Encompass
ENGINEERING & SURVEYING

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RE: Marian Meadows Preliminary PUD-Preliminary Proposed Stormwater

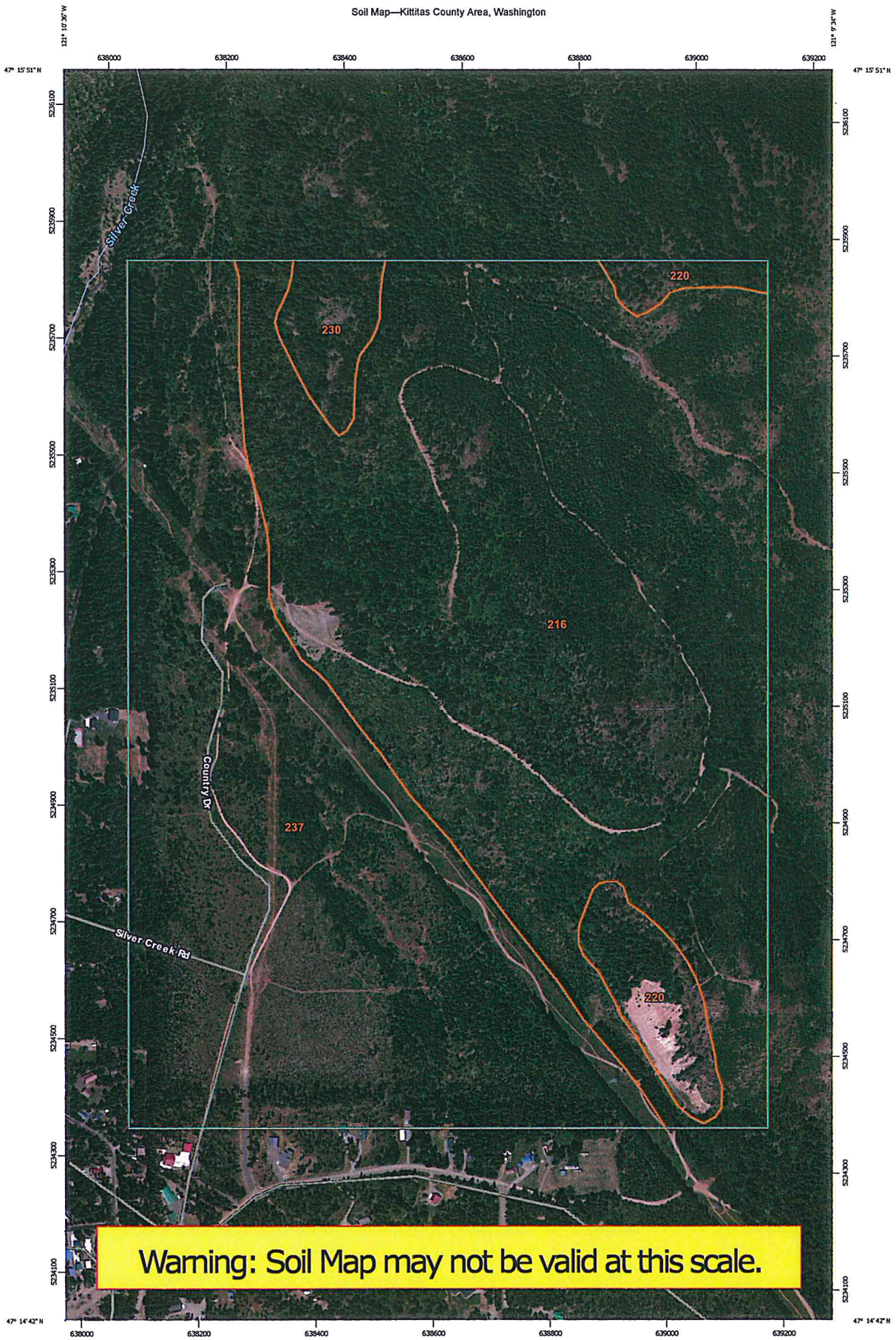
This memo is intended to accompany the preliminary development plan for the Marian Meadows PUD. This memo speaks to the general, preliminary stormwater plan. Further design and analysis will be completed in the final design of the project.

In general, stormater is expected to be managed in two ways. For the large lot area, Residential Division 7 as shown in the Phasing Plan, stormwater is expected to be managed using a combination of infiltration and full dispersion. The area of the proposed parcels in this region range from 68± to 95± acres and are expected to have impervious areas of less than 1% of each parcel. The use of infiltration and dispersion in this area will effectively mitigate any increase of stormwater runoff produced by the region.

The remaining areas located in the flatter region of the site are expected to infiltrate at least a portion of the runoff produced by the remainder of the site. The native soils in this area are characterized by the National Cooperative Soil Survey (NRCS) as being Kladnick ashy sandy loam which is a hydraulic soil group A soil. The capacity of the most limiting layer to transmit water (Ksat) is high, ranging from 1.98 to 5.95 inches per hour per the NRCS. Site specific infiltration rates are not available at this time so an infiltration rate of 2 inches per hour was used for the preliminary sizing.

This flatter region is characterized by more dense development consisting of single family residences, townhomes, RV storage facilities, camping, and community amenities. The approximate impervious assumptions for this area are detailed on the Phasing Plan. The approximate overall storage volume was determined using HydroCAD version 10.00-18 with the existing conditions and proposed impervious estimates as stated. The flow control requirements for the site include maintaining a 2-year peak flow rate equal to 50% of the existing 2-year peak flow rate as well as matching existing and developed peak flow rate for the 10-year storm. The resulting storage volume included a total pond bottom area of approximately 1.35 acres with an approximate depth of 3 feet needed to maintain the required release rates and contain 100-year design storm without overtopping. The final stormwater design will include multiple smaller ponds situated within the hatched areas designated on the Site and Utility Plan. The areas designated as potential stormwater locations include approximately 29 acres.

The NRCS soil data and preliminary HydroCAD results can be found in the following pages.


121° 10' 36" W
121° 9' 34" W
47° 15' 51" N
47° 14' 42" N
638000
638200
638400
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5236100
5235900
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Silver Creek
Country Dr
Silver Creek Rd
220
230
216
237
220
Warning: Soil Map may not be valid at this scale.
Map Scale: 1:5,990 if printed on B portrait (11" x 17") sheet.
Meters
0 50 100 200 300
N
Feet
0 250 500 1000 1500
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N 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 1:24,000.

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: Kittitas County Area, Washington
Survey Area Data: Version 9, Sep 9, 2016

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

Date(s) aerial images were photographed: Jul 25, 2010—Aug 19, 2010

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

Kittitas County Area, Washington (WA637)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
216	Roxer gravelly ashy sandy loam, 45 to 65 percent slopes	217.9	54.2%
220	Roxer complex, 45 to 65 percent slopes	16.2	4.0%
230	Rock outcrop-Roxer complex, 40 to 70 percent slopes	8.9	2.2%
237	Kladnick ashy sandy loam, 0 to 3 percent slopes	158.8	39.5%
Totals for Area of Interest		**401.8**	**100.0%**

Kittitas County Area, Washington

216—Roxer gravelly ashy sandy loam, 45 to 65 percent slopes

Map Unit Setting

National map unit symbol: 2kvb
Elevation: 2,000 to 5,400 feet
Mean annual precipitation: 40 to 65 inches
Mean annual air temperature: 43 to 45 degrees F
Frost-free period: 85 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Roxer and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Roxer

Setting

Landform: Mountain slopes
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Colluvium from basalt and glacial till with a mantle of volcanic ash

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
H1 - 1 to 8 inches: gravelly ashy sandy loam
H2 - 8 to 33 inches: very gravelly loam
H3 - 33 to 44 inches: very cobbly loam
H4 - 44 to 60 inches: very cobbly loam

Properties and qualities

Slope: 45 to 65 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: 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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Other vegetative classification: grand fir/vine maple (CWS551)
Hydric soil rating: No

Minor Components

Bograp

Percent of map unit: 10 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Kittitas County Area, Washington
Survey Area Data: Version 9, Sep 9, 2016

Kittitas County Area, Washington

220—Roxer complex, 45 to 65 percent slopes

Map Unit Setting

National map unit symbol: 2kvg
Elevation: 2,100 to 4,400 feet
Mean annual precipitation: 35 to 50 inches
Mean annual air temperature: 43 to 45 degrees F
Frost-free period: 85 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Roxer, basalt substratum, and similar soils: 55 percent
Roxer and similar soils: 40 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Roxer, Basalt Substratum

Setting

Landform: Mountain slopes
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Colluvium from basalt and glacial till over bedrock with a mantle of volcanic ash

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
H1 - 1 to 8 inches: gravelly ashy sandy loam
H2 - 8 to 33 inches: very gravelly loam
H3 - 33 to 44 inches: very cobbly loam
H4 - 44 to 51 inches: unweathered bedrock

Properties and qualities

Slope: 45 to 65 percent
Depth to restrictive feature: 40 to 50 inches to lithic bedrock
Natural drainage class: 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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Other vegetative classification: Douglas-fir/pachistima (CDS411)
Hydric soil rating: No

Description of Roxer

Setting

Landform: Mountain slopes
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Colluvium from basalt and glacial till with a mantle of volcanic ash

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
H1 - 1 to 8 inches: gravelly ashy sandy loam
H2 - 8 to 33 inches: very gravelly loam
H3 - 33 to 44 inches: very cobbly loam
H4 - 44 to 60 inches: very cobbly loam

Properties and qualities

Slope: 45 to 65 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: 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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Other vegetative classification: Douglas-fir/pachistima (CDS411)
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Kittitas County Area, Washington
Survey Area Data: Version 9, Sep 9, 2016

Kittitas County Area, Washington

230—Rock outcrop-Roxer complex, 40 to 70 percent slopes

Map Unit Setting

National map unit symbol: 2kvr
Elevation: 2,300 to 5,800 feet
Mean annual precipitation: 40 to 65 inches
Mean annual air temperature: 43 to 45 degrees F
Frost-free period: 80 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 50 percent
Roxer and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Typical profile

R - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 40 to 70 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Description of Roxer

Setting

Landform: Mountain slopes, glacial-valley walls
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Colluvium from basalt and glacial till with a mantle of volcanic ash

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
H1 - 1 to 8 inches: gravelly ashy sandy loam
H2 - 8 to 33 inches: very gravelly loam
H3 - 33 to 44 inches: very cobbly loam
H4 - 44 to 60 inches: very cobbly loam

Properties and qualities

Slope: 40 to 70 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: 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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Other vegetative classification: grand fir/vine maple (CWS551)
Hydric soil rating: No

Minor Components

Bograp

Percent of map unit: 10 percent
Hydric soil rating: No

Rubble land

Percent of map unit: 5 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Kittitas County Area, Washington
Survey Area Data: Version 9, Sep 9, 2016

Kittitas County Area, Washington

237—Kladnick ashy sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2kvx
Elevation: 2,000 to 3,000 feet
Mean annual precipitation: 45 to 75 inches
Mean annual air temperature: 43 to 45 degrees F
Frost-free period: 90 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Kladnick and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kladnick

Setting

Landform: Terraces
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Glacial outwash with a mantle of volcanic ash

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
H1 - 1 to 9 inches: ashy sandy loam
H2 - 9 to 15 inches: gravelly ashy sandy loam
H3 - 15 to 24 inches: very gravelly sandy loam
H4 - 24 to 60 inches: extremely gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Other vegetative classification: grand fir/vine maple (CWS551)
Hydric soil rating: No

Minor Components

Roslyn

Percent of map unit: 5 percent
Hydric soil rating: No

Kachess

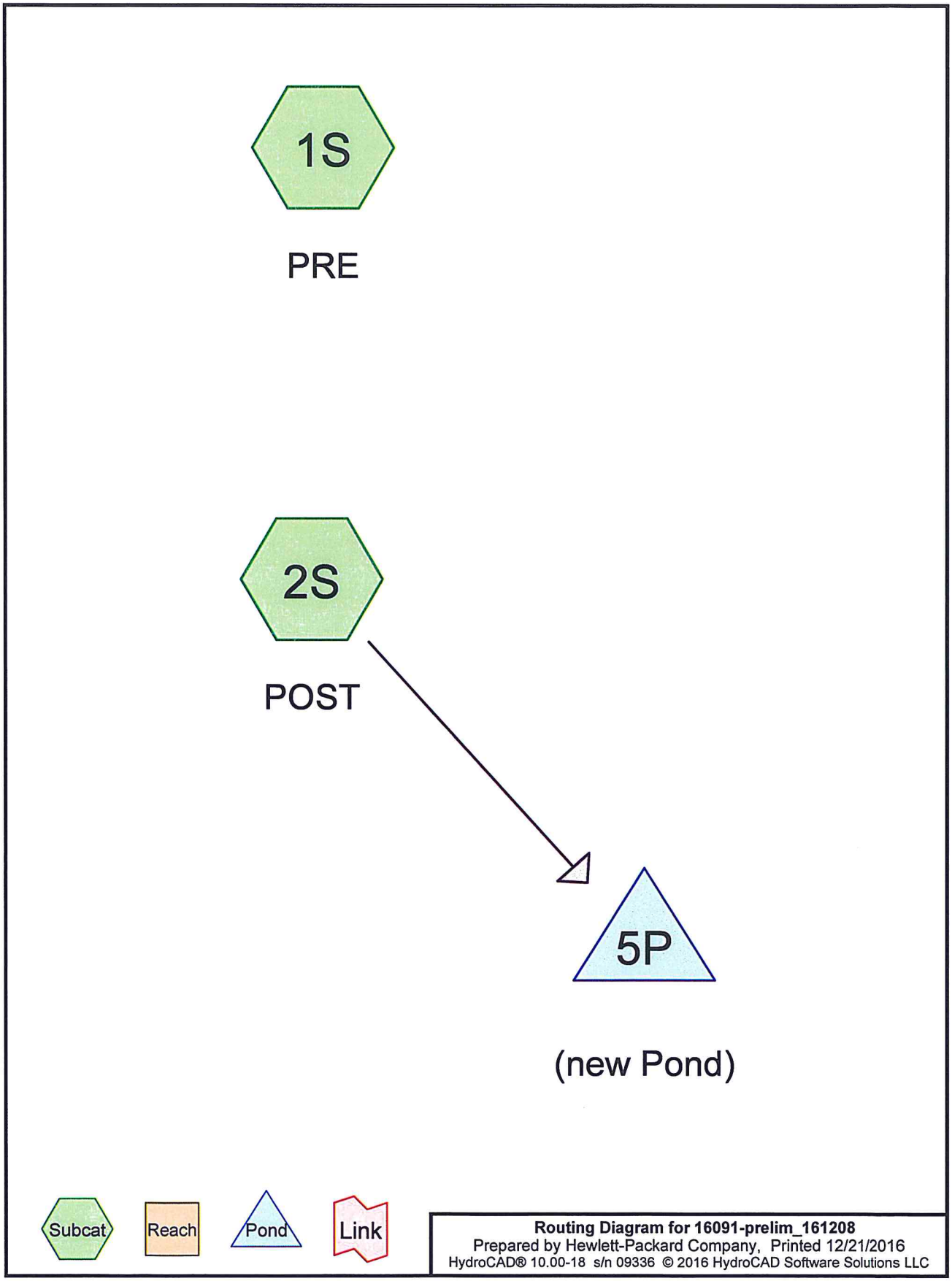
Percent of map unit: 5 percent
Hydric soil rating: No

Bertolotti

Percent of map unit: 5 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Kittitas County Area, Washington
Survey Area Data: Version 9, Sep 9, 2016



Routing Diagram for 16091-prelim_161208
Prepared by Hewlett-Packard Company, Printed 12/21/2016

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
32.640	98	Paved roads w/curbs & sewers, HSG A (2S)
216.940	43	Woods/grass comb., Fair, HSG A (1S, 2S)
249.580	**50**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
249.580	HSG A	1S, 2S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
249.580		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
32.640	0.000	0.000	0.000	0.000	32.640	Paved roads w/curbs & sewers	2S
216.940	0.000	0.000	0.000	0.000	216.940	Woods/grass comb., Fair	1S, 2S
249.580	**0.000**	**0.000**	**0.000**	**0.000**	**249.580**	**TOTAL AREA**	

Summary for Subcatchment 1S: PRE

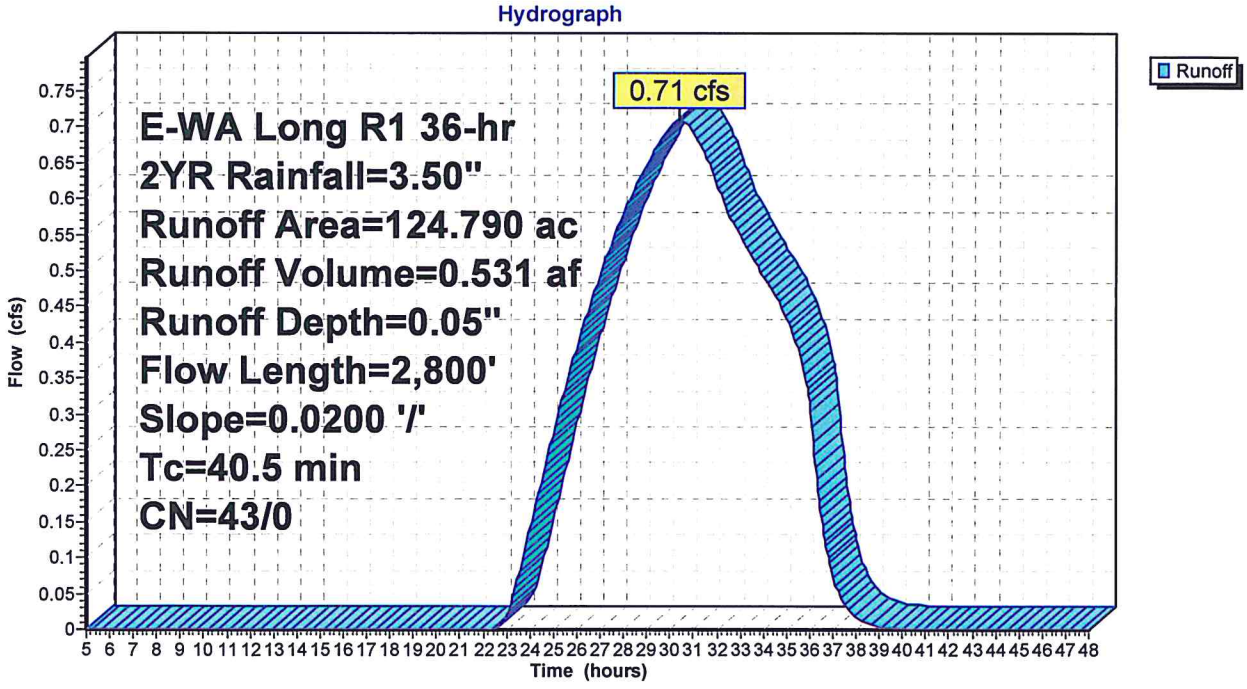
Runoff = 0.71 cfs @ 30.40 hrs, Volume= 0.531 af, Depth= 0.05"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
E-WA Long R1 36-hr 2YR Rainfall=3.50"

Area (ac)	CN	Description
124.790	43	Woods/grass comb., Fair, HSG A
124.790	43	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1	300	0.0200	0.25		**Sheet Flow,** Range n= 0.130 P2= 3.50"
16.8	1,000	0.0200	0.99		**Shallow Concentrated Flow, SHALLOW** Short Grass Pasture Kv= 7.0 fps
3.6	1,500	0.0200	7.01	140.10	**Channel Flow, CHANNEL** Area= 20.0 sf Perim= 20.0' r= 1.00' n= 0.030 Earth, grassed & winding
40.5	2,800	Total			

Subcatchment 1S: PRE



Summary for Subcatchment 2S: POST

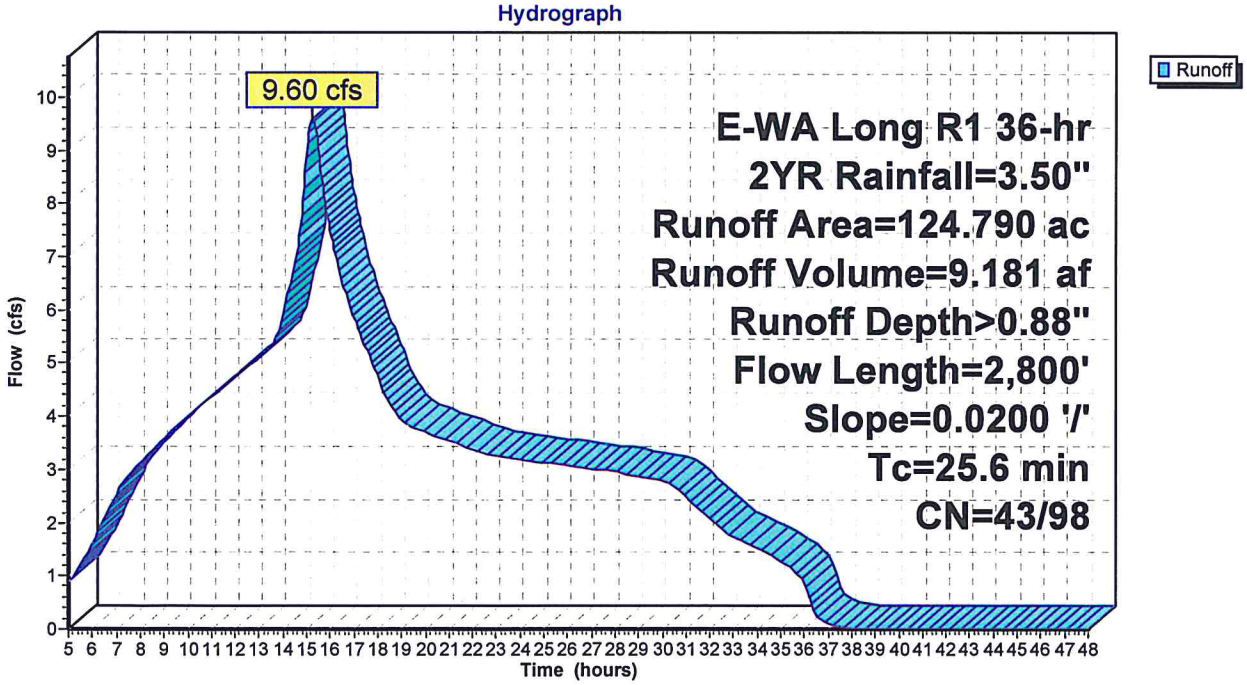
Runoff = 9.60 cfs @ 15.25 hrs, Volume= 9.181 af, Depth> 0.88"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
E-WA Long R1 36-hr 2YR Rainfall=3.50"

Area (ac)	CN	Description
32.640	98	Paved roads w/curbs & sewers, HSG A
92.150	43	Woods/grass comb., Fair, HSG A
124.790	57	Weighted Average
92.150	43	73.84% Pervious Area
32.640	98	26.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1	300	0.0200	0.25		**Sheet Flow, Sheet** Range n= 0.130 P2= 3.50"
5.5	2,500	0.0200	7.58	136.39	**Channel Flow, channel** Area= 18.0 sf Perim= 16.0' r= 1.13' n= 0.030 Earth, grassed & winding
25.6	2,800	Total			

Subcatchment 2S: POST



Summary for Pond 5P: (new Pond)

Inflow Area = 124.790 ac, 26.16% Impervious, Inflow Depth > 0.88" for 2YR event
Inflow = 9.60 cfs @ 15.25 hrs, Volume= 9.181 af
Outflow = 3.90 cfs @ 19.08 hrs, Volume= 9.181 af, Atten= 59%, Lag= 230.1 min
Primary = 0.36 cfs @ 19.08 hrs, Volume= 0.627 af
Secondary = 3.54 cfs @ 19.08 hrs, Volume= 8.554 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 2,201.28' @ 19.08 hrs Surf.Area= 1.569 ac Storage= 1.870 af

Plug-Flow detention time= 226.3 min calculated for 9.179 af (100% of inflow)
Center-of-Mass det. time= 225.6 min (1,351.0 - 1,125.4)

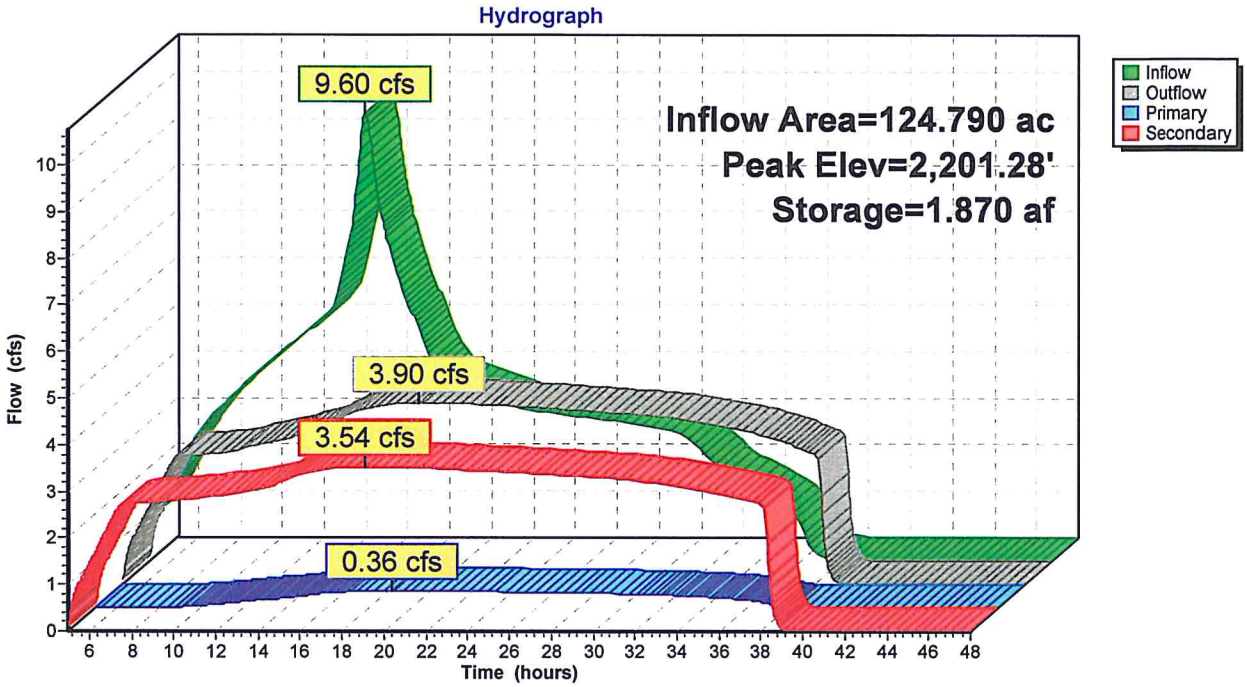
Volume	Invert	Avail.Storage	Storage Description
#1	2,200.00'	5.776 af	**50.00'W x 1,177.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Secondary	2,200.00'	**2.000 in/hr Exfiltration over Horizontal area** Conductivity to Groundwater Elevation = 2,190.00'
#2	Primary	2,200.00'	**3.6" Vert. Orifice/Grate** C= 0.600
#3	Primary	2,201.30'	**13.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.36 cfs @ 19.08 hrs HW=2,201.28' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 0.36 cfs @ 5.12 fps)
└—**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=3.54 cfs @ 19.08 hrs HW=2,201.28' (Free Discharge)
↑—**1=Exfiltration** (Controls 3.54 cfs)

Pond 5P: (new Pond)



Summary for Subcatchment 1S: PRE

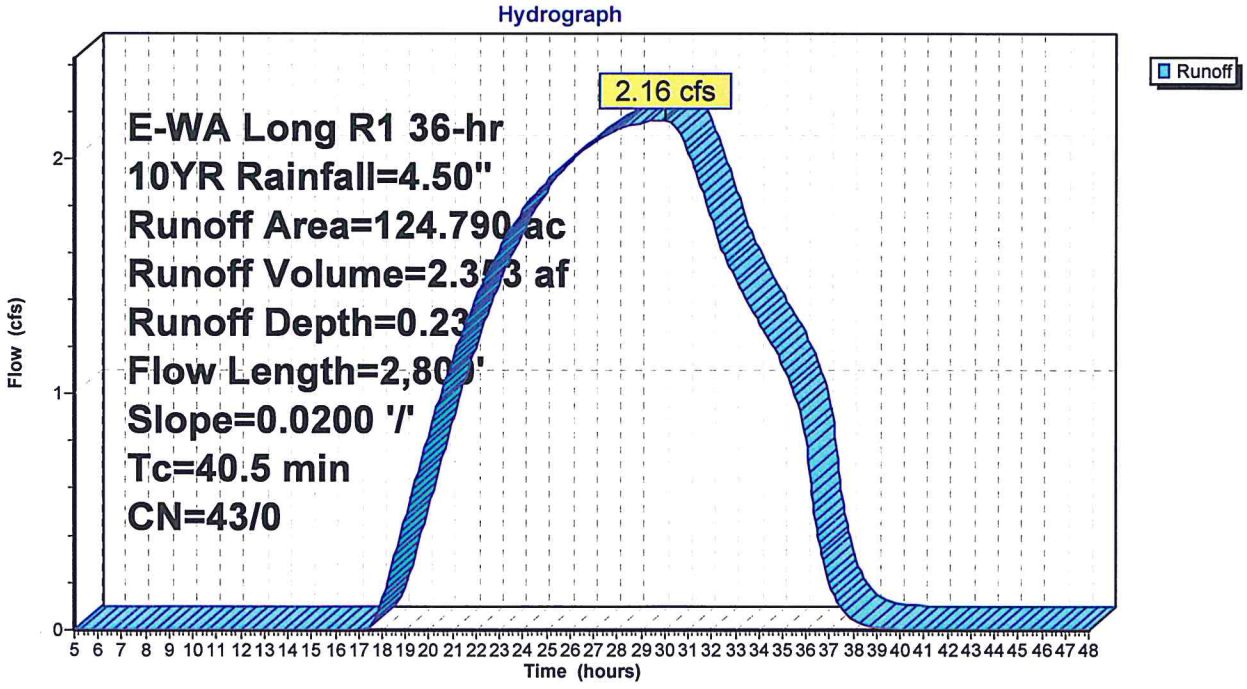
Runoff = 2.16 cfs @ 30.04 hrs, Volume= 2.353 af, Depth= 0.23"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
E-WA Long R1 36-hr 10YR Rainfall=4.50"

Area (ac)	CN	Description
124.790	43	Woods/grass comb., Fair, HSG A
124.790	43	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1	300	0.0200	0.25		**Sheet Flow,** Range n= 0.130 P2= 3.50"
16.8	1,000	0.0200	0.99		**Shallow Concentrated Flow, SHALLOW** Short Grass Pasture Kv= 7.0 fps
3.6	1,500	0.0200	7.01	140.10	**Channel Flow, CHANNEL** Area= 20.0 sf Perim= 20.0' r= 1.00' n= 0.030 Earth, grassed & winding
40.5	2,800	Total			

Subcatchment 1S: PRE



Summary for Subcatchment 2S: POST

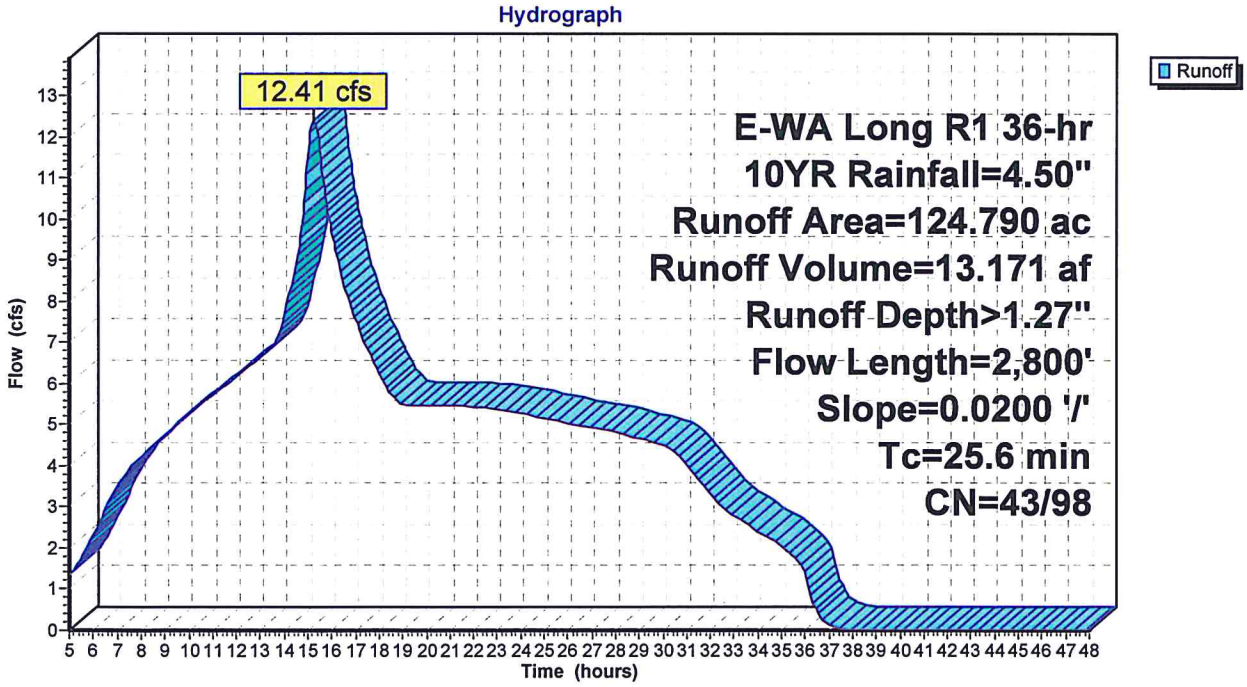
Runoff = 12.41 cfs @ 15.25 hrs, Volume= 13.171 af, Depth> 1.27"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
E-WA Long R1 36-hr 10YR Rainfall=4.50"

Area (ac)	CN	Description
32.640	98	Paved roads w/curbs & sewers, HSG A
92.150	43	Woods/grass comb., Fair, HSG A
124.790	57	Weighted Average
92.150	43	73.84% Pervious Area
32.640	98	26.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1	300	0.0200	0.25		**Sheet Flow, Sheet** Range n= 0.130 P2= 3.50"
5.5	2,500	0.0200	7.58	136.39	**Channel Flow, channel** Area= 18.0 sf Perim= 16.0' r= 1.13' n= 0.030 Earth, grassed & winding
25.6	2,800	Total			

Subcatchment 2S: POST



Summary for Pond 5P: (new Pond)

Inflow Area = 124.790 ac, 26.16% Impervious, Inflow Depth > 1.27" for 10YR event
Inflow = 12.41 cfs @ 15.25 hrs, Volume= 13.171 af
Outflow = 5.69 cfs @ 18.56 hrs, Volume= 13.171 af, Atten= 54%, Lag= 198.8 min
Primary = 1.75 cfs @ 18.56 hrs, Volume= 2.405 af
Secondary = 3.94 cfs @ 18.56 hrs, Volume= 10.766 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 2,201.88' @ 18.56 hrs Surf.Area= 1.672 ac Storage= 2.841 af

Plug-Flow detention time= 302.4 min calculated for 13.168 af (100% of inflow)
Center-of-Mass det. time= 301.8 min (1,465.6 - 1,163.8)

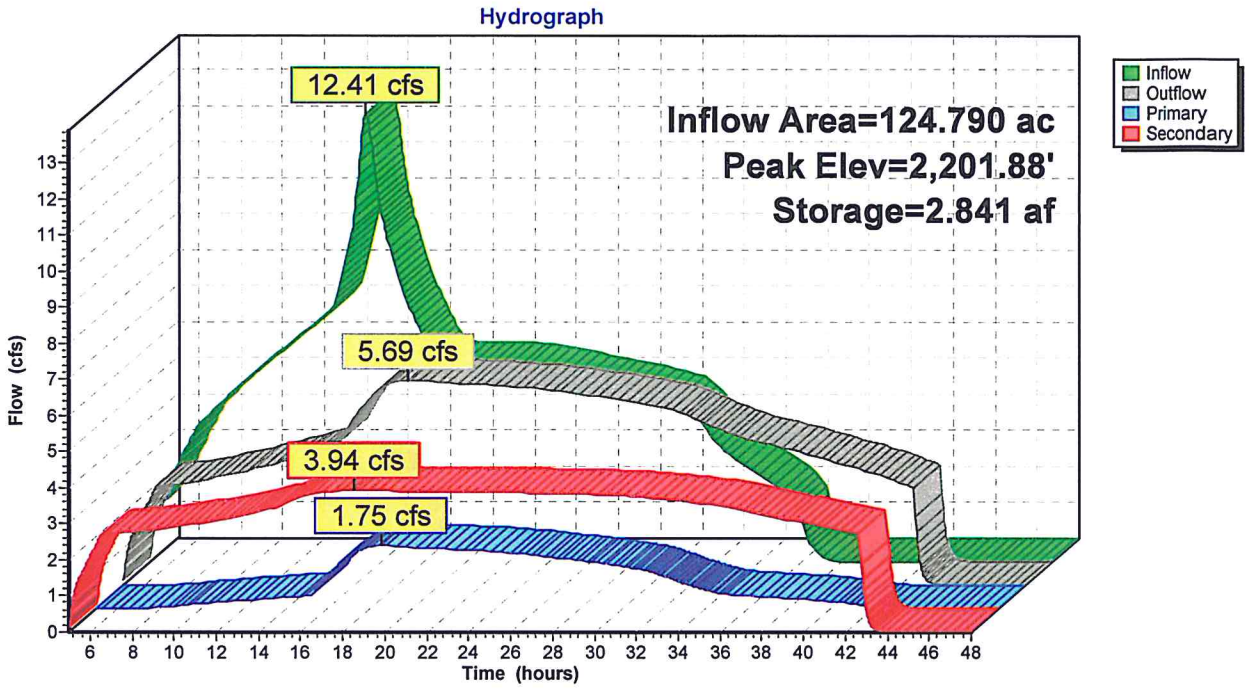
Volume	Invert	Avail.Storage	Storage Description
#1	2,200.00'	5.776 af	**50.00'W x 1,177.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Secondary	2,200.00'	**2.000 in/hr Exfiltration over Horizontal area** Conductivity to Groundwater Elevation = 2,190.00'
#2	Primary	2,200.00'	**3.6" Vert. Orifice/Grate** C= 0.600
#3	Primary	2,201.30'	**13.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.75 cfs @ 18.56 hrs HW=2,201.88' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 0.45 cfs @ 6.33 fps)
└—**3=Orifice/Grate** (Orifice Controls 1.30 cfs @ 2.59 fps)

Secondary OutFlow Max=3.94 cfs @ 18.56 hrs HW=2,201.88' (Free Discharge)
↑—**1=Exfiltration** (Controls 3.94 cfs)

Pond 5P: (new Pond)



Summary for Subcatchment 1S: PRE

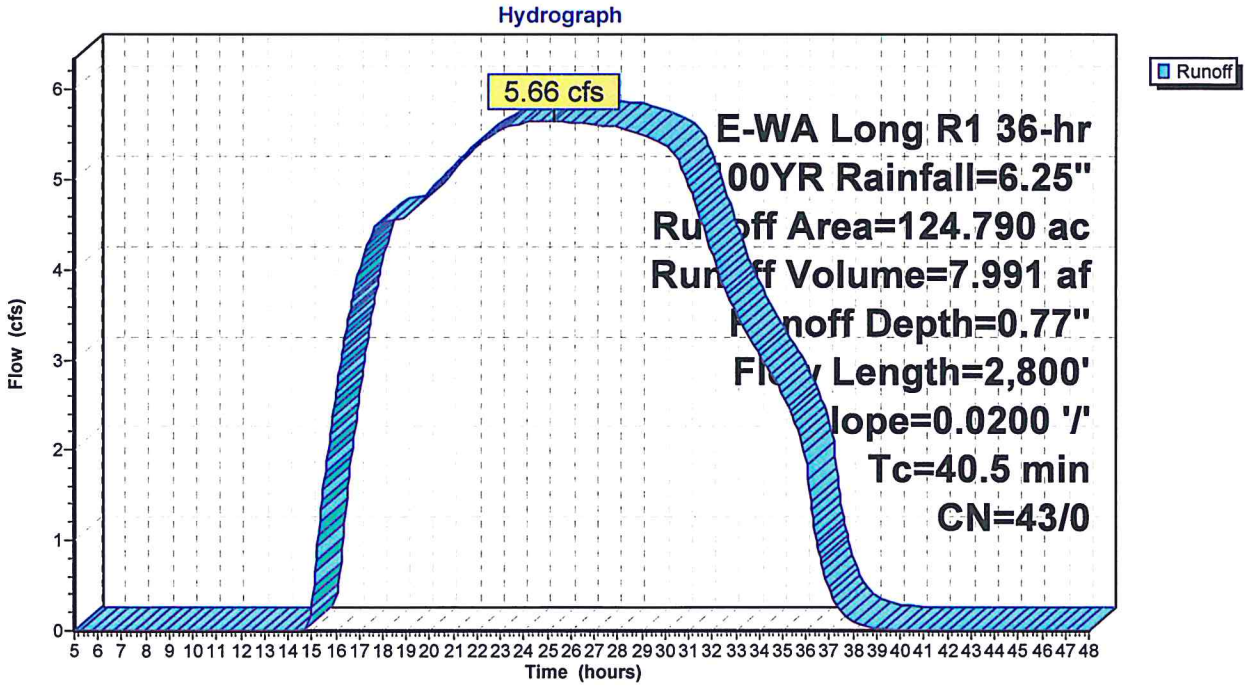
Runoff = 5.66 cfs @ 25.24 hrs, Volume= 7.991 af, Depth= 0.77"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
E-WA Long R1 36-hr 100YR Rainfall=6.25"

Area (ac)	CN	Description
124.790	43	Woods/grass comb., Fair, HSG A
124.790	43	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1	300	0.0200	0.25		**Sheet Flow,** Range n= 0.130 P2= 3.50"
16.8	1,000	0.0200	0.99		**Shallow Concentrated Flow, SHALLOW** Short Grass Pasture Kv= 7.0 fps
3.6	1,500	0.0200	7.01	140.10	**Channel Flow, CHANNEL** Area= 20.0 sf Perim= 20.0' r= 1.00' n= 0.030 Earth, grassed & winding
40.5	2,800	Total			

Subcatchment 1S: PRE



Summary for Subcatchment 2S: POST

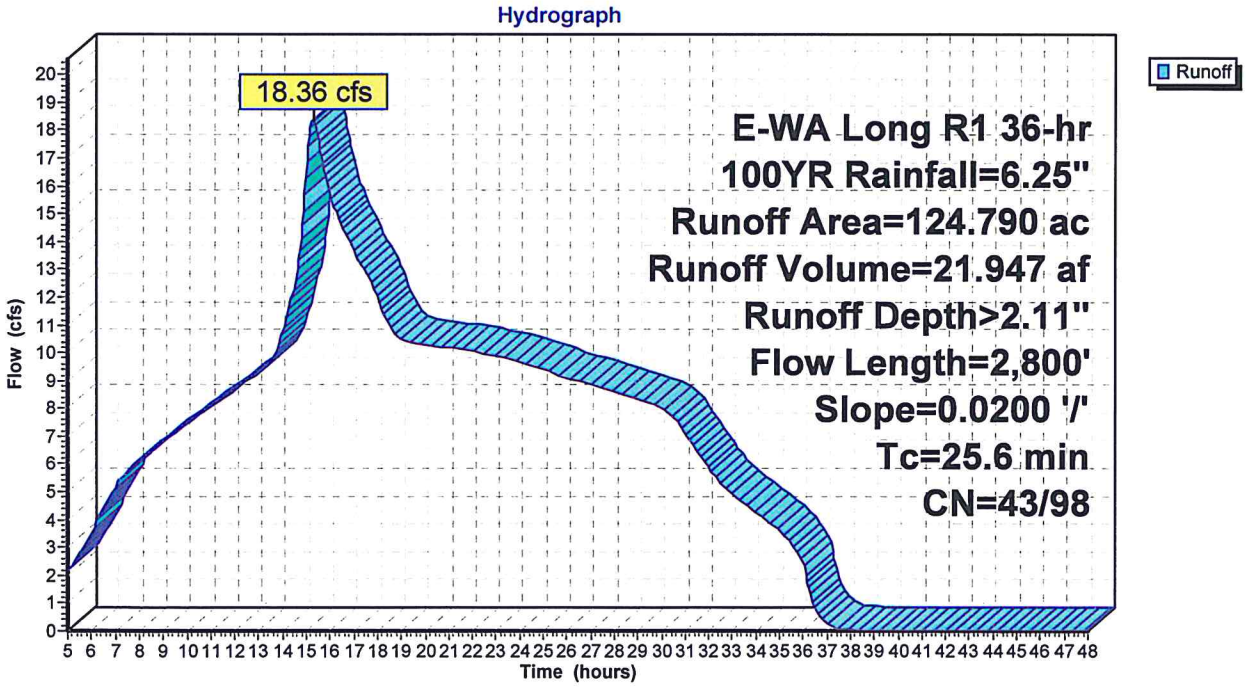
Runoff = 18.36 cfs @ 15.32 hrs, Volume= 21.947 af, Depth> 2.11"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
E-WA Long R1 36-hr 100YR Rainfall=6.25"

Area (ac)	CN	Description
32.640	98	Paved roads w/curbs & sewers, HSG A
92.150	43	Woods/grass comb., Fair, HSG A
124.790	57	Weighted Average
92.150	43	73.84% Pervious Area
32.640	98	26.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1	300	0.0200	0.25		**Sheet Flow, Sheet** Range n= 0.130 P2= 3.50"
5.5	2,500	0.0200	7.58	136.39	**Channel Flow, channel** Area= 18.0 sf Perim= 16.0' r= 1.13' n= 0.030 Earth, grassed & winding
25.6	2,800	Total			

Subcatchment 2S: POST



Summary for Pond 5P: (new Pond)

Inflow Area = 124.790 ac, 26.16% Impervious, Inflow Depth > 2.11" for 100YR event
Inflow = 18.36 cfs @ 15.32 hrs, Volume= 21.947 af
Outflow = 10.07 cfs @ 22.07 hrs, Volume= 21.947 af, Atten= 45%, Lag= 404.8 min
Primary = 5.35 cfs @ 22.07 hrs, Volume= 8.777 af
Secondary = 4.72 cfs @ 22.07 hrs, Volume= 13.169 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 2,203.00' @ 22.07 hrs Surf.Area= 1.865 ac Storage= 4.821 af

Plug-Flow detention time= 317.6 min calculated for 21.943 af (100% of inflow)
Center-of-Mass det. time= 317.2 min (1,518.0 - 1,200.8)

Volume	Invert	Avail.Storage	Storage Description
#1	2,200.00'	5.776 af	**50.00'W x 1,177.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Secondary	2,200.00'	**2.000 in/hr Exfiltration over Horizontal area** Conductivity to Groundwater Elevation = 2,190.00'
#2	Primary	2,200.00'	**3.6" Vert. Orifice/Grate** C= 0.600
#3	Primary	2,201.30'	**13.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=5.35 cfs @ 22.07 hrs HW=2,203.00' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 0.57 cfs @ 8.13 fps)
└—**3=Orifice/Grate** (Orifice Controls 4.78 cfs @ 5.18 fps)

Secondary OutFlow Max=4.72 cfs @ 22.07 hrs HW=2,203.00' (Free Discharge)
↑—**1=Exfiltration** (Controls 4.72 cfs)

Pond 5P: (new Pond)