Pacific Environment Limited

Consulting • Technologies • Monitoring • Toxicology

24 November 2014

Mr Simon Garnett
AGL
22 Tate Street
Gloucester NSW 2422

RE: AGL Mobile Methane Monitoring – Additional Route through Project Operations

Dear Simon,

This letter report provides a summary of the mobile methane (CH_4) monitoring results completed in late 2014. The route comprises the AGL site office in Gloucester, along Bucketts Way and Jacks Road through the current Gloucester Gas Project site operations and returning via Fairbairns Road. The monitoring was completed as part of the baseline monitoring on 20 October 2014 and post hydraulic fracturing on 7 November 2014.

The Picarro monitoring system was configured for this mobile monitoring campaign, measuring CH_4 concentration, isotopic values for CH_4 along with GPS coordinates. The system components are housed within an AGL vehicle (Toyota Land Cruiser Troop Carrier) and configured to meet the recommendations of the Picarro Mobile Kit User's Guide (**Picarro, 2011**). Further detail on the configuration and sampling methodology is provided in **Pacific Environment (2013, 2014).**

A summary of the results are provided in **Table 1**. **Figure 1** and **Figure 2** show the 1-second measurements, taken every 10-seconds across the monitoring route for the two respective monitoring days. **Figure 3** and **Figure 4** provide a three dimensional plot of the CH_4 concentration at the time of monitoring.

The minimum 1-second CH_4 concentrations during both runs are just below the current global average concentration of 1.82ppm reported by the World Meteorological Organisation (WMO) (**WMO, 2014**).

The maximum CH_4 concentration during the baseline monitoring was slightly higher than those measured during the post hydraulic fracturing monitoring completed on 7 November 2014. The maximum concentrations measured are less than the maximum CH_4 concentrations measured during the baseline study **Pacific Environment (2013, 2014).**

Table 1: Summary of results

Run	Time	Average CH_4 concentration	Minimum 1-second CH_4 concentration	Maximum 1-second CH_4 concentration
20 October 2014	13:17 – 14:13	1.79	1.77	2.27
7 November 2014	17:30 – 18:12	1.80	1.77	2.22

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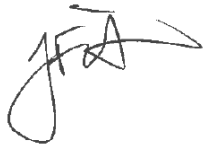
It is concluded that there was no significant change in ambient methane concentrations detected through the use of mobile methane monitoring using a Picarro instrument, when comparing data sets representing pre- and post- fracture stimulation.

Yours sincerely,



Justine Firth
Senior Scientist
Pacific Environment (Operations)

References

Pacific Environment (2013) AGL Gloucester Baseline Methane Monitoring Campaign – Preliminary Report.

Pacific Environment (2014) AGL Gloucester Methane Monitoring Campaign – Interim Report.

Picarro (2011), Picarro Mobile Kit User's Guide.

World Meteorological Organisation (WMO) (2014) WMO Greenhouse Gas Bulletin, September 2014.

Figure 1: Monitoring Route – 20 October 2014

Figure 2: Monitoring Route – 7 November 2014

Figure 3: 3-Dimensional representation of mobile methane monitoring – 20 October 2014

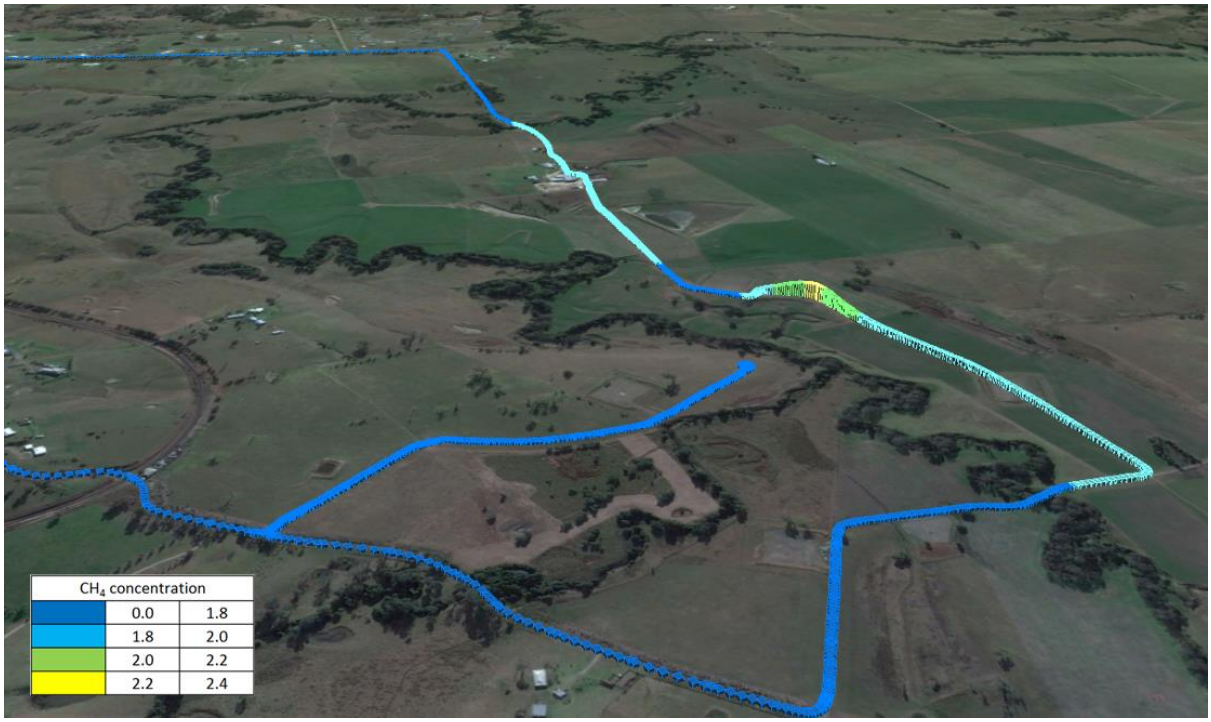


Figure 4: 3-Dimensional representation of mobile methane monitoring – 7 November 2014