GREEN INFRASTRUCTURE REVIEW

ecoPlan & Design

Grette Associates LLC
ENVIRONMENTAL CONSULTANTS

CIVIL STRUCTURAL PACIFIC ENGINEERING

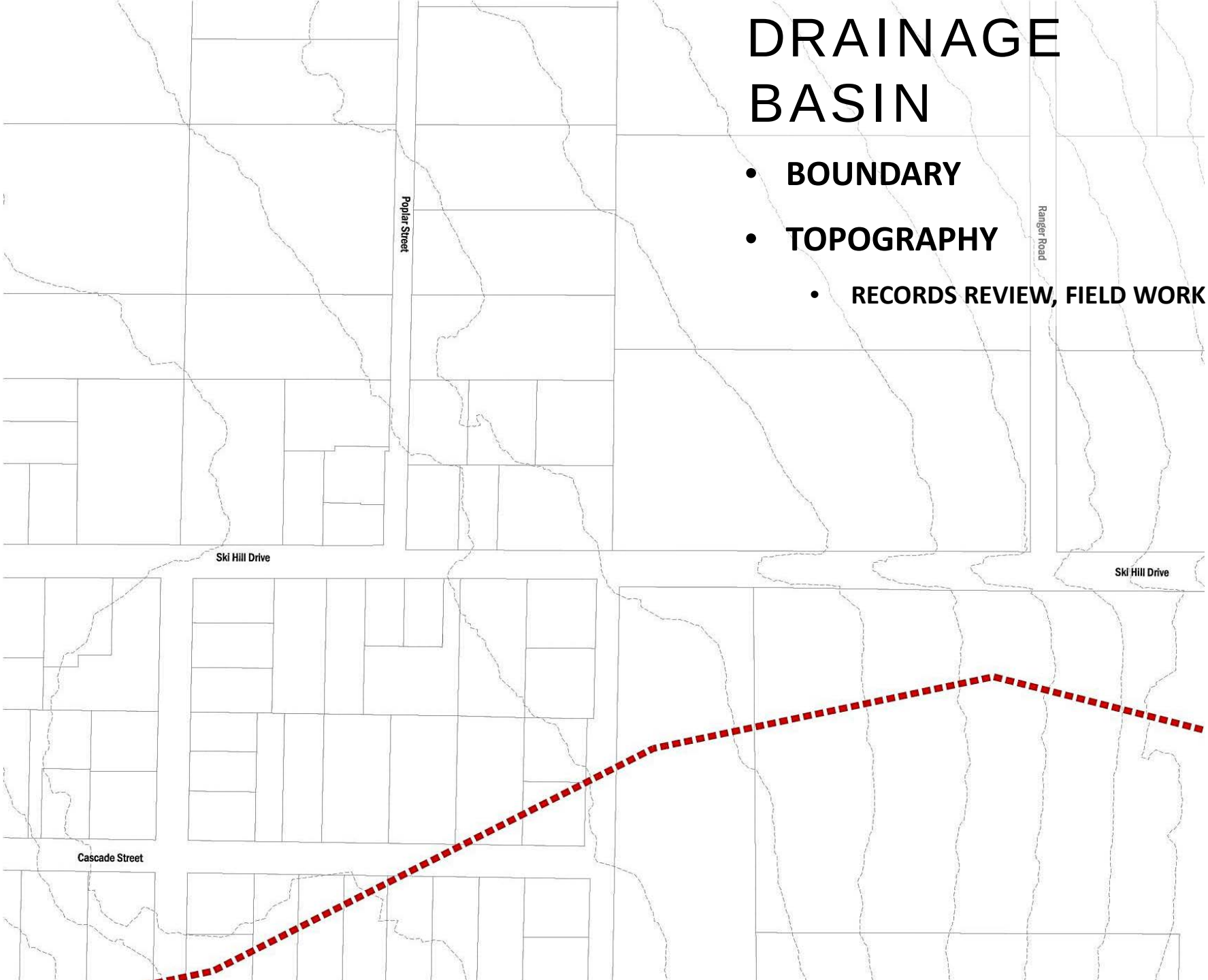
CITY OF LEAVENWORTH
THE BAVARIAN VILLAGE
WA

OVERVIEW

- **BASEMAP**
  - **2,500 ACRES**
- **HYDROLOGY/HYDRAULIC ANALYSIS**
- **STORMWATER INFLOW**

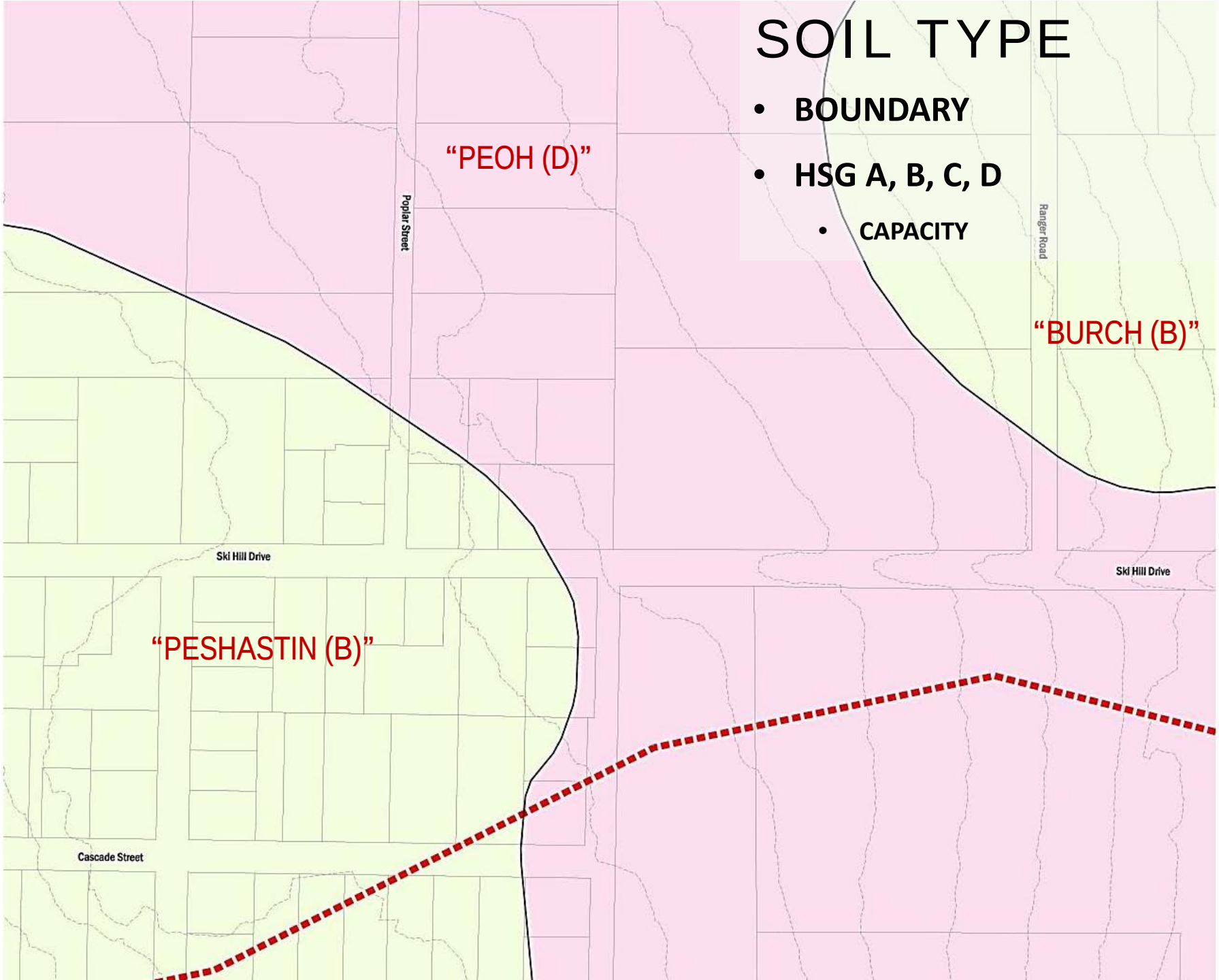
DRAINAGE BASIN

- **BOUNDARY**
- **TOPOGRAPHY**
  - **RECORDS REVIEW, FIELD WORK**



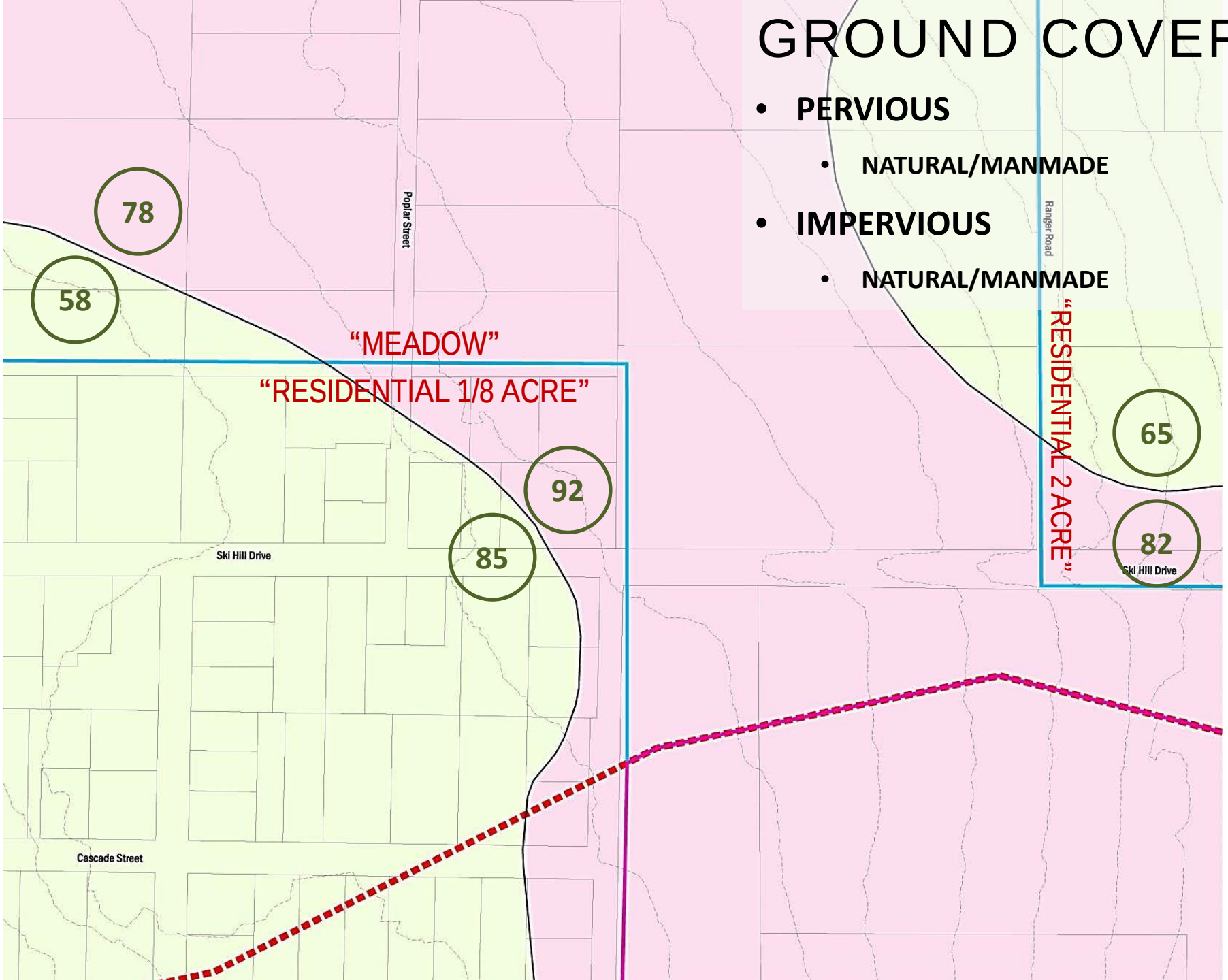
SOIL TYPE

- **BOUNDARY**
- **HSG A, B, C, D**
  - **CAPACITY**



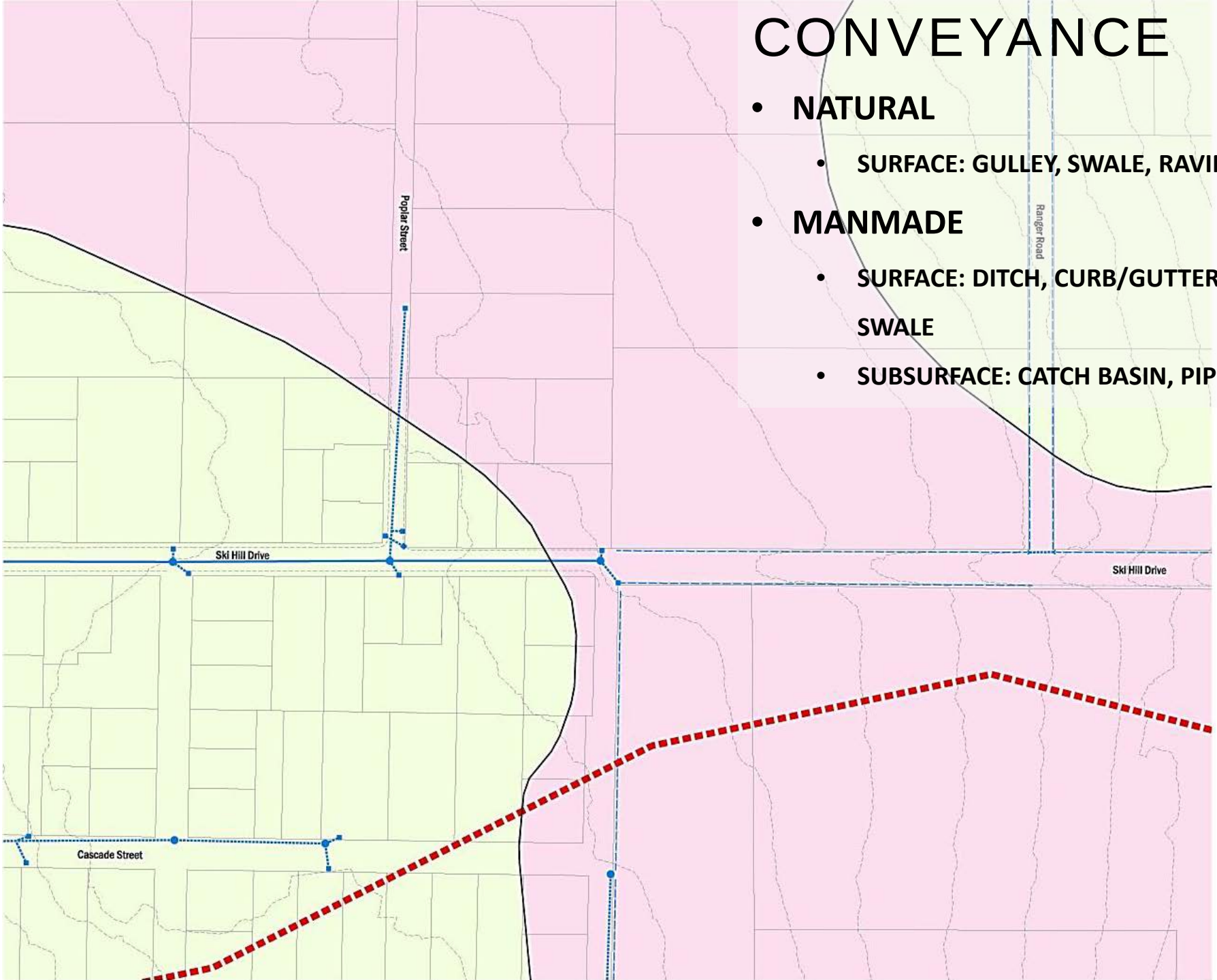
GROUND COVER

- **PERVIOUS**
  - **NATURAL/MANMADE**
- **IMPERVIOUS**
  - **NATURAL/MANMADE**



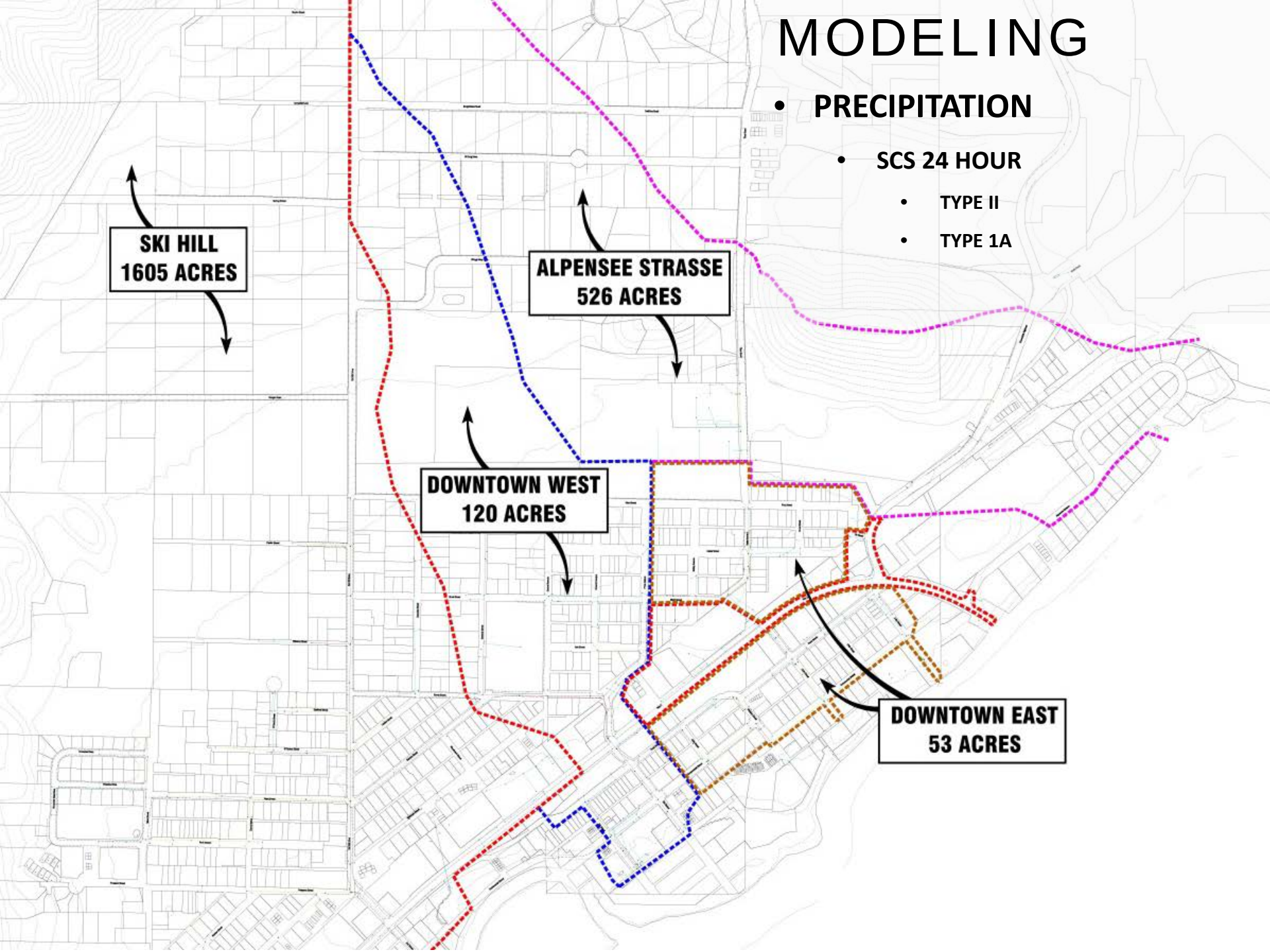
CONVEYANCE

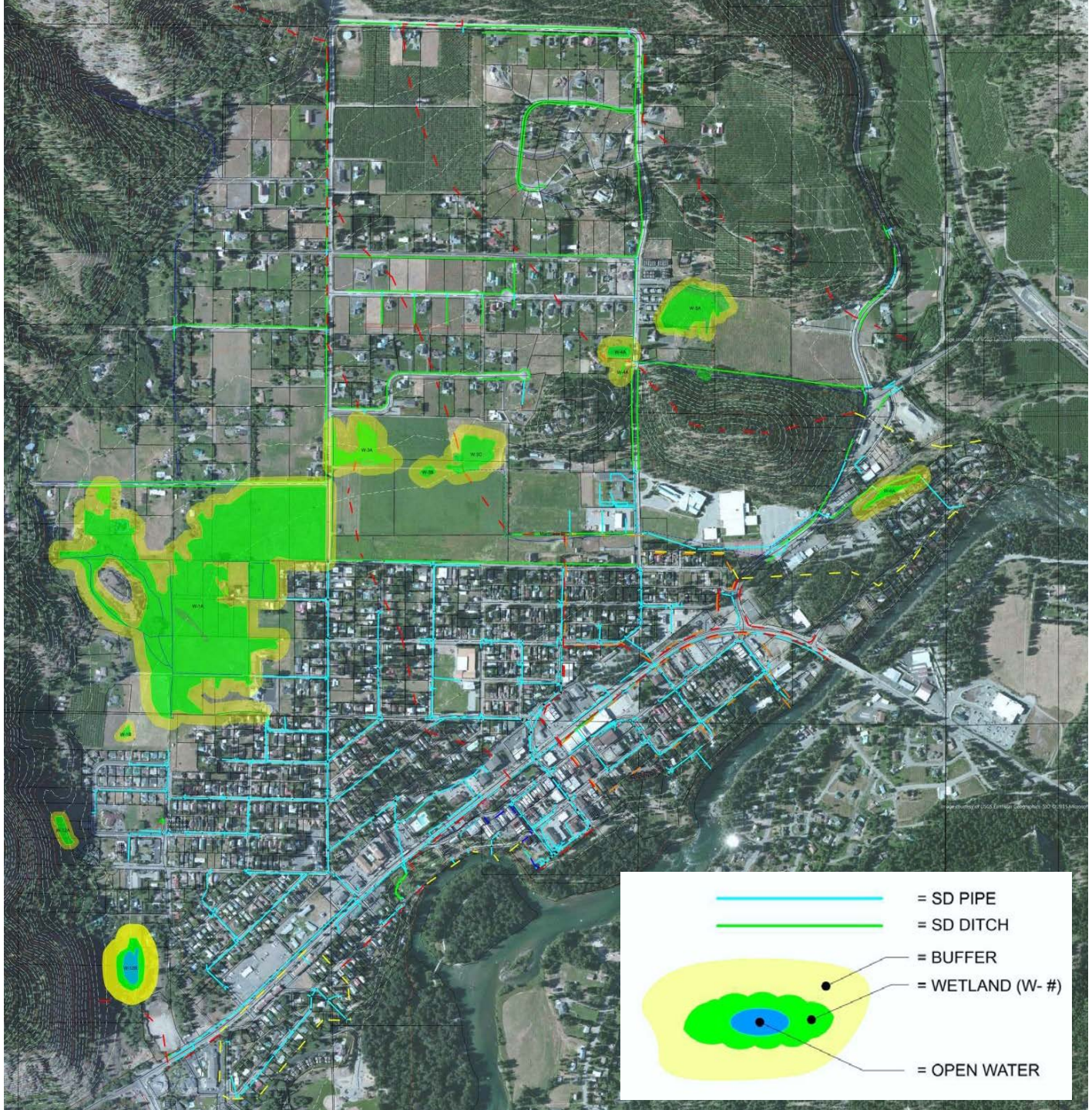
- **NATURAL**
  - **SURFACE: GULLEY, SWALE, RAVINE**
- **MANMADE**
  - **SURFACE: DITCH, CURB/GUTTER, SWALE**
  - **SUBSURFACE: CATCH BASIN, PIPE**

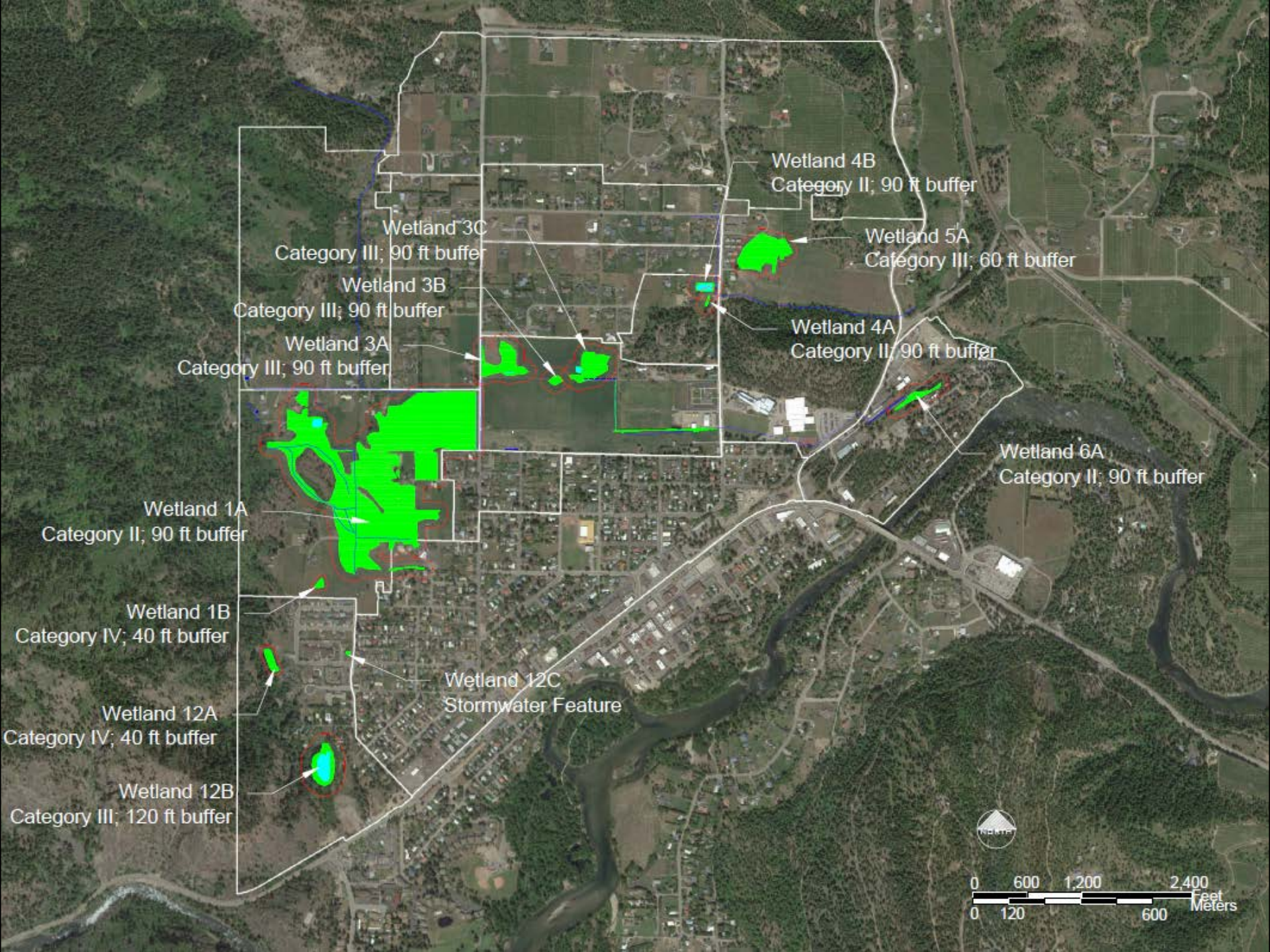


MODELING

- **PRECIPITATION**
  - **SCS 24 HOUR**
    - **TYPE II**
    - **TYPE 1A**




= SD PIPE
= SD DITCH
= BUFFER
= WETLAND (W- #)
= OPEN WATER


Wetland 4B
Category II; 90 ft buffer
Wetland 3C
Category III; 90 ft buffer
Wetland 5A
Category III; 60 ft buffer
Wetland 3B
Category III; 90 ft buffer
Wetland 4A
Category II; 90 ft buffer
Wetland 3A
Category III; 90 ft buffer
Wetland 6A
Category II; 90 ft buffer
Wetland 1A
Category II; 90 ft buffer
Wetland 1B
Category IV; 40 ft buffer
Wetland 12C
Stormwater Feature
Wetland 12A
Category IV; 40 ft buffer
Wetland 12B
Category III; 120 ft buffer
0 600 1,200 2,400 Feet
0 120 600 Meters

Wetland Category	Standard Buffer Width	Additional buffer width if wetland scores 21 – 25 habitat points (*5-6 under the 2014 system)	Additional buffer width if wetland scores 26 – 29 habitat points (*7-8 under the 2014 system)	Additional buffer width if wetland scores 30 – 36 habitat points (*9+ under the 2014 system)
Category I: Based on total score	75 ft.	Add 15 ft.	Add 45 ft.	Add 75 ft.
Category I: Forested	75 ft.	Add 15 ft.	Add 45 ft.	Add 75 ft.
Category I: Bogs	190 ft.	NA	NA	NA
Category I: Alkali	150 ft.	NA	NA	NA
Category I: Natural Heritage Wetlands	190 ft.	NA	NA	NA
Category II: Based on total score	75 ft.	Add 15 ft.	Add 45 ft.	Add 75 ft.
Category II: Vernal pool	150 ft.	NA	NA	NA
Category II: Forested	75 ft.	Add 15 ft.	Add 45 ft.	Add 75 ft.
Category III (all)	60 ft.	Add 30 ft.	Add 60 ft.	NA
Category IV (all)	40 ft.	NA	NA	NA

WETLANDS

Wetland Name	Wetland Size (ac)	Cowardin Class	HGM Class	Water Quality	Hydrology	Habitat	Total	Category
1A	42.20	PEMC	Depressional	8	6	6	20	II
1B	0.14	PEMC	Slope	5	4	5	14	IV
3A	1.95	PEMC	Slope	7	6	5	18	III
3B	0.20	PEMC	Slope	6	5	5	16	III
3C	1.85	PEMC	Slope	6	5	5	16	III
4A	0.04	PEMC	Depressional	8	6	5	19	II
4B	0.37	PUBHx	Depressional	7	6	6	19	II
5A	3.40	PEMC	Slope	7	7	4	18	III
6A	0.44	PEMC	Depressional	8	7	5	20	II
12A	0.41	PSSC	Depressional	5	4	5	14	IV
12B	1.89	PUBHx	Depressional	6	5	7	18	III
12C	0.02	PEMC	Depressional	--	--	--	--	--

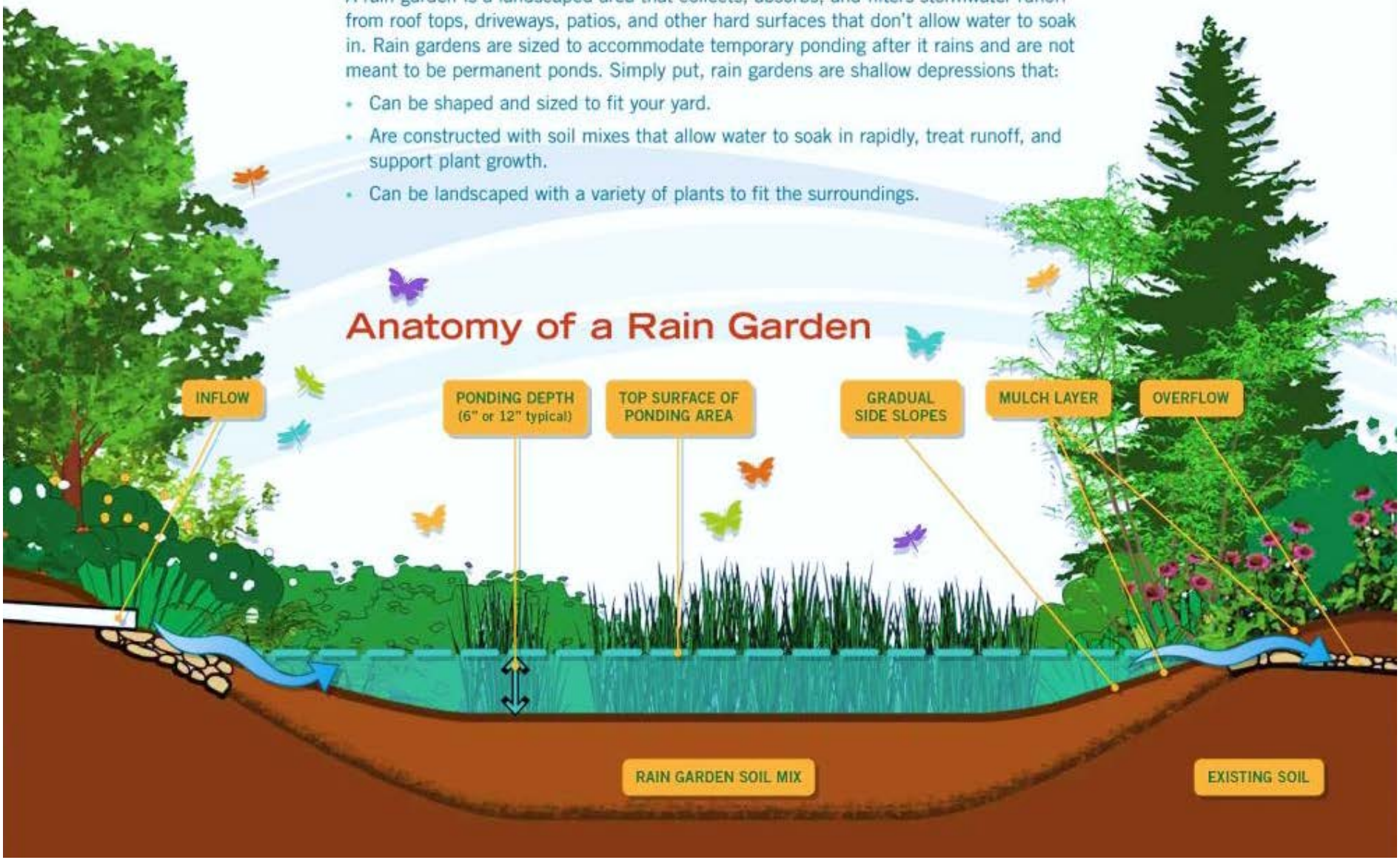
Wetland Name	Habitat	Category	Buffer (ft)
1A	6	II	90
1B	5	IV	40
3A	5	III	90
3B	5	III	90
3C	5	III	90
4A	5	II	90
4B	6	II	90
5A	4	III	60
6A	5	II	90
12A	5	IV	40
12B	7	III	120
12C	--	--	N/A

What Is a Rain Garden?

A rain garden is a landscaped area that collects, absorbs, and filters stormwater runoff from roof tops, driveways, patios, and other hard surfaces that don't allow water to soak in. Rain gardens are sized to accommodate temporary ponding after it rains and are not meant to be permanent ponds. Simply put, rain gardens are shallow depressions that:

- Can be shaped and sized to fit your yard.
- Are constructed with soil mixes that allow water to soak in rapidly, treat runoff, and support plant growth.
- Can be landscaped with a variety of plants to fit the surroundings.

Anatomy of a Rain Garden



Rain Gardens As Part of the Overall Approach to Low Impact Development

Rain gardens are important and versatile tools in the approach to managing stormwater called low impact development. In addition to rain gardens, preservation of natural areas, permeable pavement, compost-amended soils, vegetated roofs, rainwater collection systems, and other techniques can help to manage stormwater runoff in commercial and residential areas including your home. Rain gardens that are part of an engineered stormwater management system are called "bioretention" facilities.

1. Rain Gardens
2. Preservation of Existing Trees and Vegetation
3. Composting and Mulching
4. Natural Yard Management (No Pesticides or Fertilizers)
5. Retain/Restore Native Plantings as Lawn Alternatives
6. Rainwater Harvesting/Cisterns
7. Green Roofs
8. Permeable Pavement
9. Splash Blocks for Roof Downspouts
10. Soil Amendments

QUESTIONS?

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