

## SUBMISSION RE: ORANGE GROVE SUN FARM

We all use electricity, drive a car and need jobs. I am in favour of developing alternative and sustainable energy sources to 'go forward' and minimise green house gas emission. My family was one of the first installing solar panels on our rural residential property just out of Gunnedah about 10 years ago.

So far this region has seen significant expansion of coal mining and coal seam gas exploration.

I recently learned that two major solar projects are about to go ahead in the Orange Grove Road area. This development must have come to town as a general surprise; there is nothing about solar projects in council's last Economic Strategic Plan available on the internet.

I have read as much of the IES for Orange Grove Solar Farm as I could in the short time available to the public. I would like to make some comments because there are important issues not (adequately) addressed as far as I can see, which need to be followed up and resolved.

Firstly - I am really surprised that anybody thinks a floodplain – and same in a productive agricultural setting - is a good place to build a solar farm! This is a major investment in a 30-year project according to the IES. In Gunnedah, we cannot even build a house on the flood plain anymore...

I take it that 330,000 solar panels, associated infrastructures can be installed and erosion control structures put in place without changing the level of the original soil surface? Any structure on a floodplain that diverts water flow has to be approved by State Government for good reasons.

There have been quite big court cases in this region about farmers putting in banks on flood plains to protect land and infrastructure from floodwaters without approval. This is because even a tiny bank of 0.1m can seriously affect the direction and extent of flooding.

I did not find any comment on or modelling of potential effects of the solar farm on flood events on the surrounding farmlands and residences and vice versa. I did not find any climate data or analysis of (historic) flood levels suggesting the proponent is fully aware and will be taking appropriate steps. I would think these data are important in an Environmental Impact Study for a long-term project located on a floodplain.

We can surely expect some major rainfall and flood events in the 30 years of the project life. Flooding and water logging seriously affects the land and livelihood of people in this region and farmers

voiced concerns, which were not addressed in the IES as far as I can see, despite community consultation. Or have they?

Next – the soil section of the IES. As I understand the proponent is instructed to conduct soil surveys as part of the DA. I have assisted in soil surveys and know this is serious business, expensive and needs to be done by a CPSS accredited soil surveyor and adhere to standards. Standards are quoted in the IES, but were not followed. For example, according to the IES, the project is located on strategic agricultural land, which is protected by State law, but the BSAL standard was not followed.

While the IES presents some data for 3 sampling points in the 253 Ha of the project footprint, to my best knowledge, soil survey has to have at least one profile per every 2 Ha on strategic agricultural land, adding up to 125 soil profiles, not 3 sampling points (the 4<sup>th</sup> sample was not sent to the Lab according to lab data presented in Appendix E).

Soil survey has to produce a map in relation to the development, address soil quality and limitations, use standardised soil data cards and register with SALIS. I cannot find any of this in the IES. SALIS data have been viewed as part of the desktop study, but none of the sampling points are within the project area.

The soil data logs in Appendix E are not soil data cards and not completed correctly. For example, soil survey has to identify texture and colour in the field, which is mostly missing here and where texture is documented it is not confirmed by the laboratory data.

While the IES logs document texture as medium to heavy clay (where texture has been noted), according to lab data it is mostly sandy clay loam or clay loam.

The IES states soils in the project area are all Vertosols, the literature cited, tells a different story (as below). I saw the photo presented in the IES and went to look at some of the project area that can be viewed along Orange Grove Road, there is no Vertosol in sight.

In both the FAO and USDA soil taxonomy, a vertisol is a soil in which there is a high content of expansive clay known as montmorillonite that forms deep cracks in drier seasons or years. Alternate shrinking and swelling causes self-mulching, where the soil material consistently mixes itself, causing vertisols to have an extremely deep A horizon and no B horizon.

Quote taken from the IES:

The site is part of the Burburgate soil landscape, described as mixed stagnant alluvial plains and floodplains of the Namoi River on the Liverpool Plains, characterised by a complex distribution of soils, consisting of moderately drained brown clays, and poorly drained red-brown earths, with smaller areas of high floodplain often

consisting of solodic soils (OEH 2011)

As noted above, the project may result in increased levels of soil erosion. The susceptibility of soils to erosive forces is dependent on their inherent properties, namely texture, structure and dispersibility (Charman 1978). As noted in Table 6.5, the site is mapped in its entirety as Vertosols. Vertosols have high agricultural potential with high chemical fertility and water-holding capacity, however significant rainfall is required to make water available to plants (Australian Soil Club n.d.). The results of the soil erosion assessment described in Appendix E generally supported this mapping, however, minor variations in the soils were evident in each test location. Soil erodibility was found to be low to moderate overall.

Considering all of the above, I doubt the person conducting the sampling is CPSS accredited, meaning the soil part of the IES is not valid.

It is important to correctly identify soil types and associated limitations (at least) for several reasons, including erosion potential and engineering standards. For example no trees grow on Vertosols because the shrink swell properties of these soils cause tree roots to shear. Roads on these soils are usually full of cracks and potholes, fences don't stay straight for long and houses move and crack without appropriate footings and drainage.

If I understand correctly, the solar panels are mounted on posts driven into the soil and I believe the panels move like sunflowers with the sun. Panels would need to be straight and in line for 30 years to function properly for maximum production?

I would like to know what happens when we get heavy rainfalls and water gushes down the solar panels similar to roof areas and roads in urban environments and onto the ground. The solar panels do not absorb water and the runoff will be in an average year (600 to 650mm / annum) approximately 5ML or more. While council has stormwater management in place, the solar farm does not.

Another issue is the view from neighbouring farms of the solar panels, in particular from R1, the very close neighbour. The information on the landscaping proposed in the IES to screen the view is very poor. Solar panels come up to within 1m of the boundary fence of R1, correct?

It is impossible to create a functional screen by planting anything on a 1m strip. You can't even do proper soil preparation for the landscaping; you will need to get a tractor in there. Next up, you cannot plant so close to a (boundary) fence, solar panels won't function when shaded by vegetation and there ought to be access to the outer boundary for maintenance and safety reasons. If a tree falls onto solar panels there is a high risk of fire depending on the

damage of the panel. Hence, there needs to be a safe distance between the vegetation belt and solar panels.

To make this work, the proponent needs to get advice from professionals experienced in planting large scale vegetation belts and would have to pull back the solar panels by at least 30 to 50m. By personal experience it will take a minimum of 3-5 years to create a functional screen IF there is proper site preparation, trees and shrubs are suited to the local environment, planted into a soil moisture profile of at least 1m (which can take 12-18 months to achieve with good rainfall), fertilised and mulched and followed up with regular weed control and perhaps watering, depending on climatic conditions.

I am impressed that this solar farm can be built within 9 months! Most people are flat out to build a house in 9 months from start to finish...

There are a lot more issues with the IES that I cannot address due to time limitations.

As I said, I favour renewable energies over coal and coal seam gas, I have solar panels on my property, but the IES does not fill me with confidence.

There are too many inconsistencies, loose ends and important issues that have not been addressed adequately. I know that stakeholders feel they have not been consulted appropriately and the proponent has not heard their concerns.

The development of renewable energies has to be done properly, with positive and constructive involvement of the broad community and not in a hurry yielding to political or other reasons, because this is the way of the future.

It is not fair to propose that for the common good, some people have to be left behind and their health, wellbeing and livelihood have to be sacrificed. A lot of this is happening with coal mining and CSG in this region and beyond, there have even been suicides.

The proponent is in control of doing the right thing and benchmark developing alternative and sustainable energy. You can make this work and I don't think it is asked too much. If it is then this is all about making a profit and not for a sustainable future.