JUNIPER RIDGE SUBDIVISION

PRELIMINARY TECHNICAL INFORMATION REPORT

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This Preliminary Technical Information Report was prepared in accordance with the City of La Center Municipal Code (LCMC) Chapter 18.320 and the 1992 Stormwater Management Manual for the Puget Sound Basin.

ENG #: _____
DATE: 1-30-2025
JOB #: 2406

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SECTION A - PROJECT OVERVIEW

The Juniper Ridge Subdivision is located east of NW 9th Street, west of W 14th Way and W F PI, and north of NW Pacific Hwy in the City of La Center, Washington, and on parcels 258944-000 and 258945-000. The project proposes the extension of a new public road NW 14th through the site from the existing subdivision to the east. A 57-lot subdivision borders the site to the east and a forested area to the north. The property is approximately 8.02 acres and will be subdivided into 67 single and multi-family lots.

The existing site conditions consists of dense forest in the northwest half and meadow with scattered trees in the southeast half of the site. The southeast half of the site is proposed to be developed while the northwest half will remain forested and sectioned off with a boundary line adjustment. The site slopes moderately from northeast to southwest. There are no existing stormwater facilities on site. An unnamed stream flows across the parcels from northwest to southwest, and eventually flows into the East Fork Lewis River. The site's runoff contributes to one Threshold Discharge Area (TDA). Runoff from the site flows directly to the unnamed stream on site or indirectly through a ravine on the neighboring property to the south.

This project will provide a new extension from public road W 14th Way into the site and half-width frontage improvements on W F Place. The 57 proposed lots and proposed roadway will be collected and conveyed to a wet pond in the southwestern area of the site. The wetpond will treat and detain runoff before releasing water below predeveloped flow rates to the unnamed creek on site. Sanitary sewer and domestic water will also be installed on site.

SECTION B – APPROVAL CONDITIONS SUMMARY

A final staff report with Conditions of Approval will be issued with Preliminary Land Use Approval. The Approval Conditions Summary will be provided with the Final TIR.

SECTION C - DOWNSTREAM ANALYSIS

The southern half of the site that will be developed currently flows to the northern, western and southern perimeters of the site. The northern runoff flows directly to an unnamed stream. The western and southern runoff flows to multiple ravines, and eventually to the same unnamed stream within the site's TDA. The proposed discharge from the wet pond will be placed just outside the critical area limits of the stream, within the buffer on site. Proper erosion control measures and construction techniques will be implemented to maintain slope stability and restore vegetation to existing conditions. The flow spreader will also prevent concentrated flow and prevent future erosion from the discharge location.

Downstream of the discharge location, the stream adequately passes through two existing culverts. The first culvert is 48" in diameter under the 9th Avenue gravel road. The second culvert is a 4' x 6' box culvert under Pacific Highway. The stream the flows unrestricted for approximately 1900' to the East Fork Lewis River

SECTION D - QUANTITY CONTROL ANALYSIS AND DESIGN

A wetpond is proposed to provide flow control for the project. Runoff from all disturbed areas will be collected to the maximum extent feasible and conveyed to the wetpond. The wetpond shape was chosen to best fit the existing topography while providing adequate maintenance and inspection access utilizing the existing 12' wide (min) gravel road on site.

The hydrologic analysis for this site follows methods and guidelines outlined in Chapter III of the Puget Sound Manual and Chapter 14.10 of the La Center Stormwater Control Ordinance. The SBUH Hydrograph method was used to compute storm flows and volumes used in designing the storm system. Hydrocad software was used to complete the calculations.

The Predeveloped and Developed Basin maps are in Appendix A with breakdowns of impervious and pervious areas used in the modeling. The curve numbers used in the flow control calculations are located Appendix B along with the isopluvial maps, n and k values and soil group listings. The Basin Summary Sheet in Appendix C summarizes the flow control design assumptions and inputs used in the flow control analysis. Table 1 below details the wetpond design.

Table 1. Wetpond 'A' Peak Flow Rates, Actual Release, Elevations

24 HOUR STORM	PEAK INFLOW (CFS)	ALLOWABLE DISCHARGE (CFS)	ACTUAL DISCHARGE (CFS)	STORAGE VOLUME REQUIRED (CF)	PEAK WATER SURFACE ELEVATION (0'=BOTTOM)
WQ	1.45	0	0	22,300*	3.40**
2-YEAR	2.83	(1/2)*0.63=0.315	0.31	24,050	6.74
10-YEAR	4.49	1.51	0.84	27,255	7.06
25-YEAR	5.42	2.08	1.26	28,492	7.18
100-YEAR	7.10	3.17	2.56	31,256	7.43

*27,896 CF is proposed
**4.0' water quality depth is proposed to comply with the SWMM minimum depth requirements. An additional 1' of depth is proposed in the first cell for sediment storage.

Orifice sizing and placement is shown in Table 2 below. Orifice 1 was placed at the Water Quality elevation and sized to release less than ½ of the 2-year predeveloped flow. Orifice 2 was placed above the 2-year storm elevation and sized to release less than the predeveloped 10-year, 25-year and 100-year flows.

Table 2. Wetpond 'A' Orifice Sizing

ORIFICE	ORIFICE HEIGHT (0'=BOTTOM)	ORIFICE DIAMETER (INCHES)
1	4.00	2.75"
2	6.75	18"

Hydrocad reports of the stormwater modeling are located in Appendix C.

SECTION E - CONVEYANCE SYSTEM ANALYSIS AND DESIGN

The preliminary stormwater collection and conveyance system consists of catch basins and 12" storm main. Reference sheet PRE3.0 – Preliminary Stormwater Plan. A detailed sizing analysis will be provided during final engineering. See Appendix B for flow rates, storm system capacities and other hydrologic parameters used in completing the analysis.

The hydrologic analysis for this site will follow methods and guidelines outlined in Chapter III of the Puget Sound Manual and Chapter 14.10 of the La Center Stormwater Control Ordinance. The conveyance system will be designed to convey the 100-year storm.

SECTION F - WATER QUALITY DESIGN

Water quality design for this project involves providing enough wet storage to detain the entire volume of the 24-hour water quality storm. Design methods and guidelines outlined in the Puget Sound Manual and the La Center Stormwater Control Ordinance were used in the water quality design. All surfaces were considered pollution generating in this design. The water quality volume is 22,300 cf while 27,896 cf is proposed. Appendix C contains the Hydrocad modeling report for the water quality analysis.

SECTION G - SOILS EVALUATION

Based off GIS Mapping, most of the areas of the site to be developed is classified as soil group "B". The geotechnical report by Colombia West Engineering, Inc is included in the preliminary submittal package with additional information on soil characteristics on site.

SECTION H - SPECIAL REPORTS AND STUDIES

- Geotechnical/Soils Report – Preliminary Submittal Package
- Wetland Report – Preliminary Submittal Package

SECTION I – OTHER PERMITS

An NPDES Permit will be issued prior to construction. No other permits are required.

SECTION J – GROUNDWATER MONITORING PROGRAM

N/A to this design.

SECTION K - MAINTENANCE AND OPERATIONS

Maintenance and operations manuals will be provided with final engineering.

SECTION L – TECHNICAL APPENDIX

Appendix A: Maps
Appendix B: Design Criteria
Appendix C: Design Calculations
Appendix D: Geotechnical Report
Appendix E: Critical Areas Report

Appendix A – Maps

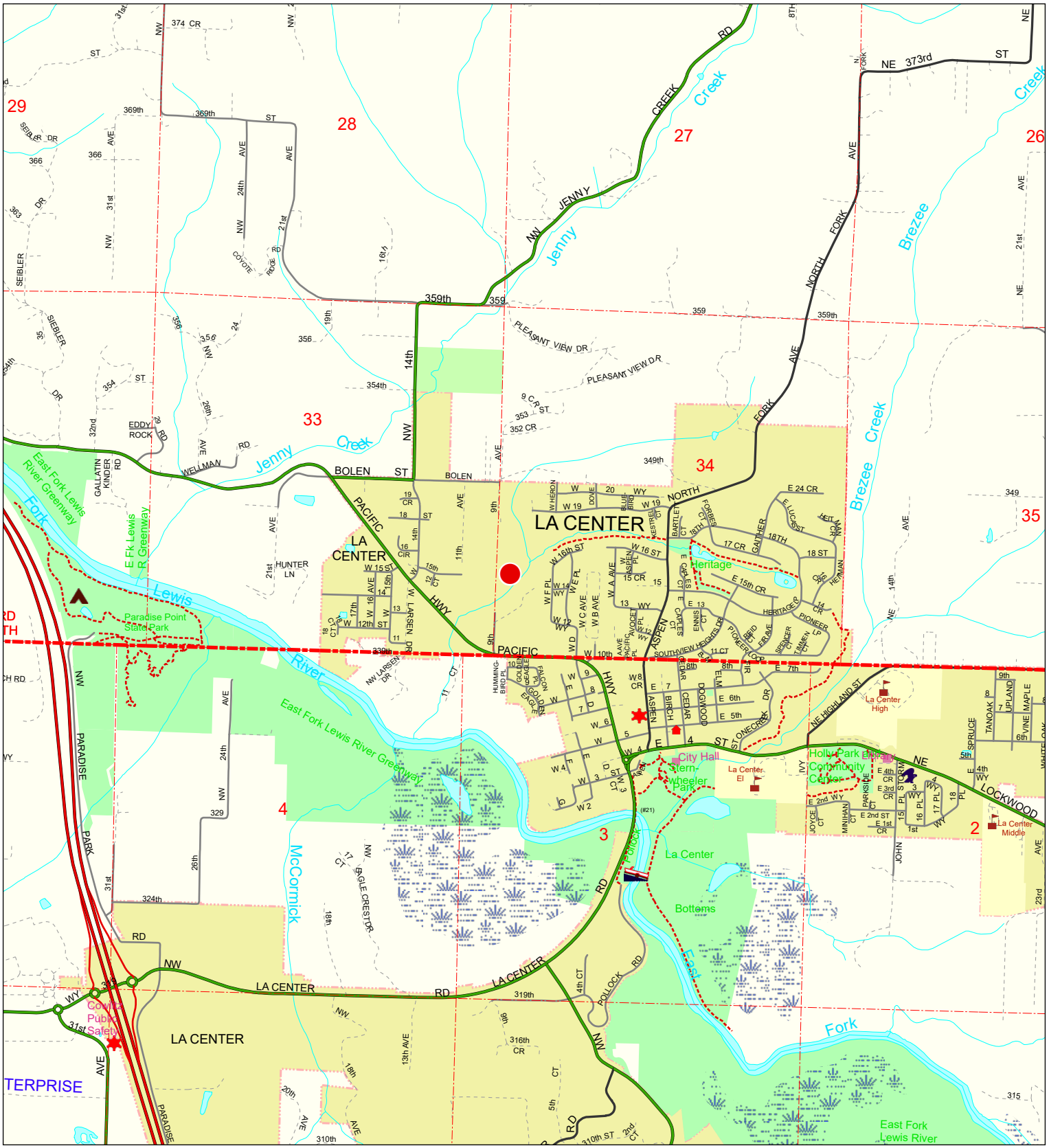
Vicinity Map

Contour Map

Soil Map

Predeveloped Basin Map

Developed Basin Map



General Location

Account: 258945000, 258944000
Owner: RITOLA MARY E
Address: 34011 NW 9TH AVE
C/S/Z: LA CENTER, WA 98629

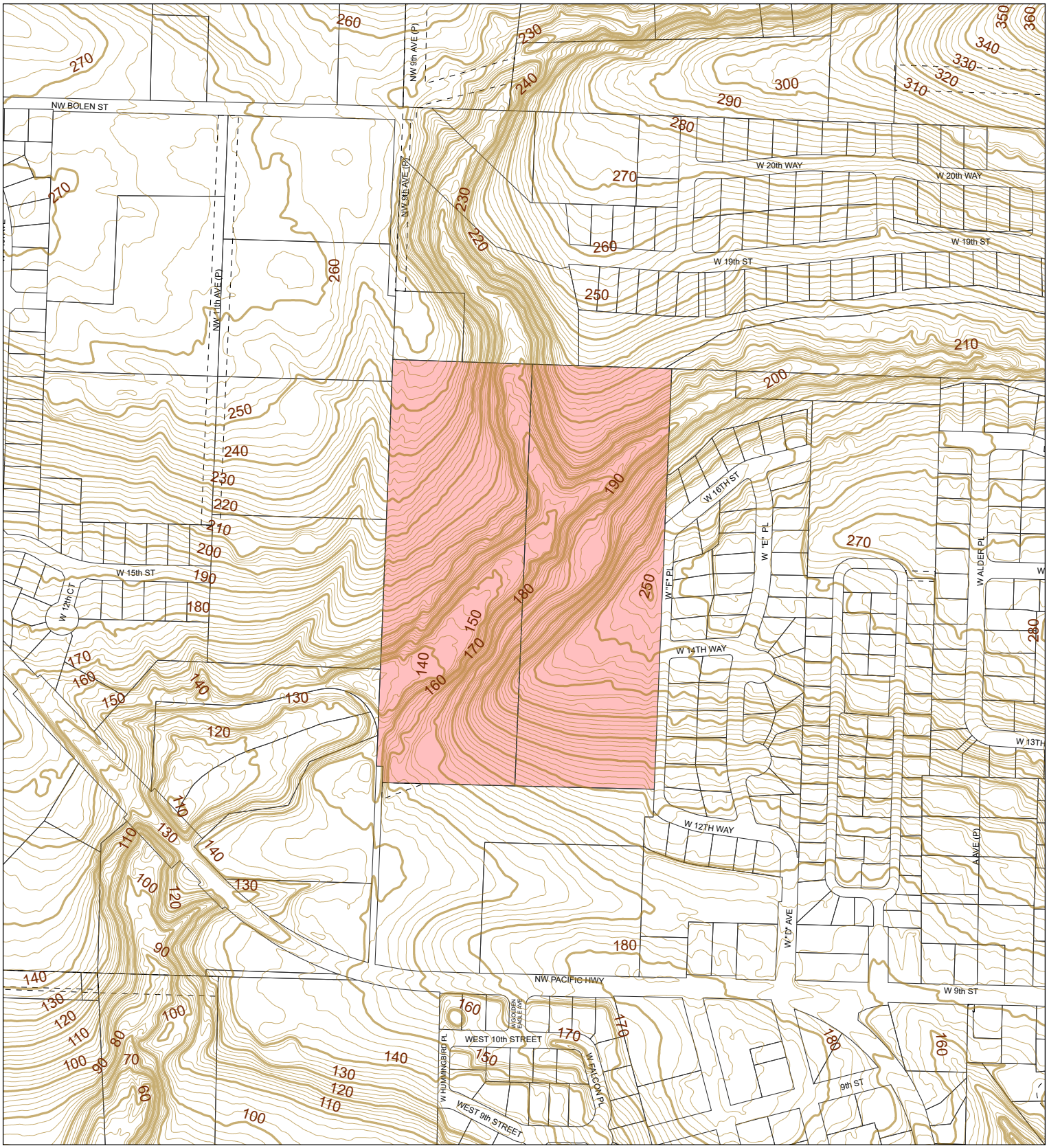
Location of Subject Property(s)

Printed on: February 07, 2024

CLARK COUNTY, WASHINGTON
Geographic Information System

0 1,000 2,000 Feet

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

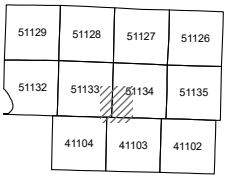


Elevation Contours

Printed on: February 07, 2024

Account: 258945000, 258944000
Owner: RITOLA MARY E
Address: 34011 NW 9TH AVE
C/S/Z: LA CENTER, WA 98629

Subject Property(s)
Public Road
Transportation or Major Utility Easement
10' Elevation Contours
2' Elevation Contours



CLARK COUNTY, WASHINGTON
Geographic Information System

0 200 400 Feet

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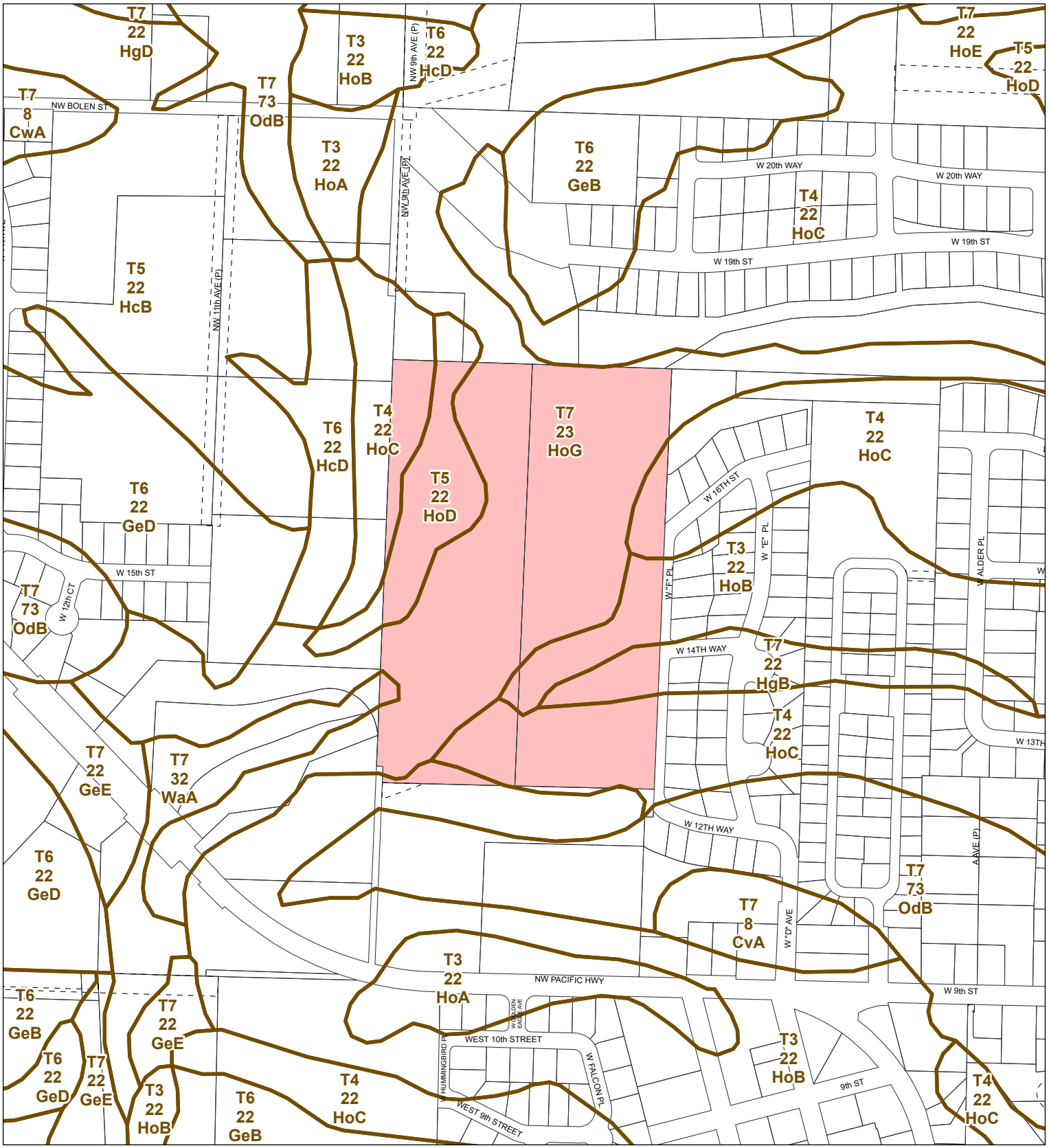
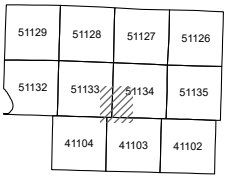


Soil Types

Printed on: February 07, 2024

Account: 258945000, 258944000
Owner: RITOLA MARY E
Address: 34011 NW 9TH AVE
C/S/Z: LA CENTER, WA 98629

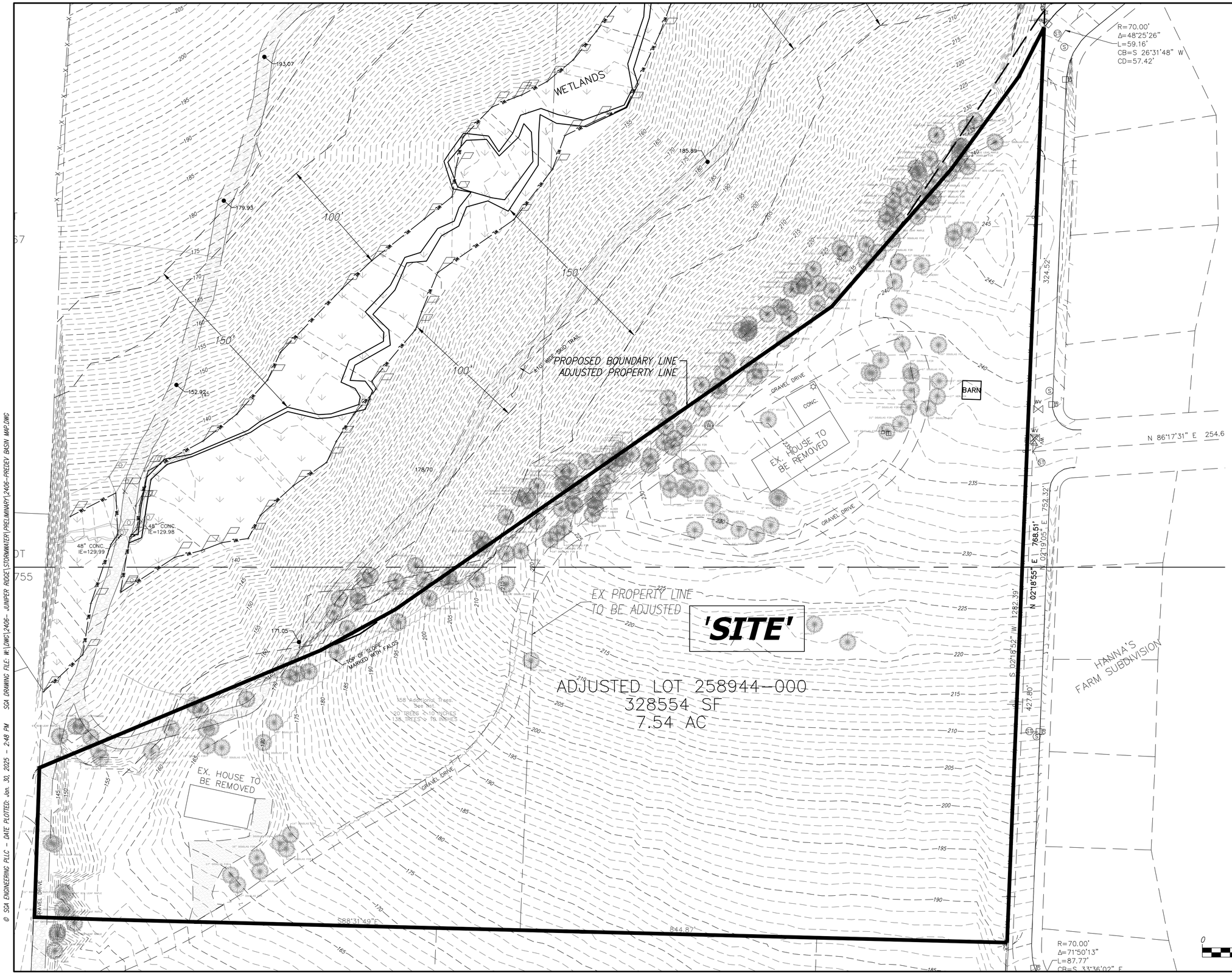
Subject Property(s)
Public Road
Transportation or Major Utility Easement
Soil Type Boundary



CLARK COUNTY, WASHINGTON
Geographic Information System

0 200 400 Feet

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.



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VOID AFTER INTERMEDIATE
STATE OF WASHINGTON
54905
REGISTERED
PROFESSIONAL ENGINEER

JUNIPER RIDGE SUBDIVISION

PREDEV BASIN

CITY OF LA CENTER

WASHINGTON

PRELIMINARY

REVISIONS

DESIGNED BY:	NDM
DRAWN BY:	NDM
CHECKED BY:	JAI
SCALE:	1" = 40'

JOB NUMBER	SHEET
2406	PREDEV

© SCA ENGINEERING PLLC - DATE PLOTTED: Jan. 30, 2025 - 2:48 PM SCA DRAWING FILE: W:\DWG\2406- JUNIPER RIDGE\STORMWATER\PRELIMINARY\2406-PREDEV BASIN MAP.DWG

DEVELOPED A		
	SF	Acres
EX AC		0.00
AC		0.00
SW		0.00
DW		0.00
GRAVEL	2414	0.06
Total Imperv	2414	0.06
Total Perv	25036	0.57
Total	27450	0.63

DEVELOPED B		
	SF	Acres
EX AC		0.00
AC		0.00
SW		0.00
DW		0.00
ROOF	30400	0.70
Total Imperv	30400	0.70
Total Perv	54110	1.24
Total	84510	1.94

DEVELOPED C		
	SF	Acres
EX AC		0.00
AC		0.00
SW		0.00
DW		0.00
ROOF	60425	1.39
Total Imperv	60425	1.39
Total Perv	46790	1.07
Total	107215	2.46

DEVELOPED D		
	SF	Acres
EX AC		0.00
AC	83065	1.91
SW		0.00
DW		0.00
ROOF		0.00
Total Imperv	83065	1.91
Total Perv		0.00
Total	83065	1.91

DEVELOPED E		
	SF	Acres
EX AC		0.00
AC	24317	0.56
SW		0.00
DW		0.00
ROOF		0.00
Total Imperv	24317	0.56
Total Perv	0	0.00
Total	24317	0.56

TOTAL DEVELOPED		
Total Imperv	200621	4.61
Total Perv	125936	2.89
Total	326557	7.50

0 40 80 120

Scale: 1" = 40'

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CITY OF LA CENTER WASHINGTON

PRELIMINARY

REVISIONS

DESIGNED BY:	NDM
DRAWN BY:	NDM
CHECKED BY:	JAI
SCALE:	1" = 40'

JOB NUMBER	SHEET
2406	DEV

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Appendix B – Design Criteria

Soil Group

Curve Numbers

n and K Numbers

Isopluvial Maps

Map Symbol	Soil Name	HSG
HlF	HILLSBORO	B
Soils Group (SG) 2 (continued)		
KeC	KINNEY	B
KeE	KINNEY	B
KeF	KINNEY	B
KnF	KINNEY	B
LaE	LARCHMOUNT	B
LaG	LARCHMOUNT	B
LcG	LARCHMOUNT	B
MsB	MOSSYROCK	B
NbA	NEWBERG	B
NbB	NEWBERG	B
PhB	PILCHUCK	C
PuA	PUYALLUP	B
SaC	SALKUM	B
VaB	VADER	B
VaC	VADER	B
WaA	WASHOUGAL	B
WgB	WASHOUGAL	B
WgE	WASHOUGAL	B
WhF	WASHOUGAL	B
YaA	YACOLT	B
YaC	YACOLT	B
YcB	YACOLT	B
Soils Group (SG) 3		
DoB	DOLLAR	C
HcB	HESSON	C
HcD	HESSON	C
HcE	HESSON	C
HcF	HESSON	C
HgB	HESSON	C
HgD	HESSON	C
HhE	HESSON	C
HoA	HILLSBORO	B

Map Symbol	Soil Name	HSG
HoB	HILLSBORO	B
Soils Group (SG) 3 (continued)		
HoC	HILLSBORO	B
HoD	HILLSBORO	B
HoE	HILLSBORO	B
HoG	HILLSBORO	B
HsB	HILLSBORO	B
McB	McBEE	C
MeA	McBEE	C
MIA	McBEE	C
OeD	OLEQUA	B
OeE	OLEQUA	B
OeF	OLEQUA	B
OlB	OLYMPIC	B
OID	OLYMPIC	B
OlE	OLYMPIC	B
OIF	OLYMPIC	B
OmE	OLYMPIC	B
OmF	OLYMPIC	B
OpC	OLYMPIC VARIANT	C
OpE	OLYMPIC VARIANT	C
OpG	OLYMPIC VARIANT	C
OrC	OLYMPIC VARIANT	C
PoB	POWELL	C
PoD	POWELL	C
PoE	POWELL	C
SmA	SAUVIE	B
SmB	SAUVIE	B
SnA	SAUVIE	D
SpB	SAUVIE	B

Soils Group (SG) 4

CvA	COVE	D
CwA	COVE	D
GeB	GEE	C

Table III-1.3 SCS Western Washington Runoff Curve Numbers
(Published by SCS in 1982) Runoff curve numbers for selected agricultural, suburban and urban land use for Type 1A rainfall distribution, 24-hour storm duration.

LAND USE DESCRIPTION		CURVE NUMBERS BY HYDROLOGIC SOIL GROUP A	B	C	D
Cultivated land(1):	winter condition	86	91	94	95
Mountain open areas:	low growing brush & grasslands	74	82	89	92
Meadow or pasture:		65	78	85	89
Wood or forest land:	undisturbed	42	64	76	81
Wood or forest land:	young second growth or brush	55	72	81	86
Orchard:	with cover crop	81	88	92	94
Open spaces, lawns, parks, golf courses, cemeteries, landscaping.					
Good condition:	grass cover on ≥75% of the area	68	80	86	90
Fair condition:	grass cover on 50-75% of the area	77	85	90	92
Gravel roads & parking lots:		76	85	89	91
Dirt roads & parking lots:		72	82	87	89
Impervious surfaces, pavement, roofs etc.		98	98	98	98
Open water bodies:	lakes, wetlands, ponds etc.	100	100	100	100
Single family residential(2):					
Dwelling Unit/Gross Acre	%Impervious(3)				
1.0 DU/GA	15				
1.5 DU/GA	20				
2.0 DU/GA	25				
2.5 DU/GA	30				
3.0 DU/GA	34				
3.5 DU/GA	38				
4.0 DU/GA	42				
4.5 DU/GA	46				
5.0 DU/GA	48				
5.5 DU/GA	50				
6.0 DU/GA	52				
6.5 DU/GA	54				
7.0 DU/GA	56				
PUD's, condos, apartments, commercial businesses & industrial areas	%impervious must be computed				
		Separate curve number shall be selected for pervious & impervious portions of the site or basin			

(1) For a more detailed description of agricultural land use curve numbers refer to National Engineering Handbook, Sec. 4, Hydrology, Chapter 9, August 1972.
(2) Assumes roof and driveway runoff is directed into street/storm system.
(3) The remaining pervious areas (lawn) are considered to be in good condition for these curve numbers.

Table III-1.4 "n" AND "k" Values Used in Time Calculations for Hydrographs

"n_s" Sheet Flow Equation Manning's Values (for the initial 300 ft. of travel)	n_s
Smooth surfaces (concrete, asphalt, gravel, or bare hand packed soil)	0.011
Fallow fields or loose soil surface (no residue)	0.05
Cultivated soil with residue cover (s≤ 0.20 ft/ft)	0.06
Cultivated soil with residue cover (s> 0.20 ft/ft)	0.17
Short prairie grass and lawns	0.15
Dense grasses	0.24
Bermuda grass	0.41
Range (natural)	0.13
Woods or forest with light underbrush	0.40
Woods or forest with dense underbrush	0.80

*Manning values for sheet flow only, from Overton and Meadows 1976 (See TR-55, 1986)

"k" Values Used in Travel Time/Time of Concentration Calculations

Shallow Concentrated Flow (After the initial 300 ft. of sheet flow, R = 0.1)	k_s
1. Forest with heavy ground litter and meadows (n = 0.10)	3
2. Brushy ground with some trees (n = 0.060)	5
3. Fallow or minimum tillage cultivation (n = 0.040)	8
4. High grass (n = 0.035)	9
5. Short grass, pasture and lawns (n = 0.030)	11
6. Nearly bare ground (n = 0.25)	13
7. Paved and gravel areas (n = 0.012)	27

Channel Flow (intermittent) (At the beginning of visible channels R = 0.2)	k_c
1. Forested swale with heavy ground litter (n = 0.10)	5
2. Forested drainage course/ravine with defined channel bed (n = 0.050)	10
3. Rock-lined waterway (n = 0.035)	15
4. Grassed waterway (n = 0.030)	17
5. Earth-lined waterway (n = 0.025)	20
6. CMP pipe (n = 0.024)	21
7. Concrete pipe (0.012)	42
8. Other waterways and pipe 0.508/n	

Channel Flow (Continuous stream, R = 0.4)	k_c
9. Meandering stream with some pools (n = 0.040)	20
10. Rock-lined stream (n = 0.035)	23
11. Grass-lined stream (n = 0.030)	27
12. Other streams, man-made channels and pipe 0.807/n**	

Exhibit C
Isopluvial Maps for Design Storms in Clark County

2-Year, 24-Hour Isopluvials

Use no less than 2" for design storms

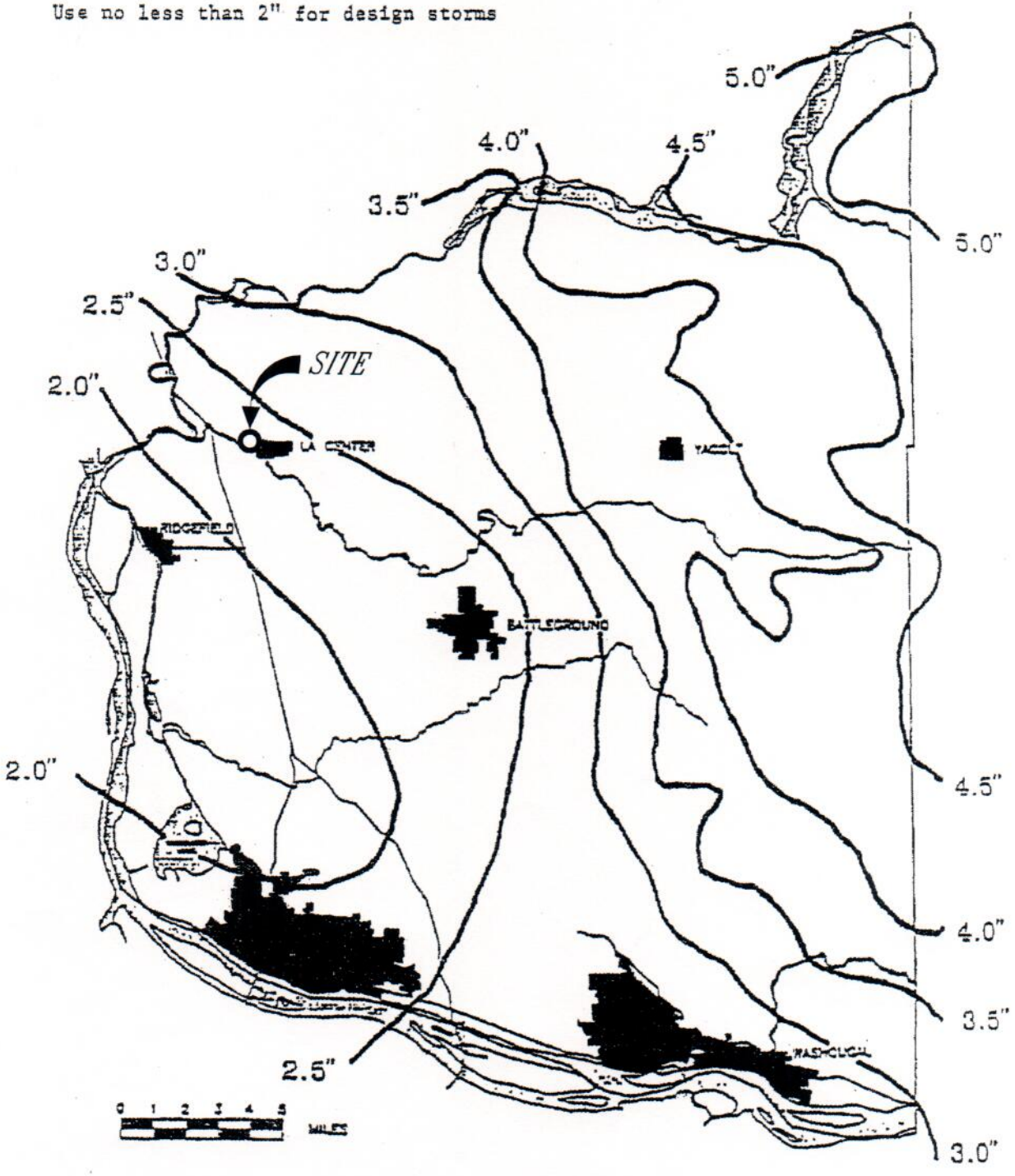


Exhibit C
Isopluvial Maps for Design Storms in Clark County

10-Year, 24-Hour Isopluvials

Use no less than 3" for design storms

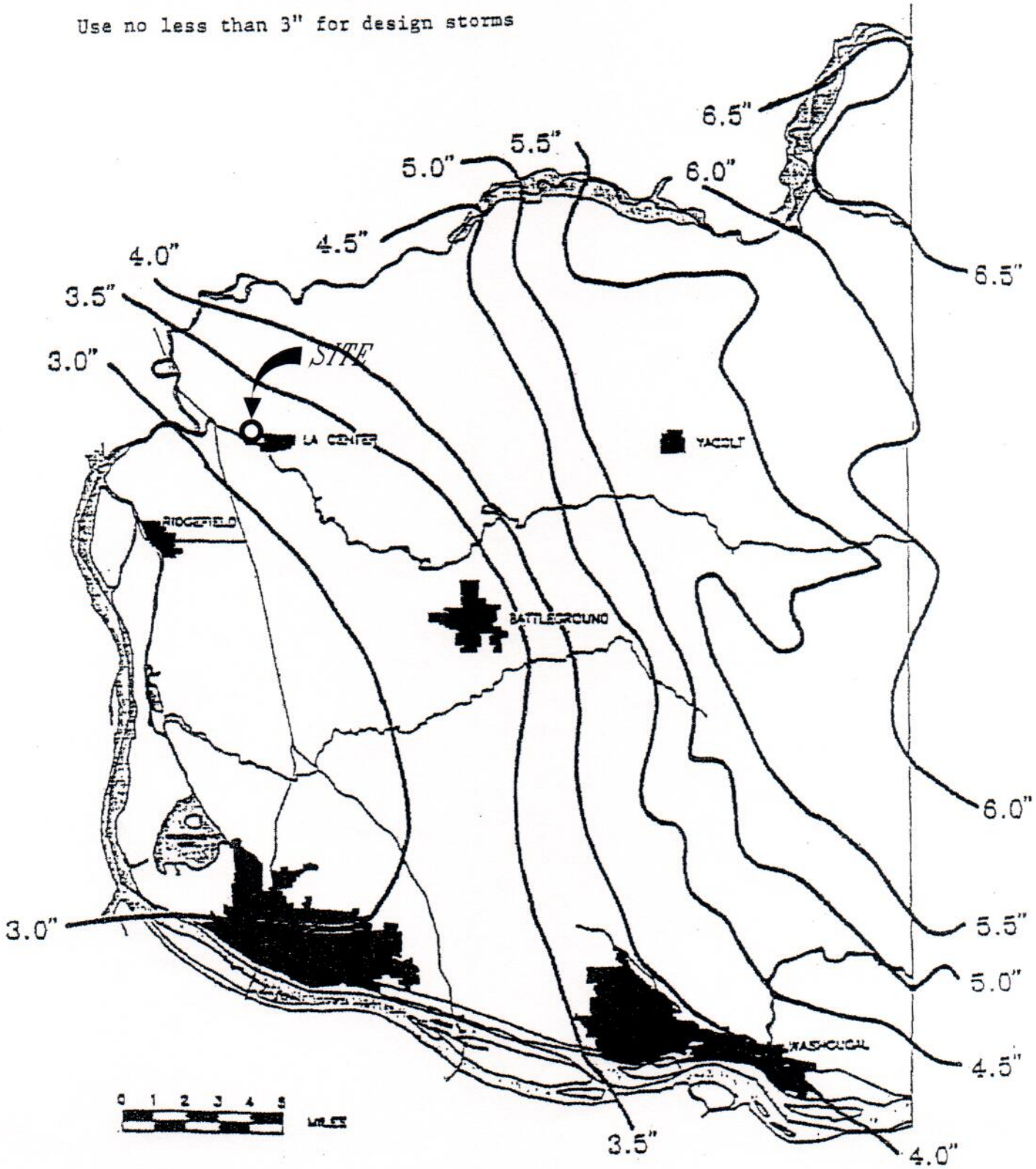


Exhibit C

Isopluvial Maps for Design Storms in Clark County

25-Year, 24-Hour Isopluvials

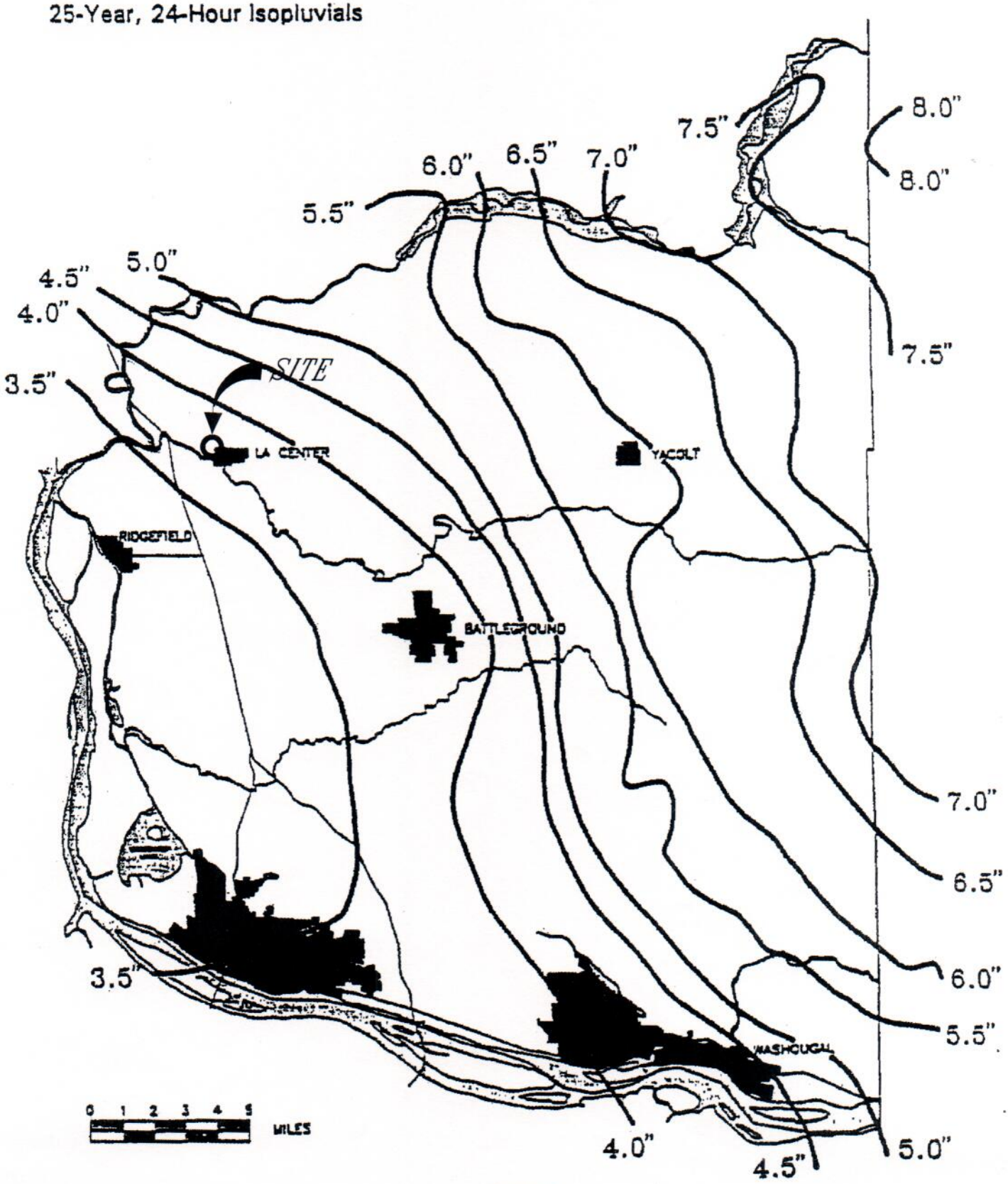
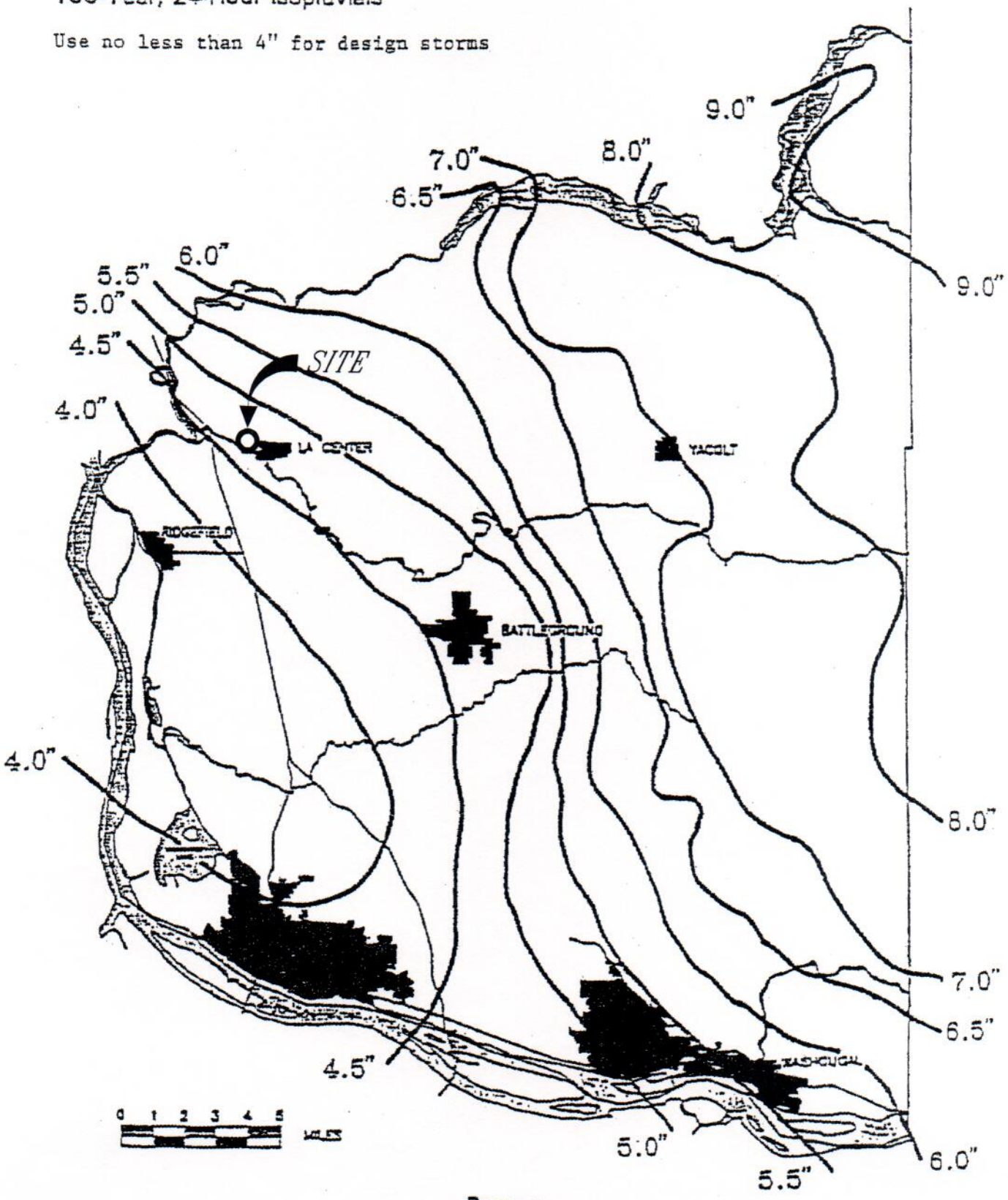


Exhibit C
Isopluvial Maps for Design Storms in Clark County

100-Year, 24-Hour Isopluvials

Use no less than 4" for design storms

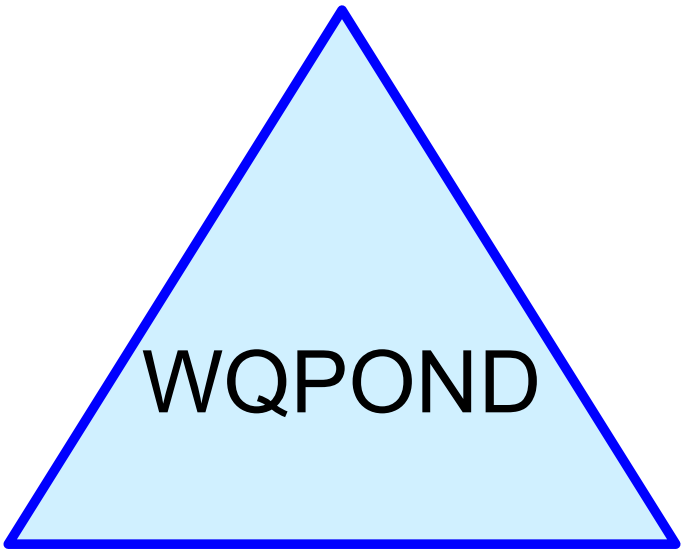


Appendix C - Design Calculations

Basin Summary Sheet

HydroCAD Water Quality Report

HydroCAD Flow Control Report



Subcat Reach Pond Link

Routing Diagram for 2406 Juniper Ridge
Prepared by HP, Printed 1/29/2025
HydroCAD® 10.10-5a s/n 05048 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	WQ	Type IA 24-hr		Default	24.00	1	1.60	2

Summary for Pond WQPOND: WQ

Inflow Area = 7.500 ac, 61.47% Impervious, Inflow Depth > 0.82" for WQ event
Inflow = 1.45 cfs @ 7.98 hrs, Volume= 0.512 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 3.40' @ 24.00 hrs Surf.Area= 8,920 sf Storage= 22,300 cf

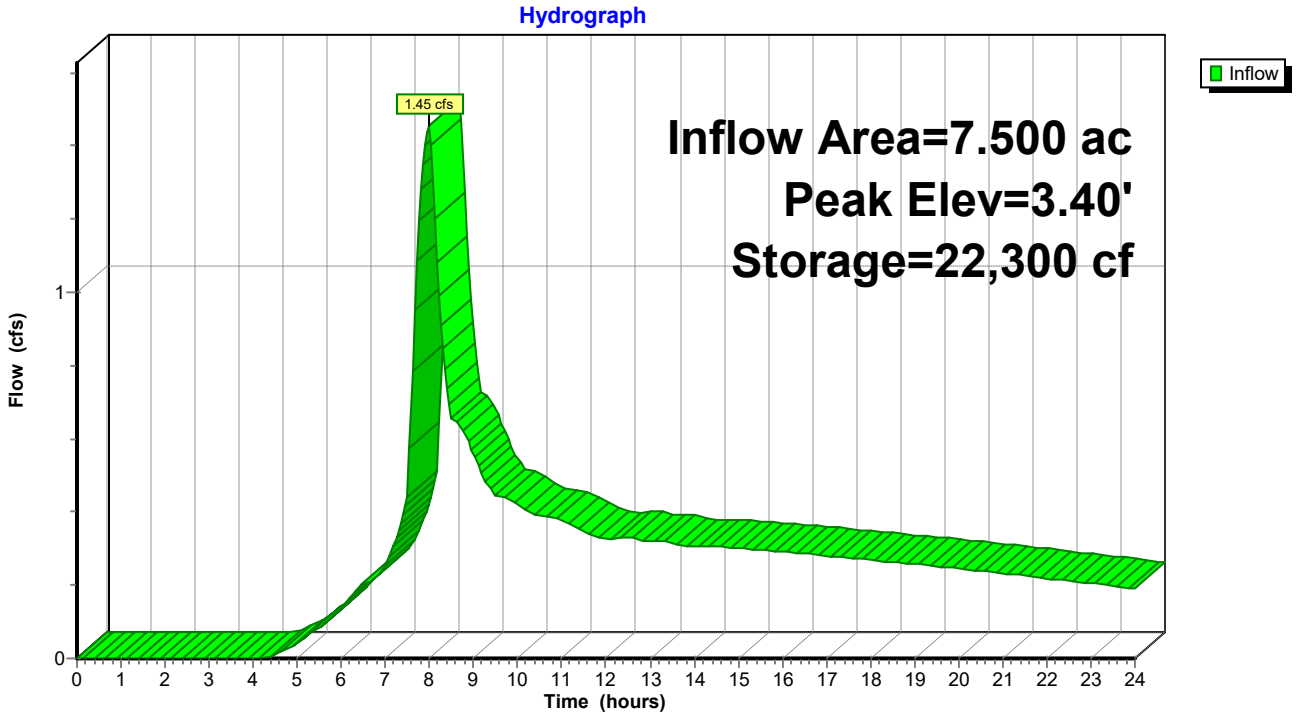
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

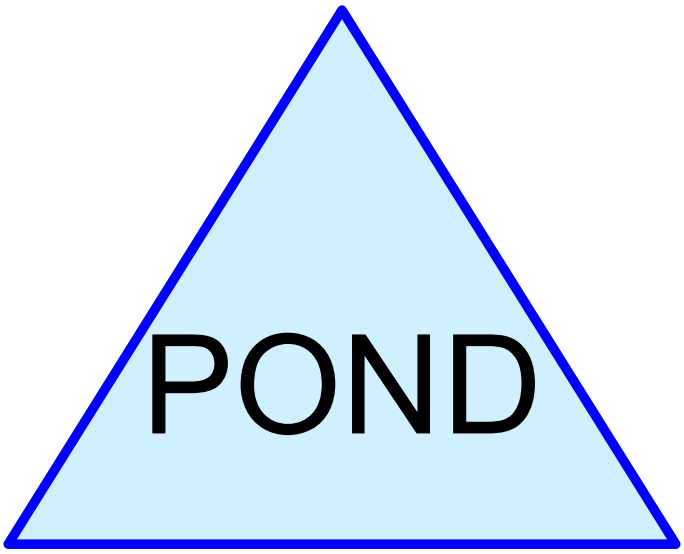
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	19,606 cf	**Custom Stage Data (Prismatic)** Listed below
#2	0.00'	8,290 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		27,896 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
0.00	3,451	0	0
1.00	4,113	3,782	3,782
2.00	4,827	4,470	8,252
3.00	5,592	5,210	13,462
4.00	6,697	6,145	19,606

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
0.00	1,074	0	0
1.00	1,509	1,292	1,292
2.00	1,997	1,753	3,045
3.00	2,538	2,268	5,312
4.00	3,417	2,978	8,290

Pond WQPOND: WQ





Subcat Reach Pond Link

Routing Diagram for 2406 Juniper Ridge
Prepared by HP, Printed 1/29/2025
HydroCAD® 10.10-5a s/n 05048 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-YR	Type IA 24-hr		Default	24.00	1	2.40	2
2	10-YR	Type IA 24-hr		Default	24.00	1	3.30	2
3	25-YR	Type IA 24-hr		Default	24.00	1	3.80	2
4	100-YR	Type IA 24-hr		Default	24.00	1	4.70	2

Summary for Pond POND: POND

Inflow Area = 7.500 ac, 61.47% Impervious, Inflow Depth > 1.52" for 2-YR event
Inflow = 2.83 cfs @ 7.97 hrs, Volume= 0.947 af
Outflow = 0.31 cfs @ 24.00 hrs, Volume= 0.395 af, Atten= 89%, Lag= 961.7 min
Primary = 0.31 cfs @ 24.00 hrs, Volume= 0.395 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.74' @ 24.00 hrs Surf.Area= 13,396 sf Storage= 24,050 cf

Plug-Flow detention time= 486.0 min calculated for 0.394 af (42% of inflow)
Center-of-Mass det. time= 196.3 min (956.9 - 760.6)

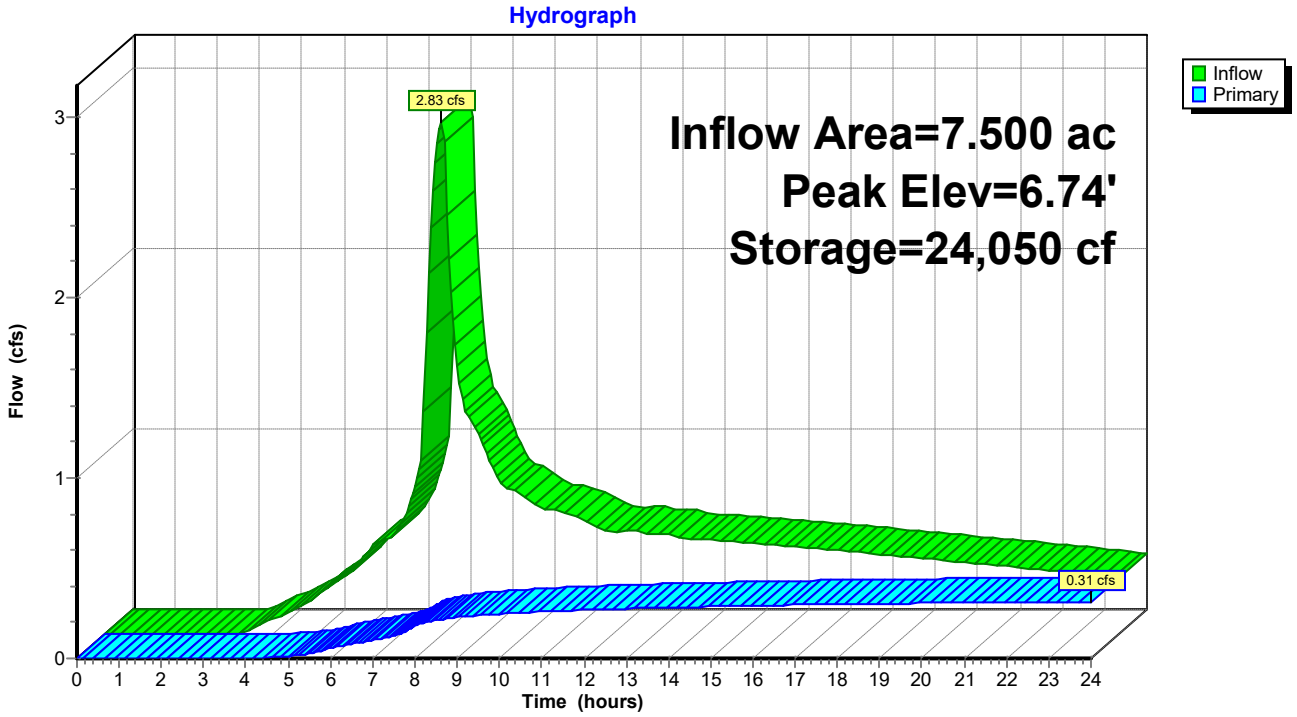
Volume	Invert	Avail.Storage	Storage Description
#1	4.00'	48,539 cf	**Custom Stage Data (Prismatic)** Listed below 65,066 cf Overall x 74.6% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
4.00	10,114	0	0
5.00	11,261	10,688	10,688
6.00	12,464	11,863	22,550
7.00	13,724	13,094	35,644
8.00	15,040	14,382	50,026
9.00	15,040	15,040	65,066

Device	Routing	Invert	Outlet Devices
#1	Primary	4.00'	**2.7" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	6.75'	**18.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.31 cfs @ 24.00 hrs HW=6.74' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.31 cfs @ 7.80 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond POND: POND



Summary for Pond POND: POND

Inflow Area = 7.500 ac, 61.47% Impervious, Inflow Depth > 2.35" for 10-YR event
Inflow = 4.49 cfs @ 7.95 hrs, Volume= 1.466 af
Outflow = 0.84 cfs @ 12.61 hrs, Volume= 0.873 af, Atten= 81%, Lag= 279.6 min
Primary = 0.84 cfs @ 12.61 hrs, Volume= 0.873 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.06' @ 12.61 hrs Surf.Area= 13,806 sf Storage= 27,255 cf

Plug-Flow detention time= 431.6 min calculated for 0.873 af (59% of inflow)
Center-of-Mass det. time= 205.8 min (942.9 - 737.0)

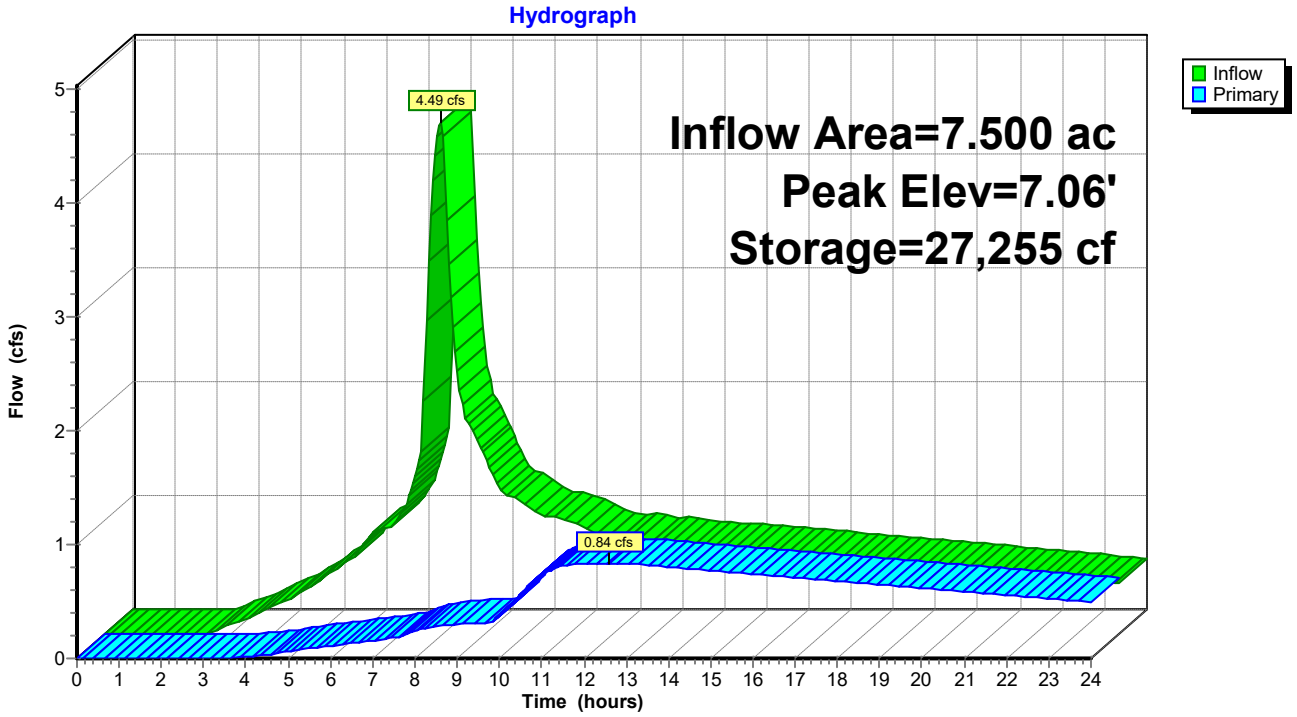
Volume	Invert	Avail.Storage	Storage Description
#1	4.00'	48,539 cf	**Custom Stage Data (Prismatic)** Listed below 65,066 cf Overall x 74.6% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
4.00	10,114	0	0
5.00	11,261	10,688	10,688
6.00	12,464	11,863	22,550
7.00	13,724	13,094	35,644
8.00	15,040	14,382	50,026
9.00	15,040	15,040	65,066

Device	Routing	Invert	Outlet Devices
#1	Primary	4.00'	**2.7" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	6.75'	**18.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.83 cfs @ 12.61 hrs HW=7.06' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.33 cfs @ 8.27 fps)
└**2=Orifice/Grate** (Orifice Controls 0.51 cfs @ 1.90 fps)

Pond POND: POND



Summary for Pond POND: POND

Inflow Area = 7.500 ac, 61.47% Impervious, Inflow Depth > 2.82" for 25-YR event
Inflow = 5.42 cfs @ 7.95 hrs, Volume= 1.762 af
Outflow = 1.26 cfs @ 10.24 hrs, Volume= 1.160 af, Atten= 77%, Lag= 137.7 min
Primary = 1.26 cfs @ 10.24 hrs, Volume= 1.160 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.18' @ 10.24 hrs Surf.Area= 13,957 sf Storage= 28,492 cf

Plug-Flow detention time= 371.8 min calculated for 1.158 af (66% of inflow)
Center-of-Mass det. time= 173.8 min (901.5 - 727.7)

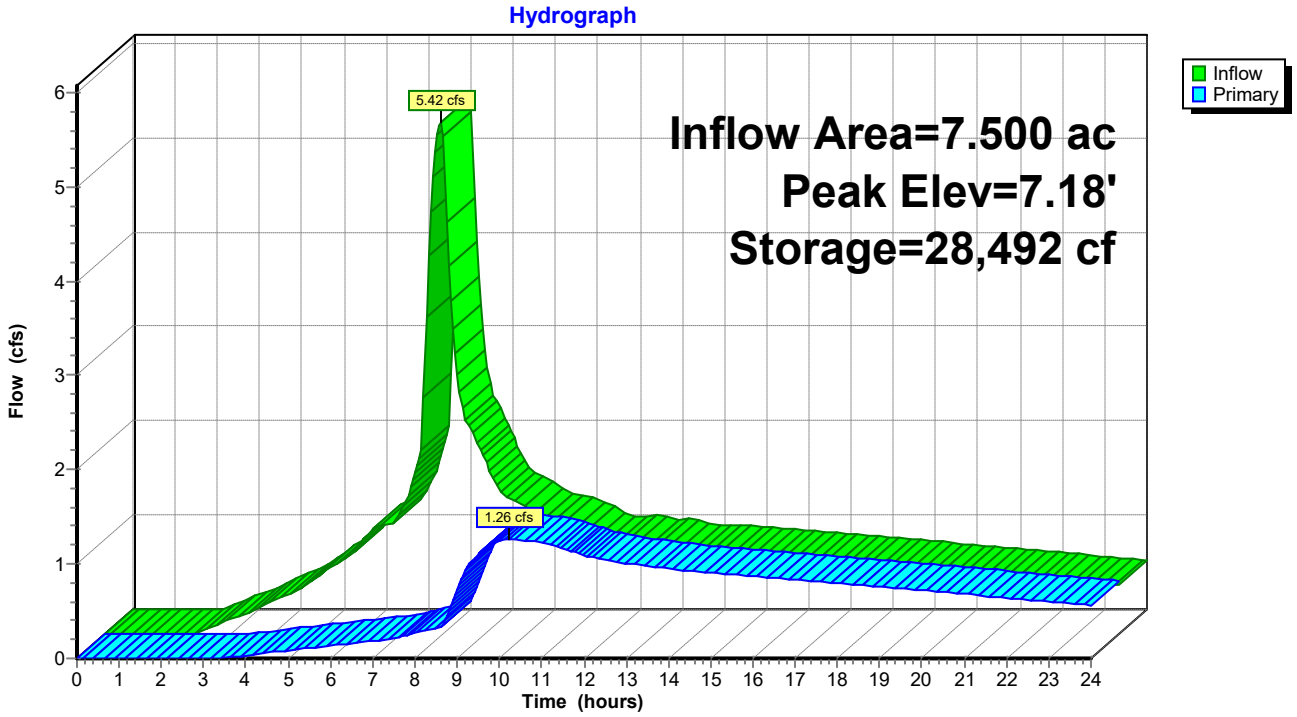
Volume	Invert	Avail.Storage	Storage Description
#1	4.00'	48,539 cf	**Custom Stage Data (Prismatic)** Listed below 65,066 cf Overall x 74.6% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
4.00	10,114	0	0
5.00	11,261	10,688	10,688
6.00	12,464	11,863	22,550
7.00	13,724	13,094	35,644
8.00	15,040	14,382	50,026
9.00	15,040	15,040	65,066

Device	Routing	Invert	Outlet Devices
#1	Primary	4.00'	**2.7" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	6.75'	**18.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.26 cfs @ 10.24 hrs HW=7.18' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.34 cfs @ 8.43 fps)
└**2=Orifice/Grate** (Orifice Controls 0.92 cfs @ 2.23 fps)

Pond POND: POND



Summary for Pond POND: POND

Inflow Area = 7.500 ac, 61.47% Impervious, Inflow Depth > 3.68" for 100-YR event
Inflow = 7.10 cfs @ 7.94 hrs, Volume= 2.302 af
Outflow = 2.56 cfs @ 8.86 hrs, Volume= 1.687 af, Atten= 64%, Lag= 55.4 min
Primary = 2.56 cfs @ 8.86 hrs, Volume= 1.687 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.43' @ 8.86 hrs Surf.Area= 14,296 sf Storage= 31,256 cf

Plug-Flow detention time= 298.8 min calculated for 1.683 af (73% of inflow)
Center-of-Mass det. time= 135.8 min (850.7 - 714.9)

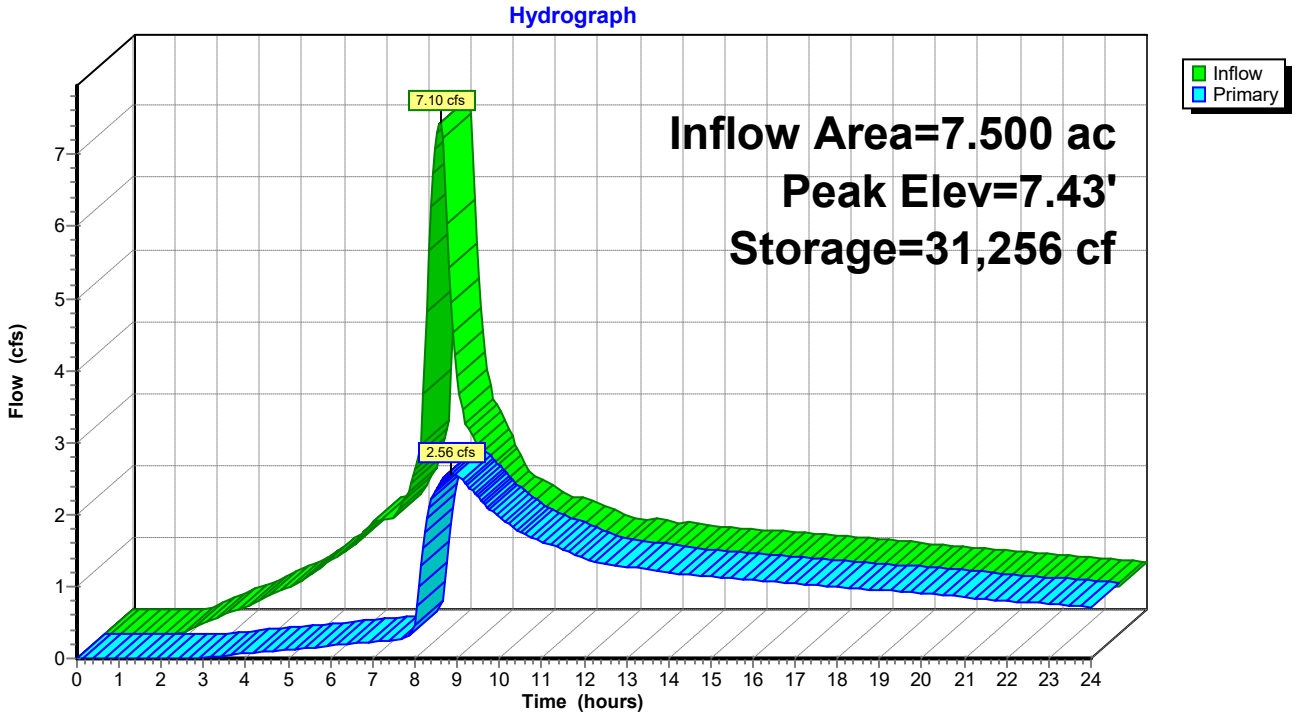
Volume	Invert	Avail.Storage	Storage Description
#1	4.00'	48,539 cf	**Custom Stage Data (Prismatic)** Listed below 65,066 cf Overall x 74.6% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
4.00	10,114	0	0
5.00	11,261	10,688	10,688
6.00	12,464	11,863	22,550
7.00	13,724	13,094	35,644
8.00	15,040	14,382	50,026
9.00	15,040	15,040	65,066

Device	Routing	Invert	Outlet Devices
#1	Primary	4.00'	**2.7" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	6.75'	**18.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.56 cfs @ 8.86 hrs HW=7.43' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.35 cfs @ 8.78 fps)
└**2=Orifice/Grate** (Orifice Controls 2.21 cfs @ 2.82 fps)

Pond POND: POND



Appendix D - Soils Report

See Preliminary Application

Appendix E – Wetland Report

See Preliminary Application