

Canberrans for Power Station Relocation (CPR) Inc  
PO Box 40  
Erindale  
ACT, 2904

The Applicant's Secretariat  
ACT Planning and Land Authority  
PO Box 365  
Mitchell, ACT, 2911

Dear Sir/Madam,

**SUBMISSION IN RESPONSE TO THE PROPOSED DEVELOPMENT  
DA 200704152  
BLOCK 1671, TUGGERANONG  
210MW GAS TURBINE POWER STATION AND DATA STORAGE CENTRE**

Canberrans for Power Station Relocation (CPR) Incorporated, hereby submits this response to the above Development Application (DA) and Preliminary Assessment (PA). We conclude this application should be rejected on grounds contained within the body of the attached submission. Our objection to this application is based on:

1. A lack of any real consultation by the Proponent with the community before the PA and DA were submitted.
2. A lack of pertinent information made available to the community upon which a reasonable analysis of potential affects of the development can be conducted.
3. The use of inappropriate, incomplete or incorrect data throughout the assessment reports.
4. The proposal is in direct contravention of the Territory Plan, and
5. Commonsense dictates that such facilities should never built near residential areas

Due to the extreme proximity of the proposed site to a densely populated suburban residential area and the significant adverse impact this facility will have on the environment and the health and wellbeing of the community, CPR submits this application should be rejected.

In the alternative CPR requests that a complete Environmental Impact Study (EIS) be conducted to ascertain the full and true impact advancing this application will have on the environment and the Canberra community. In light of the complex and multifaceted nature of this project, we request any EIS be undertaken by independent and fully competent experts who have significant experience commensurate with power stations and their holistic affect on the environment and residents.

Please contact me if we can be of additional assistance in relation to the information presented in this submission.

Yours sincerely,

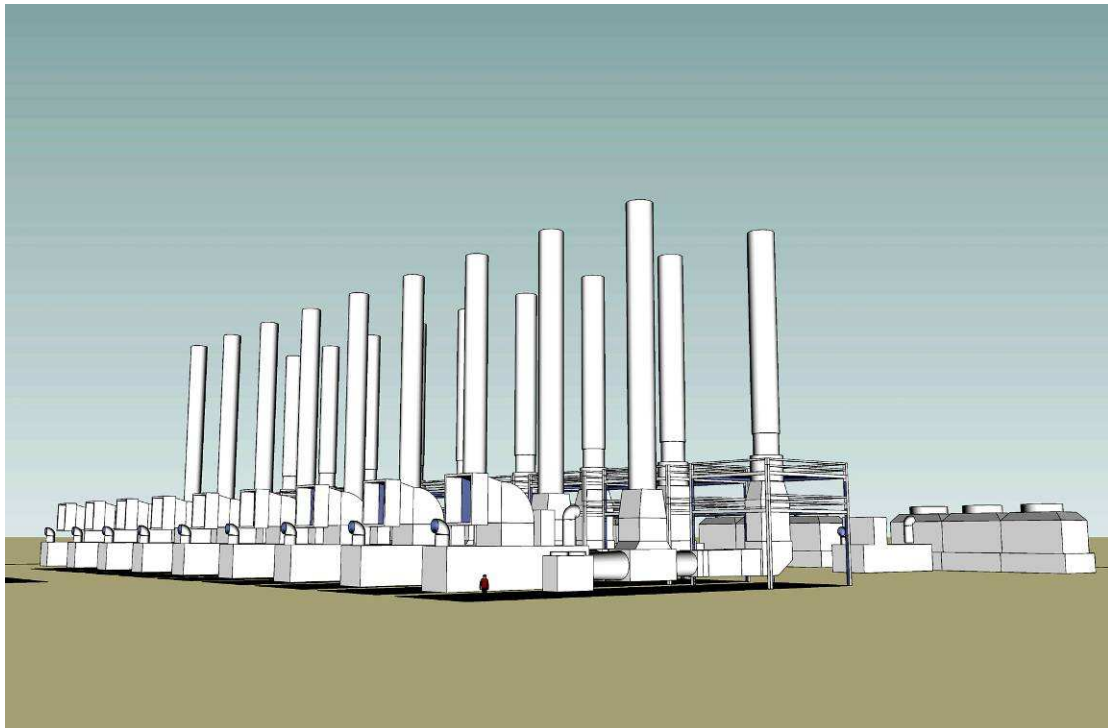
**Bill Reid**  
**President, CPR Inc**

27 May 2008

**Submission to the**  
**Preliminary Assessment of the Application for a**  
**Data Centre and a Power Station –**  
**Titled ACTEWAGL Canberra Technology City**  
**proposed for Tuggeranong Block 1671**

by

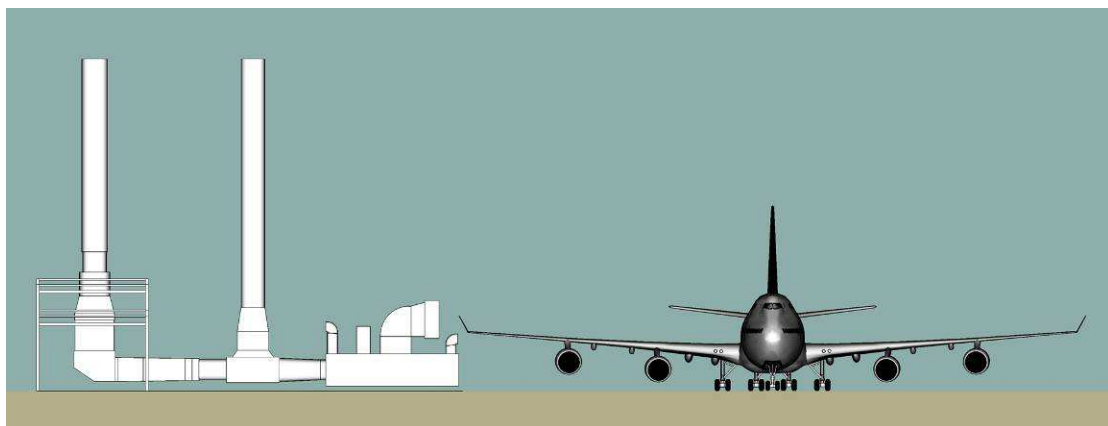
**Canberrans for Power Station Relocation Inc (CPR)**



*Scaled Illustration of proposed power station, (note the 6ft person standing in front of the first generator)*

# Table of contents

Introduction.....	4
Summary.....	6
Scale & Background Information.....	7
Questions relating to scale and background information.....	8
Divergence from the Territory Plan .....	9
Air pollution - questions and discrepancies.....	10
The wrong plume assessment.....	13
A. The site is Complex Terrain.....	14
B. There is high frequency of stable conditions at the proposed site. ....	16
Further reasons to question the plume study .....	18
Conclusion on consideration of the Air Quality Reports.....	19
The Noise Assessment is fundamentally flawed.....	20
Omission of a vibration study.....	24
Affect on the endangered bird/wildlife.....	25
Visual corruption of the nation's capital.....	26
Not appropriate use for Broadacre.....	29
Bushfire risk assessment report is inaccurate.....	30
Other Considerations .....	32
Broad acre Zoning.....	32
Benefits? .....	32
Why this site? .....	32
Lack of real and meaningful consultation .....	33
This site poses a significant terrorist target.....	33
Conclusion .....	34
References .....	35



*Single proposed gas turbine generator compared to a Boeing 747-800 Jumbo jet aircraft.*

## Introduction

**Canberrans For Power Station Relocation Inc (CPR)** was formed in May 2008 in response to community concern regarding the application made by ACTEWAGL to build a power station and Data Centre filed at the ACT Planning Authority (ACTPLA) on 26 March 2008. This response is filed under the *Land (Planning & Environment) Act 1991*, (the 1991 Act). The Act has since been repealed by the *Land and Planning Act 2007* but since ACTEWAGL filed their application 5 days prior to repeal, this matter refers to the 1991 Act.

CPR is concerned with what it considers the inappropriate haste with which ACTEWAGL has filed this proposal noting the application was submitted 5 days before the enactment of the *Planning and Development Act 2007*, (the 2007 Act) CPR further notes that discrepancies regarding the need to rezone broad acre land to allow for the noise levels and the inclusion of over 400 office spaces with air conditioning, detailed within the application plans and the statements by ACTEWAGL CEO, John Mackay and Minister Barr stating that rezoning will not take place.

CPR suggests that had an application to rezone been made, time restraints would have required the proposal to be filed under the new 2007 Act and would therefore require an automatic Environmental Impact Study (EIS).

The Planning & Development Act 2007 (ACT), s 123(b) puts a proposal on the impact track if Schedule 4 applies. Schedule 4, Part 4.2, Item 2(d), requires an EIS for development of a power station supplying 30 MW or more. It is incongruous that an EIS is not considered essential when the current application proposes a power station that is 7 times bigger.

CPR are concerned by the poverty of research, the flaws and gaps in the assessments and what we consider inaccuracies in the data filed to support ACTEWAGL's application. CPR has used independent and skilled members of the community to assess the data filed by ACTEWAGL within this application and firmly concludes that building such a facility so close to suburban Canberra on this site, with this topography and climate conditions will be detrimental to the health and well being of thousands of Canberra citizens.

Our studies and research have identified considerable flaws and guess work within the ACTEWAGL application to the extent that we do not feel any safe assurances can be drawn from the ACTEWAGL report conclusions to remain within safe limits of pollution or environmental impact.

Further we find there is no practical and realistic evidence filed to support the supposition that the benefits to the community espoused by ACTEWAGL that building this facility will bring, will in any way outweigh the very detrimental affects this facility will have on the health and well being of the population and the environment for future generations.

Our research concludes, contrary to the perfunctory reports filed in support of the ACTEWAGL application, that this site is in all likelihood, incompatible with a facility of this size and nature, and proceeding with this project on this site will irreparably damage the health and wellbeing of thousands of Canberra citizens

We draw your attention to section 9 of the Planning and Development Act 2007 and the precautionary principle. This principle, which has validity independent of the Act by virtue of the Rio Declaration, is defined to mean 'that if there is a threat of serious or irreversible environmental damage, a lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation'. A similar definition based on the UN 'Rio definition is provided for in s391(2) of the Environment Protection and Biodiversity Conservation Act– which provides that the Commonwealth Minister must take into account the precautionary principle in making certain decisions. What this principle states is that uncertainty about potentially serious hazards does not justify ignoring them. Tied to this is the idea that if an activity, such as the building of a power station, raises a threat of environmental harm then caution should be adopted in making a decision without the full scientific facts.

In the context of ACTEWAGL's application, we say, there is insufficient or inconclusive preliminary scientific evaluation as to the effects of the building of the power station on the environment and human health . This is particularly important given this activity may result in potentially irreversible harm in dangerous emissions and biodiversity destruction. In this case and cases like this, such activities should not be undertaken without the proponent demonstrating to a high scientific standard that substantial harm will not result. We hereby rely on the precautionary principle and put those charged with making decisions around this application to be cautious when assessing the potential health or environmental harms of the proposal in the absence of full scientific facts. Where there is doubt, given the potential consequences to proceeding, this application should be rejected pending further, independent, dependable and accountable scientific and accurate studies completed on all aspects of potential harm.

***“Our studies and research have identified considerable flaws and guess work within the ACTEWAGL application”***

## Summary

CPR accepts that the issues raised in this response, as with the original ACTEWAGL application, requires high level investigation and independent research to ensure that all aspects of the affects and nature of this development are considered as thoroughly as the possible consequences require.

We stress that we are aware that there may be good financial reasons proffered for building a power station. However, we believe the site to be ill thought and the potential devastating consequences of proceeding with such a development on this site without the proper thorough site specific investigations and research will be little less than life threatening, life altering and negatively irreparable to:

- the people in the pollution flight path
- the neighbouring home owners,
- The workers and visitors of the neighbouring landfill site
- The wildlife of the area,
- The financial situation of home owners in the area
- Horses and paddock users
- Aircraft and flight paths
- Schools and sports facilities in Tuggeranong valley and Woden
- The neighbouring medical facility and will irreparably damage the reputation of Canberra as a capital city.


In recognition of the enormity of the research and technical data required to ensure the safety of the citizens of Canberra in the face of the scale and significance of this proposal, CPR is requesting under section 121 of the Act a full **independent** EIS to be completed prior to a decision on building a power station in this location.

We do not believe the reports submitted to ACTPLA by ACTEWAGL are:

1. Accurate and detailed enough and
2. That ACTEWAGL have included in their application the level of detailed scientific understanding of environmental science and medicine to appreciate the pollution and associated health consequences of this project.


## Scale & Background Information

The following information has been gathered together, to demonstrate the scale of the project and its location in relation to residential housing:

 **Glossary**

About this Glossary | [Back](#) | [Print](#) | [Forward](#)

[ABC](#) - [DEF](#) - [GHI](#) - [JKL](#) - [MNO](#) - [PQRS](#) - [TUV](#) - [WXYZ](#)

Language: English [en] 

**Nitrogen oxides (NO<sub>x</sub>)**

**Similar term(s):** Nitric oxide (NO), nitrogen dioxide (NO<sub>2</sub>).


**Definition:**

NO<sub>x</sub> is the generic term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. [such as **nitric oxide** (NO) and **nitrogen dioxide** (NO<sub>2</sub>)].

Many of the nitrogen oxides are colorless and odorless. However, one common pollutant, nitrogen dioxide (NO<sub>2</sub>) along with particles in the air can often be seen as a reddish-brown layer over many urban areas.

Nitrogen oxides form when fuel is burned [...]. The primary sources of NO<sub>x</sub> are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels.

In the atmosphere, nitrogen oxides can contribute to formation of photochemical ozone (smog) and have health consequences. They also lead to acid rain and contribute to global warming.

Source: [US EPA NO<sub>x</sub>: What is it? Where does it come from?](#) 

**More:**

**Nitric oxide** (NO) is the most common form of nitrogen directly emitted into the atmosphere.

In ambient outdoor air, nitric oxide (NO), which is emitted by motor vehicles, combines with oxygen in the atmosphere under the action of sunlight, producing **nitrogen dioxide** (NO<sub>2</sub>) - a major air pollutant- and other NO<sub>x</sub>.

Source: *GreenFacts*

- The power-plant will produce large amounts of exhaust gases
- ACTEWAGL have advertised that this power plant will only run at peaking times for about a year. In order for it to be financially viable however (Kyoto – Carbon Trading) it is expected to run at full power within 2 years of being built
- Once running at full power, the power station could produce enough exhaust gases to cover a volume of 75 square km of Canberra to a depth of one meter each day
- The plans submitted to ACTPLA state that 210MW is stage one of the project, indicating that, plans for additional generating capacity may be submitted in the future
- The boundary of the facility will be 660m away from housing
- A 210MW power station could supply the needs for 229,950 homes if consumption was even throughout the day. There are 128,500 homes in ACT

**GreenFacts** Glossary  
[About this Glossary](#) | [Back](#) | [Print](#) | [Forward](#)

[ABC](#) - [DEF](#) - [GHI](#) - [JKL](#) - [MNO](#) - [PQRS](#) - [TUV](#) - [WXYZ](#)

Language:  ▼

**Lung function**

**Similar term(s):** pulmonary function.

**Definition:**

The term "lung function" refers to how well a person is breathing.


*Source: GreenFacts*

**More:**

Lung (or pulmonary) function tests are a variety of tests that measure how well a person breathes.

They can be used to help diagnose asthma, as well as to assess the severity of a person's asthma and how effectively it's being managed.

One example of a lung function test is called spirometry, which involves breathing into a device that records how much and how quickly air can be breathed out following a deep breath in.

*Source: KidsHealth dictionary* 

- Nitrogen Dioxide is produced when Nitrogen and Oxygen, both abundant in normal clean air, is heated to a high temperature during the combustion process. It is mainly produced as a result of power production and by road traffic. Nitrogen dioxide (NO<sub>2</sub>) is a reddish-brown gas, and is poisonous by inhalation
- When running at full capacity the power station could emit 2.6 tonnes of NO<sub>2</sub> into the local atmosphere each day
- NO<sub>2</sub> may decrease lung function and increase the risk of respiratory problems, particularly in children, and those with asthma. Short-term exposure to peak levels can increase respiratory allergic reactions. NO<sub>2</sub> has also been linked to an increase in Cot death in babies. Nitrogen Oxide (NO<sub>x</sub>) emissions are a precursor to photochemical smog

- In California, the EPA estimate that air pollution exposures above state standards account for 9,000 premature deaths, 1,000,000 asthma attacks and 3,000,000 lost work days. If 45,000 people within 6km of the proposed Tuggeranong power station, were similarly exposed we would expect 3.3 premature deaths, 375 extra asthma attacks, and 1125 lost days work per annum within this group of people

### Questions relating to scale and background information

- What would the expected increase in mortality and cost to the community in lost work days and hospitalisations be for this proposal?
- Is this acceptable to the community?
- What figure of human loss, life and financial, loss of quality of life, loss of working ability has ACTEWAGL placed against the possible financial gain to a 50% private company?

***“Once running at full power, the power station could produce enough exhaust gases to cover a volume of 75 square km of Canberra to a depth of one meter each day.”***



## Divergence from the Territory Plan

We believe that this project is not in keeping with the Territory plan or indeed with the Chief Ministers Canberra Plan delivered last in 2006. The Canberra environmental plan states – *“We will place continuing emphasis on clean industries to reduce greenhouse gases, noise and air pollution”*.

We believe the project will dramatically increase air pollution within Canberra suburbs, and we have no evidence that ACTEWAGL will be closing any coal powered power stations to counteract the additional greenhouse gasses produced by the new gas power station.



The Canberra Plan also states *“We need to minimise our impacts on the environment and live in harmony with it, ideally leaving it in better shape for future generations”*.

We believe this project will leave at least a 50 year legacy of poorer health in the surrounding suburbs.

The chief minister stated that he was dedicated to *“Maintaining the rural and National Capital Open Space setting of the National Capital”*

This proposal is larger than the Parliament House complex and bigger than the suburb it is proposed to sit closest to.

The Territory Plan espouses *“the achievement of an efficient, healthy and liveable city and community wellbeing”* which we conclude is directly oppositional to the development proposed.

***We note that if ACTEWAGL had submitted their Preliminary Assessment and Development Application just 5 days later, a full Environmental Impact Study would have been required due to this proposal being a Class A Development.***

Following is a list of facts and questions we have about the project; we believe each fact needs to be considered in detail and each question needs to be answered independently and accurately. We recommend that given the significance of this proposal and the potential damage to the health and well being of thousands of Canberra citizens this proposal may bring, that these studies are conducted by an independent board of environmental scientists and medical professionals.

## Air pollution - questions and discrepancies

CPR believe these need to be answered in the ACTEWAGL report on Air Pollution

- Nitrogen dioxide (and other nitrogen oxides), produced by the proposed power plant is a precursor for a number of harmful secondary air pollutants, including nitric acid, secondary inorganic aerosols and photo oxidants (including ozone). No estimate has been provided in this proposal for the increase in secondary pollutants such as O<sub>3</sub> and PM, and whether these would breach environmental guidelines. Further detailed and independent study needs to be conducted to establish whether these secondary pollutants will breach environmental standards.
- Over the lifetime of the power station, global warming is expected to increase the average temperature in Canberra by up to two degrees Centigrade, and the maximum temperatures reached will be considerably more. This appears not to have been taken into account in the plume dispersion study, which relies heavily on temperature profiles? Has this expected temperature increase also been taken into account in the O<sub>3</sub> and PM estimates as the conversion of NO<sub>2</sub> to other damaging pollutants such as O<sub>3</sub> and PM is accelerated by increased solar radiation?
- The AUSPLUME study submitted to ACTPLA makes the assumption that the background level of NO<sub>x</sub> is 75.6 µg/m<sup>3</sup> however the “Australian Capital Territory 2006 Ambient Air Quality Report against the Ambient Air Quality National Environment Protection Measure” published June 2007 indicates that a background level of greater than 90 µg/m<sup>3</sup> is more appropriate. If this base level was used, the overall level would be greater and in excess of 246µg/m<sup>3</sup> as reported in the ACTEWAGL AUSPLUME study.
- The AUSPLUME report submitted to ACTPLA states that the proposed power station will produce a maximum ground level concentration of Nitrogen Dioxide of 245µg/m<sup>3</sup>. The Australian standard for exposure to Nitrogen Dioxide for a maximum of 1-hour per annum was introduced in 1998 and is set in a different unit of measurement – parts per million (ppm). When this limit (0.12ppm) is converted to micrograms per meter cubed at 25 degrees centigrade, this converts to a limit of 225µg/m<sup>3</sup>, not 246µg/m<sup>3</sup> as reported in the ACTEWAGL AUSPLUME study. This discrepancy is confounded further if the limit is corrected for Canberra’s maximum summer-time temperature. If the maximum summer time temperature is 40 degrees centigrade, the NSW National air quality standard would need to be reduced to 214µg/m<sup>3</sup>. At this level the proposed power plan breaches NSW standards.
- The national air quality standard for Nitrogen Dioxide is also dependant on the altitude of the site, when measured in micrograms per metre cubed. We know that the proposed site is at an altitude of 630m. This will affect the national air quality standard. This does not appear to have been taken into account in the Ausplume study. This needs to be considered in detail by an independent expert.
- The Plume study provided by SDA Engineering Pty Ltd comes with no guarantee that the data supplied is correct. We believe the plume study to be flawed (see below for further details) and recommend that an independent expert needs to be appointed to completely restudy every aspect required to produce an accurate plume study.

- ACTEWAGL states the power station is initially to be used as a peaking station, where the turbines are to be switched on and off multiple times a day to meet current electricity demand. We believe that the 15ppm NO<sub>2</sub> emissions data provided to SDA Engineering is for continuous running of the turbines, and that the emissions levels will be considerably more when the turbines are stopped and started, as is planned by the operator. This therefore makes the NO<sub>2</sub> plume study inaccurate. An independent expert study needs to consider the impact this use of the turbines will have and whether they meet the specifications when used in this way.
- The specifications given by ACTEWAGL in respect of the turbines they propose appear to be without reference to the site specific altitude and climate range. This requires an independent expert to review and deliver reports on this issue.
- The maximum annual exposure to Nitrogen Dioxide as allowed by the NSW Environmental agency is 0.03ppm. At sea level, and at 25 degrees centigrade this is the equivalent of 56.4µg/m<sup>3</sup>. (This limit will decrease with temperature and possible altitude). No details have been provided by ACTEWAGL on whether these limits will be breached in the community. An independent expert report needs to be commissioned to determine if annual NO<sub>2</sub> limits will be breached in the community if this proposal is advanced.

***“The Plume study provided by SDA Engineering Pty Ltd comes with no guarantee that the data supplied is correct”***

- The NSW air emission standards, to which the ACTEWAGL Plume study refers to, has licence limits in addition to regulation limits for NO<sub>x</sub> emissions. Regulation limits specify air emissions standards that provide a minimum performance level for all industries, whereas licence limits specify site specific environmental issues in addition to the regulation requirements. These licence limits in NSW are warranted by individual circumstances of each premises, such as the age of the facility and proximity to local populations. As this is a Greenfield site, which is supposed to burn a fuel which is much cleaner than coal, and is very close to residential populations, an expert report needs to be commissioned to establish what these licence limits need to be set at, prior to ACTEWAGL building the facility.
- The World health organisation 1-hour per annum guideline for NO<sub>2</sub> exposure is 200µg/m<sup>3</sup>, and for average annual exposure is 40µg/m<sup>3</sup> at standard temperature and pressure. If these figures were used for the basis of a licence limit for the facility, they would need to be adjusted down to take account of Canberra’s altitude and higher than standard summer temperatures. This has not been proposed within the ACTEWAGL application and consideration needs to be given to this by an independent expert.

- The NO<sub>x</sub> plume study provided by SDA Engineering uses vertical temperature profiles from Wagga Wagga, which has no relevance to the site proposed. Considering how close the ACTEWAGL expected maximum NO<sub>2</sub> ground level concentrations are to the NSW 1-hour limit, it is not felt that the values provided are accurate enough to guarantee that the pollution levels will fall below the NSW NO<sub>2</sub> pollution limits. According to one Ausplume recommendation “real meteorological data should be considered if predictions are close to the maximum acceptable concentrations (that is, within 20 percent) and if it cannot be clearly demonstrated that the screening approach was conservative”
- The NO<sub>2</sub> plume study provided by SDA Engineering uses meteorological data from Canberra Airport, about 10.2km from the proposed site and is completely topographically different from the proposed site. The proposed site for the power station is in the valley surrounded on three sides by hills, which will change the wind direction and velocity of the wind. Considering how close the ACTEWAGL expected maximum NO<sub>2</sub> ground level concentrations are to the NSW 1-hour limit, it is not felt that the values provided are accurate enough to guarantee that the pollution levels will fall below the NSW NO<sub>2</sub> pollution limit
- The Government currently has a scheme to encourage people to stop using their wood heaters in order to reduce the pollution. The Tuggeranong Valley already has pollution and temperature inversion type issues so the power station will only add to this already identified problem. Concerned politicians are raising this issue with ACT Health this week (Commencing May 5<sup>th</sup>).

***“The NO<sub>x</sub> plume study provided by SDA Engineering uses vertical temperature profiles from Wagga Wagga”***



*The temperature inversion layer can be clearly seen in this photo taken on Sunday 11<sup>th</sup> May 2008.  
A power station will create a serious health hazard.*

## The wrong plume assessment

The Plume Assessment produced by SDA Engineering is fundamentally flawed.

The report claims that it was carried out in accordance with the NSW EPA document “Approved Methods for the Assessment of Air Pollutants in New South Wales” however that is not the case.

The Approved Methods for the Assessment of Air Pollutants in New South Wales document suggests that Ausplume V6 is the appropriate modelling tool for most applications:

### 2.4.2 Dispersion modelling

AUSPLUME v. 6.0 is the approved dispersion model for use in most applications in NSW. However it is not approved in some applications where other more advanced dispersion models, such as CALPUFF and TAPM, may be more appropriate. The dispersion model input file should be prepared in accordance with the requirements of Section 6 of these Approved Methods and using the data collected in stage 1 of the impact assessment.

However on page 21, it states that Ausplume is not approved for sites such as Block 1671 Tuggeranong:

AUSPLUME v. 6.0 or later is specifically *not* approved for use in the following applications:

- **complex terrain, non-steady-state conditions:** AUSPLUME is a steady-state model and is unable to adjust the winds to reflect the effects of terrain. The straight-line trajectory assumption of the plume model is unable to handle the curved flow associated with terrain-induced deflection of channelling. AUSPLUME should not be used for terrain where the height of any receptor exceeds the lowest release height.
- **buoyant line plumes** (e.g. discharges from the roof vents of aluminium smelters)
- **coastal effects such as fumigation:** AUSPLUME is unable to consider large changes in meteorological conditions which can occur over short distances across a coastline.
- **high frequency of stable calm night-time conditions:** Pollutants can accumulate under such conditions or will flow downwind with the drainage flow. AUSPLUME has no memory of the previous hour’s weather conditions as each hour is treated independently of the next and material is carried away instantaneously, to the edge of the grid, even if only light winds are prevailing.

***It appears that AUSPLUME V6  
should not have been used at all***



## A. The site is Complex Terrain

The proposed site is in an area of complex terrain. The site itself rises from 621 metres in the North to 641 metres to the South. It is located adjacent to the Mugga Lane Landfill Tip which has a substantial rise. In addition, over the hills to the West and South West is the Tuggeranong Valley and to the North West is a ridge, over which is the suburb of Isaacs, the majority of which is on sloping terrain.



The view looking from the south which shows some of the complex terrain created by the Mugga Lane Landfill site.



The view from the site back to Tuggeranong. Numerous hills and gullies

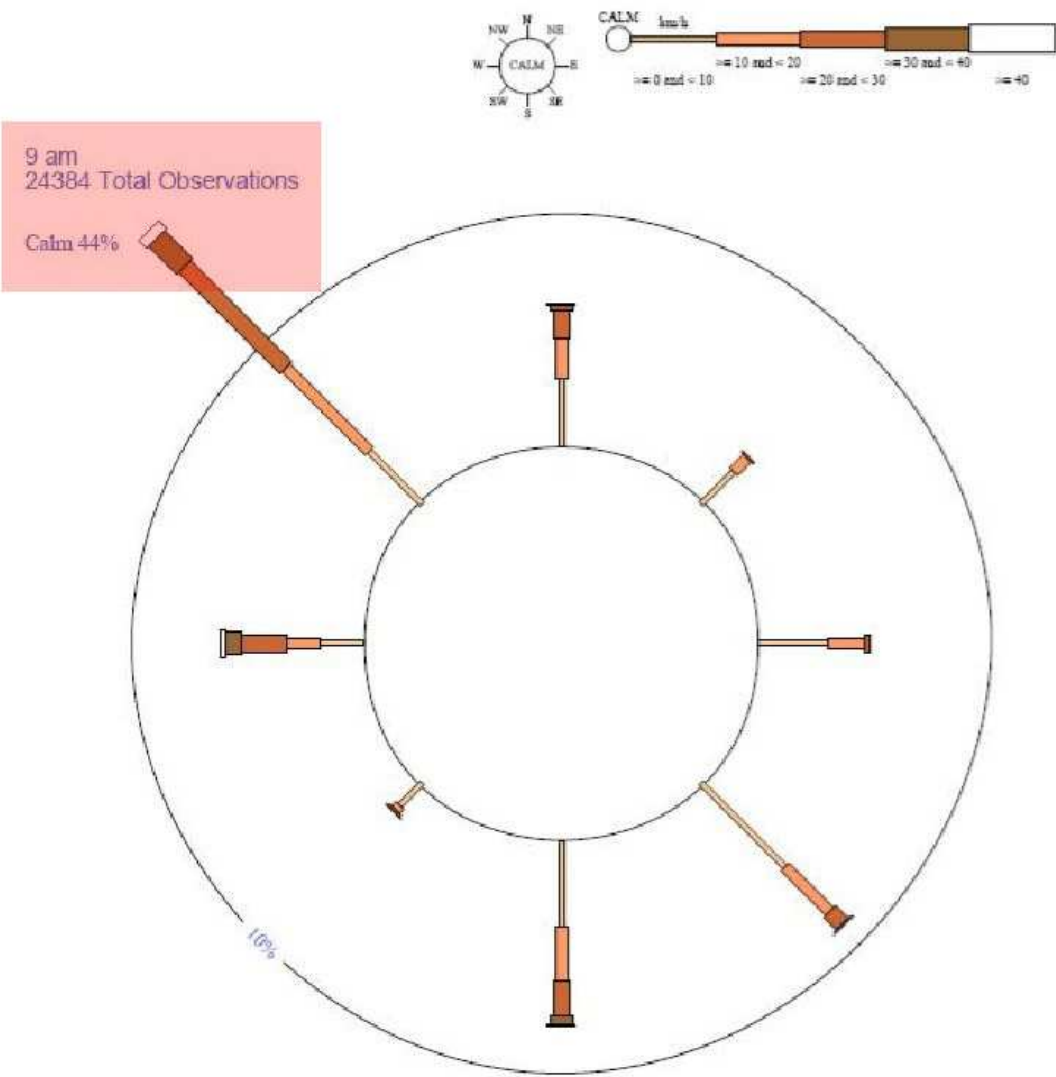


The view further to the North West towards Woden - more complex terrain

**B. There is high frequency of stable conditions at the proposed site.**

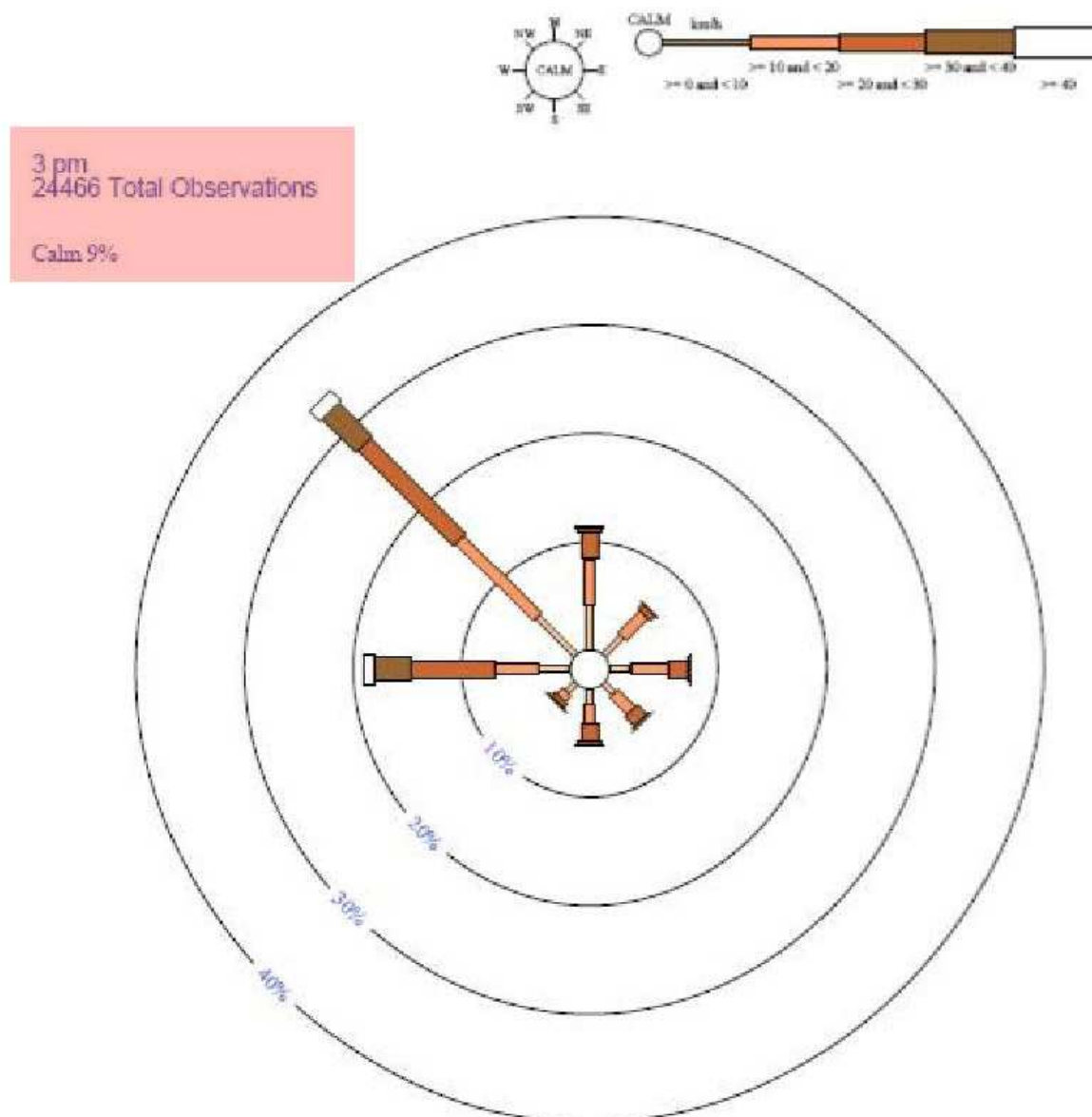
According to data from the Bureau of Meteorology (which is contained in the Acoustic Assessment from Bassett Engineering), it is:

**Calm 44% of the time at 9:00 AM**





**And calm 9% of the time at 3:00 PM**



There is a high frequency of calm conditions in Canberra. Therefore it would seem that in this case AUSPLUME V6 should not have been used to model the plume effects and therefore the assessment is invalid.

## Further reasons to question the plume study

The model has used stack heights at 36 metres, not 35 metres as detailed in the submitted plans.

### CTC Gas Fired Power Station (AUSPLUME V6)

PROJECT STAGE	GENERATOR SIZE	GENERATOR EMISSION (PPMV)	NUMBER OF GENERATORS	DIAMETER OF STACK (M)	VELOCITY OF GAS (M/S)	NSW EPA		AUSPLUME		Comments
						NO <sub>2</sub> Background level (micro g/m <sup>3</sup> )	NO <sub>2</sub> Maximum GLC (micro g/m <sup>3</sup> )	Calculated Maximum GLC (micro g/m <sup>3</sup> )	Stack Height (m)	
YEAR 1	14MW	15 (Guaranteed Max)	2	2.1	29.8	75.6	246	107	36	(Refer Appendix 1)
YEAR 2	14MW	15 (Guaranteed Max)	3	2.1	29.8	75.6	246	205	36	(Refer Appendix 2)
	20MW	15 (Guaranteed Max)	4	2.43	29					
YEAR 3	14MW	15 (Guaranteed Max)	3	2.1	29.8	75.6	246	225	36	(Refer Appendix 3)
	20MW	15 (Guaranteed Max)	5	2.43	29					
YEAR 5	14MW	15 (Guaranteed Max)	3	2.1	29.8	75.6	246	245	36	Note: This scenario was tested using guaranteed maximum levels of pollutant from supplier (Refer to Appendix 4)
	20MW	15 (Guaranteed Max)	6	2.43	29					

CPR suspects that the only reason this was done was “to make the numbers fit” That is, to get the final result under the magic 246 µg/m<sup>3</sup>.

Their own table notes state:

#### **8) Stack Height**

**The stack height is influenced by GLC, increasing the stack height will reduce GLC.**

We suspect that if the modelling was done with the correct height of 35 metres that 245 µg/m<sup>3</sup> wouldn't have been achieved and would therefore be greater than 246 µg/m<sup>3</sup>.

## Conclusion on consideration of the Air Quality Reports

We conclude that given the potential life threatening impact this proposed power station will have on thousands of Canberra citizens it is unacceptable to rely on a flawed plume study and inaccurate and incomplete air pollutant investigations. We submit that this application be rejected. In the alternative we request that independent experts are instructed to investigate and provide detailed and accurate reports on the real potential impact this proposal will have on the environment and on the community.



Aerial view facing back to Tuggeranong from the North East.  
The plume doesn't have far to travel for 1,000s of Tuggeranong residents to be affected.



## The Noise Assessment is fundamentally flawed

The Noise Assessment (Appendix M in the Preliminary Assessment) seems to depend on the following statement contained in page 2:

The installation of a 210MW capacity gas fired power station is proposed. It will include up to nine Titan 120 generators and three steam turbines with associated equipment. The full capacity is not expected to be reached until 2026. The power plant is used to supply constant electricity to a number of large data centre buildings which are also yet to be built and therefore will be required to operate 24 hours a day.

### **The above statement is not correct**

We confirmed with Mr Brooke O'Mahoney, Manager of Commercial Development at ActewAGL on the 17<sup>th</sup> May 2008, that the gas turbines that will be installed are in fact:

- 3, Solar Turbines Model Titan 130
- 6, Solar Turbines Model Titan 250

This patently brings into question the base data upon which the entire Noise Assessment is based. It would seem that the Noise Assessment depends on equipment that will not be part of this proposal so cannot be considered valid.

In addition to the significant flaw discovered above, our research also indicates that:

- The Titan 250 model is a brand new model (released in April/May 2008) that is yet to be installed in a working facility. If that is the case, where has the noise and plume data come from? We requested further information from Solar Turbines in regards to the Titan 250 however to date this has not been provided.
- This proposal includes 3, 11kv to 132kv Line Transmission Transformers located in the switchyard which have not been modelled at all. We understand that transformers like these can produce up to 85 dBa at 1 metre and in this case, they are more than 100 metres closer to the suburb of Macarthur when compared to the power station itself.

This is a clear and serious gap in the noise study.

- A Titan 130 is installed at the Ron Goodin Power Station (RGPS) in Alice Springs in the Northern Territory. This particular Titan 130 produces 103.1 dBA and they apparently cannot get it anywhere near the suggested 87dBA. This is detailed in the comprehensive report which was published in January 2007 (Full report - [http://www.powerwater.com.au/news/media\\_releases/2007/1001\\_noise\\_report\\_on\\_goodin\\_power\\_station.htm](http://www.powerwater.com.au/news/media_releases/2007/1001_noise_report_on_goodin_power_station.htm) )

On page 7 of the RGPS report it states:

### **1.2.2 Conclusions from Performance Specification Measurements**

1.2.2.1 The noise emissions from the Titan generator were measured to have a maximum  $L_{Aeq}$  of 103.1 dB(A) at a distance of 3m away from and 3m above the lip of the exhaust. A measurement was also taken at a distance of 3m away and 1m above the lip of the exhaust which resulted in an  $L_{Aeq}$  of 99.2 dB(A). The noise emissions spectra for the two measurement made above the stack were very similar, indicating that the characteristics of the noise emitted from the top of the stack do not change substantially with increased height above the exhaust stack. The height above the stack at which the maximum  $L_{Aeq}$  occurs was not assessed as 3m above the stack was the highest safe measurement position.

This real world example indicates that a Titan 130 produces levels somewhere between 99.2 and 103.1 dBA which is much higher than Bassett's base data of 87 dBA. This once again, calls into serious question the quality of the Noise Assessment.

- This situation is even more extraordinary when you consider that the above report was commissioned AFTER approximately \$800,000 was spent in an effort to reduce the noise to an acceptable level.

They failed, so the generator is being moved 25 km's out of Alice Springs. Full details can be found here:

[http://www.powerwater.com.au/news/ron\\_goodin\\_power\\_station.htm](http://www.powerwater.com.au/news/ron_goodin_power_station.htm)

- Bassett's Noise Assessment also states:
  - "Noise levels within this report have been based on data supplied by SDA Engineering Pty Ltd and through ActewAGL"... **Given ACTEWAGL's vested interest in this project, this data is suspect?**
  - "Sound Pressure Levels have been given at a distance of one metre from each source. The resulting accuracy of the noise model produced as part of this study is limited by the accuracy of the data which has been supplied." **Who is standing by this report? It seems no-one.**
  - "Noise levels at the immediate boundary of the site have been shown to slightly exceed night time industrial noise criterion. However, costly noise mitigation measures to reduce this impact are considered impractical and unnecessary." **If there is no requirement to meet standards what purpose do these standards serve?**
  - "Due to the timing of the project, logging was performed within a school holiday period. It is usually best practice to perform noise logging outside school holidays as noise levels can sometimes be affected." **Why wasn't the logging done properly?**
  - "It is expected that the entire area is to re-zoned as industrial and therefore be designated as zone A, with emission criteria of 65 dB(A) at during the day and 55 dB(A) at night." **This is quite an extraordinary statement for a consultant to make. It is their opinion that this proposal doesn't meet the current zoning requirements and indeed even if the rezoning goes ahead, the proposal still will not meet those requirements!**

The Noise Assessment states that the source data was obtained from SDA Engineering and ActewAGL (page 1 of appendix M of the application):

*'Noise levels within this report have been based on data supplied by SDA Engineering Pty Ltd and through ActewAGL. Sound Pressure Levels have been given at a distance of one metre from each source. The resulting accuracy of the noise model produced as part of this study is limited by the accuracy of the data which has been supplied.'*

There is no reference to:

- Where SDA Engineering obtained the data (apart from the Engineering Drawing),
- Where ActewAGL obtained the data,
- Original Equipment Manufacturer Data Sheets or requested data, or
- Existing operational equipment, even though such equipment exists and actual reports exist.

Given that the source data cannot be validated, and the fact that the Engineering Consultant made no attempt to validate that data which is in itself poor engineering practice, this model is considered invalid.

Although the report states (page 6) that the *'model was developed using SoundPLAN 6.4'* it does not state what recognised algorithm was applied (eg CONCAWE industrial noise algorithm), and no attempt is made within the report to validate the model, such as a similar reference facility. Given that the proposed array of nine turbine engines appears to be totally unique (we could not find another example anywhere in the world), it is just not possible to validate the model.

The Noise Assessment Report even states (page 8) *'The existing site is a green field, and therefore validation of the noise model is currently not available.'* This is essentially a 'get out of jail free card' for the consulting engineers who cannot stand by their noise assessment.

In addition to this, the report fails to discuss or address the issue of sleep arousal, which is a requirement for the cyclical operation of a peaking power station, which is what the proponents have described this facility as.

***"The resulting accuracy of the noise model produced as part of this study is limited by the accuracy of the data which has been supplied."***

The noise assessment is seriously flawed on numerous levels. The application should therefore be rejected. In the alternative an independent expert noise study is required to address all of these complex and multifaceted issues **before** construction is commenced

## **Omission of a vibration study**

A massive amount of equipment and machinery will be operating at this site both during construction and during operation.

We see the lack of a vibration study as a serious omission particularly in the context of the power generation infrastructure.

This application should be rejected and in the alternative an independent expert report is needed to address these serious omissions.



## Affect on the endangered bird/wildlife

In the light of the rare bird sightings below and given the proposed power station will irreparably damage the environment on the site and the surrounding areas – before this proposal goes ahead we demand a Regent Honeyeater survey be conducted to ensure this power station will not be removing the habitat of one of Australia's rarest birds.

Jenny Bownes, the Conservation Officer at COG (Canberra Ornithological Group) stated a record of a nationally endangered bird species, the Painted Honeyeater, has been seen in the Rose Cottage Paddocks in the past four years. She also stated there is an "ACT Lowland Woodland Conservation Strategy (Action Plan 27)" which shows a conservation corridor running through the proposed site.

Ms Bownes has already read the Ecological Assessment and was disappointed that this strategy had not been considered. COG have opposed the application on these grounds.

Located on, or within 600m radius of the proposed site, two species of birds currently on the NSW Department of Environment and Climate Change Threatened Species list have been recorded:

- The Gang-gang Cockatoo (*Callocephalon fimbriatum*) and
- The Diamond Firetail (*Stagonopleura guttata*)

It is important to note that the following birds which are uncommon or rare in the ACT have been sighted on this site:

- Black Kite
- Peregrin Falcon
- Common Brozewing
- Peaceful Dove
- Common Koel
- Tawny Frogmouth
- White's Thrush
- Satin Bowerbird
- Grey Butcherbird and
- Grey Currawong

In addition there has been no assessment into the potential affects on trees and wildlife around the need to construct large overhead power lines and gas pipes.

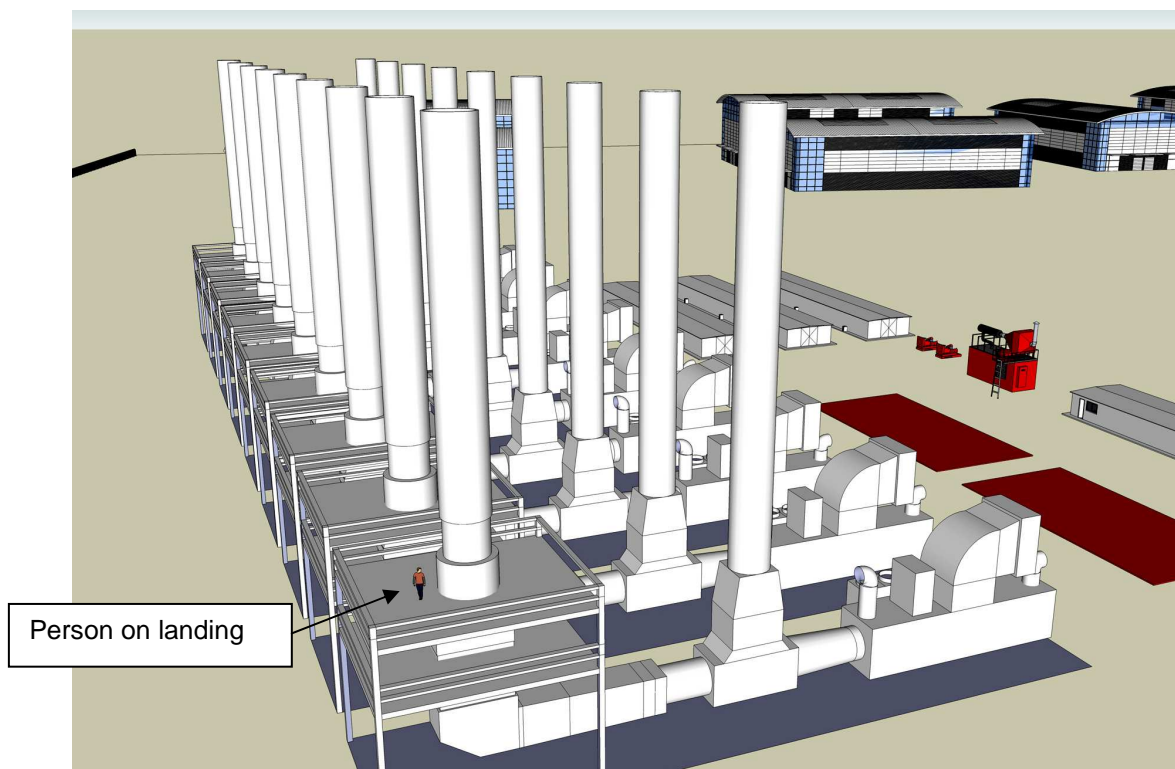
These power lines will run across large tracts of countryside – the affects are potentially devastating to local wildlife. A full environmental impact study is required to ensure that any development will not irreparably damage the environment.

## Visual corruption of the nation's capital

CPR produced the first images of the proposal which were produced on the front page of the Canberra Times.

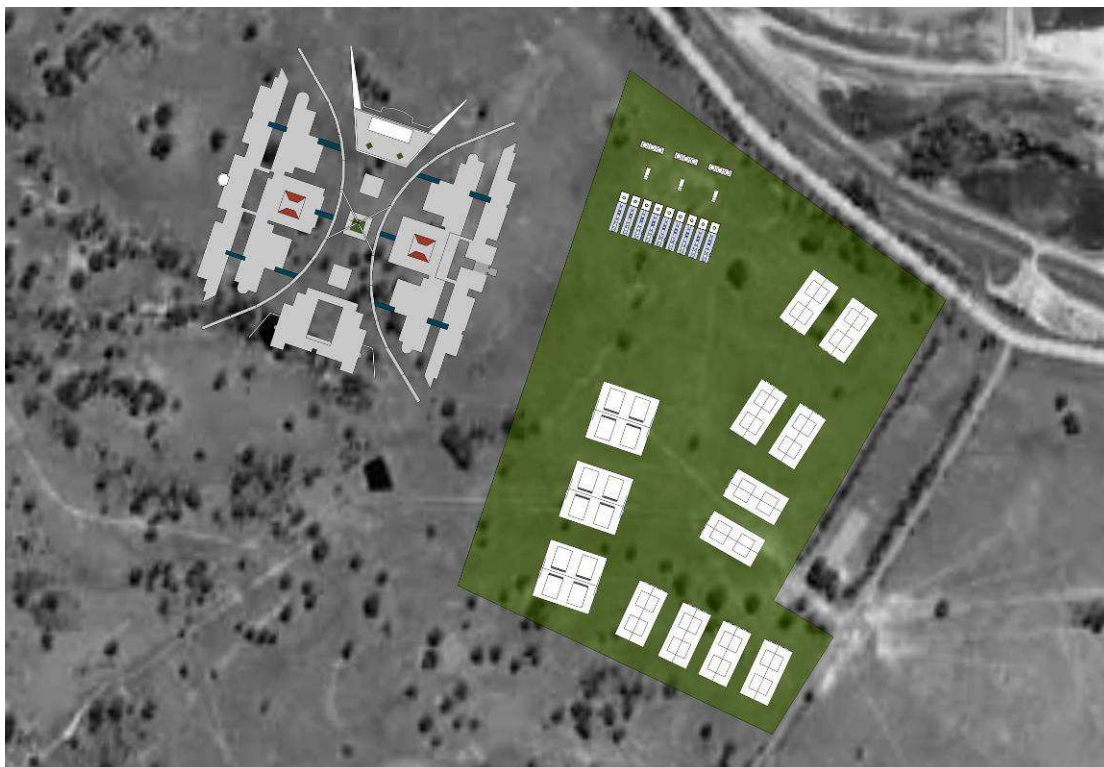
If it was ever the intention of ACTEWAGL to consult with the Canberra community on the exact site and nature of the project it would have provided the community with realistic representation and honest commentary.

It is a considerable omission on the part of ACTEWAGL not to include images such the ones that follow on a project with a budget of approximately \$2 billion.



"They are just 12 small stacks" - Michael Costello, incoming CEO for ACTEWAGL on 666 ABC Radio 14<sup>th</sup> May 2008

The chemicals from each stack are pumped out at between 104 and 108 kilometres per hour at between 465 and 500 degrees Celsius. There are 18 stacks, not 12.



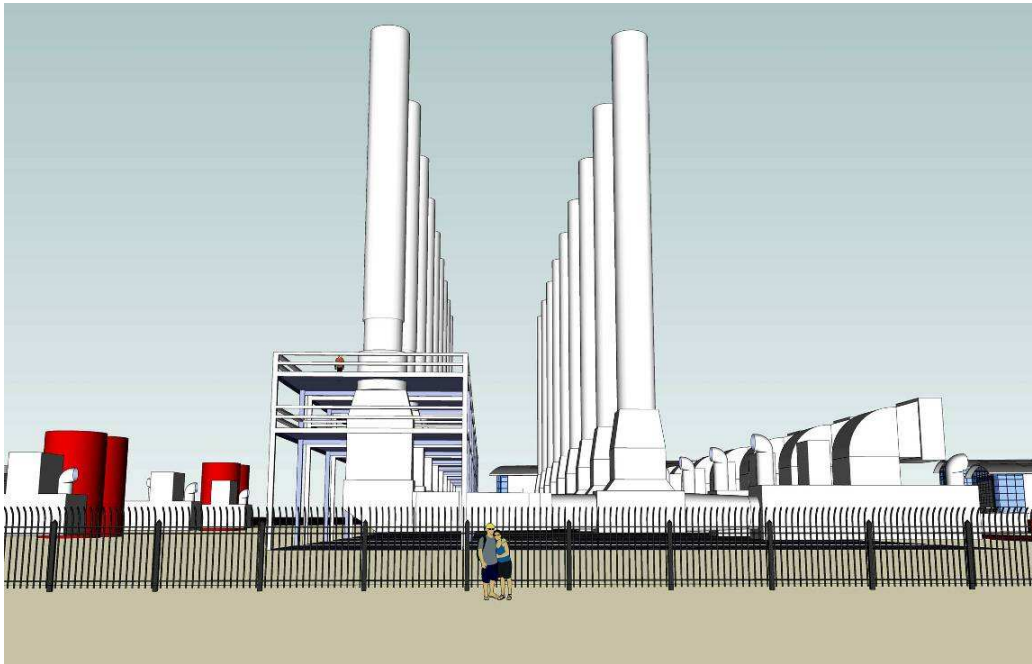
This image compares the proposed CTC site with New Parliament House. The proposed CTC site is bigger

Parliament House was built by a Statutory Authority whose purpose was to manage the construction properly.



This aerial image is from the South West.  
Pollution can easily travel to Tuggeranong.

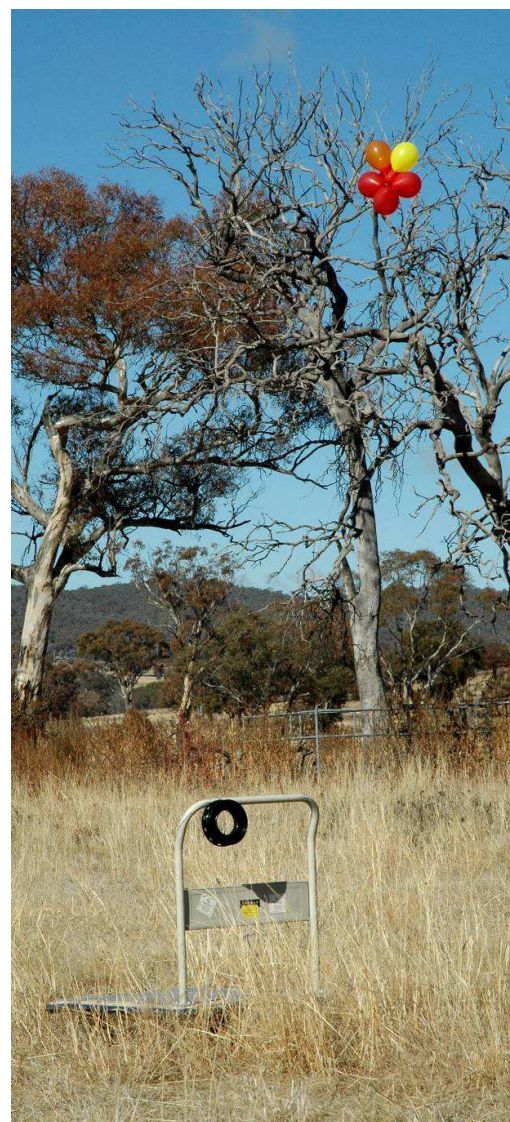




These people are standing outside the Western fence which is 2.4 metres high.  
They are approximately 42 metres away from the first stack.

"We have the best consultants that money can buy" – John Mackay, outgoing CEO of ACTEWAGL.

This photo of a trolley and party balloons was taken at the site on 16<sup>th</sup> May 2008. We are not sure what ACTEWAGL were trying to achieve with this particular test rig.



## Not appropriate use for Broadacre

The site proposed is currently designated as Broadacre and specifically as a Public space and a special purpose reserve.

Broadacre objectives per the Territory Plan include:

- to make provision for activities requiring clearance zones or protection from conflicting development
- to ensure that development does not adversely impact on the environmental quality of the locality
- that development does not adversely affect distant views from public places to major regional features

The proposal states that the data centre campus is a communications facility. A communications facility includes structures such as radio antennae masts, satellite dishes and mobile phone antennae. The data centre campus includes buildings with air-conditioned office spaces (some 9,000m<sup>2</sup>) and 400 car parking spaces. This does not fit within the definition of a communications facility and is not suitable for broadacre use.

*Evidence in this matter includes:*

Proponents' press release: [http://www.canberratechnologycity.com.au/downloads/Next-generation% 20data%20centres.pdf](http://www.canberratechnologycity.com.au/downloads/Next-generation%20data%20centres.pdf)

Floor plan: [http://203.9.249.2/e-registers/pubnote/pdf/FLOOR-200704152-01Level\\_2-GC2-.pdf](http://203.9.249.2/e-registers/pubnote/pdf/FLOOR-200704152-01Level_2-GC2-.pdf)

Cross section: [http://203.9.249.2/e-registers/pubnote/pdf/SECTION-200704152-Sheet\\_1-GC2-01.pdf](http://203.9.249.2/e-registers/pubnote/pdf/SECTION-200704152-Sheet_1-GC2-01.pdf)

Site plan including car parking spaces:

[http://www.actpla.act.gov.au/\\_ data/assets/pdf file/0004/8383/Appendix A Site Plan.pdf](http://www.actpla.act.gov.au/_data/assets/pdf_file/0004/8383/Appendix_A_Site_Plan.pdf)

Further matters relating to the existing broadacre area:

In order to implement a 100-metre outer protection area as required per AS3959 (building in a bushfire-prone area), this would have to be done OUTSIDE of block 1671 as the block itself does not contain enough space to contain this area of separation from the surrounding bushfire risk (grassfire vegetation) and the plan only shows a 15m internal protection area. This leads to the potential that more than this block's area is being planned to be developed and this could be phase 1 of the beginning of the loss of the broadacre zone altogether.

Other suggestions related to this are the Bassetts acoustic assessment report statement:

"The proposed Gas Fired Power Station location is currently designated for Broad Acre Land, and therefore zone E but it is expected that the entire area is to re-zoned as industrial and therefore be designated as zone A.

This suggests that Basset may be aware of a larger area than is being referenced in this development application and preliminary assessment. What does "entire area" mean beyond this site (being block 1671, Tuggeranong)?

## Bushfire risk assessment report is inaccurate

The executive summary of the application states that flames would be low intensity, move slowly and be 3.5m in height. The report's calculations are based on an average day's temperature (35 deg's C), less intense winds and higher dew point than was experienced recently in the 2001 and 2003 fires.

Also, reference to the SBMP (Strategic Bushfire Management Plan) fails to point out that the SBMP analysis of risk and consequence are based on small fires and the degree of risk rises as the size of fire gets larger. Hence it unrealistically lowers the bar against which the risk level is determined.

The higher level of risk is confirmed in the Strategic Bushfire Management Plan within the "consequence" map (Map 5). This shows the proposed site's location as being medium to high (with respect to a small fire, hence high to extreme for a large fire).

The risk assessment submitted as part of the preliminary assessment appears to focus on the risk level of a fire breaking out on the site or within 100m (the boundary area of assessment) and does not account for the bigger picture.

### This is an entirely deficient way of assessing the risk.

The risk of bushfire attack by way of a grassland bushfire is extreme. The fuel (grasslands) is currently 100% cured and are not extensively grazed throughout the vegetation corridor leading up to the site's boundary.

The calculation in the bushfire risk assessment report results in FDI 80. FDI = Fire Danger Index. **80 is EXTREME** and equates to 6m high flames, a fire front moving at 11km/h or more and resulting in burned area being equal to 170 hectares after ½ hour. The subject site is 21 hectares in size. It is very small in comparison to the corridor it would be sited within.

The report often quotes AS3959. This standard is titled: "*Construction of buildings in bushfire-prone areas*" but isn't referred to by name throughout the report, in order to mislead. Some of the requirements include:

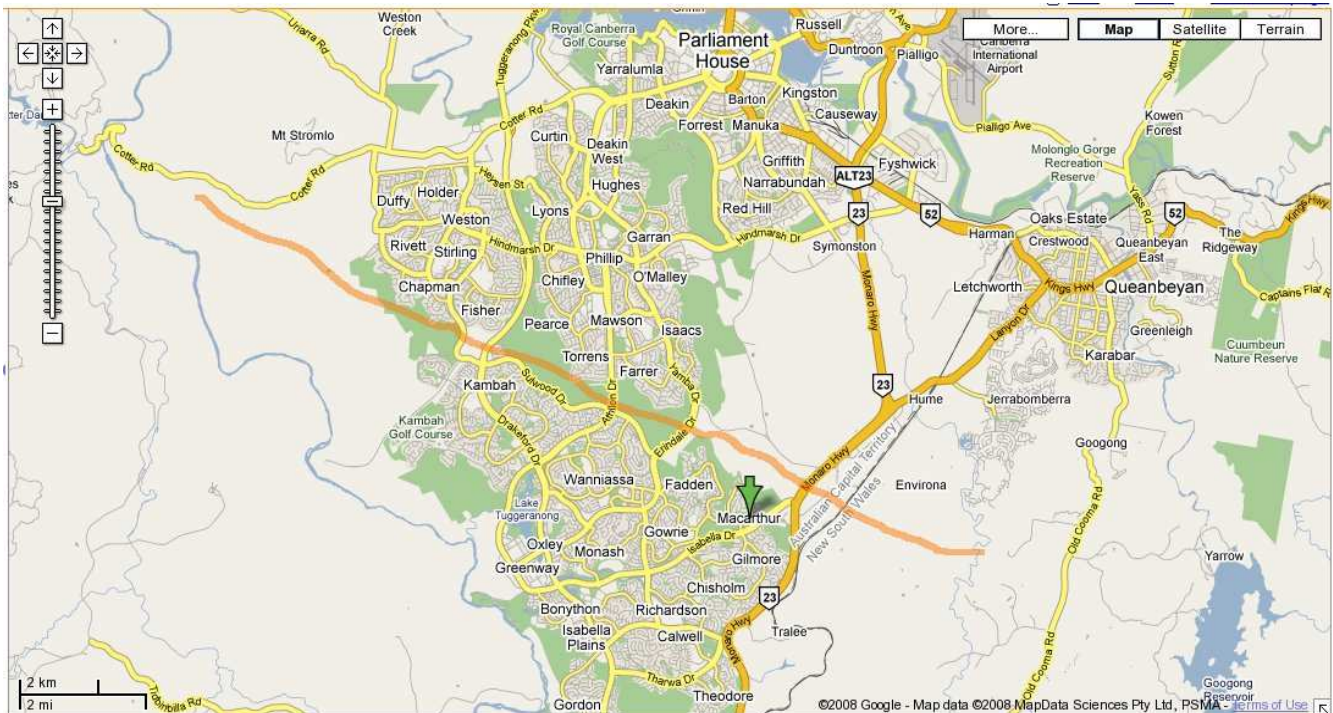
- Fire protection screens on windows
- Maximisation of distance between buildings and block boundary (current plan has buildings too close to site perimeter and car parking on the inside of the site)
- Requirement of a perimeter road to assist access (current plan has single spine service road which would not allow access/retreat by fire services in the case of attending fire)
- Requirement of a 100m outer protection area (current plan has a 15m inner protection zone only), hence would require removal of trees not on the tree assessment of the PA if a clearance area had to be created beyond the boundary of the current site plan submitted
- Minimisation of fuel sources on the site (current plan has extensive landscaping including bushes and trees which would serve as fuel) – this is a "Northern



Hemisphere" model data campus and not suitable for the Aussie bush

- Fire hydrants (i.e. water infrastructure for fire-fighting)

The proposed site is located within the Southern Vegetation Corridor which, while serving to preserve the rural setting of Canberra's suburbs, also makes the entire corridor an extreme bushfire hazard.



The photo montages by ActewAGL confirm this:

<http://www.canberratechnologycity.com.au/downloads/3D-MacArthur1-coloured.pdf>

This shows extensive grassland fuel in the foreground.

<http://www.canberratechnologycity.com.au/downloads/3D-2May-09-Coloured.pdf>

This shows the extensive vegetation corridor within which the extreme risk site would be located.

<http://www.canberratechnologycity.com.au/downloads/3D-2May-04-Coloured.pdf>

This again shows the extensive vegetation corridor within which the extreme risk site would be located.

Following the 2003 Bushfire disaster, the McLeod report analysed areas burned in the ACT within the past 80 years and in 1984-1985 the Southern Vegetation Corridor including the proposed site was entirely burnt.

During the 2003 Bushfires the site was at imminent threat but a change in the weather caused the fire to die down shortly after it crossed Erindale Drive. It was not (and could not have been) human intervention that avoided the potential fire risk.

McLeod report:

[http://www.cmd.act.gov.au/publications/archived\\_publications/mcleod\\_inquiry/report](http://www.cmd.act.gov.au/publications/archived_publications/mcleod_inquiry/report)

Specific file with the maps of last 80 years' burning areas:

We therefore conclude this site is incompatible with the proposed power station and data centre complex and request this application be rejected

## Other Considerations

### Broad acre Zoning

There are three key facts that prevent the proposed facility being classified as suitable for Broad acre zoning:

1. As per the Noise Assessment Report, the Power Station **exceeds the noise criteria for Broad acre zoning**. The Dragway proposed at Majura was rejected on these grounds before it even made it to the DA stage.
2. The Data Storage Centres do not meet the description of a Communications Facility as defined in the Territory Plan.
3. The facility includes extensive Office Spaces, which are prohibited for Broadacre development as per the Territory Plan.

### Benefits?

There has been no real evidence filed to support the proposition that this data centre and power station will create 400 jobs within Canberra. Indeed this figure has been altering considerably since it was first mentioned in October 2007 by ACTEWAGL in press releases speaking of a Data Centre in Hume.

Initially the expected jobs were reported as 600. This has fallen steadily until April 2008 when ACTEWAGL CEO John Mackay stated 300 jobs would be created. Carsten Larsen the ACTEWAGL spokesman and project manager told the Community meeting on 28 April 2008 that no more than 30 to 40 jobs would be created. The 400 car parking spaces on the plans were intended only in case of an emergency.

It should be incumbent on ACTEWAGL to detail precisely in what ways the community of Canberra will benefit from this project given that there is a high level of detriment to the environment and the health of the community.

### Why this site?

Why this proposal should be placed so close to established communities is also unclear. CPR has done extensive research and can find no recent example of placing a power station so close to established communities and any examples it can find of building new power stations have not been done without first conducting a thorough EIS.



## **Lack of real and meaningful consultation**

The lack of real and meaningful consultation has created mistrust and disillusionment with ACTEWAGL and the ACT Government, amongst businesses and residents alike.

CPR is concerned to note that no members of the public have been allowed to engage in meaningful consultation with this proposal.

Businesses and fellow ACT Government departments have also been excluded from consultation:

- ACT NOWASTE was not consulted regarding the proposal despite having staff working at the Landfill site next to the proposed power station site
- ACT Disability and Health were not consulted regarding the health facility and ACTEWAGL has not asked whether it is appropriate to merely build a 10metre high wall to dull the sound around this facility
- Mr Snow, the Managing Director of Canberra International Airport was not consulted regarding this proposal despite the enormous impact on flight paths and air safety this power station poses.

CPR notes that the flight path is only 4.68 km from the power station and a mere 2.35km from the western side noise corridor. This has potentially fatal implications for aircraft flying across or close to the power station and impinges the development or extension of Canberra International airport Canberra Airport should have been consulted before this proposal was filed.

## **This site poses a significant terrorist target**

In the present political climate it is untenable that a modern capital city would allow an enormous power supply, data centre and residential homes to be constructed so closely together.

They form one enormous terrorist target – power, data and civilian mortality in one attack.

## Conclusion

This proposal came to light by the accidental discovery by one member of the community of a small yellow sign pinned to the fence on Long Gully Road. The notice faces onto a country road where no pedestrians go and facing inwards, it is virtually impossible to see as you drive past in a car. The previous three media “advertisements” of this project had detailed this as “a data centre in Hume”.

ACTEWAGL announced at the first meeting on 28 April 2008, requested by the Tuggeranong Community, that ACTPLA had instructed them to embargo the press release until the first day of school holidays 11 April 2008. Indeed on the ACTEWAGL web site the press release was marked as being embargoed until that date.

CPR is made up of unpaid members of the community. Since the discovery of this proposal this group of individuals has spent considerable time and effort, energy and skill to read, analyse, learn and use the skills and expertise of people around them to decipher these complex and technical reports. They do not have the financial or time resources that ACTEWAGL has. They do not have the media or political connections. Without members of the community pooling skills and informing their neighbours of what is really intended for their community, ACTEWAGL and the ACT Government would have been content to let this slip through on 5th May without any consultation or response from the very people it will affect. By association ACTPLA is implicit in this “near miss” for the community.

Most recently ACTEWAGL has used its financial resources and media connections to run campaigns through radio and newspaper informing people, without real proof or analysis of what they claim will be the “enormous benefits”, “diversification of economy” and “advancing Australia’s world class position as the hub of data technology”, by installing this “data centre” on this site. In unguarded moments we have heard the CEO of ACTEWAGL state in answer to his own rhetorical question regarding building on this site “is it a done deal – absolutely”.

Members of the community have recently been subjected to Mr Barr recommending this project to the Assembly two weeks before the closing date for submissions and listened to Mr Stanhope talk about how ACTEWAGL has tried very hard to consult with the people, but there are, he says, those in the community who come with closed minds and other agendas – referring to those who object to this proposal.

CPR would like to state that there is clearly a difference of definition in consultation. No member of the community, or for that matter, ACT Government employers were consulted regarding this project during the compilation of the reports. The current campaign is not consultation. It is being told as what ACTEWAGL intend to do to us.

CPR also acknowledges that Mr Stanhope is the Environment Minister. He is the person who can reject this proposal or require an independent EIS. He is also the person who appointed Mr Mackay and spoke disparagingly about community members who objected to this proposal but praised ACTEWAGL for placing a few planks of cardboard on stands and told community members “they would look into it” – when their application was already safely filed with ACTPLA.

The members of CPR are deeply disappointed that ACTEWAGL has filed such poor, perfunctory and clearly lacking reports in support of such a significant construction.

CPR retains therefore a collective heavy heart whilst filing this submission but retains a core of faith that the process will provide the safety and protection that the community deserves rather providing the quick results ACTEWAGL and its financial backers demand.

CPR is aware that had ACTEWAGL filed this application five days later it would have been automatic that an EIS be carried out. CPR can find no example, anywhere, where there has not been an EIS carried out prior to building a power station of this size.

CPR submits this response and tenders the above results in good faith.

We ask that this application (DA 200704152) be rejected due to improper, inaccurate and unsound reports purporting to support this application cannot be relied upon.

The safety and well being of the community would be jeopardised should this application proceed. In the alternative we ask that due to the extent of the environmental impact on every aspect of Canberran life, that a full independent Environmental Impact Study be conducted to ensure the health and well being of every Canberra resident is protected.

## References

[http://www.euro.who.int/document/aig/7\\_1nitrogendioxide.pdf](http://www.euro.who.int/document/aig/7_1nitrogendioxide.pdf)  
[http://www.environment.nsw.gov.au/resources/air/actionforair/cleanairforum/Clean\\_Air\\_Witherspoon.pdf](http://www.environment.nsw.gov.au/resources/air/actionforair/cleanairforum/Clean_Air_Witherspoon.pdf)  
<http://www.euro.who.int/document/e79097.pdf>  
<http://www.health.act.gov.au/c/health?a=sendfile&ft=p&fid=1075677445&sid>  
<http://www.air-dispersion.com/formulas.html#mg/m3>  
[http://www.nationalasthma.org.au/html/management/infopapers/health\\_professionals/4004.asp](http://www.nationalasthma.org.au/html/management/infopapers/health_professionals/4004.asp)  
<http://www.environment.gov.au/atmosphere/airquality/standards.html>  
[http://www.orc.govt.nz/Documents/ContentDocuments/regional\\_plan\\_air/air\\_plan\\_14\\_Schedule16\\_17.pdf](http://www.orc.govt.nz/Documents/ContentDocuments/regional_plan_air/air_plan_14_Schedule16_17.pdf)  
[http://www.powerwater.com.au/news/ron\\_goodin\\_power\\_station.htm](http://www.powerwater.com.au/news/ron_goodin_power_station.htm)