attachment 2

Mary Vincent

From: Kieran Murphy [KMurphy@appea.com.au]
Sent: Monday, 4 August 2014 8:48 AM
To: Tony McCarthy; Rob Shearwood
Cc: Gerard Marquis
Subject: RE: APPEA advertising complaint

Hi Tony,

Thanks for getting back to me. I'd like to draw your attention to two reports that I have found quite useful:

- The Australian Council of Learned Academies (ACOLA) http://www.acola.org.au/PDF/SAF06FINAL/Final%20Report%20Engineering%20Energy%20June%202013.pdf
- Society of Petroleum Engineers. Hydraulic Fracturing 101. http://fracfocus.org/sites/default/files/publications/hydraulic_fracturing_101.pdf

In regards to your first question in relation to the statement that *"shale fracking is not the process of extracting gas"*, you are correct in noting that fracking creates pathways along which oil and natural gas can migrate more effectively. Put simply, Hydraulic fracturing is a method used by the oil and gas industry to increase the rate and total amount of oil and gas extracted from reservoirs (CSIRO). Hydraulic fracturing 'stimulates' the productivity of an existing well and is therefore commonly referred to by industry as "*hydraulic stimulation*", "*seam stimulation*" or "*fracture stimulation'*. You can have oil and gas extraction without hydraulic fracturing, and you can have hydraulic fracturing without oil and gas extraction (the technology is used in other industries to increase productivity, such as water bores and geothermal energy).

We are briefly aware of the 2013 UK Advertising Standards adjudication in relation to Cuadrilla Resources. It is a good case study of how science must be represented truthfully and in the correct context. I note that where the ASA rules against Cuadrilla it was for making comments relating to the outcomes of certain studies and Government reviews, statements of absolutes that cannot be supported, or for presenting things as fact where they should be an opinion. In this regard, the ASA decision supports our complaint against the statement made in the advertisement in the Geraldton Guardian that "*Research in the US has found that 6% of fracking wells leak into ground water in their first year*". This statement has no scientific basis and has been presented as fact, rather than as an opinion. I am confident that the UK Advertising Standards would conclude this to be misleading and breach of the rules.

For references: The advertisement claims the statement "*Research in the US has found that 6% of fracking wells leak into ground water in their first year*" was made by Anthony Ingraffea, Professor of Engineering. Cornell University. There are a number of (hotly debated) reports written by Anthony Ingraffea. We assume that the report referred to, is also referred to on the cleanwaterhealthyland.org.au website which can be found at this Link. At no point does this, or any other reports by Ingraffea draw conclusions that "6% of fracking wells leak into ground water in their first year". The closest comparable statement made by Ingraffea is that "*Operator-wide statistics in Pennsylvania show that about 6-7% of new wells drilled in each of the past three years have compromised structural integrity*". Regardless of the highly disputed accuracy of this figure, structural integrity issues do not result, ipso facto, in groundwater contamination (a fact also admitted to by Ingraffea who states *"We note that not all violations will result in groundwater contamination events").*

We have not done a full review of the report linked to in your email. On first glance it does not appear to present a balanced argument and I question it's scrutiny. Nevertheless, we are not debating that groundwater contamination *can* occur, it is a remote risk that is closely managed by all levels of the industry.

In fact, water contamination can occur from practically all sectors of the Australian economy, such as agriculture, manufacturing, building, mining etc. Statements that claim *"Research in the US has found that 6% of fracking wells leak into ground water in their first year"* is deliberately misleading and deceptive. We often encounter statements like those you provided, i.e. "*gaps in the scientific literature regarding (the) impacts*" of fracking (p1) and a "*lack of evidence on fracking-related health impacts*" (p8). There are known areas of further work, and the industry continues to fund significant new research into many of these areas. This should not be confused with misleading and deceptive statements such as those made in the advertisement.

APPEA's goal is ensure that all of the statements that we use are underpinned by sound facts and science. As stated in our letter, APPEA accepts that the Conservation Council of WA and likeminded groups are entitled to oppose the natural gas industry. We cannot, however, accept the misrepresentation of science and the use of deceptive and misleading advertising as legitimate campaign tactics.

Regards

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Attachment 2

RE: Advertising complaint – Geraldton Guardian 11 July 2014

"Shale fracking, the process of extracting gas by using toxic chemicals to crack deep rocks, can turn our water into a dangerous chemical cocktail.

FACT:

This statement is misleading. Shale fracking is not the "process of extracting gas". Hydraulic fracturing is a technology that is used to enhance the flow of gas from a well once the drilling is completed and the rig is removed from the scene. According to the CSIRO Hydraulic fracturing is a method used by the oil and gas industry since the 1940s, to increase the rate of extraction and the total amount of oil and gas from underground reservoirs.[1]

"*Toxic chemicals*" are not used "*to crack deep rocks*". This process is performed by the pressure applied to a fluid system pumped into the completed and cased well[2]. In general, brackish or salty water can be used; small quantities of chemicals and sand are then added to the water to give it the right properties for the development of induced permeability, which in turn allows the gas to then flow from the shale.[3] Water and sand typically make up over 99.5% of the fracturing fluid system.[4] The remainder is a mixture of additives, which are added at very low concentrations and controlled by the cement and steel well casing.[56]

By both weight and volume, the most prominent of these materials is a substance known as "guar", which is an emulsifying agent more typically found in ice cream which thickens the water in order to suspend the sand.[7] In Western Australia, legislation requires that all chemicals used down a well are approved, based on an assessment of their toxicity, by the Government and this information is made public.[8]

Shale gas reservoirs in Western Australia typically occur between two and four kilometres below ground, separated from near-surface fresh water aquifers by extensive layers of impermeable geological formations.[9] These layers form efficient natural barriers between fresh water and gas resources.[10]

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[1] CSIRO, unconventional gas, http://www.csiro.au/Outcomes/Energy/Energy-from-oil-and-gas/UnconventionalGas/Learn-more.aspx#fraccing

[2] GISERA, Hydraulic fracturing http://gisera.org.au/publications/factsheets/hydraulic-fracturing.pdf

[3] Cook, P, Beck, V, Brereton, D, Clark, R, Fisher, B, Kentish, S, Toomey, J and Williams, J (2013). *'Engineering Energy: Unconventional Gas Production.'* Australian Council of Learned Academies (ACOLA), www.acola.org.au.

[4] WA Department of Mines and petroleum (2014), Natural Gas from Shale and Tight Rocks Fact Sheet Chemicals used in hydraulic fracturing http://www.dmp.wa.gov.au/documents/Chemicals_used_in_hydraulic_fracturing.pdf

[5] Ibid, page 57

[6] King, G. E. (2012). Hydraulic Fracturing 101: What Every Representative, Environmentalist, Regulator, Reporter, Investor, University Researcher, Neighbor and Engineer Should Know About Estimating Frac Risk and Improving Frac Performance in Unconventional Gas and Oil Wells. Society of Petroleum Engineers.

[7] CSIRO (2012), what is hydraulic fracturing? http://www.csiro.au/Outcomes/Energy/Energy-from-oil-and-gas/UnconventionalGas/Learn-more/What-is-hydraulic-fracturing.aspx

[8] WA Department of Mines and petroleum (2014), Natural Gas from Shale and Tight Rocks. http://www.dmp.wa.gov.au/documents/Natural_Gas_from_Shale_and_Tight_Rocks_-_An_overview_of_Western_Australia_regulatory_framework.pdf

[9] WA Department of Mines and petroleum (2014), Natural Gas from Shale and Tight Rocks. http://www.dmp.wa.gov.au/documents/Natural_Gas_from_Shale_and_Tight_Rocks_-_An_overview_of_Western_Australia_regulatory_framework.pdf

[10] Geoscience Australia and ABARE & ABARE, 2010. Australian Energy Resource Assessment. Report 2010. Geoscience Australia, Canberra.

"Research in the US has found that 6% of fracking wells leak into ground water in their first year" – reference to Anthony Ingraffea, Professor of Engineering. Cornell University.

FACT:

This statement is misleading and deceptive. There have been no reports (by Professor Ingraffea or others) that have confirmed **any** groundwater contamination related to hydraulic fracturing, let alone a percentage figure.

Professor Ingraffea is a noted anti-gas activists whose claims on structural well integrity have been debunked by numerous sources worldwide. The statement that *"6% of fracking wells leak into ground water in their first year"* cannot be verified in any studies undertaken by Professor Ingraffea (or other study worldwide). The only reference to his work on the cleanwaterhealthyland.org.au website is to a 2012 analysis of oil and gas wells in Pennsylvania[11], and this has been wrongly interpreted in the advertisement.

At no point do any reports by Professor Ingraffea draw conclusions that *"6% of fracking wells leak into ground water in their first year"*. The report has been misrepresented and misquoted. The closest comparable statement made by Professor Ingraffea is that *"Operator-wide statistics in Pennsylvania show that about 6-7% of new wells drilled in each of the past three years have compromised structural integrity"*. Regardless of the highly disputed accuracy of this figure, structural integrity (sustained casing pressure) issues do not result, ipso facto, in groundwater contamination (a fact also admitted to by Ingraffea who states *"We note that not all violations will result in groundwater contamination events")*[12]. This statement is deliberately misleading and deceptive.

Many academic and scientific sources have challenged the 'findings' made by Professor Ingraffea, including many of his own colleagues at Cornell University, as the paper conflates pressure with leakage. This is an attempt to try to convince the public that the mere existence of the former is evidence of the latter.

Actual well integrity failures are very rare. Well integrity failure is where all barriers fail and a leak is possible. True well integrity failure rates are two to three orders of magnitude lower than single barrier failure rates."[13]

An August 2011 report from the Ground Water Protection Council examined more than 34,000 wells drilled and completed in the state of Ohio between 1983 and 2007, and more than 187,000 wells drilled and completed in Texas between 1993 and 2008. The data show only 12 incidents in Ohio related to failures of (or graduate erosions to) casing or cement – a failure rate of 0.03 percent. In Texas, the failure rate was only about 0.01 percent.[14] Based on Pennsylvania Department of Environmental Protection data compiled by the AP and EID in the US, the well failure rate is about one third of one-percent (0.33 percent) of all the oil and natural gas wells drilled in Pennsylvania since 2005.[15]

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[11] http://www.psehealthyenergy.org/data/PSE_CementFailureCausesRateAnalaysis_Oct_2012_Ingraffea.pdf

12 Ingraffea et al (2012) Assessment and risk analysis of casing and cement impairment in oil and gas wells in Pennsylvania, 2000–2012

[13] SPE; Environmental Risk Arising From Well Construction Failure: Difference Between Barrier and Well Failure, and Estimates of Failure Frequency Across Common Well Types, Locations and Well Age
http://www.spe.org/atce/2013/pages/schedule/tech_program/documents/spe166142-page1.pdf

[14] Groundwater Protection Council. State Oil and Gas Agency Groundwater Investigations
http://fracfocus.org/sites/default/files/publications/state_oil_gas_agency_groundwater_investigations_optimized.pdf

[15] Link to DEP database
http://www.depreportingservices.state.pa.us/ReportServer/Pages/ReportViewer.aspx?/Oil_Gas/Spud_External_Data

All wells in Australia are subject to strict well integrity regulation. High standards of well integrity ensure long term safe and environmentally responsible operations. The industry uses three levels to ensure well integrity:

- Well designs with multiple casing strings and isolating cement
- Pressure tests to confirm casing and cement integrity
- Acoustic measurement of the cement bond

Well maintenance over the working life of the well ensures it operates as designed and reviews of well performance over decades of operation, reveal very low rates of well integrity failure.

The Cooper Basin has for 50 years been one of Australia's premier oil and gas regions. Since 1969, about 700 wells have been hydraulically fractured in the Cooper without problems.[16] No evidence of chemicals from hydraulic fracturing fluid has been found in aquifers as a result of hydraulic fracturing operations." (University of Texas)[17]

"Once our water is contaminated, it will be forever"

FACT:

This statement is misleading. While the absolute goal of any industry should be to avoid contamination, pollution water can, in many situations, be cleaned. How this is done, how long it takes, and the cost depends on the extent of the water source, depth, size, location, source of water recharge, and the type of pollutant and its source[18].

Processes that can be used (individually or in combinations) to clean contaminated water include activated carbon filtration, bioremediation[19], phytoremediation, pump-and-treat and chemical oxidation.[20]

Natural processes can also remove contaminants with no human intervention.[21]

The onshore gas industry has the potential to become an important economic driver for WA, creating jobs and investment in regional communities, boosting government revenues and enhancing our State's energy security.

Numerous studies overseas and here in Australia have concluded that with proper regulation, these benefits can be delivered with minimal risk of environmental harm.

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[16] Department for Manufacturing, Innovation, Trade, Resources and Energy (South Australia) Frequently Asked Questions: Unconventional Gas in South Australia webpage http://www.petroleum.pir.sa.gov.au/prospectivity/basin_and_province_information/unconventional_gas/frequently_asked_questions#Has%20hydraulic%20fracturing

[17] University of Texas, Fact-Based Regulation for Environmental Protection in Shale Gas Development http://www.appea.com.au/wp-content/uploads/2013/05/UTexas-Austin-shale-gas-fracking-study.pdf

[18] EPA Victoria (2014) The cleanup and management of polluted groundwater Guidelines http://www.epa.vic.gov.au/~/media/Publications/840%201.pdf

[19] Sinha et al (2009), Bioremediation of Groundwater http://www98.griffith.edu.au/dspace/bitstream/handle/10072/38972/69747_1.pdf;jsessionid=740A1F1D5A0623478C0E01DA88EA09BE?sequence=1

[20] CSIRO Soil and Groundwater Remediation http://www.clw.csiro.au/research/urban/protection/remediation/projects_2.html

[21] US EPA Groundwater Contamination http://www.epa.gov/superfund/students/wastsite/grndwatr.htm