COMMENTS ON THE REQUEST OF 25th FEBRUARY 2016 BY AGL FOR AN EXTENSION OF THE LAPSE DATE FOR THE SILVERTON WIND FARM

by

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17th March 2016

Introduction:

On 25th February 2016, AGL submitted a request to the NSW Department of Planning and Environment for an extension to the lapse date of the Silverton (NSW) wind industrial complex. I argue below that many of the statements made in this request are false, that AGL displays misleading and deceptive conduct while engaged in trade and commerce and that significant omissions were made by AGL.

Furthermore, I argue that much of the science that underpins AGL's request is at best equivocal and, at worst, demonstrably wrong. In AGL's submission they state that they will protect and manage the sensitive biodiversity and suggest that this includes the tawny rock dragon. A scientific search would have shown AGL that this species does not occur in NSW.

I argue that the environmental and economic damage from inadequate decommissioning will sterilise a large part of the Broken Hill Domain from future exploration by evolving deep-penetrating geophysical techniques. The Broken Hill area is one of the most prospective exploration areas in the world. I further argue that the land disturbances before, during and after the operation of the Silverton wind industrial complex will permanently contaminate the area thereby rendering future geochemical exploration useless (especially in the light of the absence of background pre-construction data).

Since acquisition of the project in 2012, AGL have undertaken no capital works and have not justified an extension of the lapse date.

Detailed comments

In AGL's 25th February 2016 **Request for Extension to Lapse Date**, under **a) Importance of the project,** AGL does not point out that wind-generated electricity will not replace conventional base-load unsubsidised fossil fuel generated electricity[1], that wind-generated electricity is intermittent,

[1] *The total unreliability of substituting wind and solar for fossil fuel electricity*, Carlin Economics and Science, 26th February 2016

unreliable and subsidised for a limited time, that grids are having great difficulty in balancing supply and demand with intermittent supply of electricity, that major interconnectors have failed and that there is a massive loss of electricity when power is generated in remote areas and transmitted to users in more highly populated areas. AGL does not state that wind-generated electricity would not be possible without coal-generated electricity. The example of South Australia will be used later in this objection to AGL's request for an extension.

In AGL's 25th February 2016 **Request for Extension to Lapse Date**, under **a) Importance of the project**, there are misleading statements. Production in the order of 700,000 MWh per year means nothing to the average person (i.e. the electorate). What is not mentioned is that this figure is for the maximum production (i.e. if the wind blows constantly). Such conditions only exist in Antarctica with constant katabatic winds.

Furthermore, the claim that there is "*a reduction of approximately 588,000 tonnes of CO_2 per annum for the life of the project*" is false. Presumably this calculation was based on the amount of electricity that could be produced from a wind industrial complex and the maximum amount of CO_2 emissions released by coal-fired power generation for the equivalent amount of energy. What is not taken into consideration in the calculation is the amount of energy used and CO_2 released in the exploration, mining, beneficiation, transport, smelting and refining of the iron, copper and other metals to produce the steel pylons, copper wiring and magnets.

Furthermore, there is energy used and CO_2 produced to mine limestone, shale and aggregate, convert limestone and shale to cement, manufacture concrete and for the component transport, construction and maintenance of the wind industrial complex. In addition, because wind-generated electricity generation is unreliable, coal-fired generators need to be on standby 24/7 (i.e. spinning reserve) thereby emitting CO_2 and hence there are no savings in CO_2 emissions. It is the exact opposite.

These calculations are simple[2] and show that the amount of energy generated by a wind industrial complex is less than the energy needed to construct and maintain the complex. Furthermore, the CO_2 emissions generated from electricity produced by a wind industrial complex are more than that of a conventional coal-fired power station. The total CO_2 and energy budgets show that wind industrial complexes consume energy and emit CO_2. This has been known for a long time and the statement by AGL is demonstrably false.

The statement "*a reduction of approximately 588,000 tonnes of CO_2 per annum for the life of the project*" is also misleading because AGL own and operate the Loy Yang (Vic.) lignite-burning power station that has 3 times the CO_2 emissions of a gas turbine power station. Loy Yang provides Victoria with 30% of its electricity needs and uses low calorific, high sulphur, high ash and water rich lignite. If AGL were concerned about the environment and emissions, they would immediately close Loy Yang because it adds greenhouse gases (H_2O, CO_2),

[2] Plimer, Ian 2014: *Not for greens*. Connor Court.

pollutants (SO_2, NOx) and particulates to the atmosphere. AGL also own power stations in the Lake Macquarie (NSW) area that burn semi-bituminous and bituminous coal. These power stations provide NSW with 30% of its electricity needs. Burning high ash, high calorific, low sulphur Permian coals from the Hunter Valley adds CO_2 to the atmosphere. AGL also operate or have suspended operations at the Torrens (SA), Dalton (NSW) and Tarrone (Qld) gas-fired power stations for peak- and base-load power. Burning of hydrocarbon gases releases CO_2 into the atmosphere. AGL also burn landfill gas, biomass and biogas for electricity generation, processes that all release CO_2 into the atmosphere. In **Justification of the project** (p1-2), points a, b, c and d in AGL's submission are rejected because of a lack of validation. Furthermore, the economic impact of deconstruction has not been addressed.

The figures used by AGL of 700,000 MWh *per annum*, power for 120,000 homes (based on average Australian consumption of 5 MWh/y), a saving of 588,000 tonnes of CO_2 emissions *per annum* and a saving of 730 million tonnes of water *per annum* are incommensurate with the Silverton Wind Farm Developments documents[3] where is was claimed that 3,500,000 MWh *per annum* would be generated, this would power for 437,500 homes, there would be a saving of 3.5 million tonnes of CO_2 emissions *per annum* and a saving of 4,600 million litres of water *per annum*. Even if the proposed project has been scaled down, the absolute and proportional figures are wrong. If incorrect figures are presented by AGL or its subsidiary to the Community Consultation Committee, then there can be no confidence that any number, proposal, promise or argument presented by AGL can be validated or is correct. Furthermore, in the 25th February 2016 **Silverton Wind Farm – Request for Extension to Lapse Date** (p. 2) there is a claim that there will be 400 full time job years, an order of magnitude lower than that promoted on the AGL website (3,988 full time equivalent regional jobs[4])[5].

On p. 2 of AGL's 25th February 2016 **Request for Extension to Lapse Date**, under **b) Economic Benefits**, there are significant omissions regarding the negative economic impact of a wind industrial complex at Silverton. Extrapolation from the Hallett (SA) to Silverton (NSW) projects needs to be justified because the former area is a cropping and grazing area whereas the latter area is a relatively pristine, isolated hilly rangeland area. Silverton is attractive to AGL because it is windy and no payments need to be made to freehold landowners. In the financial years 2007-2012, AGL made profits of $280 million from wind industrial complexes it had developed and sold with 25 year offtake contracts, priced at $112/MWh. AGL will have to pay about $40 million a year more for electricity than it would have had to without wind industrial complexes[6]. There are no economic benefits to AGL shareholders with AGL's wind industrial complexes.

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[3] Silverton Wind Farm Developments (Community Update No 3, May 2008)

[4] Neither full time job years nor full time equivalent regional jobs are defined by AGL

[5] https://www.agl.com.au/-/media/AGL/About-AGL/Documents/How-We-Source-Energy/Wind-Environment/Silverton-Wind-Farm/Assessments-and-Reports/2012/environmental-assessment.pdf?la=en

[6] Bank of America/Morgan Stanley: AGL Energy – Wind strategy biting back. Company update 14th May, 2014

It is hard to understand the economic benefits when for every $1 in the fall of the electricity price, AGL's coal-fired thermal power stations (Loy Yang, Vic.; Bayswater and Liddell, NSW) would lose $25 million[7]. The real price at a 6.3% IRR for a NSW wind industrial complex should be about $80/MWh hence there is little economic benefit in building a wind industrial complex at Silverton. More industrial wind complex electricity lowers the wholesale electricity price hence if AGL goes ahead with Silverton, it damages other parts of their business (i.e. base-load coal-fired electricity generation). Furthermore, wind industrial complexes are expected to have a working life of 25 years but the renewables energy target mechanism expires in 2030. Battery storage (e.g. Tesla Powerwall) could change the whole market hence investors have downgraded AGL[8].

Therefore, the Silverton wind industrial complex will only have access to this revenue for 13 years after which time Silverton will have to rely on the subsidy-free wholesale price of electricity. In the interim, there is uncertainty about the massive increases in electricity prices for the consumer and how this translates in elections as opposition to the LRET is unknown. It could therefore be argued that AGL's 25th February **Silverton Wind Farm – Request for Extension to Lapse Date** is a wait-and-see attempt to hold the project while undertaking no activity and no capital expenditure. Maybe the Department of Planning and Environment could adopt a policy of "use it or lose it'.

AGL have not submitted a budgeted work program for the **Extension to Lapse Date**. The NSW Government requires this for other activities (e.g. mineral exploration) and failure to undertake the budgeted work program results in the loss of an exploration licence. The NSW Government should use the same process for the **Request for Extension to Lapse Date**. If the program for the previous extension was not carried out or significant capital works had not been undertaken, then the extension should not be granted. The NSW Government does not grant Exploration Licences for holding, speculation or waiting for better market conditions and if it appears that AGL is request an extension until there is more economic certainty, then the extension should not be granted.

Although AGL recognise the high prospectivity for mineral deposits in the project area[9], they have failed to understand the nature of mineral exploration and the evolution of technology. For example, tabulated comments[10] show that AGL believes that once there has been a one-pass exploration, then the area has been explored and that there is no further potential for a mineral deposit. This is at best naïve and at worst misleading and deceptive.

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[7] http://reneweconomy.com.au/2016/no-carrot-no-stick-why-australian-renewable-projects-are-stalled-71644

[8]http://www.businessspectator.com.au/article/2015/5/20/energy-markets/morgan-stanley-downgrades-origin-and-agl-due-tesla-powerwall

[9] https://www.agl.com.au/-/media/AGL/About-AGL/Documents/How-We-Source-Energy/Wind-Environment/Silverton-Wind-Farm/Assessments-and-Reports/2012/preferred-project-submission-report.pdf?la=en

[10] p.80: https://www.agl.com.au/-/media/AGL/About-AGL/Documents/How-We-Source-Energy/Wind-Environment/Silverton-Wind-Farm/Assessments-and-Reports/2012/preferred-project-submission-report.pdf?la=en

AGL claim that there will be "*ongoing liaison and consultation with the Mineral Exploration licence holders*.[11]" The claim that there has been ongoing consultation with the mineral exploration licence holders is false. At the time, the largest area of exploration title was held by Broken Hill Operations Pty Ltd, a subsidiary of the then ASX-listed company CBH Resources Ltd. I was a technical director[12] of CBH then and until its takeover by Toho Zinc Ltd, AGL did not consult CBH Resources and there is no record in technical or board papers of such contact after this statement in the Preferred Project Report. I have asked geological staff of the time whether there was any informal contact and they cannot recall any continuing contact with AGL. I am a director of Silver City Minerals Ltd[13], a former field hand was informed of Community Consultative Committee meetings and, since his retrenchment from Silver City Minerals Ltd, there has been no communication with Silver City Minerals.

AGL claim[14] "*The Silverton Wind Farm infrastructure will occupy about two percent of the total site and will not unreasonably limit mineral exploration within it."* This is false. The infrastructure does not limit exploration, it prevents exploration. Electric, magnetic and pulsed fields are widespread, they cover large areas and volumes within which a small volume target is hidden at depth and the fields just do not cover the area of the infrastructure. Interference to these fields is permanent if all conductive infrastructure is not removed after the working life of the wind industrial complex.

As a result of a century of prospecting and exploration, it can safely be concluded that no new ore deposit crops out. However, beneath a depth of about 100 metres, the high prospectivity cannot be dismissed. New geological, geochemical and geophysical techniques are constantly invented and build on the previous century of prospecting and exploration. New techniques are more sensitive, can detect covered targets and can explore far deeper targets than even 5 years ago when AGL dismissed the prospectivity of the Willyama Supergroup in the Broken Hill Domain.

Exploration is not a one-pass process, it is cumulative and it commonly takes decades and many companies before a mineral deposit can be found and mined. Use of new techniques and more refined data processing is not just restricted to the Broken Hill area. For example, Catalyst Metals Ltd is exploring the northern extension of the Bendigo Goldfield. Bendigo was a Tier 1 deposit that produced 23 million ounces of gold and the revenue from mining gold built Victoria. Some new techniques by Catalyst Metals Ltd have failed, others have been successful and the end result is that there are a series of targets covered by variable thicknesses of Murray-Darling Basin sediments that have now been

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[11] p.77: https://www.agl.com.au/-/media/AGL/About-AGL/Documents/How-We-Source-Energy/Wind-Environment/Silverton-Wind-Farm/Assessments-and-Reports/2012/preferred-project-submission-report.pdf?la=en

[12] Director 3rd February 1998-30th September 2010; currently an advisor to CBH Resources Ltd

[13] Director 21st February 2011 - present

[14] p.77: https://www.agl.com.au/-/media/AGL/About-AGL/Documents/How-We-Source-Energy/Wind-Environment/Silverton-Wind-Farm/Assessments-and-Reports/2012/preferred-project-submission-report.pdf?la=en

detected are drilled using a new drilling technique[15]. Such exploration was not possible a decade ago.

Modern non-invasive EM techniques can be undertaken by low-flying aircraft, a process not possible proximal to wind towers that would be higher than the flight path. Modern ground and airborne EM techniques would detect from the air or from the ground reinforcing in concrete, steel drill hole casing, wiring and magnetic fields – all of which are present in a wind industrial complex. Although the fingerprint of an orebody is small, a very large footprint needs to be explored to find the fingerprint and the proposed wind industrial complex would sterilise one of the most prospective areas in the world for ore deposits. Ground EM techniques use both fixed and moving loops, such surveys detect conductors at a considerable lateral and vertical distance and such surveys would be impossible proximal to a wind factory thereby sterilising the area and preventing modern exploration. The same arguments apply for resistivity, magneto telluric, seismic and other techniques.

New ultra-powerful IP techniques are constantly being invented and refined (e.g. Zeus™, Typhoon™). It was the Zeus™ system that led to the discovery of one of the biggest non-outcropping Tier 1 ore deposits in the world by Ivanhoe Mines Inc. The same company has developed an even better proprietary deep-penetrating IP system (Typhoon™) and the parent company in Toulouse is developing proprietary electrical, seismic and sonic pulsing exploration systems (iPulse™)[16]. Use of the iPulse™ techniques for exploration in the wind industrial complex area would not be possible because of electrical interference, micro seismic activity from vibration and interference from infrasound to ultrasound frequencies. The exclusion of modern geophysical exploration techniques in one of the most prospective areas in the world for base metals has not been addressed by AGL.

Sterilisation of one of the greatest exploration provinces in the world has profound economic implications. There is a huge negative economic consequence of a wind industrial complex at Silverton and the building of such a structure with permanent sterilisation is an act of economic vandalism towards the industry that has kept Australia solvent by contributing $860 billion to the public coffers over the last two decades.

For example, the revenue generated by the Broken Hill Zn-Pb-Ag deposit led to the industrialisation of Australia and filled the NSW Treasury coffers for more than a century[17]. The orebody has been producing wealth, taxation and employment for 133 years. Another discovery, even if it were 10% of the size of the original Broken Hill, would have an enormous economic impact on the Far West, NSW and Australia.

No wind industrial complex could possibly make such an economic contribution to Australia. This is shown by the fact that Broken Hill has had a

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[15] Catalyst Metals Ltd release to the ASX, 8th March 2016

[16] The writer was a founding director of Ivanhoe Australia Ltd until takeover by Rio and is a director of Ivanhoe's Vancouver-based high-powered exploration entity HPXploration Inc.

[17] Blainey, Geoffrey 1968: *The rise of Broken Hill*. Macmillan.

maximum population of 37,000. No town dependent upon a wind industrial complex has ever maintained a population this size and for such a long time or has had a profound economic impact to the country. If it were not for the Broken Hill orebody, there would have been no City of Broken Hill.

Ultrasensitive geochemical analytical techniques can now detect on atom in 10^{15}. Such techniques use elemental chemistry, stable and radiogenic isotopes and are now being applied to volatile elements that can leak up from ore deposits kilometres below the surface. Land disturbance, vehicles (e.g. Zn contamination from tyres), use of hydrocarbons, Mo-bearing greases etc in drilling and transport all leave an anthropogenic trace element and isotopic fingerprint that interferes with the natural geochemistry. The rare earth elements are commonly used a vector elements for mineral deposits and the use of rare earth magnets may contaminate a broad area of geological prospectivity.

The disarticulation of wind turbines and fires in generators are not uncommon and, for the purposes of future exploration, the chemistry of the turbine blades used needs to be known because residue is spread over a large area. AGL has not undertaken base-line trace element and isotope geochemical survey of the soils and substrate hence AGL is unable to quantify and assess the degree of land contamination from their activities.

Because the chemistry of the metal alloys used in construction material and the turbine blades is unknown, there could be huge contamination of a large area by elements and isotopes that can only be detected by ultrasensitive analytical techniques. This information is not available hence future exploration will have no pre-wind industrial complex baseline data. Without such information, there would be a generational impediment to future exploration.

There is a huge amount of data on the Broken Hill orebody, Broken Hill regional geology and exploration history, this information has never been compiled and is now being compiled[18]. A major compilation combined with new unpublished data is in progress and this will be available to AGL upon publication[19]. New advances in geology, geochemistry and geophysics are continually being made, most of these are published decades after their discovery and use because of the proprietary and competitive nature of the research.

The conclusion is that no modern geochemical and geophysical exploration would be possible within kilometres of any infrastructure associated with the wind industrial complex during its working life. Widespread chemical contamination is possible thereby destroying the ability to capitalise on modern high-precision geochemistry in one of the most prospective areas in the world. This geochemical contamination would be permanent. In many projects, sterilisation drilling is undertaken to guarantee that new infrastructure is not sited on an orebody at depth. This is not possible at the proposed site because of

[18] Groves, Iain and Plimer, Ian, 2016: *The giant Broken Hill Pb-Zn-Ag deposit, NSW*. In Australian Ore Deposits Monograph, Australasian Institute of Mining and Metallurgy.
[19] Plimer, Ian and Groves, Iain, 201X: The Broken Hill Pb-Zn-Ag deposit, Australia: past, present and future. Invited issue of *Ore Geology Reviews*.

the large area, the lack of baseline geochemical and geophysical studies and the land title.

I would have no objection on exploration grounds if AGL were to leave conductors in the ground in areas such as White Rock (NSW), Collector (NSW) and Flyers Creek (NSW). These areas have no known Tier 1 mineral deposits, no exploration prospectivity and minerals in these areas have had little or no contribution to the State or National economy.

By contrast, Broken Hill has been the largest accumulation of lead, zinc and silver in the world. The grades and tonnes of Broken Hill-type ore could sustain a deep mine, as the North Mine has shown. Tier 1 deposits don't occur in isolation (e.g. Iberian Pyrite Belt, Abitibi Belt) and there is every expectation that there are high grade Broken Hill-type deposit at depth just as there is every expectation that some high grade deposits were removed during major peneplanation events in the Mesoproterozoic, Neoproterozoic, Permian and Cretaceous-Tertiary weathering.

In the **Silverton Wind Farm Developments Preferred Project and Submissions Report** (p.79), it is claimed that the EA is "*an extensive document that has been prepared by experienced specialist consultants*". This is untrue. The listed specialist consultants have neither experience nor knowledge of mineral exploration. It is also claimed that the presence of wind industrial complex infrastructure would not impact on the use of "*gravity and electric remote sensing methods*." The vocabulary is that of a person who has no understanding of mineral exploration and is certainly not a specialist.

The statement "*It is proposed not to remove underground wind farm equipment, including foundations and electric cables, at the time of decommissioning because of the environmental impacts of removing sub-surface infrastructure*" shows that AGL have planned to permanently environmentally damage the site of the wind industrial complex. If there are environmental impacts for the decommissioning of a wind industrial complex then even greater environmental impacts occur with the commissioning and hence the wind industrial complex should not be constructed. In 8.10 in <u>The Mineral exploration impacts</u>, there is no demonstration of even a basic knowledge of mineral exploration demonstrating that no specialists were used.

Decommissioning of the wind industrial complex would leave reinforced concrete, casing and buried wiring that would permanently sterilise the area from future integrated geophysical exploration. The economic impact of this is profound because no new zinc deposits have been found in the last 25 years, major zinc deposits are becoming exhausted, no new zinc deposits are being developed, the life of the Broken Hill zinc-lead-silver mines is limited and the demand for zinc is increasing (i.e. galvanising, alloys, tyres, chemicals, medicines). The gap between production and consumption is already stimulating exploration and, even if a big zinc deposit was discovered today, it could take more than a decade before this supply-demand gap could be reduced. Zinc is a sacrificial metal for which there is no substitute.

My concerns about permanent sterilisation of one of the most prospective exploration areas in the world were expressed *inter alia* to Minister Frydenberg on 19th March 2016 (Federal Minister for Resources, Energy and North Australia).

The AGL website espouses how AGL use the precautionary principle. They don't. If AGL would apply the precautionary principle, then they would not permanently sterilise an area by leaving conductors on and in the ground and by chemically contaminating the site. If AGL applied the precautionary principle, then they would not allow Silverton residents to be affected by variable frequencies of sound because recent scientific research shows that the effects can be felt 10 km or more from wind industrial complexes. Silverton is a very quiet outback hamlet, the sound baseline is lower than in many other areas and hence the effects of all frequencies of sound are greater than in other areas. This information is well known and was omitted by AGL.

Mining companies are required to lodge a substantial bond to rehabilitate once mining has ceased. This is because many mining companies operate through a $2 Pty Ltd company, companies can become insolvent for a diversity of reasons and the NSW Government requires a bond in case a post-mining rehabilitation needs to be undertaken by the Government.

AGL's operations at Silverton are through three unlisted Pty Ltd subsidiary companies that are structured in the same way as mining company subsidiaries. These companies have no cash flow, no cash reserves and, because they are unlisted, have little ability to raise funds but can drawdown debt from the parent. However, the parent company carries no liabilities such as the costs for removal of conductive concrete, cabling and casing that would sterilise future mineral exploration.

There is considerable uncertainty about changes brought by the NSW Department of Planning and Environment. The draft NSW Wind Farm Guidelines 2011 (p. 7) indicate that the guidelines require the wind industrial complex owner rather than the landowner to retain responsibility for decommissioning. For example, the 10th July 2012 conditions for approval of the White Rock Wind Farm are that the proponent prepares a decommissioning and rehabilitation plan with the provision for a "*decommissioning bond or other funding mechanisms, where the plan concludes that estimated costs and funding arrangements are inadequate*." (Clause G10).

The 2nd December 2013 consent conditions for the Collector Wind Farm (p.35) state "*The updated Plan shall include estimated costs of and funding arrangements for decommissioning, including provision for a decommissioning bond or other funding mechanisms, where the Plan concludes that estimated costs and funding arrangements are inadequate."* The same words above appear on p. 34 of the recommended consent conditions of the PAC for the Flyers Creek Wind Farm (14th March 2014) and p. 29 of the Crookwell 3 Wind Farm (February 2015). However, for the Crudine Ridge Wind Farm (December 2015), in its assessment report to the PAC, the Department of Planning and Environment stated "*The Department has obtained legal advice indicating that it is the*

proponent's obligation to cover any financial costs associated with decommissioning and rehabilitation, and that the Department does not have the capacity to impose a condition of consent which requires a bond for security for decommissioning and rehabilitation, especially on private land."

Hence, the consent conditions regarding decommissioning on White Rock, Collector and Flyers Creek and recommended for Crookwell 3 may not be legal. The Minutes from the Jupiter Wind Farm Community Consultative Committee Fifth Meeting (2nd December 2015, p. 6-7) show that the Department advised "*Under the current legal framework, in the event that the owners/operators of a wind farm are unable to fulfil the decommissioning and rehabilitation under a planning approval, the obligation for these works could potentially reside with the owner of the land (as the development rights and obligations apply to the land which is the subject of the application*)" and "*However, where the company becomes insolvent, the owners of the land may be required to comply with the decommissioning and rehabilitation obligations under the consent. This is because in NSW the development rights and associated conditions apply to the subject land (rather than to a particular person or corporate entity)".*

The conclusion is that the NSW Government has no legal power to compel wind power generators to set aside funds for decommissioning a wind industrial complex (and has ceased recommending consent conditions that would have that effect). In the event that the operator does not have funds at the end to cover decommissioning costs, the responsibility to decommission the wind industrial complex would likely fall on the landowner because "*the development rights and obligations apply to the land which is the subject of the application."*

In eastern NSW, the landowner may well have to pay the cost of decommissioning and rehabilitation, especially if the wind power generating company becomes insolvent. The corporate structure of wind companies allows for easy insolvency with no liabilities to the parent company. In the case of Silverton, the three paper subsidiaries of AGL could easily become insolvent (with no liabilities to the parent company) and, because the site is Crown Land, the NSW Government would be liable for decommissioning and rehabilitation. By its own actions, the NSW Government could face huge decommissioning costs.

The NSW Government continues to encourage exploration and mining in NSW and, unless it removed electrical conductors, then no modern future exploration could be undertaken. Exploration interest in one of the most prospective areas in the world would decrease as a result of permanent sterilisation and sovereign risk would be increased. Each year the Fraser Institute in Canada publishes a risk analysis of worldwide exploration and mining and NSW is currently already not where it should be on the international rankings[20] and destruction of one of the areas of high prospectivity will only push NSW further down the investment rankings.

This is a long-term future economic loss for the Broken Hill district and this has not been dealt with in the **AGL Request for Extension to Lapse Date**.

[20] https://www.fraserinstitute.org/categories/mining

This needs clarification by the NSW Department of Planning and Environment. In the interim, a bond should be placed in escrow for the total removal of all electrical conductors during decommissioning on the same basis that mining companies place a bond or bank guarantee. For example, CBH Resources Ltd has bonds of $18.2 million and $12.1 million respectively for their Endeavor (Cobar) and Rasp (Broken Hill) mines.

In AGL's 25th February 2016 **Request for Extension to Lapse Date**, under **c) Improvements in Technology,** I draw attention to the discussion above on new high precision geochemistry and EM, resistivity, IP and pulse geophysical technology. AGL claims that an extension is needed to "*evaluate new more efficient wind turbine generator technologies, primarily the rotor diameter and the overall height*". This is not new technology that needs to be invented, it is a slight modification of existing technology that can be undertaken by desktop computer modelling studies. However, if AGL desire an extension to evaluate improvements in technology, then the same criterion should be applied to mineral exploration. No new extension should be granted until the area is understood geochemically and geophysically.

In AGL's 25th February 2016 **Request for Extension to Lapse Date**, under **d) Focus on renewables**, AGL does not point out that the proposed wind industrial complex has potential negative economic benefits when wind provides little or no electricity. These periods can last for a week, as they did in Germany in mid November 2012[21]. Without other sources of electricity supply, the grid would collapse during these periods unless demand was arbitrarily reduced, even if these periods are for a few minutes. With such unreliable wind-powered electricity, no underground mine in Broken Hill could operate using wind power, especially at night when the wind invariably does not blow. No deep underground Broken Hill mines can operate safely or efficiently when the electricity supply is unreliable.

AGL is not in the business of renewables for environmental reasons. AGL have developed many wind industrial complexes at a construction cost of about $2.4 million/MW and sold the complexes for an average price of $3 miilion/MW.

AGL is in the business of construction and selling wind industrial complexes. At an-all in generated price of ~$110/MWh, the current market is not favourable with LGCs selling for $30-35/MWh, coal-fired electricity selling for $60/MWh and uncertainty about a carbon tax and subsidies. Bank of America/Merril Lynch estimate that AGL is losing ~$$80/MWh (excluding carbon tax) for its wind industrial complex developments[22]. There is no guarantee that AGL will construct or will be the final operator of a Silverton wind industrial complex. This only serves to continue the constant uncertainty for the Silverton community.

[21] http://www.powermag.com/renewable-intermittency-is-real/?pagenum=3
[22] Bank of America/Merrill Lynch: AGL Energy – Wind strategy biting back. Company update 19th May 2014

Table 1: Wind industrial complexes developed and sold by AGL (Bank of Americal/Merril Lynch Global Research estimates)

Complex	**Year**	**Capacity (MW)**	**Construction cost**	**Sale price ($m)**	**Sale $m/MW**
Hallett 1	2007	95	200	258	2.7
Hallett 2	2008	71	159	218	3.1
Hallett 4	2009	132	310	398	3.0
Hallett 5	2011	53	129	159	3.0
Oaklands	2011	67	202	240	3.6

The best example of wind power unreliability is South Australia. South Australia has been given the dubious honour of "Australia's wind farm capital". In southeastern Australia in January 2014, the grid needed 12,000 MW at peak when the air temperature was >40°C for days. The 28 wind industrial complexes in SE Australia could only provide 128 of the 12,000 MW required and it was coal that provided the base load electricity for air conditioning. When the wind industrial complexes were needed to provide the necessary electricity for cooling, they only operated at <5% capacity.

Public records show how glorious and great South Australia is with its wind industrial complexes. During the 45°C heat wave on 14th January 2014, South Australian electricity wholesale prices spiked at $10,515/MWh. The power grid failed and many people were without electricity. This was by far the world's most expensive electricity with the price somewhat higher than the long-term spot price of $70/MWh. In South Australia, 40% of the electricity is supposed to come from wind power. It doesn't. If the wind was blowing concurrently at 11 m/s at every wind industrial complex in South Australia spread over hundreds of kilometres, then the nameplate 2014 capacity would be generated (1,203 MW). Only some 60% of South Australia's notional generating capacity is available when the system fails, failure is not an isolated incident and occurs 100 times a year.

In late 2015, South Australia had 17 sites with 1,477 MW of notional capacity from wind power generators, some 40% of the state's total generating capacity and yet it is highly unreliable. For example[23], at 10.30 pm on Sunday 1st November 2015, a widespread blackout occurred and 110,000 homes were affected by unplanned load shedding when a 275,000 volt interconnector between South Australia and Victoria caused a series of rolling blackouts as automatic safety systems began load shedding[24]. This was at a time when the wind was not blowing and a time of low demand when major consumers of

[23] Widespread power blackout hits Adelaide. *The Advertiser*, 2nd November 2015
[24] SA to push for electricity sharing, *9 News*, 2nd November 2015

electricity were not in full production (e.g. factories). This is the end result of relying on wind power for domestic and industrial use. AGL's focus on renewables is economically damaging and does not auger well for AGL's balance sheet.

On 1st November from 4 am until noon, South Australia's wind industrial complexes were generating <100 MW (i.e. 6.7% of capacity) falling to 10 MW at 10 am. The afternoon coastal breezes produced 700 MW (i.e. 47% capacity) for an hour. This was the best the wind industrial complexes could do that day, less than half of total capacity for one hour out of 24 (i.e. 4.16% of the day). Output was 150 MW at midnight and a drop of 550 MW over three hours has the capacity to trip interconnectors. The most rapid drop was 250 MW over 20 minutes just before 9 pm. It is misleading for AGL to claim that wind power provides power for 120,000 homes. Wind industrial complexes produce blackouts for far more homes. Electricity grids were not designed to cope with rapid variations of input hence it is not surprising that dependency on wind results in blackouts.

South Australia will face even greater problems in 2016 with the 2016 closure of Alinta's Port Augusta plant and the mothballing of the GDF Suez Pelican Point CCGT plant in 2014. The power purchase agreements (PPAs) between wind power companies and retailers are built around the subsidies associated with the Large-Scale Renewable Energy Target (LRET) that are directed to wind power generators as renewable energy certificates (RECs). The prices set guarantee a return of $90 to $120/MWh for every MWh delivered to the grid. In AGL's Annual Report, they complained that they must pay $112/MWh under PPAs for wind generation and such PPAs run for at least 15 years (with some for 25 years). Retailers can purchase reliable coal-fired power from Victoria at $25-35/MWh. Wind power, even with its generous subsidies, is uneconomic.

The arguments that "renewable"-generated electricity is cheap, clean and green is a fallacy. The argument that if the wind is not blowing here, then it will be blowing there is a fallacy. For example, on 16th February 2016 the production from wind industrial complexes across the SE Australian grid was South Australia 0 MW, Victoria 18 MW, New South Wales 2 MW and Tasmania 26 MW at 10.36 am whereas at 12.12 am it was South Australia 38 MW, Victoria 26 MW, New South Wales 0 and Tasmania 24 MW. Electricity is an essential service, the more cheap electricity generated, the more jobs are created and yet power prices have risen 90% in South Australia over the last year[25].

If a single 3 MW wind generator at a cost of $3 million is operated 24/7 for a year at a capacity factor of 35%, that single turbine will receive 9,198 RECs annually. At $93 a REC, in 12 months that 3 MW turbine will earn $855,414 in REC Subsidy. If the turbine operates until 2031, it will earn $13,686,624 in subsidies over the remaining life of the LRET. This is paid for by the consumer.

[25] Potter, Ben and Evans, Simon 2016: SA business fears years of high costs. *Australian Financial Review* 2nd March 2016

Table 2: Total subsidies passed on to the electricity consumer for wind-generated electricity.

Year	**Target** (millions of MWh)	**Shortfall** (millions of MWh)	**Shortfall charge in $millions** (recovered by retailers at $93/REC)	**Total recovered by retailers in $millions** (as RECs and shortfall charge at $93)
2015	18.850	2.850	$ 265.050	$1,853.050
2016	21.431	5.431	$ 505.083	$1,993.083
2017	26.031	10.031	$ 932.833	$2,420.833
2018	28.637	12.637	$1,175,241	$2,663.241
2019	31.244	15.244	$1,417,692	$2,905.692
2020	33.85	17.85	$1,660.050	$3,148.050
2021	33	17	$1,581.000	$3,069.000
2022	33	17	$1,581.000	$3,069.000
2023	33	17	$1,581.000	$3,069.000
2024	33	17	$1,581.000	$3,069.000
2025	33	17	$1,581.000	$3,069.000
2026	33	17	$1,581.000	$3,069.000
2027	33	17	$1,581.000	$3,069.000
2028	33	17	$1,581.000	$3,069.000
2029	33	17	$1,581.000	$3,069.000
2030	33	17	$1,581.000	$3,069.000
2031	33	17	$1,581.000	$3,069.000
Total	**490.043**	**234.043**	**$21,765.999**	**$45,573,000**

Over time, renewable energy becomes horrendously expensive with $46 billion added to consumers' power bills. The **Focus on Renewables** (p.2) does not mention the massive subsidies and the fact that the Paris Climate Agreement

in 2015 was non-binding and hence AGL have no obligation or requirement to do anything. This is misleading and deceptive.

The $46 billion subsidy for the generation of unreliable and inefficient energy could go to drawing down State and Federal debt, old-age pensions, schools and hospitals. This is a political decision that could be made sooner rather than later and increases risk for AGL. Some $30 billion would be required to build a duplicated transmission system[26] devoted to sending wind power output from rural Australia to the cities for a system that is unreliable and delivers meaningful output 30-35% of the time.

In AGL's 25th February 2016 **Request for Extension to Lapse Date**, under **e) AGL's Greenhouse Gas Policy and Powering Australian Renewables Fund**, I again draw the reader's attention to the fact that ownership of coal-, gas- and biomass-powered thermal power stations is incommensurate with AGL's greenhouse gas policy.

Furthermore, there is an extensive scientific literature that demonstrates that $H_2O_{(v)}$ is the main greenhouse gas in the atmosphere. The risk for Silverton residents is that the political policies on renewables has changed three times in the last three years and, with increasing State and Federal debt, this policy could again change. If such a policy changes during construction, then there is no provision for the decommissioning and removal of a half-completed wind industrial complex.

An example of this risk is that, in the forthcoming Federal election, if the Coalition wins then there will be a new accord between the leader of the National Party and the leader of the Liberal Party. This accord *inter alia* may or may not deal with the subsidising of renewable energy by the taxpayer. Although not required in this submission, public records show that I am a significant donor to the Federal National Party Member for New England as well as the National Party, LNP and Liberal Party.

In AGL's 25th February 2016 **Request for Extension to Lapse Date**, under **f) No change in scope,** my letter of 23rd March 2012 informed AGL that I wanted to build an outback residence on my freehold land at Silverton. This residence would have a 100 km view to the west and, to the north, would have a direct line of sound and sight to the proposed wind industrial complex. I can find no record that AGL undertook baseline sound measurement studies of all frequencies from my land. AGL's 25th February 2016 **Request for Extension to Lapse Date** shows concerns about uncertainty. The same applies for the building of a residence when AGL perform no site works and yet again request an extension thereby providing constant uncertainty. Unless the effects of all sound frequencies on humans are known, the one must use the precautionary principle and not build a residence. This information has not been provided by AGL to affected parties. In the light of consensus science showing that some frequencies of sound generated from wind turbines are harmful to health, AGL should

[26] Moran, Alan 2016: South Australian electricity – the state's suicide mission. *Catallaxy Files*.

abandon building the Silverton wind industrial complex because of the precautionary principle.

In AGL's 25th February 2016 **Request for Extension to Lapse Date**, on p. 2, the Importance of the Project is misleading. There is no evidence provided that component manufacture would take place in Australia and, if other wind industrial complexes are a guide, many of the components will be manufactured outside Australia. All other wind industrial complexes have had components manufactured abroad, shipped to ports and carried by road to the construction site. There is no definition of 400 full-time employee job years. Acknowledging that construction employs a large number of people for a short time, without the benefit of seeing how this is calculated, it can only be concluded that the wind industrial complex will employ very few people and, because of the skills required, these are probably not people from Broken Hill or Silverton. I note that the multiplier of 3 for a wind industrial complex is far lower than for a mining project. This only adds to concerns about the permanent sterilisation of land where a mining project is possible.

I have previously commented on the misleading statement of generation of "*700,000 MWh per year*". This is misleading as it is the maximum figure and, from reviews of other wind industrial complex generation, the figure is exaggerated three- to five-fold. This gives no confidence about other numbers and statistics that AGL promotes. I have previously commented on the 588,000 tonnes *per annum of* CO_2 reduced from emissions. Underpinning this statement is the presumption that human emissions of CO_2 (3% of annual total emissions[27]) drive global warming. It has never been shown that the human emissions of CO_2 drive global warming. If indeed it could be shown, then it would also have to be shown that the 97% of annual total emissions that are natural (oceanic and mantle degassing, respiration, hydrocarbon oxidation etc) do not drive global warming. If it is claimed that human emissions of CO_2 drive climate change, then it also needs to be shown the times in Earth history when climate did not change.

This claim by AGL about emissions reduction is a tawdry appeal to ascientific popularism that fails the logic test and reeks of hypocrisy in the light of AGL's CO_2 emissions from burning fossil fuels and biomass. AGL would be better served by being truthful and stating that they are in the power generation business to make a profit from unsubsidised brown and black coal and gas and subsidised wind, solar, biomass and hydro electricity generation and that AGL is a huge CO_2 emitter. AGL are also in the business of constructing wind industrial complexes and selling them for a profit. AGL would better serve their attempted environmental credentials by stating the truth (i.e. that the CO_2 emitted from fossil fuel, methane and biomass used to power electricity generating systems provides plant food to the atmosphere, this has contributed the greening of the Earth as satellite data has shown and, by producing electricity, AGL adds to employment, the quality of life and the standard of living of all Australians).

[27]https://www.ipcc.ch/publications_and_data/publications_ipcc_first_assessment_1990_wg1.shtml

The "*savings in water consumption*" is misleading in the light of AGL using water as a coolant for brown- and black coal-fired electricity generation. Furthermore, they do not account for the amount of water used for mining the iron ore, copper, rare earth elements, limestone, shale etc used for component manufacture of a wind industrial complex. In most mines, this can be anything from 300 to 700 kg per tonne of ore produced (depending upon the processing method). Furthermore, water is used for concrete where it is permanently chemically bound as the concrete cures and water will be used for dust suppression. Unless comparative figures on the total water budget are used, the figure of 730 million litres *per annum* is meaningless.

Water is a very delicate subject for isolated communities in an arid area of an arid continent. AGL and the Department of Planning and Environment would be well aware that the release of stored water from the Menindie Lakes Scheme for "environmental flows" has resulted in a depletion in the quantity and quality of potable water at Broken Hill and Silverton[28]. There is no regular rainfall in the Silverton area, sporadic pluvial events can precipitate huge amounts of water in a short time (e.g. 1973-1974) followed by long dry periods. Runoff water into Stephens Creek and Umberumberka adds "sweet water" to that pumped from the Darling River for human consumption. There has been no analysis of pluvial events in any environmental study of runoff from the wind industrial complex.

The suggested hay bales would be swept away during sheet erosion associated with in such events and, coupled with the land disturbance with roads, turbine sites and other infrastructure, the Umberumberka Reservoir would have increased sedimentation. Hay bales also add non-endemic seeds and plants to the area. Although AGL assures the community that no such process would take place, this assurance has not been validated with test sites during the sporadic intense pluvial events. It is clear that those who wrote AGL's evaluation of runoff have never been in the outback in a pluvial event. AGL have had more than enough time to undertake such tests during the recent dry times awaiting a pluvial event and this could have been done before yet another request for an extension.

There is an extensive literature that shows that Broken Hill rocks and soils are rich in manganese and iron. This is no surprise because metabasalts have the chemistry of tocks formed at a terrestrial triple point and these metabasalts[29] and associated manganese[30] and iron rich metasediments[31] are abundant at the site of the Silverton wind industrial complex. Weathering of

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[28] Most of the industrial water used in the Perilya Southern Operations and Rasp Mine derives from mine water pumped from No 7 shaft. Mn and Zn are removed before the water can be used in industrial plants.

[29] Phillips G.N., Archibald N.J. and Wall V. J. 1985: Metamorphosed high-Fe tholeiites: their alteration and relationship to sulphide mineralisation, Broken Hill, Australia. 88: 49-59

[30] Parr, J. M and Plimer, I. R. 1993: Models for Broken Hill-type lead-zinc-silver deposits. In: Kirkham, R. V. et al. (eds) Mineral deposit modeling. *Geol. Assoc. Canada Special Paper* 40: 253-288.

[31] Main, J. V., Mason, D. O and Tuckwell, K. D. 1983: The characteristics and interpretation of whole rock geochemical data, Willyama Supergroup, New South Wales – trends towards ore. *Aust Inst Min Metall Conference Series* 12: 115-131

these rocks puts manganese and iron into solution, pluvial events move these elements and, for much of the wind industrial complex, these elements will be shed into the Umberumberka Reservoir. Land disturbance will only decrease weathering and erosion. The Umberumberka Reservoir provides potable water for Silverton and Broken Hill and it has been shown that manganese and iron in drinking water create health problems[32].

The "*annual savings in pollution*" is misleading. AGL use dreadful quality coal for power generation at Loy Yang and emit pollutant gases and particulates. This is less of a problem with higher rank bituminous coals that they burn in NSW. Again, the amount of energy used to build the components for a wind industrial complex is more than it will produce in its working life hence the very fact of building a wind industrial complex adds to pollution. If AGL are so concerned about particulates, then they would seal all service roads in the construction area to reduce dust. As mentioned previously, the unreliability of wind electricity generation is that thermal power stations must run 24/7 as backup hence there are no SO_2, NOx and particulate savings, only the opposite.

The "*establishment of a community fund*", "*Indigenous Employment Management Plan*" and "*improvement in local infrastructure*" is an attempt at populist feel-good politics. This was clearly written by those born-and-bred in a city with no idea of how rural Australia operates. At Silverton, AGL do not have to pay landowners who may have turbines on their land ($10,000-15,000/turbine *per annum*, the establishment of an Indigenous Employment Management Plan means nothing as it does not tie AGL to training and job creation and the lack of infrastructure and expansive vistas at Silverton is the charm that attracts tourists to Silverton. These three trivial non-committal aspects are no reason to extend the project. If AGL were truly concerned about the community, especially during a long-term water crisis, it would remove 100 years of unconsolidated clastic sediment from the Umberumberka Reservoir that holds runoff water for Silverton and Broken Hill domestic consumption.

The "*protection and improved management of sensitive local biodiversity*" is misleading and deceptive and shows a basic lack of due diligence. The type area of the Barrier Ranges dragon (*Ctenophorus mirrityana*) is the Silverton Wind Farm[33,34] in the Broken Hill Complex Bioregion[35]. The NSW Scientific Committee that advises the NSW Government on the Threatened Species Conservation Act has successfully recommended that *Ctenophorus mirrityana* be an endangered species under the Act. A proposal has been made to the Federal

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[32] https://www.wind-watch.org/news/2014/09/03/open-letter-public-water-contamination-from-whitelee-wind-energy-facility/

[33] Sass, S. and Swan, G. 2010: A newly discovered population of the endangered tawny rock dragon *Ctenophorus decresii* in far western NSW and description of its habitat. *Hypertofauna* 40: 52-57.

[34] McLean, C. A., Moussalli, A., Sass, S., and Stuart-Fox, D. 2013: Taxonomic assessment of the *Ctenophorus decresii* Complex (Reptilia: Agamidae) reveals a new species of dragon lizard from Western New South Wales. *Records of the Australian Museum* 65, 51-63.

[35] Thackway, R. and Cresswell, I. 1995: An interim biogeographic regionalization for Australia: a framework for setting priorities in the National Reserves System Cooperative Program. Version 4, *Australian Nature Conservation Agency*: Canberra.

Environment Protection and Biodiversity Conservation Act for listing of *Ctenophorus mirrityana* as an endangered species. An invitation was delivered to AGL to join the proposal and no reply was forthcoming suggesting that AGL have no environmental credentials. The 2008 AGL Report on the tawny rock dragon[36] did not discover *Ctenophorus mirrityana* despite the wind industrial complex being the type area for this reptile. This suggests that environmental surveys under the supervision of AGL should be discounted as sloppy science.

This is commensurate with the AGL report on *Indigenous and Non-Indigenous Assessment* (Volumes 1 and 2) where there is no mention of Lode Horizon specific flora, the potential for site-specific endemic minerals[37], the potential for new bat species in adits and shafts, the lack of evaluation of the mineralogical and geological importance of mining and exploration sites, the route of 19th Century stage coaches, old stock routes, the importance of local smelters (e.g. Daydream, Terrible Dick) on the economic growth of Broken Hill and the presence and influence of Kidman in the *Purnamoota* area[38]. There is a written[39,40] and a rich oral history about Sir Sidney Kidman in the *Thackaringa*, Silverton, *Purnamoota*, Broken Hill and *Poolamacca* areas. For example, *Purnamoota* was once part of *Mundi Mundi*, there was a series of wells on Kidman's stock route from *Mundi Mundi* to *Corona* (e.g The Soak Stone) and Sir Sidney Kidman would have provided stock from this area to Sackville Kidman's butcher's shop in Layard Street, Silverton[41]. Remnants of his activities remain in the project area (e.g. Butcher's Dam) and were not recognised for what they are in AGL's 2008 survey and hence the European history has been devalued by AGL. If AGL make simple mistakes, the Silverton community is correct to have misgivings about the whole project.

In AGL's 25th February 2016 **Request for Extension to Lapse Date**, it is claimed that there will be "*Protection and improved management of sensitive local biodiversity including the tawny rock dragon and a previously unrecorded spinifex ecological community*." (p. 3). There is no explanation of what comprises this "management", who will undertake this "management", whether those chosen by AGL to undertake "management" have the required "management" skills and how this "management" will be undertaken. I have little confidence that AGL have the competence to undertake any "management" because, as shown by McLean *et al.* (2013), the tawny rock dragon (*Ctenophorus decresii)* does not

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[36] NGH Environmental 2008: *Status and distribution of the Tawny Rock Dragon and their habitat*. https://www.agl.com.au/-/media/AGL/About-AGL/Documents/How-We-Source-Energy/Wind-Community/Silverton-Wind-Farm/tawny-rock-dragon-report.pdf?la=en

[37] Examples of endemic minerals and type locality minerals in the Broken Hill area are: aldridgite, bernalite, birchite, "brokenhillite", costibite, ecandrewsite, edwardsite, kintoreite, kolitschite, liversidgeite, marshite, mawbyite, miersite, nyholmite, paceite, paradocrasite, plimerite, raspite, segnitite, "sturtite", vanderheydonite, willyamite and yancowinnaite. New scientific studies continue to find new minerals at Broken Hill.

[38] https://www.agl.com.au/-/media/AGL/About-AGL/Documents/How-We-Source-Energy/Wind-Community/Silverton-Wind-Farm/indigenous-non-indigenous-heritage-assessment-volume-1.pdf?la=en

[39] Bowen, Jill 1987: *Kidman: The forgotten king. The true story of the greatest pastoral landholder in modern history.* Cornstalk.

[40] Idriess, Ion 1993: *The cattle king: the story of Sir Sidney Kidman.* Harper Collins.

[41] Sackville Kidman was Sidney Kidman's brother.

exist in the Barrier Ranges and only exists in South Australia yet AGL claim that they will "manage" this non-existent animal.

This indicates very sloppy environmental studies by AGL, it shows that AGL do not consult NSW Government web sites and that AGL do not consult public record scientific research on fauna in the proposed site. If AGL's environmental understanding is so weak, then there is every likelihood that the Silverton wind industrial complex is an environmental disaster waiting to happen.

AGL has not documented that there are 23 endangered and vulnerable faunal species occurring the aeolian chenopod shrub land vegetation type of the Barrier Ranges where the Silverton wind industrial complex is planned and AGL's environmental understanding suggests that there is real danger to the endangered and vulnerable species.

The NSW Government records 195 species of birds in the Barrier Ranges. NSW Government web sites record that vulnerable bats (*Vespadelus baverstocki, Chalinolobus picatus* and *Saccolaimus flaviventris*) and threatened, vulnerable and endangered birds (*Phaps histrionica*, *Falco hypoleucos*, *Certhionyx variegates*, *Cacatua leadbeateri*, *Pyrrholaemus brunneus*, *Hieraaetus morphnoides*, *Hamirostra melanssternon* and *Lophoictinia isura*) occur in the district.

Populations of *Elanus scriptus*, *Hamirostra melanosternon*, *Ardeotis kori*, *Burhinus grallarius* and *Neophema bourkii* have been recorded in the bioregion and are considered to be at risk[42]. *Aquila audax* is a common species[43]. One had a nest at the top of the head frame at the Umberumberka Silver Mines for many years.

A survey was undertaken in 2007 and a 2008 survey showed that the bird diversity had changed and that there were species in 2008 that were not recorded in the 2007 survey (e.g. *Aphelocephala leucopsis*, *Cheramoeca leucosterna*, *Oreoica gutturalis*[44]). Water in the Umberumberka Reservoir attracts migratory birds. This suggests that short-term surveys of birds are unreliable, that the avian species diversity in the area is unknown and yet it is birds and bats are the main fatalities from rotating turbine blades.

Worldwide, rare birds and bats are sliced and diced by the rotating blades of wind turbines. In Spain, the wildlife conservation group SEO Birdlife states that each year between 6 and 18 million birds are killed by rotor blades including the rare Griffon vultures and even rarer Egyptian vultures. One Spanish wind industrial complex (Navarra) kills 400 Griffon vultures each year.

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[42] Smith, P and Smith, J. 1994: Historical change in the bird fauna of western New South Wales: ecological patterns and conservation implications. In: Lunney, D. et al. (eds). *Future of fauna in western New South Wales*. Transactions of the Royal Zoological Society of New South Wales, 123-147.

[43] Olsen, P. 1995: *Australian birds of prey: the biology and conservation of raptors*. University of New South Wales Press.

[44] https://www.agl.com.au/-/media/AGL/About-AGL/Documents/How-We-Source-Energy/Wind-Community/Silverton-Wind-Farm/biodiversity-addendum.pdf?la=en

These figures are probably an underestimate compared with statistics published in December 2002 by the California Energy Commission showing that bird deaths per turbine per year were as high as 309 in Germany and 895 in Sweden. Twice as many bats are killed when their lungs implode due to air pressure changes created by the rotor blades. Wind industrial complexes are built on uplands where there are good thermals, they kill a disproportionate number of raptors such as the wedge-tailed eagle (Australia), golden and bald eagles (USA), Egyptian and Griffon vultures (Spain) and white-tailed eagles (Norway)[45]. Birds cannot learn to avoid a turbine blade tip travelling at over 200 km/hour as impact only occurs once.

Some wind industrial complex operators have claimed elsewhere that there are fewer bird kills by turbine blades than other human activities such as buildings, cars, pesticides and power lines[46]. At the proposed Silverton site, there are no buildings that birds could fly into, there are no cars (except for a few slowly- moving cars off site on the Daydream Mine tourist road), there are no power lines and there is no agriculture where pesticides, insecticides or fungicides are used. The only power lines will be those built by AGL. Hence there will be an infinite increase in the number of birds and bats killed by human activities in the area associated with the wind industrial complex.

A search of the scientific literature shows that no studies have been undertaken on bats that use mine shafts and adits in the Barrier Ranges as their habitat. It is well known that bats use old mine workings as their home[47] (e.g. *Rhinonicteris aurantia*, listed on the IUCN Red List of Threatened Species[48]) and it is expected that new, rare, vulnerable or endangered species of bats will be endemic to the Barrier Ranges. Bats and micro-bats have already been observed[49,50] in the area, it appears that knowledge of bats is very limited, there is no monitoring of bats in the Silverton area and there is no baseline information on bats in adits and shafts. In the 25th February 2016 submission, no mention is made of vulnerable bats.

Bat death mortality by wind turbines is huge, various studies worldwide return different numbers but the conclusion is the same: Wind industrial complexes are catastrophic for bats. The Leibnitz Institute for Zoo and Wildlife Research showed that bats killed by German turbines have come from places 1,500 kilometres away and, if this is the case at Silverton, then a local ecological survey is useless. German turbines kill more than 200,000 bats a year and bat populations are being reduced. In the USA, 70 bats are killed per year per installed megawatt hence 2.8 million bats are killed each year in the USA by rotor blades. Bats reproduce slowly.

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[45] Plimer, Ian 2014: *Not for greens.* Connor Court.
[46] http://www.telegraph.co.uk/news/earth/wildlife/12176938/Controversy-as-RSPB-builds-100m-wind-turbine-despite-deadly-threat-to-birds.html
[47] http://www.environment.gov.au/cgi-bin/sprat/publicspecies.pl?taxon_id=82790
[48] McKenzie, N. and Hall, L. 2008: *Rhinonecteris aurantia*. The IUCN Red List of Threatened Species http://dx.doi.org/10.2305?IUCN.UK.2008.RLTS.T19589A8983139.en
[49] *Barrier Daily Truth*, Sunday 6th January, 2013: Beware of tiny bats.
[50] *Barrier Daily Truth*, Friday 3rd May 2013: Homes can harbour tiny winter guests.

In previous documents, AGL have attempted to evaluate how many rare, threatened, vulnerable and endangered bird and bat species will be killed by rotor blades. This assessment is invalid because AGL did not even know that the type area of an endangered species was the site of the wind industrial complex, the area has variable species diversity depending when a survey was undertaken and AGL do know enough about bats in the area. If compared to wind industrial complexes elsewhere in the world, then the rotor blades at the Silverton wind industrial complex will kill far more iconic, rare, threatened, vulnerable and endangered species than AGL suggests.

Information on rare, threatened and endangered bird and bat species is readily available on the NSW government's web site[51] I am at a loss to understand why AGL has not consulted public sites and accessible scientific information on the fauna in the area of their proposed development and yet only mention one species (albeit one that does not exist in the area) that they propose to "manage".

If AGL states that it wants to "manage" a species that does not exist then it appears that AGL have not undertaken an assessment of the principal components of fauna and their habitat consistent with the Draft Guidelines for Threatened Species Assessment (2005). The public web sites of Threatened Species, Population and Ecological Communities in NSW show that AGL have not undertaken adequate field studies consistent with the Draft Guidelines for Threatened Species Assessment (2005). Furthermore, there has been no scientific study for the potential for of mine-dwelling bats and stygofauna common in other old mining areas[52] again showing that AGL's survey techniques were not consistent with the Threatened Species Assessment (2005). Without baseline and specialist environmental studies on the fauna in the proposed area, AGL are unable to evaluate or quantify the environmental consequences of the project. In addition, AGL have not had an integrated approach to the environmental assessment by precluding earth scientists and local historians.

The threat of serious or irreversible environmental damage is a necessary recondition for the precautionary principle and, because the potential impacts of the project cannot be predicted to an adequate degree of scientific accuracy because of a lack of data and because there has been more than adequate time to acquire these data, the project should not be extended beyond the lapse date.

The flora of the Broken Hill area was first compiled by E. C. Andrews[53] and Albert Morris[54]. Morris identified a number of endemic species and species that only grew on zinc- and lead-rich rocks.

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[51] www.threatenedspecies.environment.nsw.gov.au; www.threatenedspecies.com.au

[52] https://www.dpaw.wa.gov.au/about-us/science-and-research/biological-surveys/204-sytogfauna-of-the-pilbara

[53] Andrews, E. C. 1922: The geology of the Broken *Hill district.* Memoirs of the Geological Survey of NSW, No 8.

[54] Morris, A. 1966: *Plant life of the West Darling.* Barrier Field Naturalists Club.

For example, *Acacia continua,* first named in 1864, is widespread in South Australia and has isolated occurrences in NSW, NT and WA[55]. Albert Morris recorded that in the Broken Hill district it only grows on the Line of Lode (p. 125). The original vegetation on the Line of Lode has now disappeared. *Acacia continua* still grows on Lode Horizon on the Northern Leases at Broken Hill, it is a biogeochemical indicator plant and one of the very few species world wide that can grow on metal-rich soils. As a deeply-rooted plant it can sample well beneath the surface. It is used by some geologists in the Broken Hill district for mineral exploration.

Figure 1: *Acacia continua* on a quartz-gahnite±sphalerite, garnetite and metasediment outcrop, Silver Peak section, Northern Leases

There are at least 330 km strike length of Lode Horizon rocks in the Broken Hill Domain with many Lode Horizon rocks in the *Purnamoota* area. There is little known about *Acacia continua* and it would be expected to be present in the area of the Silverton wind industrial complex. Biogeochemical studies in the Broken Hill area show that common plant species uptake metals[56] and it is well known that deeply-rooted plants sample a large volume of rock at depths of up to 80 metres[57]. However, a complete scientific understanding of the

[55] http://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:apni.taxon:296709
[56] https://www.researchgate.net/publication/237528036_FLYING_DOCTOR_Ag-Pb-Zn_PROSPECT_NORTHERN_LEASES_BROKEN_HILL_NSW
[57] Collerson, K. D. 2015: *Spinifex geochemistry leads to discovery of a new Australian metallogenic province.* https://www.ausimmbulletin.com/feature/grassroots-exploration-under-cover/

habitat of *Acacia continua* could be useful for post-mine remediation, dump revegetation and cleaning toxic wastes.

Spinifex (*Triodia scariosa*) only occurs in the Barrier Ranges on magnesian soils such as those derived from the weathering and transport of soils derived from the Ettlewood Calc Silicate Member. Spinifex was recorded in the project area but those studying the spinifex distribution only looked at aspect and not parental rock type to explain distribution. Again, this shows that without an integrated scientific study of the environment, the studies commissioned by AGL have little value.

The chenopod shrub lands of the bioregion are characterised by common and widespread species such as *Acacia aneura*, *Acacia tetragonophylla*, *Casuarina cristata*, *Alectryon oleifoliusum Callitris glacuophylla*, saltbush (*Atriplex* sp.) and bluebush (*Maireana* sp)[58,59]. In the proposed site, *Eucalyptus intertexta* is common. Floral distribution is mostly controlled by runoff and the foot slopes and valleys have a more diverse plant ecology compared to slopes and ridgecrests.

The only occurrence of the mallee *Eucalyptus gillii* occurs in the bioregion near Broken Hill. Its habitat is on weathered calc-silicate rocks, weathered amphibolite and calcrete-rich shear zones. *E. gillii* is often used by earth scientists in geological mapping. It is a significant species and major shear zones (Mount Franks, Apollyon Valley) transect the area of the proposed wind industrial complex and weathered amphibolite and calc-silicate rocks (Ettlewood Calc Silicate Member) have been mapped in the project area[60].

Some species are at risk in the bioregion and those listed in the Threatened Species Conservation Act (NSW) are *Acacia carnie* and *Lepidium monoplocoides* whereas *Eleocharis obicis* and *Rhaphidospora bonneyana* are listed as vulnerable under the Threatened Species Conservation Act. Several plants in the bioregion are considered to be rare, such as *Gahnia lanigera*, *Paspalidium clementii*, *Ixiochlamys nana*, *Pluchea baccharoides*, *Vittadinia arida*, *Atriplex lobativalvis*, *Acacia morrisii*, *Euphorbia sarcostemmoides* and *Goodenia berardiana*[61].

The area for the wind industrial complex is a sensitive area with threatened and endangered species and many rare birds (especially raptors) and bats that would be sliced and diced by turbine blades. The environmental studies show that there is still great uncertainty about the species and species

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[58] Morgan, G. and Terrey, J. 1992: *Nature conservation in western New South Wales*. National Parks Association.
[59] Benson, J. 1999: *Setting the scene: The native vegetation of New South Wales.* Native Vegetation Advisory Council of New South Wales.
[60] Barnes, R. G. 1980: Types of mineralization in the Broken Hill Block and their relationship to stratigraphy. In: Stevens, B. P. J. (ed.) A guide to the stratigraphy and mineralization in the Broken Hill Block, New South Wales. Geological Survey of New South Wales Records 20 (1), 33-70.
[61] Morton, S. R., Short, J. and Barker, R. D. 1995: *Refugia for biological diversity in arid and semi-arid Australia* (with Appendix by Griffin G. F. and Pearce, G.). CSIRO Australia.

distribution of birds and bats. The quality of the scientific rigour acceptable to AGL suggests that the Silverton wind industrial complex is an environmental disaster waiting to happen.

There is some repetition in the AGL submission on p. 3, I have previously written about the misleading comments regarding *Investor Confidence in Renewables*, *AGL's Greenhouse Gas Policy*, *Powering Australian Renewables Fund* and *New Technologies* (p. 4).

In Impacts on Community/Acceptability of Delay in the **Request for Extension to Lapse Date** (p. 4), AGL claimed that it "*continued its engagement with the local community via Silverton Wind Farm Community Consultative Committee (CCC) meetings and regular meetings with the Lease Holders, the Land Holder, the Silverton Community and the Broken Hill community*". This is untrue, misleading and deceptive. I have never been contacted by AGL (2012-2016) or Epuron (2007-2012) in my capacity as a freehold landowner at Silverton.

Firstly, in my capacity as a freehold landowner I have written seven letters to Ms Helena Orel, the AGL Community Stakeholder Engagement Manager. The first was answered, the others were not. This is not community consultation.

Secondly, the **Silverton Wind Farm – Request for Extension to Lapse Date** is on display at Newtown, Broken Hill and Wentworth. Why is it not on display at Silverton where the stakeholders and affected community reside? This is a repeat of what happened with the DA. If the Department of Planning and Environment do not see fit to consult the community and display documents in the community then AGL have a duty to undertake this community consultation and display documents. This was not done and the Silverton community has yet again been treated with cavalier contempt.

AGL and the Department of Planning and the Environment are well aware that at Silverton, like many other isolated rural communities, many people are not able to access information on the internet and hence the community can be ill-informed about matters that have a profound impact on their lives. By not initially displaying the **Request for Extension to Lapse Date** or not knowing that many Silverton residents do not have access to internet information, it has been shown that AGL's community consultation does not exist.

Thirdly, I jointly own, with my wife, Lots 16 and 17, DP757269 (160 acres *in toto*), County Yancowinna, Parish Bomangaldy is 3 km west of the hamlet of Silverton and 28 km west of the City of Broken Hill. The land is freehold unincorporated with ownership of the mineral rights (except for gold), it was originally a land grant from Queen Victoria to the Silverton Tramway company and the land is in direct line of sight and sound from the proposed wind industrial complex.

A simple title search after acquisition by AGL of the project in 2012 would have revealed the names of the owners and, if AGL concluded that Silverton

Wind Farm Developments Pty Ltd had undertaken comprehensive searches, then AGL did not undertake basic due diligence upon purchase of the project. What other aspects of the project have had poor due diligence? If AGL does not undertake simple cheap land searches, how can the Silverton community be assured that all other aspects of the wind industrial complex have been undertaken competently (e.g. baseline sound measurements at all frequencies)?

The land is locally known as the Umberumberka Silver Mines where mining commenced more than 100 years ago. Silverton was settled as the town to service the Umberumberka Silver Mines. There are 14 defunct shafts on two lines of lode, a steel head frame visible from miles away and an old crusher. The land is transected by the 19th Century stagecoach road and the 19th-20th Century defunct Silverton Tramway. It is well known in the area that I own this land, arrangements have been made with many groups (e.g. Outback Challenge, University of Wollongong) to use the land and one does not even have to undertake a property search to find the owner. The way the organisers of the Outback Challenge searched for the Umberumberka Silver Mines landowner was to as a few questions at the Silverton Hotel. Within minutes the organisers were talking to me on the 'phone. AGL personnel stay at the Silverton Hotel when they attend Community Consultative Committee meetings. A few questions at the Silverton Hotel, the Broken Hill City Council or prominent residents of Broken Hill or Silverton would have revealed the landowner.

The Department of Planning and Environment has access to land titles and either should have reminded AGL of their duty to consult all landholders and leaseholders or should have consulted the landholders directly. The latter was not done. The statement that the "*Silverton Wind Farm Community Consultative Committee (CCC) meetings and regular meetings with the Lease Holders, the Land Holder, the Silverton Community and the Broken Hill community*" is false. AGL have not contacted me at all. I have been the party that has made the contact in my capacity as a landowner and been treated with contempt.

On 29th March 2012, I wrote to Silverton Wind Farm Developments Pty Ltd stating that I planned to construct a residence on Lots 16 and 17. There was no reply to this letter. An ASX announcement by AGL on 23rd March 2012 announced the acquisition of 100% shares in Silverton Wind Farm Holdings Pty Ltd. I again wrote to AGL on 21st February 2016 asking why I had not been contacted by AGL regarding the building of a wind industrial complex. AGL's reply of 29th February stated "*Unfortunately, we don't have any record or knowledge of you owning or leasing any properties adjacent to or in proximity to the proposed wind farm development*" and then asked me to notify AGL which properties I own or lease. It is up to AGL to undertake a property search and this comment shows that AGL has not undertaken a property search, has not spoken to Silverton and Broken Hill residents about who owns land in the area and shows that AGL has not engaged with the local landowners. The above paragraphs demonstrate the poor procedural processes and business behaviour of AGL and their disdain for landowners and residents. They have certainly not demonstrated that they are fit and proper people to operate a wind industrial complex at Silverton.

On Monday 7th March 2016, an email entitled *AGL: Update on Silverton Wind Farm modification application submission* was circulated to residents, pastoralists, local government and State government recipients. On Tuesday 15th March 2016 a letter from Ms Helena Orel entitled *Submissions can be made through to 24th March 2016* was sent to residents, pastoralists, local government and State government recipients. Despite informing AGL on 23rd March 2012, 21st February 2016 and 6th March 2016 by email that I am a Silverton landowner, I was not sent these two circular email messages. This could not be a minor clerical oversight as by 7th March 2016 Mrs Helena Orel of AGL had received three letters from me and it was Ms Orel that circulated the Monday 7th March 2016 email entitled *AGL: Update on Silverton Wind Farm modification application submission* and Tuesday 15th March 2016 email entitled *Submissions can be made through to 24th March 2016*.

If AGL cannot even do a simple land title search, keep a record of land titles given to them or write truthful statements in the **Request for Extension to Lapse Date** of 25th February 2016, then they clearly do not have the competence to undertake more complex tasks and accordingly the **Request for Extension to Lapse Date** should be rejected. I again wrote to AGL on 8th March 2016[62], 14th March 2016 and 17th March 2016 and, at the time of writing this submission, I have received no answer. AGL has not engaged with landowners and their claims that they have are demonstrably false.

If AGL treat Silverton residents with such contempt and can not undertake basic background land searches, then there is very good reason to be highly sceptical of AGL's claims about the sound measurements and lack of detrimental health effects on Silverton residents from a proximal wind industrial complex.

Conclusions

The Silverton wind industrial complex was first proposed in 2007 by Epuron. The project has stalled after AGL took over the project in 2012[63]. The 25th February 2016 submission for an extension to the lapse by AGL is misleading, deceptive and demonstrably false.

The statement "*a reduction of approximately 588,000 tonnes of CO_2 per annum for the life of the project*" is false. In addition, AGL release large quantities of CO_2 from their brown coal-, black coal- and gas-burning electricity generating

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[62] Dear Ms Orel, Why was I not sent, in my capacity as a Silverton land owner, the email from you entitled **AGL: Update on Silverton Wind Farm modification application submission** dated 7th March 2016 when my letters of 23rd March 2012, 21st February 2016 and 6th March 2016 informed you that I was a Silverton landholder? The letter of 23rd March 2012 also gave you the details you requested in your letter of 29th February 2016.
Yours faithfully,
I. R. Plimer

[63] AGL vows to go ahead with Silverton wind farm project in far west NSW, *ABC Broken Hill*, 26th February 2016

operations and it is hypocritical for AGL to claim that they reduce CO_2 emissions and possibly have some environmental concerns about release of CO_2 emissions.

AGL claim that the Silverton wind industrial complex would generate 700,000 MWh per annum of electricity. This is misleading and deceptive as this is a maximum figure if the wind blew incessantly. This does not happen.

There are no economic benefits derived from generating subsidised unreliable electricity that is intermittent, that has a huge voltage drop to bring the electricity to consumers and requires new transmission lines.

AGL claimed that there will be "*ongoing liaison and consultation with the Mineral Exploration licence holders."* AGL acquired the project in 2012. This liaison has not happened and this is a false statement.

The claim that "*The Silverton Wind Farm infrastructure will occupy about two percent of the total site and will not unreasonably limit mineral exploration*" is false. One of the most prospective areas in the world will be permanently sterilised from mineral exploration because of trace element contamination and the failure to remove electrical conductors upon decommissioning.

Mineral exploration looks for a small fingerprint in a large footprint and even the small residual infrastructure from the AGL wind industrial complex would prevent modern mineral exploration.

If the area occupied by the infrastructure is so small (2%), then it would be a trivial task for AGL to remove it. The discovery of another orebody at Broken Hill would have a far greater economic impact than a wind industrial complex.

The suggestion that there will be "*savings in water consumption*" is false and "*annual savings in pollution*" is misleading and deceptive.

The statement that there will be "*Protection and improved management of sensitive local biodiversity including the tawny rock dragon* ..." is false. The tawny rock dragon does not exist in NSW and hence cannot be "managed". This shows that AGL have not undertaken appropriate environmental studies.

AGL have ignored the scientific literature that records *Ctenophorus muirrityana*, an endangered species under the NSW Threatened Species Conservation Act and that the type locality is the site of the Silverton wind industrial complex.

The statement is also misleading and deceptive because, in other documents, AGL acknowledge that they will slice and dice exotic, rare, threatened, vulnerable and endangered species of birds and bats and ignore the published documented high carnage from other wind industrial complexes.

AGL have ignored the probability of biogeochemical flora, undiscovered bats in mine workings, endemic and type locality minerals and the possibility of

stygofauna suggesting that the environmental studies undertaken were sloppy science.

AGL's statement that the "*Silverton Wind Farm Community Consultative Committee (CCC) meeting regular meetings with the Lease Holders, the Land Holder, the Silverton Community and the Broken Hill community*" is false. AGL have not contacted all landowners, refuse to answer letters from landowners and have not invited all landowners to CCC meetings.

Since the previous extension, AGL have undertaken no significant necessary environmental studies or capital works. The requested extension does not argue for an extension on the basis of project progress.

Because of the plethora of false and misleading and deceptive statements in AGL's 25th February 2016 **Request for Extension to Lapse Date** and the lack of activity on site by AGL, it is argued that the extension should not be granted.