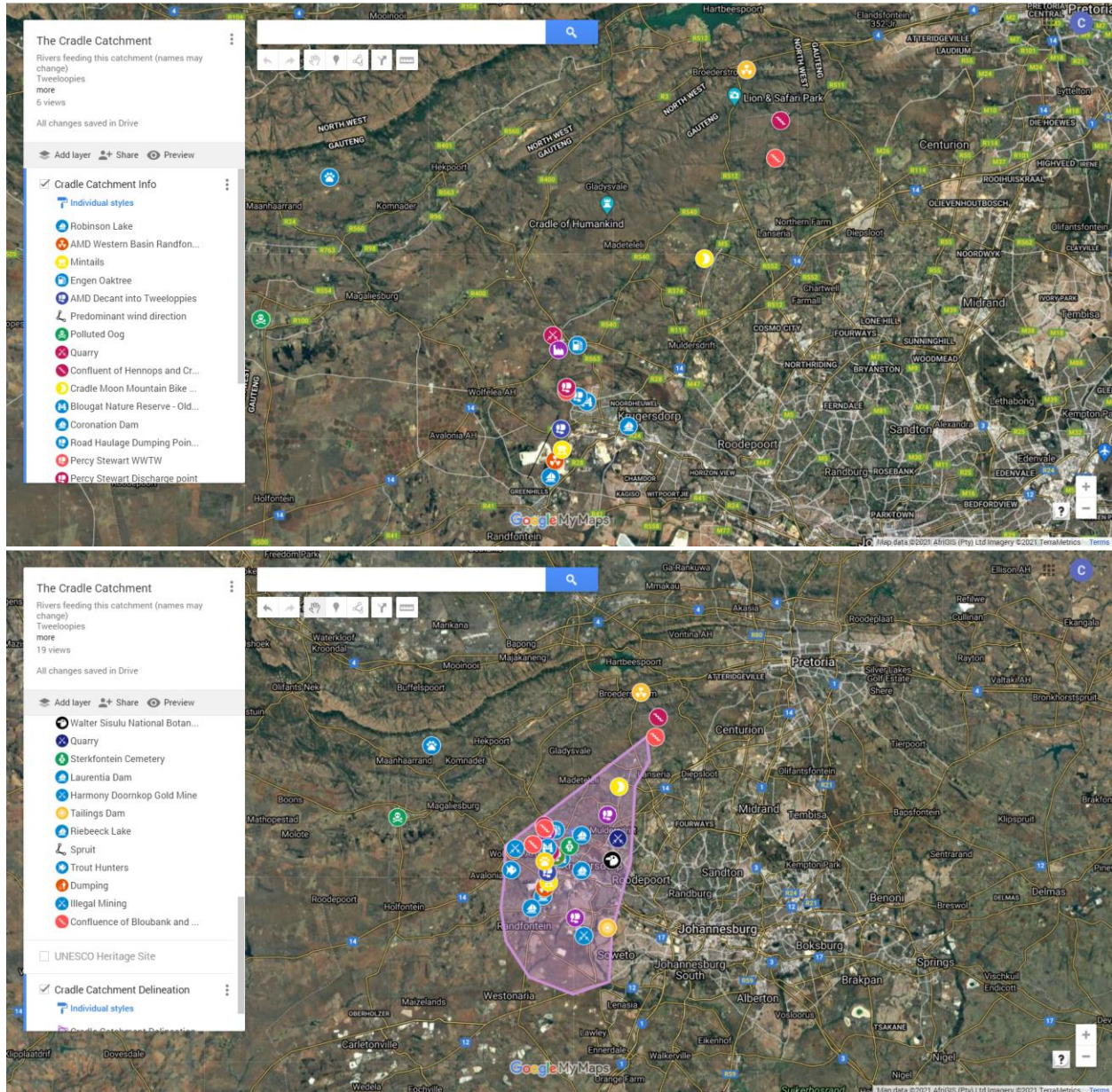


# The Cradle Catchment Tour - 12 August 2021 - Tour with Trevor Brough

Rivers feeding this catchment (names may change on various maps)

- Tweelopies
- Rietspruit
- Blougatspruit
- Bloubankspruit/Blaawbank/Bloukrans
- Crocodile/Muldusdrift se loop



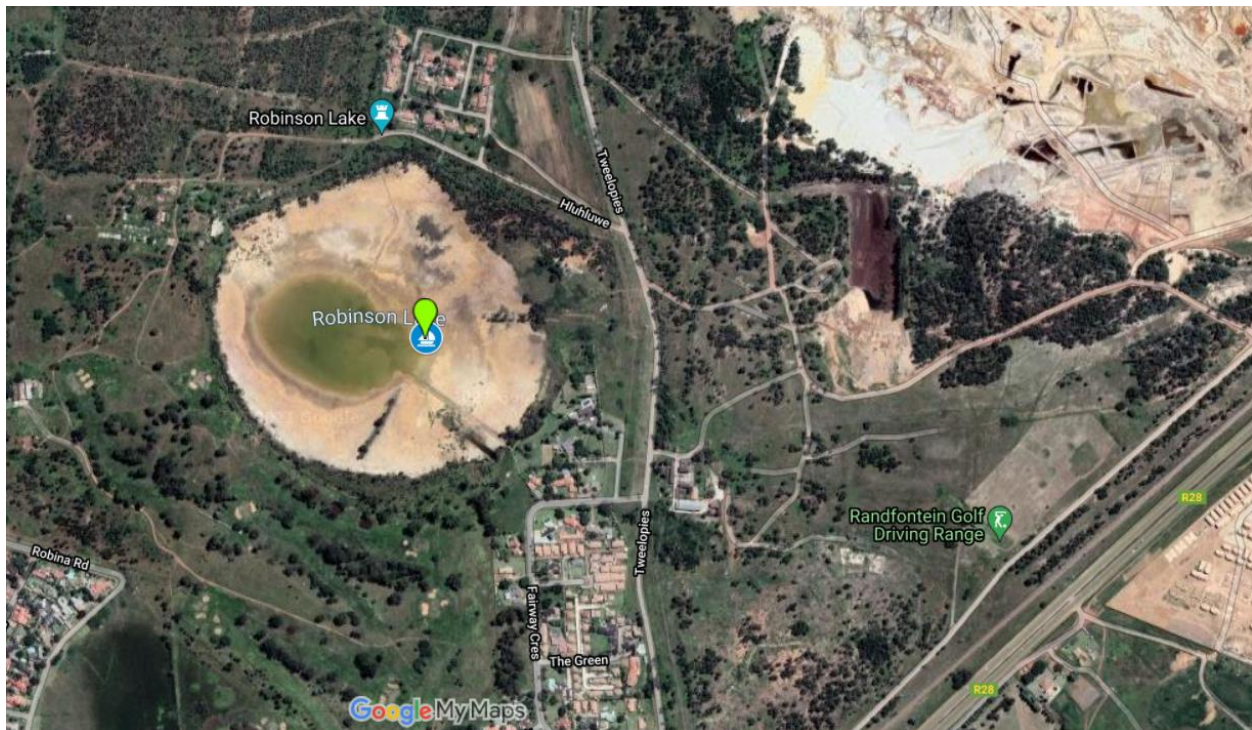
<https://www.google.com/maps/d/edit?mid=1n7Mvr1MfWq8JiGcdTEZ2X4Tcip9sLx94&usp=sharing>

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## 1. 1st Stop - Old Robinson Lake – Randfontein

This lake was once used for recreational purposes - assumed to have been the ground water that mines were pumping out in those days. The area is Radio-active. The Radioactive material are the orange dust deposits. There is supposed to be a fence around the property. No sign of rehabilitation. White Salts evident in the empty lake. The area is sinkhole prone.



Robinson Lake, Randfontein (-26.14788, 27.71314)



### Background info

- [Sinkholes \(geoscience.org.za\)](http://geoscience.org.za)
- [\(PDF\) Radiation found at Robinson Lake in Randfontein, South Africa \(researchgate.net\)](https://www.researchgate.net/publication/311111111)
- [One man's home is another man's uranium dump - The Mail & Guardian \(mg.co.za\)](http://mg.co.za)
- [KV 241-10.pdf \(wrc.org.za\)](http://wrc.org.za) – Karst System

## 2. 2nd Stop - Western basin AMD treatment facility settler plant

[OBJ]

The water in the void decants to the surface in the form of highly toxic AMD, which is characterised by a low pH, together with a high concentration of dissolved heavy metals. Lime addition to correct the pH and cause the heavy metals to precipitate/solidify. [Estimated](#) at 32 MI/Day with design capacity of 40MI/Day.



Western Basin AMD Treatment Facility (-26.13435, 27.71701)



Table 5: Quality of Treated Mine Water

| Parameter               | Units | Limit (as per DWS directive) | Average measurement for the year |
|-------------------------|-------|------------------------------|----------------------------------|
| pH                      |       | 6.5–9.5                      | 9.34                             |
| Iron                    | mg/l  | <1                           | 0.09                             |
| Manganese               | mg/l  | <10                          | 2.83                             |
| Aluminium               | mg/l  | <1                           | 0.14                             |
| Sulphates               | mg/l  | ≤3 000                       | 2 353                            |
| Electrical Conductivity | mS/m  | ≤450                         | 355                              |
| Turbidity               | NTU   | <30                          | 19.28                            |
| Uranium                 | mg/l  | <50                          | 20.49                            |

Source

Background info

- i. [ACID MINE DRAINAGE | TCTA](#)
- ii. [Western Basin: Acid Mine Drainage Project - Murray & Dickson Construction \(Pty\) Ltd \(mdconstruction.co.za\)](#)
- iii. [DWE BKS1310 AMD WESTERN BASIN | SAHRA](#)
- iv. <https://miningnews.co.za/2014/04/15/western-basin-is-an-amd-disaster-area-says-mintails/>
- v. [Gallery - Western Basin \(dws.gov.za\)](#)
- vi. [REPORT-FOR-MAY-AND-JUNE-2021\\_compressed-2.pdf \(fse.org.za\)](#)
- vii. [Jozi Gold — WG film](#)
- viii. [Acid mine drainage, West Rand | South African Government \(www.gov.za\)](#)
- ix. [110621wrc1\\_0.pdf \(pmg.org.za\)](#)
- x. [Acid Mine Drainage - Earthlife Africa](#)
- xi. [Wayback Machine \(archive.org\)](#)
- xii. [Acid mine drainage – Earthlife Africa \(archive.org\)](#)
- xiii. [SAVMIN-Process.pdf \(mintek.co.za\)](#)
- xiv. [TUT Power Point Template \(arc.agric.za\)](#)
- xv. [West Rand acid water to be tackled | Mining Safety](#)
- xvi. [Disused Mines South Africa - What's Being Done? \(environment.co.za\)](#)
- xvii. [dissertation\\_naidoo\\_s.pdf \(unisa.ac.za\)](#)
- xviii. [Case Study of Treating Acid Mine Drainage | Watercare Mining \(watercareinnovations.com\)](#)
- xix. [\(PDF\) Institutional Linkages and Acid Mine Drainage: The Case of the Western Basin in South Africa \(researchgate.net\)](#)
- xx. [Acid Mine Drainage Progress Reports: Department, Trans Caledon Tunnel Authority, & Mintek | PMG](#)
- xxi. [Mintails mining site reduced to rubble \(iol.co.za\)](#)
- xxii. [\(PDF\) Institutional Linkages and Acid Mine Drainage: The Case of the Western Basin in South Africa \(researchgate.net\)](#)
- xxiii. [Surfaces and externalities: acid mine drainage on the Witwatersrand, South Africa \(ee.co.za\)](#)
- xxiv. [: Govt approves report on Acid Mine Drainage | SAnews](#)
- xxv. [AMD FS LTS Newsletter 01 \(Medium Resolution - 7MB\).pdf \(dws.gov.za\)](#)
- xxvi. [\(PDF\) Assessment of Impacts of Acid Mine Drainage on Surface Water Quality of Tweelopiespruit Micro-Catchment, Limpopo Basin \(researchgate.net\)](#)
- xxvii. [The impact of gold mining on the Witwatersrand on the rivers and karst system of Gauteng and North West Province, South Africa - ScienceDirect](#)
- xxviii. [AMD Booklet.pdf \(sahrc.org.za\)](#)
- xxix. [hartbeespoort \(pmg.org.za\)](#)
- xxx. [Hobbs\\_19799\\_2017.pdf \(csir.co.za\)](#)
- xxxi. [Sibanye: Integrated Annual Report 2016 \(sibanyestillwater.com\)](#)

- xxxii. [FORESEEABLE IMPACTS \(pmg.org.za\)](http://pmg.org.za)
- xxxiii. [GCRO Provocation 1 McCarthy AMD September 2010 low res.pdf \(wits.ac.za\)](http://wits.ac.za)
- xxxiv. [Oberholster2\\_2013.pdf \(csir.co.za\)](http://csir.co.za)
- xxxv. [Emerging business continuity threats: acid mine drainage | Urban Gateway](#)
- xxxvi. [Flooding of the underground mine workings of the old Witwatersrand gold/uranium mining areas: acid mine drainage generation and long term options for water quality management | SpringerLink](#)
- xxxvii. [A rising acid tide in South Africa \(minesandcommunities.org\)](http://minesandcommunities.org)
- xxxviii. [Acid mine damage at critical levels - Construction, News \(property24.com\)](http://property24.com)
- xxxix. [Melissa-Fourie-on-AMD-Oct-2009.pdf \(cer.org.za\)](http://cer.org.za)
- xl. [Geochemistry of Gold One tailings and associated contaminant transport into the Randfontein area, Witwatersrand Basin. \(uwc.ac.za\)](http://uwc.ac.za)
- xli. [AMD.pdf \(assaf.org.za\)](http://assaf.org.za)
- xlii. [Request to DWS for documents relating to acid mine drainage treatment plants in the central, eastern and western basins – PAIA Requests – Centre for Environmental Rights \(cer.org.za\)](http://cer.org.za)
- xlili. [https://cer.org.za/wp-content/uploads/2021/07/191120Derelict\\_and\\_Ownerless\\_Mine\\_Rehabilitation\\_Programme.pptx](https://cer.org.za/wp-content/uploads/2021/07/191120Derelict_and_Ownerless_Mine_Rehabilitation_Programme.pptx)
- xliv. [ACID MINE DRAINAGE ON THE WITWATERSRAND:- THE PAST, THE PRESENT AND THE FUTURE | ICE-SA](#)
- xliv. [http://earthwise.bgs.ac.uk/index.php?title=Case\\_Study\\_Acid\\_Mine\\_Drainage\\_South\\_Africa&action=mpdf](http://earthwise.bgs.ac.uk/index.php?title=Case_Study_Acid_Mine_Drainage_South_Africa&action=mpdf)
- xlvi. [Acid\\_Mine\\_drainage.pdf \(idc-online.com\)](http://idc-online.com)
- xlvi. [Funds to save Joburg from acid mine water \(security.co.za\)](http://security.co.za)
- xlvi. [Acid Mine Damage reaching critical levels - South Africa \(standardsandlegal.com\)](http://standardsandlegal.com)
- xlvi. [Krugersdorp basin polluted by acid water | News24](#)
- l. <https://aidc.org.za/acid-mine-drainage-environmental-social-risks-witwatersrand-gold-fields/>
- li. [New acid mine drainage treatment plant will help water supply in Gauteng \(businesslive.co.za\)](http://businesslive.co.za)
- lii. [ZA\\_DeloitteAcidMining\\_29042014.pdf](#)
- liii. [All that glitters... Acid mine drainage: The toxic legacy of gold mining in South Africa \(earthmagazine.org\)](http://earthmagazine.org)
- liv. [The impact of acid mine drainage in South Africa | South African Journal of Science \(journals.co.za\)](http://journals.co.za)
- iv. [\(PDF\) Rising costs of both sewage treatment and the production of potable water associated with increasing levels of pollution in a portion of the crocodile-west Marico water management area \(researchgate.net\)](#)

### 3. 3rd Stop - Old Mintails/Harmony Gold



Mintails/Harmony Gold (-26.12506, 27.72375)



Buildings have been stripped.

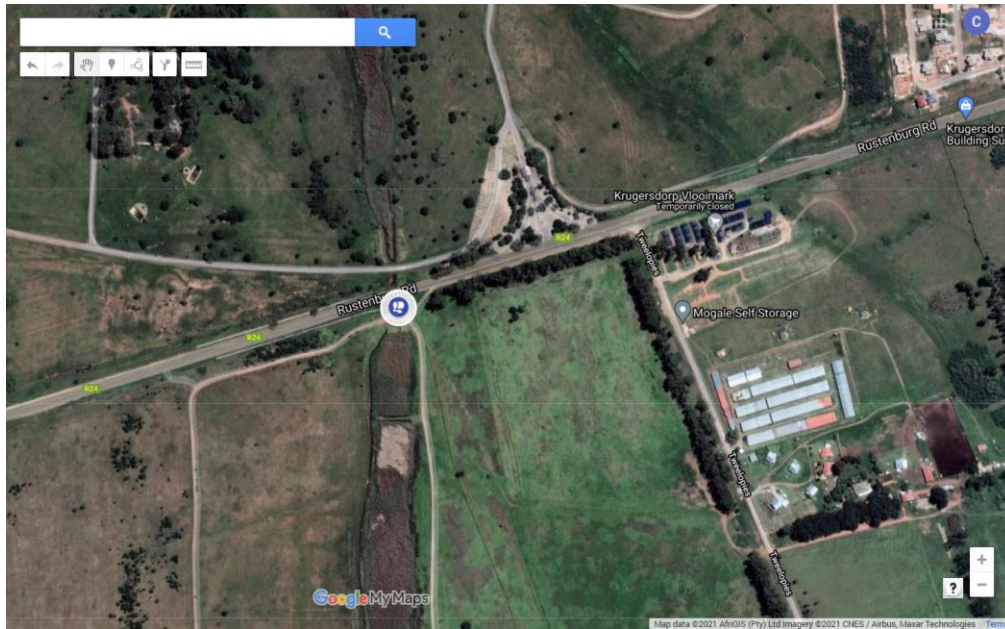


The August wind is Howling and blowing mine dump dust towards the cradle due to predominant wind direction. We keep a watch out for Zama Zamas.

#### Background info

- i. [Mintails collapse: case study in how not to close mines - Oxpeckers](#)
- ii. [Zama-zama's loot and steal West Rand mine bare - Bing video](#)
- iii. [Touring Johannesburg's toxic mine dumps. - Bing video](#)
- iv. [Zama Wars in the Wild West: Carte Blanche on Sunday - SAPeople - Worldwide South African News](#)
- v. [Mintails directors may face criminal charges \(businesslive.co.za\)](#)
- vi. [Mintails mining created an 'environmental catastrophe' in the West Rand \(iol.co.za\)](#)
- vii. [Request to Mintails SA \(Pty\) Ltd for records related to the financial provision for its Mogale Gold Operation on the West Rand of Johannesburg – PAIA Requests – Centre for Environmental Rights \(cer.org.za\)](#)
- viii. [The Wake of South Africa's Abandoned Gold Mines \(environment.co.za\)](#)
- ix. [Miner investing in operational improvements \(miningweekly.com\)](#)
- x. [Mogale City wants court interdict against mining firm - Bing video](#)

#### 4. 4th Stop - Decant Of treated AMD



*AMD Decant into Tweelopies Spruit, Rustenburg Rd (-26.10747, 27.72231)*





- Acid mine drainage after lime treatment discharge into Tweelopies Spruit
- Low flow currently due to Maintenance on a Thursday.

#### Background info

- [\(PDF\) Assessment of Impacts of Acid Mine Drainage on Surface Water Quality of Tweelopiespruit Micro-Catchment, Limpopo Basin \(researchgate.net\)](#)
- [A rising acid tide on the Witwatersrand \(environment.co.za\)](#)

## 5. 5th Stop - Blougat Nature Reserve – Old Bridge



Blougat Nature Reserve Bridge (-26.08414, 27.74715)

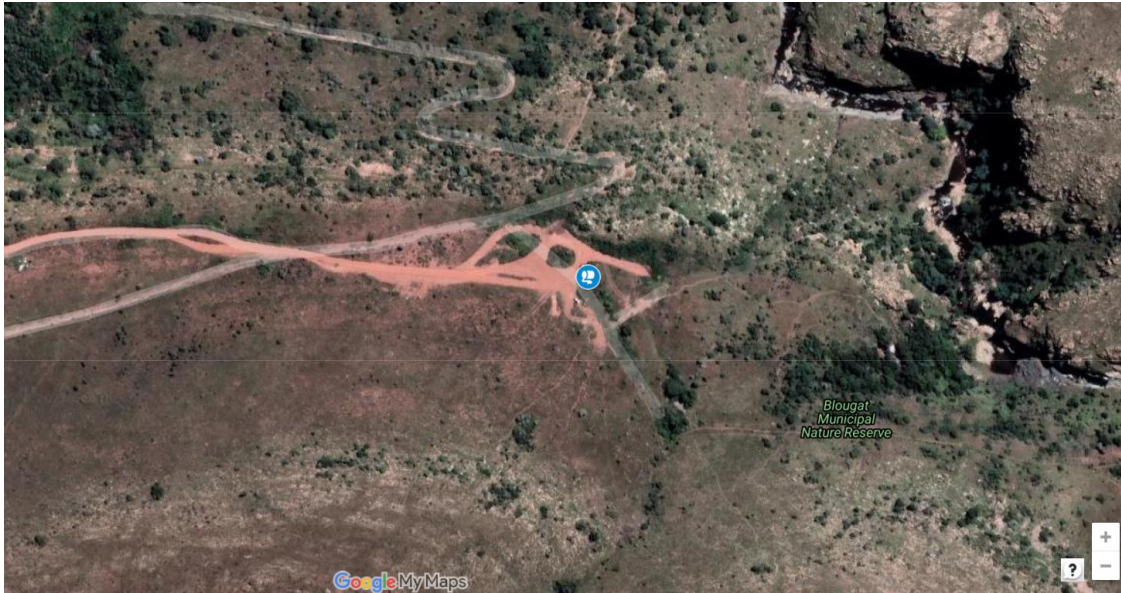


- Blougatspruit In Blougat nature reserve, source thought to be coronation.
- This is the water that comes from Krugersdorp. There is a terrible smell in the air. A lot of dumped materials and flood materials in and around the river.

Background info

- i. [Sewage threatens world heritage site - The Mail & Guardian \(mg.co.za\)](#)
- ii. [Municipality's manhole cover-up | Krugersdorp News](#)
- iii. [\(PDF\) Die impak van suur mynwater op die ekologie van die Wieg van die Mensdom en die Krugersdorp-Wildreservaat aan die Wes-Rand \(researchgate.net\)](#)
- iv. [There's something lurking | Krugersdorp News](#)
- v. [Cradle of Humankind \(southafrica.co.za\)](#)
- vi. [Microsoft Word - 00 a Contents.docx \(nwu.ac.za\)](#) - The threat of mine effluent to the UNESCO status of the Cradle of Humankind World Heritage Site

6. 6th Stop - Percy Stewart Road haulage discharge area (Into sewer line leading to Percy S WWTW)



*Percy Stewart Decant point for Road Haulage (-26.0798, 27.73882)*



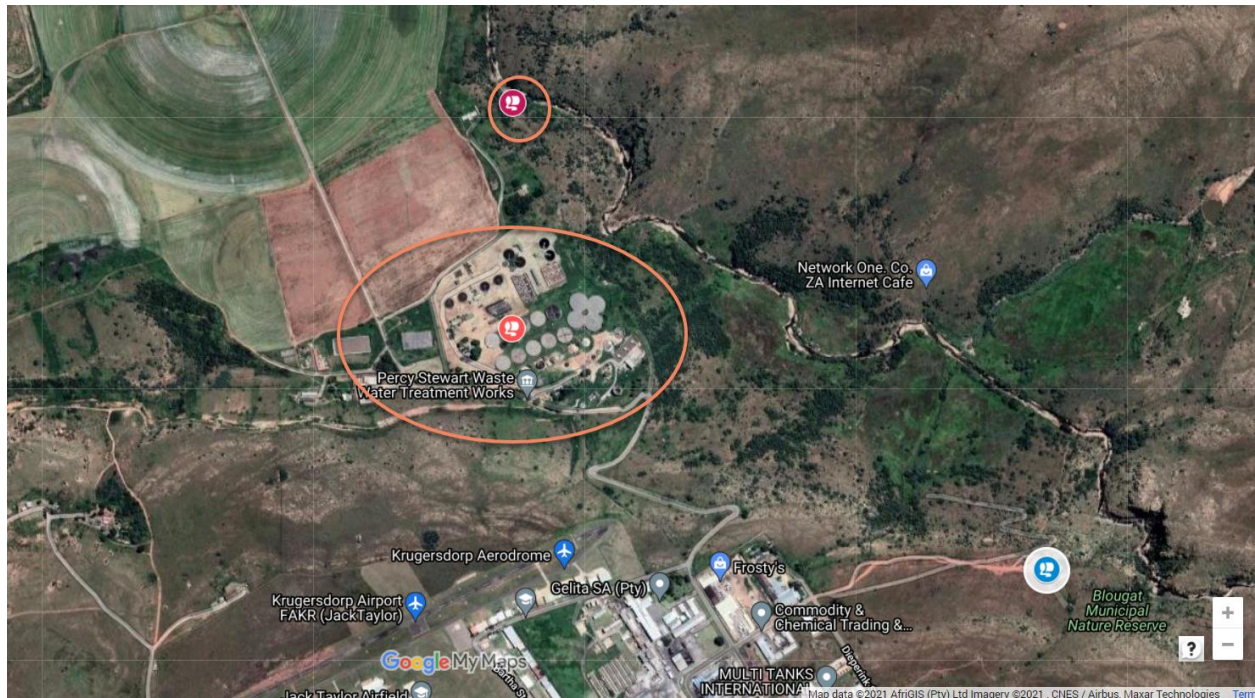
- Percy Stewart road haulage discharge, new fence erected since last week. No control of the area.

Background info

- i. None currently

## 7. 7th Stop - Percy Stewart WWTW viewing point

View of the Percy Stewart WWTW. Wastewater is used to irrigate on Neighbours grass farm property, the rest is discharged to the river. Human rights case has been opened and await site visit. The odor is terrible, there is also a gelatin factory who discharges to the sewer farm with a direct line which blocks and overflows intermittently. Along with Percy Stewart WWTW, there is are another two other municipal sewerage farms that add to the catchment along with many smaller sewerage farms for the various accommodation and tourism establishments in the area.



*Percy Stewart Waste Water Treatment Works (-26.07541, 27.72799)*



### Background info

- i. [How effective are municipalities in managing wastewater. \(702.co.za\)](http://702.co.za)
- ii. [WAR - Wildlife At Risk International - Africa - Posts | Facebook](#)
- iii. [Percy Stewart WWTW upgrade completed : project | Water&Sanitation Africa \(journals.co.za\)](#)
- iv. [Upgrading Percy Stewart WWTW : Mogale City | IMIESA \(journals.co.za\)](#)
- v. [Expanding capabilities at the Percy Stewart WWTW | Infrastructure news](#)
- vi. [NA Q 2304.pdf \(dws.gov.za\)](#)
- vii. [Process \(municipalassistant.co.za\)](#)
- viii. <https://pmg.org.za/files/201016- DWS NW DDM.pptx>
- ix. [SA's sewerage infrastructure collapsing – DA - POLITICS | Politicsweb](#)
- x. [Sewage spill creates stink at Cradle \(iol.co.za\)](#)

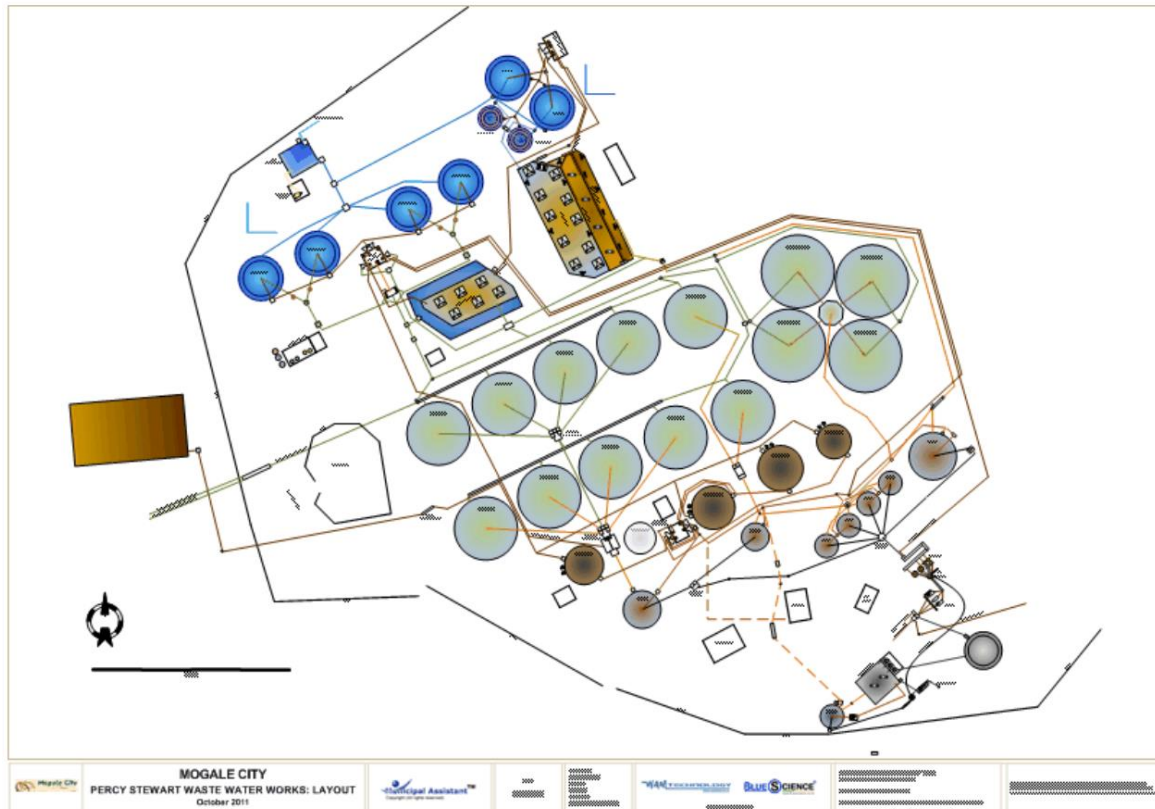
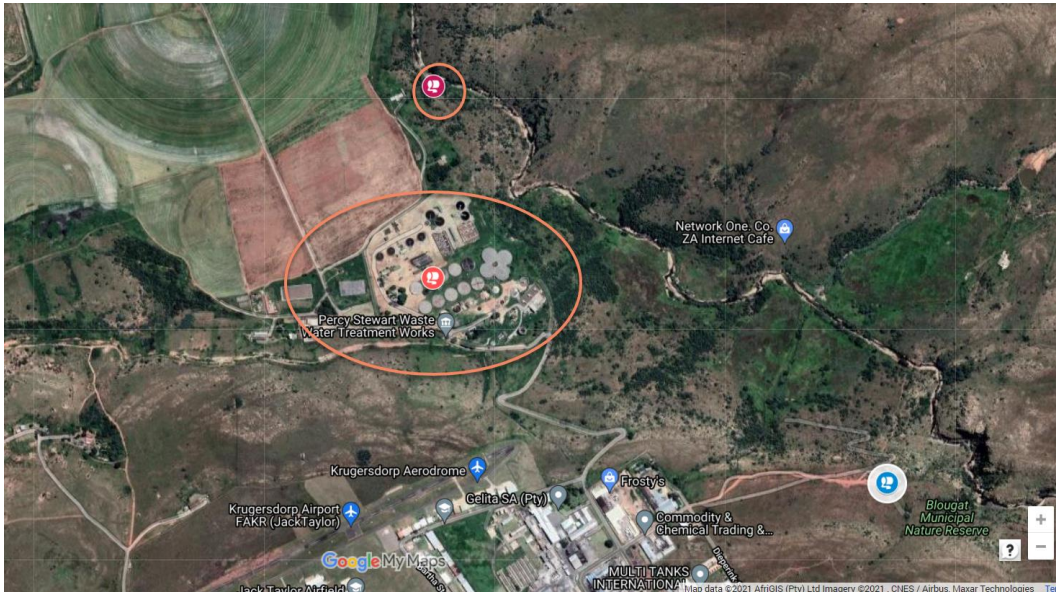


Diagram Source: [Process \(municipalassistant.co.za\)](#)

## 8. 8<sup>th</sup> Stop – Percy Stewart discharge point



PS Discharge Point into BlougatSpruit/River (-26.07131, 27.728)

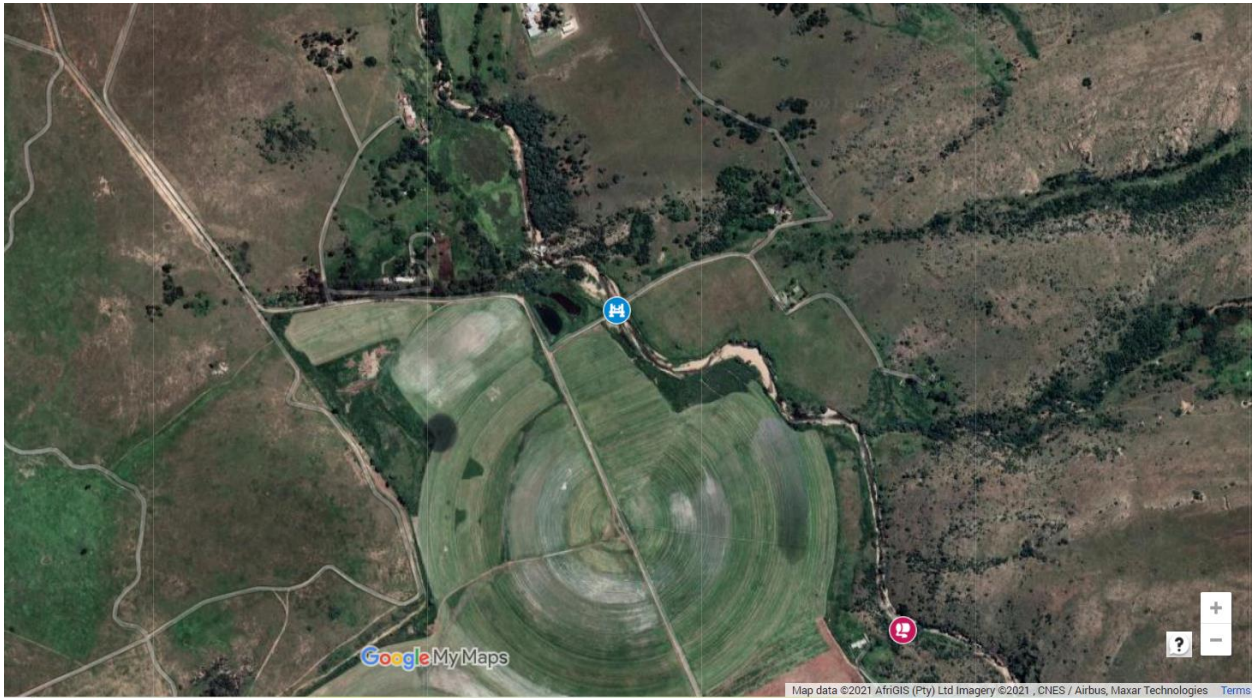


- Many manholes are uncovered, many invasives, dumped materials and veld fire damage observed around the area. The area smells.
- Percy STUART outfall into Blougatriver.

### Background info

- i. See above.

## 9. 9th Stop - Downstream Percy S WWTW



Low lying bridge, Blougatspruit, downstream of WWTW outlet (-26.06554, 27.72227)

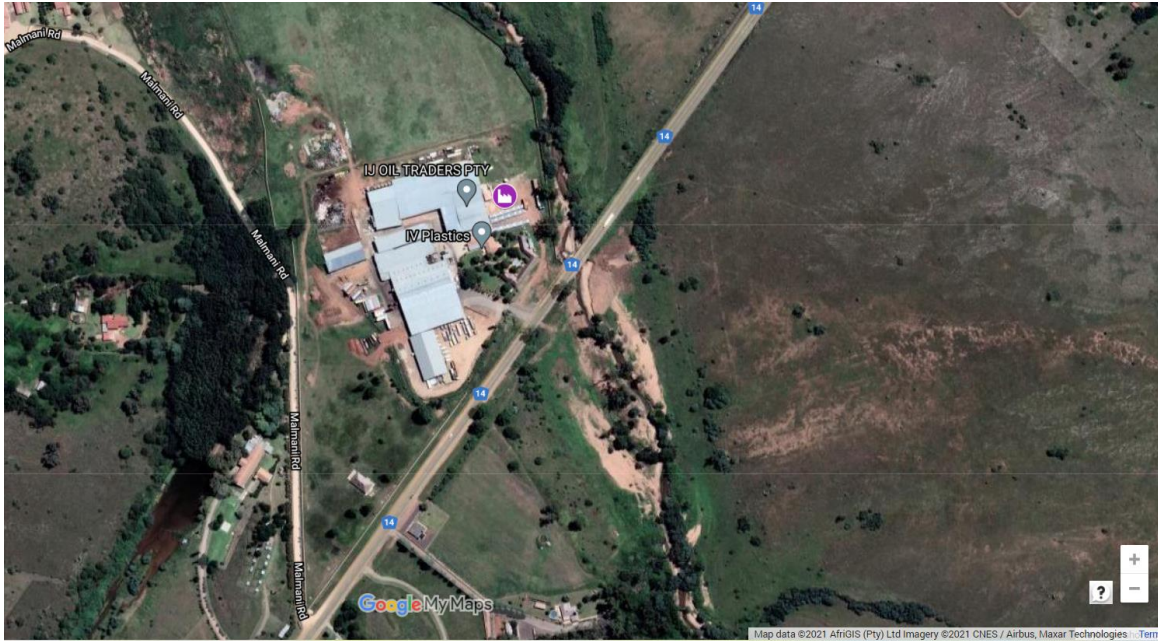


- Blougatspruit after WWTW. Low lying bridge was washed away in Jan floods. There is an odour.

### Background info

- i. None currently

## 10. 10th Stop - Oil Factory - Downstream from WWTW



Factories on adjacent to river (-26.03922, 27.72022)



- Plastics and Food oil factory next to river.

### Other Background Info

- i. None currently

## Other notes

- Garfield has water analysis.
- First compliant regarding Percy Stewart was in 2019.
- HRC case opened .
- Part of CSIR COVID-19 study.
- Cradle association has an NPC.
- Start a catchment forum.
- The Cradle area is a UNESCO heritage site.

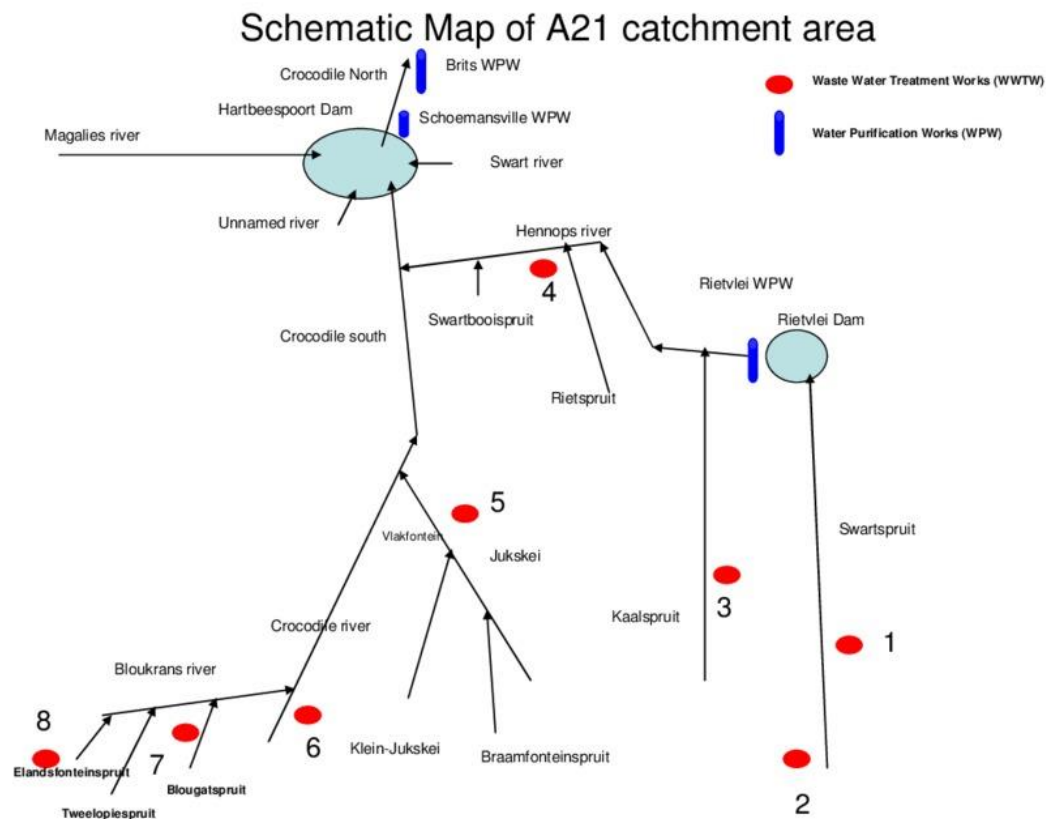


Diagram [Source](#): The Cradle Catchment are the lines marked 6, 7, 8. Different maps show different names for the spruits.

Report Prepared by Cara Stokes  
Committee member of ARMOUR

