

Fitchrona Road and Goose Lake Watershed Study

Badger Mill Creek Stakeholder Group

January 17, 2024



TEAM INTRODUCTIONS

- Linda Severson, PE | AE2S
- Ben Schulte, PE | City of Fitchburg
- Chris Barnes, PE | Town of Verona

PURPOSE OF STUDY

- Flooding closed Fitchrona Road to traffic in 2001, 2007, 2008, 2009, 2010, 2013, 2017, 2018, and 2019.
- Subsequent plans call for increased pipe capacity under Fitchrona Road.
- Suspected downstream “roadblocks” to adequate drainage.



Fitchrona Road, looking south to 18/151, photo taken June 26, 2013

PURPOSE OF STUDY

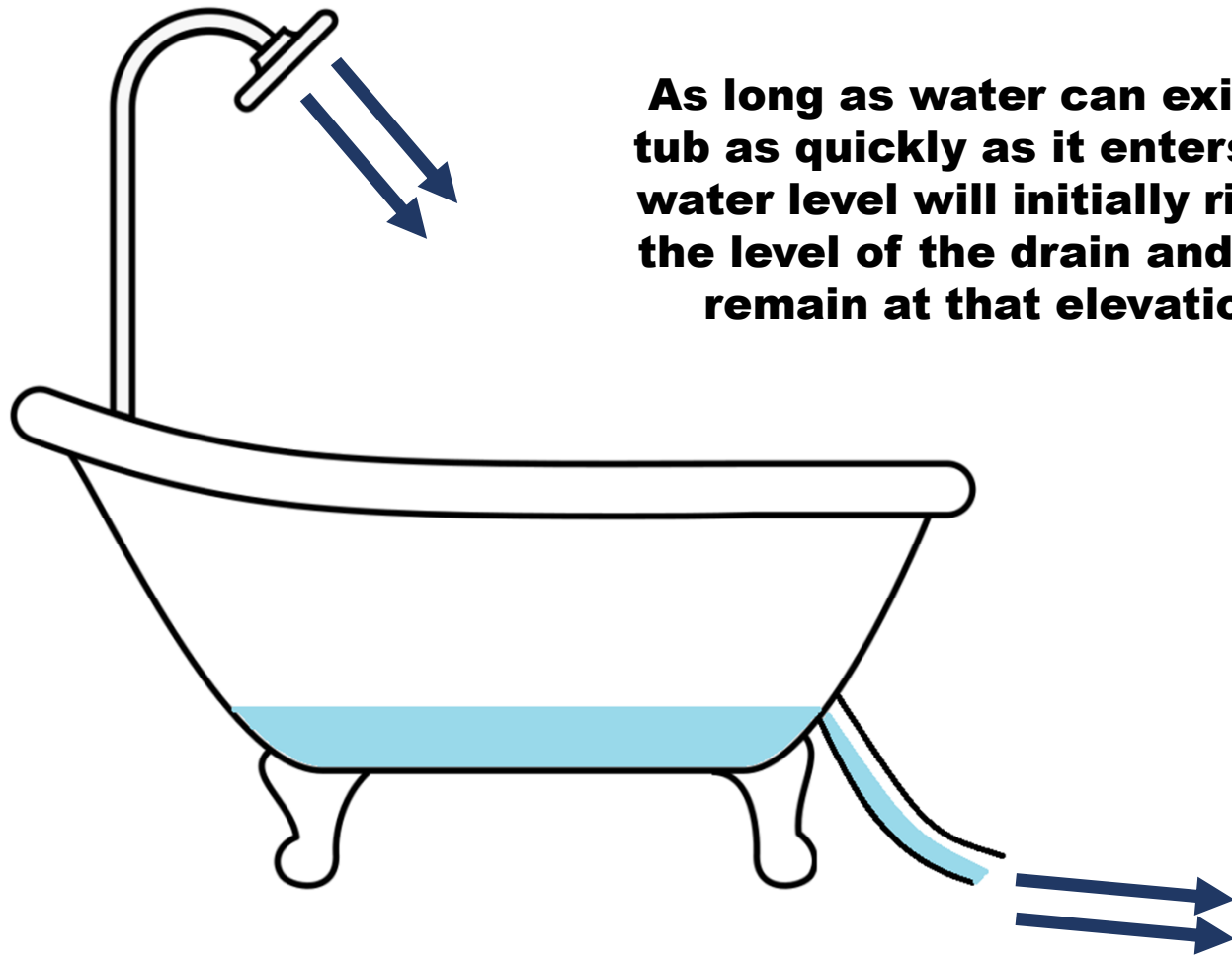


Fitchrona Rd, looking south to Military Ridge State Trail, photo taken June 9, 2008

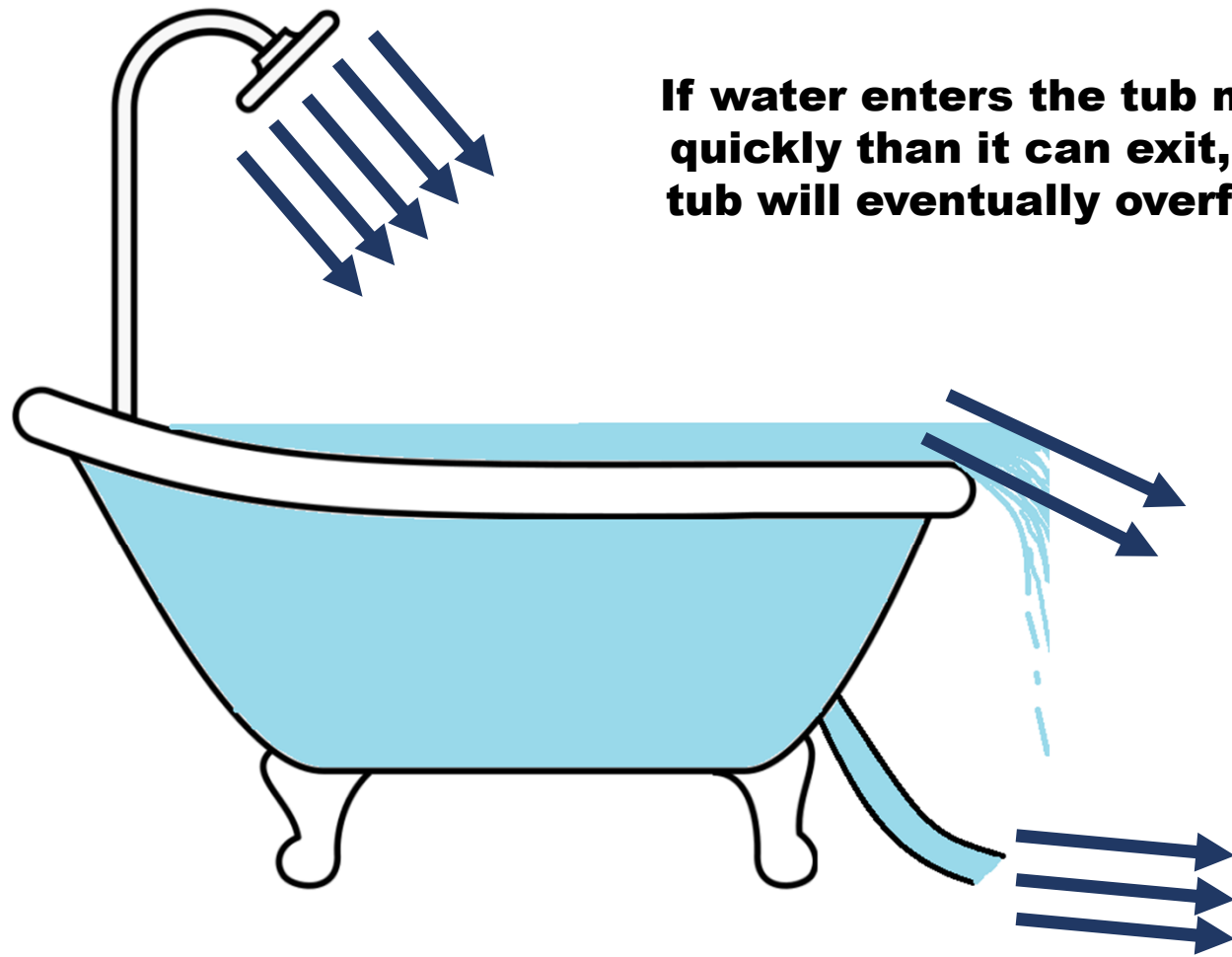


Fitchrona Road, looking south to 18/151, photo taken June 26, 2013

Background Information: Hydrology 101

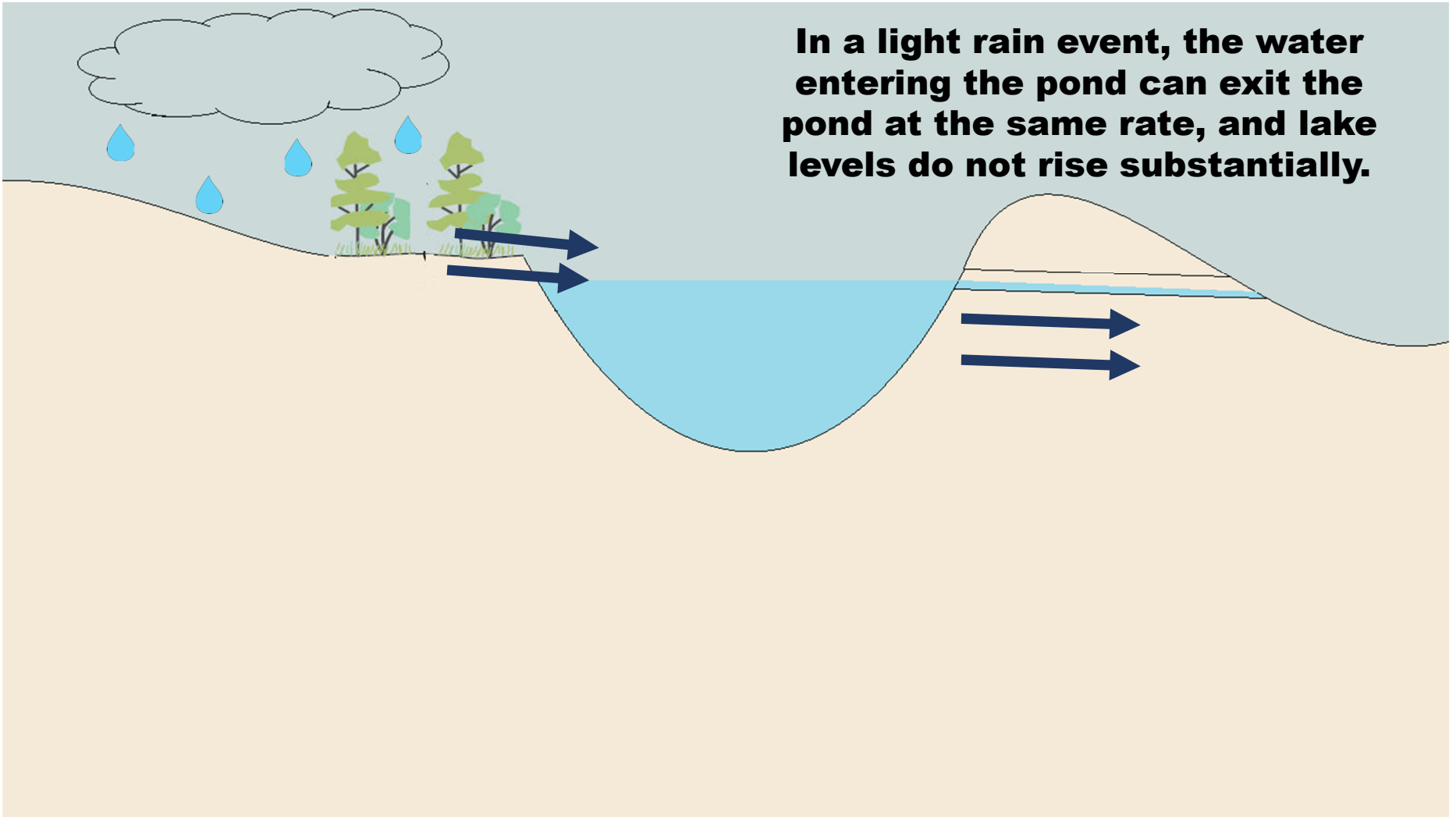


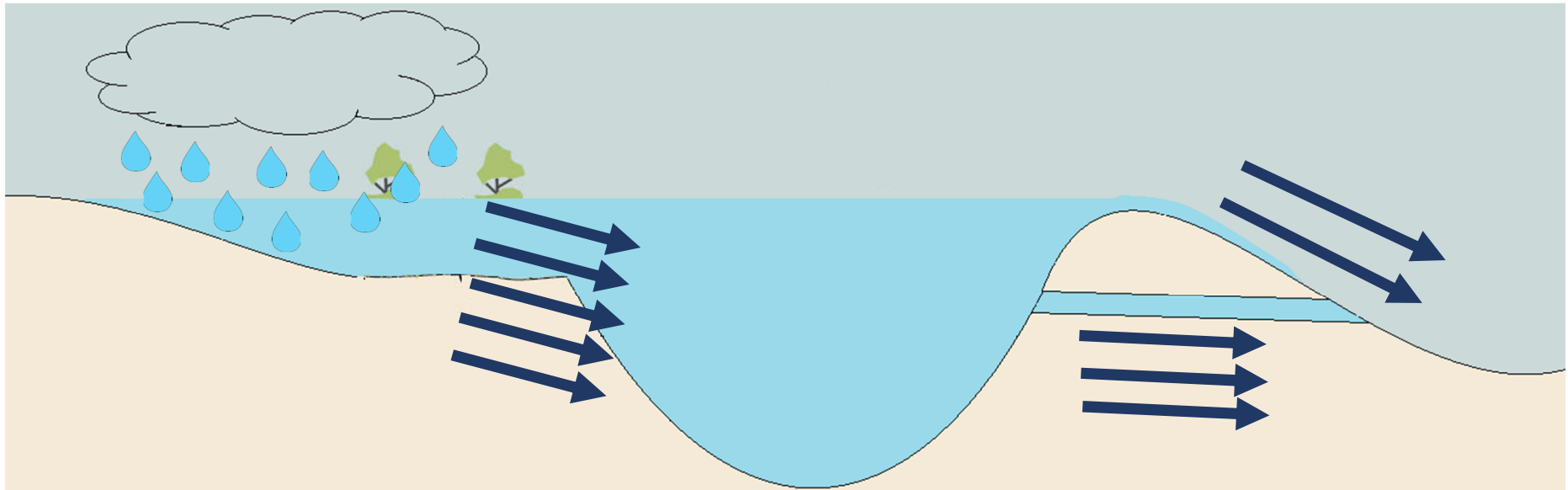
As long as water can exit the tub as quickly as it enters, the water level will initially rise to the level of the drain and then remain at that elevation.



If water enters the tub more quickly than it can exit, the tub will eventually overflow.

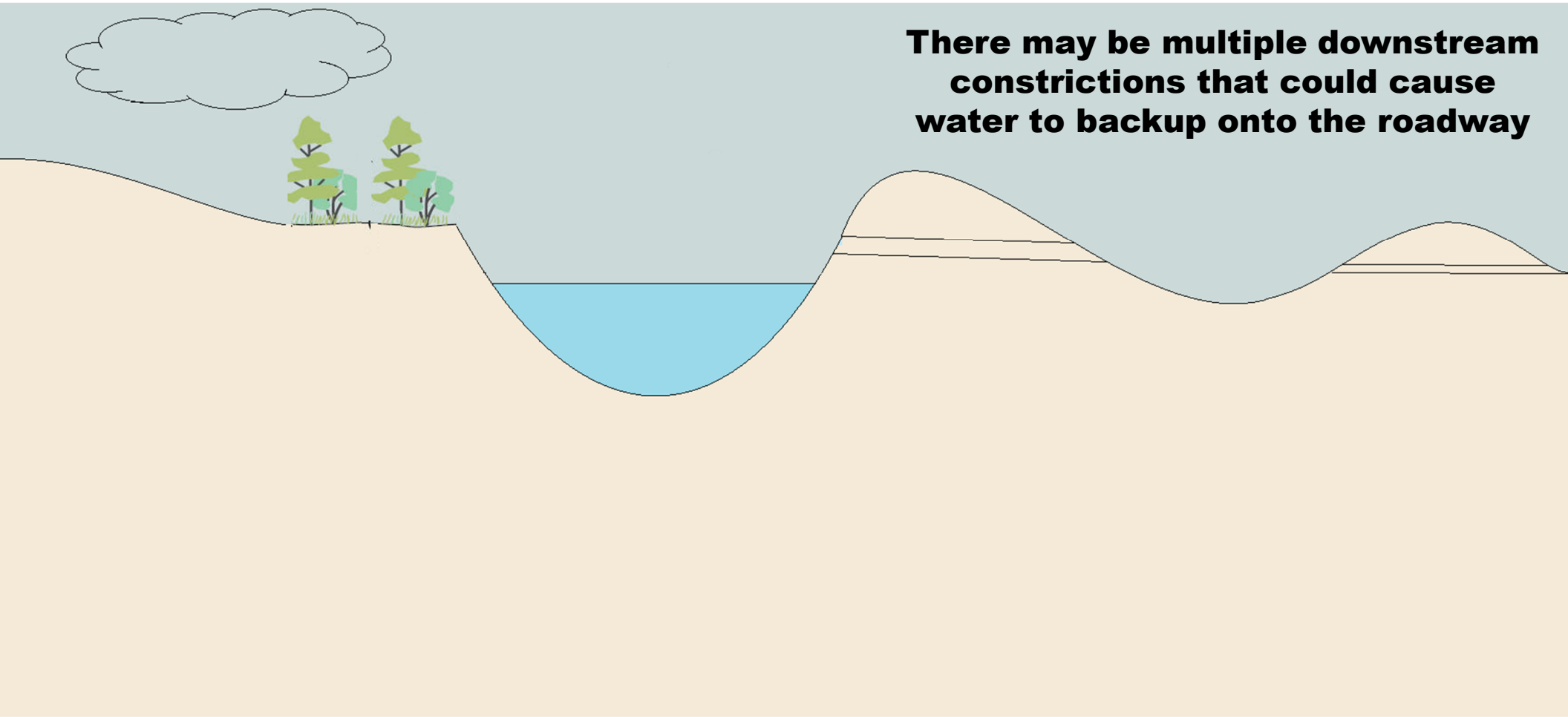
In a light rain event, the water entering the pond can exit the pond at the same rate, and lake levels do not rise substantially.

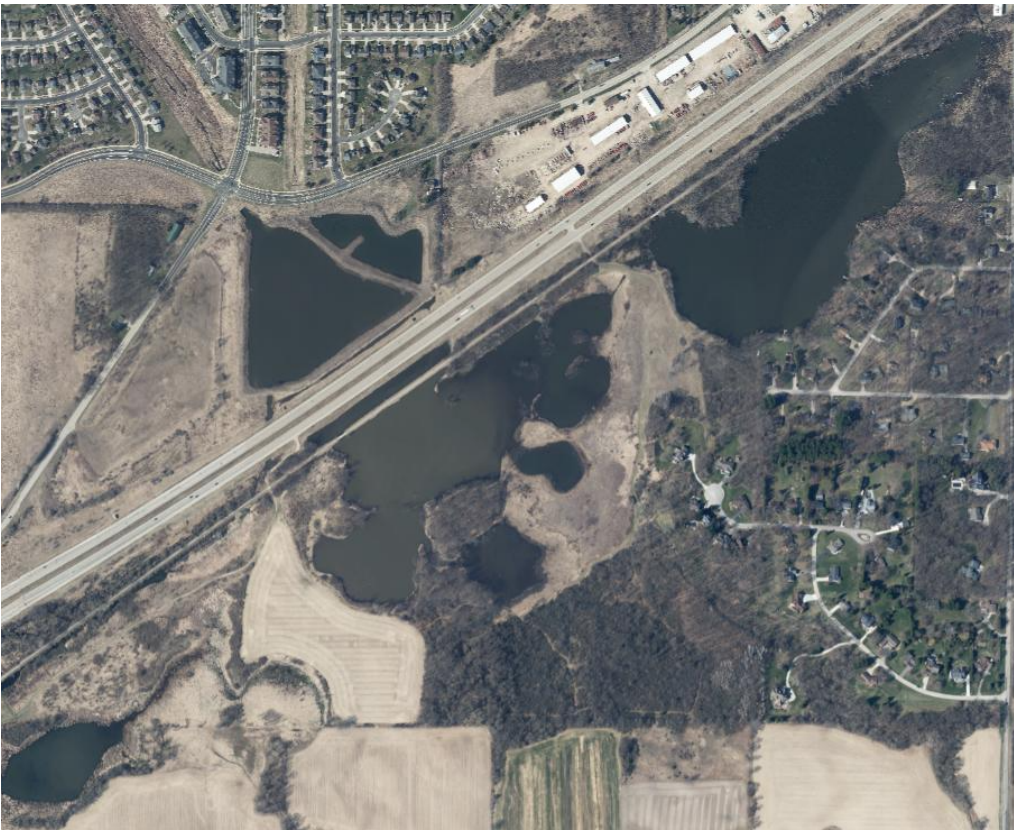




In a heavy rain event, water may enter the system more quickly than it can exit, causing water levels to rise. Given enough time under these conditions, the system would eventually find an overflow path.

**There may be multiple downstream
constrictions that could cause
water to backup onto the roadway**





2020

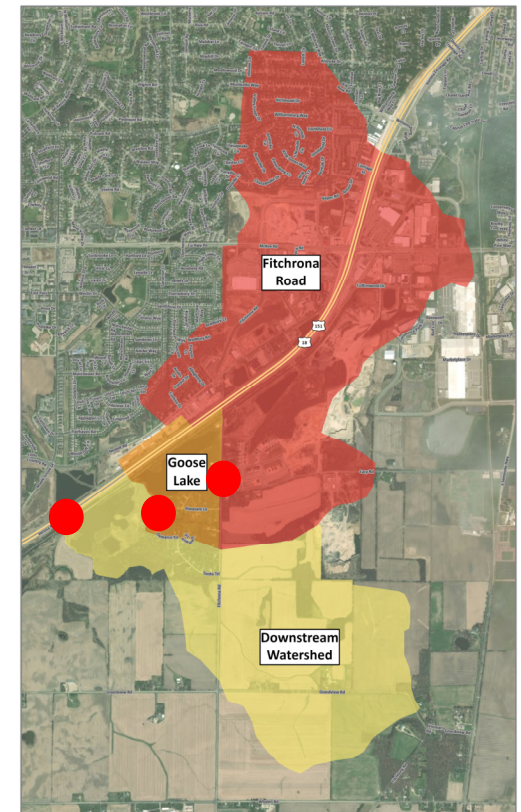


2022

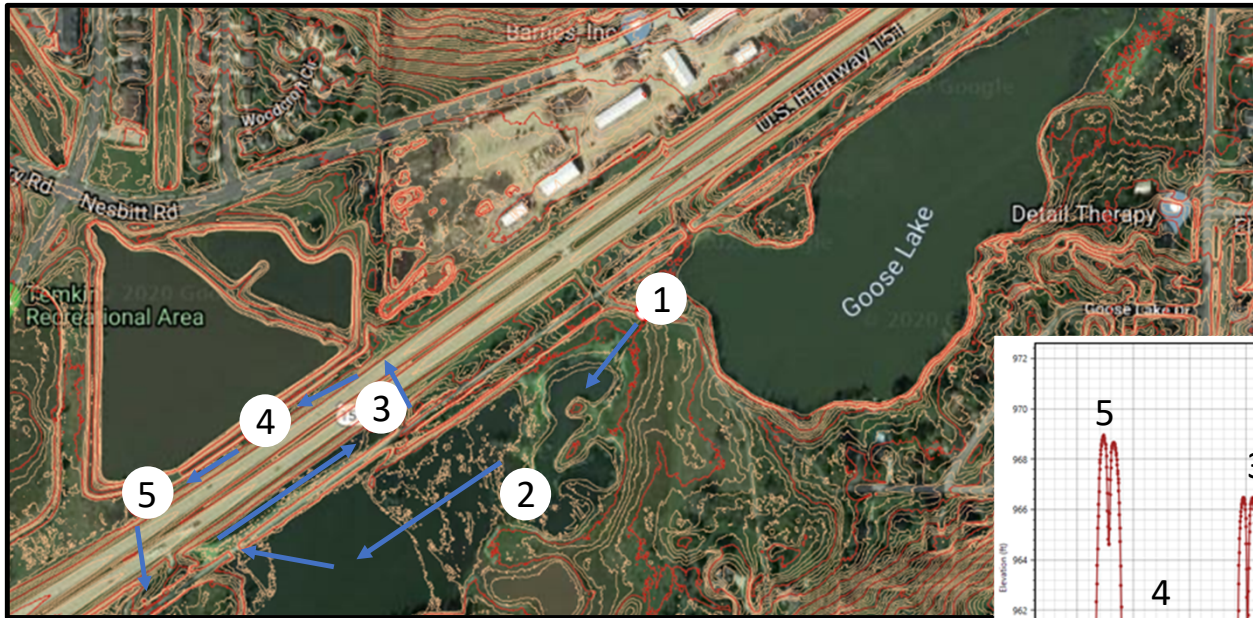
How much water is actually getting to the pond?

WATERSHEDS 101

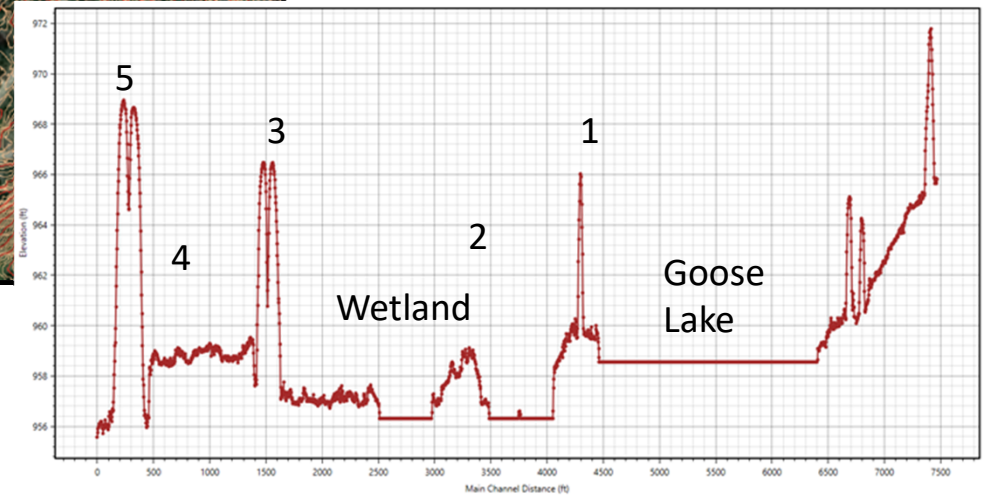
- Factors affecting runoff:
 - Drainage area size
 - Rainfall intensity, duration, and distribution
 - Soil types
 - Land use/level of imperviousness
 - Open channel or storm sewer
 - Slope of watershed (raindrop travel time)



ROADBLOCKS DOWNSTREAM OF FITCHRONA ROAD

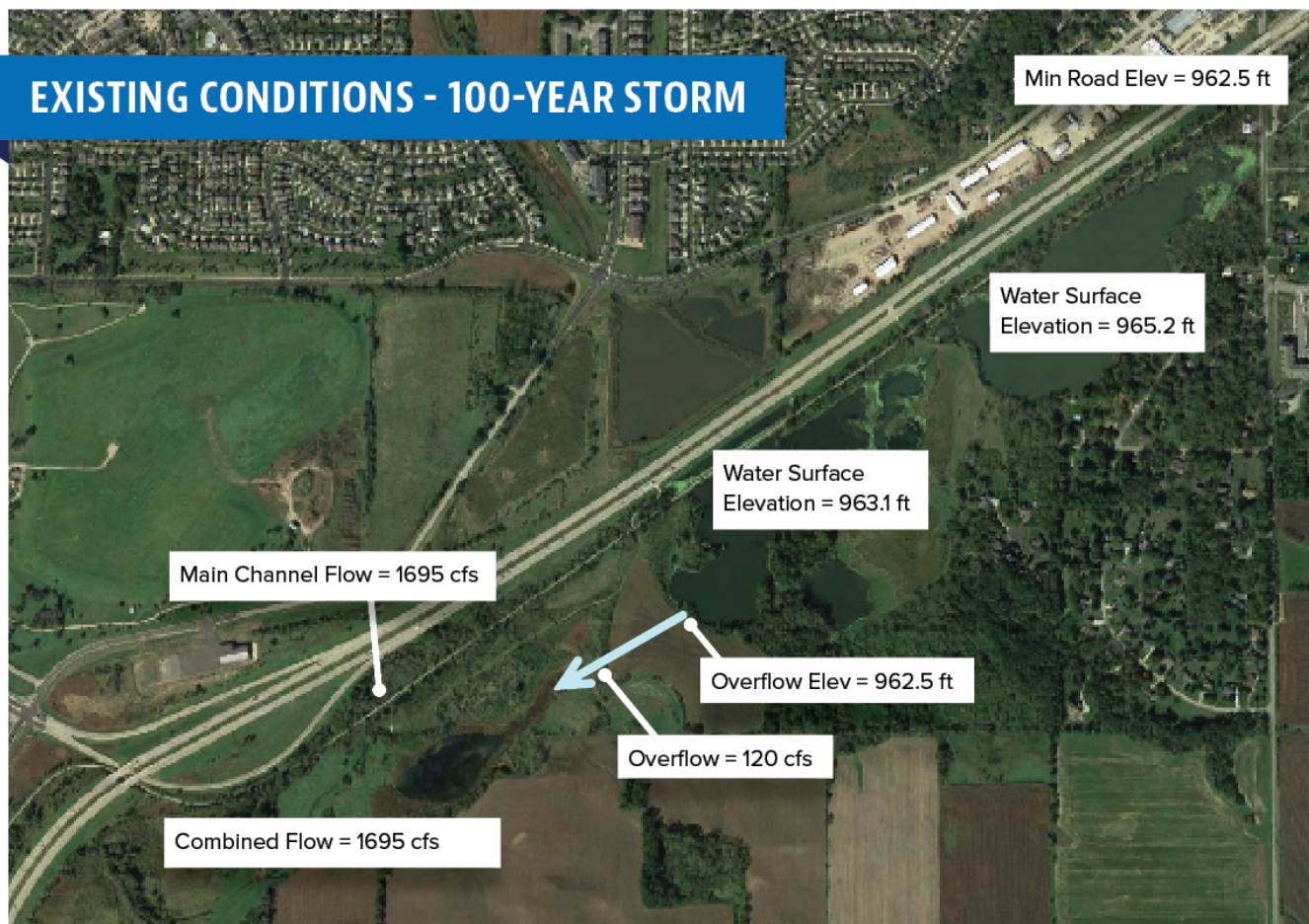


Flow Profile



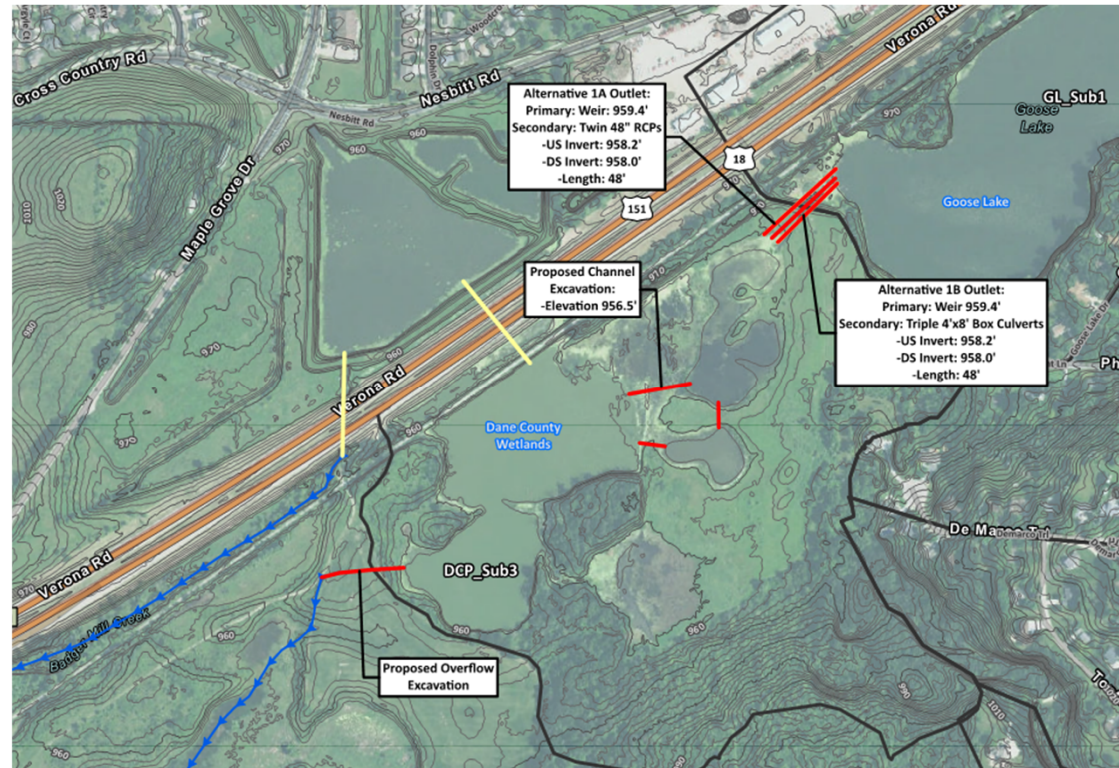
EXISTING CONDITIONS

EXISTING CONDITIONS - 100-YEAR STORM



ALTERNATIVES 1A & 1B

Increase downstream conveyance



STORM EVENT COMPARISON

Goose Lake Water Surface Elevations

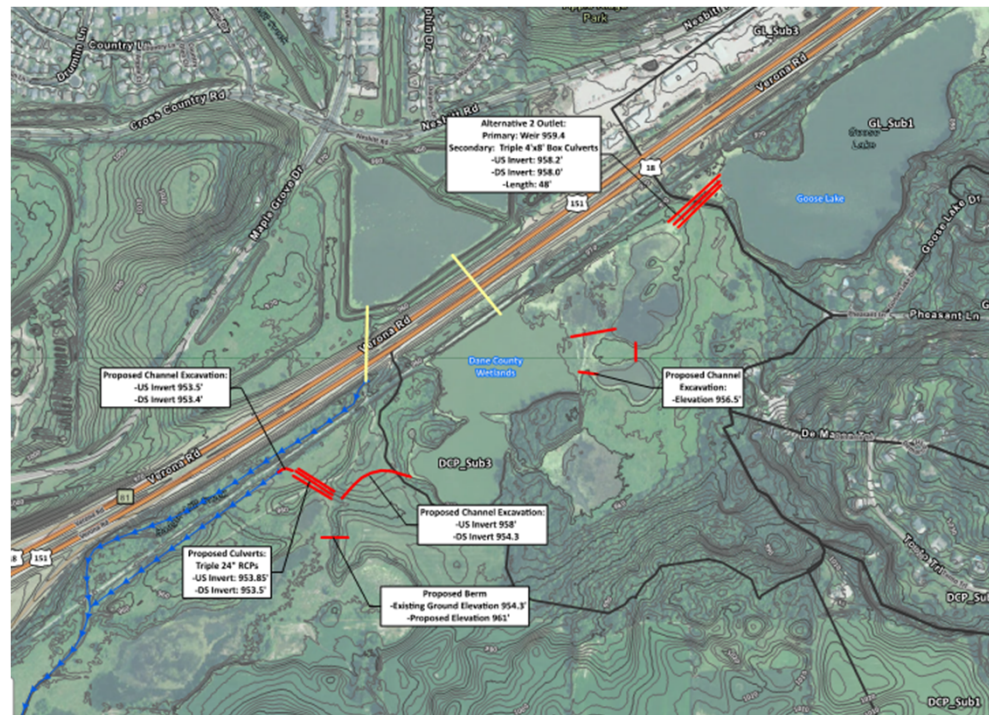
EVENT	EXISTING CONDITIONS	ALTERNATIVE 1A	ALTERNATIVE 1B
100-year	965.2	964.0	962.9
50-year	964.7	963.3	962.4
25-year	964.0	962.5	961.8
10-year	962.7	961.5	961.1
5-year	961.8	960.8	960.6
2-year	961.1	960.2	960.1

 Fitchrona Road Floods

ALTERNATIVE 2

Increase downstream conveyance


- Similar to Alternative 1B but modifies overflow route.



FREQUENT EVENT COMPARISON

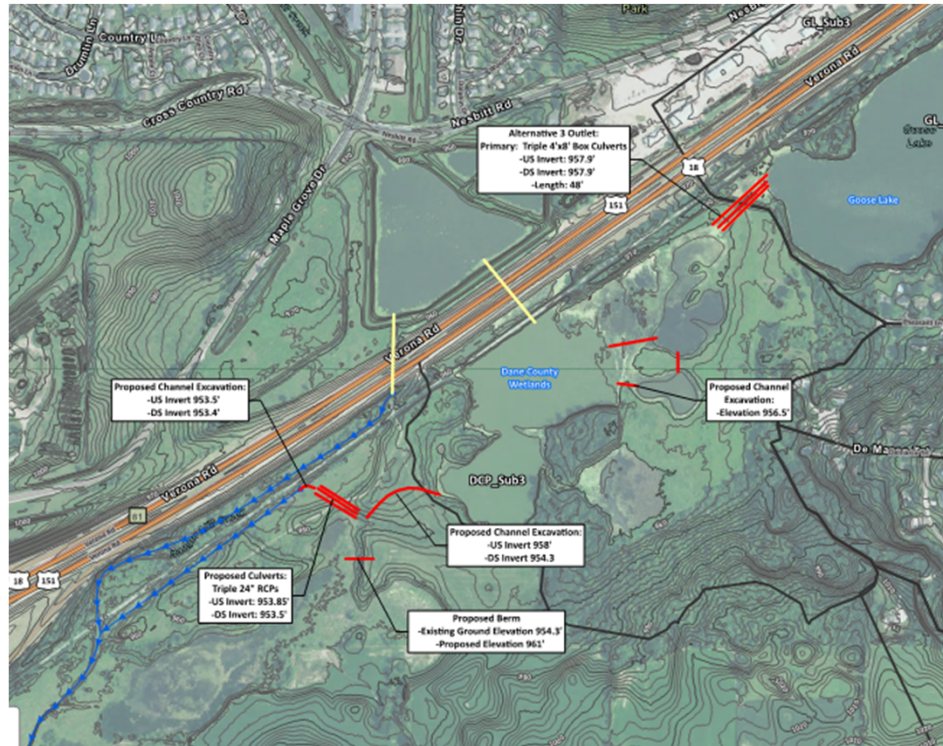
Goose Lake Water Surface Elevations

EVENT	EXISTING CONDITIONS	ALTERNATIVE 1A	ALTERNATIVE 1B	ALTERNATIVE 2
100-year	965.2	964.0	962.9	963.0
50-year	964.7	963.3	962.4	962.5
25-year	964.0	962.5	961.8	961.9
10-year	962.7	961.5	961.1	961.1
5-year	961.8	960.8	960.6	960.6
2-year	961.1	960.2	960.1	960.1

 Fitchrona Road Floods

ALTERNATIVE 3


Downstream conveyance & Lower Goose Lake water surface



FREQUENT EVENT COMPARISON

Goose Lake Water Surface Elevations

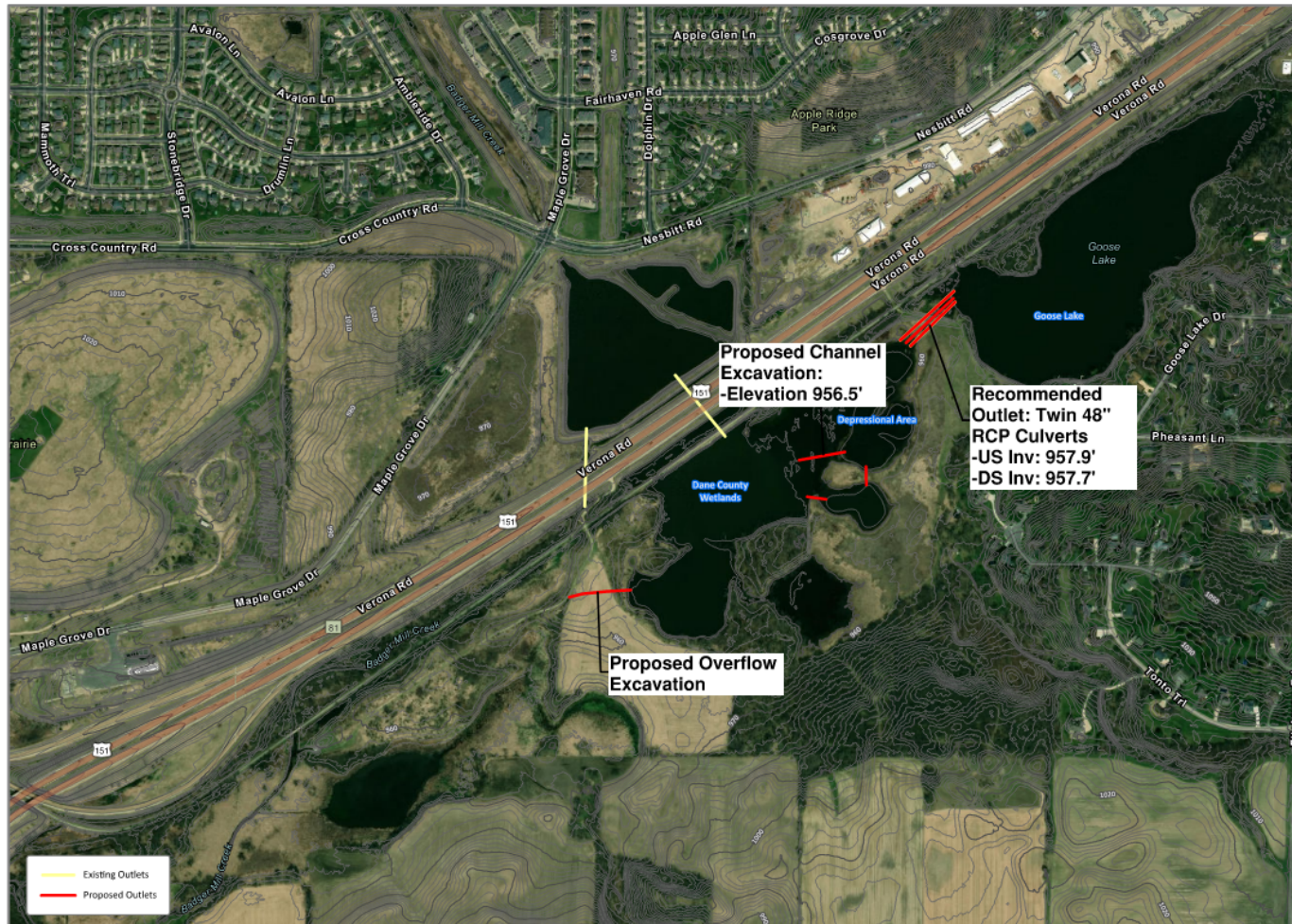
EVENT	EXISTING CONDITIONS	ALTERNATIVE 1A	ALTERNATIVE 1B	ALTERNATIVE 2	ALTERNATIVE 3
100-year	965.2	964.0	962.9	963.0	962.7
50-year	964.7	963.3	962.4	962.5	962.1
25-year	964.0	962.5	961.8	961.9	961.5
10-year	962.7	961.5	961.1	961.1	960.6
5-year	961.8	960.8	960.6	960.6	959.9
2-year	961.1	960.2	960.1	960.1	959.2

 Fitchrona Road Floods

PRELIMINARY PREFERRED PLAN

- Combination of Alternative 1A and 3
 - Overflow Route: Alt 1A
 - Outlet Capacity: Alt 1A
 - Lowering Goose Lake: Alt 3

PRELIMINARY PREFERRED PLAN



NEXT STEPS

- How does this concept level plan fit with the desires of the Badger Mill Creek Stakeholder group?
- Potential to tie this project in with groundwater augmentation?

Questions?



Contact

Ben Schulte, PE
City of Fitchburg
Ben.Schulte@Fitchburgwi.gov

Chris Barnes, PE
Town of Verona
Cbarnes@town.Verona.wi.us

