

Independent Environmental Audit:
Western Sydney Green Gas Project
SSD 10313

Audit Organisation:	Jemena Gas Networks (NSW) Limited
Auditors:	James Hart - Lead Auditor Ken Cameron – Support Auditor
Date of Audit:	14 August 2025
Draft Report Submitted:	22 August 2025
Final Report Submitted:	25 August 2025

Independent Audit Declaration Form

Project Name: Western Sydney Green gas Project
Consent Number: SSD 10313
Description of Project: Trialling Power-to-Gas (P2G) technology by converting purchased green energy from the electricity mains network into hydrogen gas and injecting it into its secondary gas distribution network over a 5-year period.
Project Address: 202-214 Chandos Road, Horsley Park, NSW, 2175 (Lot 1, DP 499001)
Proponent: Jemena Gas Networks (NSW) Limited (Jemena)
Date: 25 August 2025

I declare that:

- i. I am not related to any proponent, owner, operator or other entity involved in the delivery of the project. Such a relationship includes that of employer/employee, a business partnership, sharing a common employer, a contractual arrangement outside an Independent Audit, or that of a spouse, partner, sibling, parent, or child;
- ii. I do not have any pecuniary interest in the project, proponent or related entities. Such an interest includes where there is a reasonable likelihood or expectation of financial gain (other than being reimbursed for performing the audit) or loss to the auditor, or their spouse, partner, sibling, parent, or child;
- iii. I have not provided services (not including independent reviews or auditing) to the project with the result that the audit work performed by themselves or their company, except as otherwise declared to the Department prior to the audit;
- iv. I am not an Environmental Representative for the project; and
- v. I will not accept any inducement, commission, gift or any other benefit from auditee organisations, their employees or any interested party, or knowingly allow colleagues to do so.

Notes:

- a) Under section 10.6 of the Environmental Planning and Assessment Act 1979 a person must not include false or misleading information (or provide information for inclusion in) in a report of monitoring data or an audit report produced to the Minister in connection with an audit if the person knows that the information is false or misleading in a material respect. The proponent of an approved project must not fail to include information in (or provide information for inclusion in) a report of monitoring data or an audit report produced to the Minister in connection with an audit if the person knows that the information is materially relevant to the monitoring or audit. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000; and
- b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 307B (giving false or misleading information – maximum penalty 2 years imprisonment or 200 penalty units, or both).

Name of Auditor: James Hart

Signature: 

Qualification: Lead Environmental Auditor – Exemplar Global Certificate No. 12105

Company: James Hart Consulting

Index

1 INTRODUCTION	5
1.1 Overview	5
1.1 Project Details	5
1.2 Audit Team	6
1.3 Audit Objectives	6
1.4 Audit Scope	6
1.5 Audit Period	7
2 Methodology	7
2.1 Approval of Auditors	7
2.2 Audit Scope Development	7
2.3 Audit Process	7
2.4 Interviewed Persons	8
2.5 Details of Site Inspection	8
2.6 Agency and Community Consultation	8
2.7 Audit Compliance Status Descriptors	9
2.8 Approvals and Documents Audited	9
2.9 Issues to be considered in reviewing this report	9
3 AUDIT FINDINGS	10
3.1 Overview	10
3.2 Assessment of Compliance	10
3.3 Previous Audit Findings	10
3.4 Notices, Incidents and Complaints	11
3.5 Audit Site Inspection	12
3.6 Suitability of Plans and the EMS	12
3.7 Additional Matters Raised During Consultation	12
3.8 Key Strengths	12
3.9 Areas of Non-compliance	13
3.10 Areas of compliance	15
4 CONCLUSIONS	16
Appendices	
Appendix A. – Previous Audit Findings	17
Appendix B. – Auditor Approval	20
Appendix C. – Audit Tables	22
Appendix D. Consultation Records	44
Appendix E. Site Photographs	47
Appendix F. Hazard Audit Report	50

Abbreviations

AS	Australian Standard
CLM	Community Liaison Manager
CEMP	Construction Environmental Management Plan
CNMP	Construction Noise Management Plan
CHMP	Cultural Heritage Management Plan
DPE	Department of Planning and Environment
EIS	Environmental Impact Statement
EMS	Environmental Management Strategy
EPA	Environment Protection Authority
EP&A Act	Environmental Planning and Assessment Act 1979
EPL	Environment Protection Licence
JGN	Jemena Gas Network
P2G	Power to Gas
POEO Act	Protection of the Environment Operations Act 1997
SAOP	Safety and Operations Plan
SMP	Stormwater Management Plan
SSD	State Significant Development
TMP	Traffic Management Plan
WSSGP	Western Sydney Green Gas Project

1 INTRODUCTION

1.1 Overview

The Western Sydney Green Gas Project (WSGGP) is located at an existing high pressure natural gas facility in Chandos Road at Horsley Park, NSW, near the intersection of the M7 and M2 Motorways in Western Sydney Lakes.

The WSGGP has been developed by Jemena Gas Networks (NSW) Limited (Jemena) to trial Power-to-Gas (P2G) technology by converting purchased green energy from the electricity mains network into hydrogen gas and injecting it into its secondary gas distribution network over a 5-year period. The Project would potentially facilitate ongoing development of commercially viable P2G systems in Jemena's NSW gas network.

The WSGGP has been declared a State Significant Development, with Development Consent first awarded in August 2020. There have since been two Modifications, with the last approved in August 2022.

The operation of the facility is based the conduct of scheduled exercises to trial different parameters to enable optimisation to inform ongoing development of commercially viable P2G systems in Jemena's NSW gas network. A program of activities has been developed to coordinate the trial program.

The facility is able to generate 10.5 kg/h of green hydrogen, and is designed to operate for 12 hours per day (Standard operation). A hydrogen buffer storage pipeline allows for the storage of approximately 100kg of hydrogen at an operating pressure of 3,200 kPa.

1.1 Project Details

Project Name	Western Sydney Green Gas Project
Project Application Number	SSD 10313
Project Address	Chandos Road, Horsley Park, NSW, 2175.
Project Phase	Operational. The plant is subject to a series of trial operations to prove the viability of a commercial; P2G system for generating hydrogen gas
Project Description	<p>The WSGGP has been developed by Jemena Gas Networks (NSW) Limited (Jemena) to trial Power-to-Gas (P2G) technology by converting purchased green energy from the electricity mains network into hydrogen gas and injecting it into its secondary gas distribution network over a 5-year period. The Project would potentially facilitate ongoing development of commercially viable P2G systems in Jemena's NSW gas network.</p> <p>The plant is scheduled to be removed at the completion of the trial operation</p>

1.2 Audit Team

The audit was conducted by the following:

Auditor	Role	Qualifications
James Hart	Lead Auditor	Lead Environmental Auditor Exemplar Global No 12105 Newcastle University, Bachelor of Science (Chem) 1981 Newcastle University, Graduate Diploma in Environmental Science, 1997
Ken Cameron	Support Auditor/ SME	Lead Quality Auditor Exemplar Global No 12003 Bachelor of Engineering (Civil), UNSW (1982) MBA Deakin University (1993) Prof. Certificate in Arbitration (2006) Master of Project Management Usyd (2020)

The independent audit declaration form is attached as Appendix C.

1.3 Audit Objectives

The objective of this Independent Environmental Audit was to assess the operations at the WSGGP for compliance with approval conditions and management plan requirements and provide a report in accordance with Condition C9 of Project Approval SSD 10313 Modification 2.

1.4 Audit Scope

The scope of this audit comprised of the following:

- The period since the previous audit, being 2 December 2022 to 13 August 2025;
- Consultation with stakeholders to obtain their input into the scope of the audit;
- Review of compliance against Project Approval SSD 10313 Modification 2;
- Review of implementation of the following management plans:
 - Environmental Management Strategy P2G-2099-PA-EV-003, rev 5, dated 9/02/2023
 - Construction Air Quality Plan, Rev 0 dated 14/10/2020
 - Erosion and Sediment Control Plan, Rev 2 dated 11/11/2020
 - Cultural Heritage Management Plan, Rev 0, dated 15/10/2020
 - Construction Noise and Vibration Management Plan, Rev 0 dated 16/10/2020
 - Traffic Management Plan 2018-HSS-PLN-002, Rev 5, dated 9/02/2023
 - Emergency Response and Management Plan WSGGP, Rev 2, dated 2/11/2022.
- the performance of the operation;
- results from previous audits;
- any incidents or community complaints;
- Site inspection of the development area.

A separate Hazardous Audit was also undertaken as part of the review process.

The audit criteria were developed by the Lead Auditor, and are included as a checklist at the end of this report.

1.5 Audit Period

This was the second independent environmental audit carried out on the project, which covered the period 3 December to 13 August 2025.

2 Methodology

2.1 Approval of Auditors

Jemena engaged James Hart from James Hart Consulting the approved Lead Auditor. Ken Cameron assisted in the audit process, and was the designated SME for the review of operation and maintenance activities and emergency response planning for the WSGGP. Ken Cameron is also responsible for the Certification of the Safety Case for the WSGGP in accordance with the NSW Gas Supply (Safety & Network Management) Regulation 2022 and the NSW Gas Supply Act 1996 in relation to a Periodical Audit of the Safety and Operating Plan.

The auditor details and certification were discussed in Section 1.2 of this report. Auditor's approval letter from DPHI is attached as **Appendix C**.

2.2 Audit Scope Development

The audit scope and a checklist was developed based on the Project Approval SSD 10313 Consolidated Consent Conditions (Modification 2) and feedback from agencies consulted.

2.3 Audit Process

The audit commenced with an initial discussion with Jemena on the project requirements and a review of the Post Approval documentation available of the DPHIWSGGP SSD website.

A site inspection was undertaken on the 14 August 2025 to review the site layout and the control measures required for compliance with the SSD conditions.

Key operational documents were reviewed, and evidence of compliance was sought through the interview process. Key documents were the various management plans required under the approval. Additional documentation was requested from Jemena in support of the audit process. Review of available records on the project website and records provided during the audit process were undertaken to determine the level of compliance with the SSD Consent Conditions.

2.4 Interviewed Persons

Name and position of persons interviewed:

Name	Organisation	Position
Rahul Dorairaj	Jemena	Environmental Manager
Pratik Gandhi	Jemena	Environmental Business Partner
Nathan Tickel	Jemena	Team Leader
Alhoush Elshahomi	Jemena	Senior Engineer Renewable Gas

2.5 Details of Site Inspection

A site walk around the site was conducted with focus on the following controls:

- Erosion and sedimentation controls;
- access/egress;
- Dust management;
- Waste management;
- Site fence and screening;
- Boundary markers;
- Chemical storage;
- Site signage; and
- General housekeeping.

2.6 Agency and Community Consultation

Consultation with the following was undertaken prior to the audit to obtain feedback and to focus the audit criteria on key issues.

Refer to **Appendix C** for consultation records provided.

Contact	Agency	Comments
Elizabeth Williamson A/Team Leader Compliance – Government Projects	Department of Planning, Housing and Industry	NSW Planning does not require any additional issues or consultation to be included within the scope of the Independent Audit that is not already captured by SSD 10313, as modified, and NSW Planning's <i>Independent Audit Post Approval Requirements</i> .
Patrick Warren Senior Strategic Land Use Planner	Fairfield City Council	Council has received 1 noise complaint from an adjoining resident. This resident complained of noise from a PA system. This issue was resolved no further complaint received. Council has not received any further complaints in relation to traffic or Council assets perspective.

Issues raised during the agency consultation process were considered in development of the audit checklist and checked and reviewed during the site inspection and review of records.

2.7 Audit Compliance Status Descriptors

Compliant	The auditor has collected sufficient verifiable evidence to demonstrate that all elements of the requirement have been complied with within the scope of the audit.
Not Compliant	The auditor has determined that one or more specific elements of the conditions or requirements have not been complied with within the scope of the audit.
Not triggered	A requirement has an activation or timing trigger that has not been met during the temporal scope of the audit being undertaken (may be a retrospective or future requirement), therefore an assessment of compliance is not relevant.

2.8 Approvals and Documents Audited

The following documents and approvals were reviewed and included within the audit:

- Environmental Management Strategy P2G-2099-PA-EV-003, rev 5, dated 9/02/2023
- Erosion and Sediment Control Plan, Rev 2 dated 11/11/2020
- Cultural Heritage Management Plan, Rev 0, dated 15/10/2020
- Traffic Management Plan 2018-HSS-PLN-002, Rev 5, dated 9/02/2023
- Emergency Response and Management Plan WSGGP, Rev 2, dated 14/12/2022
- WSGGP Feedback and Complaints Register, 8/08/2025
- Letter from DPE dated 31/03/2023 Western Sydney Green Gas Project – IEA Report and RAR (SSD-10313)
- Jemena Asset Management Pty Ltd (JGN) Safety Case, (including Pipeline Management Plan and Safety & Operating Plan), ref GAS-999-PA-HSE-001, Rev 10, dated 15/04/2025
- Independent Environmental Audit: Western Sydney Green Gas Project SSD 10313, James Hart Consulting, 24 February 2023
- Jemena Response to Recommendations from the Audit, 28/02/2023
- Jemena Gas Networks (NSW) Ltd Operational Compliance Report, Western Sydney Green Hydrogen Hub, 31/10/2024
- Jemena Gas Networks (NSW) Ltd Operational Compliance Report, Western Sydney Green Hydrogen Hub, Ver 01, 23/10/2023
- Jemena Gas Networks (NSW) Ltd Post Construction Condition Survey Report Western Sydney Green Gas Project, Rev 0, 29/06/2023

2.9 Issues to be considered in reviewing this report

This audit was based on a review of compliance with the approval conditions for the operation of the Western Sydney Green gas facility.

In particular, the audit focused on the implementation of measures described in the various Environmental Management Plans to manage the impacts of the activities on the surrounding environment. The checklist appended to this report identifies those compliance issues that could be assessed given the stage of the project.

By its very nature an audit does not guarantee full compliance of all aspects of the project with the undertakings of the Management Plans and associated documentation. However; in the opinion of the auditor, the extent and scope of the field inspection together with the records maintained by Jemena were sufficient evidence to verify general compliance of the activities with the requirements of the conditions of approval.

3 AUDIT FINDINGS

3.1 Overview

The WSSG facility has been developed to trial Power-to-Gas (P2G) technology by converting purchased green energy from the electricity mains network into hydrogen gas and injecting it into its secondary gas distribution network over a 5-year period. The Project would potentially facilitate ongoing development of commercially viable P2G systems in Jemena's NSW gas network.

Operation of the plant is based on implementing a series of trial operations, to test operational capability and parameters/variables, which is managed remotely through the Control Room at North Sydney. It is not subject to continuous operation. The Plant was not in use on the day of the site inspection.

3.2 Assessment of Compliance

Overall, the project had implemented processes to generally manage compliance with the SSD 10313 Consolidated Consent Conditions (MOD 2).

The attached checklists record the outcomes of the audit process. Four non-compliances were identified where compliance with the conditions of consent or management plans could not be verified, as summarised below.

	Requirements	Findings
Part A – Administrative Controls	13	Compliant – 11
		Non-Compliant – 1
		Not Triggered – 1
Part B – Environmental Conditions - General	18	Compliant – 17
		Non-Compliant – 0
		Not Triggered – 1
Part C – Environmental Management and Reporting	17	Compliant – 10
		Non-Compliant – 3
		Not Triggered – 4
Appendix 3 - Incident Notification and Reporting Requirements	1	Compliant – 0
		Non-Compliant – 0
		Not Triggered – 1

3.3 Previous Audit Findings

Previous audit findings were reviewed as part of the current audit to assess implementation of actions identified to address issues. Actions to address previous audit findings had been identified and previous non-compliances had been closed out. Where close out of previous

issues could not be verified, these issues were again raised as non-conformances in the current audit.

A summary of previous findings and status is provided in Appendix A.

3.4 Notices, Incidents and Complaints

Following the submission of the previous Independent Audit Report to the Department on 28 February 2023, the Department issued an Operational Reporting Warning letter and recorded a Breach for non-compliance to Conditions B8 and C8 (Ref: ENF-57180476). Further, the Department issued a Warning letter for a non-compliance to Condition B6.

No agency notices, orders, penalty notices or prosecutions have been issued, and no reportable environmental incidents that constitute material harm to the environment occurred during the period covered by this audit.

A Complaints Register is available where information regarding complaints was recorded, including the relevant resolution. No complaints have been received during the period covered by the current audit.

Summary of Complaints

No complaints in relation to this facility have been received during the period covered by the current audit.

3.5 Audit Site Inspection

The site inspection was conducted on 13 August 2025 by the Lead Auditor James Hart and SME Ken Cameron assisted Nathan Tickle. The plant was not operational at the time of this audit, but had been previously observed by the SME during SAOP compliance audit activities.

The site environmental controls and mitigation measures were verified including:

- Site is fenced and secure.
- Access to the WSGGP is along paved roads, with gravel hardstands adjacent to the WSGG facility, and were free of any deposited material.
- All other areas are grassed and maintained.
- Hazardous areas are identified.
- Equipment on site are subject to a detailed maintenance regime on site,
- Receptacles were provided for waste management,
- Site is clean and tidy.

No issues were identified during the site inspection:

3.6 Suitability of Plans and the EMS

Environmental Management System (EMS) presented for this project may be considered appropriate for the size and nature of this development project. Plans were updated during the project to address issues associated with commissioning and operational activities.

Review of management plans found that the plans complied with requirements of the conditions of consent. Where compliance with requirements of the requirements of management plans could not be demonstrated, non-compliances were raised. Details of non-compliances are provided in Section 3.19.

3.7 Additional Matters Raised During Consultation

One matter was raised during the consultation process with agencies.

Fairfield City Council	Council has received 1 noise complaint from an adjoining resident. This resident complained of noise from a PA system. This issue was resolved no further complaint received.	The site does not use a PA system.
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3.8 Key Strengths

Overall, the project environmental performance in compliance with SDD 10313 was satisfactorily met with the following key strengths noted:

- Environmental controls have been established to address the SSD approval requirements.
- Plant is well maintained with no obvious areas of deterioration or the potential to cause environmental harm.

3.9 Areas of Non-compliance

The table following outlines the identified non-compliances as well the auditor's recommendations. Auditor's notes are detailed in the attached **Appendix A – Audit Table**

Issue No.	Condition	Requirement	Issue sighted	Recommendation
2/NC-01	A2	The development may only be carried out: (a) generally in accordance with the EIS; and (b) in accordance with the conditions of this consent. Note: The general layout of the development is shown in Appendix 2.	Non-compliances have been identified with the requirements of the conditions of consent, triggering a non-compliance with this condition.	Jemena to ensure that systems are in place to ensure compliance with all conditions of consent.
2/NC-02	C2	Within 3 months, unless otherwise agreed with the Secretary, of: (a) the submission of an incident report under condition C5 below; (b) the submission of an audit report under condition C9 below; and (c) the approval of any modification to the conditions of this consent; or (d) a direction of the Secretary under condition A4 of schedule 2; the Applicant must review, and if necessary revise, the strategies, plans, and programs required under this consent to the satisfaction of the Secretary. Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted to the Secretary for approval, unless otherwise agreed with the Secretary. Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the development.	Records were not provided to demonstrate that Jemena had reviewed, and if necessary revised, the SAOP to the satisfaction of the Secretary.	Jemena should implement a process to review, and if necessary revise all strategies, plans, and programs required under this consent, to the satisfaction of the Secretary.
2/NC-03	C10	Within 12 weeks of commissioning this audit, or as otherwise agreed by the Secretary, the Applicant must submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report and a timetable for the implementation of these recommendations as required.	The previous audit was not submitted with 12 weeks of commissioning the audit. Audit commissioned 8/11/2022, Audit Report submitted 28/02/2023.	Jemena should ensure that a process is implemented to ensure that audit reports are submitted within 12 weeks of commissioning of the audit.

Independent Environmental Audit – Western Sydney Green Gas Project

Commercial in Confidence

Issue No.	Condition	Requirement	Issue sighted	Recommendation
			It is noted that the audit was conducted shortly before the Christmas holiday period.	
2/ NC-04	C10C	Independent Audit Reports and the Applicant's response to audit findings must be submitted to the Secretary within 2 months of undertaking the independent audit site inspection, as outlined in the Independent Audit Post Approvals Requirements (2020) (or as amended from time to time) unless otherwise agreed by the Secretary	<p>The previous Independent Audit Report and the Applicant's response to audit findings were not submitted within 2 months of undertaking the site inspection.</p> <p>It is noted that the audit was conducted shortly before the Christmas holiday period.</p>	Jemena should ensure that a process is implemented to ensure that audit reports, including the response to audit findings, are completed and submitted within 2 months of undertaking the site inspection.

Suggestions for Improvement

The following Suggestions for Improvement were identified during the audit process

- Jemena may consider verifying that the salinity of the water is suitable for irrigation. (SDD B15(a) refers)

3.10 Areas of compliance

All other relevant conditions audited were found to be either compliant or not triggered. Refer to the audit checklist provided as an attachment for full details of compliance.

4 CONCLUSIONS

Jemena have developed and generally implemented management plans and associated documentation to address the requirements of the conditions of consent.

While compliance with aspects of the conditions of the project approval and management plans was found, four (4) non-compliances were raised where compliance with requirements of the conditions of consent or management plans prepared for the site was not demonstrated. Three suggestions for improvements were also identified.

Jemena should ensure that actions are identified and implemented to address the findings contained within this audit to enable compliance with all obligations and ensure environmental impacts of the developments are appropriately managed.

ATTACHMENTS

- ✓ **Substantive Changes**
- ✓ **Auditor CV**
- ✓ **Audit Checklists**
- ✓ **Hazard Audit Report**

CIRCULATION

- ✓ **Jemena**

Appendix A. – Previous Audit Findings

Independent Environmental Audit – Western Sydney Green Gas Project

Commercial in Confidence

Issue No.	Condition	Requirement	Issue sighted		2025 Status
NC-01	A2	The development may only be carried out: (a) generally in accordance with the EIS; and (b) in accordance with the conditions of this consent. Note: The general layout of the development is shown in Appendix 2.	Non-compliances have been identified with the requirements of the conditions of consent, triggering a non-compliance with this condition.	Jemena will ensure that systems are in place to ensure compliance with all the conditions of consent.	Jemena has updated the internal system (OMNIA) to set reminders to ensure compliance with all conditions of consent. Non-compliances raised in the current audit. Remains open. Refer 2/NC-01
NC-02	B6	The Applicant must: (e) notify the relevant local emergency management committee following construction of the development, and prior to commencing operations.	There is no evidence of notification to local emergency management committee	Jemena will formally notify local emergency management committee about the site operations once the commissioning of micro turbines and fuel cells are carried out.	Local emergency management committee notified by Email on 21 April 2023. Closed
NC-03	B8	Prior to the commencement of construction, unless the Secretary agrees otherwise, the Applicant must prepare a Traffic Management Plan for the development to the satisfaction of the Secretary. This plan must: (e) include a protocol for undertaking independent dilapidation surveys to assess the existing condition of Chandos Road, prior to and following construction or decommissioning activities;	Independent dilapidation survey not carried out post construction.	Jemena will engage a surveyor to undertake a dilapidation survey once the commissioning of micro turbines and fuel cells are carried out.	Post works dilapidation survey was conducted and report developed on 10 July 2023. Closed

Independent Environmental Audit – Western Sydney Green Gas Project

Commercial in Confidence

Issue No.	Condition	Requirement	Issue sighted		2025 Status
NC-04	C5	The Applicant must provide regular compliance reporting to the Department on the development in accordance with the relevant <i>Compliance Reporting requirements</i> (DPE May 2020), or its latest version.	Operational Compliance Report not issued within 52 weeks of the commencement of operations	Jemena will establish a process to ensure that compliance reports are submitted on time.	Compliance reports for 2023 and 2024 had been submitted within the required timeframe to DPHI. Closed
NC-05	C8	Prior to commencing operations, the Applicant must submit work as executed plans of the development to the Secretary.	Work as Executed plans not submitted to the Secretary.	Jemena will submit work as executed plans to DPE once the commissioning of micro turbines and fuel cells are carried out.	works as executed plans to DPE on 08 Aug 2023. Closed
NC-06	C11	Unless the Secretary agrees otherwise, from the commencement of development under this consent, the Applicant must: (a) make the following information publicly available on its website as relevant to the stage of the development: <ul style="list-style-type: none"> how complaints about the development can be made; a complaints register; (b) keep this information up to date.	The project website does not clearly identify how complaints about the development can be made. It is unclear how complaints can be made about the operation of the WSGGP – there is no link on the JGN Web Site for lodging a complaint, but there is the standard DPE link on the SDD website. There is no register of Complaints available	Jemena will update its website to include the information on how a complaint can be made relating to the facility.	A Complaints register available on the project website. Reference to Planning Portal website for the project for making a complaint. Closed

Appendix B. – Auditor Approval



Department of Planning and Environment

Mr Russell Brooks
Senior Approvals & Stakeholder Manager
JEMENA GAS NETWORKS (NSW) LTD
Level 15, 567 Collins Street
MELBOURNE VIC 3000

27/10/2022

Dear Russell Brooks

**Green Gas Project - Independent Auditor Nomination (SSD-10313)
Independent Auditor Nomination**

I refer to your request (SSD-10313-PA-18) for the Secretary's approval of suitably qualified persons to prepare the Independent Auditor Nomination for the Green Gas Project - Independent Auditor Nomination (SSD-10313).

The Department of Planning and Environment (the Department) has reviewed the nominations and information you have provided and is satisfied that these experts are suitably qualified and experienced. Consequently, I can advise that the Secretary approves the appointment of an expert to prepare the Independent Audit.

In accordance with Condition C9 of SSD-10313 (the Consent) and the Independent Audit Post Approval Requirements, the Secretary has agreed to the following auditor:

- Mr. James Hart of James Hart Consulting

The Department is not able to endorse Ken Cameron as an Independent Auditor at this time as Mr. Cameron does not appear to meet the Independent Audit Post Approval Requirements. Mr. Cameron does not appear to be certified as a Lead Environmental Auditor and does not appear to have undertaken any audits under the 2020 Post Approval Requirements.

The Independent Audit must be prepared, undertaken and finalised in accordance with the Independent Audit Post Approval Requirements. Failure to meet these requirements will require revision and resubmission.

The Department reserves the right to request an alternate auditor or audit team for future audits.

Notwithstanding the agreement for the above-listed audit team for this Project, each respective project approval or consent requires a request for the agreement to the auditor or audit team be submitted to the department, for consideration of the Secretary. Each request is reviewed and depending on the complexity of future projects, the suitability of a proposed auditor or audit team will be considered.

The Department asks that all future requests lodged through the Major Projects Portal include a cover letter, to make it clear what is being requested.

Appendix C. – Audit Tables

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project
Company: Jemena Gas Networks (NSW) Limited
Date: December 2022

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
PART A ADMINISTRATIVE CONDITIONS					
Obligation to Minimise Harm to the Environment					
A1	In addition to meeting the specific performance criteria established under this consent, the Applicant must implement all reasonable and feasible measures to prevent, and if prevention is not reasonable or feasible, minimise any material harm to the environment that may result from the construction and operation of the development, and any decommissioning of the development and/or rehabilitation required under this consent.	Environmental Management Strategy P2G-2099-PA-EV-003, rev 5, dated 9/02/2023	Controls to prevent environmental harm identified in the Environmental Management Strategy . On site controls implemented to manage stormwater runoff. No material harm has been caused to the environment.	Compliant	
Terms of Consent					
A2	The development may only be carried out: (a) generally in accordance with the EIS; and (b) in accordance with the conditions of this consent. <i>Note: The general layout of the development is shown in Appendix 2.</i>	Evidence presented confirms general compliance with conditions of consent	Non-compliances have been identified with the requirements of the conditions of consent, triggering a non-compliance with this condition. Recommendation: Jemena to ensure that systems are in place to ensure compliance with all conditions of consent.	Not Compliant	NC-01
A3	If there is any inconsistency between the above documents, the most recent document must prevail to the extent of the inconsistency. However, the conditions of this consent prevail to the extent of any inconsistency.		No inconsistencies have been identified	Compliant	
A4	The Applicant must comply with any requirement/s of the Secretary arising from the Department's assessment of: (c) any strategies, plans or correspondence that are submitted in accordance with this consent; (d) any reports, reviews or audits commissioned by the Department regarding compliance with this consent; and (e) the implementation of any actions or measures contained in these documents.		The Secretary has not required any changes to documentation.	Compliant	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project
Company: Jemena Gas Networks (NSW) Limited
Date: December 2022

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
Limits of Operations					
A5	A maximum of 87,600 kilograms of hydrogen gas may be produced at the site in any calendar year.	WSHHH Production and Injection Data July 2022- June 2023 July 2023- June 2024. July 2024 – June 2025	Total production in 2022 was 1068.5kg 2022-2023 – 4573.8kg 2023 - 2024– 164kg 2024- 5191.7kg No hydrogen permitted to be injected since December 2024.	Compliant	
A6	A maximum of 2% by volume of hydrogen gas may be injected into the Applicant's natural gas distribution network.	Network Blending Report October 2024 – Sapling results	Injection of Hydrogen processor controlled. Sampling results confirm H ₂ injection <2%. No hydrogen permitted to be injected since December 2024. Sampling was undertaken at four locations to verify mixing within the system. One (1) result greater than 2%.	Compliant	
A7	On-site storage of full hydrogen cylinders, compressed natural gas vehicles when not in-use and high-pressure hydrogen storage facility are not permitted	Site inspection	No facilities on storage of full hydrogen cylinders. No high pressure hydrogen storage facility	Compliant	
A8	The Applicant may carry out operations for 5 years from the date of commencement of operations.		Operations commenced in November 2021 – permitted to operate until November 2026	Compliant	
Structural Adequacy					
A9	The Applicant must ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the Building Code of Australia. <i>Notes:</i> <ul style="list-style-type: none"> Under Part 6 of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for the development. Part 8 of the EP&A Regulation sets out the requirements for the certification of the development 	Site inspection/ interview	No new buildings during the period covered by the current audit.	Compliant	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project**Company: Jemena Gas Networks (NSW) Limited****Date: December 2022**

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
Demolition and Rehabilitation					
A10	The Applicant must ensure that all demolition work on site is carried out in accordance with Australian Standard AS 2601-2001: The Demolition of Structures, or its latest version.	Site inspection/ interview	No demolition work was required for the development of the facility	Not Triggered	
A11	The Applicant must: (a) rehabilitate the site progressively, as soon as reasonably practicable following disturbance; (b) minimise the disturbance area at any time; (c) employ interim rehabilitation strategies to minimise dust generation, soil erosion and weed incursion on parts of the site that cannot yet be permanently rehabilitated; and (d) within 18 months of the cessation of operations decommission and remove project infrastructure, unless the Secretary agrees otherwise.	Site Inspection	Site inspection on 13 August 2025 determined that the site has been fully restored with no areas requiring further rehabilitation. Site still in operation	Compliant	
Protection of Public Infrastructure					
A12	Unless the Applicant and the applicable authority agree otherwise, the Applicant must: (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the development; and (b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the development	Site interview	Jemena advised that there was no requirement to relocate or protect public infrastructure	Compliant	
Operation of Plant and Equipment					
A13	The Applicant must ensure that all plant and equipment used on site, or in connection with the development, is: (a) maintained in a proper and efficient condition; and (b) operated in a proper and efficient manner.	WSHH Buffer Store PMs Jul-23 to Jun-24 WSHH Electrolyser Package PMs Jul-23 to Jun-24 Electrolyser PM Compliance July 23 – Jun 24.	Records sighted to verify that plant had been maintained. SAP used for management of maintenance activities.	Compliant	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project**Company: Jemena Gas Networks (NSW) Limited****Date: December 2022**

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
PART B ENVIRONMENTAL CONDITIONS - GENERAL					
Notification of Commencement					
B1	<p>Unless the Secretary agrees otherwise, the Applicant must prepare the following documents at least one month prior to commencing construction of the development to the satisfaction of the Secretary:</p> <ul style="list-style-type: none">(a) a Construction Safety Study that is consistent with the Department's Hazardous Industry Planning Advisory Paper No. 7, 'Construction Safety';(b) a Hazard and Operability Study, prepared by a suitably qualified, experienced and independent expert whose appointment has been endorsed by the Secretary, that is consistent with the Department's Hazardous Industry Planning Advisory Paper No. 8, 'HAZOP Guidelines', and must be accompanied by a program for the implementation of all recommendations made in the report. The study must include a suitably designed firewall with Fire Resistance Level (FRL) of at least 240/240/240 to mitigate potential fire-related impacts from the high-pressure hydrogen storage facility. If the Applicant intends to defer the implementation of a recommendation, reasons must be documented;(c) a Final Hazard Analysis based on the final design of the development that is consistent with the Department's Hazardous Industry Planning Advisory Paper No. 6, 'Hazard Analysis'; and(d) a Fire Safety Study that is consistent with the Department's Hazardous Industry Planning Advisory Paper No. 2, 'Fire Safety Study Guidelines' and the New South Wales Government's 'Best Practice Guidelines for Contaminated Water Retention and Treatment Systems', and in consultation with FRNSW and RFS. <p>Following the Secretary's approval, the Applicant must operate the development in accordance with the approved Construction Safety Study, Hazard and Operability Study, Final Hazard Analysis, and Fire Safety Study.</p> <p>Notes:</p>	Independent Environmental audit: Western Sydney Green Gas Project, SSD 10313, 24/02/2023	Submission and approval before the commencement of construction. Verified previous audit	Compliant	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project**Company: Jemena Gas Networks (NSW) Limited****Date: December 2022**

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
	<ul style="list-style-type: none"> Construction, other than preliminary works that are outside the scope of the hazard studies, must not commence until study recommendations have been considered and, where appropriate, acted upon. For developments in which the construction period exceeds six months, the commissioning portion of the Construction Safety Study may be submitted two months prior to commencement of commissioning. 				
B2	Unless the Secretary agrees otherwise, the Applicant must prepare a revised Safety and Operating Plan (SAOP) at least one month prior to commencing construction of the development to the satisfaction of the Secretary – Authorising in relation to all the assets and equipment located within the development footprint, as shown in Appendix 2.	Independent Environmental audit: Western Sydney Green Gas Project, SSD 10313, 24/02/2023	DPE letter dated 11/11/2020 approving WSGGP Safety and Operating Plan. Verified previous audit.	Compliant	
Pre-commissioning					
B3	<p>Unless the Secretary agrees otherwise, the Applicant must develop the following documents at least one month prior to commencement of commissioning of the development to the satisfaction of the Secretary:</p> <p>(a) a comprehensive Emergency Plan. The Applicant must keep two copies of the plan on-site in a prominent position adjacent to the site entry points at all times The Emergency Plan must:</p> <ul style="list-style-type: none"> be consistent with the Department's Hazardous Industry Planning Advisory Paper No. 1, 'Emergency Planning'; identify the fire risks and controls of the development; include procedures that would be implemented if there is a fire on-site or in the vicinity of the site; and include an Evacuation Plan for flooding and bushfire events, in consultation with Council and the NSW SES; and <p>(b) a comprehensive Safety Management System, covering all on-site operations and associated transport activities involving hazardous materials. The Safety Management System must:</p> <ul style="list-style-type: none"> consistent with the Department's Hazardous Industry Planning Advisory Paper No. 9, 'Safety Management'; and 	<p>Independent Environmental audit: Western Sydney Green Gas Project, SSD 10313, 24/02/2023</p> <p>Letter from DPHI: Western Sydney Green Gas Project (SSD-10313) – Emergency Plan, 9/03/2023</p>	<p>Verified previous audit.</p> <p>Updated Emergency Plan submitted to DPHI and approved 9/02/2023.</p>	Compliant	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project**Company: Jemena Gas Networks (NSW) Limited****Date: December 2022**

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
	<ul style="list-style-type: none">identify all safety related procedures, responsibilities and policies, along with details of mechanisms for ensuring adherence to the procedures. Records must be kept on-site and must be available for inspection by Secretary upon request. Following approval, the Applicant must implement the Emergency Plan and Safety Management System. Notes: <ul style="list-style-type: none">The update of a relevant existing site document may satisfy the condition where all the relevant requirements are addressed in the updated document.				
Pre-startup					
B4	The Applicant must prepare a Pre-startup Compliance Report for the development to the satisfaction of the Secretary. This report must be submitted to the Secretary for approval at least one month prior to carrying out any operations under this consent, and detail the development's compliance with the documents required under condition 1 of schedule 3 of this consent, including: (a) date of document preparation; (b) date that construction and commissioning commenced; and (c) actions proposed and/or taken in order to implement the recommendations made in the documents.	Independent Environmental audit: Western Sydney Green Gas Project, SSD 10313, 24/02/2023	Verified previous audit.	Compliant	
Storage and Handling of Dangerous Goods					
B5	The Applicant must ensure that all dangerous goods and hazardous materials storage and handling undertake on-site is in accordance with: (a) the requirements of all relevant Australian Standards; and (b) the NSW EPA's Storing and Handling of Liquids: Environmental Protection – Participants Handbook if the chemicals are liquids, or its latest version. In the event of an inconsistency between the requirements listed from (a) to (b) above, the most stringent requirement must prevail to the extent of the inconsistency.	Site inspection	Nitrogen cylinders stored on site in open area. No other dangerous goods stored on site.	Compliant	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project
Company: Jemena Gas Networks (NSW) Limited
Date: December 2022

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
Operating Conditions					
B6	<p>The Applicant must:</p> <ul style="list-style-type: none"> (a) deleted; (b) minimise the fire risks of the development, including managing vegetation fuel loads on-site; (c) ensure that the development complies with the relevant objectives in the RFS's Planning for Bushfire Protection 2019 (or latest version); (d) assist the RFS and emergency services as much as practicable if there is a fire in the vicinity of the site; and (e) notify the relevant local emergency management committee following construction of the development, and prior to commencing operations. 	<p>Site inspection</p> <p>Email to RFS 21/04/2023 – Western Sydney Green Gas Project – Commencement of Commissioning of</p>	<p>Site is within existing industrial complex associated with the JGN Transmission and Gas Network</p> <p>Area around the site either mowed paddock or road/hardstand.</p> <p>There are no other potential fuel loads near the development.</p> <p>In the case of fire emergency in the adjacent areas the WSGG Facility will be shut down.</p> <p>Local emergency management committee was notified 21/04/2023.</p>	Compliant	
TRAFFIC					
Traffic Management Requirements					
B7	<p>The Applicant must:</p> <ul style="list-style-type: none"> (a) minimise the impacts of the site access upgrades for the development; (b) maintain all footpaths, roads and utility-related infrastructure on site in a safe and serviceable condition; (c) upgrade the access road and turning circle to an all-weather sealed surface; (d) provide sufficient parking on site for all vehicles and ensure vehicles associated with the development do not park on the public road network; (e) ensure frequency of cylinder refilling vehicles entering and leaving the site do not exceed four trips per week, unless otherwise agreed by the Secretary subject to the Final Hazard Analysis required under Schedule 3 Condition B1; and (f) minimise the traffic noise impacts of the development. 	<p>Site inspection</p> <p>Review of Complaints Register</p>	<p>Site access from existing entrance to the JGN facility</p> <p>Roads and utility-related infrastructure on site were maintained in good condition.</p> <p>No footpaths in the vicinity of the entrance to the site</p> <p>Adequate areas for parking and vehicle movement through the site</p> <p>No cylinder filling vehicles are entering the site</p> <p>No noise complaints recorded during operations</p>	Compliant	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project
Company: Jemena Gas Networks (NSW) Limited
Date: December 2022

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
Traffic Management Plan					
B8	<p>Prior to the commencement of construction, unless the Secretary agrees otherwise, the Applicant must prepare a Traffic Management Plan for the development to the satisfaction of the Secretary. This plan must:</p> <ul style="list-style-type: none"> (a) be prepared in consultation with GSP, Council and TfNSW; (b) describe the measures that would be implemented to comply with the transport management requirements in condition B7 above; (c) include details of the transport route to be used for all construction and operational traffic; (d) include details of the measures that would be implemented to minimise traffic safety issues and disruption to local users of the transport route/s during construction and operations; (e) include a protocol for undertaking independent dilapidation surveys to assess the existing condition of Chandos Road, prior to and following construction or decommissioning activities; (f) include a swept path analysis of entry and exit to the site and identify a schedule for access upgrades (if required) to the satisfaction of Council and TfNSW; and (g) include a program to: <ul style="list-style-type: none"> • record and track any light and heavy vehicle movements associated with the development; and • monitor the effectiveness of these measures. <p>The Applicant must implement the approved Traffic Management Plan for the development.</p>	<p>Traffic Management Plan 2018-HSS-PLN-002, Rev 5, dated 9/02/2023</p> <p>Letter from DPHI: Western Sydney Green Gas Project (SSD-10313) - Traffic Management Plan, 16/02/2023</p> <p>Post Construction Condition Survey Report, Western Sydney Gas Project, Rev 0, 29/06/2023</p>	<ul style="list-style-type: none"> a) Plan includes details of consultation with Fairfield City Council, WSPT and TfNSW b) Plan defines measures to be implemented c) Plan includes details of Heavy Vehicle route d) Measures to minimise traffic safety issues defined e) Independent dilapidation survey carried out post construction 22/06/2023. f) Site access through existing street entry g) Plan provides anticipated traffic volumes, does not include commitment to track any light of heavy vehicle movements. Effectiveness of measures to be checked twice daily and recorded in Site Diary. Sighted letter from DPE dated 27/11/2020 approving Traffic Management Plan <p>Records of deliveries to site available through the ordering process.</p>	Compliant	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project
Company: Jemena Gas Networks (NSW) Limited
Date: December 2022

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No												
AMENITY																	
Construction and Operating Hours																	
B9	<p>The Applicant must comply with the operating hours set out in Table 1.</p> <table><tr><th colspan="2">Table 1: Operating Hours</th></tr><tr><th>Activity</th><th>Operating Hours</th></tr><tr><td>Operations excluding microturbines, fuel cell and blowdowns</td><td>24 hours a day 7 days a week</td></tr><tr><td>Microturbines and fuel cell</td><td>7 am to 10 pm 7 days a week</td></tr><tr><td>Construction and decommissioning activities</td><td>7 am to 6 pm Monday to Friday</td></tr><tr><td>Blowdowns (excluding emergency work)</td><td>8 am to 1 pm Saturday at no time on Sundays and NSW public holidays</td></tr></table> <p>The following activities may be undertaken outside of the hours identified in Table 1 without the approval of the Secretary:</p> <p>(a) the delivery of materials as requested by the NSW Police Force or other authorities for safety reasons;</p> <p>(b) emergency work to avoid the loss of life, property and/or material harm to the environment;</p> <p>(c) construction works that cause LAeq (15 mins) noise levels that are:</p> <ul style="list-style-type: none">no more than 5 dB(A) above the rating background level at any residence in accordance with the Interim Construction Noise Guideline (DECC, 2009), or its latest version; andno more than the noise management levels specified in Table 3 of the Interim Construction noise Guideline (DECC, 2009), or its latest version, at other sensitive land uses; andfor continuous or impulsive vibration values, measured at the most affected residence, no more than those for human exposure to vibration, specified in Table 2.2 of Assessing vibration: a technical guideline (DEC, 2006), or its latest version; andfor intermittent vibration values measured at the most affected residence, no more than those for human exposure to vibration, specified in Table 2.4 of Assessing vibration: a technical guideline (DEC, 2006), or its latest version; <p>(d) where a negotiated agreement has been reached with affected receivers; or</p>	Table 1: Operating Hours		Activity	Operating Hours	Operations excluding microturbines, fuel cell and blowdowns	24 hours a day 7 days a week	Microturbines and fuel cell	7 am to 10 pm 7 days a week	Construction and decommissioning activities	7 am to 6 pm Monday to Friday	Blowdowns (excluding emergency work)	8 am to 1 pm Saturday at no time on Sundays and NSW public holidays	<p>Construction Noise and Vibration Management Plan presented, Rev 0 dated 16/10/2020</p> <p>Includes Out of Hours Protocol</p> <p>Requirements of SDA have been addressed</p>	<p>Operational hours only</p> <p>Any ongoing maintenance activities, including blowdowns (except for emergencies) undertaken in normal business hours.</p>	Compliant	
Table 1: Operating Hours																	
Activity	Operating Hours																
Operations excluding microturbines, fuel cell and blowdowns	24 hours a day 7 days a week																
Microturbines and fuel cell	7 am to 10 pm 7 days a week																
Construction and decommissioning activities	7 am to 6 pm Monday to Friday																
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AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project
Company: Jemena Gas Networks (NSW) Limited
Date: December 2022

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
	(e) works as approved through the out-of-hours work protocol outlined in the Environmental Management Strategy under Schedule 4 of this consent.				
Noise					
B10	<p>The Applicant must:</p> <ul style="list-style-type: none"> (a) minimise the noise generated by any construction or decommissioning activities on site in accordance with the best practice requirements outlined in the Interim Construction Noise Guideline (DECC, 2009), or its latest version; (b) implement all reasonable and feasible measures to minimise the operational noise of the development; (c) notify the occupants of residences within 200 metres of the site boundary and GSP 24 to 48 hours prior to undertaking blow downs (excluding emergency works); and (d) comply with the operational noise levels within the Noise Policy for Industry (NSW EPA, 2017), or its latest version. 	Construction Noise and Vibration Management Plan presented, Rev 0 dated 16/10/2020	Noise and Vibration plan includes controls required to minimise noise during the construction, operation and decommissioning of the site. Jemena advised that there has been no Blowdowns of the facility. Equipment housed within containers with noise attenuation.	Compliant	
Air					
B11	<p>The Applicant must minimise the:</p> <ul style="list-style-type: none"> (a) dust emissions of the development, including wind-blown and traffic generated dust; (b) greenhouse gas emissions of the development; (c) surface disturbance of the development; and (d) other air emissions of the development. 	Construction Air Quality Plan, Rev 0 dated 14/10/2020 Site inspection	Construction Air Quality Plan identifies controls for management of air emissions during construction. Works now complete – access on road, all areas vegetated. No air quality complaints have been received.	Compliant	
B12	The Applicant must ensure that no offensive odours are emitted from the development, as defined under the POEO Act.	Site inspection and interview. Jemena advised that hydrogen gas is not odourised	It was reported that no offensive odours were generated by the site. No odour related complaints have been received.	Compliant	
Visual					
B13	<p>The Applicant must:</p> <ul style="list-style-type: none"> (a) minimise the off-site visual impacts of the development, including the potential for any glare or reflection; 	Site inspection	Facility is located behind existing JGN facility – no obvious visual impact on the area	Compliant	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project
Company: Jemena Gas Networks (NSW) Limited
Date: December 2022

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
	(b) ensure the visual appearance of infrastructure (including paint colours) blends in as far as possible with the surrounding landscape; and (c) not mount any commercial advertising signs or logos on site, except where this is required for identification or safety purposes.				
Lighting					
B14	The Applicant must: (a) minimise the off-site lighting impacts of the development; and (b) ensure that any external lighting associated with the development: <ul style="list-style-type: none"> is installed as low intensity lighting (except where required for safety or emergency purposes); does not shine above the horizontal; and complies with Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting, or its latest version. 	Site inspection	Minimal lighting on site - in keeping with lighting systems used for the rest of the JGN facility. No lighting complaints have been received.	Compliant	
SOIL AND WATER					
Operating Conditions					
B15	The Applicant must: (a) ensure that the development does not cause any water pollution, as defined under section 120 of the POEO Act; (b) ensure that stormwater runoff from the development is managed using Waste Sensitive Urban Design (WSUD) techniques consistent with the Western Sydney Parklands Design Manual and considers the Fairfield City Council Stormwater Management Policy; and (c) minimise any soil erosion associated with the construction of the development in accordance with the relevant requirements in the Managing Urban Stormwater: Soils and Construction (Landcom, 2004) manual, or its latest version.	Erosion and Sediment Control Plan presented, Rev 2 dated 11/11/2020 Laboratory Report – Eurofins, 28/02/2025.	Site has been restored and maintained to prevent soil erosion. Wastewater from site for irrigation of grass areas – Jemena have undertaken sampling and analysis of the wastewater to assess its suitability for irrigation. It was reported that no contaminants were present at levels considered a risk for irrigation. Salinity was not considered in the analysis. Opportunity for Improvement Jemena may consider verifying that the salinity of water is suitable for irrigation.	Compliant	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project**Company: Jemena Gas Networks (NSW) Limited****Date: December 2022**

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
WASTE					
B16	The Applicant must: (a) minimise the waste generated by the development; (b) classify all waste generated on site in accordance with the EPA's Waste Classification Guidelines 2014 (or its latest version); (c) store and handle all waste on site in accordance with its classification; (d) not receive or dispose of any waste on site; and (e) remove all waste from the site as soon as practicable, and ensure it is sent to an appropriately licensed waste facility for disposal.	Site inspection	No waste was stored on site at time of inspection. Jemena advised that Waste as in general household rubbish is bagged up by Tech's and removed by the JGN cleaning contractor for this site.	Compliant	
HERITAGE					
Protection of Heritage Items					
B17	The Applicant must ensure the development does not cause any direct or indirect impacts on heritage items located outside the approved development footprint.	Cultural Heritage Management Plan, Rev 0, dated 15/10/2020	No impacts on heritage items located outside the approved development footprint have occurred.	Compliant	
B18	If historical and/or Aboriginal archaeological heritage items are unexpectedly discovered during construction of the development, all works must cease, and a suitably qualified and experienced archaeologist be brought in to assess the find. Depending on the nature of the discovery, additional assessment, recording and management measures may be required prior to the recommencement of works in the affected area. Heritage NSW and/or members of the relevant Local Aboriginal Land Council must be notified of this discovery in writing.	Site interview.	No historical and/or Aboriginal archaeological heritage items were discovered during construction	Not triggered	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project
Company: Jemena Gas Networks (NSW) Limited
Date: December 2022

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
PART C ENVIRONMENTAL MANAGEMENT AND REPORTING					
ENVIRONMENTAL MANAGEMENT					
Environmental Management Strategy					
C1	<p>Prior to commencing construction, the Applicant must prepare an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must:</p> <ul style="list-style-type: none"> (a) prepared in consultation with the Council and GSP; (b) provide the strategic framework for environmental management of the development; (c) identify the statutory approvals that apply to the development; (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development; (e) describe the procedures that would be implemented to: <ul style="list-style-type: none"> • keep the local community and relevant agencies informed about the operation and environmental performance of the development; • receive, handle, respond to, and record complaints; • resolve any disputes that may arise; • respond to any non-compliance; and • respond to emergencies; and (f) include: <ul style="list-style-type: none"> • the following sub-plans: <ul style="list-style-type: none"> o noise; o air quality; o stormwater management including erosion and sediment controls during construction; and o heritage. • copies of any strategies, plans and programs approved under the conditions of this consent; and • a clear plan depicting monitoring to be carried out in relation to the development. 	<p>Environmental Management Strategy Rev 1 dated 12/11/2020 – plan addresses the construction phase of the project</p> <p>DPE letter dated 27/11/2020 presents approval for the Plan</p> <p>Updated Environmental Management Strategy rev 3, dated 10/5/2021 – plan includes the commission and operational phase of the project</p> <p>DPE letter dated 14/05.2021 presents approval for the Plan.</p> <p>Environmental Management Strategy P2G-2099-PA-EV-003, rev 5, dated 9/02/2023</p>	<p>Document has been developed to address SDD criteria</p> <ul style="list-style-type: none"> a) Summary of Consultation included in document b) Strategic framework defined c) Statutory Approvals included d) Roles and responsibilities described e) Requirements defined <ul style="list-style-type: none"> - Stakeholder Communication - Complaints and dispute management process described - Issue management procedure included - Non-compliance process described - Refers to Project Emergency Response Plan f) Sub Plans provided <ul style="list-style-type: none"> - Construction Environmental Management Plan - Construction Noise and Vibration Management Plan - Construction Air Quality Management Plan - Erosion and Sediment Control Plan - Cultural Heritage Management Plan <p>Monitoring requirements for the project are defined.</p>	Compliant	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project
Company: Jemena Gas Networks (NSW) Limited
Date: December 2022

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
	<p>Following the Secretary's approval, the Applicant must implement the Environmental Management Strategy.</p> <p><i>Notes:</i></p> <ul style="list-style-type: none"> The update of a relevant existing site documents may satisfy the condition where all the relevant requirements are addressed in the updated document. 		Evidence sighted during the audit verified implementation of the EMS.		
Revision of Strategies, Plans and Programs					
C2	<p>Within 3 months, unless otherwise agreed with the Secretary, of:</p> <p>(a) the submission of an incident report under condition C5 below;</p> <p>(b) the submission of an audit report under condition C9 below; and</p> <p>(c) the approval of any modification to the conditions of this consent; or</p> <p>(d) a direction of the Secretary under condition A4 of schedule 2; the Applicant must review, and if necessary revise, the strategies, plans, and programs required under this consent to the satisfaction of the Secretary.</p> <p>Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted to the Secretary for approval, unless otherwise agreed with the Secretary.</p> <p><i>Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the development.</i></p>		<p>Previous audit submitted 26/02/2023. EMS reviewed 22/02/2023 – Conditional Approval provided 24/02/2023.</p> <p>TMP reviewed – Approved 16/02/2023 SAOP – no evidence of review Emergency management Plan – Approved 9/03/2023 Recommendation: Jemena should implement a process to review, and if necessary revise all strategies, plans, and programs required under this consent ,to the satisfaction of the Secretary.</p>	Not Compliant	2/NC-02
COMPLIANCE					
Incident Notification, Reporting and Response					
C3	<p>The Secretary must be notified in writing via the Major Projects website immediately after the Applicant becomes aware of an incident. The notification must identify the development (including the application number and the name of the development if it has one) and set out the location and nature of the incident. Subsequent notification requirements must be given, and reports submitted in accordance with the requirements set out in Appendix 3.</p>		Jemena stated that no incidents had occurred that required notification to DPHI	Not Triggered	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project
Company: Jemena Gas Networks (NSW) Limited
Date: December 2022

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
Non-Compliance Notification					
C4	<p>The Secretary must be notified in writing via the Major Projects website within seven days after the Applicant becomes aware of any non-compliance. A non-compliance notification must identify the development and the application number for it, set out the condition of consent that the development is non-compliant with, the way in which it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.</p> <p><i>Note: A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance</i></p>		Jemena stated that no incidents had occurred that required notification to DPHI	Not Triggered	
Compliance Reporting					
C5	The Applicant must provide regular compliance reporting to the Department on the development in accordance with the relevant <i>Compliance Reporting requirements</i> (DPE May 2020), or its latest version.	<p>Operational Compliance Report - Western Sydney Green Hydrogen Hub, Ver 01, 31/10/2024</p> <p>Email response from DPHI 5/02/2025 acknowledging receipt of 2024 report.</p> <p>Operational Compliance Report - Western Sydney Green Hydrogen Hub, 24/10/2023</p> <p>Email response from DPHI 27/10/2023 acknowledging receipt of 2023 report.</p>	<p>2023 and 2024 WSGGP Operational Compliance reports prepared and available on project website.</p> <p>2024 report submitted 1/11/2024</p>	Compliant	
NOTIFICATIONS					
Notification of Department					
C6	Prior to commencing the construction, operations or decommissioning of the development or the cessation of operations, the Applicant must notify the Department and Council in writing of the date of commencement, or cessation, of the relevant phase.	JGN letter dated 22/12/2020 advising commencement of construction phase activities	<p>Notifications letters sent to Council and DPE prior to construction and operation.</p> <p>Verified previous audit</p>	Compliant	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project**Company: Jemena Gas Networks (NSW) Limited****Date: December 2022**

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
	If any of these phases of the development are to be staged, then the Applicant must notify the Department and Council in writing prior to commencing the relevant stage, and clearly identify the development that would be carried out during the relevant stage.	JGN letter dated 14/05/2021 advising commencement of Commissioning JGN letter dated 1/11/2021 advising commencement of Operation			
Final Layout Plans					
C7	Prior to commencing construction, the Applicant must submit detailed plans of the final layout of the development to the Secretary.		General Arrangement drawings included as part of submission documents. Verified previous audit.	Compliant	
	Work as Executed Plans				
C8	Prior to commencing operations, the Applicant must submit work as executed plans of the development to the Secretary.	Major Projects Portal summary Reply from Major Projects Portal verifying submission on 8/08/2023	Submitted 8/08/2023 through the Major Projects Portal	Compliant	
Independent Environmental Audit					
C9	Unless the Secretary agrees otherwise, 12 months after the commencement of operations of the development and every three years thereafter, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development. This audit must: (a) be prepared in accordance with the relevant Independent Audit Post Approval requirements (DPE 2020); (b) be conducted by a suitably qualified lead auditor and suitably qualified, experienced and independent team of experts in any field specified by the Secretary, whose appointment has been endorsed by the Secretary; (c) include consultation with Council and relevant agencies; (d) include a comprehensive Hazard Audit of the development in accordance with the Department's publication Hazardous Industry Planning Advisory Paper No. 5, 'Hazard Audit Guidelines' and include a review of the site Safety Management	Independent Environmental audit: Western Sydney Green Gas Project, SSD 10313, 24/02/2023	Commencement of Operations – November 2021. Audit commissioned 8/11/2022 Audit inspection conducted 2/12/2022 a) Audit report reflects requirements of the Independent Audit Post Approval, May 2020 b) Auditor approved for initial audit 27/10/2022. c) Records of consultation included in Section 2.6 and Appendix C d) Hazard Audit undertaken, and attached to Independent Audit report – Appendix D e) f)	Compliant	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project
Company: Jemena Gas Networks (NSW) Limited
Date: December 2022

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
	<p>System and a review of all entries made in the incident register since the previous audit;</p> <p>(e) review the adequacy of any strategies, plans or programs required under the abovementioned approvals;</p> <p>(f) recommend appropriate measures or actions to improve the environmental performance of the development, and/or any strategy, plan or program required under the abovementioned approvals; and</p> <p>(g) be conducted and reported to the satisfaction of the Secretary.</p> <p><i>Note: A reference to Independent Audit Post Approval Requirements (2020) in this development consent also includes future amendments to this document.</i></p>		<p>g)</p> <p>h)</p> <p>i) Section 3.6</p> <p>j) Section 3.9</p> <p>k)</p> <p>l)</p> <p>m)</p> <p>n) Report issued to and acknowledged by DPHI.</p>		
C10	<p>Within 12 weeks of commissioning this audit, or as otherwise agreed by the Secretary, the Applicant must submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report and a timetable for the implementation of these recommendations as required.</p>		<p>Audit submitted 28/02/2023.</p> <p>The audit was not submitted within 12 weeks of commissioning the audit.</p> <p>Recommendation:</p> <p>Jemena should ensure that a process is implemented to ensure that audit reports are submitted within 12 weeks of commissioning of the audit.</p>	Not Compliant	2/NC-03
C10A	<p><i>The Secretary may require the initial and subsequent Independent Audits to be undertaken at different times to those specified in the Independent Audit Post Approval Requirements (2020), upon giving at least 4 weeks' notice (or timing) to the Applicant of the date upon which the audit must be commenced.</i></p>		<p>Audits conducted 3 yearly as per the <i>Independent Audit Post Approval Requirements (2020)</i>.</p> <p>No requests from the Secretary to undertake audits at different times.</p>	Not Triggered	
C10B	<p><i>In accordance with the specific requirements in the Independent Audit Post Approval Requirements (2020) (or as amended from time to time), the Applicant must:</i></p> <p>(a) review and respond to each Independent Audit Report prepared under condition C9 of this consent, or condition C10A where notice is given by the Secretary;</p>	<p>Letter to DPHI: Response to Recommendations from the Audit, 28/02/2023</p>	<p>Response to audit findings prepared and submitted to DPHI 28/02/2023.</p>	Compliant	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project
Company: Jemena Gas Networks (NSW) Limited
Date: December 2022

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
	(b) submit the response to the Secretary; and make each Independent Audit Report, and response to it, publicly available within 60 days of submission to the Secretary, unless otherwise agreed by the Secretary.				
C10C	Independent Audit Reports and the Applicant's response to audit findings must be submitted to the Secretary within 2 months of undertaking the independent audit site inspection, as outlined in the <i>Independent Audit Post Approvals Requirements (2020)</i> (or as amended from time to time) unless otherwise agreed by the Secretary	Letter to DPHI: Response to Recommendations from the Audit, 28/02/2023	Response to audit findings prepared and submitted to DPHI 28/02/2023. Audit inspection 2/12/2022. Audit Reports and the Applicant's response to audit findings were not submitted within 2 months of undertaking the independent audit site inspection. Recommendation: Jemena should ensure that a process is implemented to ensure that audit reports, including the response to audit findings, are completed and submitted within 2 months of undertaking the site inspection.	Not Compliant	2/NC-04
C10D	Notwithstanding the requirements of the <i>Independent Audit Post Approvals Requirements (2020)</i> , the Secretary may approve a request for ongoing independent operational audits to be ceased, where it has been demonstrated to the Secretary's satisfaction that independent operational audits have demonstrated operational compliance. The Applicant must implement these recommendations, to the satisfaction of the Secretary.		No requests to cease ongoing operational audits have been issued.	Not Triggered	
	ACCESS TO INFORMATION				
C11	Unless the Secretary agrees otherwise, from the commencement of development under this consent, the Applicant must: (a) make the following information publicly available on its website as relevant to the stage of the development: <ul style="list-style-type: none"> the EIS; the final general arrangement plans for the development; 	https://www.jemena.com.au/future-energy/future-gas/western-sydney-green-hydrogen-hub/#:~:text=Western%20Sydney-,Hydrogen,-Hub	Jemena Website includes description of WSGGP, and a link to the WSGGP DPE Website, which includes approvals and approved management plans for the project. The following information was available;	Compliant	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project
Company: Jemena Gas Networks (NSW) Limited
Date: December 2022

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
	<ul style="list-style-type: none"> current statutory approvals for the development; approved strategies, plans or programs required under the conditions of this consent; the proposed staging plans for the development if the construction, operation or decommissioning of the development is to be staged; how complaints about the development can be made; a complaints register; compliance reports; any independent environmental audit, and the Applicant's response to the recommendations in any audit; and any other matter required by the Secretary; and <p>(b) keep this information up to date.</p>		<u>Feedback and Complaints Register</u> <u>Environmental Impact Statement</u> <u>Independent Environmental Impact Report - 2022</u> <u>Response to Recommendations from the Audit</u> <u>Operational Compliance Report - 2022</u> <u>Operational Compliance Report - 2023</u> <u>Operational Compliance Report - 2024</u> Noted that no complaints have been received during the period covered by the report.		
	UPDATING AND STAGING OF STUDIES, STRATEGIES AND PLANS				
C12	<p>To ensure the studies, strategies and plans for the development are updated on a regular basis and incorporate any required measures to improve the environmental performance of the development, the Applicant may submit revised studies, strategies or plans required for the development under the conditions of consent at any time. With the agreement of the Secretary, the Applicant may also submit any study, strategy or plan required under the conditions of this consent on a staged basis.</p>	Evidence of staged submission	EMS was submitted on a staged basis. All plans have been submitted to and approved by DPHI.	Compliant	
C13	<p>The Secretary may approve a revised strategy or plan required under the conditions of consent, or the stage submission of these documents, at any time. With the approval of the Secretary, the Applicant may prepare the revised or staged strategy or plan without undertaking consultation with all parties nominated under the applicable condition in this consent.</p> <p><i>Notes:</i></p> <ul style="list-style-type: none"> <i>While any study, strategy or plan may be submitted on a progressive basis, the Applicant must ensure that the existing operations on site are covered by suitable studies, strategies or</i> 	DPE Office of Energy and Climate Change dated 22 December 2022	<p>A letter from DPE Office of Energy and Climate Change dated 22 December 2022 is included on the WSGG Project SSD site confirming that the Safety Case lodged under the requirements of the <i>Gas Supply Act</i>.</p> <p>No further revisions which required consultation with other parties.</p>	Compliant	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project

Company: Jemena Gas Networks (NSW) Limited

Date: December 2022

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
	<p><i>plans at all times.</i></p> <ul style="list-style-type: none"> <i>If the submission of any study, strategy or plan is to be staged, then the relevant study, strategy or plan must clearly describe the specific stage to which the study, strategy or plan applies, the relationship of this stage to any future stages, and the trigger for updating the study, strategy or plan.</i> 				
APPENDIX 3: INCIDENT NOTIFICATION AND REPORTING REQUIREMENTS					
	<p>Written Incident Notification Requirements</p> <ol style="list-style-type: none"> A written incident notification addressing the requirements set out below must be submitted to the Secretary via the Major Projects website within seven days after the Applicant becomes aware of an incident. Written notification of an incident must: <ol style="list-style-type: none"> identify the development and application number; provide details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident; identify how the incident was detected; identify when the Applicant became aware of the incident; identify any actual or potential non-compliance with conditions of consent; describe what immediate steps were taken in relation to the incident; identify further action(s) that will be taken in relation to the incident; and identify a development contact for further communication regarding the incident. Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Secretary, the Applicant must provide the Secretary and any relevant public authorities (as determined by the Secretary) with a detailed report on the incident addressing all requirements below, and such further reports as may be 	Site interview	Jemena stated that no incidents had occurred that required notification to DPHI	Not Triggered	

AUDIT CHECKLIST: SSD 10313 Western Sydney Green Gas Project**Company: Jemena Gas Networks (NSW) Limited****Date: December 2022**

Approval ID	Compliance Requirement	Evidence collected	Independent Audit Findings and Recommendations	Compliance Status	Issue No
	requested. 4. The Incident Report must include: (a) a summary of the incident; (b) outcomes of an incident investigation, including identification of the cause of the incident; (c) details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and (d) details of any communication with other stakeholders regarding the incident.				

Appendix D. Consultation Records

Friday, August 8, 2025 at 2:08:04 PM Australian Eastern Standard Time

Subject: RE: Western Sydney Green Gas Facility - Independent Environment Audit
Date: Thursday, 7 August 2025 at 4:32:26 pm Australian Eastern Standard Time
From: Elizabeth Williamson
To: james.hart59@outlook.com
Attachments: image001.png

Good afternoon James,

Thank you for your email requesting input into the scope of the audit.

NSW Planning does not require any additional issues or consultation to be included within the scope of the Independent Audit that is not already captured by SSD 10313, as modified, and NSW Planning's *Independent Audit Post Approval Requirements*.

Please don't hesitate to contact me if you have any questions.

Elizabeth Williamson

A/Team Leader Compliance – Government Projects

NSW Planning | Department of Planning, Housing and Infrastructure

T 02 8289 6610 | M 0447 041 325 | [E elizabeth.williamson@planning.nsw.gov.au](mailto:elizabeth.williamson@planning.nsw.gov.au)

Locked Bag 5022 | PARRAMATTA NSW 2124

www.dpie.nsw.gov.au



The Department of Planning and Environment acknowledges that it stands on Aboriginal land. We acknowledge the traditional custodians of the land and we show our respect for elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.

If you are submitting a compliance document or request as required under the conditions of consent or approval, please note that the Department is no longer accepting lodgement via compliance@planning.nsw.gov.au.

The Department has upgraded the Major Projects Website to improve the timeliness and transparency of its post approval and compliance functions. As part of this upgrade, proponents are now requested to submit all post approval and compliance documents online, via the Major Projects Website. To do this, please refer to the instructions available [here](#).

From: James Hart <james.hart59@outlook.com>

Sent: Friday, 1 August 2025 10:14 AM

To: DPE PSVC Compliance Mailbox <compliance@planning.nsw.gov.au>

Cc: Rahul Dorairaj <Rahul.Dorairaj@jemen.com.au>

Subject: Western Sydney Green Gas Facility - Independent Environment Audit

Attention Rob Sherry,

Hi Rob,

I'm have been approved auditor as the Lead Environmental Auditor for the Western Sydney

1 of 2

Tuesday, August 5, 2025 at 11:06:20 AM Australian Eastern Standard Time

Subject: RE: Western Sydney Green Gas Facility - Independent Environment Audit
Date: Tuesday, 5 August 2025 at 9:51:10 am Australian Eastern Standard Time
From: Patrick Warren
To: James Hart
Attachments: image001.jpg, image003.jpg, image004.png, image005.png, image006.jpg, image007.jpg

Hi James,

Council has received 1 noise complaint from an adjoining resident. This resident complained of noise from a PA system. This issue was resolved no further complaint received.

Council has not received any further complaints in relation to traffic or Council assets perspective.

Kind Regards

Patrick Warren

Senior Strategic Land Use Planner | Strategic Land Use Planning

02 9725 0215 | pwarren@fairfieldcity.nsw.gov.au

Customer Service: 9725 0222 | PO Box 21 Fairfield NSW 1860

www.fairfieldcity.nsw.gov.au

mail@fairfieldcity.nsw.gov.au



*We acknowledge the Cabrogal of the Darug Nation who are the Traditional Custodians of this Land.
We also pay our respect to the Elders both past, present and emerging of the Darug Nation.*

From: James Hart <james.hart59@outlook.com>
Sent: Friday, 1 August 2025 10:23 AM
To: mail@fairfieldcity.nsw.gov.au
Cc: Rahul Dorairaj <Rahul.Dorairaj@jemenal.com.au>
Subject: Western Sydney Green Gas Facility - Independent Environment Audit

To whom it may concern,

I have been engaged to undertake the Independent Environmental audit of the Western Sydney Green Gas Facility, as required by Schedule 4 Condition C9 of Consolidated Development Consent SSD-10313.

As a requirement of the Independent Environmental Audit process, I am seeking feedback from Fairfield City Council and relevant agencies in regard to any issues that may have arisen or concerns which you may have in relation to the site operations. Any issues raised will be included in the audit.

Appendix E. Site Photographs



Waste facilities provided.



Drainage area grassed to minimise erosion and sediment in stormwater runoff



Site maintained in neat and tidy condition. Stone surface provided to reduce stormwater runoff.

Appendix F. Hazard Audit Report

Hazard Audit: Western Sydney Green Gas Project SSD 10313	
Audit Organisation:	Jemena Gas Networks (NSW) Limited
Auditors:	James Hart – Lead Auditor Ken Cameron – Support Auditor
Date of Audit:	August 2025
Draft Report Submitted:	25/08/2025
Final Report Submitted:	25/08/2025

Contents

Executive Summary and Recommendations	53
Scope of report and investigations	53
Summary and major findings	53
Recommendations	53
1 Introduction and Scope of Report	54
1.1 Objectives	54
1.2 Summary and conclusions	54
1.3 Recommendations	55
2 Overview of the site	56
2.1 Site location, Surrounding Land Uses and Layout	56
2.2 Process description	57
2.3 Properties of materials being handled/processed	58
3 Overview of the site	59
3.1 Plant and Equipment	59
3.2 Loading and Unloading Operations	60
3.3 Storage	60
3.4 Process control	60
3.5 Fire Safety	61
3.6 Environmental Protection Systems	63
4 Overview of the site	64
4.1 Plant procedures, records and other documentation	64
4.2 Operator Training	64
4.3 Emergency Planning	64
5 Site History	66
5.1 Incident History	66
5.2 Previous Studies	67
6 Conclusions	68
7 Appendices	68
8 Glossary of abbreviations	68

Executive Summary and Recommendations

Scope of report and investigations

The Western Sydney Green Gas Project (WSGGP) has been developed by Jemena Gas Networks (NSW) Limited (Jemena) to trial Power-to-Gas (P2G) technology by converting purchased green energy from the electricity mains network into hydrogen gas and injecting it into its secondary gas distribution network over a 5-year period. The Project would potentially facilitate ongoing development of commercially viable P2G systems in Jemena's NSW gas network.

This audit has been undertaken in support of the Independent Environmental Audit of the Western Sydney Green Gas facility as required under Clause c9 (d) of SSD 10313, and is the second Hazard Audit of the facility. The audit was based on a desktop review of provided information, site inspection in August 2025 and follow up with Jemena personnel.

Summary and major findings

Jemena have maintained the operation of the trial Power to Gas facility, which has enabled the continuing research programme. There continues to be an appropriate process for the management of hazards, as reflected in the process control systems developed, and the operation and maintenance practices implemented for the facility. While hydrogen can be seen as an inherently hazardous material, the level of control demonstrated during this review determined that the operational hazard controls may be considered adequate for this facility.

The major finding is that there is a continuing high level of engineering and management oversight of the operation of the facility. Quantities of hazard material are considered small, with appropriate control systems observed during this audit. Jemena have continued to implement appropriate operational procedures reflecting the nature of the facility, with appropriate records maintained to demonstrate operations and maintenance activities. Training of personnel is of a high level given the specialist nature of hydrogen gas in comparison to the natural gas assets usually operated and maintained by Jemena.

Recommendations

There are no recommendations for action identified during this Hazard Audit of the WSGGP.

5 Introduction and Scope of Report

5.1 Objectives

This audit has been undertaken in support of the Independent Environmental Audit of the Western Sydney Green Gas facility as required under Clause c9 (d) of SSD 10313. It has been undertaken in conformance with the DPE publication Hazardous Industry Planning Advisory Paper No.5, 'Hazard Audit Guidelines', and includes a review of the site Safety Management System and a review of all entries made in the incident register since the commencement of operations. This is the first Hazard Audit of the facility.

The audit process consisted of a visit to site, review of relevant documentation as identified in this report, and interviews with relevant personnel

The audit was conducted by the following:

Auditor	Role	Qualifications
James Hart	Lead Auditor	Lead Environmental Auditor Exemplar Global No 12105 Newcastle University, Bachelor of Science (Chem) 1981 Newcastle University, Graduate Diploma in Environmental Science, 1997
Ken Cameron	Supporting Auditor / SME	Lead Quality Auditor Exemplar Global No 12003 Bachelor of Engineering (Civil), UNSW (1982) MBA Deakin University (1993) Prof. Certificate in Arbitration (2006) Master of Project Management Usyd (2020)

5.2 Summary and conclusions

The Western Sydney Green Gas Project (WSGGP) involves trialling Power-to-Gas (P2G) technology by converting purchased green energy from the electricity mains network into hydrogen gas and injecting it into its secondary gas distribution network over a 5-year period, and commenced operation in 2022. The Project is designed to facilitate ongoing development of commercially viable P2G systems in Jemena's NSW gas network.

As befits the experimental nature of the facility, there is a high level of the management of hazards reflected in the process control systems developed, and the operation and maintenance practices implemented for the facility. While hydrogen can be seen as an inherently hazardous material, the level of control demonstrated during this review determined that the operational hazard controls may be considered adequate for this facility.

The key findings of the Hazard Audit are as follows:

- The WSGG Facility is located within the existing secure Compound developed by Jemena for their natural gas transmission assets.
- The hydrogen gas is generated through package units, with a buffer storage and infrastructure for injection of hydrogen into the natural gas network.
- Quantities of hazard material on site are generally small in volume due to the size of the experimental electrolyser unit installed in the facility.

- Plant and equipment may be considered to be in good condition (being in operation since November 2021), with a regular maintenance regime continuing to be implemented.
- The site is designed for remote operation, with a central control room offsite overseeing the operation of the facility.
- Fire control systems are appropriate given the nature of the facility.
- A comprehensive Environmental Strategy has been maintained in accordance with the SSD conditions.
- Jemena have established appropriate operational procedures reflecting the nature of the facility, with appropriate records maintained to demonstrate operations and maintenance activities.
- Training of personnel is of a high level given the specialist nature of hydrogen gas in comparison to the natural gas assets usually operated and maintained by Jemena.
- Emergency Planning process reflect the broad experience of Jemena in operating high pressure gas facilities and distribution networks.
- There have been no incidents recorded during the operational phase of the facility.

5.3 Recommendations

There are no recommendations for action identified during this Hazard Audit of the WSGGP.

6 Overview of the site

6.1 Site location, Surrounding Land Uses and Layout

Jemena Gas Networks (NSW) Limited (Jemena) have developed the Western Sydney Green Gas Project (WSGGP), which involves trialling Power-to-Gas (P2G) technology by converting purchased green energy from the electricity mains network into hydrogen gas and injecting it into its secondary gas distribution network over a 5-year period. The Project would potentially facilitate ongoing development of commercially viable P2G systems in Jemena's NSW gas network.

The Project is located at the existing Jemena high pressure gas facility in Horsley Park (Horsley Park Facility), located in Western Sydney parklands precinct. There is significant security fencing round the site due to the nature of the high pressure gas facility, with adequate road access and parking. Buildings used for WSGG are modular in design and may be considered appropriate. There were no shortcomings identified and no improvement identified for this site.

Figure 2.1 provides the site location.

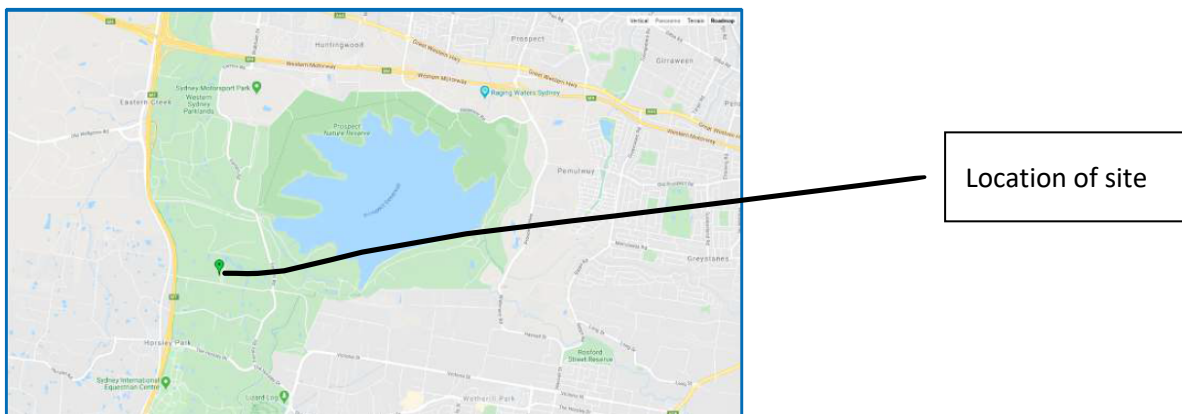
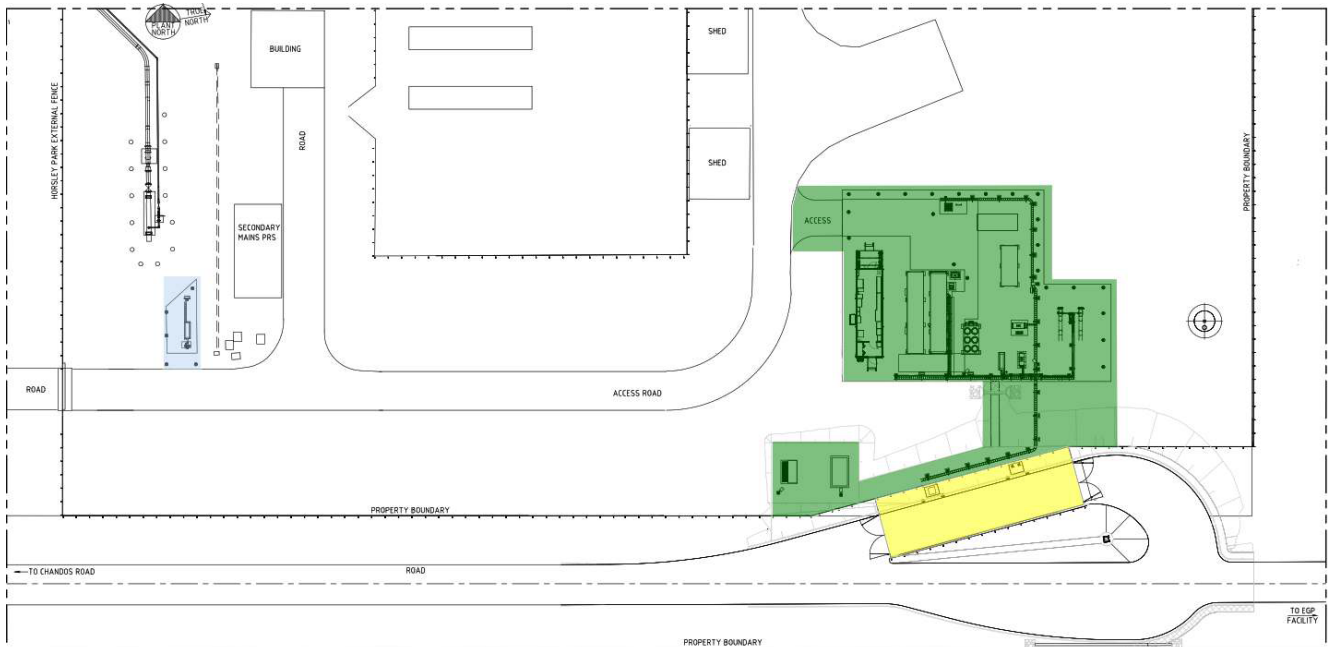


Figure 2.2 Provides a general layout of the Jemena high pressure gas facility



Figure 2.3 provides the layout of the WSSG facility



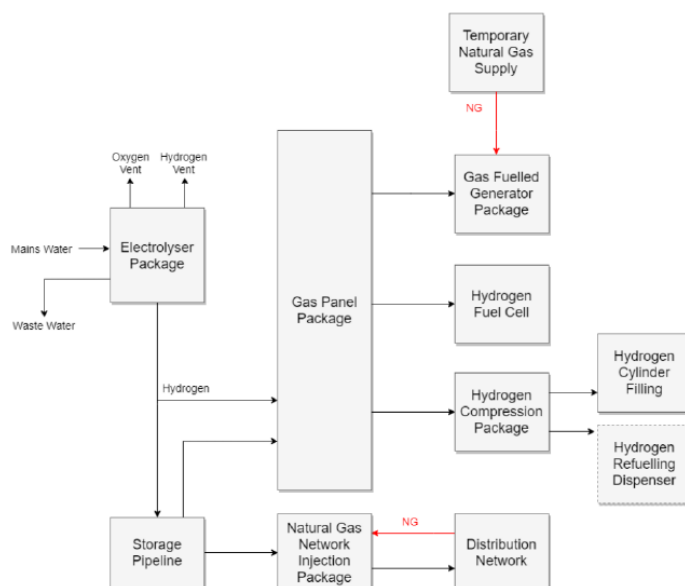
The site is located within the Western Sydney parklands. Surrounding land use is parkland and urban farms. The site is adjacent to Eastern Creek.

6.2 Process description

The facility currently undertakes the following key functions:

- Conversion of mains water into hydrogen gas using grid (renewable) electricity through electrolysis;
- storage of hydrogen gas in a buried on-site carbon steel pipeline (this will be used for buffering the various produced hydrogen gas usage options); and
- control and safely manage hydrogen gas pressures, temperatures and flow rates for injection into Jemena's Secondary Mains gas pipeline and downstream medium and low pressure network.

Figure 2.4 presents a flow diagram and general facility.



6.3 Properties of materials being handled/processed

This section should include a listing of hazardous materials being handled, stored or processed at the facility, with an indication of variations in quantities held. The location of significant quantities of hazardous materials should be marked on a site map.

Material Safety Data Sheets may be included as attachments out.

The following hazardous materials are handled, processed or stored at the facility:

Hydrogen	Generated by electrolyser Stored in buffer pipeline	Buffer Storage Capacity as line pack – 100 – 120 kg of Hydrogen
Nitrogen	Used for purging of electrolyser modules Stored in bottle on site	2 * 12 man packs
Oxygen	Generated by electrolyser Vented to atmosphere	Vented
Natural gas	Used for backup power supply	Piped supply from adjacent high pressure gas facility
Ion exchange resin	Used for water purification Stored on site	11 x 25L bags Mixed bed Resin, 1 x 25L bag Ion exchange resin

7 Overview of the site

7.1 Plant and Equipment

The Basis for design is described in the Jemena, WSGGP, Basis for Design (2019. Rev 3. P2G-2099-DG-DN-001 A). The following is a summary of key components.

Electrolyser	<ul style="list-style-type: none"> Package – Three main packages consisting of electrolyser stack, power container and cooling unit. Production – 10.5 kg/h of green hydrogen Currently being run intermittently. Designed for 12 hours per day operation
Hydrogen buffer storage pipeline	<ul style="list-style-type: none"> Location – Buried below ground, with two risers located at the facility. Length – ~340 m Material – X52 Carbon Steel Operating Pressure – 3,200 kPag Maximum Allowable Operating Pressure (MAOP) – 3,800 kPag Hydrogen Stored – ~100 kg Emergency Operation – Blowdown vent located on the southern riser
Site Control Hut	<ul style="list-style-type: none"> Purpose: <ul style="list-style-type: none"> Management of high voltage (HV), medium voltage (MV) and low voltage (LV) supply; Data and communication between packages and NSW Control Room; Remote operations and field desk Criticality – Provides power to the facility through switchboard at the front of site.
Gas Control Panel	<ul style="list-style-type: none"> Two gas panels: <ul style="list-style-type: none"> one located within the main facility area. one located at the injection to the secondary main. Monitoring – Hydrogen monitoring in place
Hydrogen Microturbine	<ul style="list-style-type: none"> Production – 65kWh <ul style="list-style-type: none"> Operation – 7 am – 10 pm only Supply –100% hydrogen
Fuel Cell	<ul style="list-style-type: none"> Production – 30kWh Operation – still in the process of being commissioned, plan is for operation between 7 am – 10 pm only Supply - Hydrogen
Hydrogen Compressor	<ul style="list-style-type: none"> Production – 7.1 kg/h Standard Operation – 24hrs per day when in use periodically
Electrical	<ul style="list-style-type: none"> HV Transformer – 2.5 mVA HV Switchgear

Buildings, pipework and associated facilities were found to be in a good condition.

No recommendations have been identified.

7.2 Loading and Unloading Operations

Water and electricity are taken from the local supply network. Natural gas is used to power a generator set, and this is taken from the adjacent high pressure gas facility.

Nitrogen bottles are supplied in packaged unit and are offloaded by the supplier using specialist equipment.

Ion Exchange resins are supplied in containers and offloaded adjacent the water purification unit.

Gas generated from the facility can be injected into the adjacent gas network. A tanker load out facility has not been installed

No recommendations have been identified.

7.3 Storage

Process vessels include:

- Water purification unit
- Electrolyser
- Hydrogen Buffer Storage tank

Storage on site consists of the following:

- Nitrogen bottles for purging of electrolyser.
- Ion exchange resins
- Waste water tank

The storage layout, condition of storage containers and associated equipment, drainage and containment systems were found to be adequate for the facility.

Operating procedures have been developed, reflecting the experimental nature of the facility, with training of personnel in handling of hydrogen gases.

No recommendations have been identified.

7.4 Process control

The facility has been established to trial Power-to-Gas (P2G) technology by converting purchased green energy from the electricity mains network into hydrogen gas and injecting it into its secondary gas distribution network over a 5-year period. The Project could potentially facilitate ongoing development of commercially viable P2G systems in Jemena's NSW gas network.

The design of the facility was subject to a rigorous process as identified in the following documents:

- Hazard and Operability Study (Revision 1, dated 17 August 2020).
- Final Hazard Analysis Rev A, dated 3/12/2020.
- Commissioning Safety Study report (rev 0, dated 3/3/2021).
- WSGGP Pre-startup Compliance report, rev 0 dated 30/09/2021.
- Jemena Asset Management Pty Ltd (JGN) Safety Management System for WSGGP, Revision 0, dated 19 March 2021.
- WSGGP Operational Compliance report, Rev 1 dated 16/12/2022.

The Western Sydney Green Hydrogen Hub is an unmanned facility, with the primary operation via local control systems monitored through telemetry linked to Jemena's NSW Control Room (24x7 operation). The telemetry provides data via Supervisory Control and Data Acquisition (SCADA), which in turn will alert the control room staff of the condition of the site prompting a response in line with the response sheet for the facility. The SCADA provides the functionality to override the local control systems.

In the event of equipment failure the system is designed to automatically isolate, and not impact upon the existing natural gas facilities.

The primary objective of the control system is to provide control over processing functions, protect plant, equipment and personnel, and enable simple and reliable plant shutdown, depressurisation, and isolation of equipment. The facility is occasionally manned, with minimal operator involvement required, including for start-up, shutdown, and restart. The systems therefore monitor and control the facilities on a continuous basis under all operating and environmental conditions.

The facility is provided with a local Programmable Logic Controller designed to control all major process functions, and a safety instrumented system (SIS) that will shut down (trip) a range of equipment and equipment packages, and close major isolation valves during emergency events or process trips. Hydrogen gas quality are measured by a gas analyser, with data visible to the facility SCADA to enable plant adjustments to be made, if necessary.

The facility was not in operation during the conduct of the site inspection, however the SME has previously observed operation of control systems during the commissioning phase of the project.

No recommendations have been identified.

7.5 Fire Safety

Fire Safety systems are described in the Fire Safety Study prepared by GPA Engineering for the WSGGP (doc ref; P2G-2099-RP-RM-006, Rev A dated 14/09/2020). The report identifies the release of flammable gas (hydrogen) due to release from piping, fitting, valve or flange; or release from a Pressure Relief Valve or vent. To remove the potential for fuel release the WSGGP relies on the use of an Emergency Shutdown sequence and evacuation from the site.

Fixed gas detectors are installed within package units and at key plant locations. Personnel are required to carry portable hand-held gas detectors within the vicinity of the plant. Firefighting system have not been provided as the WSGGP emergency shutdown (ESD) philosophy is to isolate the sources of hydrogen, i.e., station inlet and outlet, and to blow down inventory manually. This philosophy is typical of gas plants due to the quick burning nature of gaseous hydrocarbons/hydrogen and is the most effective means of fire mitigation. The blowdown of held inventory will be via actuated valves to local vents to atmosphere to be operated by personnel as and when required. These valves can be operated from the local site control room only. They will not open automatically.

Blowdown of the electrolyser package will be via the package vent. The package PLC will automatically blowdown hydrogen via the package vent when an ESD is initiated.

. The Emergency Response Plan has been developed to address evacuation processes.

There is also a small diameter (15mm) gas supply line form the adjacent Gas receiving facility that can be used for the fuel cell. No specific controls have been established for this aspect.

Consequence modelling identified in the fire safety study determined that the risk attributed to a flash fire or explosion are unlikely to impact beyond the site boundary, nor will they impact adjacent properties or members of the public.

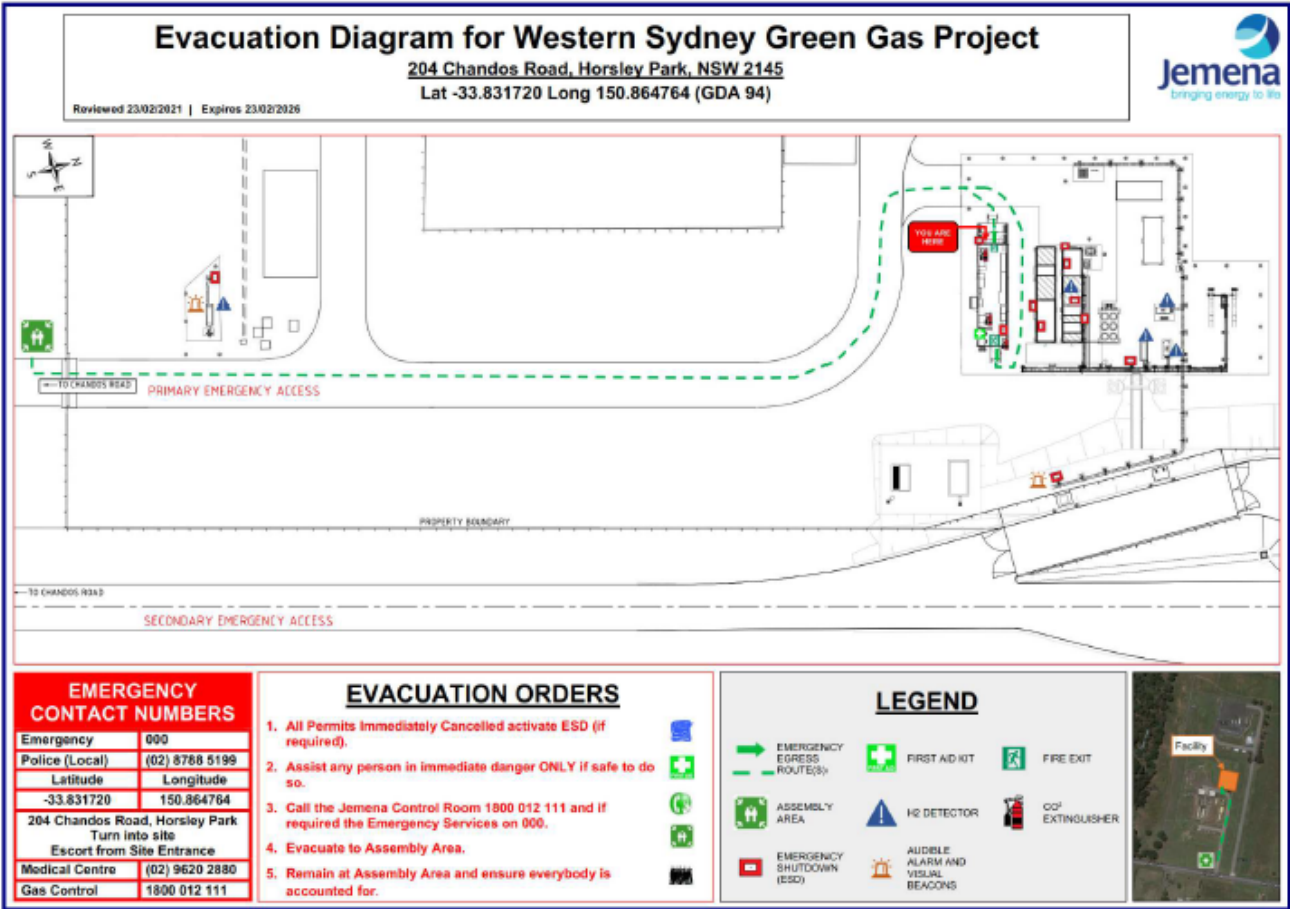
The extent of Hazardous Areas is indicated in the extract below, which was taken from the WSGGP Hazardous Area Plan (Drawing P2G-2099-DW-HA-001 Rev A dated 12/12/2019) appended to the Fire Safety Study.



514

Bush fire protection is addressed through the maintenance of grassed areas around the facility and the presence of hard stands. In the event of a bushfire in the surrounding area the plant can be shutdown remotely by the Control Room.

The Emergency Response Plan includes an Evacuation Diagram, including the location of Fire Extinguishers, with an extract provided below:



Given the nature of the facility the fire protection systems may be considered adequate.

No recommendations have been identified.

7.6 Environmental Protection Systems

A comprehensive Environmental Management Strategy has been developed for the WSGG facility, and this has been subject to a full SSD Audit. Control systems established for this site may be considered adequate.

No recommendations have been identified.

8 Overview of the site

8.1 Plant procedures, records and other documentation

The facility has been established trial Power-to-Gas (P2G) technology by converting purchased green energy from the electricity mains network into hydrogen gas and injecting it into its secondary gas distribution network over a 5-year period.

The operation of the facility is based the conduct of scheduled exercises to trial different parameters to enable optimisation to inform ongoing development of commercially viable P2G systems in Jemena's NSW gas network. A program of activities has been developed to coordinate the trial program.

To facilitate understanding by Jemena personnel and to inform operational tasks, the Field Operations and Maintenance Specification (GAS-4999-SP-ME-001, 31/03/2021 Rev C) has been developed. The document provides a comprehensive summary of:

- Operating procedures
- Maintenance program and procedures
- Instrument maintenance
- Training practices
- Monitoring program and records
- Hot work permit systems
- Material Safety Data Sheets (MSDSs)

Detailed records are maintained and are presented through regular operational reports to management.

There were no activities occurring at the time of the site inspection.

No recommendations have been identified.

8.2 Operator Training

Give the unique nature of hydrogen and the experimental nature of this facility, Jemena have undertaken a comprehensive training program for all personnel involved with the project. Maintenance personnel are familiar with safe work practices associated with natural gas networks, and have received additional awareness training to alert them to the hazards associated with Hydrogen gas.

Detailed training records are available.

No recommendations have been identified.

8.3 Emergency Planning

Jemena have prepared a comprehensive Emergency Response and Management Plan (ERMP) for the WSGG Facility (rev 1 dated 28/03/2021) to describe the action to be taken for foreseeable emergency events. The plan states that the ERMP has been prepared in accordance with the DPE *Hazardous Industry Planning Advisory Paper No. 1, 'Emergency Planning'*, and reflects the Jemena experience in similar hazardous facilities.

The plan has been prepared in conjunction with external consultation with Fairfield Council and the NSW SES.

The Plan identifies hazardous material on site, but does not nominate nitrogen which is used to purge the electrolyser units during operation.

The plan is based on the standard Jemena Emergency Response process, and includes a description of roles and responsibilities, definition of an emergency and escalation process. The Control Room has a primary role in the initial response to an incident, and is supported by an Incident Management team for significant incidents, with scope for escalation to the Emergency Management Team. A Crisis Management team will be called for in the case of a significant event.

The process for escalation, and for communication to Emergency response Agencies is subject to regular testing across the Jemena network, and has also been implemented for gas network operations on numerous occasions over the last three years. There have been no Emergency Response Exercises involving the WSGG Facility.

Emergency Resources and Equipment are identified, as well as automatic shutdown systems. General Emergency procedures are described, and reflect the functions of this facility.

No recommendations have been identified.

9 Site History

9.1 Incident History

Jemena have provided their Annual Compliance report for the WSGG Facility, which includes a register of incidents during the construction and commissioning phases, with reports from 2022, 2023 and 2024 available for review.

The following incidents were noted for historical incidents (prior to operational phase) leading up to the Commissioning phase of the facility.

Date	Reporting pathway	Summary	Response	Status
25/11/2020	Internal*	Pad foot (mat) used to spread load of the cranes outrigger damaged the access road surface as the crane took the containers load.	Larger mats to be used. Access road surface to be addressed as part of final works (i.e. spray seal).	Closed
02/12/2020	Internal*	Trench excavation crew along the JGN/EGP boundary contacted buried 1/2" electrical conduit (2mm cable within the conduit broken). Not on DBYD, no maker tape installed above conduit and no surface markers in the area.	Additional requests for information to be sought for future trenching works in the area.	Closed
28/01/2021	Internal*	Power outage at JGN TRS facility as a result of cable strike due to construction of temporary pad (Note: Stand-by officer in place, cables exposed, timber skids used as protection).	Damaged cable section repaired. Steel road plates to be used in future and stop works to be initiated to re-assess risks should methodology required to be altered.	Closed
03/02/2021	Internal*	Bottom split on plastic jerry can causing a diesel spill (20L).	Area cleaned up with spill kit and defective jerry can replaced.	Closed
24/02/2021	Internal*	Bell hole being pumping out (due to wet weather) resulting in slight trench collapse dislodging a CP cable which was then hit by 8T excavator bucket.	CP cable repaired. Toolbox held about wet weather and implications of trenches / bell holes shifting and any cables in these areas.	Closed
05/03/2021	Internal*	EGP NBN cable damaged during cable relocation activities due to excessive folding of the cable.	Works stopped. Optus repaired the cable. Toolbox held.	Closed
24/03/2021	Internal*	Near miss – Gust of wind below electrolyser door open as it was not secured / latched. Door caught by worker.	Door latches installed.	Closed

Date	Reporting pathway	Summary	Response	Status
31/03/2021	Internal*	Telstra cable struck during excavation of stormwater pit. Subcontracted permit officer in place did not identify.	Cable repaired. Subcontracted permit officer removed from site. Principal Contractor personnel to be designated spotter for all future excavation permits / works.	Closed

None of the identified incidents required notification to the DPE as they did not result in significant property damage or personal injury.

There have been no incidents recorded during the Operational Phase, and no departures from relevant regulations and standards, and deviations from the development consent conditions of approval and licensing authorities' conditions.

9.2 Previous Studies

The following safety studies were undertaken during the design and construction phases of the project:

- WSGGP HAZOP Report – P2G-2099-RP-HZ-0002, Rev 1 dated 17/08/2020.
- Final Hazard Analysis - P2G-2099-RP-HZ-005, Rev A 03/09/2020
- WSGGP Pre-startup Compliance Report – Rev 0. Dated 30/09/2021.

There are no outstanding recommendations arising from these studies.

There have been no previous hazard audits of this facility.

10 Conclusions

The Western Sydney Green gas Project was established to trial Power-to-Gas (P2G) technology by converting purchased green energy from the electricity mains network into hydrogen gas and injecting it into its secondary gas distribution network over a 5-year period. The nature of the operation, with a high level of process planning and operational performance exercises has resulted in a robust design that is overseen by a high level of management support.

While hydrogen can be seen as an inherently hazardous material, the level of control demonstrated during this review determined that the operational hazard controls may be considered adequate for this facility. Recommendations have been made in the review of Emergency response, otherwise the identification and management of hazards for this facility was found to be adequate.

11 Appendices

Nil

12 Glossary of abbreviations

Abbreviations

DPE	Department of Planning, Industry and Environment
P2G	Power to gas
SCADA	Supervisory Control and Data Acquisition
SME	Subject Matter Expert
SSD	State Significant Development
WSGGP	Western Sydney Green Gas Project

ATTACHMENTS – NIL