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# PRELIMINARY

# STORMWATER MANAGEMENT REPORT

FOR

# 931 CHEMAWA ROAD NORTH PARTITION

**KEIZER, OR 97303** 

SUBMITTED MAY 27, 2025



BY WILLAMETTE ENGINEERING PO BOX 9032 SALEM, OREGON 97305 PH: 503-304-0905 JER.WILLENGR@JUNO.COM

### TABLE OF CONTENTS

#### 1. Project Description

- 1.1 Size and Location
- 1.2 Scope and Proposed Improvements
- 1.3 Watershed Draining to the Site
- 1.4 Existing Conditions and Constraints
- 1.5 Green Stormwater Infrastructure used
- 1.6 Regulatory Permits Required
- 1.7 100-yr Escape Route Defined
- 2. Methodology
  - 2.1 Depth to Groundwater
  - 2.2 Trees and Native Vegetation
  - 2.3 Infiltration Results
  - 2.4 Soils
- 3. Analysis
  - 3.1 Computation Methods and Software Utilized
  - 3.2 Design Assumptions and Inputs
    - a) Pre-Developed Input CN, Area, Tc, Storms
    - b) Post-Developed Input CN, Area, Tc, Storms
- 4. Green Storm Water Infrastructure (GSI) Analysis
- 5. Source Control
- 6. Downstream Analysis Report

# **1. Project Description:**

#### 1.1 Size and Location

Keizer Storm Water Standards require the detention and water quality be designed and constructed for new impervious areas. Chemawa Road is currently fully developed with water quality swales on both sides of the street. Additional water quality measures are not required by the City of Keizer.

The private lane and Parcel 2 and 3 roof and parking runoff will be detained and treated in a new water quality rain garden on Parcel 2. There are no offsite flows onto the project.

1.2 Scope and Proposed Improvements

The project resides within City of Keizer. Keizer storm water standards will be followed to address storm water for this subdivision project.

1.3 Watershed draining to the Site - there are no offsite storm flows to the new Bio-swale.

1.4 Existing Conditions and Constraints

The existing site has an existing house which will be on Parcel1. The house downspouts drain to the soil adjacent to the house. This will remain unchanged.

The rear portion of the partition is a grassed area with an existing shed which will be removed during the development.

The edges of the property have many trees. As many as possible will be retained during the development.

1.5 Green Stormwater Infrastructure Used

Due to a high permeability rate in excess of 2 inches/hour based upon infiltration testing this project will be containing and infiltrating the water quality volume within the new Water Quality Rain Garden to be placed in Parcel 2. This are considered green storm water infrastructures (GSI).

#### 1.6 Regulatory Permits Required

Permission from City of Keizer to construct the project is required. The partition arrangement requires that the project storm water be collected and treated prior to discharge to the ground. This report and submitted design plans indicate that the project storm water is being treated as required by Keizer development standards.

#### 1.7 100-yr Escape Route Defined

The project's 100 year Storm event peak water discharge will be to the Keizer right-of-way at the south end of the private drive onto Chemawa Road.

### 2. Methodology

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2.1 Depth to Groundwater
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Groundwater was not found in the digging of the infiltration test pits.

2.2 Trees and Native Vegetation

Native vegetation will be preserved to the extent possible.

2.3 Infiltration Results

Infiltration testing was performed in the project vicinity. Infiltration Tests for the Water Quality Pond were performed by Branch Engineering. The pits were dug to a depth of 3.5 feet or to the depth of the bottom of the proposed facility. All test pits showed infiltration numbers in excess of 2 inches per hour.

2.4 Hazardous Materials Potential

The project vicinity has a history of being undeveloped open space. Since no other history of prior development exists, hazardous materials are not anticipated onsite.

## 3. Analysis

#### 3.1 Computation Methods & Software Utilized

The Santa Barbara Urban Hydrograph (SBUH) method was calculated utilizing HydroCAD version 10 software. The Springwood Estates pre-and post development time of concentrations were calculated. These values were used in the HydroCAD method. The post development hydrographs were then routed through infiltration basins using the storage indication method. All hydraulic calculations are attached. See these Hydraulic Calculations Summaries for more discussion.

#### **3.2 Design Assumptions & Inputs**

The entire portions of Parcel 2 and 3 and the access lane portion on Parcel 1 are included in the storm water design package.

Storm Water Areas:

Access Lane & Fire Truck	-	2,650 square feet
Patios	-	400 square feet
Driveways	-	2,800 square feet
Two Duplexes	-	6,000 square feet
Landscape	-	2,780 square feet
Total Area	_	14,630 square feet

An infiltration rate of 3.75" per hour was used for subgrade infiltration rated. This was determined from field tests.

#### 3.3 Hydrologic Calculations Summary (Pre & Post)

There is no Flow Control for the project. All storm water up to the 100 year storm is infiltrated.

As stated in the Keizer Design Standards, the 24 hour duration precipitation rates used are as follows. 2-Year = 1.1"P(2) = 2.2"P(10) = 3.2"P(100) = 4.4" Water Quality Depth = 1.38".

### 4. Green Stormwater Infrastructure (GSI) Analysis

This project proposes using a combination swale along Dearborn Ave and a water quality rain garden for Parcels 2 and 3.

#### **5. Source Control**

There is no unmitigated pollution generating activity on the project site.

#### 6. Downstream Analysis Report

There is no existing storm water system in Dearborn. Therefore, there is no downstream analysis.

# Chemawa Partition

Hydrocad is based on City of Keizer Design Standards February 2023

# Areas

Pre-Developed:

14,630 SF CN=58 (Salem Pre-Dev with Soil grade B)

#### Total= 14,630 SF (Tc = 10 min) (Weighted CN=58)

Post-Developed:

Pavement = 2,650 SF CN=98 Patios = 400 SF CN=98 Driveways = 2,800 SF CN=98 Buildings = 6,000 SF CN=98 Landscape = 2,780 SF CN=74

#### Total = 14,630 SF (Tc=5 min) (Weighted CN=93)

### Soil (Web Soil Survey)

Cloquato silt loam (Hydraulic soil group B)

Infiltration Rate = 3.5" per hour (use 1.75" per hour)(factor of safety = 2.0)

### Storm Events (City of Keizer)

WQ: 1.38"

2-year: 2.2"

5-year: 2.7"

10-year: 3.2"

25-year: 3.6"

50-year: 4.1"

100-year: 4.4"

#### Pond Storage

@ 131 = 880 SF

@ 134 = 880 SF

#### Flow Control

Infiltration = 1.75" per hour

#### Pond Water Levels

Water quality: 131.12

2-year: 131.35

5-year: 131.58

10-year: 131.89

25-year: 132.21

50-year: 132.68

100-year: 133.00 (Freeboard = 1.0 foot)

# Peak Flow (cfs)

	Water	quality	2-y	/ear	5-ye	ear	10-y	/ear
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Total	0.00 cfs	0.00 cfs	0.00 cfs	0.00 cfs	0.01 cfs	0.00 cfs	0.01 cfs	0.00 cfs

	25-	year	50-	/ear	100-י	year
	Pre	Post	Pre	Post	Pre	Post
Total	0.01 cfs	0.00 cfs	0.02 cfs	0.00 cfs	0.02 cfs	0.00 cfs

7

WQ

Type IA 24-hr

Printed 5/7/2025 Page 1

#### Event# Event Storm Type Mode Duration B/B Curve Depth AMC Name (hours) (inches) Type IA 24-hr 1 2 1 2 yr Default 24.00 2.20 2 Type IA 24-hr 5 yr Default 24.00 1 2.70 2 3 Type IA 24-hr 2 10 yr Default 24.00 1 3.20 4 25 yr Type IA 24-hr Default 24.00 1 3.60 2 50 yr 5 Type IA 24-hr Default 2 24.00 1 4.10 6 100 yr Type IA 24-hr Default 4.40 2 24.00 1

Default

24.00

1

1.38

2

#### Rainfall Events Listing (selected events)

Inflow A	rea =	14,630 sf, 0.00% Impervious,	Inflow Depth = 0.07" for 2 yr event	
Inflow	=	0.00 cfs @ 21.76 hrs, Volume=	86 cf	
Primary	=	0.00 cfs @ 21.76 hrs, Volume=	86 cf, Atten= 0%, Lag= 0.0 mi	in

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs



Inflow Area	a =	14,630 sf,	0.00% Im	pervious,	Inflow Depth =	0.18"	for 5 yr event
Inflow	=	0.01 cfs @	19.58 hrs, `	Volume=	225 c	f	
Primary	=	0.01 cfs @	19.58 hrs, `	Volume=	225 c	f, Atten	= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs



Inflow Area	a =	14,630 sf,	0.00% Imperv	vious, Inf	flow Depth =	0.34"	for 10 yr event
Inflow	=	0.01 cfs @	18.06 hrs, Volu	ume=	416 cf		
Primary	=	0.01 cfs @	18.06 hrs, Volu	ume=	416 cf	, Atten=	= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs



Inflow Are	a =	14,630 sf,	0.00% Im	pervious,	Inflow Depth =	0.49"	for 25 yr event
Inflow	=	0.01 cfs @ 1	17.12 hrs,	Volume=	601 c	f	
Primary	=	0.01 cfs @ 1	17.12 hrs,	Volume=	601 c	f, Atten	= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs



Inflow A	rea =	14,630 sf,	0.00% Impervious,	Inflow Depth = 0.71"	for 50 yr event
Inflow	=	0.02 cfs @	8.81 hrs, Volume=	867 cf	
Primary	- =	0.02 cfs @	8.81 hrs, Volume=	867 cf, Atte	n= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs



**Chemawa Partition** 

Printed 5/7/2025

Page 7

Inflow Are	ea =	14,630 sf,	0.00% Impervious,	Inflow Depth = 0.85"	for 100 yr event
Inflow	=	0.02 cfs @	8.12 hrs, Volume=	1,042 cf	
Primary	=	0.02 cfs @	8.12 hrs, Volume=	1,042 cf, Atter	n= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs



Inflow A	rea =	14,630 sf,	0.00% Impervious,	Inflow Depth = 0.00"	for WQ event
Inflow	=	0.00 cfs @	0.00 hrs, Volume=	0 cf	
Primary		0.00 cfs @	0.00 hrs, Volume=	0 cf, Atter	n= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

#### Link PRE: Pre Development



**Chemawa Partition** 



# Division 004 Appendix C-Infiltration Testing

Tester's	Name:		Diameter of noie.	rest method:	
Tester's l	Company:	Tester's Contact N	lumber:		
	Depth. fe	et		Soil Texture	
		71		S'ITY /	-lau
					-1-19
			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
	Time interval	Maaguramant	Dran in water laval	Dereclation vate	
Time	Time interval, minutes	Measurement,	Drop in water level,	Percolation rate,	Remark
Time	Time interval, minutes	Measurement,	Drop in water level,	Percolation rate, inches per hour	Remark
Time 9:25 9.35	Time interval, minutes 30	Measurement,	Drop in water level,	Percolation rate, inches per hour	Remark
Time 9:25 9:55	Time interval, minutes 30	Measurement,	Drop in water level,	Percolation rate, inches per hour	Remark
Time 9:25 9:55 10:25	Time interval, minutes 35	Measurement, 1 N 3 1/2 2 1/2 5 1/2	Drop in water level,	Percolation rate, inches per hour	Remark
Time 9:25 9:55 10:25 10:55	Time interval, minutes 35	Measurement, IN $3\frac{2}{2}$ $2\frac{2}{2}$ $2\frac{12}{2}$ $2\frac{12}{2}$ $2\frac{12}{2}$	Drop in water level,	Percolation rate, inches per hour	Remark
Time 9:25 9:55 (0:35 (0:55 (0:55 (1):25 (1):55	Time interval, minutes 35	Measurement, IN $3 \frac{1}{2}$ $2 \frac{1}{2}$ $2 \frac{1}{2}$ $2 \frac{1}{2}$	Drop in water level,	Percolation rate, inches per hour	Remark
Time 9:25 9:55 10:25 10:55 11:25 11:55 11:55	Time interval, minutes 35	Measurement, IN $3 \frac{1}{2}$ $2 \frac{1}{2}$	Drop in water level,	Percolation rate, inches per hour	Remark

Figure 4C-3. Infiltration Test Data Table

1<sup>31</sup>4" PER 30 MINUTE USE 31/2" PER HOUR

Location Depth to	bottom of hole:	mawardN	Date: 4/24/2	S Test Hole Num Test Method:	ber: Z
Tester's	Name: Company:	Testar's Contact N	lumber		
	Depth, fe	et		Soil Texture	y day
	Time interval,	Measurement,	Drop in water level,	Percolation rate,	
Time	minutes	IN	IN	inches per hour	Remarks
Time 9:23	minutes 30	IN	IN	inches per hour	Remarks
Time 9:23 9:53 0:23	minutes 30	  		inches per hour	Remarks
Time 9:23 9:53 0:23 0:53 11:23	minutes 30	14 7 7 7		inches per hour	Remarks
Time 9:23 9:53 0:23 0:53 11:23 11:53 2:23	minutes 30	1X 7 7 6 7 8 310		inches per hour	Remarks

Figure 4C-3. Infiltration Test Data Table

5" / 30 MIN = 18" PER HOUR









![](_page_22_Figure_0.jpeg)

![](_page_22_Picture_1.jpeg)