



Status of mine flooding in the Pittsburgh coal, 2018

by:

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collaborators:

Bruce Leavitt (!)
Paul Ziemkiewicz

Bryant Mountjoy (current student)
Dave Light (WVU 2016)
Eric Perry (WVU 2014)
Tim Denicola (WVU 2013)
Kurt McCoy (2004)
Eb Werner

Bruce's legacy

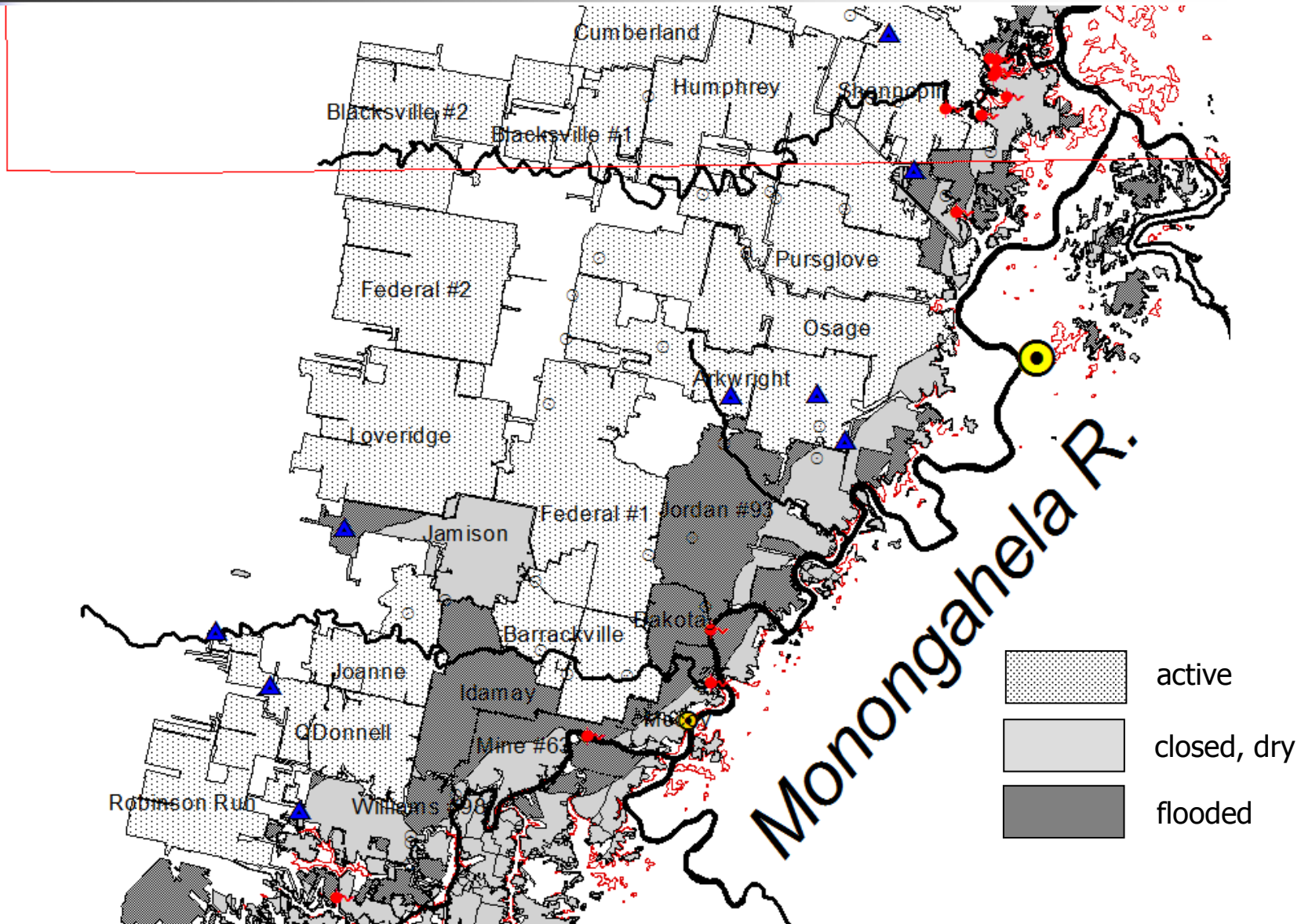




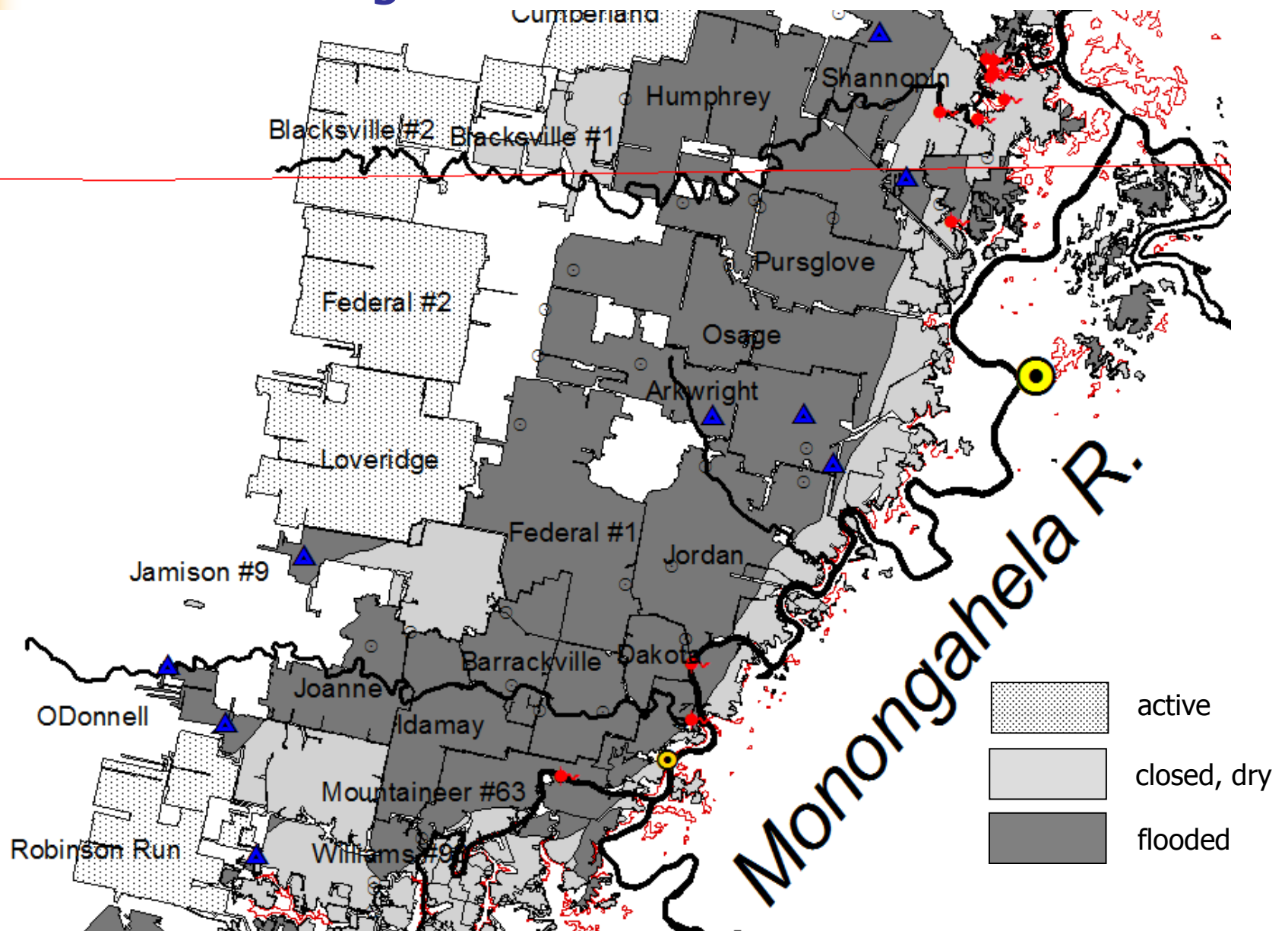
outline

- mine flooding history in Pittsburgh seam
 - “the early days” 70’s closures and flooding
 - Morgantown mine closures/flooding 1994-2006
 - re-dewatering of Morgantown “pool” 2006-present
- mine-pool breakouts
 - accurately anticipated....
 - and totally unexpected !!
- what’s in the the future ??

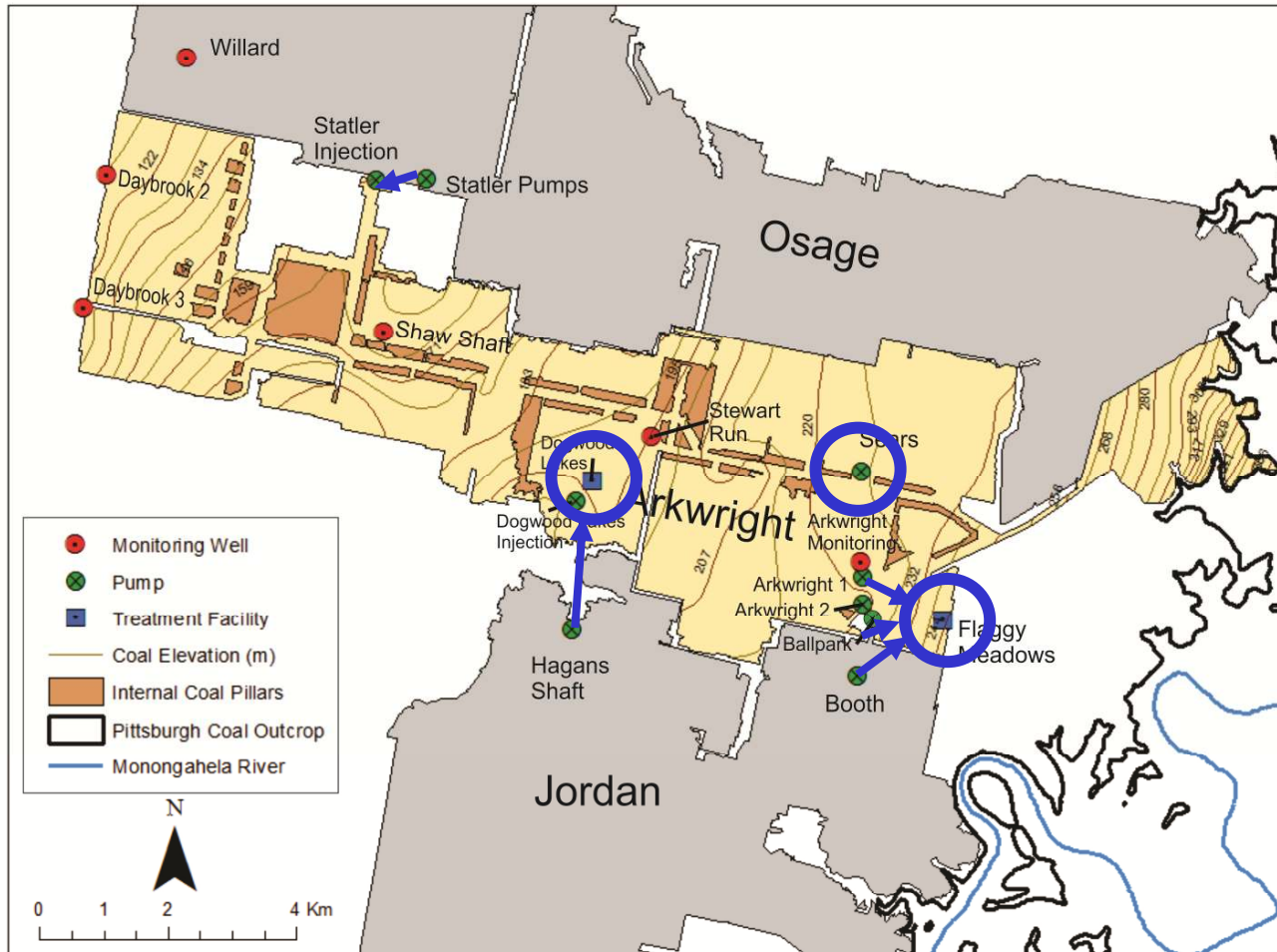
estimated 1980 pools (2002 mapping)



2006 flooding

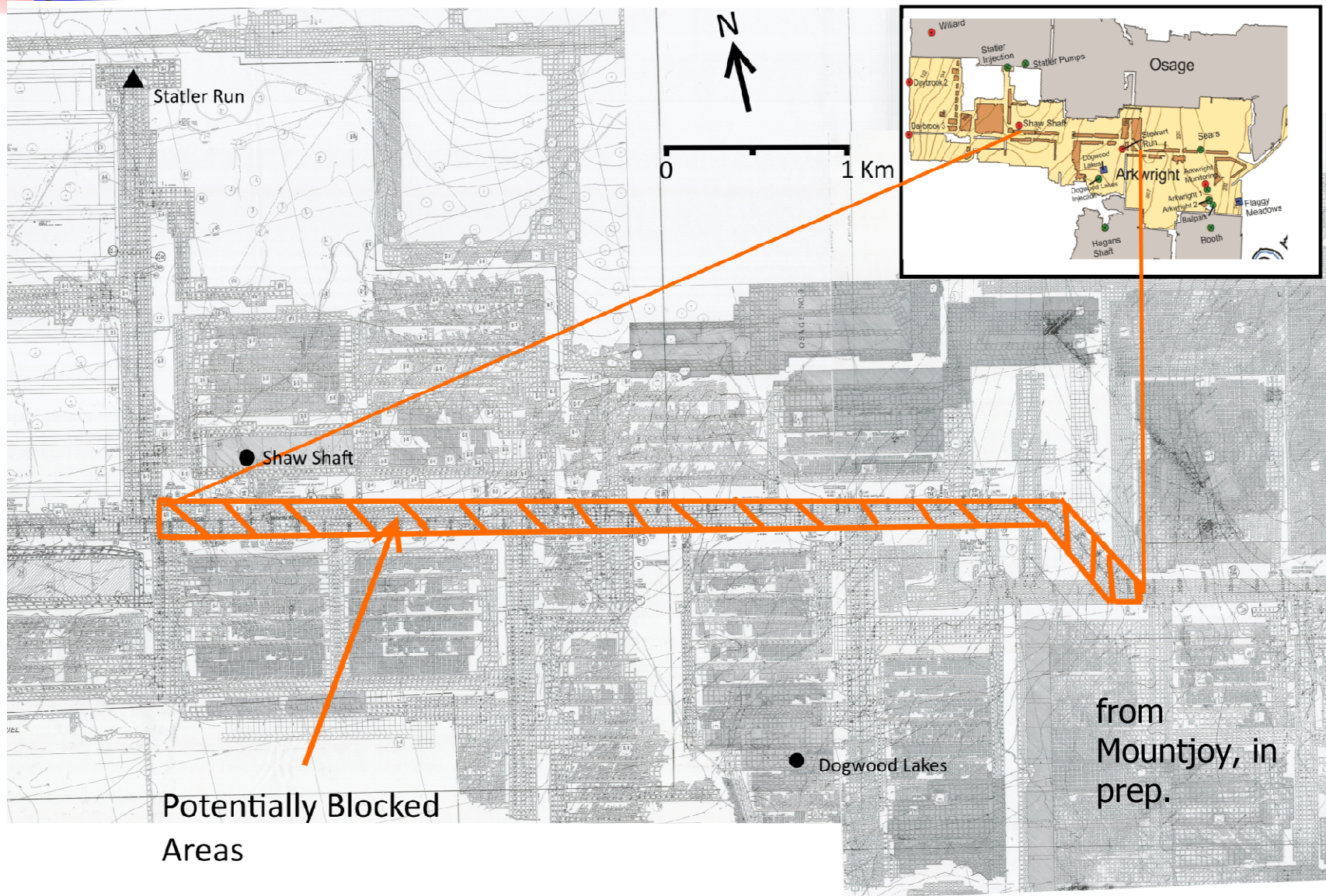


treatment of Northern WV Pittsburgh seam mine waters at CONSOL facilities

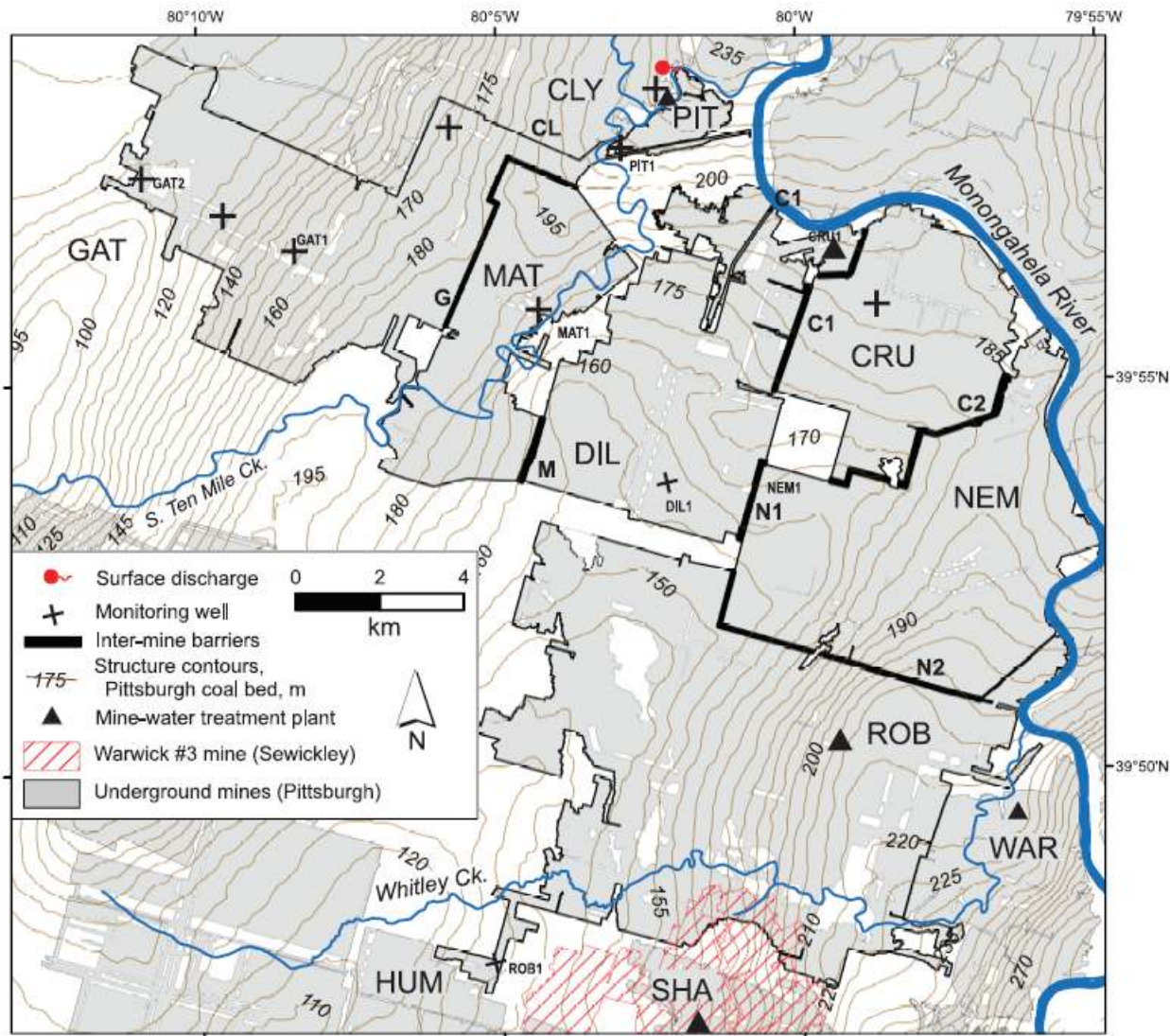


from Mountjoy, in prep.

potential areas of blockage in mains



an old flooding prediction for which timing didn't pan out...



Pitt Gas had a small seasonal discharge into Ten Mile Creek starting in 2013, about 7 years after Leavitt and Donovan predicted.

The culprit: barrier leakage into 2 mines being pumped (Clyde, Dilworth)

Light reproduced this phenomena with MODFLOW

from Light and Donovan, 2015 and Light, 2016

McDonald Township blowout, 2005





other “out of the blue” breakouts

- Sutersville PA 2011

- Monongahela PA 2017

see Rich Beam’s excellent
Powerpoint @ PADEP





observations

- in post-flooding of the Pittsburgh seam, there is a tendency for mines that are pumping to control water levels in surrounding mines as well as themselves, due to both barrier leakage and engineering
- flooding in WV portion of Pittsburgh seam first began in 1972 and was essentially complete by 2006 (34 years) – 1994 Morgantown area mine closures took 11 years to flood
- from 2006-2017 it has been pumped down over ca. 200 feet
- will it re-flood all over again????



more observations

- over 90% of Pittsburgh-seam mine water is treated over Arkwright mine – system conceived by Bruce Leavitt and his colleagues at CONSOL
- those slope breaks in flooding curves often mean something
- some of the most catastrophic breakouts of mine water have been unpredictable



conclusion

- Thanks Bruce!!!! we miss you!