

Submission by Robert H. McNaught to the IPC regarding the Narrabri Gas Project (2020 Aug 21)

Here I address the most recent Santos and DPIE submissions since 2020Aug 10.

Summary

- There has been no acknowledgement in the most recent documents that there have been significant earthquakes in this region.
- The assessment of the impact of illumination from the gas flares is mischaracterised in the latest Santos submission. They simply reassert their original assessment, ignoring my several comments on the inadequacy of that survey.
- The issue of dust devils carrying combustible material through a gas flare is again not taken seriously without giving any reason other than a belief that it is insignificant. The contention that combustible material wouldn't be raised into the flare is not justifiable given the high wind speeds and vertical motions dust devils contain. Dust devils will become dramatically more common during the hottest summer days - which are getting hotter. This is in line with the dramatically increasing number of catastrophic fire days as climate change continues.

Earthquakes

The 3rd paragraph of “Santos comments to IPC following public hearings_Final Submission” starts

Santos has relied upon the best available science, expert research and opinion in our application to develop the Narrabri Gas Project so that the community can be confident it will not harm people, water resources or the environment.

As the Department of Planning found, it is “difficult to reconcile the significant community concerns about the Narrabri Gas Project with the technical advice from experts that the risk of any significant impacts occurring is generally low and can be controlled using standard engineering practice and imposing strict conditions on Santos”.

Why then is there is no mention of the M5 earthquake in the Southern Pilliga on New Year’s night 1968/9 despite this information being readily available on the Geosciences Australia website.

Intraplate earthquakes (occurring well away from tectonic plate boundaries) can be significant, like those near New Madrid (in Missouri, USA) in 1811-12 that were of M7 to M8 in intensity. This is similar to what occurred in recent (pre-settlement) history on the western edge of the Pilliga region when the

Walgett scarp was formed, changing the westerly course of the Namoi River at Come by Chance, forcing it NW towards Walgett.

Ignorance of these events in making the original assessments is disappointing, but failing to address them *subsequent* to having them brought to attention is more disturbing. I can find no reference to the potential consequences of earthquakes like these in the most recent documents. If use of generic seismic threats is all that is considered, there is no basis for confidence that the potential threat has been adequately assessed - as both Santos and the DPIE assert.

Assessment of light from the Project

This is covered in section 12 of "Santos comments to IPC following public hearings_Final Submission" p38, but they simply reassert the results from the flawed study that I criticised in the Astronomical Society of Coonabarabran spoken and written presentation – they do not challenge my findings. On p38 they also misrepresent my criticism by stating

"Some submitters stated that the light assessment was not accurate, measurements taken of flares with shields were not representative and cumulative impacts with other light sources were not assessed."

then answering with

“Measurements were taken from existing flares, none of which are shielded.”

In my submission, I clearly state that the **surrounding trees** are shielding the flares which have 4 m flames on a 6 m stack. As their own consultant states, these are surrounded by **20 m tall trees**. This is the shielding I was clearly referring to and it impacts the illumination of the air at lower angles. The extrapolation of this data to a flare atop a 50 m tall stack is clearly inappropriate.

In the original submission I also put forward the question as to how *the IPC* could assess the light impact independently from the Vickery extension. Given that the Vickery extension is now approved, should Vickery approach the sky brightness limits at the Observatory, it would leave no leeway for Santos to remain within the limit with their non-routine flares.

Effect of the non-routine flare on traffic on the Newell Highway

There is no discussion of how the impact of the bright light from the occasional non-routine flare at Leewood will impact drivers on the Newell Highway or how this can be mitigated. A similar, but less severe issue exists for the Bibblewindi non-routine flare.

Dust Devils and fire

p43 of “Santos comments to IPC following public hearings_Final Submission” states

“Flares & Windblown Debris

Several submitters made reference to the whirly-whirly wind scenario and the potential to start fires by means of lofted vegetative material being ignited in gas flares and falling to ground starting a bushfire.

This is not supported by evidence of vegetation fires starting in such a manner, with no identifiable record of fires having started from such causes.

Gas flare operation will be in full compliance with the requirements of the Rural Fires Act 1997.”

The appropriate term for “whirly-whirly” would be a dust devil and as these can have internal wind speeds of over 100km/hr, it is a topic that cannot simply be dismissed because it is seen simply as a theoretical possibility. I shall repeat below what I put in my written submission, as actually witnessing these events clearly demonstrates what the potential is.

The first example is of a dust devil passing into a low intensity hazard reduction burn during autumn in Colorado:

Article with video: <https://gizmodo.com/controlled-burn-spawns-a-fiery-dust-devil-1554883262>

Video only: <https://www.youtube.com/watch?v=uAvb3wLivRk>

The second and third videos below, show the specific interaction of a dust devil with a gas flare:

<https://www.youtube.com/watch?v=WZLBrQ7dKus>

<https://www.youtube.com/watch?v=lcY2XLUvLcs>

p44 goes on to state:

“The potential for windblown debris to pass through safety flares or pilot flares and result in the ignition of a bushfire is considered negligible. This is because of the distance to potential ignitable sources of wind carried debris, and because the heavier debris types required to ignite and spread fire are most likely to be blown along or near the ground, not at the height of the flares. Small air-borne particles (if they were to pass through the flares) are expected to incinerate within the flare or burn to extinction prior to reaching the edge of the sterile zone.”

This again ignores the wind speeds and vertical motions within a dust devil being easily capable of carrying combustible material large enough to meet the cleared periphery. The first video above has tumble weeds about a metre across being raised over ten metres. Given that this scenario is “theoretically possible” the next issue is that dust devils will become significantly more common as climate change dramatically increases the number of warm days over summer. Dust devils are *much* more common on these hotter days.

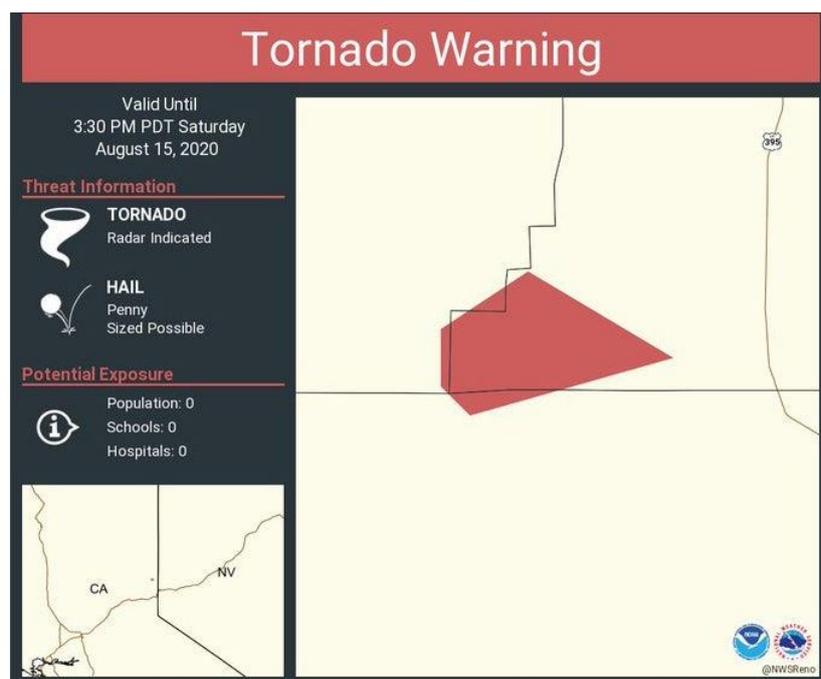
To give an idea of how climate change is changing extreme events I want to highlight two examples from this year, both involving Australia.

Fire tornadoes

A fire tornado occurs when there is such a significant smoke plume over a fire that it forms a pyrocumulonimbus cloud (thunderstorm cloud). These thunderstorms can then spawn a tornado. The first ever confirmed fire

tornado was during the 2003 Canberra fires, when the trail of damage consistent with a tornado was found to coincide with the location of a tornado that was both seen and video recorded. Since 2003 there have been a number of fire tornadoes identified, the latest being this week (2020 Aug 16) in Lassen Co, California, resulting in what is believed to be the first ever fire tornado warning being issued by the National Weather Service.

<https://www.washingtonpost.com/weather/2020/08/16/california-fire-tornado-warning/>



The path of damage within a fire ground can easily be identified as caused by a tornado, so these recent events are a new emerging phenomenon that must be attributed to climate change.

Smoke affecting stratospheric winds

Normally the stratosphere is kept distinct from the troposphere by the tropopause boundary layer, but this second new phenomenon again results from results from pyrocumulonimbus clouds during the megafires in Australia in 2019/20. At least 18 pyrocumulonimbus formed over December and January this summer injecting smoke well into the stratosphere. The paper on this, titled *Australian PyroCb Smoke Generates Synoptic-Scale Stratospheric Anticyclones*, appears in *Geophysical Research Letters* on 2020 May 30.

<https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2020GL088101>

and popularised in the Australian science magazine

<https://cosmosmagazine.com/earth/earth-sciences/rise-and-rotate/>

from which I quote:

The researchers believe this is the first example “of smoke causing changes to winds in the stratosphere”, which they claim “opens up a whole new vein of scientific research”.

It’s thought that the big smoke cloud may be one of the largest, if not the largest, wildfire smoke plumes in the stratosphere that’s been visible to satellites.

Members of the Astronomical Society of Coonabarabran recorded the phenomenon into 2020 May, with the smoke still visible long after sunset indicating the extreme height. The new phenomenon was that the density of

the smoke allowed sufficient solar heating that instead of settling back down to the tropopause, spiralled upwards to 31km, changing the stratospheric winds.

General Comments on “Santos comments to IPC following public hearings_Final Submission”

The 4th paragraph starts

“While I outlined Santos’ capability in my presentation to the Panel, one thing I would like to reiterate in this further submission is our strong track record of coexistence with farmers.”

This is meaningless when some disputes have ended in non-disclosure agreements.

p3 *“We are committed to a lower carbon future and taking practical measures to reduce our emissions, including at Narrabri where our appraisal gas is already being beneficially used for power generation at Wilga Park.”*

What is needed is a commitment to minimising the impacts *now*, not just slow change under the 2050 net zero target. Changes are needed like no routine flaring at *any* Santos facility and for Santos and the NSW and Australian governments to sign up to the World Bank Initiative for no flaring. As Santos and the DPIE often say, the NGP is a small project, so any real impact will not result from the Wilga Park power station, but through real institutional changes. Having changes being made dependent on *additional supply* means we are going *backwards* with regard to emissions.