Travel Time (min)	**=**	**3.14**	**+**	**0.00**	**+**	**0.00**	**=**	**3.14**
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 ..... 24.79 min

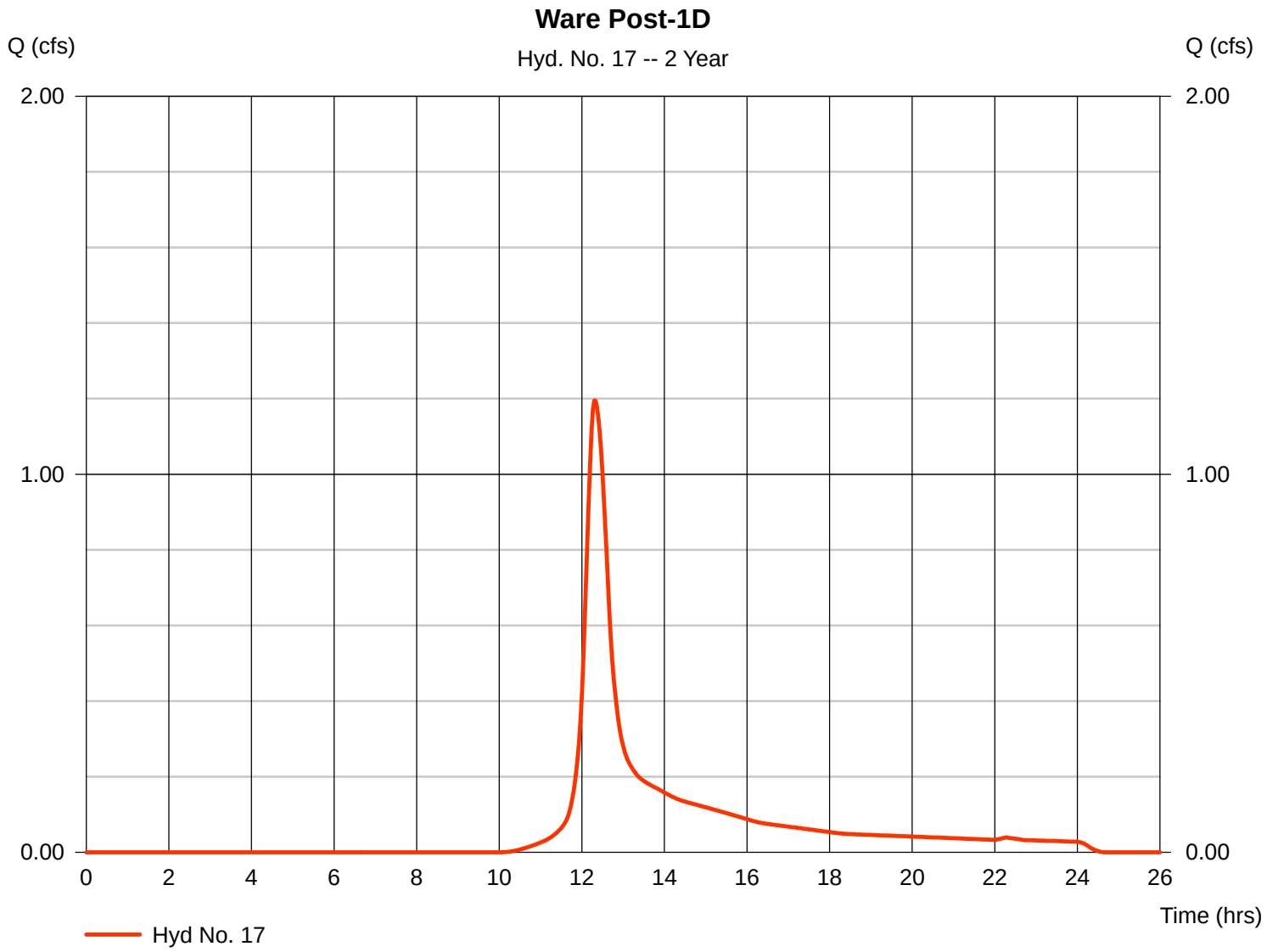
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 17

Ware Post-1D

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.195 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.30 hrs
Time interval	=	2 min	Hyd. volume	=	6,067 cuft
Drainage area	=	1.170 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.90 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



32

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No. 17

Ware Post-1D

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.150		0.011		0.011		
Flow length (ft)	=	150.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.80		0.00		0.00		
Land slope (%)	=	0.40		0.00		0.00		
Travel Time (min)	**=**	**23.67**	**+**	**0.00**	**+**	**0.00**	**=**	**23.67**
Shallow Concentrated Flow								
Flow length (ft)	=	75.00		0.00		0.00		
Watercourse slope (%)	=	0.40		0.00		0.00		
Surface description	=	Unpaved		Paved		Paved		
Average velocity (ft/s)	=	1.02		0.00		0.00		
Travel Time (min)	**=**	**1.22**	**+**	**0.00**	**+**	**0.00**	**=**	**1.22**
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 ..... 24.90 min

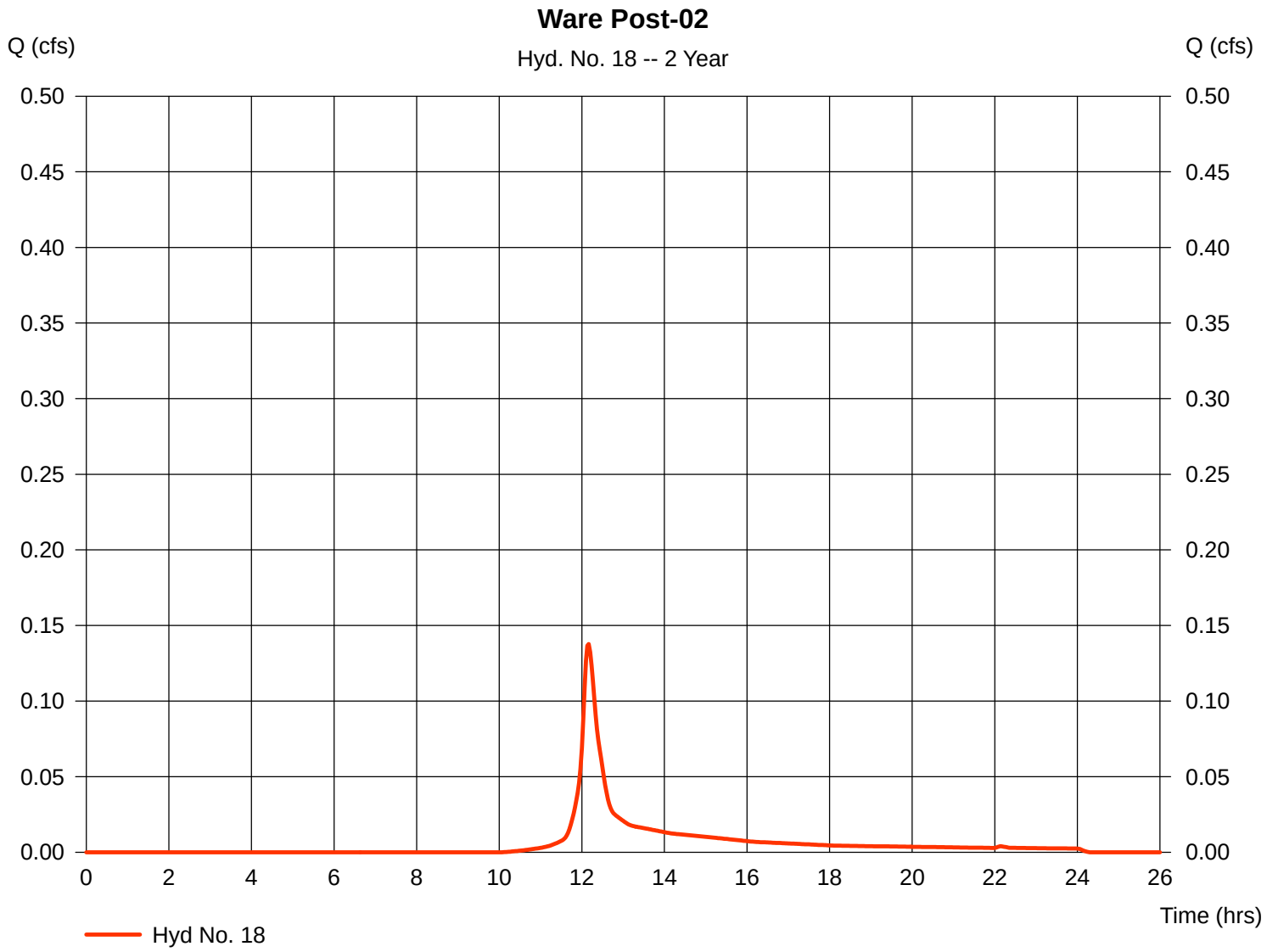
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 18

Ware Post-02

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.138 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.17 hrs
Time interval	=	2 min	Hyd. volume	=	543 cuft
Drainage area	=	0.100 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.30 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



34

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No. 18

Ware Post-02

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.150		0.011		0.011		
Flow length (ft)	=	74.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.80		0.00		0.00		
Land slope (%)	=	0.50		0.00		0.00		
Travel Time (min)	**=**	**12.30**	**+**	**0.00**	**+**	**0.00**	**=**	**12.30**
Shallow Concentrated Flow								
Flow length (ft)	=	0.00		0.00		0.00		
Watercourse slope (%)	=	0.00		0.00		0.00		
Surface description	=	Paved		Paved		Paved		
Average velocity (ft/s)	=	0.00		0.00		0.00		
Travel Time (min)	**=**	**0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
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 ..... 12.30 min

Hydrograph Report

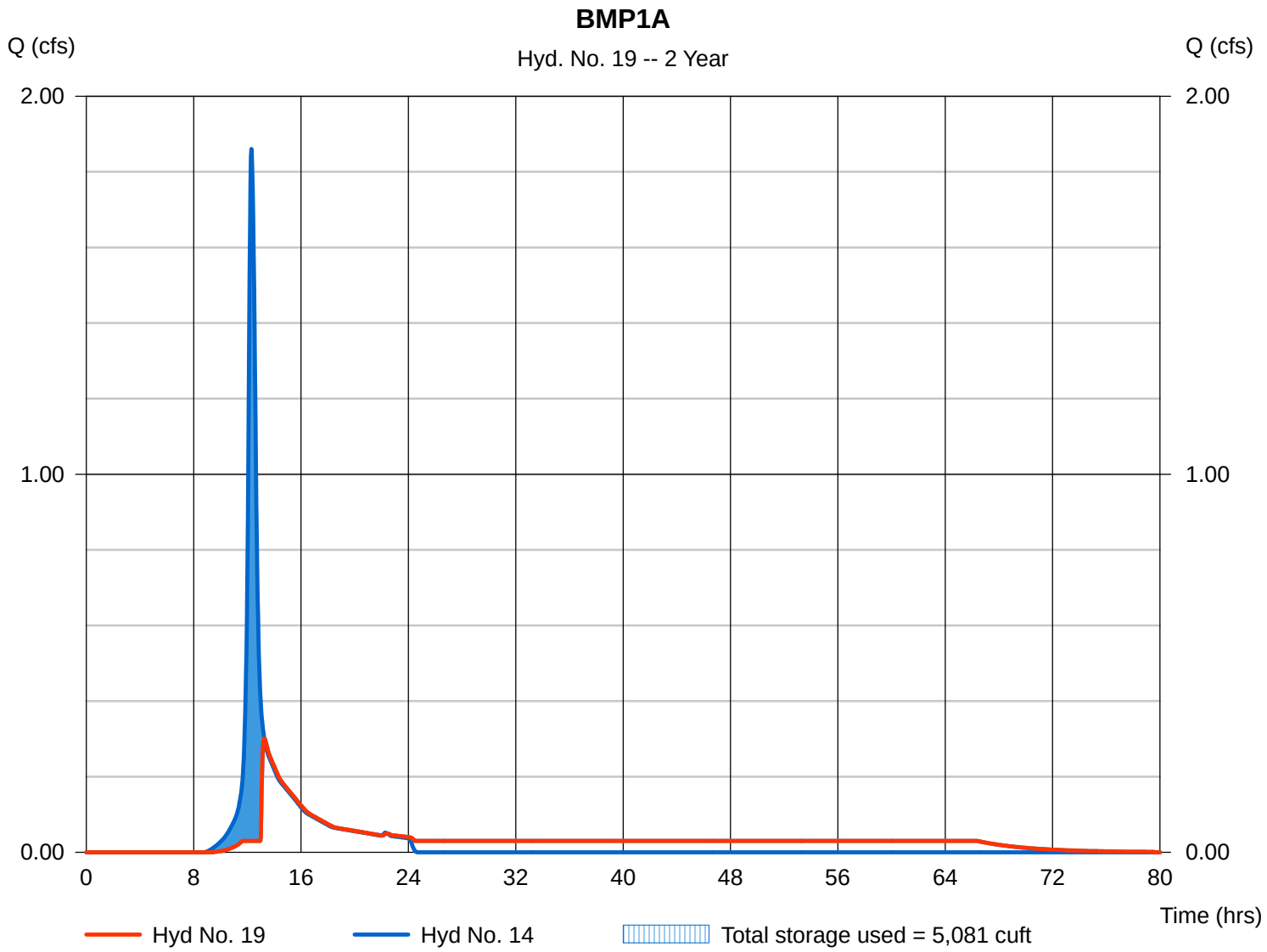
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 19

BMP1A

Hydrograph type	=	Reservoir	Peak discharge	=	0.301 cfs
Storm frequency	=	2 yrs	Time to peak	=	13.27 hrs
Time interval	=	2 min	Hyd. volume	=	9,178 cuft
Inflow hyd. No.	=	14 - Ware Post-1A	Max. Elevation	=	7.54 ft
Reservoir name	=	WARE-BMP1A	Max. Storage	=	5,081 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Pond No. 3 - WARE-BMP1A

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	3.00	n/a	0	0
0.50	3.50	n/a	419	419
1.25	4.25	n/a	628	1,047
3.25	6.25	n/a	1,047	2,094
3.50	6.50	n/a	209	2,303
4.00	7.00	n/a	1,182	3,485
4.25	7.25	n/a	694	4,179
4.50	7.50	n/a	764	4,943
4.62	7.62	n/a	392	5,335
4.75	7.75	n/a	444	5,779
5.00	8.00	n/a	6,887	12,666

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	Inactive	Inactive
Span (in)	= 6.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 3.50	0.00	0.00	0.00
Length (ft)	= 0.50	0.00	0.00	0.00
Slope (%)	= 0.03	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.33	Inactive	Inactive	Inactive
Crest El. (ft)	= 7.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.410 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	3.00	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.05	42	3.05	0.00	---	---	---	0.00	---	---	---	0.000	0.003	0.003
0.10	84	3.10	0.00	---	---	---	0.00	---	---	---	0.000	0.006	0.006
0.15	126	3.15	0.00	---	---	---	0.00	---	---	---	0.000	0.009	0.009
0.20	168	3.20	0.00	---	---	---	0.00	---	---	---	0.000	0.012	0.012
0.25	210	3.25	0.00	---	---	---	0.00	---	---	---	0.000	0.015	0.015
0.30	251	3.30	0.00	---	---	---	0.00	---	---	---	0.000	0.018	0.018
0.35	293	3.35	0.00	---	---	---	0.00	---	---	---	0.000	0.021	0.021
0.40	335	3.40	0.00	---	---	---	0.00	---	---	---	0.000	0.024	0.024
0.45	377	3.45	0.00	---	---	---	0.00	---	---	---	0.000	0.027	0.027
0.50	419	3.50	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
0.58	482	3.58	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
0.65	545	3.65	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
0.73	607	3.73	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
0.80	670	3.80	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
0.87	733	3.88	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
0.95	796	3.95	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
1.03	859	4.03	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
1.10	921	4.10	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
1.18	984	4.18	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
1.25	1,047	4.25	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
1.45	1,152	4.45	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
1.65	1,256	4.65	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
1.85	1,361	4.85	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
2.05	1,466	5.05	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
2.25	1,571	5.25	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
2.45	1,675	5.45	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
2.65	1,780	5.65	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
2.85	1,885	5.85	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.05	1,989	6.05	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.25	2,094	6.25	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.28	2,115	6.28	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.30	2,136	6.30	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.33	2,157	6.33	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030

Continues on next page...

WARE-BMP1A

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.35	2,178	6.35	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.38	2,199	6.38	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.40	2,219	6.40	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.43	2,240	6.43	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.45	2,261	6.45	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.48	2,282	6.48	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.50	2,303	6.50	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.55	2,421	6.55	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.60	2,539	6.60	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.65	2,658	6.65	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.70	2,776	6.70	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.75	2,894	6.75	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.80	3,012	6.80	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.85	3,130	6.85	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.90	3,249	6.90	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.95	3,367	6.95	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.00	3,485	7.00	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.03	3,554	7.03	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.05	3,624	7.05	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.08	3,693	7.08	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.10	3,763	7.10	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.13	3,832	7.13	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.15	3,901	7.15	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.18	3,971	7.18	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.20	4,040	7.20	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.23	4,110	7.23	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.25	4,179	7.25	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.28	4,255	7.28	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.30	4,332	7.30	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.33	4,408	7.33	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.35	4,485	7.35	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.38	4,561	7.38	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.40	4,637	7.40	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.43	4,714	7.43	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.45	4,790	7.45	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.48	4,866	7.48	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.50	4,943	7.50	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.51	4,982	7.51	0.00	---	---	---	0.05	---	---	---	0.000	---	0.045
4.52	5,021	7.52	0.00	---	---	---	0.13	---	---	---	0.000	---	0.128
4.54	5,060	7.54	0.00	---	---	---	0.23	---	---	---	0.000	---	0.235
4.55	5,100	7.55	0.00	---	---	---	0.36	---	---	---	0.000	---	0.362
4.56	5,139	7.56	0.00	---	---	---	0.51	---	---	---	0.000	---	0.506
4.57	5,178	7.57	0.00	---	---	---	0.66	---	---	---	0.000	---	0.665
4.58	5,217	7.58	0.00	---	---	---	0.84	---	---	---	0.000	---	0.837
4.60	5,257	7.60	0.00	---	---	---	1.02	---	---	---	0.000	---	1.023
4.61	5,296	7.61	0.00	---	---	---	1.22	---	---	---	0.000	---	1.221
4.62	5,335	7.62	0.00	---	---	---	1.43	---	---	---	0.000	---	1.430
4.63	5,379	7.63	0.00	---	---	---	1.67	---	---	---	0.000	---	1.668
4.65	5,424	7.65	0.00	---	---	---	1.92	---	---	---	0.000	---	1.919
4.66	5,468	7.66	0.00	---	---	---	2.18	---	---	---	0.000	---	2.181
4.67	5,513	7.67	0.00	---	---	---	2.45	---	---	---	0.000	---	2.454
4.69	5,557	7.69	0.00	---	---	---	2.74	---	---	---	0.000	---	2.737
4.70	5,601	7.70	0.00	---	---	---	3.03	---	---	---	0.000	---	3.031
4.71	5,646	7.71	0.00	---	---	---	3.33	---	---	---	0.000	---	3.334
4.72	5,690	7.72	0.00	---	---	---	3.65	---	---	---	0.000	---	3.647
4.74	5,735	7.74	0.00	---	---	---	3.97	---	---	---	0.000	---	3.969
4.75	5,779	7.75	0.00	---	---	---	4.30	---	---	---	0.000	---	4.300
4.78	6,468	7.78	0.00	---	---	---	4.96	---	---	---	0.000	---	4.961
4.80	7,156	7.80	0.00	---	---	---	5.65	---	---	---	0.000	---	5.652
4.83	7,845	7.83	0.00	---	---	---	6.37	---	---	---	0.000	---	6.373
4.85	8,534	7.85	0.00	---	---	---	7.12	---	---	---	0.000	---	7.123
4.88	9,223	7.88	0.00	---	---	---	7.90	---	---	---	0.000	---	7.899
4.90	9,911	7.90	0.00	---	---	---	8.70	---	---	---	0.000	---	8.702
4.93	10,600	7.93	0.00	---	---	---	9.53	---	---	---	0.000	---	9.531
4.95	11,289	7.95	0.00	---	---	---	10.38	---	---	---	0.000	---	10.38
4.98	11,977	7.98	0.00	---	---	---	11.26	---	---	---	0.000	---	11.26
5.00	12,666	8.00	0.00	---	---	---	12.16	---	---	---	0.000	---	12.16

...End

Hydrograph Report

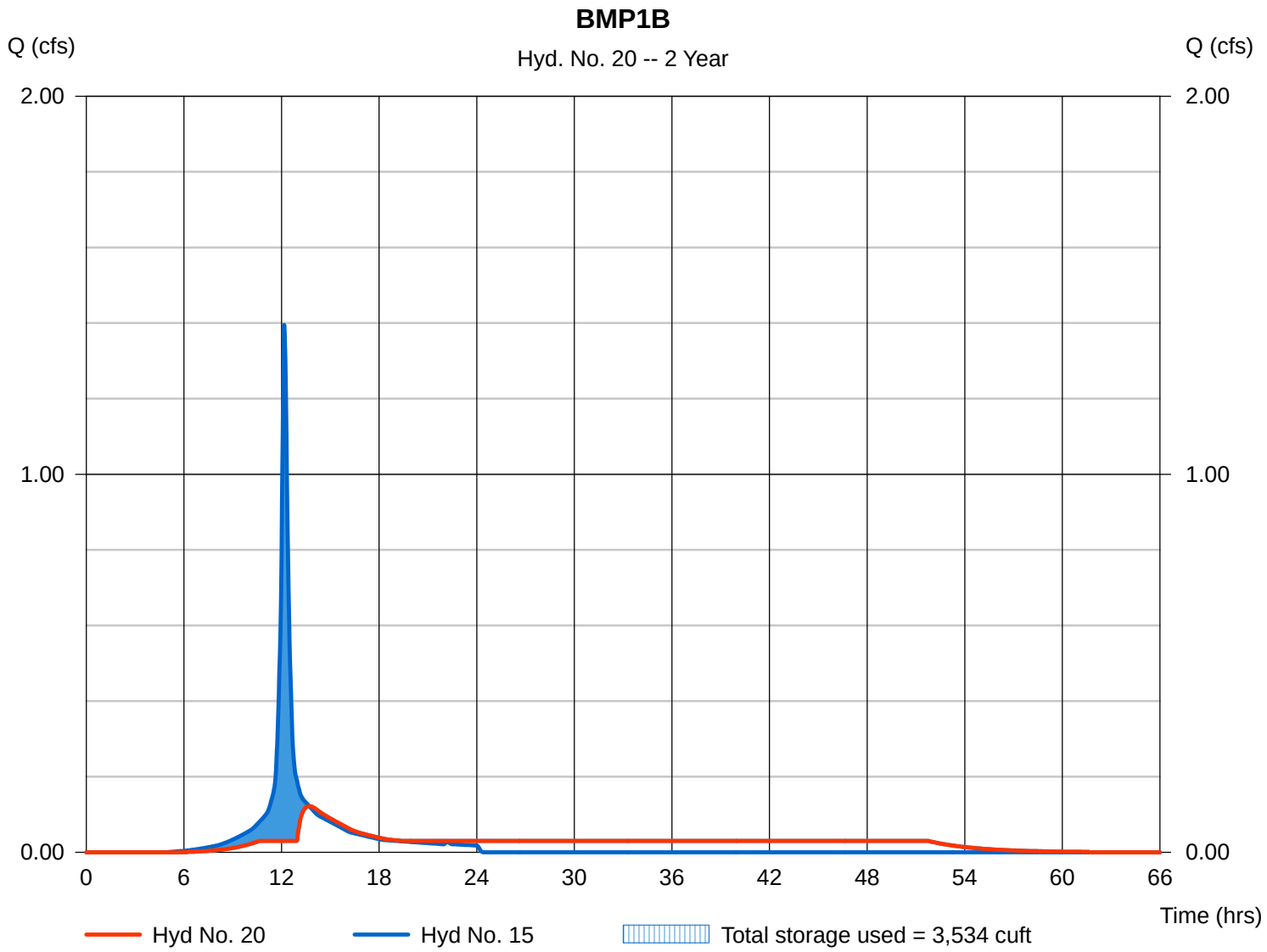
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 20

BMP1B

Hydrograph type	=	Reservoir	Peak discharge	=	0.122 cfs
Storm frequency	=	2 yrs	Time to peak	=	13.70 hrs
Time interval	=	2 min	Hyd. volume	=	5,791 cuft
Inflow hyd. No.	=	15 - Ware Post-1B	Max. Elevation	=	6.85 ft
Reservoir name	=	WARE-BMP1B	Max. Storage	=	3,534 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Pond No. 4 - WARE-BMP1B

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	2.50	n/a	0	0
0.50	3.00	n/a	314	314
1.25	3.75	n/a	471	785
3.25	5.75	n/a	785	1,570
3.50	6.00	n/a	157	1,727
4.00	6.50	n/a	904	2,631
4.50	7.00	n/a	1,300	3,931
5.50	8.00	n/a	27,382	31,313

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	Inactive	Inactive
Span (in)	= 6.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 3.00	0.00	0.00	0.00
Length (ft)	= 0.50	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.33	Inactive	Inactive	Inactive
Crest El. (ft)	= 6.83	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.410 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	2.50	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.05	31	2.55	0.00	---	---	---	0.00	---	---	---	0.000	0.003	0.003
0.10	63	2.60	0.00	---	---	---	0.00	---	---	---	0.000	0.006	0.006
0.15	94	2.65	0.00	---	---	---	0.00	---	---	---	0.000	0.009	0.009
0.20	126	2.70	0.00	---	---	---	0.00	---	---	---	0.000	0.012	0.012
0.25	157	2.75	0.00	---	---	---	0.00	---	---	---	0.000	0.015	0.015
0.30	188	2.80	0.00	---	---	---	0.00	---	---	---	0.000	0.018	0.018
0.35	220	2.85	0.00	---	---	---	0.00	---	---	---	0.000	0.021	0.021
0.40	251	2.90	0.00	---	---	---	0.00	---	---	---	0.000	0.024	0.024
0.45	283	2.95	0.00	---	---	---	0.00	---	---	---	0.000	0.027	0.027
0.50	314	3.00	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
0.58	361	3.08	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
0.65	408	3.15	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
0.73	455	3.23	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
0.80	502	3.30	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
0.87	550	3.38	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
0.95	597	3.45	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
1.03	644	3.53	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
1.10	691	3.60	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
1.18	738	3.68	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
1.25	785	3.75	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
1.45	864	3.95	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
1.65	942	4.15	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
1.85	1,021	4.35	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
2.05	1,099	4.55	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
2.25	1,178	4.75	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
2.45	1,256	4.95	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
2.65	1,335	5.15	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
2.85	1,413	5.35	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.05	1,492	5.55	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.25	1,570	5.75	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.28	1,586	5.78	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.30	1,601	5.80	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.33	1,617	5.83	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.35	1,633	5.85	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.38	1,649	5.88	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.40	1,664	5.90	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030

Continues on next page...

WARE-BMP1B

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.43	1,680	5.93	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.45	1,696	5.95	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.48	1,711	5.98	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.50	1,727	6.00	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.55	1,817	6.05	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.60	1,908	6.10	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.65	1,998	6.15	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.70	2,089	6.20	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.75	2,179	6.25	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.80	2,269	6.30	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.85	2,360	6.35	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.90	2,450	6.40	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
3.95	2,541	6.45	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.00	2,631	6.50	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.05	2,761	6.55	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.10	2,891	6.60	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.15	3,021	6.65	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.20	3,151	6.70	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.25	3,281	6.75	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.30	3,411	6.80	0.00	---	---	---	0.00	---	---	---	0.000	0.030	0.030
4.35	3,541	6.85	0.00	---	---	---	0.10	---	---	---	0.000	0.030	0.127
4.40	3,671	6.90	0.00	---	---	---	0.64	---	---	---	0.000	0.030	0.667
4.45	3,801	6.95	0.00	---	---	---	1.43	---	---	---	0.000	0.030	1.460
4.50	3,931	7.00	0.00	---	---	---	2.41	---	---	---	0.000	0.030	2.441
4.60	6,669	7.10	0.00	---	---	---	4.83	---	---	---	0.000	---	4.826
4.70	9,407	7.20	0.00	---	---	---	7.74	---	---	---	0.000	---	7.742
4.80	12,146	7.30	0.00	---	---	---	11.08	---	---	---	0.000	---	11.08
4.90	14,884	7.40	0.00	---	---	---	14.80	---	---	---	0.000	---	14.80
5.00	17,622	7.50	0.00	---	---	---	18.86	---	---	---	0.000	---	18.86
5.10	20,360	7.60	0.00	---	---	---	23.24	---	---	---	0.000	---	23.24
5.20	23,098	7.70	0.00	---	---	---	27.91	---	---	---	0.000	---	27.91
5.30	25,837	7.80	0.00	---	---	---	32.86	---	---	---	0.000	---	32.86
5.40	28,575	7.90	0.00	---	---	---	38.07	---	---	---	0.000	---	38.07
5.50	31,313	8.00	0.00	---	---	---	43.53	---	---	---	0.000	---	43.53

...End

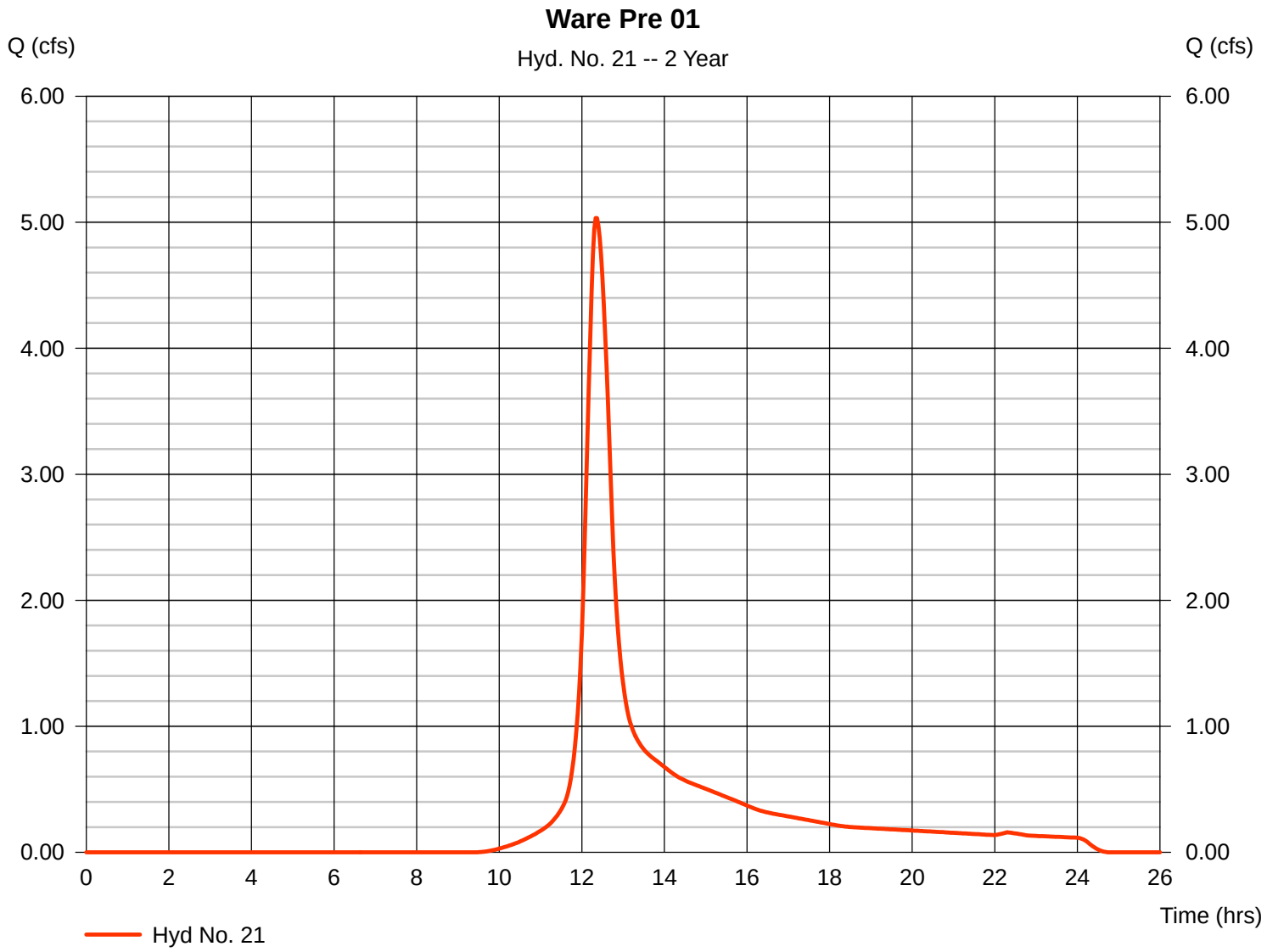
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 21

Ware Pre 01

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.033 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.37 hrs
Time interval	=	2 min	Hyd. volume	=	26,707 cuft
Drainage area	=	4.440 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	28.10 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



42

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No. 21

Ware Pre 01

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.150		0.011		0.011		
Flow length (ft)	=	150.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.80		0.00		0.00		
Land slope (%)	=	0.50		0.00		0.00		
Travel Time (min)	**=**	**21.65**	**+**	**0.00**	**+**	**0.00**	**=**	**21.65**
Shallow Concentrated Flow								
Flow length (ft)	=	439.00		0.00		0.00		
Watercourse slope (%)	=	0.50		0.00		0.00		
Surface description	=	Unpaved		Paved		Paved		
Average velocity (ft/s)	=	1.14		0.00		0.00		
Travel Time (min)	**=**	**6.41**	**+**	**0.00**	**+**	**0.00**	**=**	**6.41**
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 ..... 28.10 min

Hydrograph Report

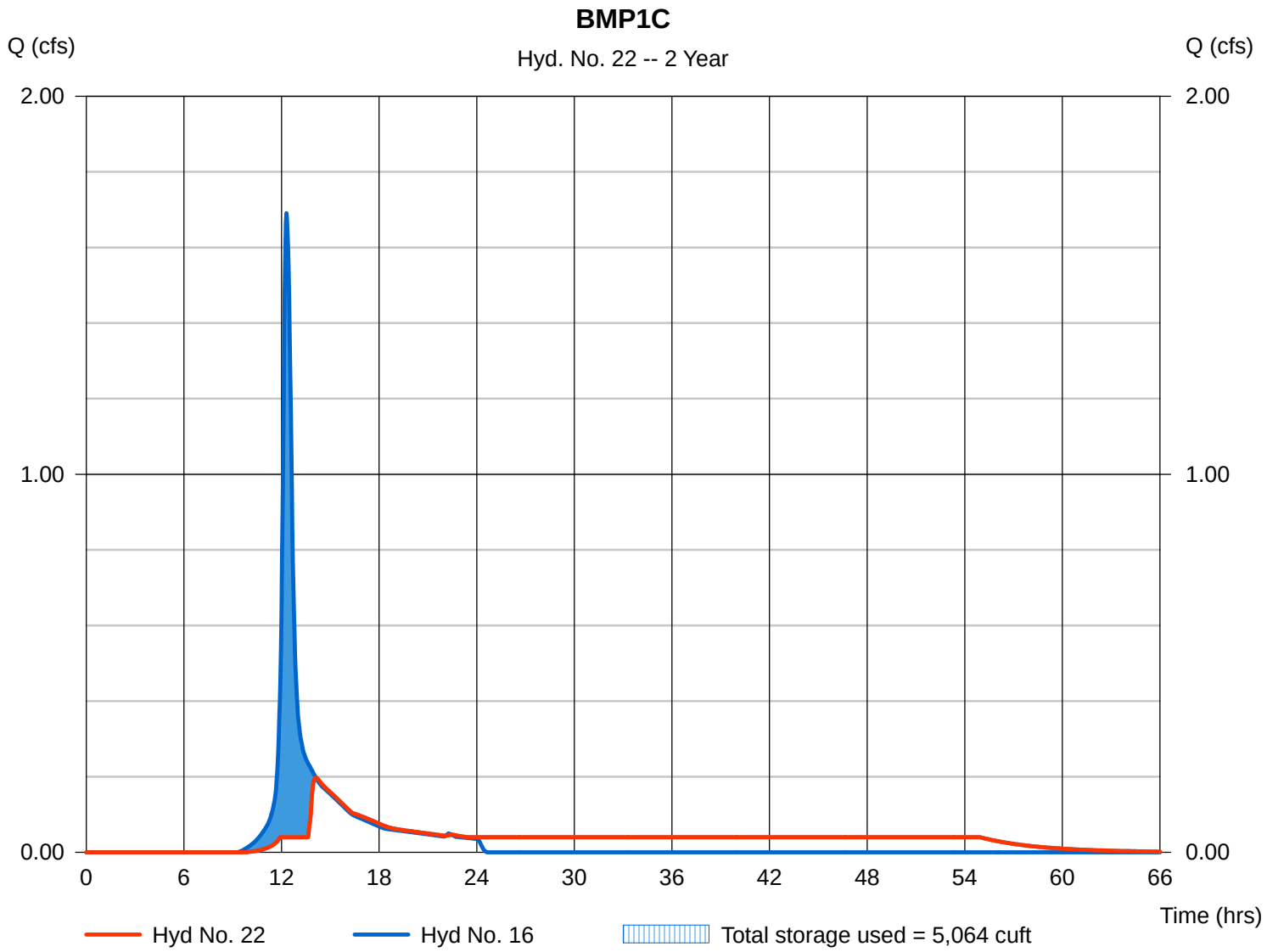
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 22

BMP1C

Hydrograph type	=	Reservoir	Peak discharge	=	0.197 cfs
Storm frequency	=	2 yrs	Time to peak	=	14.10 hrs
Time interval	=	2 min	Hyd. volume	=	8,389 cuft
Inflow hyd. No.	=	16 - Ware Post-1C	Max. Elevation	=	7.71 ft
Reservoir name	=	WareBMP1C	Max. Storage	=	5,064 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Pond No. 5 - WareBMP1C

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	3.50	n/a	0	0
0.50	4.00	n/a	512	512
1.25	4.75	n/a	767	1,279
3.25	6.75	n/a	1,279	2,558
3.50	7.00	n/a	256	2,814
4.00	7.50	n/a	1,488	4,302
4.25	7.75	n/a	903	5,205
4.50	8.00	n/a	1,010	6,215

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	Inactive	Inactive
Span (in)	= 6.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 3.50	0.00	0.00	0.00
Length (ft)	= 0.50	0.00	0.00	0.00
Slope (%)	= 0.03	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.33	Inactive	Inactive	Inactive
Crest El. (ft)	= 7.69	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.410 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	3.50	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.05	51	3.55	0.00	---	---	---	0.00	---	---	---	0.000	0.004	0.004
0.10	102	3.60	0.00	---	---	---	0.00	---	---	---	0.000	0.008	0.008
0.15	154	3.65	0.00	---	---	---	0.00	---	---	---	0.000	0.012	0.012
0.20	205	3.70	0.00	---	---	---	0.00	---	---	---	0.000	0.016	0.016
0.25	256	3.75	0.00	---	---	---	0.00	---	---	---	0.000	0.020	0.020
0.30	307	3.80	0.00	---	---	---	0.00	---	---	---	0.000	0.024	0.024
0.35	358	3.85	0.00	---	---	---	0.00	---	---	---	0.000	0.028	0.028
0.40	410	3.90	0.00	---	---	---	0.00	---	---	---	0.000	0.032	0.032
0.45	461	3.95	0.00	---	---	---	0.00	---	---	---	0.000	0.036	0.036
0.50	512	4.00	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
0.58	589	4.08	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
0.65	665	4.15	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
0.73	742	4.22	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
0.80	819	4.30	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
0.87	896	4.37	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
0.95	972	4.45	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
1.03	1,049	4.52	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
1.10	1,126	4.60	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
1.18	1,202	4.67	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
1.25	1,279	4.75	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
1.45	1,407	4.95	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
1.65	1,535	5.15	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
1.85	1,663	5.35	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
2.05	1,791	5.55	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
2.25	1,919	5.75	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
2.45	2,046	5.95	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
2.65	2,174	6.15	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
2.85	2,302	6.35	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.05	2,430	6.55	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.25	2,558	6.75	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.28	2,584	6.78	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.30	2,609	6.80	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.33	2,635	6.83	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.35	2,660	6.85	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.38	2,686	6.88	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.40	2,712	6.90	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040

Continues on next page...

WareBMP1C

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.43	2,737	6.93	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.45	2,763	6.95	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.48	2,788	6.98	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.50	2,814	7.00	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.55	2,963	7.05	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.60	3,112	7.10	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.65	3,260	7.15	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.70	3,409	7.20	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.75	3,558	7.25	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.80	3,707	7.30	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.85	3,856	7.35	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.90	4,004	7.40	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
3.95	4,153	7.45	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
4.00	4,302	7.50	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
4.03	4,392	7.53	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
4.05	4,483	7.55	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
4.08	4,573	7.58	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
4.10	4,663	7.60	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
4.13	4,753	7.63	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
4.15	4,844	7.65	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
4.18	4,934	7.68	0.00	---	---	---	0.00	---	---	---	0.000	0.040	0.040
4.20	5,024	7.70	0.00	---	---	---	0.06	---	---	---	0.000	0.040	0.103
4.23	5,115	7.73	0.00	---	---	---	0.28	---	---	---	0.000	0.040	0.315
4.25	5,205	7.75	0.00	---	---	---	0.57	---	---	---	0.000	0.040	0.610
4.28	5,306	7.78	0.00	---	---	---	0.93	---	---	---	0.000	0.040	0.969
4.30	5,407	7.80	0.00	---	---	---	1.34	---	---	---	0.000	0.040	1.382
4.33	5,508	7.83	0.00	---	---	---	1.80	---	---	---	0.000	0.040	1.842
4.35	5,609	7.85	0.00	---	---	---	2.31	---	---	---	0.000	0.040	2.346
4.38	5,710	7.88	0.00	---	---	---	2.85	---	---	---	0.000	0.040	2.889
4.40	5,811	7.90	0.00	---	---	---	3.43	---	---	---	0.000	0.040	3.469
4.43	5,912	7.93	0.00	---	---	---	4.04	---	---	---	0.000	0.040	4.084
4.45	6,013	7.95	0.00	---	---	---	4.69	---	---	---	0.000	0.040	4.733
4.48	6,114	7.98	0.00	---	---	---	5.37	---	---	---	0.000	0.040	5.412
4.50	6,215	8.00	0.00	---	---	---	6.08	---	---	---	0.000	0.040	6.121

...End

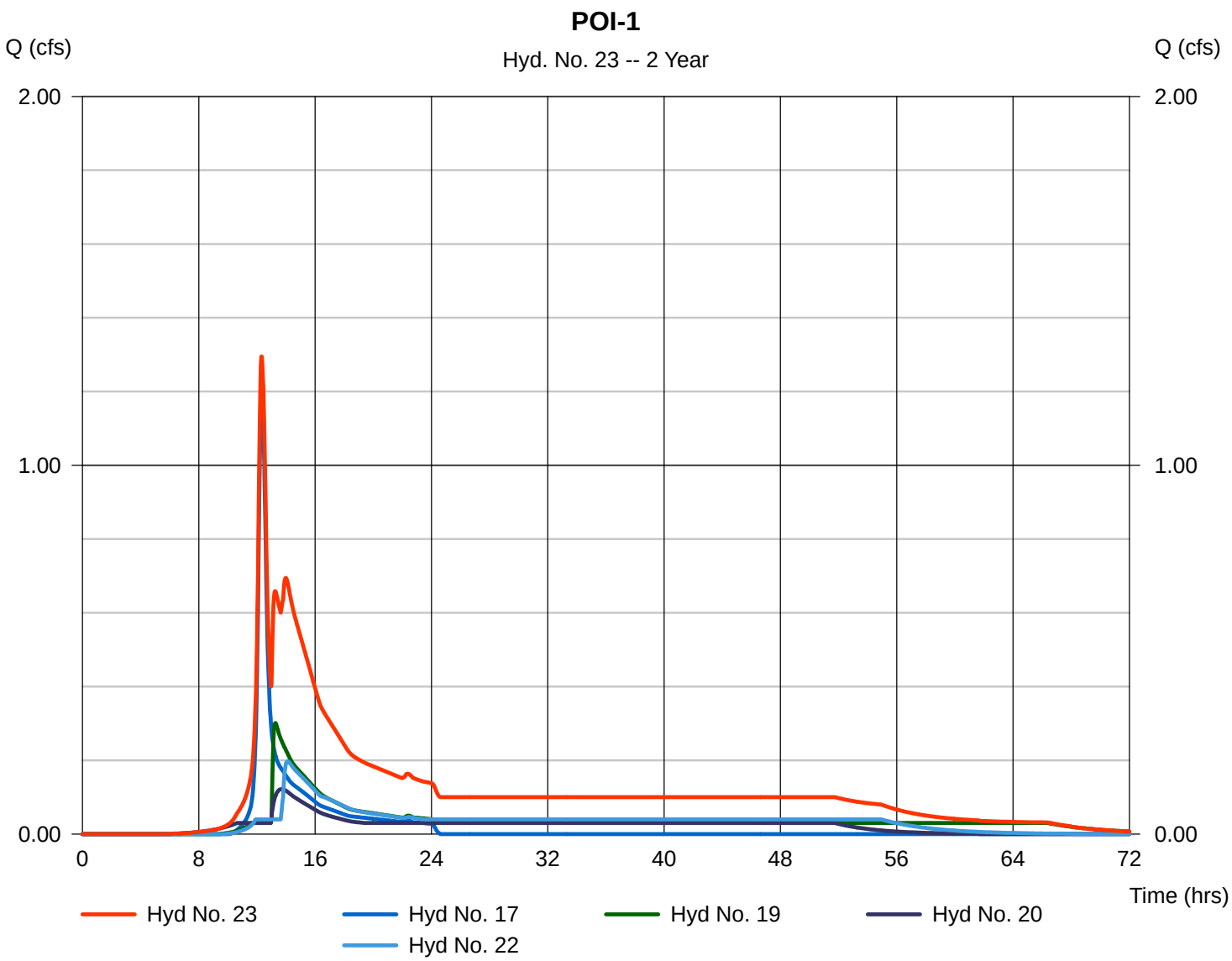
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 23

POI-1

Hydrograph type	= Combine	Peak discharge	= 1.295 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.30 hrs
Time interval	= 2 min	Hyd. volume	= 29,425 cuft
Inflow hyds.	= 17, 19, 20, 22	Contrib. drain. area	= 1.170 ac



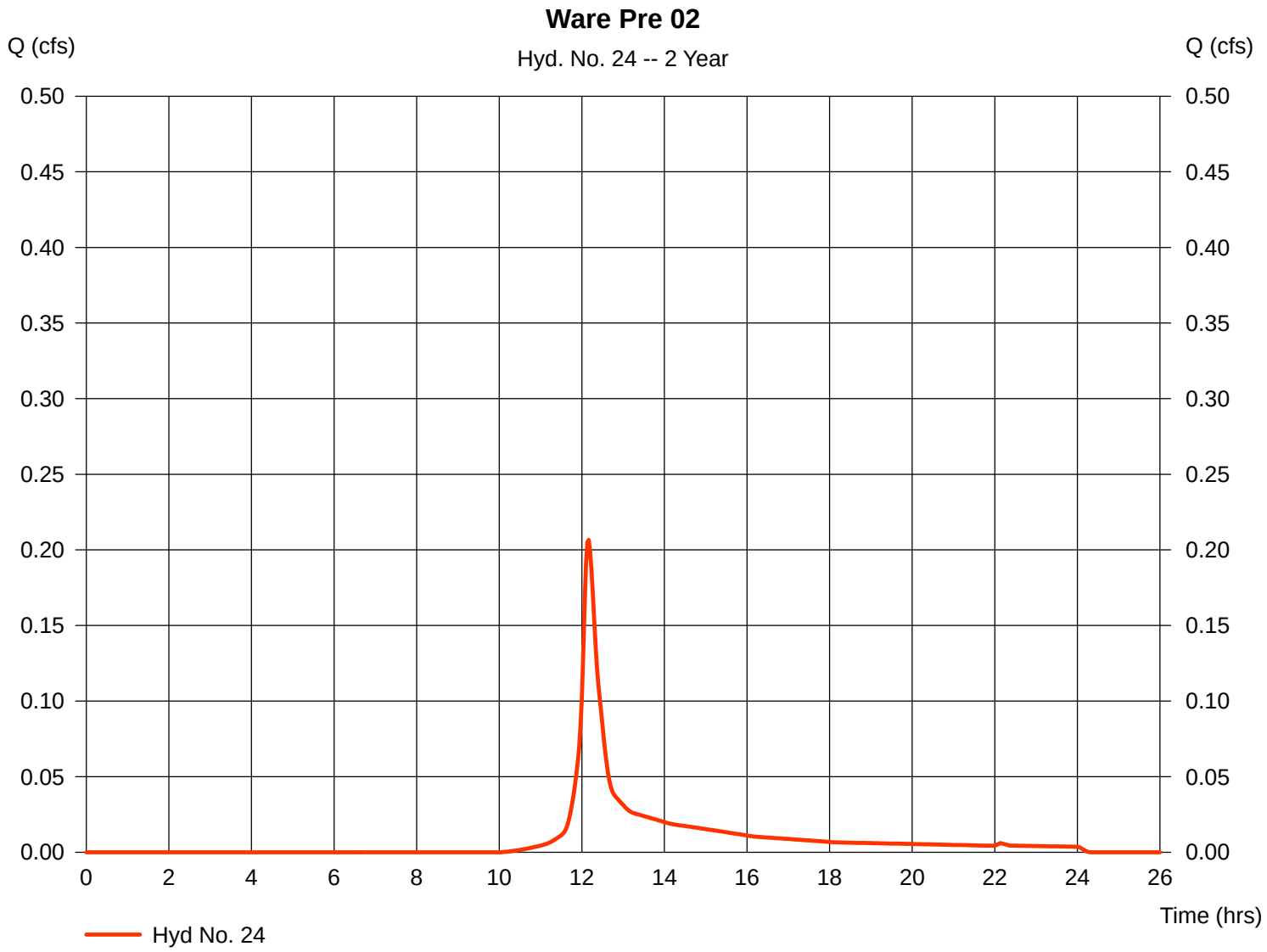
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 24

Ware Pre 02

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.207 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.17 hrs
Time interval	=	2 min	Hyd. volume	=	815 cuft
Drainage area	=	0.150 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.80 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



48

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No. 24

Ware Pre 02

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.150		0.011		0.011		
Flow length (ft)	=	78.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.80		0.00		0.00		
Land slope (%)	=	0.50		0.00		0.00		
Travel Time (min)	**=**	**12.83**	**+**	**0.00**	**+**	**0.00**	**=**	**12.83**
Shallow Concentrated Flow								
Flow length (ft)	=	0.00		0.00		0.00		
Watercourse slope (%)	=	0.00		0.00		0.00		
Surface description	=	Paved		Paved		Paved		
Average velocity (ft/s)	=	0.00		0.00		0.00		
Travel Time (min)	**=**	**0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
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 ..... 12.80 min

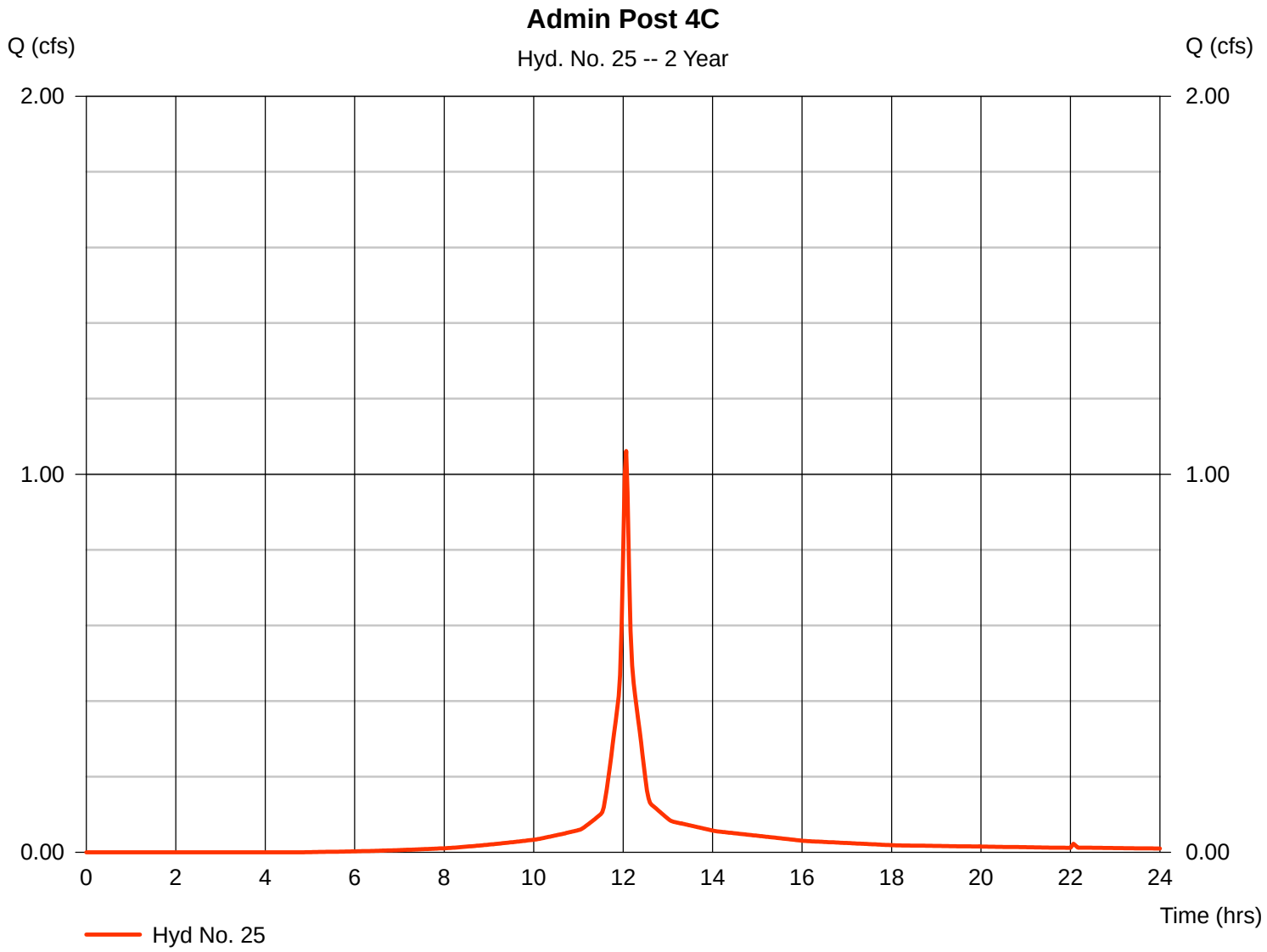
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 25

Admin Post 4C

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.062 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	3,270 cuft
Drainage area	=	0.340 ac	Curve number	=	91
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

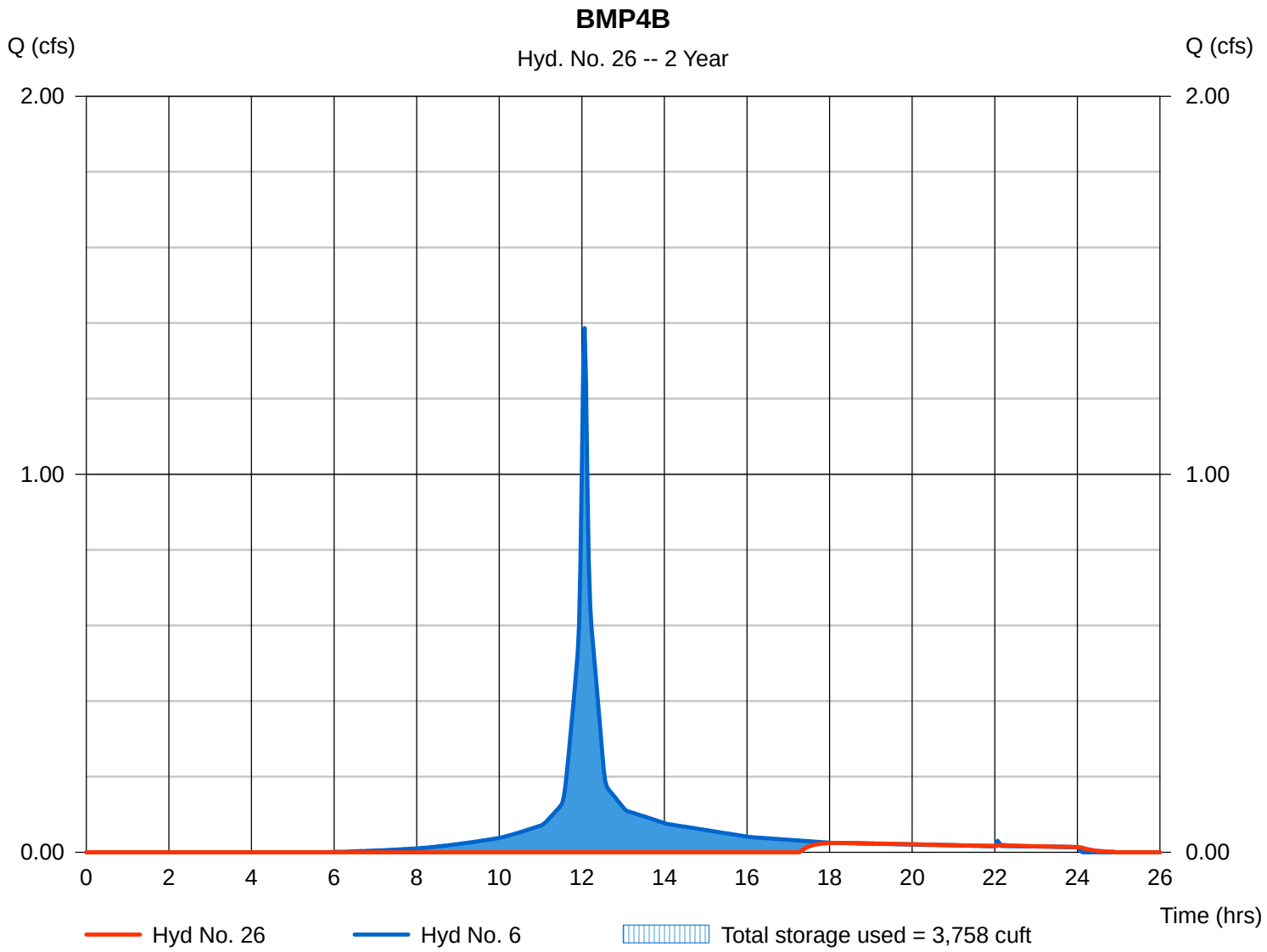
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 26

BMP4B

Hydrograph type	=	Reservoir	Peak discharge	=	0.025 cfs
Storm frequency	=	2 yrs	Time to peak	=	18.20 hrs
Time interval	=	2 min	Hyd. volume	=	486 cuft
Inflow hyd. No.	=	6 - Admin Post 4B	Max. Elevation	=	8.30 ft
Reservoir name	=	ADMIN-BMP4B	Max. Storage	=	3,758 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Pond No. 6 - ADMIN-BMP4B

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	4.00	n/a	0	0
0.50	4.50	n/a	176	176
1.25	5.25	n/a	263	439
3.25	7.25	n/a	439	878
3.50	7.50	n/a	88	966
4.00	8.00	n/a	515	1,481
5.00	9.00	n/a	7,493	8,974

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	Inactive	Inactive
Span (in)	= 6.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 4.50	0.00	0.00	0.00
Length (ft)	= 0.50	0.00	0.00	0.00
Slope (%)	= 0.03	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.33	Inactive	Inactive	Inactive
Crest El. (ft)	= 8.33	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 3.790 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	4.00	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.05	18	4.05	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.10	35	4.10	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.15	53	4.15	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.20	70	4.20	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.25	88	4.25	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.30	105	4.30	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.35	123	4.35	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.40	140	4.40	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.45	158	4.45	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.50	176	4.50	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.58	202	4.58	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.65	228	4.65	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.73	255	4.72	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.80	281	4.80	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.87	307	4.87	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
0.95	334	4.95	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
1.03	360	5.02	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
1.10	386	5.10	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
1.18	413	5.17	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
1.25	439	5.25	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
1.45	483	5.45	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
1.65	527	5.65	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
1.85	571	5.85	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
2.05	615	6.05	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
2.25	659	6.25	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
2.45	702	6.45	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
2.65	746	6.65	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
2.85	790	6.85	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.05	834	7.05	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.25	878	7.25	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.28	887	7.28	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.30	896	7.30	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.33	904	7.33	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.35	913	7.35	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.38	922	7.38	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.40	931	7.40	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.43	939	7.43	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000

Continues on next page...

52

ADMIN-BMP4B

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.45	948	7.45	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.48	957	7.48	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.50	966	7.50	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.55	1,017	7.55	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.60	1,069	7.60	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.65	1,120	7.65	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.70	1,172	7.70	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.75	1,223	7.75	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.80	1,275	7.80	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.85	1,326	7.85	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.90	1,378	7.90	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
3.95	1,429	7.95	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
4.00	1,481	8.00	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
4.10	2,230	8.10	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
4.20	2,979	8.20	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
4.30	3,729	8.30	0.00	---	---	---	0.00	---	---	---	0.000	---	0.000
4.40	4,478	8.40	0.00	---	---	---	0.64	---	---	---	0.000	---	0.637
4.50	5,227	8.50	0.00	---	---	---	2.41	---	---	---	0.000	---	2.411
4.60	5,977	8.60	0.00	---	---	---	4.83	---	---	---	0.000	---	4.826
4.70	6,726	8.70	0.00	---	---	---	7.74	---	---	---	0.000	---	7.742
4.80	7,475	8.80	0.00	---	---	---	11.08	---	---	---	0.000	---	11.08
4.90	8,224	8.90	0.00	---	---	---	14.80	---	---	---	0.000	---	14.80
5.00	8,974	9.00	0.00	---	---	---	18.87	---	---	---	0.000	---	18.87

...End

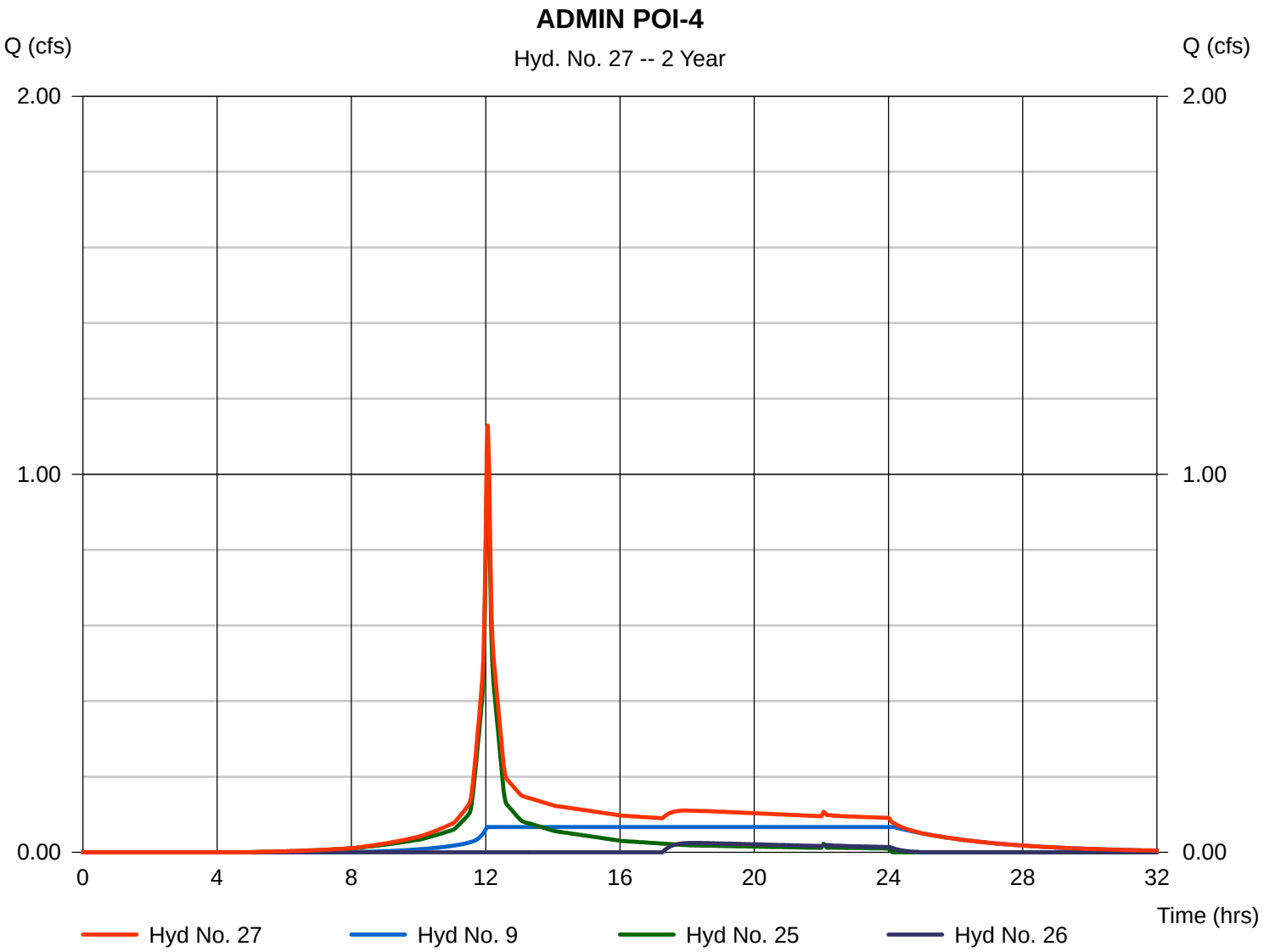
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 27

ADMIN POI-4

Hydrograph type	=	Combine	Peak discharge	=	1.129 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	7,554 cuft
Inflow hyds.	=	9, 25, 26	Contrib. drain. area	=	0.340 ac



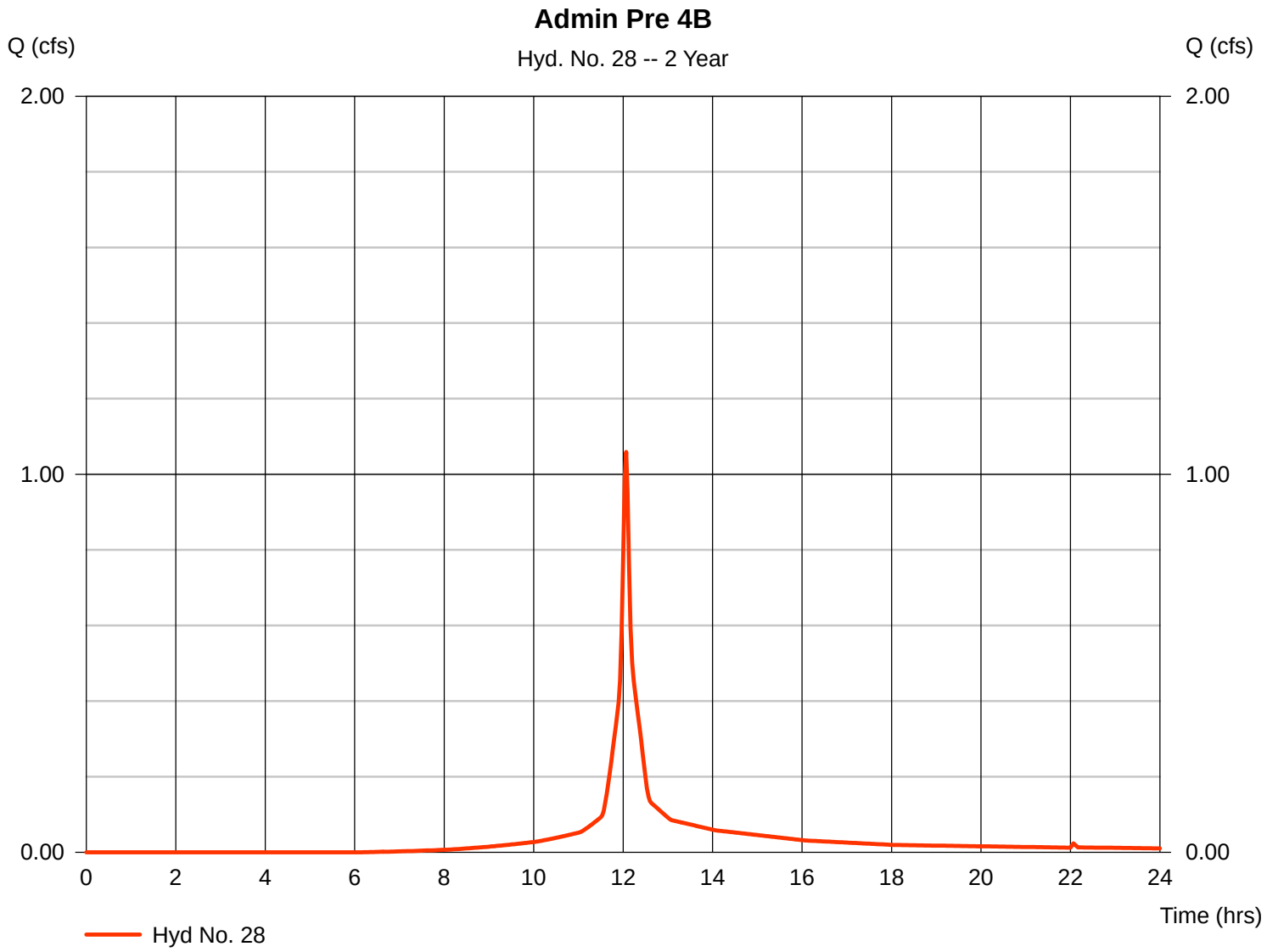
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 28

Admin Pre 4B

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.059 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	3,203 cuft
Drainage area	=	0.370 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.80 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



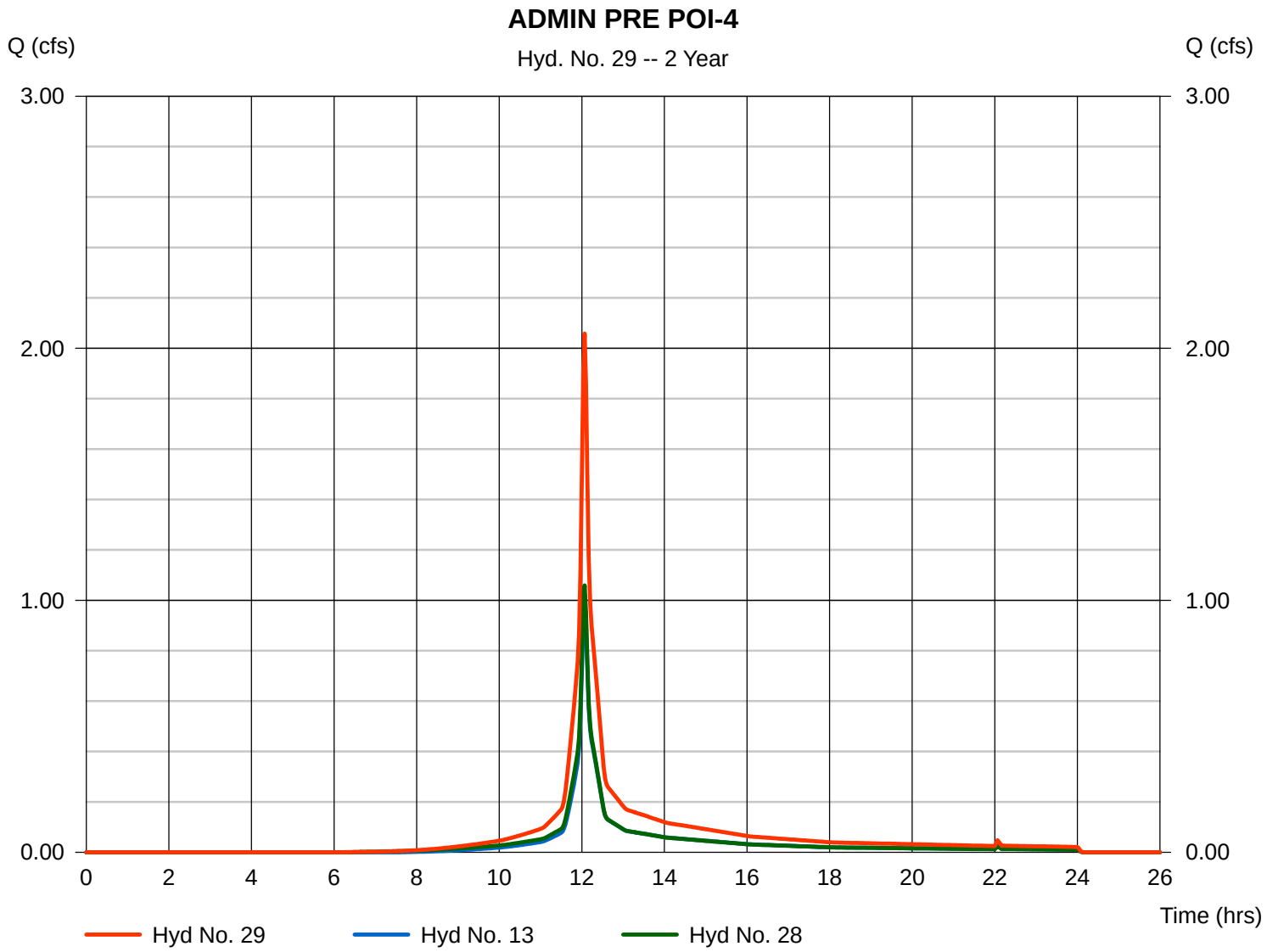
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 29

ADMIN PRE POI-4

Hydrograph type	=	Combine	Peak discharge	=	2.058 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	6,192 cuft
Inflow hyds.	=	13, 28	Contrib. drain. area	=	0.770 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.763	2	724	2,307	------	------	------	Admin Post 01
2	SCS Runoff	0.375	2	724	1,142	------	------	------	Admin Post 02
3	SCS Runoff	0.482	2	724	1,454	------	------	------	Admin Post 3A
4	SCS Runoff	1.016	2	724	3,035	------	------	------	Admin Post 3B
5	SCS Runoff	1.816	2	728	7,098	------	------	------	Admin Post 4A
6	SCS Runoff	2.421	2	724	7,574	------	------	------	Admin Post 4B
7	Reservoir	0.020	2	710	1,444	3	6.45	856	BMP3A
8	Combine	1.036	2	724	4,479	4, 7	------	------	ADMIN POI-3
9	Reservoir	0.067	2	696	7,087	5	7.69	4,591	BMP4A
10	SCS Runoff	0.808	2	724	2,442	------	------	------	Admin Pre 01
11	SCS Runoff	0.623	2	724	1,903	------	------	------	Admin Pre 02
12	SCS Runoff	2.726	2	728	10,450	------	------	------	Admin Pre 03
13	SCS Runoff	1.877	2	724	5,712	------	------	------	Admin Pre 04A
14	SCS Runoff	3.749	2	738	18,511	------	------	------	Ware Post-1A
15	SCS Runoff	2.380	2	730	10,176	------	------	------	Ware Post-1B
16	SCS Runoff	3.531	2	738	17,392	------	------	------	Ware Post-1C
17	SCS Runoff	2.703	2	738	13,315	------	------	------	Ware Post-1D
18	SCS Runoff	0.311	2	728	1,192	------	------	------	Ware Post-02
19	Reservoir	3.501	2	744	18,496	14	7.72	5,669	BMP1A
20	Reservoir	2.032	2	736	10,165	15	6.98	3,877	BMP1B
21	SCS Runoff	10.74	2	740	56,073	------	------	------	Ware Pre 01
22	Reservoir	3.040	2	748	17,379	16	7.88	5,736	BMP1C
23	Combine	10.40	2	744	59,357	17, 19, 20, 22	------	------	POI-1
24	SCS Runoff	0.466	2	728	1,788	------	------	------	Ware Pre 02
25	SCS Runoff	1.805	2	724	5,736	------	------	------	Admin Post 4C
26	Reservoir	0.493	2	748	3,844	6	8.38	4,308	BMP4B
27	Combine	1.872	2	724	16,667	9, 25, 26	------	------	ADMIN POI-4
28	SCS Runoff	1.874	2	724	5,825	------	------	------	Admin Pre 4B
29	Combine	3.751	2	724	11,537	13, 28	------	------	ADMIN PRE POI-4

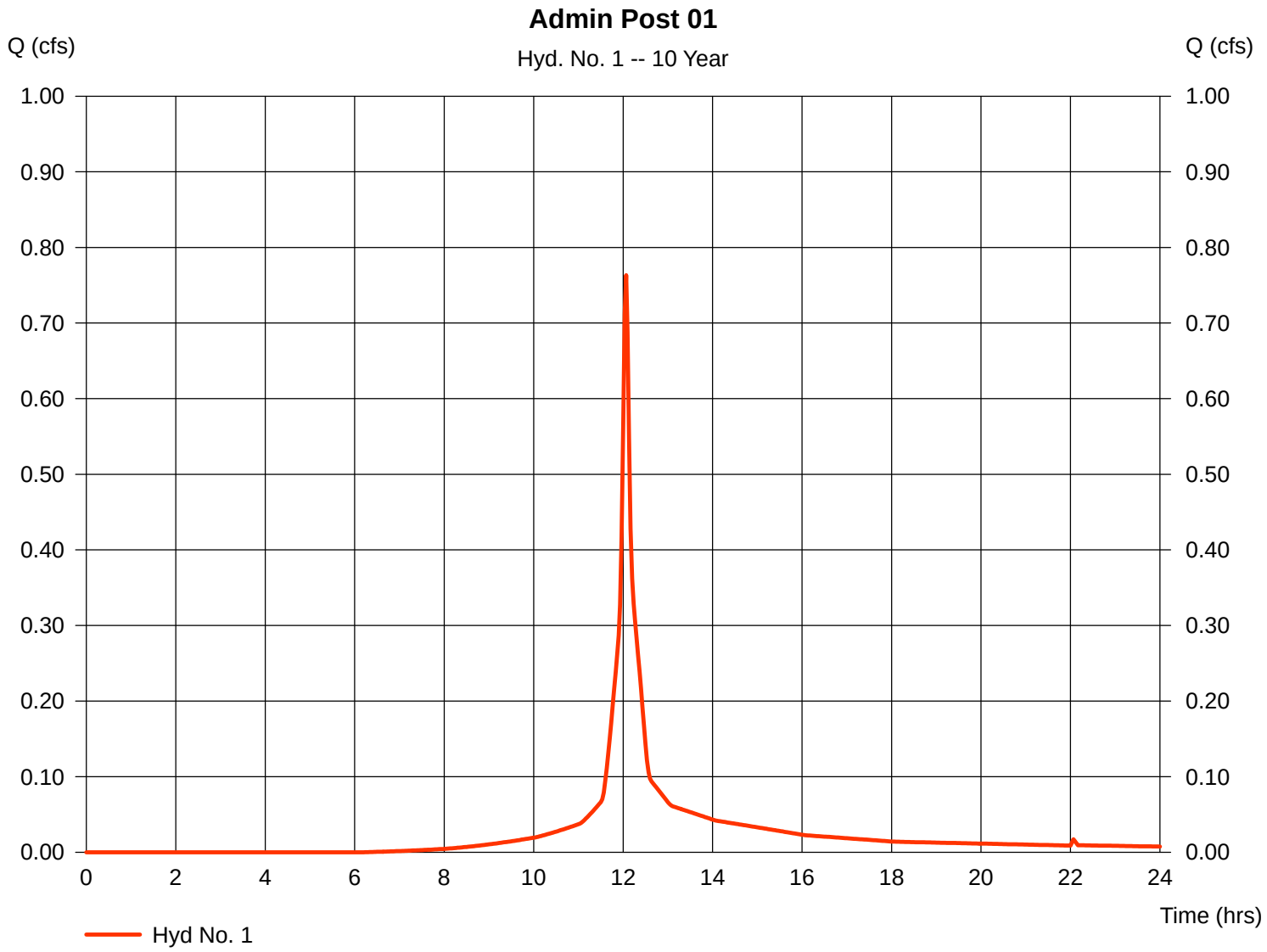
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 1

Admin Post 01

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.763 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	2,307 cuft
Drainage area	=	0.170 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.50 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



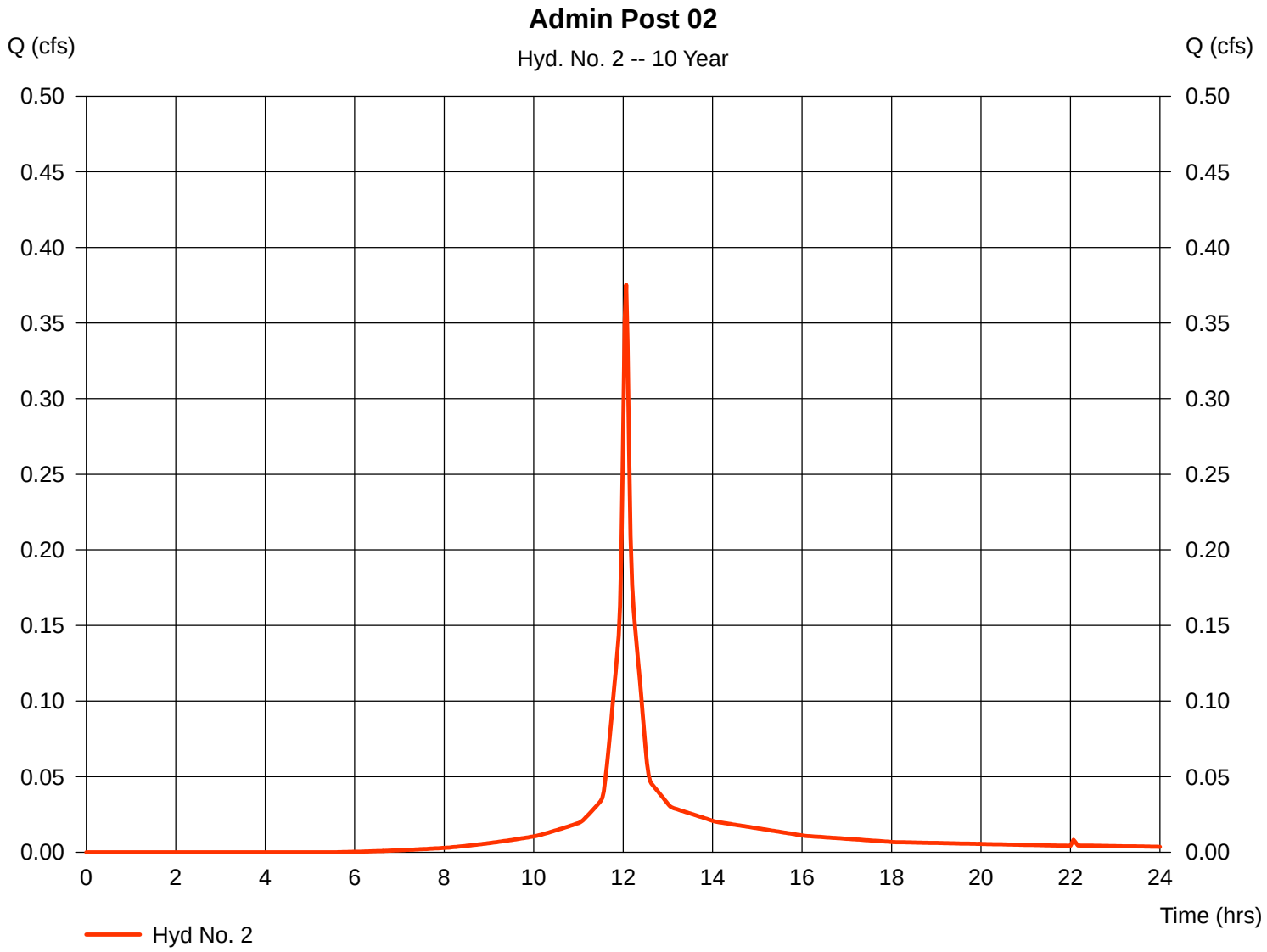
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 2

Admin Post 02

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.375 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	1,142 cuft
Drainage area	=	0.080 ac	Curve number	=	84
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



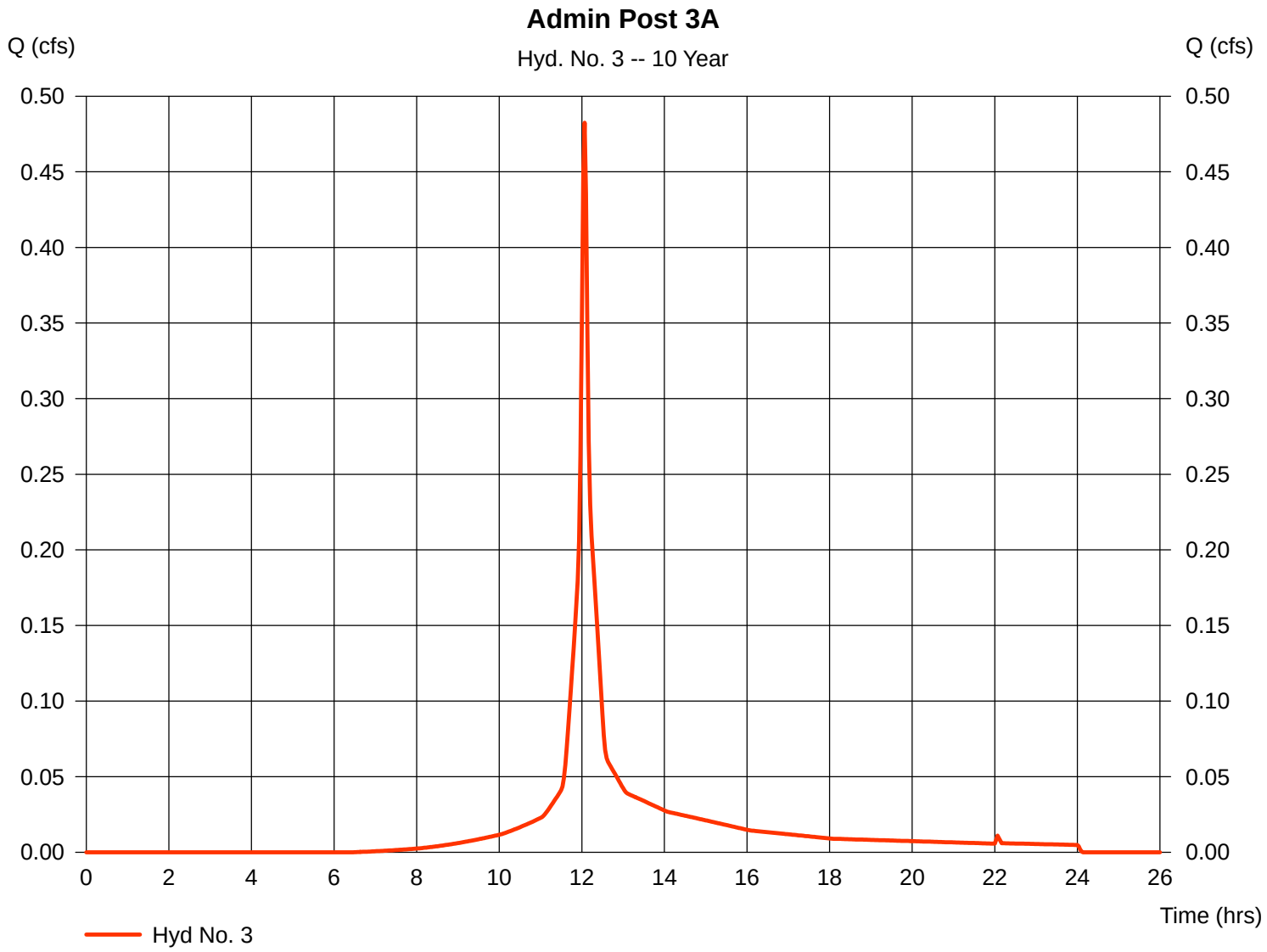
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 3

Admin Post 3A

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.482 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	1,454 cuft
Drainage area	=	0.110 ac	Curve number	=	81
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



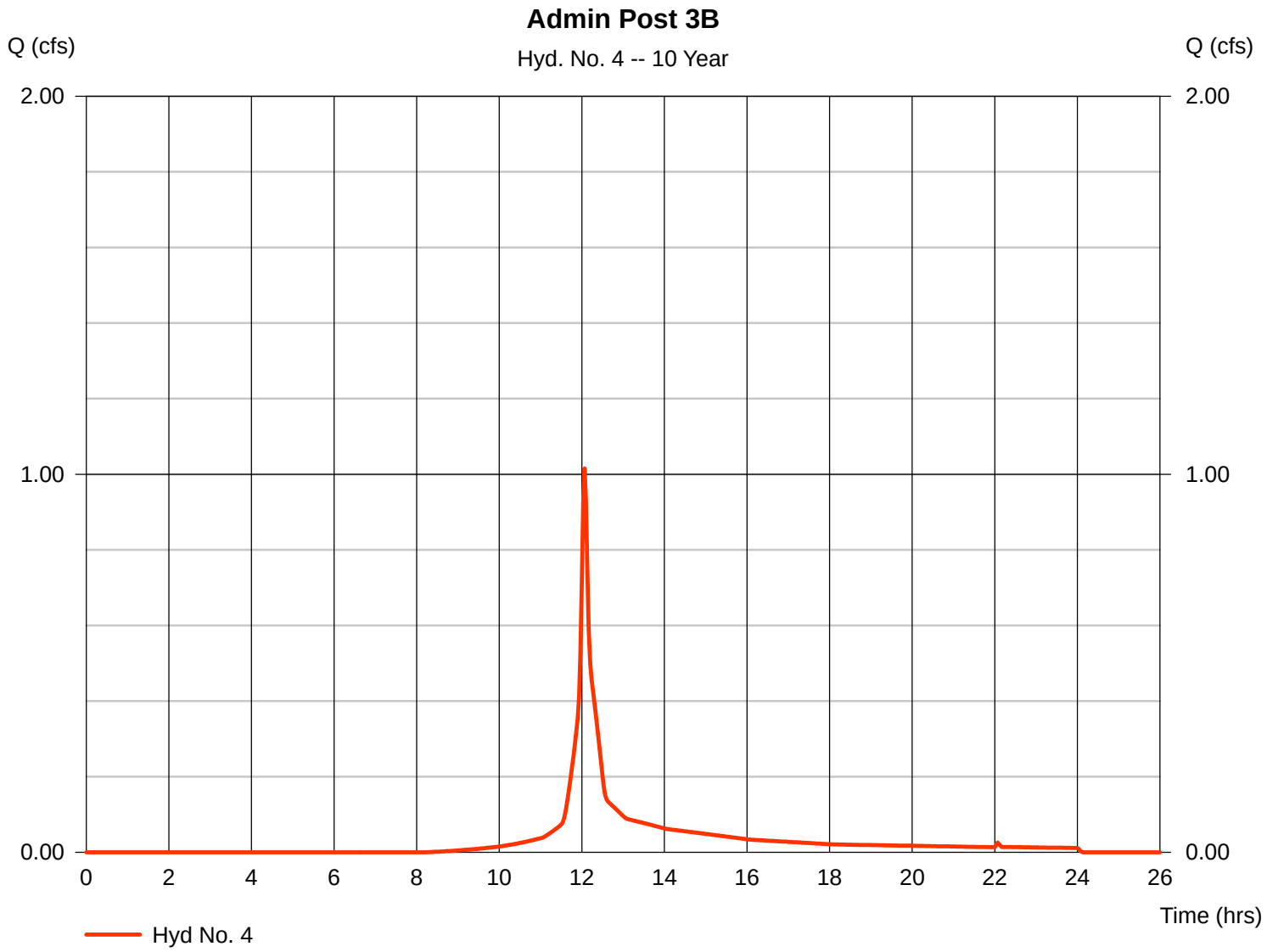
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 4

Admin Post 3B

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.016 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	3,035 cuft
Drainage area	=	0.280 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



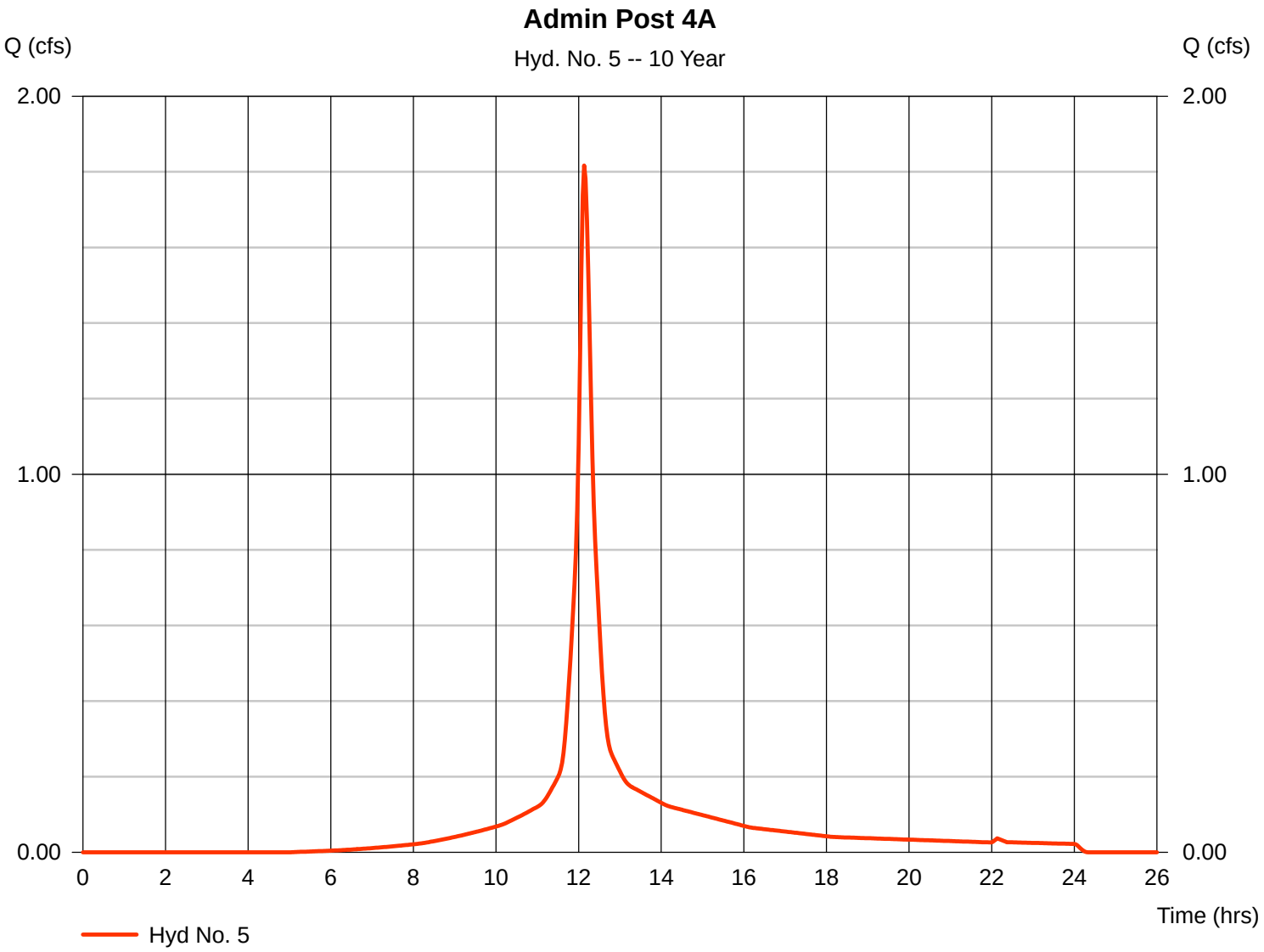
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 5

Admin Post 4A

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.816 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.13 hrs
Time interval	=	2 min	Hyd. volume	=	7,098 cuft
Drainage area	=	0.430 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.20 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



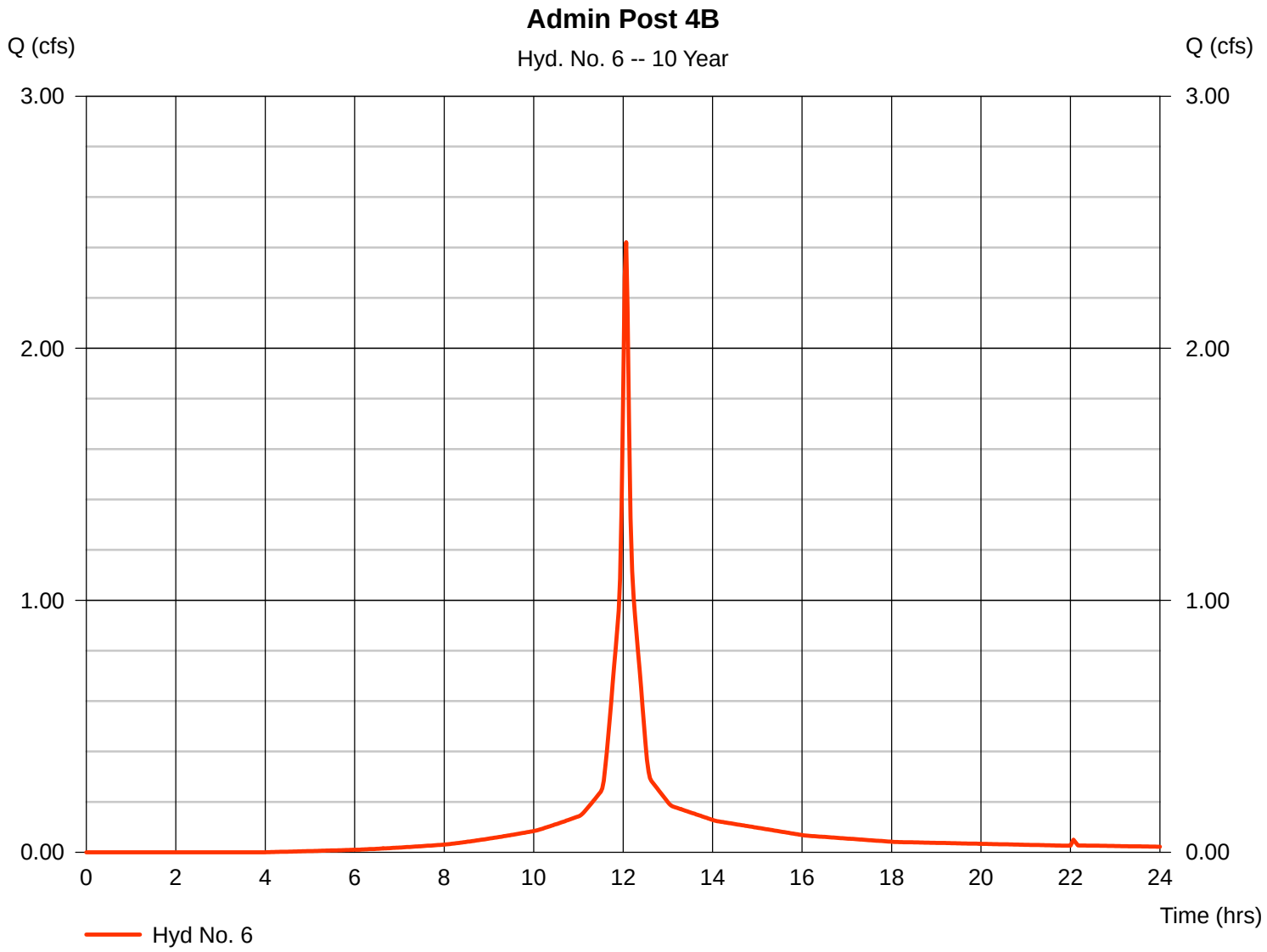
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 6

Admin Post 4B

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.421 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	7,574 cuft
Drainage area	=	0.470 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

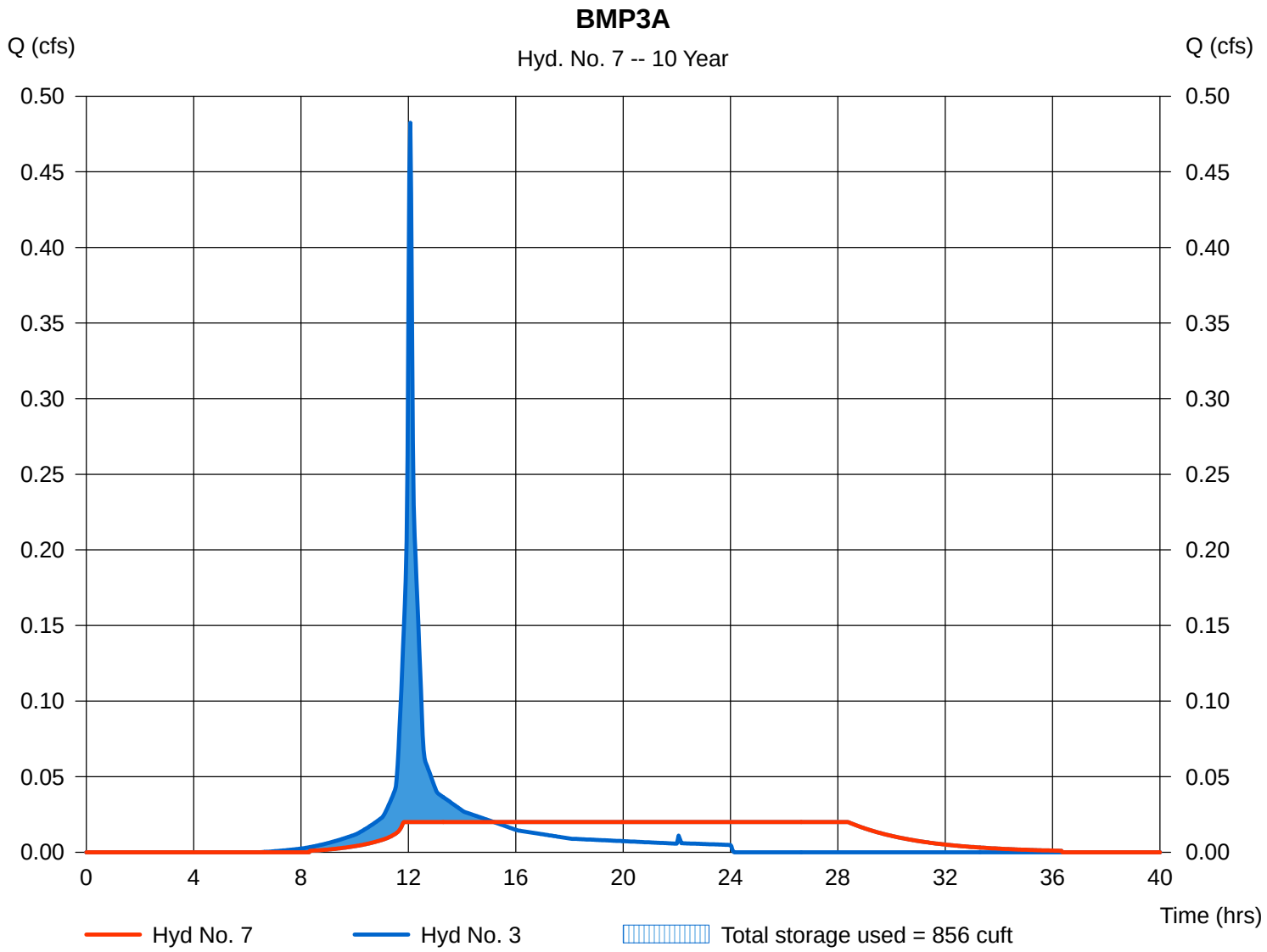
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 7

BMP3A

Hydrograph type	=	Reservoir	Peak discharge	=	0.020 cfs
Storm frequency	=	10 yrs	Time to peak	=	11.83 hrs
Time interval	=	2 min	Hyd. volume	=	1,444 cuft
Inflow hyd. No.	=	3 - Admin Post 3A	Max. Elevation	=	6.45 ft
Reservoir name	=	ADMIN-BMP3A	Max. Storage	=	856 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



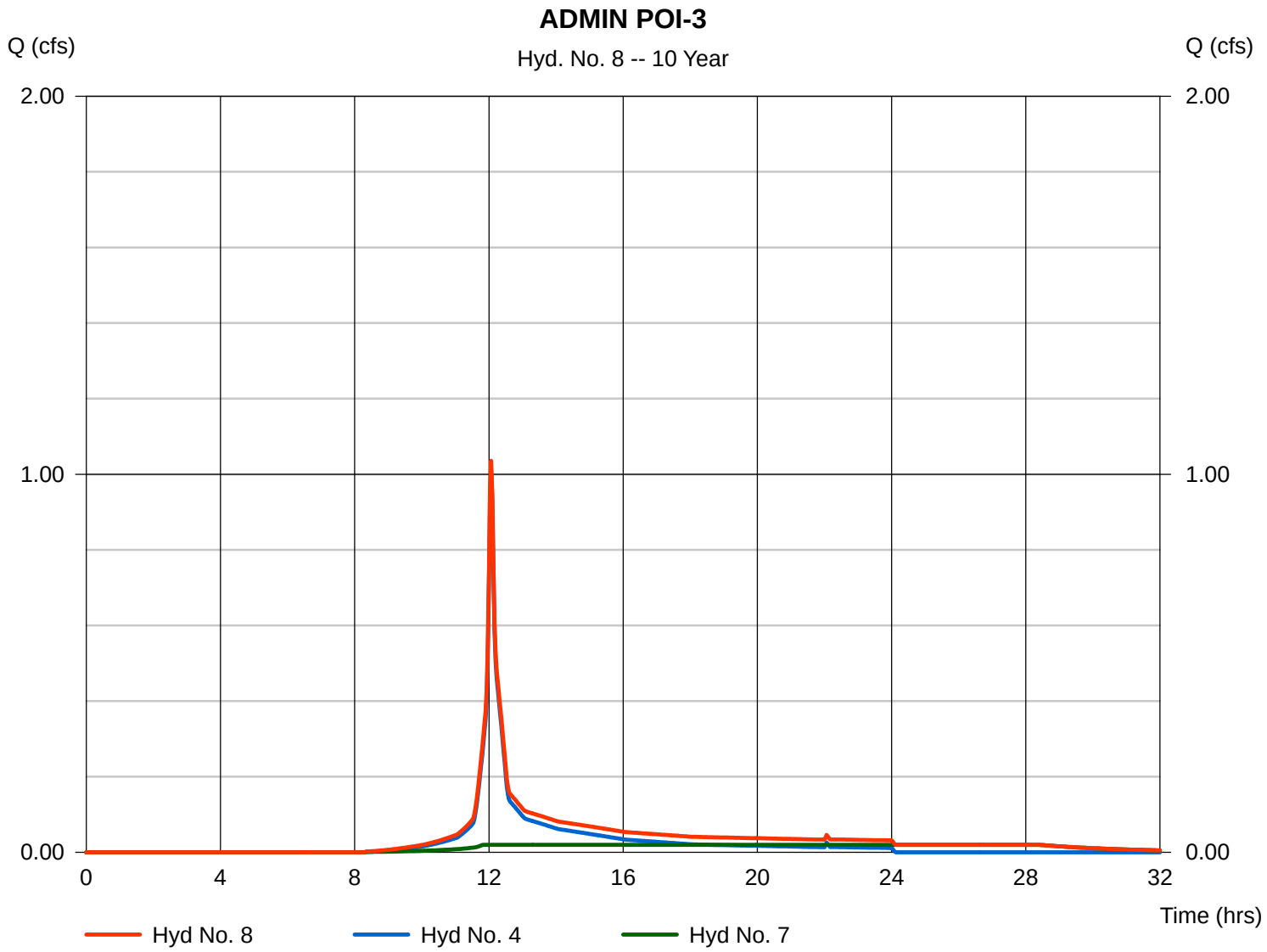
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 8

ADMIN POI-3

Hydrograph type	= Combine	Peak discharge	= 1.036 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 4,479 cuft
Inflow hyds.	= 4, 7	Contrib. drain. area	= 0.280 ac



Hydrograph Report

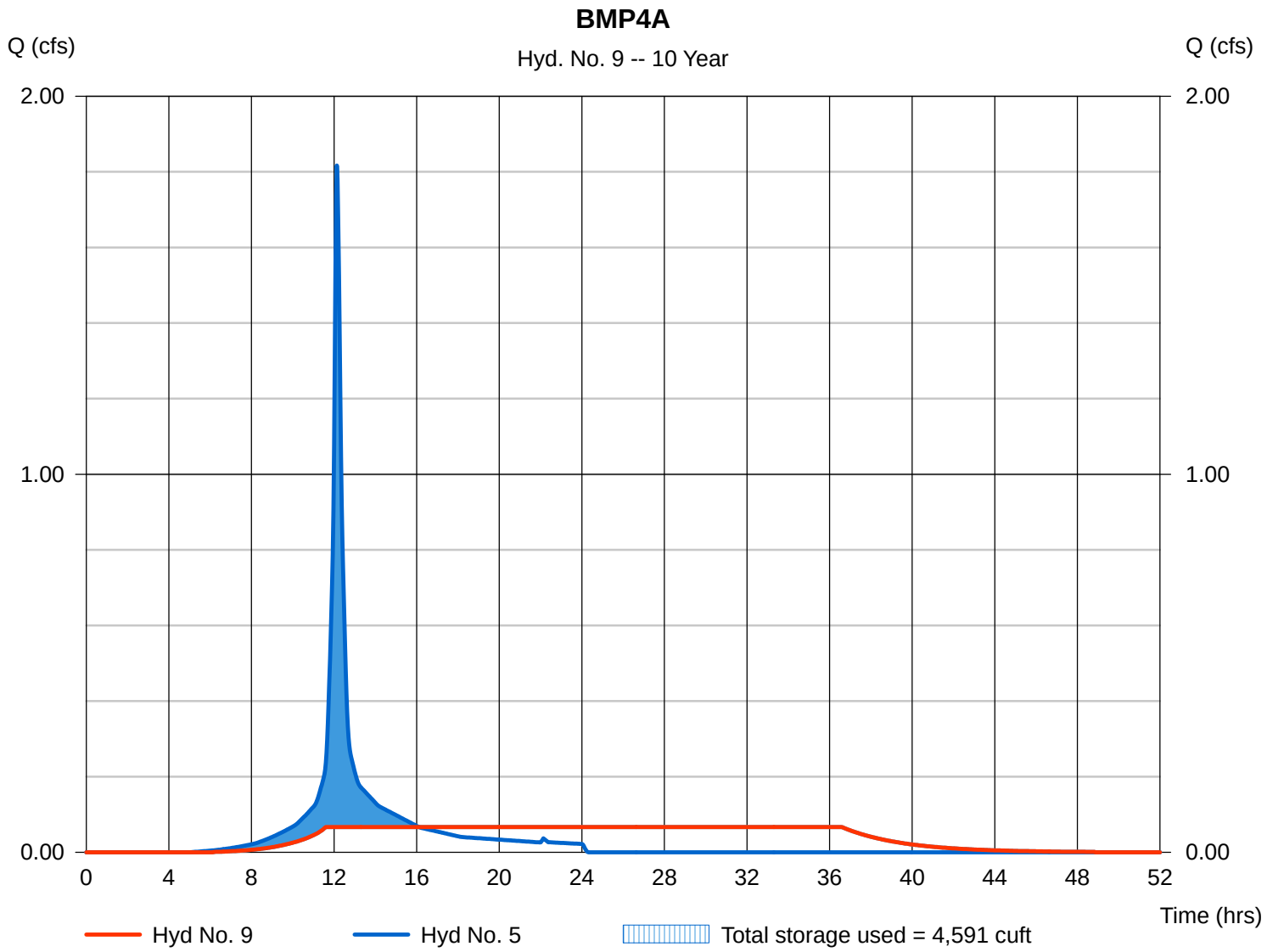
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 9

BMP4A

Hydrograph type	=	Reservoir	Peak discharge	=	0.067 cfs
Storm frequency	=	10 yrs	Time to peak	=	11.60 hrs
Time interval	=	2 min	Hyd. volume	=	7,087 cuft
Inflow hyd. No.	=	5 - Admin Post 4A	Max. Elevation	=	7.69 ft
Reservoir name	=	ADMIN-BMP4A	Max. Storage	=	4,591 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



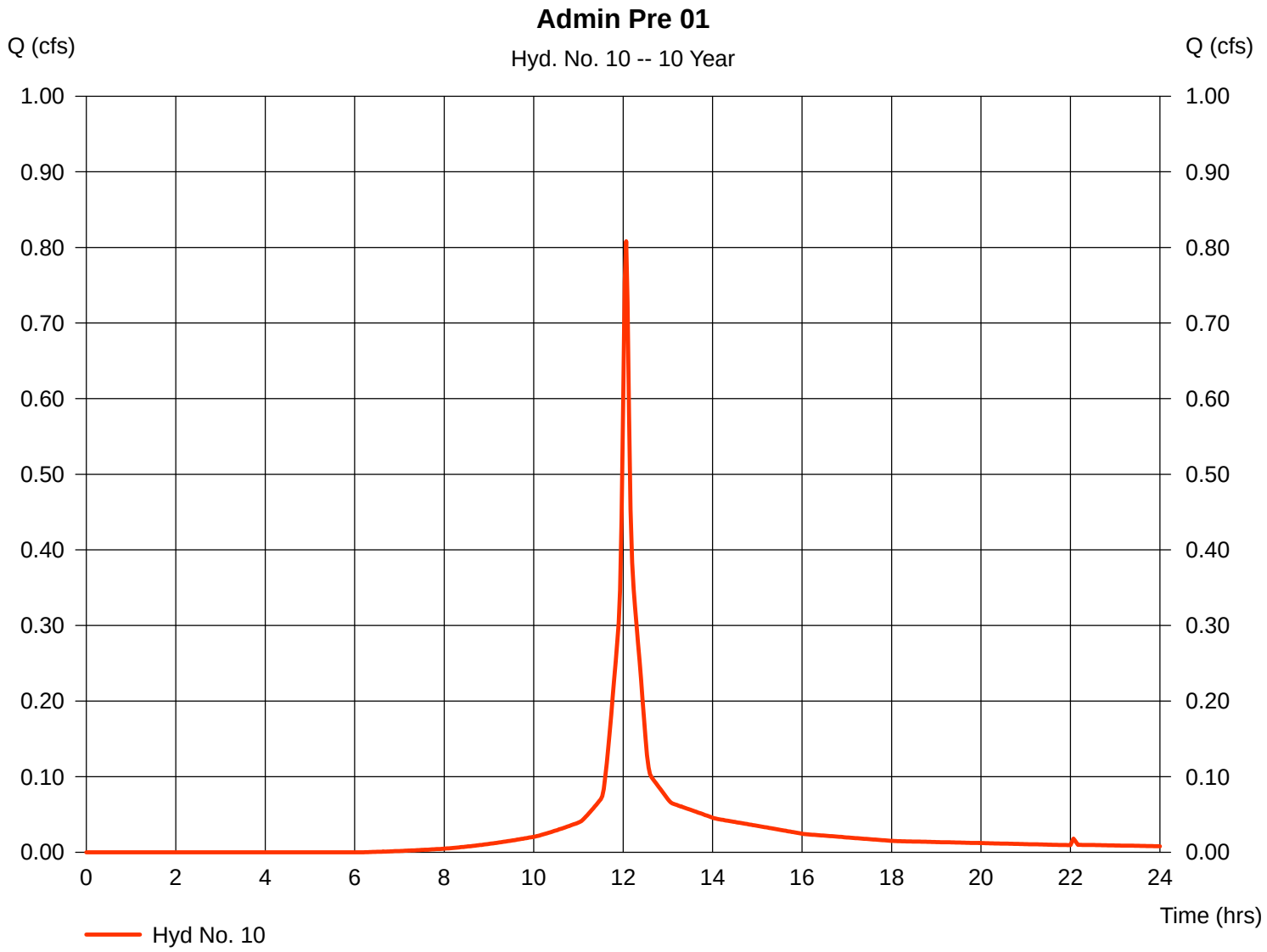
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 10

Admin Pre 01

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.808 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	2,442 cuft
Drainage area	=	0.180 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



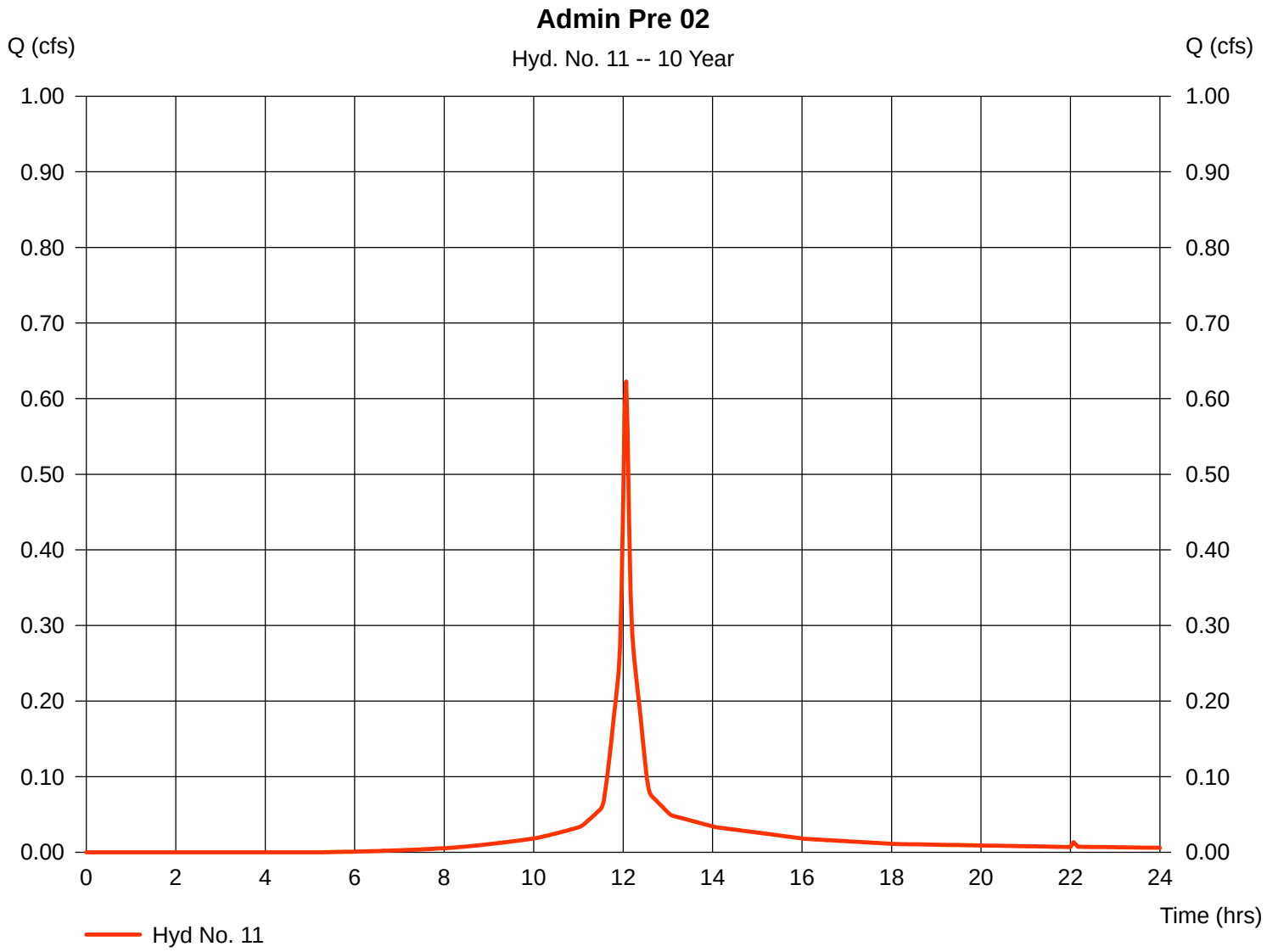
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 11

Admin Pre 02

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.623 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	1,903 cuft
Drainage area	=	0.130 ac	Curve number	=	85
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



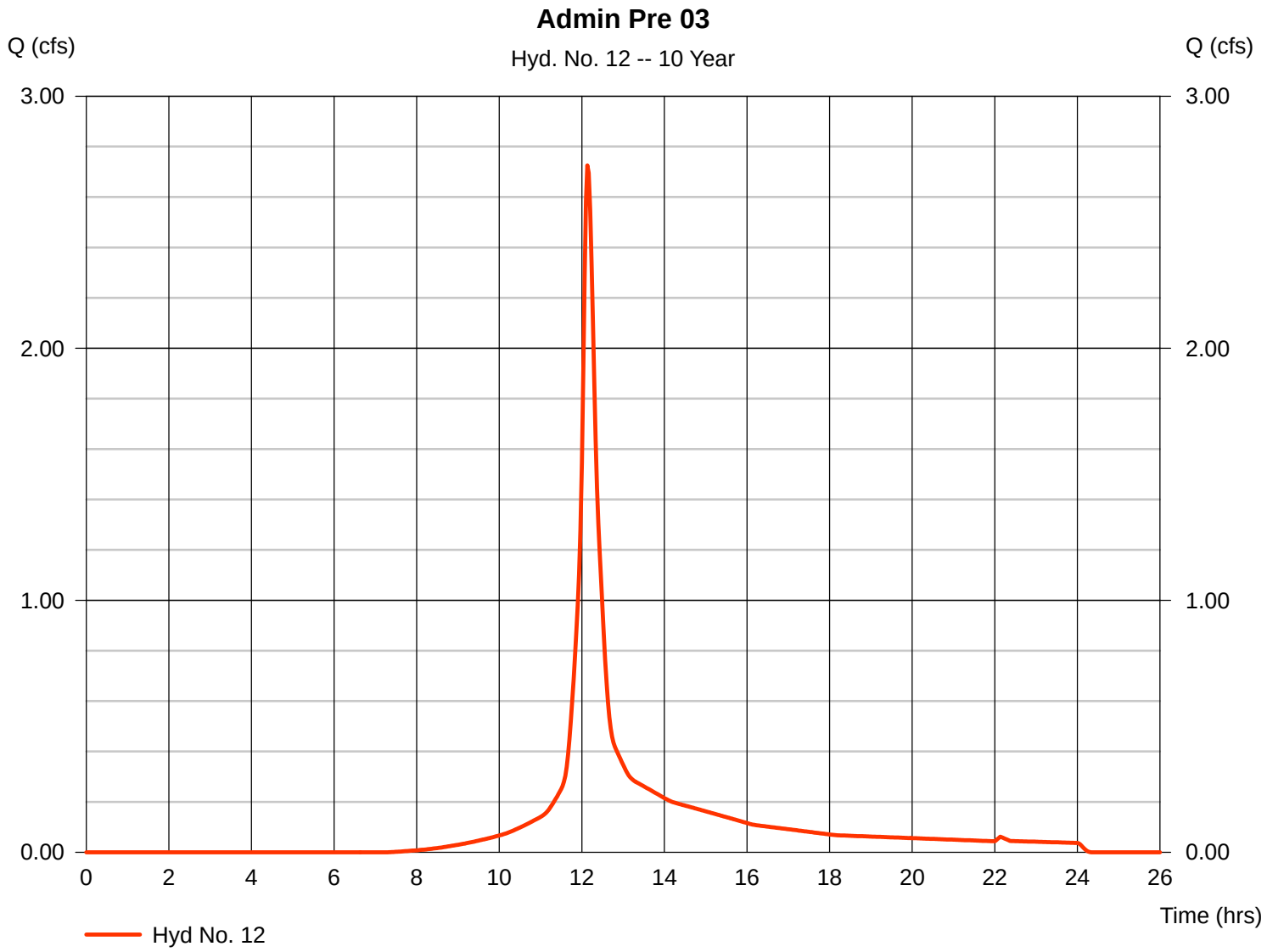
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 12

Admin Pre 03

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.726 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.13 hrs
Time interval	=	2 min	Hyd. volume	=	10,450 cuft
Drainage area	=	0.780 ac	Curve number	=	78
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.00 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



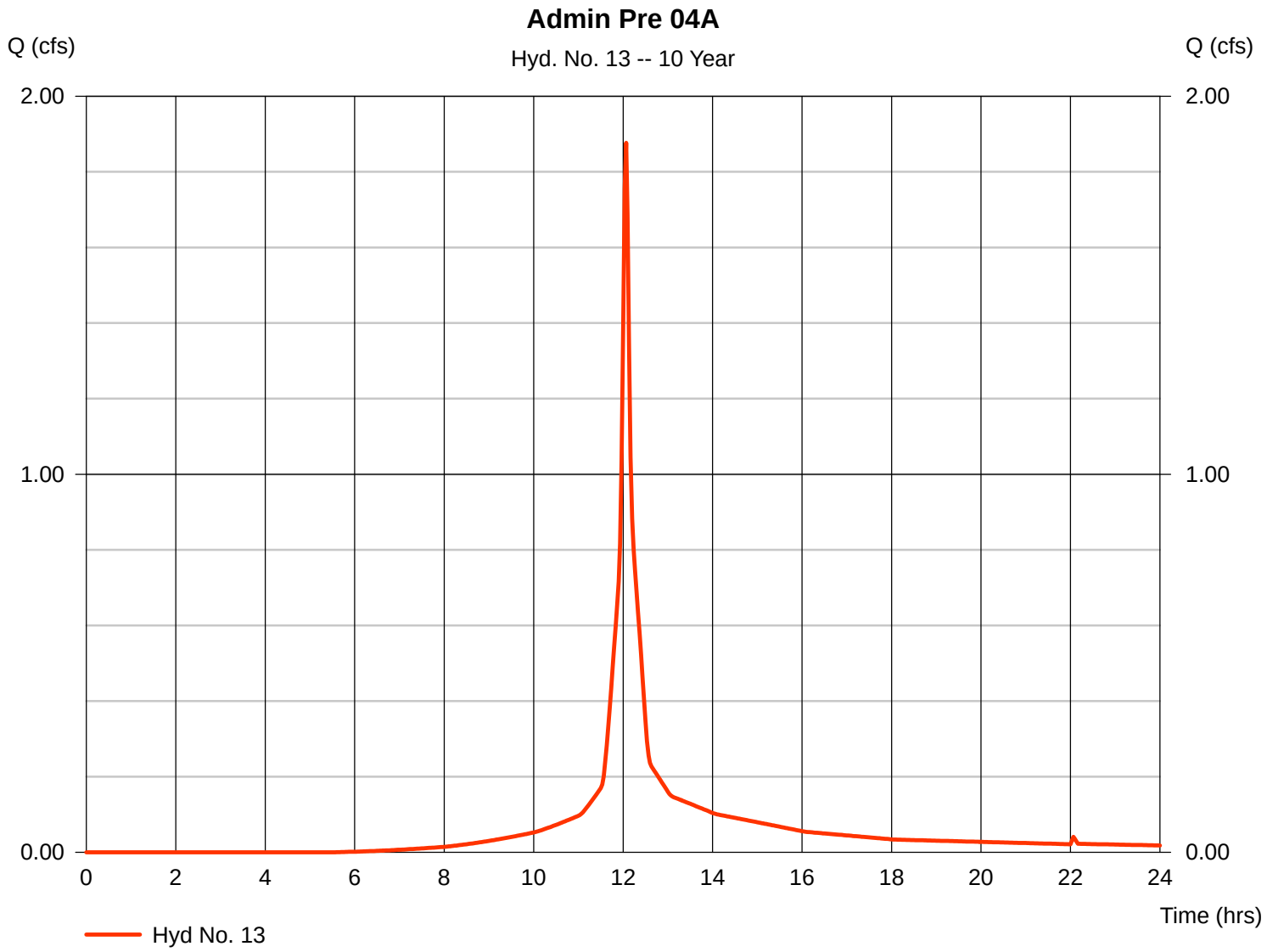
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 13

Admin Pre 04A

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.877 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	5,712 cuft
Drainage area	=	0.400 ac	Curve number	=	84
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.50 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



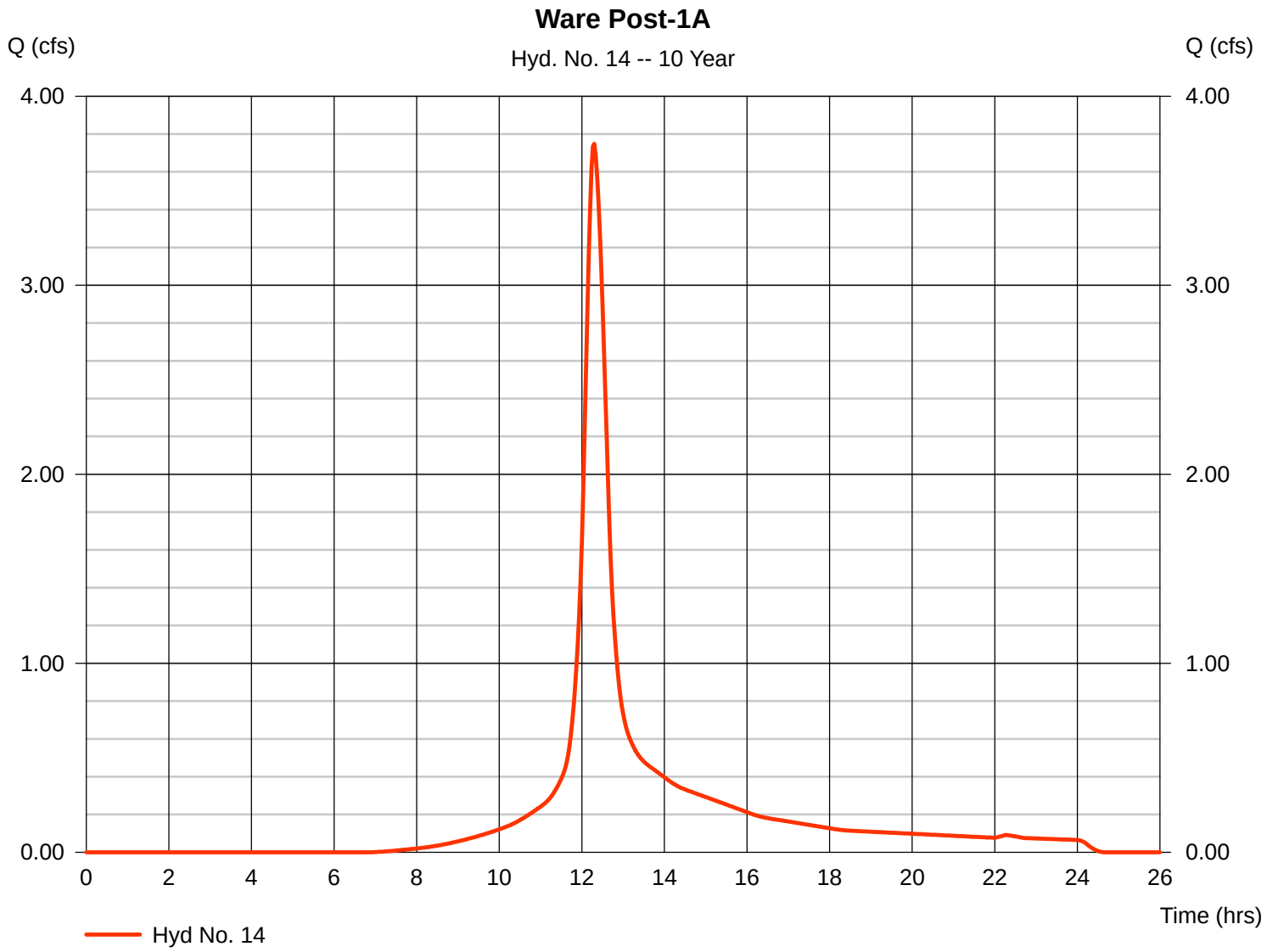
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 14

Ware Post-1A

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.749 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.30 hrs
Time interval	=	2 min	Hyd. volume	=	18,511 cuft
Drainage area	=	1.370 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	26.60 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



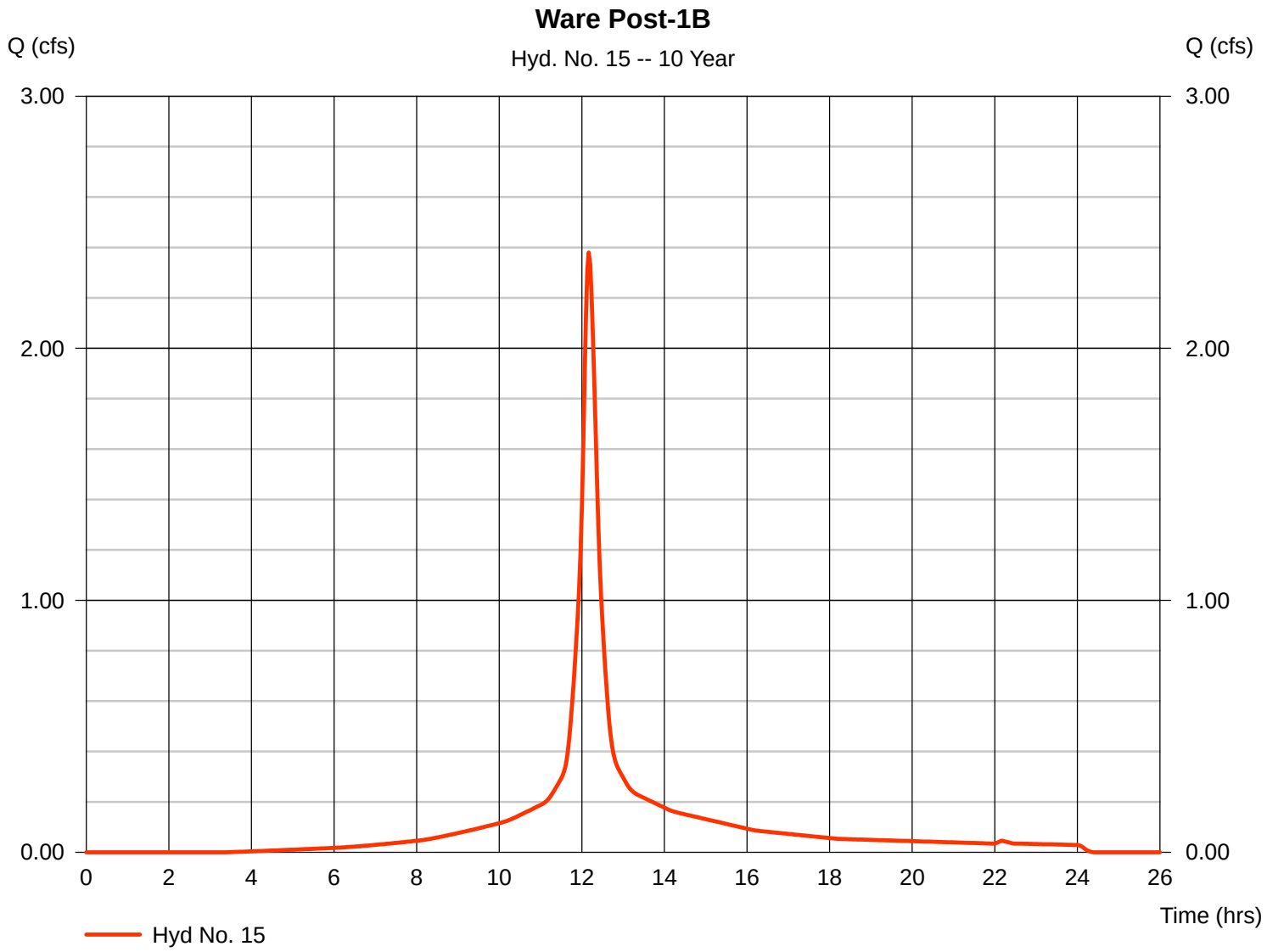
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 15

Ware Post-1B

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.380 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.17 hrs
Time interval	=	2 min	Hyd. volume	=	10,176 cuft
Drainage area	=	0.580 ac	Curve number	=	91
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.90 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



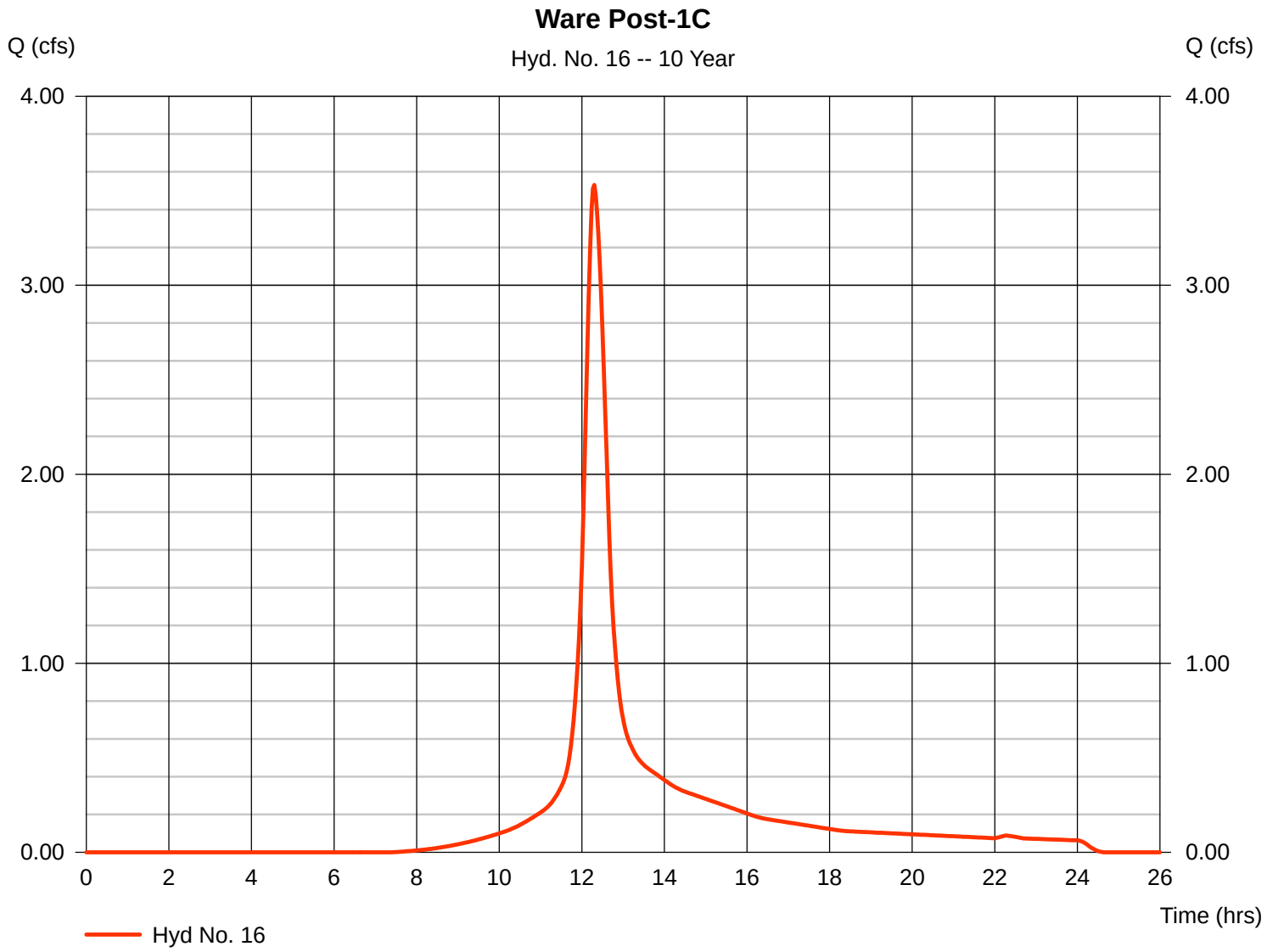
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 16

Ware Post-1C

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.531 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.30 hrs
Time interval	=	2 min	Hyd. volume	=	17,392 cuft
Drainage area	=	1.360 ac	Curve number	=	78
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.79 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



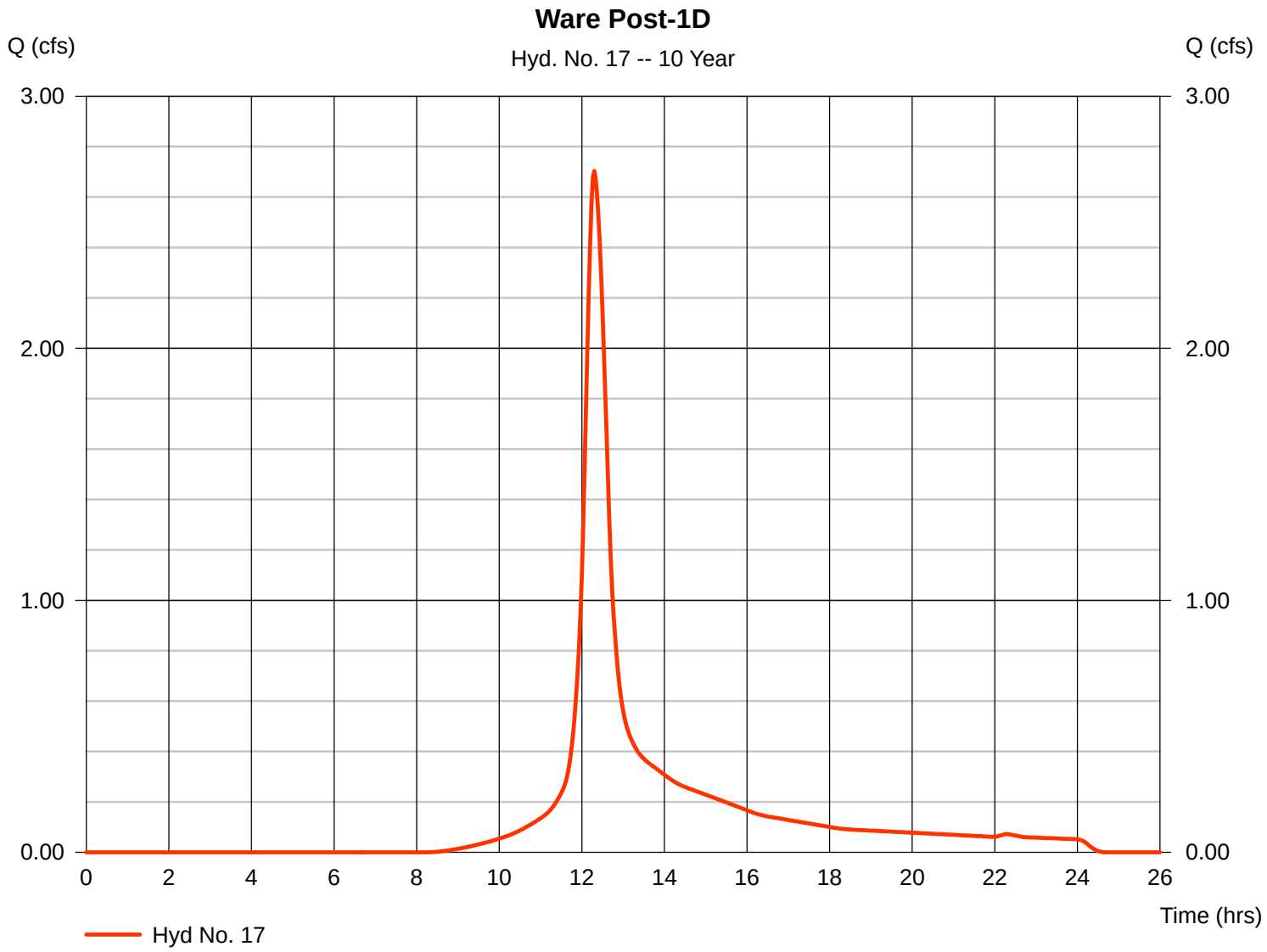
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 17

Ware Post-1D

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.703 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.30 hrs
Time interval	=	2 min	Hyd. volume	=	13,315 cuft
Drainage area	=	1.170 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.90 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



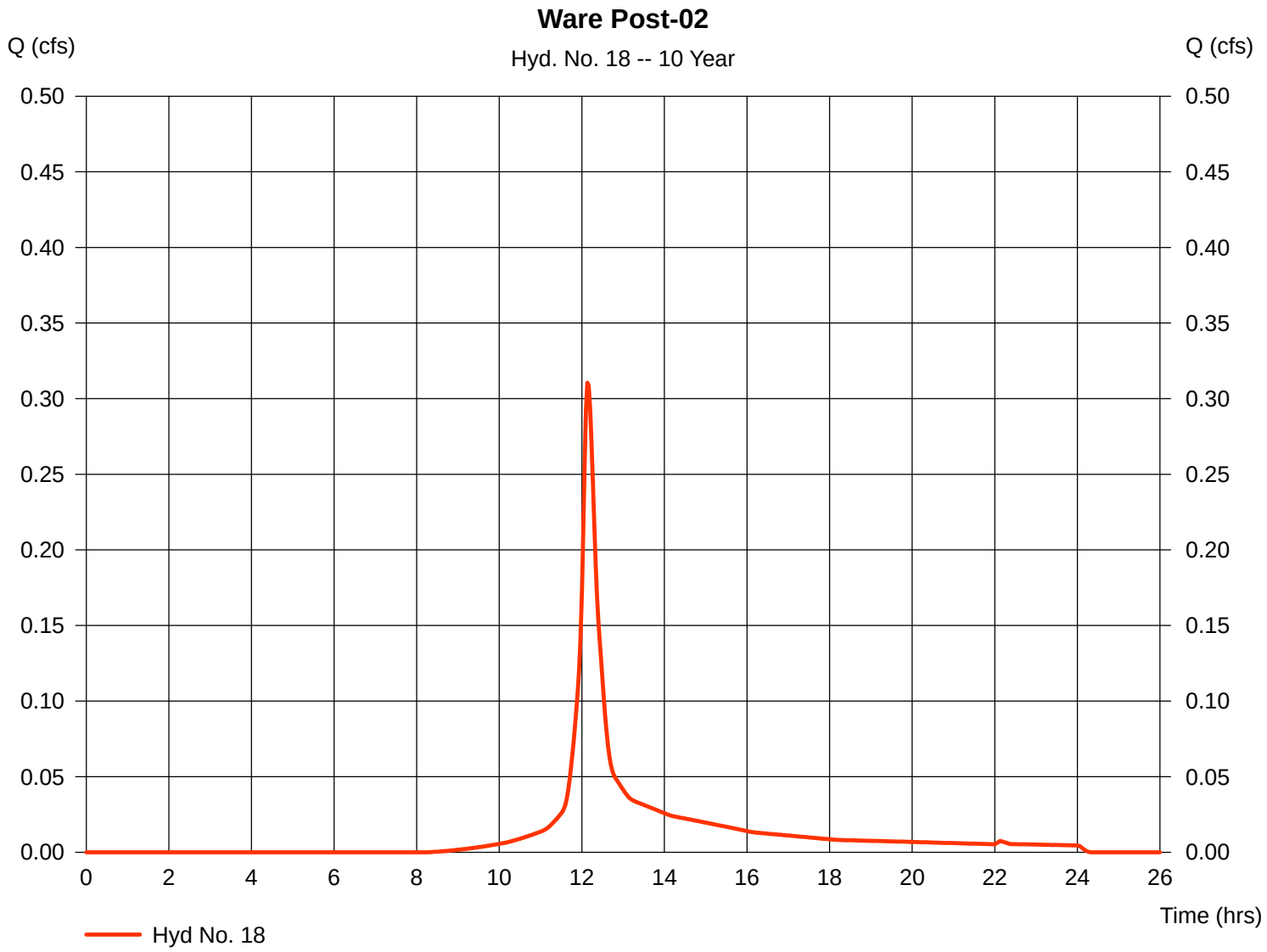
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 18

Ware Post-02

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.311 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.13 hrs
Time interval	=	2 min	Hyd. volume	=	1,192 cuft
Drainage area	=	0.100 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.30 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

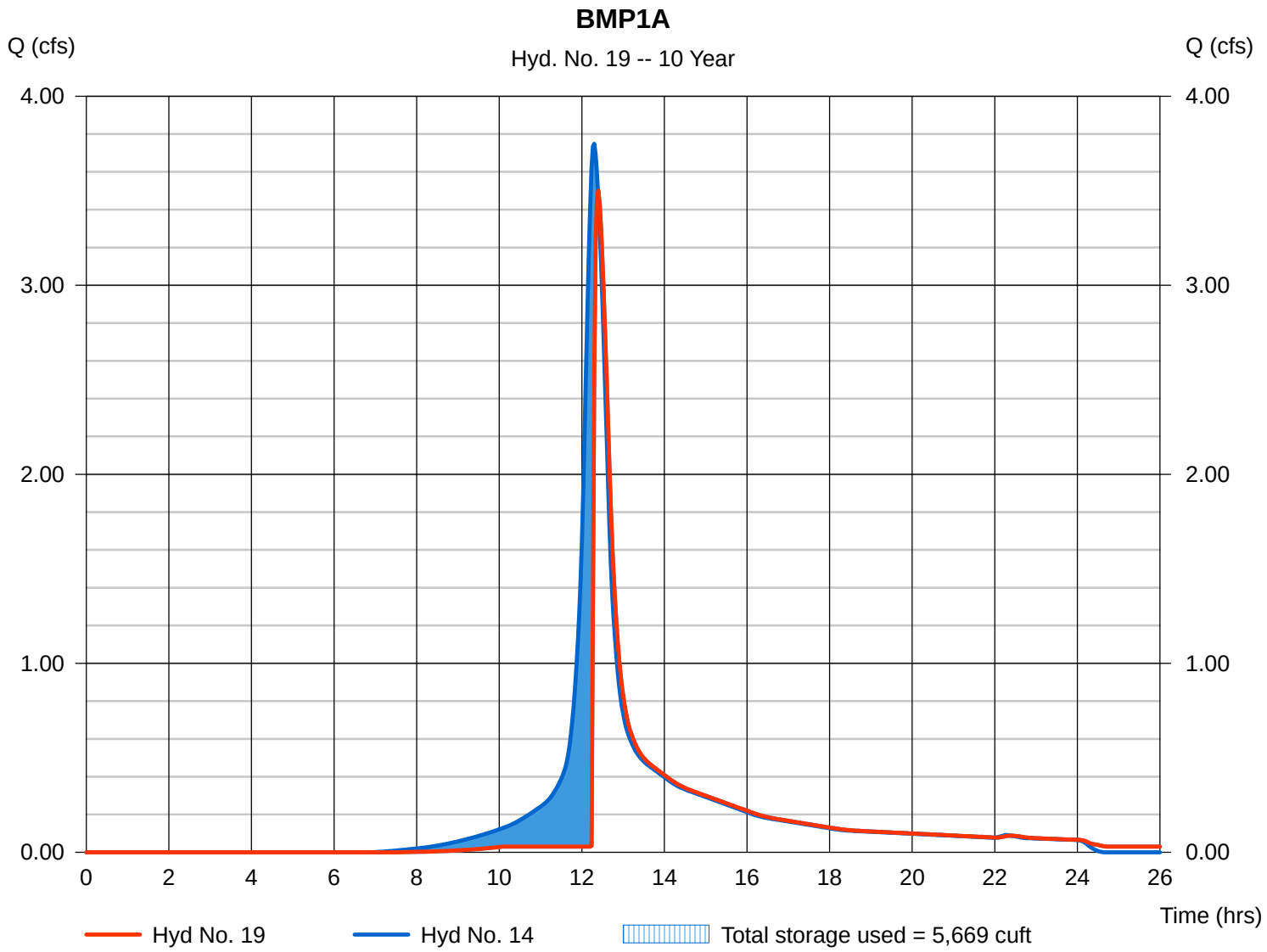
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 19

BMP1A

Hydrograph type	=	Reservoir	Peak discharge	=	3.501 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.40 hrs
Time interval	=	2 min	Hyd. volume	=	18,496 cuft
Inflow hyd. No.	=	14 - Ware Post-1A	Max. Elevation	=	7.72 ft
Reservoir name	=	WARE-BMP1A	Max. Storage	=	5,669 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

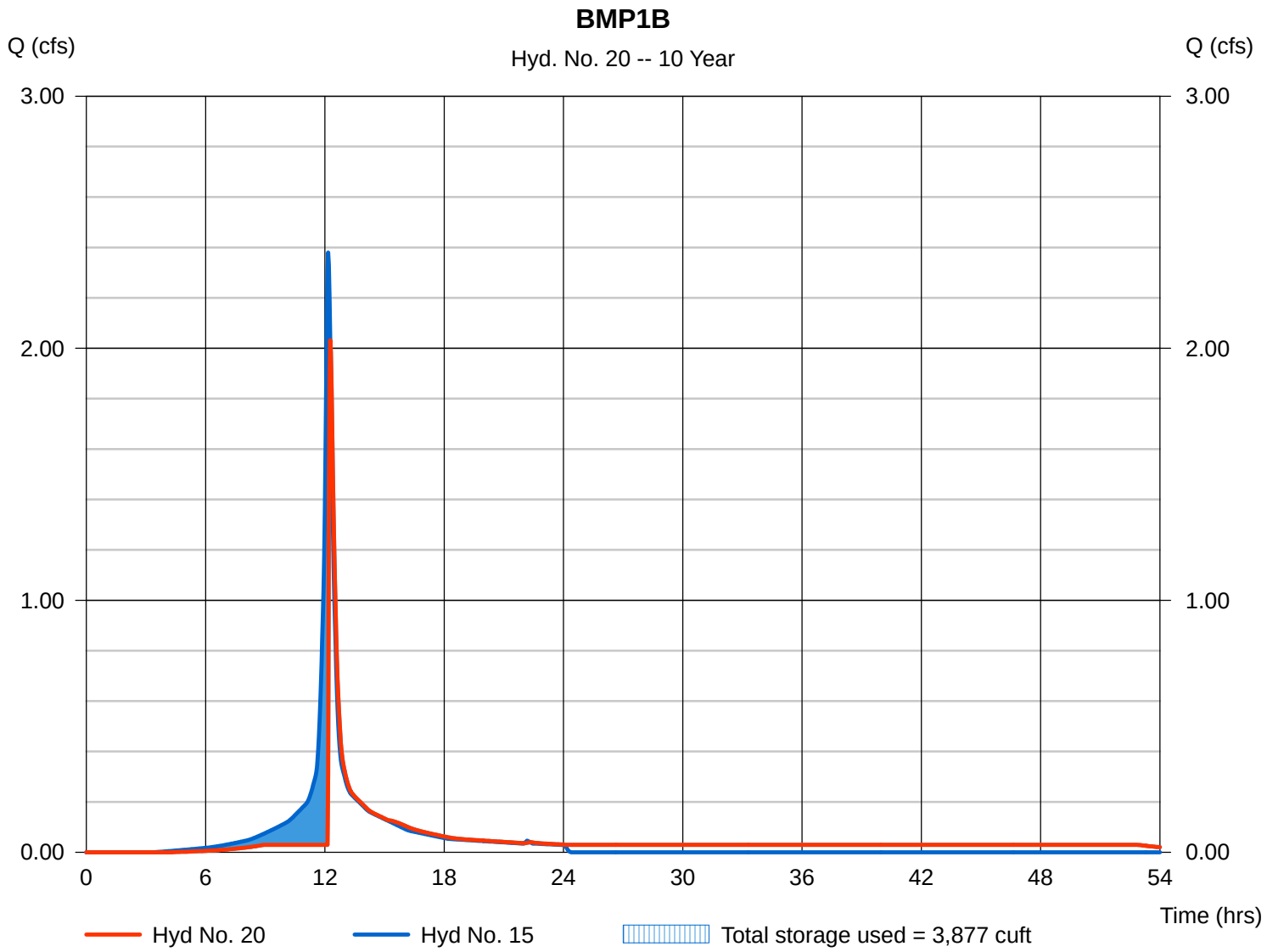
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 20

BMP1B

Hydrograph type	=	Reservoir	Peak discharge	=	2.032 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.27 hrs
Time interval	=	2 min	Hyd. volume	=	10,165 cuft
Inflow hyd. No.	=	15 - Ware Post-1B	Max. Elevation	=	6.98 ft
Reservoir name	=	WARE-BMP1B	Max. Storage	=	3,877 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



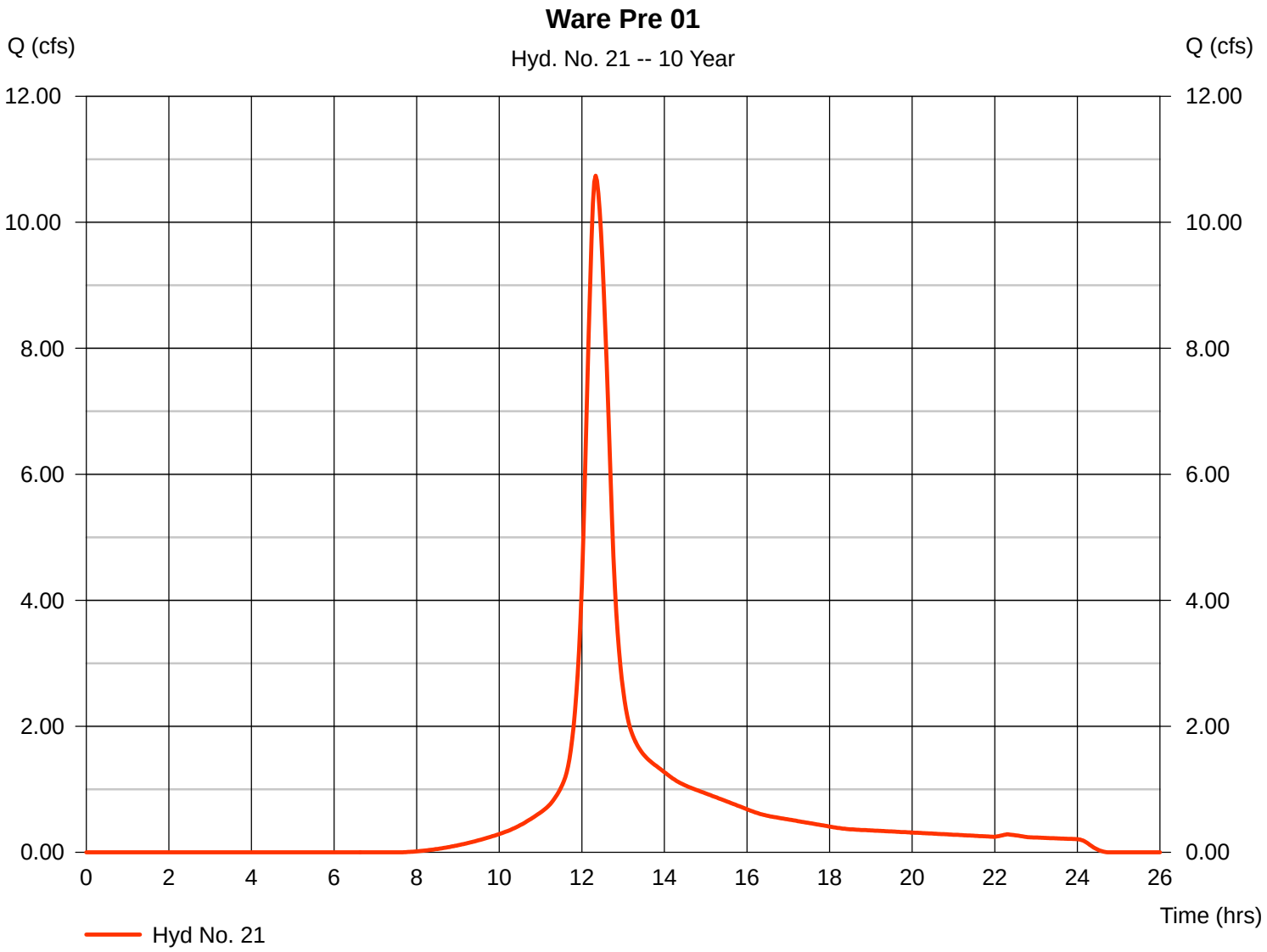
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 21

Ware Pre 01

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.74 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.33 hrs
Time interval	=	2 min	Hyd. volume	=	56,073 cuft
Drainage area	=	4.440 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	28.10 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

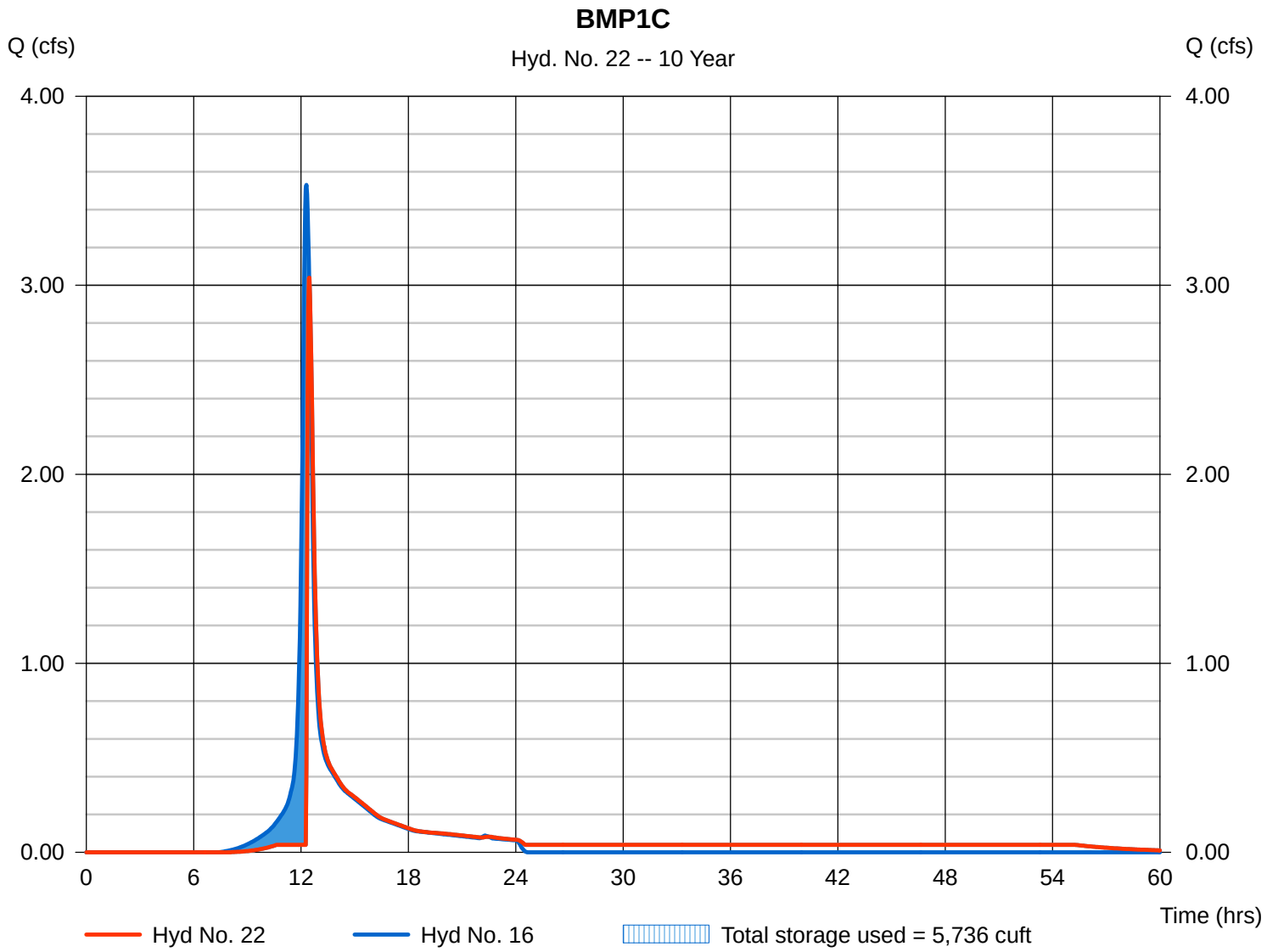
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 22

BMP1C

Hydrograph type	=	Reservoir	Peak discharge	=	3.040 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.47 hrs
Time interval	=	2 min	Hyd. volume	=	17,379 cuft
Inflow hyd. No.	=	16 - Ware Post-1C	Max. Elevation	=	7.88 ft
Reservoir name	=	WareBMP1C	Max. Storage	=	5,736 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



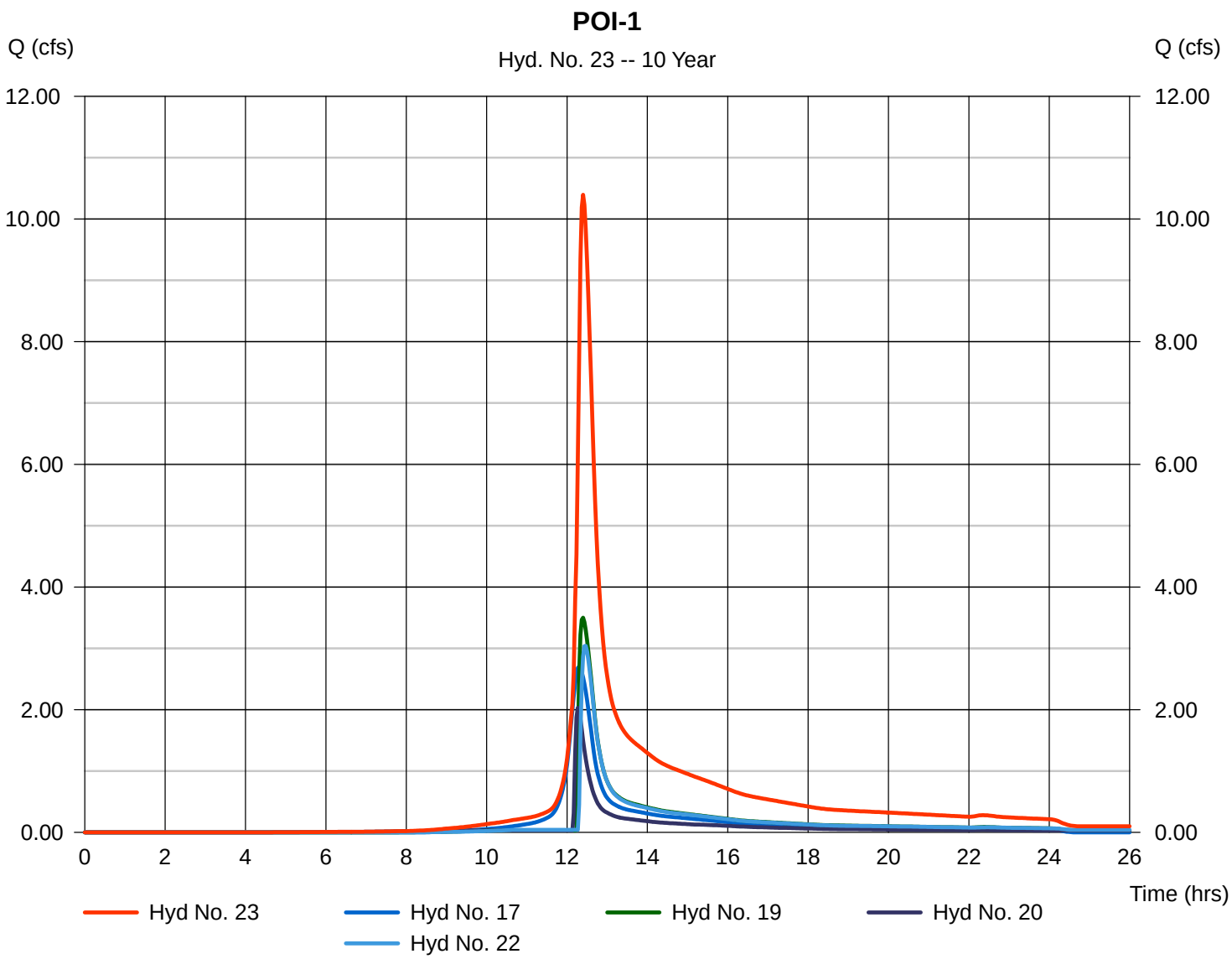
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 23

POI-1

Hydrograph type	= Combine	Peak discharge	= 10.40 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.40 hrs
Time interval	= 2 min	Hyd. volume	= 59,357 cuft
Inflow hyds.	= 17, 19, 20, 22	Contrib. drain. area	= 1.170 ac



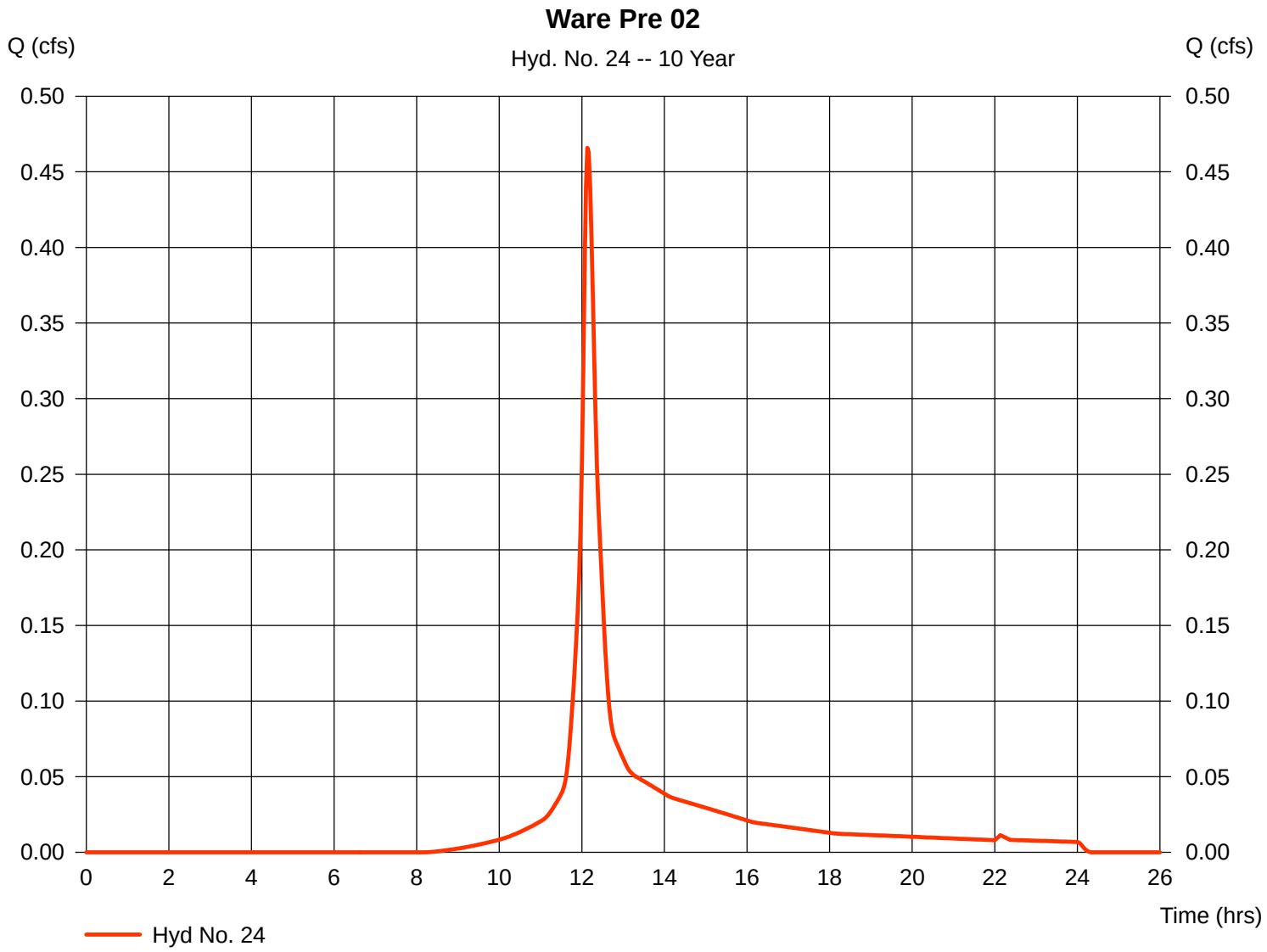
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 24

Ware Pre 02

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.466 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.13 hrs
Time interval	=	2 min	Hyd. volume	=	1,788 cuft
Drainage area	=	0.150 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.80 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



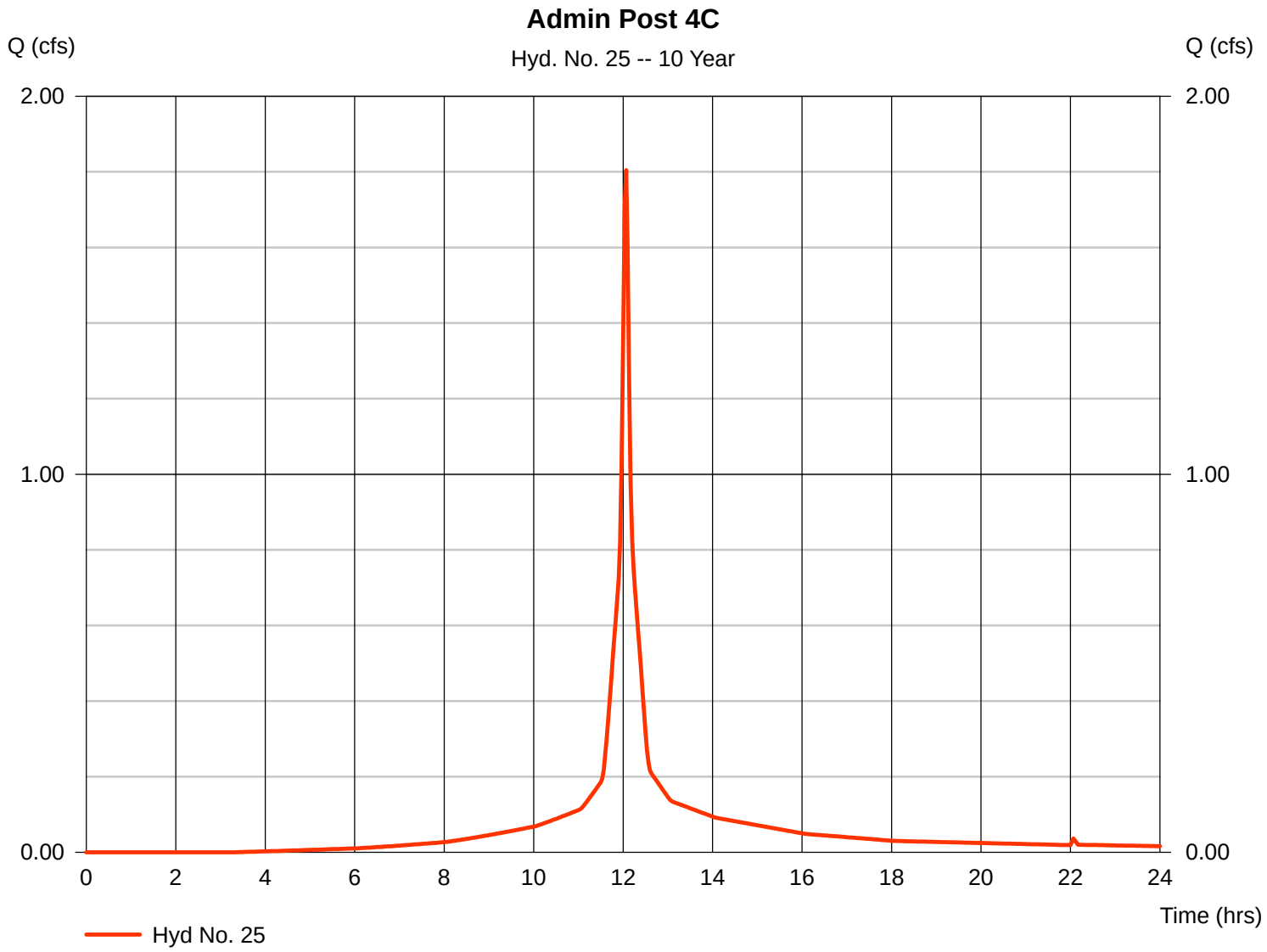
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 25

Admin Post 4C

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.805 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	5,736 cuft
Drainage area	=	0.340 ac	Curve number	=	91
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

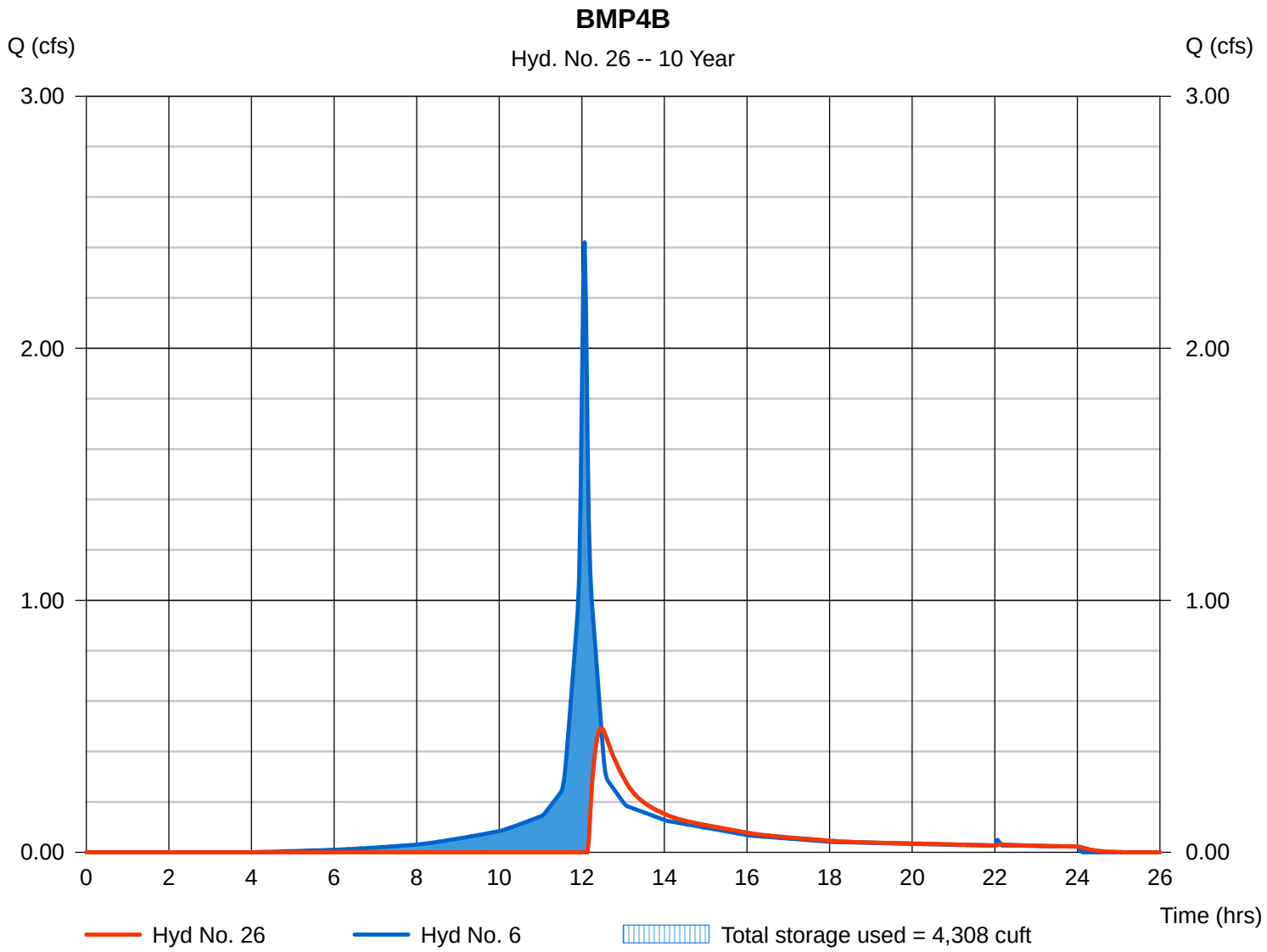
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 26

BMP4B

Hydrograph type	=	Reservoir	Peak discharge	=	0.493 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.47 hrs
Time interval	=	2 min	Hyd. volume	=	3,844 cuft
Inflow hyd. No.	=	6 - Admin Post 4B	Max. Elevation	=	8.38 ft
Reservoir name	=	ADMIN-BMP4B	Max. Storage	=	4,308 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



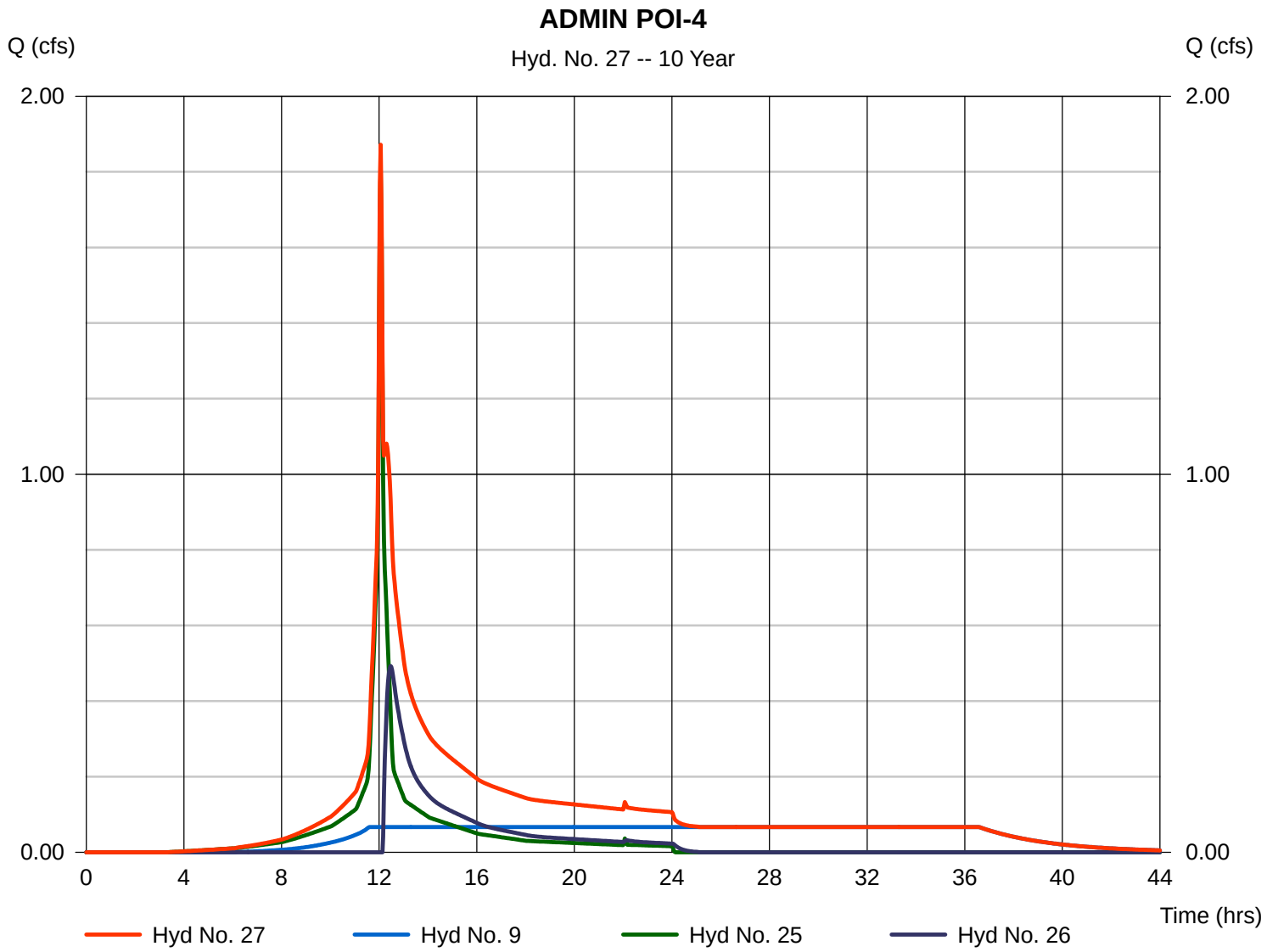
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 27

ADMIN POI-4

Hydrograph type	= Combine	Peak discharge	= 1.872 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 16,667 cuft
Inflow hyds.	= 9, 25, 26	Contrib. drain. area	= 0.340 ac



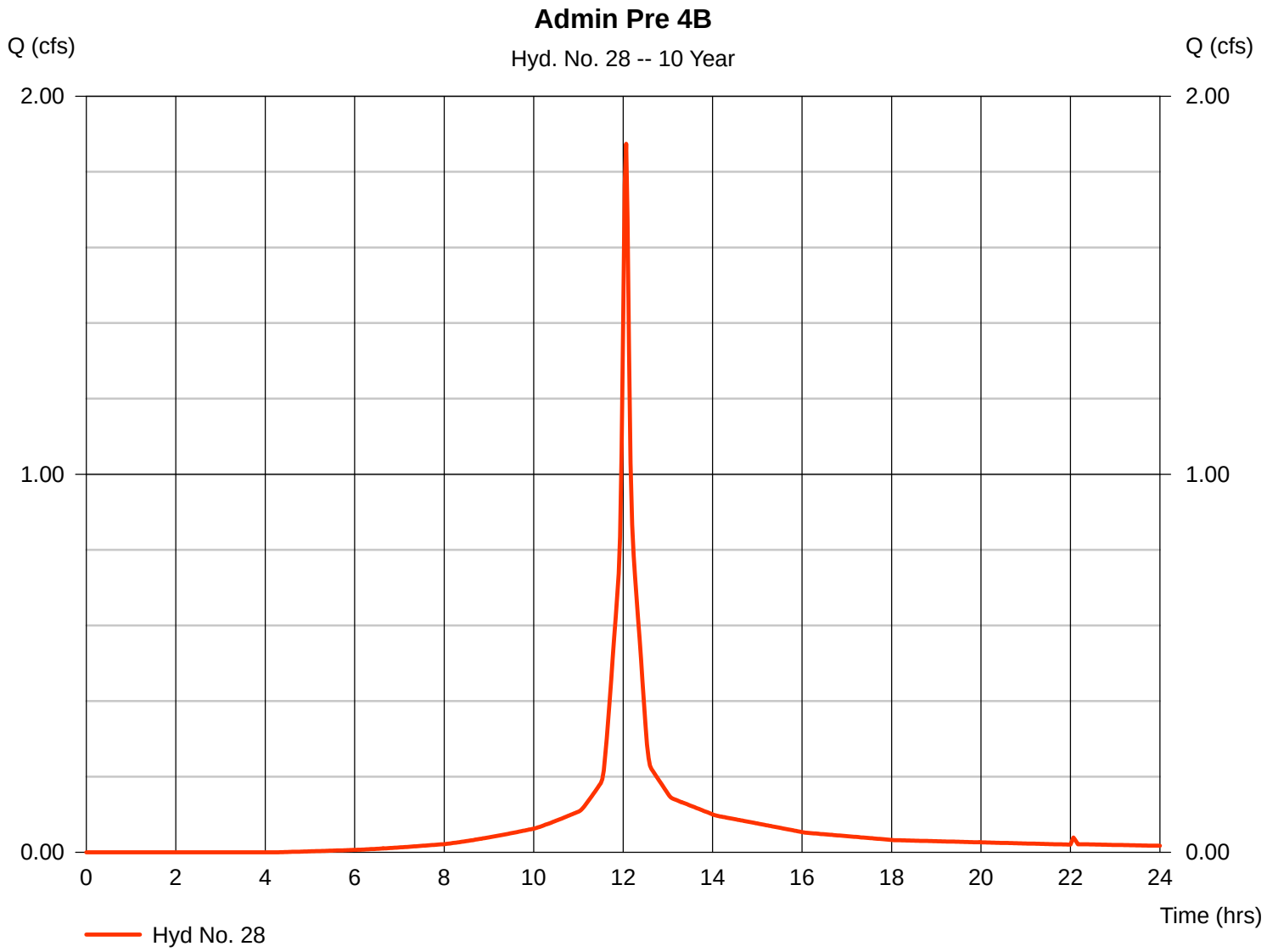
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 28

Admin Pre 4B

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.874 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	5,825 cuft
Drainage area	=	0.370 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



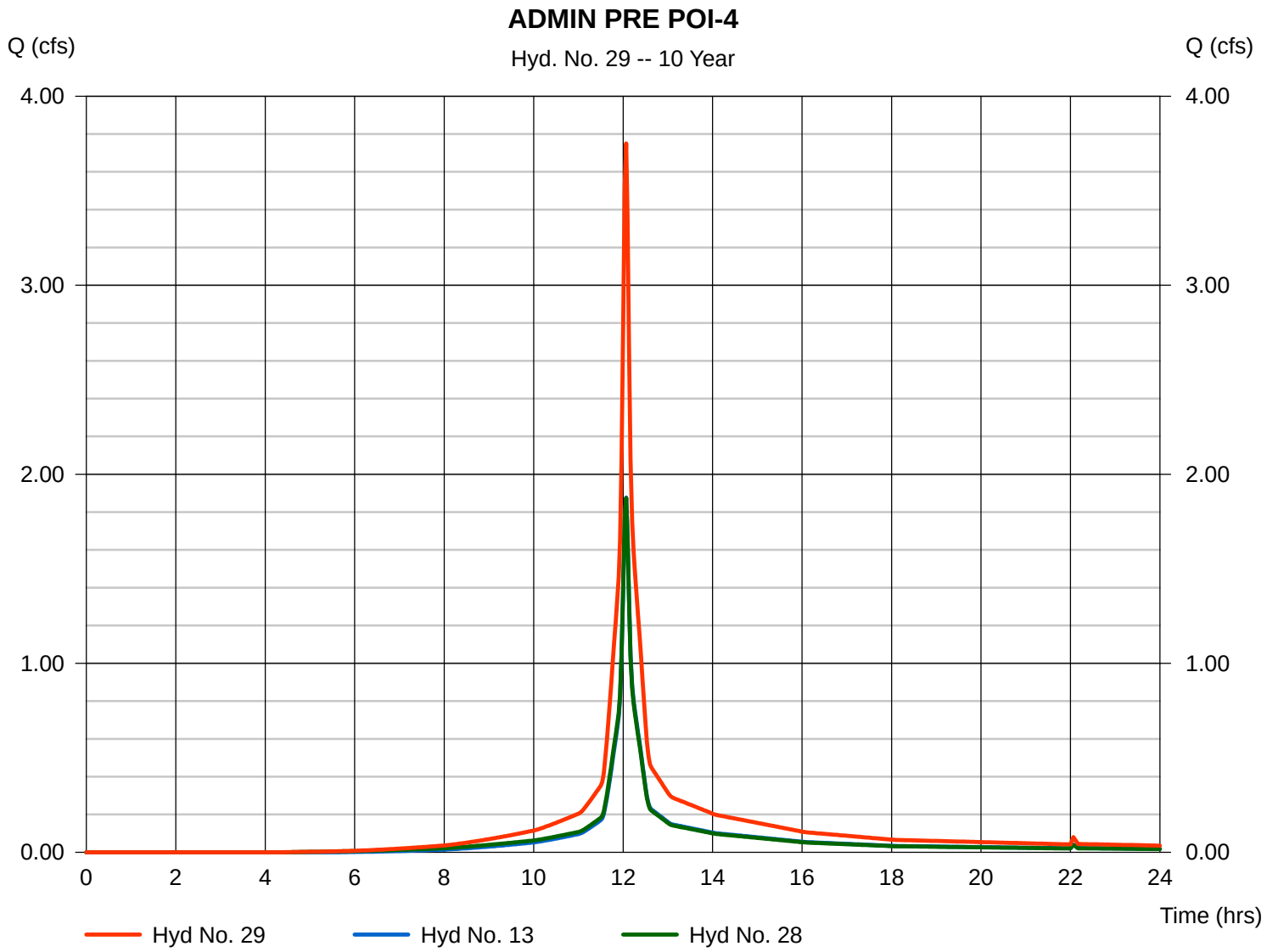
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 29

ADMIN PRE POI-4

Hydrograph type	= Combine	Peak discharge	= 3.751 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 11,537 cuft
Inflow hyds.	= 13, 28	Contrib. drain. area	= 0.770 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.934	2	724	2,844	------	------	------	Admin Post 01
2	SCS Runoff	0.456	2	724	1,399	------	------	------	Admin Post 02
3	SCS Runoff	0.593	2	724	1,799	------	------	------	Admin Post 3A
4	SCS Runoff	1.288	2	724	3,852	------	------	------	Admin Post 3B
5	SCS Runoff	2.191	2	728	8,637	------	------	------	Admin Post 4A
6	SCS Runoff	2.886	2	724	9,130	------	------	------	Admin Post 4B
7	Reservoir	0.020	2	702	1,789	3	7.13	1,119	BMP3A
8	Combine	1.308	2	724	5,641	4, 7	------	------	ADMIN POI-3
9	Reservoir	0.067	2	674	8,627	5	8.01	5,822	BMP4A
10	SCS Runoff	0.989	2	724	3,011	------	------	------	Admin Pre 01
11	SCS Runoff	0.753	2	724	2,324	------	------	------	Admin Pre 02
12	SCS Runoff	3.399	2	728	13,066	------	------	------	Admin Pre 03
13	SCS Runoff	2.278	2	724	6,997	------	------	------	Admin Pre 04A
14	SCS Runoff	4.630	2	738	22,981	------	------	------	Ware Post-1A
15	SCS Runoff	2.822	2	730	12,191	------	------	------	Ware Post-1B
16	SCS Runoff	4.400	2	738	21,746	------	------	------	Ware Post-1C
17	SCS Runoff	3.433	2	738	16,899	------	------	------	Ware Post-1D
18	SCS Runoff	0.395	2	728	1,513	------	------	------	Ware Post-02
19	Reservoir	4.375	2	742	22,967	14	7.75	5,858	BMP1A
20	Reservoir	2.506	2	736	12,180	15	7.00	4,006	BMP1B
21	SCS Runoff	13.45	2	740	70,365	------	------	------	Ware Pre 01
22	Reservoir	4.213	2	742	21,734	16	7.93	5,932	BMP1C
23	Combine	14.34	2	740	73,780	17, 19, 20, 22	------	------	POI-1
24	SCS Runoff	0.592	2	728	2,270	------	------	------	Ware Pre 02
25	SCS Runoff	2.139	2	724	6,871	------	------	------	Admin Post 4C
26	Reservoir	1.029	2	738	5,400	6	8.42	4,644	BMP4B
27	Combine	2.310	2	726	20,898	9, 25, 26	------	------	ADMIN POI-4
28	SCS Runoff	2.242	2	724	7,043	------	------	------	Admin Pre 4B
29	Combine	4.520	2	724	14,040	13, 28	------	------	ADMIN PRE POI-4

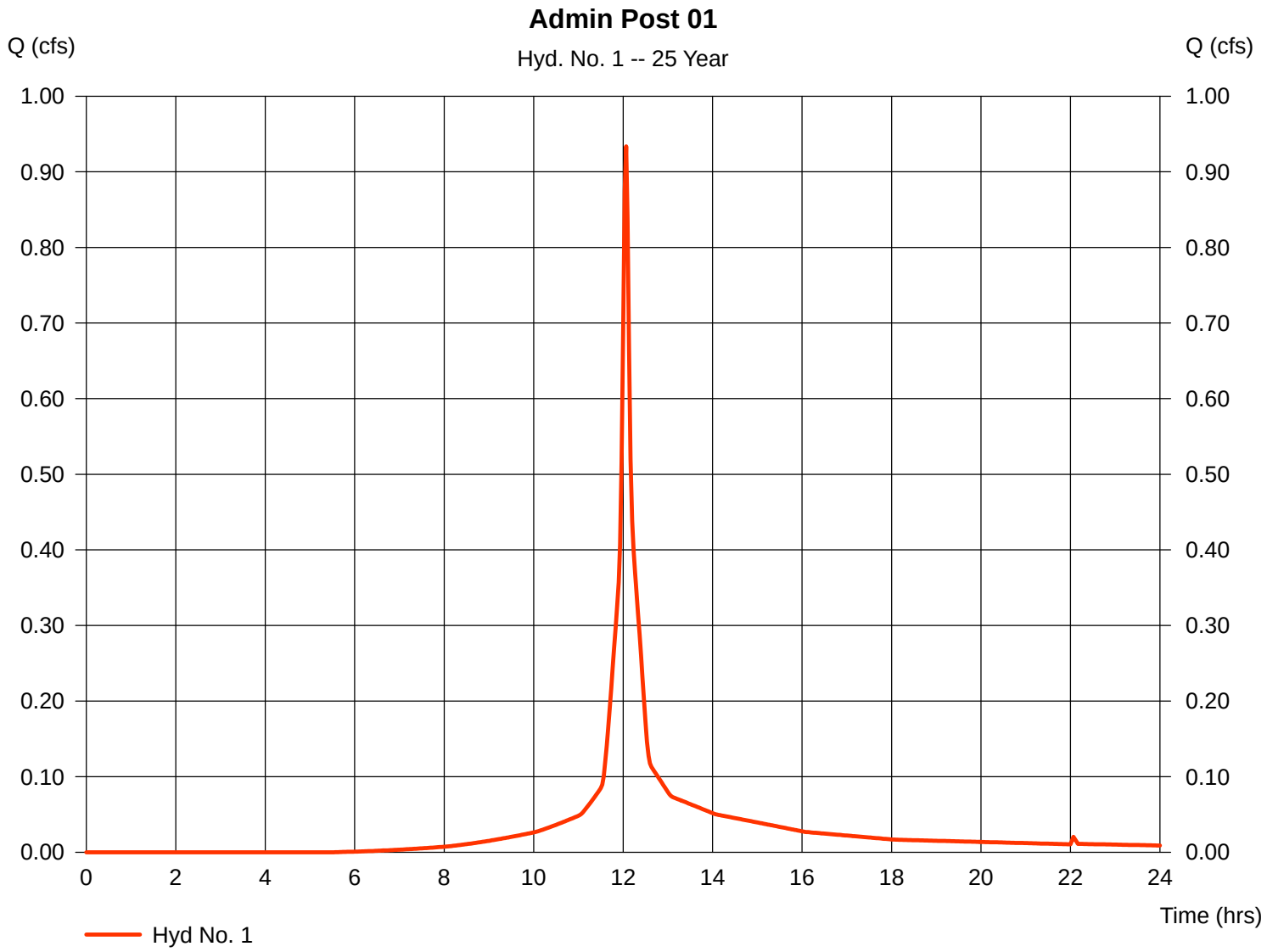
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 1

Admin Post 01

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.934 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	2,844 cuft
Drainage area	=	0.170 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.50 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



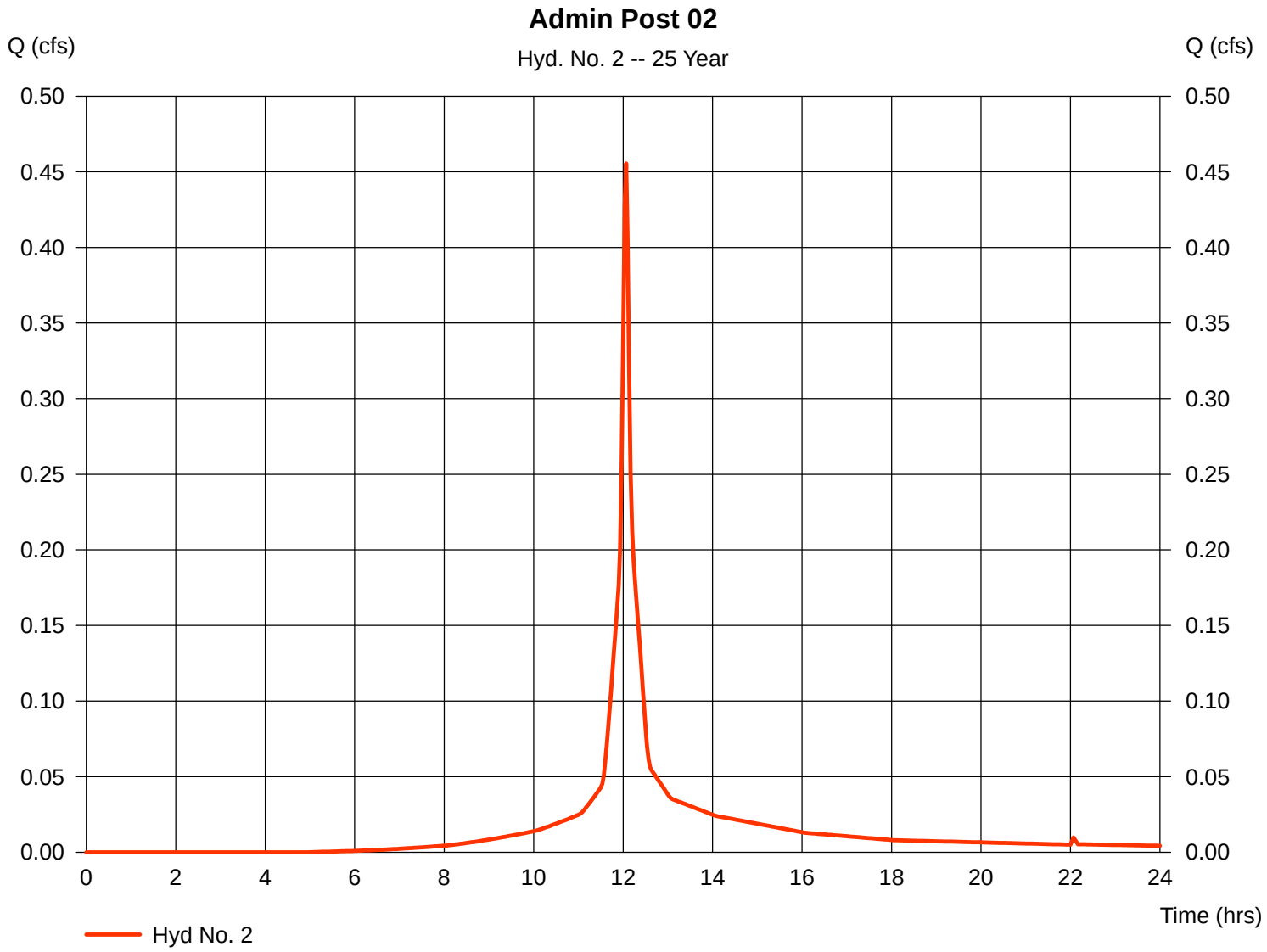
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 2

Admin Post 02

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.456 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	1,399 cuft
Drainage area	=	0.080 ac	Curve number	=	84
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



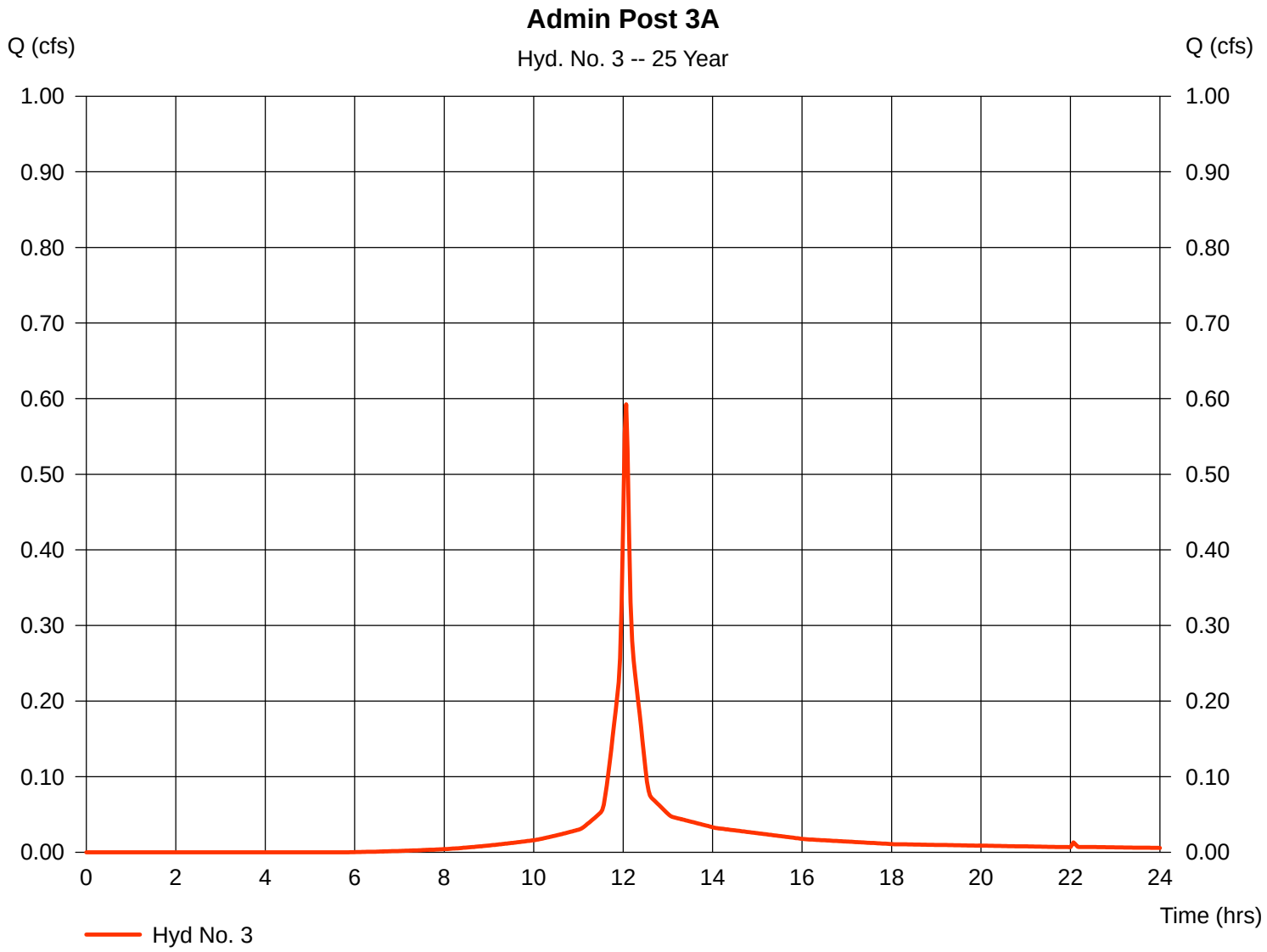
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 3

Admin Post 3A

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.593 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	1,799 cuft
Drainage area	=	0.110 ac	Curve number	=	81
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



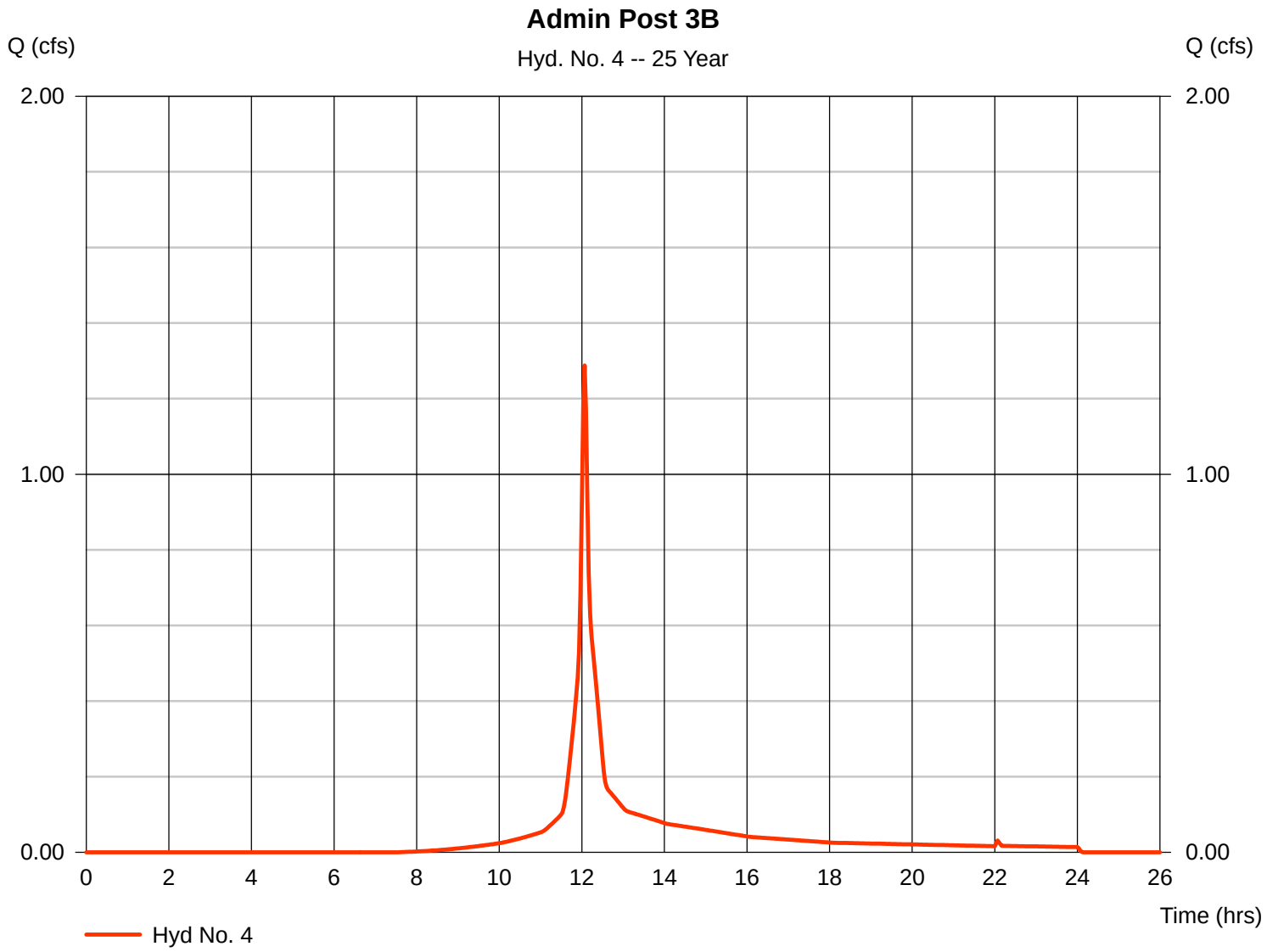
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 4

Admin Post 3B

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.288 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	3,852 cuft
Drainage area	=	0.280 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



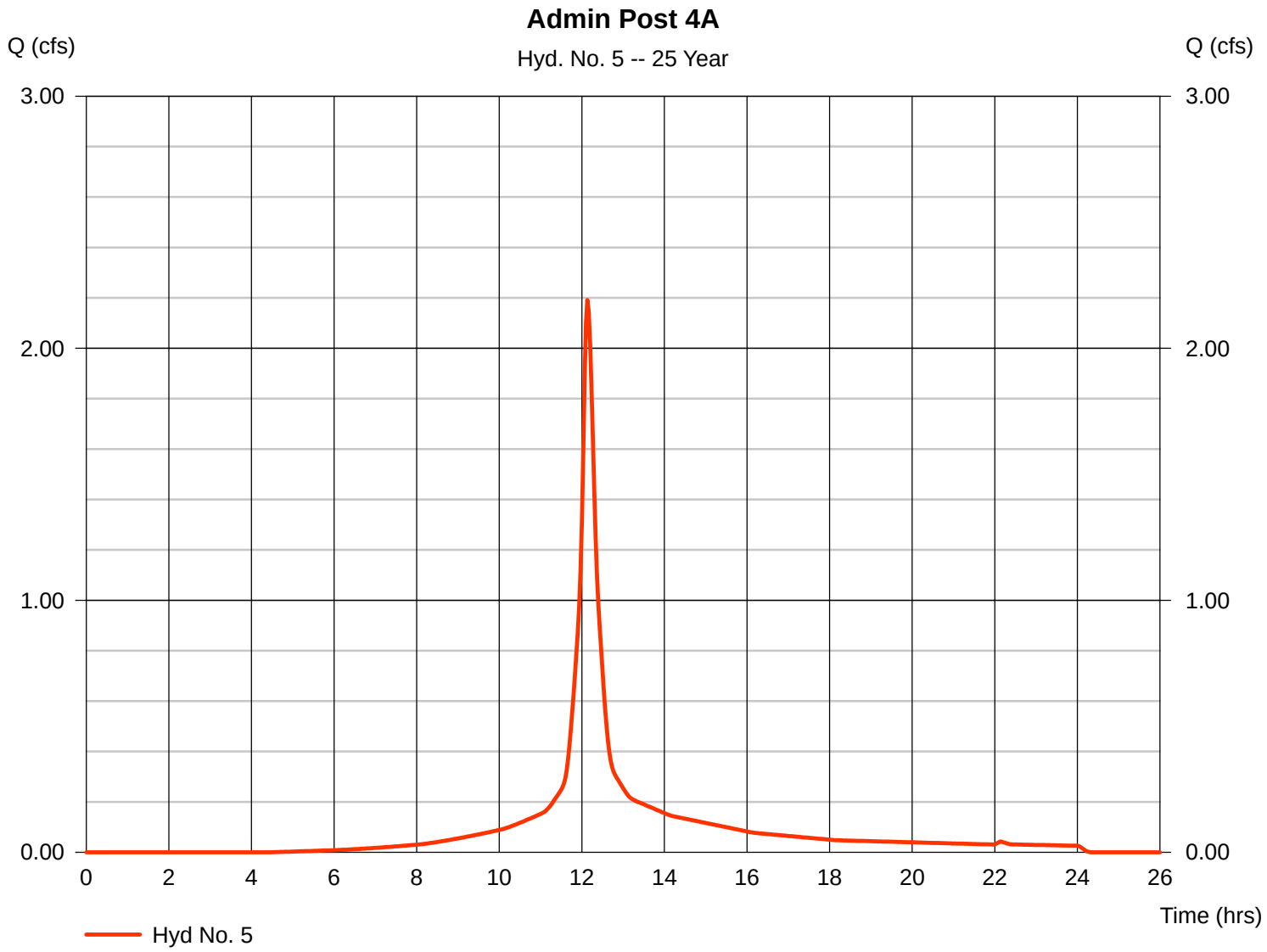
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 5

Admin Post 4A

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.191 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.13 hrs
Time interval	=	2 min	Hyd. volume	=	8,637 cuft
Drainage area	=	0.430 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.20 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



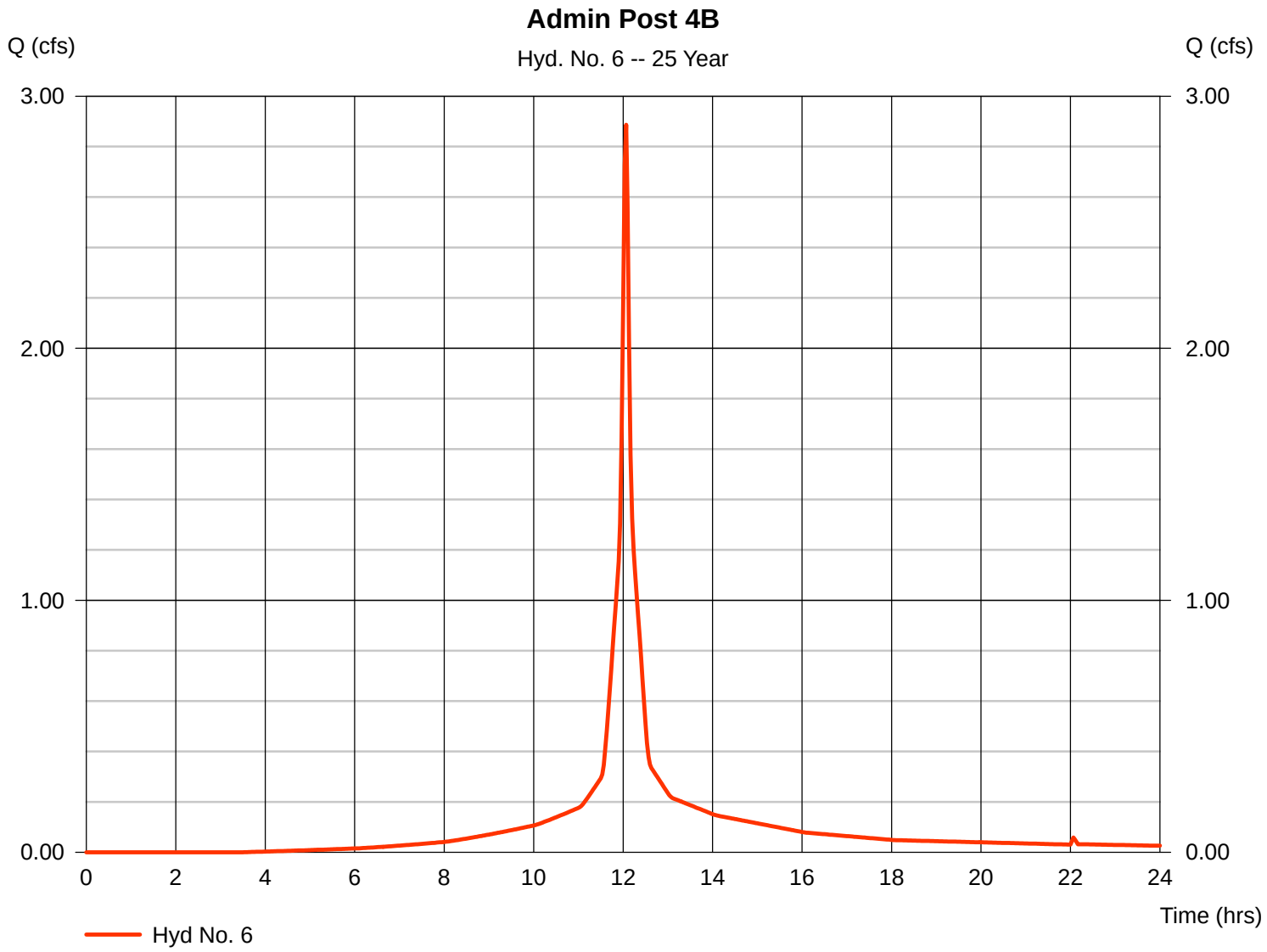
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 6

Admin Post 4B

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.886 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	9,130 cuft
Drainage area	=	0.470 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

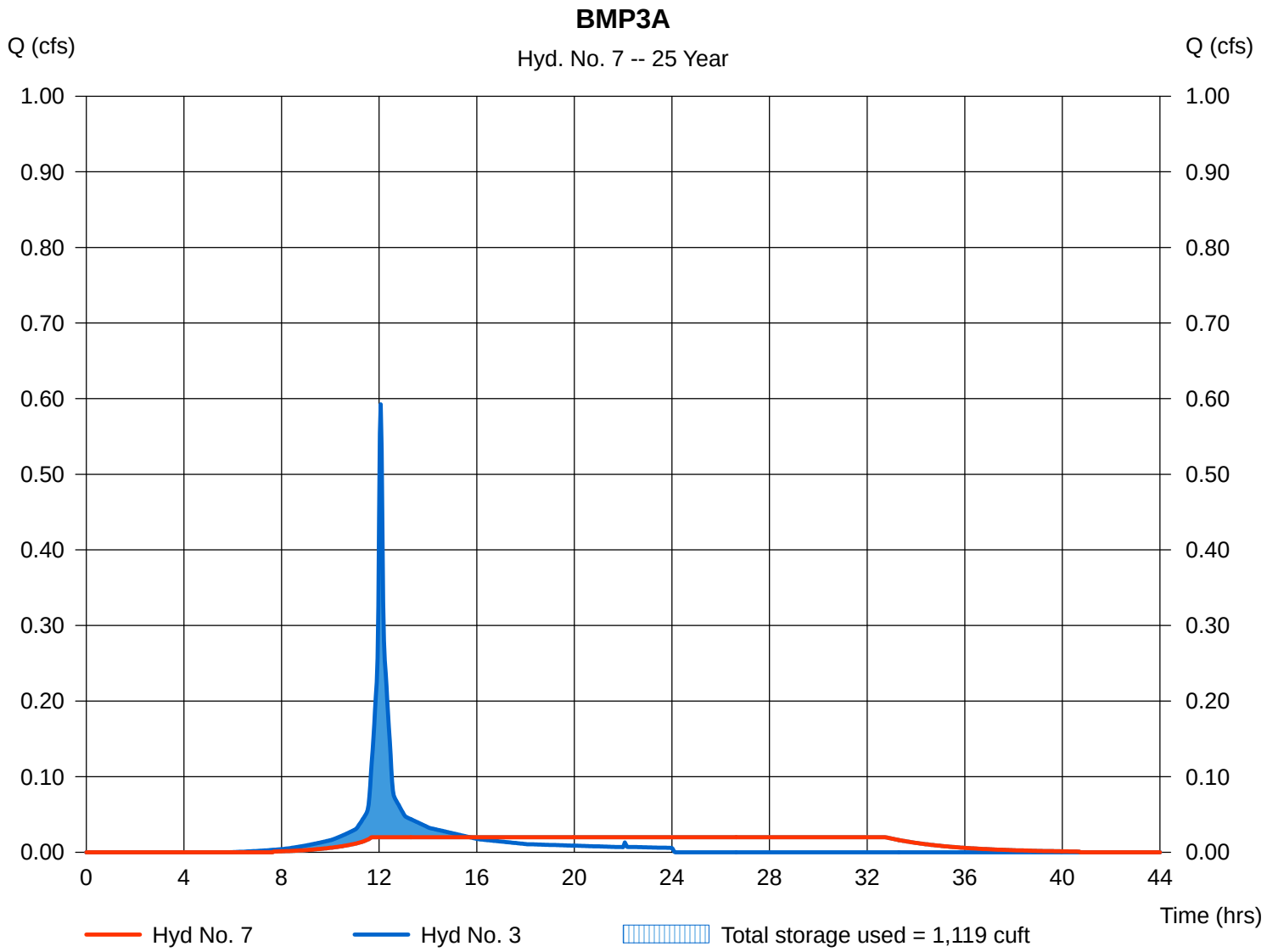
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 7

BMP3A

Hydrograph type	=	Reservoir	Peak discharge	=	0.020 cfs
Storm frequency	=	25 yrs	Time to peak	=	11.70 hrs
Time interval	=	2 min	Hyd. volume	=	1,789 cuft
Inflow hyd. No.	=	3 - Admin Post 3A	Max. Elevation	=	7.13 ft
Reservoir name	=	ADMIN-BMP3A	Max. Storage	=	1,119 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



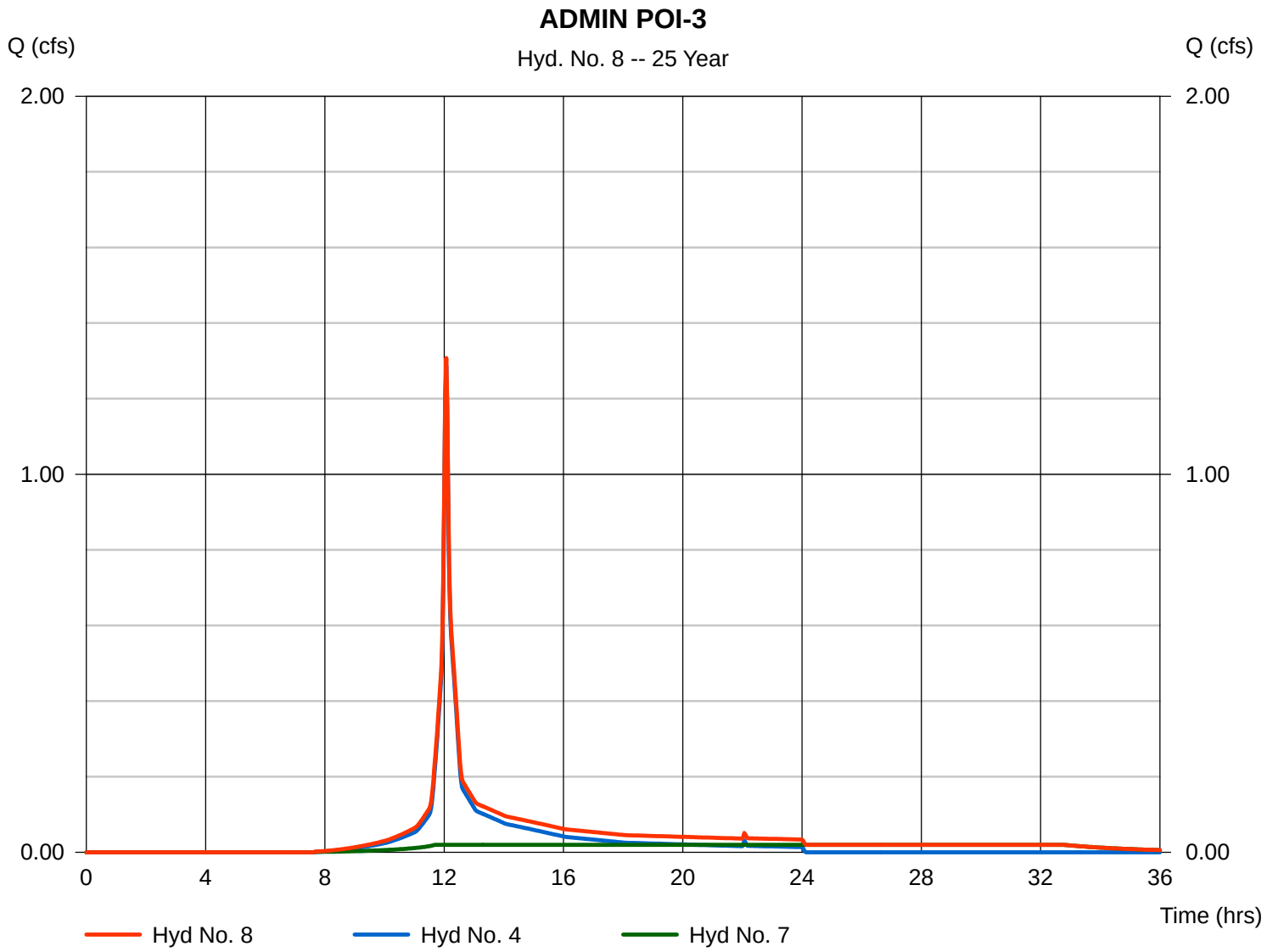
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 8

ADMIN POI-3

Hydrograph type	=	Combine	Peak discharge	=	1.308 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	5,641 cuft
Inflow hyds.	=	4, 7	Contrib. drain. area	=	0.280 ac



Hydrograph Report

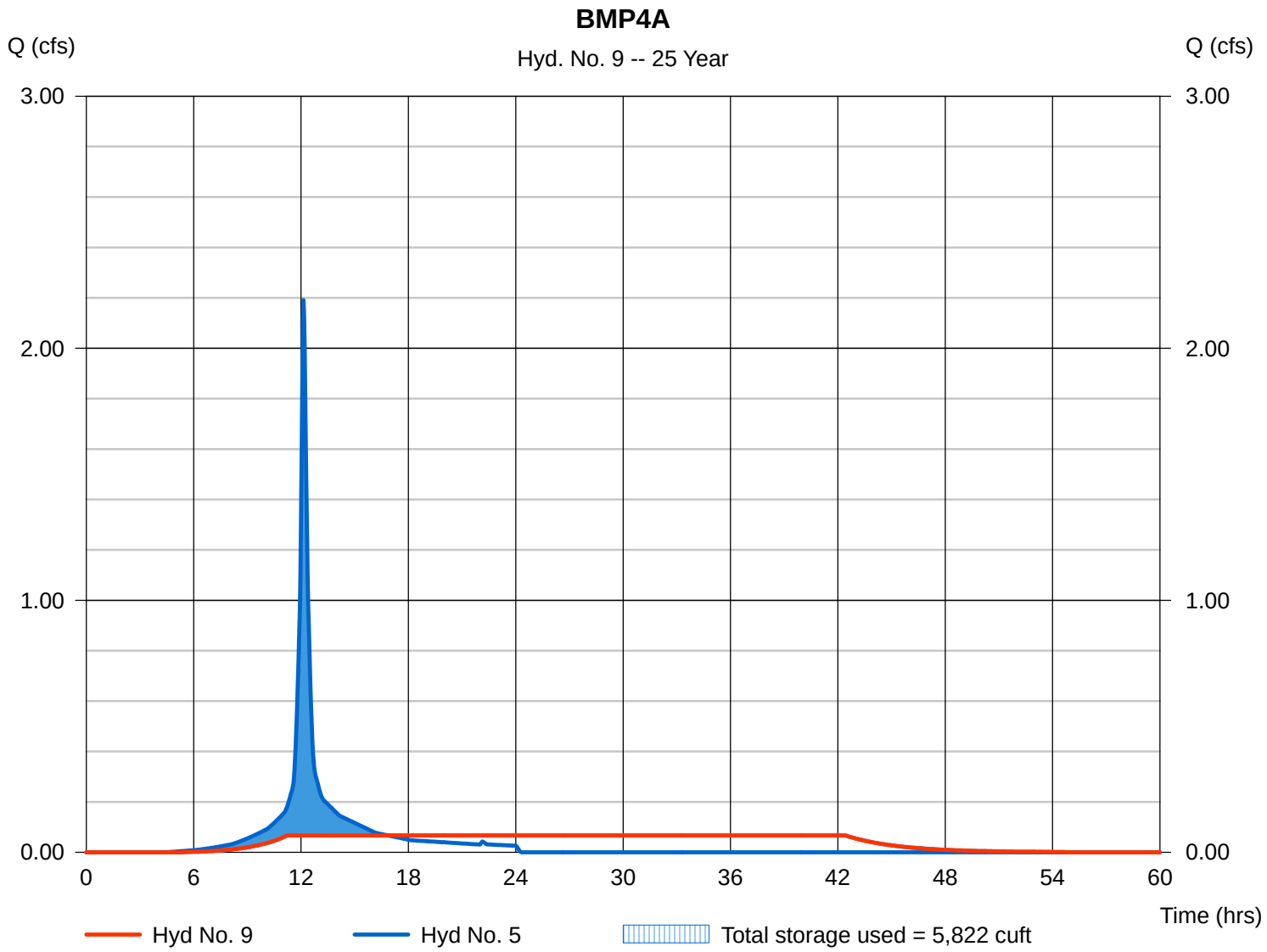
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 9

BMP4A

Hydrograph type	=	Reservoir	Peak discharge	=	0.067 cfs
Storm frequency	=	25 yrs	Time to peak	=	11.23 hrs
Time interval	=	2 min	Hyd. volume	=	8,627 cuft
Inflow hyd. No.	=	5 - Admin Post 4A	Max. Elevation	=	8.01 ft
Reservoir name	=	ADMIN-BMP4A	Max. Storage	=	5,822 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



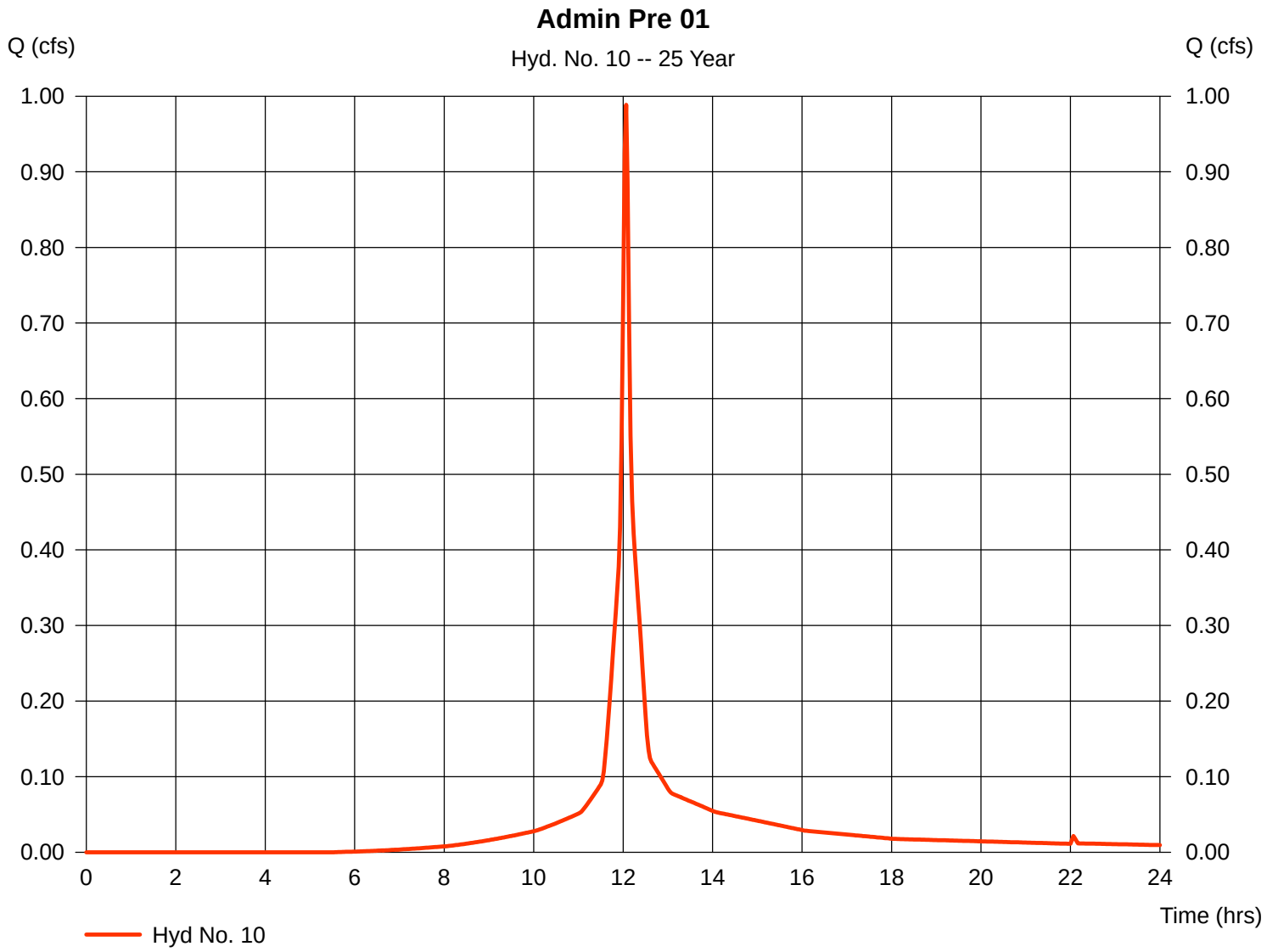
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 10

Admin Pre 01

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.989 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	3,011 cuft
Drainage area	=	0.180 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



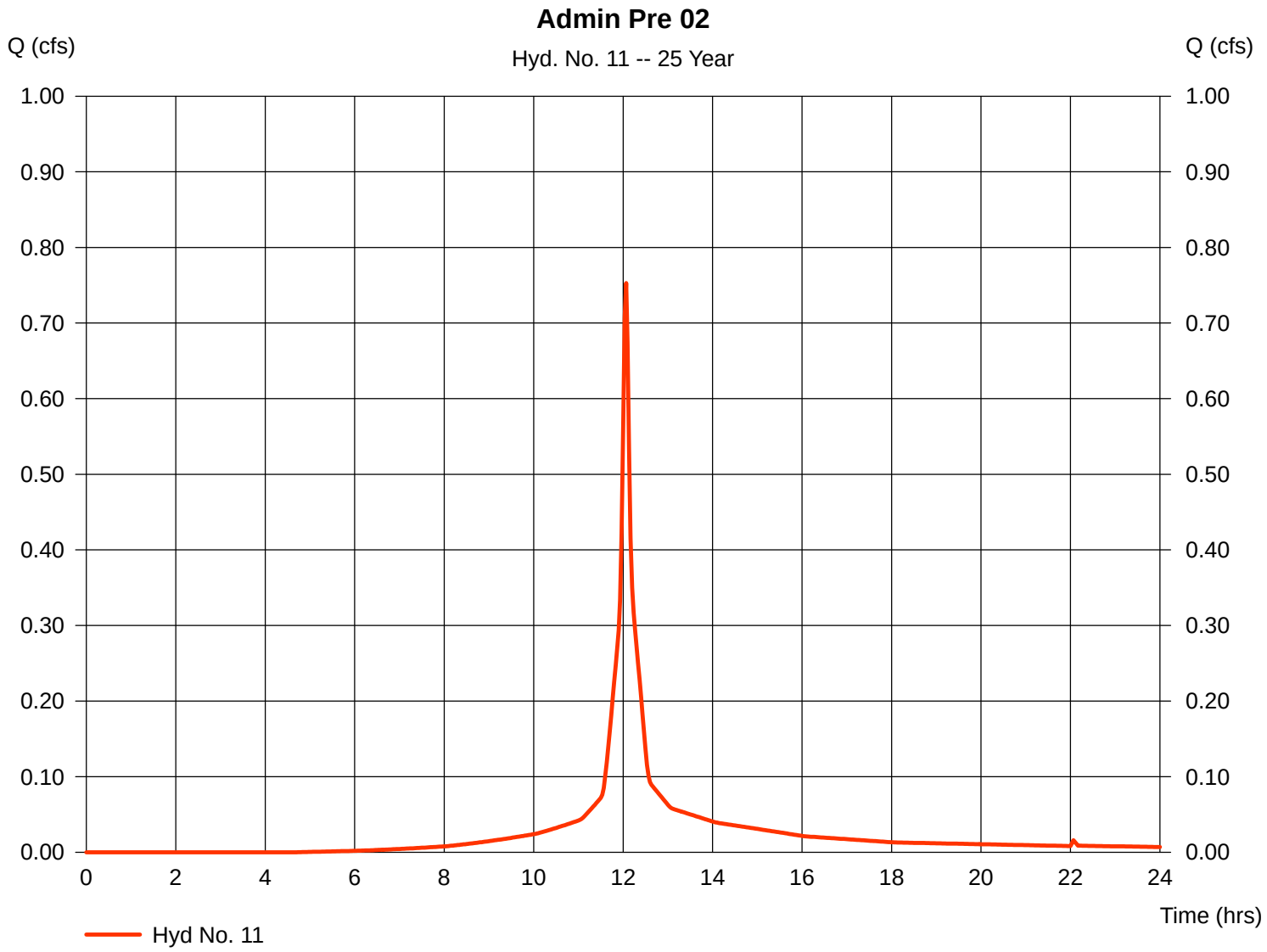
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 11

Admin Pre 02

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.753 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	2,324 cuft
Drainage area	=	0.130 ac	Curve number	=	85
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



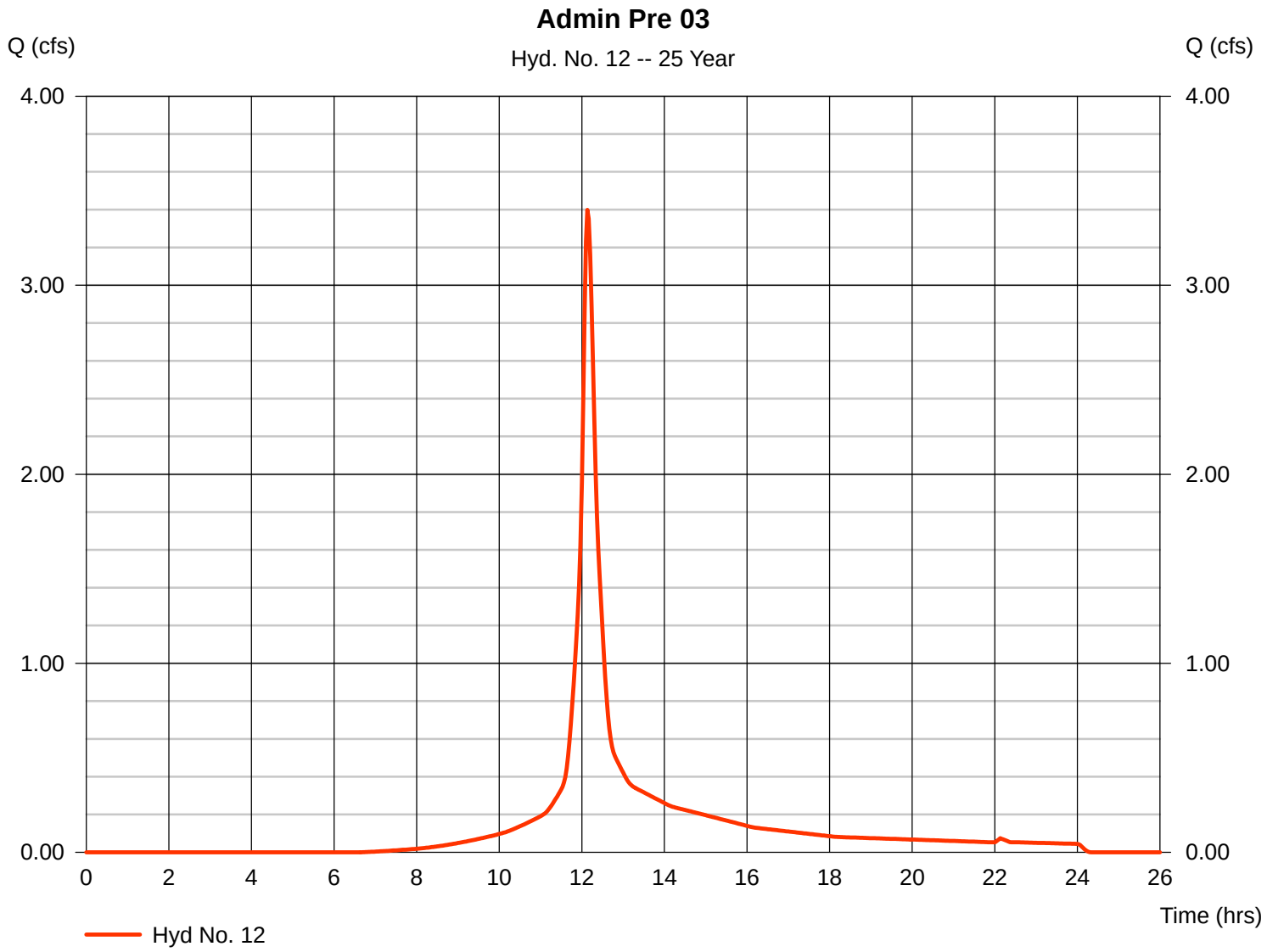
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 12

Admin Pre 03

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.399 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.13 hrs
Time interval	=	2 min	Hyd. volume	=	13,066 cuft
Drainage area	=	0.780 ac	Curve number	=	78
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.00 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



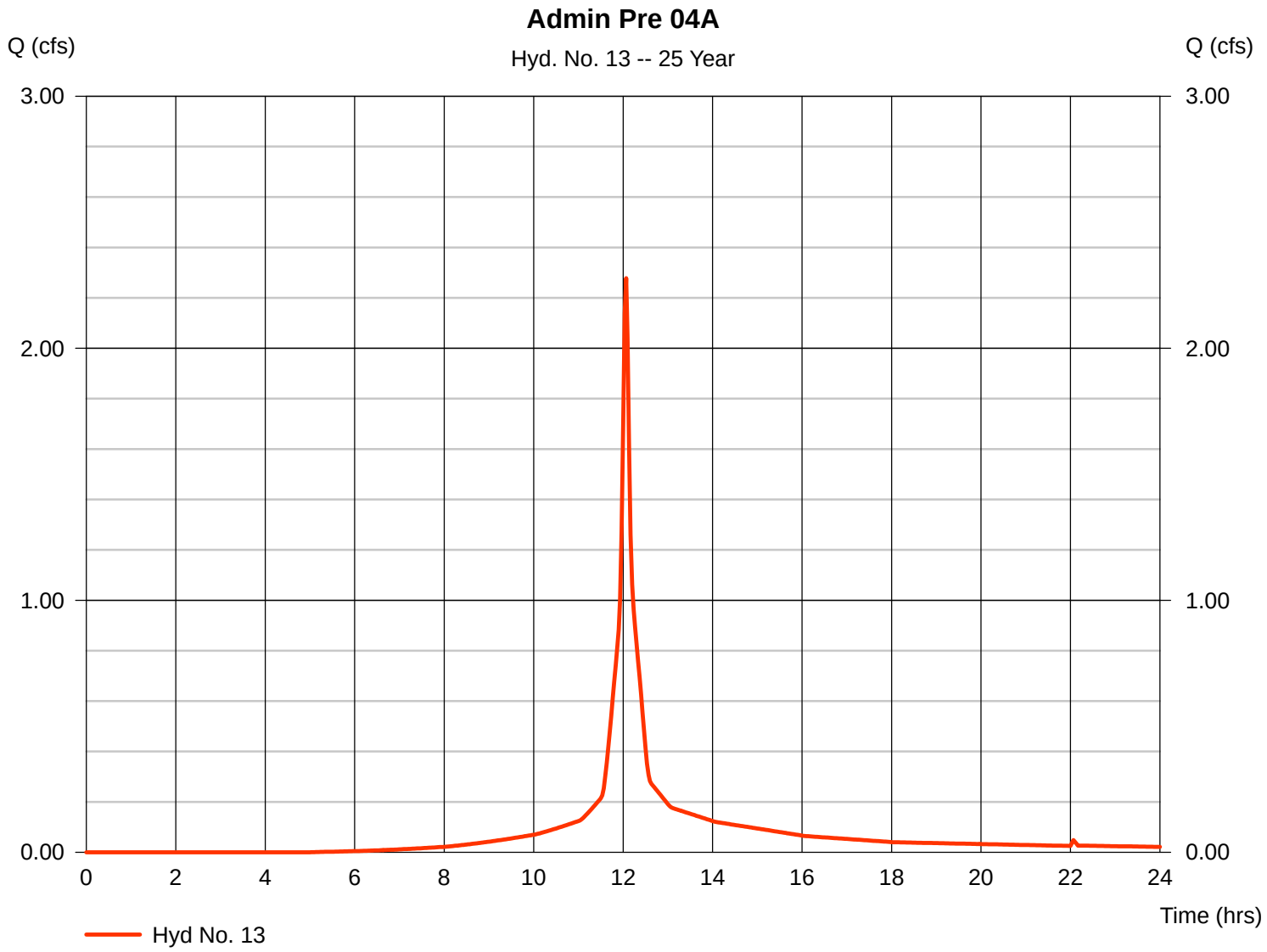
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 13

Admin Pre 04A

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.278 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	6,997 cuft
Drainage area	=	0.400 ac	Curve number	=	84
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.50 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



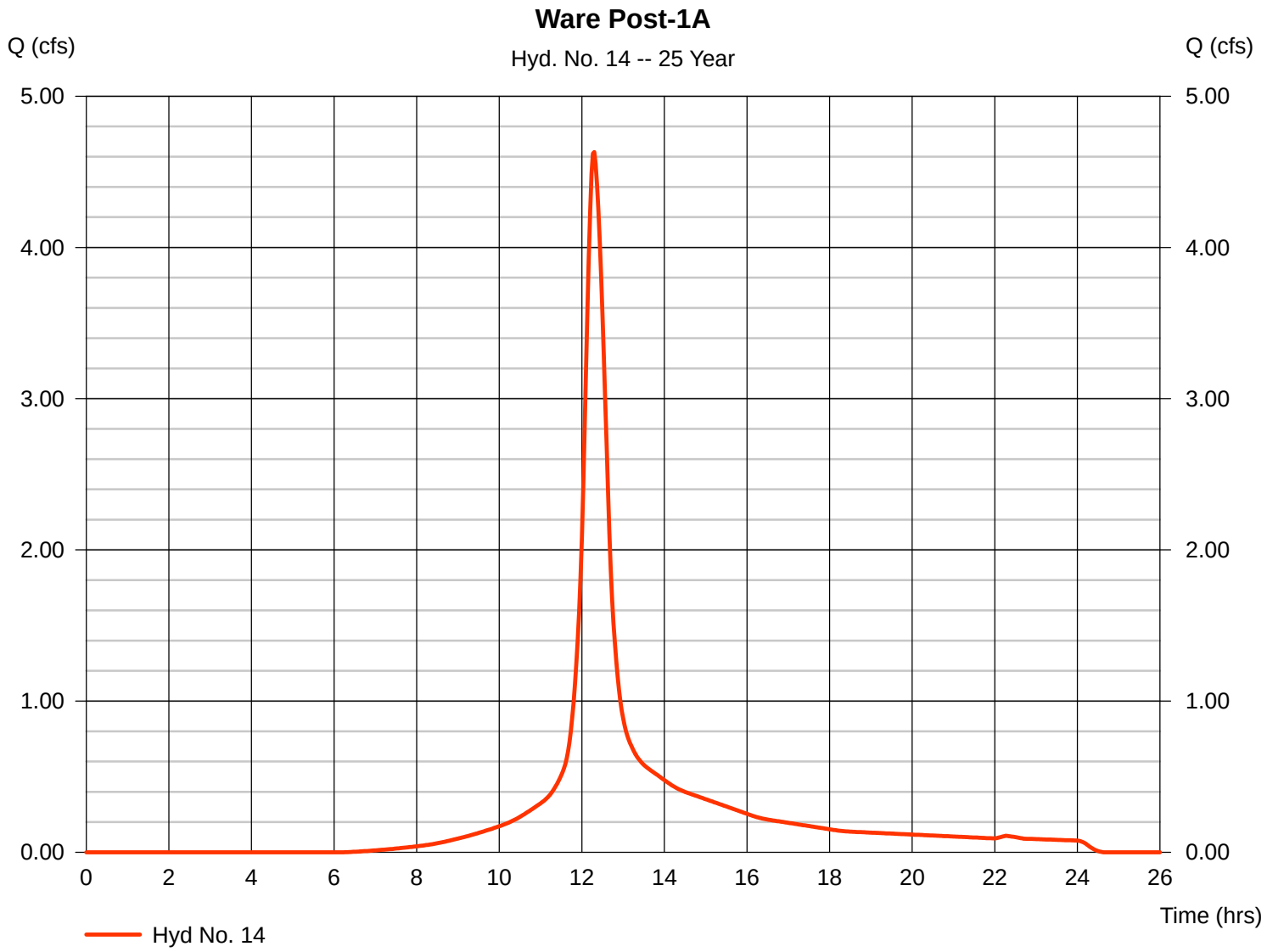
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 14

Ware Post-1A

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.630 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.30 hrs
Time interval	=	2 min	Hyd. volume	=	22,981 cuft
Drainage area	=	1.370 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	26.60 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



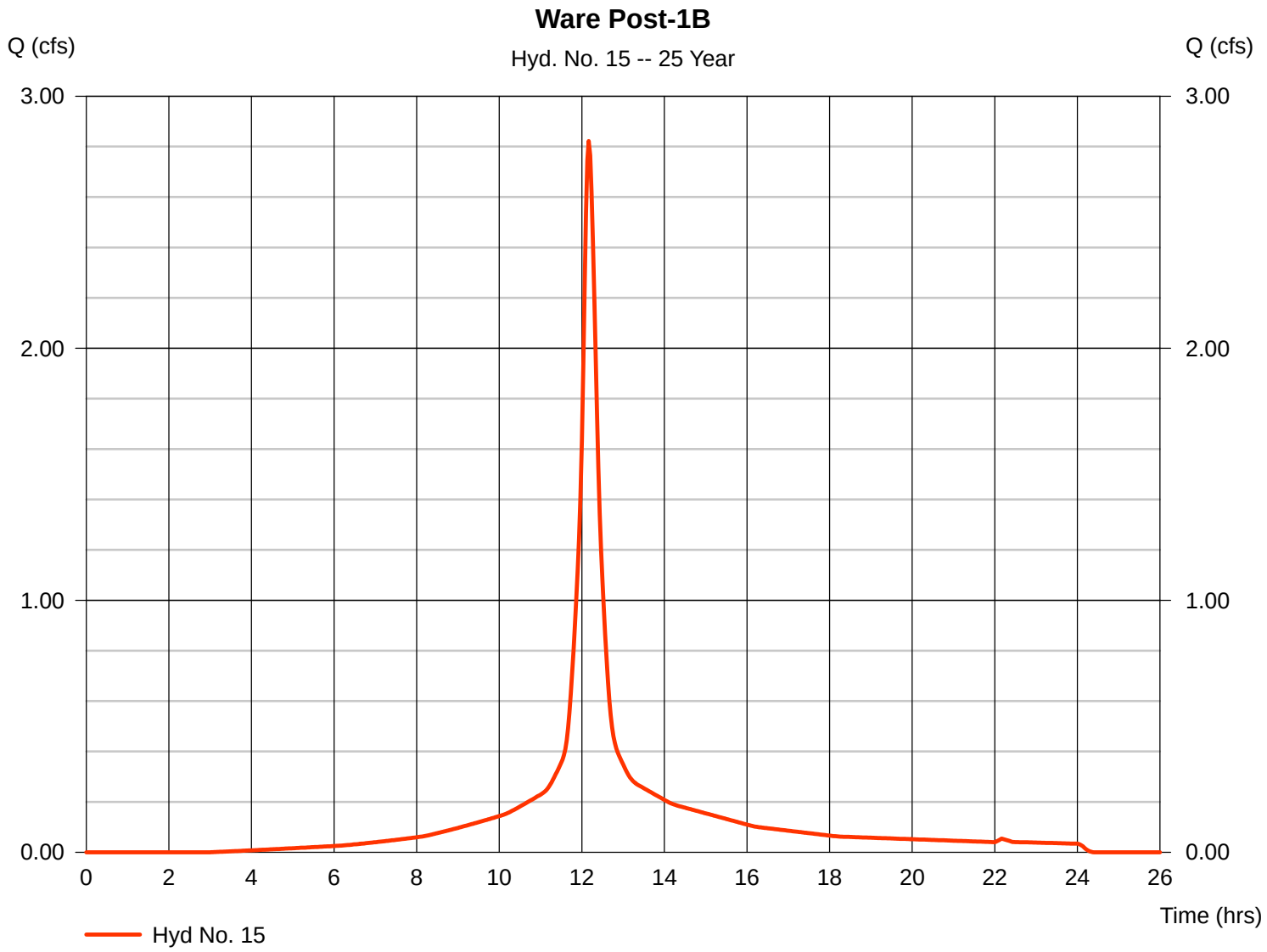
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 15

Ware Post-1B

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.822 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.17 hrs
Time interval	=	2 min	Hyd. volume	=	12,191 cuft
Drainage area	=	0.580 ac	Curve number	=	91
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.90 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



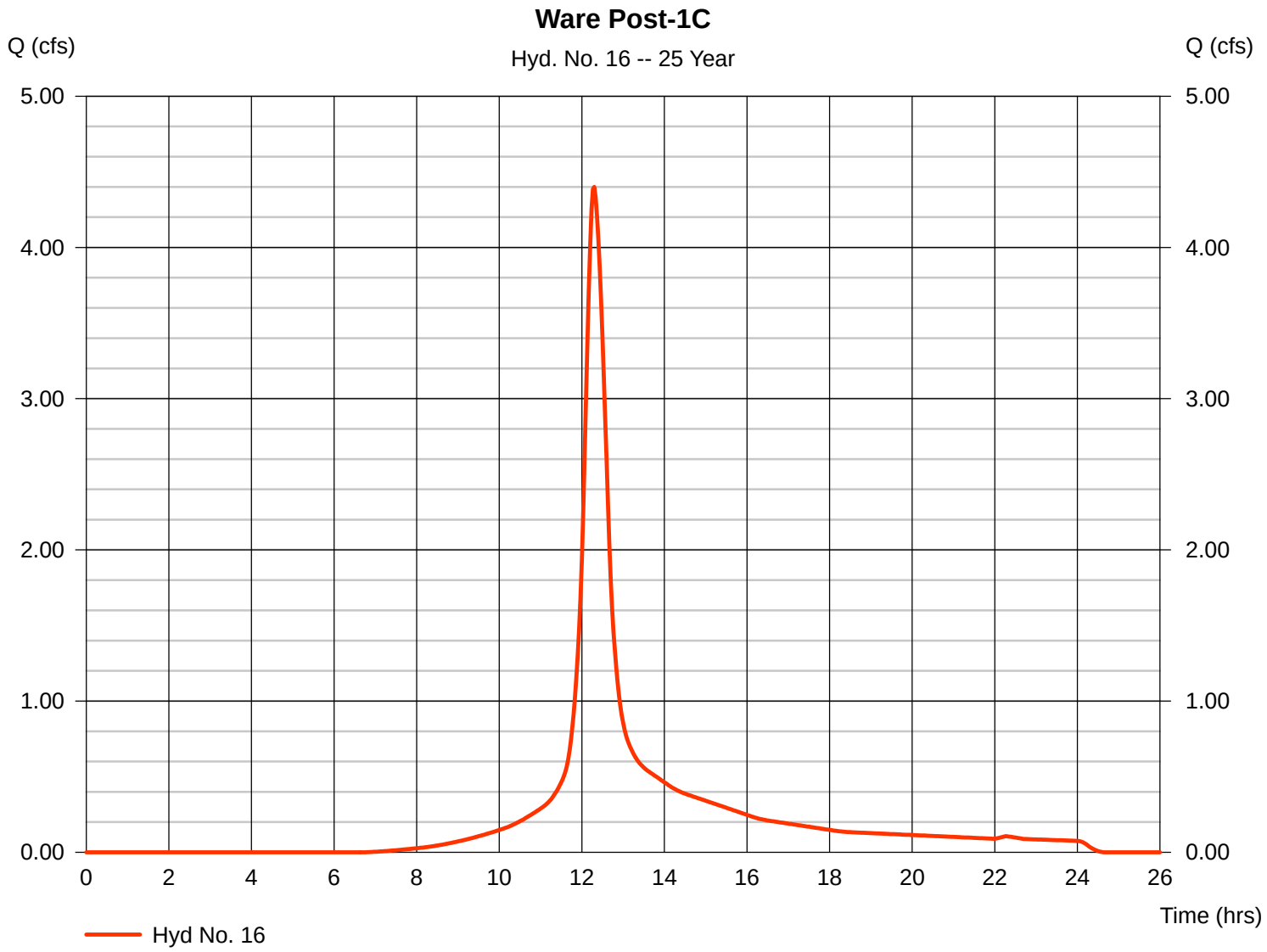
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 16

Ware Post-1C

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.400 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.30 hrs
Time interval	=	2 min	Hyd. volume	=	21,746 cuft
Drainage area	=	1.360 ac	Curve number	=	78
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.79 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



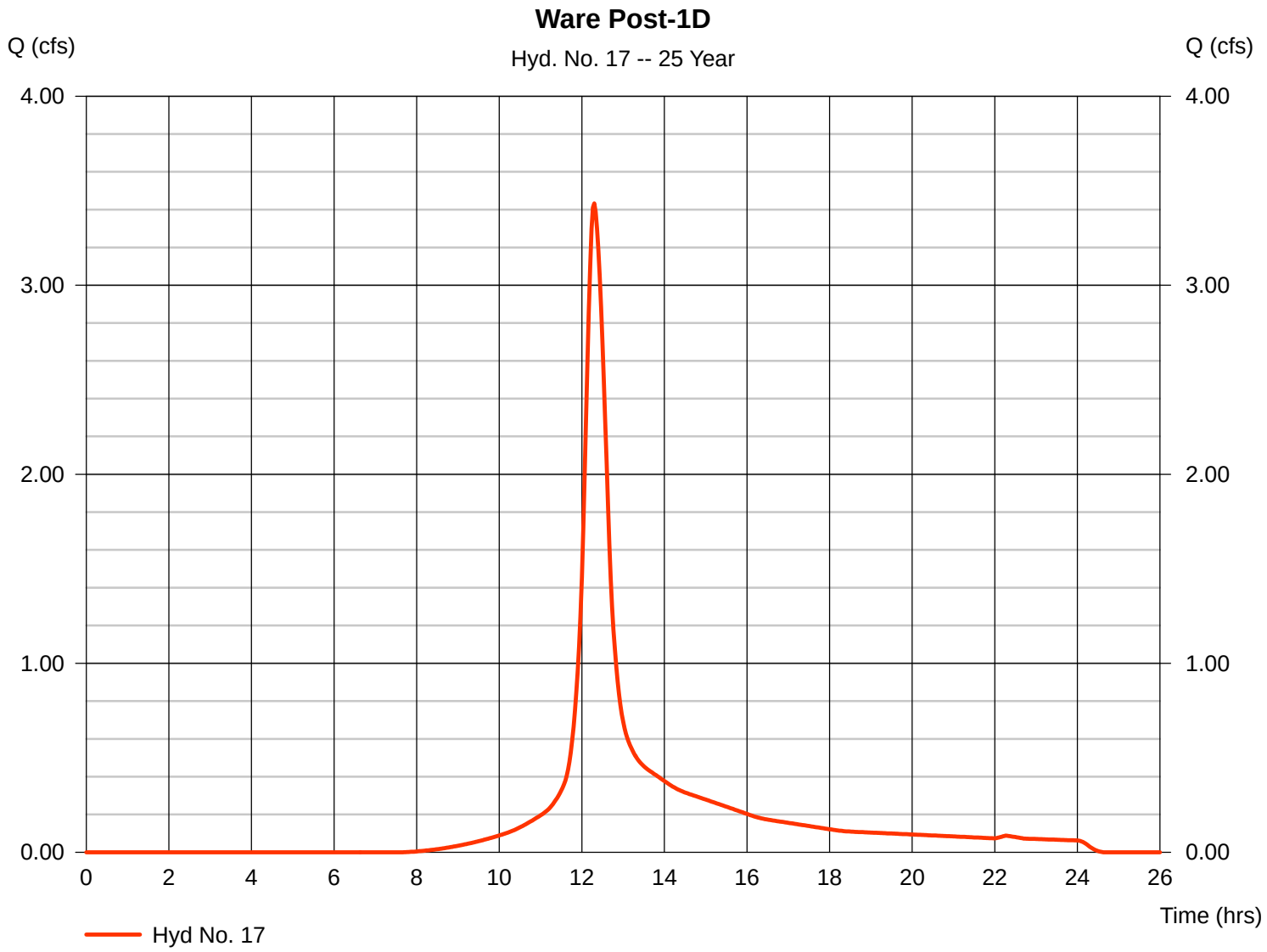
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 17

Ware Post-1D

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.433 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.30 hrs
Time interval	=	2 min	Hyd. volume	=	16,899 cuft
Drainage area	=	1.170 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.90 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



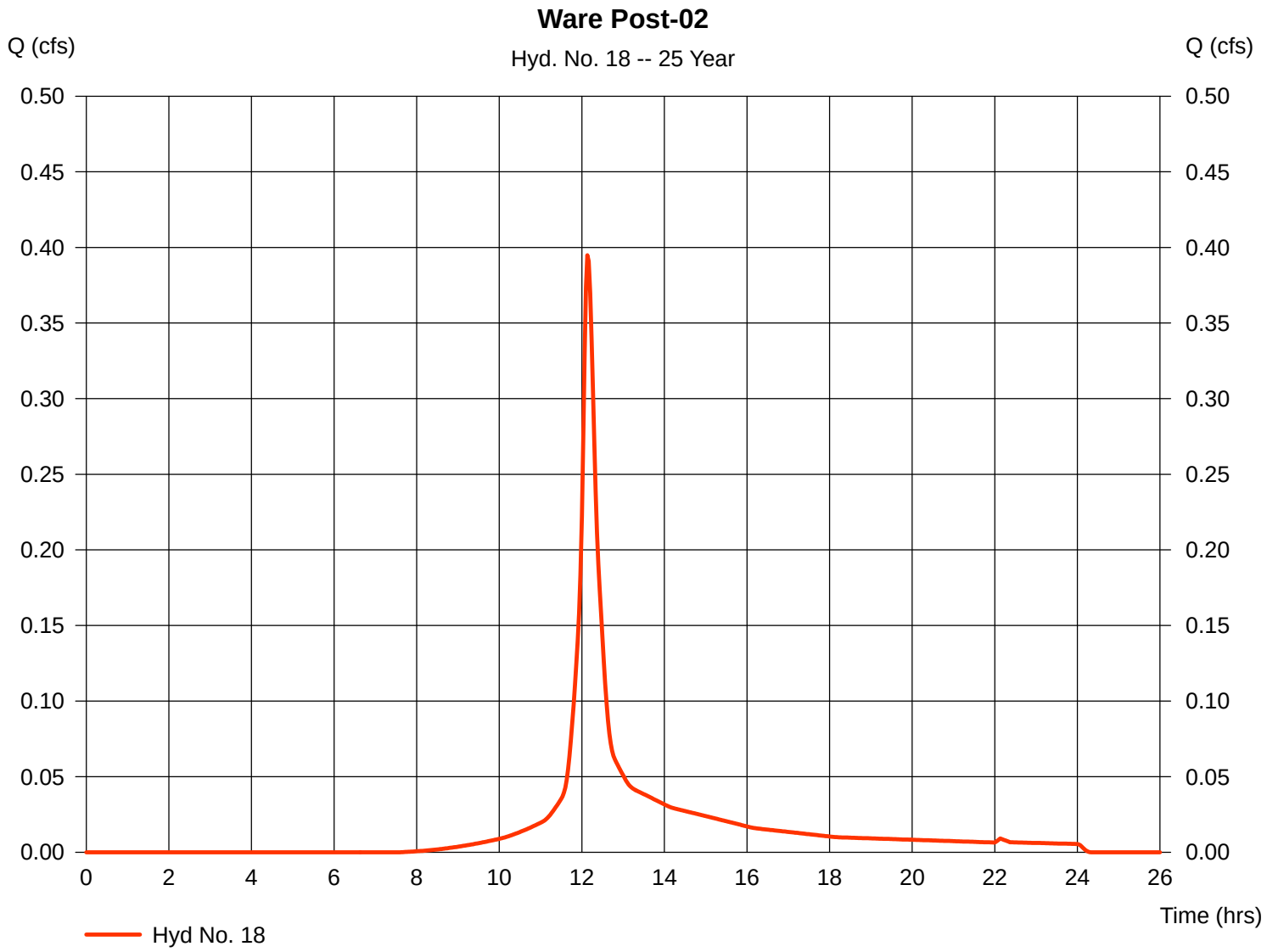
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 18

Ware Post-02

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.395 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.13 hrs
Time interval	=	2 min	Hyd. volume	=	1,513 cuft
Drainage area	=	0.100 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.30 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

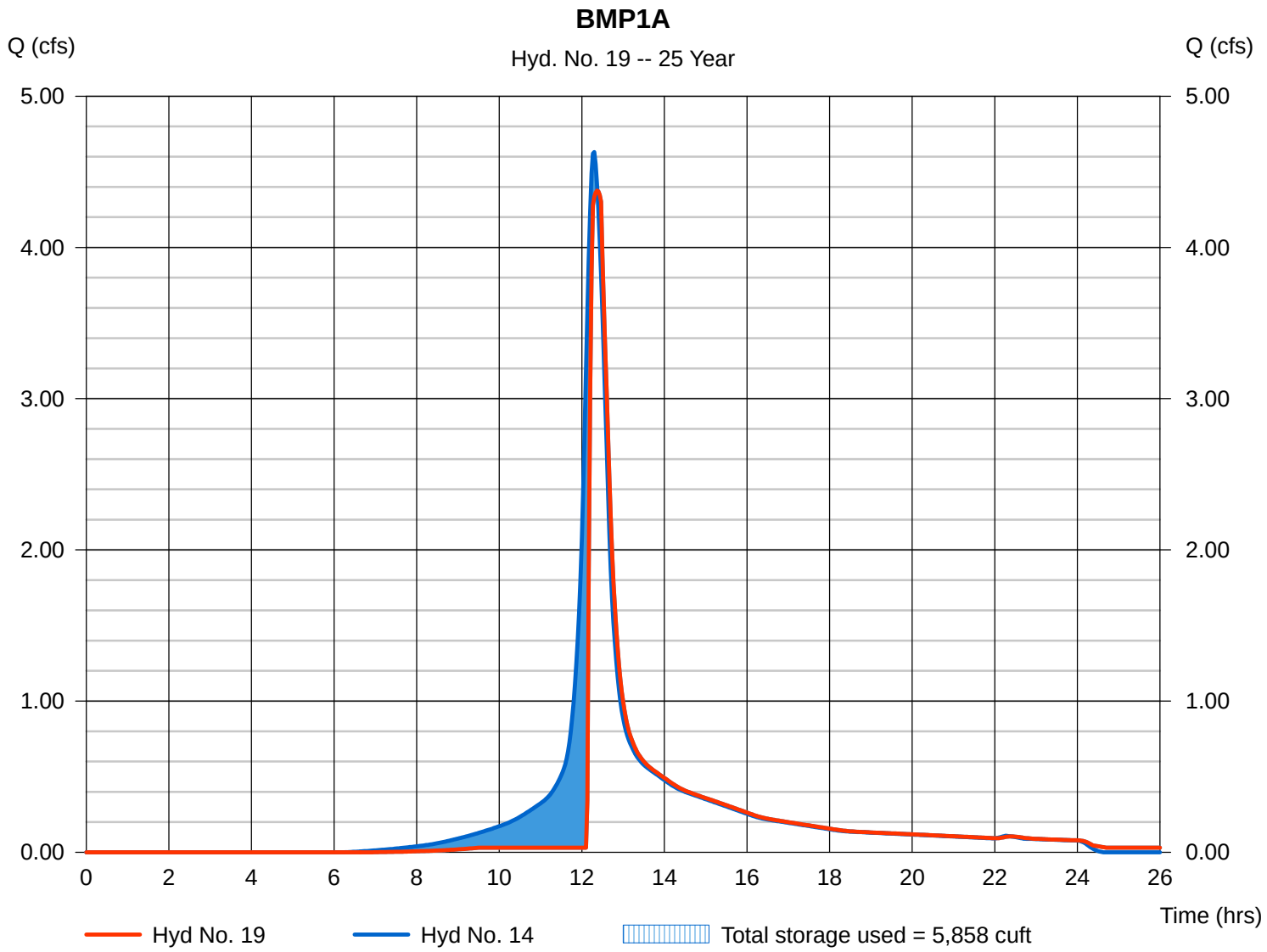
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 19

BMP1A

Hydrograph type	=	Reservoir	Peak discharge	=	4.375 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.37 hrs
Time interval	=	2 min	Hyd. volume	=	22,967 cuft
Inflow hyd. No.	=	14 - Ware Post-1A	Max. Elevation	=	7.75 ft
Reservoir name	=	WARE-BMP1A	Max. Storage	=	5,858 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

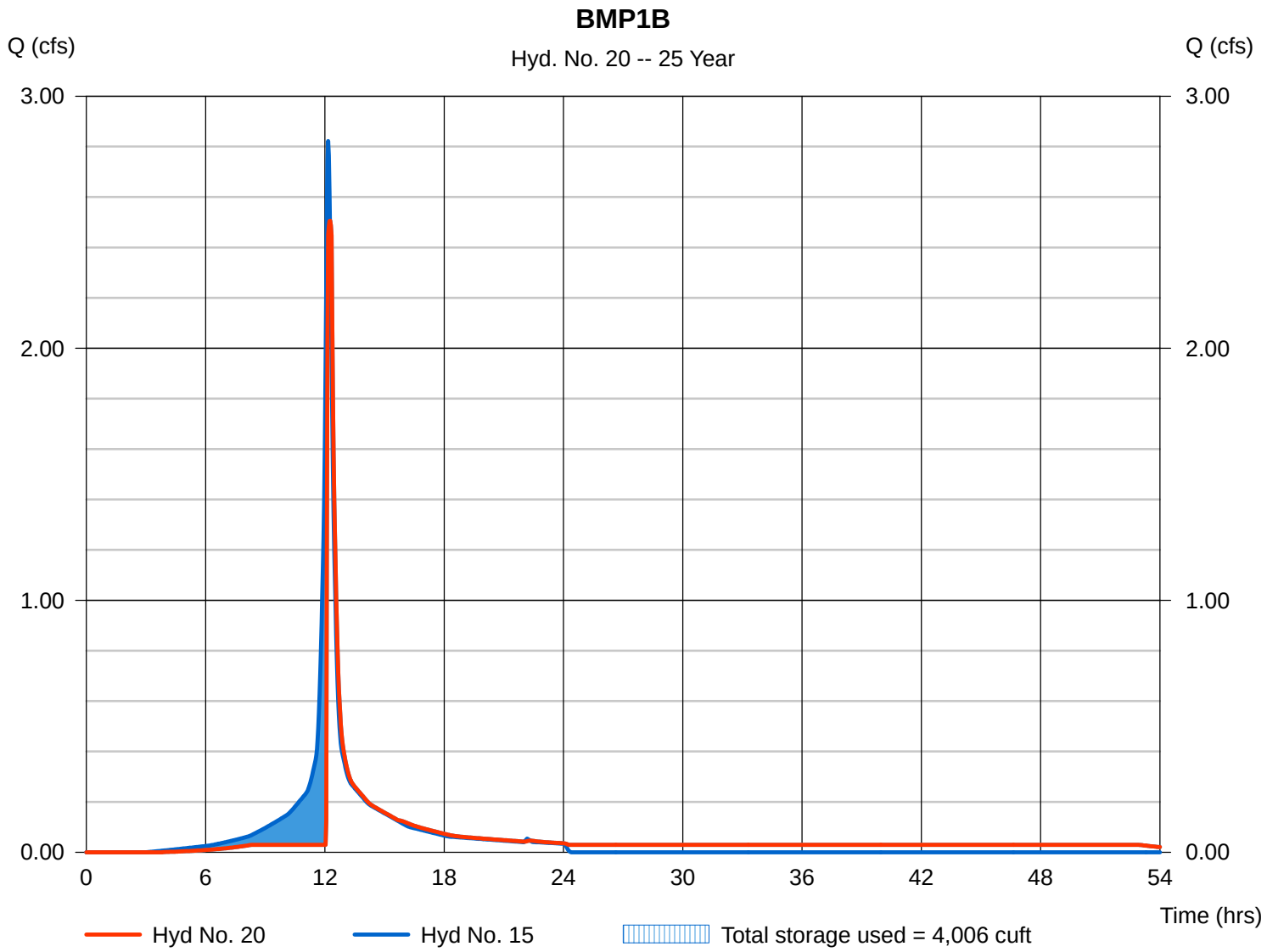
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 20

BMP1B

Hydrograph type	=	Reservoir	Peak discharge	=	2.506 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.27 hrs
Time interval	=	2 min	Hyd. volume	=	12,180 cuft
Inflow hyd. No.	=	15 - Ware Post-1B	Max. Elevation	=	7.00 ft
Reservoir name	=	WARE-BMP1B	Max. Storage	=	4,006 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



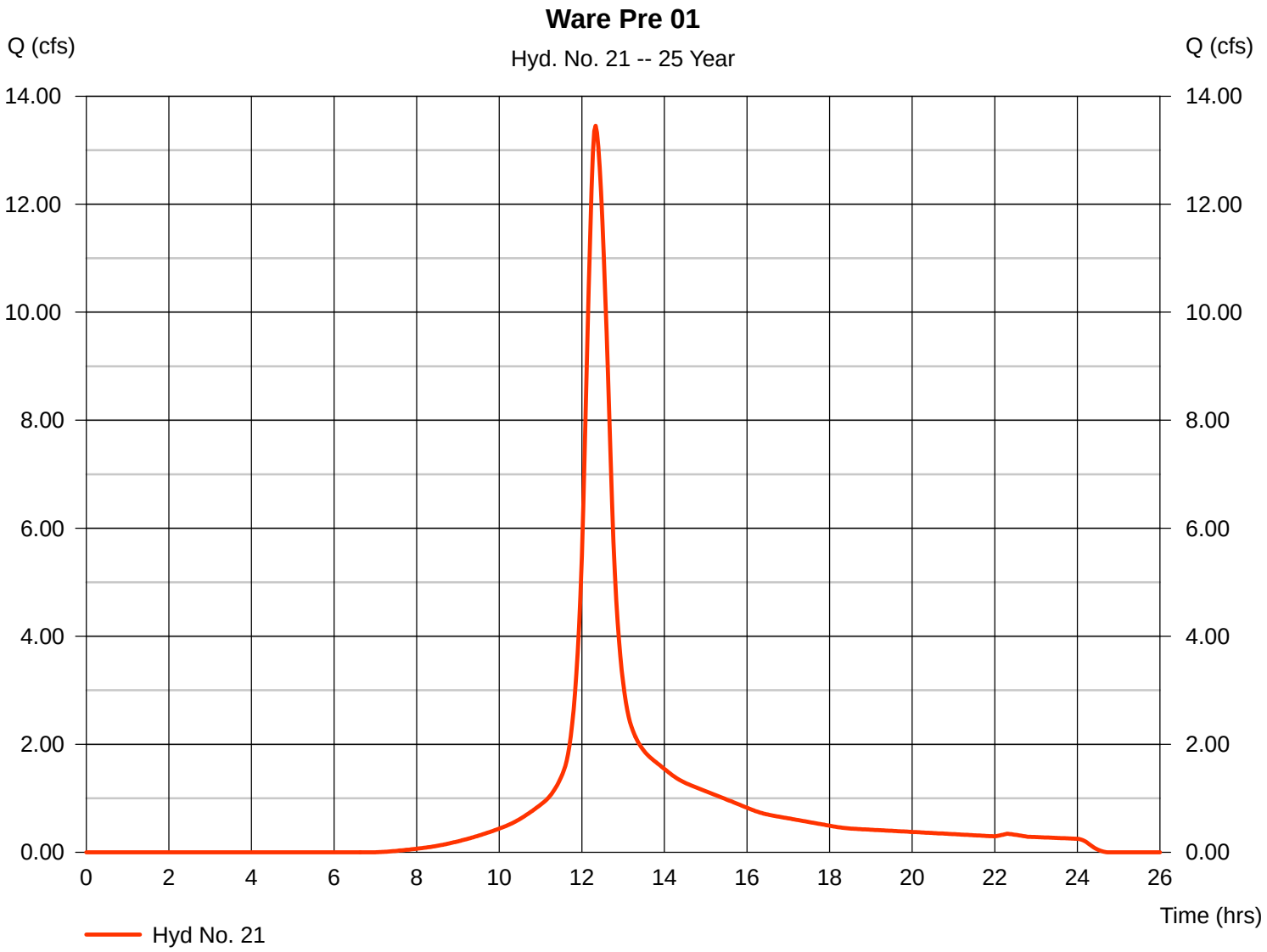
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 21

Ware Pre 01

Hydrograph type	=	SCS Runoff	Peak discharge	=	13.45 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.33 hrs
Time interval	=	2 min	Hyd. volume	=	70,365 cuft
Drainage area	=	4.440 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	28.10 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

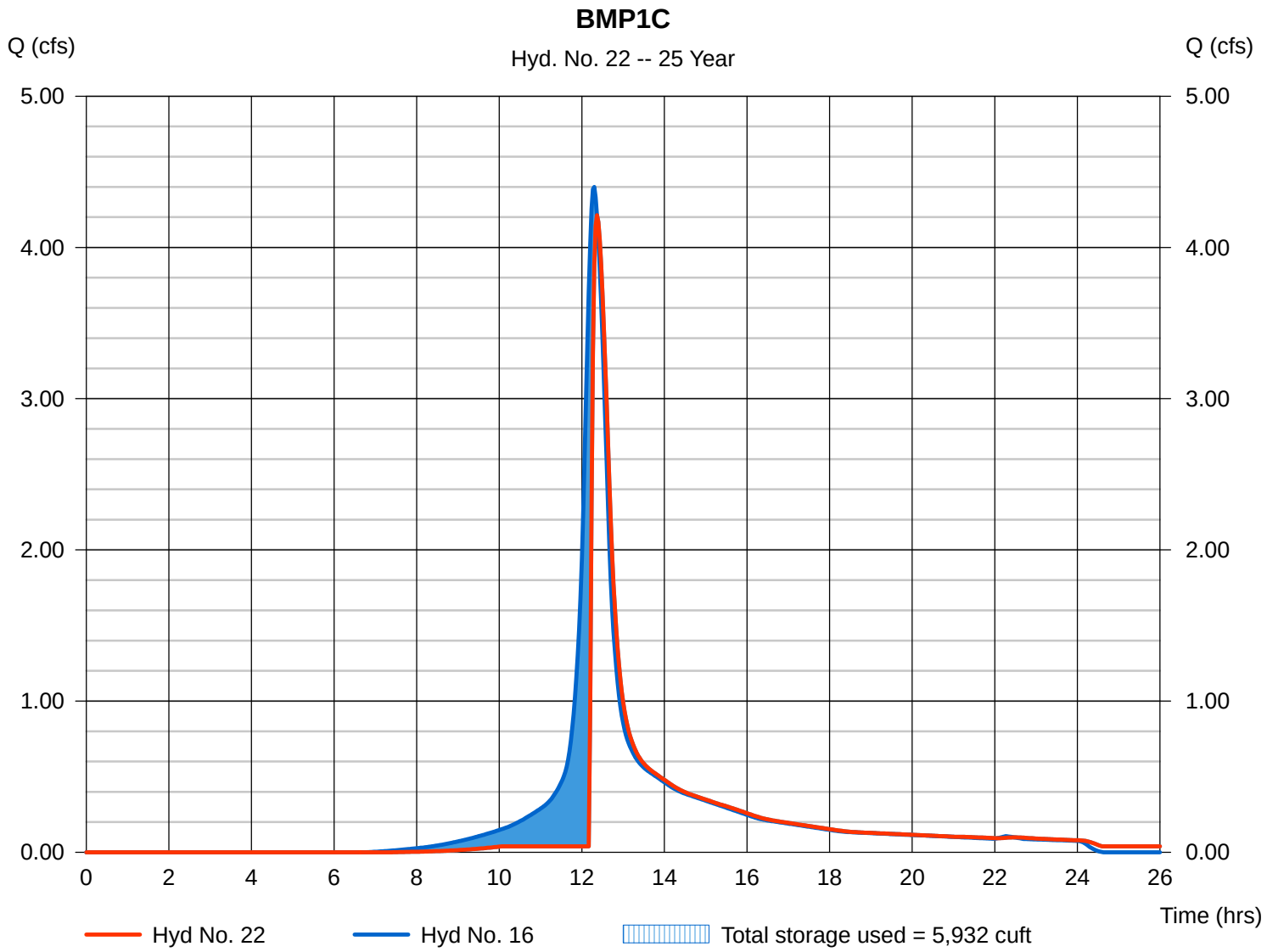
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 22

BMP1C

Hydrograph type	=	Reservoir	Peak discharge	=	4.213 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.37 hrs
Time interval	=	2 min	Hyd. volume	=	21,734 cuft
Inflow hyd. No.	=	16 - Ware Post-1C	Max. Elevation	=	7.93 ft
Reservoir name	=	WareBMP1C	Max. Storage	=	5,932 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



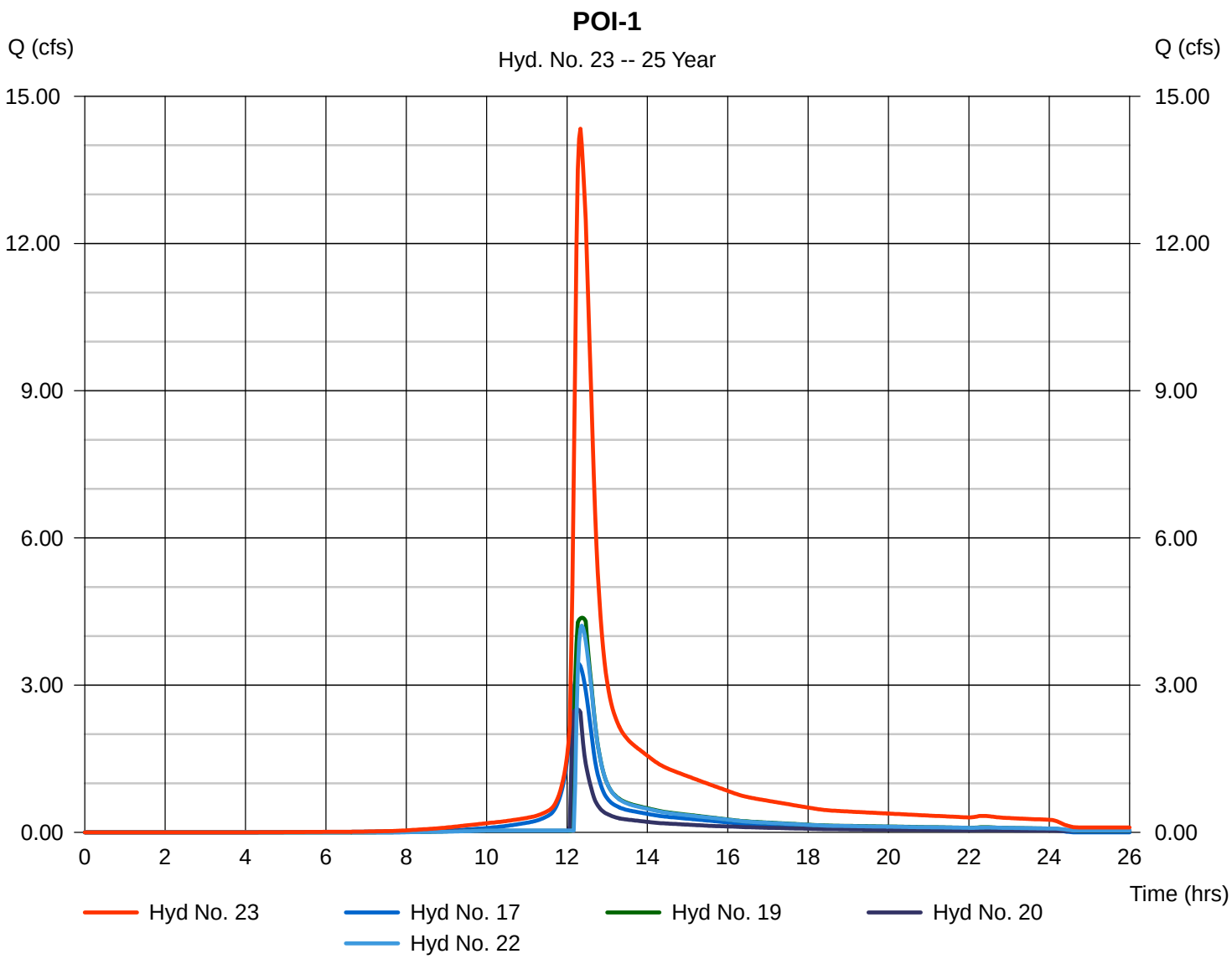
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 23

POI-1

Hydrograph type	= Combine	Peak discharge	= 14.34 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.33 hrs
Time interval	= 2 min	Hyd. volume	= 73,780 cuft
Inflow hyds.	= 17, 19, 20, 22	Contrib. drain. area	= 1.170 ac



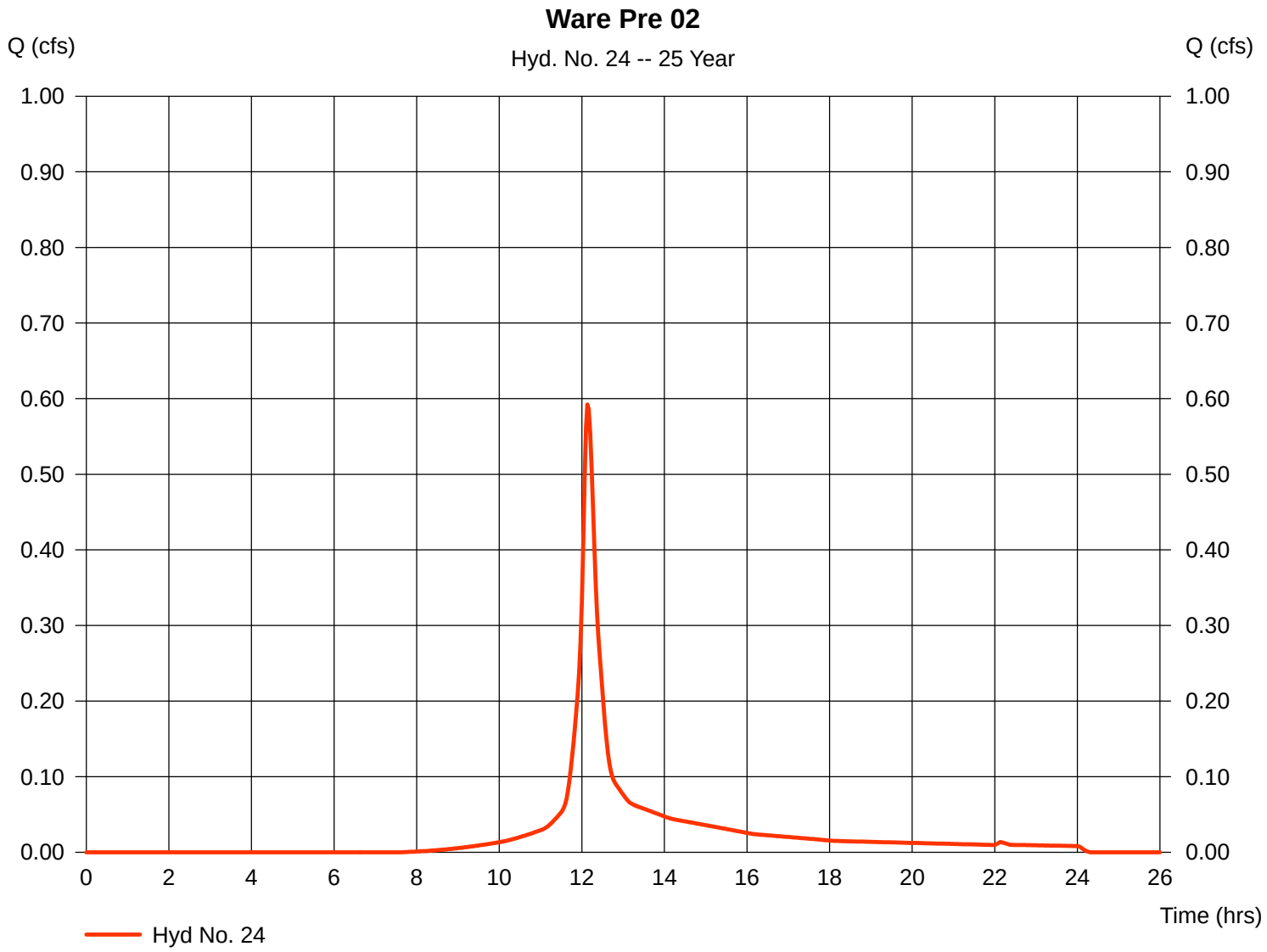
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 24

Ware Pre 02

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.592 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.13 hrs
Time interval	=	2 min	Hyd. volume	=	2,270 cuft
Drainage area	=	0.150 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.80 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



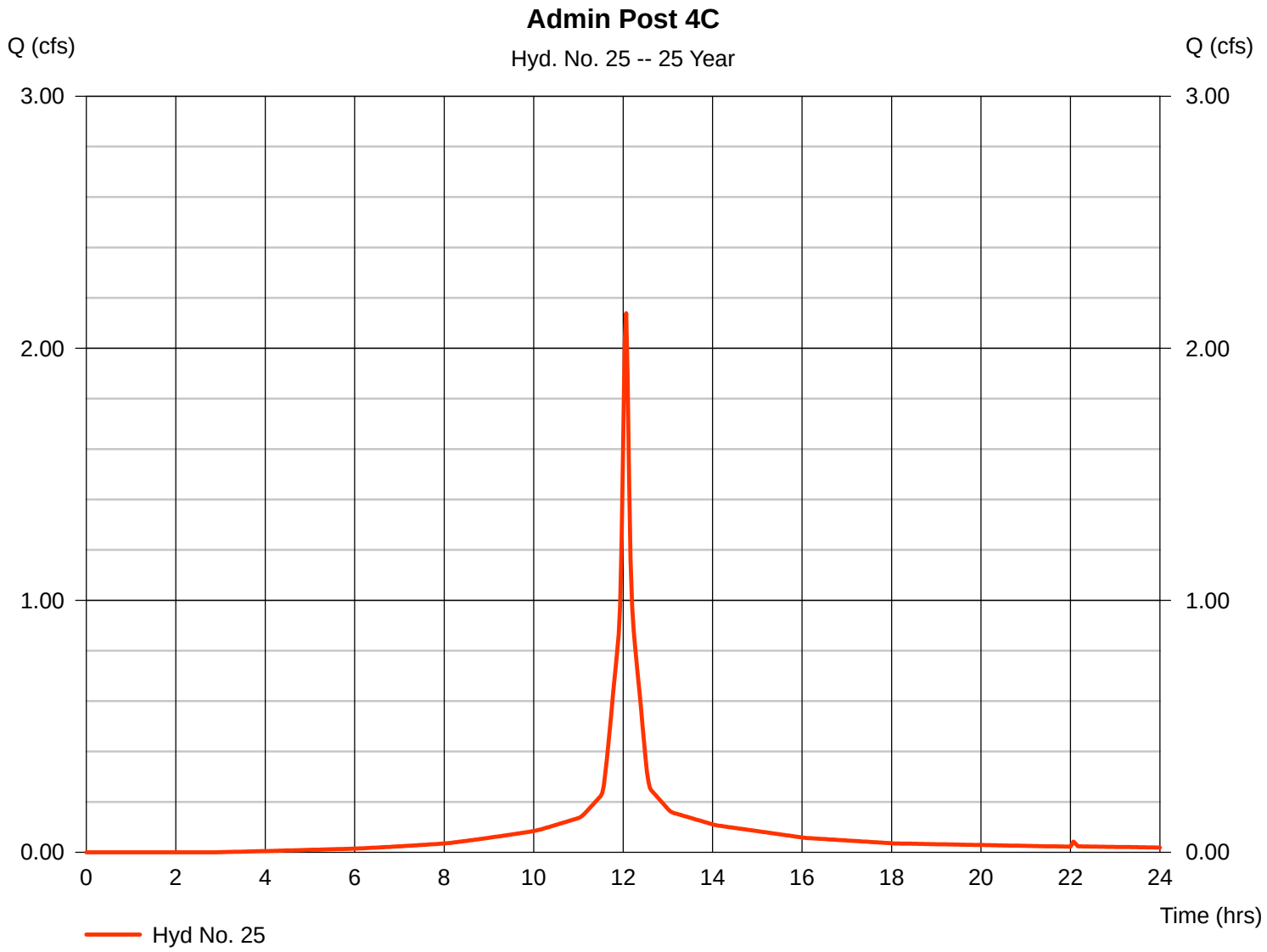
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 25

Admin Post 4C

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.139 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	6,871 cuft
Drainage area	=	0.340 ac	Curve number	=	91
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

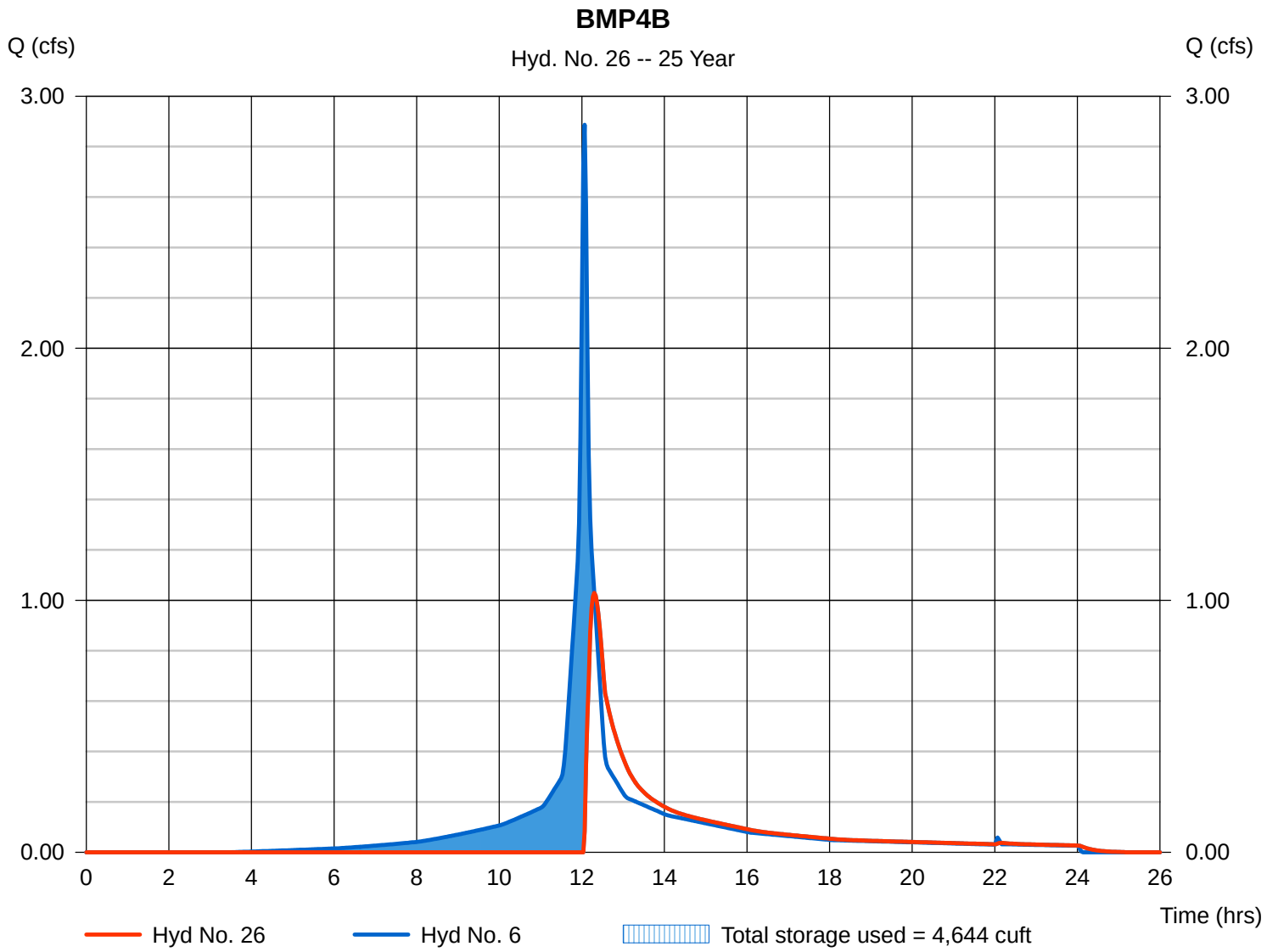
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 26

BMP4B

Hydrograph type	=	Reservoir	Peak discharge	=	1.029 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.30 hrs
Time interval	=	2 min	Hyd. volume	=	5,400 cuft
Inflow hyd. No.	=	6 - Admin Post 4B	Max. Elevation	=	8.42 ft
Reservoir name	=	ADMIN-BMP4B	Max. Storage	=	4,644 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



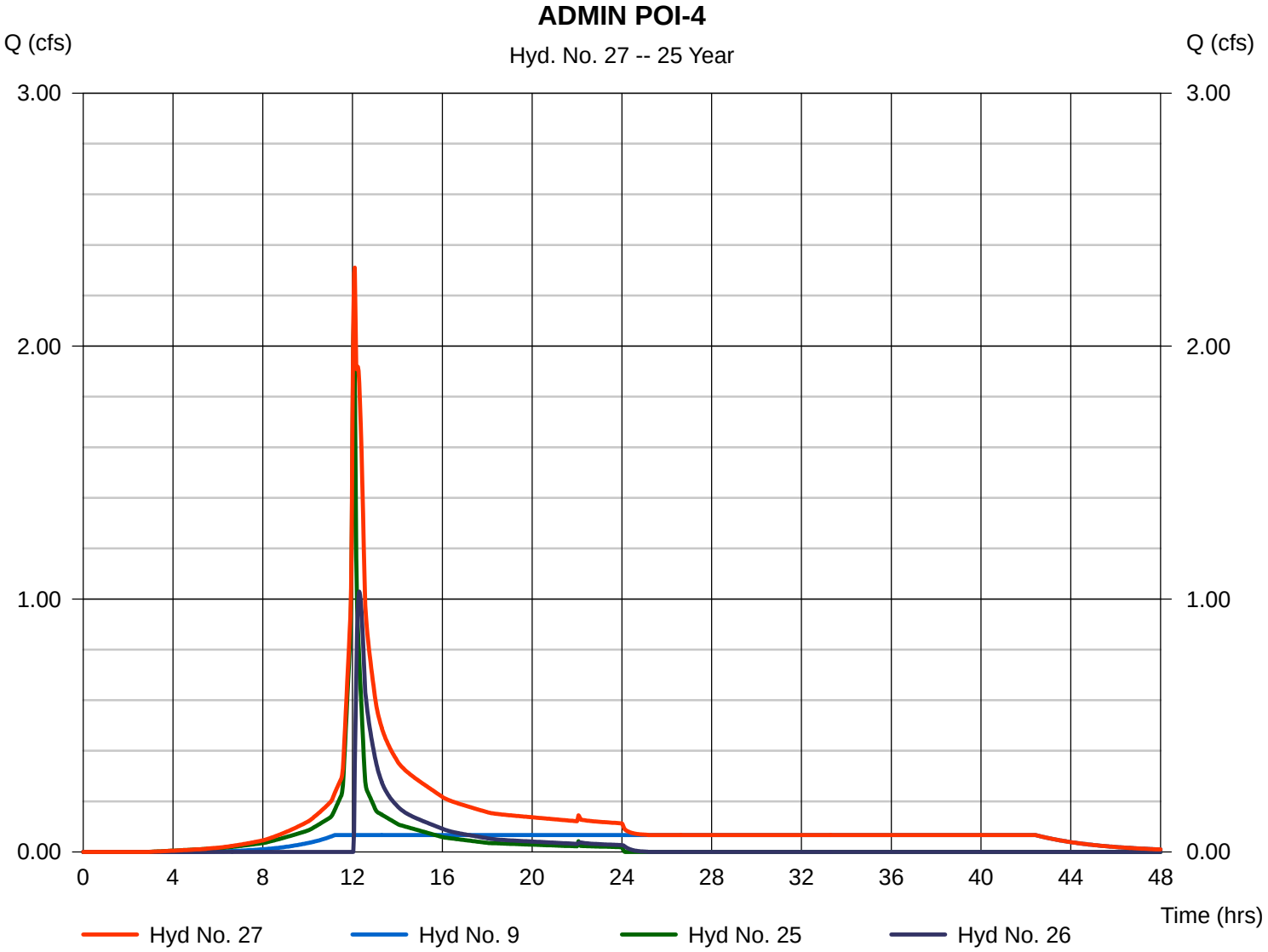
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 27

ADMIN POI-4

Hydrograph type	= Combine	Peak discharge	= 2.310 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 20,898 cuft
Inflow hyds.	= 9, 25, 26	Contrib. drain. area	= 0.340 ac



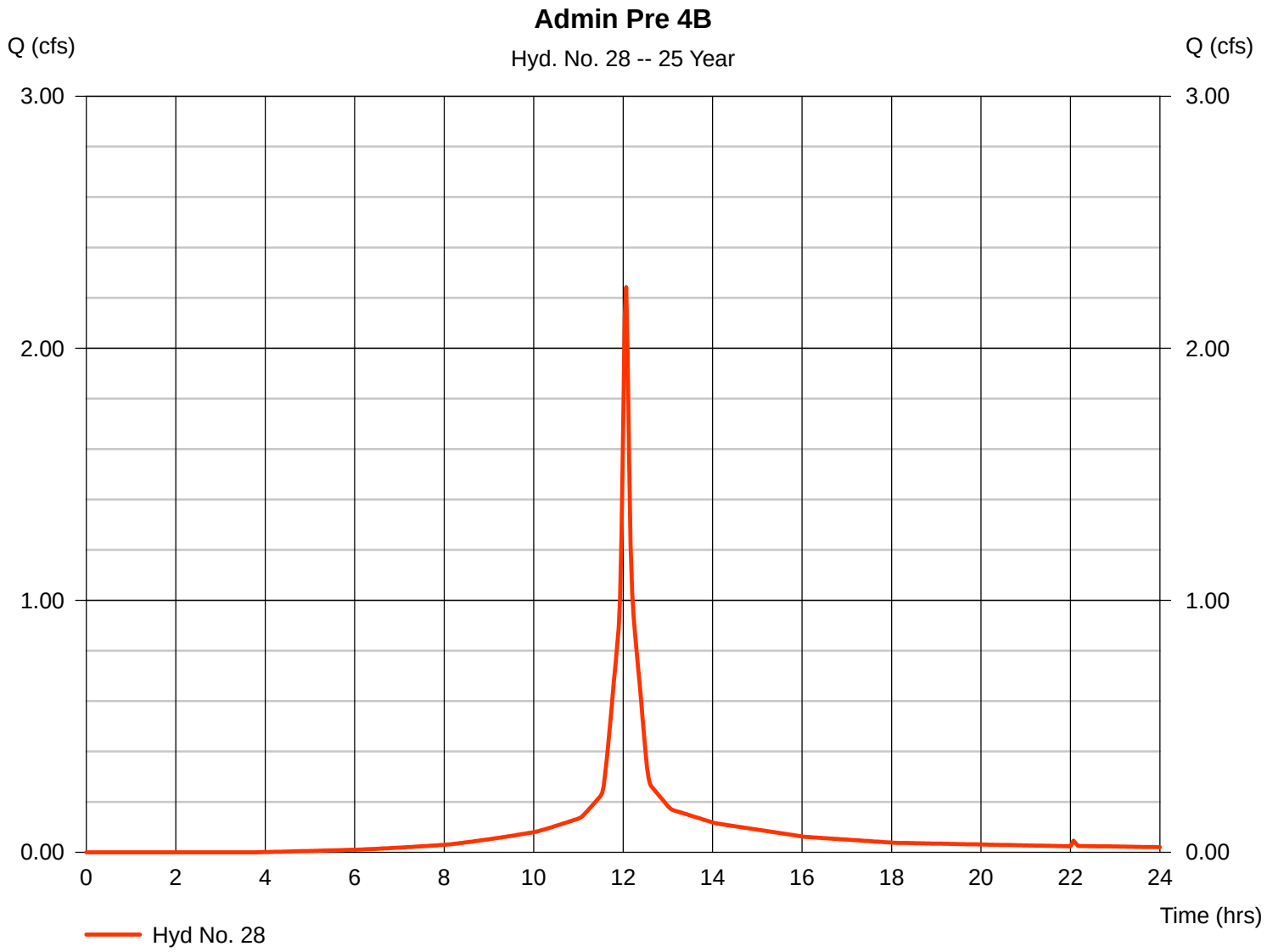
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 28

Admin Pre 4B

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.242 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	7,043 cuft
Drainage area	=	0.370 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



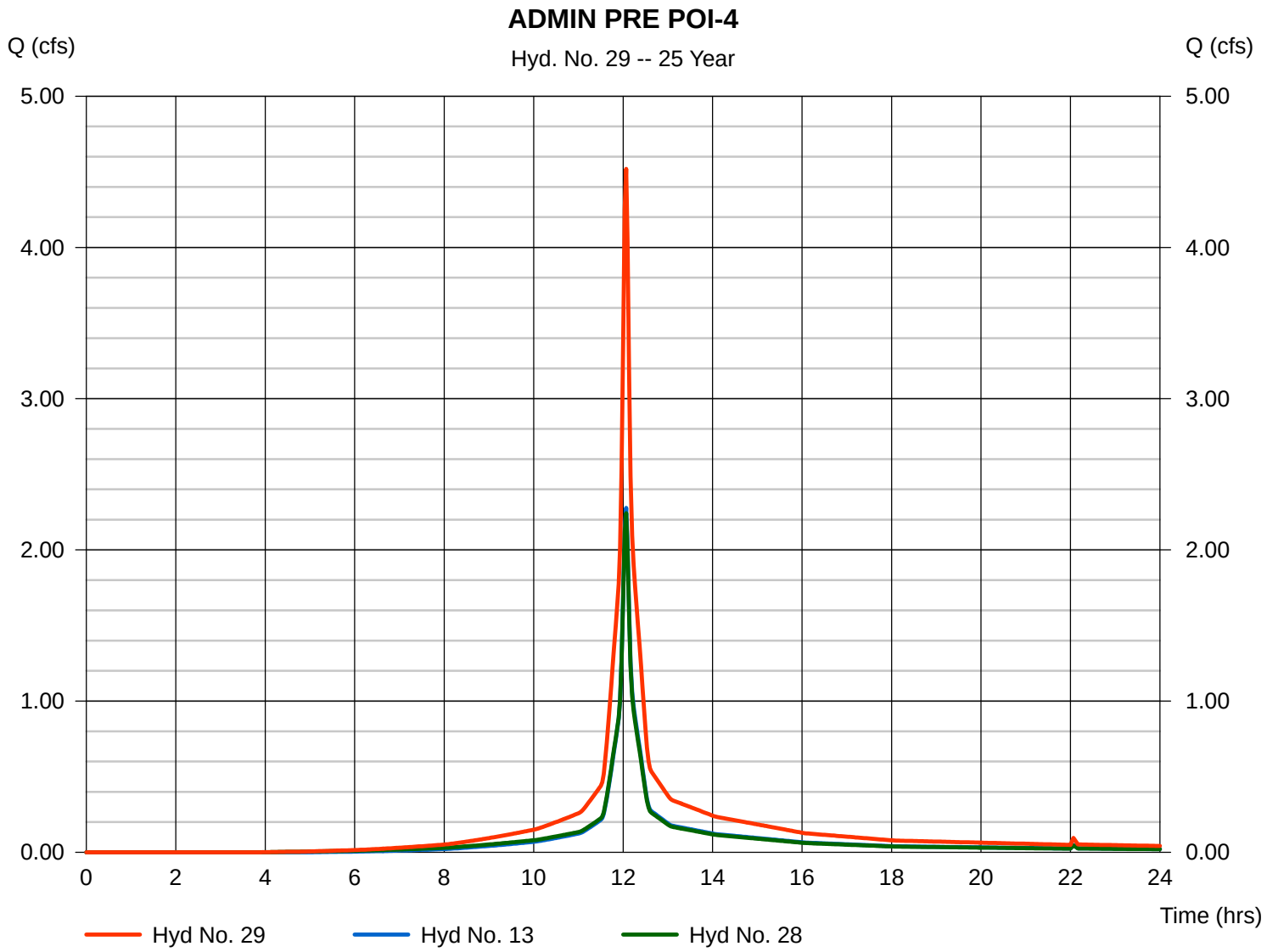
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 29

ADMIN PRE POI-4

Hydrograph type	= Combine	Peak discharge	= 4.520 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 14,040 cuft
Inflow hyds.	= 13, 28	Contrib. drain. area	= 0.770 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	1.274	2	724	3,942	------	------	------	Admin Post 01
2	SCS Runoff	0.615	2	724	1,922	------	------	------	Admin Post 02
3	SCS Runoff	0.813	2	724	2,505	------	------	------	Admin Post 3A
4	SCS Runoff	1.843	2	724	5,554	------	------	------	Admin Post 3B
5	SCS Runoff	2.936	2	728	11,757	------	------	------	Admin Post 4A
6	SCS Runoff	3.811	2	724	12,268	------	------	------	Admin Post 4B
7	Reservoir	0.038	2	874	2,495	3	7.57	1,609	BMP3A
8	Combine	1.863	2	724	8,049	4, 7	------	------	ADMIN POI-3
9	Reservoir	0.235	2	820	11,746	5	8.33	7,263	BMP4A
10	SCS Runoff	1.349	2	724	4,174	------	------	------	Admin Pre 01
11	SCS Runoff	1.012	2	724	3,177	------	------	------	Admin Pre 02
12	SCS Runoff	4.758	2	728	18,460	------	------	------	Admin Pre 03
13	SCS Runoff	3.077	2	724	9,609	------	------	------	Admin Pre 04A
14	SCS Runoff	6.404	2	736	32,154	------	------	------	Ware Post-1A
15	SCS Runoff	3.702	2	730	16,244	------	------	------	Ware Post-1B
16	SCS Runoff	6.155	2	738	30,723	------	------	------	Ware Post-1C
17	SCS Runoff	4.926	2	738	24,370	------	------	------	Ware Post-1D
18	SCS Runoff	0.567	2	728	2,182	------	------	------	Ware Post-02
19	Reservoir	5.428	2	746	32,139	14	7.79	6,933	BMP1A
20	Reservoir	2.935	2	738	16,233	15	7.02	4,498	BMP1B
21	SCS Runoff	18.95	2	740	99,910	------	------	------	Ware Pre 01
22	Reservoir	6.069	2	740	30,711	16	8.00	6,208	BMP1C
23	Combine	19.04	2	740	103,453	17, 19, 20, 22	------	------	POI-1
24	SCS Runoff	0.851	2	728	3,273	------	------	------	Ware Pre 02
25	SCS Runoff	2.802	2	724	9,156	------	------	------	Admin Post 4C
26	Reservoir	2.443	2	728	8,538	6	8.50	5,237	BMP4B
27	Combine	4.795	2	726	29,439	9, 25, 26	------	------	ADMIN POI-4
28	SCS Runoff	2.973	2	724	9,504	------	------	------	Admin Pre 4B
29	Combine	6.049	2	724	19,113	13, 28	------	------	ADMIN PRE POI-4

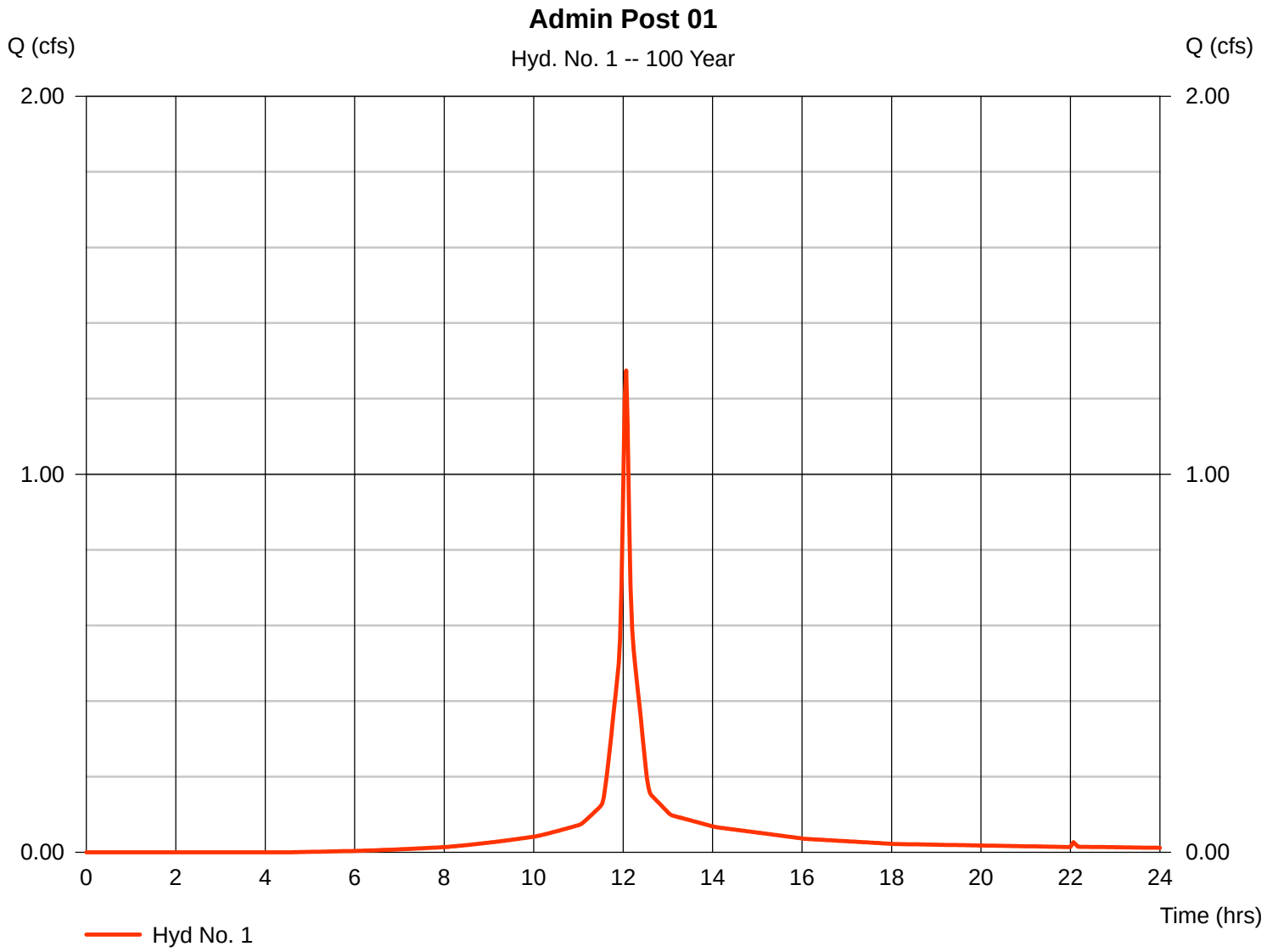
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 1

Admin Post 01

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.274 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	3,942 cuft
Drainage area	=	0.170 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.50 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



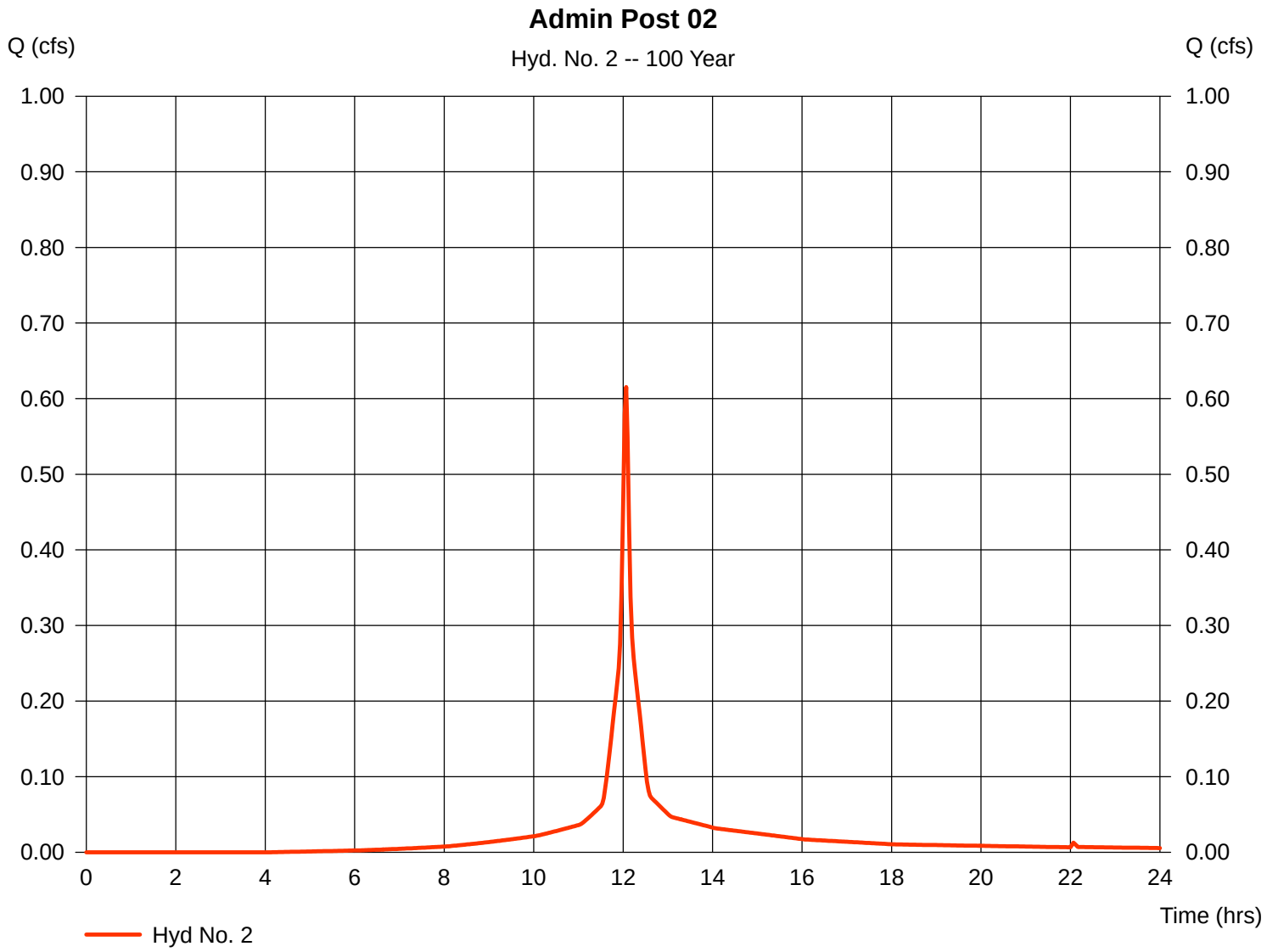
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 2

Admin Post 02

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.615 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	1,922 cuft
Drainage area	=	0.080 ac	Curve number	=	84
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



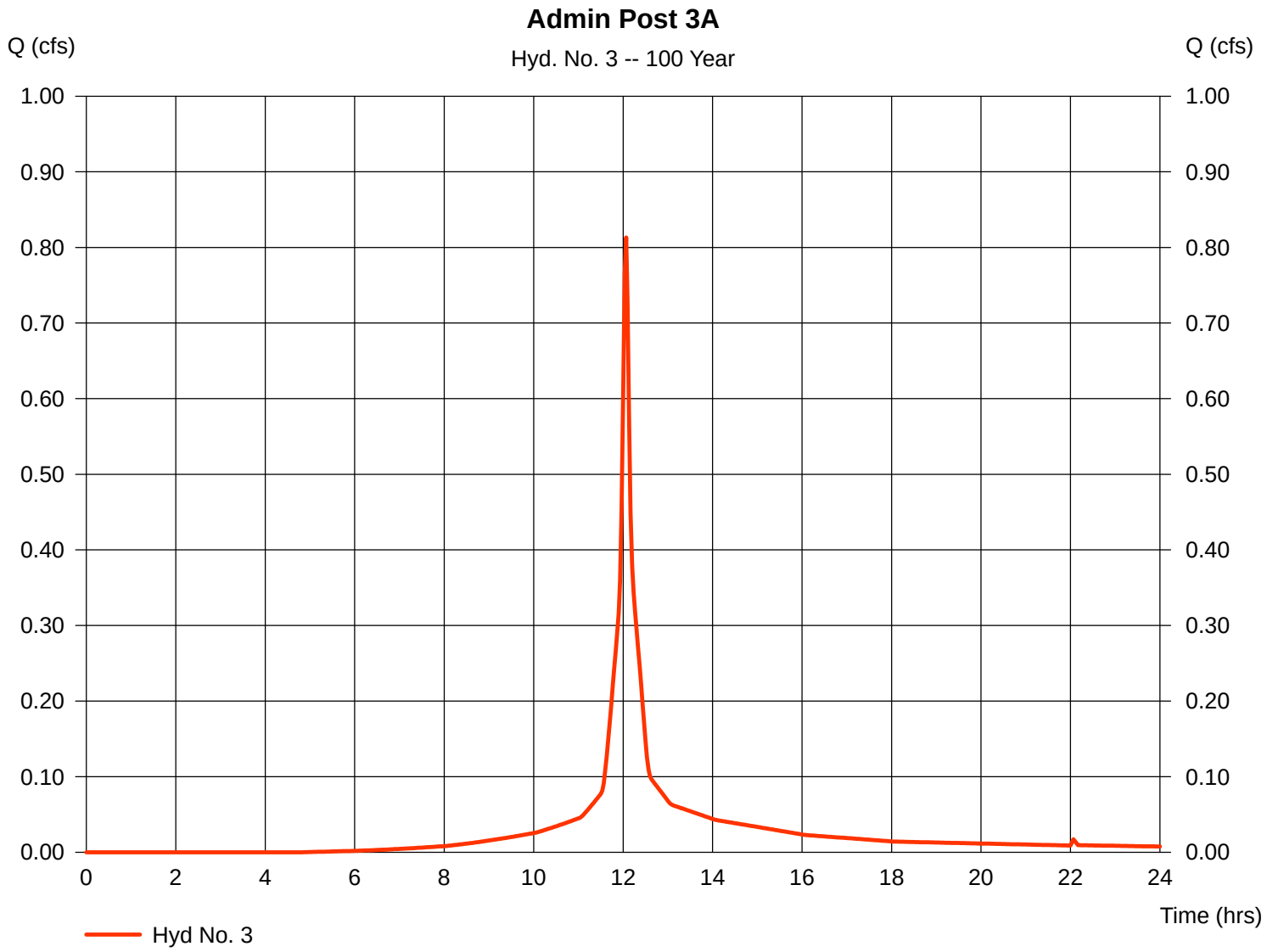
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 3

Admin Post 3A

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.813 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	2,505 cuft
Drainage area	=	0.110 ac	Curve number	=	81
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



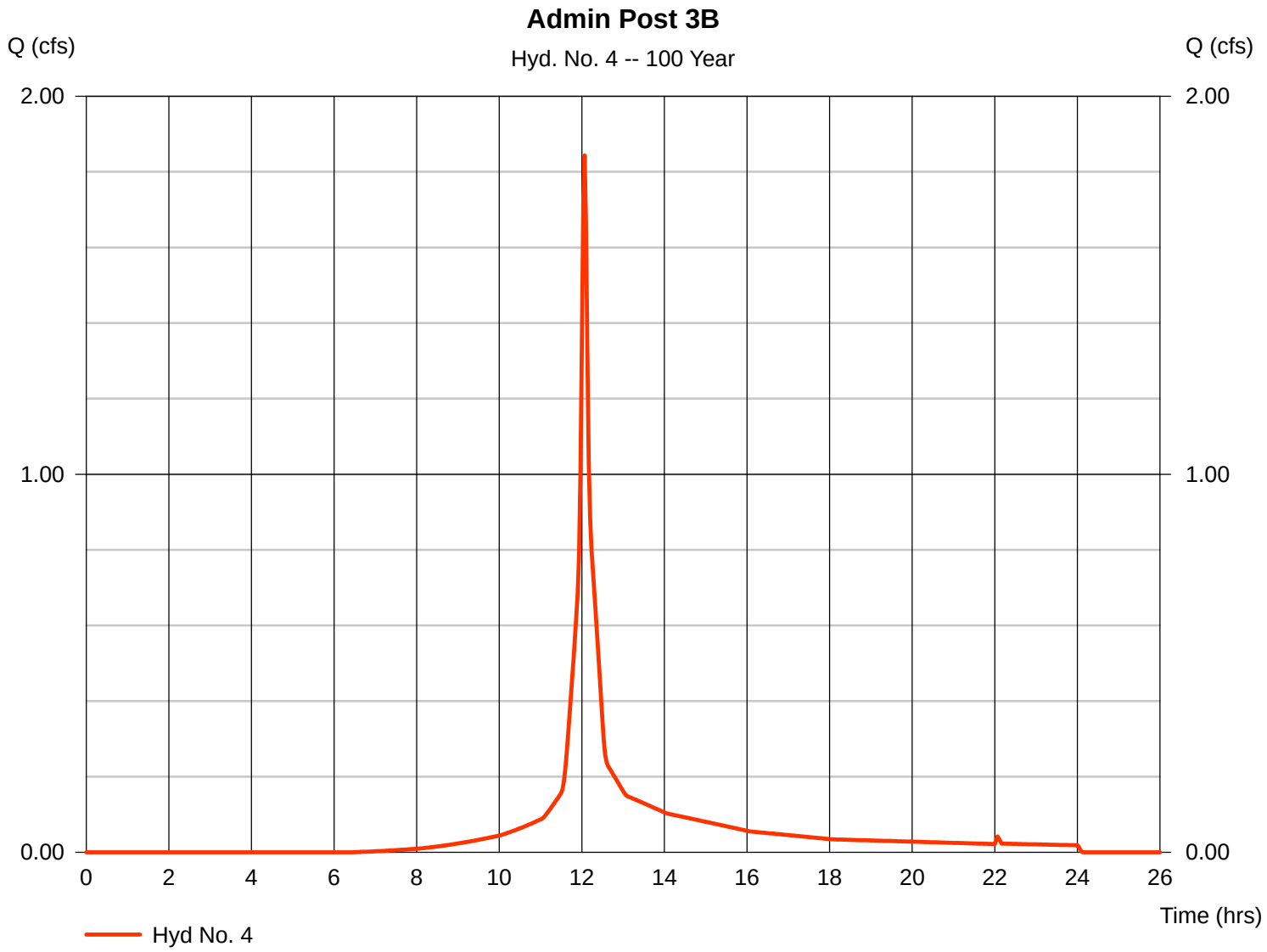
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 4

Admin Post 3B

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.843 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	5,554 cuft
Drainage area	=	0.280 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



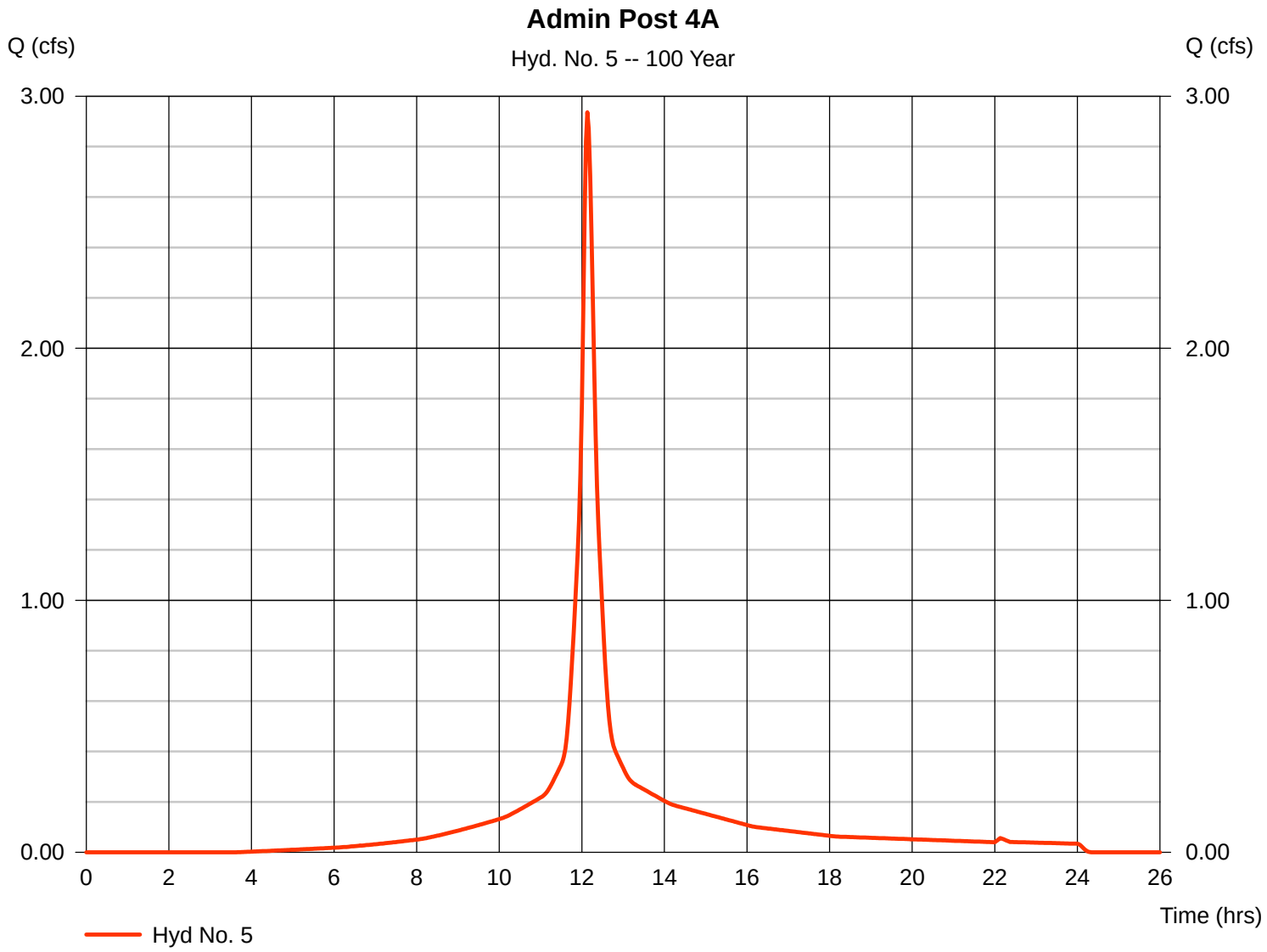
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 5

Admin Post 4A

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.936 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.13 hrs
Time interval	=	2 min	Hyd. volume	=	11,757 cuft
Drainage area	=	0.430 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.20 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



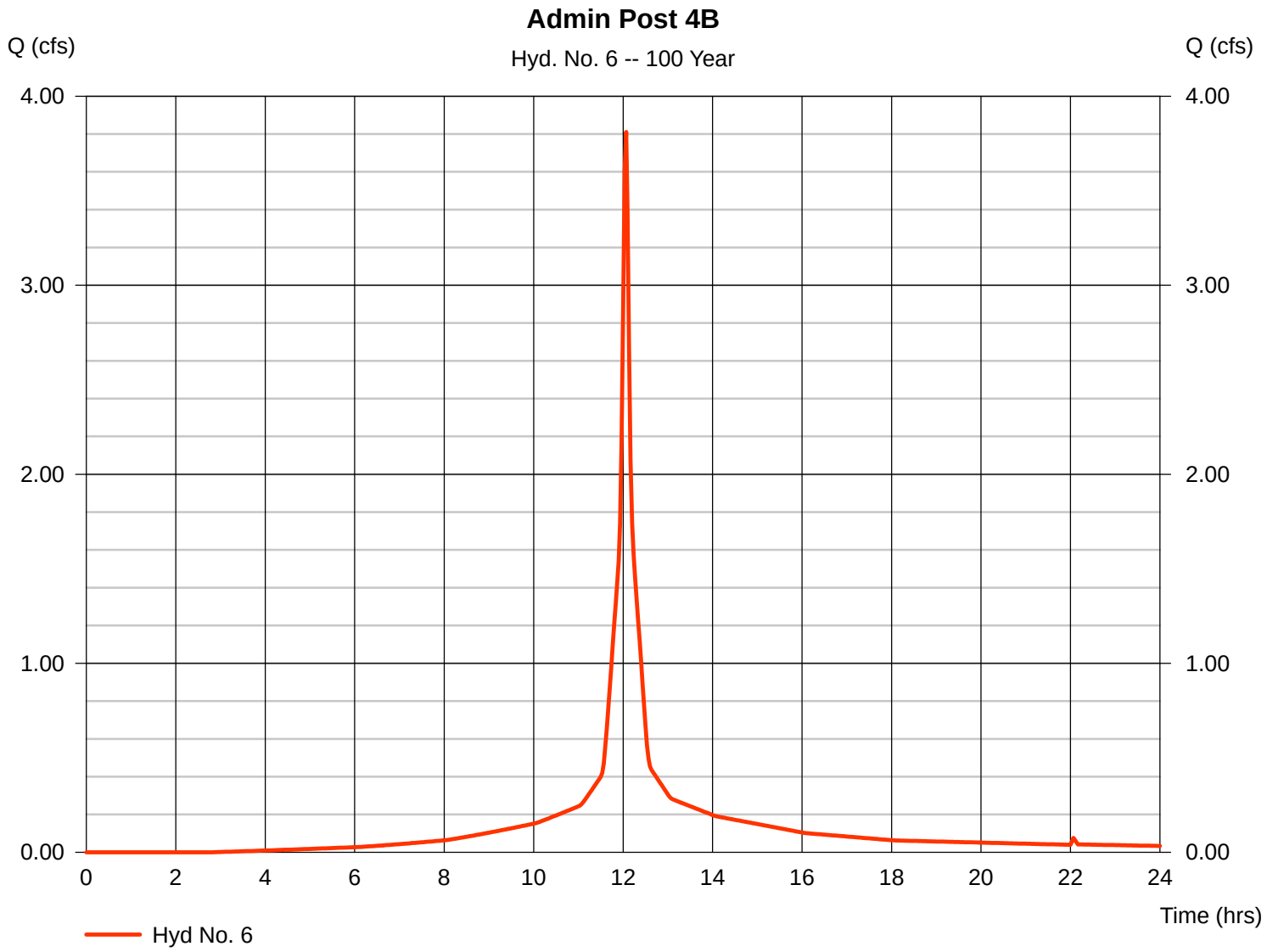
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 6

Admin Post 4B

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.811 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	12,268 cuft
Drainage area	=	0.470 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

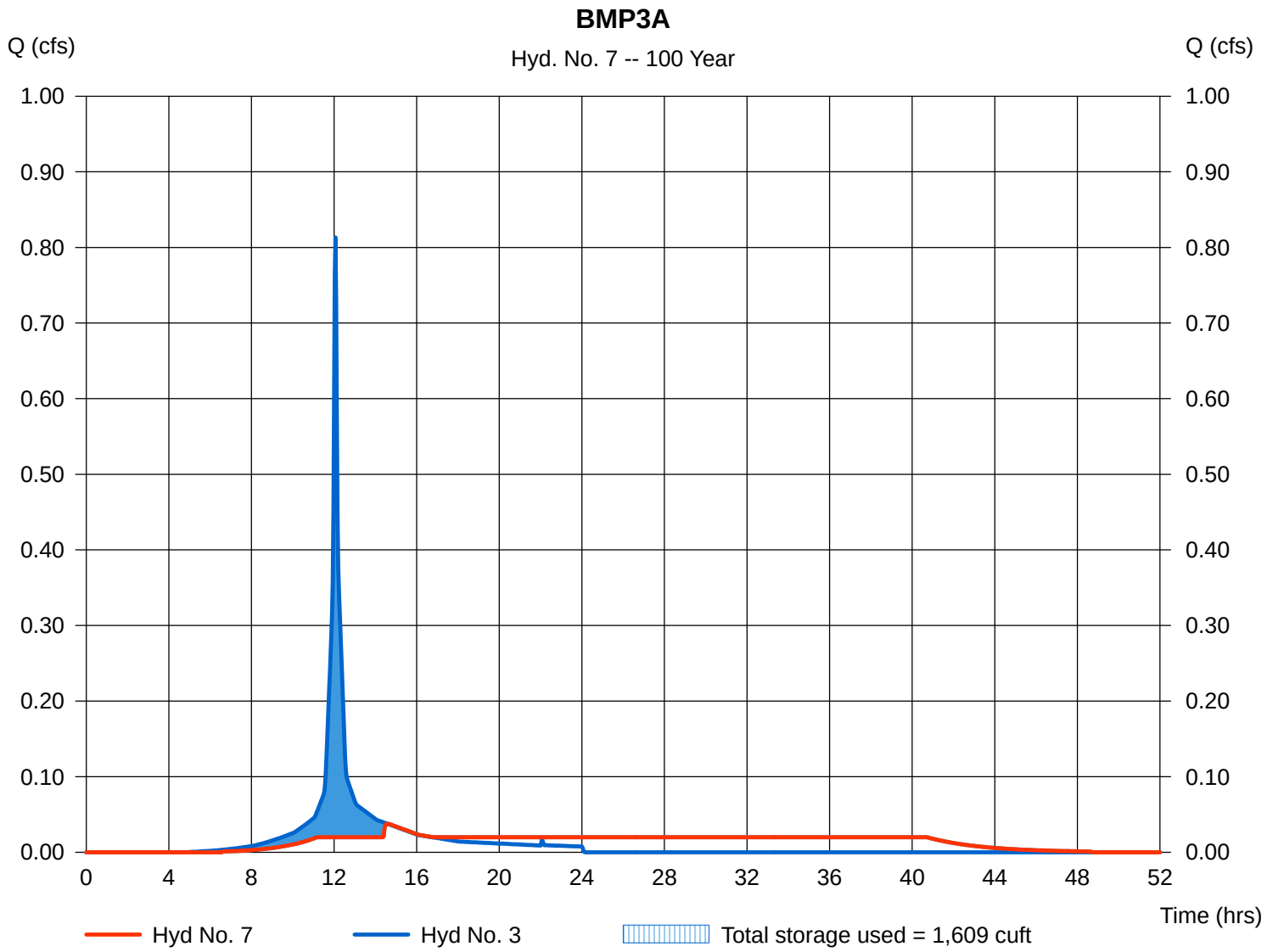
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 7

BMP3A

Hydrograph type	=	Reservoir	Peak discharge	=	0.038 cfs
Storm frequency	=	100 yrs	Time to peak	=	14.57 hrs
Time interval	=	2 min	Hyd. volume	=	2,495 cuft
Inflow hyd. No.	=	3 - Admin Post 3A	Max. Elevation	=	7.57 ft
Reservoir name	=	ADMIN-BMP3A	Max. Storage	=	1,609 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



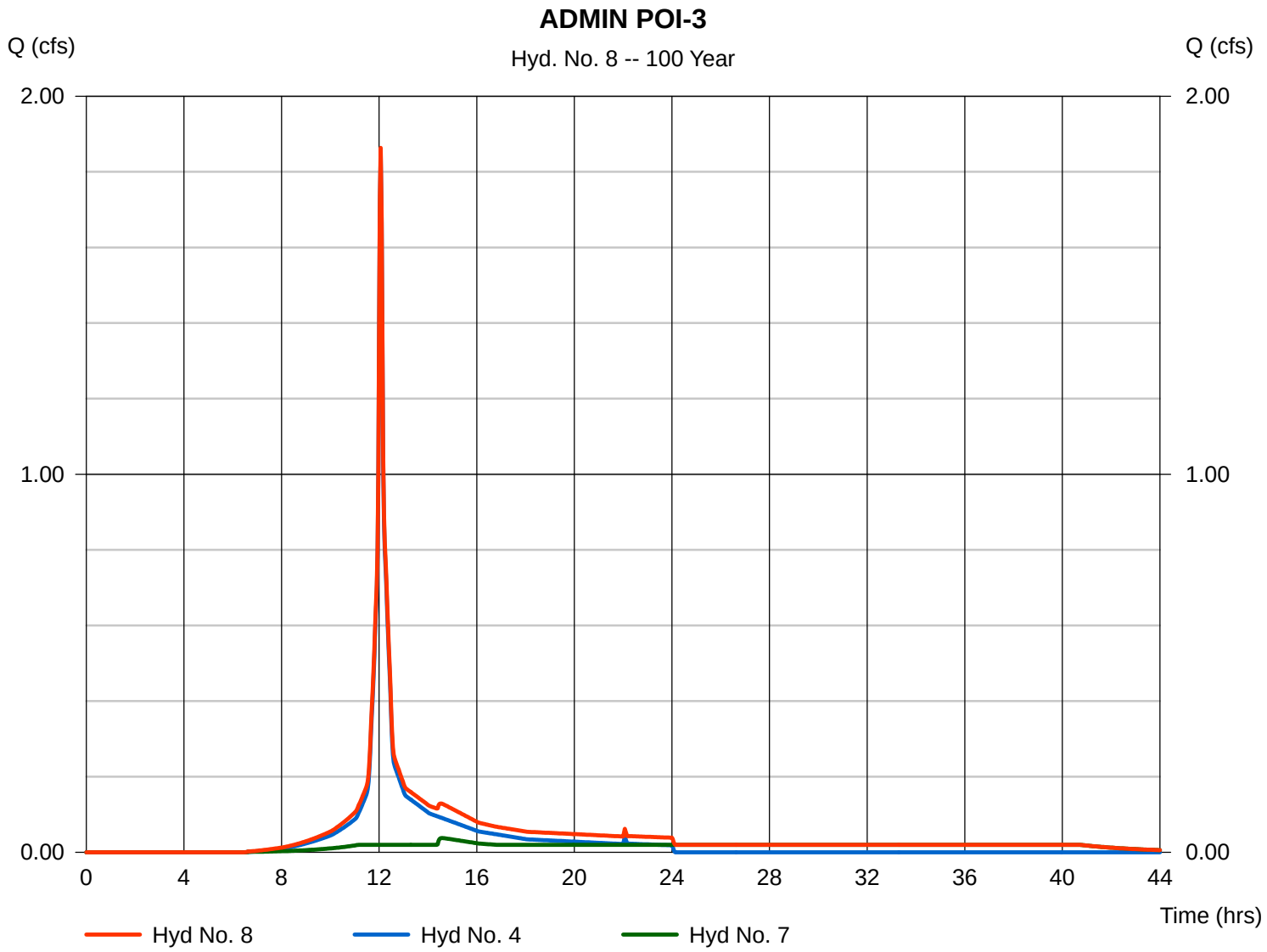
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 8

ADMIN POI-3

Hydrograph type	=	Combine	Peak discharge	=	1.863 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	8,049 cuft
Inflow hyds.	=	4, 7	Contrib. drain. area	=	0.280 ac



Hydrograph Report

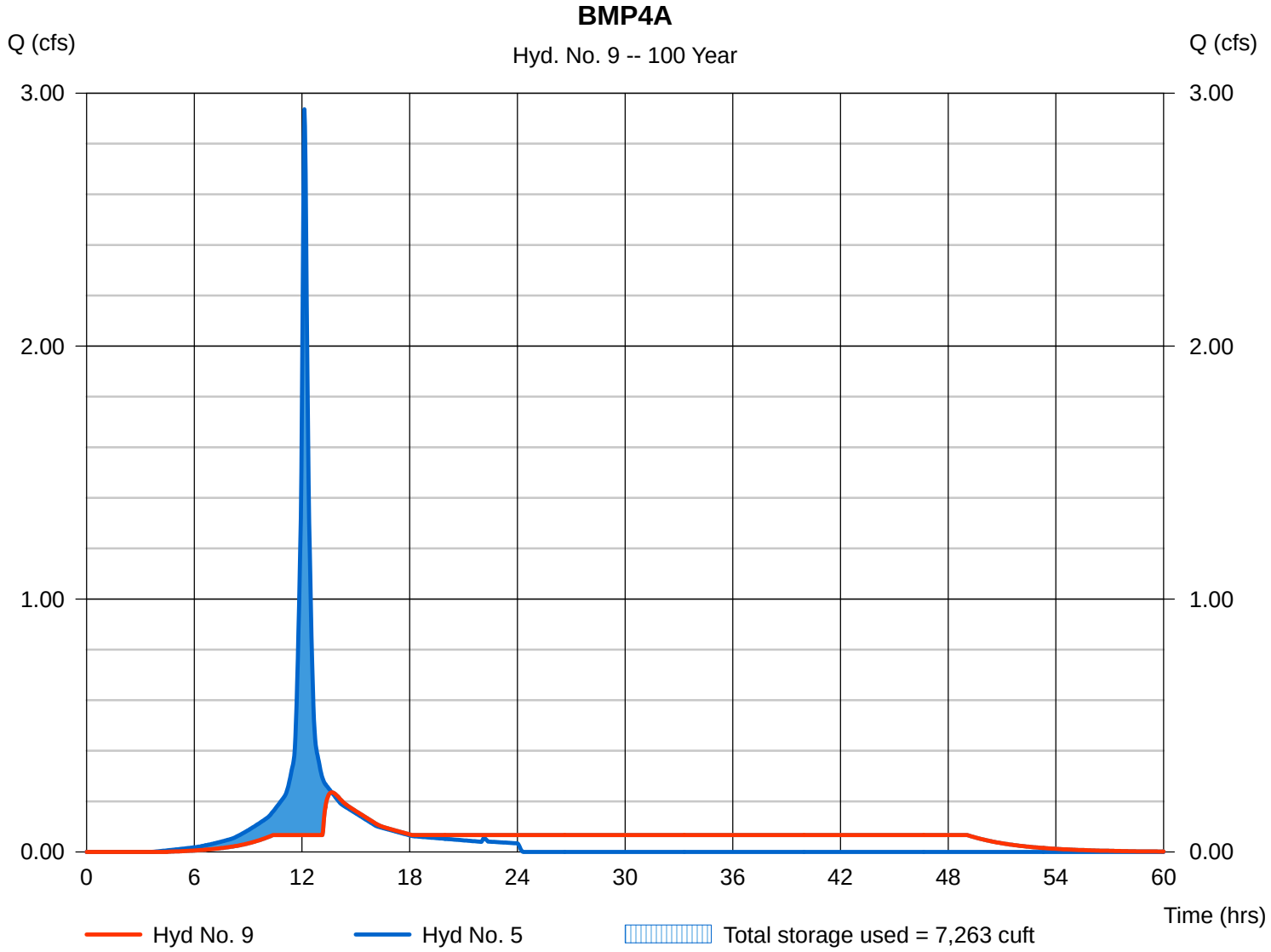
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 9

BMP4A

Hydrograph type	=	Reservoir	Peak discharge	=	0.235 cfs
Storm frequency	=	100 yrs	Time to peak	=	13.67 hrs
Time interval	=	2 min	Hyd. volume	=	11,746 cuft
Inflow hyd. No.	=	5 - Admin Post 4A	Max. Elevation	=	8.33 ft
Reservoir name	=	ADMIN-BMP4A	Max. Storage	=	7,263 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



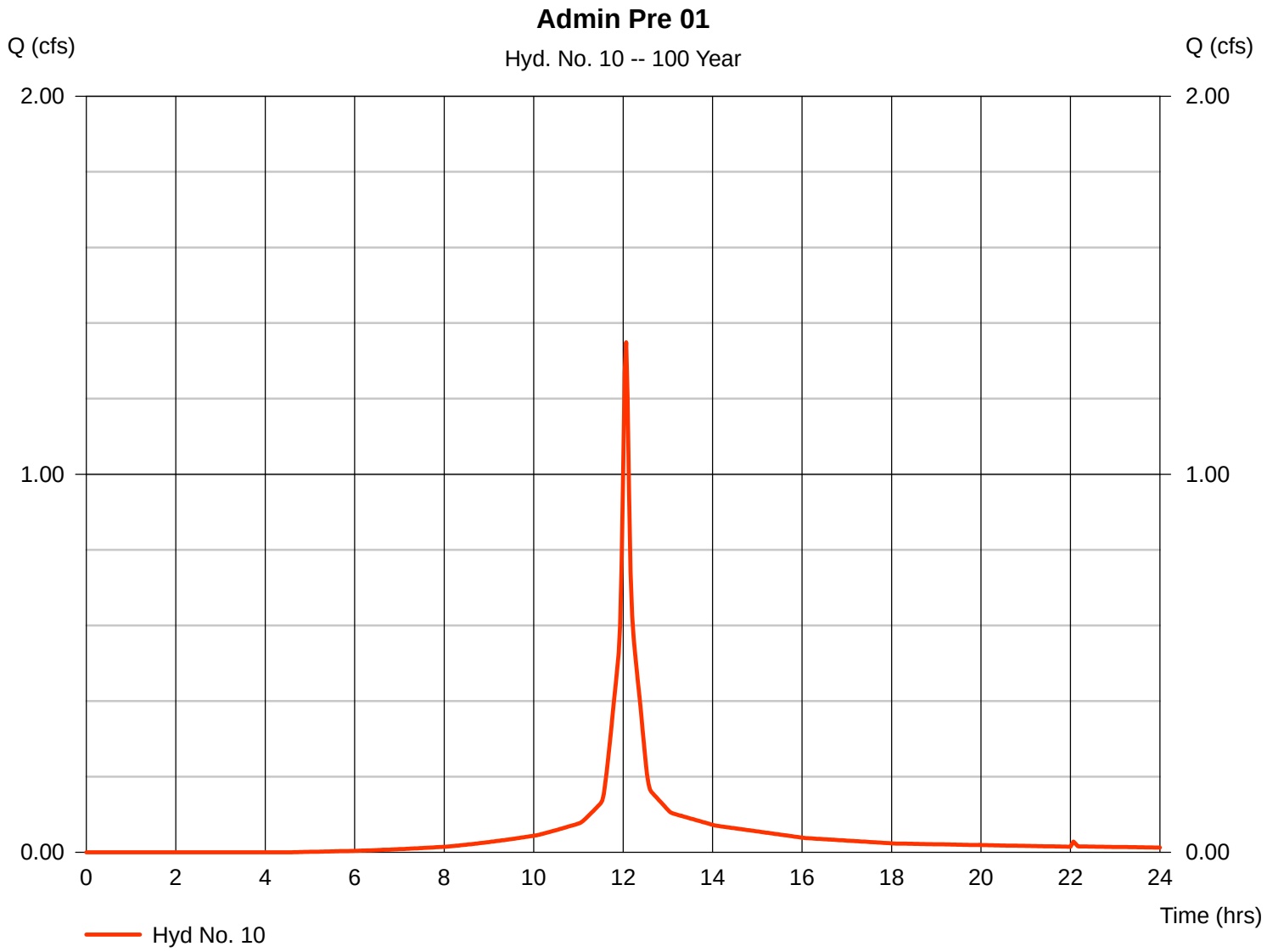
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 10

Admin Pre 01

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.349 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	4,174 cuft
Drainage area	=	0.180 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



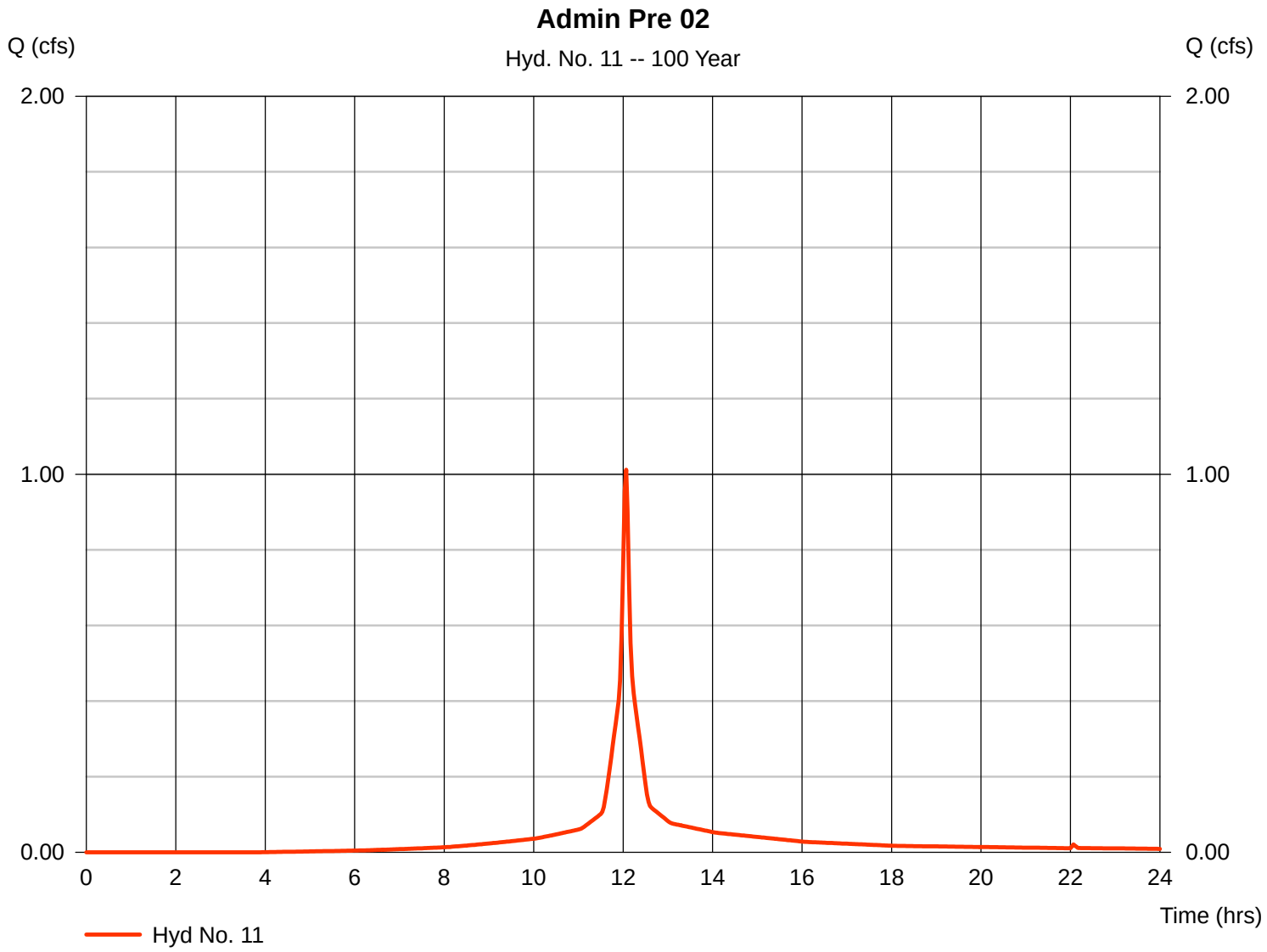
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 11

Admin Pre 02

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.012 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	3,177 cuft
Drainage area	=	0.130 ac	Curve number	=	85
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



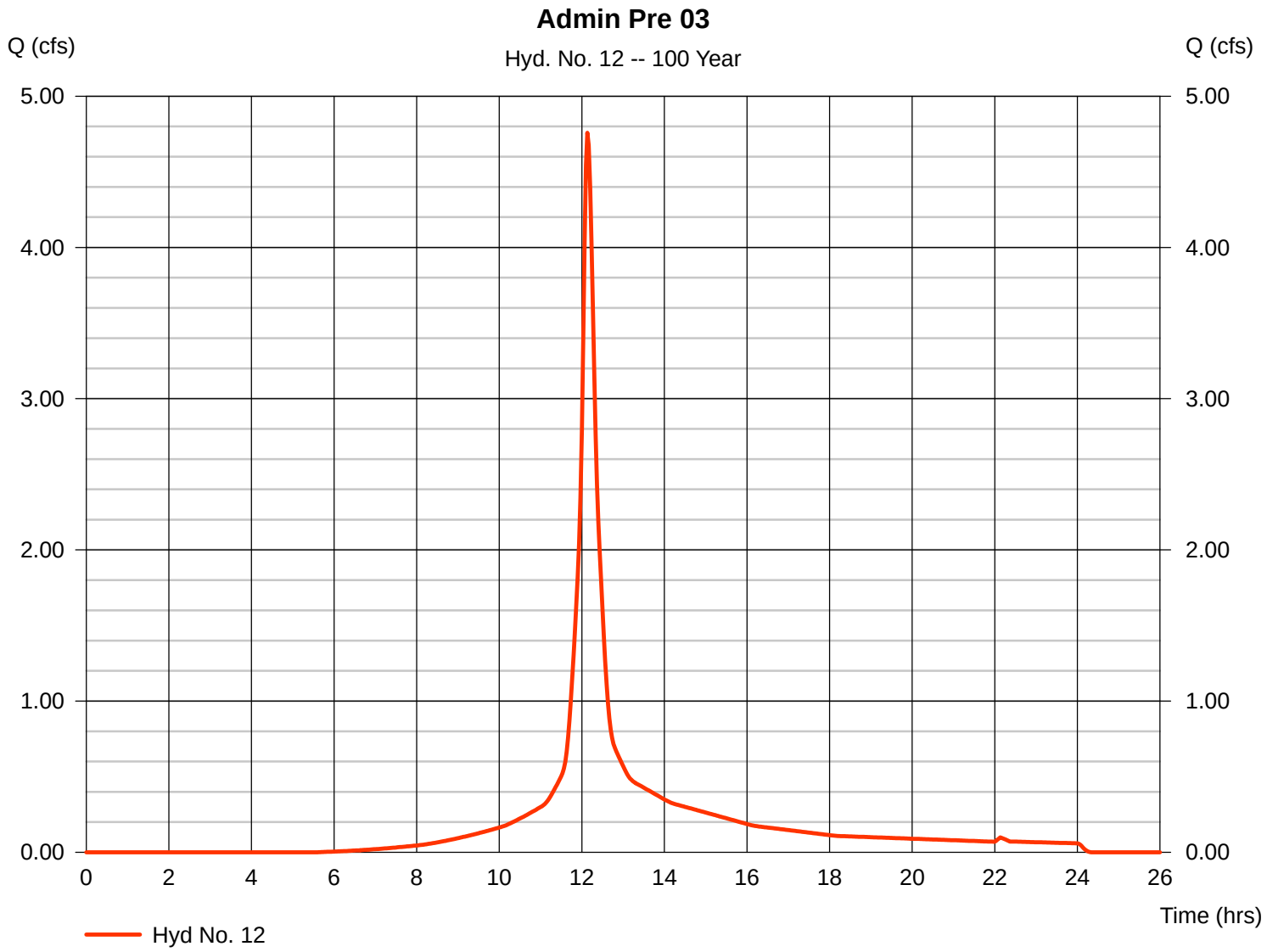
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 12

Admin Pre 03

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.758 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.13 hrs
Time interval	=	2 min	Hyd. volume	=	18,460 cuft
Drainage area	=	0.780 ac	Curve number	=	78
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.00 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



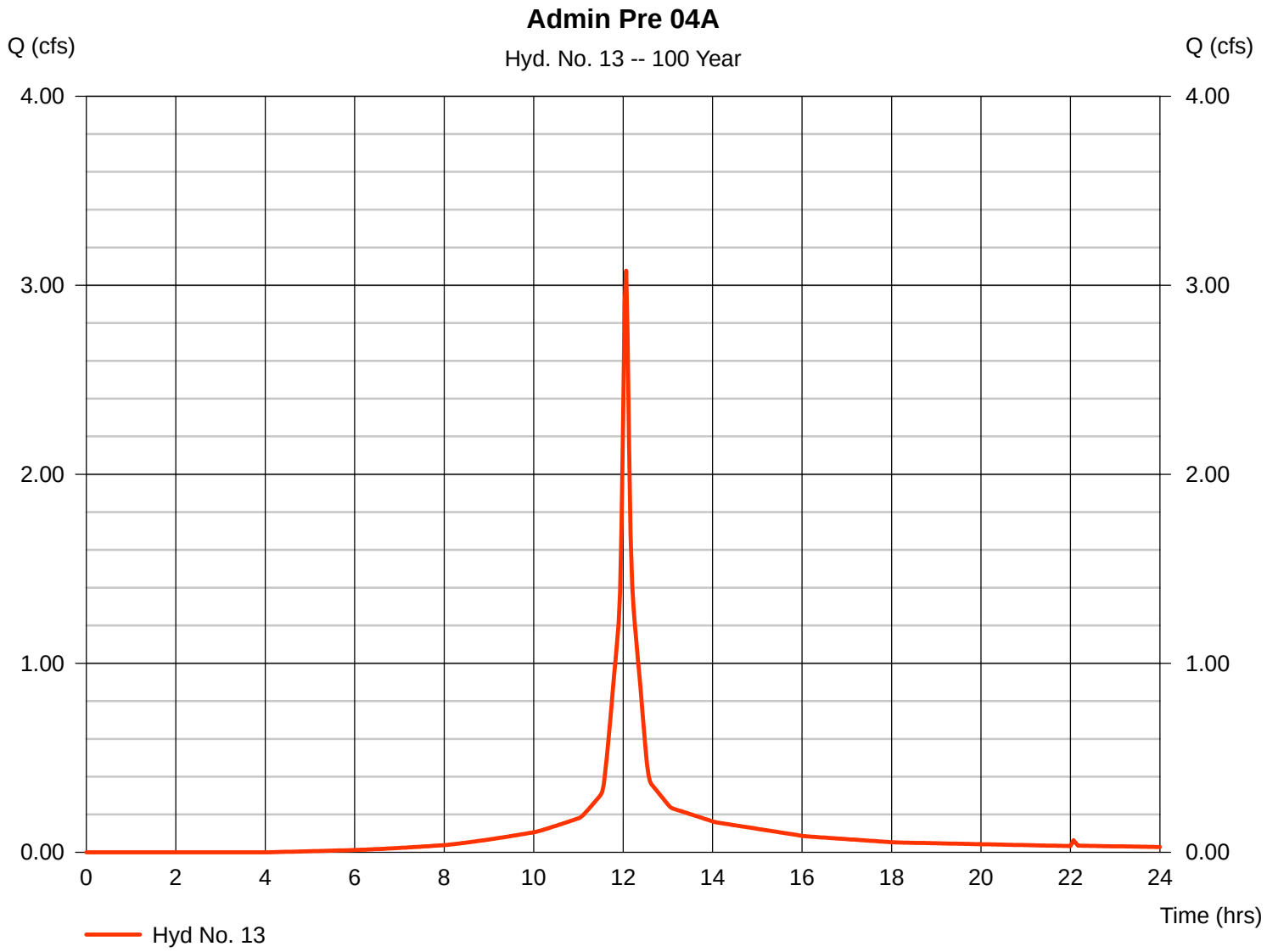
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 13

Admin Pre 04A

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.077 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	9,609 cuft
Drainage area	=	0.400 ac	Curve number	=	84
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.50 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



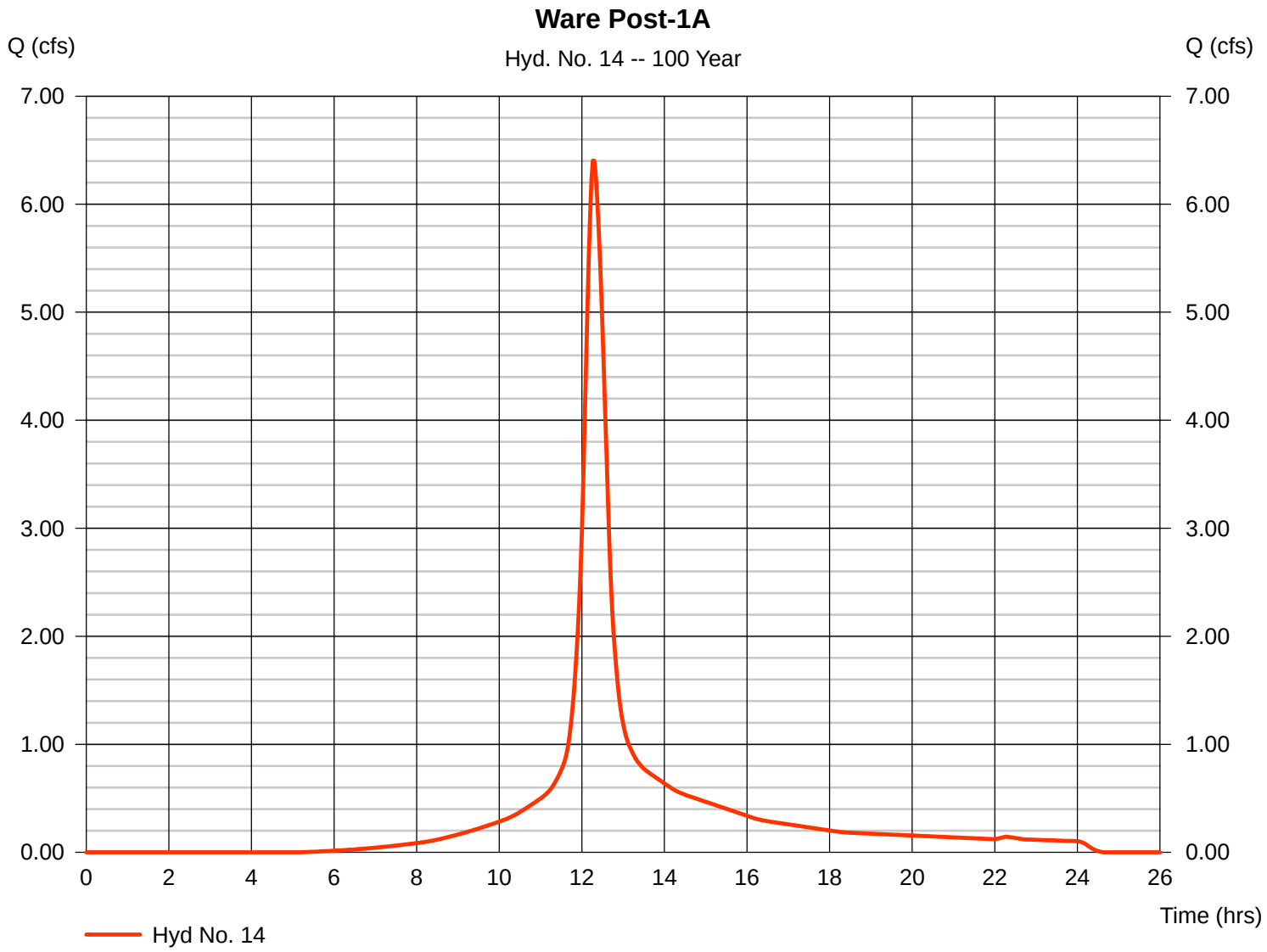
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 14

Ware Post-1A

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.404 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.27 hrs
Time interval	=	2 min	Hyd. volume	=	32,154 cuft
Drainage area	=	1.370 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	26.60 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



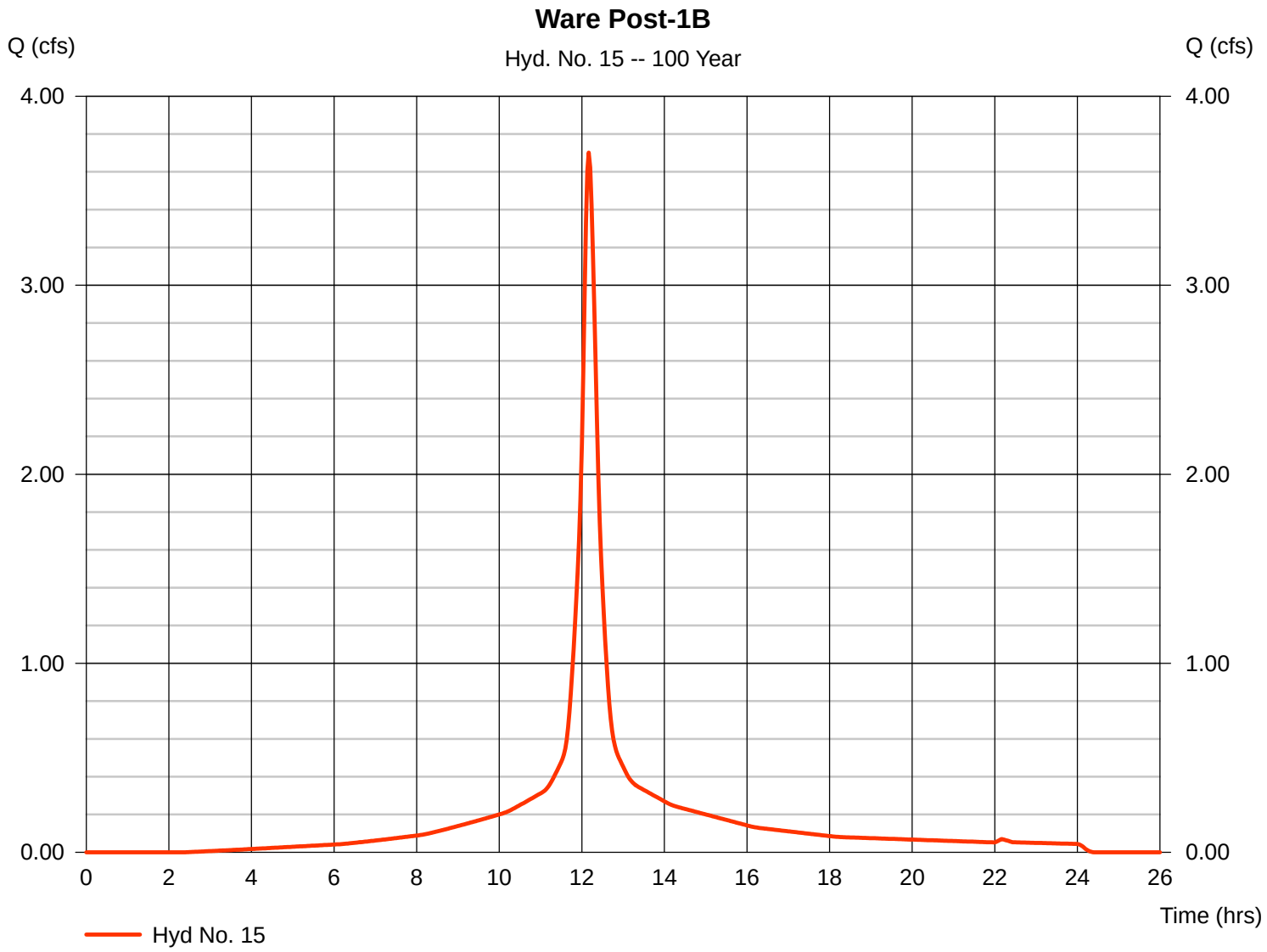
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 15

Ware Post-1B

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.702 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.17 hrs
Time interval	=	2 min	Hyd. volume	=	16,244 cuft
Drainage area	=	0.580 ac	Curve number	=	91
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.90 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



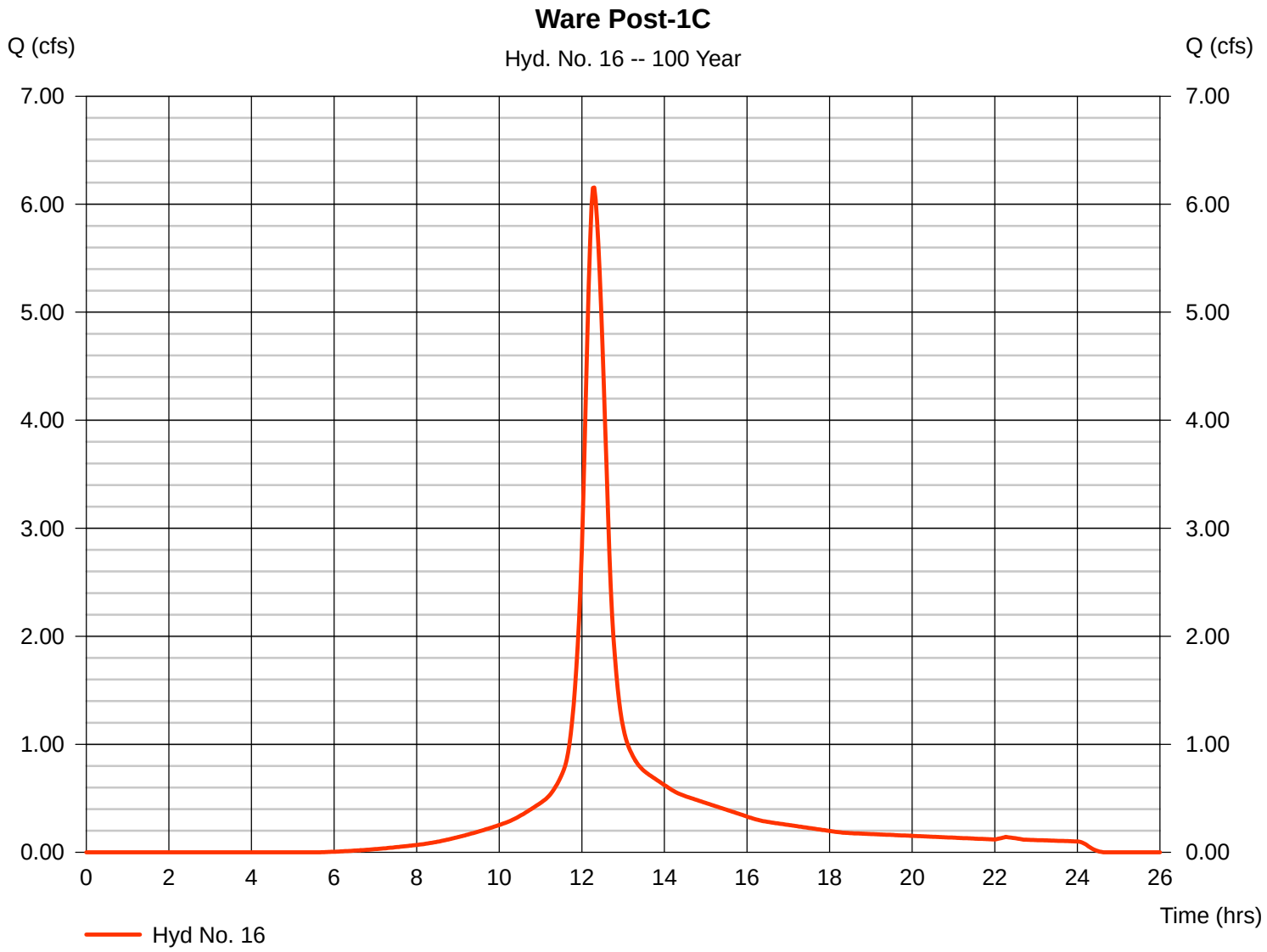
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 16

Ware Post-1C

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.155 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.30 hrs
Time interval	=	2 min	Hyd. volume	=	30,723 cuft
Drainage area	=	1.360 ac	Curve number	=	78
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.79 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



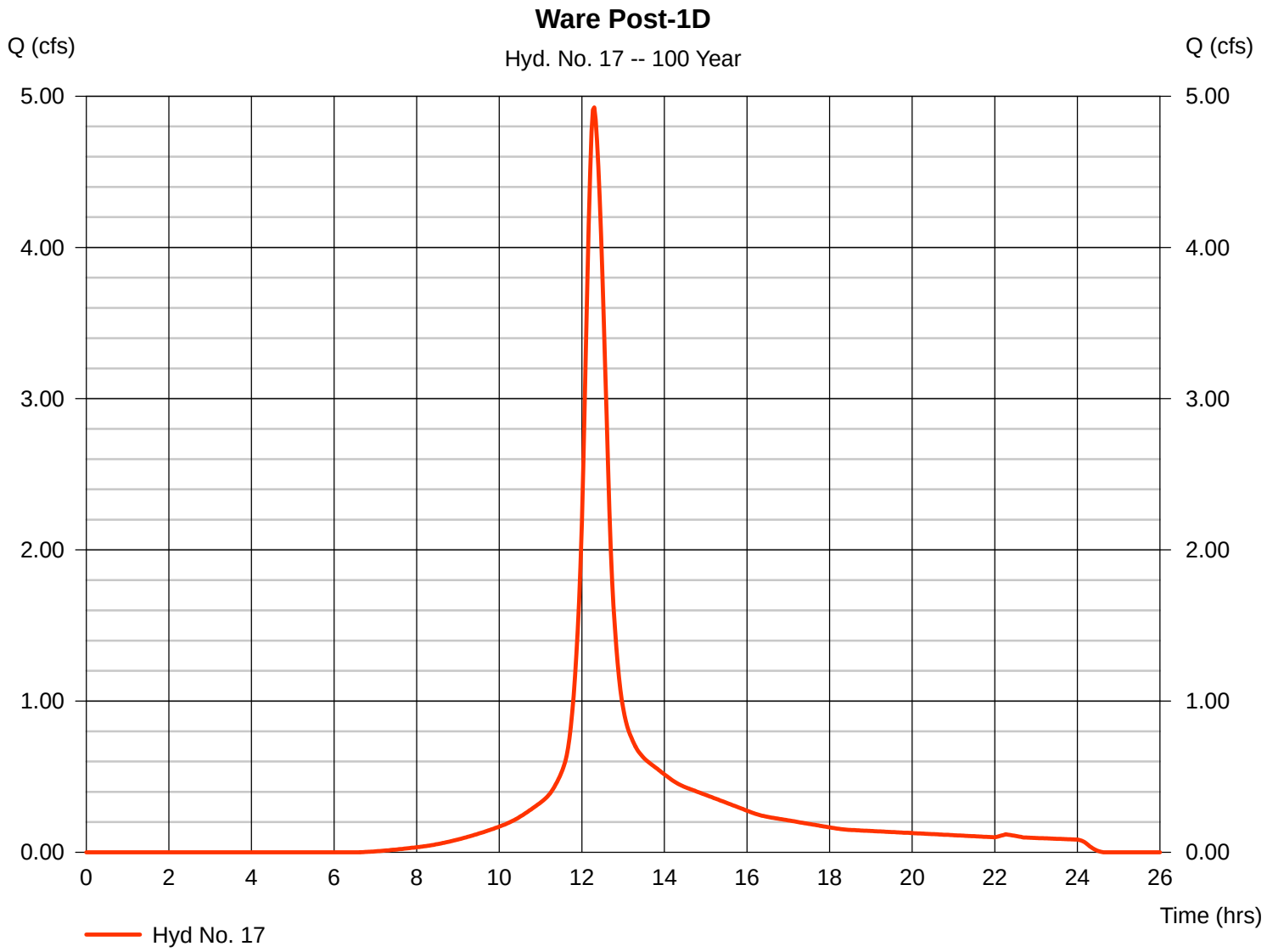
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 17

Ware Post-1D

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.926 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.30 hrs
Time interval	=	2 min	Hyd. volume	=	24,370 cuft
Drainage area	=	1.170 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.90 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



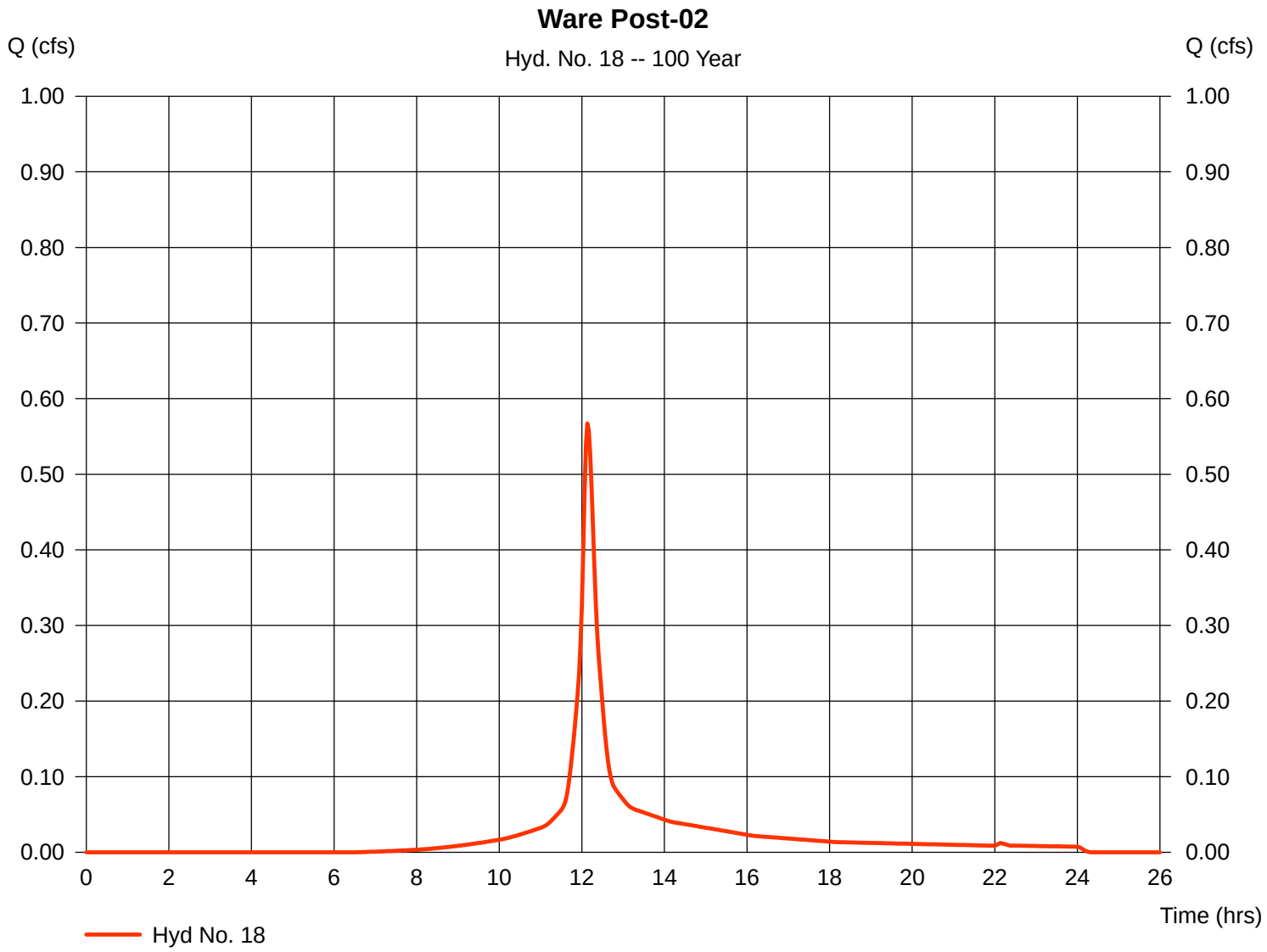
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 18

Ware Post-02

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.567 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.13 hrs
Time interval	=	2 min	Hyd. volume	=	2,182 cuft
Drainage area	=	0.100 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.30 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

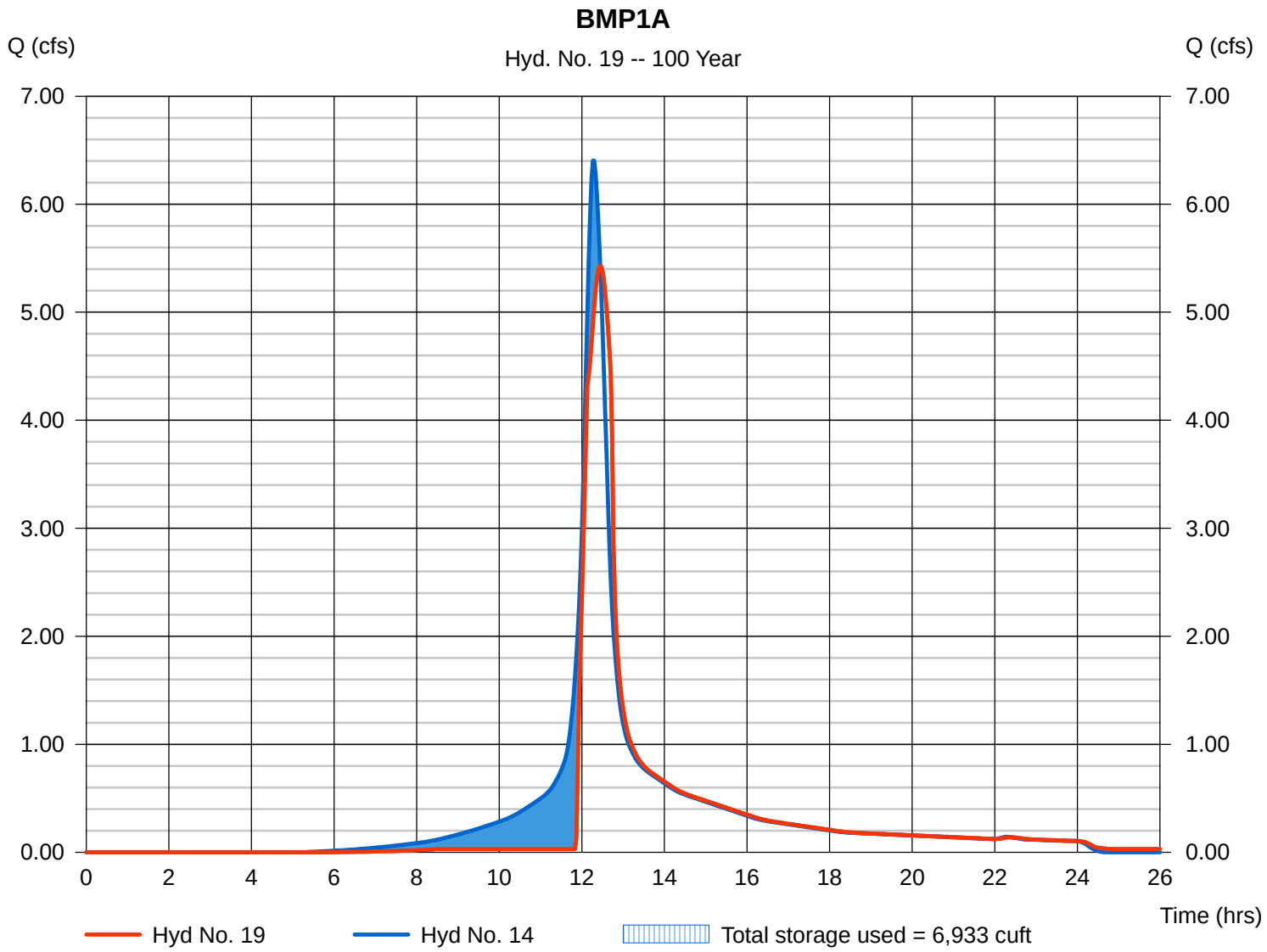
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 19

BMP1A

Hydrograph type	=	Reservoir	Peak discharge	=	5.428 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.43 hrs
Time interval	=	2 min	Hyd. volume	=	32,139 cuft
Inflow hyd. No.	=	14 - Ware Post-1A	Max. Elevation	=	7.79 ft
Reservoir name	=	WARE-BMP1A	Max. Storage	=	6,933 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

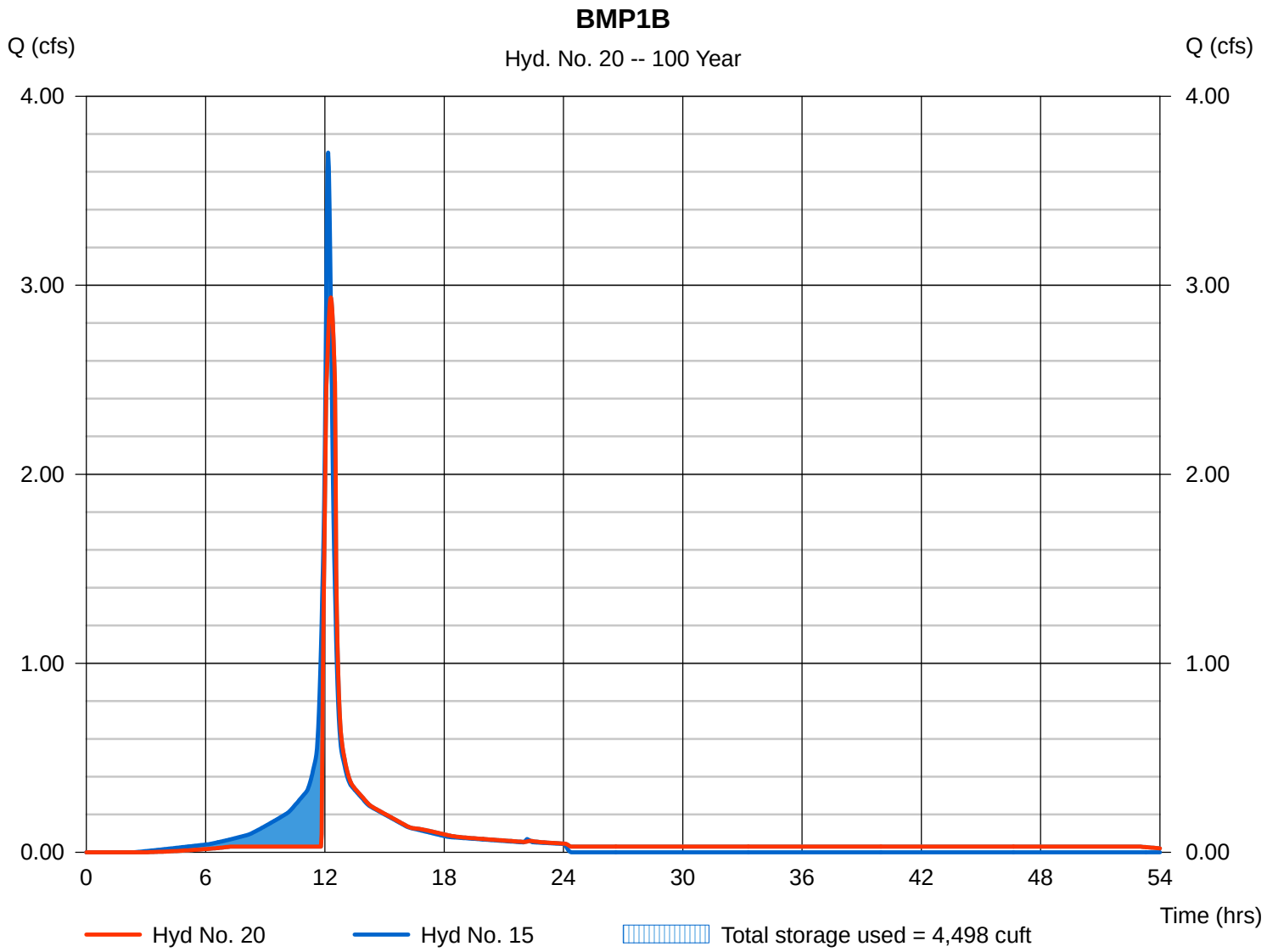
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 20

BMP1B

Hydrograph type	=	Reservoir	Peak discharge	=	2.935 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.30 hrs
Time interval	=	2 min	Hyd. volume	=	16,233 cuft
Inflow hyd. No.	=	15 - Ware Post-1B	Max. Elevation	=	7.02 ft
Reservoir name	=	WARE-BMP1B	Max. Storage	=	4,498 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



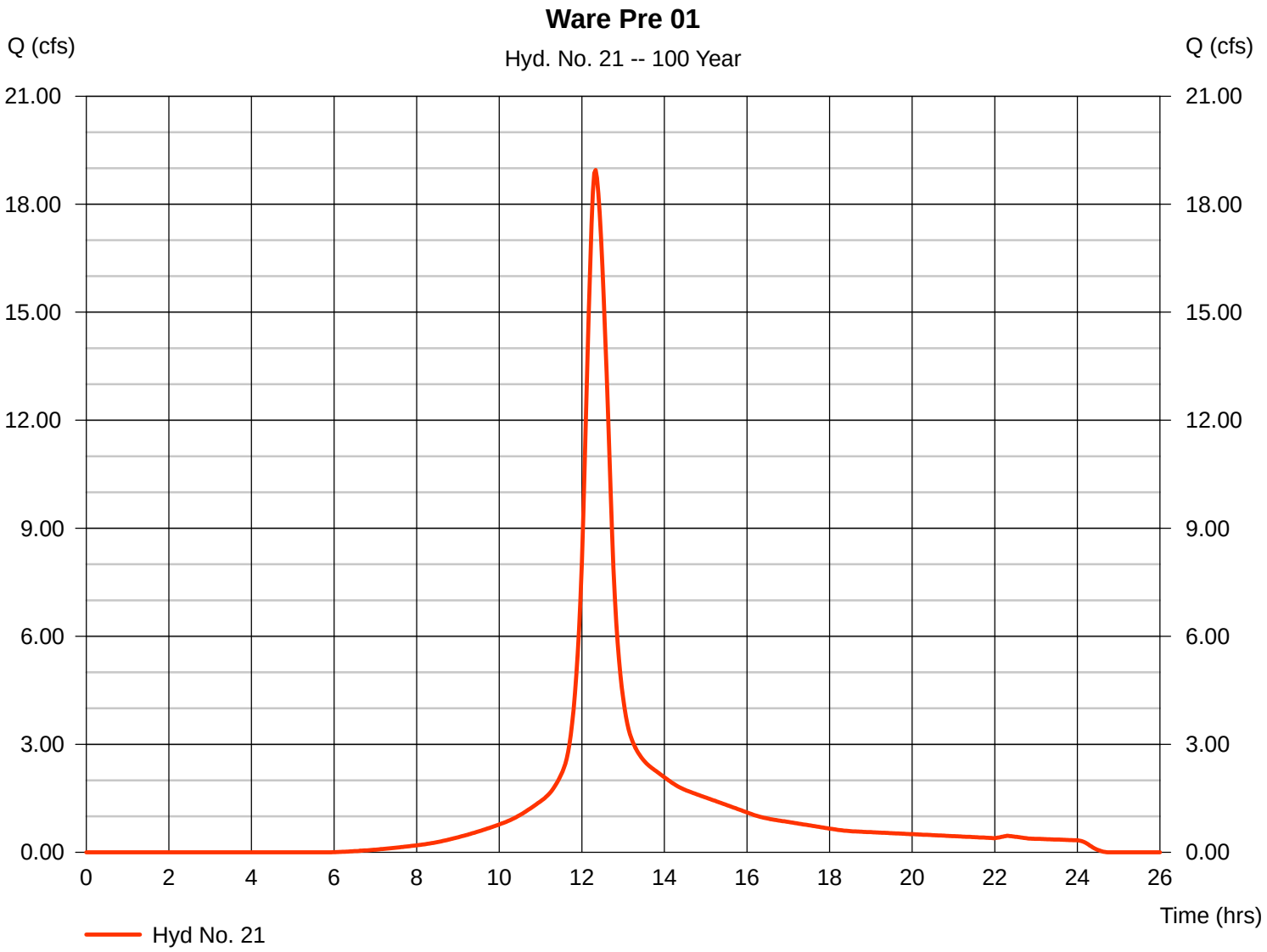
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 21

Ware Pre 01

Hydrograph type	=	SCS Runoff	Peak discharge	=	18.95 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.33 hrs
Time interval	=	2 min	Hyd. volume	=	99,910 cuft
Drainage area	=	4.440 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	28.10 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

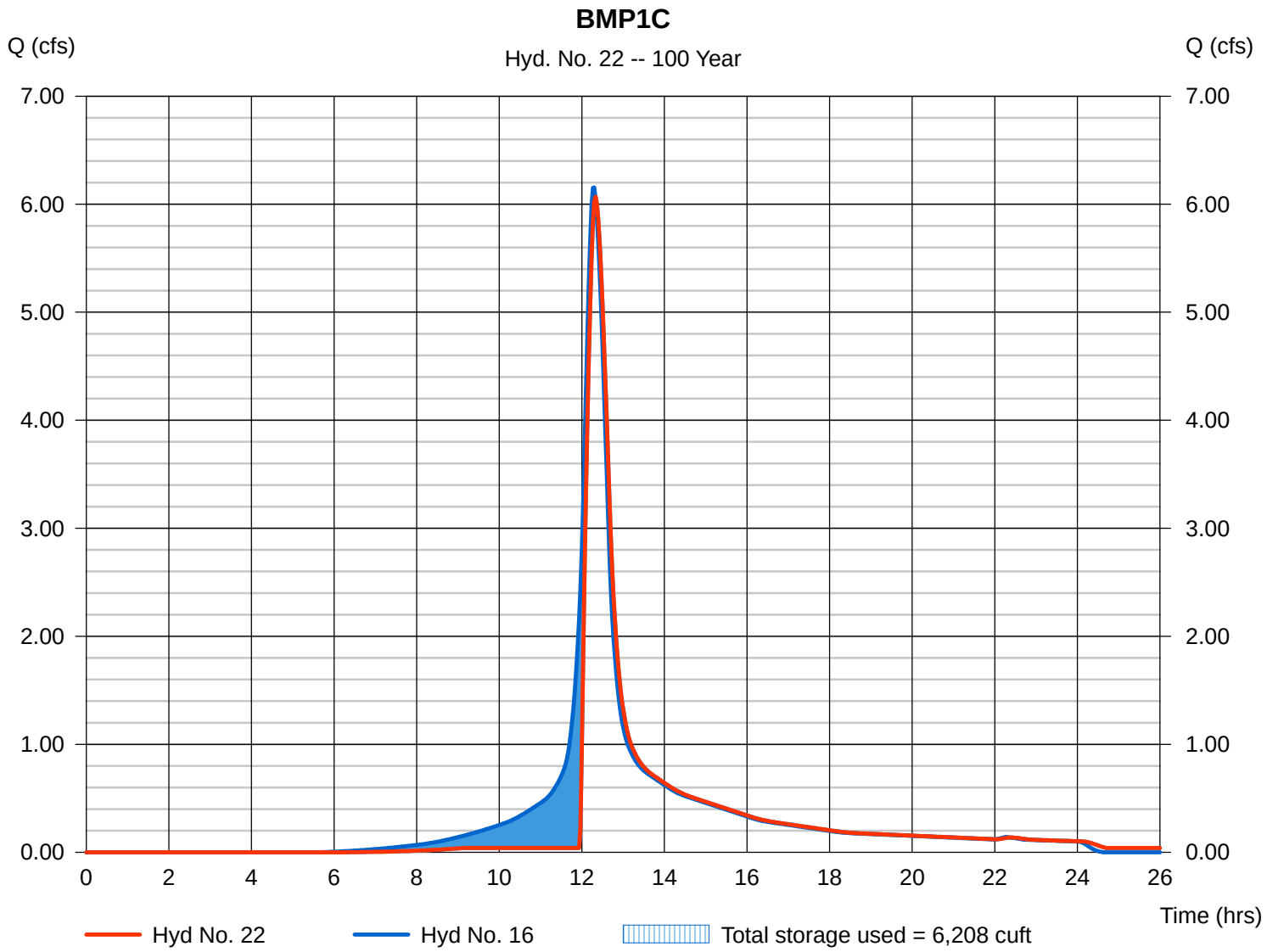
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 22

BMP1C

Hydrograph type	=	Reservoir	Peak discharge	=	6.069 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.33 hrs
Time interval	=	2 min	Hyd. volume	=	30,711 cuft
Inflow hyd. No.	=	16 - Ware Post-1C	Max. Elevation	=	8.00 ft
Reservoir name	=	WareBMP1C	Max. Storage	=	6,208 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



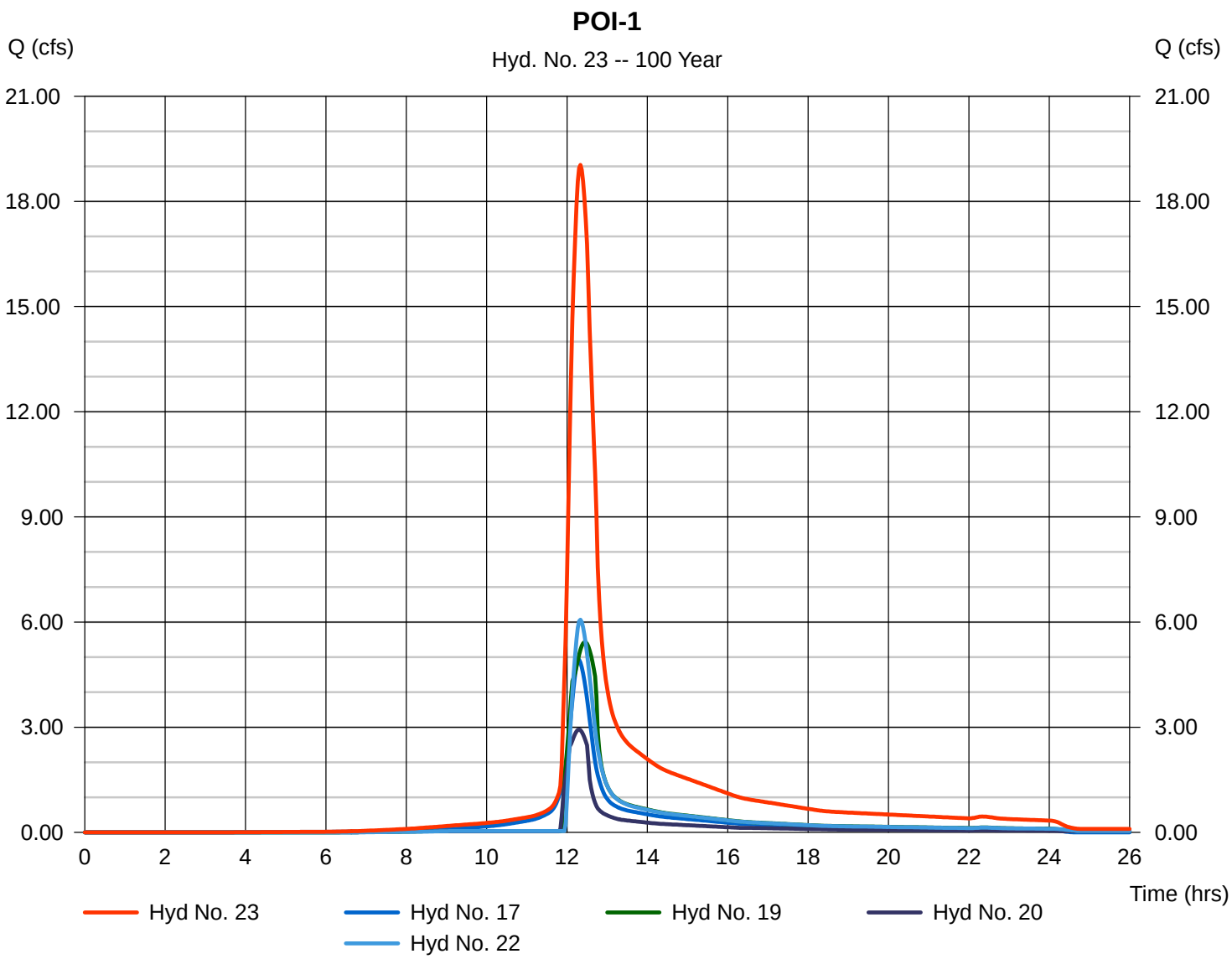
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 23

POI-1

Hydrograph type	=	Combine	Peak discharge	=	19.04 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.33 hrs
Time interval	=	2 min	Hyd. volume	=	103,453 cuft
Inflow hyds.	=	17, 19, 20, 22	Contrib. drain. area	=	1.170 ac



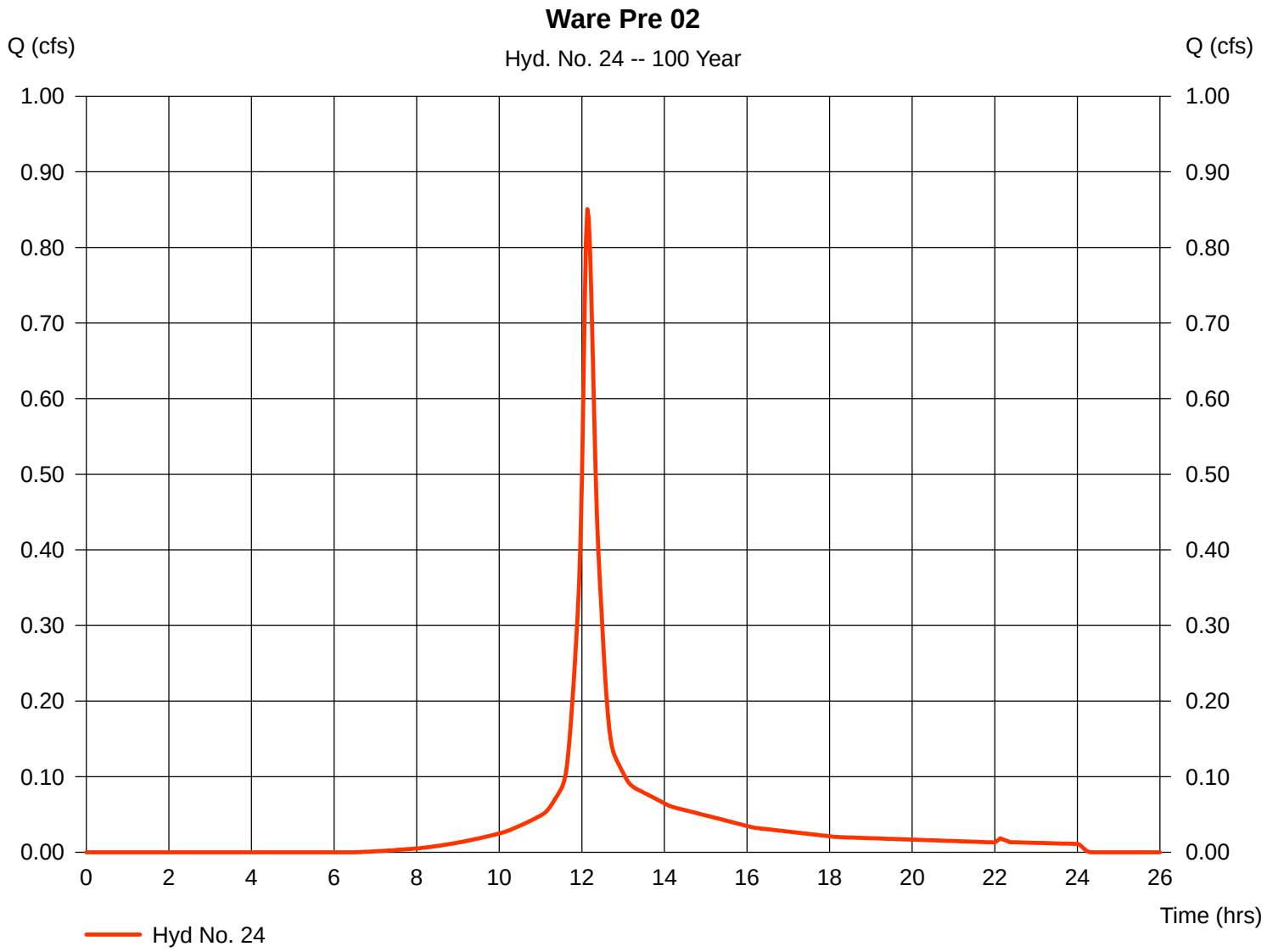
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 24

Ware Pre 02

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.851 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.13 hrs
Time interval	=	2 min	Hyd. volume	=	3,273 cuft
Drainage area	=	0.150 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.80 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



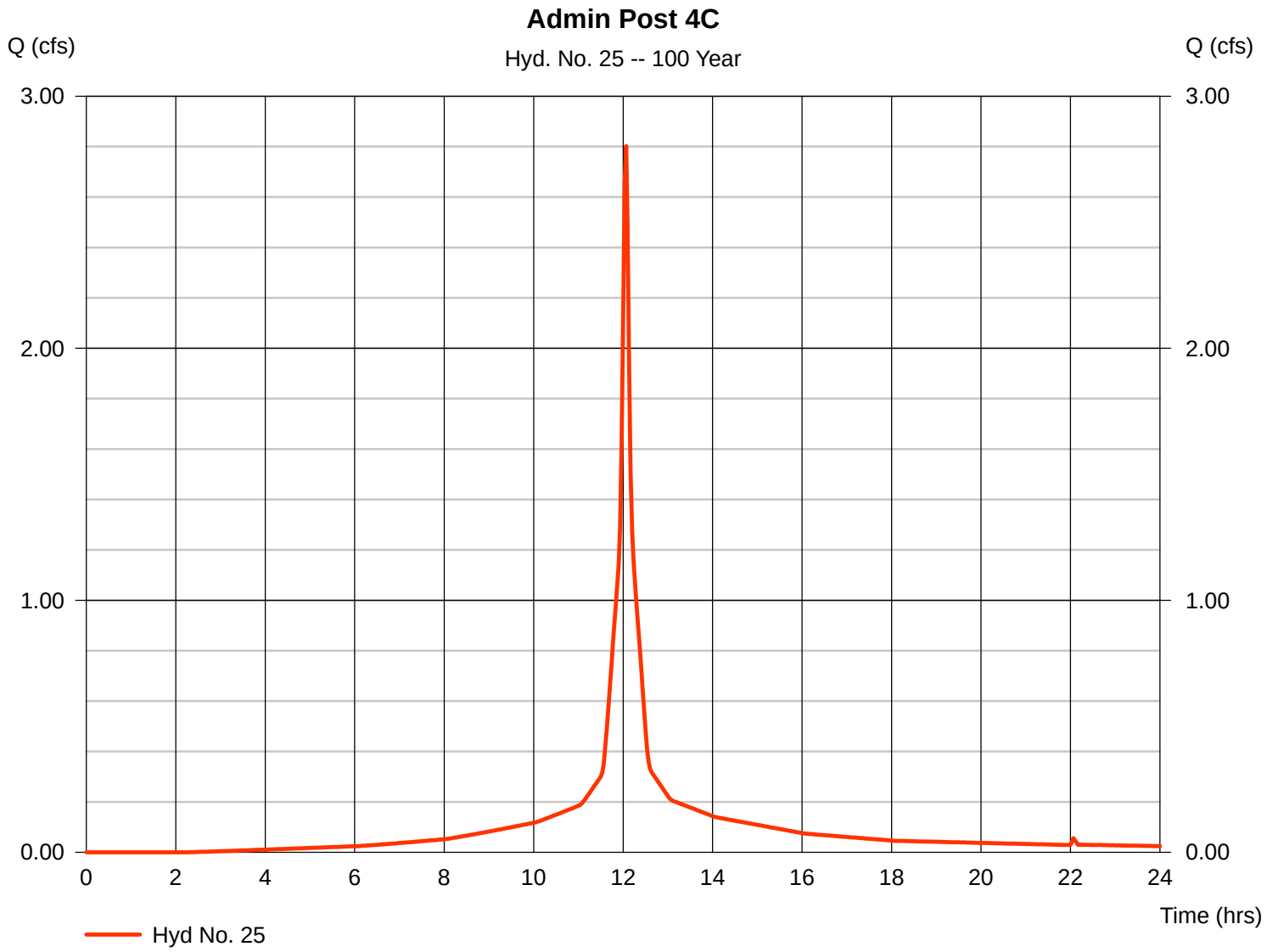
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 25

Admin Post 4C

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.802 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	9,156 cuft
Drainage area	=	0.340 ac	Curve number	=	91
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

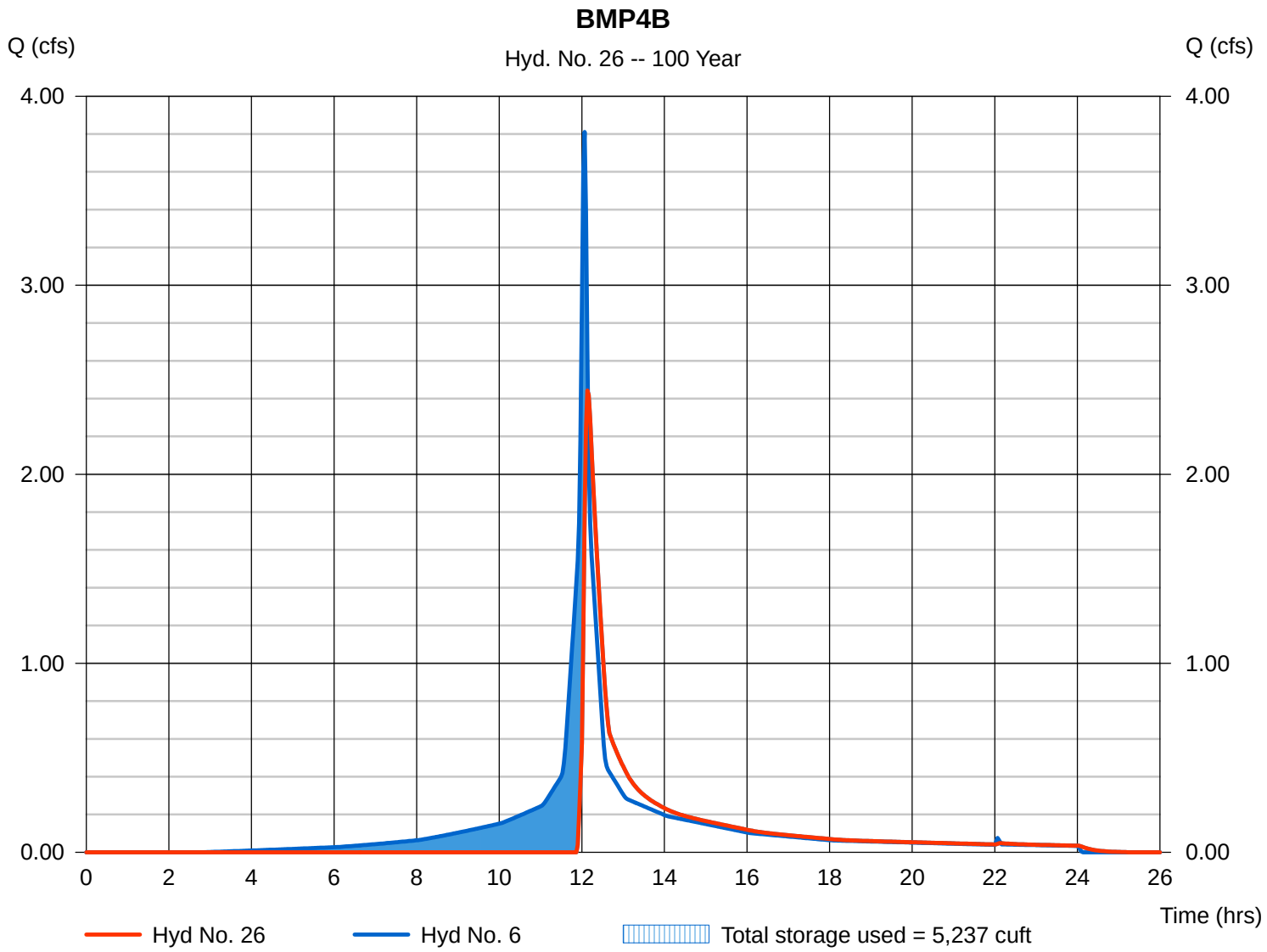
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 26

BMP4B

Hydrograph type	=	Reservoir	Peak discharge	=	2.443 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.13 hrs
Time interval	=	2 min	Hyd. volume	=	8,538 cuft
Inflow hyd. No.	=	6 - Admin Post 4B	Max. Elevation	=	8.50 ft
Reservoir name	=	ADMIN-BMP4B	Max. Storage	=	5,237 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



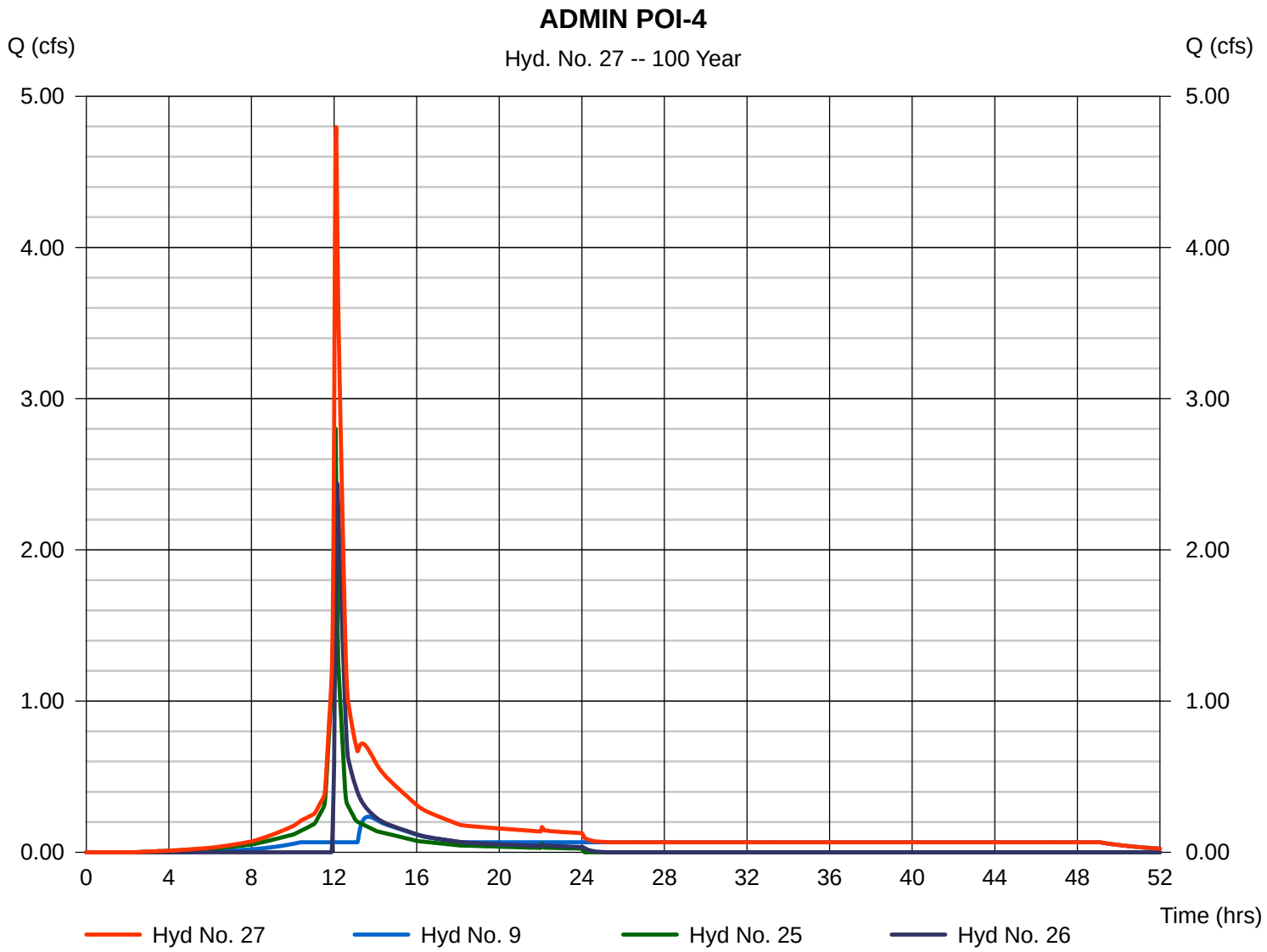
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 27

ADMIN POI-4

Hydrograph type	= Combine	Peak discharge	= 4.795 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 29,439 cuft
Inflow hyds.	= 9, 25, 26	Contrib. drain. area	= 0.340 ac



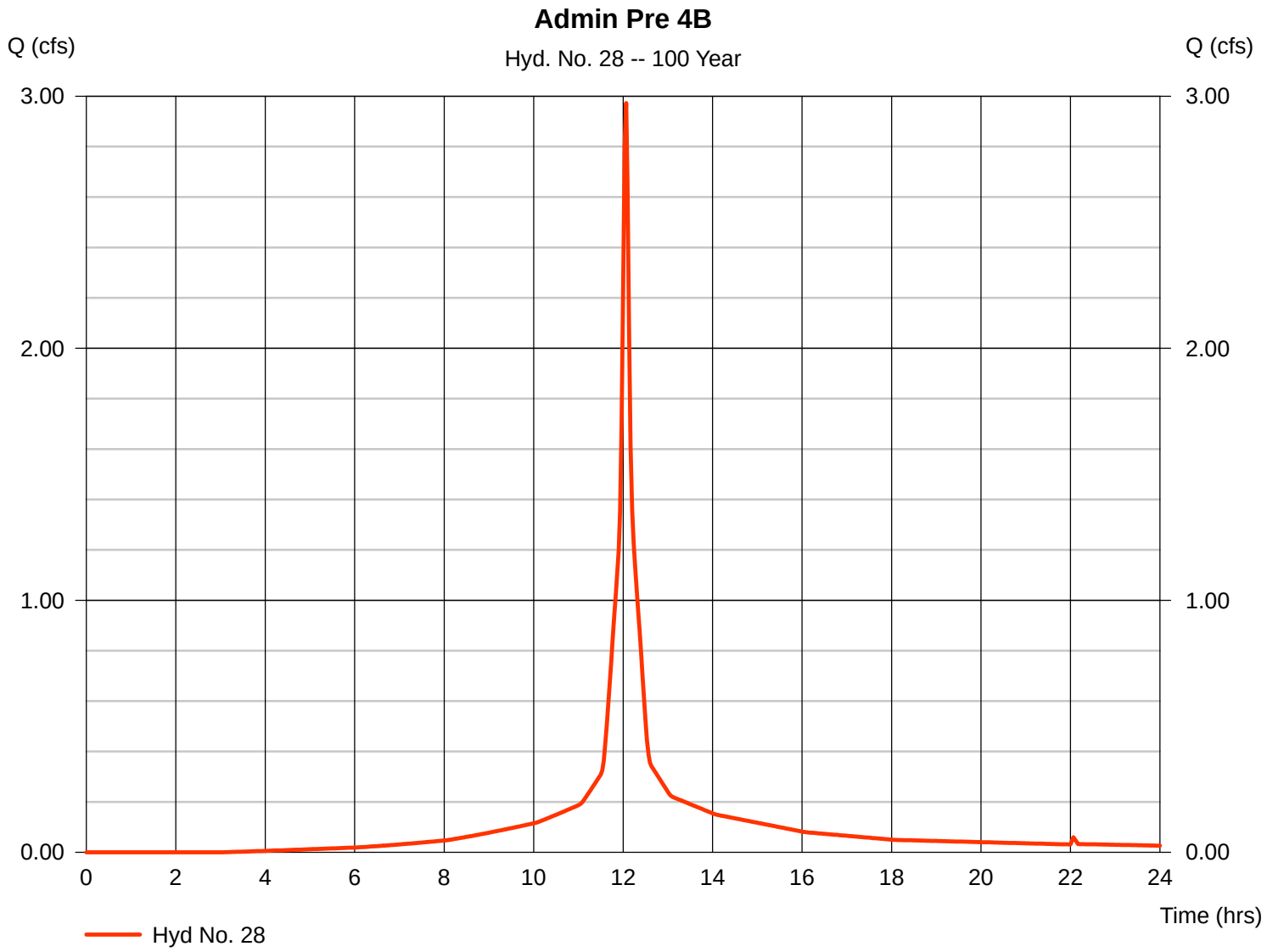
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 28

Admin Pre 4B

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.973 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	9,504 cuft
Drainage area	=	0.370 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	5.00 min
Total precip.	=	9.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



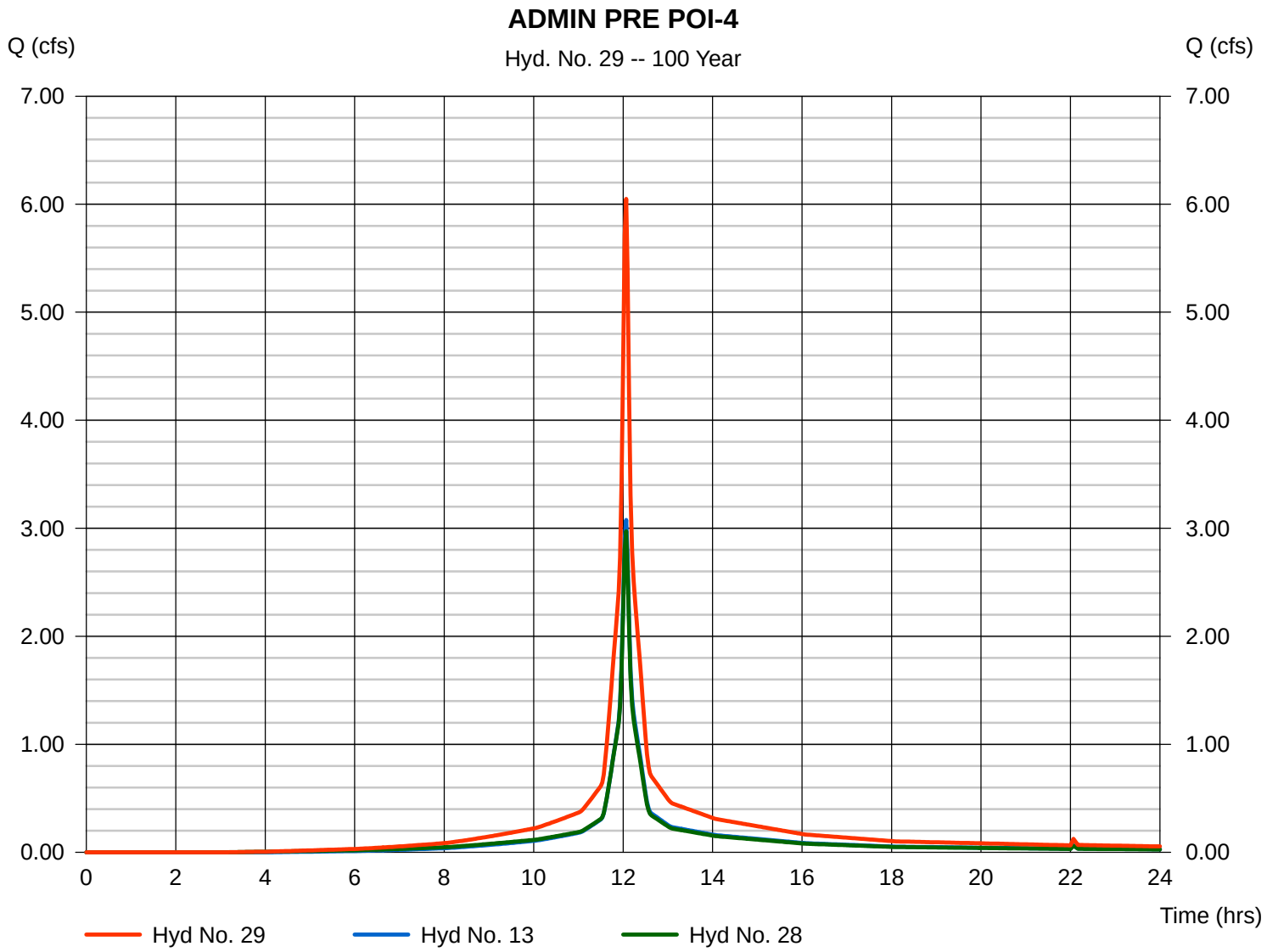
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Hyd. No. 29

ADMIN PRE POI-4

Hydrograph type	=	Combine	Peak discharge	=	6.049 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	19,113 cuft
Inflow hyds.	=	13, 28	Contrib. drain. area	=	0.770 ac



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	61.6600	11.2500	0.8400	--------
3	0.0000	0.0000	0.0000	--------
5	61.7800	10.7500	0.7900	--------
10	56.6700	10.0000	0.7300	--------
25	49.6300	8.2500	0.6700	--------
50	40.3200	6.0000	0.5900	--------
100	37.8600	5.2500	0.5600	--------

File name: Virginia Beach.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.93	4.73	3.96	3.42	3.02	2.71	2.46	2.26	2.09	1.94	1.82	1.71
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	7.00	5.63	4.75	4.13	3.66	3.30	3.01	2.78	2.58	2.41	2.26	2.14
10	7.85	6.36	5.41	4.73	4.23	3.84	3.52	3.26	3.04	2.85	2.69	2.55
25	8.79	7.09	6.03	5.29	4.74	4.32	3.98	3.70	3.46	3.26	3.08	2.93
50	9.80	7.85	6.69	5.90	5.32	4.87	4.51	4.21	3.96	3.75	3.57	3.40
100	10.28	8.23	7.02	6.21	5.61	5.15	4.78	4.48	4.22	4.00	3.81	3.65

Tc = time in minutes. Values may exceed 60.

Precip. file name: Virginia Beach.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	3.00	3.80	0.00	5.00	6.00	7.00	8.00	9.00
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Hydraflow Table of Contents

P165_STORMWATER_REV01.gpw

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, May 15, 2014

Watershed Model Schematic 1

Hydrograph Return Period Recap 2

2 - Year

Summary Report 3

Hydrograph Reports 4

Hydrograph No. 1, SCS Runoff, Admin Post 01 4
TR-55 Tc Worksheet 5
Hydrograph No. 2, SCS Runoff, Admin Post 02 6
Hydrograph No. 3, SCS Runoff, Admin Post 3A 7
Hydrograph No. 4, SCS Runoff, Admin Post 3B 8
Hydrograph No. 5, SCS Runoff, Admin Post 4A 9
TR-55 Tc Worksheet 10
Hydrograph No. 6, SCS Runoff, Admin Post 4B 11
Hydrograph No. 7, Reservoir, BMP3A 12
Pond Report - ADMIN-BMP3A 13
Hydrograph No. 8, Combine, ADMIN POI-3 15
Hydrograph No. 9, Reservoir, BMP4A 16
Pond Report - ADMIN-BMP4A 17
Hydrograph No. 10, SCS Runoff, Admin Pre 01 19
Hydrograph No. 11, SCS Runoff, Admin Pre 02 20
Hydrograph No. 12, SCS Runoff, Admin Pre 03 21
TR-55 Tc Worksheet 22
Hydrograph No. 13, SCS Runoff, Admin Pre 04A 23
TR-55 Tc Worksheet 24
Hydrograph No. 14, SCS Runoff, Ware Post-1A 25
TR-55 Tc Worksheet 26
Hydrograph No. 15, SCS Runoff, Ware Post-1B 27
TR-55 Tc Worksheet 28
Hydrograph No. 16, SCS Runoff, Ware Post-1C 29
TR-55 Tc Worksheet 30
Hydrograph No. 17, SCS Runoff, Ware Post-1D 31
TR-55 Tc Worksheet 32
Hydrograph No. 18, SCS Runoff, Ware Post-02 33
TR-55 Tc Worksheet 34
Hydrograph No. 19, Reservoir, BMP1A 35
Pond Report - WARE-BMP1A 36
Hydrograph No. 20, Reservoir, BMP1B 38
Pond Report - WARE-BMP1B 39
Hydrograph No. 21, SCS Runoff, Ware Pre 01 41
TR-55 Tc Worksheet 42
Hydrograph No. 22, Reservoir, BMP1C 43
Pond Report - WareBMP1C 44
Hydrograph No. 23, Combine, POI-1 46
Hydrograph No. 24, SCS Runoff, Ware Pre 02 47
TR-55 Tc Worksheet 48
Hydrograph No. 25, SCS Runoff, Admin Post 4C 49
Hydrograph No. 26, Reservoir, BMP4B 50
Pond Report - ADMIN-BMP4B 51

Contents continued...

Hydrograph No. 27, Combine, ADMIN POI-4 53
Hydrograph No. 28, SCS Runoff, Admin Pre 4B 54
Hydrograph No. 29, Combine, ADMIN PRE POI-4 55

10 - Year

Summary Report 56
Hydrograph Reports 57
Hydrograph No. 1, SCS Runoff, Admin Post 01 57
Hydrograph No. 2, SCS Runoff, Admin Post 02 58
Hydrograph No. 3, SCS Runoff, Admin Post 3A 59
Hydrograph No. 4, SCS Runoff, Admin Post 3B 60
Hydrograph No. 5, SCS Runoff, Admin Post 4A 61
Hydrograph No. 6, SCS Runoff, Admin Post 4B 62
Hydrograph No. 7, Reservoir, BMP3A 63
Hydrograph No. 8, Combine, ADMIN POI-3 64
Hydrograph No. 9, Reservoir, BMP4A 65
Hydrograph No. 10, SCS Runoff, Admin Pre 01 66
Hydrograph No. 11, SCS Runoff, Admin Pre 02 67
Hydrograph No. 12, SCS Runoff, Admin Pre 03 68
Hydrograph No. 13, SCS Runoff, Admin Pre 04A 69
Hydrograph No. 14, SCS Runoff, Ware Post-1A 70
Hydrograph No. 15, SCS Runoff, Ware Post-1B 71
Hydrograph No. 16, SCS Runoff, Ware Post-1C 72
Hydrograph No. 17, SCS Runoff, Ware Post-1D 73
Hydrograph No. 18, SCS Runoff, Ware Post-02 74
Hydrograph No. 19, Reservoir, BMP1A 75
Hydrograph No. 20, Reservoir, BMP1B 76
Hydrograph No. 21, SCS Runoff, Ware Pre 01 77
Hydrograph No. 22, Reservoir, BMP1C 78
Hydrograph No. 23, Combine, POI-1 79
Hydrograph No. 24, SCS Runoff, Ware Pre 02 80
Hydrograph No. 25, SCS Runoff, Admin Post 4C 81
Hydrograph No. 26, Reservoir, BMP4B 82
Hydrograph No. 27, Combine, ADMIN POI-4 83
Hydrograph No. 28, SCS Runoff, Admin Pre 4B 84
Hydrograph No. 29, Combine, ADMIN PRE POI-4 85

25 - Year

Summary Report 86
Hydrograph Reports 87
Hydrograph No. 1, SCS Runoff, Admin Post 01 87
Hydrograph No. 2, SCS Runoff, Admin Post 02 88
Hydrograph No. 3, SCS Runoff, Admin Post 3A 89
Hydrograph No. 4, SCS Runoff, Admin Post 3B 90
Hydrograph No. 5, SCS Runoff, Admin Post 4A 91
Hydrograph No. 6, SCS Runoff, Admin Post 4B 92
Hydrograph No. 7, Reservoir, BMP3A 93
Hydrograph No. 8, Combine, ADMIN POI-3 94
Hydrograph No. 9, Reservoir, BMP4A 95
Hydrograph No. 10, SCS Runoff, Admin Pre 01 96
Hydrograph No. 11, SCS Runoff, Admin Pre 02 97
Hydrograph No. 12, SCS Runoff, Admin Pre 03 98

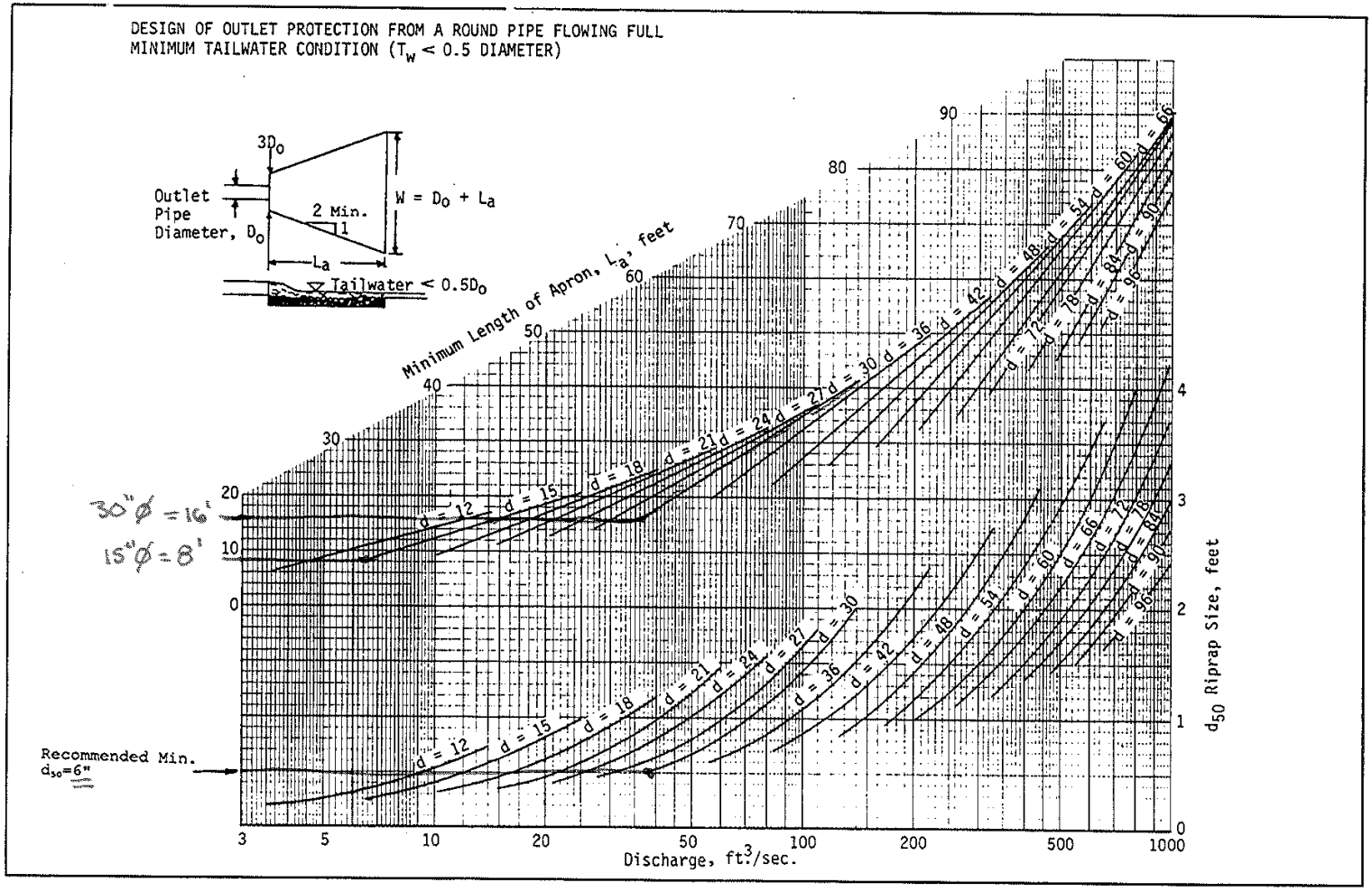
Contents continued...

Hydrograph No. 13, SCS Runoff, Admin Pre 04A 99
Hydrograph No. 14, SCS Runoff, Ware Post-1A 100
Hydrograph No. 15, SCS Runoff, Ware Post-1B 101
Hydrograph No. 16, SCS Runoff, Ware Post-1C 102
Hydrograph No. 17, SCS Runoff, Ware Post-1D 103
Hydrograph No. 18, SCS Runoff, Ware Post-02 104
Hydrograph No. 19, Reservoir, BMP1A 105
Hydrograph No. 20, Reservoir, BMP1B 106
Hydrograph No. 21, SCS Runoff, Ware Pre 01 107
Hydrograph No. 22, Reservoir, BMP1C 108
Hydrograph No. 23, Combine, POI-1 109
Hydrograph No. 24, SCS Runoff, Ware Pre 02 110
Hydrograph No. 25, SCS Runoff, Admin Post 4C 111
Hydrograph No. 26, Reservoir, BMP4B 112
Hydrograph No. 27, Combine, ADMIN POI-4 113
Hydrograph No. 28, SCS Runoff, Admin Pre 4B 114
Hydrograph No. 29, Combine, ADMIN PRE POI-4 115

100 - Year

Summary Report 116
Hydrograph Reports 117
Hydrograph No. 1, SCS Runoff, Admin Post 01 117
Hydrograph No. 2, SCS Runoff, Admin Post 02 118
Hydrograph No. 3, SCS Runoff, Admin Post 3A 119
Hydrograph No. 4, SCS Runoff, Admin Post 3B 120
Hydrograph No. 5, SCS Runoff, Admin Post 4A 121
Hydrograph No. 6, SCS Runoff, Admin Post 4B 122
Hydrograph No. 7, Reservoir, BMP3A 123
Hydrograph No. 8, Combine, ADMIN POI-3 124
Hydrograph No. 9, Reservoir, BMP4A 125
Hydrograph No. 10, SCS Runoff, Admin Pre 01 126
Hydrograph No. 11, SCS Runoff, Admin Pre 02 127
Hydrograph No. 12, SCS Runoff, Admin Pre 03 128
Hydrograph No. 13, SCS Runoff, Admin Pre 04A 129
Hydrograph No. 14, SCS Runoff, Ware Post-1A 130
Hydrograph No. 15, SCS Runoff, Ware Post-1B 131
Hydrograph No. 16, SCS Runoff, Ware Post-1C 132
Hydrograph No. 17, SCS Runoff, Ware Post-1D 133
Hydrograph No. 18, SCS Runoff, Ware Post-02 134
Hydrograph No. 19, Reservoir, BMP1A 135
Hydrograph No. 20, Reservoir, BMP1B 136
Hydrograph No. 21, SCS Runoff, Ware Pre 01 137
Hydrograph No. 22, Reservoir, BMP1C 138
Hydrograph No. 23, Combine, POI-1 139
Hydrograph No. 24, SCS Runoff, Ware Pre 02 140
Hydrograph No. 25, SCS Runoff, Admin Post 4C 141
Hydrograph No. 26, Reservoir, BMP4B 142
Hydrograph No. 27, Combine, ADMIN POI-4 143
Hydrograph No. 28, SCS Runoff, Admin Pre 4B 144
Hydrograph No. 29, Combine, ADMIN PRE POI-4 145

IDF Report 146

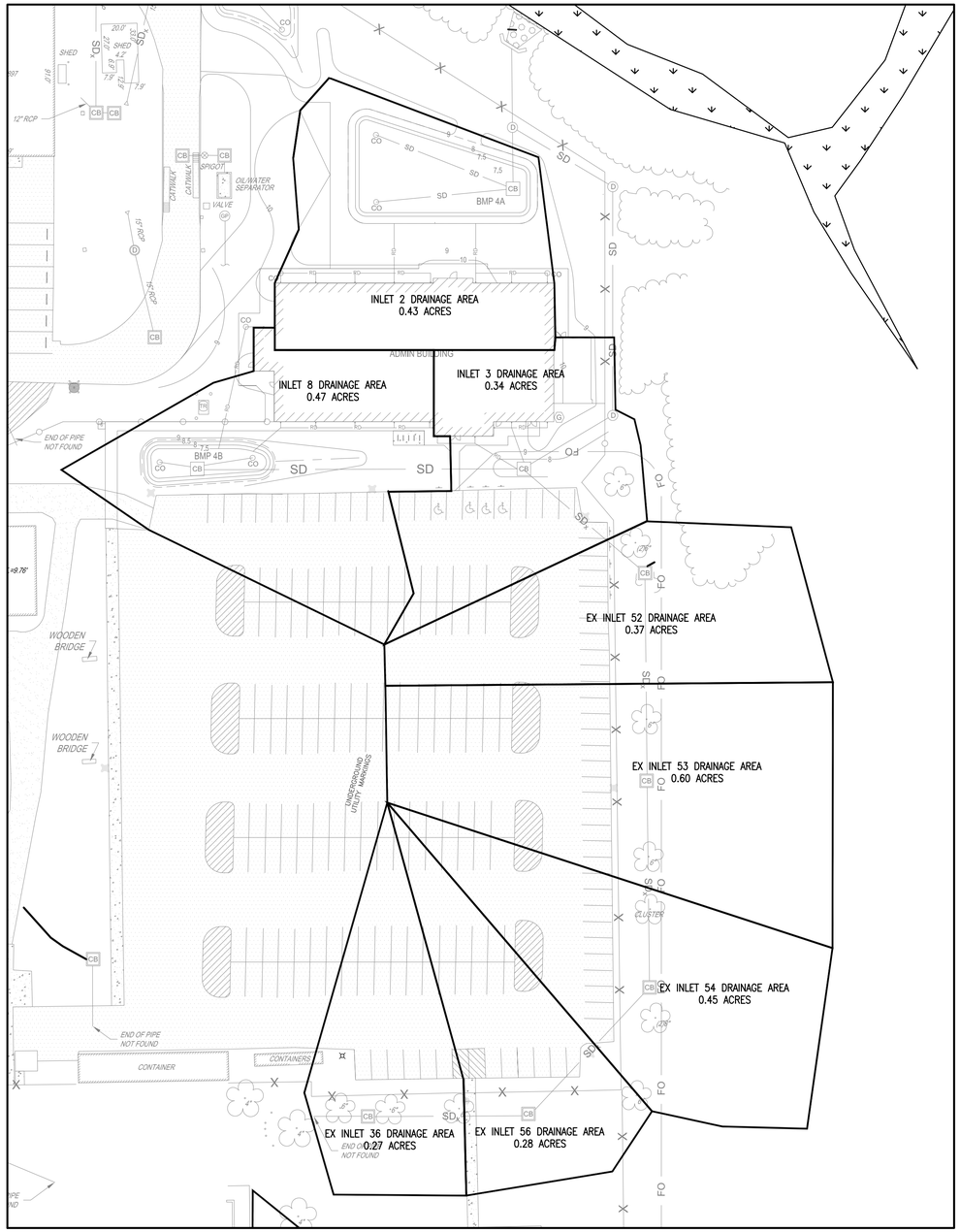


Source: USDA-SCS

Plate 3.18-3

APPENDIX F

STORM SEWER CONVEYANCE CALCULATIONS



ADMINISTRATION BUILDING

0 20' 40' 860'

SCALE: 1" = 40'

N

NO.	DESCRIPTION	DATE	APPR.

NAVFAC

PRELIMINARY DESIGN
NOT FOR CONSTRUCTION
SEAL

LEEBCOR SERVICES, LLC
430 McLaws Circle
Suite 201
Williamsburg, VA 2318
CONTRACTOR INFO

Baker
Michael Baker Jr, Inc.
100 Airside Drive
Moon Township, PA 15108
A/E INFO

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY

SATISFACTORY TO DATE 06/17/14

DES | DRW | CHK

PM

BRANCH MANAGER

CHIEF ENG/ARCH

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID ATLANTIC
Norfolk, Va
IPT – PWD

JOINT EXPEDITIONARY BASE LITTLE CREEK, VIRGINIA

FY2013 P-165 SOF COMBAT SERVICES SUPPORT FACILITY

POST-DEVELOPMENT PIPE CONVEYANCE

SCALE: AS NOTED

AEPROJECT NO.: XXXXXX

CONSTR. CONTR. NO. N40085-12-D-6304

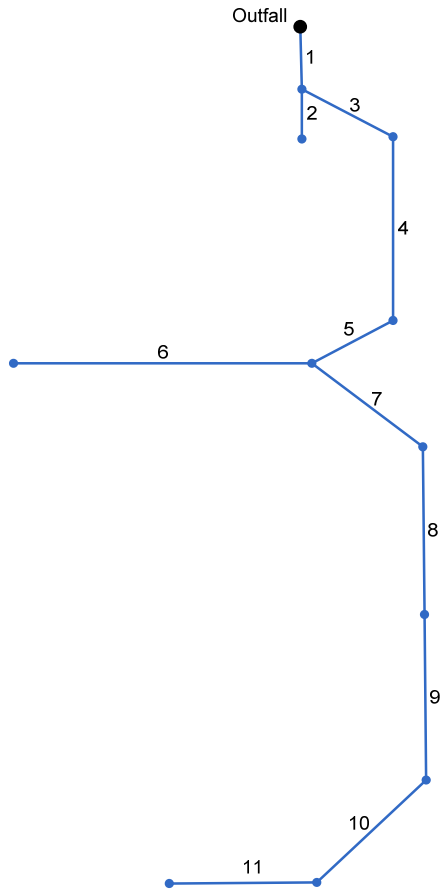
NAVFAC DRAWING NO.

SHEET OF ##

SW203

FINAL SUBMISSION

Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan



Project File: P-165 Admin Outlet 1 Revised.stm	Number of lines: 11	Date: 5/14/2014

Storm Sewers v10.30

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	43.000	88.934	MH	0.00	0.00	0.00	5.0	4.01	0.16	4.08	30	Cir	0.012	0.87	8.75	STMH-1 to Outlet-1
2	1	34.250	1.066	DrGrt	0.00	0.43	0.85	5.0	4.08	0.12	4.12	15	Cir	0.012	1.00	8.33	IN-2 to STMH-1
3	1	64.012	-58.162	MH	0.00	0.00	0.00	5.0	4.08	0.14	4.17	30	Cir	0.012	0.88	8.50	STMH-2 to STMH-1
4	3	126.500	59.228	MH	0.00	0.00	0.00	5.0	4.17	0.13	4.34	30	Cir	0.012	0.88	8.50	STMH-3 to STMH-2
5	4	57.195	58.950	DrGrt	0.00	0.34	0.85	5.0	4.34	0.14	4.42	30	Cir	0.012	1.50	7.62	IN-3 to STMH-3
6	5	180.000	31.050	DrGrt	0.00	0.47	0.85	5.0	4.42	0.15	4.69	15	Cir	0.012	1.00	8.33	IN-8 to IN-3
7	5	88.291	-108.314	DrGrt	0.00	0.37	0.85	5.0	4.42	0.29	4.68	18	Cir	0.013	1.19	7.78	EX IN-52 to IN-3
8	7	115.504	48.867	DrGrt	0.00	0.60	0.85	5.0	4.68	0.23	4.95	18	Cir	0.013	0.50	7.70	EX IN-53 to EX IN-
9	8	114.004	-0.007	DrGrt	0.00	0.45	0.85	5.0	4.95	0.26	5.25	15	Cir	0.013	1.10	7.78	EX IN-54 to EX IN-
10	9	96.573	43.614	DrGrt	0.00	0.28	0.85	5.0	5.28	0.29	5.56	15	Cir	0.013	1.15	7.72	EX IN-56 to EX IN-
11	10	89.003	46.405	DrGrt	0.00	0.27	0.85	5.0	5.62	0.37	5.95	12	Cir	0.013	1.00	8.66	EX IN-36 to EX IN-

Project File: P-165 Admin Outlet 1 Revised.stm | Number of lines: 11 | Date: 5/14/2014

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1	STMH-1	Manhole	8.75	Cir	4.00	4.00	30	Cir	4.08	15 30	Cir Cir	4.08 4.08
2	IN-2	DropGrate	8.33	Cir	4.00	4.00	15	Cir	4.12			
3	STMH-2	Manhole	8.50	Cir	4.00	4.00	30	Cir	4.17	30	Cir	4.17
4	STMH-3	Manhole	8.50	Cir	4.00	4.00	30	Cir	4.34	30	Cir	4.34
5	IN-3	DropGrate	7.62	Cir	4.00	4.00	30	Cir	4.42	15 18	Cir Cir	4.42 4.42
6	IN-8	DropGrate	8.33	Cir	4.00	4.00	15	Cir	4.69			
7	EX IN-52	DropGrate	7.78	Cir	4.00	4.00	18	Cir	4.68	18	Cir	4.68
8	EX IN-53	DropGrate	7.70	Cir	4.00	4.00	18	Cir	4.95	15	Cir	4.95
9	EX IN-54	DropGrate	7.78	Cir	4.00	4.00	15	Cir	5.25	15	Cir	5.28
10	EX IN-56	DropGrate	7.72	Cir	4.00	4.00	15	Cir	5.56	12	Cir	5.62
11	EX IN-36	DropGrate	8.66	Cir	4.00	4.00	12	Cir	5.95			

Project File: P-165 Admin Outlet 1 Revised.stm | Number of Structures: 11 | Run Date: 5/14/2014

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	STMH-1 to Outlet-1	18.46	30	Cir	43.000	4.01	4.08	0.163	6.51	6.58	0.19	6.77	End	Manhole
2	IN-2 to STMH-1	2.87	15	Cir	34.250	4.08	4.12	0.117	6.77*	6.83*	0.08	6.91	1	DropGrate
3	STMH-2 to STMH-1	16.20	30	Cir	64.012	4.08	4.17	0.141	6.65*	6.74*	0.15	6.89	1	Manhole
4	STMH-3 to STMH-2	16.63	30	Cir	126.500	4.17	4.34	0.134	6.89*	7.06*	0.16	7.22	3	Manhole
5	IN-3 to STMH-3	16.83	30	Cir	57.195	4.34	4.42	0.140	7.22*	7.30*	0.27	7.58	4	DropGrate
6	IN-8 to IN-3	3.14	15	Cir	180.000	4.42	4.69	0.150	7.58*	7.94*	0.10	8.04	5	DropGrate
7	EX IN-52 to IN-3	12.04	18	Cir	88.291	4.42	4.68	0.294	7.70*	8.86*	0.86	9.72	5	DropGrate
8	EX IN-53 to EX IN-52	9.93	18	Cir	115.504	4.68	4.95	0.234	9.72*	10.75*	0.25	11.00	7	DropGrate
9	EX IN-54 to EX IN-53	6.31	15	Cir	114.004	4.95	5.25	0.263	11.00*	12.08*	0.45	12.54	8	DropGrate
10	EX IN-56 to EX IN-54	3.56	15	Cir	96.573	5.28	5.56	0.290	12.54*	12.83*	0.15	12.98	9	DropGrate
11	EX IN-36 to EX IN-56	1.80	12	Cir	89.003	5.62	5.95	0.371	12.98*	13.21*	0.08	13.29	10	DropGrate

Project File: P-165 Admin Outlet 1 Revised.stm | Number of lines: 11 | Run Date: 5/14/2014

NOTES: Return period = 10 Yrs. ; *Surcharged (HGL above crown).

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	STMH-1	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
2	IN-2	2.87	0.00	2.87	0.00	DrGrt	0.0	0.00	5.06	2.53	2.00	Sag	2.00	0.020	0.020	0.000	0.22	24.32	0.22	24.32	0.0	Off
3	STMH-2	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
4	STMH-3	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
5	IN-3	2.27	0.00	2.27	0.00	DrGrt	0.0	0.00	5.06	2.53	2.00	Sag	2.00	0.020	0.020	0.000	0.19	21.09	0.19	21.09	0.0	Off
6	IN-8	3.14	0.00	3.14	0.00	DrGrt	0.0	0.00	5.06	2.53	2.00	Sag	2.00	0.020	0.020	0.000	0.24	25.69	0.24	25.69	0.0	Off
7	EX IN-52	2.47	0.00	2.47	0.00	DrGrt	0.0	0.00	5.06	2.53	2.00	Sag	2.00	0.020	0.020	0.000	0.20	22.19	0.20	22.19	0.0	Off
8	EX IN-53	4.00	0.00	4.00	0.00	DrGrt	0.0	0.00	5.06	2.53	2.00	Sag	2.00	0.020	0.020	0.000	0.28	29.88	0.28	29.88	0.0	Off
9	EX IN-54	3.00	0.00	3.00	0.00	DrGrt	0.0	0.00	5.06	2.53	2.00	Sag	2.00	0.020	0.020	0.000	0.23	25.01	0.23	25.01	0.0	Off
10	EX IN-56	1.87	0.00	1.87	0.00	DrGrt	0.0	0.00	5.06	2.53	2.00	Sag	2.00	0.020	0.020	0.000	0.17	18.77	0.17	18.77	0.0	Off
11	EX IN-36	1.80	0.00	1.80	0.00	DrGrt	0.0	0.00	5.06	2.53	2.00	Sag	2.00	0.020	0.020	0.000	0.16	18.37	0.16	18.37	0.0	Off

Project File: P-165 Admin Outlet 1 Revised.stm | Number of lines: 11 | Run Date: 5/14/2014

NOTES: Inlet N-Values = 0.016; Intensity = 56.67 / (Inlet time + 10.00) ^ 0.73; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Hydraulic Grade Line Computations

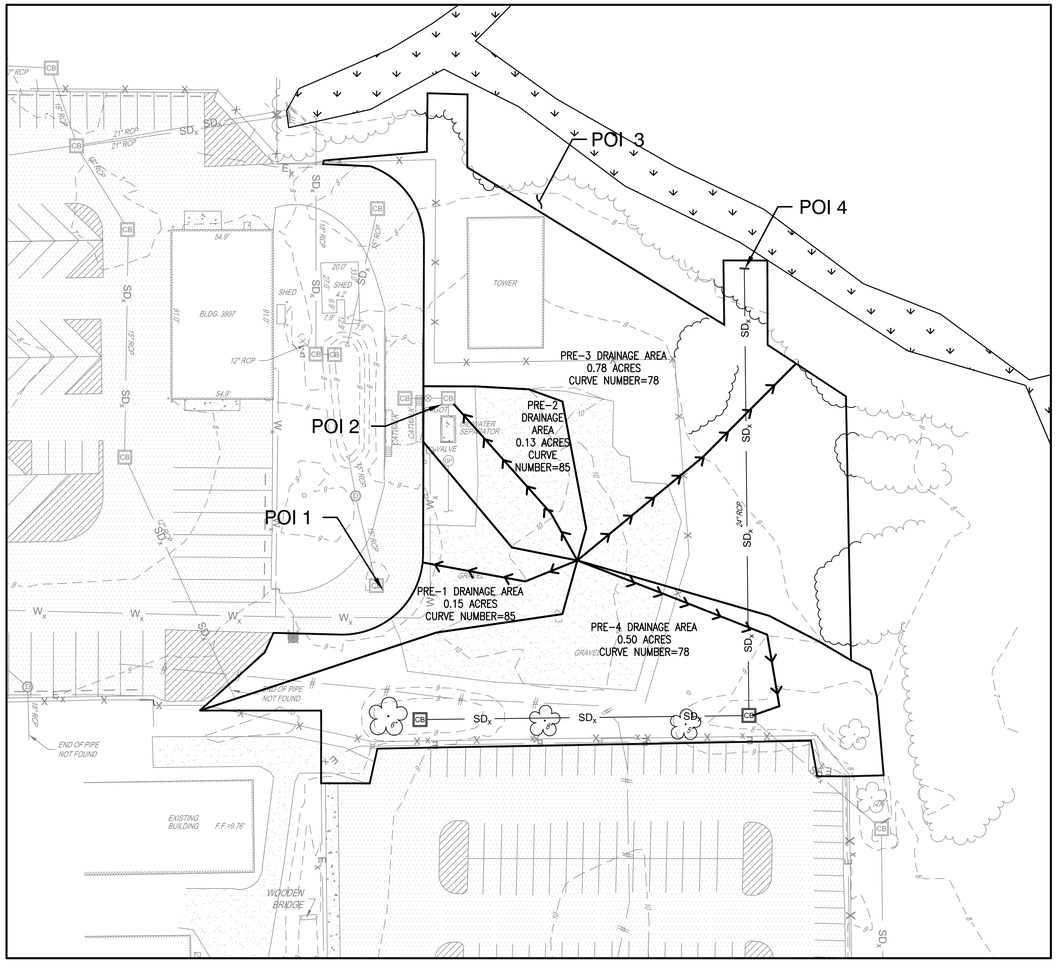
Line	Size (in)	Q (cfs)	Downstream Invert elev (ft)	Downstream HGL elev (ft)	Downstream Depth (ft)	Downstream Area (sqft)	Downstream Vel (ft/s)	Downstream Vel head (ft)	Downstream EGL elev (ft)	Downstream Sf (%)	Len (ft)	Upstream Invert elev (ft)	Upstream HGL elev (ft)	Upstream Depth (ft)	Upstream Area (sqft)	Upstream Vel (ft/s)	Upstream Vel head (ft)	Upstream EGL elev (ft)	Upstream Sf (%)	Check Ave Sf (%)	Check Enrgy loss (ft)	JL coeff (K)	Minor loss (ft)
1	30	18.46	4.01	6.51	2.50	4.91	3.76	0.22	6.73	0.173	43.000	4.08	6.58	2.50	4.91	3.76	0.22	6.80	0.172	0.172	0.074	0.87	0.19
2	15	2.87	4.08	6.77	1.25	1.23	2.34	0.08	6.86	0.168	34.250	4.12	6.83	1.25	1.23	2.34	0.08	6.91	0.168	0.168	0.058	1.00	0.08
3	30	16.20	4.08	6.65	2.50	4.91	3.30	0.17	6.82	0.133	64.012	4.17	6.74	2.50	4.91	3.30	0.17	6.91	0.133	0.133	0.085	0.88	0.15
4	30	16.63	4.17	6.89	2.50	4.91	3.39	0.18	7.06	0.140	126.500	4.34	7.06	2.50	4.91	3.39	0.18	7.24	0.140	0.140	0.177	0.88	0.16
5	30	16.83	4.34	7.22	2.50	4.91	3.43	0.18	7.40	0.144	57.195	4.42	7.30	2.50	4.91	3.43	0.18	7.49	0.144	0.144	0.082	1.50	0.27
6	15	3.14	4.42	7.58	1.25	1.23	2.56	0.10	7.68	0.201	180.000	4.69	7.94	1.25	1.23	2.56	0.10	8.04	0.201	0.201	0.362	1.00	0.10
7	18	12.04	4.42	7.70	1.50	1.77	6.82	0.72	8.42	1.316	88.291	4.68	8.86	1.50	1.77	6.81	0.72	9.58	1.315	1.315	1.161	1.19	0.86
8	18	9.93	4.68	9.72	1.50	1.77	5.62	0.49	10.21	0.894	115.504	4.95	10.75	1.50	1.77	5.62	0.49	11.24	0.894	0.894	1.033	0.50	0.25
9	15	6.31	4.95	11.00	1.25	1.23	5.14	0.41	11.41	0.955	114.004	5.25	12.08	1.25	1.23	5.14	0.41	12.49	0.954	0.954	1.088	1.10	0.45
10	15	3.56	5.28	12.54	1.25	1.23	2.90	0.13	12.67	0.304	96.573	5.56	12.83	1.25	1.23	2.90	0.13	12.96	0.304	0.304	0.293	1.15	0.15
11	12	1.80	5.62	12.98	1.00	0.79	2.29	0.08	13.06	0.256	89.003	5.95	13.21	1.00	0.79	2.29	0.08	13.29	0.256	0.256	0.228	1.00	0.08

Project File: P-165 Admin Outlet 1 Revised.stm | Number of lines: 11 | Run Date: 5/14/2014

; c = cir e = ellip b = box

APPENDIX G

WATER QUAILITY AND MISCELLANEOUS CALCUATIONS

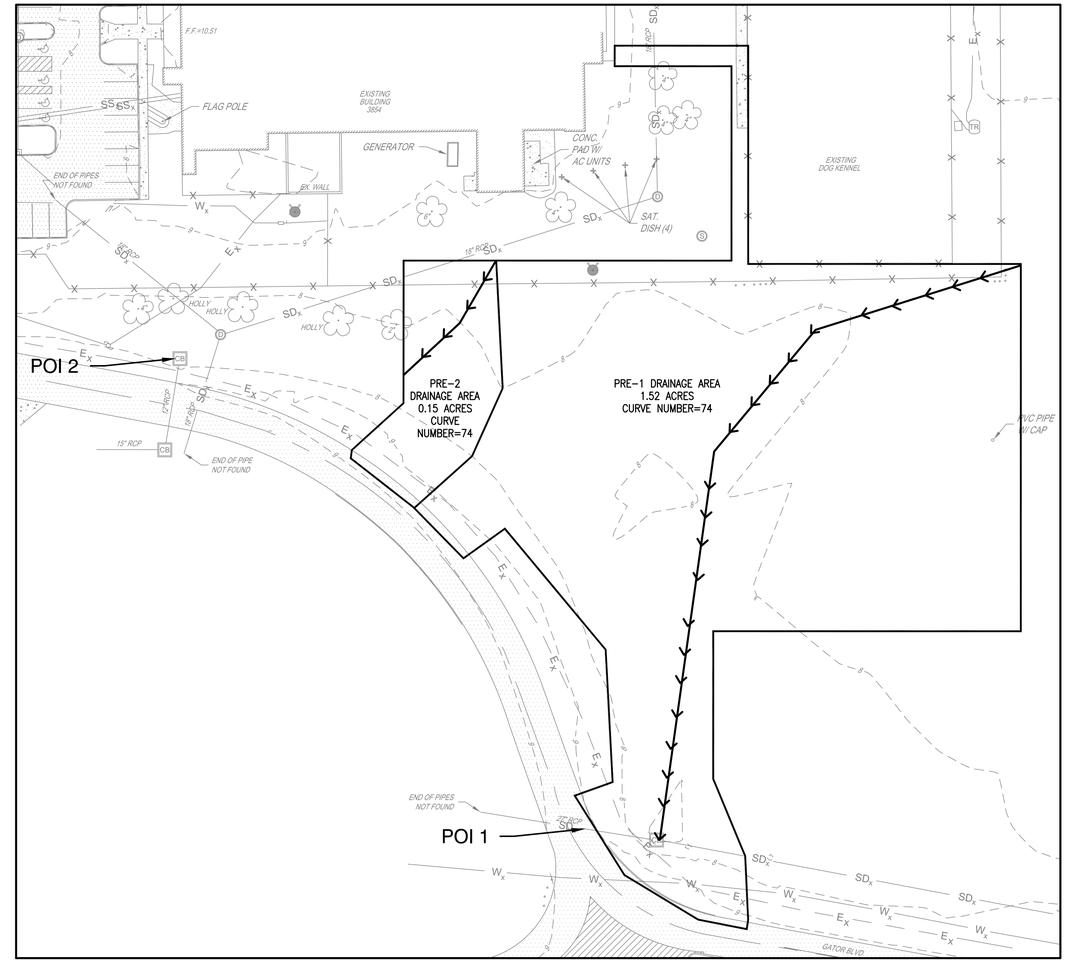


ADMINISTRATION BUILDING

0 20' 40' 860'

SCALE: 1" = 40'

N



WAREHOUSE

0 20' 40' 860'

SCALE: 1" = 40'

N

NO.	DESCRIPTION	DATE	APPR.

NAVFAC

PRELIMINARY DESIGN

NOT FOR CONSTRUCTION

SEAL

LEEBCOR SERVICES, LLC

430 McLaws Circle
Suite 201
Williamsburg, VA 23188

CONTRACTOR INFO

Baker

Michael Baker Jr, Inc.
100 Airside Drive
Moon Township, PA 15108

A/E INFO

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY

SATISFACTORY TO DATE 06/17/14

DES | DRW | CHK

PM

BRANCH MANAGER

CHIEF ENG/ARCH

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID ATLANTIC
Norfolk, VA

IPT - PWD

JOINT EXPEDITIONARY BASE LITTLE CREEK, VIRGINIA

FY2013 P-165 SOF COMBAT SERVICES
SUPPORT FACILITY

WATER QUALITY - PRE-DEVELOPMENT STORMWATER

SCALE: AS NOTED

eEPROJECT NO.: XXXXXX

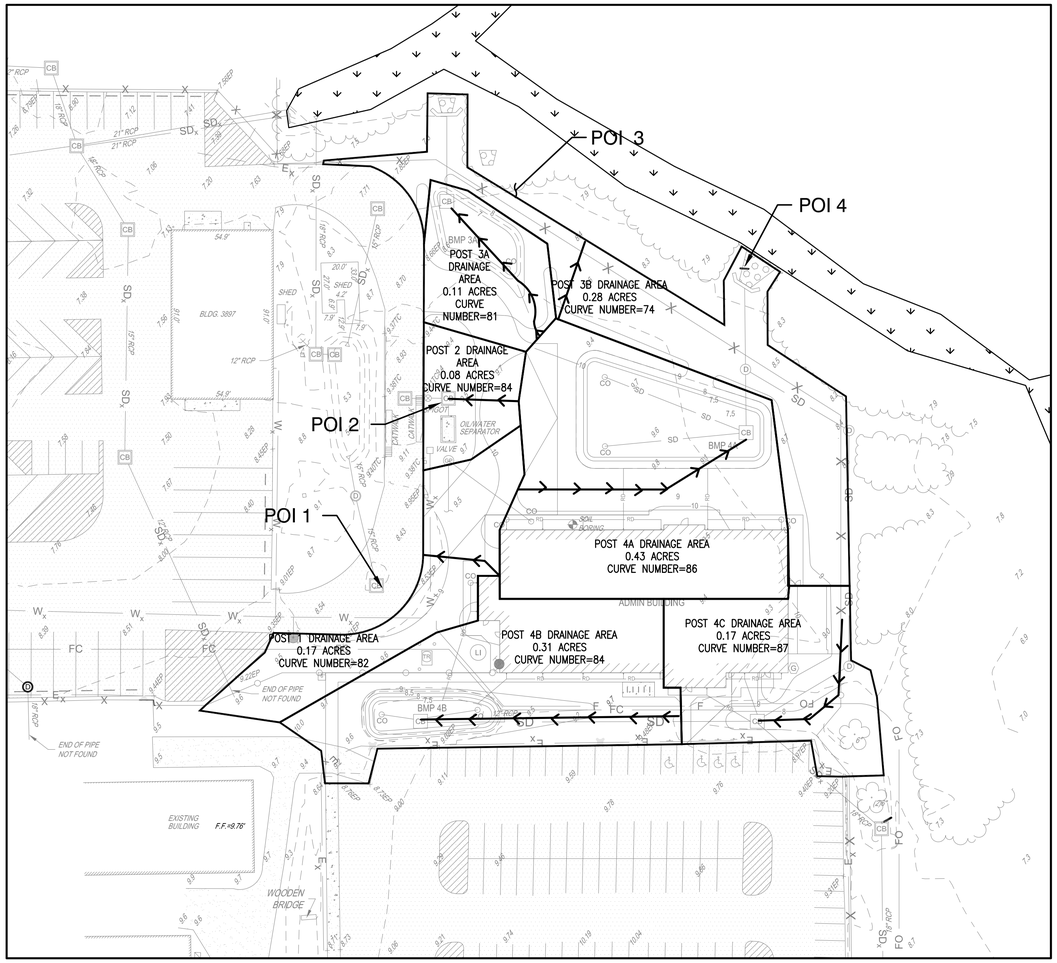
CONSTR. CONTR. NO.: N40085-12-D-6304

NAVFAC DRAWING NO.

SHEET ## OF ##

SW102

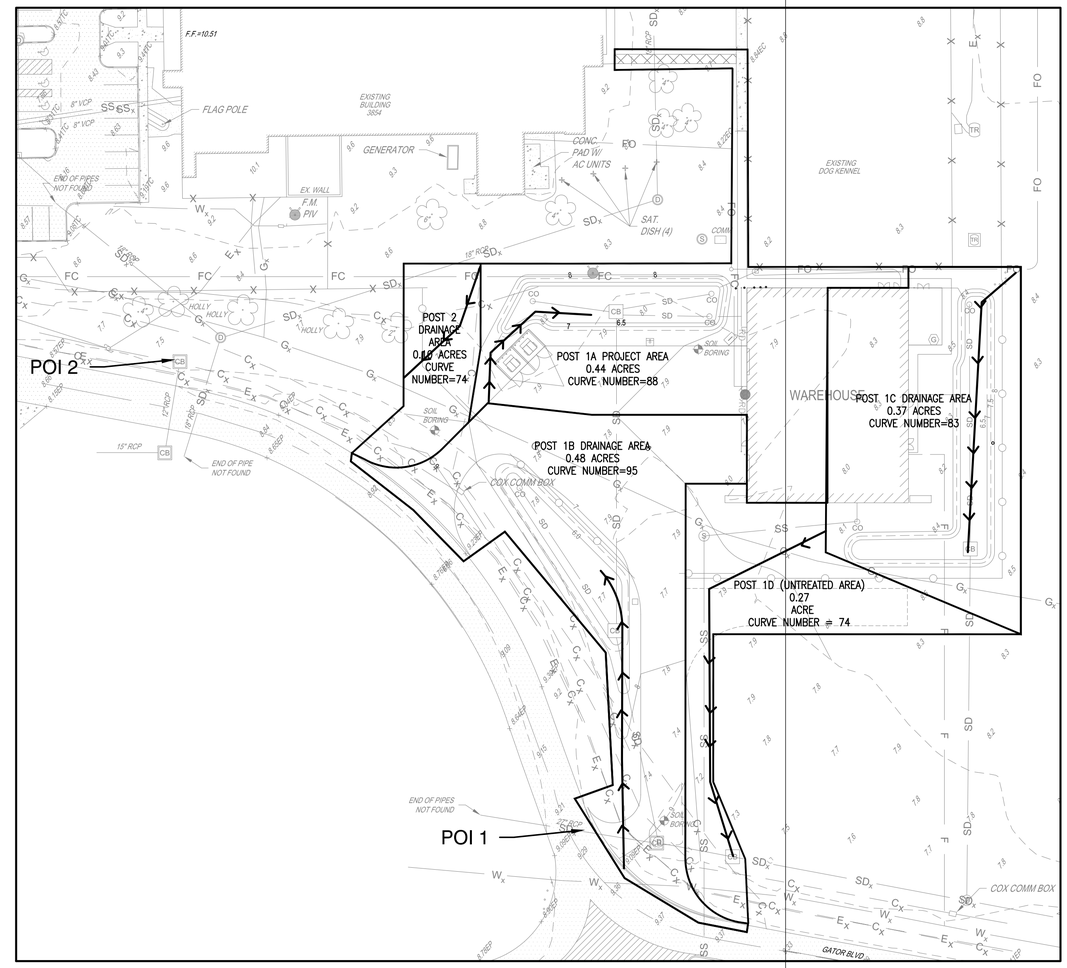
FINAL SUBMISSION



ADMINISTRATION BUILDING

0 20' 40' 860'

SCALE: 1" = 40'



WAREHOUSE

0 20' 40' 860'

SCALE: 1" = 40'

NO.	DESCRIPTION	DATE	APPR.

NAVFAC

PRELIMINARY DESIGN
NOT FOR CONSTRUCTION
SEAL

LEEBCOR SERVICES, LLC
430 McLaws Circle
Suite 201
Williamsburg, VA 23188
CONTRACTOR INFO

Baker
Michael Baker Jr, Inc.
100 Airside Drive
Moon Township, PA 15108
A/E INFO

APPROVED
FOR COMMANDER NAVFAC
ACTIVITY
SATISFACTORY TO DATE 06/17/14
DES | DRW | CHK
PM
BRANCH MANAGER
CHIEF ENG/ARCH

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID ATLANTIC
Norfolk, Va
IPT - PWD
JOINT EXPEDITIONARY BASE LITTLE CREEK, VIRGINIA
FY2013 P-165 SOF COMBAT SERVICES SUPPORT FACILITY
WATER QUALITY - POST-DEVELOPMENT STORMWATER

SCALE: AS NOTED
eEPROJECT NO.: XXXXXX
CONSTR. CONTR. NO. N40085-12-D-6304
NAVFAC DRAWING NO.
SHEET OF ##
SW202

PRE-FINAL (100%) SUBMISSION

Project: P-165 Combat Services Support Facility
Subject: Weighted Curve Number (CN) Calculations - WATER QUALITY

Baker

Prepared By: JMP Date: 5/14/2014
Checked By: JOP Date: 5/14/2014

Administration Building

Pre-Development Conditions

Drainage Area	*Soil Name & Hydrologic Group*	*Cover Description*	*CN*	*Area (AC)*	*Product of CN x Area*
Pre-1	Tetolum loam, C	Gravel	89	0.11	9.9
	Tetolum loam, C	Open space, Good	74	0.04	2.9
			Sum:	0.15	12.7
			Weighted CN:		***85***
Pre-2	Tetolum loam, C	Gravel	89	0.10	8.9
	Tetolum loam, C	Open space, Good	74	0.03	2.3
			Sum:	0.13	11.1
			Weighted CN:		***85***
Pre-3	Tetolum loam, C	Gravel	89	0.09	7.6
	Tetolum loam, C	Building	98	0.07	6.5
	Tetolum loam, C	Open space, Good	74	0.62	46.2
			Sum:	0.78	60.3
			Weighted CN:		***78***
Pre-4	Tetolum loam, C	Gravel	89	0.13	11.8
	Tetolum loam, C	Open space, Good	74	0.37	27.3
			Sum:	0.50	39.0
			Weighted CN:		***78***
			Total Site:	***1.56***	123.2
			Weighted CN:		***79***

Administration Building

Post-Development Conditions

Drainage Area	*Soil Name & Hydrologic Group*	*Cover Description*	*CN*	*Area (AC)*	*Product of CN x Area*
Post-1	Tetolum loam, C	Open Space, Good	74	0.11	8.1
(to Ex. Pond)	Tetolum loam, C	Asphalt Pavement	98	0.04	4.4
	Tetolum loam, C	Concrete Sidewalk	98	0.01	1.2
	Tetolum loam, C	Building	98	0.00	0.0
			Sum:	0.17	13.6
			Weighted CN:		***82***
Post-2	Tetolum loam, C	Open Space, Good	74	0.04	3.2
(to Ex. Pond)	Tetolum loam, C	Asphalt Pavement	98	0.03	3.2
	Tetolum loam, C	Concrete Sidewalk	98	0.00	0.0
	Tetolum loam, C	Building	98	0.00	0.0
			Sum:	0.08	6.4
			Weighted CN:		***84***
Post-3A	Tetolum loam, C	Open Space, Good	74	0.08	5.8
(To BMP 3a)	Tetolum loam, C	Asphalt Pavement	98	0.03	3.0
	Tetolum loam, C	Concrete Sidewalk	98	0.00	0.0
	Tetolum loam, C	Building	98	0.00	0.0
			Sum:	0.11	8.8
			Weighted CN:		***81***
Post-3B	Tetolum loam, C	Open Space, Good	74	0.28	20.5
(un-treated)	Tetolum loam, C	Asphalt Pavement	98	0.00	0.0
	Tetolum loam, C	Concrete Sidewalk	98	0.00	0.0
	Tetolum loam, C	Building	98	0.00	0.0
			Sum:	0.28	20.5
			Weighted CN:		***74***
Post-4A	Tetolum loam, C	Open Space, Good	74	0.22	16.2
	Tetolum loam, C	Asphalt Pavement	98	0.04	4.2
	Tetolum loam, C	Concrete Sidewalk	98	0.04	3.5
	Tetolum loam, C	Building	98	0.13	12.9
			Sum:	0.43	36.8
			Weighted CN:		***86***
Post-4B	Tetolum loam, C	Open Space, Good	74	0.18	13.6
	Tetolum loam, C	Asphalt Pavement	98	0.00	0.0
	Tetolum loam, C	Concrete Sidewalk	98	0.03	3.4
	Tetolum loam, C	Building	98	0.09	8.5
			Sum:	0.31	25.5
			Weighted CN:		***84***
Post-4C	Tetolum loam, C	Open Space, Good	74	0.11	8.0
	Tetolum loam, C	Asphalt Pavement	98	0.00	0.0
	Tetolum loam, C	Concrete Sidewalk	98	0.03	3.0
	Tetolum loam, C	Building	98	0.07	6.5
			Sum:	0.20	17.5
			Weighted CN:		***85***
			Total Site:	***1.56***	129.0
			Weighted CN:		***82***

Warehouse

Pre-Development Conditions

Drainage Area	*Soil Name & Hydrologic Group*	*Cover Description*	*CN*	*Area (AC)*	*Product of CN x Area*
Pre-1	Tetolum loam, C	Open space, Good	74	1.52	112.8
			Sum:	1.52	112.8
			Weighted CN:		***74***
Pre-2	Tetolum loam, C	Open space, Good	74	0.15	11.1
			Sum:	0.15	11.1
			Weighted CN:		***74***
			Total Site:	***1.67***	123.9
			Weighted CN:		***74***

Post-Development Conditions

Drainage Area	*Soil Name & Hydrologic Group*	*Cover Description*	*CN*	*Area (AC)*	*Product of CN x Area*
Post-1A	Tetolum loam, C	Open Space, Good	74	0.18	13.4
	Tetolum loam, C	Concrete Pavement	98	0.11	10.5
	Tetolum loam, C	Concrete Sidewalk	98	0.04	3.7
	Tetolum loam, C	Building	98	0.12	11.3
			Sum:	0.44	38.9
			Weighted CN:		***88***
Post-1B	Tetolum loam, C	Open Space, Good	74	0.06	4.6
	Tetolum loam, C	Concrete Pavement	98	0.42	41.2
	Tetolum loam, C	Concrete Sidewalk	98	0.00	0.0
	Tetolum loam, C	Building	98	0.00	0.0
			Sum:	0.48	45.8
			Weighted CN:		***95***
Post-1C	Tetolum loam, C	Open Space, Good	74	0.23	17.3
	Tetolum loam, C	Concrete Pavement	98	0.00	0.0
	Tetolum loam, C	Concrete Sidewalk	98	0.02	2.4
	Tetolum loam, C	Building	98	0.12	11.3
			Sum:	0.37	31.0
			Weighted CN:		***83***
Post-1D	Tetolum loam, C	Open Space, Good	74	0.27	20.0
	Tetolum loam, C	Concrete Pavement	98	0.00	0.0
	Tetolum loam, C	Concrete Sidewalk	98	0.00	0.0
	Tetolum loam, C	Building	98	0.00	0.0
			Sum:	0.27	20.0
			Weighted CN:		***74***
Post-2	Tetolum loam, C	Open Space, Good	74	0.10	7.5
	Tetolum loam, C	Concrete Pavement	98	0.00	0.0
	Tetolum loam, C	Concrete Sidewalk	98	0.00	0.0
	Tetolum loam, C	Building	98	0.00	0.0
			Sum:	0.10	7.5
			Weighted CN:		***74***
			Total warehouse site:	***1.67***	143.2
			Warehouse Site Weighted CN:		***86***

Project: P-165 SOF Combat Services Support
Subject: Water Quality Calculations - ADMINISTRATION BUILDING

Baker

Prepared By: JMP Date: 4/30/2014
Checked By: JOP Date: 3/20/2014

Water Quality Regulations
Water Quality Procedures, Pg. 94-108, Chapter 5 Virginia Stormwater Management Handbook, 1999
Appendix 5D, Worksheet 1

STEP 1 **Determine the applicable area (A) and the post-developed impervious cover (I_{post}).**

Applicable area (A) =*	*1.56*	*acres*	*(Limit of Disturbance Planning Area)*
Post-development impervious cover:			
structures:	*0.28*	*acres*	
parking lot:	*0.15*	*acres*	
roadway:	*0.00*	*acres*	
sidewalk:	*0.11*	*acres*	
TOTAL	*0.55*	*acres*	

I_{post} = (total post-development impervious cover /A) x100 *35.2* *%*

** The area subject to the criteria may vary from locality to locality. Therefore, consult the locality for proper determination of this value.*

STEP 2 **Determine to average land cover condition ($I_{watershed}$) or the existing impervious cover ($I_{existing}$).**

Pre-development impervious cover:		
structures:	*0.07*	*acres*
parking lot:	*0.43*	*acres*
roadway:	*0.00*	*acres*
sidewalk:	*0.00*	*acres*
TOTAL	*0.49*	*acres*

$I_{existing}$ = (total pre-development impervious cover / A) X100 *31.7* *%*

$I_{watershed}$ = (average land cover condition for Chesapeake Bay) *16.0* *%*

STEP 3 **Determine the appropriate development situation**
Situation 3: Land development where the existing percent impervious cover ($I_{existing}$) is greater than the average land cover condtion ($I_{watershed}$)

Requirement: The pollutant discharge after development (L_{post}) shall not exceed 1) the pollutant discharge based on existing conditions ($L_{pre(existing)}$) less 10% or 2) the pollutant discharge based on the average land cover condtion ($L_{pre(watershed)}$), whichever is greater.

Project: P-165 SOF Combat Services Support
Subject: Water Quality Calculations - ADMINISTRATION BUILDING

Prepared By: JMP Date: 4/30/2014
Checked By: JOP Date: 3/20/2014

STEP 4 **Determine the relative pre-development pollutant load (L_{pre})**

$$L_{pre(watershed)} = [0.05 + (0.009 \times I_{watershed})] \times A \times 2.28$$

$$L_{pre(existing)} = [0.05 + (0.009 \times I_{existing})] \times A \times 2.28$$

$L_{pre(watershed)}$ =	*0.69*	*lb/year*
$L_{pre(existing)}$ =	*1.19*	*lb/year*

STEP 5 **Determine the relative post-development pollutant load (L_{post})**

$$L_{post} = [0.05 + (0.009 \times I_{post})] \times A \times 2.28$$

L_{post} =	*1.30*	*lb/year*

STEP 6 **Determine the relative pollutant removal requirement (RR)**

$Condition\ 1$: $RR = L_{post} - (0.9 \times L_{pre(existing)})$; or
$Condition\ 2$: $RR = L_{post} - L_{pre(watershed)}$, which ever value of RR is less

Condition 1 RR:	*0.23*	*lb/yr*
Condition 2 RR:	*0.61*	*lb/yr*

Therefore, BMP's must be able to treat approximately 0.23 lb/yr

STEP 7 **Identify best management practice (BMP) options for the site.**

Required pollutant removal efficiency:

$$EFF = (RR \div L_{post})$$

EFF = *18%*

Selected BMP and location:

BMP 3A: Bioretention Basin located North of the Asphalt Drive in drainage area 3A
BMP 4A: Bioretention Basin located North of the Admin Bldg in Drainage Area 4A

Pollutant load entering the proposed BMPs

$$L_{BMP} = [0.05 + (0.009 \times I_{BMP})] \times A_{BMP} \times 2.28$$

$$L_{removed} = EFF_{BMP} \times L_{BMP}$$

Project: P-165 SOF Combat Services Support
Subject: Water Quality Calculations - ADMINISTRATION BUILDING

Baker

Prepared By: JMP Date: 4/30/2014
Checked By: JOP Date: 3/20/2014

BMP 3A:

$A_{BMP\ 3A}$ = 0.11 ac

Post-development impervious cover:

structures:		acres
parking lot:	0.03	acres
roadway:	0.00	acres
sidewalk:		acres
TOTAL	0.03	acres

$I_{BMP\ 3A}$ = 28.43 %

$L_{BMP\ 3A}$ = 0.08 lb/year
$EFF_{BMP\ 3A}$ = 65.0 % (Bioretention Basin (Table 5-14))
$L_{removed\ BMP\ 3A}$ = **0.05** lb/year

BMP 4A:

$A_{BMP\ 4A}$ = 0.43 ac

Post-development impervious cover:

structures:	0.13	acres
parking lot:	0.04	acres
roadway:		acres
sidewalk:	0.04	acres
TOTAL	0.21	acres

$I_{BMP\ 3A}$ = 49.05 %

$L_{BMP\ 3A}$ = 0.48 lb/year
$EFF_{BMP\ 3A}$ = 65.0 % (Bioretention Basin (Table 5-14))
$L_{removed\ BMP\ 3A}$ = **0.31** lb/year

Project: P-165 SOF Combat Services Support
Subject: Water Quality Calculations - ADMINISTRATION BUILDING

Baker

Prepared By: JMP Date: 4/30/2014
Checked By: JOP Date: 3/20/2014

BMP 4B:

$A_{BMP\ 4B}$ = 0.31 ac

Post-development impervious cover:

structures:	0.09	acres
parking lot:	0.00	acres
roadway:		acres
sidewalk:	0.03	acres
TOTAL	0.12	acres

$I_{BMP\ 3A}$ = 39.71 %

$L_{BMP\ 3A}$ =	0.28	lb/year
$EFF_{BMP\ 3A}$ =	65.0	% (Bioretention Basin (Table 5-14))
$L_{removed\ BMP\ 3A}$ =	**0.18**	lb/year

$L_{removed/BMP\ 3A} + L_{removed/BMP\ 4A} + L_{removed/BMP\ 4b}$ = **0.55** lb/yr

Since $L_{removed}$ > RR the site is compliant with VA DCR and DEQ

VIRGNIA WQV

Total Treatment Volume from 1-inch per impervious acre

Total Impervious Area (acres)	0.55
Total Impervious Area (ft^2)	23,891
Required Water Quality Volume, WQV (ft^3)	**1,991**

Section 438 WQV

Per Section 438 of the Energy Independence and Security Act, the project must treat runoff generated by the 95th percentile rain fall event for the project footprint. The 95th Percentile was calculated to be 1.75 inches and was based on 30-years of precipitation data from the Norfolk, Virginia Station.

Total Treatment Volume from 95th Percentile Storm over project area

Total Project Footprint (acres)	0.55
Total Project Footprint (ft^2)	23,891
95th Percentile Design Storm (inches)	1.75
Required Water Quality Volume, WQV (ft^3)	**3,488**

Project: P-165 SOF Combat Services Support
Subject: Water Quality Calculations - ADMINISTRATION BUILDING

Prepared By: JMP Date: 4/30/2014
Checked By: JOP Date: 3/20/2014

Low Impact Development WQV

Calculations based on UFC 3-210-10 Low Impact Development, Chapter 3.

INITIAL ABSTRACTION, I_a

$$S = \frac{1000}{CN} - 10$$

$$I_a = 0.2 \times S$$

Where:

Pre-development Weighted Curve Number, CN:	79	
Pre-development Potential Maximum Retention after Runoff (in), S:	2.6	
Initial Abstraction, I_a:	0.5	
Post-development Weighted Curve Number, CN':	82	
Post-development Potential Maximum Retention after Runoff (in), S':	2.1	
Initial Abstraction, I_a:	0.43	

DEPTH OF INCREASE IN RUNOFF, D

$$D = \frac{(P-0.2\times S')^2}{(P+0.8\times S')} - \frac{(P-0.2\times S)^2}{(P+0.8\times S)}$$

Where:

Design Storm Rainfall Depth (in), P:	1.75	[from 95th Pe
Depth of increase in runoff (in), D:	0.12	USE THIS

If P< 0.2 x S then use equation:

$$D = \frac{(P-0.2\times S')^2}{(P+.8\times S')}$$

Depth of increase (in), D:	0.51	N/A

DESIGN STORAGE, V_{LID}

V_{LID} = D x A

where:
D = depth of increase
A = Area

Design Storage Volume, V_{LID} :	81,050	(cubic inch
	47	(cubic-feet

Project: P-165 SOF Combat Services Support
Subject: Water Quality Calculations - WAREHOUSE

Prepared By: JMP Date: 3/20/2014
Checked By: JOP Date: 3/20/2014

Water Quality Regulations
Water Quality Procedures, Pg. 94-108, Chapter 5 Virginia Stormwater Management Handbook, 1999
Appendix 5D, Worksheet 1

STEP 1 **Determine the applicable area (A) and the post-developed impervious cover (I_{post}).**

Applicable area (A) =*	*1.67*	*acres*	*(Limit of Disturbance Planning Area)*
Post-development impervious cover:			
structures:	*0.23*	*acres*	
parking lot:	*0.53*	*acres*	
roadway:	*0.00*	*acres*	
sidewalk:	*0.06*	*acres*	
TOTAL	*0.82*	*acres*	

I_{post} = (total post-development impervious cover /A) x100 *49.2* *%*

** The area subject to the criteria may vary from locality to locality. Therefore, consult the locality for proper determination of this value.*

STEP 2 **Determine to average land cover condition ($I_{watershed}$) or the existing impervioud cover ($I_{existing}$).**

Pre-development impervious cover:		
structures:	*0.00*	*acres*
parking lot:	*0.00*	*acres*
roadway:	*0.00*	*acres*
sidewalk:	*0.00*	*acres*
TOTAL	*0.00*	*acres*

$I_{existing}$ = (total pre-development impervious cover / A) X100 *0.0* *%*

$I_{watershed}$ = (average land cover condition for Chesapeake Bay) *16.0* *%*

STEP 3 **Determine the appropriate development situation**
Situation 2: Land development where the existing percent impervious cover ($I_{existing}$) is less than or equal to the average land cover condtion ($I_{watershed}$) and the proposed improvements will create a total percent impervious cover (I_{post}) which is greater than the average land cover condition ($I_{watershed}$)

Requirement: The pollutant discharge after development (L_{post}) shall not exceed existing pollutant discharge based on the average land cover condition ($L_{pre(watershed)}$).

Project: P-165 SOF Combat Services Support
Subject: Water Quality Calculations - WAREHOUSE

Prepared By: JMP Date: 3/20/2014
Checked By: JOP Date: 3/20/2014

STEP 4 **Determine the relative pre-development pollutant load (L_{pre})**

$$L_{pre(watershed)} = [0.05 + (0.009 \times I_{watershed})] \times A \times 2.28$$

$$L_{pre(existing)} = [0.05 + (0.009 \times I_{existing})] \times A \times 2.28$$

$L_{pre(watershed)}$ =	*0.74*	*lb/year*
$L_{pre(existing)}$ =	*0.19*	*lb/year*

STEP 5 **Determine the relative post-development pollutant load (L_{post})**

$$L_{post} = [0.05 + (0.009 \times I_{post})] \times A \times 2.28$$

L_{post} =	*1.87*	*lb/year*

STEP 6 **Determine the relative pollutant removal requirement (RR)**

$$RR = L_{post} - L_{pre(watershed)}$$

RR:	*1.14*	*lb/yr*

Therefore, BMP must be able to treat approximately 1.14 lb/yr

STEP 7 **Identify best management practice (BMP) options for the site.**

Required pollutant removal efficiency:

$$EFF = (RR \div L_{post})$$

EFF = *61%*

Selected BMP and location:

BMP 1A: Bioretention Basin located northwest of Warehouse
BMP 1B: Bioretention Basin located southwest of Warehouse
BMP 1C: Bioretention Basin located east of Warehouse

Pollutant load entering the proposed BMPs

$$L_{BMP} = [0.05 + (0.009 \times I_{BMP})] \times A_{BMP} \times 2.28$$

$$L_{removed} = EFF_{BMP} \times L_{BMP}$$

Bioretention Basin Removal Efficiency (EFF_{BMP})= 65% (Table 3.11-1. Since the Bioretention Basins capture and treat a volume exceeding 1-inch of runoff from the impervious area)

Project: P-165 SOF Combat Services Support
Subject: Water Quality Calculations - WAREHOUSE

Baker

Prepared By: JMP Date: 3/20/2014
Checked By: JOP Date: 3/20/2014

BMP 1A:

$A_{BMP\ 1A}$ = 0.44 ac

Post-development impervious cover:

structures:	0.12	acres
parking lot:	0.11	acres
roadway:	0.00	acres
sidewalk:	0.04	acres
TOTAL	0.26	acres

$I_{BMP\ 1A}$ = 59.0 %
$L_{BMP\ 1A}$ = 0.58 lb/year
$EFF_{BMP\ 1A}$ = 65.0 % (Bioretention Basin (Table 3.11-1))
$L_{removed/BMP\ 1A}$ = 0.38 lb/year

BMP 1B:

$A_{BMP\ 1B}$ = 0.48 ac

Post-development impervious cover:

structures:	0.00	acres
parking lot:	0.42	acres
roadway:	0.00	acres
sidewalk:	0.00	acres
TOTAL	0.42	acres

$I_{BMP\ 1B}$ = 87.1 %
$L_{BMP\ 1B}$ = 0.92 lb/year
$EFF_{BMP\ 1B}$ = 65.0 % (Bioretention Basin (Table 3.11-1))
$L_{removed/BMP\ 1B}$ = 0.60 lb/year

Project: P-165 SOF Combat Services Support
Subject: Water Quality Calculations - WAREHOUSE

Prepared By: JMP Date: 3/20/2014
Checked By: JOP Date: 3/20/2014

BMP 1C:

$A_{BMP\ 1C}$ = 0.37 ac

Post-development impervious cover:

structures:	0.12	acres
parking lot:	0.00	acres
roadway:	0.00	acres
sidewalk:	0.02	acres
TOTAL	0.14	acres

$I_{BMP\ 1C}$ = 37.3 %

$L_{BMP\ 1C}$ = 0.33 lb/year

$EFF_{BMP\ 1C}$ = 65.0 % (Bioretention Basin (Table 3.11-1))

$L_{removed/BMP\ 1C}$ = 0.21 lb/year

$L_{removed/BMP\ 1A} + L_{removed/BMP\ 1B} + L_{removed/BMP\ 1C}$ = 1.19 lb/yr

Since $L_{removed}$ > RR the site is compliant with VA DCR and DEQ

VIRGNIA WQV

Total Treatment Volume from 1-inch per impervious acre

Total Impervious Area (acres)	0.82
Total Impervious Area (ft^2)	35,726
Required Water Quality Volume, WQV (ft^3)	**2,977**

Section 438 WQV

Per Section 438 of the Energy Independence and Security Act, the project must treat runoff generated by the 95th percentile rain fall event for the project footprint. The 95th Percentile was calculated to be 1.75 inches and was based on 30-years of precipitation data from the Norfolk, Virginia Station.

Total Treatment Volume from 95th Percentile Storm over project area

Total Project Area (acres)	0.82
Total Project Area (ft^2)	35,726
95th Percentile Design Storm (inches)	1.75
Required Water Quality Volume, WQV (ft^3)	**5,216**

Project: P-165 SOF Combat Services Support
Subject: Water Quality Calculations - WAREHOUSE

Prepared By: JMP Date: 3/20/2014
Checked By: JOP Date: 3/20/2014

Low Impact Development WQV

Calculations based on UFC 3-210-10 Low Impact Development, Chapter 3.

INITIAL ABSTRACTION, I_a

$$S = \frac{1000}{CN} - 10$$

$$I_a = 0.2 \times S$$

Where:

Pre-development Weighted Curve Number, CN:	74
Pre-development Potential Maximum Retention after Runoff (in), S:	3.5
Initial Abstraction, I_a:	0.7
Post-development Weighted Curve Number, CN':	86
Post-development Potential Maximum Retention after Runoff (in), S':	1.7
Initial Abstraction, I_a:	0.33

DEPTH OF INCREASE IN RUNOFF, D

$$D = \frac{(P-0.2\times S')^2}{(P+0.8\times S')} - \frac{(P-0.2\times S)^2}{(P+0.8\times S)}$$

Where:

Design Storm Rainfall Depth (in), P:	1.75	[from 95th Pe
Depth of increase in runoff (in), D:	0.42	USE THIS

If P< 0.2 x S then use equation:

$$D = \frac{(P-0.2\times S')^2}{(P+.8\times S')}$$

Depth of increase (in), D:	0.66	N/A

DESIGN STORAGE, V_{LID}

V_{LID} = D x A

where:
D = depth of increase
A = Area

Design Storage Volume, V_{LID} :	2,135,024	(cubic inch
	1,236	(cubic-feet

Project: P-165 Combat Services Support Facility
Subject: 30 years of rainfall data for 95th Percentile Storm

Prepared By: JMP Date: 3/20/2014
Checked By: JOP Date: 3/20/2014

95th Percentile
1.75 inches

STATION	STATION_NAME	ELEVATION	LATITUDE	LONGITUDE	DATE	PRCP	mm	inches
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050114	3327	332.7	13.09843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100930	2352	235.2	9.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20060901	1651	165.1	6.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110827	1562	156.2	6.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091112	1433	143.3	5.641732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20051008	1402	140.2	5.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910420	1354	135.4	5.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980827	1173	117.3	4.61811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980204	1156	115.6	4.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030918	1069	106.9	4.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030903	1034	103.4	4.070866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980725	1011	101.1	3.980315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900810	930	93	3.661417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940302	925	92.5	3.641732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020613	914	91.4	3.598425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050523	914	91.4	3.598425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040815	907	90.7	3.570866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040814	864	86.4	3.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920813	859	85.9	3.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900824	838	83.8	3.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920104	833	83.3	3.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960712	790	79	3.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20121029	785	78.5	3.090551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961008	765	76.5	3.011811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090908	744	74.4	2.929134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850605	729	72.9	2.870079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871110	701	70.1	2.759843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010729	701	70.1	2.759843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870906	699	69.9	2.751969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19881003	683	68.3	2.688976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840214	681	68.1	2.681102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871210	671	67.1	2.641732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850927	663	66.3	2.610236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080925	658	65.8	2.590551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850926	645	64.5	2.53937
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920816	640	64	2.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100729	640	64	2.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010616	635	63.5	2.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910727	622	62.2	2.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020828	622	62.2	2.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20061112	622	62.2	2.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890812	615	61.5	2.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940310	610	61	2.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030912	587	58.7	2.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19941121	582	58.2	2.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19831212	579	57.9	2.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19951021	577	57.7	2.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090605	577	57.7	2.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840530	574	57.4	2.259843

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860726	572	57.2	2.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110725	571	57.1	2.248031
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960801	566	56.6	2.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080723	564	56.4	2.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890818	556	55.6	2.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930313	554	55.4	2.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850103	546	54.6	2.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100927	546	54.6	2.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020714	536	53.6	2.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930806	533	53.3	2.098425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970724	531	53.1	2.090551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20081211	523	52.3	2.059055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090822	521	52.1	2.051181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091111	521	52.1	2.051181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19911017	516	51.6	2.031496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980404	516	51.6	2.031496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910807	513	51.3	2.019685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870119	511	51.1	2.011811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900809	503	50.3	1.980315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921126	500	50	1.968504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030407	500	50	1.968504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030714	500	50	1.968504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940725	498	49.8	1.96063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130208	490	49	1.929134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870118	488	48.8	1.92126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940719	488	48.8	1.92126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19981213	483	48.3	1.901575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020614	483	48.3	1.901575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010818	472	47.2	1.858268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20031119	467	46.7	1.838583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130722	467	46.7	1.838583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010723	465	46.5	1.830709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940211	462	46.2	1.818898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930904	460	46	1.811024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940504	460	46	1.811024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020327	457	45.7	1.799213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050716	457	45.7	1.799213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19981004	455	45.5	1.791339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870101	452	45.2	1.779528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890714	452	45.2	1.779528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20071024	452	45.2	1.779528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20121028	452	45.2	1.779528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20121226	452	45.2	1.779528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940729	450	45	1.771654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860828	447	44.7	1.759843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940526	447	44.7	1.759843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890323	445	44.5	1.751969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021205	445	44.5	1.751969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20051121	437	43.7	1.720472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030131	434	43.4	1.708661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020827	432	43.2	1.700787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120422	432	43.2	1.700787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950612	429	42.9	1.688976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100929	429	42.9	1.688976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920724	422	42.2	1.661417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20041112	419	41.9	1.649606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930108	417	41.7	1.641732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020724	414	41.4	1.629921

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040604	414	41.4	1.629921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100517	411	41.1	1.61811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980628	406	40.6	1.598425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19851130	404	40.4	1.590551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090805	404	40.4	1.590551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870122	401	40.1	1.57874
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910329	401	40.1	1.57874
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040830	399	39.9	1.570866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840328	396	39.6	1.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870912	396	39.6	1.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070415	396	39.6	1.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090812	396	39.6	1.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021224	394	39.4	1.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860811	389	38.9	1.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880103	386	38.6	1.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890415	386	38.6	1.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021011	386	38.6	1.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050506	386	38.6	1.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900914	384	38.4	1.511811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921210	381	38.1	1.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110813	381	38.1	1.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960107	378	37.8	1.488189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960624	378	37.8	1.488189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030719	376	37.6	1.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860615	368	36.8	1.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890713	363	36.3	1.429134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19911003	361	36.1	1.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931215	358	35.8	1.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940710	358	35.8	1.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021116	358	35.8	1.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20031214	356	35.6	1.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090618	353	35.3	1.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19941014	348	34.8	1.370079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050228	345	34.5	1.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20071226	345	34.5	1.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091015	345	34.5	1.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19881101	343	34.3	1.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950502	343	34.3	1.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020119	343	34.3	1.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19941117	340	34	1.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880830	338	33.8	1.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930304	338	33.8	1.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19951004	338	33.8	1.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020606	338	33.8	1.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120721	338	33.8	1.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840629	335	33.5	1.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890218	333	33.3	1.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010924	330	33	1.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030409	330	33	1.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980810	328	32.8	1.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070730	325	32.5	1.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850212	320	32	1.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19851002	320	32	1.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860429	320	32	1.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860430	320	32	1.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850922	318	31.8	1.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19861224	318	31.8	1.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030817	318	31.8	1.251969

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070316	317	31.7	1.248031
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910710	315	31.5	1.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930604	315	31.5	1.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980321	315	31.5	1.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120714	315	31.5	1.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840423	312	31.2	1.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20031224	312	31.2	1.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120601	312	31.2	1.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980508	310	31	1.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080305	310	31	1.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961219	307	30.7	1.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050920	307	30.7	1.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010526	305	30.5	1.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19891018	302	30.2	1.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20011211	302	30.2	1.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020901	302	30.2	1.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090406	302	30.2	1.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870920	300	30	1.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980127	300	30	1.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19851021	297	29.7	1.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120622	297	29.7	1.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880718	295	29.5	1.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910108	295	29.5	1.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19941116	295	29.5	1.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980116	295	29.5	1.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960328	292	29.2	1.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890919	290	29	1.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971101	290	29	1.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20041113	290	29	1.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080213	290	29	1.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960416	287	28.7	1.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030805	287	28.7	1.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070729	287	28.7	1.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870804	284	28.4	1.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890306	284	28.4	1.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19891208	284	28.4	1.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20060924	284	28.4	1.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090517	284	28.4	1.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870424	282	28.2	1.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971019	282	28.2	1.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19891001	279	27.9	1.098425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940606	279	27.9	1.098425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961102	279	27.9	1.098425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030410	279	27.9	1.098425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20060914	279	27.9	1.098425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130117	279	27.9	1.098425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130607	279	27.9	1.098425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130711	279	27.9	1.098425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850503	277	27.7	1.090551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870222	277	27.7	1.090551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970716	277	27.7	1.090551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020916	277	27.7	1.090551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070819	277	27.7	1.090551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090806	277	27.7	1.090551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110917	277	27.7	1.090551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850710	274	27.4	1.07874
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880603	274	27.4	1.07874
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880909	274	27.4	1.07874

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130518	274	27.4	1.07874
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900402	272	27.2	1.070866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950216	272	27.2	1.070866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110706	272	27.2	1.070866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110923	272	27.2	1.070866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120625	272	27.2	1.070866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940802	269	26.9	1.059055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960718	269	26.9	1.059055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980217	269	26.9	1.059055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980318	269	26.9	1.059055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020318	269	26.9	1.059055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010321	267	26.7	1.051181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19851121	264	26.4	1.03937
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960112	264	26.4	1.03937
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871027	262	26.2	1.031496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19881117	262	26.2	1.031496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960929	262	26.2	1.031496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980308	262	26.2	1.031496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020331	262	26.2	1.031496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021106	262	26.2	1.031496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070728	262	26.2	1.031496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880820	259	25.9	1.019685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020207	259	25.9	1.019685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20071026	259	25.9	1.019685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110709	259	25.9	1.019685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870913	257	25.7	1.011811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890313	257	25.7	1.011811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890925	257	25.7	1.011811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950308	257	25.7	1.011811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20051205	257	25.7	1.011811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110628	257	25.7	1.011811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890915	254	25.4	1
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900429	254	25.4	1
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960522	254	25.4	1
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020419	254	25.4	1
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021112	254	25.4	1
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900608	251	25.1	0.988189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930109	251	25.1	0.988189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971017	251	25.1	0.988189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020502	251	25.1	0.988189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090301	251	25.1	0.988189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880712	249	24.9	0.980315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920507	249	24.9	0.980315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920806	249	24.9	0.980315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940731	249	24.9	0.980315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20081130	249	24.9	0.980315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910729	246	24.6	0.968504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931026	246	24.6	0.968504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940128	246	24.6	0.968504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19981103	246	24.6	0.968504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050423	246	24.6	0.968504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120828	246	24.6	0.968504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19881105	244	24.4	0.96063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920605	244	24.4	0.96063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920609	244	24.4	0.96063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921031	244	24.4	0.96063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090924	244	24.4	0.96063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120509	244	24.4	0.96063

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20121008	244	24.4	0.96063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960507	241	24.1	0.948819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070603	241	24.1	0.948819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910925	239	23.9	0.940945
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840404	236	23.6	0.929134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890321	236	23.6	0.929134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960406	236	23.6	0.929134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050602	236	23.6	0.929134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19851104	234	23.4	0.92126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871128	234	23.4	0.92126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890224	234	23.4	0.92126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890716	234	23.4	0.92126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890914	234	23.4	0.92126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900527	234	23.4	0.92126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920809	234	23.4	0.92126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030808	234	23.4	0.92126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20061122	234	23.4	0.92126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080705	234	23.4	0.92126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100206	234	23.4	0.92126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850322	231	23.1	0.909449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900101	231	23.1	0.909449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900913	231	23.1	0.909449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970722	231	23.1	0.909449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980115	231	23.1	0.909449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030222	231	23.1	0.909449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090907	231	23.1	0.909449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840118	229	22.9	0.901575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840529	229	22.9	0.901575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860812	229	22.9	0.901575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920817	229	22.9	0.901575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20061225	229	22.9	0.901575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910318	226	22.6	0.889764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950424	226	22.6	0.889764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960827	226	22.6	0.889764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971130	226	22.6	0.889764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020719	226	22.6	0.889764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960911	224	22.4	0.88189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050629	224	22.4	0.88189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20051225	224	22.4	0.88189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080528	224	22.4	0.88189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030216	221	22.1	0.870079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030523	221	22.1	0.870079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040526	221	22.1	0.870079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040527	221	22.1	0.870079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20060808	221	22.1	0.870079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20061107	221	22.1	0.870079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070805	221	22.1	0.870079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100205	221	22.1	0.870079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870601	218	21.8	0.858268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19901023	218	21.8	0.858268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971107	218	21.8	0.858268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980309	218	21.8	0.858268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100805	218	21.8	0.858268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930116	216	21.6	0.850394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091219	216	21.6	0.850394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860103	213	21.3	0.838583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871215	213	21.3	0.838583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19891031	213	21.3	0.838583

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920803	213	21.3	0.838583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921004	213	21.3	0.838583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980223	213	21.3	0.838583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130429	213	21.3	0.838583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880821	211	21.1	0.830709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19881128	211	21.1	0.830709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890228	211	21.1	0.830709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900210	211	21.1	0.830709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961207	211	21.1	0.830709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980205	211	21.1	0.830709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19981209	211	21.1	0.830709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020313	211	21.1	0.830709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050628	211	21.1	0.830709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20101028	211	21.1	0.830709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110126	211	21.1	0.830709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110605	211	21.1	0.830709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19881004	208	20.8	0.818898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950917	208	20.8	0.818898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20031106	208	20.8	0.818898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040803	208	20.8	0.818898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080201	208	20.8	0.818898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100303	208	20.8	0.818898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120802	208	20.8	0.818898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850523	206	20.6	0.811024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871228	206	20.6	0.811024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890330	206	20.6	0.811024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910919	206	20.6	0.811024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050515	206	20.6	0.811024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091225	206	20.6	0.811024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100117	206	20.6	0.811024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100818	206	20.6	0.811024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120825	206	20.6	0.811024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840415	203	20.3	0.799213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19851129	203	20.3	0.799213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890407	203	20.3	0.799213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19891122	203	20.3	0.799213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961018	203	20.3	0.799213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021016	203	20.3	0.799213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030522	203	20.3	0.799213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20031210	203	20.3	0.799213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850226	201	20.1	0.791339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850706	201	20.1	0.791339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930317	201	20.1	0.791339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021029	201	20.1	0.791339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090228	201	20.1	0.791339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090712	201	20.1	0.791339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110310	201	20.1	0.791339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120303	201	20.1	0.791339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19841119	198	19.8	0.779528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870705	198	19.8	0.779528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920326	198	19.8	0.779528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921030	198	19.8	0.779528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930519	198	19.8	0.779528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930603	198	19.8	0.779528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080731	198	19.8	0.779528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120530	198	19.8	0.779528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130803	198	19.8	0.779528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840414	196	19.6	0.771654

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19861202	196	19.6	0.771654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900216	196	19.6	0.771654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920814	196	19.6	0.771654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940723	196	19.6	0.771654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080511	196	19.6	0.771654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100125	196	19.6	0.771654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840405	193	19.3	0.759843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880412	193	19.3	0.759843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980123	193	19.3	0.759843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030330	193	19.3	0.759843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850201	191	19.1	0.751969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890303	191	19.1	0.751969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19911016	191	19.1	0.751969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920727	191	19.1	0.751969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960516	191	19.1	0.751969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970214	191	19.1	0.751969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970820	191	19.1	0.751969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050823	191	19.1	0.751969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050923	191	19.1	0.751969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120820	191	19.1	0.751969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120918	191	19.1	0.751969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840110	188	18.8	0.740157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840914	188	18.8	0.740157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850524	188	18.8	0.740157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870905	188	18.8	0.740157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19901026	188	18.8	0.740157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930426	188	18.8	0.740157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971227	188	18.8	0.740157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010606	188	18.8	0.740157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030215	188	18.8	0.740157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040401	188	18.8	0.740157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040625	188	18.8	0.740157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050516	188	18.8	0.740157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050609	188	18.8	0.740157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110117	188	18.8	0.740157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840306	185	18.5	0.728346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860817	185	18.5	0.728346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870910	185	18.5	0.728346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871111	185	18.5	0.728346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890324	185	18.5	0.728346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910725	185	18.5	0.728346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920215	185	18.5	0.728346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930513	185	18.5	0.728346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970319	185	18.5	0.728346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030130	185	18.5	0.728346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050323	185	18.5	0.728346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130226	185	18.5	0.728346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880904	183	18.3	0.720472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19891102	183	18.3	0.720472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900622	183	18.3	0.720472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950721	183	18.3	0.720472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970812	183	18.3	0.720472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010813	183	18.3	0.720472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020106	183	18.3	0.720472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20031217	183	18.3	0.720472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050413	183	18.3	0.720472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080619	183	18.3	0.720472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090315	183	18.3	0.720472

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110306	183	18.3	0.720472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19831110	180	18	0.708661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850117	180	18	0.708661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19861211	180	18	0.708661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870301	180	18	0.708661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880517	180	18	0.708661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910820	180	18	0.708661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19911124	180	18	0.708661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960813	180	18	0.708661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970109	180	18	0.708661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040909	180	18	0.708661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19841203	178	17.8	0.700787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880408	178	17.8	0.700787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910618	178	17.8	0.700787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930226	178	17.8	0.700787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930416	178	17.8	0.700787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960430	178	17.8	0.700787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021117	178	17.8	0.700787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860222	175	17.5	0.688976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880505	175	17.5	0.688976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900522	175	17.5	0.688976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920815	175	17.5	0.688976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940117	175	17.5	0.688976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950215	175	17.5	0.688976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950514	175	17.5	0.688976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20041013	175	17.5	0.688976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050130	175	17.5	0.688976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050924	175	17.5	0.688976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20061007	175	17.5	0.688976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100512	175	17.5	0.688976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100614	175	17.5	0.688976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130818	175	17.5	0.688976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880108	173	17.3	0.681102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880522	173	17.3	0.681102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890221	173	17.3	0.681102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900317	173	17.3	0.681102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900330	173	17.3	0.681102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900701	173	17.3	0.681102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940922	173	17.3	0.681102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950301	173	17.3	0.681102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19951014	173	17.3	0.681102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970428	173	17.3	0.681102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021213	173	17.3	0.681102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20031028	173	17.3	0.681102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20081113	173	17.3	0.681102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090808	173	17.3	0.681102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110523	173	17.3	0.681102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19861013	170	17	0.669291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970116	170	17	0.669291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070517	170	17	0.669291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20071025	170	17	0.669291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080704	170	17	0.669291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20081105	170	17	0.669291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100719	170	17	0.669291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120515	170	17	0.669291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940815	168	16.8	0.661417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19951107	168	16.8	0.661417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19951111	168	16.8	0.661417

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021220	168	16.8	0.661417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030531	168	16.8	0.661417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030804	168	16.8	0.661417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20041128	168	16.8	0.661417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20061006	168	16.8	0.661417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091213	168	16.8	0.661417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100312	168	16.8	0.661417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840313	165	16.5	0.649606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19841128	165	16.5	0.649606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870831	165	16.5	0.649606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880211	165	16.5	0.649606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880626	165	16.5	0.649606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19891209	165	16.5	0.649606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910622	165	16.5	0.649606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960127	165	16.5	0.649606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971113	165	16.5	0.649606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20060831	165	16.5	0.649606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070505	165	16.5	0.649606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070606	165	16.5	0.649606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090506	165	16.5	0.649606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091113	165	16.5	0.649606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110928	165	16.5	0.649606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120819	165	16.5	0.649606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850612	163	16.3	0.641732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19911123	163	16.3	0.641732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960119	163	16.3	0.641732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960409	163	16.3	0.641732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020926	163	16.3	0.641732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080422	163	16.3	0.641732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090504	163	16.3	0.641732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090928	163	16.3	0.641732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19831124	160	16	0.629921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860629	160	16	0.629921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870604	160	16	0.629921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930922	160	16	0.629921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930927	160	16	0.629921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19951209	160	16	0.629921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960603	160	16	0.629921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970208	160	16	0.629921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980704	160	16	0.629921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040426	160	16	0.629921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040628	160	16	0.629921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050714	160	16	0.629921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20051215	160	16	0.629921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080906	160	16	0.629921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110915	160	16	0.629921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840523	157	15.7	0.61811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850627	157	15.7	0.61811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880125	157	15.7	0.61811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890607	157	15.7	0.61811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920128	157	15.7	0.61811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970821	157	15.7	0.61811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980612	157	15.7	0.61811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20061028	157	15.7	0.61811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090328	157	15.7	0.61811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090729	157	15.7	0.61811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880504	155	15.5	0.610236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910120	155	15.5	0.610236

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920811	155	15.5	0.610236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950228	155	15.5	0.610236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960708	155	15.5	0.610236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960713	155	15.5	0.610236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130806	155	15.5	0.610236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19831215	152	15.2	0.598425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850818	152	15.2	0.598425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900108	152	15.2	0.598425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900819	152	15.2	0.598425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960202	152	15.2	0.598425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980128	152	15.2	0.598425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020830	152	15.2	0.598425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021113	152	15.2	0.598425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20041019	152	15.2	0.598425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050308	152	15.2	0.598425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050729	152	15.2	0.598425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20061108	152	15.2	0.598425
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860719	150	15	0.590551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870125	150	15	0.590551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910111	150	15	0.590551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930105	150	15	0.590551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980422	150	15	0.590551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010425	150	15	0.590551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030207	150	15	0.590551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030316	150	15	0.590551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040316	150	15	0.590551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050408	150	15	0.590551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20071216	150	15	0.590551
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19831206	147	14.7	0.57874
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900329	147	14.7	0.57874
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940224	147	14.7	0.57874
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030306	147	14.7	0.57874
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100518	147	14.7	0.57874
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110118	147	14.7	0.57874
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110731	147	14.7	0.57874
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19831115	145	14.5	0.570866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850512	145	14.5	0.570866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880807	145	14.5	0.570866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890205	145	14.5	0.570866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890916	145	14.5	0.570866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900510	145	14.5	0.570866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940325	145	14.5	0.570866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940329	145	14.5	0.570866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950321	145	14.5	0.570866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980504	145	14.5	0.570866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020302	145	14.5	0.570866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030709	145	14.5	0.570866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040928	145	14.5	0.570866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091027	145	14.5	0.570866
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870525	142	14.2	0.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890318	142	14.2	0.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900529	142	14.2	0.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921103	142	14.2	0.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921228	142	14.2	0.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940805	142	14.2	0.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960912	142	14.2	0.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961108	142	14.2	0.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970326	142	14.2	0.559055

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980409	142	14.2	0.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010623	142	14.2	0.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030305	142	14.2	0.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030607	142	14.2	0.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070225	142	14.2	0.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090313	142	14.2	0.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120127	142	14.2	0.559055
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870819	140	14	0.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900318	140	14	0.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900505	140	14	0.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920812	140	14	0.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930405	140	14	0.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19941127	140	14	0.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950107	140	14	0.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960609	140	14	0.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970702	140	14	0.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971222	140	14	0.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980613	140	14	0.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19981228	140	14	0.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020904	140	14	0.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040522	140	14	0.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090327	140	14	0.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130725	140	14	0.551181
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860827	137	13.7	0.53937
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880609	137	13.7	0.53937
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900106	137	13.7	0.53937
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910702	137	13.7	0.53937
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920905	137	13.7	0.53937
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970423	137	13.7	0.53937
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970814	137	13.7	0.53937
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080218	137	13.7	0.53937
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091202	137	13.7	0.53937
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110205	137	13.7	0.53937
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110611	137	13.7	0.53937
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860126	135	13.5	0.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871127	135	13.5	0.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880202	135	13.5	0.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880326	135	13.5	0.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890227	135	13.5	0.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19901110	135	13.5	0.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910730	135	13.5	0.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931030	135	13.5	0.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940112	135	13.5	0.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010718	135	13.5	0.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030604	135	13.5	0.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20051209	135	13.5	0.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070821	135	13.5	0.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080810	135	13.5	0.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090717	135	13.5	0.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20121007	135	13.5	0.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20121015	135	13.5	0.531496
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840223	132	13.2	0.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870110	132	13.2	0.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870309	132	13.2	0.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870626	132	13.2	0.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19891123	132	13.2	0.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920426	132	13.2	0.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930303	132	13.2	0.519685

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950120	132	13.2	0.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960317	132	13.2	0.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960401	132	13.2	0.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970503	132	13.2	0.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010217	132	13.2	0.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010313	132	13.2	0.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030615	132	13.2	0.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20060714	132	13.2	0.519685
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870828	130	13	0.511811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900421	130	13	0.511811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921127	130	13	0.511811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940205	130	13	0.511811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19951219	130	13	0.511811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980903	130	13	0.511811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19981224	130	13	0.511811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010205	130	13	0.511811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20051007	130	13	0.511811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070817	130	13	0.511811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20081115	130	13	0.511811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090415	130	13	0.511811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091130	130	13	0.511811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120811	130	13	0.511811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130801	130	13	0.511811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880819	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900303	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910107	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910303	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920701	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920828	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950806	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950901	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950922	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980211	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980527	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010605	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010624	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020403	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030210	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040519	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040802	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100209	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100926	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130712	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130721	127	12.7	0.5
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840422	124	12.4	0.488189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19881019	124	12.4	0.488189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19891109	124	12.4	0.488189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920123	124	12.4	0.488189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920310	124	12.4	0.488189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920530	124	12.4	0.488189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19951114	124	12.4	0.488189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970314	124	12.4	0.488189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030613	124	12.4	0.488189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030619	124	12.4	0.488189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030904	124	12.4	0.488189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20060905	124	12.4	0.488189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070424	124	12.4	0.488189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080117	124	12.4	0.488189

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080905	124	12.4	0.488189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20081104	124	12.4	0.488189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840308	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19881021	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890429	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890523	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900126	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900219	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19911229	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920526	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930212	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930406	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940906	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960729	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960731	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970513	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980710	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19981126	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010331	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040331	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080719	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091231	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120304	122	12.2	0.480315
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19831218	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870425	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880212	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880419	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900709	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900823	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19911110	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940721	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961019	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980622	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980904	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010315	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010601	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021028	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040821	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20041104	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20051130	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20061027	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20071215	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080706	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20081221	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20101212	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110228	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110524	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130114	119	11.9	0.468504
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19831120	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19841205	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850817	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19851015	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19851213	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890814	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900615	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19941118	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19941205	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980501	117	11.7	0.46063

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050715	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080616	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080724	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100712	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120219	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120711	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120806	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120815	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130306	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130610	117	11.7	0.46063
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850202	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860630	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880204	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880528	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19901129	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910207	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910313	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920906	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940101	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940301	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950603	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961227	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970228	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970429	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971109	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980401	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040813	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050402	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090831	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100613	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120826	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130223	114	11.4	0.448819
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19831125	112	11.2	0.440945
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840227	112	11.2	0.440945
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840603	112	11.2	0.440945
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840819	112	11.2	0.440945
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840929	112	11.2	0.440945
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910302	112	11.2	0.440945
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960612	112	11.2	0.440945
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020509	112	11.2	0.440945
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021021	112	11.2	0.440945
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021105	112	11.2	0.440945
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030411	112	11.2	0.440945
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040413	112	11.2	0.440945
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040611	112	11.2	0.440945
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050203	112	11.2	0.440945
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100516	112	11.2	0.440945
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870412	109	10.9	0.429134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870416	109	10.9	0.429134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870731	109	10.9	0.429134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880306	109	10.9	0.429134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900815	109	10.9	0.429134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19901208	109	10.9	0.429134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930531	109	10.9	0.429134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940728	109	10.9	0.429134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961205	109	10.9	0.429134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19981223	109	10.9	0.429134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010521	109	10.9	0.429134

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040918	109	10.9	0.429134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20051024	109	10.9	0.429134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090604	109	10.9	0.429134
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850816	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860125	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870519	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880102	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19891212	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900331	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19901215	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920226	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940328	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950430	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960220	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960611	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961007	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970128	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970215	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980417	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010329	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010820	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021104	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030227	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030518	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050328	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050626	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070106	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091209	107	10.7	0.42126
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840624	104	10.4	0.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850130	104	10.4	0.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850131	104	10.4	0.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870801	104	10.4	0.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880905	104	10.4	0.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900731	104	10.4	0.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19901204	104	10.4	0.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910630	104	10.4	0.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19911015	104	10.4	0.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920718	104	10.4	0.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040915	104	10.4	0.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20041127	104	10.4	0.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20060925	104	10.4	0.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090326	104	10.4	0.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120111	104	10.4	0.409449
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840508	102	10.2	0.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850707	102	10.2	0.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880203	102	10.2	0.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880617	102	10.2	0.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890405	102	10.2	0.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910814	102	10.2	0.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921220	102	10.2	0.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930421	102	10.2	0.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931017	102	10.2	0.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960204	102	10.2	0.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20011006	102	10.2	0.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050122	102	10.2	0.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20061121	102	10.2	0.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080520	102	10.2	0.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110330	102	10.2	0.401575

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20111129	102	10.2	0.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120229	102	10.2	0.401575
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19831204	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870403	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871225	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880407	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890810	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900204	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19941020	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950711	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19951028	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19951103	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960216	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971027	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971106	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020227	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020425	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040118	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050214	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090827	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100302	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20111227	99	9.9	0.389764
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860219	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870504	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880427	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890113	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890510	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19891116	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900808	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940327	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940726	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940910	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020103	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020317	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020412	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080714	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080910	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090910	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20101003	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120324	97	9.7	0.38189
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860127	94	9.4	0.370079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880510	94	9.4	0.370079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900711	94	9.4	0.370079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900811	94	9.4	0.370079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920508	94	9.4	0.370079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930327	94	9.4	0.370079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971026	94	9.4	0.370079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020415	94	9.4	0.370079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040310	94	9.4	0.370079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040627	94	9.4	0.370079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070214	94	9.4	0.370079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080307	94	9.4	0.370079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100426	94	9.4	0.370079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20101211	94	9.4	0.370079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130324	94	9.4	0.370079
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880413	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890605	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910102	91	9.1	0.358268

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910714	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910809	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19911228	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920925	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930216	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960307	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970925	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010810	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030811	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050422	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050731	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20081027	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20081125	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100329	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110504	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120602	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130405	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130618	91	9.1	0.358268
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840818	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19841001	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850120	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19851004	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860218	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890727	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910514	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920213	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920225	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921112	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930526	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940321	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19941026	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950810	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960124	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971210	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030317	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20031211	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040412	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070302	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090317	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100409	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20101216	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110820	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20111221	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130817	89	8.9	0.350394
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840416	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870531	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880624	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890315	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890331	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890505	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890622	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940104	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950204	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19951015	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961126	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971229	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980908	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010120	86	8.6	0.338583

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021030	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20031205	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080708	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130131	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130419	86	8.6	0.338583
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840506	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850324	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850825	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871003	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880319	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890807	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931021	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940308	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950413	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950902	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960506	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970205	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020410	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030529	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030831	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070412	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070705	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080222	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090106	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090802	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100606	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100717	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110922	84	8.4	0.330709
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840119	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19861026	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880215	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900223	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920412	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920422	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920531	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931223	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940102	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940114	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940223	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940413	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960306	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960505	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020815	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030422	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030702	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040125	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050520	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070816	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080405	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110930	81	8.1	0.318898
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19841111	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850414	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860628	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870330	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870803	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900820	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920424	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930505	79	7.9	0.311024

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931031	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19951207	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960302	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960812	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961201	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970303	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970928	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971018	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980615	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20061116	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20101014	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110821	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130511	79	7.9	0.311024
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840325	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850111	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850329	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19851122	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860227	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860314	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860701	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890502	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19901227	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910819	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930605	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970422	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970626	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020326	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020505	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030106	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030302	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050224	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050421	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20051129	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20060816	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080926	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090314	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090414	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100121	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120827	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130523	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130901	76	7.6	0.299213
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19831222	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840111	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850701	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860211	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860408	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860421	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19861111	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870126	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871129	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880726	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880727	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890106	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890406	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19891103	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930121	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950130	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970603	74	7.4	0.291339

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980816	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980828	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030101	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030526	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040626	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080315	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080406	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110713	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20111019	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20111117	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130312	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130420	74	7.4	0.291339
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19831228	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840321	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850110	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850727	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860514	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860814	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870217	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870702	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19881209	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890112	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910430	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19911109	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19911210	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920505	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940127	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950613	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961231	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010920	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020831	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030425	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040919	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20071115	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090107	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091218	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120309	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120919	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130207	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130922	71	7.1	0.279528
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19841104	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850725	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870216	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870930	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890609	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890821	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900222	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900630	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900713	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900922	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920323	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920921	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930506	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931229	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940331	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19941101	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950306	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950827	69	6.9	0.271654

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960816	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020125	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020504	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030129	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030228	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040616	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070628	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20071230	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080119	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080316	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080330	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20081114	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090420	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090526	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090603	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090814	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120204	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120807	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130115	69	6.9	0.271654
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850728	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860319	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860521	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880117	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890222	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890304	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19891020	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910520	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931027	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931128	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940629	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950412	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971016	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971122	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971224	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980319	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010417	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040610	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050501	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20061222	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070502	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080404	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080709	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20081017	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100602	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100801	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20111207	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120504	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130404	66	6.6	0.259843
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840509	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850618	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860320	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860406	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871126	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880925	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900207	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920307	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920719	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930627	64	6.4	0.251969

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930901	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970526	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980418	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980829	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20011218	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020312	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020320	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030320	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030426	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040917	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050412	64	6.4	0.251969
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070101	63	6.3	0.248031
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070508	63	6.3	0.248031
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070807	63	6.3	0.248031
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080516	63	6.3	0.248031
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090128	63	6.3	0.248031
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100130	63	6.3	0.248031
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100928	63	6.3	0.248031
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19831203	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840628	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850205	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860816	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19861218	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871007	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880623	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900125	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900712	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900814	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19901207	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19901231	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920319	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921104	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931221	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940209	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940508	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940812	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19951101	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970601	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010401	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010525	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030116	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030418	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040411	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050305	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070425	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080403	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080515	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080518	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20081018	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090507	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090828	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110518	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110619	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120404	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20121027	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130508	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130613	61	6.1	0.240157
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130703	61	6.1	0.240157

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19851031	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860908	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870623	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880720	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19881028	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890109	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890501	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900129	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900325	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19901018	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910415	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931210	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950128	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950323	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950608	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950916	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19951231	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960423	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960527	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960904	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970804	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020123	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021204	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030521	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100625	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120216	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130512	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130524	58	5.8	0.228346
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840630	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850209	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850702	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860720	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880516	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890506	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890811	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890920	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920219	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921105	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930601	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930905	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931028	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931228	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940130	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19941110	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950218	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960803	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971022	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971102	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010304	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020627	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020726	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021211	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030730	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040105	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040630	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040805	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050603	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20051110	56	5.6	0.220472

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070626	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20071018	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080720	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080911	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20081025	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090319	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100623	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100912	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20101201	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110102	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120630	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20121229	56	5.6	0.220472
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880313	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880709	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880824	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19891019	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19911224	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921011	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921229	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930329	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930402	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931109	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950115	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960129	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960203	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960319	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960703	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960725	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970614	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980419	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980609	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030617	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040612	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050320	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050524	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20061204	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070516	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080122	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20081001	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090927	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100222	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100620	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110323	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110331	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130316	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130702	53	5.3	0.208661
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850525	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860210	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19861115	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19861120	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870415	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880219	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880428	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880908	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890203	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19891213	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910224	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910602	51	5.1	0.200787

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910616	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920103	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930529	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930703	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930704	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950510	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950816	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950908	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961224	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970305	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970815	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980113	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980320	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980512	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010114	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010130	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021225	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030502	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040424	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040503	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20051122	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20060916	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070121	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070427	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080916	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090505	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090705	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091101	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110321	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120121	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120727	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20121216	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130331	51	5.1	0.200787
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19831219	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840204	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850102	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19851102	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860929	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870228	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870310	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880101	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880309	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890206	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890509	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900411	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920619	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930803	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931205	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940118	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940210	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940309	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950519	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950704	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970721	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971114	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010330	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020113	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030327	48	4.8	0.188976

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030716	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030723	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030809	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040907	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20051204	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20061020	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20071019	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080512	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090509	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100528	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100616	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110807	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20111116	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120906	48	4.8	0.188976
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870508	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871221	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890101	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900121	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900124	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900528	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19901221	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910924	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930111	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960315	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970412	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970911	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010118	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010719	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20011224	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030408	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040126	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050216	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20051006	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070222	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070727	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20081212	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090316	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091105	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100903	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120929	46	4.6	0.181102
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19831229	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840528	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19851101	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19851103	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860129	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19861014	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870524	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870714	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880118	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880506	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880525	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890613	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19891002	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900224	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900719	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910322	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910901	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920621	43	4.3	0.169291

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930514	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931012	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931211	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940303	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940903	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950423	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960208	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960515	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970427	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980317	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010602	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20011014	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20021210	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030405	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20031011	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050713	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050819	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20061123	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070407	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070719	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090102	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090127	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090218	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090622	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100203	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100224	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100425	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100523	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20101104	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110426	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110828	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110905	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20111216	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120720	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20121221	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130507	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130823	43	4.3	0.169291
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19831213	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840305	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850522	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860422	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19861112	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880318	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890620	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890705	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890718	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900926	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19901004	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920127	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930107	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930124	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930629	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930921	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940103	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940108	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940322	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940909	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950707	41	4.1	0.161417

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19951216	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960102	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960715	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980307	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010413	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020428	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020711	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030123	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030429	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030729	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20031120	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040306	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040427	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050317	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20061017	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070608	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20071027	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080729	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080930	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091010	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091127	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100629	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110517	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110620	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110921	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120224	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20121113	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130713	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130811	41	4.1	0.161417
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840228	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19851022	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19851231	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860214	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870208	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870603	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880519	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890110	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890217	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890621	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900618	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19901109	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921113	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930110	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930222	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931105	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940703	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960101	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960221	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960630	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961009	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961105	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970125	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970903	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971025	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980119	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980203	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980616	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19981216	38	3.8	0.149606

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19981217	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010424	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010702	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010925	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020421	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030206	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030810	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030909	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040623	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20051120	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20061018	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070122	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070620	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070826	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090113	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110207	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110225	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110815	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20111001	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20111122	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120202	38	3.8	0.149606
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840927	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19841029	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19841206	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850407	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850729	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860119	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860416	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860713	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870223	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870417	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880810	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890103	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890307	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890616	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890617	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890817	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900320	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900513	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900526	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910528	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910726	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19911122	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920725	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921211	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930512	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931117	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931220	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940516	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19941210	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19941211	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950119	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950525	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950923	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960106	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960301	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960906	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960910	36	3.6	0.141732

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961202	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970331	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19981219	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010615	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010708	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010726	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020817	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030223	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030516	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030816	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070701	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080401	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090118	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110408	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120724	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20121009	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130216	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130412	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130724	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130828	36	3.6	0.141732
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840307	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840419	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840531	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850104	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850518	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850628	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850716	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850722	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880404	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880723	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890219	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900407	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910226	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910711	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921125	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930221	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930518	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19931216	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940902	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970424	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970602	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980507	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980624	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980922	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19981230	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010322	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030628	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20031029	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040801	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040812	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20041015	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050816	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070108	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070629	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20071223	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20081108	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091123	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100311	33	3.3	0.129921

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100427	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110428	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120205	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120321	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120902	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20121220	33	3.3	0.129921
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19831116	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840503	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840928	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850301	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850323	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850604	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860221	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860820	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19861025	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19861109	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870805	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871222	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880422	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880518	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880924	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890314	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890628	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890922	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900309	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900417	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900727	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19901025	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910424	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920706	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940318	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950217	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960426	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960824	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970310	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970723	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980216	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980526	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980716	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19980930	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010527	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010529	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030508	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20041004	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050429	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050807	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050817	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070118	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070202	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070604	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070605	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20071011	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080111	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080815	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100313	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20101117	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110416	30	3	0.11811
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110514	30	3	0.11811

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840206	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19840823	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850225	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19850827	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860203	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19860409	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870520	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870609	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870815	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870827	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19870908	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871130	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871204	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19871211	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19880731	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19881231	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890207	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890717	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19890918	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900603	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19900718	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19901012	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910113	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910428	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910527	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910808	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19910914	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19911203	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19920430	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19921212	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19930122	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940816	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19940817	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950606	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19950907	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960130	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19960714	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19961226	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19970406	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971108	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	19971201	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010326	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20010512	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020121	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20020513	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030608	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20030731	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20031026	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20040109	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20041123	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20050730	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20070201	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20071110	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20080308	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20090411	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20091226	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20100530	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20110610	28	2.8	0.110236

GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20111104	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20120220	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20121107	28	2.8	0.110236
GHCND:USW00013750	NORFOLK NAS VA US	5.2	36.95	-76.28333	20130305	28	2.8	0.110236

APPENDIX H

GEOTECHNICAL REPORT

ECS Project No. 04:9732A

Heavy Duty Concrete Pavement Design

Design Criteria

- Anticipated daily traffic per RFP, 20 Single Unit Trucks, 20 H-20 Loadings – Appx ESAL Equivalent = 500,000 ESAL's over 20 year design life.
- Initial Serviceability (p_o) = 4.2
- Terminal Serviceability (p_t) = 2.0
- Reliability = 85
- Standard Deviation = .35

Rigid Pavement Design Parameters

- Design Serviceability Loss = p_o - p_t = 2.2
- Effective Roadbed Soil Resilient Modulus, M_R = 1500 X CBR 19.3 = 28,000
- Effective Modulus of Subgrade Reaction, k = M_R/19.4 = 1400 psi
- Concrete Modulus of Elasticity (E_c) = 3.6 x10^6 psi
- Mean Concrete Modulus of Rupture (S'_c) = 569
- Load Transfer Coefficient, J = 3.8
- Drainage Coefficient C_d = 1.0

Heavy-Duty Concrete Pavement:

Layer	Material Description	Thickness (Di)(in)
1	PCC at f'_c = 4,000 psi	8
2	VDOT No. 21B Dense Gradded Aggerate	6
3	Geotextile (Mirafi HP370 or equivalent)	Subgrade
Total		14.0

***Minimum Pavement Sections per Project RFP*

Proposed pavement section is adequate

ECS Project No. 04:9732A

Rigid Pavement Heavy-Duty Pavement

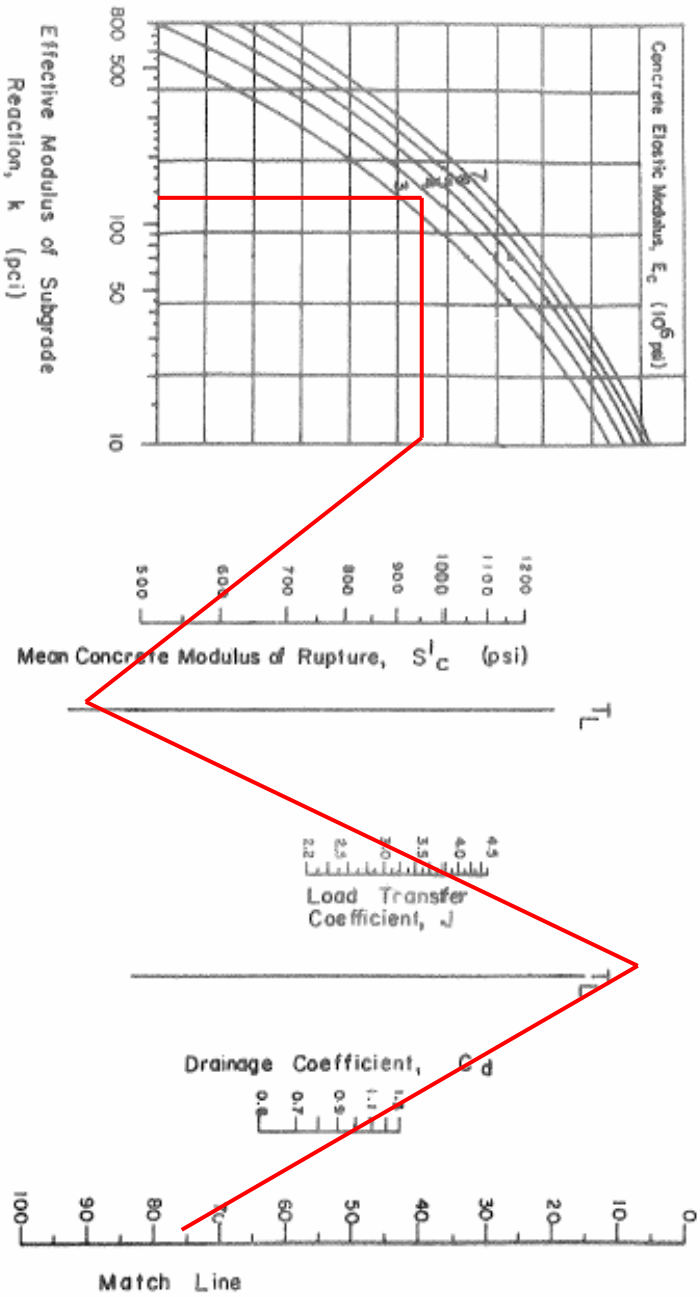


Figure 3 Design chart for rigid pavements based on using mean values for each input. (From thee AASHTO Guide for Design of Pavements Structures. Copyright 1993. American Association of State Highway and Transportation Officials, Washington, DC.)

ECS Project No. 04:9732A

Rigid Pavement Heavy-Duty Pavement Continued

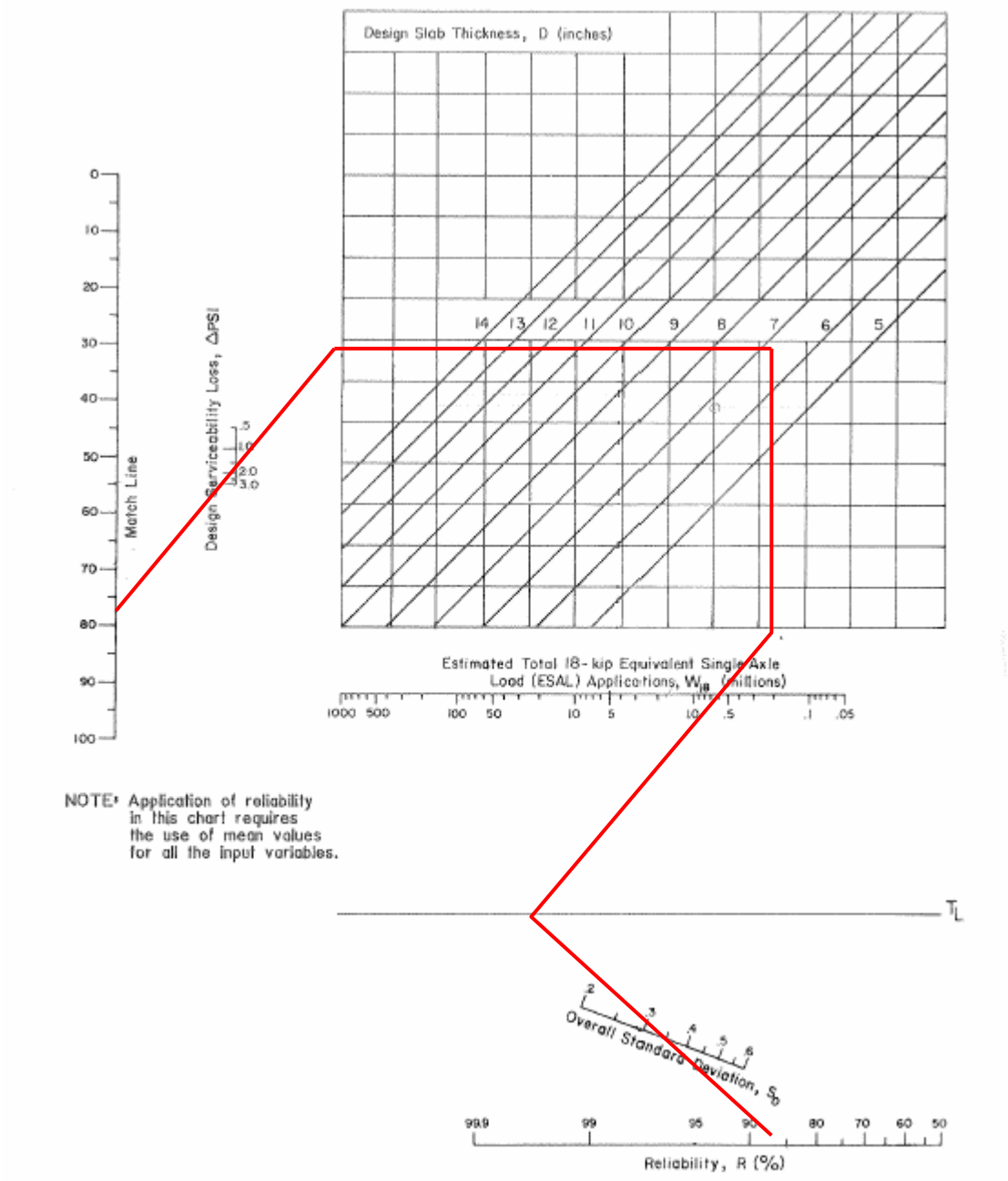


Figure 3 continued Design chart for rigid pavements based on using mean values for each input. (From thee AASHTO Guide for Design of Pavements Structures. Copyright 1993. American Association of State Highway and Transportation Officials, Washington, DC.)

LEED 2009 for New Construction and Major Renovations

SS CREDIT 6.1: STORMWATER DESIGN - QUANTITY CONTROL

Project # 1000027435 MRTC Office Building

All fields and uploads are required unless otherwise noted.

ALL OPTIONS

Select one of the following:

- ○ **Option 1.** Design Storms
- ◉ **Option 2.** Percentile Rainfall Events

OPTION 2. PERCENTILE RAINFALL EVENTS

Select one of the following:

- ◉ **Case 1.** Non-Zero Lot Line Projects
- ○ **Case 2.** Zero Lot Line Projects

CASE 1. NON-ZERO LOT LINE PROJECTS

☒ The runoff from the developed site is managed for the 95th percentile of regional or local rainfall events using Low Impact Development (LID) and green infrastructure that replicates natural site hydrology processes.

Upload SSc6.1-3. Provide calculations showing the 95th percentile regional or local rainfall event amount and how the runoff is managed onsite by these practices.

Upload *Files: 0*

Describe the proposed practices to be implemented on the project site and what qualifies these strategies as LID or green infrastructure techniques that best replicate natural site hydrology processes.

Upload SSc6.1-5. Provide any applicable specifications, drawings, and storage and infiltration calculations of the LID practices utilized on site.

Upload *Files: 0*

Version 5.0
Copyright © 2009 U.S. Green Building Council. All Rights Reserved.

Save Form

ADDITIONAL DETAILS

- ☐ Special circumstances preclude documentation of credit compliance with the submittal requirements outlined in this form.
- ☐ The project team is using an alternative compliance approach in lieu of standard submittal paths.
- ☐ The project team is pursuing exemplary performance of SS Credit 6.1.

SUMMARY

SS Credit 6.1: Stormwater Design - Quantity Control Points Documented:	0	Check Compliance
SS Credit 6.1: Stormwater Design - Quantity Control Exemplary Performance Documented:	N	

- ☐ The project team reserves one point in the Innovation in Design credit category for exemplary performance in SS Credit 6.1.

Version 5.0
Copyright © 2009 U.S. Green Building Council. All Rights Reserved.

Save Form

LEED 2009 for New Construction and Major Renovations

SS CREDIT 6.2: STORMWATER DESIGN - QUALITY CONTROL

Project # 1000027435 MRTC Office Building

All fields and uploads are required unless otherwise noted.

ALL OPTIONS

Complete the table below. List the TSS removal efficiencies for the Best Management Practices (BMPs) implemented on the project. The table will calculate the weighted TSS removal efficiency for each BMP based on the percentage of the site that the BMP treats where BMPs operate in a simple series. For more complex situations (such as two BMPs into one), either simplify the interactions to fit the table, or provide additional calculations in the Special Circumstances section of the form.

Table SSc6.2-1. TSS Removal Efficiency

BMP Type/Label	BMP Description and/or Location	In Series with BMP Above?	Percent Site Treated by BMP	TSS Removal Efficiency (%)	Source of TSS Removal Efficiency data	Weighted Average TSS Removal Efficiency (%)		
BMP 3A	Bio-retention Pond	N/A	34	86	National or regional source	29.24	+	-
BMP 4A	Bio-retention Pond	No	28	86	National or regional source	24.08	+	-
SW4B	Grass Swale	No	12	63	National or regional source	7.56	+	-
BMP4B	Bio-Retention	Yes	20	86	National or regional source	10.7	+	-
EX POND	Existing Pond	No	19.5	80	State or local program (80% defau	15.6	+	-
Total weighted average TSS removal efficiency (must be at least 80%)						87.18		

☒ The BMPs listed in the table are designed to treat stormwater runoff from 90% of the average annual rainfall.

ADDITIONAL DETAILS

☐ Special circumstances preclude documentation of credit compliance with the submittal requirements outlined in this form.

☐ The project team is using an alternative compliance approach in lieu of standard submittal paths.

☐ The project team is pursuing exemplary performance of SS Credit 6.2.

Save Form

Version 4.0
Copyright © 2009 U.S. Green Building Council. All Rights Reserved.

SUMMARY

SS Credit 6.2: Stormwater Design - Quality Control Points Documented:	0	Check Compliance
SS Credit 6.2: Stormwater Design - Quality Control Exemplary Performance Documented:	N	

☐ The project team reserves one point in the Innovation in Design credit category for exemplary performance in SS Credit 6.2.

Version 4.0
Copyright © 2009 U.S. Green Building Council. All Rights Reserved.

LEED 2009 for New Construction and Major Renovations

SS CREDIT 6.1: STORMWATER DESIGN - QUANTITY CONTROL

Project # 1000027435 MRTC Office Building

All fields and uploads are required unless otherwise noted.

ALL OPTIONS

Select one of the following:

- ○ **Option 1.** Design Storms
- ◉ **Option 2.** Percentile Rainfall Events

OPTION 2. PERCENTILE RAINFALL EVENTS

Select one of the following:

- ◉ **Case 1.** Non-Zero Lot Line Projects
- ○ **Case 2.** Zero Lot Line Projects

CASE 1. NON-ZERO LOT LINE PROJECTS

☒ The runoff from the developed site is managed for the 95th percentile of regional or local rainfall events using Low Impact Development (LID) and green infrastructure that replicates natural site hydrology processes.

Upload SSc6.1-3. Provide calculations showing the 95th percentile regional or local rainfall event amount and how the runoff is managed onsite by these practices.

Upload *Files: 0*

Describe the proposed practices to be implemented on the project site and what qualifies these strategies as LID or green infrastructure techniques that best replicate natural site hydrology processes.

Upload SSc6.1-5. Provide any applicable specifications, drawings, and storage and infiltration calculations of the LID practices utilized on site.

Upload *Files: 0*

Version 5.0
Copyright © 2009 U.S. Green Building Council. All Rights Reserved.

Save Form

ADDITIONAL DETAILS

☐ Special circumstances preclude documentation of credit compliance with the submittal requirements outlined in this form.

☐ The project team is using an alternative compliance approach in lieu of standard submittal paths.

☐ The project team is pursuing exemplary performance of SS Credit 6.1.

SUMMARY

SS Credit 6.1: Stormwater Design - Quantity Control Points Documented:	0	Check Compliance
SS Credit 6.1: Stormwater Design - Quantity Control Exemplary Performance Documented:	N	

☐ The project team reserves one point in the Innovation in Design credit category for exemplary performance in SS Credit 6.1.

Version 5.0
Copyright © 2009 U.S. Green Building Council. All Rights Reserved.

Save Form

LEED 2009 for New Construction and Major Renovations

SS CREDIT 6.2: STORMWATER DESIGN - QUALITY CONTROL

Project # 1000027435 MRTC Office Building

All fields and uploads are required unless otherwise noted.

ALL OPTIONS

Complete the table below. List the TSS removal efficiencies for the Best Management Practices (BMPs) implemented on the project. The table will calculate the weighted TSS removal efficiency for each BMP based on the percentage of the site that the BMP treats where BMPs operate in a simple series. For more complex situations (such as two BMPs into one), either simplify the interactions to fit the table, or provide additional calculations in the Special Circumstances section of the form.

Table SSc6.2-1. TSS Removal Efficiency

BMP Type/Label	BMP Description and/or Location	In Series with BMP Above?	Percent Site Treated by BMP	TSS Removal Efficiency (%)	Source of TSS Removal Efficiency data	Weighted Average TSS Removal Efficiency (%)		
SW 1A	Grass Swale	N/A	1	63	National or regional source	0.63	+	-
BMP 1A	Bio-retention Pond	Yes	28	86	National or regional source	23.54	+	-
SW 1B	Grass Swale	No	12	63	National or regional source	7.56	+	-
BMP 1B	Bio-retention Pond	Yes	30	86	National or regional source	19.3	+	-
BMP 1C	Bio-retention Pond	No	24	86	National or regional source	20.64	+	-
PERM PAVE	Permeable Paveme	No	15	60	National or regional source	9	+	-
Total weighted average TSS removal efficiency (must be at least 80%)						80.67		

☒ The BMPs listed in the table are designed to treat stormwater runoff from 90% of the average annual rainfall.

ADDITIONAL DETAILS

☐ Special circumstances preclude documentation of credit compliance with the submittal requirements outlined in this form.

☐ The project team is using an alternative compliance approach in lieu of standard submittal paths.

☐ The project team is pursuing exemplary performance of SS Credit 6.2.

Save Form

Version 4.0
Copyright © 2009 U.S. Green Building Council. All Rights Reserved.

SUMMARY

SS Credit 6.2: Stormwater Design - Quality Control Points Documented:	0	Check Compliance
SS Credit 6.2: Stormwater Design - Quality Control Exemplary Performance Documented:	N	

☐ The project team reserves one point in the Innovation in Design credit category for exemplary performance in SS Credit 6.2.

Version 4.0
Copyright © 2009 U.S. Green Building Council. All Rights Reserved.