

ASSESSMENT REPORT
Newcastle Gas Storage Facility
Tail Gas Modification (10_0133 – MOD 3)

EXECUTIVE SUMMARY

AGL Energy Limited (AGL) owns and operates the Newcastle Gas Storage Facility, located in Tomago near Newcastle in NSW (see **Figure 1**).

AGL is seeking to modify the Newcastle Gas Storage Facility project approval to enable it to treat tail gas and transfer it into the local gas network and install additional infrastructure on the existing site to improve safety.

The Department did not receive any public submissions during the public exhibition period and none of the relevant government agencies objected to the proposal. The Department received one objection from the Tomago Aluminium Company regarding the loss of gas from the proposed flaring process.

On balance, the Department considers this modification application presents an opportunity to increase the range of recipients that could utilise the tail gas by-product generated onsite. Subject to the imposition of strict conditions, the Department considers that the proposed modification would benefit the local community and is therefore in the public interest.



Figure 1: Site Context

1 BACKGROUND

AGL Energy Limited (AGL) owns and operates the Newcastle Gas Storage Facility (NGSF) located in Tomago, approximately 13 kilometres (km) north-west of Newcastle, within the Port Stephens local government area (see **Figure 1**).

The project was approved under delegation by the NSW Planning Assessment Commission (PAC) on 10 May 2012 and commenced operating in June 2015. The main components of the project include (see **Figure 2**):

- a gas plant site capable of holding approximately 1,500 terajoules (TJ) of liquefied natural gas (LNG);
- 5.1 km high-pressure gas pipeline (Hexham – Tomago pipeline) connecting the gas plant site to the Jemena trunk main; and
- access roads and other ancillary infrastructure.

The project approval has been modified twice. Modification 1 was approved by the PAC on 5 February 2013 to allow for the washing out of concrete mixers and pump trucks on site during construction. Modification 2, approved on 31 January 2014, involved the construction and operation of a 4.5 km low pressure pipeline to transfer residual ‘tail gas’ between the gas storage plant and the Tomago Aluminium Company smelter facility.

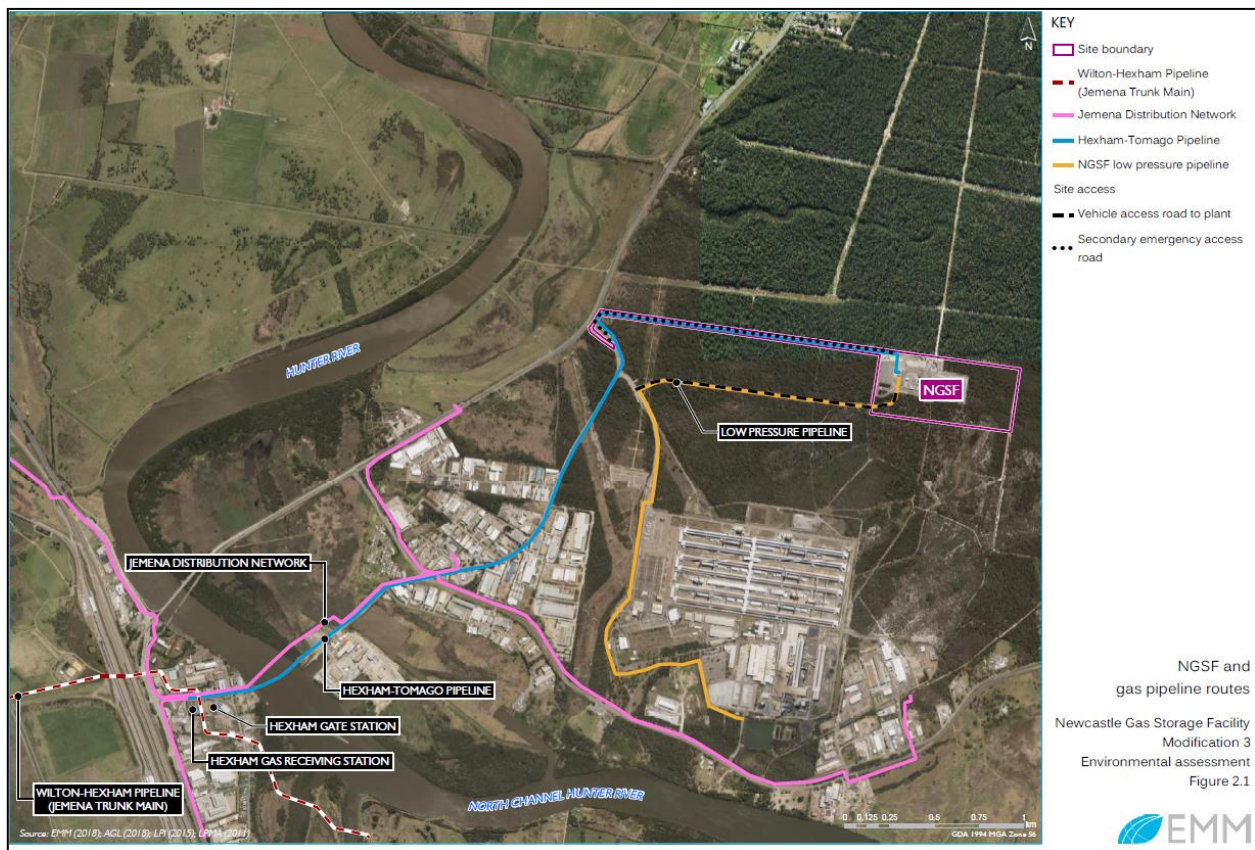


Figure 2: Project layout

As part of the project, natural gas taken from the Wilton-Newcastle trunk main is liquefied and stored as LNG at the gas plant site (see **Figure 3**). Liquefaction of natural gas occurs at the site for approximately nine months of the year during periods of low gas demand. During periods of peak gas demand, the LNG is re-gasified by heating and is then reinjected into the Wilton-Newcastle trunk main.

Approximately 370 terajoules (TJ) of gas by-product known as ‘tail gas’ is vaporised each year from the liquefaction process and storage of LNG. This tail gas cannot be re-liquefied and recycled back into the storage tank as it creates an unacceptable build-up of nitrogen levels over time.

An existing process flare at the gas plant site is currently used to flare tail gas and vent and purge the system during maintenance, start up and shutdown of the plant, and the commissioning of new equipment as required.

All the remaining tail gas generated is consumed exclusively by the Tomago Aluminium Company's smelting facility. This is because the 4.5 km low pressure gas pipeline currently provides the only available outlet for tail gas from the site. AGL has recognised the need to strengthen its commercial position by diversifying its tail gas customer base beyond the Tomago Aluminium Company.



Figure 3: Gas plant layout

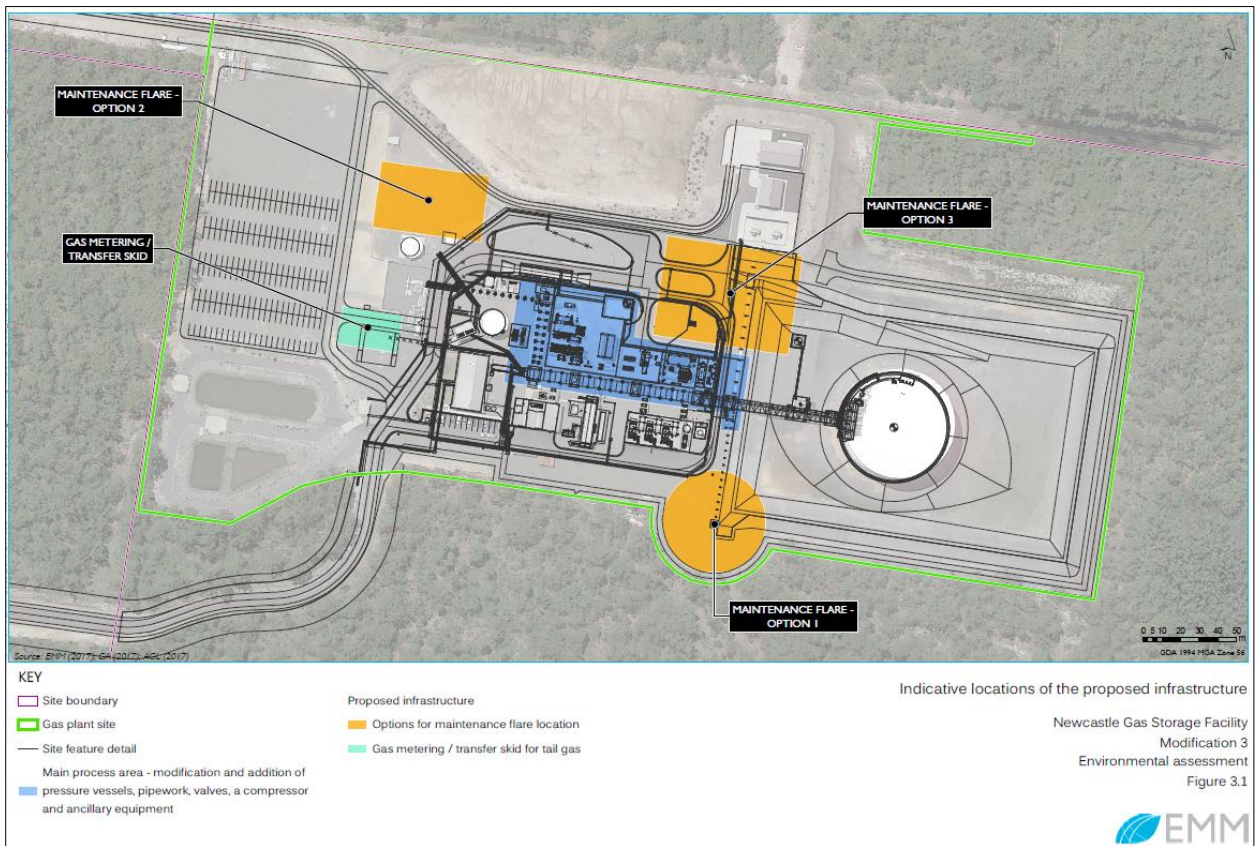


Figure 4: Proposed Modification Layout

2 PROPOSED MODIFICATION

AGL is seeking to modify the project approval to enable the treatment and transfer of the tail gas into Jemena's gas distribution network. It is estimated that the 370 TJ of tail gas produced per year would be enough to supply the annual requirements of approximately 2,000 small businesses.

To ensure tail gas sent to the Jemena distribution network meets Australian gas quality standards, minor operational changes and additional infrastructure (see **Figure 4**) at the gas plant are required, including:

- occasional gas treatment flaring using the existing process flare;
- a transfer skid for connection to Jemena's distribution network;
- pressure vessels, pipework, valves, containment for the existing oily waste collection vessel and other ancillary equipment in the main process area of the gas plant site; and
- a maintenance flare to ensure ongoing safety during periods when the existing process flare is offline for maintenance (approximately 4-6 weeks per year).

All new infrastructure proposed would be entirely located within the existing footprint of the gas plant site. While the extension of the Jemena gas distribution network does not form part of the proposed modification, AGL has consulted with Jemena regarding planned network extensions and identified a potential route alignment. The network extension is expected to utilise existing pipeline and road corridors and would be assessed under a separate approval process.

The proposed modification is described in further detail in the Environmental Assessment (EA) (see **Appendix C**).

3 STATUTORY CONTEXT

3.1 Section 75W

The Department is satisfied the proposal can be characterised as a modification as it involves minor changes to the project's infrastructure that would have similar impacts to the approved project.

On 28 October 2010, the then Minister for Planning declared the project to be a critical infrastructure project. In making this declaration, the Minister was satisfied that the project is essential for the State for economic, environmental and social reasons.

The project is classified as a transitional Part 3A project, and the proposed modification must therefore be assessed and determined under the former Section 75W of the *Environmental Planning & Assessment Act 1979* (EP&A Act).

3.2 Approval Authority

The Minister for Planning is the approval authority for the modification application, however the proposal may be determined by the Executive Director, Resource Assessments and Business Systems, under the Minister's delegation of 11 October 2017. This is because less than 10 objections were received on the proposal, no reportable political donations were made and Council did not object to the proposal.

4 CONSULTATION

The Department publicly exhibited the application and accompanying EA from 3 November until 17 November 2017. During the exhibition period, the Department received six submissions from public authorities and one from the Tomago Aluminium Company. There were no public submissions.

The **Environment Protection Authority (EPA)** advised that any additional air emissions from the proposal would be minor and would be unlikely to result in any increased environmental impacts compared to existing activities conducted at the site. Consideration of air quality impacts are discussed further in **Section 5.1**.

The **Department of Industry – Crown Lands and Water** sought clarification on whether the proposed earthworks would intercept the groundwater table and if so, asked to be consulted on monitoring and licensing requirements. Potential groundwater impacts are further discussed in **Section 5.2**.

The **Office of Environment and Heritage, Division of Resources and Geosciences, Hunter Water Corporation** and **Rural Fire Service** did not have any concerns with the proposed modification.

The **Tomago Aluminium Company** objected to the proposal, indicating that the smelting facility can continue to consume all the tail gas without the need for gas treatment flaring. They also noted that overall gas availability would be reduced if gas treatment flaring was undertaken as Tomago would require a new source of gas for their smelting facility. The potential air quality impacts associated with the gas treatment flaring are further discussed in **Section 5.1** and consideration of the availability of gas for end users is discussed in **Section 7**.

AGL provided a Response to Submissions document to address the issues raised in the submissions. The submissions and the Response to Submissions document are provided as **Appendix B** and **C** respectively.

5 ASSESSMENT

In assessing the merits of the proposed modification, the Department has considered the:

- project approval;
- modification application and supporting information;
- requirements of the EP&A Act and the Department's planning guidelines for hazardous development; and
- submissions on the application and the applicant's response to submissions.

5.1 Air Quality

Under existing arrangements, gas treatment flaring is not required for tail gas consumed by the Tomago smelter facility. The proposed modification would require the ability for AGL to flare small amounts of tail gas to meet Jemena's gas distribution network standards. This is dependent on the quality of gas received from the Jemena trunk main.

Based on historical gas quality data, AGL would flare approximately 2.5 TJ of tail gas per year as part of the gas treatment process. While the Department acknowledges the concerns that the Tomago Aluminium Company raised about this additional flaring, it notes that 2.5 TJ represents only a very small proportion (1%) of the total gas that would be transferred, and would only result in a slight increase in site emissions.

A new maintenance flare would also operate for a period of up to 6 weeks each year. Only one flare would operate at any given time, with the maintenance flare running when the existing process flare is undergoing maintenance and the processing plant is offline. This maintenance flare is required for safety purposes, regardless of whether the gas is transferred directly to the Tomago smelter facility or into the local gas distribution network.

The primary air emissions associated with the flaring of natural gas comprise mainly of nitrogen dioxide (NO₂), carbon monoxide (CO), sulfur dioxide (SO₂) and particulate matter (PM₁₀ and PM_{2.5}), which at certain concentrations may impair human health as well as the health of plants and animals, or reduce visibility.

Existing ambient air quality in the area surrounding the NGSF is influenced by local industries, some of which are regulated in accordance with environmental protection licences. Based on air quality data collected prior to the construction of the NGSF in September 2011 and August 2012, the background concentrations of NO₂, CO, SO₂ and PM₁₀ and PM₂₅ are below the impact assessment criteria specified in the *Approved Methods for the Modelling and Assessment of Air Pollutants* (EPA, 2016).

The EA includes an Air Quality Impact Assessment undertaken by Pacific Environment in accordance with the Approved Methods. It modelled two operating scenarios:

- maintenance flaring scenario for a period of 4 – 6 weeks each year, at a rate of approximately 1,500 kg/hr; and
- gas treatment flaring scenario, at a rate of approximately 1,000 kg/hr from the process flare and liquefaction system stack.

The incremental ground level concentrations of NO₂, CO, SO₂, PM₁₀ and PM_{2.5} at nearby sensitive receptors for both modelled scenarios are predicted to comply with air quality criteria specified in the Approved Methods. EPA raised no concerns with the assessment of air quality impacts and advised that AGL would be required to submit a licence variation application for Environment Protection Licence 20130 to capture the new infrastructure proposed.

Consequently, the Department considers no changes to the maximum allowable air discharge limits are necessary. Nevertheless, the Department has recommended updating a condition to ensure the proposed maintenance flare would be subject to the same discharge limits.

5.2 Other issues

The Department's consideration of other issues is summarised in **Table 1**.

Table 1: Other issues

Issue	Consideration	Recommendation
<i>Hazards</i>	<ul style="list-style-type: none"> The NGSF is classified as a major hazard facility (MHF) as the quantity of natural gas stored onsite exceeds threshold amounts specified in Schedule 15 of the <i>Work Health and Safety Regulation 2017</i>. A quantitative risk assessment undertaken by AGL's assessment of the modification application indicates that there would be no changes to individual or societal fatality or injury risk results. This is because the thermal radiation impact would not extend offsite. Hence, the proposed modification would not result in hazard or risk impacts outside of the NGSF boundary and no material changes to the existing Fire Safety Study or Fire Hazard Analysis are necessary. However, the Hazard and Operability Study (HAZOP study) would need to be updated prior to constructing any components associated with the proposed modification. The Department considers hazards and risks on site can continue to be acceptably managed under the existing conditions. 	<ul style="list-style-type: none"> The Department recommends inclusion of the condition requiring the preparation of an updated HAZOP in accordance with the Department's <i>Hazardous Industry Planning Advisory Paper No.8, 'HAZOP Guidelines'</i>.
<i>Noise</i>	<ul style="list-style-type: none"> Tomago has a small population of 277 residents, with the nearest residential receiver 1.3 km south east of the facility. Construction and installation of the required components would take approximately eight months and occur within standard construction hours specified in the existing approval. The proposed maintenance flare would only operate when the remainder of the site is inactive. No exceedances of operational noise criteria at receiver locations specified in Condition C8 and EPL 20130 are predicted. The Department is satisfied that the proposal could be carried out within the existing noise limits. 	<ul style="list-style-type: none"> Comply with existing noise criteria and condition which require AGL to implement a Noise Management Plan for construction works and an Operational Environmental Management Plan throughout the life of the project.
<i>Water Quality</i>	<ul style="list-style-type: none"> The project site is located within the Tomago Sandbeds Catchment Area which is used as a potable water source for the Hunter Region. The deepest excavation proposed for construction at the gas plant site would be 1 metre below ground and is unlikely to intersect the groundwater table. A suitably sized containment area would be constructed in accordance with Australian Standards to ensure that the increased oily waste volumes likely to be generated on the site would be fully contained. 	<ul style="list-style-type: none"> Comply with existing conditions which require AGL to implement a Groundwater Management Plan and Surface Water Management Plan throughout the life of the project.
<i>Traffic</i>	<ul style="list-style-type: none"> Construction traffic would consist of up to 7 light vehicle movements per day, approximately 15 heavy vehicle deliveries, and two mobile cranes. Construction traffic would use the existing site access roads. There would be no change to the number of personnel required to operate the NGSF. 	<ul style="list-style-type: none"> Comply with existing conditions which require AGL to implement a Traffic Management Plan during construction and an Operational Environmental Management Plan throughout the life of the project.

6 RECOMMENDED CONDITIONS

The Department has drafted a Notice of Modification (see **Appendix A**) for the proposed modification, as well as a consolidated version of the project approval as modified (see **Appendix B**).

The Department considers that the proposal to transfer tail gas from the NGSF to the Jemena distribution network could be appropriately managed within the existing approval and post-approval management framework.

To ensure post-approval strategies, plans and programs are up to date, the Department has recommended a condition requiring the proponent to review and where necessary revise these documents within 3 months of any modification to the Project Approval.

7 CONCLUSION

The Department has assessed the modification application and supporting information in accordance with the relevant requirements of the EP&A Act.

The modification application would allow more recipients to consume the tail gas by-product which is currently limited to the adjoining smelter facility. Based on historical gas quality data received at the NGSF, less than 1% of tail gas would be lost as part of the gas treatment process should AGL opt to solely feed into the Jemena gas distribution network.

The ability to transfer 370 TJ of tail gas into the wider Jemena distribution network would meet the demands of approximately 2,000 small businesses a year and strengthen AGL's commercial position with a wider customer base. Operation of a maintenance flare would also enhance the safety of the site.

The proposed modification is entirely located within the existing project site and would not significantly increase the approved impacts of the project, as the construction and operational impacts would be temporary and managed in accordance within the existing environmental management framework.

Furthermore, the change to air emission ground level concentrations at sensitive receptors are predicted to be minor and would continue to comply with existing air quality criteria.

On balance, the Department considers that the proposed modification is in the public interest, and should be approved subject to conditions.

8 RECOMMENDATION

It is recommended that the Executive Director, Resource Assessments and Business Systems, as delegate of the Minister for Planning:

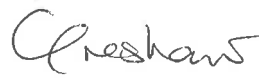
- **consider** the findings and recommendations of this report;
- **determine** that the modification application (MP 10_0157 MOD 3) falls within the scope of section 75W of the EP&A Act;
- **modify** the approval (MP 10_0157); and
- **sign** the attached modification of approval (**Appendix A**).

Recommended by:

 23/2/18

Anthony Ko
Senior Environmental Assessment Officer
Resource and Energy Assessments


Recommended by:

 23/2/18

Clay Preshaw
Director
Resource and Energy Assessments

9 DECISION

The recommendation is: Approved / Not approved by:

 27/2/18

David Kitto
Executive Director
Resource Assessments and Business Systems
as delegate of the Minister for Planning

APPENDIX A:
NOTICE OF MODIFICATION

APPENDIX B:
CONSOLIDATED APPROVAL

APPENDIX C:
MODIFICATION APPLICATION

See the Department's website at:

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8840