Kwinana Ammonia Project

Kwinana Industrial Area

Change To Environmental Conditions

To Allow Ammonia Export

Wesfarmers CSBP Ltd

Section 46 Report and Recommendations
of the Environmental Protection Authority

Environmental Protection Authority
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Summary and recommendations

Description of change to project

The Minister for the Environment and Heritage has requested the Environmental Protection Authority (EPA) to consider and provide advice under Section 46(3) of the *Environmental Protection Act 1986* on Wesfarmers CSBP Ltd's (CSBP) proposal to export shipments of ammonia from its Kwinana site.

Section 46(3) of the *Environmental Protection Act 1986* requires the EPA to report to the Minister on whether or not the proposed changes to conditions and procedures should be allowed. In addition, the EPA may make recommendations as it sees fit.

This report provides the EPA's advice and recommendations to the Minister for the Environment and Heritage on the environmental factors, conditions and procedures relevant to the proposal.

Relevant environmental factors

It is the EPA's opinion that the following environmental factor is relevant to the proposal, which requires detailed evaluation in the report:

(a) Off-site individual risk

Conclusion

The EPA supports CSBP's request to export ammonia from its facilities at Kwinana on the basis of the advice provided by the Department of Industry and Resources (DOIR) and Fremantle Ports and subject to the ammonia transfers (imports and exports) being limited to no more than nine per year.

The EPA is satisfied that CSBP and the relevant authorities have established procedures in place to manage the public risk associated with ammonia importation and that the procedures will be updated as required to incorporate ammonia export, prior to the commencement of export operations. The EPA is satisfied that the off-site individual fatality risk for ammonia export is similar to the risk for the currently approved ammonia importation.

Recommendations

The EPA submits the following recommendations to the Minister for the Environment and Heritage:

1. That the Minister notes that this report is pursuant to Section 46(3) of the *Environmental Protection Act 1986* and thus is limited to consideration of proposed changes to the original conditions.
2. The Minister notes that the proposed change is to enable Wesfarmers CSBP Ltd to export shipments of anhydrous ammonia from the Fremantle Ports' Bulk Cargo Jetty at Kwinana to overseas markets.
3. The EPA recommends that the Minister considers the report on the relevant environmental factor as set out in Section 3.
4. That the Minister notes that the EPA has concluded that the modified proposal can be managed to meet the EPA's objectives, and thus not impose an unacceptable impact on the environment provided there is satisfactory implementation by the proponent of the amended conditions, including the proponent's commitments, as set out in Section 4.

5. The Minister imposes the amended conditions, commitments and procedures recommended in Appendix 4 of this report.

Conditions

The EPA recommends that the following conditions, which are set out in detail in Appendix 4, be imposed if the proposal by Wesfarmers CSBP Ltd is approved for implementation:

The existing Environmental Conditions/commitments applied to the project (Ministerial Statement 470 published on 18 March 1998), be subject to modifications necessary to:

- Enable Wesfarmers CSBP Ltd to export shipments of anhydrous ammonia from the Kwinana site and that ammonia import/export operations be limited to no more than nine transfers per annum.

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3. Statement of Environmental Conditions of Approval (Statement 470, 18 March 1998)
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1. Introduction and background

The Minister for the Environment and Heritage has requested the Environmental Protection Authority (EPA) to consider and provide advice under Section 46(3) of the Environmental Protection Act 1986 on Wesfarmers CSBP Ltd's (CSBP) proposal to export shipments of ammonia from its Kwinana site (Figure 1).

Ammonia is used in the manufacture of chemicals and fertilisers, including ammonium nitrate, sodium cyanide and concentrated nitrogenous fertilisers. It is also used extensively in nickel refining. Ammonia is a Class 2.3 (toxic gas) dangerous goods and can be lethal if inhaled at high concentrations. Although ammonia is a gas at normal temperatures, it is generally stored, transferred and shipped as a refrigerated liquid.

In August 1988, CSBP (jointly with Norsk Hydro A.S.) received environmental approval from the then Minister for Environment to develop an Ammonia-Urea Plant at Kwinana (EPA, 1987). The project included the manufacture of ammonia and its export to the world market. The Ammonia-Urea Project did not commence and a subsidiary of CSBP, the Kwinana Nitrogen Company Pty Ltd (KNC) subsequently applied to the Authority to activate those parts of the proposal related to ammonia storage and shipping. The Minister agreed that this could proceed on the basis of the conditions set for the Ammonia-Urea Plant and CSBP constructed an additional ammonia storage tank (30,000 tonnes) and an ammonia export pipeline.

CSBP then sought Ministerial approval to change the purpose of the ammonia pipeline between the ammonia storage tanks and terminal on the Kwinana Bulk Cargo Jetty from export to import of ammonia. The EPA advised the proponent that the proposed changes were not of sufficient environmental significance to justify formal assessment.

Importation of ammonia commenced in 1989 on the basis of compliance with the relevant conditions for the proposed Ammonia-Urea Plant. The implementation of a plan restricting access (except to people with adequate protective clothing) within proximity of the proposed loading and offloading facilities was one of the conditions of approval. Significant public concern arose at the time about the exclusion zone, and as a result Technica Ltd (Technica) was engaged to review the risks to the public of ammonia importation (Technica, 1991). Subsequent to Technica's report, the Authority published, for public comment, Bulletin 502, "*Preliminary interpretation of report by Technica Ltd on Risk assessment of ammonia import facility, Kwinana"*, in March 1991. The EPA then finalised its position on ammonia importation in Bulletin 621, "*Ammonia import facility – Kwinana"* after consideration of Technica's advice, public comment and the Authority's *"Criteria for the assessment of risk from industry"*, Bulletin 601. The EPA's position set out in Bulletin 621 was that importation could proceed subject to the development of a plan that meets the following requirements.

"A public access restriction plan shall be implemented by the Department of State Development (as the nominee of the Minister for State Development) for future ammonia unloading operations. The plan shall include:

- *A method to exclude the public from the Fremantle Port Authority land between CSBP and Wells Park, including the beach to the west of that land, during the unloading of ammonia;*
- *A method to warn the public should a spill occur; and*
- *A method to inform people within the Wells Park area of action that they should take in the event of a spill.*

This plan shall be in place until the Kwinana Integrated Emergency Management System is operational."

The risk assessment conducted by Technica was based on the importation of up to nine shipments (150,000 tonnes) of ammonia per year. Ammonia imports are normally for 23,000 to 26,000 tonnes and import rates are approximately 650 tonnes per hour (tph). The proponent has advised that a total of 884,000 tonnes of ammonia, in 41 shipments, has now been imported without incident.

CSBP received approval to construct and operate a 650 tonne per day (tpd) Ammonia Plant at Kwinana in March 1998 (EPA, 1998). The Ammonia Plant was subsequently commissioned in April 2000.

CSBP now seeks approval to export shipments of ammonia from the Kwinana Bulk cargo Jetty. The EPA considers it prudent to amend the proposal for the 650 tpd ammonia plant to include all aspects of CSBP's ammonia operations at Kwinana (manufacture, storage and transfer (import/export)), since the main component of the original proposal for an Ammonia-Urea Plant (EPA, 1987) has not been implemented to date. A Section 46 amendment is therefore considered appropriate.

Further details of the proposal are presented in Section 2 of this Report. Section 3 discusses environmental factors relevant to the proposal. The Conditions and procedures to which the proposal should be subject, if the Minister determines that it may be implemented, are set out in Section 4. Section 5 presents the EPA's conclusions and Section 6, the EPA's Recommendations.

Environmental Condition Statement No 034, published on 2 August 1988 is presented in Appendix 2 and Environmental Condition Statement No. 470, published on 18 March 1998 is presented in Appendix 3. The draft recommended conditions and procedures and proponent's commitments are provided in Appendix 4.

2. The proposal

CSBP proposes to export shipments of anhydrous ammonia from the Fremantle Ports' Bulk Cargo Jetty at Kwinana to overseas markets. The proponent proposes to utilise its existing ammonia storage tanks, ammonia transfer pipeline (previously used for ammonia importation) and mobile loading/unloading arm trolley. The only additional item required to facilitate ammonia export is an export pump which is proposed to be installed in the ammonia transfer line near to the 30,000 tonne ammonia storage tank. The inventory of ammonia in the ammonia transfer pipeline will be the same as for an import operation. The layout of CSBP's operations and the Fremantle Ports wharf is shown in Figure 2.

The proponent has advised that the initial ammonia export operation is likely to proceed by gravity transfer from the ammonia storage tanks to the ship with an expected loading rate of approximately 230 tonnes per hour. The proponent proposes to install an ammonia export pump should there be subsequent export operations which is expected to increase the ammonia transfer flow rate to approximately 500 tonnes per hour.

The proponent proposes to limit the total number of ammonia transfers (imports and exports) to no more than nine per calendar year.

Table 1 summarises the key project characteristics of the approved project and proposed extension.

Table 1: Key project characteristics (approved and proposed extension)

(Assessment No. 1468)

Proposal Characteristics	Unit	Ammonia Plant (including storage and import/export)
Capacity	tonnes per day NH_3	650
	tonnes per annum NH_3	225,000
Natural Gas Consumption	Gigajoules/tonne NH_3	32 - 34
	Petajoules/year	7.4
Water Consumption	tonnes per day	6,000 (make-up)
Location	-	CSBP Kwinana
<u>Gaseous emissions:</u> NO_x (as NO_2)	kg/tonne NH_3	0.54
	kg/day	350
CO_2	tonnes/tonne NH_3	1.8
	tonnes per day	1,200
Fugitive Gases:- • NH_3	-	flared
• H_2	-	flared
<u>Aqueous discharge:</u> Cooling System (including polishing unit blowdown)	-	recirculating treated sub-artesian water
Flow	tonnes per day	2,100
Heat Load	-	mainly to atmosphere
Nitrogen	kg/day	6 - 10
Phosphorus	kg/day	6
Oily water	-	de-oiled to contain less than 30 ppm of oil
Noise at boundaries	59 dB(A) at BP boundary	will comply with regulations
Ammonia storage	No.1 tank No. 2 tank	10,000 tonnes 30,000 tonnes
Ammonia transfers (import/export)	Transfers per calendar year	Maximum of 9 transfers

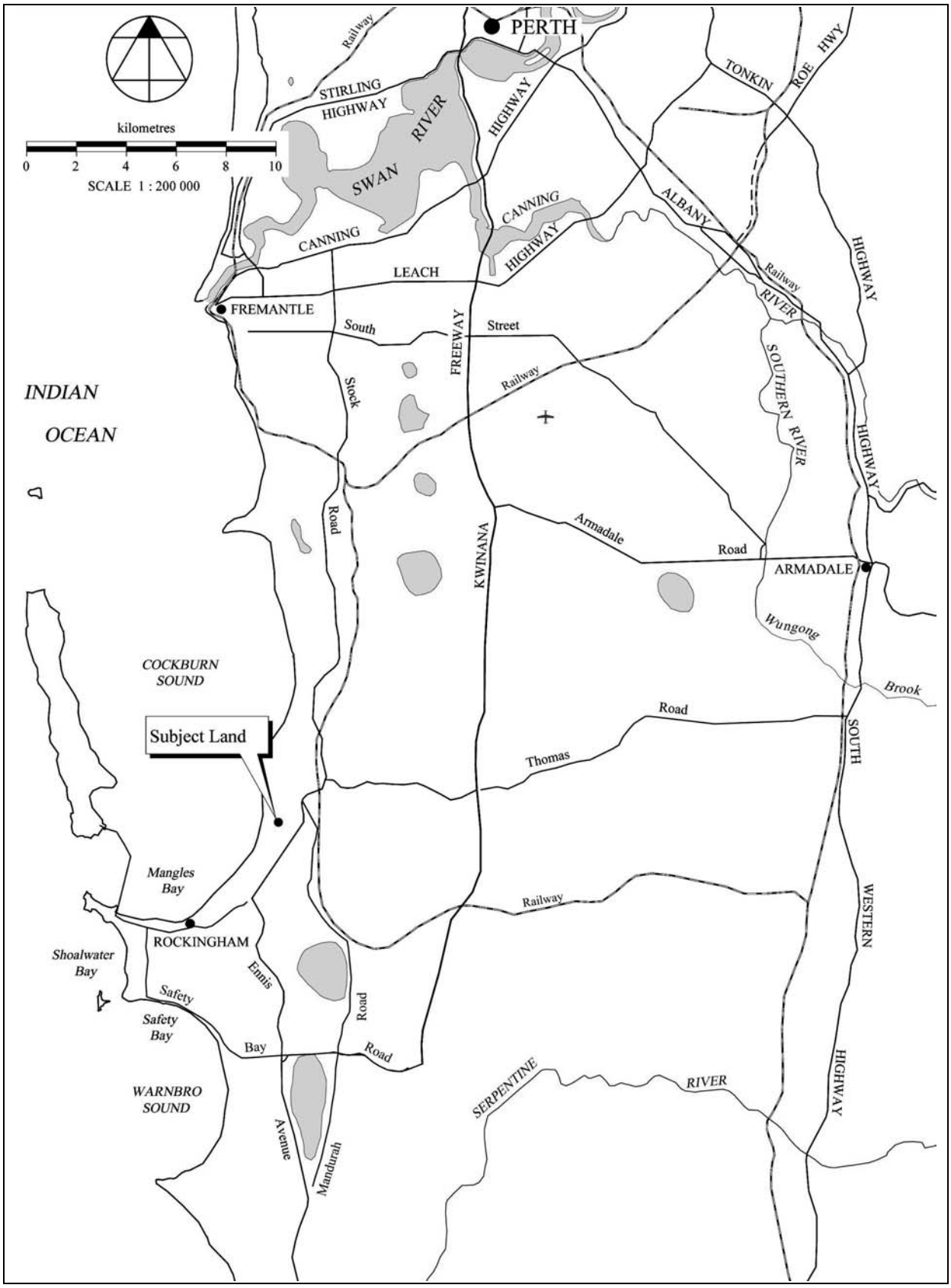

Figure 1: CSBP's Kwinana Site Location

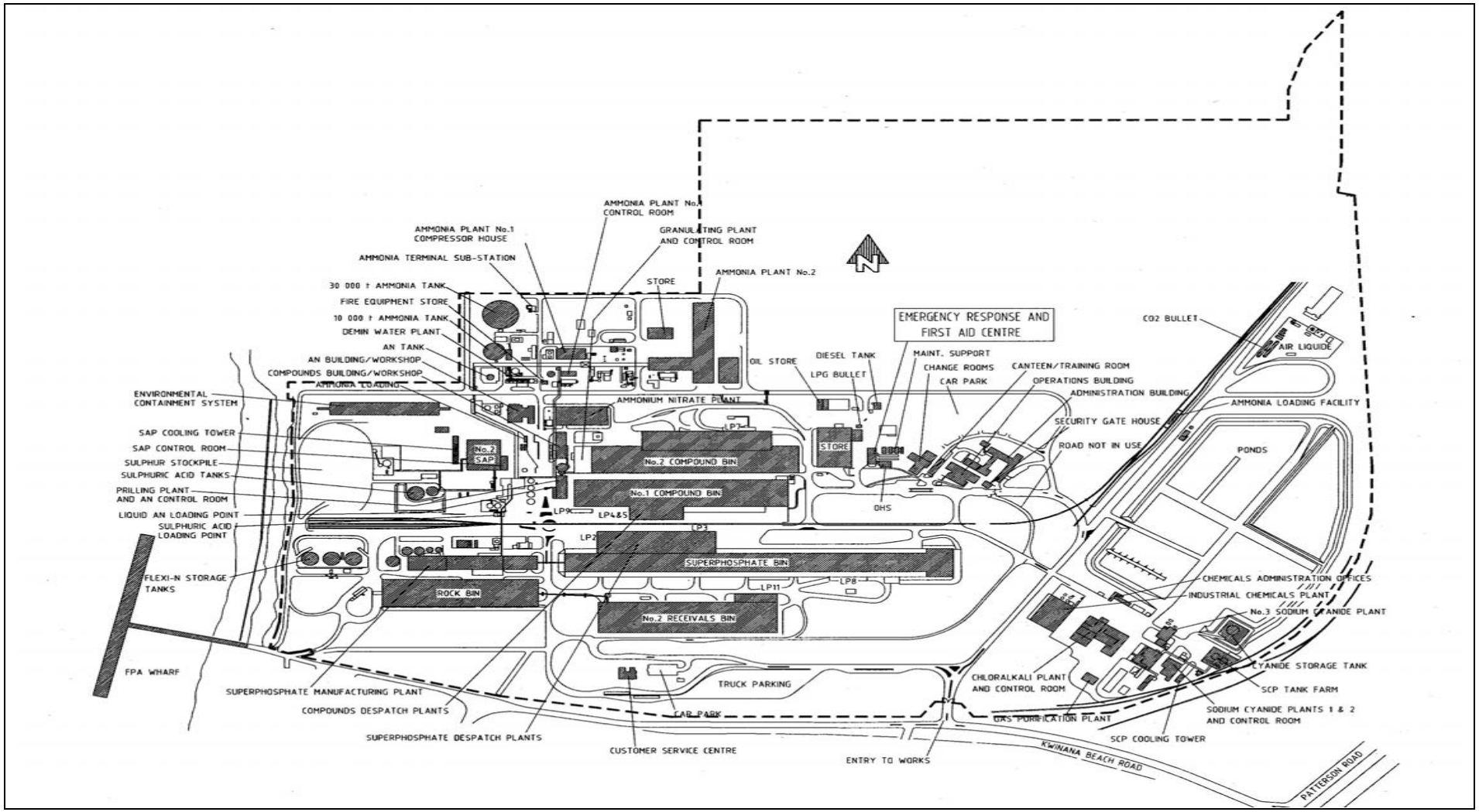

Figure 2: CSBP's Kwinana Site Layout

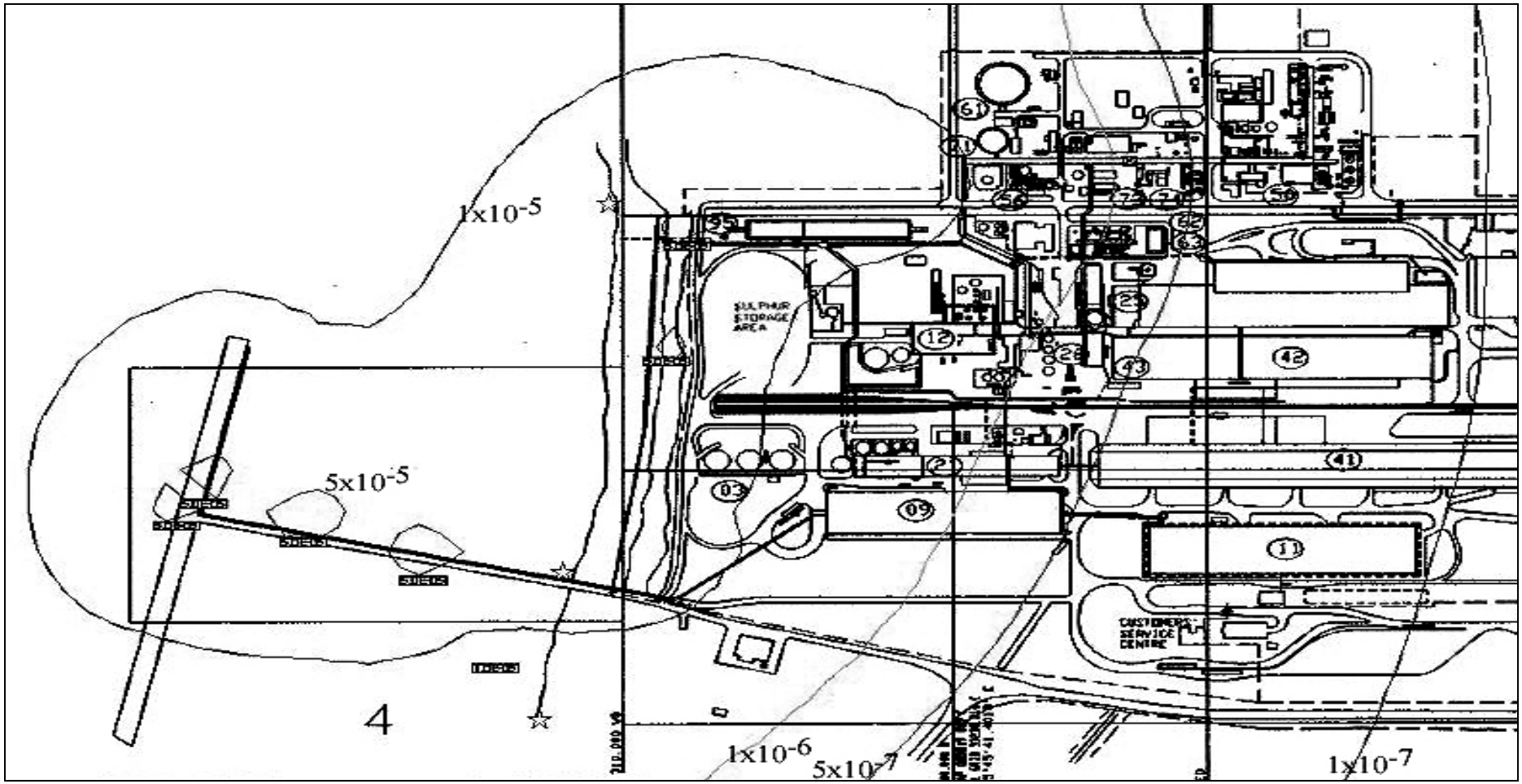

Figure 3: Individual Risk Contours "Nine Imports per Year"

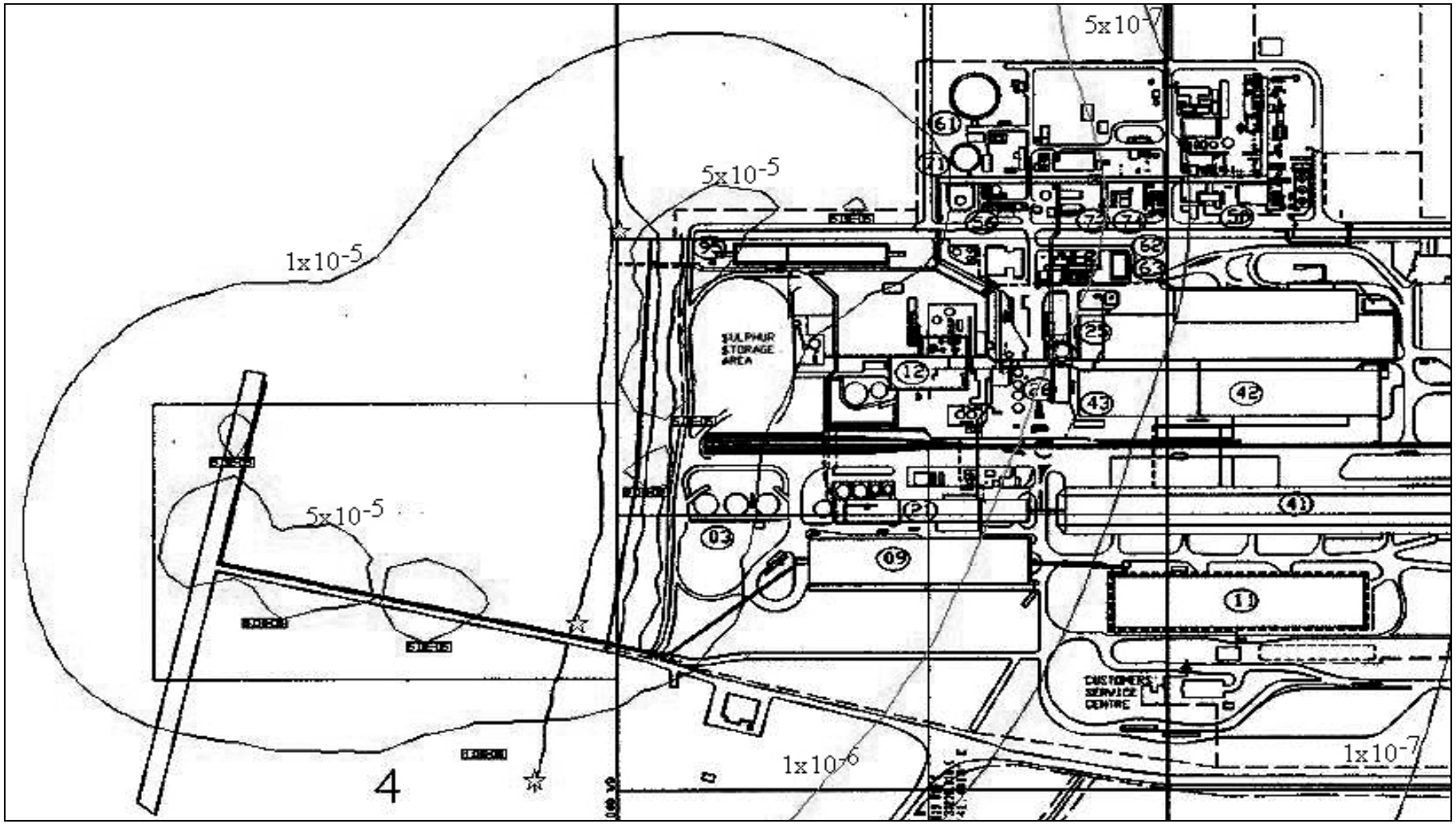

Figure 4: Individual Risk Contours "Nine Exports per Year"

3. Relevant environmental factors

Section 46(3) of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment and Heritage on whether or not the proposed changes to conditions or procedures should be allowed. In addition, the EPA may make recommendations as it sees fit.

In the EPA's opinion the following environmental factor is relevant to the proposal:

(a) Off-site individual risk.

It is the EPA's view that the proposed modification to the ammonia transfer system (an additional pump) will not have any impact on emissions to air, groundwater or the marine environment. The slight increase in noise emissions from the pump is not expected to impact on boundary noise levels.

Off-site individual risk

A risk assessment of the Ammonia Import facility was conducted in 1991 (Technica, 1991). CSBP commissioned Det Norske Veritas (DNV) to conduct an "Ammonia Import/Export Sensitivity Analysis" (Jan 2003) that revises Technica's risk assessment and provide an indication of CSBP's liability in terms of off-site individual fatality risk and societal risk (to Wells Park) when considering its potential ammonia import/export schedule.

The conclusion of the risk assessment is that the risk associated with the ammonia import/export facility meets the EPA individual risk criteria (5×10^{-5}) for industrial areas at the site boundary, when importing or exporting up to three ships of ammonia per year. However, the import or export of nine shipments of ammonia will exceed the EPA individual risk criteria at CSBP's western boundary by 30m for imports (Figure 3) and at the northern boundary by 50m (on to BP land) for exports (Figure 4).

The individual fatality risk at Wells Park for nine imports/exports of ammonia per year is well below the EPA risk criteria (1×10^{-5}) for active open spaces. The EPA has not set criteria for societal risk. However, the societal risk at Wells Park due to import/export activities does not exceed the upper tolerable limit as defined in the 1991 risk assessment of the Ammonia Import Facility.

The Department of Industry and Resources (DoIR) has reviewed the Ammonia Import/Export Sensitivity Analysis and the addendum and is satisfied that the analysis provides a reasonable representation of the risks likely to be posed by the range of ammonia import/export scenarios proposed. DoIR considers that the areas of boundary risk exceedance are relatively small and located in areas where there is limited access to both the public and other industrial activities. DoIR recommends that Fremantle Ports maintain at least the current public exclusion zones during ammonia transfer operations. DoIR is currently considering the applicability of using non-annualised risk to determine suitable exclusion zones during product transfer operations. CSBP is required to operate the ammonia storage, transfer and manufacture operations in accord with a Safety Report for the ammonia facility that meets the requirements of the National Standard for the Control of Major Hazard Facilities, to the Satisfaction of the Chief Inspector of Explosives and Dangerous Goods. The report will be amended to include ammonia export prior to export operations commencing.

The safety of ammonia transfers is also managed through the following plans and procedures:

- Wesfarmers CSBP Standard Operating Procedures;
- Wesfarmers CSBP Emergency Response Plan;

- Fremantle Ports Standard Operating Procedures;
- Fremantle Ports Dangerous Cargoes Standard; and
- Fremantle Ports Emergency Response Plan.

Fremantle Ports also has operational responsibility for the coordination of the Public Access Restriction Plan. Fremantle Ports has confirmed that it has no objection to the export operation subject to the continued application of all appropriate conditions and controls applicable to ammonia imports at the jetty. Although Fremantle Ports' procedures do not need to be amended to incorporate ammonia export, it will meet with CSBP to confirm all operational and emergency procedures since imports of ammonia have been infrequent. CSBP's procedures will be amended to include ammonia export, prior to export operations commencing.

Assessment

The area considered for assessment of this factor is CSBP's ammonia import/export facilities at its site at Kwinana and includes the existing ammonia storage tanks, ammonia transfer pipeline (previously used for ammonia importation) and mobile loading/unloading arm trolley.

The EPA's environmental objectives for this factor are to:

- ensure that the risk can be managed to meet the intent of the EPA's criteria for off-site individual fatality risk (EPA Guidance Statement No. 2: *Off-site individual risk from Hazardous Industrial Plant*);

The EPA's individual risk criteria as stated in EPA Guidance Statement No.2 (EPA, 2000), which would apply to the proposed plant and other relevant infrastructure are as follows:

- a risk level in residential areas of one in a million per year or less, is so small as to be acceptable to the EPA;
- risk levels from industrial facilities should not exceed a target of fifty in a million per year at the site boundary for each individual facility, and the cumulative risk level imposed upon an industry should not exceed a target of one hundred in a million per year; and
- a risk level for any non-industrial activity located in buffer zones between industrial facilities and residential zones of ten million per year per year or lower, is so small as to be acceptable to the EPA.

The EPA notes that the DoIR has reviewed the "Ammonia Import/Export Sensitivity Analysis" (DNV, Jan 2003) and based on its technical advice, the EPA is satisfied that the analysis is representative of the likely risk levels for the various import/export scenarios. The EPA notes that the risk associated with ammonia export is only marginally greater than for import and that its criterion for off-site individual fatality risk is met outside the exclusion zone at Well's Park. The EPA also notes that the societal risk at Wells Park due to import/export activities does not exceed the upper tolerable limit as defined in the Technica risk assessment (Technica, 1991) of the Ammonia Import Facility.

The EPA notes that the import and-or export of nine shipments of ammonia exceeds the EPA individual risk criteria at CSBP's western boundary by 30m for imports and at its northern boundary by 50m (on to BP land) for exports. The EPA considers, on advice of the DoIR, that the areas of boundary risk exceedance are relatively small and located in areas where there is limited access to both the public and other industrial activities. The EPA has been advised

that the northern boundary exceedance mostly relates to the proximity of the ammonia storage tanks to the site boundary. The EPA has also been advised that BP is aware of this issue and that CSBP is currently negotiating to lease additional land which would effectively address risk exceedance at this location.

The EPA notes that CSBP is required to operate the ammonia storage, transfer and manufacture operations in accord with the DoIR endorsed Ammonia Area Safety Report and that the report will be amended to include ammonia export operations. The EPA also notes that Fremantle Ports has responsibility for implementation of the Public Access Restriction Plan and has no objection to the proposed export operation subject to the continued application of all appropriate conditions and controls applicable to ammonia imports at the jetty.

The EPA supports CSBP's request to export ammonia from its facilities at Kwinana on the basis of the information provided by the proponent and advice from DoIR and Fremantle Ports, and subject to the number of transfers (imports and exports) being limited to nine per year.

Ministerial Conditions for ammonia operations

The EPA notes that ammonia importation is subject to Ministerial Conditions and proponent's commitments in Statement 034 (Proposed Ammonia-Urea Plant at Kwinana). The EPA also notes that the proposed Ammonia-Urea Plant has not been constructed to date and that the only conditions/commitments within this Statement that have been activated are those that relate to the storage and importation of ammonia. Given that CSBP has not proceeded with the construction of the proposed Ammonia-Urea Plant, the EPA considers that it is prudent to now incorporate the storage and import/export operations with the Ministerial Statement of approval for the existing 650 tpd ammonia plant (Statement 470).

The EPA has been advised by DoIR that the detailed specific commitments originally made by CSBP in Statement 034 in relation to ammonia (export pump, ammonia export pipeline and bulk cargo jetty and marine loading arm) are broadly addressed within the Ammonia Area Safety Report and/or the relevant Australian Standards and implemented under the authority of DoIR. The EPA therefore considers that the current conditions/commitments should be substantially amended to avoid duplication, given that management of public risk rightly resides with DoIR.

The EPA is satisfied that public access restriction and protection of public safety is currently being adequately managed during ammonia importation through implementation of the Fremantle Ports' Emergency Response Plan. The EPA therefore considers that the Ministerial Condition (Condition 7 of Statement 034) that restricts public access is no longer required in the new Statement (Appendix 4). The EPA notes that DoIR is currently considering the applicability of using non-annualised risk to determine suitable exclusion zones during product transfer operations.

The EPA recommends that Statement 034 be amended to allow for the removal of those conditions that relate to the storage and importation of ammonia (which will now be in the new statement (Appendix 4). The EPA recommends that the Minister for the Environment and Heritage consults with the relevant decision making authorities to update Statement 034.

Summary

Having particular regard to the:

(a) proposal meeting the EPA's individual fatality risk criterion outside the current exclusion zone at Well's Park;

(b) advice obtained from the DoIR in relation to the management of risk;

(c) advice from Fremantle Ports that it has no objections to the export operations subject to the continued application of all appropriate conditions and controls applicable to ammonia imports at the jetty; and

(d) commitments made by the proponent;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for off-site individual risk.

4. Conditions and commitments

Section 46(3) of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment and Heritage on whether or not the proposed changes to conditions or procedures should be allowed. In addition, the EPA may make recommendations as it sees fit.

4.1 Recommended commitments

Wesfarmers CSBP Ltd has made changes to commitments (addition of commitment No. 9) to reflect discussions with the EPA Service Unit which have been part of the assessment process. The proponent's consolidated commitments as shown below (Table 2), should be made enforceable conditions.

Table 2: Proponent's consolidated commitments

COMMITMENT	OBJECTIVE	ACTION	TIMING	WHOSE ADVICE	MEASUREMENT/ COMPLIANCE CRITERIA
1. Minimize the impacts of discharges of phosphorus and nitrogen from the plant.	To protect the biota and amenity of Cockburn Sound.	• By selecting processes and equipment which give rise to the lowest discharges of nitrogen and phosphorus. (The selection of cooling water treatment process is of particular significance). • By continuing the implementation of measures to reduce discharges from other sources on CSBP's Kwinana site.	• Before construction • By 1 January 2000		• Confirmation of advice on expected N+P discharges contained in CER. • Monitoring and reporting site discharges as required under current licence conditions
2. Seek to reduce discharges of greenhouse gases from the plant.	To minimize the effects of global warming arising from the discharge of greenhouse gases to the atmosphere.	• By implementing commercially viable opportunities to recover and reuse CO_2 discharged from the plant. • By incorporating, where practicable, advances in ammonia catalyst technologies which reduce the generation of CO_2 from the production of ammonia.	• Ongoing • Ongoing	Greenhouse Challenge Office (Federal Government).	• Include new ammonia plant in annual reporting of Greenhouse Gas inventories.
3. Ensure that noise generated from the Kwinana Ammonia Project will not exceed current regulations.	To maintain the amenity of nearby industrial, residential and recreational areas.	• By specifying the procurement of equipment which complies with current requirements. • By conducting noise surveys of the operating plant and implementing noise abatement measures if non-compliance is detected.	• Before construction • Within 6 months of commissioning		• Reporting of results of surveys and agreeing plans to achieve attenuation if required.
4. Minimize the risk to the community arising from the operation of the plant.	To protect the nearby communities from exposure to unacceptable levels of risk to health and safety.	• By preparing and implementing a comprehensive Safety Management System (SMS) for the operation of the plant. • By incorporating risk reduction measures recommended by Quantarisk into plant design.	• Before commissioning • Completed as at 1/1/1998	DoIR	• Approval of the SMS** by relevant authorities. • Regular independent audit of compliance with the SMS** reported to the DOIR.
5. Minimize the risk to persons involved in construction of the plant from the operation of adjacent plants on the Kwinana site.	To protect the health and well being of people employed in the construction of the plant.	• By preparing and implementing a Construction Safety Management Plan.	• Before construction	DoIR	• Auditing and reporting as required by the plan.
6. Revise the preliminary risk assessment for the project.	To demonstrate compliance with EPA criteria at fenceline with BP and reduction of cumulative risk level for whole CSBP site.	• Revise preliminary risk assessment and include knock-on effects, loss of control releases, mitigation measures to meet ALARP*, sensitivity analysis with respect to probit equations and weather data.	• Before construction	DoIR	• The EPA's criteria for individual fatality risk off-site.
7. Conduct a final quantified risk assessment on the project.	To confirm that the final plant design meets EPA risk criteria and that there is a reduction in risk for the whole CSBP site.	• Conduct final risk assessment taking into account final plant design.	• Before commissioning	DoIR	• The EPA's criteria for individual fatality risk off-site.
8. Decommission the existing	To ensure that decommissioning	• Prepare and implement a	• At least 6 months		• The EPA's requirement.

COMMITMENT	OBJECTIVE	ACTION	TIMING	WHOSE ADVICE	MEASUREMENT/ COMPLIANCE CRITERIA
ammonia plant, following commissioning and stabilisation of the new plant.	is carried out in an environmentally acceptable manner.	Decommissioning Management Plan.	before decommissioning		
9. Limit ammonia import/export operations to no more than 9 transfers per annum.	To protect nearby industry, public recreation areas and communities from unacceptable safety impacts.	• Ensure effective testing and maintenance procedures in line with the SMS • Include in the Ammonia Safety Report	• Ongoing	DoIR	• No more than 9 operations in a calendar year.

As Low As Reasonably Practicable.
** - Safety Management System.
1 - Ammonia Import/Export Sensitivity Analysis, DNV, Jan 2003
DOIR – Department of Industry and Resources.
SMS – Safety Management System

4.2 Recommended conditions

Having considered the proponent's commitments and the information provided in this report, the EPA recommends that the following conditions be imposed if the proposal by Wesfarmers CSBP Ltd is approved for implementation:

(a) The existing Ministerial Conditions applied to the project (Ministerial Statement 470 published on 18 March 1998), be updated to include the standard conditions currently applied to new proposals.

The amended conditions and amended Consolidated Commitments statement are presented in Appendix 4.

5. Conclusions

The EPA has considered the proposal by CSBP to Export Ammonia, Kwinana and has concluded that it can be managed to meet the EPA's objectives for the relevant environmental factor, off-site individual risk, subject to the ammonia transfers (imports and exports) not exceeding nine per year.

The EPA is satisfied that CSBP and the relevant authorities have established procedures in place to manage the public risk associated with ammonia importation and that the procedures will be updated as required to incorporate ammonia export, prior to the commencement of export operations. The EPA is satisfied that the off-site individual fatality risk for ammonia export is similar to the risk for the currently approved ammonia importation.

In addition to the above, the EPA considers that conditions attaching to the environmental approval should be updated. It has therefore reported also on the updating of conditions.

6. Recommendations

The EPA submits the following recommendations to the Minister for the Environment and Heritage:

1. That the Minister notes that this report is pursuant to Section 46(3) of *the Environmental Protection Act 1986* and thus is limited to consideration of proposed changes to the original conditions.
2. The Minister notes that the proposed change is to enable Wesfarmers CSBP Ltd to export shipments of anhydrous ammonia from the Fremantle Ports' Bulk Cargo Jetty at Kwinana to overseas markets.
3. The EPA recommends that the Minister considers the report on the relevant environmental factors as set out in Section 3.
4. That the Minister notes that the EPA has concluded that the modified proposal can be managed to meet the EPA's objectives, and thus not impose an unacceptable impact on the environmental provided there is satisfactory implementation by the proponent of the amended conditions, including the proponent's commitments, as set out in Section 4.
5. The Minister imposes the amended conditions, commitments and procedures recommended in Appendix 4 of this report.

Appendix 1

References

1. Det Norske Veritas (Jan 2003). *Ammonia Import/Export Sensitivity Analysis. Revision 1.*
2. Det Norske Veritas (Feb 2003). *Addendum to Ammonia Import/Export Sensitivity Analysis. Revision 0.*
3. Environmental Protection Authority WA (2000). *Final Guidance No. 2, Guidance for Risk Assessment and Management: Off-site individual risk from Hazardous Industrial Plant.* Environmental Protection Authority, Perth. W.A.
4. Environmental Protection Authority WA (1987). EPA Bulletin 309. *Proposed Ammonia-Urea Plant at Kwinana*. Environmental Protection Authority, Perth. W.A.
5. Environmental Protection Authority WA (1991). EPA Bulletin 502. *Preliminary interpretation of report by Technica Ltd on "Risk assessment of ammonia import facility, Kwinana"*. Environmental Protection Authority, Perth. W.A.
6. Environmental Protection Authority WA (1992). EPA Bulletin 621. A*mmonia import facility - Kwinana*. Environmental Protection Authority, Perth. W.A.
7. Environmental Protection Authority WA (1998). EPA Bulletin 882. *Kwinana ammonia project, Kwinana Industrial Area*. Environmental Protection Authority, Perth. W.A.
8. Technicia Ltd (Feb 1991). *Risk Assessment of Ammonia Import Facility, Kwinana for Environmental Protection Authority, Western Australia, Report 2*.

Appendix 2

Statement of Environmental Conditions of Approval
(Statement 034, 2 August 1988)

Ass # 020

Bull # 309

State # 034

MINISTER FOR ENVIRONMENT

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED (PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL PROTECTION ACT 1986)

PROPOSED AMMONIA-UREA PLANT AT KWINANA

CSBP AND FARMERS LTD NORSK HYDRO A.S.

This proposal may be implemented subject to the following conditions:

1. The proponent adhering to the proposal as assessed by the Environmental Protection Authority and fulfilling the commitments made for environmental protection (copy of commitments attached).

2. The plant shall be constructed on the proponent's preferred site as defined in the Environmental Review and Management Programme.

3. The proponent shall prepare in stages, a comprehensive and integrated hazard and risk management strategy, to the requirements of the various Government Agencies involved and to the Environmental Protection Authority's satisfaction.

   This shall consist of the following, with the results being forwarded to the Environmental Protection Authority:

   - the HAZOP review to be completed and submitted before mechanical construction commences and to be conducted in a manner approved by the Environmental Protection Authority;

   - a hazard analysis update (including a fire safety plan, a plan detailing the management of the commissioning stage and a plan of emergency procedures) to be approved before plant commissioning; and

   - an audit of risk and hazards to be submitted to the Environmental Protection Authority after two years of operation and upon request thereafter.

4. No more than 30 000 tonnes of ammonia (not including existing 10 000 tonne storage) shall be stored at the Kwinana plant location without further referral to and the approval of the Environmental Protection Authority.

Published on

2 AUG 1988

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5. Prior to commissioning the plant, the proponent shall prepare a Plant Emergency Plan to the satisfaction of the Environmental Protection Authority, taking into account all appropriate contingencies. This Plan should conform with requirements of the Kwinana Emergency Plan and the Port Safety Management Plan.

6. The Government shall prepare and implement, by a date to be determined by the Minister for Environment, an overall and integrated Kwinana Emergency Plan and an integrated Fremantle Port Safety Management Plan incorporating the Kwinana industrial area and its surrounds. The Port Safety Plan should be compatible and integrated with the Kwinana Emergency Plan.

7. Prior to commissioning the plant, the Government, coordinated by the nominee of the Minister for Economic Development and Trade, shall devise and implement a plan, to the satisfaction of the Environmental Protection Authority, restricting access (except to people with adequate protective clothing) within proximity of the proposed loading and off-loading facilities.

8. Prior to commissioning the plant, the proponent shall provide to the Environmental Protection Authority's satisfaction, management proposals for the CSBP complex, designed to achieve additional reductions in nitrogen load of 7 tonnes per year. Nitrogen discharged from both the proposed plant and the CSBP complex into Cockburn Sound shall be monitored in a manner acceptable to the Environmental Protection Authority.

9. Prior to commissioning the plant, the proponent shall prepare a detailed report to the satisfaction of the Environmental Protection Authority, outlining the methods by which likely odours and fugitive emissions generated from the plant will be minimised or eliminated.

10. Prior to commissioning the plant, the proponent shall prepare a proposal for solid waste management and disposal from the site, to the satisfaction of the Environmental Protection Authority.

11. Although a preliminary proposal has been received, the proponent's final cooling water proposal shall be referred to the Environmental Protection Authority and its approval obtained prior to the commencement of construction.

12. Prior to commissioning the plant, the proponent shall develop a monitoring programme and reporting arrangements to the satisfaction of the Environmental Protection Authority which shall indicate how environmental management will be modified in response to monitoring reports.

Monitoring shall include, amongst other things, periodic wastewater monitoring such as:

- temperature of the wastewater discharge and of the surface waters of the Cockburn Sound at an appropriate distance from the point of discharge; and

- pH, nitrogen, total dissolved solids, and total suspended solids of the effluent.

B Hodge.

Barry Hodge, MLA
MINISTER FOR ENVIRONMENT

27 JUL 1988

CSBP & FARMERS LTD
NORSK HYDRO a.s

PROPOSED AMMONIA/UREA PLANT

MANAGEMENT COMMITMENTS

- Prepared by -

Kinhill Engineers Pty Ltd
47 Burswood Road
Victoria Park, WA 6100

Tel. (09)362.5900
Ref. PE7039/K15:B

November 1987

MANAGEMENT COMMITMENTS

1 OPERATIONAL PHILOSOPHY

- The incorporation of safety aspects into operations will commence with the selection of technologies and plant design that will minimize the risk of plant failure and human error. During the design phase, the proponents will undertake a Hazard and Operability (HAZOP) study in conjunction with the technology suppliers and engineering contractors to further enhance the plant's safety. In the procurement and construction phase, close attention will be paid to the quality control systems, both in vendors' equipment fabrication and in the plant construction.

- The philosophy for the automatic or manual shut-down procedure is developed based on maximum safety of the operators and equipment and the minimum disturbance to the environment.

2 DESIGN

2.1 General

- The process licensors' design philosophy will be adhered to.

- Operational stability will be achieved by duplication of critical equipment, a high level of automation and intensive training of operators.

- A check will be made on the final design to verify consistency with assumptions made in the preliminary risk analysis.

- If any of the economic factors affecting the cooling split change during the design stage of the project, then the situation will be reassessed and, where possible, the proponents will attempt to increase the use of air cooling if it is economic to do so.

2.2 Standards

- Appropriate Australian and international standards will be used in the design of the facilities.

- The ammonia storage tank will be designed to comply with API620.

- In accordance with recommended practice, the plant will be designed to a higher standard for earthquakes than required for normal structures.

2.3 Layout

- The design and layout of the plant will provide protection against damage and avoid the placement of equipment in vulnerable positions where impacts from vehicles could occur. The layout will also take into account plant operability, maintenance and access for escape and rescue.

2.4 Aesthetics

- The plant site will be attractively landscaped, and buildings will be aesthetically designed and have neutral coloration for compatability with the surrounding industrial setting.

2.5 Safety features

- All employees will be trained in the safe work practices and emergency procedures appropriate to the operation of the plant and handling of all associated materials.

- The process will be designed to meet or improve on current emission guidelines.

- The plant will be highly instrumented and computer-controlled, and will be equipped with interlock systems which, upon initiation from carefully selected process or equipment performance criteria, will ensure a safe emergency shut-down of the plant.

- Gas monitoring systems and equipment condition monitors will be installed in the plants, as required.

- Vapour detectors will be provided in the annular space of the ammonia storage tank, to provide early warning of ammonia releases and enable prompt emergency action to minimize vapour emissions (e.g. through the application of foam).

2.6 Water supply

- Where the clay seal separating the Safety Bay Sand from the limestone exists, the design and specification of the production bores will ensure that no leakage can occur across this seal.

3 CONSTRUCTION

- Liaison with local authorities will be conducted to ensure that impacts associated with noise, dust and traffic are minimized.

- Construction activity will be restricted to normal construction industry working hours.

- Dust suppression watering practices will be implemented.

- All construction materials and practices will be in accordance with the relevant Australian and international codes.

4 OPERATIONS

4.1 General

- Ongoing control of dust will be implemented.

- The dosage of anti-foulant (Alfloc 7348 for example) to the cooling water system will be controlled.

- Procedures will be developed and written for the operation of the plant, including automatic or manual shut-down.

4.2 Maintenance

- Regular preventative maintenance programmes will be implemented to minimize plant component failures.

- All maintenance tasks will require a written work permit, where all safety procedures will be specified, including their method of control and how the item maintained is to be tested before recommissioning.

- The routine checks on the plant and equipment, which will be carried out both continuously by the operators and periodically by the plant inspectors, will ensure that any unsafe or environmentally unacceptable leak or operating condition is detected and corrected. The plant management will be responsible for ensuring that all agreed routines are carried out and for making all personnel (including outside contractors working at site) aware of all the operational and personnel safety requirements on the site. Such requirements include familiarization with and adherence to all operational, safety and work routines, as well as personal safety requirements.

4.3 Management structure

- The plant will have an independent organization for its operation and maintenance, backed up by a Management Agreement with CSBP & Farmers Ltd and a Technical and General Assistance Agreement with Norsk Hydro a.s.

- In the setting up and operation of this structure, the plant will be able to draw on the extensive experience of both companies in relation to management of operations in the Kwinana region and that of operation of the ammonia/urea industry in particular.

- Policies will be set for the following areas:

  - industrial relations
  - safety and health
  - recruitment and training
  - public relations
  - environmental control.

5 HANDLING, STORAGE AND TRANSPORT

5.1 Products

5.1.1 Urea

- During plant operation, urea dust will be managed by operating the urea granulation process (including the urea dust scrubber) at design specification, regular monitoring of the gaseous emission from the scrubber, and maintenance of good housekeeping in and around the plant.

- Transfer of urea from the plant to the storage building will be via an enclosed conveyor. From the storage building to the ship loader, a high capacity covered conveyor will be used, with provision in the design for a dust extraction system if needed.

5.1.2 Ammonia

- The use of valves and other fittings that contain copper, zinc or silver, or their alloys, will be avoided in all facilities handling ammonia.

Export pump

- The pumps will stop automatically on activation of the emergency shut-down (ESD) system, and will be fitted with pressure differential alarms between suction and discharge.
- Ammonia vapour detectors will be strategically positioned around the pump and valves and set to operate the ESD system at a specific concentration level.
- If a no-flow signal is received from flow switches installed on the discharge flow meter, the ESD system will be activated.

Ammonia export pipeline

- The materials of construction will be suitable for the operating temperature of -33°C and will comply with Australian standards.
- A comprehensive quality assurance programme will be prepared covering manufacture and installation of pipelines, pipeline supports and valves.
- Corrosion protection of the pipeline will be provided.
- Valves will be welded onto the pipework where possible.
- Pressure monitoring of pipelines will be provided during operation for automatic operation and activation of ESD valves on sudden pressure drop.
- Isolation valves will be installed at each end of the pipeline and at the start of the wharf, working off an ESD system to minimize the amount of ammonia released if a pipe failure occurs.
- The line will be insulated and cooled prior to loading to minimize vapour generation during loading.
- The line will be protected from overpressure by a safety relief valve.
- As a safety precaution, the pipeline will be patrolled during the loading operation.
- The pipeline will be protected by impact barriers wherever there is a potential for damage by vehicles.
- Between shipments, the line will be depressurized and left full of ammonia vapour at slightly above atmospheric pressure.
- The export pipeline will be subjected to a full HAZOP study prior to the commissioning of the plant.
- Breathing apparatus will be made available to workers in the pipeline vicinity during loading.

- The above-ground ammonia pipeline will be clearly identified, including the use of warning signs.

Bulk cargo jetty and marine loading arm

- A comprehensive quality assurance programme will be prepared, covering the manufacture and installation of the pipeline and loading arm.
- Comprehensive procedures covering every aspect of the tanker loading operation will be developed.
- Pressure monitoring of the pipeline and loading arm will be undertaken during operation to enable automatic isolation of the wharf pipeline and loading arm by an ESD system acting on sudden pressure loss in order to minimize the amount of ammonia released in the event of a failure.
- Other activity on the wharf during tanker loading operations will be limited.
- Only electrical equipment approved for hazardous areas will be permitted to be energized for loading of ammonia.
- Procedures to warn against and prevent non-approved activities during loading will be implemented.
- An operator will be stationed on the wharf during the entire loading operation to watch the pipeline, report any malfunctions and to guard against any other activities interfering with loading.
- Corrosion protection will be provided for the pipeline and loading arm.
- Valves will be welded onto pipework (not flanged), where possible.
- The pipeline will be cooled prior to liquid loading to reduce vapour generation during loading.
- Shore-based ESD system will automatically activate the Speed Seal emergency release coupling and close the wharf isolation valves.
- Adequate fire-fighting facilities will be provided on the wharf.
- The loading arm will be stored between shipments and maintained, installed and commissioned according to a strict set of procedures.
- Although the concept of a mobile loading arm is considered reasonable, the proponents will investigate the feasibility of a permanently installed loading arm at the wharf.

5.2 Raw materials

5.2.1 Natural gas

- Safeguard systems will be designed to ensure that the natural gas fuel is shut off by a trip system in the event of a flame out or other furnace or fired boiler failure events.

5.2.2 Methyldiethanolamine (MDEA)

- Gloves and eye protection will be worn during MDEA handling operations.

- Contact with aluminium, copper, zinc and magnesium alloys will be avoided in the MDEA handling area.

5.2.3 Nitrogen

- The plant will have a continuous supply of nitrogen (for process purging) from a nitrogen gas distribution system in the Kwinana region, as well as from a plant storage of liquid nitrogen equipped with separate evaporator capacity to ensure safe and quick handling of hazardous developments in the plant.

6 ENVIRONMENTAL ISSUES

6.1 Gaseous wastes

- All gaseous waste products will be regularly monitored and disposed of in an environmentally safe manner and in accordance with statutory requirements to the satisfaction of the Environmental Protection Authority (EPA).

6.2 Odours

- The proponents confirm their commitment that adequate measures will be taken, both during the design stage and during the commissioning and operation stages of the plant development, to prevent odour generation from process vents, leaks and accidental gas releases.

6.3 Liquid wastes

- All liquid waste products will be regularly monitored and disposed of in an environmentally safe manner and in accordance with statutory requirements to the satisfaction of the EPA.

- Surface runoff from the process areas of the plant will be channelled into holding ponds and appropriately treated before disposal to Cockburn Sound.

- Acidic or alkaline effluents from the water treatment plant will be neutralized in a small holding pond before being pumped into the main holding pond.

- Spent oil changed from machinery will be sold for reprocessing.

- Normal operating and maintenance procedures will require that any oil leaks be attended to immediately because of the possibility of damage to the equipment, fires and the hazard of slippery surfaces. Any spillages will be mopped up and cleaned up using standard techniques with dry absorbents and biodegradable solvents.

- There will be a separate sewerage system for any oily water which will allow any such water to be diverted to sumps for retention and skimming. Recovered oil will be removed by a truck and disposed of off-site and the clean water redirected to the main holding pond for neutralization.

6.4 Solid wastes

- The plant will normally produce minimal solid wastes. Septic systems will be provided for the sanitary system.

- Domestic solid waste will be disposed of to sanitary landfill to the satisfaction of the local authorities.

- The disposal of used catalysts will be as follows:

  - those that contain only non-toxic compounds, e.g. Fe_2O_3 or Al_2O_3, will be safely disposed of on any landfill site;

  - those containing a high proportion of recoverable metals, such as the nickel, platinum or copper-based catalysts, will be sold for their metal content;

  - those that cannot be sold for their metal content and that contain significant proportions of elements which can be toxic to the environment, such as chromium, will be disposed by approved means.

- The proponents will explore other options, including the possible use of spent catalysts in CSBP & Farmers Ltd's superphosphate mixtures to provide trace elements (Cu, Zn, Mo) required by plants and crops.

6.5 Noise

- Noise levels within the plant and at the plant boundaries will be in accordance with statutory requirements.

6.6 Monitoring

- Monitor bores will be installed between the production bores and the Nufarm contaminant plume to monitor the migration of the plume.

- Monitor bores will be installed to monitor the migration of the saltwater wedge to the west of the plant site.

- The concentration of anti-foulant (Alfloc 7348 for example) in the effluent will be checked periodically as part of the effluent monitoring programme.

- The groundwater abstracted for the plant process and cooling water will be regularly monitored for contaminants.

6.7 Reporting

- The proponents will make the results of any monitoring available to the relevant authorities.

7 OCCUPATIONAL HEALTH

7.1 General

- Occupational health issues will be addressed in detail in the design stage of the project.

7.2 Medical care

- On-site first aid facilities will be provided, together with support from CSBP & Farmers Ltd's Kwinana works facilities, which include the availability of an ambulance and an occupational health nurse during normal working hours.

- The proponents will liaise with all relevant local and State authorities in reviewing the design of medical and first aid procedures and facilities for the plant.

8 SAFETY

8.1 HAZOP study

- The final design of the plant will be subject to a full HAZOP study before commissioning of the plant, as will any subsequent changes to design before implementation. This will ensure that the safety standards set for the plant are adhered to and will minimize the likelihood of plant failure.

- The HAZOP study will meet the EPA's guidelines for HAZOP, as defined in Bulletin 278, May 1987.

- The results of the HAZOP study will be made available to the Department of Occupational Health, Safety and Welfare on request.

- Installation of new equipment and alterations to existing equipment will undergo a detailed check procedure on the design, including HAZOP analyses, prior to requisition.

8.2 Emergency procedures

- The emergency response plan for the plant will provide effective understanding of credible accident scenarios within the plant and adjacent facilities and the necessary responses in terms of plant and personnel. In view of the short time available for response, planning and training for immediate recognition of emergencies and evacuation to safe areas for toxic releases is essential. The plan will be implemented before start-up and tested at regular intervals.

- A plan for public safety and awareness will be developed, including procedures for emergencies.

- Apart from the emergency procedures worked out for the specific operational requirements, prior to the commissioning of the plant, procedures will be developed to cover the requirements of the site, including:

  - definition of emergencies (e.g. fire, gas leaks);
  - organization of emergency control teams;
  - escape routes and assembly points for personnel;
  - liaison requirements with local and State authorities, the State Energy Commission of Western Australia and the general public;
  - warnings to fire brigades, hospitals and the police.

- The proponents will liaise with all relevant public authorities, including the local Counter-Disaster Advisory Committee, and nearby industrial operators in the development of emergency procedures. Copies of the procedures will be made available to all bodies affected.

8.3 Fire protection

- A fire protection system will be incorporated in accordance with the requirements of the plant design and the Western Australian Fire Brigades Board.

- The fire protection system will be supplied from a separate tank and pumping system fed from the production bores, with back-up from the scheme water main. Permanent hydrants will be situated at selected locations around the plant, together with foam generators in areas of the plant where ammonia leaks could occur.

- All plant personnel will be trained in the appropriate fire-fighting techniques.

- The fire-fighting capability of CSBP & Farmers Ltd's Kwinana works, and the Kwinana Industries Mutual Aid Group, established by industrial operators in the Kwinana industrial area, will be available for emergency assistance.

8.4 Ship loading management plan

- The proponents intend to develop a management plan for ship loading with the Fremantle Port Authority. The plan will include:

  - definition of emergencies (e.g. fire, gas leaks);
  - organization of emergency control teams;
  - escape routes and assembly points for personnel;
  - liaison requirements with local and State authorities, the EPA and the general public in the event of an emergency;
  - procedure for warning fire brigades and hospitals;
  - management of vehicle access to the wharf during loading;
  - provision of breathing apparatus to anyone going onto the wharf during loading.

8.5 Auditing

- Regular safety audits of the plant will be undertaken.

8.6 Security

- Security around the plant will be ensured by the installation of chain-link boundary fences, with access to the plant via a single gatehouse and emergency exits.

- Security patrols of the plant will be carried out.

- During ship loading, the export pipeline will be regularly inspected.

8.7 Training

- All employees will be trained in the safe work practices and emergency procedures appropriate to the operation of the plant and handling of all associated materials.

- Plant operator training will be provided, based on the experience available to the proponents from their existing ammonia/urea establishments. Some personnel will have practical training in these plants.

- Maintenance and inspection procedures (including work permits) will be developed to protect maintenance workers and to prevent unsafe situations from developing.

- Operation manuals will be developed which outline how various situations are to be handled by operators.

Appendix 3

Statement of Environmental Conditions of Approval
(Statement 470, 18 March 1998)

MINISTER FOR THE ENVIRONMENT;
EMPLOYMENT AND TRAINING

Statement No.
000470

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED (PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL PROTECTION ACT 1986)

Title: KWINANA AMMONIA PROJECT, KWINANA INDUSTRIAL AREA

Proposal: Construction and operation of a 650 tonne per day (tpd) ammonia plant to replace the existing 300 tpd ammonia plant, at CSBP Kwinana site (immediately to the east of the existing ammonia plant), which is located within the Kwinana heavy industrial area, Town of Kwinana, about 33 km south of Perth, as documented in schedule 1 of this statement.

Proponent: Wesfarmers CSBP Limited

Proponent Address: 40 The Esplanade, PERTH W A 6000

Assessment Number: 1140

Report of the Environmental Protection Authority: Bulletin 882

The proposal to which the above report of the Environmental Protection Authority relates may be implemented subject to the following conditions and procedures:

1 Implementation

1-1 Subject to these conditions and procedures, the proponent shall implement the proposal as documented in schedule 1 of this statement.

2 Proponent Commitments

2-1 The proponent shall implement the consolidated environmental management commitments documented in schedule 2 of this statement.

2-2 The proponent shall implement subsequent environmental management commitments which the proponent makes as part of the fulfilment of conditions and procedures in this statement.

Published on
18 MAR 1998

18th FLOOR, ALLENDALE SQUARE, 77 ST. GEORGE'S TERRACE, PERTH 6000 TELEPHONE: (08) 9421 7777 FACSIMILE: (08) 9221 4665/8

3 Environmental Management System

3-1 In order to manage the environmental impacts of the project, and to fulfil the requirements of the conditions and procedures in this statement, prior to construction, the proponent shall prepare Environmental Management System documentation with components such as those adopted in Australian Standards AS/NZS ISO 14000 series, to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection.

3-2 The proponent shall implement the Environmental Management System referred to in condition 3-1.

4 Decommissioning Management Plan

4-1 At least six months prior to decommissioning of the new ammonia plant, the proponent shall prepare a Decommissioning Management Plan to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection.

This Plan shall address:

1 removal or, if appropriate, disposal on-site of plant and infrastructure;

2 rehabilitation of all disturbed areas to agreed final land uses; and

3 identification of contaminated areas, including provision of evidence of notification to relevant statutory authorities.

4-2 The proponent shall implement the Decommissioning Management Plan required by condition 4-1.

4-3 The proponent shall make the Decommissioning Management Plan required by condition 4-1 publicly available, to the requirements of the Environmental Protection Authority.

5 Changes to Implementation

5-1 Where, in the course of implementing the proposal, the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment determines, on advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

6 Proponent

6-1 The proponent for the time being nominated by the Minister for the Environment under section 38(6) or (7) of the Environmental Protection Act is responsible for the implementation of the proposal until such time as the Minister for the Environment has exercised the Minister's power under section 38(7) of the Act to revoke the nomination of that proponent and nominate another person in respect of the proposal.

6-2 Any request for the exercise of that power of the Minister referred to in condition 6-1 shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the proposal in accordance with the conditions and procedures set out in the statement.

6-3 The proponent shall notify the Minister for the Environment of any change of proponent contact name and address within 30 days of such change.

7 Commencement

7-1 The proponent shall provide evidence to the Minister for the Environment within five years of the date of this statement that the proposal has been substantially commenced.

7-2 Where the proposal has not been substantially commenced within five years of the date of this statement, the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment will determine any question as to whether the proposal has been substantially commenced.

7-3 The proponent shall make application to the Minister for the Environment for any extension of approval for the substantial commencement of the proposal beyond five years from the date of this statement.

7-4 Where the proponent demonstrates to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority that the environmental parameters of the proposal have not changed significantly, then the Minister may grant an extension not exceeding five years for the substantial commencement of the proposal.

8 Compliance Auditing

8-1 The proponent shall submit periodic Performance and Compliance Reports, in accordance with an audit program prepared in consultation between the proponent and the Department of Environmental Protection.

8-2 Unless otherwise specified, the Department of Environmental Protection is responsible for assessing compliance with the conditions contained in this statement and for issuing formal clearance of conditions.

8-3 Where compliance with any condition is in dispute, the matter will be determined by the Minister for the Environment.

Note

1 The proponent is required to apply for a Works Approval and Licence for this project under the provisions of Part V of the Environmental Protection Act.

CHERYL EDWARDES (Mrs) MLA
MINISTER FOR THE ENVIRONMENT

18 MAR 1998

Schedule 1

PROPOSAL

The new ammonia plant will be located immediately to the east of the existing ammonia plant at the CSBP site, within the Kwinana Industrial Area (attached Figures 1 and 2).

The ammonia project involves construction and operation of:

- a new 650 tpd or 225,000 tpa ammonia plant; and
- ancillary equipment to support the ammonia plant including:

  - installation of a 25 tonne per hour (tph) natural gas fuelled steam boiler for use during plant start-up and shutdown operations;
  - "polishing water unit" to produce boiler quality feed water by treating demineralised water from an existing CSBP water treatment plant; and
  - a cooling water tower.

The proposed plant will be integrated with a number of existing CSBP facilities during its operation (attached Figure 3).

This project does not include the transport and distribution of ammonia throughout the State. The preliminary layout of the components of the proposed plant is shown in Figure 4 (attached).

The general arrangement of the plant will include the following sections:

1 reforming;
2 synthesis loop;
3 carbon dioxide removal;
4 heat exchange/cooling;
5 water polishing unit;
6 ammonia synthesis;
7 power generation;
8 process and motor control centre;
9 refrigeration;
10 groundwater bore; and
11 storage.

The main characteristics of the proposal are summarised in Table 1 (attached).

The new ammonia plant will incorporate the Haldor Topsøe technology, for which a licence was made available to CSBP by Technipetrol SpA of Italy.

The process flow diagram (attached Figure 5) shows various stages of the ammonia production process, which include:

1 desulphurisation of natural gas feed (methane);
2 reforming of methane and steam to carbon monoxide and hydrogen;
3 shift conversion of carbon monoxide to carbon dioxide;
4 removal of carbon dioxide by absorption;
5 purification of "synthesis gas" by methanation;
6 compression of the "synthesis gas";
7 synthesis of ammonia from "synthesis gas"; and
8 refrigeration and storage of ammonia.

Following commissioning and stabilisation of the new plant, the existing plant will be shutdown and in due course dismantled.

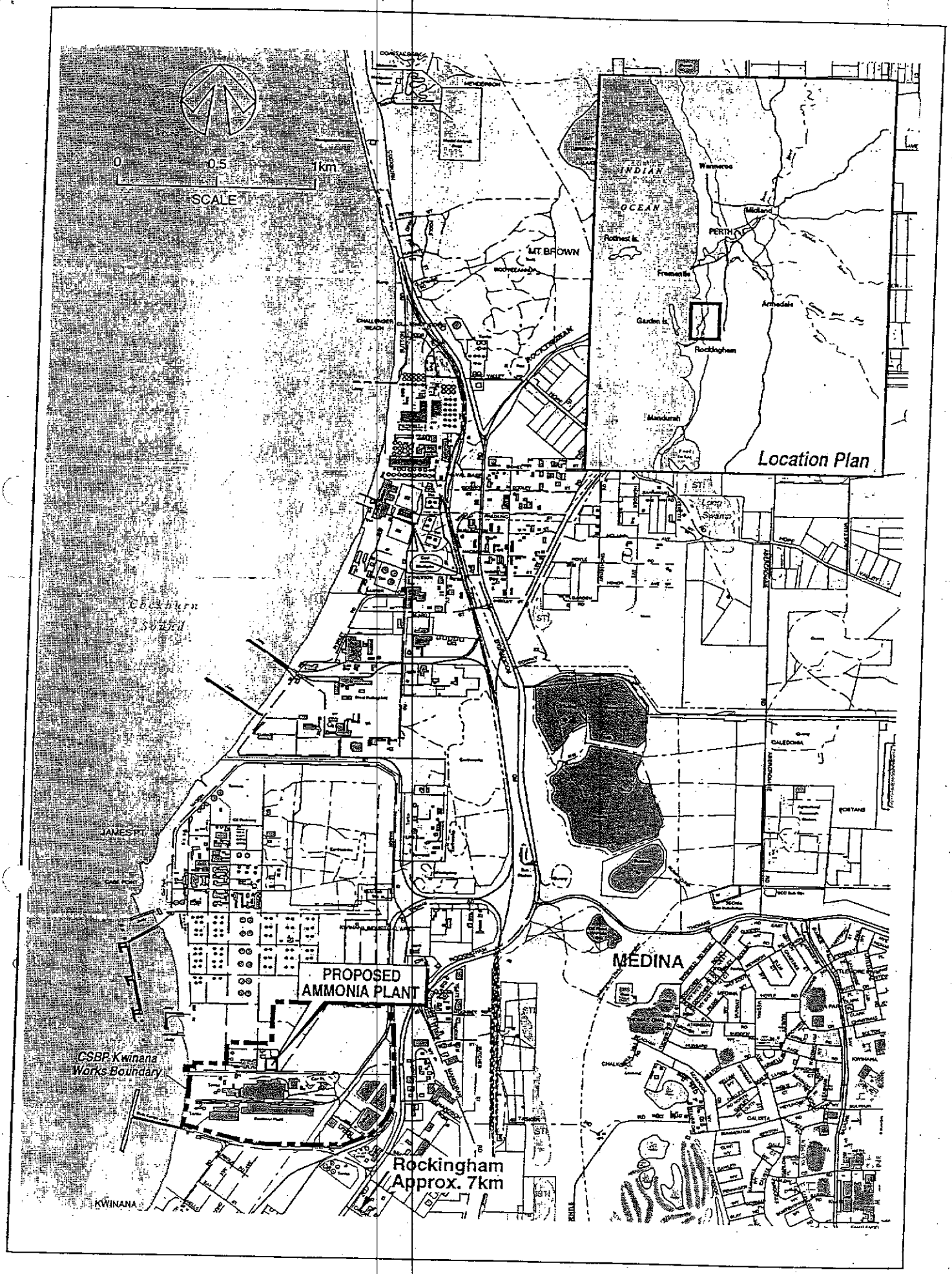


Figure 1. Location map.

PROPOSAL TABLE AND FIGURES

Table 1: Summary of key proposal characteristics

Proposal Characteristics	Unit	Proposed Plant
Capacity	tonnes per day NH_3	650
	tonnes per annum NH_3	225,000
Natural Gas Consumption	Gigajoules/tonne NH_3	32 - 34
	Petajoules/year	7.4
Water Consumption	tonnes per day	6,000 (make-up)
Location	-	CSBP Kwinana
Gaseous emissions:		
NO_x (as NO_2)	kg/tonne NH_3	0.54
	kg/day	350
CO_2	tonnes/tonne NH_3	1.8
	tonnes per day	1,200
Fugitive Gases:-		
• NH_3	-	flared
• H_2	-	flared
Aqueous discharge:		
Cooling System (including polishing unit blowdown)	-	recirculating treated sub-artesian water
Flow	tonnes per day	2,100
Heat Load	-	mainly to atmosphere
Nitrogen	kg/day	6 - 10
Phosphorus	kg/day	6
Oily water	-	de-oiled to contain less than 30 ppm of oil
Noise at boundaries	59 dB(A) at BP boundary	will comply with regulations
Individual risk at CSBP boundary:-		
• BPRK fence	deaths/million/year	< 50
• Kwinana Beach Road	deaths/million/year	< 10
• Nearest residential	deaths/million/year	< 1

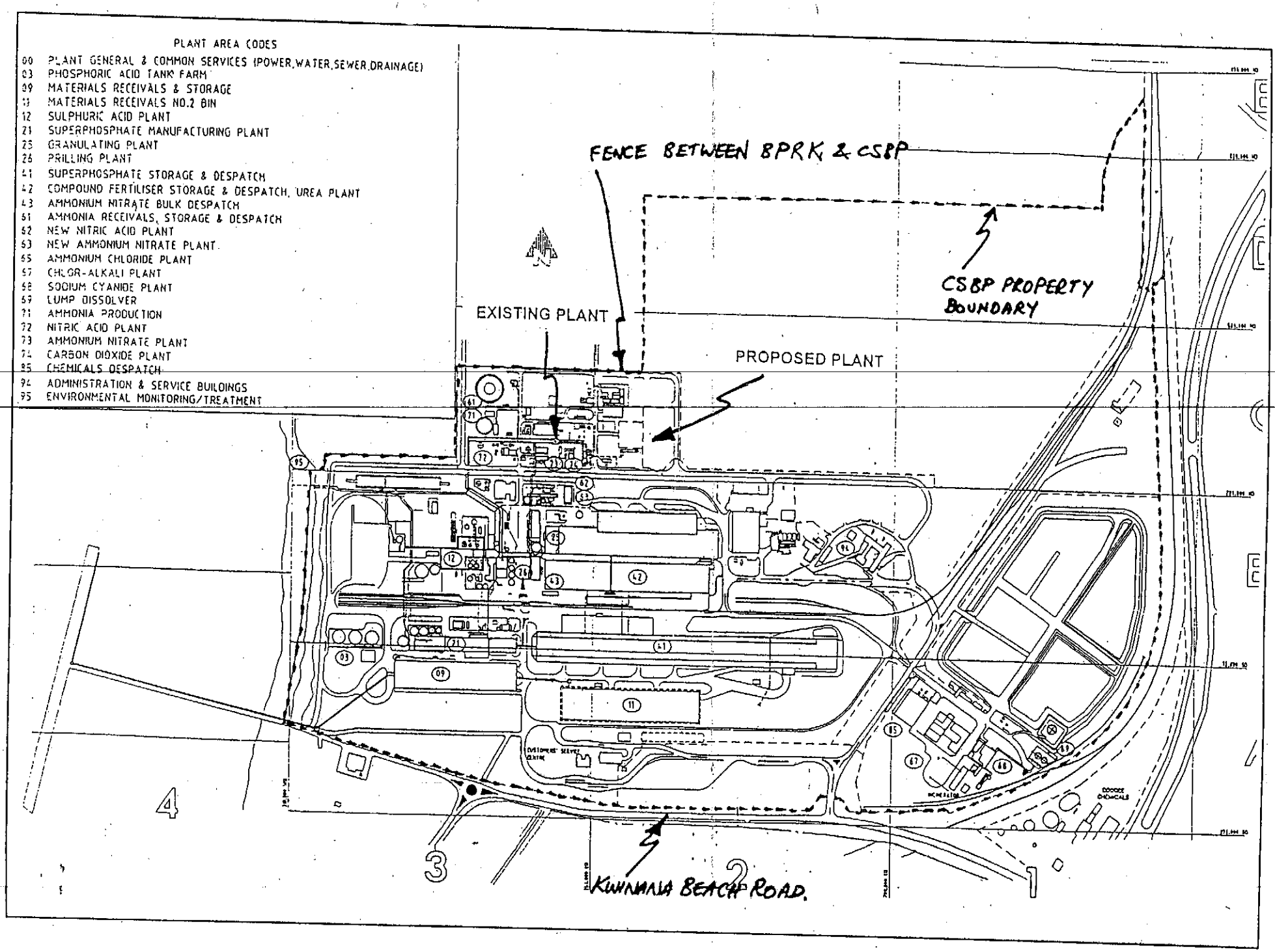


Figure 2. Proposed ammonia plant location.

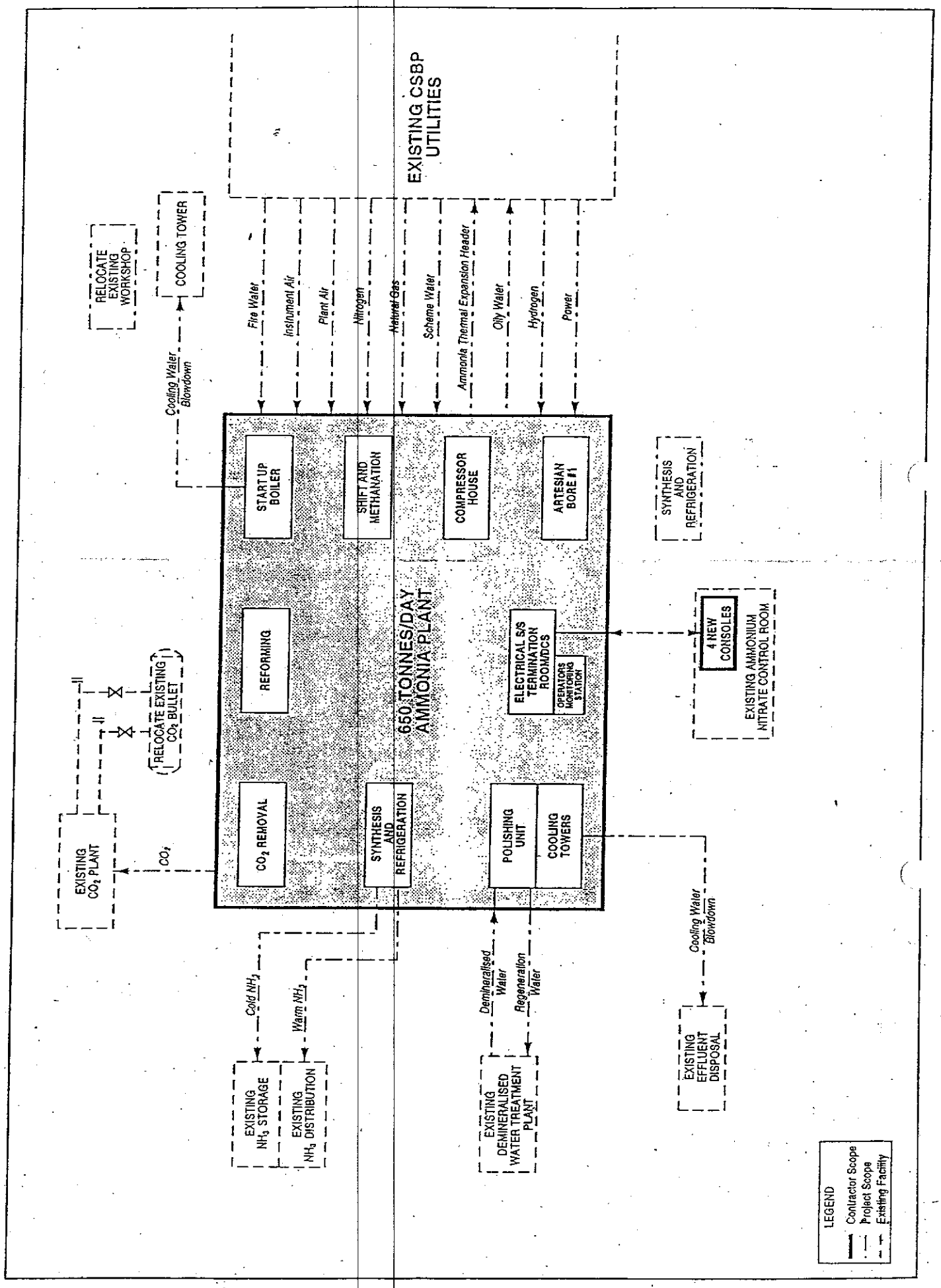


Figure 3. Project integration with existing CSBP facilities.

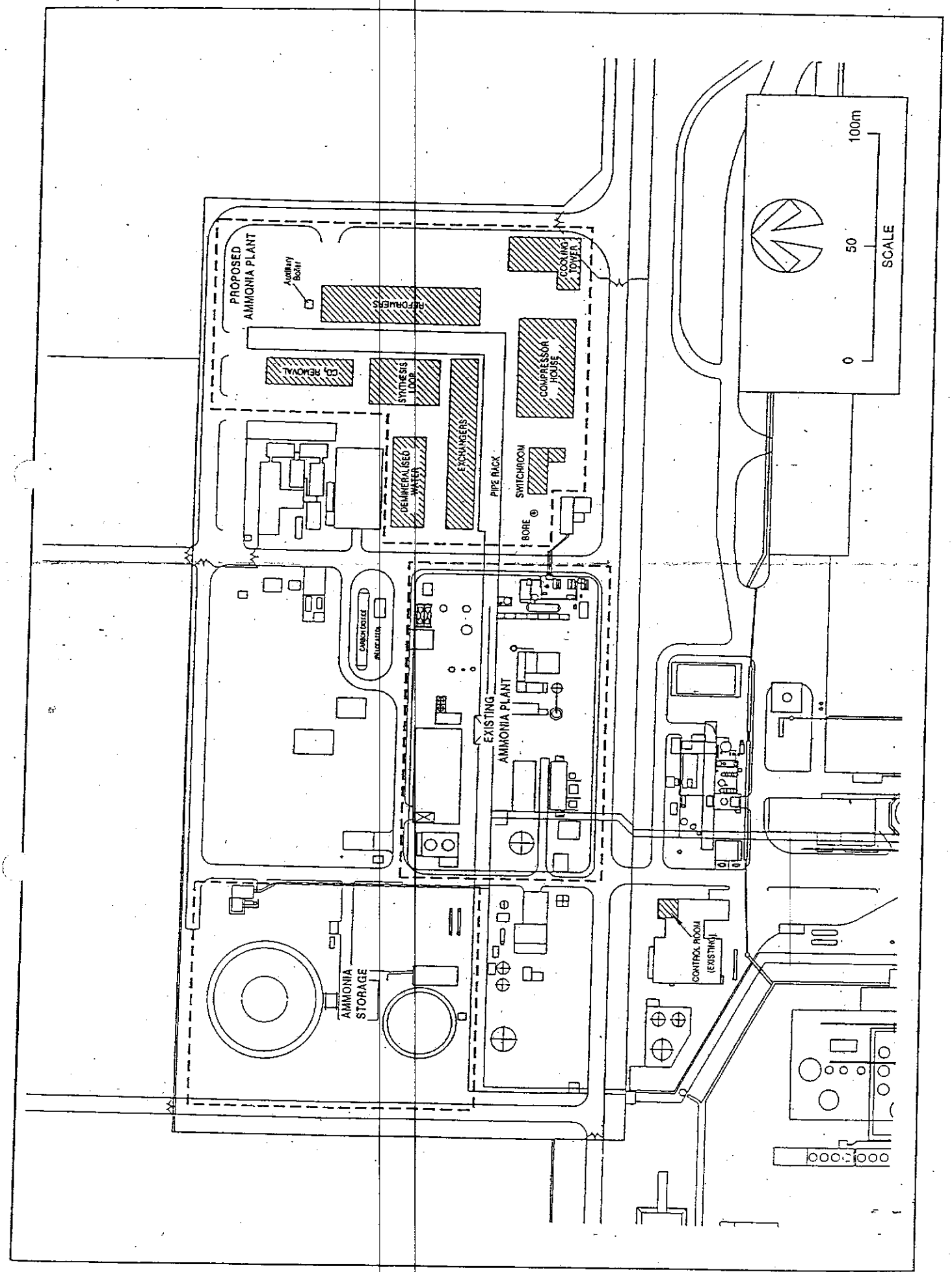
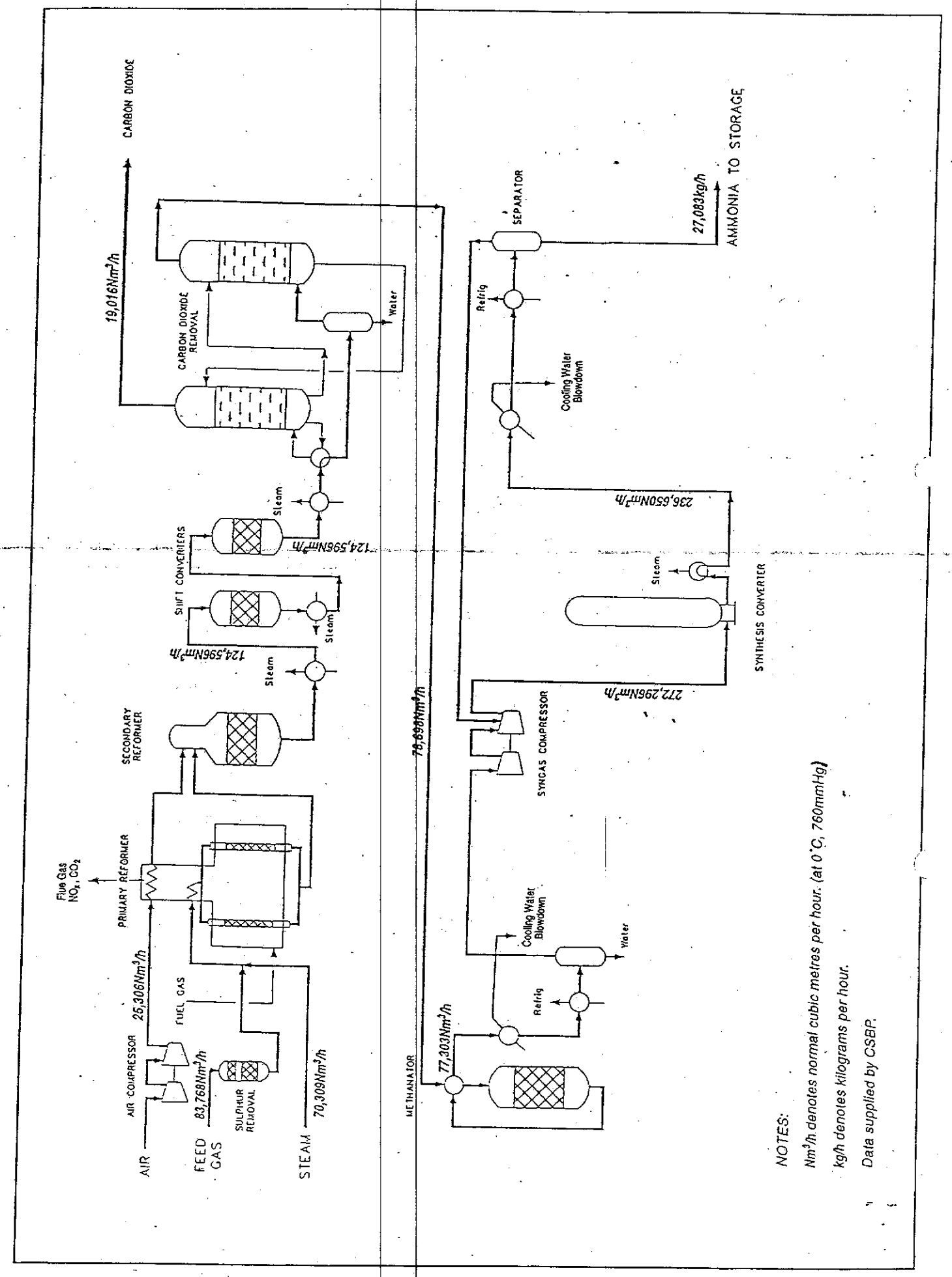


Figure 4. Proposed ammonia plant layout.



NOTES:

Nm³/h denotes normal cubic metres per hour. (at 0°C, 760mmHg)

kg/h denotes kilograms per hour.

Data supplied by CSBP.

Figure 5. Process flow chart.

Schedule 2

Proponent's Consolidated Environmental Management Commitments

KWINANA AMMONIA PROJECT
KWINANA INDUSTRIAL AREA (1140)

WESFARMERS CSBP LIMITED

KWINANA AMMONIA PROJECT, KWINANA INDUSTRIAL AREA (1140)

COMMITMENT	OBJECTIVE	ACTION	TIMING	WHOSE ADVICE	MEASUREMENT/ COMPLIANCE CRITERIA
1. The proponent will minimize the impacts of discharges of phosphorus and nitrogen from the Kwinana Ammonia Project (KAP).	To protect the biota and amenity of Cockburn Sound.	• By selecting processes and equipment which give rise to the lowest discharges of nitrogen and phosphorus. (The selection of cooling water treatment process is of particular significance). • By continuing the implementation of measures to reduce discharges from other sources on CSBP's Kwinana site.	• Before construction. • By 1 January 2000	DEP	• Confirmation of advice on expected N+P discharges contained in CER. • Monitoring and reporting site discharges as required under current licence conditions
2. The proponent will seek to reduce discharges of greenhouse gases from the Kwinana Ammonia Project.	To minimize the effects of global warming arising from the discharge of greenhouse gases to the atmosphere.	• By implementing commercially viable opportunities to recover and reuse CO_2 discharged from the Kwinana Ammonia Project. • By incorporating, where practicable, advances in ammonia catalyst technologies which reduce the generation of CO_2 from the production of ammonia.	• Ongoing. • Ongoing.	Office of Greenhouse Challenge.	Include new ammonia plant in annual reporting of Greenhouse Gas Inventories.
3. The proponent will ensure that noise generated from the Kwinana Ammonia Project will not exceed current regulations.	To maintain the amenity of nearby industrial, residential and recreational areas.	• By specifying the procurement of equipment which complies with current requirements. • By conducting noise surveys of the operating plant and implementing noise abatement measures if non-compliance is detected.	• Before construction. • Within 6 months of commissioning.	DEP	Reporting of results of surveys and agreeing plans to achieve attenuation if required.
4. The proponent will minimize the risk to the community arising from the operation of the Kwinana Ammonia Project.	To protect the nearby communities from exposure to unacceptable levels of risk to health and safety.	• By preparing and implementing a comprehensive Safety Management System for the operation of the plant. • By incorporating risk reduction measures recommended by Quantarisk into plant design.	• Before commissioning. • Completed as at 1/1/1998.	DME	• Approval of the SMS** by relevant authorities. • Regular independent audit of compliance with the SMS** reported to the DME. •
5. The proponent will minimize the risk to persons involved in construction of the KAP from the operation of adjacent plants on the Kwinana site.	To protect the health and well being of people employed in the construction of the KAP.	By preparing and implementing a Construction Safety Management Plan.	Before construction.	DEP DME	Auditing and reporting as required by the plan.
6. The proponent will revise the preliminary risk assessment for the project.	To demonstrate compliance with EPA criteria at fenceline with BP and reduction of cumulative risk level for whole CSBP site.	Revise preliminary risk assessment and include knock-on effects, loss of control releases, mitigation measures to meet ALARP*, sensitivity analysis with respect to probit equations and weather data.	Before construction.	DME DEP	The EPA's criteria for individual fatality risk off-site.
7. The proponent will conduct a final quantified risk assessment on the project.	To confirm that the final plant design meets EPA risk criteria and that there is a reduction in risk for the whole CSBP site.	Conduct final risk assessment taking into account final plant design.	Before commissioning.	DME DEP	The EPA's criteria for individual fatality risk off-site.
8. The proponent will decommission the existing ammonia plant, following commissioning and stabilisation of the new plant.	To ensure that decommissioning is carried out in an environmentally acceptable manner.	Prepare and implement a Decommissioning Management Plan.	At least 6 months before decommissioning.	DEP	The EPA's requirement.

* - As Low As Reasonably Practicable.

** - Safety Management System.

Appendix 4

Recommended Environmental Conditions
and Proponent's Consolidated Commitments

Statement No.

Recommended Environmental Conditions

STATEMENT TO AMEND CONDITIONS APPLYING TO PROPOSALS (PURSUANT TO THE PROVISIONS OF SECTION 46 OF THE ENVIRONMENTAL PROTECTION ACT 1986)

KWINANA AMMONIA PROJECT, KWINANA INDUSTRIAL AREA
(Including Storage*, Import* and Export of Ammonia)

Note: Asterisks indicate that these components have been included from the PROPOSED AMMONIA-UREA PLANT AT KWINANA (Statement No. 034)

Proponent: Wesfarmers CSBP Limited

Proponent Address: PO Box 345, Kwinana WA 6167

Assessment Number: 1468

Previous Assessment Numbers: 020 and 1140

Previous Statement Numbers: Statement No. 034 published on 2 August 1988, Statement No. 470 published on 18 March 1998.

Report of the Environmental Protection Authority: Bulletin 1094

Previous Reports of the Environmental Protection Authority: Bulletins 309 and 882.

The above proposals, with the exception of the manufacture of ammonia-urea (as referred to in Statement No. 034), are now subject to the following conditions and procedures which replace all previous conditions and procedures relating to ammonia production (Statement No. 470), ammonia storage and import/export (Statement No. 034):

Procedural conditions

1 Implementation and Changes

1-1 The proponent shall implement the proposal as documented in schedule 1 of this statement subject to the conditions of this statement.

1-2 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment and Heritage determines, on advice of the Environmental Protection Authority, is substantial, the proponent shall refer the matter to the Environmental Protection Authority.

1-3 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment and

Heritage determines, on advice of the Environmental Protection Authority, is not substantial, the proponent may implement those changes upon receipt of written advice.

2 Proponent Commitments

2-1 The proponent shall implement the environmental management commitments documented in schedule 2 of this statement.

2-2 The proponent shall implement subsequent environmental management commitments which the proponent makes as part of the fulfilment of the conditions in this statement.

3 Proponent Nomination and Contact Details

3-1 The proponent for the time being nominated by the Minister for the Environment and Heritage under section 38(6) or (7) of the Environmental Protection Act 1986 is responsible for the implementation of the proposal until such time as the Minister for the Environment and Heritage has exercised the Minister's power under section 38(7) of the Act to revoke the nomination of that proponent and nominate another person as the proponent for the proposal.

3-2 If the proponent wishes to relinquish the nomination, the proponent shall apply for the transfer of proponent and provide a letter with a copy of this statement endorsed by the proposed replacement proponent that the proposal will be carried out in accordance with this statement. Contact details and appropriate documentation on the capability of the proposed replacement proponent to carry out the proposal shall also be provided.

3-3 The nominated proponent shall notify the Department of Environmental Protection of any change of contact name and address within 60 days of such change.

4 Commencement and Time Limit of Approval

4-1 The proponent shall provide evidence to the Minister for the Environment and Heritage within five years of the date of this statement that the proposal has been substantially commenced or the approval granted in this statement shall lapse and be void.

Note: The Minister for the Environment and Heritage will determine any dispute as to whether the proposal has been substantially commenced.

4-2 The proponent shall make application for any extension of approval for the substantial commencement of the proposal beyond five years from the date of this statement to the Minister for the Environment and Heritage, prior to the expiration of the five-year period referred to in condition 4-1.

The application shall demonstrate that:

- the environmental factors of the proposal have not changed significantly;
- new, significant, environmental issues have not arisen; and
- all relevant government authorities have been consulted.

Note: The Minister for the Environment and Heritage may consider the grant of an extension of the time limit of approval not exceeding five years for the substantial commencement of the proposal.

Environmental conditions

5 Compliance Audit and Performance Review

5-1 The proponent shall prepare an audit program in consultation with and submit compliance reports to the Department of Environmental Protection which address:

- the implementation of the proposal as defined in schedule 1 of this statement;
- evidence of compliance with the conditions and commitments; and
- the performance of the environmental management plans and programs.

Note: Under sections 48(1) and 47(2) of the *Environmental Protection Act 1986*, the Chief Executive Officer of the Department of Environmental Protection is empowered to audit the compliance of the proponent with the statement and should directly receive the compliance documentation, including environmental management plans, related to the conditions, procedures and commitments contained in this statement.

Usually, the Department of Environmental Protection prepares an audit table which can be utilised by the proponent, if required, to prepare an audit program to ensure that the proposal is implemented as required. The Chief Executive Officer is responsible for the preparation of written advice to the proponent, which is signed off by either the Minister or, under an endorsed condition clearance process, a delegate within the Environmental Protection Authority or the Department of Environmental Protection that the requirements have been met.

5-2 The proponent shall submit a performance review report every five years after the start of the operations phase, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority, which addresses:

- the major environmental issues associated with the project; the targets for those issues; the methodologies used to achieve these; and the key indicators of environmental performance measured against those targets;
- the level of progress in the achievement of sound environmental performance, including industry benchmarking, and the use of best available technology where practicable;
- significant improvements gained in environmental management, including the use of external peer reviews;
- stakeholder and community consultation about environmental performance and the outcomes of that consultation, including a report of any on-going concerns being expressed; and
- the proposed environmental targets over the next five years, including improvements in technology and management processes.

6 Decommissioning Plans

6-1 Prior to construction, the proponent shall prepare, and subsequently implement, a Preliminary Decommissioning Plan, which provides the framework to ensure that the site is left in an environmentally acceptable condition to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

The Preliminary Decommissioning Plan shall address:

1) rationale for the siting and design of plant and infrastructure as relevant to environmental protection, and conceptual plans for the removal or, if appropriate, retention of plant and infrastructure;

2) a conceptual rehabilitation plan for all disturbed areas and a description of a process to agree on the end land use(s) with all stakeholders;

3) a conceptual plan for a care and maintenance phase; and

4) management of noxious materials to avoid the creation of contaminated areas.

6-2 At least six months prior to the anticipated date of decommissioning, or at a time agreed with the Environmental Protection Authority, the proponent shall prepare a Final Decommissioning Plan designed to ensure that the site is left in an environmentally acceptable condition to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

The Final Decommissioning Plan shall address:

1) removal or, if appropriate, retention of plant and infrastructure in consultation with relevant stakeholders;

2) rehabilitation of all disturbed areas to a standard suitable for the agreed new land use(s); and

3) identification of contaminated areas, including provision of evidence of notification and proposed management measures to relevant statutory authorities.

6-3 The proponent shall implement the Final Decommissioning Plan required by condition 6-2 until such time as the Minister for the Environment and Heritage determines, on advice of the Environmental Protection Authority, that the proponent's decommissioning responsibilities have been fulfilled.

6-4 The proponent shall make the Final Decommissioning Plan required by condition 6-2 publicly available, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

7 Work Practices

7-1 Prior to commencement of construction, the proponent shall submit a written prescription for contractor work practices covering plant and pipeline construction and operation, to ensure that work practices are carried out at the level of international best practice, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

7-2 The proponent shall ensure that the prescription of work practices required by condition 7-1 is implemented, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

Procedures

1 Where a condition states "to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority", the Chief Executive Officer of the Department of Environmental Protection will obtain that advice for the preparation of written advice to the proponent.

2 The Environmental Protection Authority may seek advice from other agencies, as required, in order to provide its advice to the Chief Executive Officer of the Department of Environmental Protection.

Notes

1 The Minister for the Environment and Heritage will determine any dispute between the proponent and the Environmental Protection Authority or the Department of Environmental Protection over the fulfilment of the requirements of the conditions.

Schedule 1

PROPOSAL

The new ammonia plant will be located immediately to the east of the existing ammonia plant at the CSBP site, within the Kwinana Industrial Area (attached Figures 1 and 2).

The ammonia project involves construction and operation of:

- a new 650 tpd or 225,000 tpa ammonia plant; and
- ancillary equipment to support the ammonia plant including:
    - installation of a 25 tonne per hour (tph) natural gas fuelled steam boiler for use during plant start-up and shutdown operations;
    - "polishing water unit" to produce boiler quality feed water by treating demineralised water from an existing CSBP water treatment plant; and
    - a cooling water tower.

The plant will be integrated with a number of existing CSBP facilities during its operation (attached Figure 3).

This project does not include the transport and distribution of ammonia throughout the State. The preliminary layout of the components of the plant is shown in Figure 4 (attached).

The general arrangement of the plant will include the following sections:

1 reforming;
2 synthesis loop;
3 carbon dioxide removal;
4 heat exchange/cooling;
5 water polishing unit;
6 ammonia synthesis;
7 power generation;
8 process and motor control centre;
9 refrigeration;
10 groundwater bore; and
11 storage.

The main characteristics of the proposal are summarised in Table 1 (attached).

The new ammonia plant will incorporate the Haldor Topsøe technology, for which a licence was made available to CSBP by Technipetrol SpA of Italy.

The process flow diagram (attached Figure 5) shows various stages of the ammonia production process, which include:

1 desulphurisation of natural gas feed (methane);
2 reforming of methane and steam to carbon monoxide and hydrogen;
3 shift conversion of carbon monoxide to carbon dioxide;
4 removal of carbon dioxide by absorption;
5 purification of "synthesis gas" by methanation;
6 compression of the "synthesis gas";
7 synthesis of ammonia from "synthesis gas"; and
8 refrigeration and storage of ammonia.

Following commissioning and stabilisation of the new plant, the existing plant will be shutdown and in due course dismantled.

PROPOSAL TABLE AND FIGURES

Table 1: Key proposal characteristics (approved and proposed extension) (Assessment No. 1468)

Proposal Characteristics	Unit	Ammonia Plant (including storage and import/export)
Capacity	tonnes per day NH_3	650
	tonnes per annum NH_3	225,000
Natural Gas Consumption	Gigajoules/tonne NH_3	32 - 34
	Petajoules/year	7.4
Water Consumption	tonnes per day	6,000 (make-up)
Location	-	CSBP Kwinana
<u>Gaseous emissions:</u>		
NO_x (as NO_2)	kg/tonne NH_3	0.54
	kg/day	350
CO_2	tonnes/tonne NH_3	1.8
	tonnes per day	1,200
Fugitive Gases:-		
• NH_3	-	flared
• H_2	-	flared
<u>Aqueous discharge:</u>		
Cooling System (including polishing unit blowdown)	-	recirculating treated sub-artesian water
Flow	tonnes per day	2,100
Heat Load	-	mainly to atmosphere
Nitrogen	kg/day	6 - 10
Phosphorus	kg/day	6
Oily water	-	de-oiled to contain less than 30 ppm of oil
Noise at boundaries	59 dB(A) at BP boundary	will comply with regulations
Ammonia storage	No.1 tank	10,000 tonnes
	No. 2 tank	30,000 tonnes
Ammonia transfers (import/export)	Transfers per calendar year	Maximum of 9 transfers

Schedule 2

Proponent's Consolidated Environmental Management Commitments

26 March 2003

KWINANA AMMONIA PROJECT
KWINANA INDUSTRIAL AREA
(Assessment No. 1468)

WESFARMERS CSBP LIMITED

SCHEDULE 2

KWINANA AMMONIA PROJECT, KWINANA INDUSTRIAL AREA (INCLUDING STORAGE, IMPORT AND EXPORT OF AMMONIA) (Assessment No. 1468)

Note: The term "commitment" as used in this schedule includes the entire row of the table and its six separate parts as follows:

- a commitment and number;
- the objective of the commitment;
- the "action" to be undertaken by the proponent;
- the timing requirements of the commitment;
- the body/agency to provide technical advice to the Department of Environmental Protection; and
- the measurement/compliance criteria.

COMMITMENT	OBJECTIVE	ACTION	TIMING	WHOSE ADVICE	MEASUREMENT/ COMPLIANCE CRITERIA
1. Minimize the impacts of discharges of phosphorus and nitrogen from the plant.	To protect the biota and amenity of Cockburn Sound.	• By selecting processes and equipment which give rise to the lowest discharges of nitrogen and phosphorus. (The selection of cooling water treatment process is of particular significance). • By continuing the implementation of measures to reduce discharges from other sources on CSBP's Kwinana site.	• Before construction • By 1 January 2000		• Confirmation of advice on expected N+P discharges contained in CER. • Monitoring and reporting site discharges as required under current licence conditions
2. Seek to reduce discharges of greenhouse gases from the plant.	To minimize the effects of global warming arising from the discharge of greenhouse gases to the atmosphere.	• By implementing commercially viable opportunities to recover and reuse CO_2 discharged from the plant. • By incorporating, where practicable, advances in ammonia catalyst technologies which reduce the generation of CO_2 from the production of ammonia.	• Ongoing • Ongoing	Greenhouse Challenge Office (Federal Government).	• Include new ammonia plant in annual reporting of Greenhouse Gas inventories.
3. Ensure that noise generated from the Kwinana Ammonia Project will not exceed current regulations.	To maintain the amenity of nearby industrial, residential and recreational areas.	• By specifying the procurement of equipment which complies with current requirements. • By conducting noise surveys of the operating plant and implementing noise abatement measures if non-compliance is detected.	• Before construction • Within 6 months of commissioning		• Reporting of results of surveys and agreeing plans to achieve attenuation if required.
4. Minimize the risk to the community arising from the operation of the plant.	To protect the nearby communities from exposure to unacceptable levels of risk to health and safety.	• By preparing and implementing a comprehensive Safety Management System (SMS) for the operation of the plant. • By incorporating risk reduction measures recommended by Quantarisk into plant design.	• Before commissioning • Completed as at 1/1/1998	DoIR	• Approval of the SMS** by relevant authorities. • Regular independent audit of compliance with the SMS** reported to the DOIR.
5. Minimize the risk to persons involved in construction of the plant from the operation of adjacent plants on the Kwinana site.	To protect the health and well being of people employed in the construction of the plant.	• By preparing and implementing a Construction Safety Management Plan.	• Before construction	DoIR	• Auditing and reporting as required by the plan.

COMMITMENT	OBJECTIVE	ACTION	TIMING	WHOSE ADVICE	MEASUREMENT/ COMPLIANCE CRITERIA
6. Revise the preliminary risk assessment for the project.	To demonstrate compliance with EPA criteria at fenceline with BP and reduction of cumulative risk level for whole CSBP site.	• Revise preliminary risk assessment and include knock-on effects, loss of control releases, mitigation measures to meet ALARP*, sensitivity analysis with respect to probit equations and weather data.	• Before construction	DoIR	• The EPA's criteria for individual fatality risk off-site.
7. Conduct a final quantified risk assessment on the project.	To confirm that the final plant design meets EPA risk criteria and that there is a reduction in risk for the whole CSBP site.	• Conduct final risk assessment taking into account final plant design.	• Before commissioning	DoIR	• The EPA's criteria for individual fatality risk off-site.
8. Decommission the existing ammonia plant, following commissioning and stabilisation of the new plant.	To ensure that decommissioning is carried out in an environmentally acceptable manner.	• Prepare and implement a Decommissioning Management Plan.	• At least 6 months before decommissioning		• The EPA's requirement.
9. Limit ammonia import/export operations to no more than 9 transfers per annum.	To protect nearby industry, public recreation areas and communities from unacceptable safety impacts.	• Ensure effective testing and maintenance procedures in line with the SMS • Include in the Ammonia Safety Report	• Ongoing	DoIR	• No more than 9 operations in a calendar year.

* - As Low As Reasonably Practicable.
** - Safety Management System.
1 - Ammonia Import/Export Sensitivity Analysis, Det Norske Veritas, Jan 2003
~~DoIR – Department of Industry and Resources~~
SMS – Safety Management System

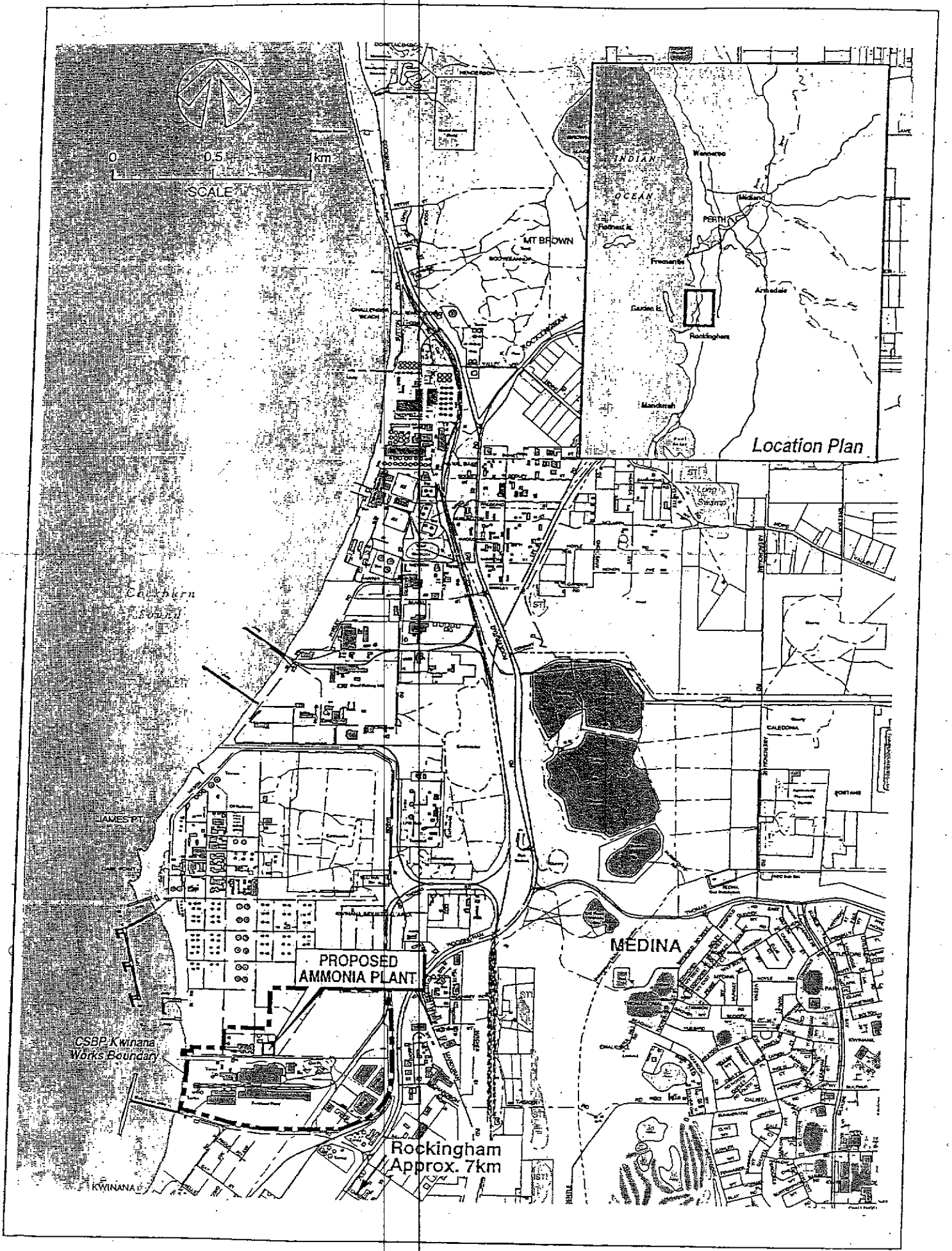


Figure I. Location map.

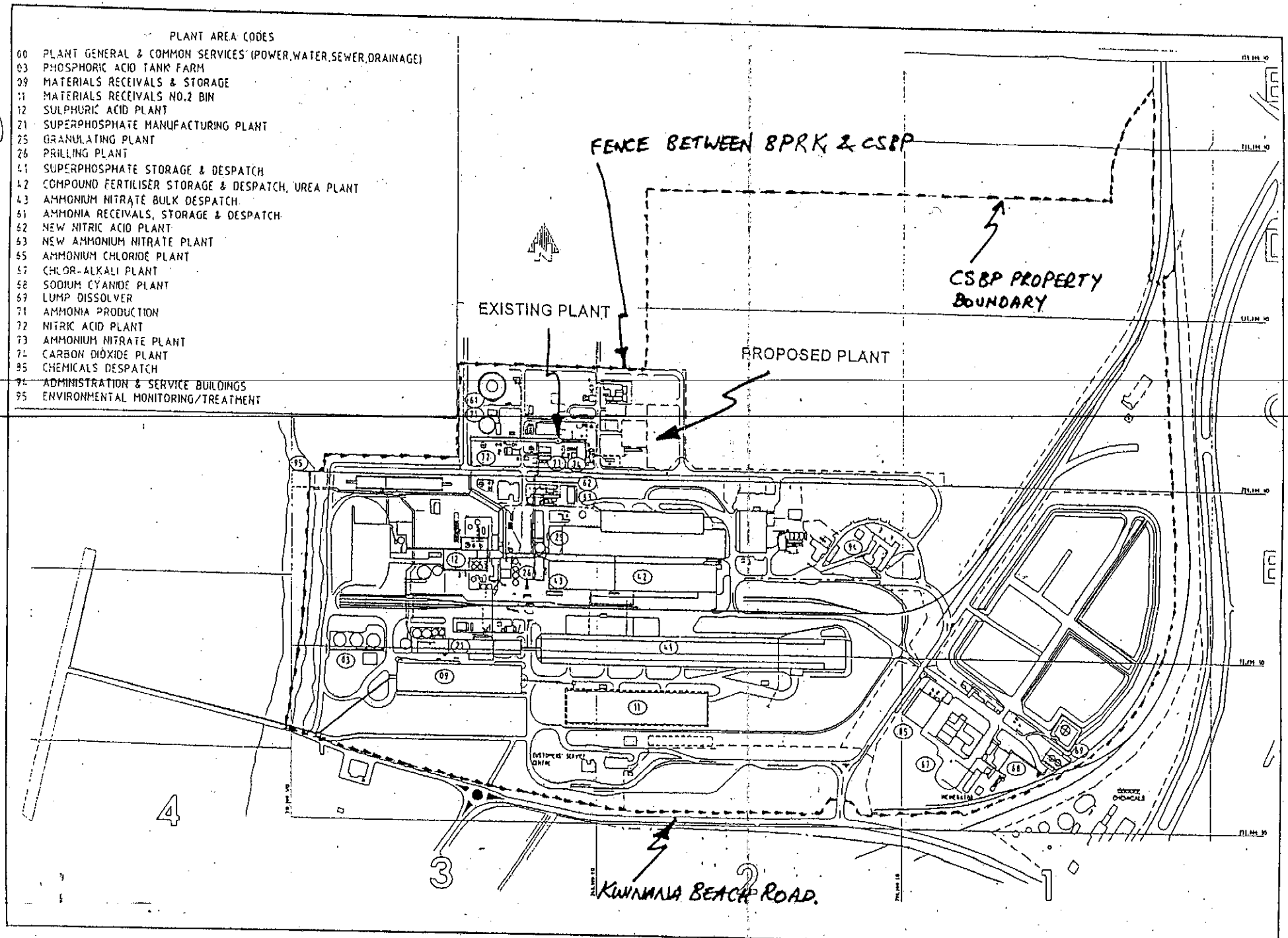


Figure 2. Proposed ammonia plant location.

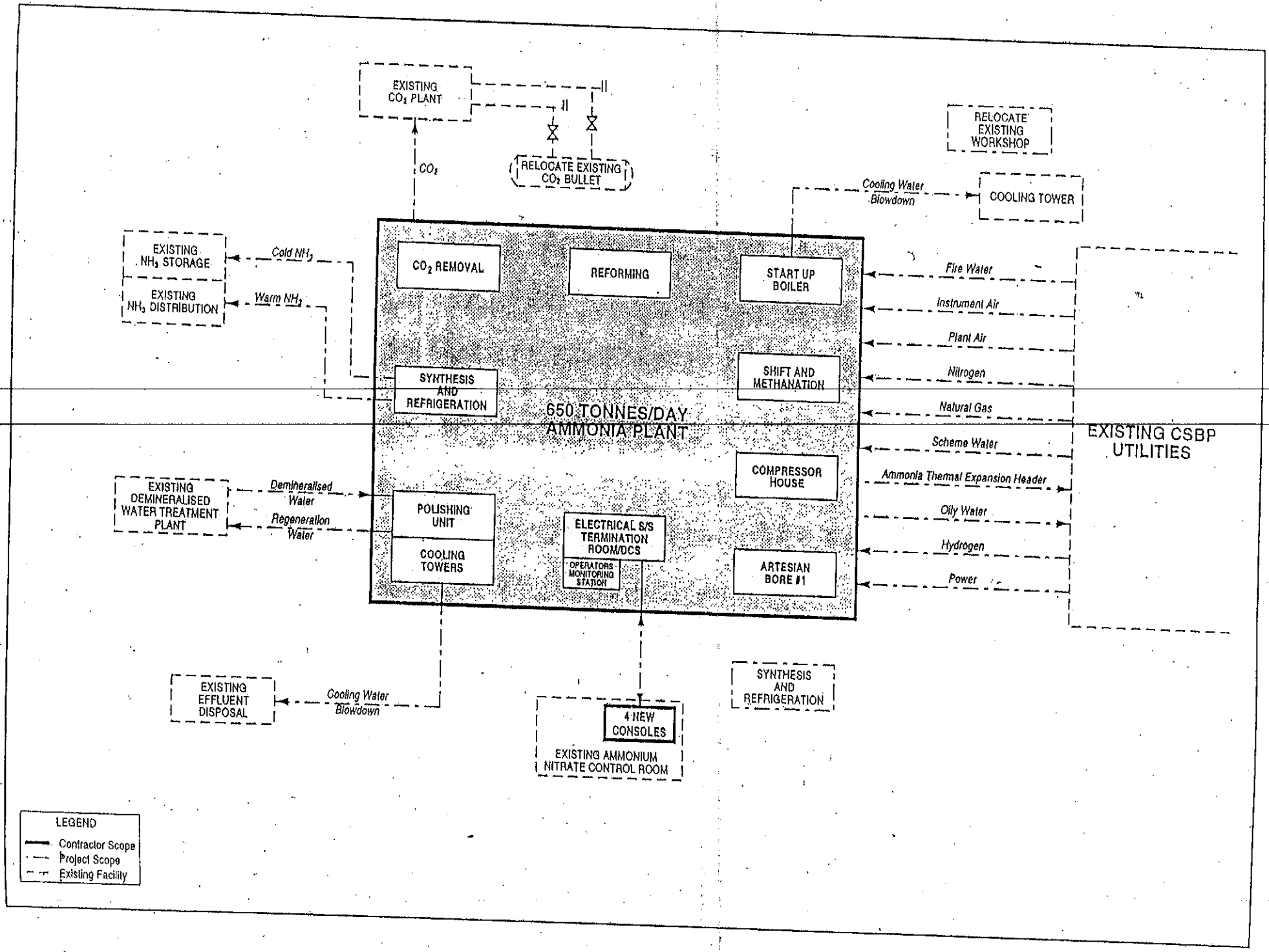


Figure 3. Project integration with existing CSBP facilities.

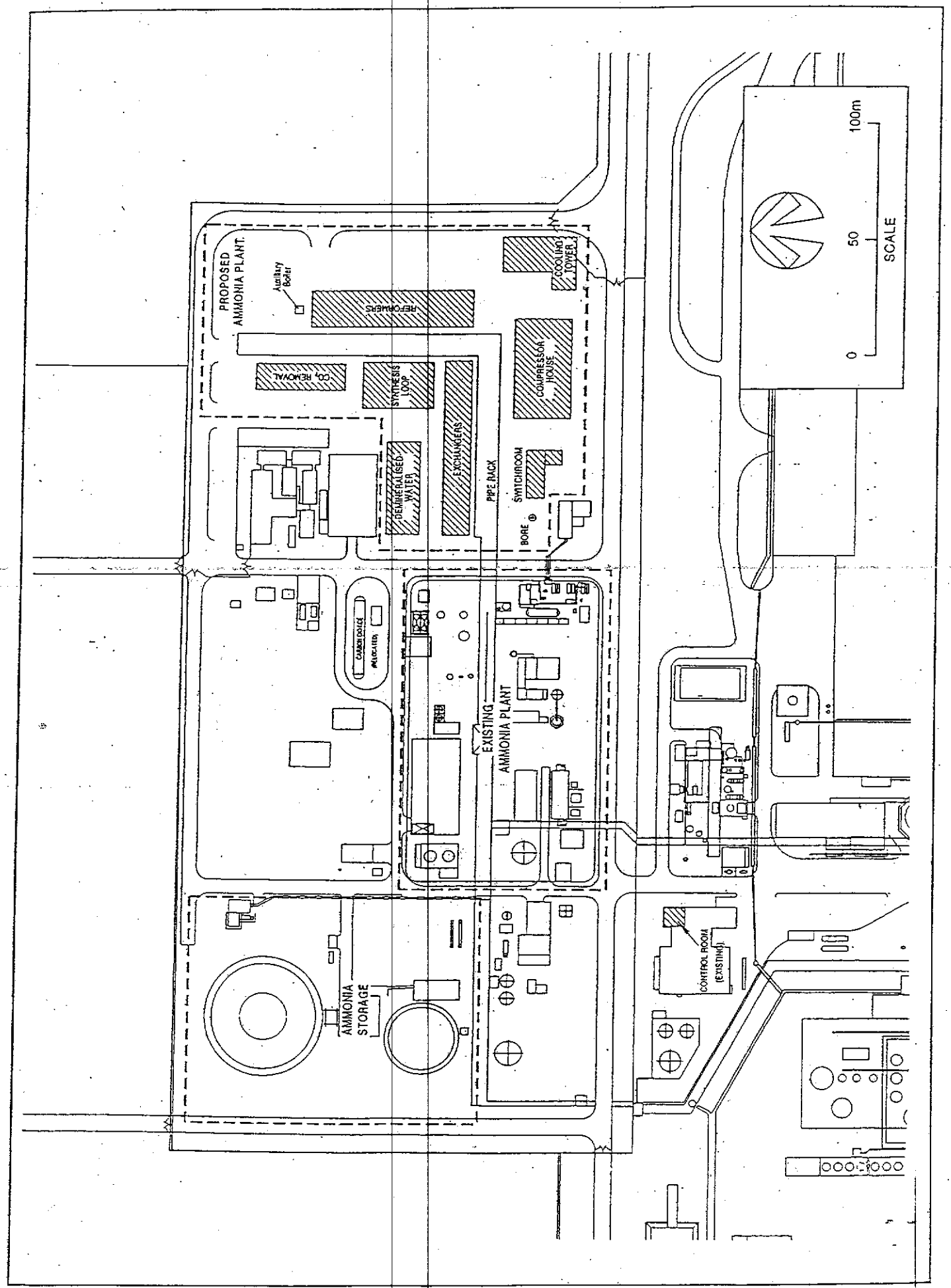
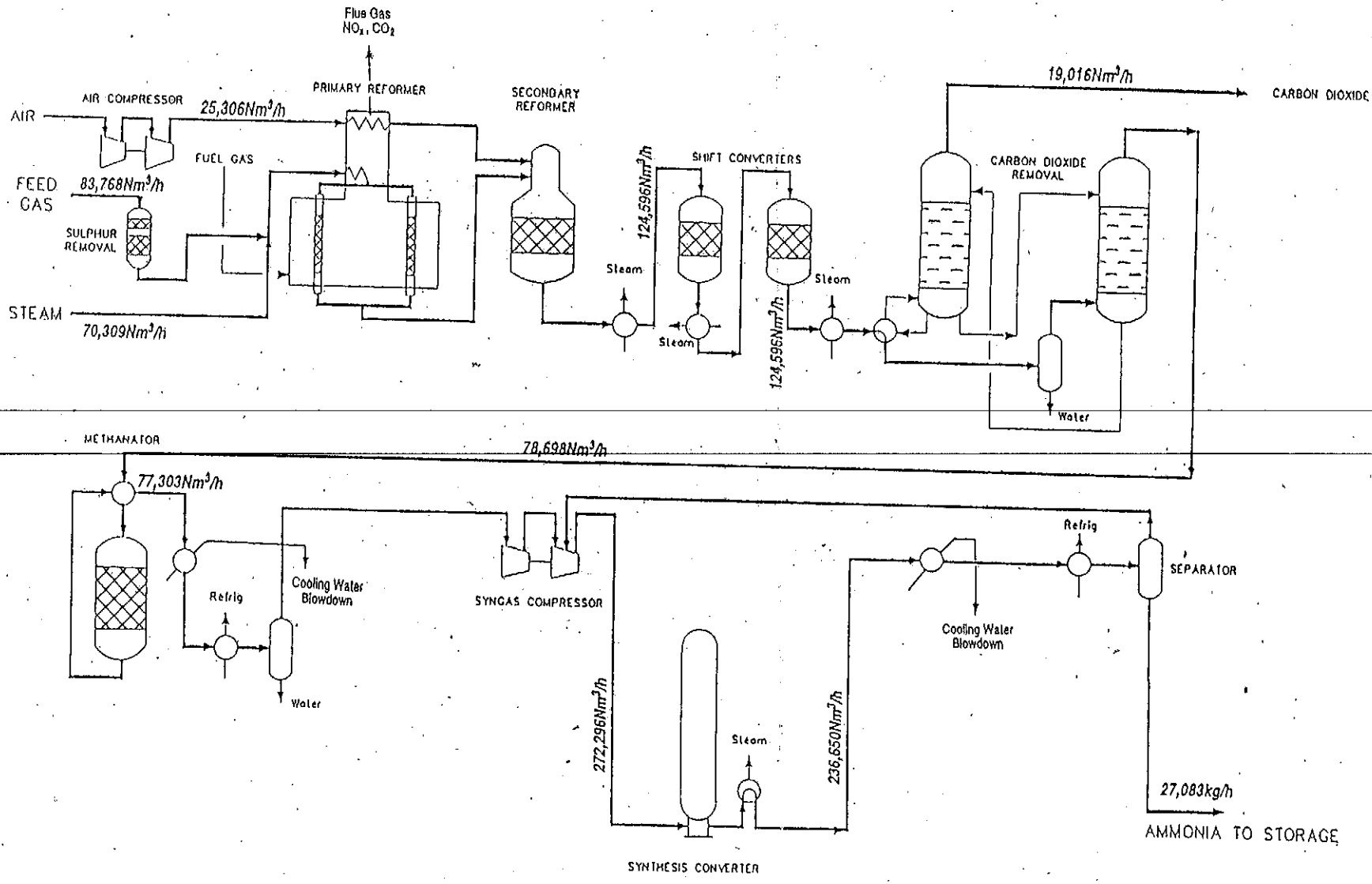


Figure 4. Proposed ammonia plant layout.

Figure 5. Process flow chart.



NOTES:

Nm^3/h denotes normal cubic metres per hour. (at 0°C, 760mmHg)

kg/h denotes kilograms per hour.

Data supplied by CSBP.