WESTCOUNTRY RIVERS TRUST CITIZEN SCIENCE

MONITORING OF THE PAR RIVER AND ITS TRIBUTARIES

OCTOBER 2021

River Par at Ponts Mill with Eden Marathon runners in the background.

CONTENTS & PAGES

It should be noted that no monitoring was done between January and March 2021 but the Excel graphs suggest otherwise.

A. KEY POINTS FROM OCTOBER 2021

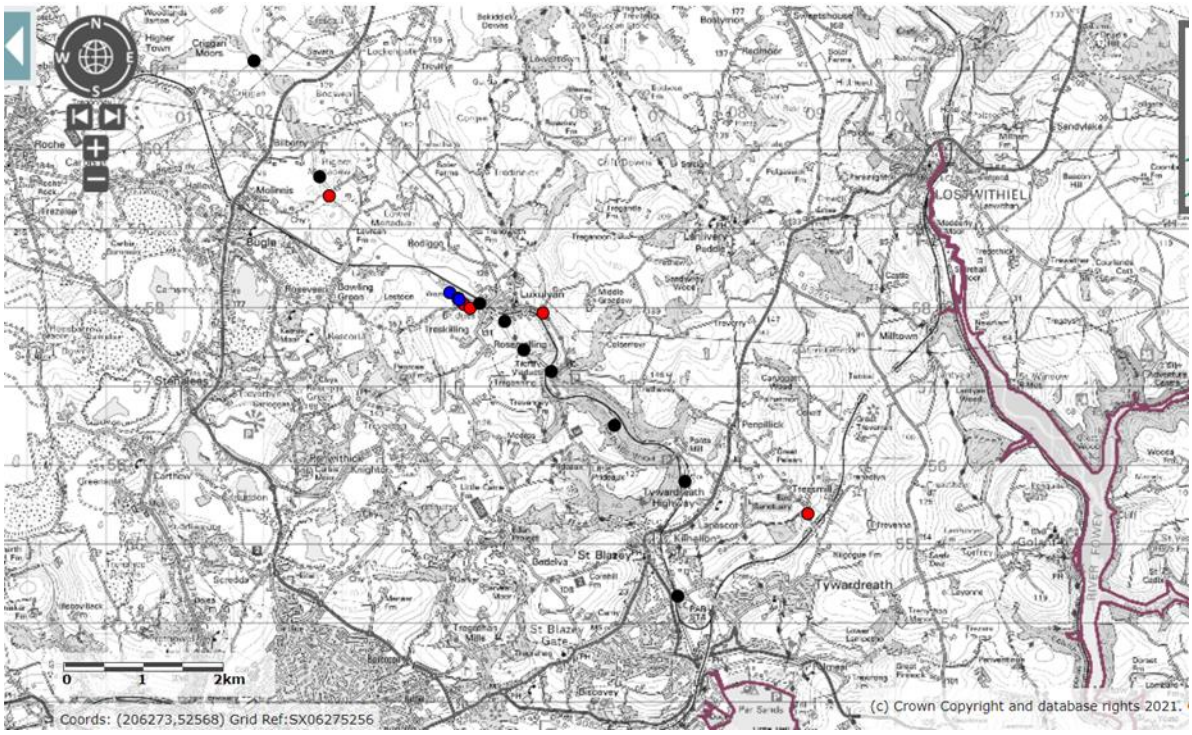
1. The Environment Agency was contacted following very high readings for phosphates downstream from the SWW sewage treatment works. Officers very quickly initiated investigations as well as contacting SWW.
2. The Carbis Stream continues to be slightly milky. Is this a historic problem arising from the erosion of clay from its banks?
3. Otters continue to be present in the Luxulyan Valley section of the Par River.

B. OUR GROUP

Monitoring is part of the Citizen Science programme run by the West Country Rivers Trust (WCRT) and is carried out monthly by volunteers from the Friends of Luxulyan Valley. The team comprises: Dave Burrell; Mandy Case; Joan Farmer; Veronica Jones; Sue Perry; Linda and Roger Smith; Dave Stillings. They have received training from Lydia Deacon, Junior Evidence and Engagement Officer of the West Country Rivers Trust (https://wrt.org.uk/project/become-a-citizen-scientist/). Results are logged on the Cartographer website. The support and advice given by Ross Tonkin, Claire and Gary Phillips, David Edwards, Matt Healey, Simon Browning and Lydia Deacon is greatly appreciated. The interest and encouragement offered by Environment Agency officers, especially Lisa Best and Lisa Goodall, has been invaluable.

C. OCTOBER 2021 MONITORING POINTS

This month we monitored fully at 15 locations, with 4 extra phosphate samples taken near the SWW treatment works at Luxulyan. Most of these have been monitored before. One location, Rock Mill Quarry, was not monitored because the group wishes to focus on the more informative sites. However, a heron was spotted rising from the river near Rock Mill Quarry and this was recorded on Cartographer.
This month's monitoring points along the main Par River are shown in **black**. Those in **red** are on tributaries. **Blue** shows where extra phosphate readings were taken.



Source: https://magic.defra.gov.uk/MagicMap.aspx

LOCATION	MONITORED BY
Criggan Moors, Par River, SX 01882 61133	Roger Smith
South of Minorca Lane, Par River, SX 02657 59788	Roger Smith
Carbis Stream SX 02834 59401	Roger Smith
Luxulyan sewage treatment works, Par River, SX 0455 58114	Joan Farmer, Veronica Jones & Roger Smith
Treverbyn Stream, SX 04532 58033	Joan Farmer, Veronica Jones & Roger Smith
Rosemullion, Tregarrick Stream, SX 04623 57990	Joan Farmer, Veronica Jones & Roger Smith
Luxulyan allotments, Par River, SX 04732 58045	Joan Farmer, Veronica Jones & Roger Smith
Luxulyan SWW pumping station, Par River, SX 05033 57849	Joan Farmer, Veronica Jones & Roger Smith
Gatty's Bridge, Bokiddick Stream SX 05531 57953	Joan Farmer
Cam Bridges, Par River, SX 05292 57454	Joan Farmer & Roger Smith
Treffry Viaduct, Par River, SX 05650 57179	Joan Farmer, Veronica Jones & Roger Smith
Lady Rashleigh Mine, Par River, SX 06451 56509	Joan Farmer, Veronica Jones & Roger Smith
Ponts Mill, Par River, SX 07354 55875	Joan Farmer, Veronica Jones & Roger Smith
Middleway, Par Canal, SX 07233 54299	Veronica Jones
Treesmill, Tywardreath Stream, SX 08873 55385	Veronica Jones

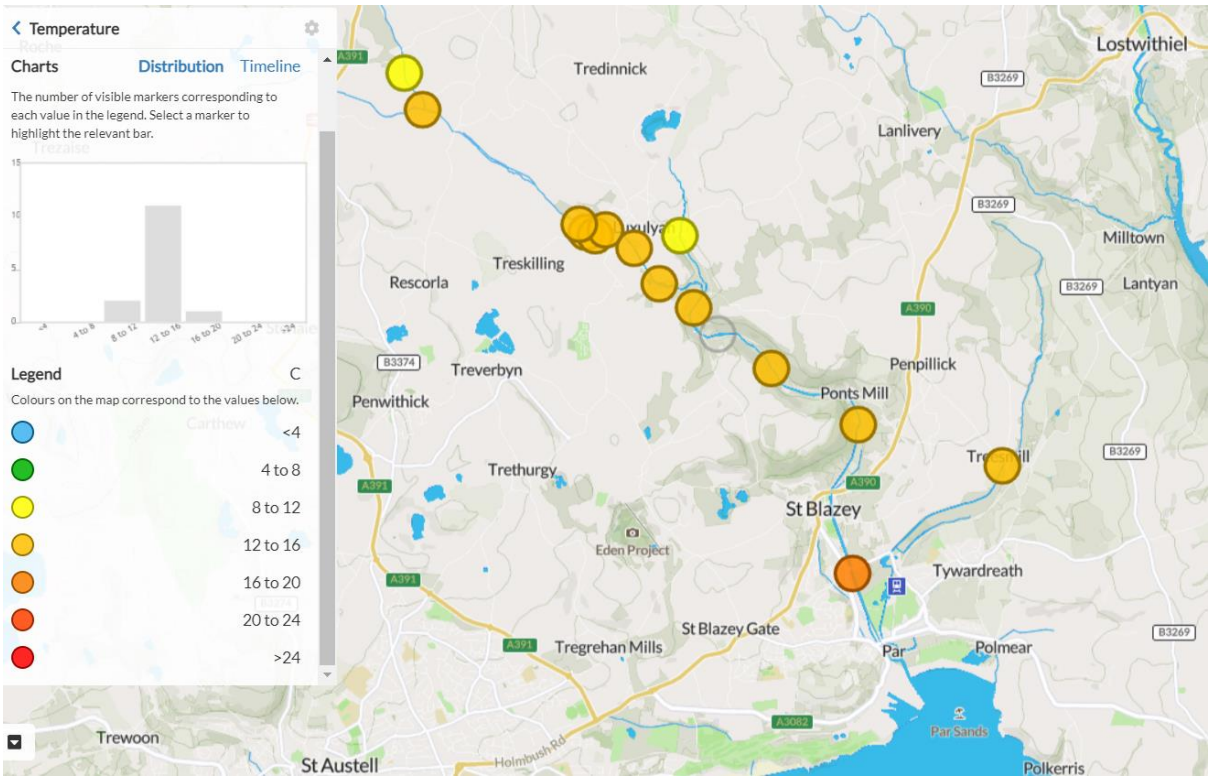
Surveys conducted on these dates, each of which is colour-coded:
9th October 2021
10th October 2021
11th October 2021

D. TEMPERATURE

1. This is the WRT's explanation of why this is monitored:

Temperature is a vital parameter within the river ecosystem. It controls many of the aquatic species life cycles. Temperature fluctuates with the seasons; however, you do get variation within that, particularly in small rivers and streams. Another important reason to measure temperature is to track the impact of our warming climate on our waterbodies.

2. **Geographical comparison.** The Cartographer website shows temperatures recorded at monitoring sites in the area. (Thanks to Simon Browning (WRT) for showing the filter mechanism on these maps!) Source: Cartographer.



3. These are the results for October 2021:

PAR RIVER/TRIBUTARY	LOCATION	Temperature ˚Celsius
Par (Bissa)	Criggan Moors, SX 01882 61133	10
Par	South of Minorca Lane, SX 02657 59788	10
Tributary	Carbis Stream SX 02834 59401	13
Par	Luxulyan sewage treatment works SX 0455 58114	14
Tributary	Treverbyn Stream, SX 04532 58033	13
Tributary	Tregarrick Stream, Rosemullion, SX 04623 57990	14
Par	Luxulyan allotments SX 04732 58045	14
Par	Luxulyan SWW pumping station SX 05033 57849	14
Par	Cam Bridges SX 05292 57454	12.8
Tributary	Gatty's Bridge, Bokiddick Stream SX 05531 57953	11.8
Par	Treffry Viaduct SX 05650 57179	12.8
Par	Lady Rashleigh Mine SX 06451 56509	13
Par	Ponts Mill SX 07354 55875	12
Tributary	Tywardreath Marsh Stream (Treesmill) SX 08902 55414	16.5
Par	Middleway (Par Canal) SX 07238 54295	15.5

Surveys conducted on these dates, each of which is colour-coded:

9th October 2021

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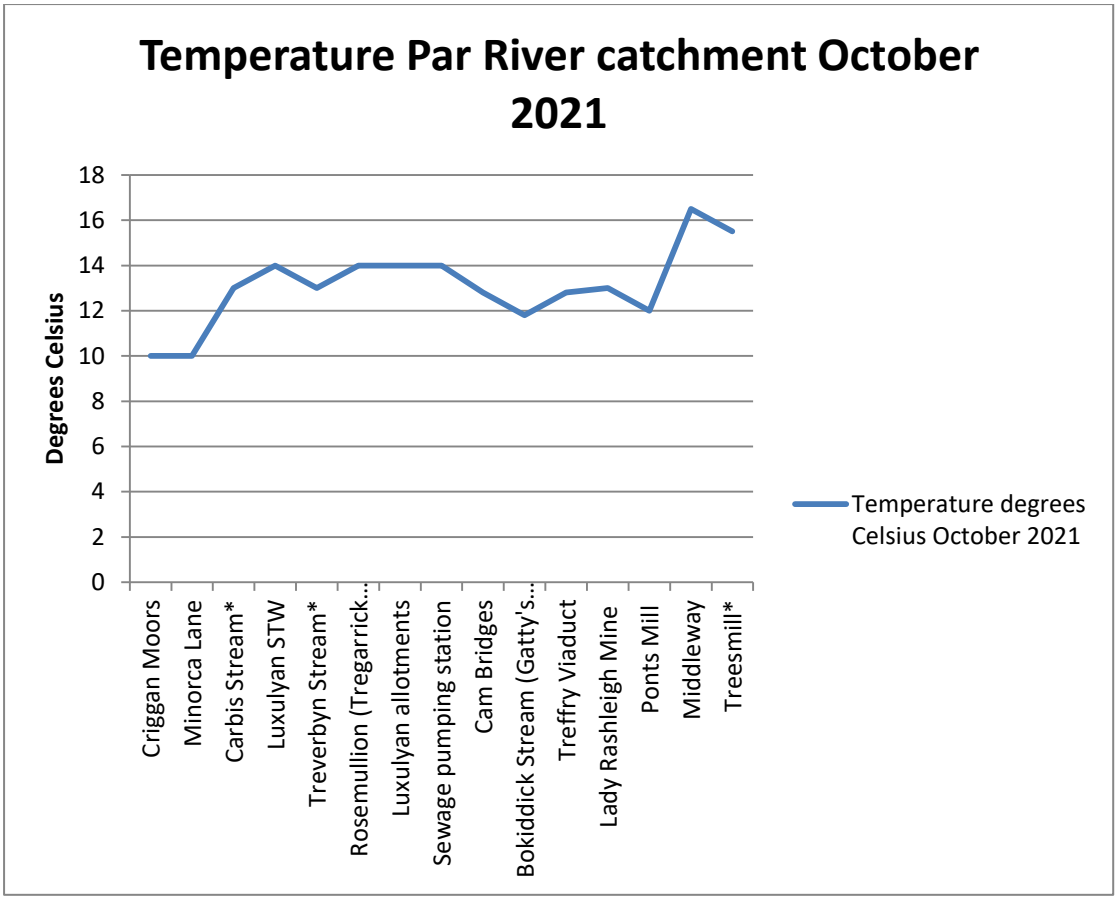
11th October 2021

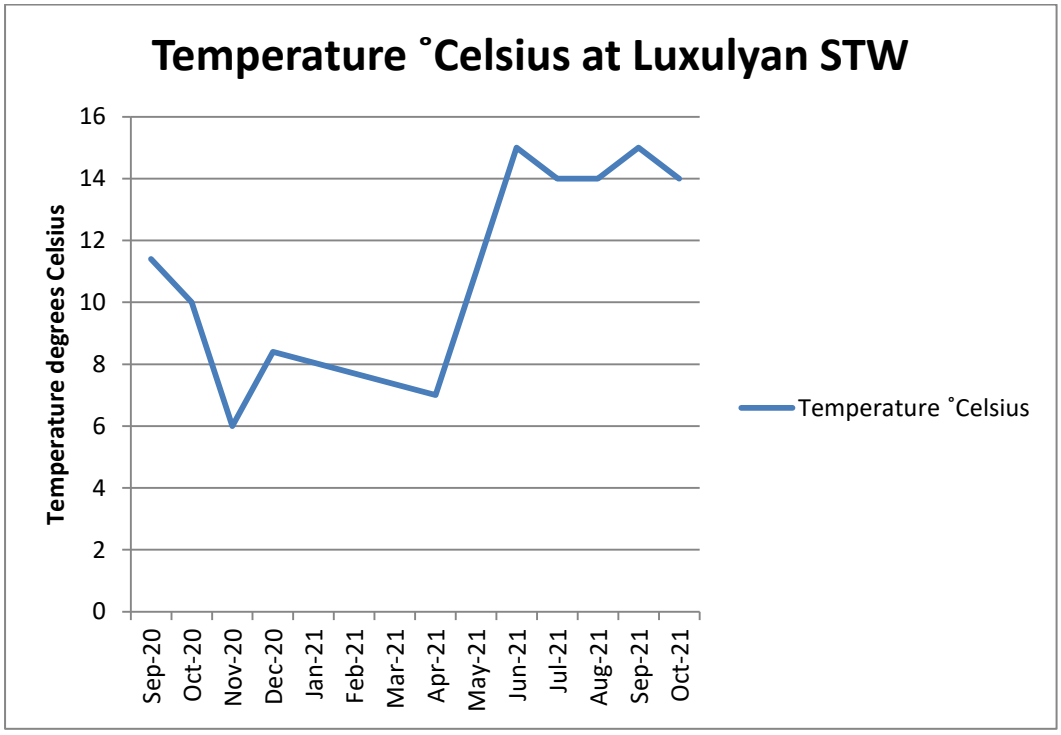


*indicates a tributary of the Par River.

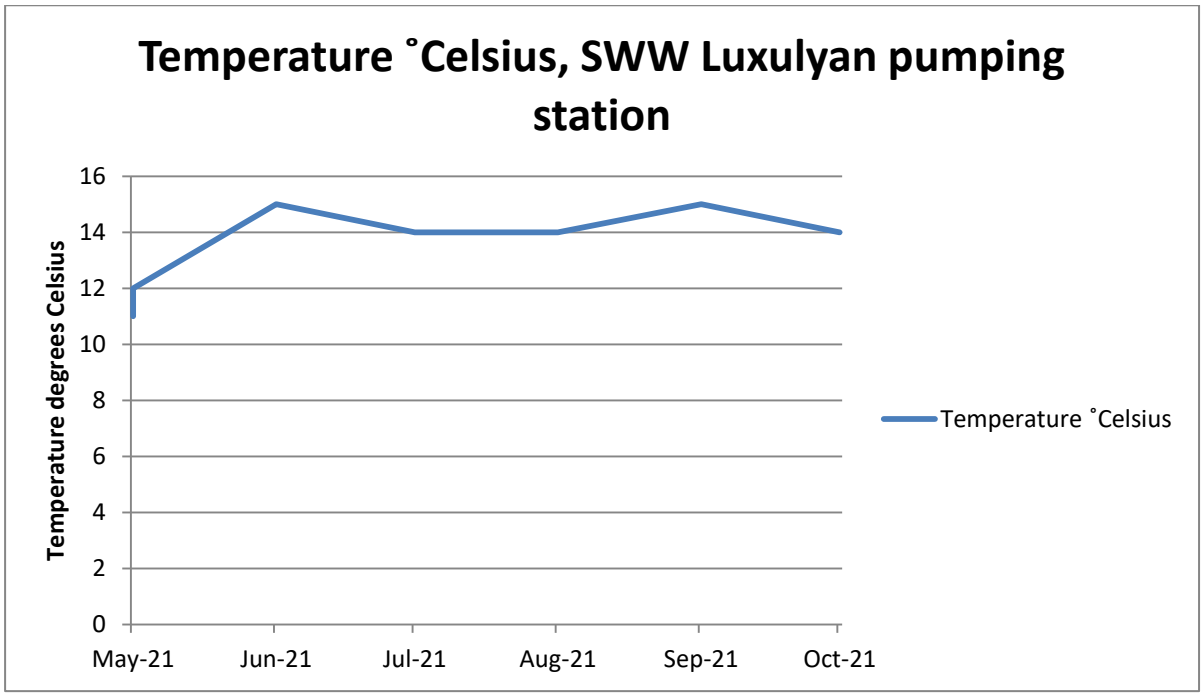
These temperatures are arranged, broadly speaking, from north (upstream) to south (downstream), and in order of flow. The last 2 readings are significantly higher. This may be partly due to the weather, which had been unseasonably warm, the amount of tree cover and the volume of water at those points. It should be pointed out that Middleway is the former Par Canal, rather than the river, although it is fed by the river upstream. It does mean that the water is split between two water-courses so that the lower volumes in each might be warmed more quickly.

4. **Historical data** on temperature at selected sites (no monitoring January to March 2021):

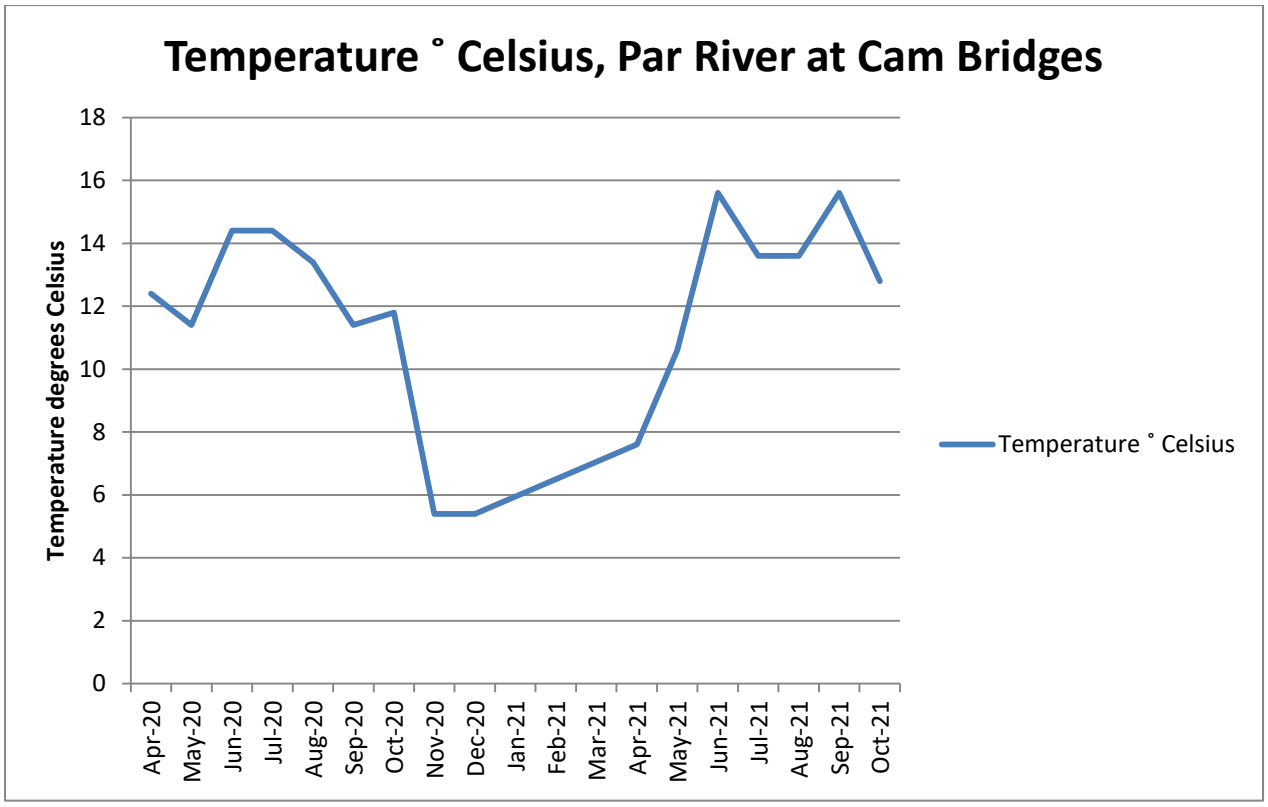
(a) Luxulyan sewage treatment works SX 0455 58114



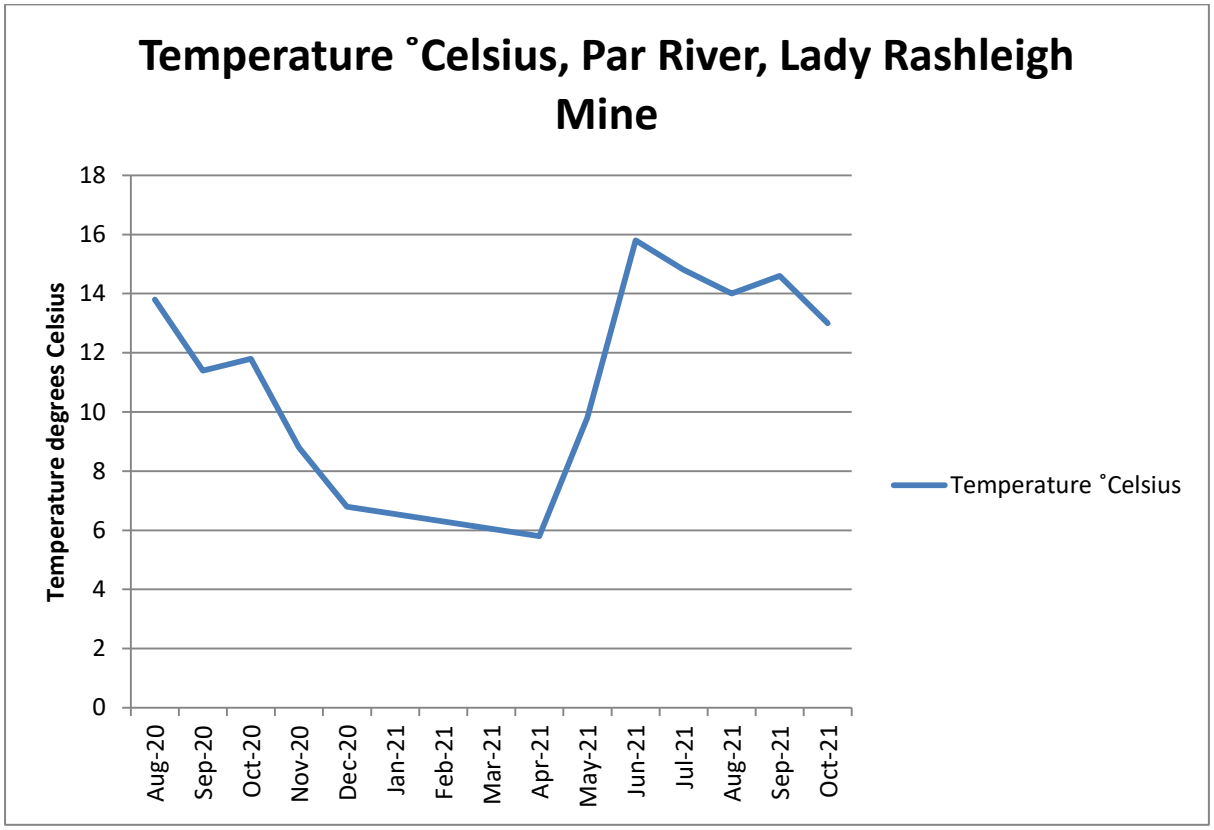
(b) Luxulyan SWW pumping station SX 05033 57849



(c) Cam Bridges SX 05292 57454



(d) Lady Rashleigh Mine SX 06451 56509



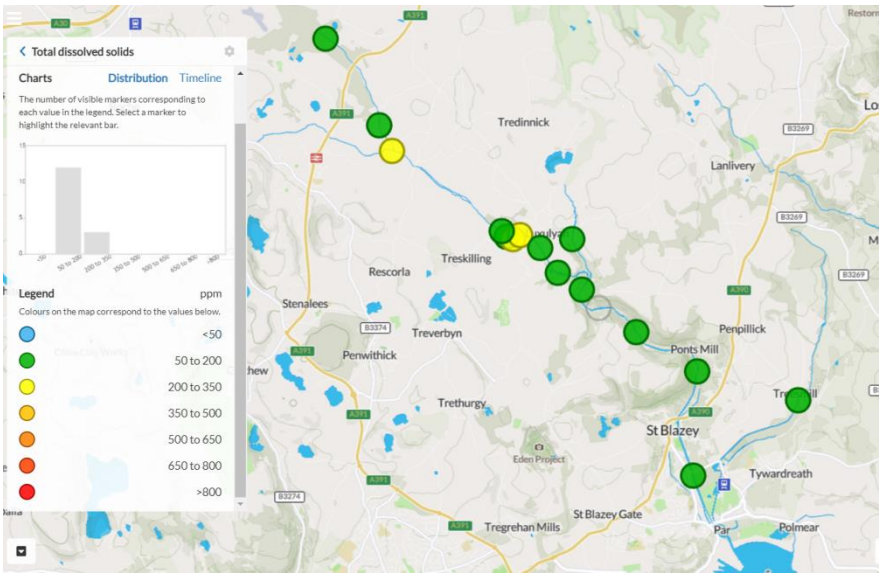
Temperatures in the late summer and early autumn appear to be higher in 2021 than in 2020. But with such a limited set of results it would be unjustified to draw any conclusion from this. Nonetheless, over the long term, it is a measure which should be watched.

E. TOTAL DISSOLVED SOLIDS

1. We measure these in ppm (parts per million). This is the WRT's explanation:

Total Dissolved Solids (TDS) is directly related to the conductivity of the water. The more minerals, salts and metals that are dissolved in the water the more conductive it gets. Low levels of dissolved solids in waters such as those on Dartmoor near to the source of the river are a result of very low levels of input from the surrounding landscape. As the river runs down to the sea it collects material from many different inputs, some natural and some man-made such as farms, sewage plants, factories and residential areas. This typically increases the amount of solids dissolved in the water leading to a higher reading. Harmful pollution from things like sewage, slurry and factory discharge will usually elevate your TDS reading. However, some pollutants such as oil can lower conductivity; therefore it should be used as a general indicator of water quality not a specific measure of toxicity. Geology will influence the normal level of conductivity in a watercourse (e.g. Areas dominated by granite generally give a lower conductivity than those with limestone). Regular monitoring will allow the detection of changes in conductivity which can indicate pollution.

2. **Geographical comparison.** Source: Cartographer.



PAR RIVER/TRIBUTARY	LOCATION	Total Dissolved Solids ppm
Par (Bissa)	Criggan Moors, SX 01882 61133	76
Par	South of Minorca Lane, SX 02657 59788	63
Tributary	Carbis Stream SX 02834 59401	277
Par	Luxulyan sewage treatment works SX 0455 58114	172
Tributary	Treverbyn Stream, SX 04532 58033	86
Tributary	Tregarrick Stream, Rosemullion, SX 04623 57990	202
Par	Luxulyan allotments SX 04732 58045	200
Par	Luxulyan SWW pumping station SX 05033 57849	190
Par	Cam Bridges SX 05292 57454	196
Tributary	Gatty's Bridge, Bokiddick Stream SX 05531 57953	84
Par	Treffry Viaduct SX 05650 57179	165
Par	Lady Rashleigh Mine SX 06451 56509	154
Par	Ponts Mill SX 07354 55875	151
Tributary	Tywardreath Marsh Stream (Treesmill) SX 08902 55414	127
Par	Middleway (Par Canal) SX 07238 54295	131

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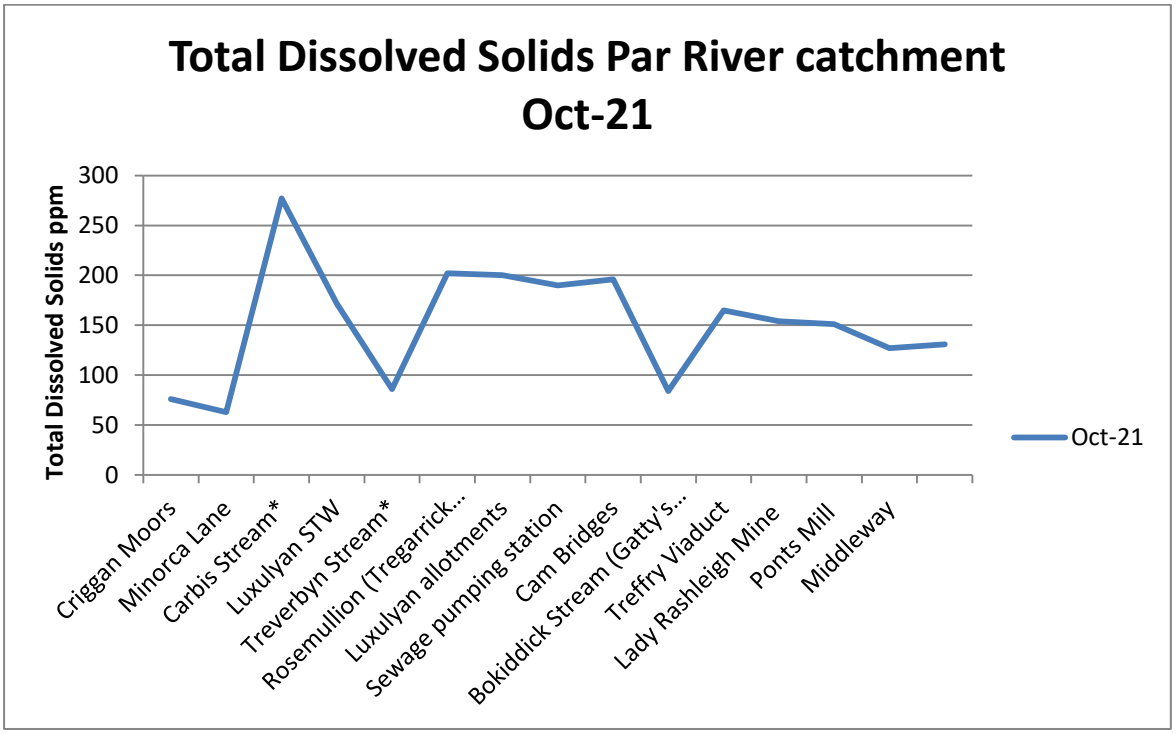


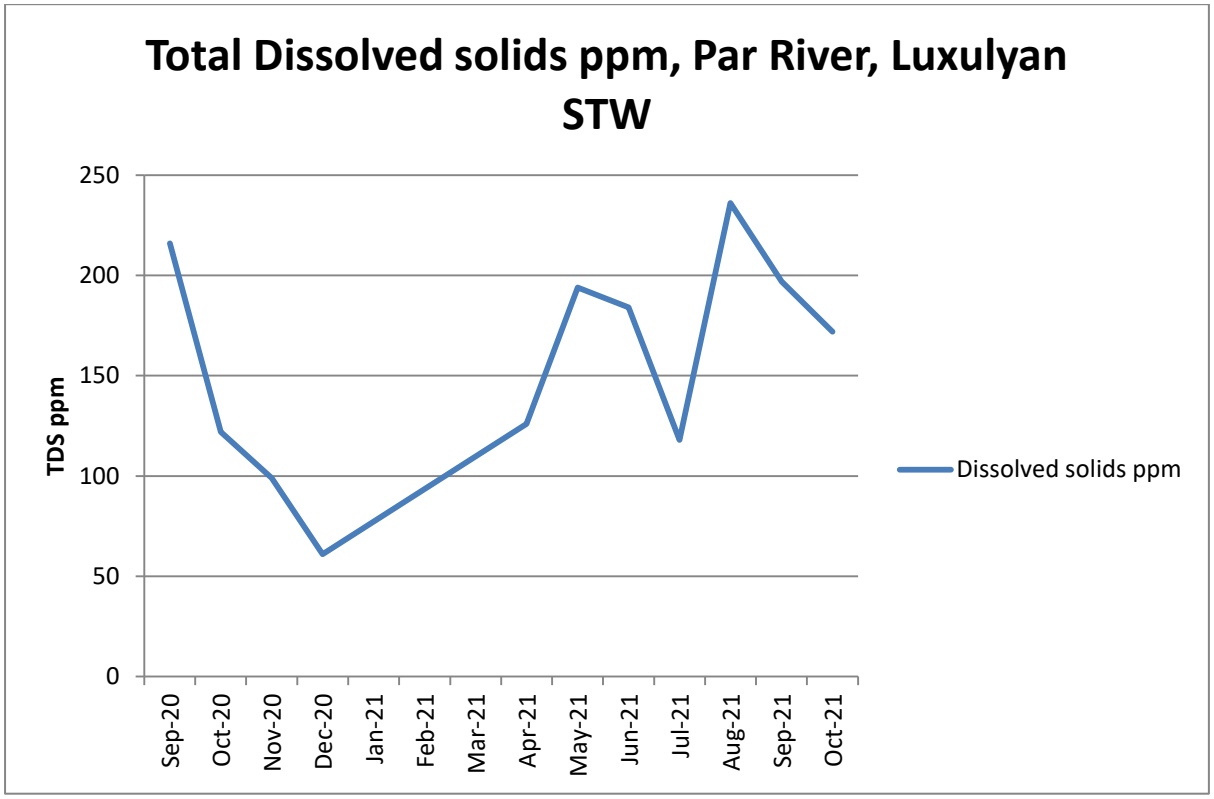
*indicates a tributary of the Par River.

Once again, the relatively high score on the Carbis Stream may reflect china clay in the stream, which was slightly milky in appearance (unfortunately there are no photos because my camera battery ran out). It has been assumed that this is the result of erosion from the banks, rather than

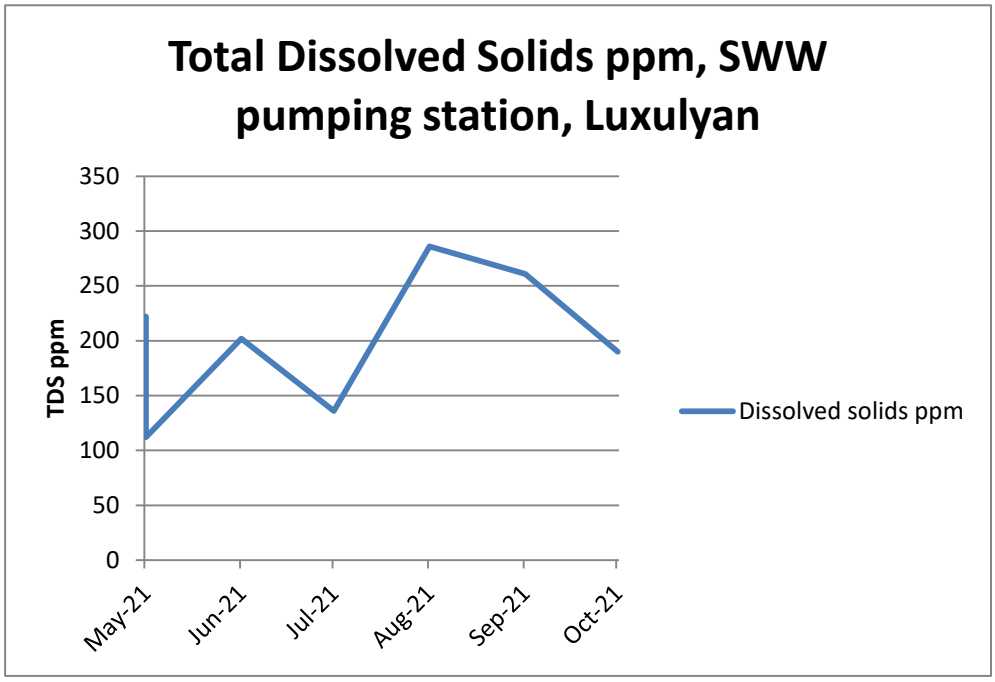
current discharges from working plants but perhaps this should be investigated. Other rivers in the St Austell area do carry china clay from operating works. Otherwise, the usual observation can be repeated: TDS levels on the main Par River seem to be greater from the STW downstream, if tributaries are ignored. Tributaries seem to have lower TDS than the main river, with the exception of the Carbis Stream.

3. **Historical data** on total dissolved solids at selected sites (no monitoring January to March 2021):

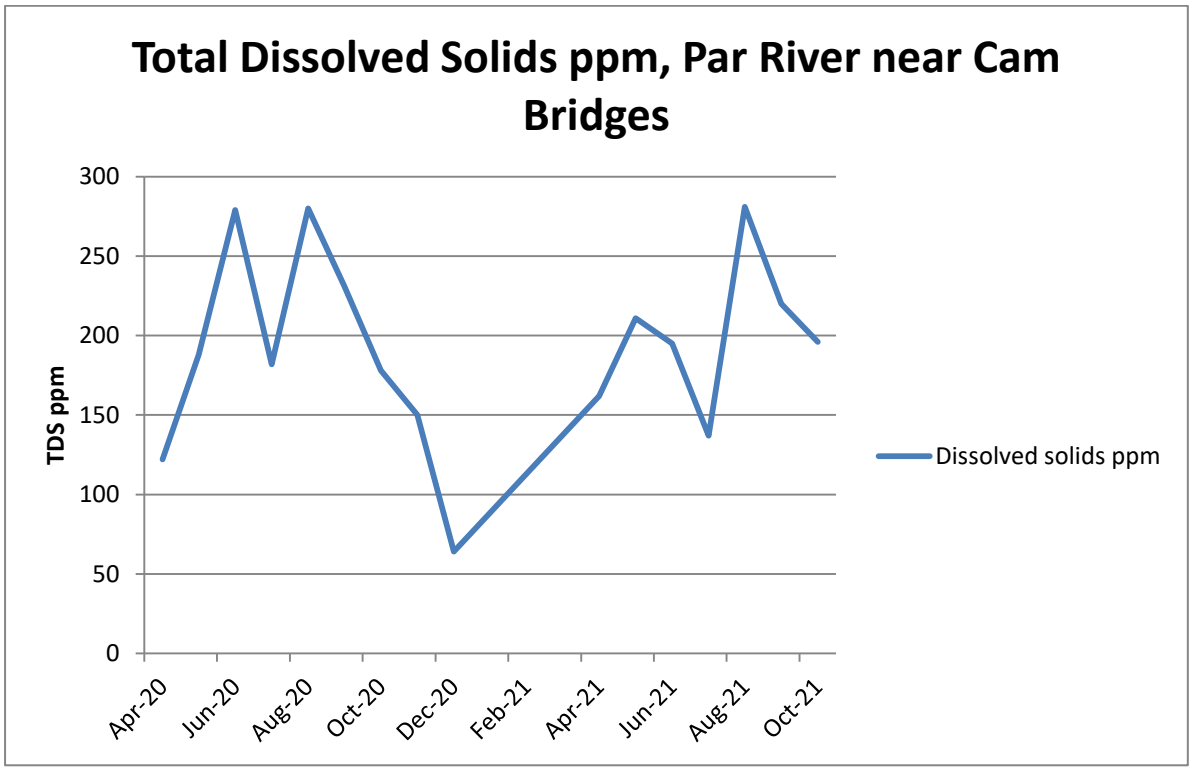
   (a) Luxulyan sewage treatment works SX 0455 58114



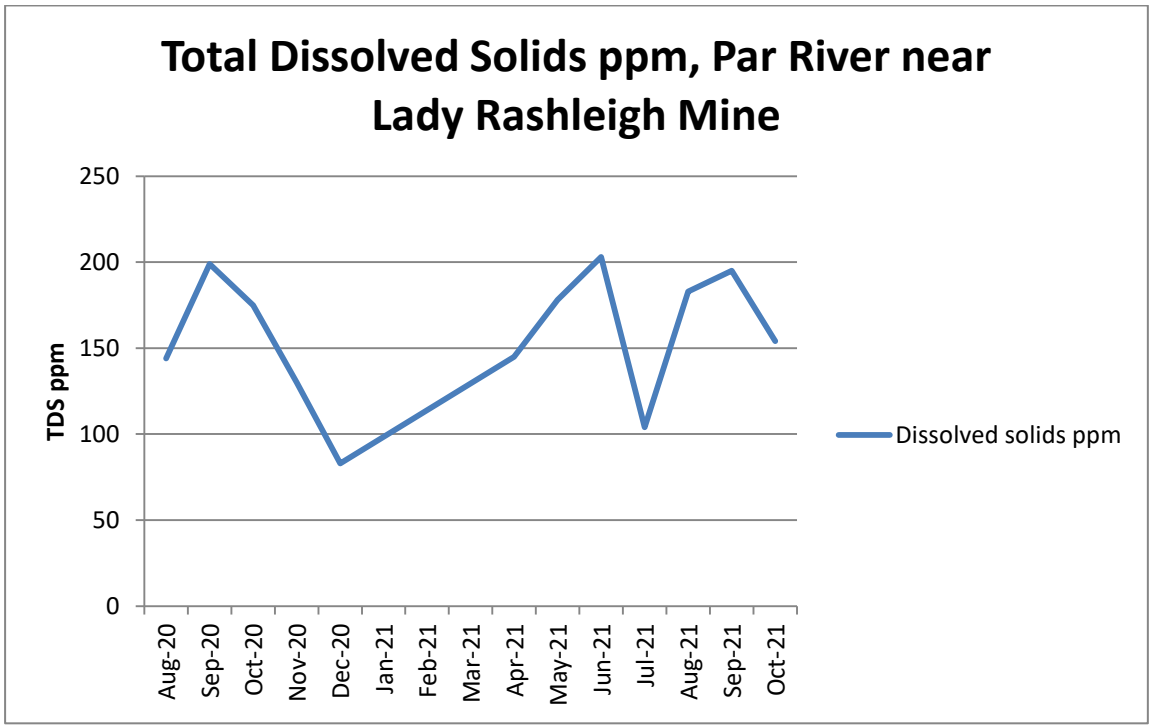
(b) Luxulyan SWW pumping station SX 05033 57849



(c) Cam Bridges SX 05292 57454



(d) Lady Rashleigh Mine SX 06451 56509

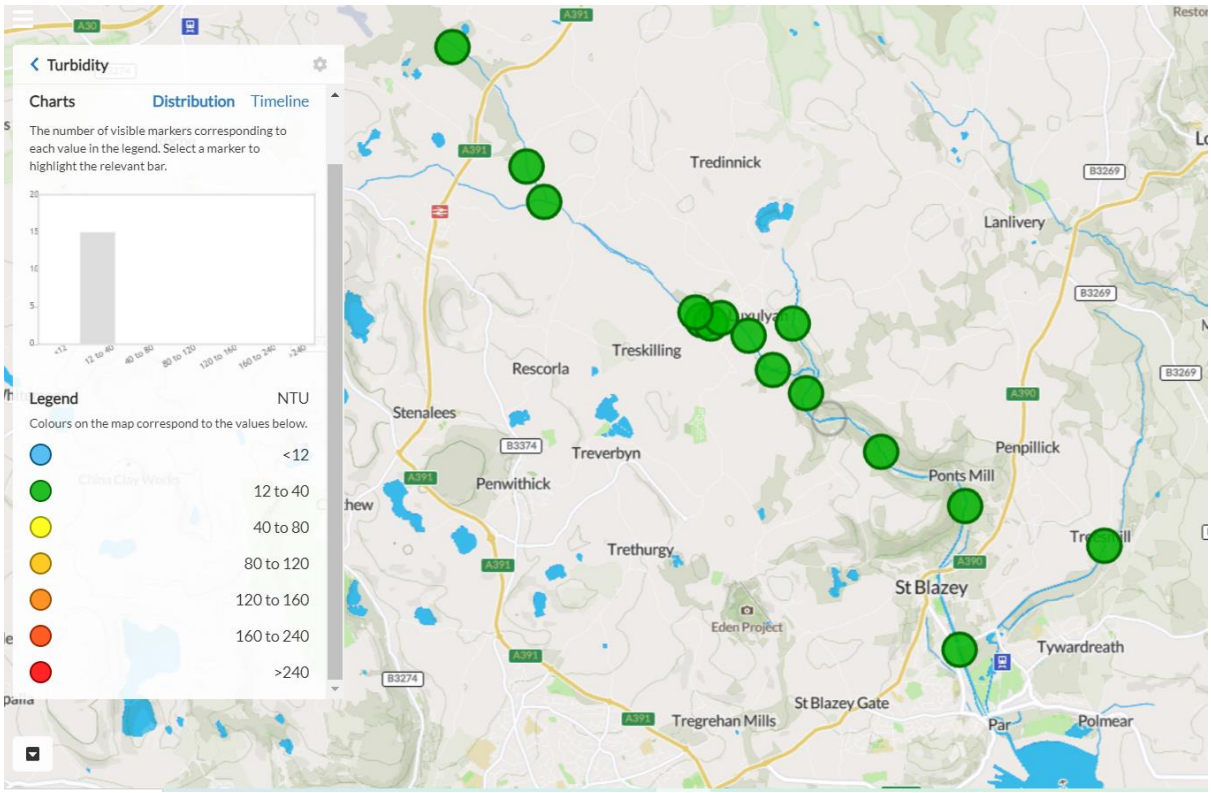


F. TURBIDITY

1. This is the WRT explanation of this measure:

Turbidity tube is a measure of the optical clarity of the water. The more suspended particles in the water the lower the clarity and the higher the turbidity. You will often find your waterbody gets more turbid after heavy rainfall due to soil running off the fields and sediment being mixed into the water column. This loss of topsoil is both a problem for farmer and river. It can often contain chemicals from the fertiliser and pesticides used on the land. An increase in sediment level on the substrate of the river can cause smothering of habitat by removing light and oxygen. Aquatic wildlife such as the less mobile invertebrates and fish eggs struggle to survive in low oxygen conditions and without light, plants are unable to grow. It is a good idea to sample your river after different weather conditions to understand how it responds to rainfall or drought.

2. **Geographical comparison.** Where scores are shown as 0, it means that the reading using the Secchi tube was <12. Source: Cartographer.



PAR RIVER/TRIBUTARY	LOCATION	Turbidity
Par (Bissa)	Criggan Moors, SX 01882 61133	0
Par	South of Minorca Lane, SX 02657 59788	0
Tributary	Carbis Stream SX 02834 59401	14
Par	Luxulyan sewage treatment works SX 0455 58114	0
Tributary	Treverbyn Stream, SX 04532 58033	0
Tributary	Tregarrick Stream, Rosemullion, SX 04623 57990	0
Par	Luxulyan allotments SX 04732 58045	0
Par	Luxulyan SWW pumping station SX 05033 57849	0
Par	Cam Bridges SX 05292 57454	0
Tributary	Gatty's Bridge, Bokiddick Stream SX 05531 57953	0
Par	Treffry Viaduct SX 05650 57179	0
Par	Lady Rashleigh Mine SX 06451 56509	0
Par	Ponts Mill SX 07354 55875	0
Tributary	Tywardreath Marsh Stream (Treesmill) SX 08902 55414	0
Par	Middleway (Par Canal) SX 07238 54295	0

Surveys conducted on these dates, each of which is colour-coded:

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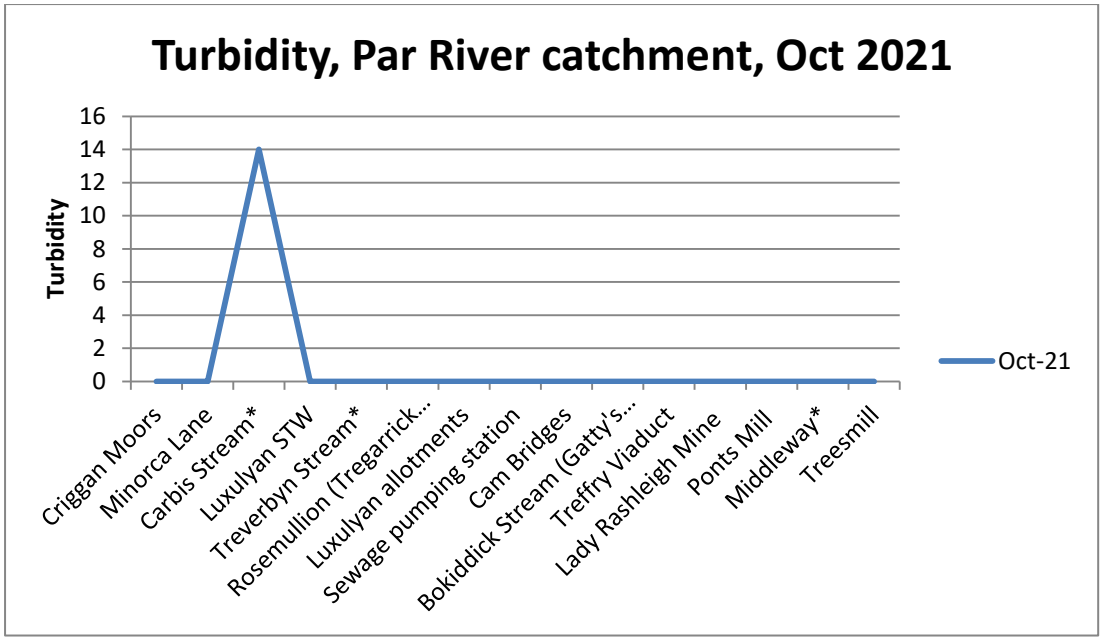
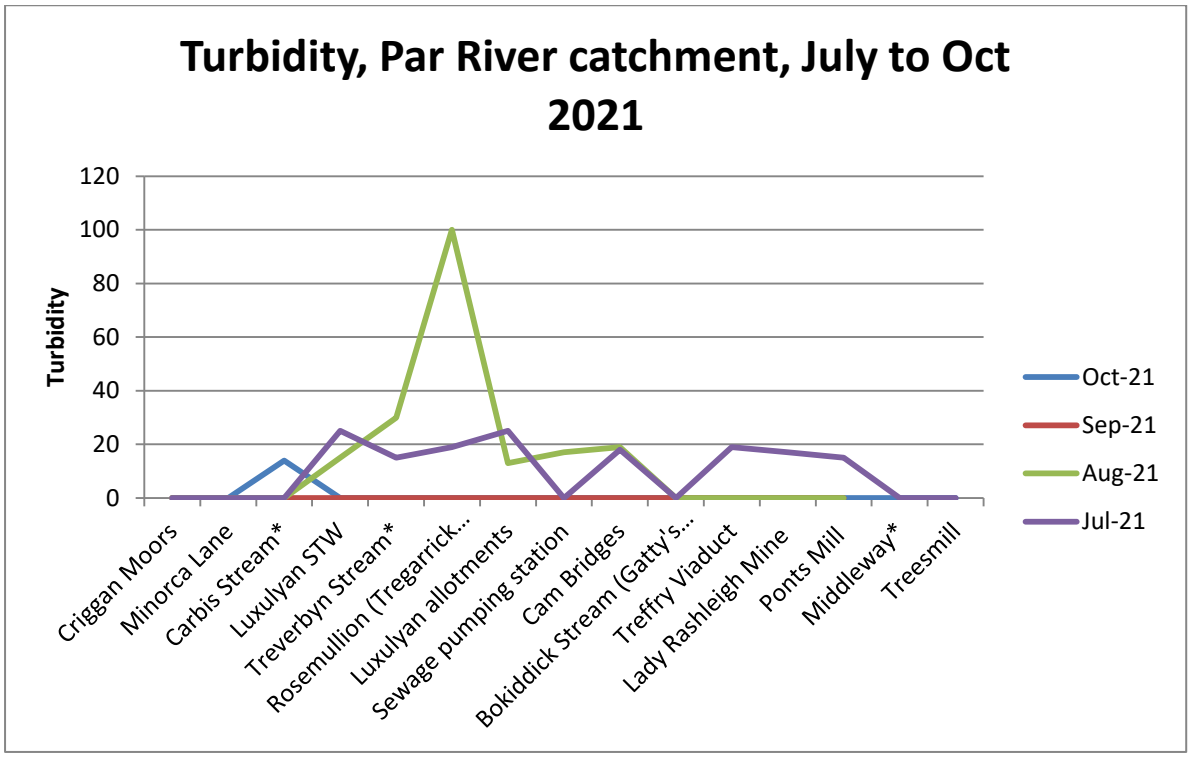


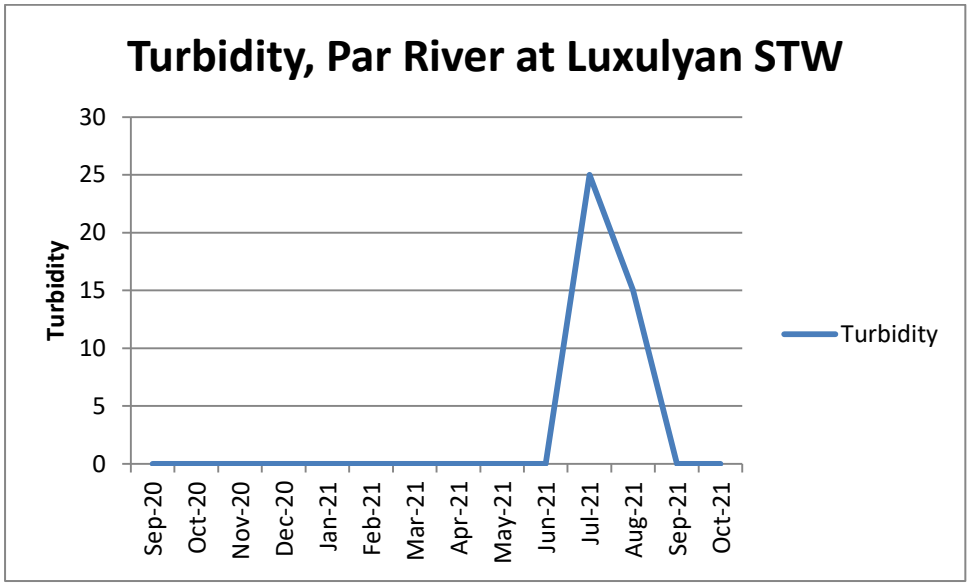
*indicates a tributary of the Par River.



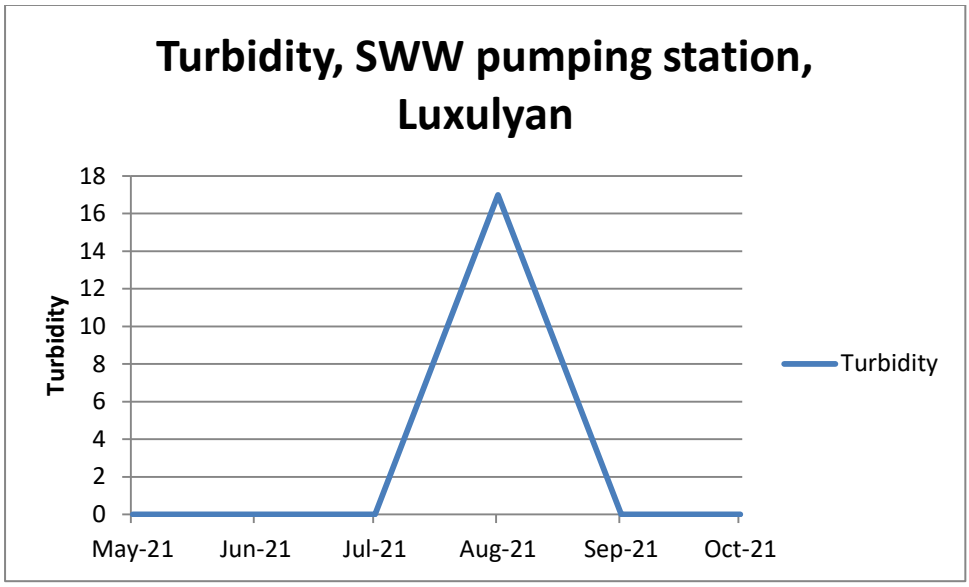
The turbidity in the Carbis stream may be the result of china clay pollution. Turbidity scores for most locations since monitoring began in 2020 are usually <12 (recorded on Excel as 0 for convenience). The Carbis and Tregarrick Streams have been outliers (the latter as a result of thick silt in the stream) although high rainfall preceding readings has sometimes raised levels elsewhere.

3. Historical data on turbidity at selected sites (no monitoring January to March 2021):

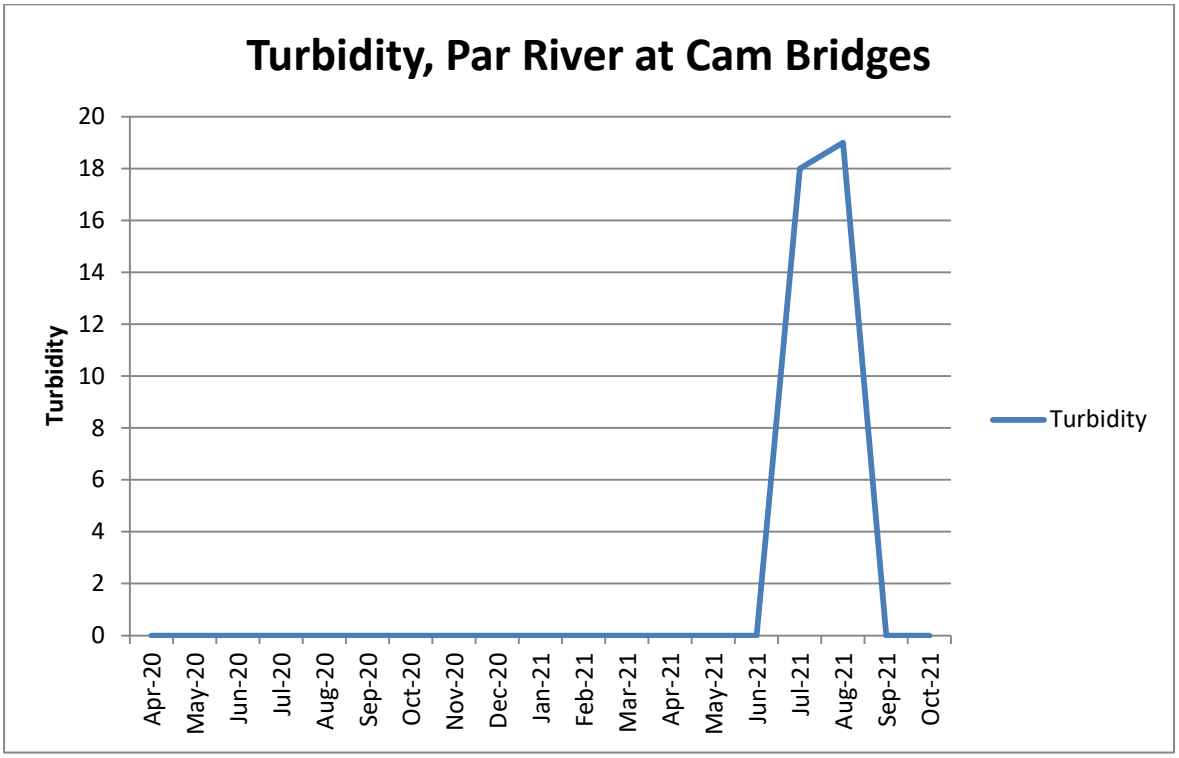
Luxulyan sewage treatment works SX 0455 58114



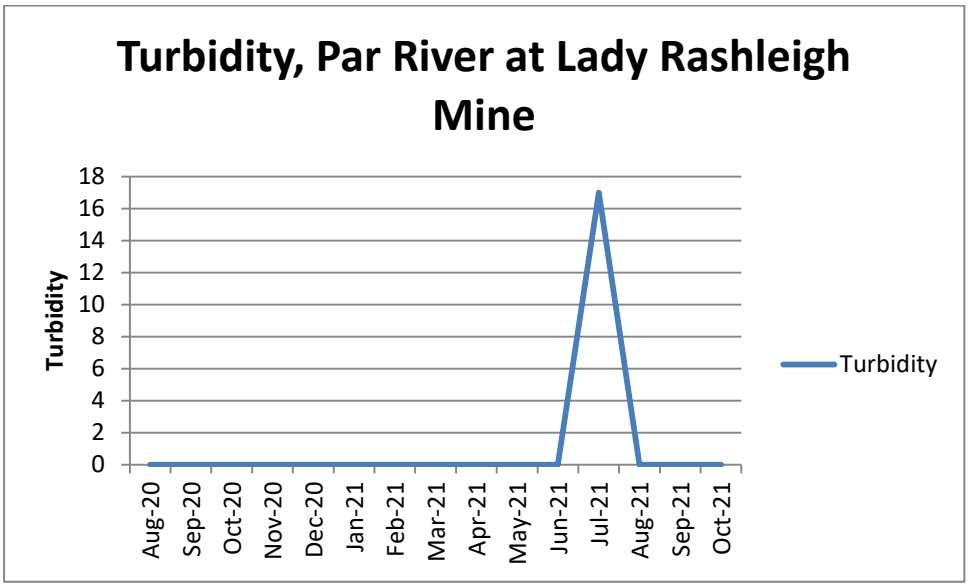
(a) Luxulyan SWW pumping station SX 05033 57849



(b) Cam Bridges SX 05292 57454



(d) Lady Rashleigh Mine SX 06451 56509



G. PHOSPHATES

1. This is the WRT's explanation of this measure.

Phosphate occurs naturally within the river ecosystem, but in very low levels under 0.05 mg/l. Therefore, higher levels may indicate anthropogenic input. Phosphate is found in animal and human waste, cleaning chemicals, industrial runoff and fertiliser so this can be a good indicator of pollution. Having raised levels of phosphate can lead to increases in plant growth within the watercourse. This leads to a depletion of oxygen due to the plant's aerobic respiration during the night. Without oxygen aquatic species cannot survive and the river ecosystem collapses. (It is important to note that phosphate is taken up by plants. You may get a low reading but high plant growth, indicating eutrophication.)

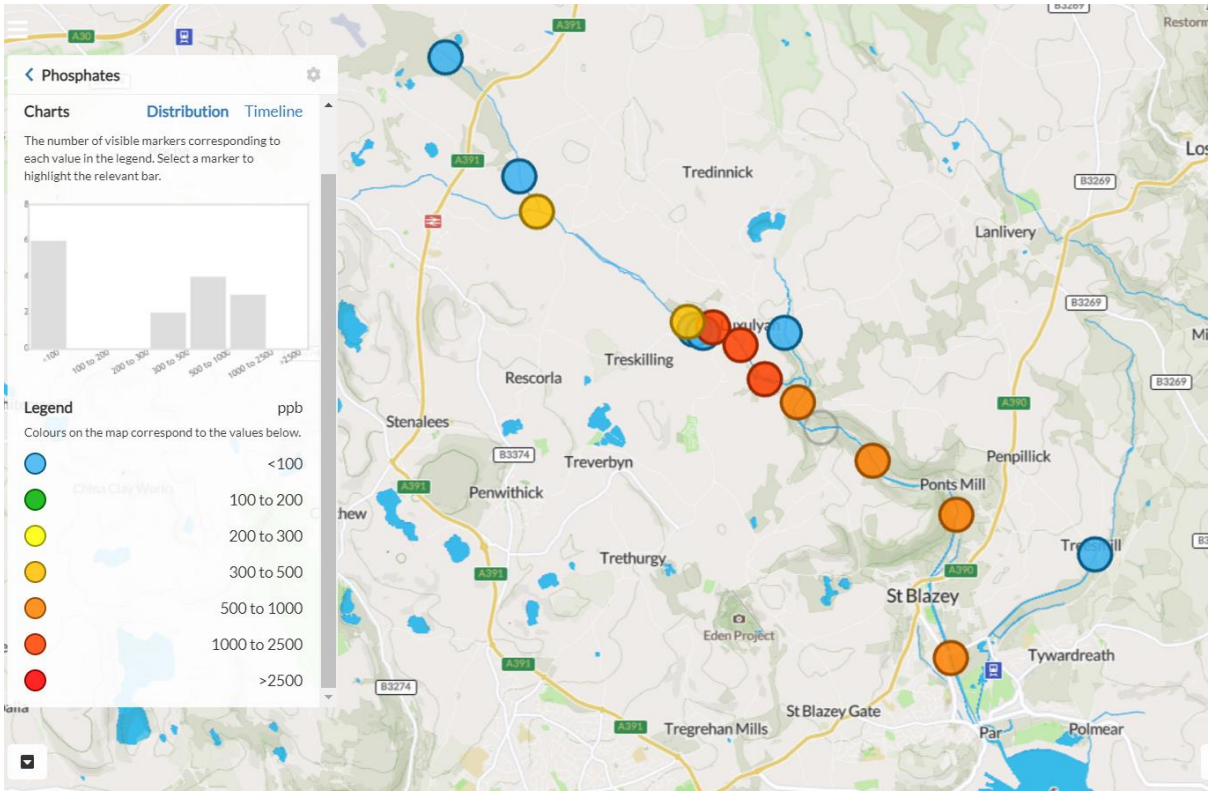
Ranges on phosphate diagnostic colour chart:

0 – 100 OK

200 – 300 HIGH

500 – 2500 – TOO HIGH

2. **Geographical comparison.** Not all of these were recorded by the FoLV group and some are not for September 2021. Source: Cartographer.



PAR RIVER/TRIBUTARY	LOCATION	Phosphates ppb
Par (Bissa)	Criggan Moors, SX 01882 61133	0
Par	South of Minorca Lane, SX 02657 59788	0
Tributary	Carbis Stream SX 02834 59401	300
Par	Luxulyan sewage treatment works SX 0455 58114	300
Tributary	Treverbyn Stream, SX 04532 58033	0
Tributary	Tregarrick Stream, Rosemullion, SX 04623 57990	0
Par	Luxulyan allotments SX 04732 58045	1000
Par	Luxulyan SWW pumping station SX 05033 57849	1000
Par	Cam Bridges SX 05292 57454	1000
Tributary	Gatty's Bridge, Bokiddick Stream SX 05531 57953	0
Par	Treffry Viaduct SX 05650 57179	500
Par	Lady Rashleigh Mine SX 06451 56509	500
Par	Ponts Mill SX 07354 55875	500
Tributary	Tywardreath Marsh Stream (Treesmill) SX 08902 55414	0
Par	Middleway (Par Canal) SX 07238 54295	500

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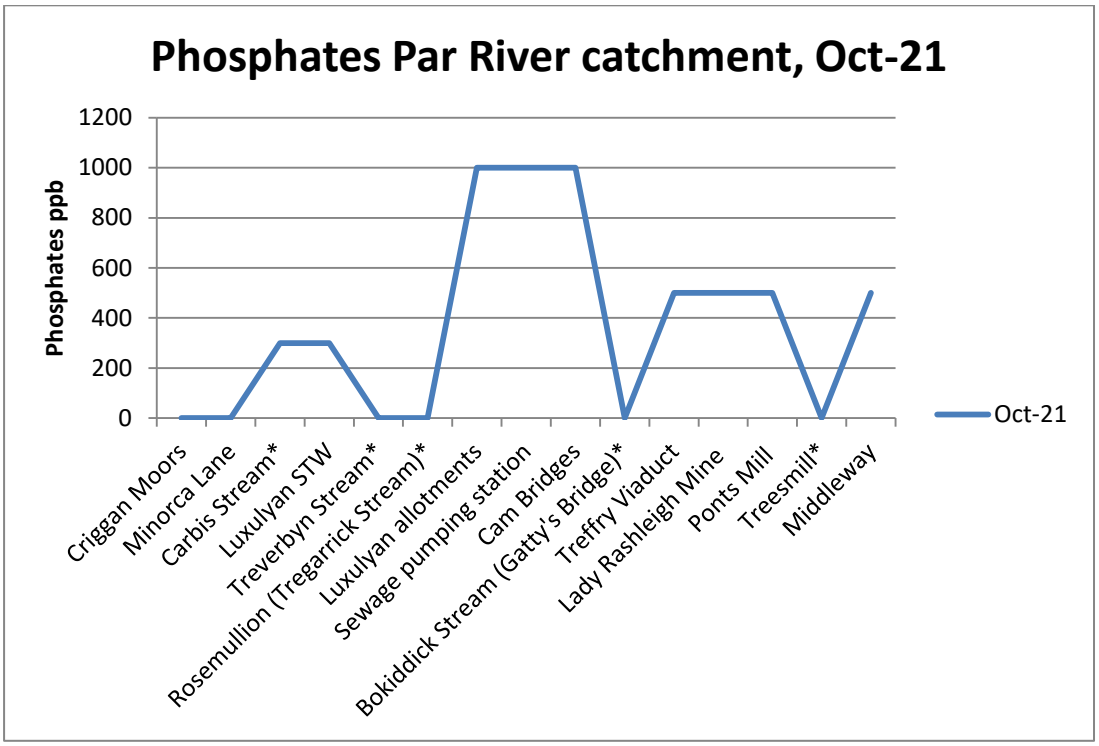
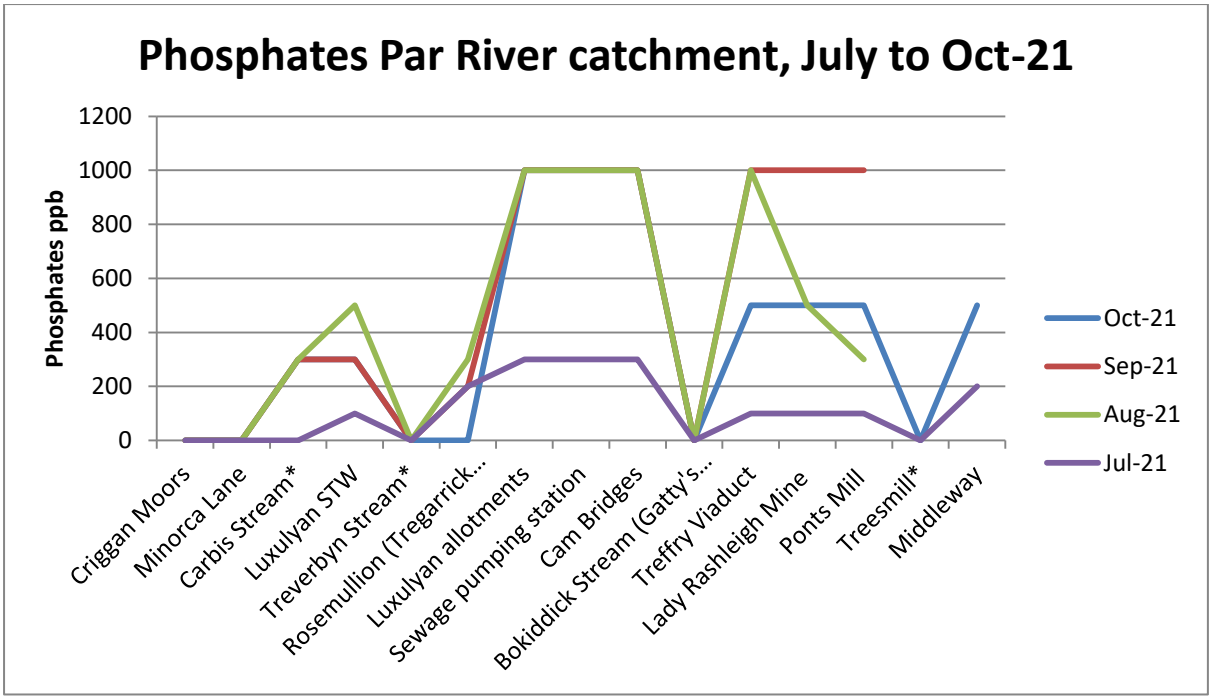


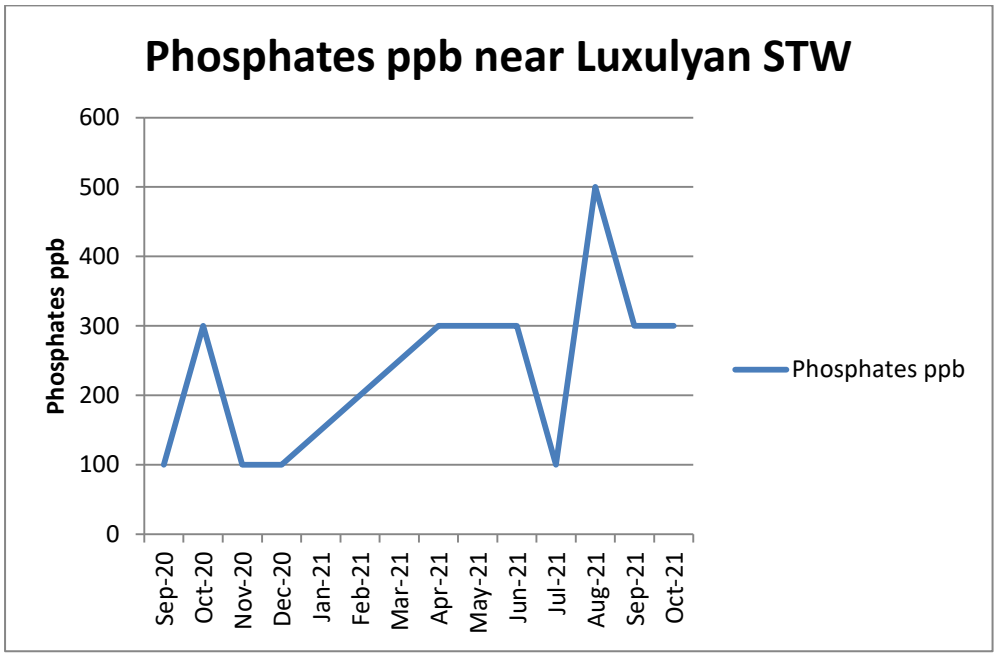
*indicates a tributary of the Par River.



The pattern is consistent. Ignoring the dips, which represent phosphate-free tributaries (with the exception of the Carbis Stream), levels rise from acceptable levels in most of the Upper Par to the *Too High* category (WRT guidance) shortly after the STW, remaining at *Too High* or *High* levels thereafter. The report to the Environment Agency hotline on 9th October 2021 and observations in relation to phosphates in the vicinity of the Luxulyan STW are covered more fully in **Section I Discussion**.

4. **Historical data on phosphates at selected sites (no monitoring January to March 2021):**

(a) Luxulyan sewage treatment works SX 0455 58114

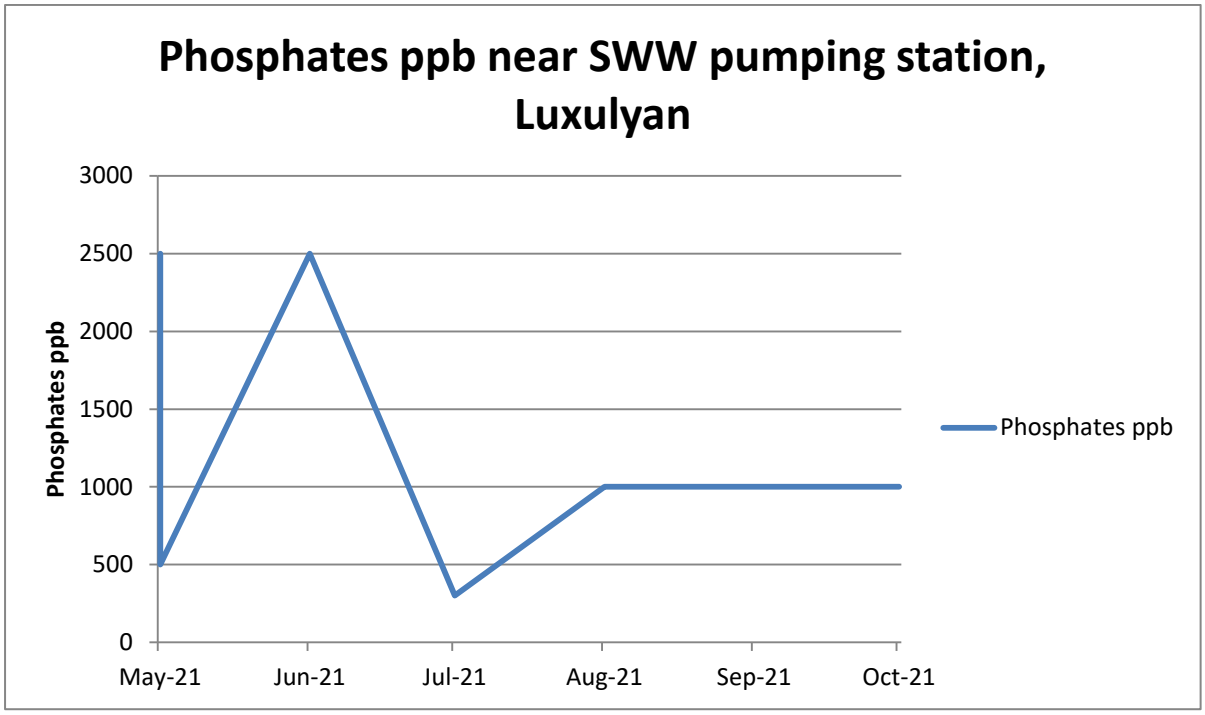


Four further phosphate readings were taken in this vicinity:

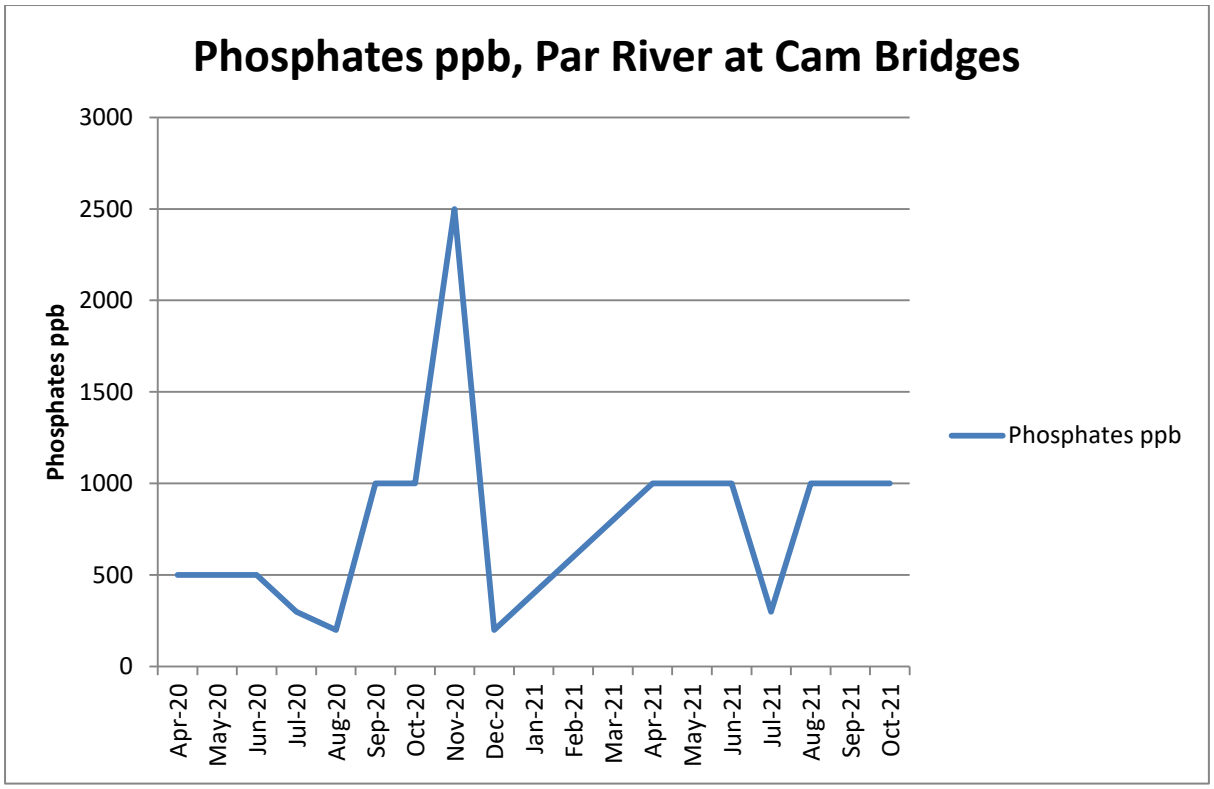
LOCATION	PHOSPHATES PPB
Upstream from SWW Final Effluent discharge point (Outlet 1 at SX 0440 5815)	100
Under the downstream end of the bridge over the river immediately upstream from the normal monitoring point	500
By the large outfall opposite (diagonally upstream) from the normal monitoring point	2500
About 10 metres downstream from the normal monitoring point	2500

See **Section I Discussion** below.

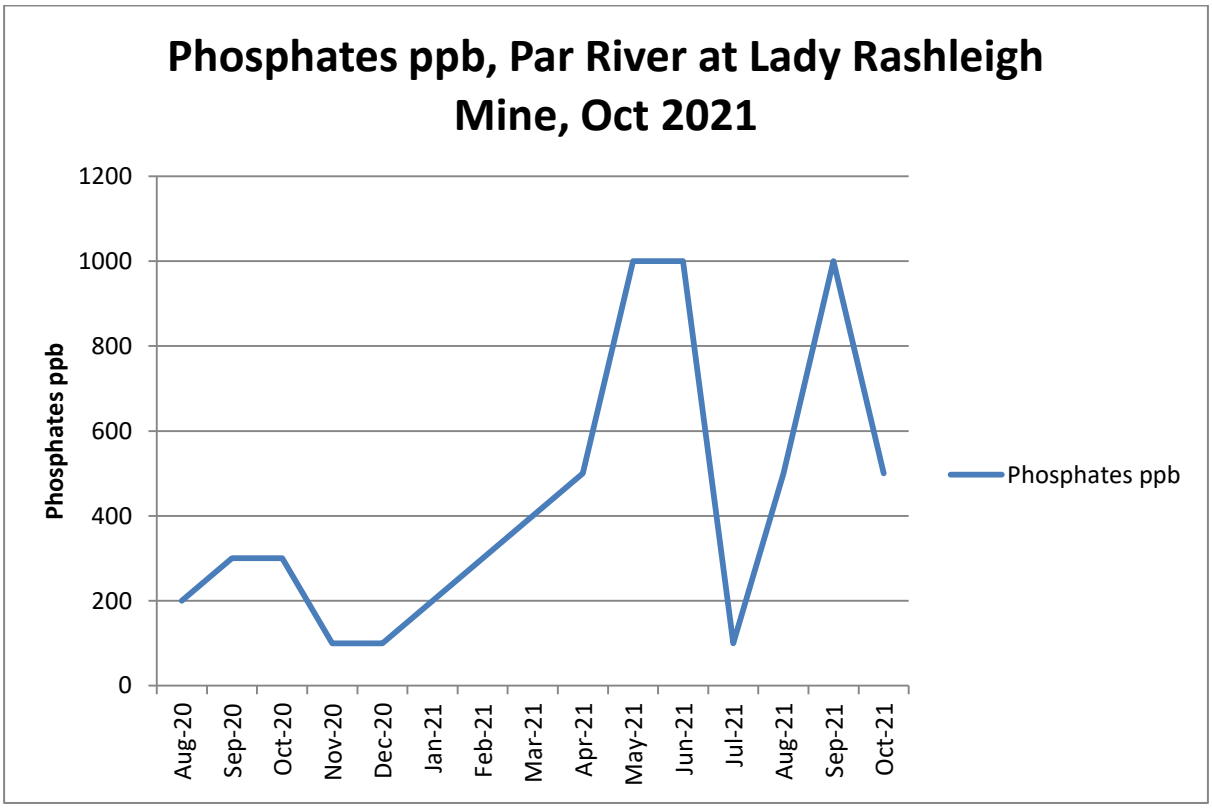
(b) Luxulyan SWW pumping station SX 05033 57849



(c) Cam Bridges SX 05292 57454

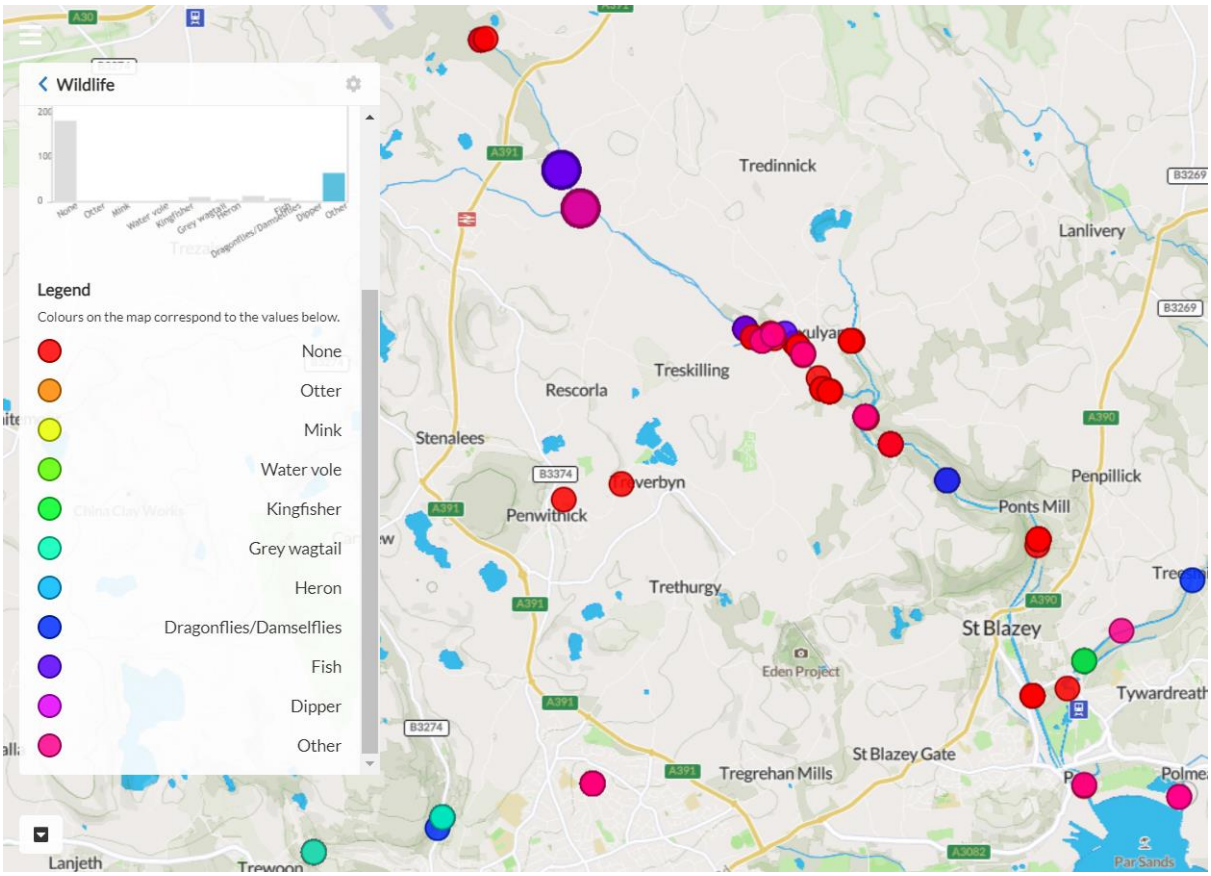


(d) Lady Rashleigh Mine SX 06451 56509



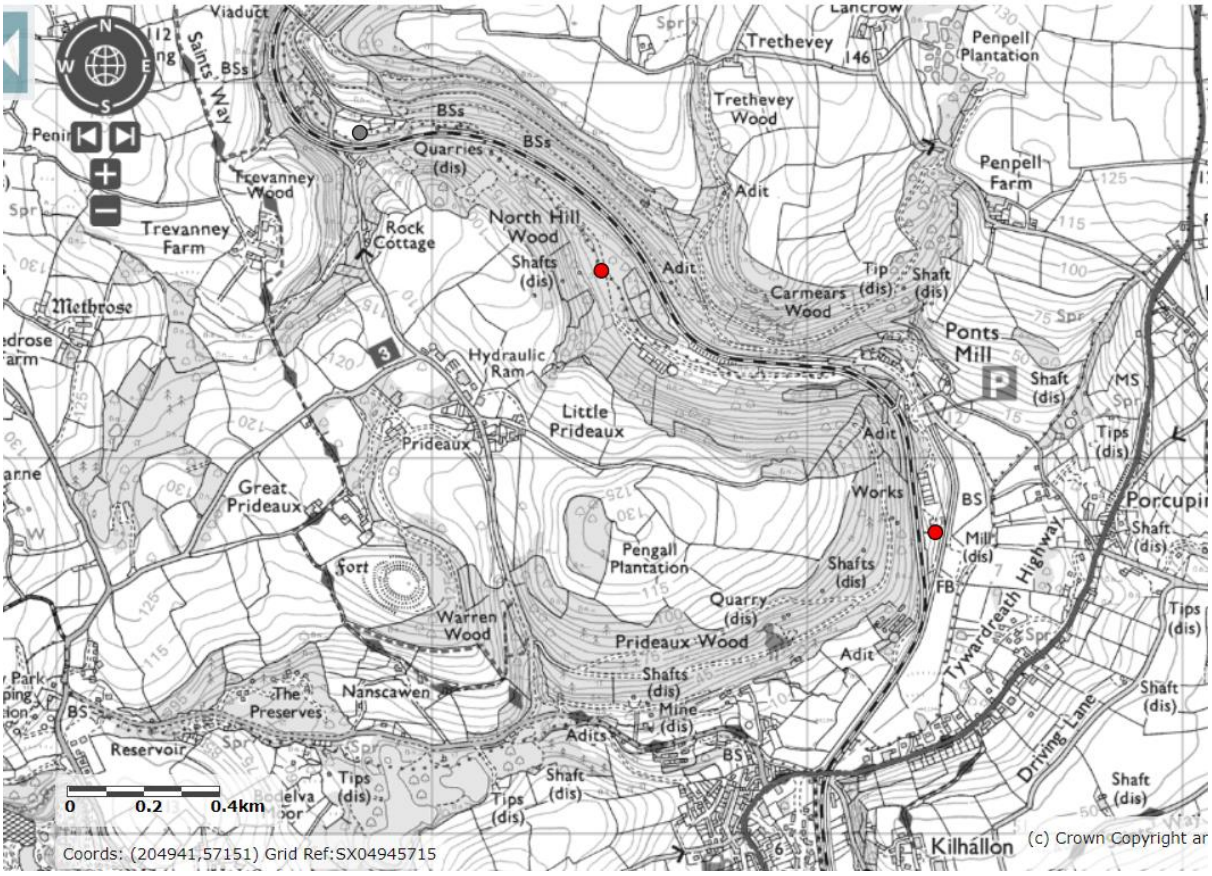
H. OTHER OBSERVATIONS

1. Wildlife



Source: Cartographer.

2. Otter survey:



FoLV otter survey, October 2021

Source: https://magic.defra.gov.uk/MagicMap.aspx

Red dots – definite evidence of otters. Recorded on ORKS database.
Grey dots – possible evidence. Not recorded on ORKS database

DATE	LOCATION	LIVE SIGHTING	SPRAINT (FRESH)	SPRAINT (RECENT)	SPRAINT (OLD)	TRACK/ PRINT	OTHER*
10/10/2021	SX 06456 56498 LRM – boulder in river		✓		✓		
10/10/2021	SX 07342 55795 SGPM			✓			
10/10/21	SX 05802 56860 RMQ						PP

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Possible footprint SX 05802 56860 near Rock Mill Quarry

Fresh spraint on boulder near Lady Rashleigh Mine, SX 06456 56498

A more detailed report on the monthly surveys and a table of cumulative results is available if required.

3. Other observations

A heron was seen near Rock Mill Quarry, pleasing in itself but also a signifier of the presence of fish and, therefore, river quality. Himalayan Balsam was still widespread along the entire catchment,

with the exception of Luxulyan Valley, where clearing parties led by Cormac Ranger Jenny Heskett have been very effective.

I. DISCUSSION

1. This section will look only at the matter of very high phosphate levels in the Par River in the vicinity of the St Austell North (Luxulyan) Sewage Treatment Works. This is not to say that South West Water is the cause of this problem, although the Environment Agency is exploring this possibility with them.

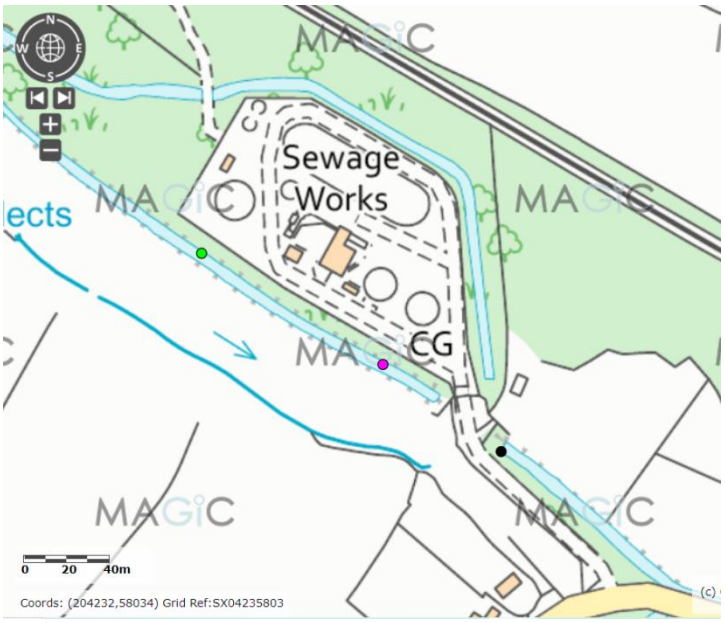
   This treatment works: 'provides secondary treatment and ultraviolet (UV) disinfection,' and 'was completed in early 2006. Improvements to the storm discharge from St Austell North STW were also made at that time. Storm overflow event duration monitoring (EDM) was installed at … St Austell North STW by April 2011' (https://environment.data.gov.uk/bwq/profiles/profile.html?_search=Par&site=ukk3106-27300).

2. Our group has noticed that phosphate levels only become seriously elevated downstream from the STW, yet at the usual monitoring point readings have never been of great concern (see graph in 4 (a) page 21 above); however, levels between there and the allotments have been markedly higher. Last month we became aware of two outfalls from the STW:

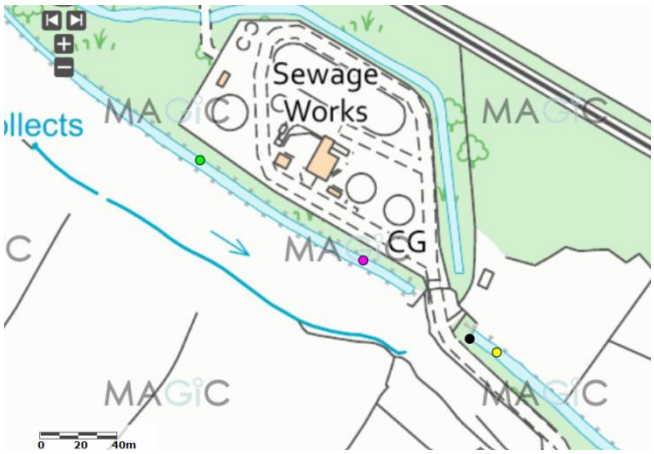
Green dot Storm Effluent discharge point (Outlet 2 at SX 0432 5820). This should not be operational in dry weather.

Purple dot normal Final Effluent discharge point (Outlet 1 at SX 0440 5815)

Black dot WRT CSI usual monitoring point (SX 0455 58114)

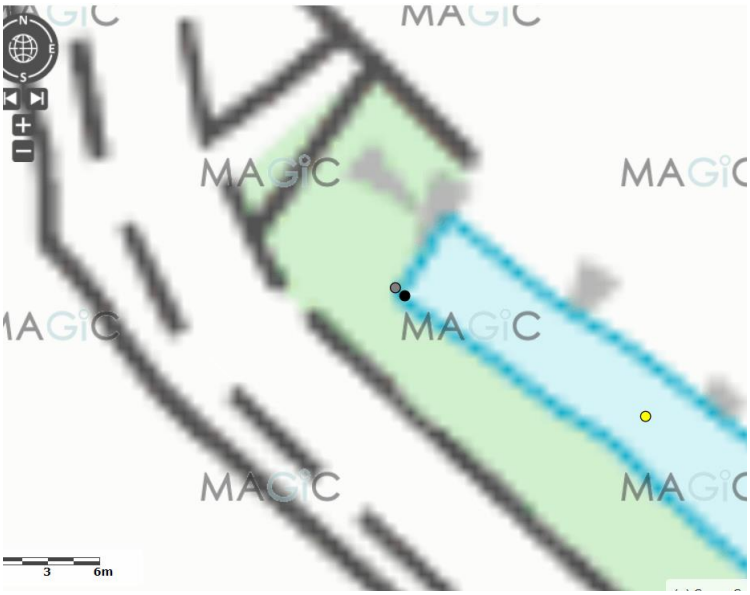


3. We have attempted to find other watercourses and factors that might have had an impact on phosphates (see previous reports), including the impact of farm slurry and other sewerage arrangements. None of them could be shown to have any effect on the river. This left the STW as the only possibility that we could think of. Special mention must be given to Joan Farmer for initiating a far more intensive investigation of the vicinity of the STW.
4. On Saturday 9th October 2021, a sample of water was taken upstream of the Final Effluent discharge point at SX 0440 5815 (purple dot in map above). (Overhanging vegetation made it impossible to go upstream of the Storm Effluent discharge point at SX 0432 5820, which during the dry spell ought not to have been active anyway.) A low phosphate reading here would show there was no problem upstream from the STW. This was the case: it was 100 ppb.
5. After recording 300 ppb at the usual monitoring spot at SX 0455 58114 (black dot in above map) it was decided to take a reading from water taken mid-river about 10 metres downstream. This is shown approximately by the yellow dot in the next map:

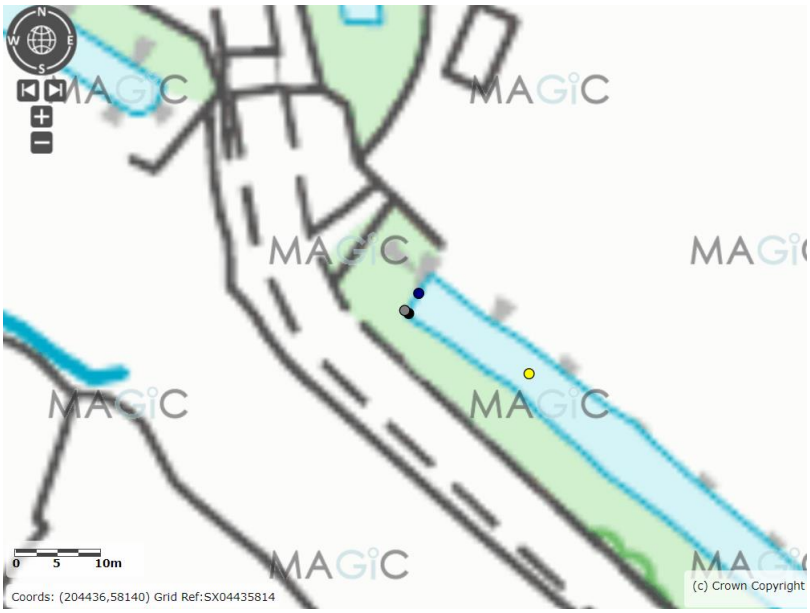


This time the maximum possible reading using our kit was made: 2500 ppb. The next photo is looking from the usual monitoring spot in the direction of the place where the mid-river sample was taken. No tributaries enter in this stretch. On one side is a field and on the other a belt of bushes and trees. In other words, there was no obvious source of contamination.

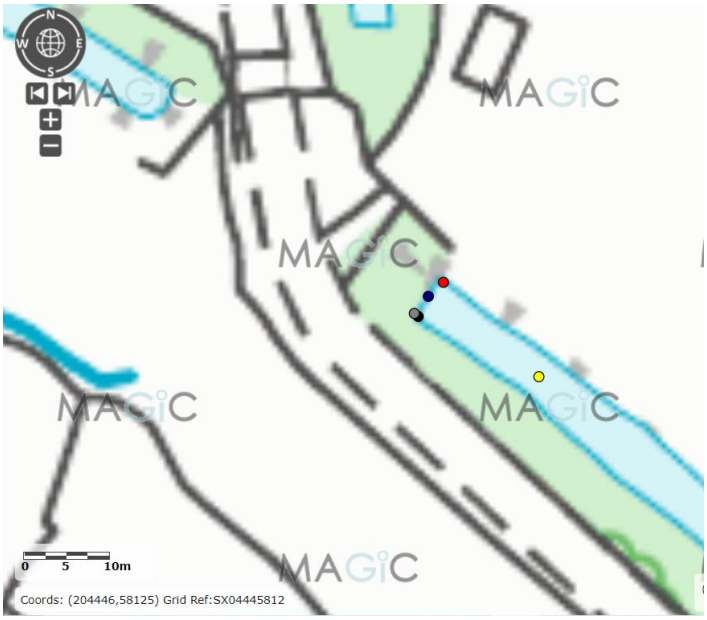
6. At first we couldn't understand how the readings went from 300 ppb to 2500 ppb in such a short stretch but then realised that readings at our usual spot might have been diluted by water from 2 small outfalls draining local fields entering the river a metre from our position. This is shown in the photo and by the grey dot in the map below.



To test this idea we sampled river upstream of the twin outfall, and usual monitoring position, under the downstream side of the bridge (see blue dot in next map). This gave a reading of 500 ppb.



7. Something downstream of the bridge had to be the cause of the 2500 ppb reading. The only visible candidate was the large outfall (red dot in map below) which has been a mystery to us ever since we began monitoring in this location.



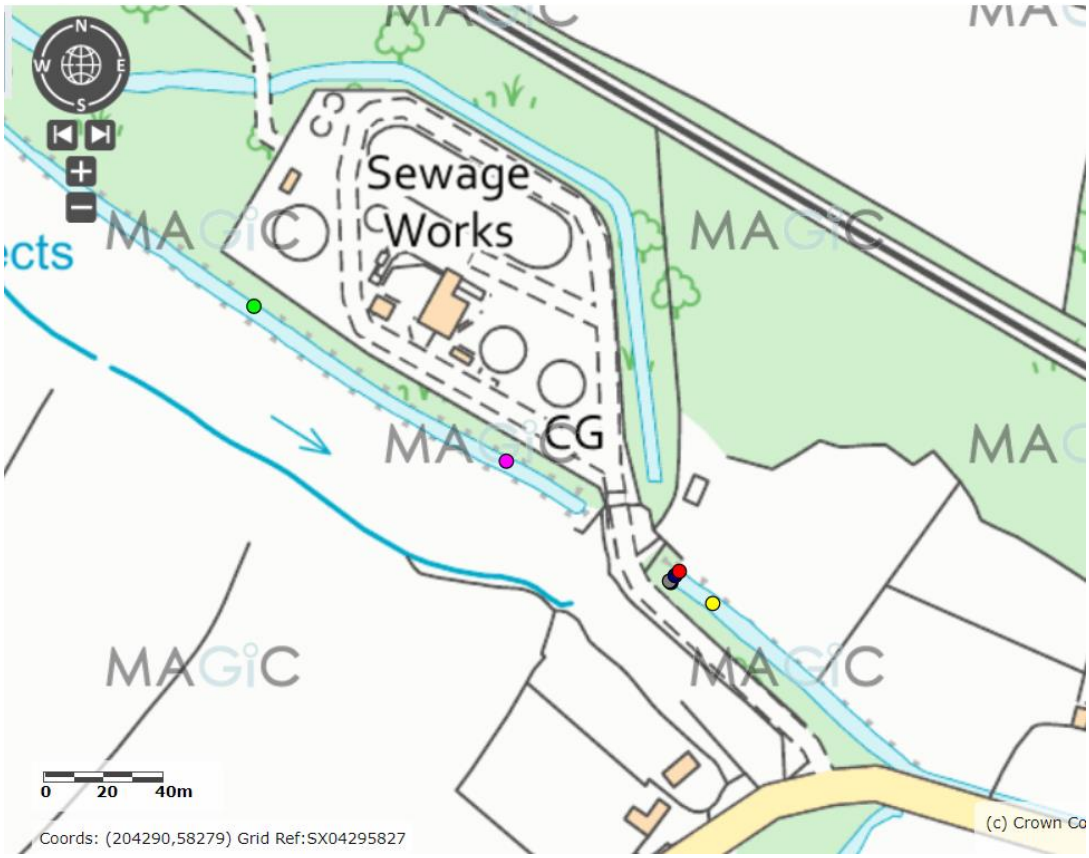
This outfall has a metal hinged flap that is permanently open. We have never observed large volumes of water emerging from it, although sometimes, as was the case on this occasion, small amounts of foam and a reddish tinged liquid emerges. We don't know its purpose but its position suggests it is the outfall from a water channel that flows around the northern perimeter of the STW (see map in section 5 above).

The mystery outfall pipe. Note flap that is always up, the foam and reddish liquid emerging.

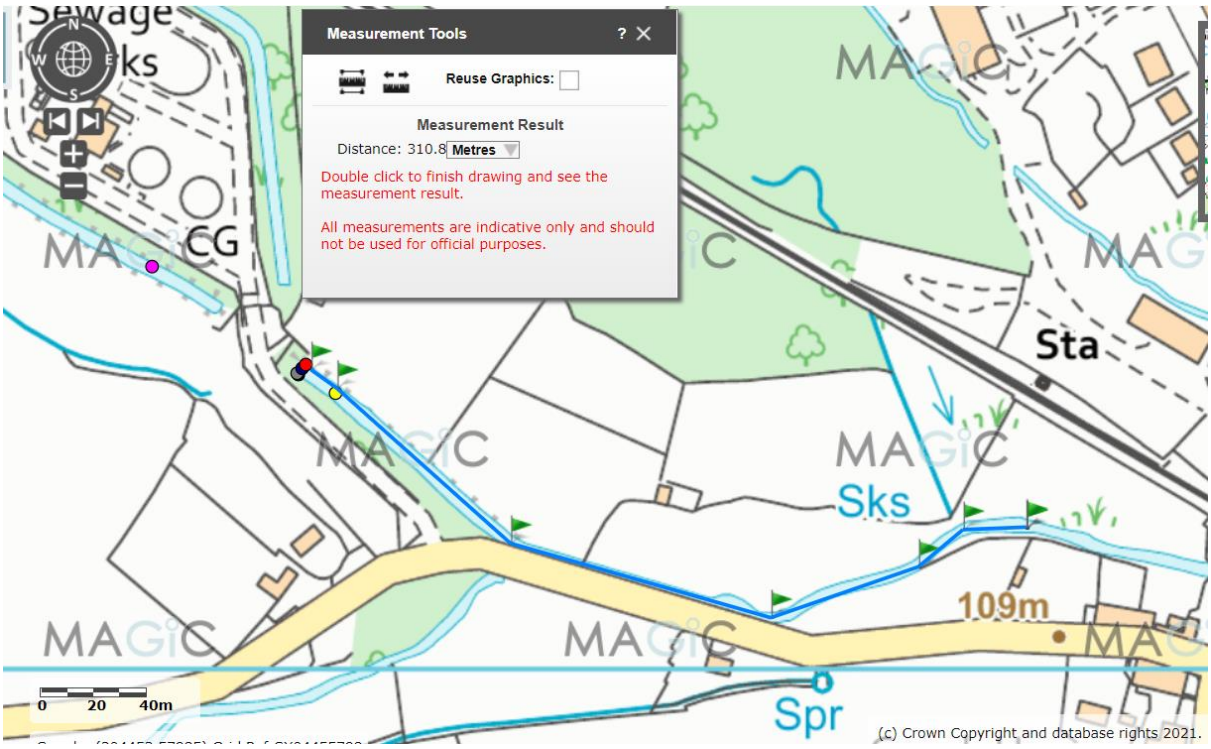
Liquid flowing from the mystery outfall

7. Summary of phosphate readings near St Austell North (Luxulyan) STW, 9th October 2021:

SAMPLING LOCATION AND OTHER POINTS & TIMING OF SAMPLE	PHOSPHATE ppb	WRT PHOSPHATE GUIDELINES	Dot on map below
Approx. SX 0437 5817 (between SWW STW Storm effluent discharge and point and Final effluent discharge point 2.45 pm	100	**OK**	Between green and purple dots
SX 0446 5811 Mid-river as it emerges from under the bridge 3.10 pm	500	**TOO HIGH**	Blue dot
SX 0455 58114 Southern bank downstream of 2 small outfalls and opposite large metal outfall pipe. Regular monitoring spot. 2.22 pm	300	**HIGH**	Black dot
SX 0447 5811 Northern bank immediately below large diameter outlet pipe with open flap Approx. 3 pm	2500	**TOO HIGH**	Red dot
Approximately SX 0449 5809 Mid river about 10 meters downstream from bridge Approx. 3 pm	2500	**TOO HIGH**	Yellow dot
SX 04732 58045 Luxulyan allotments. Regular monitoring spot. 3.50 pm	1000	**TOO HIGH**	310 metres downstream of monitoring spot – see second map



This map shows the distance between the bridge near the STW and Luxulyan allotments. Readings from the allotments downstream made on 9th and 10th October was a minimum of 500 ppb (Too High – WRT guidelines).



8. It seemed as if the high phosphate level was the result of something emerging from the large, unexplained outfall at SX 0447 5811. Given the very high levels the Environment Agency hotline was contacted later on Saturday 9th October. Information was also sent by email. Shortly after a very helpful conversation with the official manning the hotline someone from the Cornwall section rang me. On Monday 11th October the following message was received from the EA:

   SWW have investigated the report and did not find any issues on site and do not currently have a phosphate limit as part of the Environmental Permit for the sewage treatment works in question. However, within the Environment Agency, we are still exploring what drains into the channel described in your report as the 'large diameter outlet pipe' and how this flows through the sewage treatment works. I can confirm that [a colleague] has followed this up further with South West Water.

   In addition, a colleague went out earlier in the week to undertake some sampling and I thought that you would be interested in the results – please see below.

URN	Name	Date	Time	0111 Ammonia(N) (mg/l)	0180 Orthophospht (mg/l)
81618801	PAR RIVER U/S LUXULYAN STW FE	12-Oct-21	1300	0.08	0.04
81618801	PAR RIVER U/S CHANNEL OUTFALL D/S STW FE	12-Oct-21	1310	0.81	1.6
81618801	CHANNEL OUTFALL FROM PIPE NORTH BANK D/S ST AUSTELL LUXULYAN STW	12-Oct-21	1252	0.36	0.083
81610186	PAR RIVER DOWNSTREAM OF ST.AUSTELL (NORTH) STW	12-Oct-21	1245	0.68	1.3

Within these sample results, the higher phosphate reading seems to be linked to the final effluent from the sewage treatment works as it is highest in the sample taken downstream of the effluent entering the river.

It may be that the flow from the outfall in question is higher at certain times as it was quite low flowing when the sample was taken. It may be interesting to compare these results with the results that the group have been collecting.

Therefore, it looks more likely that phosphate levels are linked to the final effluent discharge point rather than the mystery outfall, although investigation continues.

9. Further investigation by the EA and SWW should yield more information. It is concerning that no phosphate limit is stipulated in the Environmental Permit. The figure for Ammonia has clearly been included because of its significance but as a CSI group we don't have the knowledge required to make any comment.

10. On a general point, it is noticeable that in the media concern is increasingly being voiced about the poor quality of Britain's rivers. This is not the fault of the Environment Agency; rather it is the direct result of swingeing cuts in funding for the agency since 2010. Our group's experience is that the EA provides a swift, encouraging and helpful response whenever the alarm is raised and information supplied and we are grateful to them. The growing partnership between the WRT and EA gives hope for the future of Britain's rivers but sooner or later the politicians must act.

Roger Smith, 18th October 2021