



DRAINAGE PLAN
MOSCELYN MEADOWS ADDITION
OCTOBER 2014

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PROJECT NARRATIVE

EXISTING CONDITIONS

The proposed site is an undeveloped piece of land at the north west intersection of 151st Street West and Moscelyn Road. This area is bounded on the north by Reece Farms Addition and to the west by a single family residence.

The site is currently farmland and features tree rows on the north line as well as the west line. The site drains to the east to the 151st Street ROW via sheet flow and shallow concentrated flow. Moscelyn is a gravel road with ditch sections that convey the residential neighborhoods runoff from the west to the east.

There is offsite runoff which encroaches the northern property line of Lot 1 from the north. This runoff, from Reece Farms Addition, includes approximately 7.8 acres of primarily backyard runoff that is concentrated in a roadside ditch section. The offsite runoff from the west is contained in the Moscelyn ditch section, as previously described.

The drainage patterns as defined above can be seen on the Aerial (Exhibit 2).

PROPOSED CONDITIONS

The property is being platted as 3 single family lots, each approximately 1.46 acres, with access to Moscelyn. Since the properties will feature a single family structure on each lot, we do not expect a full mass grading project with this site. Each lot will be graded per each structure to be developed and thus minimize the amount of disturbance on site. Each lot is expected to continue to sheet flow across each lot to the east.

Moscelyn will remain gravel with ditch sections conveying runoff to the east. Each lot will need to provide a ditch culvert no smaller than a 24" at each of their respective entrances.

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

OFFSITE CONDITIONS

There is currently 7.8 acres of runoff encroaching Lot 1 from the north. This flow, based on field visits, appears to meander through the trees in a non-defined channel before overtopping the tree row onto Lot 1. This area includes mainly backyard drainage from the north subdivision and is directly discharged to the Hendryx ditch section in a 24" driveway culvert. The total runoff generated from this area is approximately 24 cfs in the 25 year event and 32 cfs in the 100 year event. Due to the upstream drive culvert being a 24" structure, we do not expect any more flow than the 25 year event peak discharge. With that said, this site will have a 20' Drainage Easement along the north line for a proposed ditch/channel section. The channel section, approximately 1' in depth with 4:1 sideslopes, will convey this runoff in the easement directly to the east and into the 151st ROW. There is a 27" x 42" HERCP at this location which conveys runoff to the east and into the Auburn Hills pond system.

As previously discussed, approximately 7.4 acres of runoff flows into the Moscelyn ditch section from the west. This runoff is conveyed to the east and into the same HERCP as previously mentioned.

The overall site location can be seen as Exhibit 1.

EXISTING CONDITIONS RUNOFF CALCULATIONS

DRAINAGE METHODS & STANDARDS

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

- STORM SERIES
 - 24-hour; 2-yr, 5-yr, 10-yr, 25-yr, 100-yr Storm Events
 - 2-yr Rainfall Intensity = 3.83 in
 - 10-yr Rainfall Intensity = 5.22 in
 - 100-yr Rainfall Intensity = 7.37 in

- FLOW DATA
 - Areas per LIDAR data, USGS Quadrangle Sheet, Aerial Photos, and Site Visits
 - Rational Formula Method for existing onsite flows (C = 0.55)
 - Time of Concentration: Lag Method (minimum 15 min)

SITE CHARACTERISTICS

The site is currently farmland that sheet drains to the east and into the 151st Street ROW. The site has a consistent 2% slope from west to east and accepts runoff from the north onto the property. There is no defined channel on this property as it is currently farmed, although there is evidence of offsite runoff in the adjacent tree row.

The existing site characteristics can be seen from the aerial exhibit (Exhibit 2).

EXISTING CONDITIONS HYDROLOGIC ANALYSIS

The proposed site was analyzed for peak runoff values for the entire storm series based on undeveloped conditions in Type C soils. A minimum Time of Concentration of 15 minutes was used due to the sites size and runoff length. A Rational Runoff Coefficient of 0.55 was used based on open space.

DOWNSTREAM DRAINAGE CAPACITY

This site, as well as adjacent conveyances, are sheet and ditch flows. These areas will pond water as well as conveying it to the east and into the 151st Street ROW. At this point in the ROW there is a storm water sewer system that conveys the runoff to the east and into the Auburn Hills pond system. The pipe and open end structure is a 27"x42" HERCP (33" equivalent – 6.3 sq ft of open end area). We anticipate this pipe to have a capacity of approximately 50-60 cfs (at 8-9 ft/s velocity) when flowing full. This pipe appears to convey at least the 25 year storm event from the basin, and based on upstream constraints (ie culvert sizes in ditch sections) we would anticipate this pipe to handle the 100-year rainfall event without overtopping 151st Street at this section of the roadway (assuming no downstream control on the system).

POST-DEVELOPMENT HYDROLOGIC ANALYSIS

DRAINAGE METHODS & STANDARDS

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

- STORM SERIES
 - 24-hour; 2-yr, 5-yr, 10-yr, 25-yr, 50-yr, 100-yr Storm Events Calculated
 - Rational Formula Method used for peak runoff
 - C = 0.61 (Single-Family Residential – <1 acre lot)
 - Time of Concentration; Lag Method, minimum Tc = 15min

- OFFSITE RUNOFF EVALUATION
 - Basin sizes and flow paths determined using Lidar
 - Site visits to determine overflow path

DEVELOPED CONDITIONS HYDROLOGIC ANALYSIS

The site is being platted into 3 residential lots of equal size with direct access from the gravel covered Moscelyn Road. The lots are expected to develop into 3 separate single family homes with minimal disturbance to the lot. The site was analyzed for peak flow runoff values for Type C soils based on single family homes. A rational coefficient of 0.61 was used assuming a 15 minute Time of Concentration.

DETENTION FACILITIES

The site is less than 5 acres in size and is expected to add less than 1 acre of impervious surface and is therefore not proposing detention onsite.

DISCHARGE POINTS SUMMARY

The site discharges primarily to the 151st Street ROW where the runoff is conveyed to the east via a storm water sewer installed with Auburn Hills Addition. This structure appears to handle the storm series from this property as well as offsite flow that contributes to the overall drainage basin.

Upon development, we expect some runoff from this site to discharge to the Moscelyn ROW ditch. Each lot will need at least a 24" pipe culvert under their driveway to convey the runoff from the west upstream ROW ditch section.

OFFSITE FLOW

This site experiences offsite runoff encroachments near the northeast portion of the property. The adjacent subdivision, Reece Farms, discharges via ditch and shallow concentrated flow approximately 7.8 acres of backyard runoff. This runoff is somewhat mitigated by upstream driveway culverts and also stands along the tree line separating the two properties. However, the proposed site will accept all offsite runoff along this north line in a 20' Drainage Easement which will feature a 5' bottom width channel approximately 1' in depth. This ditch will only be required along north line of Lot 1 as it will accept the offsite runoff in this area, however, we

are proposing the easement be extended along the entire north line of the property to account for onsite grading and any other overflow areas from the north that may occur due to the adjacent ditch being clogged or larger storm event overflows. This offsite flow appears to produce approximately 32 cfs in the 100-year storm event. However, as mentioned previously, upstream culverts appear to be sized for smaller events and may release a smaller amount of runoff than the anticipated peak flow event.

Offsite flow from the west appears to be contained in the Moscelyn ROW ditch. The Offsite Drainage Basin Exhibit is attached as Exhibit 6.

WATER QUALITY

We do not expect this site to disturb or add more than 1 acre of impervious area with the development of 3 single family homes. Therefore, no water quality is required on the site. However, if the site (cumulative amongst all the lots) disturbs more than 1 acre of runoff it will need to provide water quality treatment to meet the City of Wichita WQ ordinance.

DOWNSTREAM CHANNEL PROTECTION

Due to the relatively small size of the site (less than 5 acres) no downstream channel protection is required.

FLOODPLAIN SUBMITTAL

SOURCE OF FLOODPLAIN INFORMATION

This site lies within a FEMA Zone X per FEMA FIRM Panel 317 of 700 for Wichita, Sedgwick County, Kansas; effective May 2, 2012.

FEDERAL, STATE, & LOCAL PERMITTING

US ARMY CORPS OF ENGINEERS

There does not appear to be any jurisdictional waters of the US on this site.

KANSAS DEPT OF AGRICULTURE – DWR PERMITTING

There does not appear to be any DWR permitting needed on the proposed site at this time. The areas of discharge do not account for more than 640 acres.

FEMA

No FEMA permitting is expected at this time.

KANSAS DEPT OF TRANSPORTATION

There is no KDOT ROW adjacent or near this property which would require a permit at this time.

SEDGWICK COUNTY PERMITTING

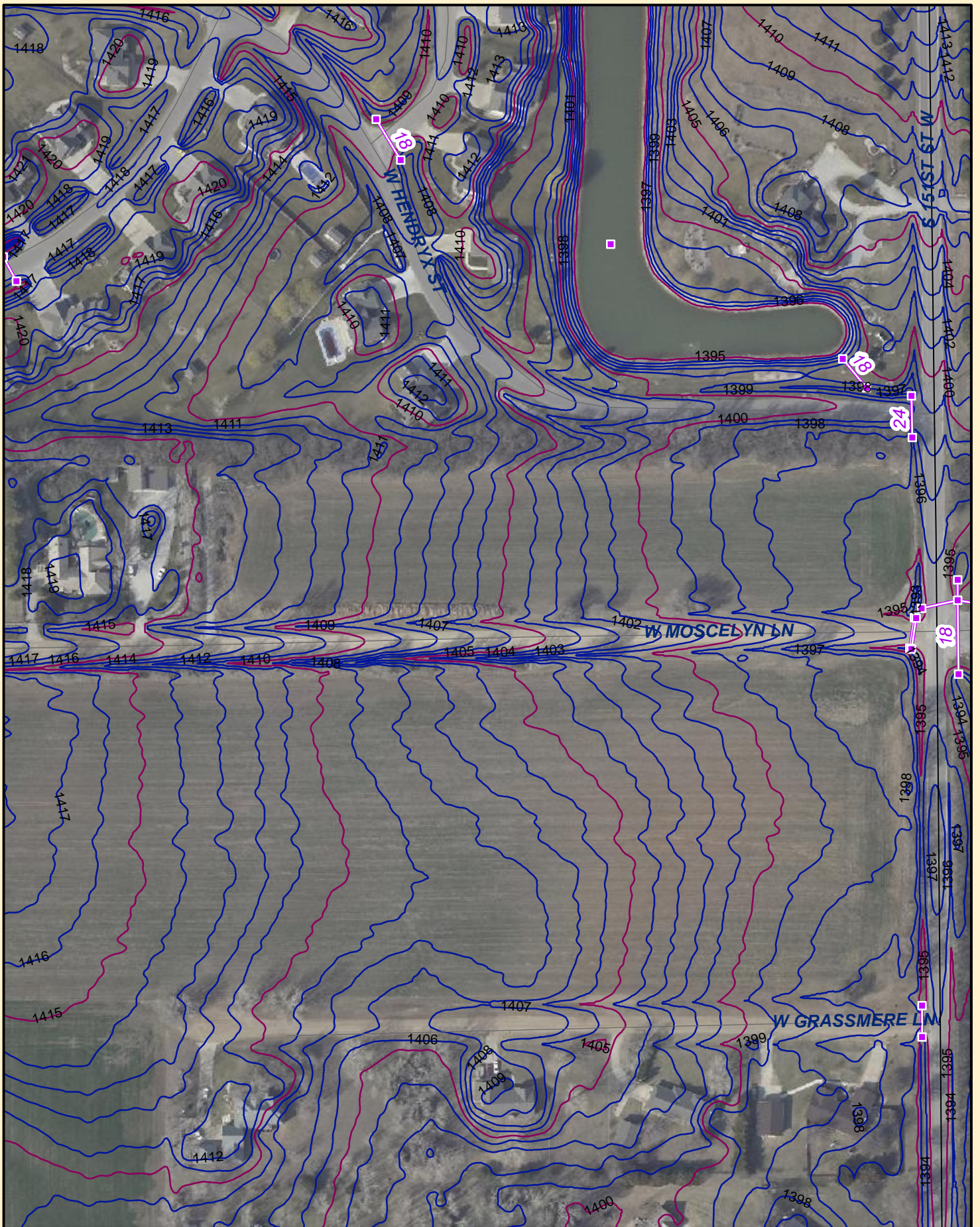
There does not appear to be any Sedgwick County permitting needed at this time.

- EXHIBIT 1: Site Location Map
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- EXHIBIT 5: Floodplain Location (FIRM)
- EXHIBIT 6: Offsite Drainage Basin Exhibit

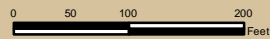


Site Location





Lidar Exhibit



Moscelyn Meadows Addition

WICHITA, SEDGWICK COUNTY, KANSAS

CERTIFICATE OF SURVEY

State of Kansas)
 County of Sedgwick) SS
 I, Chad R. Abbott, the undersigned registered land surveyor of the State of Kansas, do hereby certify that the following described tract of land was surveyed on July 11, 2014. The survey was made by me or under my direct supervision and the accompanying plat "MOSCELYN MEADOWS ADDITION, WICHITA, SEDGWICK COUNTY, KANSAS", is a true and correct exhibit of the property surveyed, described as follows:

Beginning at the Northeast corner of the Southeast Quarter of Section 27, Township 27 South, Range 2 West of the Sixth Principal Meridian, Sedgwick County, Kansas; thence West along the North line of said Southeast Quarter, a distance of 1055.0 feet, more or less, to a point 1582.0 feet East of the Northwest corner of said Quarter Section; thence South parallel with the West line of said Southeast Quarter, a distance of 210.00 feet; thence East parallel with the North line of said Southeast Quarter, a distance of 1055.00 feet, more or less, to a point in the East line of said Southeast Quarter; thence North 210.00 feet to the point of beginning.

EXCEPT:
 A tract in the Southeast Quarter of Section 27, Township 27 South, Range 2 West of the Sixth Principal Meridian, Sedgwick County, Kansas, described as beginning at a point on the North line of said Southeast Quarter, a distance of 1582.00 feet East of the Northwest corner of said Southeast Quarter; thence on a bearing of N 89°43'51" E (Assumed) along said North line, a distance of 87.25 feet; thence S 01°44'24" W a distance of 210.12 feet; thence S 89°43'51" W, parallel with said North line, a distance of 82.13 feet; thence N 00°20'38" E, parallel with the West line of said Southeast Quarter, a distance of 210.00 feet to point of beginning.

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

Chad R. Abbott L.S. #1340

OWNER'S CERTIFICATE

State of Kansas)
 County of Sedgwick) SS

Know all men by these presents that we the undersigned owner of the land as above set forth in the Surveyor's Certificate, have caused the same to be surveyed and platted into lots and a block. The same to be known as "MOSCELYN MEADOWS ADDITION, WICHITA, SEDGWICK COUNTY, KANSAS". The 30' Street Right-of-Way along Moscelyn Lane is hereby dedicated to and for the use of the public. The 80' Street Right-of-Way along 151st Street West is hereby dedicated to and for the use of the public. Access control as shown on the face of the plat is hereby granted to the appropriate governing body. A drainage plan has been developed for the plat and all drainage easements, right-of-ways, or reserves shall remain at established grades or as modified with the approval of the applicable City or County Engineer, and will remain unobstructed to allow for the conveyance of storm water.

for JBL, Inc.

NOTARY CERTIFICATE

State of Kansas)
 County of Sedgwick) SS

BE IT REMEMBERED, that on this ____ day of _____, 2014, before me the undersigned, a Notary Public in and for the County and State aforesaid, came Jeff Lange for JBL, Inc., to me personally known to be the same person who executed the foregoing instrument of writing and duly acknowledged the execution of the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year above written.

_____, Notary Public

My Appointment Expires: _____

PLANNING COMMISSION CERTIFICATE

State of Kansas)
 County of Sedgwick) SS

This plat of "MOSCELYN MEADOWS ADDITION, WICHITA, SEDGWICK COUNTY, KANSAS" has been submitted to and approved by the Wichita-Sedgwick County Metropolitan Area Planning Commission, Wichita, Kansas.

Dated this ____ day of _____, 2014.

WICHITA-SEDGWICK COUNTY METROPOLITAN PLANNING COMMISSION

_____, Chairman
 Don Klausmeyer, Chairman

Attest: _____ Secretary
 John L. Schlegel, Secretary

GOVERNING BODY

State of Kansas)
 County of Sedgwick) SS

This plat approved and all dedications shown hereon, if any, accepted by the City of Wichita, Kansas, this ____ day of _____, 2014.

At the Direction of the City Council

Attest: _____ City Clerk
 Karen Sublett

TRANSFER RECORD

State of Kansas)
 County of Sedgwick) SS

Entered on transfer record this ____ day of _____, 2014

_____, County Clerk
 Kelly B. Arnold, County Clerk

REGISTER OF DEEDS

State of Kansas)
 County of Sedgwick) SS

This is to certify that this instrument was filed for record in the Register of Deeds office this ____ day of _____, 2014 at _____ o'clock ____; and is duly recorded.

_____, Register of Deeds
 Bill Meek, Register of Deeds

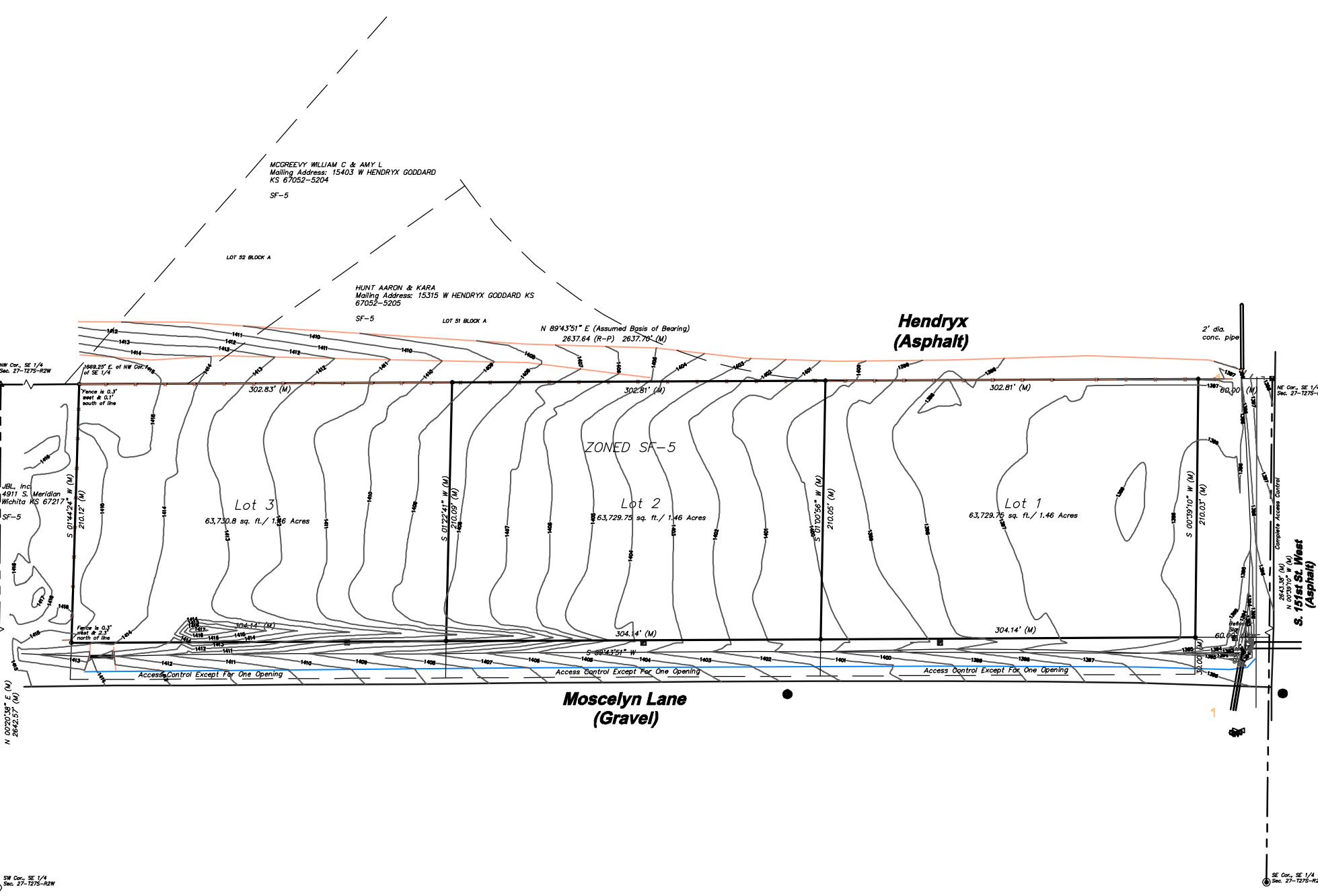
Attest: _____ Deputy
 Tonya E. Buckingham, Deputy

COUNTY SURVEYOR

State of Kansas)
 County of Sedgwick) SS

Reviewed in accordance with K.S.A. 58-2005 on this ____ day of _____, 2014.

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

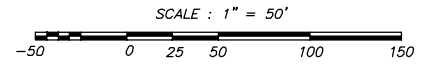


LEGEND:

- (M) = MEASURED OR CALCULATED FROM MEASUREMENT
- = FOUND 5/8" REBAR IN TRIMBLE (ORIGIN UNKNOWN)
- = FOUND 1/2" REBAR WITH LS #340 CAP
- △ = FOUND 3/4" IRON PIPE (ORIGIN UNKNOWN)
- = FOUND ALUMINUM CAP
- = SET 1/2" REBAR WITH LS #340 CAP
- = TELEPHONE REBAR
- = PIPELINE MARKER (1-800-875-1302)
- = SIGN (As Noted)
- = MANHOLE
- = WATER VALVE
- = FIRE HYDRANT
- = FENCE

JOB DESCRIPTION: PRELIMINARY PLAT	
PREPARED FOR: JBL, Inc. 4011 S. Meridian Wichita, KS 67217	
JOB LOCATION: 151st St. W. & Moscelyn Ln	DATE OF PREPARATION: 08-21-2014
JOB NUMBER: A13555	SHEET 1 OF 1

Abbott and Survey
 520 S. Holland, Ste. 103 Wichita, KS 67209
 Ph. 316.262.2262 Fax 316.262.2268
 surveyors@benchmarks.net



DRAINAGE PLAN

Moscelyn Meadows Addition

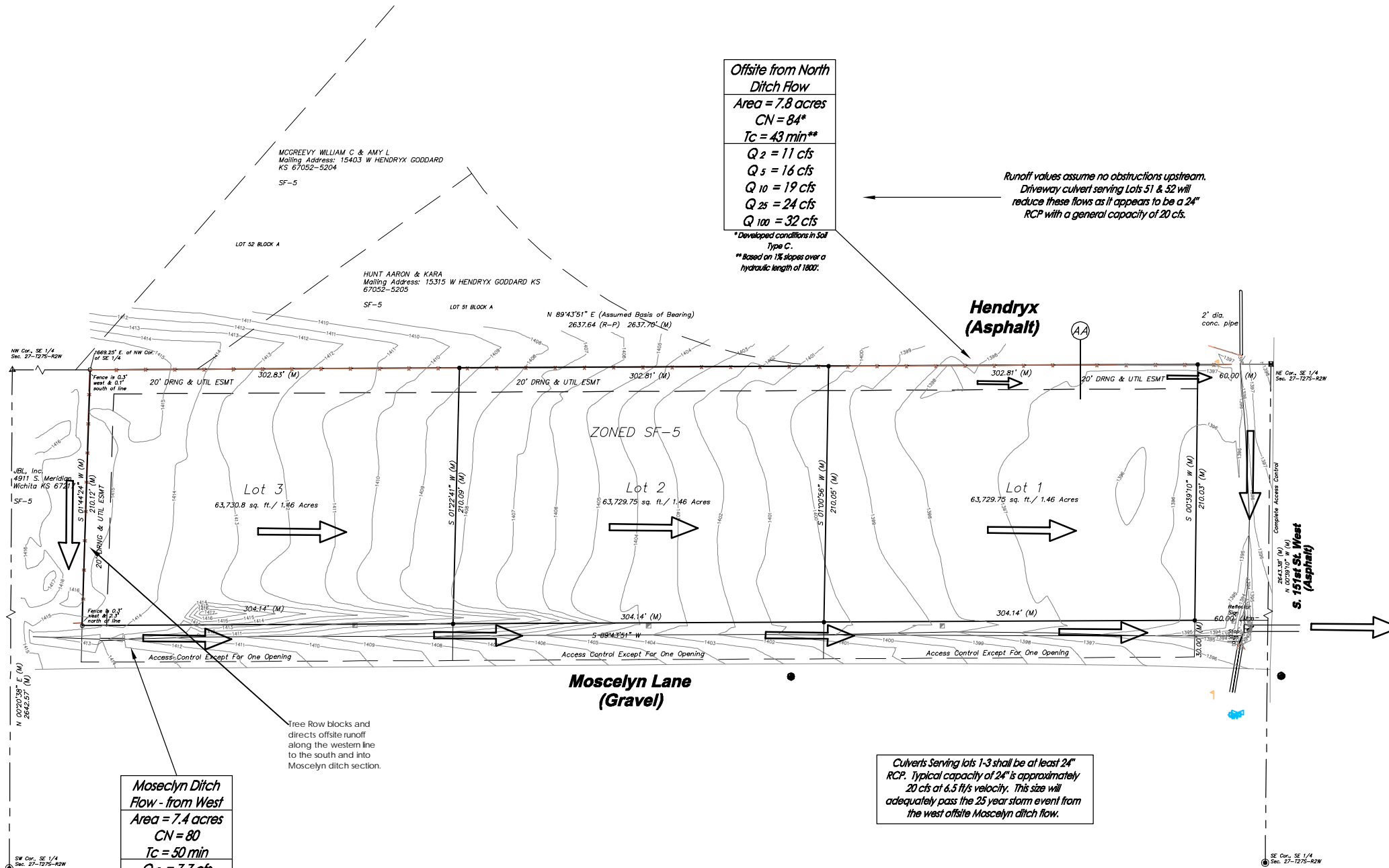
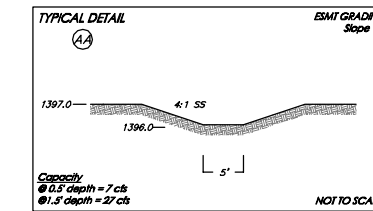
WICHITA, SEDGWICK COUNTY, KANSAS

Offsite from North Ditch Flow
 Area = 7.8 acres
 CN = 84*
 Tc = 43 min**
 Q₂ = 11 cfs
 Q₅ = 16 cfs
 Q₁₀ = 19 cfs
 Q₂₅ = 24 cfs
 Q₁₀₀ = 32 cfs

* Developed conditions in Soil Type C.
 ** Based on 1% slopes over a hydraulic length of 1800'.

Runoff values assume no obstructions upstream. Driveway culvert serving Lots 51 & 52 will reduce these flows as it appears to be a 24" RCP with a general capacity of 20 cfs.

Total Site	
Area = 4.4 acres	
Tc = 15 min	
EXISTING	DEVELOPED
C' = 0.55	C' = 0.61
Q ₂ = 9.3 cfs	Q ₂ = 10 cfs
Q ₅ = 11 cfs	Q ₅ = 12 cfs
Q ₁₀ = 13 cfs	Q ₁₀ = 14 cfs
Q ₁₀₀ = 18 cfs	Q ₁₀₀ = 20 cfs



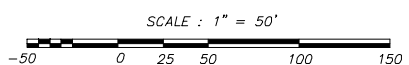
Moscelyn Ditch Flow - from West
 Area = 7.4 acres
 CN = 80
 Tc = 50 min
 Q₂ = 7.7 cfs
 Q₅ = 12 cfs
 Q₁₀ = 15 cfs
 Q₂₅ = 18 cfs
 Q₁₀₀ = 26 cfs

Culverts Serving lots 1-3 shall be at least 24" RCP. Typical capacity of 24" is approximately 20 cfs at 6.5 ft/s velocity. This size will adequately pass the 25 year storm event from the west offsite Moscelyn ditch flow.

JOB DESCRIPTION: PRELIMINARY PLAT	
PREPARED FOR: JBL, Inc. 4011 S. Meridian Wichita, KS 67217	
JOB LOCATION: 161st St W. & Moscelyn Ln	DATE OF PREPARATION: 08-21-2014
JOB NUMBER: A13655	SHEET 1 OF 1

AS and Survey

520 S. Holland, Ste. 103 Wichita, KS 67209
 Ph. 316.262.2262 Fax 316.262.2268
 surveyors@benchmarkks.net



LEGEND:

- (M) = MEASURED OR CALCULATED FROM MEASUREMENT
- = FOUND 5/8" REBAR IN TRIMBLE (ORIGIN UNKNOWN)
- = FOUND 1/2" REBAR WITH LS #1340 CAP
- △ = FOUND 3/4" IRON PIPE (ORIGIN UNKNOWN)
- = FOUND ALUMINUM CAP
- = SET 1/2" REBAR WITH LS #1340 CAP
- ☐ = TELEPHONE RISER
- 1 = PIPELINE MARKER (1-800-875-3302)
- = SDN (As Noted)
- = MANHOLE
- = WATER VALVE
- = FIRE HYDRANT
- = FENCE

NOTES: This site is not expected to disturb more than 1 acre of ground surface and will not require water quality treatment. In the event that this overall site disturbs one acre or more, water quality treatment will need to be provided as part of the site development package.

Due to the site being under 5 total acres, and under 1 acre of disturbance, no detention or downstream channel protection is being provided.

This site lies within a FEMA SFHA Zone X per FEMA FIRN Panel 317 of 700 for Wichita, Sedgwick County, Kansas, effective May 2, 2012.

DRAINAGE PLAN

MOSCELYN MEADOWS ADDITION

Baughman Company, P.A.
 315 E. 15th St. Wichita, KS 67211 P 316.262.7271 F 316.262.0149

Baughman ENGINEERS | SURVEYORS | PLANNERS | LANDSCAPE ARCHITECTS



PANEL
20173C0317F
 eff. 5/2/2012

W MOSCELYN LN
 AREA OF MINIMAL FLOOD HAZARD Zone X



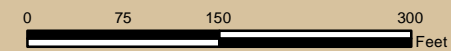
FEMA FIRM





Moscelyn Meadows

Offsite Drainage Basins



SUPPORTING CALCULATIONS

APPENDIX A: USGS Soils Survey

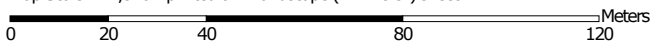
APPENDIX B : HydraFlow Hydrographs
Offsite Basins

USGS Soils Survey

Hydrologic Soil Group—Sedgwick County, Kansas
(Moscelyn Meadows)




Map Scale: 1:1,540 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 14N WGS84

MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points






 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available


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 1:24,000.

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: Sedgwick County, Kansas
 Survey Area Data: Version 10, Sep 3, 2014

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

Date(s) aerial images were photographed: Jul 18, 2010—Sep 27, 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.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Sedgwick County, Kansas (KS173)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
5977	Vanoss silt loam, 1 to 3 percent slopes	B	0.9	20.3%
5982	Nalim loam, 1 to 3 percent slopes	C	0.1	2.0%
6323	Blanket silt loam, 1 to 3 percent slopes	C	3.6	77.6%
Totals for Area of Interest			4.6	100.0%

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

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

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

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

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

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

Tie-break Rule: Higher

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

HydraFlow Hydrographs

Offsite Basins

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

1 - Reece Offsite



2 - Moscelyn Ditch



Legend

<u>Hyd.</u>	<u>Origin</u>	<u>Description</u>
1	SCS Runoff	Reece Offsite
2	SCS Runoff	Moscelyn Ditch

Hydrograph Return Period Recap

Hydroflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

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	-----	7.425	10.71	1.067	15.61	19.11	23.65	27.70	32.25	Reece Offsite
2	SCS Runoff	-----	5.030	7.652	0.431	11.65	14.55	18.37	21.80	25.70	Moscelyn Ditch

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	10.71	2	740	1.271	-----	-----	-----	Reece Offsite
2	SCS Runoff	7.652	2	744	1.009	-----	-----	-----	Moscelyn Ditch
					<p>E:\Projects\Moscelyn Meadows Drainage Plan\Water Resources\HydraFlow\moscelyn10.m</p>				

Hydrograph Report

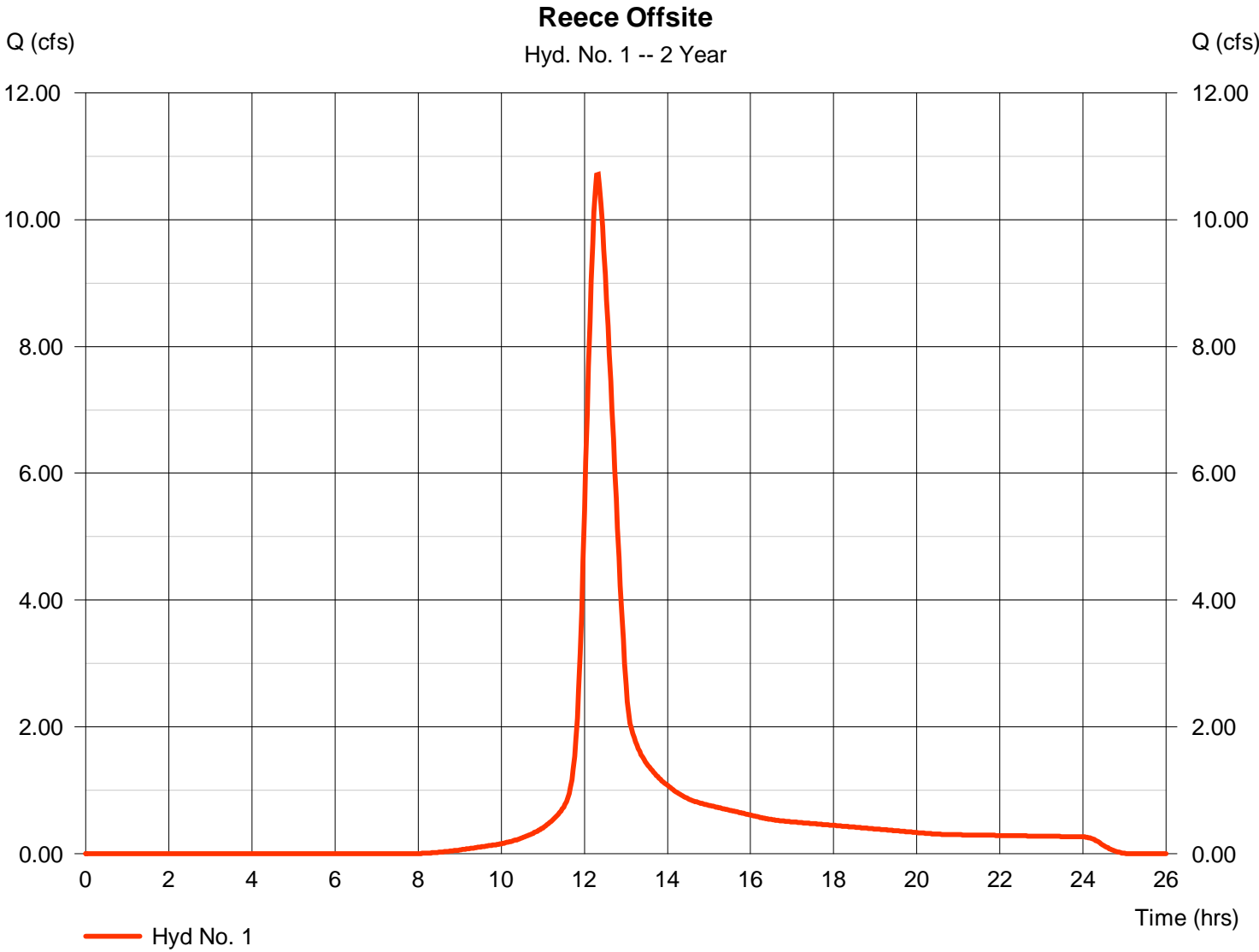
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Monday, 10 / 20 / 2014

Hyd. No. 1

Reece Offsite

Hydrograph type	= SCS Runoff	Peak discharge	= 10.71 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.33 hrs
Time interval	= 2 min	Hyd. volume	= 1.271 acft
Drainage area	= 7.800 ac	Curve number	= 84
Basin Slope	= 1.1 %	Hydraulic length	= 1800 ft
Tc method	= LAG	Time of conc. (Tc)	= 42.64 min
Total precip.	= 3.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

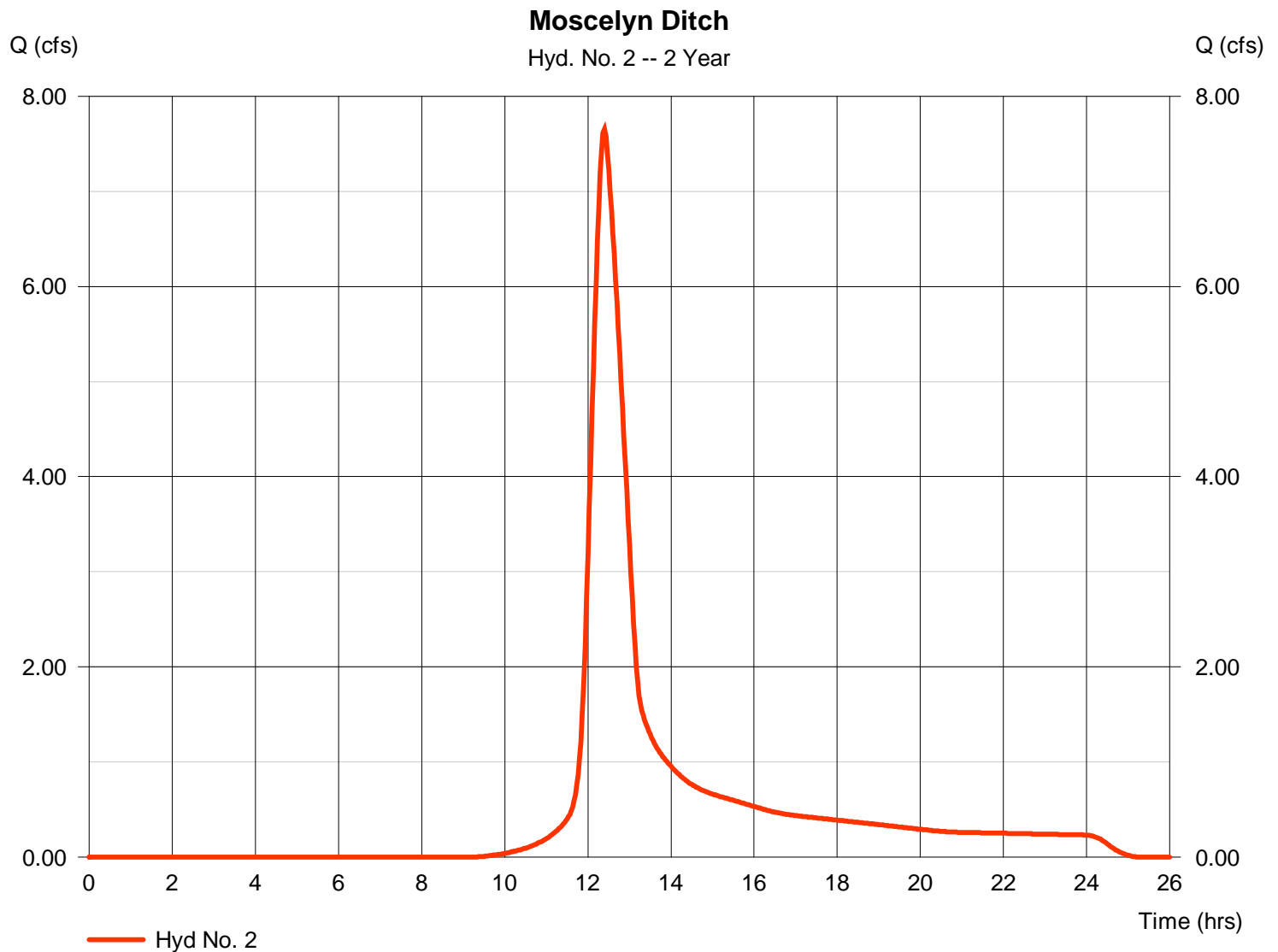
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Monday, 10 / 20 / 2014

Hyd. No. 2

Moscelyn Ditch

Hydrograph type	= SCS Runoff	Peak discharge	= 7.652 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.40 hrs
Time interval	= 2 min	Hyd. volume	= 1.009 acft
Drainage area	= 7.400 ac	Curve number	= 80
Basin Slope	= 1.4 %	Hydraulic length	= 2200 ft
Tc method	= LAG	Time of conc. (Tc)	= 50.56 min
Total precip.	= 3.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

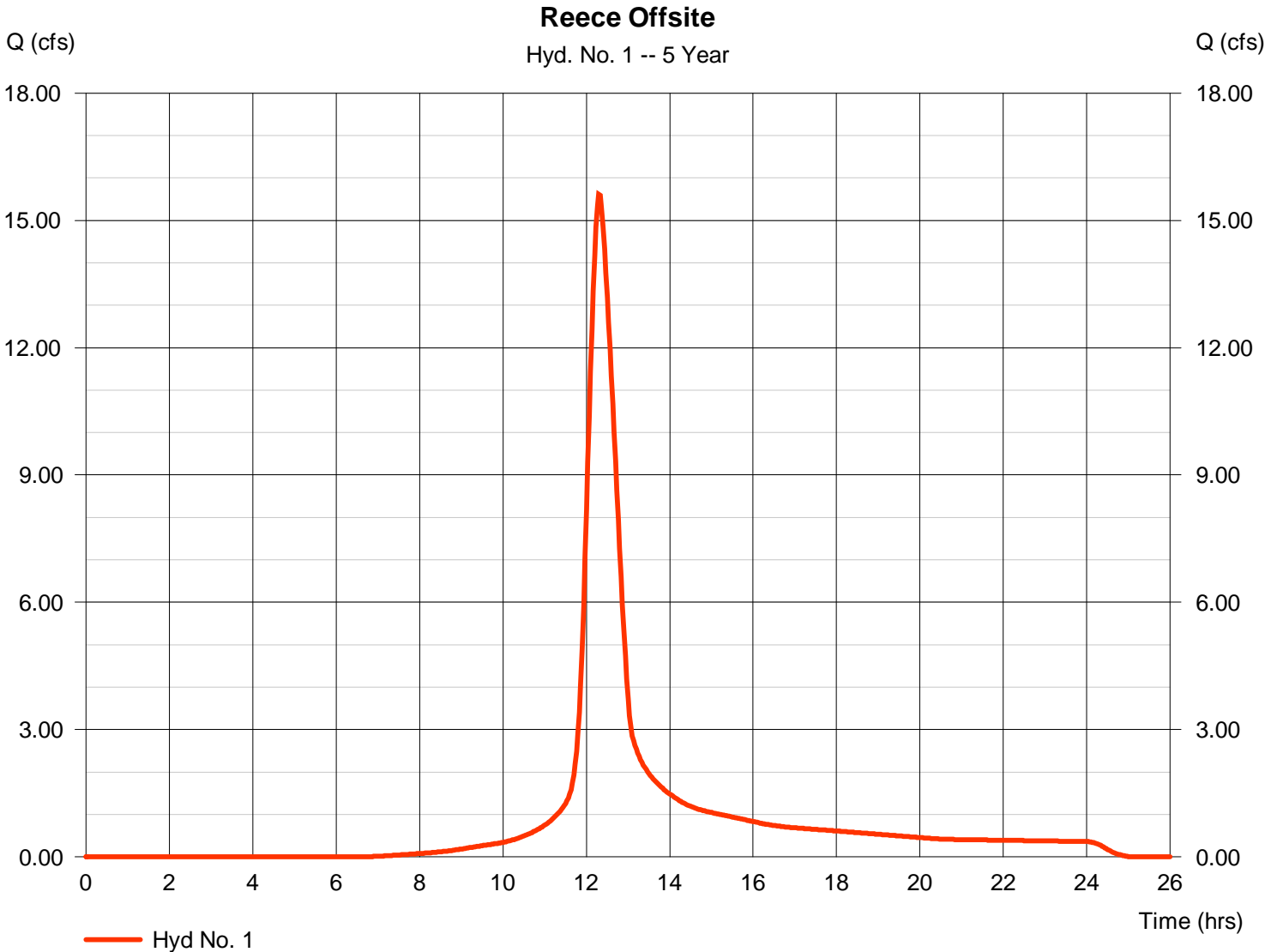
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	15.61	2	738	1.848	-----	-----	-----	Reece Offsite
2	SCS Runoff	11.65	2	744	1.518	-----	-----	-----	Moscelyn Ditch
					E:\Projects\Moscelyn Meadows Drainage Plan\Water Resources\HydraFlow\moscelyn10.m				
					Water Resources\HydraFlow\moscelyn10.m / 2014				

Hydrograph Report

Hyd. No. 1

Reece Offsite

Hydrograph type	= SCS Runoff	Peak discharge	= 15.61 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.30 hrs
Time interval	= 2 min	Hyd. volume	= 1.848 acft
Drainage area	= 7.800 ac	Curve number	= 84
Basin Slope	= 1.1 %	Hydraulic length	= 1800 ft
Tc method	= LAG	Time of conc. (Tc)	= 42.64 min
Total precip.	= 4.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

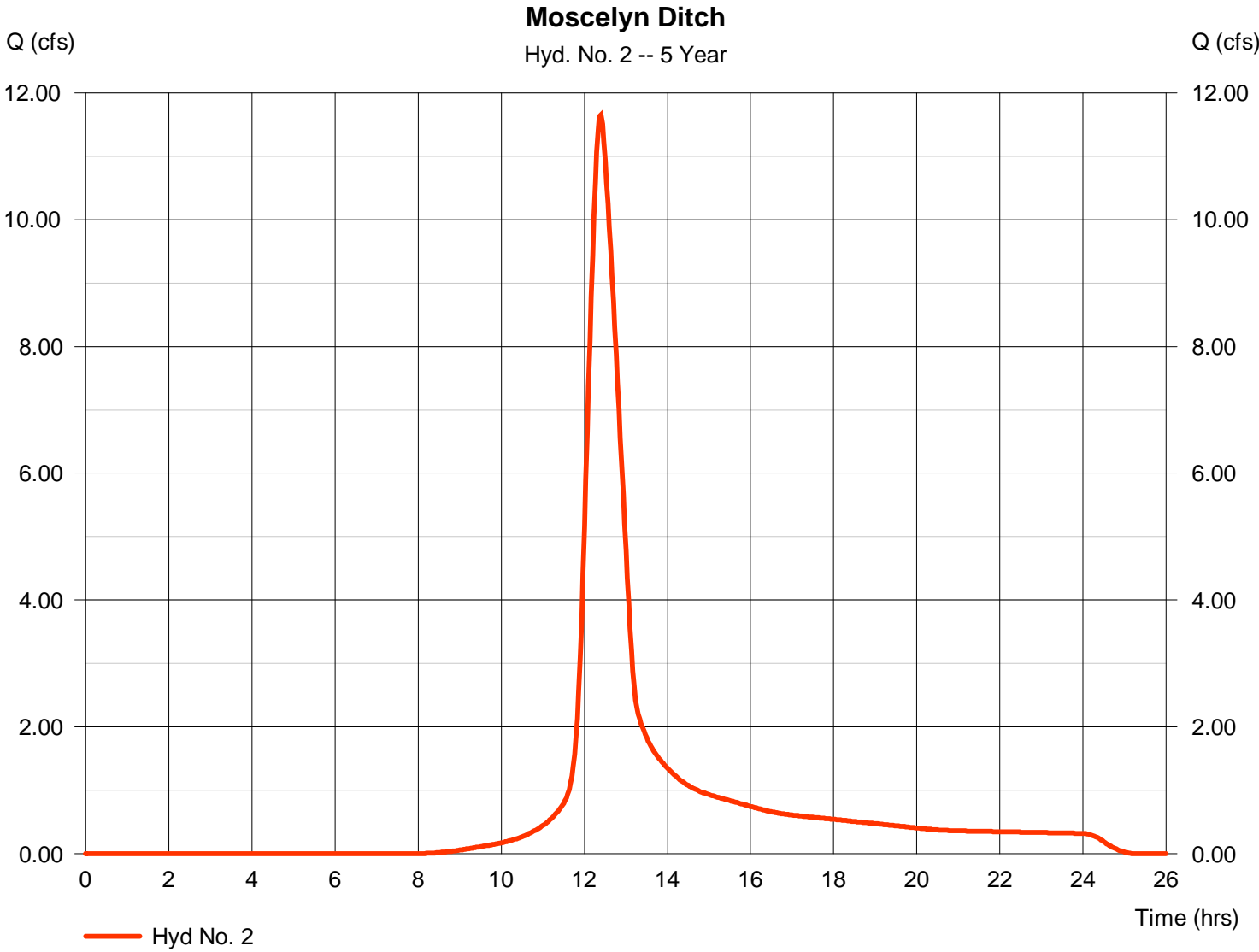
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Monday, 10 / 20 / 2014

Hyd. No. 2

Moscelyn Ditch

Hydrograph type	= SCS Runoff	Peak discharge	= 11.65 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.40 hrs
Time interval	= 2 min	Hyd. volume	= 1.518 acft
Drainage area	= 7.400 ac	Curve number	= 80
Basin Slope	= 1.4 %	Hydraulic length	= 2200 ft
Tc method	= LAG	Time of conc. (Tc)	= 50.56 min
Total precip.	= 4.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	19.11	2	738	2.267	-----	-----	-----	Reece Offsite
2	SCS Runoff	14.55	2	744	1.892	-----	-----	-----	Moscelyn Ditch
					E:\Projects\Moscelyn Meadows Drainage Plan\Water Resources\HydraFlow\moscelyn\10/20 / 2014				

Hydrograph Report

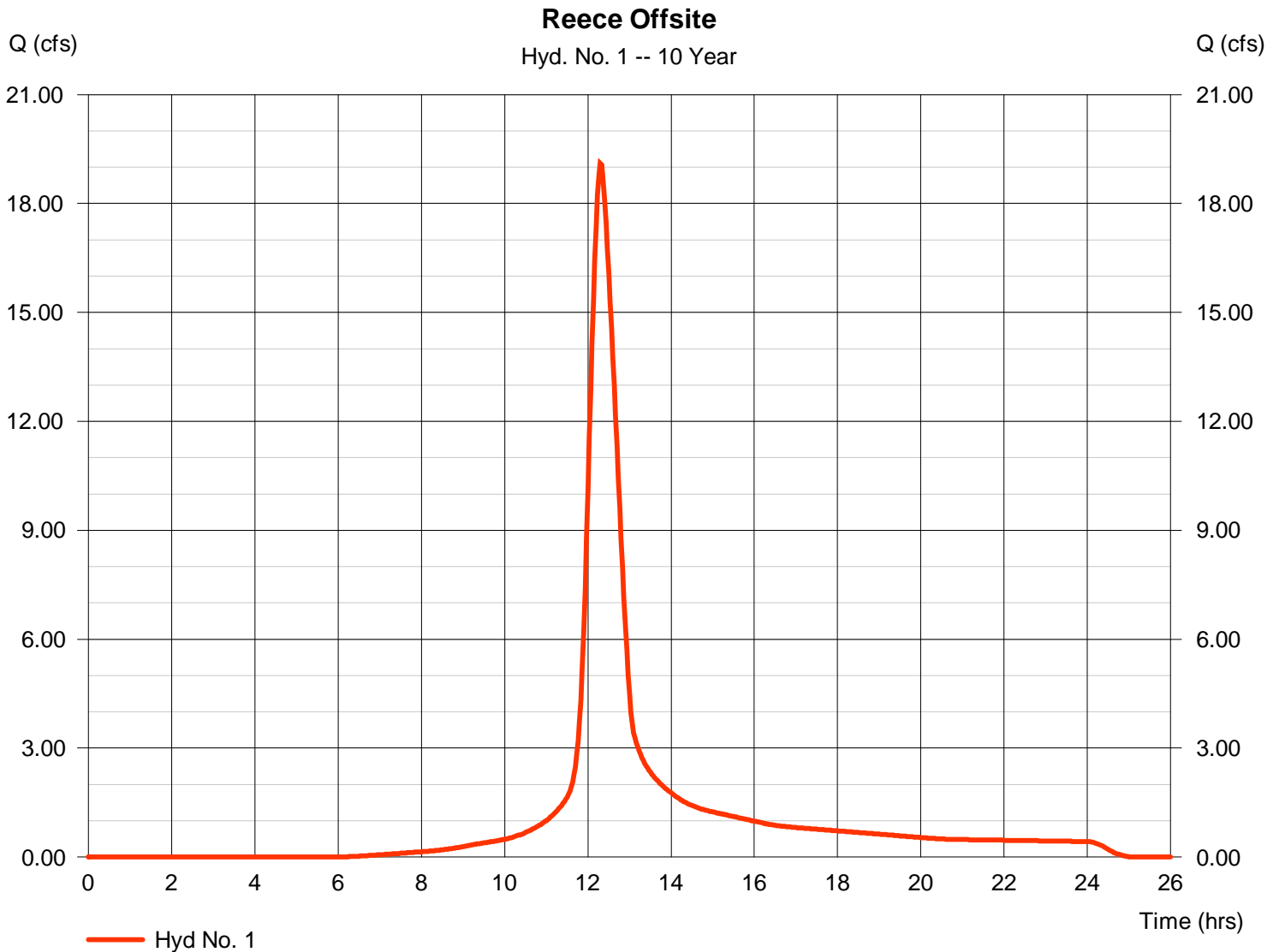
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Monday, 10 / 20 / 2014

Hyd. No. 1

Reece Offsite

Hydrograph type	= SCS Runoff	Peak discharge	= 19.11 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.30 hrs
Time interval	= 2 min	Hyd. volume	= 2.267 acft
Drainage area	= 7.800 ac	Curve number	= 84
Basin Slope	= 1.1 %	Hydraulic length	= 1800 ft
Tc method	= LAG	Time of conc. (Tc)	= 42.64 min
Total precip.	= 5.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

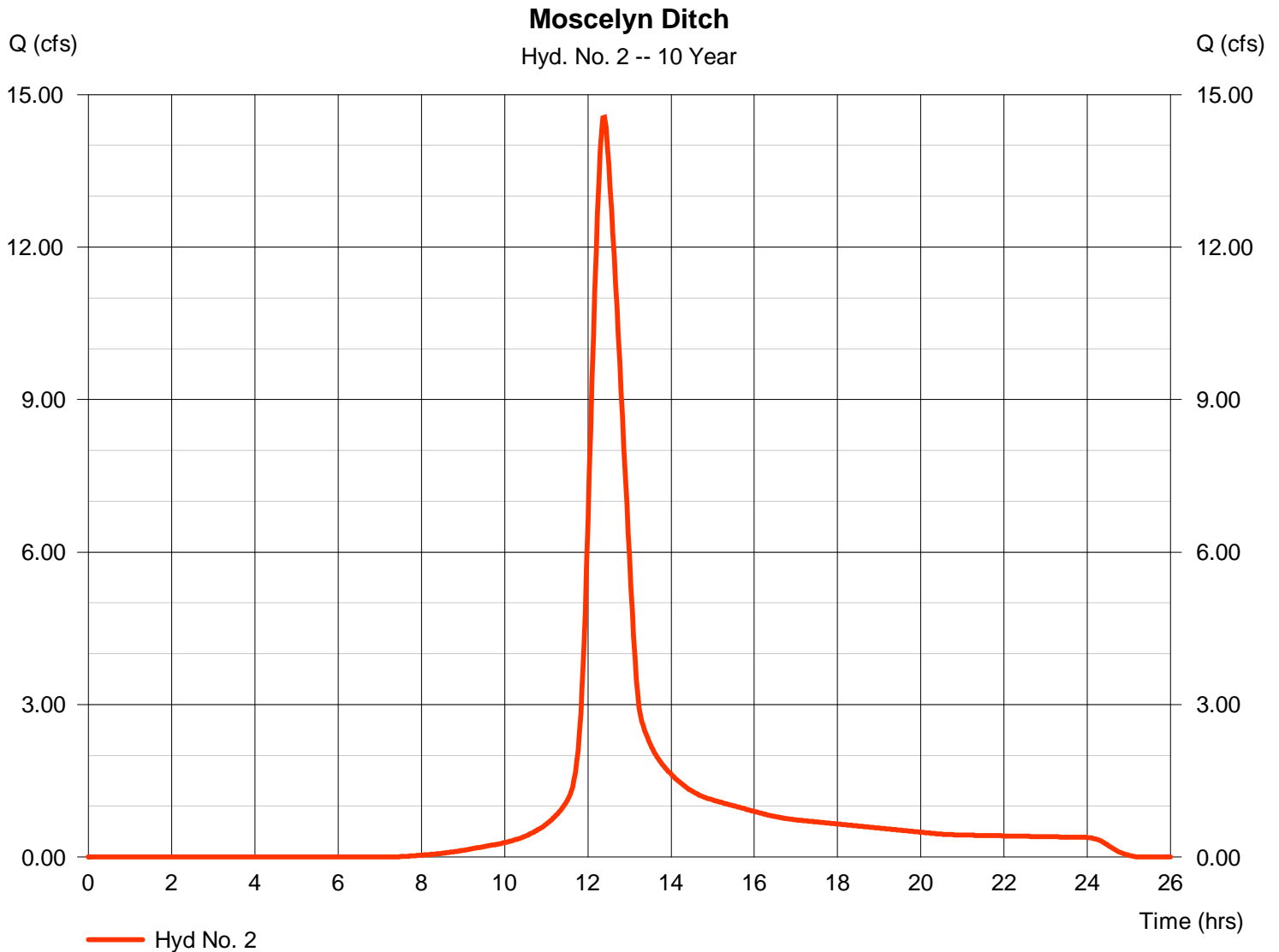
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Monday, 10 / 20 / 2014

Hyd. No. 2

Moscelyn Ditch

Hydrograph type	= SCS Runoff	Peak discharge	= 14.55 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.40 hrs
Time interval	= 2 min	Hyd. volume	= 1.892 acft
Drainage area	= 7.400 ac	Curve number	= 80
Basin Slope	= 1.4 %	Hydraulic length	= 2200 ft
Tc method	= LAG	Time of conc. (Tc)	= 50.56 min
Total precip.	= 5.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	23.65	2	738	2.815	-----	-----	-----	Reece Offsite
2	SCS Runoff	18.37	2	742	2.387	-----	-----	-----	Moscelyn Ditch
					E:\Projects\Moscelyn Meadows Drainage Plan\Water Resources\HydroFlow\moscelyn10.m				
					Water Resources 25 Year Flood Moscelyn 10/20 / 2014				

Hydrograph Report

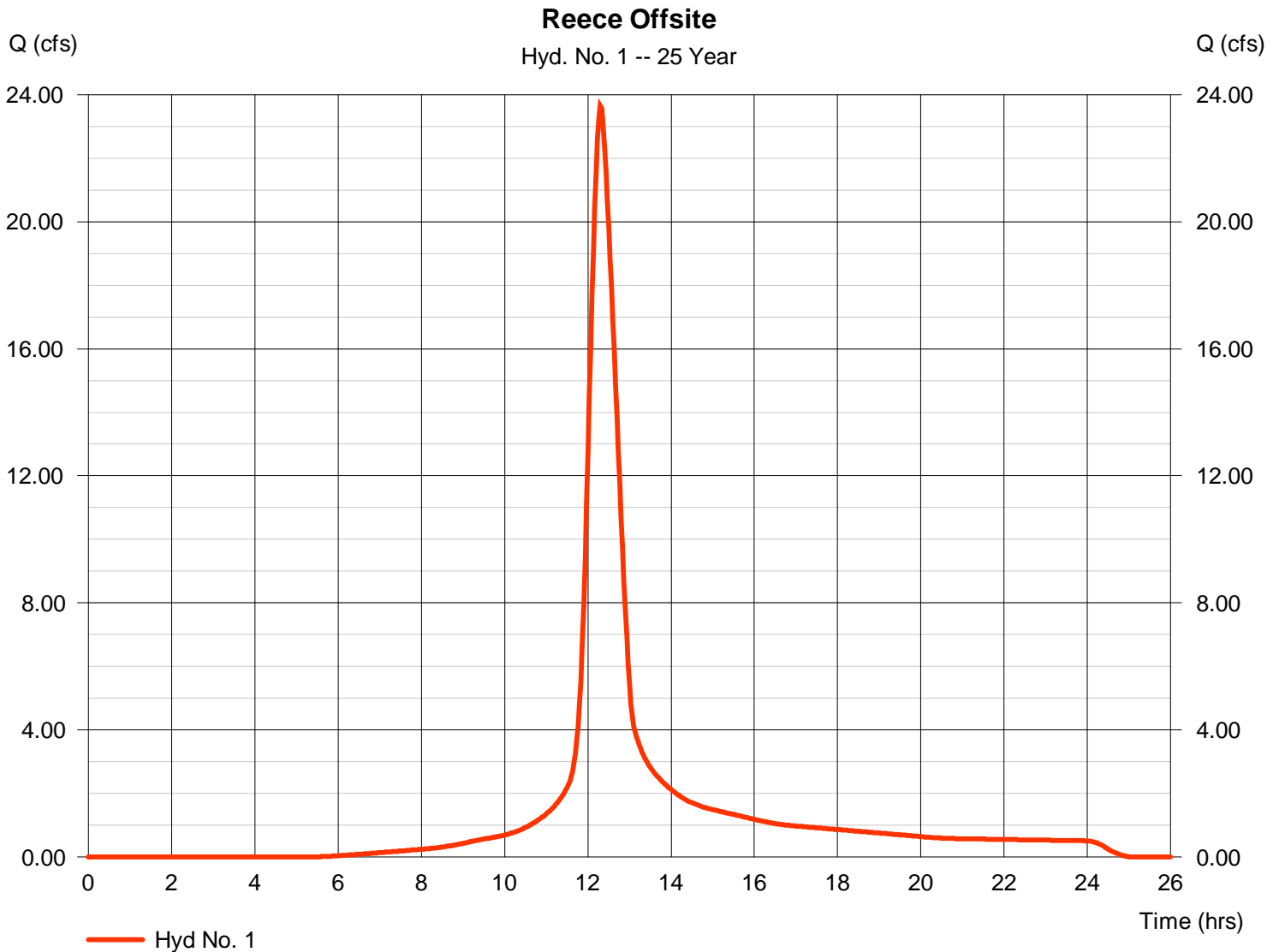
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Monday, 10 / 20 / 2014

Hyd. No. 1

Reece Offsite

Hydrograph type	= SCS Runoff	Peak discharge	= 23.65 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.30 hrs
Time interval	= 2 min	Hyd. volume	= 2.815 acft
Drainage area	= 7.800 ac	Curve number	= 84
Basin Slope	= 1.1 %	Hydraulic length	= 1800 ft
Tc method	= LAG	Time of conc. (Tc)	= 42.64 min
Total precip.	= 6.10 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

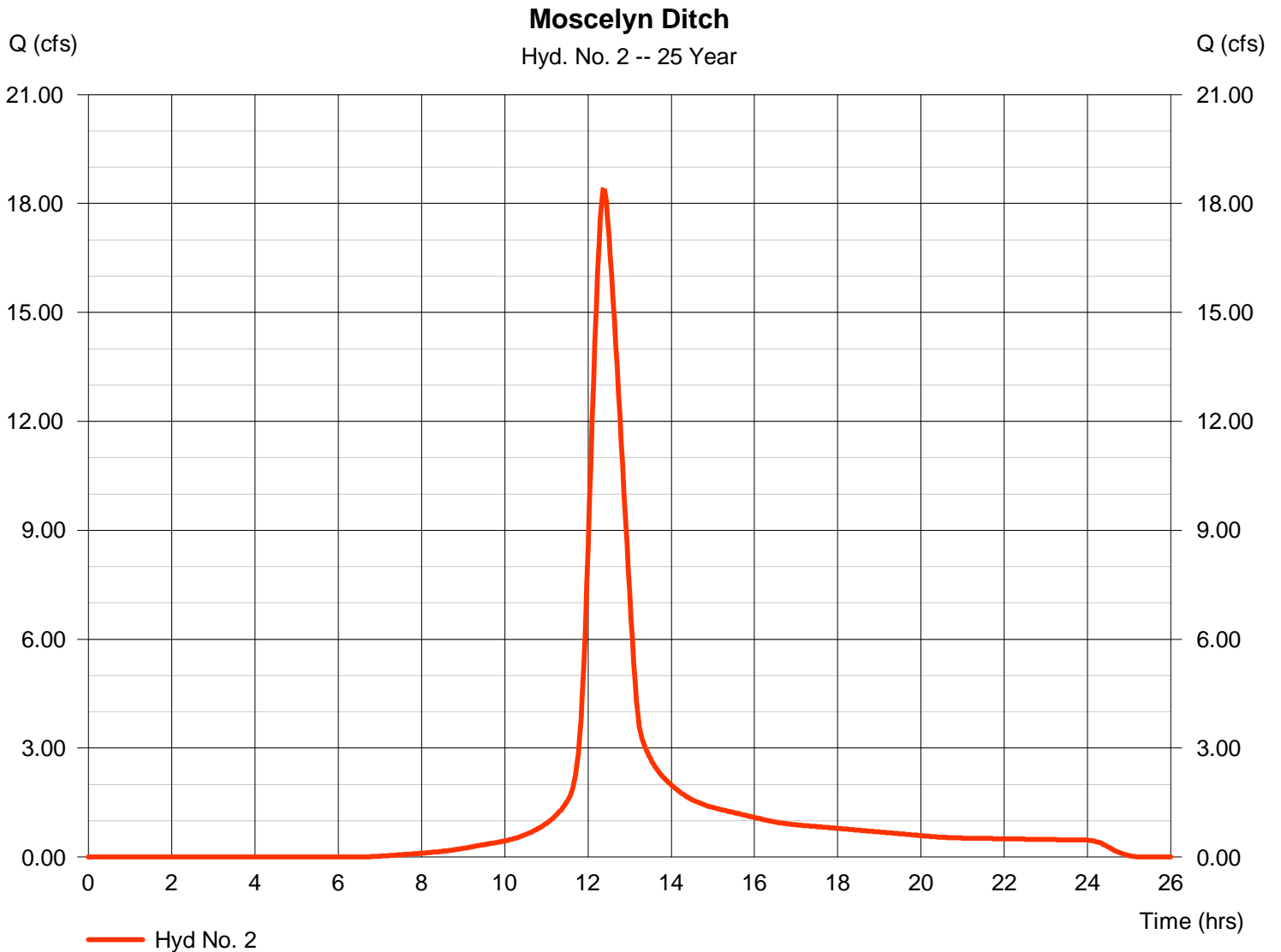
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Monday, 10 / 20 / 2014

Hyd. No. 2

Moscelyn Ditch

Hydrograph type	= SCS Runoff	Peak discharge	= 18.37 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.37 hrs
Time interval	= 2 min	Hyd. volume	= 2.387 acft
Drainage area	= 7.400 ac	Curve number	= 80
Basin Slope	= 1.4 %	Hydraulic length	= 2200 ft
Tc method	= LAG	Time of conc. (Tc)	= 50.56 min
Total precip.	= 6.10 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	32.25	2	738	3.874	-----	-----	-----	Reece Offsite
2	SCS Runoff	25.70	2	742	3.353	-----	-----	-----	Moscelyn Ditch
					E:\Projects\Moscelyn Meadows Drainage Plan\Water Resources\HydroFlow\moscelyn\10/20 / 2014				

Hydrograph Report

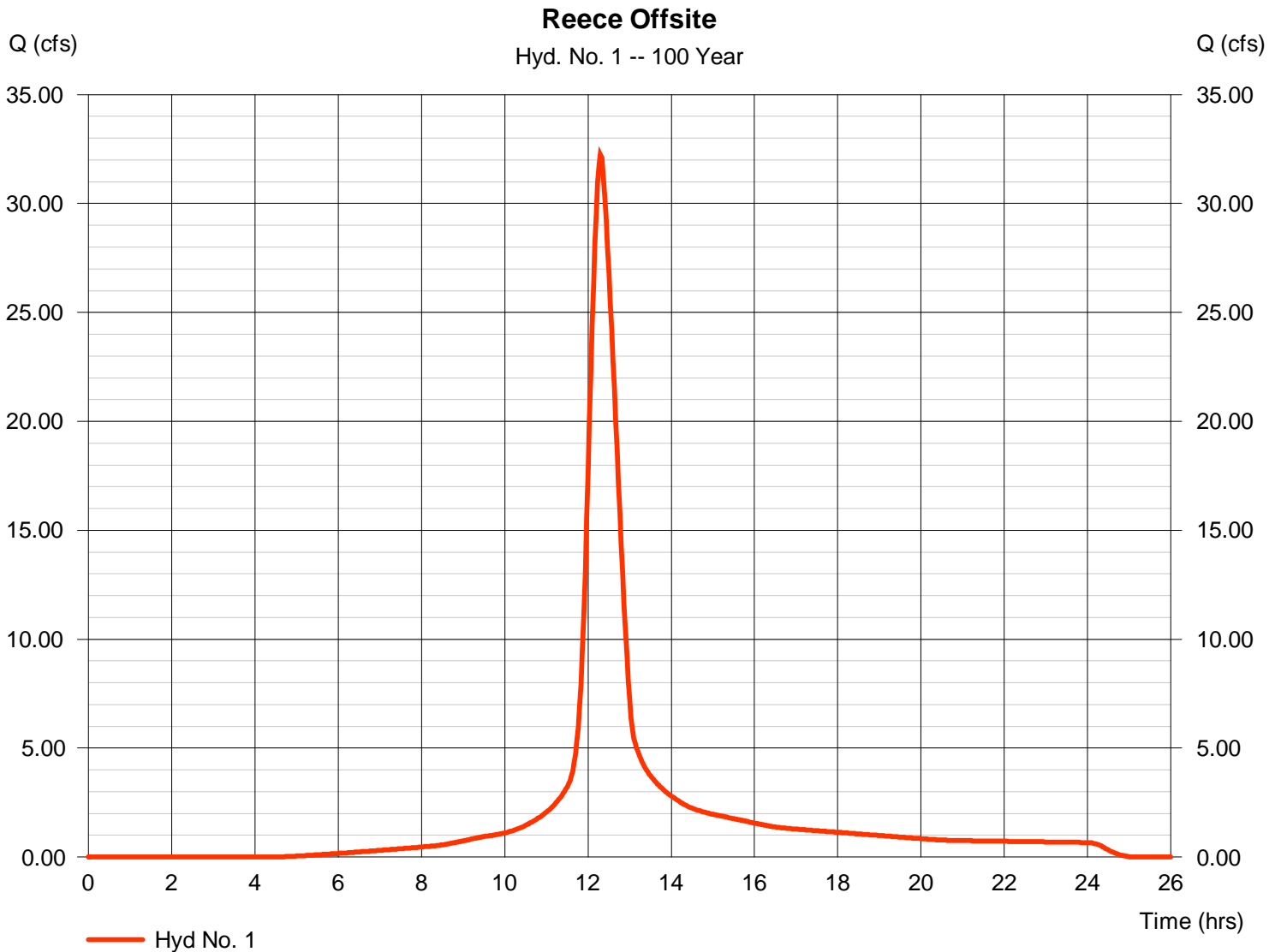
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Monday, 10 / 20 / 2014

Hyd. No. 1

Reece Offsite

Hydrograph type	= SCS Runoff	Peak discharge	= 32.25 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.30 hrs
Time interval	= 2 min	Hyd. volume	= 3.874 acft
Drainage area	= 7.800 ac	Curve number	= 84
Basin Slope	= 1.1 %	Hydraulic length	= 1800 ft
Tc method	= LAG	Time of conc. (Tc)	= 42.64 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

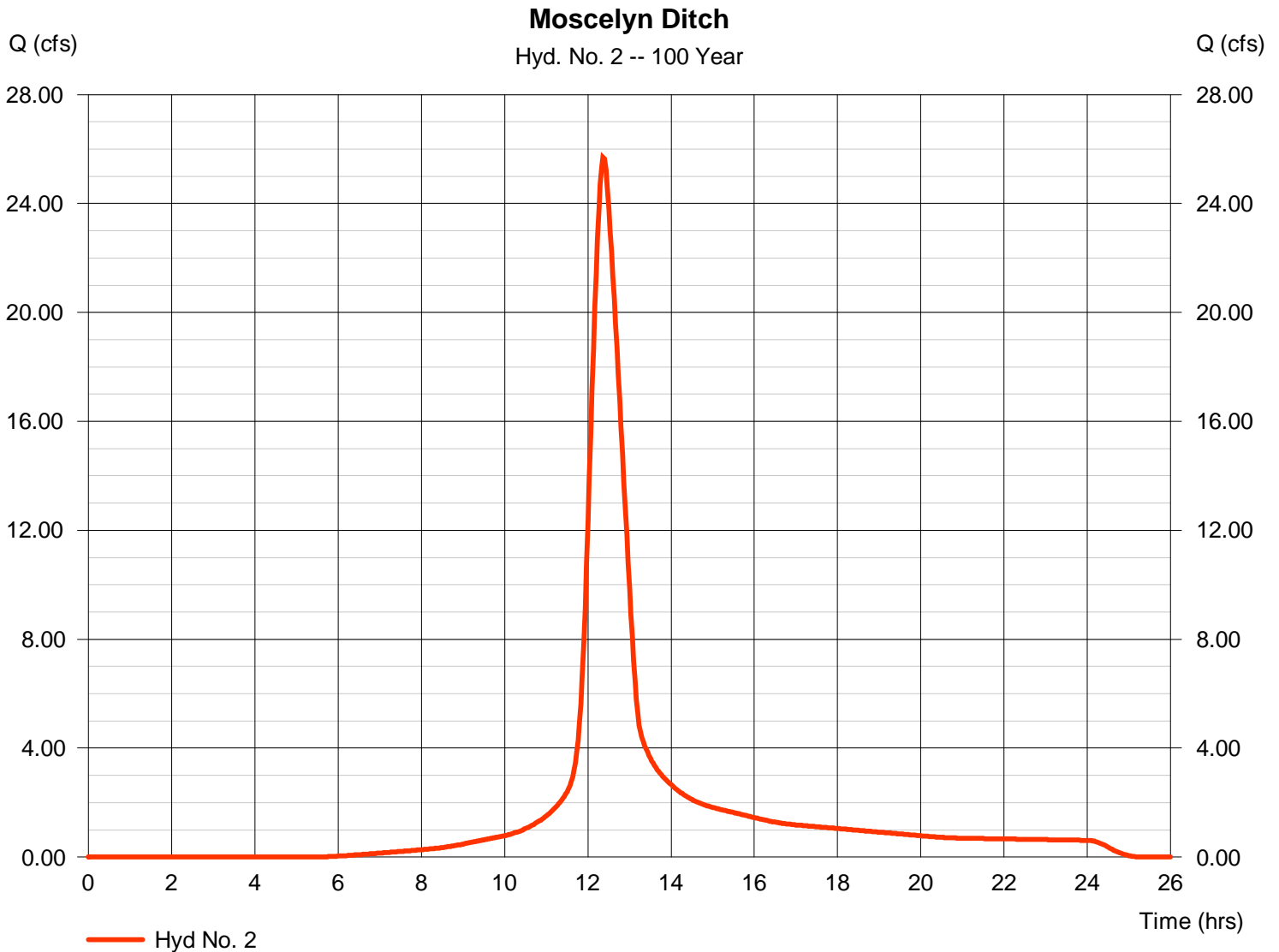
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Monday, 10 / 20 / 2014

Hyd. No. 2

Moscelyn Ditch

Hydrograph type	= SCS Runoff	Peak discharge	= 25.70 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.37 hrs
Time interval	= 2 min	Hyd. volume	= 3.353 acft
Drainage area	= 7.400 ac	Curve number	= 80
Basin Slope	= 1.4 %	Hydraulic length	= 2200 ft
Tc method	= LAG	Time of conc. (Tc)	= 50.56 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Monday, 10 / 20 / 2014

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	27.8967	9.8000	0.7047	-----
2	76.3137	14.3000	0.8844	-----
3	1.2000	0.1000	0.0000	-----
5	52.6224	11.2000	0.7497	-----
10	55.1841	11.1000	0.7229	-----
25	60.7012	11.1000	0.7068	-----
50	66.9222	11.3000	0.7004	-----
100	62.2794	10.1000	0.6624	-----

File name: wich_IDF.IDF

$$\text{Intensity} = B / (T_c + D)^E$$

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.18	3.40	2.90	2.55	2.29	2.08	1.91	1.78	1.66	1.56	1.48	1.40
2	5.57	4.54	3.85	3.35	2.97	2.67	2.43	2.23	2.06	1.92	1.80	1.69
3	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
5	6.52	5.33	4.55	3.99	3.57	3.24	2.97	2.75	2.57	2.41	2.27	2.15
10	7.40	6.09	5.22	4.60	4.13	3.76	3.46	3.21	3.00	2.82	2.67	2.53
25	8.51	7.03	6.05	5.35	4.81	4.39	4.05	3.76	3.52	3.32	3.14	2.98
50	9.47	7.86	6.78	6.00	5.41	4.94	4.56	4.24	3.98	3.75	3.55	3.37
100	10.31	8.53	7.37	6.53	5.90	5.40	5.00	4.66	4.37	4.13	3.92	3.73

T_c = time in minutes. Values may exceed 60.

Precip. file name: wich_24hr.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.80	3.50	1.20	4.50	5.20	6.10	6.90	7.80
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

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Drainage Plan
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