

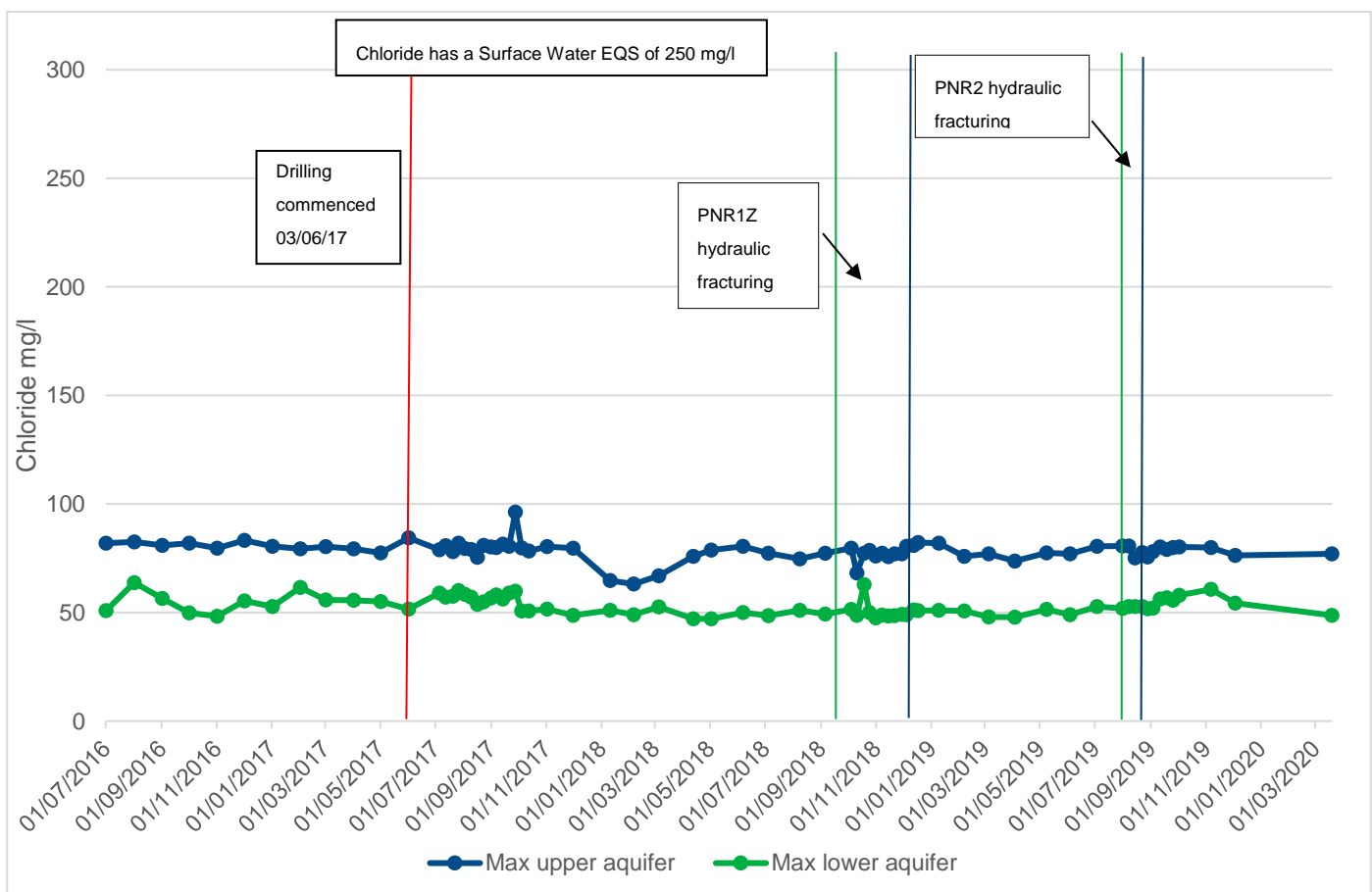
# Preston New Road Groundwater Monitoring Data Q1 2020

The following report includes Cuadrilla's quarterly groundwater monitoring data for Quarter 1 2020 (January - March 2020). All data is presented in the tables below. The data can be viewed by zooming in.

As noted in the last quarterly report, in January 2020 we agreed a revised monitoring plan to reflect that operations on site have reduced. The monitoring is now undertaken every 3 months and some substances are not required to be analysed for. Details of our approval of these changes can be found in CAR Form UP3431VF/0348127 on citizen space.

## Chloride

Groundwater Monitoring Preston New Road Chloride in 2 Aquifers (Maximum Values) Quarter 1 2020



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

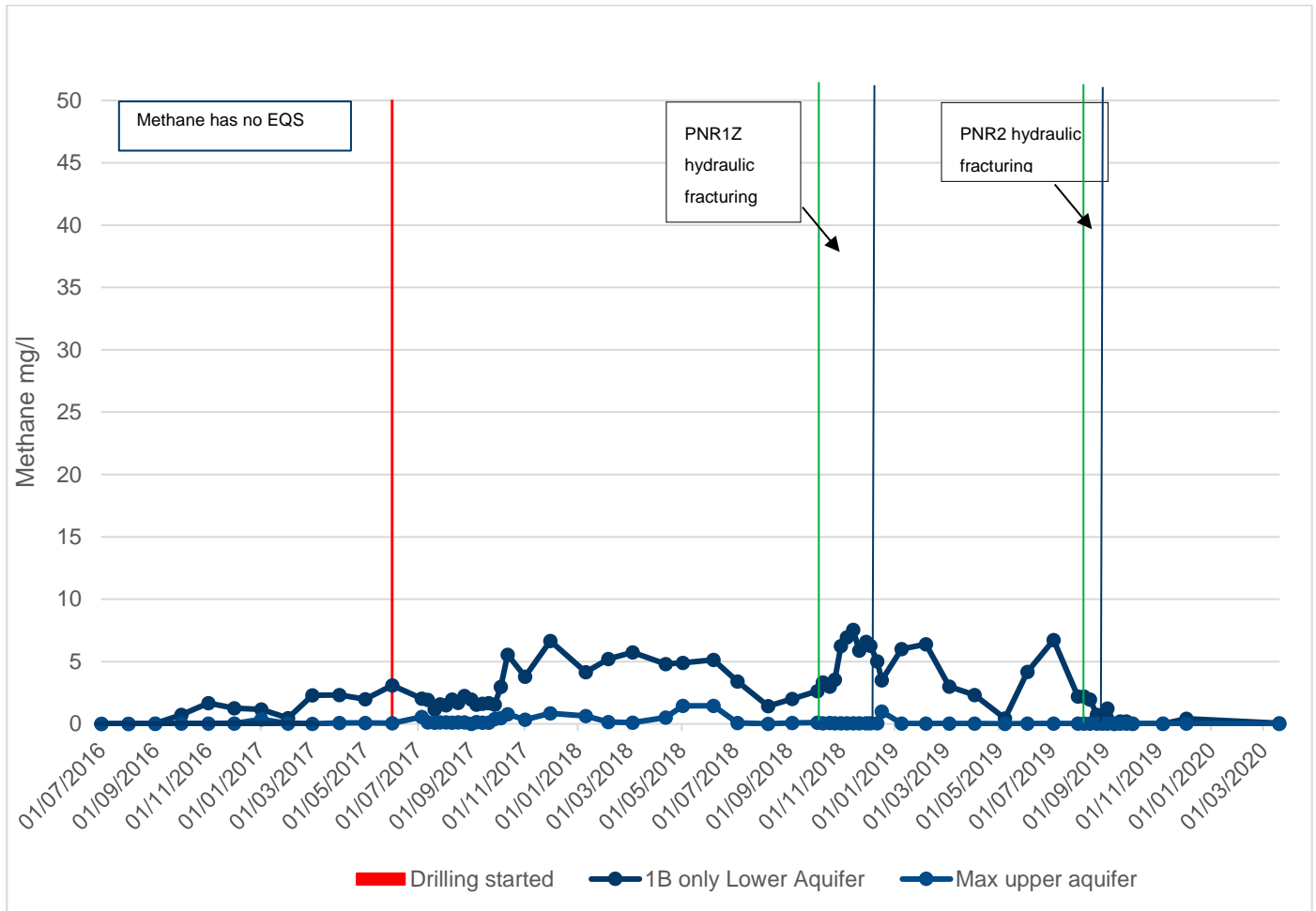
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## Methane

Groundwater Monitoring Preston New Road Methane in 2 aquifers (Maximum Values) Quarter 1 2020



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

## Cuadrilla Preston New Road Groundwater Quality Monitoring Q1 2020 - Upper Aquifer

Substance/ Parameter	Q1 2020				Q1 2020		Pre Frack	
	BH 1 A	BH 2 A	BH 3 A	BH 4 A	Summary		Aquifer A upper	
	19-Mar-20	18-Mar-20	18-Mar-20	18-Mar-20	Min	Max	Min	Max
Dissolved Aluminium #							20	45
Dissolved Mercury #							1	1
Dissolved Antimony #							2	3
Dissolved Arsenic #							2.5	12.7
Dissolved Barium #	178	107	51.2	140	51.2	178	37	421
Dissolved Beryllium							0.5	0.5
Dissolved Boron							12	60
Dissolved Cadmium #	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	0.5	0.5
Total Dissolved Chromium #							1.5	6.8
Dissolved Cobalt #							2	2
Dissolved Copper #							7	8
Dissolved Lead #							5	5
Dissolved Lithium							5	48
Dissolved Nickel #							2	11
Dissolved Selenium #							3	10
Dissolved Strontium	227	275	535	224	224	535	202	649
Dissolved Vanadium #							1.5	2.3
Dissolved Zinc #	3.88	7.6	106	3.03	3.03	106	0	33
Dissolved Silver							5	5
Dissolved Sodium #	29.2	25.5	29.7	38.6	25.5	38.6	24.1	42.3
Dissolved Magnesium #							32.1	39.7
Dissolved Potassium #	2.4	3.22	3.28	1.61	1.61	3.28	1.4	3.3
Dissolved Calcium #	115	118	114	119	114	119	101.9	138
Total Dissolved Iron #							20	2012
EPH (C8-C40) #							10	620
GRO (C4-C8) #							10	87
GRO (C8-C12) #							10	18
GRO (C4-C12) #							10	101
MTBE #							0.1	5
Benzene #							0.5	5
Toluene #							5	5
Ethylbenzene #							1	5
m/p-Xylene #							2	5
o-Xylene #							1	5
Fluoride							0.03	0.4
Bromide							0.05	0.18
Chloride #	59.5	52	53.9	77.1	52	77.1	24.6	96.3
Nitrate as NO <sub>3</sub> #							0.2	46.5
Nitrite as NO <sub>2</sub> #							0.02	0.7
Ammoniacal Nitrogen as NH <sub>4</sub> #							0.03	0.66
Dissolved Ethene #							1	1
Dissolved Ethane #							1	1
Dissolved Butane							1	2
Dissolved Propane							1	2
Dissolved Methane	<0.001	<0.001	0.0112	<0.001	0	0.0112	0.01	1.45
Dissolved Carbon Dioxide							17.4	63.2
δ13C - CH <sub>4</sub>							-74.6	28
δ13C - CO <sub>2</sub>							-63.9	29.16
Total Alkalinity as CaCO <sub>3</sub> #							250	600
Acrylamide							50	50
Laurylamine							50	50
Hydroxyethyl ethylene diamine							50	50
Myristyl dimethylamine							50	50
Octyldimethylamine							50	50
para phenylene diamine							50	50
BOD (Settled) #							1	32
COD (Settled) #							5	22
pH #							6.81	7.95
Salinity							0.1	11.2
Total Dissolved Solids #							384	2242
Total Suspended Solids #							10	7669

## Interpretation of Data

The information as presented shows no significant increases over the background. Borehole 3A 18 March 2020 is seen to have a Zinc reading of 106 mg/l which is anomalous. This is being pursued with the Operator.

\*"Q1 2020 Summary" columns are the minimum and maximum readings for each determinand for comparison against the pre-hydraulic fracturing background minimum and maximum results.

## Cuadrilla Preston New Road Groundwater Quality Monitoring Q1 2020 - Lower Aquifer

Substance/ Parameter	Q1 2020				Q1 2020		Pre Frack	
	BH 1 B	BH 2 B	BH 3 B	BH 4 B	Summary		Background	
	19-Mar-20	18-Mar-20	18-Mar-20	18-Mar-20	Min	Max	Min	Max
Dissolved Barium #	124	74.1	58.4	61.2	58.4	124	49	397
Dissolved Cadmium #	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	0.5	0.6
Total Dissolved Chromium #							1.5	6.6
Dissolved Cobalt #							2	2
Dissolved Copper #							7	22
Dissolved Lead #							5	6
Dissolved Lithium							5	55
Dissolved Nickel #							2	20
Dissolved Selenium #							3	4
Dissolved Strontium	218	591	481	521	218	591	207	683
Dissolved Vanadium #							1.5	2.7
Dissolved Zinc #	3.83	6.3	1.39	2.78	1.39	6.3	0	28
Dissolved Silver							5	5
Dissolved Sodium #	34.6	27.6	25.2	25.8	25.2	34.6	24.9	53.1
Dissolved Magnesium #							31.4	40
Dissolved Potassium #	2.16	2.06	1.81	1.75	1.75	2.16	1.6	3.7
Dissolved Calcium #	108	118	111	117	108	118	98.2	136
Total Dissolved Iron #							20	3472
EPH (C8-C40) #							10	11
GRO (C4-C8) #							10	60
GRO (C8-C12) #							10	51
GRO (C4-C12) #							10	97
MTBE #							0.1	5
Benzene #							0.5	5
Toluene #							5	5
Ethylbenzene #							1	5
m/p-Xylene #							2	5
o-Xylene #							1	5
Fluoride							0.3	1.1
Bromide							0.05	0.17
Chloride #	48.7	45.9	46.7	42.7	42.7	48.7	10	63.8
Nitrate as NO3 #							0.2	15.1
Nitrite as NO2 #							0.02	0.24
Ammoniacal Nitrogen as NH4 #							0.03	0.41
Dissolved Ethene #							1	1
Dissolved Ethane #							1	1
Dissolved Butane							2	2
Dissolved Propane							2	2
Dissolved Methane	0.0436	<0.001	0.011	0.00192	0	0.0436	0.01	6.66
Dissolved Carbon Dioxide							9.8	47.9
δ13C - CH4							-73.6	0
δ13C - CO2							-35.3	27.2
Total Alkalinity as CaCO3 #							262	510
Acrylamide							50	50
Laurylamine							50	50
Hydroxyethyl ethylene diamine							50	50
Myristyl dimethylamine							50	50
Octyldimethylamine							50	50
para phenylene diamine							50	50
BOD (Settled) #							1	15
COD (Settled) #							7	26
pH #							6.84	8.06
Salinity							0.1	10.2
Total Dissolved Solids #							393	901
Total Suspended Solids #							10	8891

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## Interpretation of Data

Dissolved Methane has been to increase against the background maximum recorded within the 1st year in BH 1(B). The British Geological Survey have also detected Methane in other parts of the aquifer and stated that Methane (CH<sub>4</sub>) is also often detected, though rarely at high concentrations. The composition of CH<sub>4</sub>, where present, suggests that it has been produced in the superficial sediments by microbial reaction of organic matter.

\*"Q1 2020 Summary" columns are the minimum and maximum readings for each determinand for comparison against the pre-hydraulic fracturing background minimum and maximum results.