

# Carr Bridge Brook Monitoring Programme - December 2016 to August 2019

This report summarises the surface water quality data collected by the Environment Agency since December 2016. The raw data is provided in a separate file on our Citizen Space page.

## Baseline Sampling, 2015

The Environment Agency document 'Water Quality at Cuadrilla's Preston New Road Site' presented baseline water quality data for Carr Bridge Brook for 2015. This brook was chosen for monitoring purposes because it runs close to Cuadrilla's Preston New Road drilling site. Two sample points were selected - an upstream site on Plumpton Lane (just north of Plumpton Hall Farm) and a downstream site on Moss House Lane (see attached map). The list of measured parameters is based upon the monitoring requirements of permit EPR/AB3101MW, Schedule 3, table S3.2.

## Active Phase Sampling 2016 to present

In December 2016 a further programme of water quality analysis was commenced. This fortnightly sampling programme uses the same chemical parameters and sample points as the baseline survey of 2015 and has enabled us to see if Cuadrilla's site has had any effect on the brook.

In our opinion, the drilling, fracturing and well testing activities so far have had no measurable impact on Carr Bridge Brook.

## Data Interpretation

Data is summarised in the four graphs below. Chloride, methane and acrylamide would be an indication of pollution from the hydraulic fracturing process. Suspended solids is an indication of runoff from the site surface.

**Suspended Solids:** Indicates if there is an escape of standing surface water from the site.

**Chloride:** The local aquifer is very strongly saline and therefore any flowback water would also be strongly saline.

**Methane:** This is generated by the hydraulic fracturing process.

**Acrylamide:** Poly-acrylamide is used in the hydraulic fracturing process.

The graphs and data also show that drilling activity has not had any measurable impact on the brook.

The collated data show that water quality in Carr Bridge Brook is strongly influenced by local weather conditions and the impact of runoff from the surrounding agricultural catchment. We have taken a detailed look at the variation in suspended solids and metals data which, especially upstream, closely matches periods of wet and snowy weather. Also of note is that the most pronounced peaks in suspended solids all occur upstream of the well-pad.

### Notes

August 2019, some upstream results unavailable due to access issues.

13 June 2018, some downstream sample results unavailable due to a lost sample bottle.

10 and 28 September, 8 October 2018 both upstream and downstream C banding data in the C5-44 range are unavailable as EA lab changes analysis methodology.

Recent elevated levels of aluminium detected upstream of the site are highly unlikely to be due to operations on site.

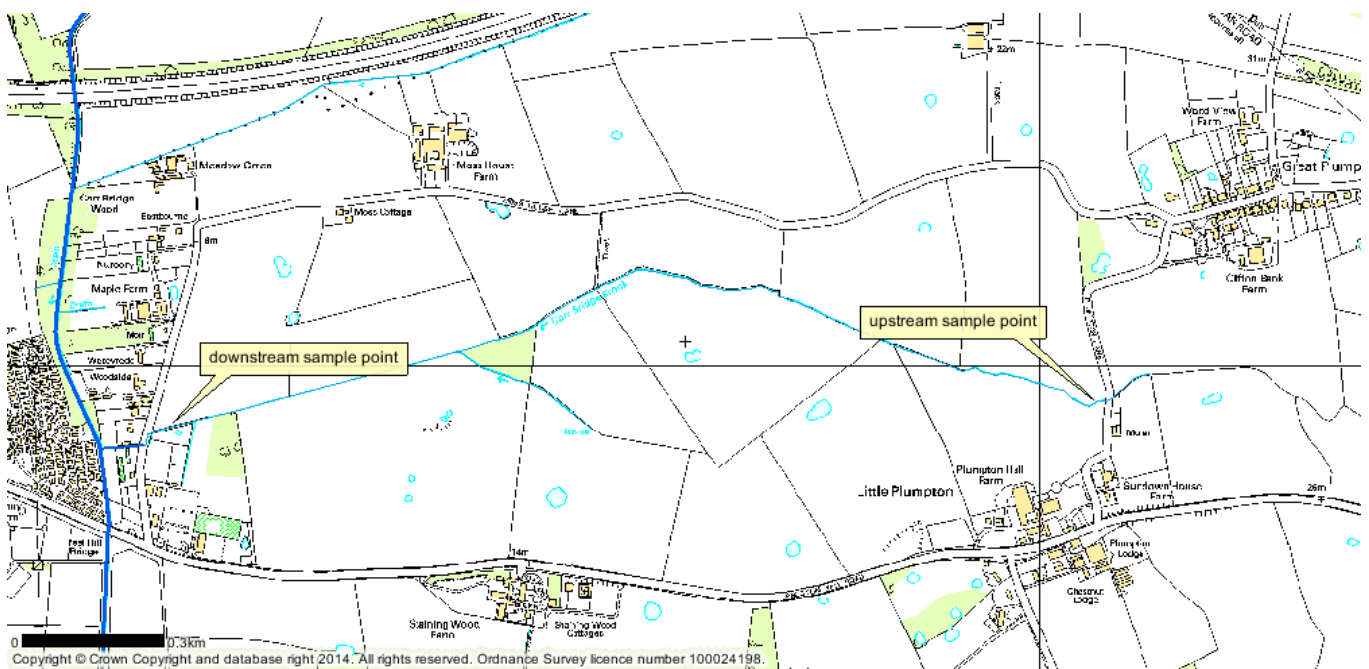
## Future Monitoring

We will continue monitoring Carr Bridge Brook over the coming months, continuing to collect samples every two weeks as before. The programme is flexible to take account of the need to adjust the sampling frequency or occasionally collect ad hoc samples as necessary.

In the longer term, we will consider future sampling frequency that is proportionate to the operations on site. If we do intend to make any changes to our sampling frequency in the future, we will let people know via our Community Update.

We will regularly update our Citizen Space page with the sampling data.

## Carr Bridge Brook Sampling Points

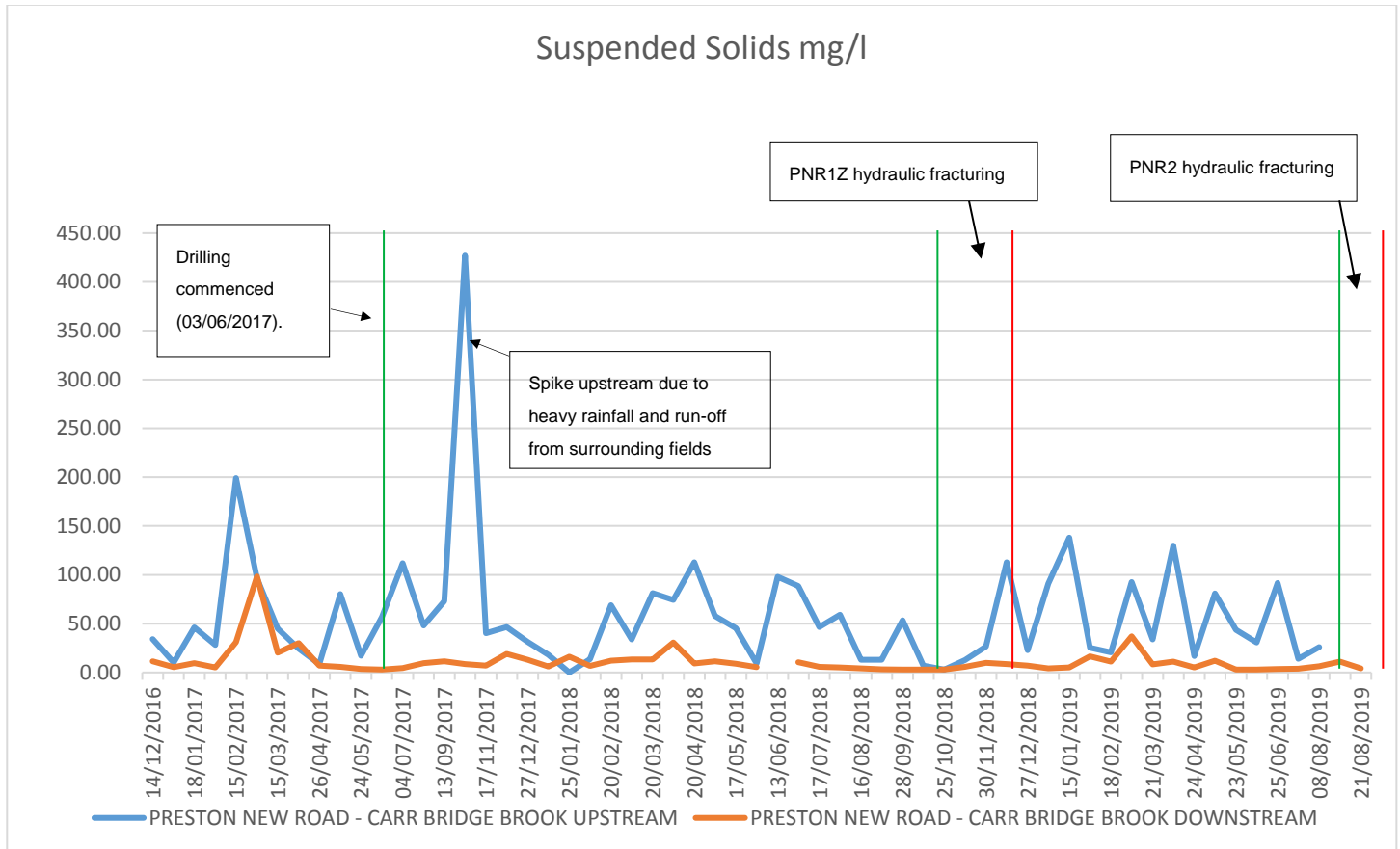


customer service line  
03708 506 506

incident hotline  
0800 80 70 60

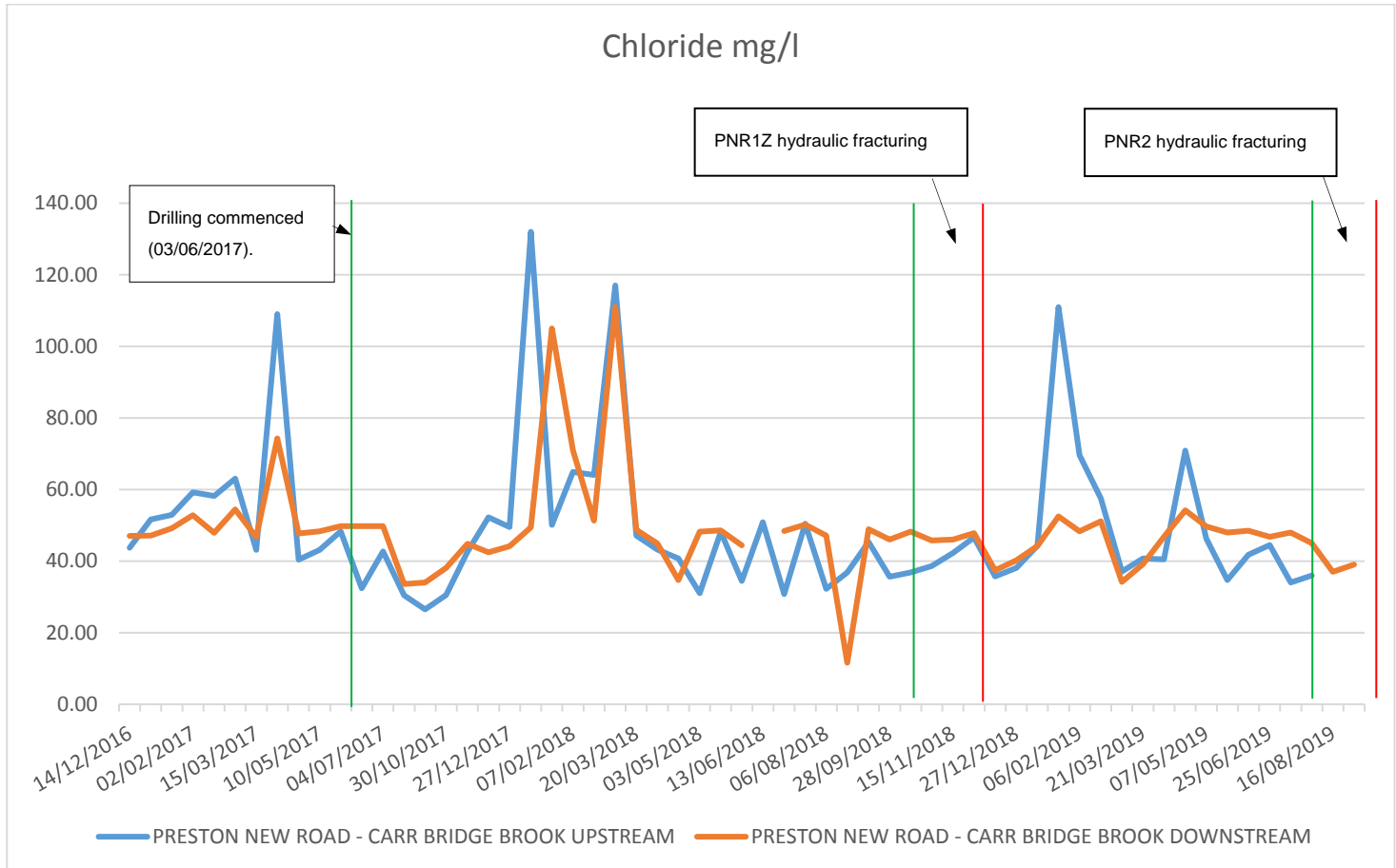
floodline  
03459 88 11 88

## Suspended Solids



PNR1Z Hydraulic Fracturing commenced 15.10.2018 and stopped on 17.12.2018  
 PNR2 Hydraulic Fracturing commenced 13.08.2019 and stopped on 26.08.2019

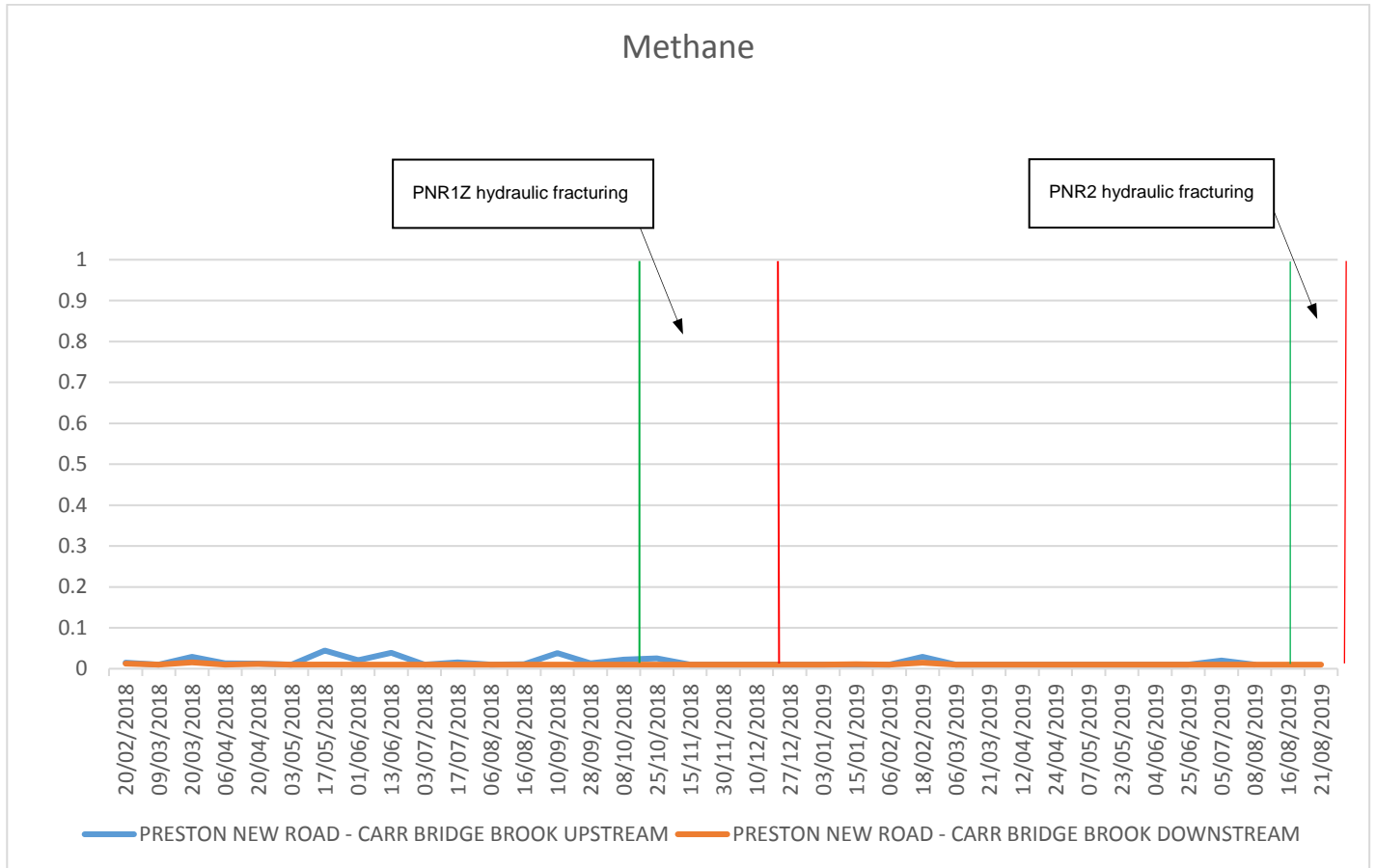
## Chloride



PNR1Z Hydraulic Fracturing commenced 15.10.2018 and stopped on 17.12.2018

PNR2 Hydraulic Fracturing commenced 13.08.2019 and stopped on 26.08.2019

## Methane

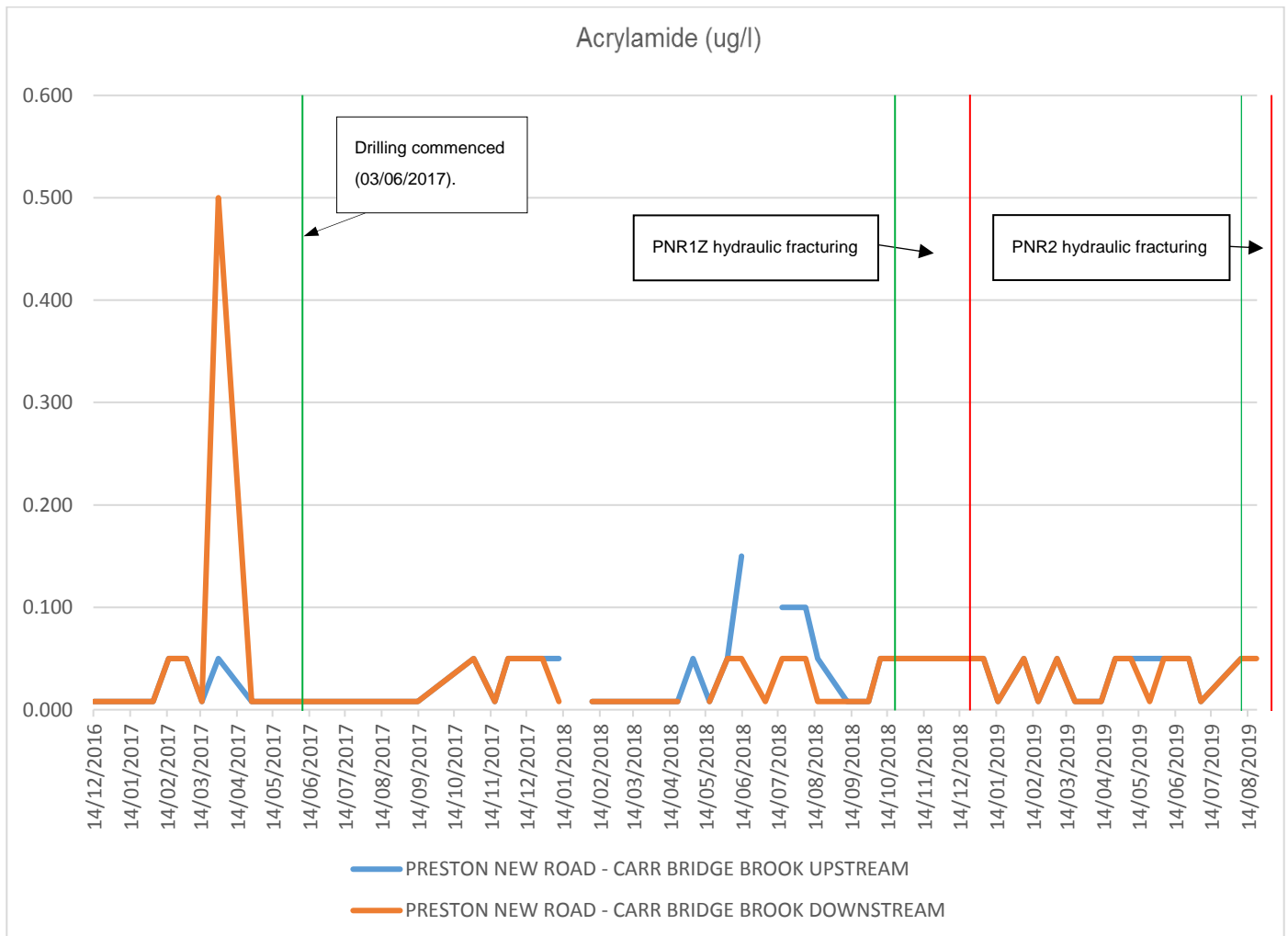


PNR1Z Hydraulic Fracturing commenced 15.10.2018 and stopped on 17.12.2018

PNR2 Hydraulic Fracturing commenced 13.08.2019 and stopped on 26.08.2019

All results prior to 20 February 2018 were less than 0.5 mg/l which was the limit of detection at the time.

## Acrylamide



PNR1Z Hydraulic Fracturing commenced 15.10.2018 and stopped on 17.12.2018

PNR2 Hydraulic Fracturing commenced 13.08.2019 and stopped on 26.08.2019

Limit of detection was 0.5 ug/l or below depending on quality of the sample received. Spike shown on 29 March 2017 was a poor quality sample and therefore the limit of detection was compromised.

No Acrylamide was being used on site at the time. As a reference, the drinking water standard is 0.1 ug/l.