

ASSESSMENT REPORT

Section 75W Modification Smithfield Energy Facility (DA 94/165 MOD 2)

1. INTRODUCTION

This report assesses a modification request by Smithfield Investors No. 1 Pty Ltd (the Proponent) to modify the Smithfield Energy Facility, Smithfield. The request has been lodged pursuant to section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

2. BACKGROUND

The Proponent operates the Smithfield Energy Facility located at 33 Herbert Place, Smithfield in the Cumberland local government area (see **Figure 1**). The facility has been in operation since 1996 and operates as a natural gas Combined Cycle Gas Turbine (CCGT or cogeneration) power plant, supplying both baseload electricity to the NSW electricity grid and heat in the form of steam to the adjacent Visy Smithfield Recycling Facility (Visy site).

The site is located within an existing industrial area and is bounded to the south, west and east by the Visy site and another industrial operator to the north (see **Figure 1**). Main access to the site is from the Cumberland Highway and Herbert Place. The closest residential receivers to the site are located in the suburbs of Smithfield and Guildford West, which are approximately 450 metres (m) south and 850 m east of the site (see **Figure 1**).

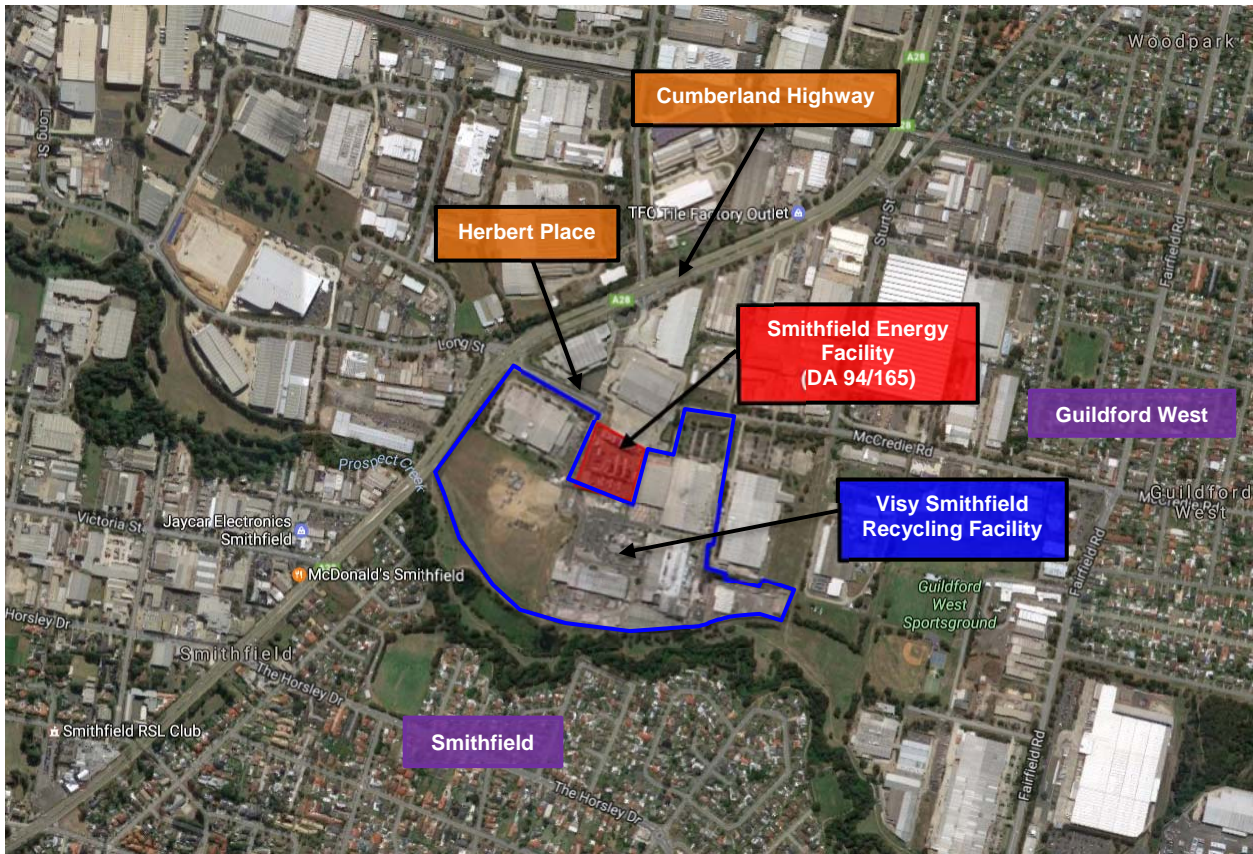


Figure 1: Site Location

The facility currently operates under an existing Ministerial consent (DA 94/165) granted by the then Minister for Planning. The facility uses natural gas as a fuel source and consists of three power trains, which is a type of power station unit comprising (see **Figure 2**):

- a 38 megawatt (MW) gas turbine to generate electricity;
- a heat recovery system generator to produce steam from waste heat; and
- an exhaust gas stack to carry waste process heat and gases away from the facility.

At present, the power trains are configured to operate as a baseload power plant in cogeneration mode. This means that it uses the gas and steam turbines together to produce electricity, while also capturing waste heat from the gas turbines. The cogeneration plant also contains a four-cell cooling tower, which is primarily used to cool or condense the steam that is being generated by the steam turbine.

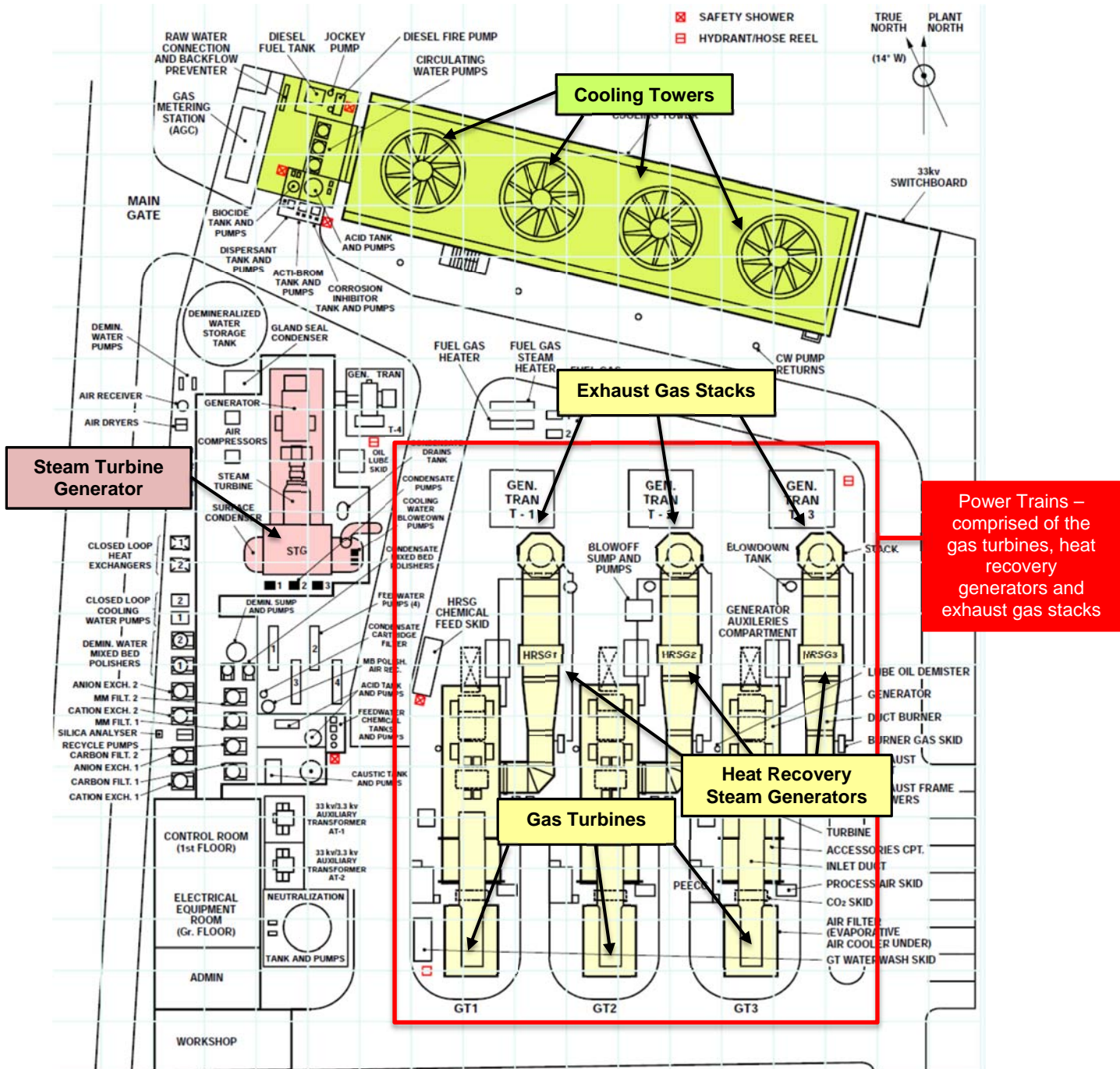


Figure 2: Smithfield Energy Facility Current Site Layout (Cogeneration Mode)

The cogeneration process is summarised as follows:

- natural gas is used to drive a gas turbine (located in each power train) to generate electricity for the grid;
- waste heat (or hot flue gases) is captured from the gas turbines and is converted into process steam via a heat recovery steam generator;
- a single 62 MW steam turbine generates additional electricity from the process steam produced by the heat recovery steam generator; and
- process steam is exported from the facility to the adjacent Visy site.

The eastern Australian domestic natural gas market has recently experienced volatile gas prices and gas supplies due to the rapid growth in liquefied natural gas exports. Consequently, this has had flow-on effects for the price of electricity for the eastern Australian states. The Proponent notes that at times when domestic gas prices are consistently high or when domestic gas supplies cannot be guaranteed, it is not economically feasible to operate the facility in cogeneration mode.

The Proponent is now seeking to modify its development consent, so that in addition to operating in cogeneration mode, the facility can also operate in Open Cycle Gas Turbine mode (OCGT or open cycle mode) to respond quickly to domestic gas and electricity market circumstances. In open cycle mode, the facility would operate as a peaking plant, which means it would only provide electricity to the NSW electricity grid during periods of peak demand. Under an open cycle mode of operation, the facility would not be operating as a cogeneration plant and would not supply steam to the Visy site.

In 2015, Visy Industries Pty Ltd obtained planning approval to reinstate two gas-fired backup boilers for the Visy site (DA 13/94 MOD 7). The boilers, which are now being installed, will provide steam during times when the facility is not operating in cogeneration mode (that is, as a baseload power station).

The decision to operate the facility in either cogeneration or open cycle mode would be based on prevailing market conditions, dictated by the forecast cost of natural gas and related energy market factors.

3. APPROVAL HISTORY

On 18 November 1994, development consent was granted by the then Minister for Planning for the development of a natural gas cogeneration power plant (DA 94/165). The development consent permits the construction and operation of a cogeneration plant, consisting of three gas turbines, three heat recovery steam generators, a single steam turbine and associated infrastructure.

The development consent was modified on one previous occasion. On 9 May 2006, a section 96(1A) modification (DA 94/165 MOD 1) was granted to remove requirements for meteorological and ambient air quality monitoring.

4. PROPOSED MODIFICATION

The Proponent has lodged a modification request under section 75W of the EP&A Act to modify the Smithfield Energy Facility development to allow the facility to be used intermittently in open cycle mode in addition to operating the facility in cogeneration mode.

To enable the facility to operate occasionally in open cycle mode, the proposed modification would require the three existing power trains to be reconfigured as follows:

- installing ducts at the gas turbines to direct flue gases to the exhaust gas stack, while bypassing the heat recovery steam generator in each power train; and
- upgrade the three existing gas exhaust stacks so that it can handle the higher temperatures associated with the exhaust gases.

During open cycle mode, the existing heat recovery steam generators, steam turbine and two of the four cells in the cooling tower would not be operating and would be placed on care and maintenance. The remaining two cooling cells would be operational (one active and one standby). The bypass ducting would be designed to allow exhaust gas flows to be reinstated to the heat recovery steam generators when the facility goes back to cogeneration mode. It is anticipated the proposed changes would fit within the existing internal footprint of the facility.

The modification and comparison with the existing operation is described in full in the Environmental Assessment (EA) included in **Appendix B** and is illustrated in **Table 1** and **Figures 3** and **4**.

Table 1: Description of the Modification

Aspect	Cogeneration Mode (Approved Operation)	Open Cycle Mode (Proposed Modification)
Description of Operational Mode	Supplies both baseload electricity to the NSW electricity grid and heat in the form of steam to the adjacent Visy site.	Supplies only baseload electricity to the NSW electricity grid during periods of peak demand. No steam would be provided to the Visy site.
Electricity Generation Capacity	150 MW	No change
Operational Components	The following components are operational during cogeneration mode: <ul style="list-style-type: none"> • three gas turbines, • heat recovery steam generators; • exhaust gas stacks; • steam turbine; and • four cell cooling tower. 	The following components would be operational during open cycle mode: <ul style="list-style-type: none"> • three gas turbines; • exhaust gas stacks; and • two of the four cells in the cooling tower. <p>The heat recovery steam generators, steam turbine and two cells of the cooling tower would not be in operation during open cycle mode.</p>
Power Plant Operation Times	7,100 hours per year	Less than 852 hours per year (periods of peak demand only)
Construction Works	N/A	<i>Bypass Ducting</i> <ul style="list-style-type: none"> • Installation of a horizontal section of box-shaped ducting at the gas turbine of each power train to divert exhaust gases around the heat recovery generators and conveyed to the gas exhaust stacks. • Noise silencers would be installed to reduce in-duct sound. <i>Gas Exhaust Stacks</i> <ul style="list-style-type: none"> • Upgrade of the gas exhaust stacks to handle higher temperatures. • The stacks would have the same external scale, dimensions, base footprint and system of access platforms and ladders as the existing stacks. <i>Construction Timing</i> <ul style="list-style-type: none"> • 10 weeks
Employees	Operation – 19 employees	Construction – 20 employees Operation – No change
CIV	N/A	\$6 million

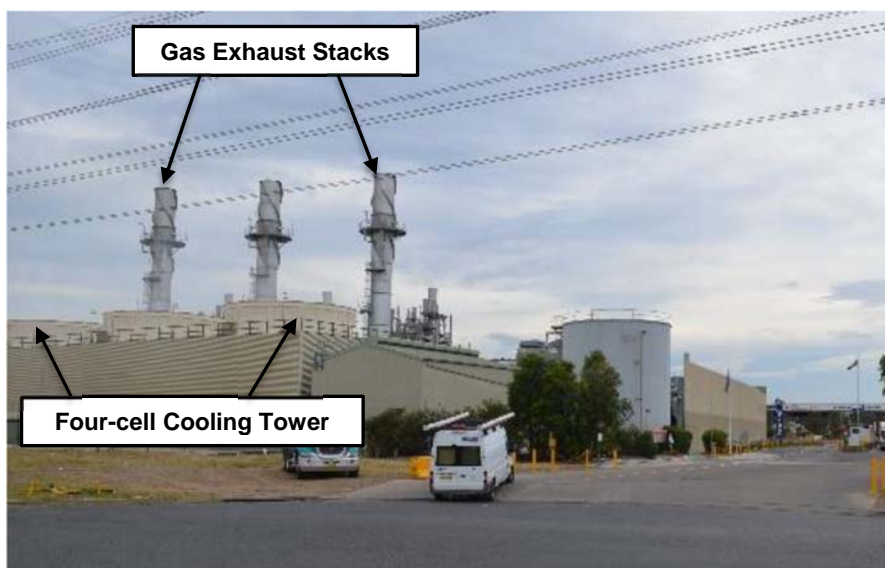


Figure 3: View looking south toward the Smithfield Energy Facility

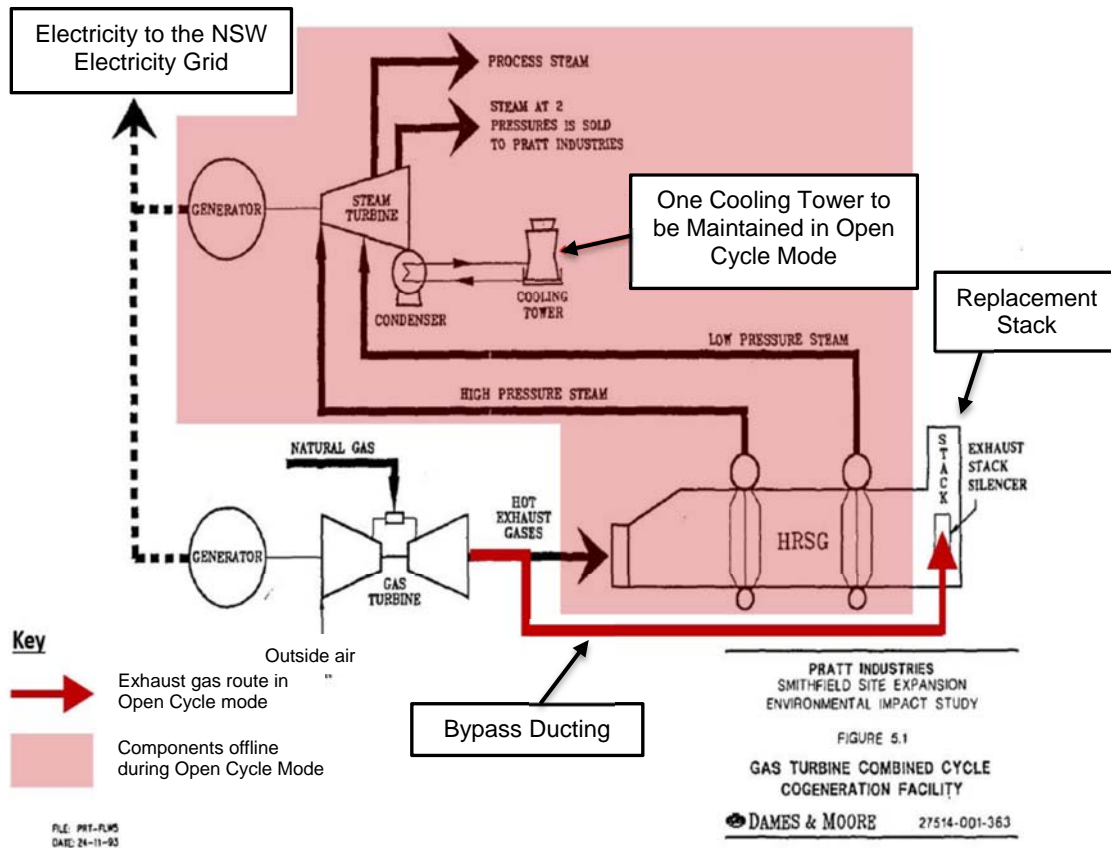


Figure 4: Proposed Modification (OCGT or Open Cycle Mode)

5. STATUTORY CONTEXT

5.1 Approval Authority

The Minister for Planning is the approval authority for the request. Under the Minister's delegation of 16 February 2015, the Acting Director, Industry Assessments, may determine the request under delegation as:

- the relevant local council has not made an objection; and
- a political disclosure statement has not been made; and
- there are no public submissions in the nature of objections.

5.2 Section 75W

Under clause 8J(8)(a) of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), a development consent granted by the Minister for Planning under s101 of the unamended EP&A Act is to be modified under Section 75W of the EP&A Act. Despite the repeal of Part 3A of the EP&A Act on 1 October 2011, the effect of section 75W is continued for such consents by the operation of Clause 12 of Schedule 6A of the EP&A Act.

The Department notes that:

- the primary function and purpose of the approved development would not change as a result of the proposed modification;
- the modification is of a scale that warrants the use of section 75W of the EP&A Act; and
- any potential environmental impacts would be appropriately managed through the existing or modified conditions of consent.

Therefore, the Department is satisfied the proposed modification is within the scope of section 75W of the EP&A Act and does not constitute a new development application. Accordingly, the Department considers that the request should be assessed and determined under section 75W of the EP&A Act rather than requiring a new development application to be lodged.

6. CONSULTATION

Under section 75W of the EP&A Act, the Department is not required to notify or exhibit the modification request. Upon receipt, the request was placed on the Department's website and following a review of the documentation, the Department did not consider that further public consultation was necessary. Notwithstanding, the Department sought comments from Cumberland Council (Council) and Environment Protection Authority (EPA).

The Department referred the modification request and draft instrument to **Council**, however Council did not make a submission.

The **EPA** commented on issues relating to air quality and noise impacts noting an assessment of ozone impacts and a new noise assessment against current NSW environmental noise policies would be required as part of an application to vary the facility's Environment Protection Licence (EPL) 5701. The Proponent provided a response to submissions (RTS) report which responded to the EPA's comments.

7. ASSESSMENT

The Department has assessed the merits of the proposed modification. During this assessment, the Department has considered the:

- EIS and assessment report for the original application;
- existing conditions of consent (as modified);
- the EA supporting the proposed modification (**Appendix B**);
- submissions from State government authorities and Council (**Appendix C**);
- the Proponent's response to issues raised in submissions;
- relevant environmental planning instruments, policies and guidelines; and
- requirements of the EP&A Act, including the objects of the EP&A Act.

The Department considers the key assessment issue is noise. The Department's assessment of other issues is provided in **Table 3**.

7.1 Noise

The proposal to change the facility from cogeneration mode to open cycle mode of operation has the potential to increase noise impacts at the nearest sensitive receivers. The facility currently operates 24 hours a day, 7 days a week as a cogeneration plant, with the closest sensitive receiver located 450 m south of the site in Smithfield (see **Figure 5**).



Figure 5: Nearest Sensitive Receivers (R1 – R11)

Noise limits are currently in place for the site as per the facility's EPL and development consent as shown in **Table 2**. To date, the cogeneration plant has not received any noise complaints from its adjoining neighbours.

A Noise Impact Assessment (NIA) was prepared by Benbow Environmental Pty Ltd, which modelled the potential worst-case scenario noise emissions from the facility when operating in open cycle mode.

Operation

When the facility is operating under open cycle mode, the main sources of noise would be from the exhaust frame blowers, duct pumps and fan vents. The NIA noted that open cycle plants are likely to be noisier than cogeneration plants, as the higher exhaust exit temperatures from the proposed open cycle gas turbines may result in the refraction or bending of sound waves at the top of the stacks, towards nearby residential receivers.

Table 2: Predicted Noise Levels at the Nearest Sensitive Receivers Under Several Scenarios

Receivers	Noise Criteria as per EPL and Consent		Scenario 1 Existing CCGT Operation Day/Night	Scenario 2 OCGT Operation With Silencer Day/Night	Scenario 3 OCGT Operation No Silencer Day/Night
	LA10 (15 min)				
	Day and Evening	Night			
R1	48	43	39	42	47
R2	48	43	38	41	46
R3	48	43	37	40	45
R4	46	41	39	41	47
R5	46	41	37	40	46
R6	46	41	34	38	44
R7	46	41	30	31	36
R8	46	41	32	34	39
R9	46	41	29	31	37
R10	46	41	27	27	31
R11	46	41	21	24	29
Western Boundary	70	65	53	53	53

Note: Bolded numbers denotes exceedances of the noise criteria

To address this potential issue and to ensure the proposed modification complies with the EPL and consent noise criteria, the Proponent has committed to installing silencers within the ducting or stacks, which would be capable of up to 10 dB(A) reduction. As shown in **Table 2**, the NIA predicted compliance with the noise criteria at all sensitive receivers, at all times when modelled with silencers installed (Scenario 2). In contrast, the assessment predicted exceedances of the night-time criteria by up to 6 dB(A) at six receivers (R1 to R6) and one exceedance of the day-time criteria at R4, when modelled with no additional noise controls (see **Table 2**, Scenario 3).

The EPA initially requested the Proponent's noise assessment be undertaken in accordance with current NSW environmental noise policies. The Department understands the noise limits currently in place for the facility were set in 1994 and pre-date the *NSW Industrial Noise Policy (INP)*. In its RTS, the Proponent reiterated that the proposed modification would be designed to ensure noise emissions at the site would not increase, and it also provided a manufacturer's guarantee for the performance of the proposed silencers to be installed.

The EPA accepted this argument and indicated its support of the proposed modification noting no recent issues of non-compliances or exceedances of the facility's noise limits. The EPA further stated the Proponent would be required to vary its EPL and that as part of the EPL licence variation, the Proponent would need to verify the noise predictions in the NIA with the contemporary requirements of the INP.

The Department concurs with the EPA and has recommended consent conditions requiring the Proponent to prepare a noise verification study for the proposed modification, upon first commencement of the facility in open cycle mode. Further, the Department has recommended the deletion of operational noise limits under Condition 16(b) of the development consent, to enable the process of contemporising the noise limits to be prescribed in the EPL, without the need for further modification to the development consent. To ensure there is no increase in noise emissions at the facility when operating in open cycle mode, the Department has also recommended the Proponent install and operate equipment in line with best practice, so that it complies with all noise limits or requirements specified in the facility's EPL.

The Department also recommends the Proponent update its Noise Management Plan (NMP) for the facility to include:

- mitigation measures to minimise noise when the facility is either in cogeneration or open cycle mode;
- details of a noise monitoring program to monitor and respond to any noise issues; and
- details of a protocol or contingencies to be implemented in the event the silencers are not operating.

Overall, the Department considers the proposed modification would not result in adverse noise impacts to nearby receivers. Under cogeneration mode, noise levels from the facility would not change from what is currently being emitted, and there have been no recent issues of non-compliances with the consent or EPL. The Department notes the Applicant will be required to have contingency measures in place should any exceedances of the noise limits be detected during open cycle mode. However, the Department considers any exceedances of the noise limits in open cycle mode would be infrequent and minor, given the proximity of the nearest sensitive receivers and elevated background levels. The Department's assessment concludes the operational noise impacts associated with the proposed modification are acceptable and can be appropriately managed by the Proponent.

Construction

During construction, the key noise sources from the proposed modification would be from construction plant and equipment. The EPA requested further information on construction noise impacts associated with the installation of the replacement stacks and the bypass ducting.

In its RTS, the Proponent clarified that construction noise from the installation works are expected to be negligible at the nearest sensitive receivers, given existing operational noise from the facility and other nearby industrial activities in the surrounding area are likely to mask noise from the construction works. The Proponent also confirmed that construction works are expected to take 10 weeks and would be restricted to standard construction hours of work being Monday to Friday 7 am to 6 pm, Saturday 8 am to 1 pm with no work on Sundays or public holidays. These standard construction hours are currently included in the development consent.

The EPA raised no further issues. The Department considers any construction impacts would only occur in the short term and could be managed through existing conditions in the consent. No additional conditions are recommended.

7.2 Other Issues

The Department's assessment of other issues is provided in **Table 3**.

Table 3: Assessment of Other Issues

Issue	Assessment	Recommendation
Hazards and Risk	<ul style="list-style-type: none"> • Several existing hazards requirements are included in the development consent to manage hazards and risk at the facility, such as implementing a Safety Management System and undertaking regular hazard audits. • The Preliminary Hazard Analysis (PHA) for the modification noted there would be an increased risk from the hot surfaces of the stack due to higher temperatures associated with the exhaust gases (as the heat is not being recovered during open cycle mode). • The PHA also considered the change from cogeneration mode to open cycle mode and found there would be: <ul style="list-style-type: none"> ○ a reduction in potential hazards associated with the generation of hot water or steam; ○ a reduction in the quantities and use of chemicals required for the treatment of cooling water; and ○ no alterations to the natural gas fuel supply systems. • The Department has reviewed the PHA and considers the proposed modification is not potentially hazardous under the provisions in <i>State Environmental Planning Policy No 33 – Hazardous and Offensive Development</i> (SEPP 33), as there would be no increase in the quantity of dangerous goods or hazardous chemicals. • The Department also notes the supply and use of natural gas would continue to be supplied from existing pipelines and there would be no changes to the fire safety requirements for the facility. 	<p>Require the Proponent to update and implement the following studies, plans or systems:</p> <ul style="list-style-type: none"> • Hazard Operability Study • Construction Safety Study; • Emergency Plan; • Safety Management System; and • Pre and Post Start Up Compliance Reports

Issue	Assessment	Recommendation
	<ul style="list-style-type: none"> The Department's assessment concludes the proposed modification complies with the criteria set out in the Department's <i>Hazardous Industry Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning</i>, and has recommended the Applicant update its hazards studies for the facility including a number of pre-construction, pre-commissioning and post start-up hazards studies. 	
Air Quality	<ul style="list-style-type: none"> The Proponent prepared a quantitative air quality impact assessment (AQIA) which assessed the air quality impacts of the proposed modification. The AQIA modelled two scenarios (upgraded stacks only and cumulative impacts of the back-up boilers on the adjoining Visy site) assuming 100% of nitrogen oxides (NO_x) emitted are converted to nitrogen dioxide (NO₂) for all sources. Under a worst-case scenario, the air dispersion modelling predicted no exceedances to the EPA air quality criteria for NO₂ (being 246 µg/m³ annual average and 62 µg/m³ hourly average). The AQIA concluded air emissions are unlikely to cause harm to human health or the surrounding environment. At the EPA's request, the Proponent also considered ozone impacts, given gas turbine start-ups may result in higher NO_x or ozone levels on high ozone days. The EA demonstrated an ozone assessment would not be triggered as the predicted emissions are below the screening impact level for an ozone assessment. The EPA was satisfied that NO_x and ozone impacts are not likely to increase at the nearest sensitive receivers. The Department notes the facility would only operate as a peaking plant during periods of high demand and would primarily operate in cogeneration mode (existing facility) for most of the year. To date, there are no recent issues of environmental performance or non-compliances associated with the existing facility. The Department is of the view that air quality impacts would be minimal and can be managed via the site's existing EPL. As such, no new conditions are required. 	No additional conditions are required
Visual Amenity	<ul style="list-style-type: none"> The facility is located within an established industrial area. The closest residential receiver is located 450 m south of the site. The facility has three existing 30 m stacks, however a 15 m high vegetation screen runs along the southern boundary of the Visy site providing screening for the residents to the south of the site. The EA noted the visual impact of the proposed modification would be insignificant as it would be located within the existing footprint of the facility and would not be visible from the site boundary. This is because the replacement gas exhaust stacks would be the same height as the existing stacks and the bypass ducting would not be visible above any existing structures at the site. The EA also noted that when the facility is configured for open cycle mode, the facility's exhaust gas stacks would only emit flue gases intermittently during periods of peak demand. As only one of the four cells in the cooling tower would only be operational, there would also be a reduction in the presence of visual steam from the facility. The Department considers the visual impacts of the proposed modification would be negligible given the replacement stacks would be of a similar height and appearance as the existing exhaust stacks. In addition, the Department also considers the reduction in visual steam emissions from the stacks would improve the visual amenity and being located within an existing industrial area, the proposed modification would be consistent with other similar structures on site. The Department's assessment concludes that visual impacts would be negligible and no additional conditions are required. 	No additional conditions are required

8. CONCLUSION

The Department has assessed the proposed modification in accordance with the relevant requirements of the EP&A Act. The Department considers the proposed modification can be carried out with minimal additional environmental impact.

The proposed modification does not involve an increase in electricity generation capacity but enables the facility to switch between operational modes to respond to electricity market conditions.

The existing suite of consent conditions include requirements for ongoing impact mitigation relating to air quality, noise, hazards and risk and these requirements would continue to apply to the proposed modification. The EPA advised the modification may require changes to the Proponent's EPL in relation to noise impact but all other issues can be managed through the EPL. There were no objections from Council or the public.

The Department is satisfied that the modification should be approved, subject to conditions.

9. RECOMMENDATION

It is recommended that the Acting Director, Industry Assessments, as delegate for the Minister for Planning:

- consider the findings and recommendations of this report;
- determine that the application falls within the scope of section 75W of the EP&A Act;
- approve the modification application DA 94/165 MOD 2, subject to conditions; and
- sign the attached notice of modification (**Appendix A**).

Recommended by:



24.8.17

Pamela Morales
Acting Senior Planner
Industry Assessments

Recommended by:



24/8/17.

Joanna Bakopanos
Team Leader
Industry Assessments

DECISION

Approved by:



24/8/17

Kelly McNicol
Acting Director
Industry Assessments

as delegate of the Minister for Planning.

APPENDIX A – INSTRUMENT OF MODIFICATION

APPENDIX B – ENVIRONMENTAL ASSESSMENT

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8386

APPENDIX C – SUBMISSIONS

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8386

APPENDIX D – CONSOLIDATED APPROVAL