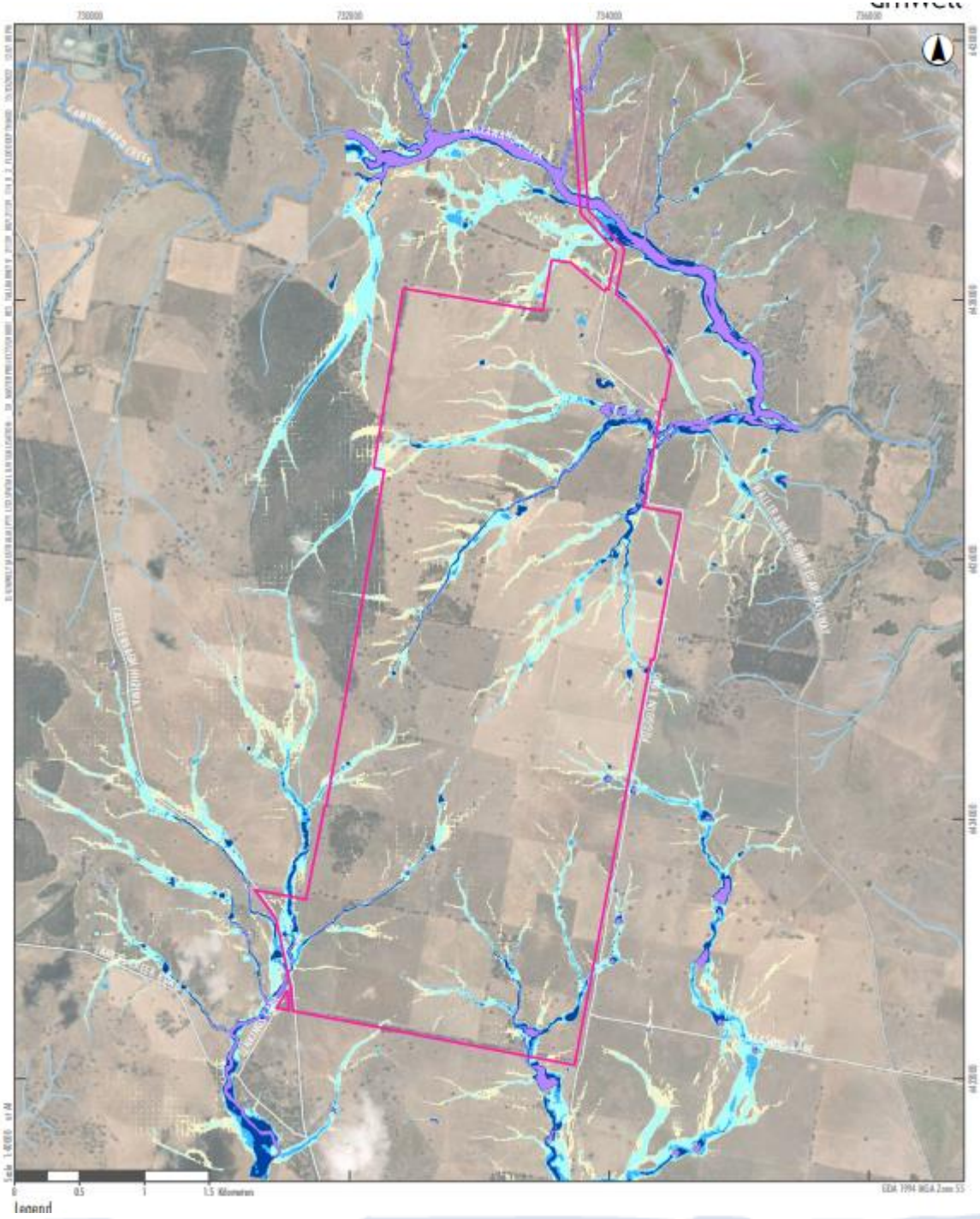
National Rational Energy Network Inc.

To protect and advance public welfare and the natural environment by opposing Commonwealth, State or Territory Law, or Corporate actions, that impose counterproductive energy policies and costs on all citizens.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Legend

- 870ha
- 500MW solar plus 500mW BESS
- Good grazing and farming land
- Productive
- Solar for 38 years
- To be returned to agricultural production
- Many waterways and Tallawang Creek
- Local bores and groundwater
- Contamination from panels, BESS plus infrastructure not even mentioned as a risk.

- 500MW of monocrystalline panels contain:
- Aluminium ~350 tonne
- Copper ~34 tonne
- Silver ~385 kg
- Lead ~9.6 tonne
- Nickel ~688kg
- Tin ~1.4 tonne
- Zinc ~3.4 tonne
- No data on Cadmium, Tellarium, Selenium, Indium.

Spontaneous Glass Breakage — Increasing incidents of tempered glass shattering without impact have been documented (PV Magazine USA, June 21, 2024). Once compromised, moisture ingress can trigger corrosion and leaching.

Weather-Related Damage — Damage rates from hail, wind, and storms have exceeded modeling expectations by up to 300% (PV Magazine USA, June 11, 2024). Each breakage point becomes a new vector for leaching.

Long-Term Storage Degradation — Panels stored improperly have been found to degrade before installation, raising the odds of early failure (PV Magazine, March 27, 2025).

UV-Induced Degradation — Research from Fraunhofer ISE, reported in PV Magazine (Aug. 15, 2025), found that standard accelerated UV testing—equivalent to roughly one year of European sunlight—.... revealing that current testing methods may underrepresent or mischaracterize real-world degradation patterns.

As Yousuf, H., Yi, J., et al. (2024) explain in Heliyon:

"Heavy metals such as cadmium (Cd), copper (Cu), arsenic (As), mercury (Hg), lead (Pb), hexavalent chromium (Cr+6), zinc (Zn), and nickel (Ni) are known to have adverse effects on soil quality and can potentially leach into groundwater or be taken up by crops, entering the food chain

...Secondly, the decomposition of materials utilized in solar photovoltaic (PV) installation poses a potential risk..

In a field study of a 750-kW crystalline silicon array in New York, Robinson and Meindl measured soils directly beneath the panels and compared them to soils 100 feet away.

Selenium concentrations were 97% higher beneath the panels; lithium was elevated by 386%, strontium by 86%, nickel by 37%, and barium by 61%.

In central Italy, Moscatelli et al. (2022) monitored soils beneath ground-mounted PV arrays for seven years. They found substantial, lasting changes in soil chemistry and biology, including:

Higher pH and electrical conductivity,

Reduced water-holding capacity and soil temperature,

A 61% loss of total organic carbon and a 50% reduction in total nitrogen under panels compared to controls,

Lower microbial activity and “striped” patterns of soil degradation across the installation.

Italy’s own policymakers took note — the country now bans the installation of ground-mounted solar arrays on active agricultural land, explicitly to protect soil health and food production.

- Beryl solar has had two fires since 2019.
- Stubbo solar had a fire early 2025.
- Two semi-trailers carrying panels for Stubbo solar crashed scattering panels on roadside.
- No knowledge of who did the cleanup or where panels were disposed of.
- Is anyone monitoring contamination?

- eg. Table B4 Surface Water Risk Assessment
- No mention of probable contamination from panels or BESS at all.

Table B4 Risk Assessment and Mitigation Measures

Potential Impacts to Surface Water	Relevant Environmental Value/s	Pre-Mitigated Impact			Mitigation Measure	Residual (Mitigated) Impact	
		Sensitivity	Magnitude	Significance		Magnitude	Significance
Discharge of sediments (both air and water-borne) from exposed ground during construction and decommissioning phases resulting in impacts on receiving environment surface water quality.	• Aquatic ecosystems • Irrigation • Farm supply • Stock watering • Visual Recreation • Cultural & Spiritual Values	**Moderate**	**Moderate**	**Moderate**	• A Construction Environmental Management Plan (CEMP) will be developed for the Project which will incorporate an Erosion and Sediment Control Plan and detail methods for minimising sediment-laden runoff and rehabilitation of disturbed areas in accordance with the International Erosion Control Association's (IECA) Best Practice Erosion and Sediment (BPESC) guidelines (IECA, 2008).	**Low**	**Low**
Soil disturbance	• Aquatic ecosystems • Primary Recreation • Secondary Recreation • Visual Recreation • Cultural & Spiritual Values	**Low**	**Moderate**	**Low**	• The Project would require minimal vegetation clearing. The area of vegetation to be cleared will be kept to a minimum determined during detailed design of the Project. • Placement of infrastructure in vegetated areas will be avoided where possible. Where clearance of vegetation is required, clearance activities would be undertaken in accordance with the Project Area-specific CEMP prior to the commencement of construction.	**Low**	**Negligible**
Discharge of stormwater from the Project Area during operational phase resulting in impacts on receiving environment surface water quality.	• Aquatic ecosystems • Irrigation • Farm supply • Stock watering • Visual Recreation • Cultural & Spiritual Values	**Low**	**Moderate**	**Low**	• Infrastructure such as inverters and battery storage will be located with a minimum 300 mm freeboard above the maximum 1% AEP flood level. It is common for this type of infrastructure to be housed within containers or small sheds with relatively small footprints. Given the shallow depths across the site, raising these small fill pads is highly unlikely to result in any adverse impacts offsite. • Operation phase mitigation measures will be guided by an operational management plan developed for the Project, which will detail methods for minimising sediment loss from the Project Area in accordance with best practice guidelines. • Stormwater runoff from the Project Area during the operational phase will be discharged diffusely across the Project Area via vegetated surfaces wherever practical. • Post-construction, disturbed areas will be stabilised by the establishment and maintenance of a vegetated groundcover consisting of low-growing grasses. A weed control program will be implemented for the Project Area to manage noxious weeds and reduce weed invasion. In order to reduce the potential impact of pesticide use, glyphosate-based products, or similar non-residual and non-persistent herbicides, will be used to manage vegetation and grazing on-the Project Area. This groundcover is expected to both significantly reduce the incidence of impact erosion as well as provide for the additional filtering of suspended solids and biological uptake of nutrients. Consequently, the likelihood that stormwater generated from the Project Area will contain levels of suspended solids significantly greater than baseline existing conditions is low. • Stormwater discharging from the Project Area post-development is anticipated to be of a quality that will not impact the surface water receiving environment, which is currently considered to be 'Moderately Disturbed' (DEHP, 2013). Specific treatment and/or detention of stormwater for the removal of sediments and gross pollutants prior to the release to the environment are not considered necessary.	**Low**	**Negligible**

> Stormwater discharging from the Project Area post-development is anticipated to be of a quality that will not impact the surface water receiving environment, which is currently considered to be 'Moderately Disturbed' (DEHP, 2013). Specific treatment and/or detention of stormwater for the removal of sediments and gross pollutants prior to the release to the environment are not considered necessary.

- No awareness of contamination potential.
- Only concerned with sediment and detritus.

NSW RURAL FIRE SERVICE

OP 1.2.22 OPERATIONAL PROTOCOL FOR INCIDENTS INVOLVING PHOTOVOLTAIC (SOLAR) ARRAYS AND BATTERY ELECTRIC STORAGE SYSTEMS

- RFS guidance barely addresses large solar and BESS.
- Shower BESS with water to keep cool
- Don't let runoff into ground or waterways!
- Bushfire and Emergency Plan yet to be published

Disposal Hazard - Landfill

Assessing the Hazardous Waste Potential of Photovoltaic Modules: A Statistical Evaluation of Leaching Test Data by Siegfried, G., et al. (2024) shows that even new silicon-based PV modules have measurable odds of failing the EPA's hazardous waste limits for lead

In Leaching of Cadmium and Tellurium from Cadmium Telluride (CdTe) Thin-Film Solar Panels under Simulated Landfill Conditions (Ramos-Ruiz, A., Wilkening, J.V., Field, J.A., & Sierra-Alvarez, R., Journal of Hazardous Materials, 2017).

IRENA / IEA-PVPS Task 12. End-of-Life Management: Solar Photovoltaic Panels. (2016)

Fraunhofer ISE. Material and Energy Flows of the Solar Industry. (2020)

IEA-PVPS Task 12. Photovoltaic Module End-of-Life Management: A State-of-the-Art Review. (2016)

Liu, H., Kim, J., Zhang, J., & Kim, J. H. (2024). A Review of Toxicity Assessment Procedures of Solar Photovoltaic Modules.

Siegfried, G. et al. (2024). Assessing the Hazardous Waste Potential of Photovoltaic Modules.

PV Magazine USA. Various field-failure reports (2024–2025).

Ramos-Ruiz, A. et al. (2017). Leaching of Cadmium and Tellurium from CdTe Thin-Film Solar Panels.

Robinson, R. & Meindl, A. (2022). Soil Contamination Beneath a 750-kW PV System.

Yousuf, H. et al. (2024). Heavy Metal Impacts on Soil Under Solar Installations

Credit: JW Thompson

- Both the Proponent and DPHI exhibit flippant disregard to contamination
- 'must grind it up and eat it' – Matt Riley DPHI
- Unprofessional and disingenious
- Ignoring reality dos not make it go away
- PFAS and asbestos examples should inform
- Negligent?

Conditions of Consent

- Baseline soil and water testing
- Annual repeat testing
- Thorough testing after decommissioning and removal of infrastructure
- All raw data immediately publicly available
- Significant fines for ANY level of contamination above baseline as proponent and DPHI imply none will occur.