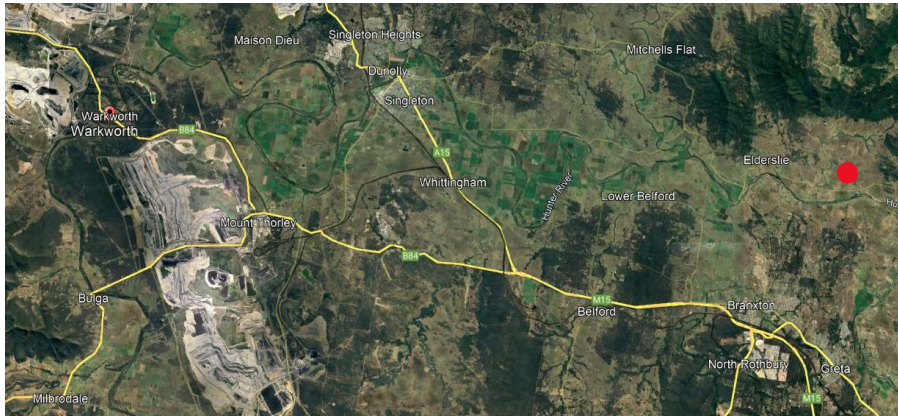


REDBANK POWER STATION SUBMISSION:

- I am a resident in the Singleton LGA and a constant downwind recipient of particulate pollution from the several open cut coal mines to the west of my residence in Stanhope (indicated by red dot on the satellite image below), which is some 40km distant as the crow (or windborne pollution) flies. I will also be down wind of the proposed Verdant Power Station.



Evidence of pollution experienced: This photograph taken today shows the result of wiping a damp paper towel lightly across my outdoor glass coffee tabletop. The period since it was last cleaned is 7 days. Unfortunately, this photograph does not show the sparkling mineral deposits [IE This is not windblown topsoil nor vehicle emissions or wood smoke residue. It is coal dust].



- I am not going to voice my objection to this proposal based on additional pollution concerns, despite having those concerns.
- In lieu of any objections in that regard I wish to make suggestions regarding any Conditions of Approval that the IPC could impose on the proposed development.
- These suggested Approval Conditions are based on concerns held regarding the proponent's proposed sources of biomass fuel not only in the short term (first 5 years of operation) but also for the longer term (5 years +) and the proposed use of the waste ash to be produced by the operations of the power plant.

Concerns regarding the proponent's projected volumes of biomass sourced from plantation/cropped resources and their suggestion that these can be grown on approximately 600,000 hectares of 'marginal land' to meet the power stations annual fuel needs:

The proponent's figures (shown below) clearly relying on consistent volumes of biomass from a) purpose grown fuel crops b) biomass from agricultural waste and c) biomass from clearing of invasive native species (totalling 2,013,172), which comprises almost their entire fuel supply needs, especially from year 5 onwards.

However, they have not accounted for the **multiple risks** of bushfire, drought or flooding reducing the availability of any, or all, of these sources.

Extracts from Verdant's EIS:

Table 3.5. Summary of the estimated fuel potentially available for Redbank Power Station.

Fuel Type	Stage 1 Year 1	Year 2	Stage 2 Year 3	Year 4	Year 5	Year 6 and onwards
Standard Fuels						
Purpose grown fuel crops	50,000	100,000	200,000	400,000	490,000	490,000
Eligible Waste Fuels						
Biomass from invasive native species control	500,000	500,000	500,000	500,000	500,000	500,000
Biomass from Agricultural wastes	1,023,172	1,023,172	1,023,172	1,023,172	1,023,172	1,023,172
Biomass from approved land clearing works	125,799	125,799	125,799	125,799	125,799	125,799
TOTAL (tonnes)	1,698,971	1,748,971	1,848,971	2,048,971	2,138,971	2,138,971

Extract from Verdant's EIS

Within 300km of the Redbank Power Station, the NSW Department of Primary Industries determined⁵⁰ that there is over 8 million hectares of potential suitable land for growing energy crops. Verdant Earth would require approximately 60,000 hectares of land to support 100% of the standard fuel load if it consisted entirely of short-rotation woody crops (490,000 tonnes). Whilst Verdant will consider only marginal, less productive lands for the growing of woody (e.g. mallee) energy crops, the area of land required is still less than 1% of this potential available land solely within 300km of the Redbank Power Station.

Verdant's discussions with local mine sites have revealed the potential for establishment of an 8,000 ha crop of Bana Grass which would yield an average of 50 dry tonnes/ha (approximately 400,000 tonnes per annum) which provide over half of the total feedstock requirements for the power station.

Extract from Verdant's EIS

However, in light of the significant amount of potential eligible waste fuel available, and the amount of land potentially available to be used for energy crops, Redbank Power Station could easily be supplied with 700,000 dry tonnes of biomass per year to generate electricity at maximum capacity on an ongoing basis for the life of the plant (expected to be about 30 years until refurbishment is needed).

Biomass fuel from agricultural waste:

I question whether the projected 1,023,172 tonnes pa of agricultural waste (stubble etc), that the proponent has calculated, based on the arable land area within a 300km radius, is actually available.

The practice of burning stubble, in the field, is reducing. Stubble retention has been the increasing trend as farmers learn about the benefits. Stubble retention also becomes more common during long periods of drought.

Hence, the proponent's calculation, based on waste from arable land production, within the 300km radius, may become wishful thinking.

Purpose grown fuel crops:

I also have serious doubts about the year 5 projected 490,000 tonnes pa of locally sourced (within a 300km radius) purpose grown biomass fuels that the proponent is anticipating will be available for Redbank power generation.

Additionally, the proponent has stated that to grow that volume of biomass fuel crops will require 600,000 hectares of land.

The proponent also states that the land to be used for growing biomass fuel crops will be 'marginal' land.

Extract from Verdant's EIS:

3.3.6. Higher Use Orders

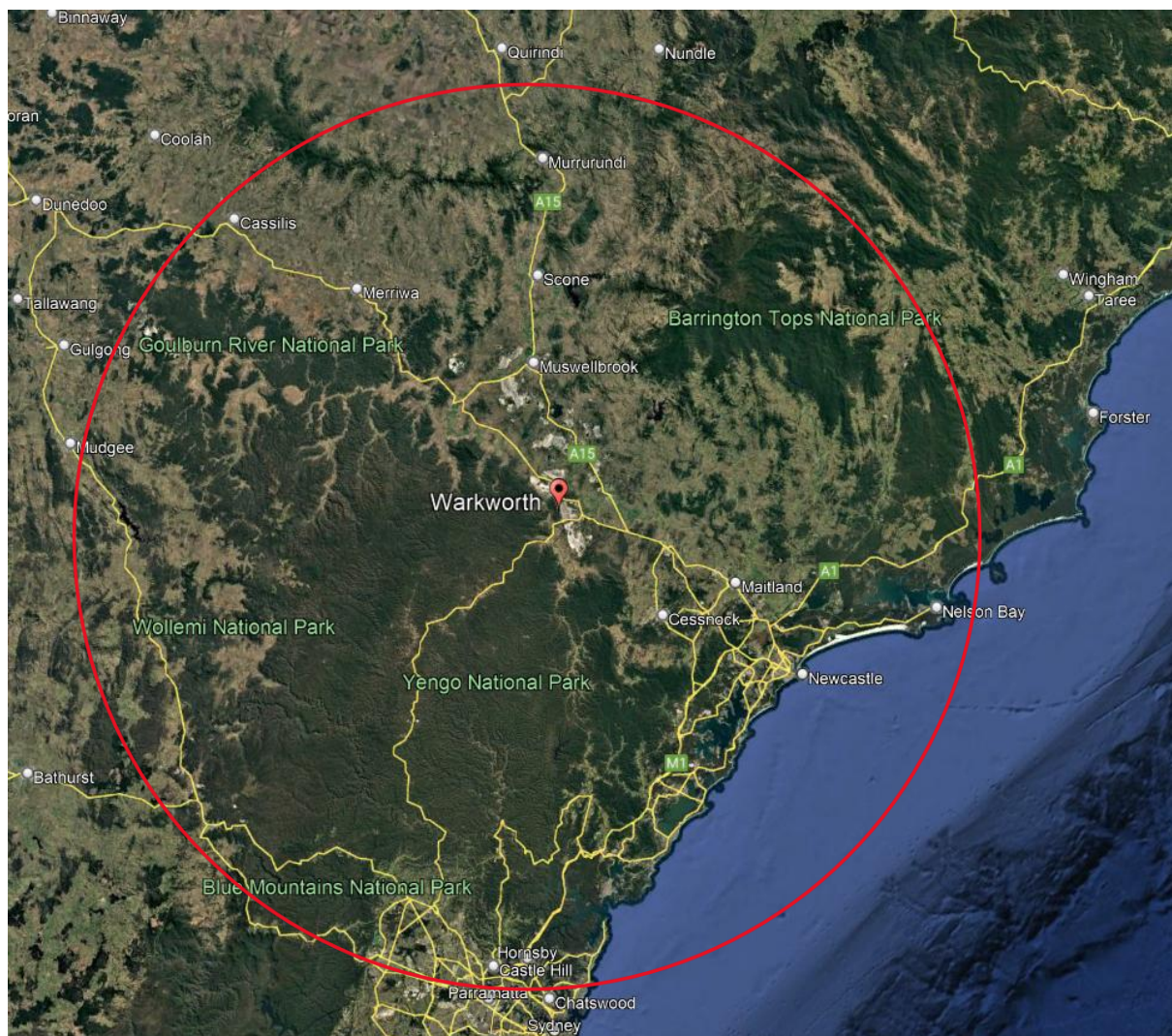
For standard fuels, a higher order use assessment is not required. However, energy crops should not be grown on land that is productive for other high-quality markets such as food and fibre. Land capability studies will therefore be prepared for land prior to it becoming designated for use in growing energy crops to ensure the land is considered marginal land not suitable for these markets.

I seriously doubt any suitable 'marginal land' can support the concentrated growth of a pre-contracted annual volume of purpose grown biomass crops of any type without access to irrigation water especially in periods of drought conditions.

NOTE: Marginal land can also become non marginal land once under irrigation.

For context: The following map shows the area falling within a 300km radius of the proposed Verdant Biomass Power Plant.

The area is contained within an area from just below Quirindi, then west nearly to Mudgee and skirting the Goulburn River National Park, south to within the borders of the City of Sydney and including the Wollemi, Yengo and a large section of the Blue Mountains National Parks then east to Newcastle and Nelsons Bay and finally north east to skirt around the Barrington Tops National Park.



Heavily treed land, including 4 National Parks, comprises approximately 50% of the land area within a 300km radius of the proposed Verdant project.

The remaining 50% comprises of mining leases, The Greater Sydney area, several other cities, and towns many of which are surrounded by expanding housing developments,

and any of rural land is mainly located on the flatter lands or gentler foothills surrounding several river systems.

Several river valleys are located throughout this area supporting rich, fertile river flats.

North-Eastern Quadrant: Rural land here is used predominately for irrigated fodder production and intensive cropping with the balance of the land used for mostly beef and dairy cattle production/grazing and stud horse farms and lifestyle properties.

South-Eastern Quadrant (excluding the densely developed Sydney area): Rural land closer to Newcastle includes the grape growing areas and wine productions industries, with more fodder production properties and market gardens along the land surrounding Hunter, Patterson, and Williams Rivers. This area is also dominated by much smaller rural properties many of which are small grazing/livestock properties which peter out on the outskirts of the National Parks lands, all totally unsuited to broad acre biofuel crop growing.

North-Western Quadrant: Beef farming is far more dominant use of rural properties as opposed to crop growing, although some is present.

South-Western Quadrant: Heavily treed National Parks dominate this area.

In view of these observations, regarding what I believe is a massive over calculation of the biomass fuel resources that will be permanently available to support Verdant Power Station operations, and the concerns they raise, I propose the following be considered prior to any subsequent approval of the Verdant project.

This may avoid any requests from the proponent to modify the Approval, at a later date, to allow vastly more polluting materials and waste matter (Potentially being: Vehicle tyres; wood materials from building demolitions and scrap wood and items from council kerbside collections), to be used as 'stop gap' fuel to maintain the plants power generation levels, due to a shortfall in the currently projected volumes of both purpose grown fuel crops and supplies of cleared invasive woody plants.

Suggested conditions:

To be completed prior to approval being obtained to restart operating the Verdant Power Station

- Proponent be required to submit to the relevant NSW Government Department (DPI?) the DP numbers of properties and the details of the property holders who

have agreed, in principle, to produce purpose grown biomass crops/tree for the Verdant Power Station.

- The proponent to require to supply a statutory declaration completed and signed by the prospective fuel crop grower which must include a property map outlining the proposed location of the purpose grown crops/trees listing the types/species of biomass fuel per hectare they are planning to grow and also to include an initial planting date for the biofuel crop. (To show that they will be in full production by year 5).
- In addition, the land holder must, within that statutory declaration, outline any additional irrigation volume needs (and supply proof of a current water licences), to support the crop's production as well as any other current water uses and volumes taken under their current water licences.
- Proponent be required to pay the costs for any government employee required to ascertain if in fact the land to be used is 'marginal land', which will be completed via a property visit/inspection, and must include an agronomists report, rather than via a desk top study (LLS?)
- Proponent to supply a draft example of the legal contract they will be requiring landholder /biomass fuel growers to enter into.

Concerns regarding a one of the suitable purpose grown biomass crops suggested by the proponent.

The proponent has suggested that 8,000 hectares of mining company land, currently classified as being under regenerated/remediation management, could be used to grow Banna Grass, being a suitable biomass fuel, which could produce 400,000 tonnes per annum, once dried and prepared for burning.

The proponent does not however, acknowledge that the mining land undergoing, or earmarked for remediated or regeneration, requires it to be returned, as closely as possible, to its prior state.

That land was previous was either heavily treed (requiring the planting and care of locally known species), or lightly treed grazing land. Neither scenario involves a planted crop for constant harvesting.

Whilst I am certain that the mining companies would welcome making a profit from land they have set aside for remediate or regeneration purposes that was not the purpose of the classification the land has been given.

NOTE Banna Grass:

Banna grass, is a hybrid cross of Pearl Millet and Napier Grass originating from Africa. If grown locally (within a 300km radius) it would require both fertilizer (nitrogen is suggested

as the best form for this crop) and regular irrigation to achieve the required growth, placing further strain on the local water resources being shared with both graziers and for the growing of other important crops such as lucerne and other fodder crops.

Banna grass can also become invasive, spreading onto other land, via pieces of broken rhizomes and self-rooting stems carried by floodwater or dropped during transportation.

We have enough invasive noxious grasses and plants spread locally via general traffic movements from the mines in the Hunter Valley already (African lovegrass, Chilean needlegrass and giant Parramatta grass are just some examples), without another contender.

Suggested Conditions

- No land classified that is held or set aside currently, or in the future, for regeneration or remediation purposes be permitted to be put under Banna grass, or any other biomass fuel production, for the purposes of supplying fuel to Verdant Power Station.
- That any contract with Verdant to supply Banna grass as a biofuel includes a clause requiring the landholder to ensure that their Banna grass does not invade other sections of their own or any other property via any means.

Concerns about the additional water requirements for the projected 850,000 tonnes (with 25% moisture content) of biomass plantation/cropped resources.

The Power Station itself will require a 3,300ML water licence to operate.

The growing of biomass fuel will also require water resources for irrigation.

As most irrigated private landholdings are located on, or near to, rivers or major creeks, which are already under volume/flow stress from major non-agricultural classified water takers [IE Coal mines, quarries and turf farms], I suggest that it could be potentially highly productive land, or landholders who already hold a high security irrigation water licence, who will be most likely to be interested in growing a biomass crop with a guaranteed annual financial return.

That may mean that during future periods of drought, or low volume flows, when general water licence holders face a reduced % take (or even zero %) situation, there will be an increased number of high security irrigation (for the supply of 'critical' biomass fuel), licence holders able to continue accessing our precious and vital water resources.

Additional, due to this, biomass crop locations may compete with current (and potentially new), fodder production cropping lands, especially if a landholder is locked into a supply contract for biomass fuel supply volumes with Verdant.

This will further reduce the availability of fodder for livestock (cattle and horses) during drought periods.

Suggested Conditions:

- That the proponent agrees to, and advises all potential biomass fuel crop growers that wish to enter into a legal contract with Verdant, that any currently held irrigation licences that are subsequently used to produce biomass crops will be subject to the same restriction conditions, during low water flows and drought conditions, as other local farming/agricultural properties.
- That no water licences, for irrigation, be approved by any water authority solely for biomass fuel crops.

Concerns regarding the long-term impacts of further fragmentation of native habitat that could occur within a 300km radius of the Verdant/Redbank site.

I am concerned that the prospect of a cash return for biomass fuel sourced from cleared native habitat lands (and potentially small stands of EECs), plus an ongoing annual cash return for plantation grown or cropped monoculture biomass species on that cleared land, will incentivize a dramatic increase in the clearing of land within 300km radius of Verdant/Redbank site. IE Further impacting a 300km radius of an already very heavily cleared and degraded part of NSW.

Habitat fragmentation and degraded landscapes are already a major issue for this part of the Hunter and this projects anticipated long term access to locally grown biomass fuel resources, that they use to support their argument for approval, will further fragment and degrade the regions remaining native habitat, potentially replacing up to 600,000 hectares it with heavily managed monoculture plantations which are not conducive to the support of native fauna nor their food sources.

Suggested Conditions:

- Proponent supplies to the relevant authority, prior to gaining approval, the planned information packages for prospective biomass growing landholders outlining a requirement to not clear native habitat, stands of old growth trees or hollow trees for the purposes of avoiding further fragmentation of native habitat, wildlife corridors and connectivity for the purposes of growing biomass fuel crops.

Concerns regarding the need for both fertilisers and herbicides for both monoculture coppiced tree plantation species and other crops grown for biomass fuel purposes.

I am very concerned about agricultural inputs, other than water, that both cropped and plantation grown biomass fuels will require. IE Fertilisers and the use of herbicide.

Biofuel crops will require fertilizers to ensure sufficient growth as well as herbicides to remove grass cover initially and prior to planting each seasonal cycle.

Plantation grown trees grown and harvested either via coppicing, thinning, or felling require management practices to ensure optimum growth.

This includes spraying herbicide on weeds and other unwanted growth between the trees, initial fertilizing for traditional forestry plantations and constant fertilizing for coppiced tree plantations with a fertilizer such as blood and bone.

The proponent has made it clear that they prefer the coppiced plantation model as they promote it as a 'green,' sustainable and renewable model.

This has the potential to increase the areas of land within the 'suggested' 300km radius of the Redbank Power station that becomes compromised due to the loss of other naturally occurring native plant species on which insects, including several species of native and wild bees' colonies depend. This will further decrease local insect populations which has already become a genuinely concerning noticeable trend.

Additionally, where irrigation is also practiced, which will be necessary constantly for coppiced tree plantations to promote rapid growth, fertilizers can enter to local water network which in turn can lead to blue green algae blooms in adjoining dams on grazing properties, creeks, and even entire stretches of rivers.

Suggested Condition:

- The proponent provides, prior to approval, the planned information packages for prospective biofuel growers encouraging restricting the use of heavy applications of fertilizer.
- The proponent provides, prior to approval, the planned information packages for prospective biofuel growers encouraging the non-use of herbicides which are harmful to bees and other pollinating insects.

'Produced ash for soil improvement' recycling proposal.

Extract from the Redbank/Verdant EIS

Ash generated by the Proposal will be regularly tested and transported off-site for beneficial use as a soil amendment in agriculture in accordance with EPA requirements. Trucks used to deliver biomass to the site will be backloaded with the ash for removal to an approved site for reuse in accordance with the *Ash from Burning Biomass Order and Exemption* 2014. Once Domestic Biomass is approved, Verdant will apply for a separate RROE for the resulting ash derived from Domestic Biomass.

The proponent has suggested that the ash produced by the power station can be recycled, by using it as a natural 'soil conditioner' and that this is also a form of 'carbon sequestering.'

However, they have not provided a calculation of the volumes of ash that would be required to be 'recycled' in this manner on a monthly nor even annual basis, hence there is no knowledge of how much ash may need to be 'recycled' during the life of this project.

Question: Will biomass fuel growers be required to accept this ash waste from Redbank as part of a contractual agreement?

I realise that the recycling of this byproduct of Verdant's proposal is a major part of their 'recycle and reuse' philosophy and was a key feature of their EA. Whilst there are pros regarding the use of wood ash in this manner there are many definite cons for this practice, especially in the case of biomass fuel production, unless done in a professional and controlled manner.

<https://www.google.com/search?q=impacts+of+excessive+application+of+woodash+to+biomass+fuel+crops&ie=UTF-8>

Extract:

Excessive application of wood ash to biomass fuel crops can lead to detrimental effects on both the plants and the soil. While wood ash can be beneficial in small amounts due to its nutrient content (especially potassium) and ability to raise soil pH, excessive application can cause issues like nutrient imbalances, inhibited seed germination, reduced biomass production, and potential heavy metal contamination.

Whilst there are three main benefits regarding the use of applications of wood ash, being: a nutrient supply; a soil pH corrector and a soil structure improver, there are multiple negative impacts to take into consideration.

Examples: The creation of nutrient imbalances; increasing saline levels in soil; raised and damaging alkaline levels in the soil; heavy metal accumulation in plant due to their presence in the wood ash (EG From burning treated wood waste such, as treated soft woods, and wood that has been treated for termite infestation); negative impacts on soil ecosystem (especially in wet conditions) and the potential to increase soil erosion.

Soil Testing:

Before applying wood ash, it's crucial to test the soil to determine its nutrient levels and pH. This helps determine the appropriate amount of ash to apply.

Controlled Application:

Apply ash at recommended rates based on soil test results and crop requirements.

Monitor Plant Growth:

Regularly monitor plant growth and health to identify any potential negative impacts from ash application.

Consider Ash Type:

Different types of wood ash may have varying compositions and properties. Use ash from a known and consistent source.

Long-term Monitoring:

Long-term studies are needed to fully understand the effects of repeated ash application on soil and biomass production.

In conclusion: While wood ash can be a valuable resource for biomass crop production, excessive application can lead to several negative consequences. Careful management and monitoring are essential to maximize the benefits of wood ash while minimizing its potential harm.

The following on the benefits, and cons, of Biochar is also of interest.

<https://www.envpk.com/what-is-biochar-uses-advantages-and-disadvantages/>

I am concerned that landholders provided with this 'free soil conditioner' for their biomass plantation, or fuel crop, will not have the expertise necessary to ensure that they do not damage their soil due to overuse. Additionally, I have concerns regarding landholders being forced to accept waste ash from Verdant/Redbank, even if they do not wish to use it, as part of a contractual agreement [IE Properties being used as a 'convenient' waste dump for the waste ash].

Suggested Conditions:

- The proponent agrees to not include any contractual obligation on the landholders who enter into an agreement with Verdant to supply purpose grown biomass fuel or crops to accept ash waste from the power station. Purely voluntary.
- The proponent provides, in advance of approval, the documentation to be included in any future information packages for prospective biofuel growers outlining the methods they should use to ascertain and maintain good soil health if waste ash from Verdant power station is applied to their land.
- The proponent submit, prior to approval, a full and detail plan to the EPA for the responsible disposal of any excess ash waste that is not accepted by landholders who supply biomass fuel to Verdant (and not just stockpile it on the site of the power station).

Harvesting, drying, and chipping of both woody invasive plants and purpose grown biomass.

Extract from Verdant's EIS

3.3.4. Biomass Fuel Receival, Transportation and Storage

All preparation including drying, chipping and screening will be performed off site by suppliers. No material will be accepted at Redbank Power Station that has not been pre-validated to show that it meets biomass fuel specifications and relevant approved use conditions of the NSW EPA. Non-compliant biomass will not be accepted.

The purpose grown biomass fuel will require regular harvesting to occur.

Where mechanical means are to be used what noise and time restrictions will be applied and which agency will ensure these are adhered to?

The proponent has stated that they will only take delivery of pre dried and correctly sized chipped biomass fuel from plantations or crop sources.

Where will the drying take place?

If the drying is done on the land used for growing purposes, what facilities will need to be built? EG If drying sheds required what extra burden will this place on the electricity grid supply?

Where will the chipping occur?

If on the land used for growing purposes, what noise restrictions would be potentially placed on the hours of operation, and which agency will monitor this?

If invasive native and non-native plants (EGs Lantana and African Olive) are to be dried and chipped at an industrial location away from where they were sourced how will this be managed under the Hunter Regional Strategic Weed Management Plan

https://www.lls.nsw.gov.au/_data/assets/pdf_file/0010/806509/Hunter-Regional-Strategic-Weed-Management-Plan-2023-2027.pdf

Extracts:

Control order

Control orders establish control zones and related measures to prevent, eliminate, minimise or manage a biosecurity risk or impact. Species regulated under a control order must be immediately destroyed and the land kept free of that species. Control orders are used to manage weeds under approved eradication programs and last for a maximum duration of five years (or can be renewed for longer-term eradication programs).

The physical characteristics of weeds allows them to be easily introduced to the Hunter, be spread throughout the region, and invade natural, agricultural and urban areas, by a range of mechanisms such as:

- The movement of contaminated items such as grain, fodder and machinery
- Sale of prohibited plants via online platforms, markets, roadside stalls, nurseries, pet stores and aquariums
- Waterway flows and ocean currents
- Releasing unwanted aquatic plants into local waterways
- Dumping of plants, garden waste and grass clippings into natural areas
- Movement along utility easements and transport corridors

How will the requirement for **immediate destruction of woody weeds** like non-native lantana (which can regrow from a piece of stem) or African olive that has seeds on it be attained if transported for drying and/or chipping to another location?

Suggested Conditions:

- The proponent shall provide legally binding assurances that none of their contracted growers will harvest biofuel crops using mechanical means that contravene any time and noise restrictions. These restrictions/requirements should also be included in any examples of contracts that the proponent is required to provide prior to approval.
- Prior to approval, the proponent is required to supply an estimation of how much electricity will be required for drying purposes, by volume, for different types of

biomass fuels crops, as a percentage of the amount of electricity the Verdant/Redbank power plant will generate.

- If the any woody weed/plant material contains noxious or invasive weeds then all drying, storing and chipping must be conducted on the source property and the load fully covered/contained to avoid spillage onto road reserves on route to the Verdant/Redbank power station site.

The use of a constant 125,799 tonnes of dry fuel sourced from land clearing for major infrastructure projects and other approved projects and developments as a fuel source.

The suggestion that timber and woody weeds sourced via clearing activities for major infrastructure projects and any approved projects and developments could be a permanent source of a set volume of biomass fuel for the Redbank power station is very concerning.

This would include all future and current clearing for coal mining and quarries, including expansions. Additionally, it would include all greenfield developments (housing and industrial parks).

This could then lead to unnecessary full clearing being conducted, for payment to the mining, quarrying of development company, based on the volume of cleared timber supplied, rather than selected clearing aimed at reducing fragmentation of native habitat and lose of connectivity to the remaining old growth forested areas.

However Verdant appear to view land clearing for these purposes as purely an opportunity to easily obtain their estimated annual volumes of fuel.

Extract from Verdant EIS:

Verdant Earth have been developing supply agreements with companies that have commercial volumes available of waste biomass from approved clearing activities. It is however important to note that suppliers will change from year to year as market conditions and project development will create opportunities for feedstock fuel sources.

Suggested Condition:

- The proponent be required to display on its website a Statement of Support for the natural environment which includes suitable guidelines for retaining green spaces, including native habitat and food sources for native when undertaking clearing for both greenfield developments and government infrastructure projects.
- The proponent is not permitted to pay any developer of government contractor for the supply of either cleared timber or woody weeds from either greenfield development of government infrastructure project.
- The proponent, in lieu of payment to the suppliers, be required to make a payment equal to the value of the processed tonnage of timber or woody weed to selected

non-profit environmental and conservation groups to support their efforts to protect, conserve and increase native habitat within NSW.

I realise that some of these suggested Conditions for Approval may not be easily placed solely upon the proponent of the project.

However, I am sure there must be a mechanism to impose them on the relevant party if they sign a future agreement with Verdant to supply biomass fuel sources or become part of the supply chain processes.

I urge you to take them all into consideration when making your final recommendations and decision.

Yours sincerely,

Pamela Austin.