South Bar Lake Culvert Flow Observations

South Bar Lake Outlet

Minimum Lake Level Control

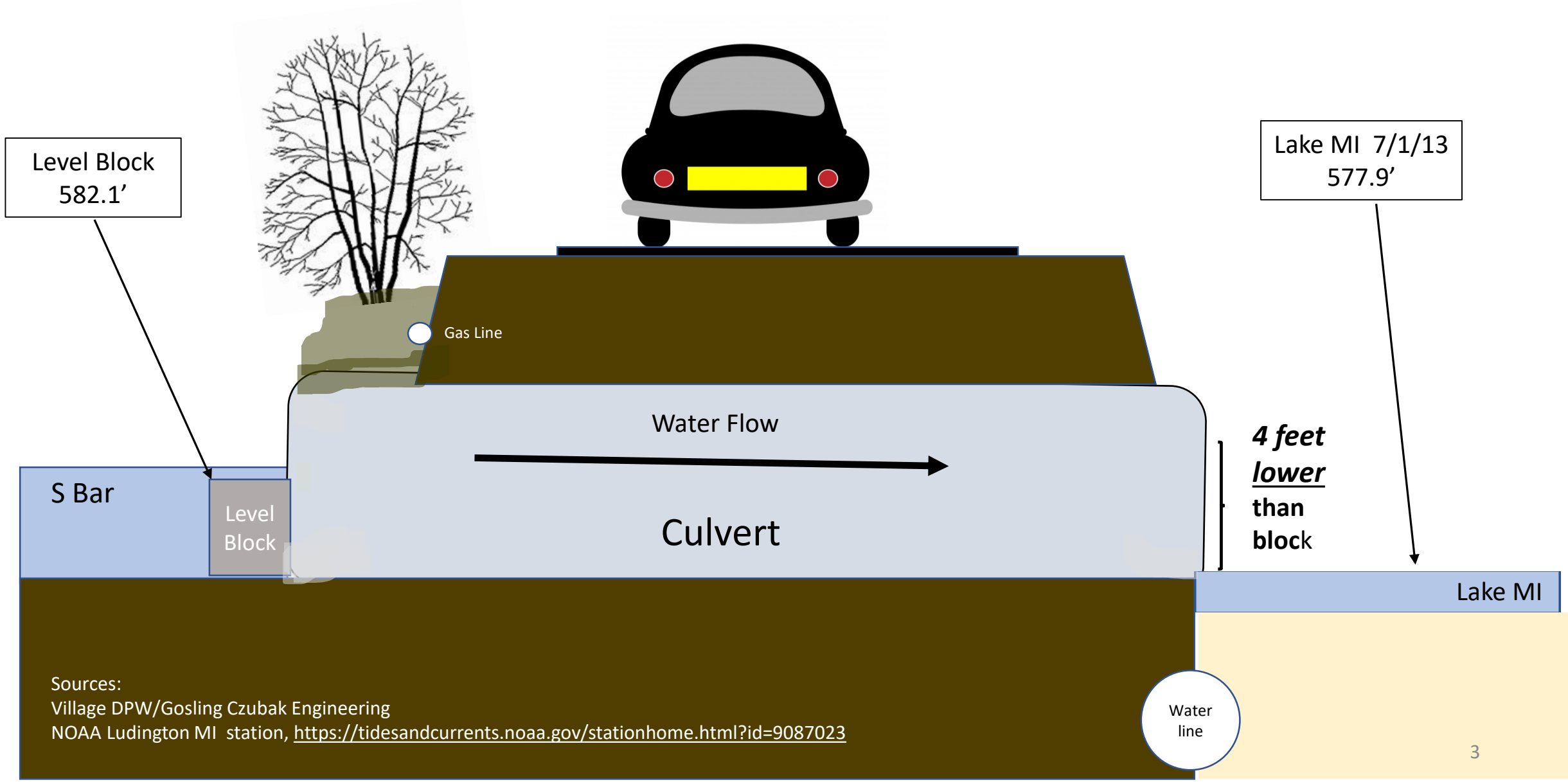
- Minimum S. Bar Lake levels have long been controlled by a “level block” (miniature dam) at the S. Bar entrance to the outlet culvert into Lake Michigan.
- In 2019, the village DPW and surveyors from Gosling Czubak Engineering measured the height of the level block in the same terminology as government measuring of Lake Michigan water levels.
- The level block measures 582.1 feet, this is the minimum controlled height of S. Bar Lake.

S. Bar Lake outlet culvert

Outlet culvert “level block”

July 1, 2013

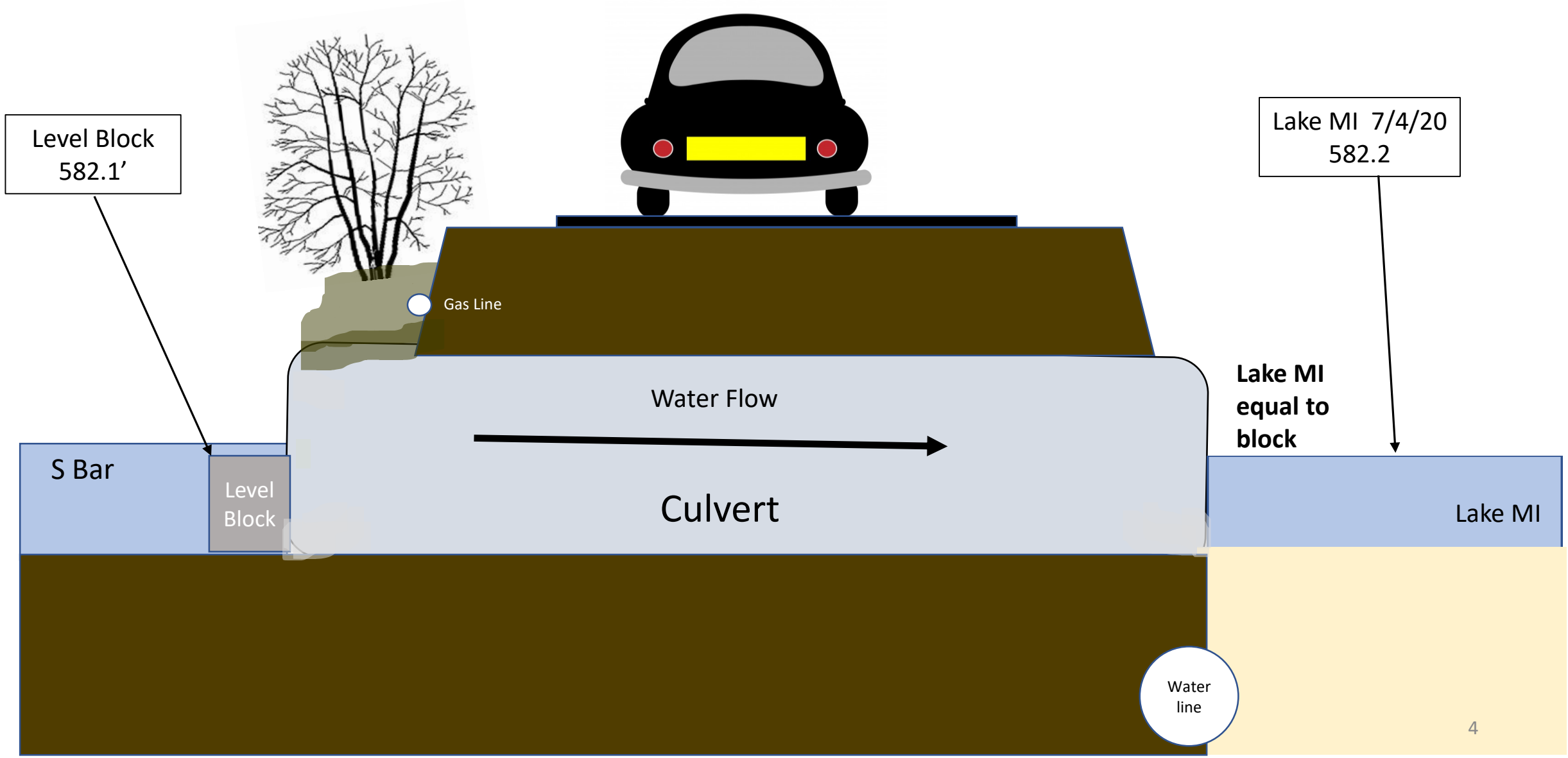
Strong water flow, plenty of lake level height difference



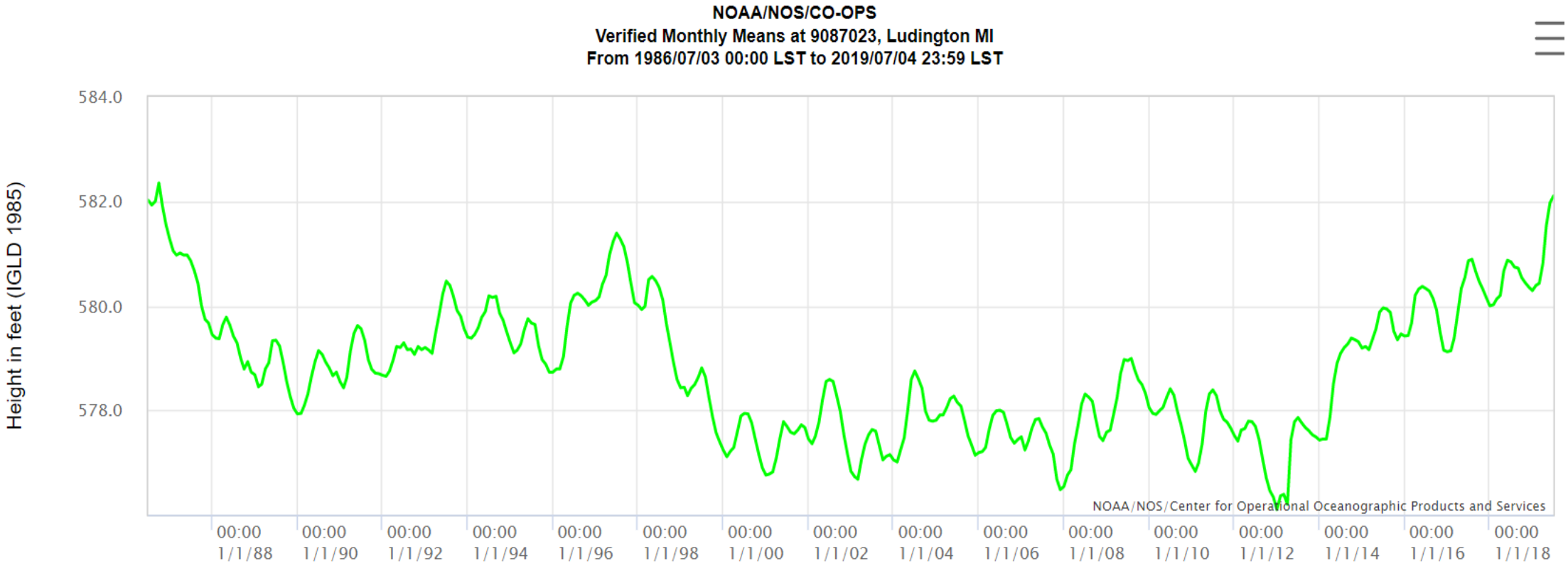
Sources:
Village DPW/Gosling Czubak Engineering
NOAA Ludington MI station, https://tidesandcurrents.noaa.gov/stationhome.html?id=9087023

July 1, 2019

Lake levels become “equal” – Lake MI compared to minimum S Bar level



Thirty-three years on Lake Michigan water levels



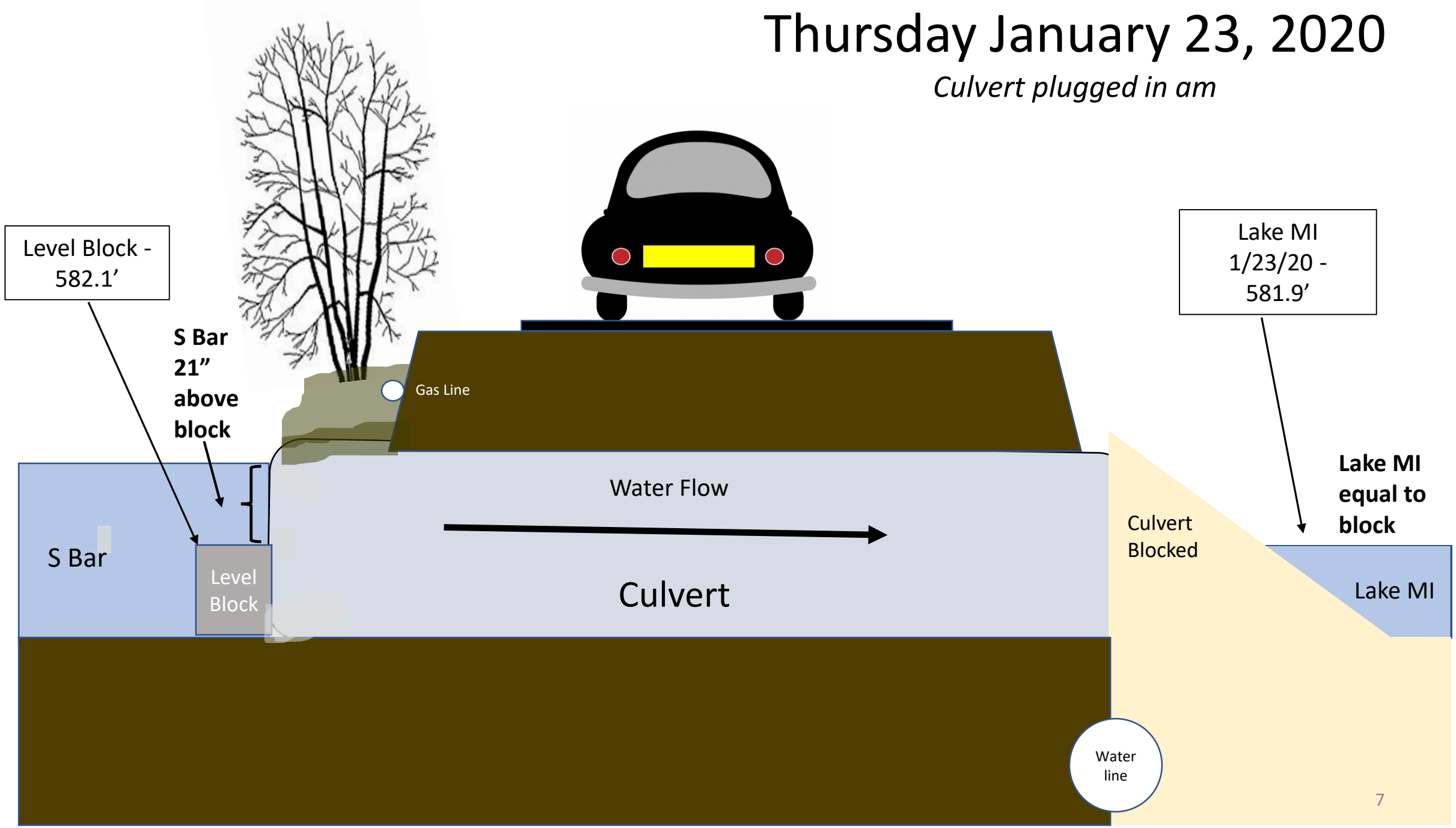
With high Lake MI water levels come “plug ups”

- Wave action with winds anywhere from southwest to northwest drift sand constantly
- Drifting much higher up since water levels are higher
- Result: S Bar Lake outlet culvert is continuously plugging up in the Lake MI side
- DPW with backhoe on the beach “un-plugging” every 2 to 5 days
- Fire hosing, kneeling in waders, on the level block to push sand out from culvert inside

A recent few days of “plugging and un-plugging follow…

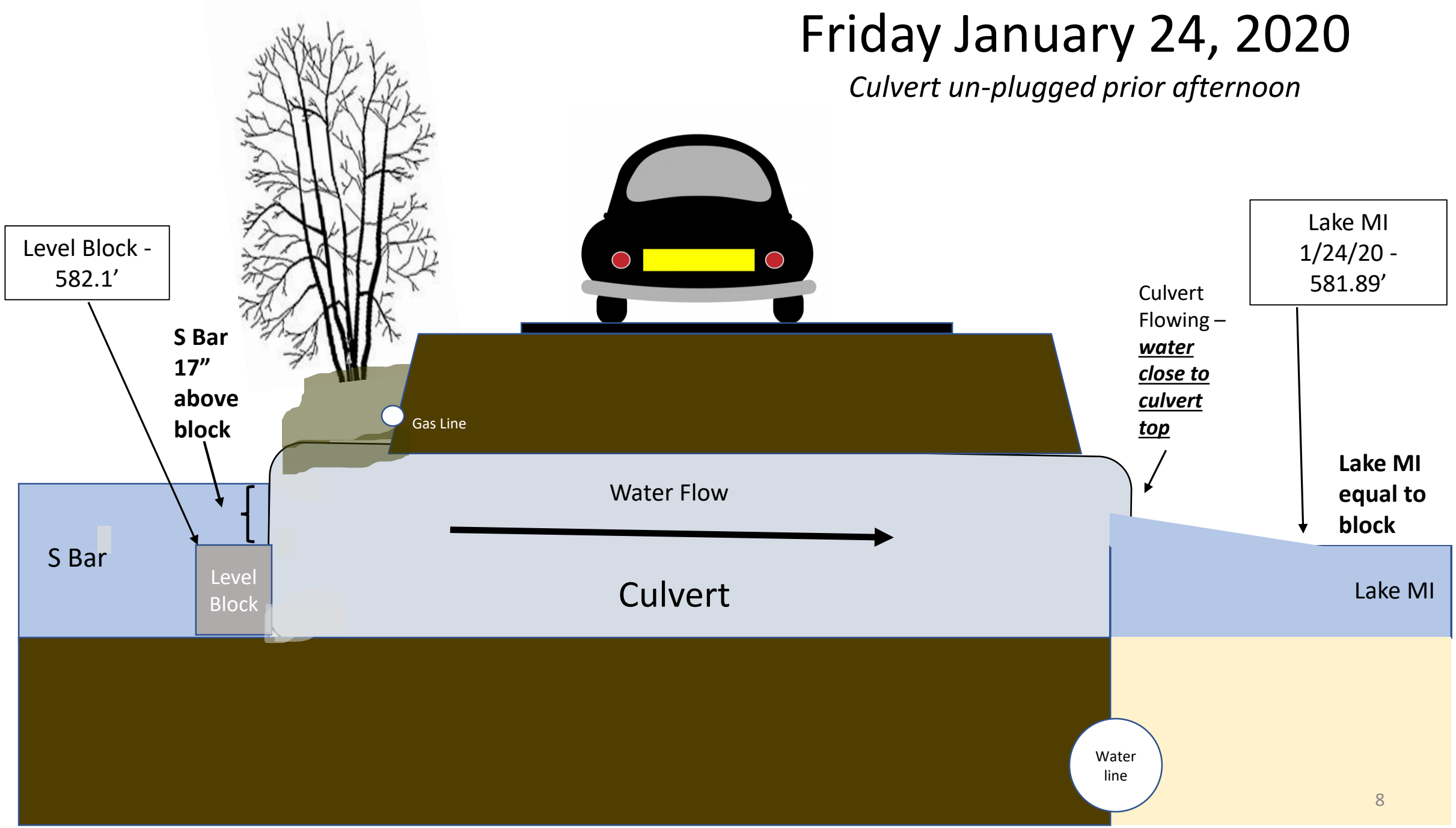
Thursday January 23, 2020

Culvert plugged in am



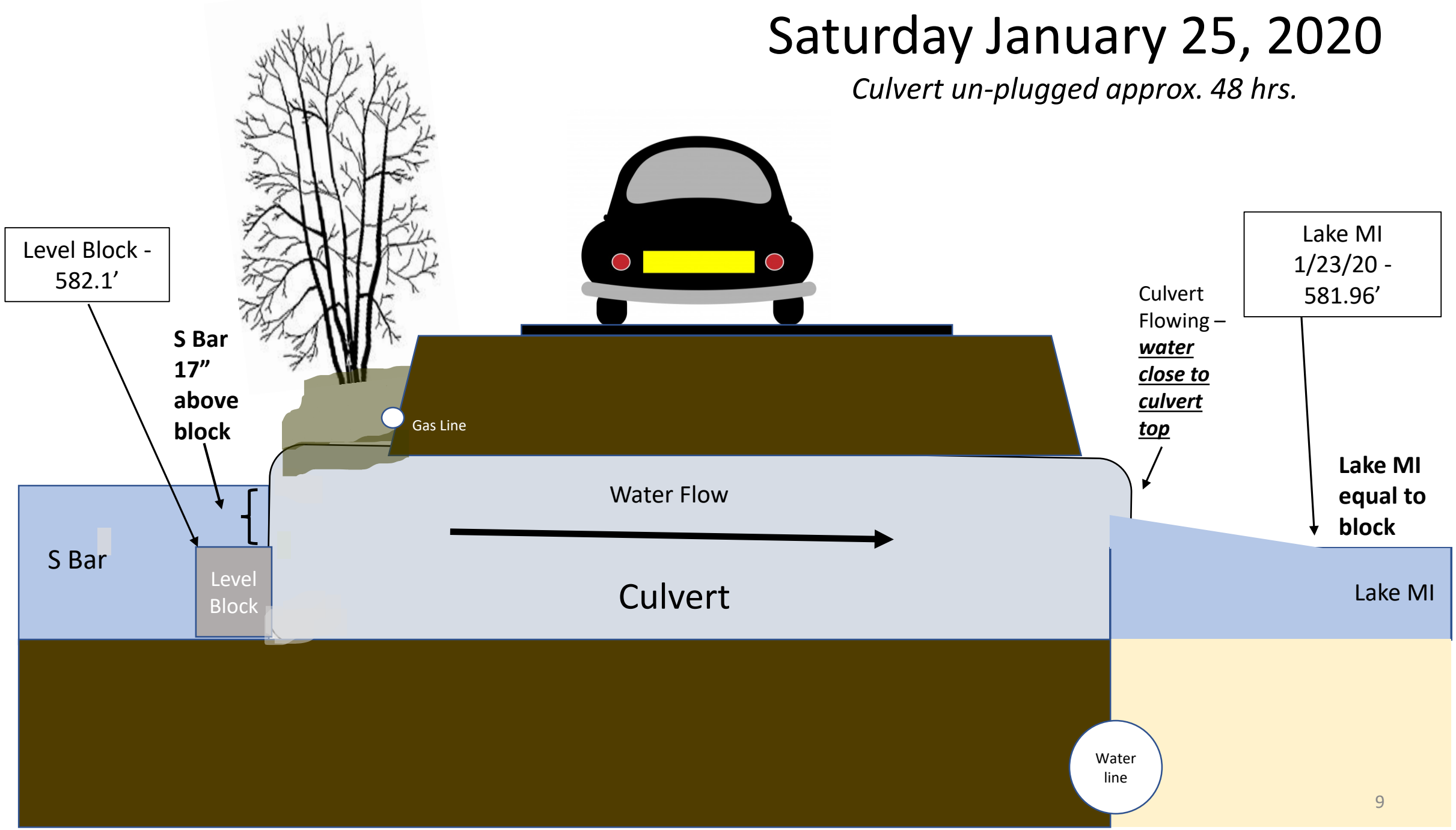
Friday January 24, 2020

Culvert un-plugged prior afternoon



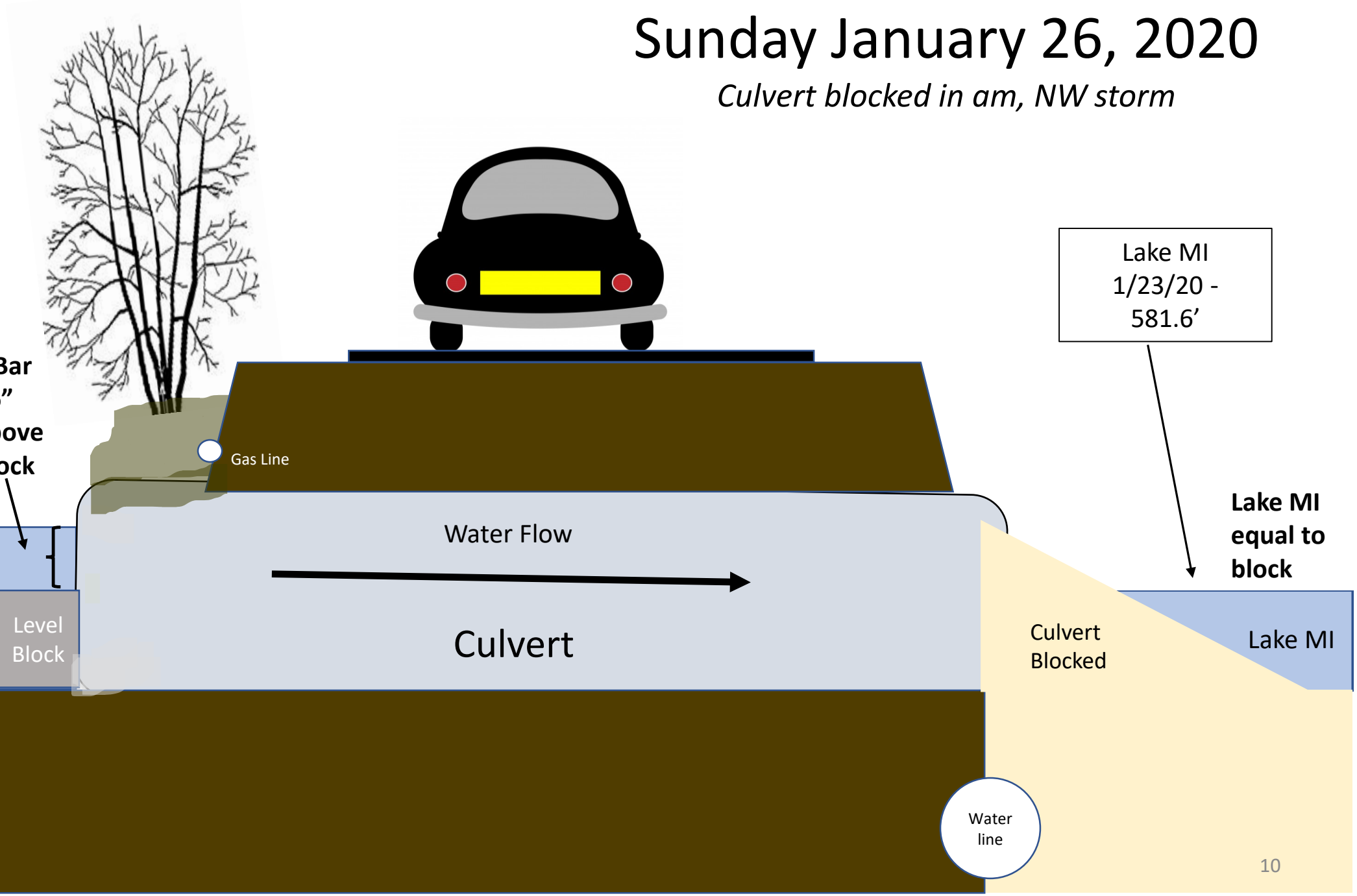
Saturday January 25, 2020

Culvert un-plugged approx. 48 hrs.



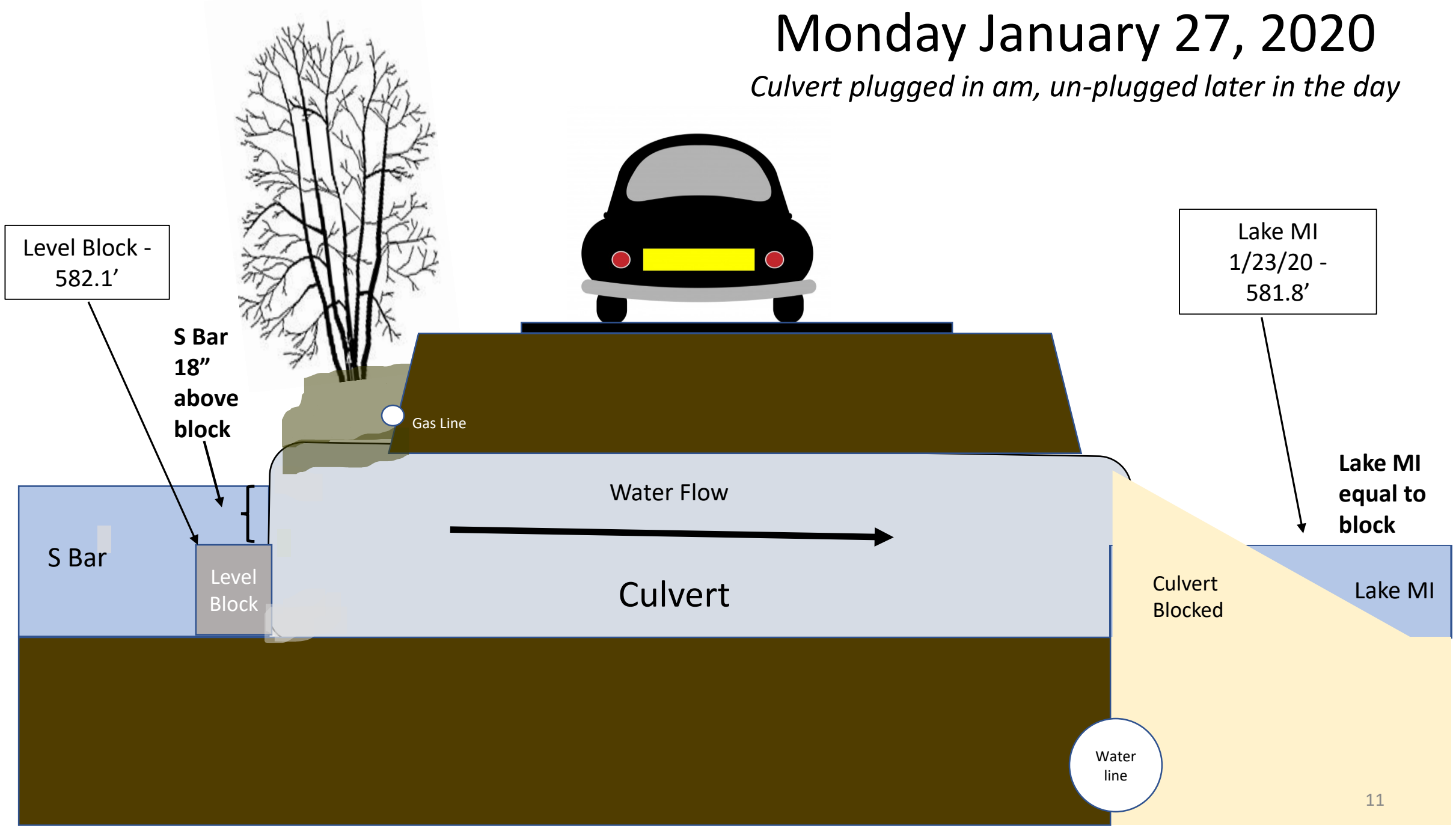
Sunday January 26, 2020

Culvert blocked in am, NW storm



Monday January 27, 2020

Culvert plugged in am, un-plugged later in the day



Observations/Conclusions

- Since 2019, Lake MI water level is effectively equal to S. Bar “normal height” maintained by the historic culvert level block
- Continuous sand clogging at current Lake MI water levels results in continuous S. Bar Lake flooding
- Flood levels vacillate from 16” to 24” (give or take) over culvert level block
- Not enough duration between clogs to bring S. Bar level down (made worse by increased flow into S Bar?)

- ***Will a larger flow structure (replacing the current culvert) + design aimed at sand buildup help? Engineering consulting needed?***

- ***What “public” is responsible for maintaining lake levels - Lake property owners? The village overall? The watershed (village + parts of the township)?***

- ***What will higher Lake MI levels predicted in 2020 do? Culvert will want to flow backward if not for sand clogging? OR S. Bar floods higher and seeks new outflow?***