

PUBLIC ENVIRONMENTAL REPORT

CALTEX

NORTH FREMANTLE TERMINAL EXTENSION



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PUBLIC ENVIRONMENTAL REPORT

CALTEX NORTH FREMANTLE

TERMINAL EXTENSION

PREPARED FOR: CALTEX OIL (AUSTRALIA) PTY. LTD.

PREPARED BY: CCD AUSTRALIA, CONSULTING ENGINEERS
AND CALTEX OIL (AUSTRALIA) PTY. LTD.

DATE : OCTOBER, 1990.

CONTENTS

	Page No
HOW TO MAKE PUBLIC SUBMISSIONS	iii
SUMMARY	iv
1.0 INTRODUCTION	1
1.1 Project	1
1.2 Purpose of the Public Environmental Report	3
1.3 Parties Involved	3
1.4 Authorities Consulted	4
2.0 DESCRIPTION OF PROPOSAL	6
2.1 Proposed Location	6
2.2 Structure Plan	7
2.3 Extension Works	7
2.4 Public Participation	9
2.5 Timing for the Proposal	9
3.0 OPERATIONAL PROCESSES	10
3.1 Product Movement	10
3.2 Product Turnover	11
3.3 Road Tanker Loading	12
3.4 Rail Tanker Loading	12
3.5 Lube Oil	13
3.6 Oil Product Storage	13
3.7 Fire Protection	14
3.8 Boiler System	14
3.9 Safety Systems	14
4.0 ENVIRONMENTAL ASSESSMENT	16
4.1 Existing Environment	16
4.2 Identification of Issues	16
4.3 Site Works	17
4.4 Construction	17
4.5 New Storage Tanks	17
4.6 Fuel Storage - Risk and Hazard Assessment	18
4.7 Infra-structure	25
4.8 Transport	26
4.9 Discharges from the Site	26
5.0 MANAGEMENT PROCEDURES	29
5.1 Control Systems	29
5.2 Engineering Codes and Standards	30
5.3 Upgraded Fire and Spillage Control	31
5.4 Terminal Operating Procedures	31
5.5 Risk Management	32
5.6 Transportation	33
5.7 Decommissioning of Surplus Installations	34
5.8 Landscaping and Aesthetics	34
6.0 ENVIRONMENTAL MANAGEMENT COMMITMENTS	35
7.0 CONCLUSION	38

GLOSSARY AND NOMENCLATURE

39

REFERENCES

40

FIGURES

- FIG. 1 Terminal Locations
- FIG 2. Proposed structure plan
- FIG. 3. Proposed site layout
- FIG. 4. Terminal Flow diagram
- FIG. 5. Photo montage view of new tanks from North Fremantle Residential Area
- FIG. 6. Photo montage view of new tanks from Stirling Highway
- FIG. 7. Knutsford Street Depot Risk Contours
- FIG. 8. Existing Caltex Terminal Risk Contours
- FIG. 9. Proposed Caltex Terminal Risk Contours
- FIG.10. North Fremantle Area Risk Contours at present
- FIG.11. North Fremantle Area Risk Contours after proposed consolidation
- FIG.12. Proposed pollution control system

APPENDICES

- APPENDIX A. Draft Guidelines for Caltex Oil (Australia) Pty. Ltd. Proposed Tank Farm Expansions - Bracks Street, North Fremantle.
- APPENDIX B. Environmental Assessment Procedure.
- APPENDIX C. Ampol Limited involvement
- APPENDIX D. Caltex North Fremantle Oil Terminal - Risk Analysis Summary
- APPENDIX E. Caltex Oil, Marketing and Operations Manual - Volume 3, Fire Safety and Environmental Control - Content Outline.

HOW TO MAKE PUBLIC SUBMISSIONS

The Environmental Protection Authority (EPA) invites submissions on this proposal.

Following receipt of comments from government agencies and the public, the EPA will discuss the issues raised with the proponent, and may ask for further information. The EPA will then prepare its assessment report which will make recommendations to Government, taking into account issues raised in the public submissions.

WHY WRITE A SUBMISSION?

A submission is a way to provide information, express your opinion and put forward your suggested course of action including any alternative approach. It is useful if you indicate any suggestions you have to improve the proposal.

All submissions received will be acknowledged.

DEVELOPING A SUBMISSION

You may agree or disagree, or comment on, the general issues associated with the proposal or with specific issues. It helps if you give reasons for your conclusions, supported by relevant data.

You may make an important contribution by suggesting ways to make the proposal environmentally more acceptable.

When making comments on specific issues

- clearly state your point of view;
- indicate the source of your information or argument if this is applicable; and
- suggest recommendations, safeguards or alternatives.

POINTS TO KEEP IN MIND

By keeping the following points in mind, you will make it easier for your submission to be analysed.

Attempt to list points so that the issues raised are clear. A summary of your submission is helpful. Refer each point to the appropriate section, chapter or recommendation in the document describing the proposal. If you discuss sections of the proposal keep them distinct and separate, so there is no confusion as to which section you are considering.

Attach any factual information you wish to provide and give details of the source. Make sure your information is accurate.

Please indicate whether your submission can be quoted, in part or in full, by the EPA in its Assessment Report. A list of those groups or individuals making submissions is usually included in the Environmental Protection Authorities assessment reports, unless there is a specific request that the group or individual not be listed.

REMEMBER TO INCLUDE

YOUR NAME / ADDRESS / DATE

SUBMISSIONS SHOULD BE ADDRESSED TO:

The Chairman
Environmental Protection Authority
1 Mount Street
PERTH WA 6000

Attention: Mr S Watson

SUMMARY

Caltex Oil (Australia) Pty. Ltd. intends to consolidate its metropolitan terminal operations by extending its terminal in Bracks Street, North Fremantle.

Continued terminal operations in North Fremantle are of strategic importance to Caltex, Fremantle Port Authority and Westrail.

The terminal extensions will be northward of the existing site and include the erection of seven new storage tanks, closure and relocation of Walter Place and removal of old rail sidings.

As a consequence of the extension, Caltex and Ampol will de-commission their installations in Port Beach Road and return the site to the Fremantle Port Authority for public use.

Caltex will also terminate its use of the Commonwealth Storage Tanks in Knutsford Street, Fremantle and the inter-connecting pipeline.

A preliminary risk assessment undertaken for the proposal and the cumulative impact of the oil industry operations at North Fremantle showed that the level of individual risk at residential areas was within the Environmental Protection Authorities guidelines of one fatality per million hours of exposure.

The level of risk for the beach front users and the residents around Knutsford Street would be improved as a consequence of the proposal.

The impact of construction and operation of the extended terminal on the surrounding environment has been examined. Management actions have been identified to ensure minimisation of any adverse impacts.

Caltex would operate the terminal under a comprehensive set of safety systems to guard against fire, spillage and environmental degradation.

Landscaping and facade work on installations would be undertaken to provide screening and to maintain an acceptable public perception of the terminal.

PUBLIC ENVIRONMENTAL REPORT
CALTEX NORTH FREMANTLE TERMINAL EXTENSION

1.0 INTRODUCTION

1.1. PROJECT

Caltex Oil (Australia) Pty. Ltd. intends to consolidate its operations in the Perth Metropolitan Region at its terminal in Bracks Street, North Fremantle.

Ampol Limited has agreed to also rationalise its operations and participate in the venture. Correspondence indicating their intent is shown in Appendix C. The consolidation will involve extension of the existing terminal to replace the capacity of the Ampol Terminal in Port Beach Road, North Fremantle, tanks in the old Golden Fleece Terminal in Port Beach Road and tanks presently leased from the Commonwealth in Knutsford Street, Fremantle.

The location of the terminal in North Fremantle is of strategic importance to Caltex and to the Fremantle Port Authority in terms of both bulk cargo operations and servicing shipping in the Port. (IRM, P21.)

Caltex operates and maintains the terminal for the storage and distribution of refined petroleum products throughout Western Australia. Refined products are received from B.P. Refinery and marine tankers, via pipelines from the Kwinana area and Fremantle Port. These products are then distributed by a pipeline to the Port area and by road and rail tankers to other areas. Lubricating oils are blended on site, then packaged and distributed by road.

The consolidation of its operation in Bracks Street and upgrading of the site, including Ampol's participation, would involve a number of activities including :-

1. Relinquishing the present lease of the Commonwealth Government owned storage tanks in Knutsford Street, Fremantle.

2. Relinquishing the present lease of the pipeline from Knutsford Street tanks to the Bracks Street terminal.
3. Ceasing operations in the storage area on Port Beach Road (the old Golden Fleece Terminal), relocating the tanks to the Bracks Street terminal and releasing this land back to the Fremantle Port Authority for beach front development and community activities.
4. Ceasing Ampols operations of its Port Beach Road terminal in Fremantle and releasing this site back to the Fremantle Port Authority.
5. Relocating storage tanks from the de-commissioned sites and constructing new tanks at the Bracks Street terminal to achieve a similar total storage potential overall, upgrading of fire protection systems and liquid catchment systems in line with the additional volume of storage on the Bracks Street site.
6. Constructing bunded areas around the tanks.
7. Constructing new access roads and landscaping.

The consolidated terminal operations would not change dramatically from their present format.

Product transfers to the terminal would increase in line with present Ampol requirements.

Lubricating oil blending operations would increase in line with Ampol requirements. Packaged product distribution only would increase as all Ampol lubricating oils are routed through Caltex at present.

Product storage would increase in line with the relinquished storage of :-

-	Ampol	-	12930 kl
-	Old Golden Fleece	-	4350 kl
-	Knutsford Street	-	48400 kl

The total proposed product storage for the extended terminal would be 86,000 kl.

Road transfers of fuel oil products would increase in line with Ampol's present distribution. There would be no total increase of road traffic in the area, but all trips would originate at the Caltex terminal.

1.2.

PURPOSE OF THE PUBLIC ENVIRONMENTAL REPORT

Caltex referred the proposal to the Environmental Protection Authority for the Authority's consideration.

The Environmental Protection Authority assessed the referral and determined that a formal public review was appropriate. Details of the Environmental Protection Authority's requirements are shown in Appendix A.

The purpose of this document is to outline the activities involved in the project, identify any likely impacts on the existing environment and detail methods to control or ameliorate potentially adverse impacts.

The detail presented should be readily understood by the general public and in sufficient detail to demonstrate that the proponent has thoroughly examined the likely affects of the project and has incorporated appropriate measures to ensure that community standards are maintained.

This Public Environmental Report is submitted to the Environmental Protection Authority for assessment under Part IV of the Environmental Protection Act 1986.

A flow diagram explaining the Environmental Protection Authority's assessment procedure is shown in Appendix B.

1.3.

PARTIES INVOLVED

Caltex Oil Australia is the proponent for the development and is also the owner of the old Golden Fleece operations and the operator of fuel storage tanks in Knutsford Street, Fremantle on lease from the Commonwealth Government.

Ampol have reached an agreement with Caltex Oil to amalgamate their North Fremantle Fuel Depot into the proposed extension.

The Fremantle Port Authority have an interest in the project because of the importance of the operation with respect to both servicing and patronage of the Port.

Westrail are the owners of the land on which extensions will take place, and have offered Caltex a 50 year lease over the site and undertaken to remove obsolete rail sidings. Westrail have an interest in the project because of the value of the operation with respect to rail transport activities.

1.4.

AUTHORITIES CONSULTED

During the feasibility assessment of the project, Caltex held discussions with the following :-

- **FREMANTLE PORT AUTHORITY** - to determine Port requirements and to facilitate Government and project approvals.
- **WESTRAIL** - to determine land availability, track relocation works and to facilitate project approvals.
- **DEPARTMENT OF MINES** - to identify codes and regulations for technical requirements.
- **CITY OF FREMANTLE** - to advise Council of the project details and to establish planning and engineering requirements.
- **ENVIRONMENTAL PROTECTION AUTHORITY** - to identify requirements for environmental assessment of the project.
- **WATER AUTHORITY OF WESTERN AUSTRALIA** - to establish requirements for effluent discharge and drainage.
- **HEALTH DEPARTMENT OF W.A. (Pollution Control Division)** - to establish requirements for effluent discharge and drainage.
- **AMPOL, B.P. AUSTRALIA AND SHELL** - to determine the cumulative risks and hazards of the North Fremantle Area.

- **NORTH FREMANTLE RATEPAYERS ASSOCIATION** - to identify Community concerns and inform them of the project.

Details of correspondence with the above groups will be presented to the Environmental Protection Authority for their information.

On behalf of Westrail, Caltex prepared a structure plan for the area immediately surrounding the site. City of Fremantle has indicated support for the plan, subject to the following conditions :-

1. Walter Place shall remain open as a public road until alternative access to Port Beach Road has been constructed and dedicated as a public road.
2. The new access to Port Beach Road shall be designed to comply with the road design standards of the National Association of Australian State Road Authorities Standards. Details of the designs shall be submitted to the Council in the form of a separate development application.
3. A pedestrian accessway shall be provided at the southern end of the proposed Caltex lease to connect the new Port Beach Rail Station to Port Beach Road and vested in the Crown under Section 20A of the Town Planning and Development Act.
4. The pedestrian accessway shall be constructed and drained to the specification of the Director of Engineering Services.
5. Separate development applications for any extensions of the utilisation of existing leases for housing of containers shall be submitted to the Council for determination.

Caltex currently have before the City of Fremantle an application for development approval for the Terminal extension.

Formal approval of the proposal from the Decision Making Authorities is pending approval and advice from the Environmental Protection Authority.

2.0

DESCRIPTION OF PROPOSAL

2.1.

PROPOSED LOCATION

The location of the proposed Terminal Expansion is Bracks Street in North Fremantle, immediately north of the existing Caltex oil fuel terminal.

The location of the Terminal is shown in Figure 1.

Caltex selected the site for the following reasons :-

- . existing infrastructure and facilities in place at the current terminal.
- . required area of open flat land immediately adjacent to the site.
- . current terminal site owned freehold by the Company and occupied as a fuel Terminal for sixty two (62) years.
- . no record of complaint with respect to odours and public hazard
- . no serious industrial accidents at the current terminal
- . strategic location for servicing and patronage of the Fremantle Port.
- . strategic location for servicing the company's metropolitan fuel outlets.
- . would allow consolidation of operations of nearby old Golden Fleece and Ampol Terminals and the ultimate removal of these
- . suitable land use zoning in place.

The proposal is based upon expanding an existing facility and the consolidation of nearby similar activities.

Alternative locations for a new facility were not considered because of the need to utilise the existing network of pipelines from BP Australia and the Fremantle Port and of the opportunity to consolidate the operations of three North Fremantle Oil Terminals.

2.2. STRUCTURE PLAN

A structure plan shown in Figure 2 was prepared by the proponent to rationalise the road network in the area and the existing Westrail leaseholds.

The plan allows for the orderly development and improved accessibility, particularly in the case of emergency access around the fuel storage depots in Bracks Street.

The structure plan will be implemented as follows :-

- Westrail have undertaken to remove obsolete track, and to lay new rail lines.
- The Fremantle Port Authority and Westrail have undertaken to relinquish land for a new road network.
- Existing lessees have undertaken to relocate to new lease areas.
- Caltex have undertaken to fund the extension of Bracks Street to Port Beach Road and the closure of Walter Place between Bracks Street and Port Beach Road.
- Caltex and Westrail have undertaken to provide a new public accessway connecting the passenger rail station to the beach.

In conjunction with the modification to the road network, Fremantle Port Authority have indicated that they will upgrade Port Beach Road and improve the capacity of the Tydeman Road intersection. This should reduce the incidence of itinerant traffic using Bracks Street to bypass the traffic signals at Tydeman Road.

2.3. EXTENSION WORKS

The proposed extension works are shown in Figure 3 and include the following :-

- A new rail tanker loading facility which will improve tanker loading operations. Two tankers can be loaded simultaneously.
- Three new distillate tanks each 37 metres in diameter and 15 metres high with a storage capacity of 15,000 kl.

- One new petrol tank of 37 metres in diameter and 15 metres high with a storage capacity of 15,000 kl.
- Installation of three relocated (from Ampol) petrol tanks.
 - one of 3261 kl storage capacity
 - one of 6554 kl storage capacity
 - one of 2649 kl storage capacity
- Close the section of Walter Place to the North of the existing Caltex terminal.
- Release the land presently occupied by the old Golden Fleece terminal back to Port Authority.
- Construct a new access road to the East of the new terminal section and extend Bracks Street parallel to the extended terminal.
- Install new fire fighting systems, pump and fire water storage.
- Install new pollution control systems for water run off and spillage.
- Landscaping around new terminal section.

The fire fighting and water cooling systems installed will conform to AS 1940 - 1988 as will the bunding design for the new tanks. The bunding capacity will accommodate 100% of the volume of the largest tank plus 10% of the volume of the rest.

The proposed extensions will also involve the relocation of the Baguley's Container Storage Yard and the relocation or protection by easement of the water and Telecom's services located in Walter Place.

The existing rail car filling station will be relocated to optimise the storage capacity of the sidings.

The new developments will be constructed in accordance with the relevant industry standards and to the requirements of the Department of Mines.

Once extension works have been completed, Caltex and Ampol will immediately decommission and remove their nearby fuel storage facilities and return the land to the Fremantle Port Authority for public use. Further, Caltex will terminate their use of the Knutsford Street fuel storage tanks and the interconnecting pipeline which runs through the City of Fremantle.

2.4. PUBLIC PARTICIPATION

During the development and planning of the proposal, Caltex consulted with officers of the City of Fremantle, the Environmental Protection Authority and representatives of the North Fremantle Ratepayer's Association

Caltex Oil discussed the proposal with representatives of the Ratepayers Association and hosted them on a detailed inspection of the site and the existing North Fremantle Terminal. Full details of the proposed extensions were made available and input was invited. No major concerns were expressed and to date no formal comment has been received from the Association or its members.

2.5. TIMING FOR THE PROPOSAL

Caltex Oil and Ampol are keen for the project to take place as soon as possible. Caltex's operational and commercial commitments require that work be underway on the project early in the 1991 Calendar Year.

Westrail have undertaken to commence track relocation works as soon as formal approvals have been granted.

Detailed design of the new road system has been undertaken and documents are currently before the City of Fremantle for approval.

3.0

OPERATIONAL PROCESSES

3.1.

PRODUCT MOVEMENT

The Caltex Terminal is essentially a distribution depot for refined petroleum products with a blending operation producing various lubricating products for the motor and allied trades. A flow diagram of the operational process is shown in Figure 4.

Motor spirit and distillate products are imported then distributed by road, rail and pipeline. Lubricating oils are imported, blended to produce various "Trade Name" products and exported by road either in bulk or after packaging.

Motor spirit and distillate are imported from two sources :

- 1) **From British Petroleum Kwinana Refinery**
Two pipelines are installed from the refinery to feed all terminals in the North Fremantle area. The pipelines run directly to the BP Terminal where they are distributed to the other terminals (Caltex, Shell, Ampol) with a second distribution manifold located on Port Beach Road (opposite the Ampol Terminal) for Ampol/Caltex use. From this manifold a 250mm and 150mm pipeline connect to the Caltex Terminal for transfer of motor spirit and distillate.

- 2) **From No. 1 Berth Fremantle Port**
Import of distillate by ships to the terminal is via a 200mm pipeline from the No. 1 Berth. This pipeline also connects to the BP distribution manifold where the distillate can be directed to the storage vessels in Knutsford Street.

Pipelines used for importing of petroleum products are washed with water after transfer operations and then left filled with water from the distribution manifold to Caltex terminal until required for further transfer. The wash water is recovered and fed through the oil/water separation system at the Terminal.

Lubricating oil based products are imported via road tanker from the BP Kwinana refinery.

3.2.

PRODUCT TURNOVER

Expected Terminal throughput is as follows :

Motor Spirit	242,000 kl per year
Distillate	194,600 kl per year
Distribution	16 road tankers per day 14 rail tankers per day by pipeline to Victoria Quay - (ship fuel loading)
Lubricating Oils	13 road tankers per week
Distribution	2-3 road tankers per week rest by road transport - (drums/packages)

It is proposed that there will be eleven (11) tanks in the terminal which contain large quantities of flammable inventories with nine (9) tanks containing small amounts of blended oil products, products for blending and kerosene.

The fourteen (14) tanks at the old Golden Fleece and Ampol Terminals will be decommissioned and the four (4) tanks at the Knutsford Street Depot will cease to be used by Caltex.

All tanks in the terminal will have recently been refurbished or constructed and all internal pipelines will have been renewed as part of the terminal upgrade.

All tanks will be fitted with foam lines for foam addition in the event of fire. Tank levels will be indicated by float gauges with measurements taken before and after transfer. Transfer operations will be manual in all cases with operational presence at the tanks and, in the case of pipeline transfer, manual inspection of the pipeline.

When the tanks are out of service (not utilised for filling operations, overnight and holiday periods) they will be isolated with chains and locks.

All the tanks will be bunded in compliance with the Australian Standards AS 1940 for flammable storage.

Main transfer pumps for the flammable liquids are located within the sight of the various operational activities in a separate bunded area outside of the bunded tank areas.

3.3.

ROAD TANKER LOADING

A maximum of two (2) road tankers can be loaded at any one time. The loading bay is designed to load motor spirit (leaded or unleaded) or distillate in either bay.

The tankers are filled manually though under the control of a computerised system. A key card system is installed where both the driver and truck are identified by the computer and a predetermined (key punched) amount can be loaded. The driver connects to the loading system via a flexible loading arm equipped with camlock quick sealing valves. The loading quantity is keyed in (with computer check of the identified truck possible capacity) and under computer control the truck is loaded to the pre-set amount then isolated. Ramping of flow is also controlled during start and end of filling by computer.

Overfill protection is provided by a "Scully" plug on all road tankers which activates level probes in the tanker hatches. As soon as the probe senses a liquid level it automatically stops the loading by closing a solenoid operated valve.

A mechanical device is fitted to lock the tanker brakes and immobilise the tanker. Unless this device is activated, loading of the tanker is inhibited. Therefore until the filling pipe is properly disconnected and the Scully plug removed the tanker cannot be driven away. The Scully also provides earthing for any static potential.

All filling is by a closed bottom load system with vapour recovery hoses being utilised to remove any vapour generated during the filling.

The truck filling bay is equipped with heat sensors and fixed foam deluge systems in case of fire. Any spillage is routed via internal drains to an underground collection tank which flows to an oil/water separator system. Spillage control is discussed in more detail in Section 4.9 of this report.

3.4.

RAIL TANKER LOADING

Rail tanker loading is a manual operation requiring the presence of two operators at all times.

Loading is made through loading arms inserted to the tanker hatches and activation of the pre-set metering system to fill. Two operators are in attendance and a quick shut off trip system is available at the loading area.

When the pre-set quantity has been delivered the loading valve is closed automatically and the loading pump can be stopped manually as required.

It is possible to load two tankers simultaneously with either motor spirit or distillate as required.

Fire fighting equipment and hydrants are located nearby in case of fire, and spillage is contained by an internal drain system which feeds to an oil/water separator system. Spillage control is discussed in more detail in Section 4.9 of this report.

3.5. LUBE OIL

Lubricating oils, delivered by road tanker, are stored in four main storage tanks in the terminal. The oils are then transferred as required to the blending area or to tankers for distribution.

Blending operations are carried out in the terminal and are located in a large building used for both storage of packaged product and blending.

Oils are pumped from the lube oil storage tanks to small tanks in the blending area and then fed as required to various steam heated vats in the area. Blending and additive mixing is made on a batch basis and the blended products are filled into small tanks, drums or plastic containers as required.

All operations are manual with most of the terminal labour force located in this area.

3.6. OIL PRODUCT STORAGE

Products are stored in two areas :

- Purchased materials store, which is a section of the blending operations building. Average inventory in this building would be 100m³ of various products in drums, plastic containers, cans etc. Also in this area are pre-packaged grease, engine coolants and aerosols.
- Drum store, where drummed oils are stored prior to shipment. This area contains drums of grease, light oils and blended products. Average inventory would be 350m³.

3.7. FIRE PROTECTION

There is a fire water ring main on site with a dedicated storage of 450 kl capacity. There are two fire pumps both diesel driven with automatic pump start on loss of system pressure. Separate foam facilities exist for the fuel oil tank farm area and for road truck loading facilities. Foam lines are fitted to all motor spirit and distillate storage tanks.

A transponder is directly connected to the fire brigade which operates on start of a fire pump. Fire brigade arrival at site being assessed at 3 to 5 minutes. Caltex tests and maintains the fire water pumps on a weekly basis.

Fire extinguishers and portable foam facilities exist in the terminal at strategic locations. All employees are trained in fire fighting and undergo regular fire training drills.

3.8. BOILER SYSTEM

A low pressure oil fired boiler system exists on site to generate heating steam required for the lubricating oil storage tanks and blending vats.

3.9. SAFETY SYSTEMS

The following safety systems or procedures are incorporated into the terminal operations:

1. Alarm Systems :
 - a) Fire alarm push buttons at strategic locations
 - b) Automatic initiation of alarm to local fire brigade or fire pump start.

2. Fire Fighting Systems :
 - a) Fire water ring main with foam injection systems
 - b) Fixed deluge system with foam injection at road car filling bays
 - c) Portable foam systems
 - d) Extinguishers at strategic locations
 - e) Fire water emergency supply tank in case of mains failure
 - f) Availability of fire water cooling to tanks in emergency.
 - g) Fixed foam injection (manual) to all major tanks.

3. All tanks and pipelines isolated when not in use (overnight/weekends/holiday periods).
4. Bunding : Tank farm bund areas conform to AS 1940.
5. Spill Control : Drainage system with hydrocarbon separation units.
6. Mutual Aid System : All terminals (BP, Shell, Ampol, Caltex) have a mutual aid system where staff and materials are available immediately in an emergency situation.
7. Transfer Pipeline : Transfer pipelines (from BP Kwinana) are inspected (walked) while in use and left under water when not required.
8. Training : All personnel are trained in fire fighting.
9. Security : When the terminal is not staffed by Caltex (night/weekend etc.) security personnel make regular routine inspections.
10. Road Tanker Filling : This operation is under automatic control with various built in safety checks and systems, and under constant operational supervision.
11. Rail Tanker Loading : Constant operational presence by two employees during filling operations.

4.0

ENVIRONMENTAL ASSESSMENT

4.1.

EXISTING ENVIRONMENT

The existing terminal is located in an area of light industry, other petroleum products terminals and warehouses.

The current terminal site is zoned 'industrial' under the City of Fremantle Town Planning Scheme No. 3.

The proposed extension will cover Walter Place and an area presently occupied by Baguley's Container Storage. The land north of Walter Place is zoned 'Railways and Port Installation' under the City of Fremantle Town Planning Scheme No. 3. There is no intention to alter that zoning.

Both Westrail and Fremantle Port Authority have indicated that in the future they will require the land for such purposes. Caltex's use of the land would be by way of a 50 year lease from Westrail.

The site for the proposed extension is essentially flat and consists of vacant railway marshalling yards and bulk storage areas leased by Westrail to Baguley's and Bellway.

The nearest residential zone is to the east of Stirling Highway. The nearest dwelling is about 240 metres away from the Caltex terminal. A buffer zone of industrial development and railway land exists between the proposed terminal and the Stirling Highway.

Public amenities in the form of beaches and a Surf Lifesaving Club are immediately to the west of the Caltex terminal on Port Beach Road. The Surf Lifesaving Club is about 100m away.

4.2.

IDENTIFICATION OF ISSUES

An impact assessment matrix shown in Table 1 was used to identify issues requiring detailed examination. These issues are discussed in the following section with emphasis being placed on concerns expressed by the community regarding the fuel storage, the visual intrusion of the storage tanks and the amenity of the beach front.

CALTEX OIL RATIONALISATION OF STORAGE TANKS AND FUEL TERMINAL EXPANSION

ENVIRONMENTAL EFFECTS DEVELOPMENT	SOCIAL ENVIRONMENT								PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT			
	RECREATION	LANDSCAPE/VISUAL	HISTORICAL/CULTURAL	PERSONAL AND SOCIAL VALUES	RISKS AND HAZARDS	EXISTING LAND USES	LAND VALUE	EMPLOYMENT	LANDFORM	NUISANCE (NOISE, DUST, SMELL)	CLIMATE/ATMOSPHERE	FOUNDATION MATERIALS	GROUND WATER	PUBLIC UTILITIES	EROSION/LAND STABILITY	MARINE	URBAN LAND	FORESHORE
SITE WORKS										- 1								
CONSTRUCTION							+ 1			- 1				- 2				
<u>TERMINAL OPERATION</u>																		
- NEW TANKS	+ 2	- 1															+ 2	
- PETROL / OIL STORAGE	- 1			- 1	- 1													
- TRANSPORT					- 1													
<u>INFRASTRUCTURE</u>																		
- ROAD					+ 1	+ 1												
- RAIL		+ 1				+ 1	+ 1											
- SERVICES														- 1				
<u>DISCHARGES</u>																		
- GASEOUS	- 1			- 1	- 2	- 1												
- FUEL / OIL	- 2			- 2	- 2					- 2			- 2			- 2		- 2
- STORMWATER						- 1						- 1				- 2		- 1
- SEWAGE																		

POTENTIAL IMPACT IDENTIFIED



NATURE OF IMPACT

- + BENEFICAL
- ADVERSE

MAGNITUDE OF IMPACT

- 1 - MINOR
- 2 - MODERATE
- 3 - MAJOR

TABLE 1

4.3.

SITE WORKS

The site is a coastal location and has potential for noise and dust from siteworks to be experienced in the residential areas located immediately to the east. Fortunately a considerable proportion of the site is paved, as a result of its past railway operations, and Caltex will control any windborne sand and dust during the preparation of the site for construction. Construction works will take place only between the hours of 7.00am and 6.00pm on weekdays, or as required by the City of Fremantle. It is considered that noise omissions would not be excessive and that they would be in the same order as that created by the normal traffic flow along Stirling Highway.

4.4.

CONSTRUCTION

Construction of the project is likely to take fifty two (52) weeks and involve the expenditure of \$9.5 million dollars. It is expected that the project will create employment for a construction workforce of about 20 - 30 persons on site, plus off site fabrication.

Extensions to the terminal will require public utilities to be relocated or protected by way of easement. The utilities affected are water and Telecom. A 205mm steel water main running between Bracks Street and Port Beach Road, along Walter Place would require protection. Telecom cables running along Walter Place and servicing the Surf Lifesaving Club would require relocation along the proposed new road network.

Provision for the protection or relocation of these utilities will be made. Caltex will ensure that such works are effected to the satisfaction of the Utility Authorities concerned.

4.5.

NEW STORAGE TANKS

Immediate impact of the construction of the new storage tanks would be their visual intrusion into the skyline. Ratepayers of the North Fremantle residential area were concerned that the ocean vistas would be obscured.

Photo montage representations of the facility are shown in Figures 5 and 6. When viewed from the most prominent location in the North Fremantle residential area, the new tanks will not intrude above the horizon line of the sea. They will be in scale with the existing Port and infrastructure developments, and the vista would be improved once the old Golden Fleece tanks located on the foreshore are removed.

The tanks have the most dominant impact when viewed from Stirling Highway immediately adjacent to the site. The location of such facilities in this area, zoned "Industry", is not inconsistent with the current land uses along Stirling Highway.

Nevertheless, Caltex will undertake landscaping and plant vegetation around the perimeter of the development, to both reduce the overall perception of scale, and to obscure the ground level improvements.

The company will also treat the foremost tanks with colour tones or shadow lines to minimise their visual impact on the users of Stirling Highway.

The most significant impact of the new tank construction will be the removal of the existing Ampol and old Golden Fleece terminals on valuable beach front land and the relinquishment of the lease of the Knutsford Street storage tanks. Caltex will decommission these installations immediately the new terminal is operational, and return the land to the Fremantle Port Authority within three months. The Fremantle Port Authority has indicated that they intend to utilise the land for public recreation.

The Commonwealth fuel storage tanks in Knutsford Street are surrounded by urban development. Examination of this installation by the Risk Management consultant, revealed that the risk level exceeded the Environmental Protection Authority's current requirements for residential areas (IRM, P138). The fatality contours for the Knutsford Street Storage area are shown in Figure 7. Further, the connecting pipeline between the Knutsford Street storage tanks and the Caltex Terminal in Bracks Street, runs through the City of Fremantle and has been the subject of allegations with respect to leakage.

4.6

FUEL STORAGE - RISK AND HAZARD ASSESSMENT

Storage of large quantities of fuels and oils in the terminal presents potential for risk and hazards to users and occupiers of surrounding land. Caltex engaged a Risk Management consultant to examine the risks and hazards of the development. A detailed scope of work was prepared in consultation with the Environmental Protection Authority. The Risk and Hazard study examined the current proposal by Caltex, and the cumulative effect of the existing fuel storage areas in North Fremantle. The principal objectives of the study were:-

- to perform a preliminary risk assessment of the Caltex terminals in Fremantle including existing and proposed development as a supporting document to this Public Environmental Report.
- to assess to the satisfaction of the E.P.A. whether risk guidelines adopted by the E.P.A. could be met by the proponent,
- to perform risk assessment of the B.P., Shell and Ampol Storage Terminals in North Fremantle,
- provide E.P.A. with information on the cumulative risk levels in the North Fremantle area around the fuel storage facilities.

Basically, the risk analysis assessed what could go wrong, what would the effects and consequences be and, what would be the likelihood of its occurrence. The risk levels determined were then assessed against the Environmental Protection Authority guidelines to establish their acceptability. The hazards identified and safeguards in place are summarised in Table 2.

The preliminary Risk Assessment incorporates the activities of Caltex Oil, B.P. Australia and Ampol, but not Shell.

Shell have indicated that they will perform an in-house study and present the results to the Environmental Protection Authority as a stand-alone study.

The Environmental Protection Authority or other Government Agency, are expected to produce risk contours for Shell as part of their assessment of this proposal.

The detailed report titled "Caltex Risk Analysis for North Fremantle Fuel Oil Storage Facilities" by Industrial Risk Management Pty. Ltd. is held by the Environmental Protection Authority and Caltex Oil (Australia) Pty. Ltd. A summary of the report is presented in Appendix D.

The predicted fatality contours for the existing Caltex Terminal and the expanded Caltex terminal are shown in Figures 8 and 9 respectively.

**TABLE 2
HAZARD IDENTIFICATION AND SAFEGUARDS**

POSSIBLE INITIATING EVENT	POSSIBLE CONSEQUENCES	PREVENTION/PROTECTION MEASURES
<p>1 <u>TRANSFER PIPELINES</u> a) Pipeline rupture (low flash point products) b) Pipeline rupture (high flash point products) c) leak from pipeline fittings.</p>	<p>Spill and environmental pollution. Fire if ignited. Spill and environmental pollution. Minor spill. Fire if ignited.</p>	<p>Transfer pipelines between terminals are patrolled during a transfer. Strict control of ignition sources within Terminal. Rapid leak detection due to strong odour and isolate and transfer. Ship to Shore frequency is low (twice/year). Staff always present during transfer. Leak detected by smell. Emergency action to contain leak, by operating the emergency isolation valve.</p>
<p>2 <u>REFINED PRODUCTS TANK</u> A) Tank overfilled during transfer</p>	<p>Rupture of tank roof or failure of floating roof system. Roof fire if ignited</p>	<p>Tank level is measured before transfer and the required quantity that would not result in an overflow is calculated before advising to commence transfer operation. Transfer is expected to be only 2-3 times a week. An operator is always present during the transfer operation. Two way radios are used for communication during all transfers. Spill will be contained within the tank bund. All tanks are fitted with relief vents. Foam injectors on tanks. Fire hydrants around tank farm for cooling or foam spray. Cooling water sprays manually initiated to adjacent tanks to stop fire from spreading. Cont'd</p>

TABLE 2
HAZARD IDENTIFICATION AND SAFEGUARDS

POSSIBLE INITIATING EVENT	POSSIBLE CONSEQUENCES	PREVENTION/PROTECTION MEASURES
<p>b) Tank wall or pipeline failure.</p> <p>c) Product drained during water draining of tanks</p>	<p>Spill into bund. Bund fire if ignited.</p> <p>Product overflow into separator pit and fire if ignited.</p>	<p>Tank structures and fittings inspected regularly. Operational presence in tank farms is regular with opening and closing of valves for transfer operations and distribution of products.</p> <p>Water draining is a supervised process, tank is taken to ascertain interface and hence draining time.</p>
<p>3 ROAD TANKER LOADING</p> <p>a) Tanker overfill</p> <p>b) Loading pipe rupture</p> <p>c) Road tanker collision due to increased tanker movements.</p>	<p>Product spill. Fire if ignited.</p> <p>Product spill. Fire if ignited.</p> <p>Product spill. Fire if ignited.</p>	<p>Computer to trip loading system automatically. Scully system to trip system if flow meter trip fails or flow incorrect set. Bay constantly manned during loading.</p> <p>Combination of flexible and rigid connections used. Ignition sources carefully controlled. Water deluge system in some loading bays, other have adjacent fire water systems. Operational presence required at all times.</p> <p>Road tanker traffic in the terminal should be restricted to one-way traffic only. This will involve less manoeuvring of tankers and eliminate the chance of collision.</p> <p style="text-align: right;">Cont'd</p>

**TABLE 2
HAZARD IDENTIFICATION AND SAFEGUARDS**

POSSIBLE INITIATING EVENT	POSSIBLE CONSEQUENCES	PREVENTION/PROTECTION MEASURES
<p>4 <u>RAIL TANKER LOADING</u> a) Tanker overfill</p>	<p>Product spill. Fire if ignited.</p>	<p>Flow meter in loading line is set to the safe fill limit of the tanker. Valves automatically tripped by the flow meter. Meters are checked and calibrated quarterly. Two operators are present during loading so that pump can be manually stopped and the valve shut off if necessary. Tanker top loaded so that level can be visually observed.</p>
<p>5 <u>LUBE OIL TANK FARM</u> a) Tank overfilled during tanker unloading.</p>	<p>Product overflow into bund. Product non-flammable. Fire only if ignited by an already existing fire (not just a source of ignition).</p> <p>Rupture of tank roof. Possible fire of tank only if there is an already existing fire in the bund.</p>	<p>Tank level is measured before transfer and it is ensured that tank has adequate capacity to receive that tanker inventory before unloading commences. An operator is always present during the unloading operation. Each load is approximately 25 kl and much less than tank capacity.</p> <p>All tanks are fitted with breathers. Fire hydrants exist around the tank farm to cool adjacent tanks and stop fire from spreading. All sources of ignition are strictly controlled.</p>
<p>6 <u>LUBE OIL TANKER UNLOADING</u> a) Product hose rupture</p> <p>b) Road tanker collision due to increased tanker movements or when two tankers have to unload simultaneously.</p>	<p>Product spill in area.</p> <p>Product spill. Possibility of fire if one of the colliding vehicles is carrying gasoline and ignition source is present.</p>	<p>No unloading will be done if there is even a minor fire emergency on site. Hoses pressure tested regularly. Closed valve on tanker will contain spill. Oil will be recovered from sumps.</p> <p>Road tanker traffic into the terminal should be one-way. The tanker will always face the direction of the exit to drive away quickly in an emergency.</p> <p>Cont'd</p>

**TABLE 2
HAZARD IDENTIFICATION AND SAFEGUARDS**

POSSIBLE INITIATING EVENT	POSSIBLE CONSEQUENCES	PREVENTION/PROTECTION MEASURES
<p>7 <u>WAREHOUSE FIRES</u></p> <p>a) Rupture of 20 litre drums (impact, dropping etc)</p> <p>b) Warehous Fires or fire where additives stored.</p>	<p>Spillage of flammable material ignited.</p> <p>Toxic combustion products. Toxic decomposition products.</p>	<p>Adequate fire fighting equipment available. Areas always under supervision.</p> <p>Breathing apparatus must be used to fight warehouse/drum storage area fires</p>

The impact of the extended Caltex Terminal in Bracks Street does not intrude into the residential areas. It does however approach the Beach recreational area, but will not overly reduce the amenity of the beach area as it currently exists.

The cumulative fatality contours that currently exist have a greater impact on the recreational potential of the foreshore area. The predicted cumulative fatality contours for the North Fremantle area for the current and proposed situation are shown in Figures 10 and 11 respectively.

The location of the current Ampol and old Golden Fleece terminals, present an increased level of risk for beach users. The combined effect after the proposed consolidation removes this impact from the beach area altogether. This is a significant improvement.

The preliminary Risk Assessment concluded as follows :-

- The risk results for the existing Terminals satisfy the criteria outlined in the Environmental Protection Authority's Guidelines.
- The results pertaining to the proposed Caltex consolidation in its Bracks Street Terminal also satisfy the criteria outlined in the Environmental Protection Authority's Guidelines.
- The storage depot on Knutsford Street Fremantle does encroach on the adjacent residential zone (in Knutsford Street) with an individual risk level of one in a million years.
- Cumulative risk levels for individual risk at residential areas, including the existing and proposed Caltex development are less than one in a million per year. There is no net increase in cumulative risk to residential areas due to the proposed development.
- The consolidation of operations at the Caltex Bracks Street terminal will result in an overall reduction in cumulative risk in the Fremantle area due to :

- Closure of the Ampol terminal

- Closure of the old Golden Fleece storage

Handover of the Knutsford Street depot and pipeline running through Fremantle to the Commonwealth Government.

- The proposed consolidation of the Caltex terminal in Bracks Street North Fremantle would not pose undue risk to the residential areas as they presently exist.

The social values of the public, with respect to locating major fuel terminals in what is considered to be a prime beach front area, have been expressed through the North Fremantle Ratepayers Association. It is their considered opinion that such facilities should be located further inland.

Representatives of the Fremantle Port Authority on the other hand, consider it to be an integral part of Port operations to have bulk storage facilities, for the discharge of imported cargo and to provide bunkering facilities for ships, located within the general port area.

4.7

INFRASTRUCTURE

Revisions to the infrastructure associated with the proposal, particularly road and rail, are considered to have beneficial impacts. The construction of a new road link to Port Beach Road will improve accessibility to the existing industrial area and benefit, not only the Caltex operations, but the storage and warehousing activities that take place nearby.

Westrail will be removing obsolete rail tracks and tidying up the Leighton Marshalling Yards in general. This will improve the visual amenity of the area and rationalise the rail services to the Rous Head area. Vacant Westrail land will become useable for other Port related activities.

The requirement of the City of Fremantle to improve access to the Port Beach area from the public transport system along Stirling Highway, and the Perth to Fremantle Passenger Railway, will be accommodated by the provision of a Public Access-Way located on the northern boundary of the Caltex development, running from Stirling Highway to Port Beach Road. Caltex will construct this facility to the requirements and satisfaction of the City of Fremantle.

4.8

TRANSPORT

Product movement to and from the existing Caltex Terminal is by way of rail, road and pipeline. These modes of transport will continue for the extended terminal, but it is envisaged that the inclusion of the Ampol operations will produce an increase in the road transport activities.

Bracks Street will be extended through the Westrail Marshalling Yard area to provide new access onto Port Beach Road. The standard of the road network will be based on providing maximum accessibility for semi-trailer type vehicles, and on providing alternate routes should a road blockage occur. Caltex will construct the new access road to the requirements and satisfaction of the City of Fremantle.

The Fremantle Port Authority have indicated that they will be undertaking upgrading works at the junction of Tydeman Road and Port Beach Road, to improve the capacity of the intersection.

Caltex will schedule its tanker movements so as to minimise peak period congestion on the local road network and to distribute the flow evenly between both entrances to Bracks Street.

Product movement will only take place in vehicles fully approved for such purposes.

4.9.

DISCHARGES FROM THE SITE

Caltex proposes that there will be no discharges from the site, however the potential for such discharges to occur must be considered.

The Risk Management Consultants identified that toxic gases could be created on the site as a result of fire or product spillage.

A detailed examination of toxic gas releases was undertaken in the preliminary Risk Assessment.

Potential escapes were conservatively modelled as continuous plumes.

Potentially hazardous discharges of toxic gases were found not to be a significant risk to the general public.

Release of vapour from volatile fuels will require control. Caltex will undertake filling operations using a closed system incorporating vapour recovery hoses and will store volatile fuels only in the tanks fitted with vapour sealed covers.

Terminal operations are however performed at low pressures and leaks from small holes would result in relatively minor releases of material.

The Risk Management Consultants found that the resulting consequences of small leaks would not exceed the site boundaries (IRM, P85).

Spillage of petroleum products from storage tanks, process areas or transfer systems could occur.

To contain spillages, Caltex will bund all tank installations, pump units and loading areas in accordance with the Australian Standards AS 1940 and the requirements of the Department of Mines.

A pollution control system as shown in Figure 12, will be installed by Caltex. In all operational areas where there is potential for spillage, a drain system will collect the liquid and transfer it to an oil separation unit. Collected hydro carbon slop will be contained on site in a slop tank and then removed by private contractors. Any water collected will be discharged into an on-site evaporative pond lined with bentonite clay to prevent seepage.

All stormwater will be collected on the site and piped to a combined oil separator and silt trap before being discharged via an on site lined holding basin to an on site soakage area.

There will be no connection to any street drainage system.

All stormwater collected in the holding basin will be monitored daily by trained Caltex staff to check for oil contamination. Samples will be taken and tested by a National Association of Testing Authorities approved laboratory to ensure that the water quality complies with Environmental Protection Authority requirements before being discharged into the soakage area.

It is unlikely that any fuel or oils would reach the Beach area to the west of the site. Any surface flow would be contained in the dunal depression adjacent to Port Beach Road. Contaminated materials would be recovered and treated.

5.0 **MANAGEMENT PROCEDURES**

5.1. **CONTROL SYSTEMS**

Caltex oil have a comprehensive operational control system in place at the existing terminal. This will be continued for the extended terminal. Details of the control system are contained in the Caltex Marketing and Operations Manual, Volume 3, Fire Safety and Environmental Control.

A content outline of this document is presented in Appendix E. The complete document is available for review at the Environmental Protection Authority Library or Caltex Oil (Australia) Pty. Ltd.

Caltex practices the following basic principles for the operation of its oil terminals:-

Environmental

- (1) To provide equipment and facilities designed as to maximise Protection of the Environment ;
- (2) To establish internal training, procedures and controls, and with the rest of Industry co-ordinated organisations, to protect the Environment to prevent spills and if/when they do occur to effect containment, recovery and expeditious clean up;
- (3) To co-operate fully with Statutory Authorities, in this very important area, involving Public Safety and Welfare.

Safety

- (1) To safeguard employees against possible personal suffering or hardship;
- (2) To safeguard the employee's family or dependents against possible distress, hardship or need, if extended loss of time and income occur;
- (3) To avoid unnecessary cost to the Company.

The safety systems as outlined in Section 3.9 of this report will continue for the extended terminal.

5.2. ENGINEERING CODES AND STANDARDS

The proposed terminal, including the existing facilities, will be developed to comply to the relevant standards as follows :-

Pipework	Australian Standard 1836 - Tubes for pressure purposes Australian Standard 2129 - Flanges for pipes, valves and fittings
Storage Tanks	Australian Standard 2906 - Fuel containers - portable, plastics and metal. Australian Standard 1692 - Tanks for flammable and combustible liquids. Australian Standard 2624 - Steel plate and strip for the construction of welded steel tanks for oil storage. American Petroleum Institute Standard 650
Electrical Wiring	Australian Standard 3000 - Electrical installations - Buildings, structures and premises. Australian Standard 1076 - Code of Practice for selection installation and maintenance of electrical apparatus and associated equipment for use in explosive atmospheres. Australian Standard 2380 - Electrical Equipment for explosive atmospheres, Explosion - protection techniques.
Fire Fighting and Bunding	Australian Standard 1940 - The storage and handling of flammable and combustible liquids.

In addition, Caltex will also carry out the following procedures:-

Tank Cleaning and Inspection every two years.

Tank non destructive testing every five years.

Associated pipework inspected with the tanks.

The following principles will also apply to the Tank Farm construction.

- . Product lines 50mm diameter and over shall be of welded constructions.
- . No victaulic joints - in tank farms or manifold systems
- . No cast iron or brass valves on product lines or manifold systems.
- . Main tank valves to be cast steel 150 AS rating.
- . Stairways to be on windward side of tanks where prevailing wind is characteristic of the area.
- . Adequate metal walkways and stair crossings of pipelines - All existing wooden walkways and platforms in tank farms and manifold systems to be replaced.

5.3. **UPGRADED FIRE AND SPILLAGE CONTROL**

New fire fighting equipment will be installed, commensurate with the consolidated storage facilities at the new terminal.

These will include new fire pump house, extra fire pump, water storage - 750 cubic metres, six (6) extra monitors, a foam addition to new and relocated tanks, automatic fire pump start from the jacking pump, deluge system for rail loading gantry - foam type.

The drain systems will be upgraded with gravity separators to accommodate the run-off from the new tank bund areas. These areas will remain closed with valves, and be only drained under operational supervision.

The Australian Standard AS 1940 will form the minimum requirement for fire protection facilities at the terminal. In addition, Caltex will install a top application fixed foam system to all floating roof tanks storing volatile or flammable liquids.

5.4. **TERMINAL OPERATING PROCEDURES**

The following procedures will be continued with the extended terminal operations.

Security	All visitors will report before entry to the installations. External Security Firms will provide out of hours patrol at the installations when 24 hour cover by staff is not available.
	All distribution systems which run off site, will be patrolled during product transfer and left under water when not in use.
Naked Flames	All matches, lighters, cigarettes etc. will be removed from personnel prior to entry to the tank farm.
Fire Training	All terminal operators will undergo regular fire drill training.
General Safety	General safety management of the site will be in accordance with the requirements of the Occupational Health, Safety and Welfare Act.
Mutual Aid	A mutual aid system will continue to operate with other terminals in the North Fremantle area to provide emergency assistance in the form of personnel or materials required.
Equipment Isolation	When equipment is not in service or out of hours, all tanks and pipelines will be isolated and isolation valves will be locked closed.

5.5. RISK MANAGEMENT

The following general, technical and management recommendations were made in the Preliminary Risk Assessment report for the effective and responsible Risk Management of the terminal:-

1. That all chemicals which evolve toxic fumes on heating or combustion are located (bulk storage) in an area where they are protected from heat radiation evolving from a potential fire (bund, tank or general oil products).
It is further recommended that no flammable materials are stored with them.

2. It is advised that all employees and the fire brigade and emergency services be informed that in the case of fire involving chemicals, breathing apparatus **MUST** be worn. This is also advised for any warehouse fire with the potential for toxic fume generation.
3. Where alcohols are stored on site in large quantities it would be advisable that alcohol resistant foam be available for use. Normal foams will break down in the presence of alcohols.
4. It should be ensured that where the possibility for a warehouse type fire exists barriers are installed (brick walls or other) to ensure the fire cannot spill out into any adjoining road or public access area.
5. Where terminals are not staffed on a 24 hour basis it would be advisable for the security patrols (which exist) to briefly inspect all bunded areas. In this way an alarm can be raised in the case of failures occurring.
6. Material Safety Data Sheets for all substances on site should be available for use by employees in case of incidents.

Caltex will incorporate these recommendations into both its physical development and management techniques.

5.6. **TRANSPORTATION**

The management of products to and from the terminal by road tanker operation, will be scheduled so;

1. that queuing of tankers is avoided in the public street system,
2. that peak movements do not coincide with the general peak traffic movements, particularly at the intersections of Bracks Street with Tydeman Road and Port Beach Road, and
3. that truck traffic is evenly distributed over the local street network.

5.7.

DE-COMMISSIONING OF SURPLUS INSTALLATIONS

Once extension works have been completed, Caltex will:-

1. De-commission its old Golden Fleece operations on Port Beach Road, reinstate the site and return it to the Fremantle Port Authority
2. Discontinue its use of the Commonwealth storage tanks in Knutsford Street and the interconnecting pipeline.

Once extension works have been completed, Ampol will :-

1. De-commission its operations on Port Beach Road, reinstate the site and return it to the Fremantle Port Authority.

5.8.

LANDSCAPING AND AESTHETICS

Caltex will install and maintain strategic landscaping and facade work on installations to a standard acceptable to the City of Fremantle and strive to maintain an acceptable public perception of the terminal installation.

The following commitments are made by Caltex Oil (Australia) Pty. Ltd. to demonstrate how they propose to manage the terminal operations and accept responsibility for any unacceptable environmental impact arising out of the operations.

1. Caltex will protect by easement or relocate any public utility services that conflict with the terminal extensions to the satisfaction of the relevant Statutory Authority.
2. Caltex will design and construct a new road to connect Bracks Street to Port Beach Road and facilitate the closure of the section of Walter Place between Bracks Street and Port Beach Road, to the satisfaction of the City of Fremantle.
3. Caltex will design and construct a pedestrian accessway to connect the new Port Beach Railway Station to Port Beach Road.
4. Caltex will design and construct the terminal extensions in accordance with the relevant Australian Standards and Building Codes to the satisfaction of the Department of Mines, the City of Fremantle and the WA Fire Brigades Board.
5. Caltex will undertake site works in a manner, and at such times as to ensure that dust and noise emission levels outside the boundaries of the site do not adversely impact upon occupiers and users of adjacent land.

Such works will be undertaken to the satisfaction of the City of Fremantle on advice from the Department of Occupational Health Safety and Welfare and the Environmental Protection Authority.

6. Caltex will de-commission its operations at the old Golden Fleece terminal, reinstate the site and return it to the Fremantle Port Authority once the extended terminal is commissioned to the satisfaction of the Fremantle Port Authority and the Environmental Protection Authority.
7. Caltex will terminate its use of the Commonwealth Fuel Storage tanks in Knutsford Street, Fremantle and the pipeline that connects the tanks to the Bracks Street terminal.

8. Ampol will de-commission its operations at Port Beach Road, re-instate the site and return it to the Fremantle Port Authority once the extended Caltex Terminal is commissioned to the satisfaction of the Fremantle Port Authority and the Environmental Protection Authority.
9. Caltex will landscape and plant vegetation around the perimeter of the development to reduce the overall perception of scale and to obscure ground level improvements, to the satisfaction of the City of Fremantle.
10. Caltex will treat the foremost tanks with colour tones or shadow lines to minimise their visual impact on the users of Stirling Highway to the satisfaction of the City of Fremantle.
11. Caltex will schedule its product movement to and from the terminal in a manner that will minimise the traffic impact on the local road network.
12. Caltex will trap all stormwater on site and direct it through a combined oil separator and silt trap before discharge to an on site soakage area to the satisfaction of the Environmental Protection Authority.
13. Caltex will install a collection drain system in all areas of potential spillage to the satisfaction of the Environmental Protection Authority.
14. Caltex will continue its comprehensive control system for the terminal operations to the satisfaction of Department of Occupational Health Safety and Welfare and the Department of Mines.
15. Caltex will locate all chemicals that evolve toxic fumes on heating or combustion in one area where they are protected from heat radiation or fire to the satisfaction of the Department of Mines and the Environmental Protection Authority.
16. Caltex will ensure that all personnel and emergency services are aware that breathing apparatus must be worn in cases of chemical fires.
17. Caltex will provide alcohol resistant foam in areas where large quantities of alcohols are stored on site.

18. Caltex will have readily available Material Safety Data Sheets for all substances on site.
19. Caltex will provide fire resistant barriers in buildings adjacent to public areas to the satisfaction of the WA Fire Brigade Board.

CONCLUSION

The proposed extension of the Caltex Terminal in Bracks Street, North Fremantle can be undertaken with minimal impact on the local environment.

A preliminary risk and hazard study has shown that Environmental Protection Authority requirements can be met.

Cumulative risk levels for individual risk at residential areas are less than one in a million per year.

The consolidation of the operations in the Bracks Street terminal will result in an overall reduction in cumulative risk in the Fremantle area due to closure of the Ampol and old Golden Fleece terminals in Port Beach Road and the return to the Commonwealth of the Knutsford Street depot and the pipeline running through Fremantle.

No discharges are proposed from the terminal, but measures to contain any escapes have been identified and included in the extension works.

The amenity of the Beach area will be improved with removal of the old storage tanks in Port Beach Road and the restoration of the sites.

Management of the Terminal operations will be undertaken in accordance with Caltex's proven terminal operating procedures.

Landscaping and facade work on installations will be undertaken to present the development to a standard acceptable to the City of Fremantle.

GLOSSARY AND NOMENCLATURE

BUND	-	Safety wall
FREQUENCY	-	Number of occurrences per unit of time
HAZARD	-	A physical situation with a potential for human injury, damage to property, damage to the environment or some combination of these.
INDIVIDUAL RISK	-	The frequency of which an individual may be expected to sustain a given level of harm from the realisation of specified hazards
RISK	-	The likelihood of a specified individual event occurring within specified period.
RISK ASSESSMENT	-	The quantitative evaluation of the likelihood of undesired events and the likelihood of harm or damage being caused, together with the value judgements made concerning significance of the results.
AS	-	Australian Standard
BP	-	British Petroleum
EPA	-	Environmental Protection Authority
FCC	-	Fremantle City Council
FPA	-	Fremantle Port Authority
PRA	-	Preliminary Risk Assessment
kl	-	Kilolitres
kW	-	Kilowatts
m	-	Metres
m²	-	Square metres
m³	-	Cubic metres
mm	-	Millimetres
m/s	-	Metres per second
t	-	Tonnes

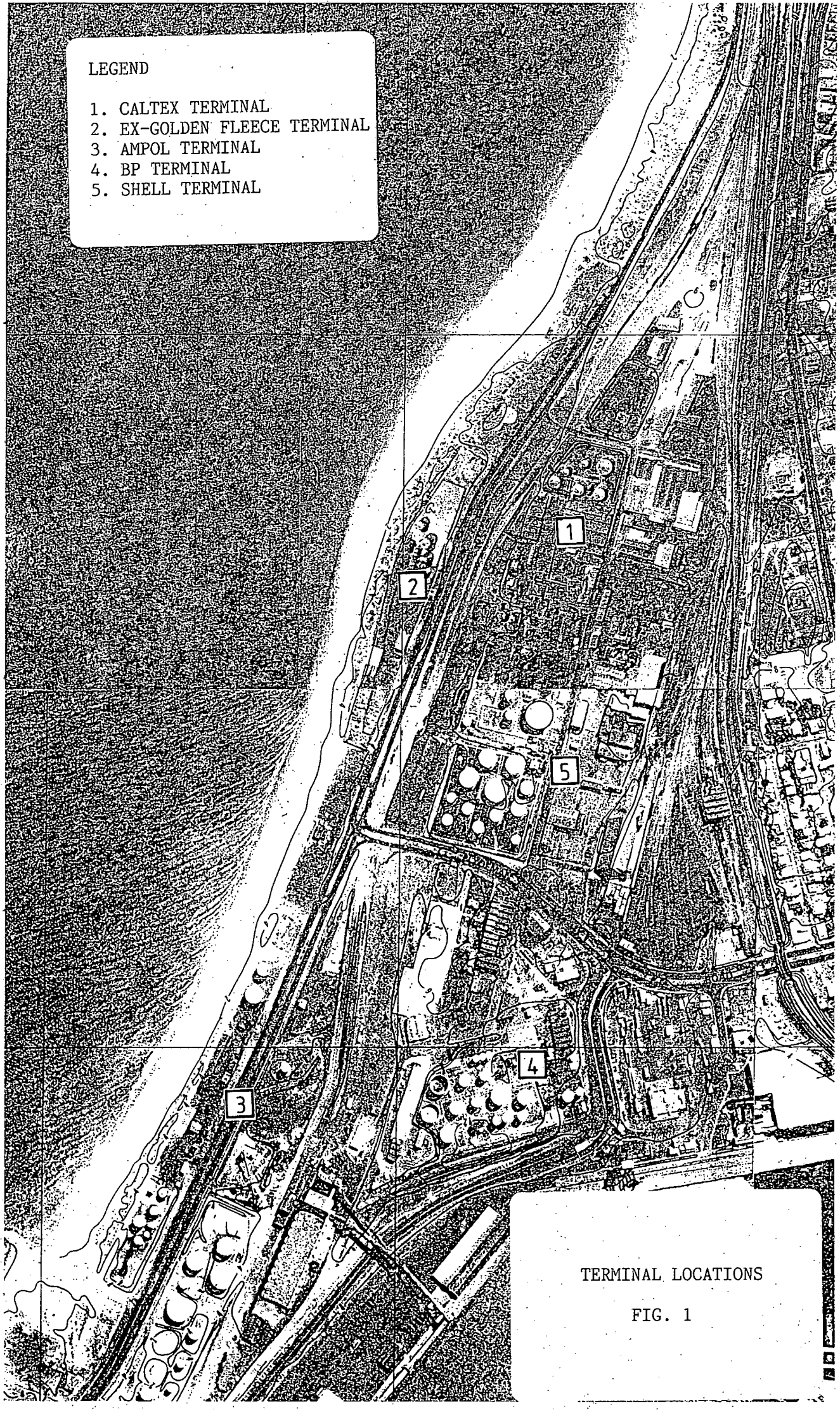
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FIGURES

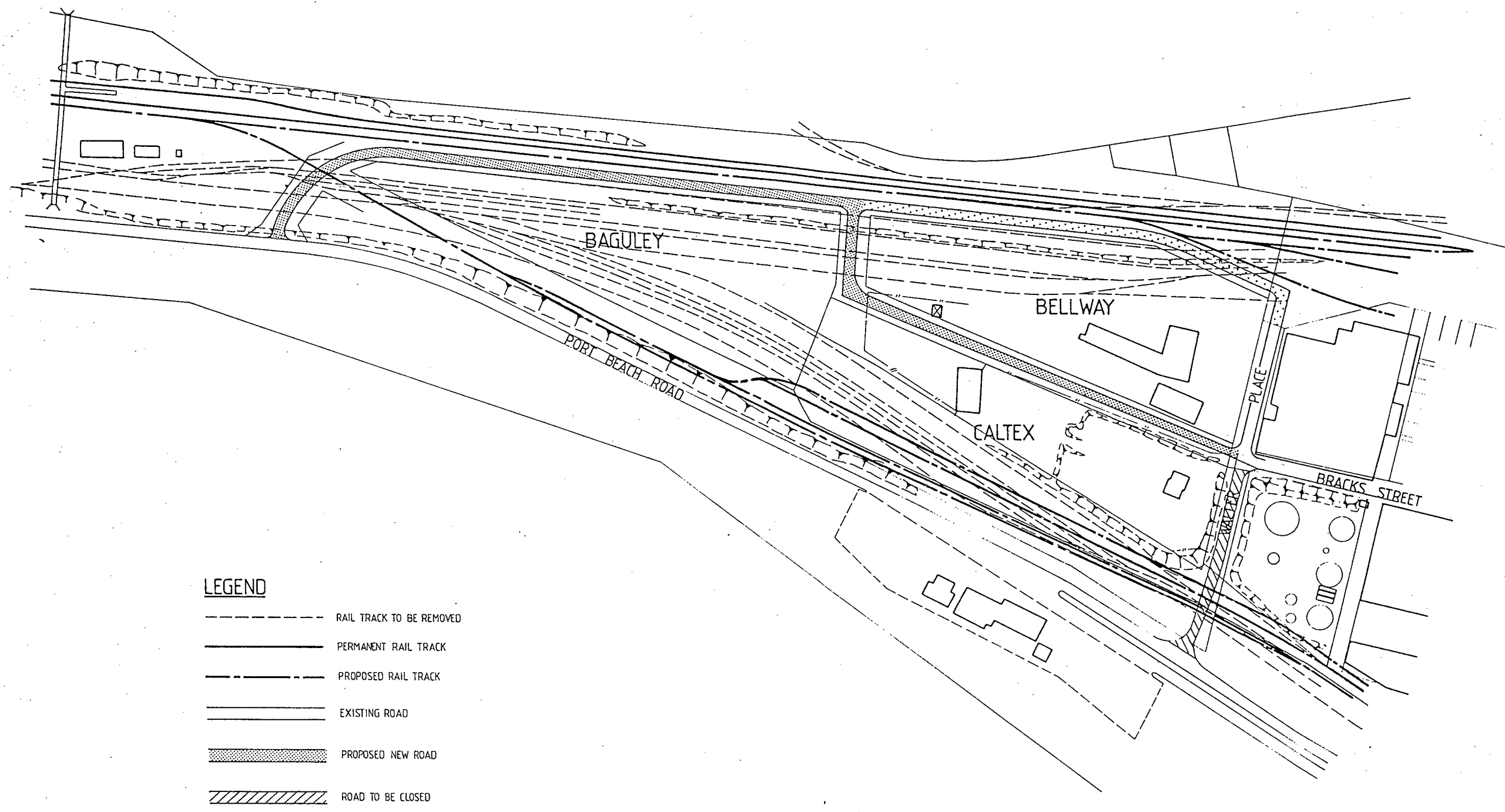
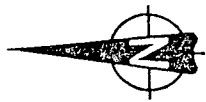
LEGEND

1. CALTEX TERMINAL
2. EX-GOLDEN FLEECE TERMINAL
3. AMPOL TERMINAL
4. BP TERMINAL
5. SHELL TERMINAL



TERMINAL LOCATIONS

FIG. 1



- LEGEND**
- RAIL TRACK TO BE REMOVED
 - PERMANENT RAIL TRACK
 - - - PROPOSED RAIL TRACK
 - EXISTING ROAD
 - ▨ PROPOSED NEW ROAD
 - ▩ ROAD TO BE CLOSED
 - ⋯ PROPOSED FUTURE ROAD

**EXTENSION OF
NORTH FREMANTLE TERMINAL**

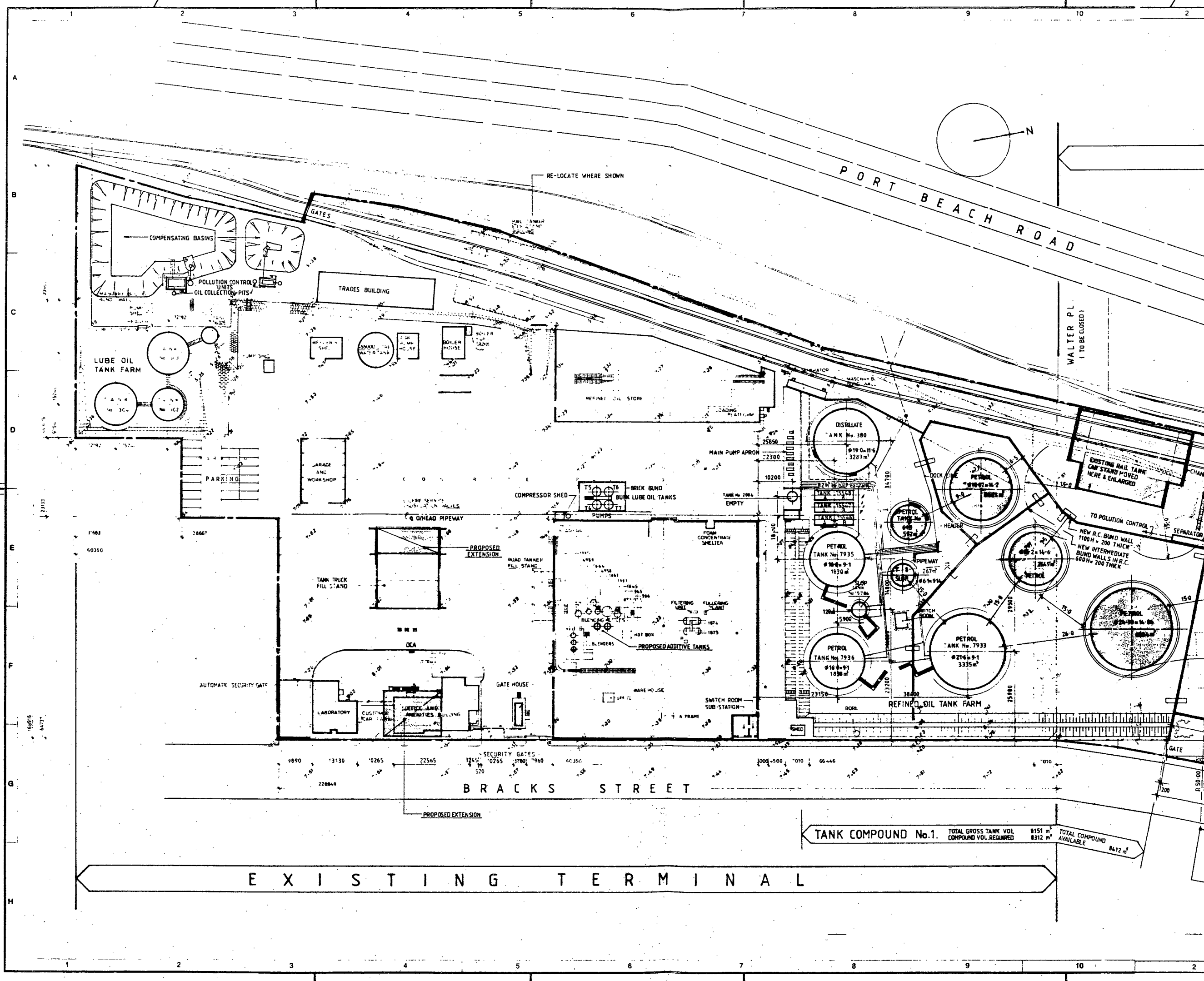
Connell Campbell & Drew
Consulting Engineers
Mechanical Electrical Civil Plumbing
41 Old Street, 2nd Floor, Perth, Western Australia 6000. Tel: (09) 322 1431

CLIENT:
**CALTEX OIL
(AUSTRALIA) PTY. LTD.**

**FIG. 2. PROPOSED
STRUCTURE PLAN**

SCALE N.T.S.	DRAWING NO	REV No
DATE DEC 1989	89336-C-2	
DRAWN N.A.S.		
DESIGN D.P.	SHEET	OF
CHECK <i>Jorkis</i>		





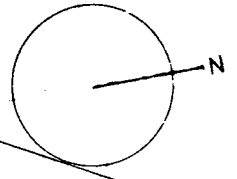
TANK COMPOUND No. 1.	
TOTAL GROSS TANK VOL	8151 m ³
COMPOUND VOL. REQUIRED	8312 m ³
TOTAL COMPOUND AVAILABLE	8412 m ³

EXISTING TERMINAL

BRACKS STREET

PORT BEACH ROAD

WALTER PL.
(TO BE CLOSED)



A
B
C
D
E
F
G
H

1 2 3 4 5 6 7 8 9 10 2

1 2 3 4 5 6 7 8 9 10 2

A	GM 5 85	ADJACENT WAREHOUSE SHOWN
		PROPOSED BUND & TANKS RE-
		POSIT ONED
B	GM 3 89	GENERALLY REVISED
C	GM 11 90	POLLUTION CONTROL UPDATED

P R O P O S E D E X T E N S I O N S

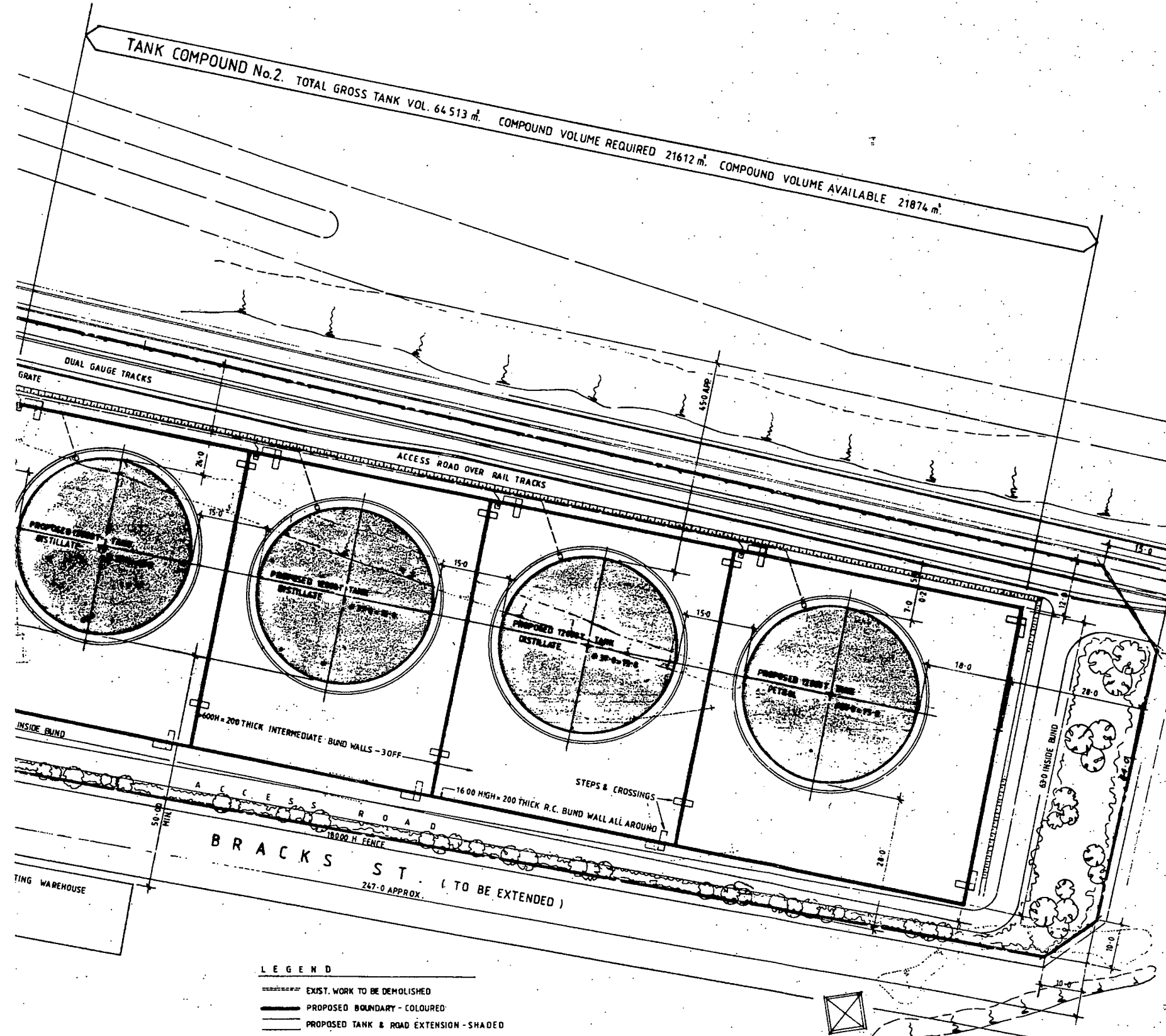


FIG. 3. CALTEX PROPOSED EXTENSIONS

LEGEND

	EXIST. WORK TO BE DEMOLISHED
	PROPOSED BOUNDARY - COLOURED
	PROPOSED TANK & ROAD EXTENSION - SHADED

REFERENCE DRAWINGS	
CALTEX OIL (AUSTRALIA) PTY. LIMITED	
COPYRIGHT THIS DRAWING AND DESIGN MUST NOT BE COPIED IN WHOLE OR PART WITHOUT THE WRITTEN CONSENT OF CALTEX OIL AUSTRALIA PTY. LIMITED	
FREMANTLE, W.A. TERMINAL	
ADDITIONAL STORAGE - PROPOSAL 10/88 LAYOUT	
DRAWN G. MAZAK	DATE 10-88
CHECKED	DATE
APPROVED	DATE
SCALE 1:500	SIZE A1
DRAWING No 39899	REV C

CALTEX NORTH FREMANTLE TERMINAL

FLOW DIAGRAM

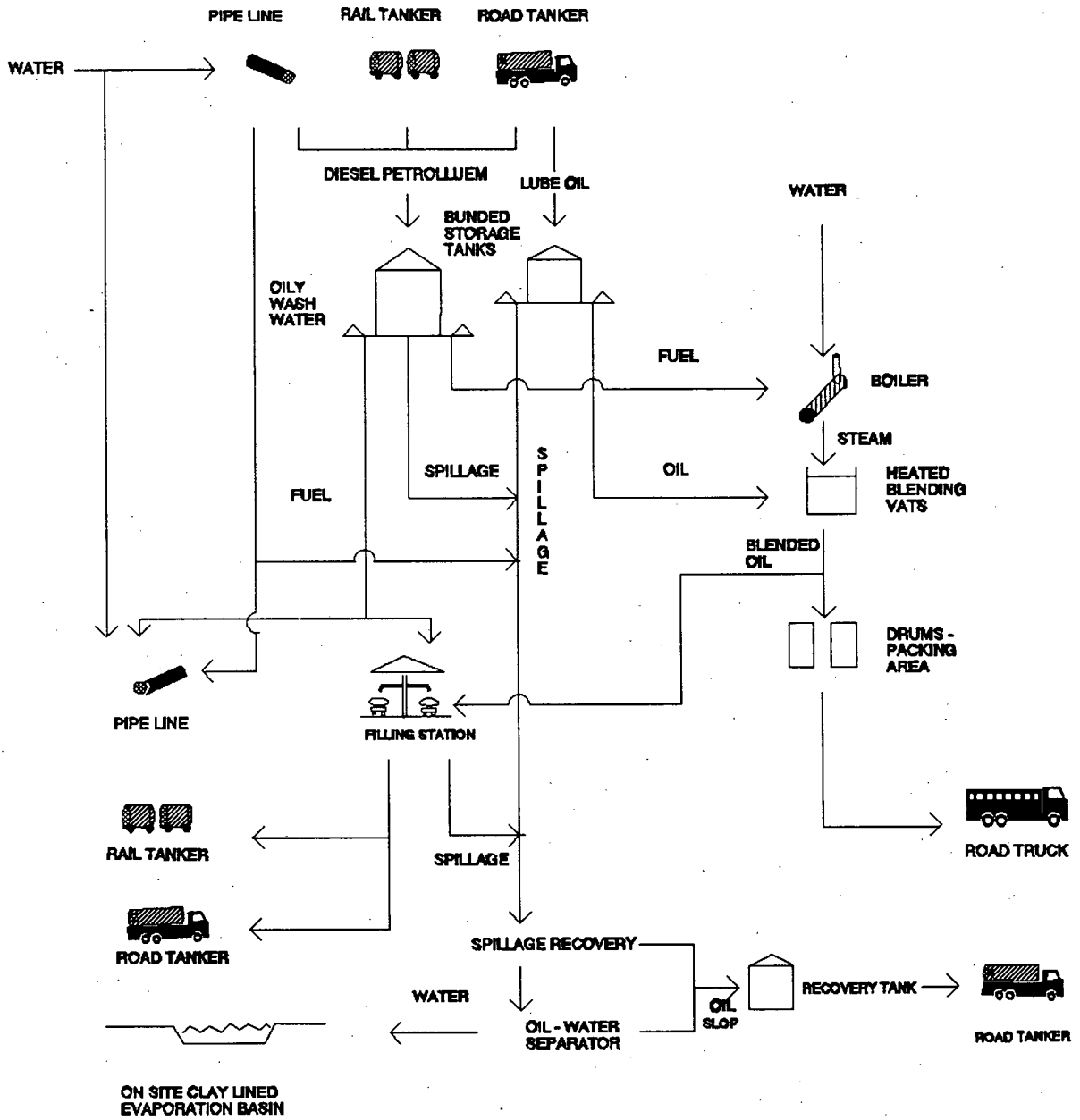


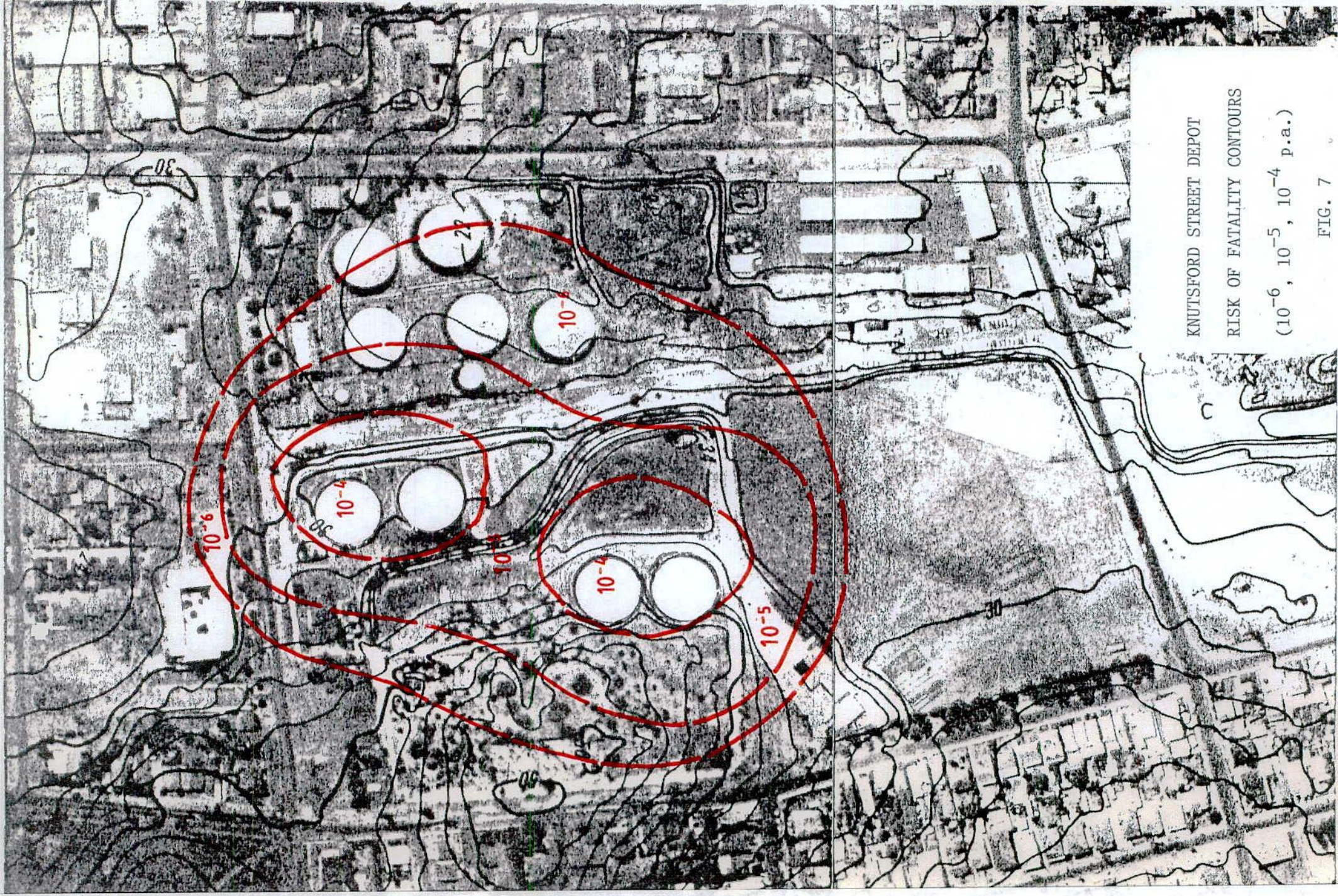
FIGURE 4

FIG. 5. PHOTO MONTAGE VIEW OF NEW TANKS FROM NORTH FREMANTLE RESIDENTIAL AREA





FIG. 6. PHOTO MONTAGE VIEW OF NEW TANKS FROM STIRLING HIGHWAY

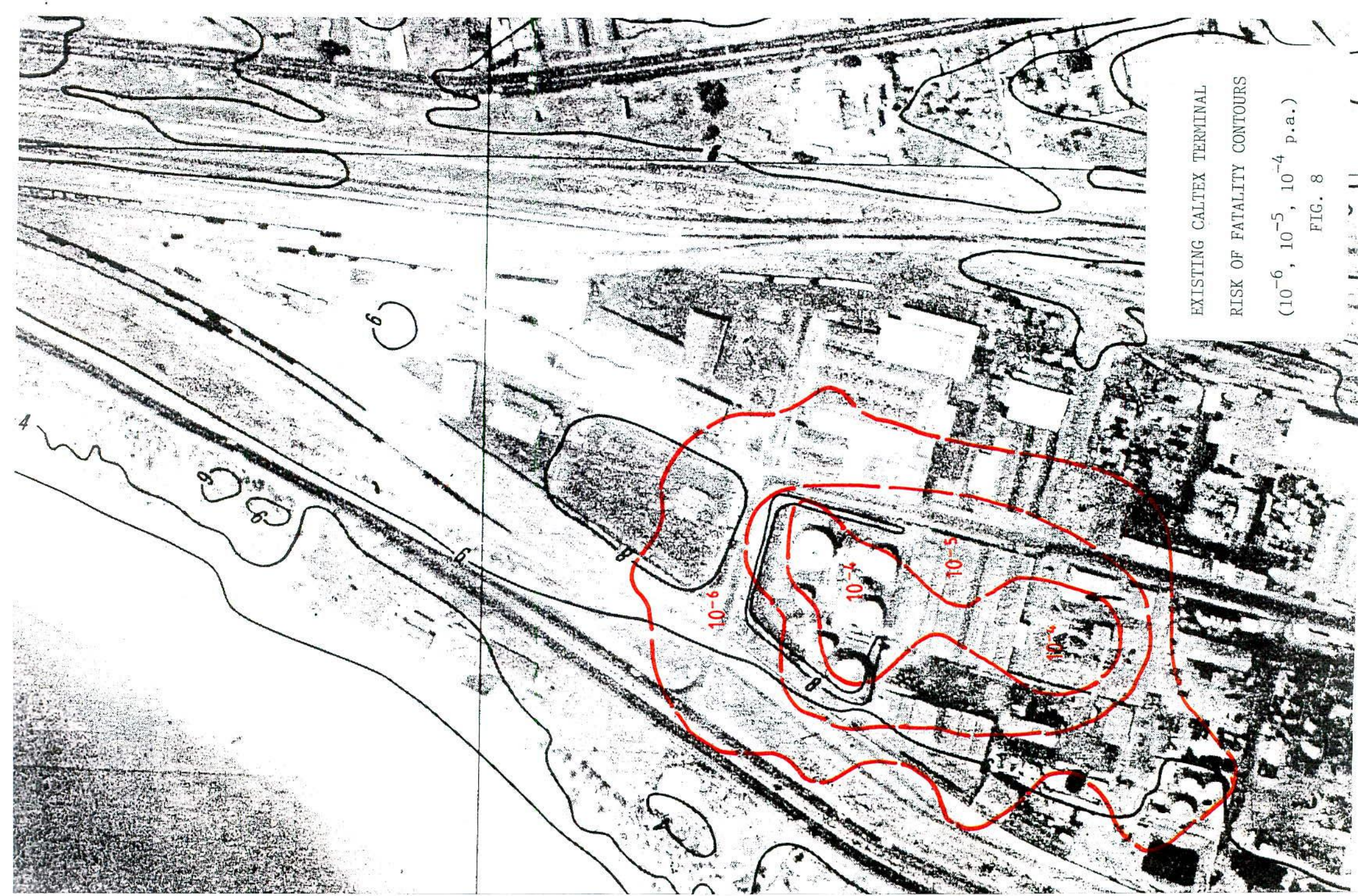


KNUTSFORD STREET DEPOT

RISK OF FATALITY CONTOURS

(10^{-6} , 10^{-5} , 10^{-4} p.a.)

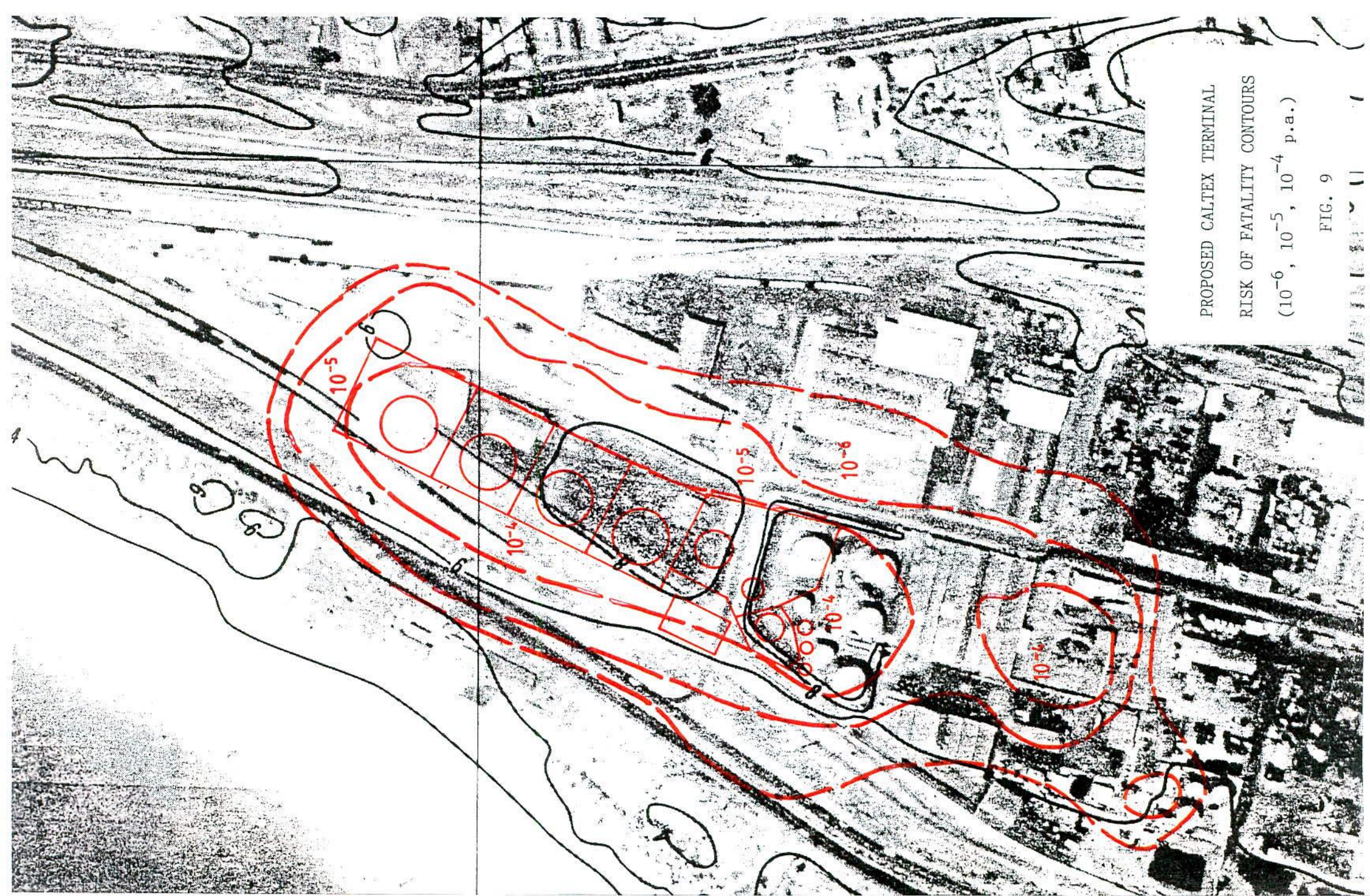
FIG. 7



EXISTING CALTEX TERMINAL
RISK OF FATALITY CONTOURS

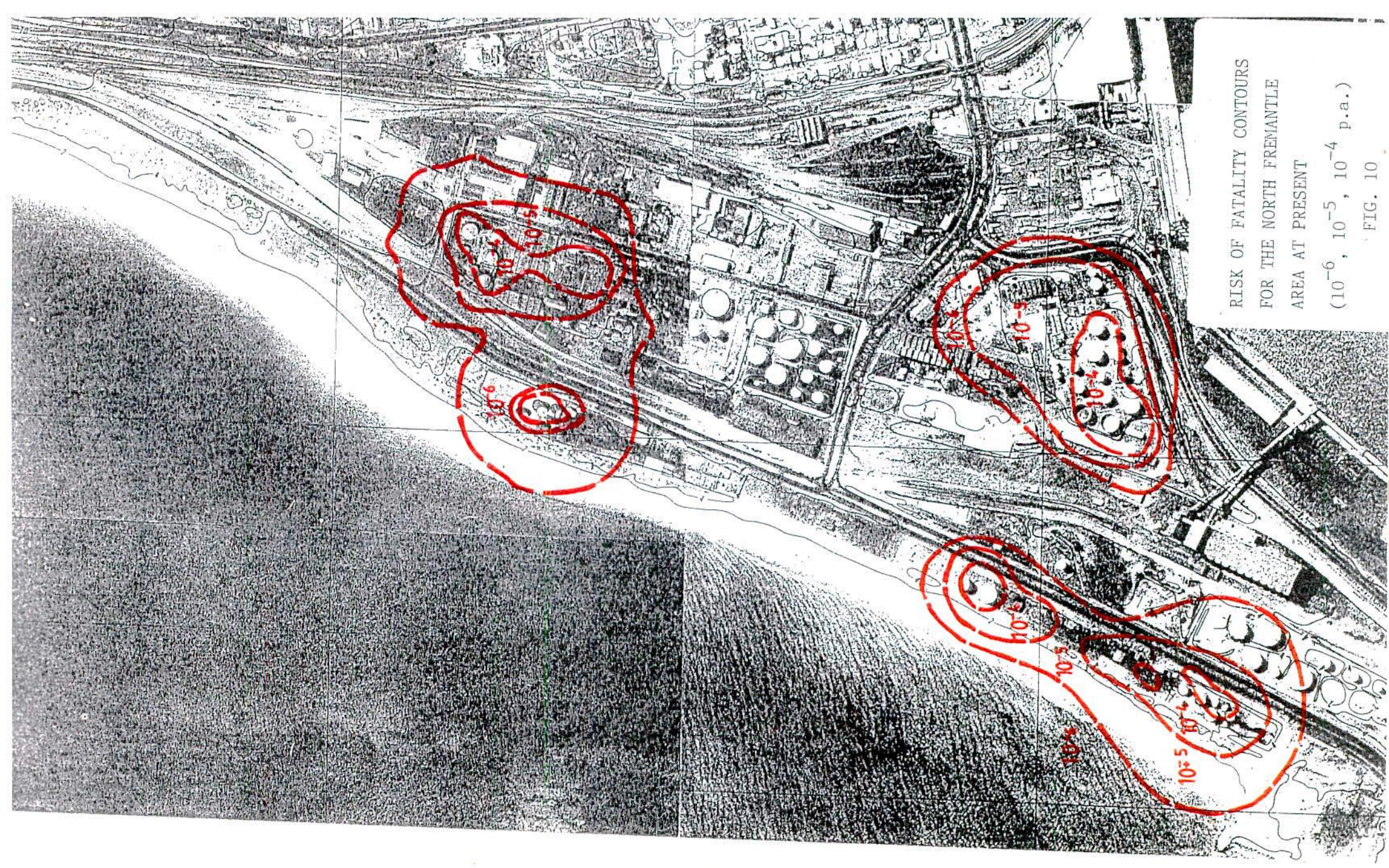
(10^{-6} , 10^{-5} , 10^{-4} p.a.)

FIG. 8



PROPOSED CALTEX TERMINAL
RISK OF FATALITY CONTOURS
(10^{-6} , 10^{-5} , 10^{-4} p.a.)

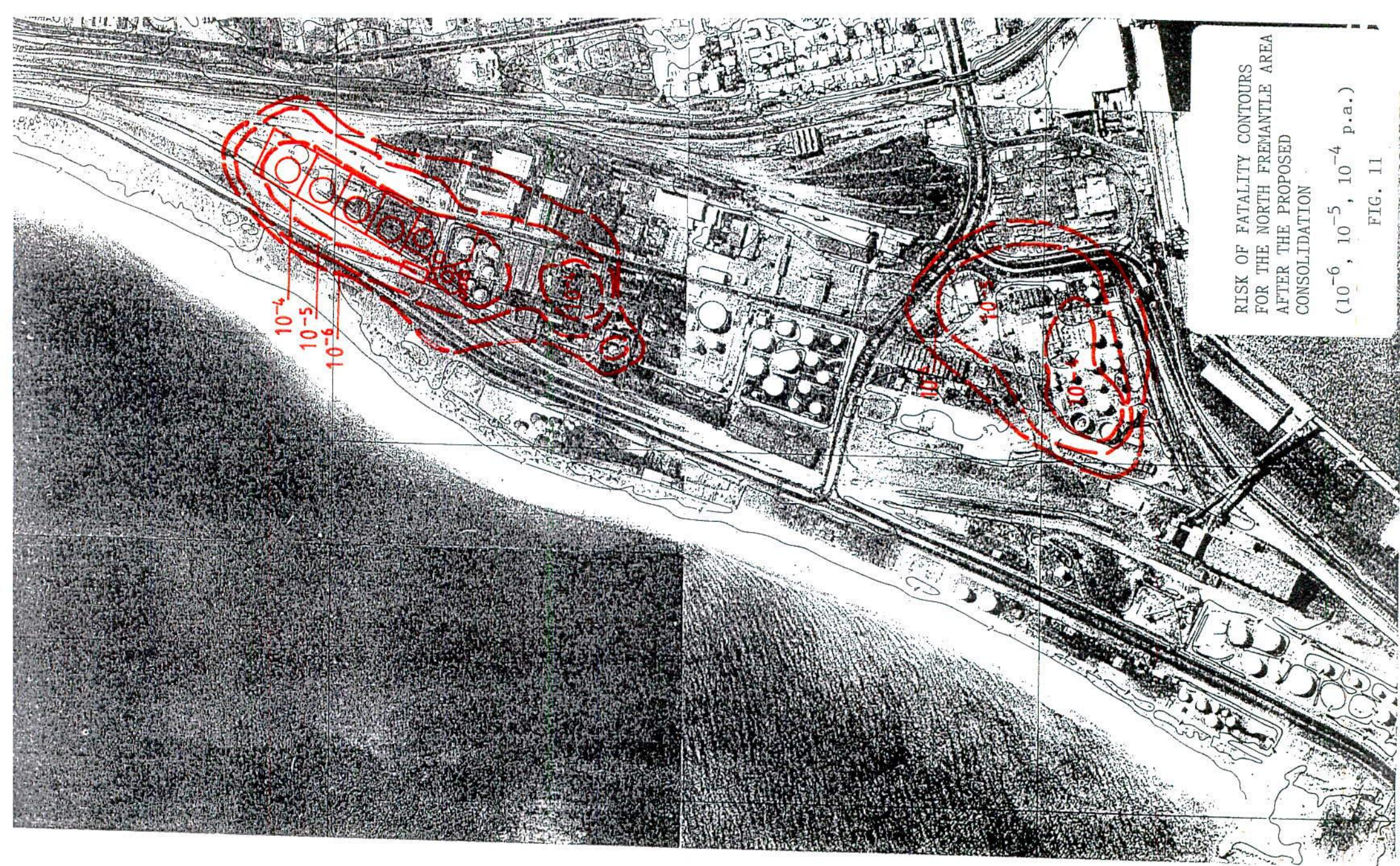
FIG. 9



RISK OF FATALITY CONTOURS
FOR THE NORTH FREMANTLE
AREA AT PRESENT

(10^{-6} , 10^{-5} , 10^{-4} p.a.)

FIG. 10



RISK OF FATALITY CONTOURS
FOR THE NORTH FREMANTLE AREA
AFTER THE PROPOSED
CONSOLIDATION

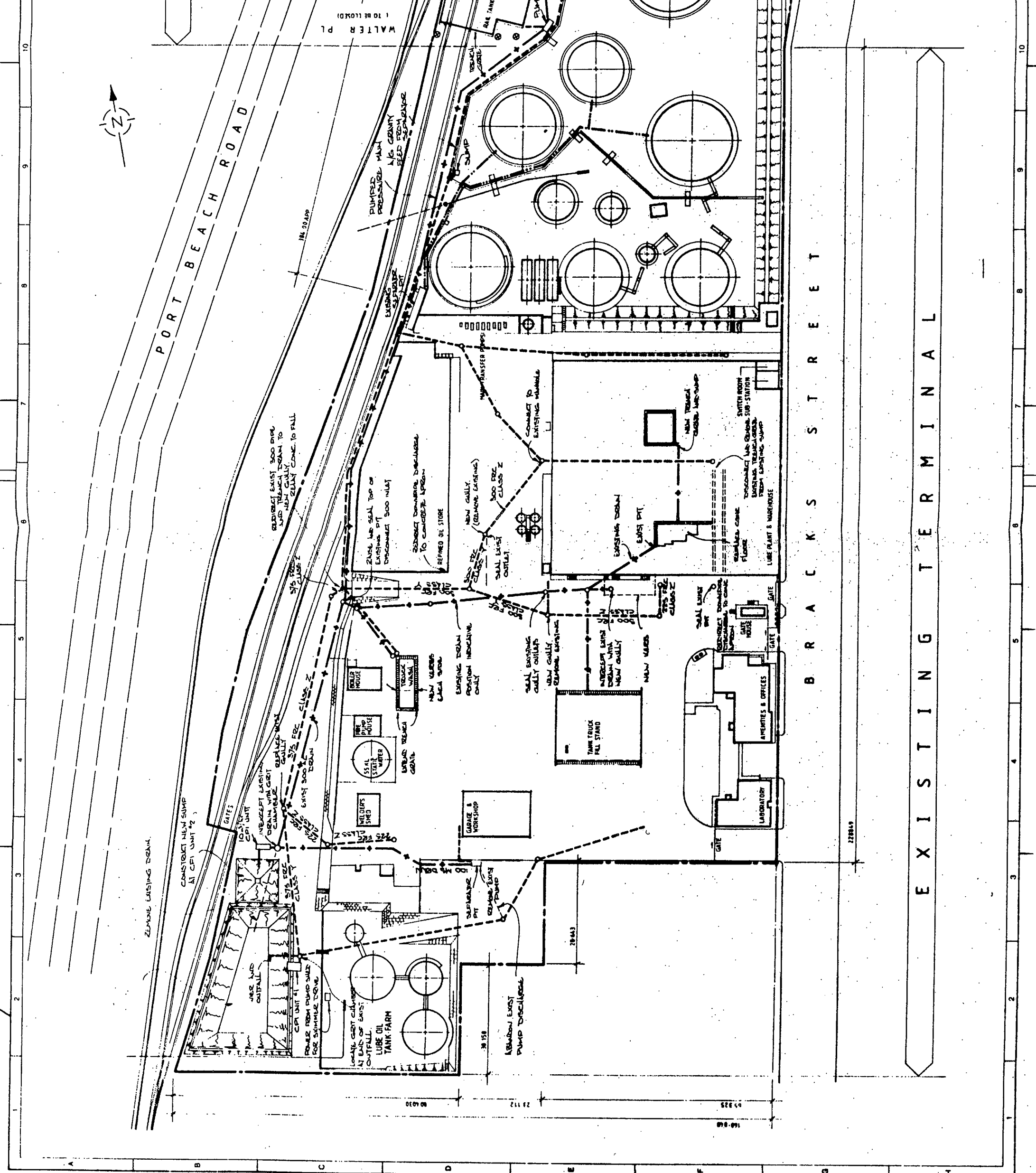
(10^{-6} , 10^{-5} , 10^{-4} p.a.)

FIG. 11



PORT BEACH ROAD

WALTER PL
1 TO BE (LOAD)



ZEMUR EXISTING DRAIN

CONSTRUCT NEW SUMP
AT CPT UNIT #2

REDIRECT EXIST 300 DIA
AND TRUCK DRAIN TO
NEW GULLY. GULLY
TO FALL

2 INCH W/ SEAL TOP OF
EXISTING PIT
DISCONNECT 300 INLET

REDIRECT DOMESTIC DRAINAGE
TO COMPOSITE ASPEN
REFINED OIL STORE

NEW GULLY
(RANDOM CLASSING)

300 DIA
EXIST CLASS Z

SEAL EXIST
OUTLET

EXISTING DRAIN
EXIST PIT

NEW TRENCH
RANDOM LUB-SUMP

CONNECT HAS EXISTING SUB-STATION
EXISTING TRUCK-AREA
FROM EXISTING SUMP

LUBE PLANT & WAREHOUSE

EXISTING DRAIN
POSITION INDICATIVE
ONLY

NEW VEHICLES
CARWASH

SEAL EXISTING
GULLY OUTLET

NEW GULLY
RANDOM EXISTING

INTERCEPT EXIST
DRAIN WITH
NEW GULLY

NEW VEHICLES

SEAL LUNGE
PIT

EXISTING TRUCK-AREA
FROM EXISTING SUMP

GATE

NEW W/ SEAL
OUTFALL

POWER FROM PUMP SUITS
FOR SWIMMING POOL

LOCATE GULLY OUTFALL
AT END OF EXIST
OUTFALL

LUBE OIL
TANK-FARM

NEW W/ SEAL
OUTFALL

NEW W/ SEAL
OUTFALL

NEW W/ SEAL
OUTFALL

NEW W/ SEAL
OUTFALL

NEW W/ SEAL
OUTFALL

NEW W/ SEAL
OUTFALL

NEW W/ SEAL
OUTFALL

NEW W/ SEAL
OUTFALL

NEW W/ SEAL
OUTFALL

NEW W/ SEAL
OUTFALL

NEW W/ SEAL
OUTFALL

NEW W/ SEAL
OUTFALL

NEW W/ SEAL
OUTFALL

A B C D E F G H

1 2 3 4 5 6 7 8 9 10

B R A C K S S T R E E T

EXISTING TERMINAL

228849

M 630

M 158

M 1443

M 925

M 948

10

9

8

7

6

5

4

3

2

1

PROPOSED EXTENSIONS

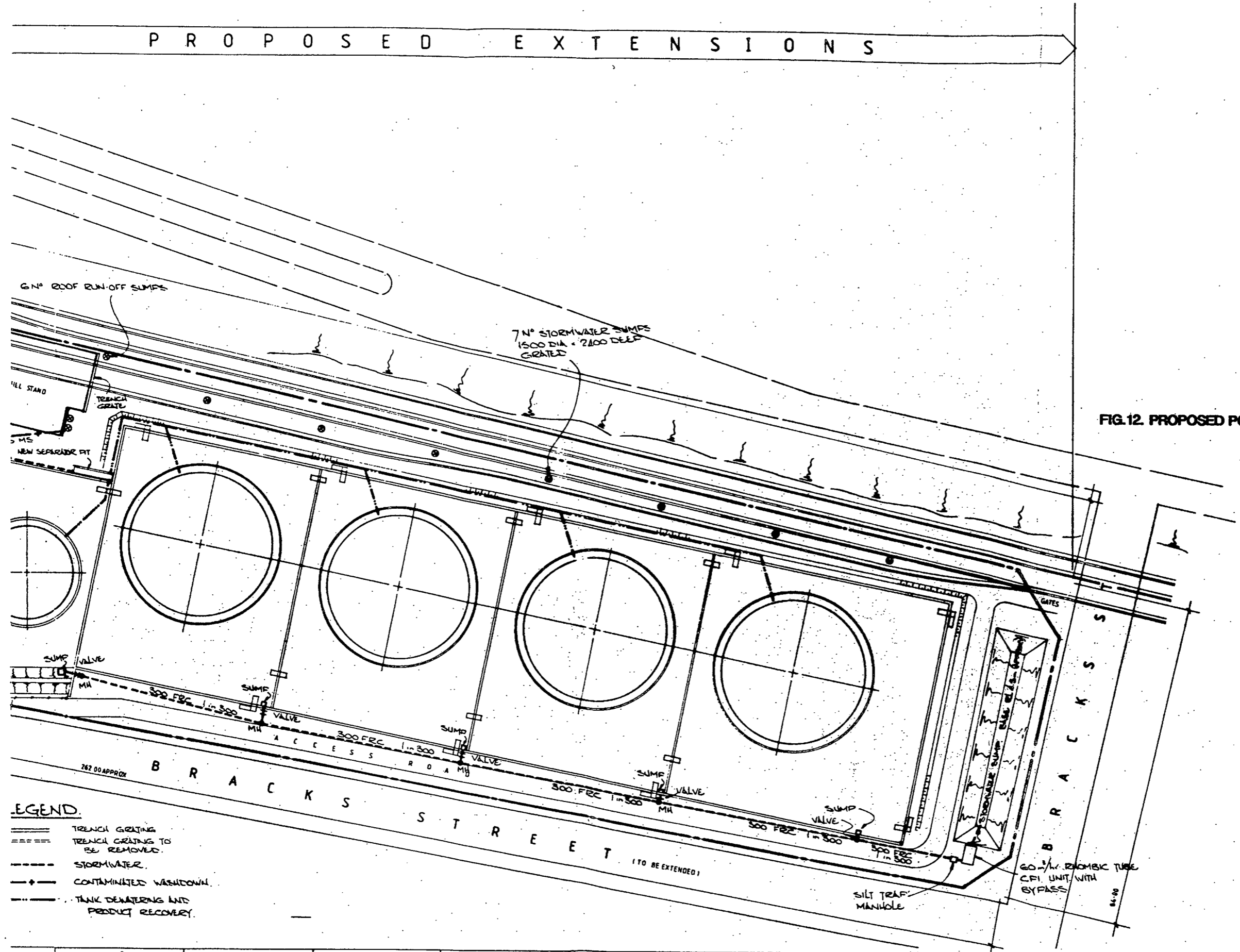


FIG.12. PROPOSED POLLUTION CONTROL SYSTEM

- LEGEND.**
- ==== TRENCH GRATING
 - TRENCH GRATING TO BE REMOVED.
 - STORMWATER.
 - +--- CONTAMINATED WASHDOWN.
 - TANK DRAINING AND PRODUCT RECOVERY.

MARK	BY	DATE	DESCRIPTION / REVISION
REFERENCE DRAWINGS			
CALTEX OIL (AUSTRALIA) PTY. LIMITED			
COPYRIGHT THIS DRAWING AND DESIGN MUST NOT BE COPIED IN WHOLE OR PART WITHOUT THE WRITTEN CONSENT OF CALTEX OIL AUSTRALIA PTY. LIMITED.			
FREMANTLE, W.A. TERMINAL EXTENSIONS 1989 POLLUTION CONTROL LAYOUT			
DRAWN	DATE	APPROVED	DATE
G.HAZAK	9-89		
CHECKED	DATE	DATE	DATE
SCALE	SIZE	DRAWING NO.	REV.
1:500	A1	40181	

APPENDIX A

**DRAFT GUIDELINES FOR CALTEX OIL (AUSTRALIA) PTY. LTD.
PROPOSED TANK FARM EXPANSION -
BRACKS STREET, NORTH FREMANTLE**

- o cadastral information;
- o former and current land use considerations;
- o changes to services, drainage systems, roads; and
- o impacts on adjacent land uses (eg. residential and industrial)

4. PLANT DESCRIPTION

A clear description of the existing and proposed facility, including plant design, should be given.

Advantages or disadvantages of the proposed expansion, when compared with the existing operation, should be discussed at both a site specific and regional level.

5. POTENTIAL ENVIRONMENTAL IMPACTS AND MANAGEMENT

This section should briefly describe any effects on the environment from the existing facility and provide a more detailed description of the effects that could be expected if the proposed expansion was approved (eg. cumulative effects). Impacts should be quantified where possible, and the criteria used for making an assessment of their significance should be discussed.

The PER should also indicate approaches that will be adopted to ameliorate and manage the identified impacts. Issues that should be addressed include:

- o levels of gas, liquid or solid waste discharged to the environment from operations at the expanded plant eg. spill controls, gas venting controls and treatment of waste material associated with tank cleaning operations; and
- o how any potential impacts on the receiving environment will be managed.

6. PRELIMINARY RISK ANALYSIS FOR NORTH FREMANTLE FUEL OIL STORAGE FACILITIES

The Authority considers that a preliminary risk analysis (PRA) will need to be undertaken that considers the major Fuel Oil Storage Facilities located in North Fremantle. Facilities that should be included in the PRA are Caltex, Ampol, Shell and BP.

This analysis will be used to ensure that current and future development plans, both within the immediate area and in surrounding areas, are made after consideration of the risk levels associated with the fuel oil storage facilities.

7. MONITORING

Spill, leak, odour and risk control issues associated with operations at the facility should be managed through an environmental management programme (EMP). The PER should include details of the timing, scope and purpose of the EMP, including who is responsible for the preparation of the EMP and its on-going costs. How it will be reviewed/modified based on the

**DRAFT GUIDELINES FOR CALTEX OIL (AUSTRALIA) PTY LTD PROPOSED
TANK FARM EXPANSION - BRACK STREET, NORTH FREMANTLE.**

These guidelines identify issues that should be addressed within the Public Environmental Review (PER). They are not intended to be exhaustive and the proponent may consider that other issues should also be included in the document.

The PER should facilitate public review of the key environmental issues. The PER should be a general public document. Its purpose should be explained and the contents should be concise and accurate as well as being readily understood. Specialist information and technical description should be included where it assists in the understanding of the proposal. It may be appropriate to include ancillary or lengthy information in technical appendices.

Where specific information has been requested by a Government Department or the Local Authority, this should be included in the document.

1. SUMMARY

The PER should contain a summary of:

- o salient features of the proposal;
- o the potential environmental impacts and their significance;
- o safeguards and commitments;
- o the environmental management programme; and
- o conclusions.

2. INTRODUCTION

The PER should include an explanation of the following:

- o identification of proponent;
- o background and objectives of the proposal;
- o brief details of the scope and timing of the proposal;
- o identification of government bodies whose approvals need to be attained;
- o relevant statutory requirements and approvals; and
- o scope, purpose and structure of the PER.

3. PROPOSED LOCATION AND ALTERNATIVES CONSIDERED

A brief discussion of alternative sites considered along with the proposed site should be provided. The method used to select the proposed site should be clear and reasoned. The selection of this option should be explained and information on the environmental advantages and disadvantages of the proposed option should be included.

The location should be described in detail. A plan of the area should illustrate the relative position of the proposed site. Any changes that will occur as a consequence of this proposal should also be described. The site is to be defined both in terms of the existing land uses and/or currently approved uses and infrastructure including;

results and the mechanism proposed to make the information available to the public.

8. CONCLUSION

GUIDELINES

A copy of these guidelines should be included in the document.

REFERENCES

All references should be listed.

APPENDICES

Where detailed technical or supporting documentation is required, this should be placed in appendices.

COMMITMENTS

Where an environmental problem has the potential to occur the proponent should cover this potential problem with a commitment to rectify it. Where appropriate, the commitment should include:

- o who will do the work;
- o what is the nature of the work;
- o to whose satisfaction the work will be carried out;
- o when the work will be carried out; and
- o if appropriate where the work will be carried out.

The form and substance of commitments can be seen in recent EPA assessment reports (eg. Bulletin 419).

Commitments should be individually numbered and collated into a section of their own in the document to facilitate their transfer into Ministerial conditions which are legally enforceable.

GLOSSARY

A glossary should be provided in which all technical terms, and unfamiliar abbreviations and units of measurement are explained in everyday language.

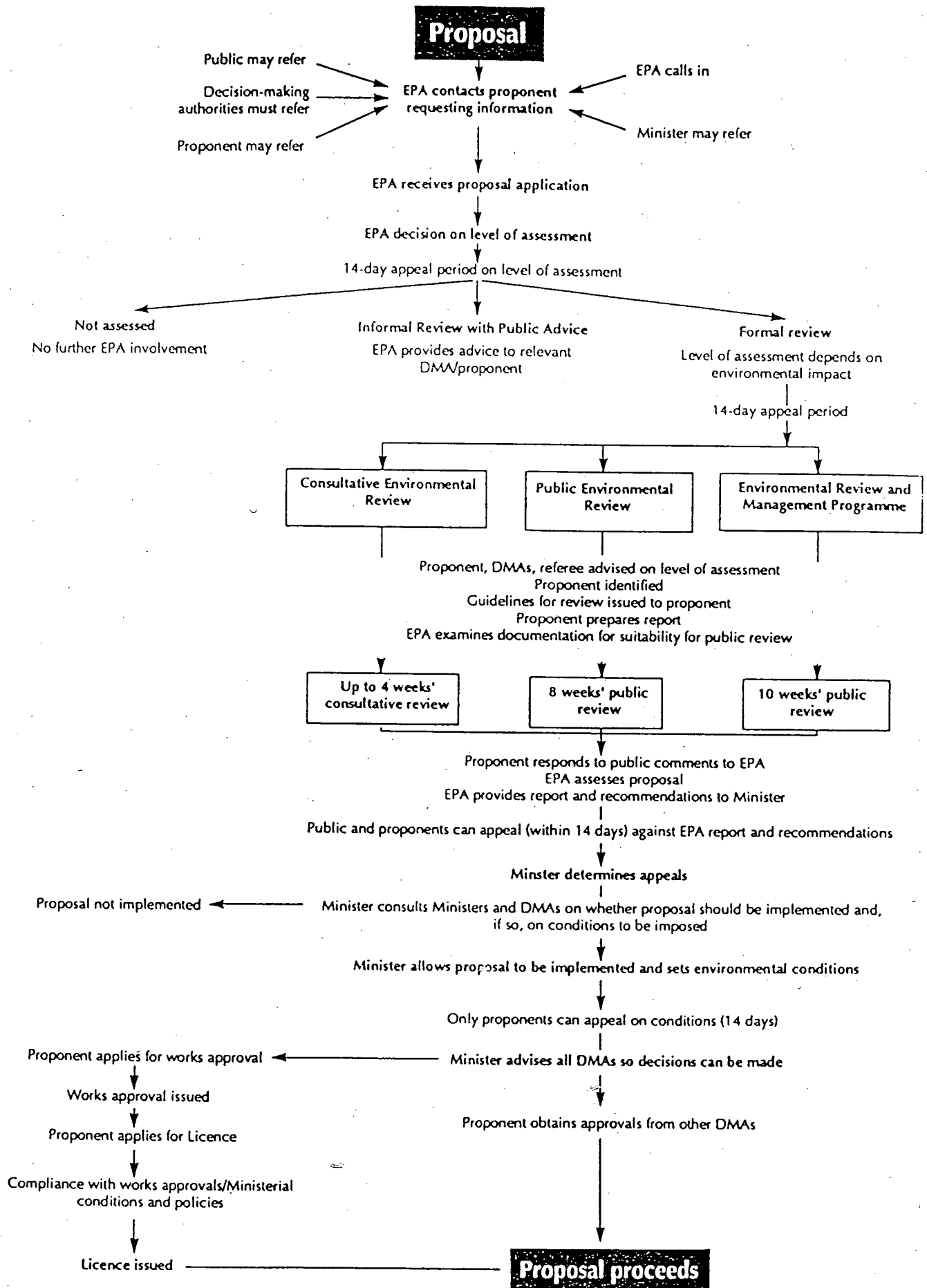
HOW TO MAKE A PUBLIC SUBMISSION

The PER should include instructions to the public on how they can make a submission. These instructions should be placed at the beginning of the document.

APPENDIX B

ENVIRONMENTAL ASSESSMENT PROCEDURE

The environmental assessment path



APPENDIX C

AMPOL LIMITED INVOLVEMENT



Ampol Limited
580 George Street
Sydney NSW 2000
Telephone (02) 364 4444
Facsimile (02) 364 4700
Telex AA 121325

2 November, 1990.

The Manager
The EPA of Western Australia
PERTH WA 6000

Dear Sir,

RE: Development of Caltex Terminal, Fremantle

I wish to confirm that Ampol intends entering into a joint venture agreement with Caltex for the operation and ownership of the Caltex Fremantle Terminal.

The joint venture will involve the construction of several additional tanks at the Caltex Terminal and the closure of the Ampol terminal. Ampol will subsequently demolish its terminal and rehabilitate the site.

This proposal has been agreed in principle between Caltex and Ampol but is still subject to the negotiation of an operating agreement and the Board approval of both companies.

Yours faithfully,



R.E. Gay
NATIONAL OPERATIONS MANAGER

APPENDIX D

CALTEX NORTH FREMANTLE OIL TERMINAL

RISK ANALYSIS SUMMARY

Industrial Risk Management

CALTEX NORTH FREMANTLE

OIL TERMINALS

RISK ANALYSIS SUMMARY

690558S

SEPTEMBER, 1990

SYDNEY

18-24 Chandos Street
St Leonards
NSW 2065

Tel : 61-2-4374200
Fax : 61-2-9063023
61-2-4384179

PERTH

6th Floor, GCA Centre
160 St George's Terrace
WA 6000

Tel : 61-9-3222652
Fax : 61-9-3221398

MELBOURNE

27 Flinders Lane
Melbourne
VIC 3000

Tel : 61-3-6535529
Fax : 61-3-6501490

HONG KONG

6th Floor
Washington Plaza
230 Wanchai Road

Tel : 852-5-8932371
Fax : 852-5-8345781

SAN FRANCISCO

Suite 2110
Four Embarcadero Center
CA 94111

Tel : 1-415-9565834
Fax : 1-415-9561186



CONTENTS

	Page No.
1. BACKGROUND	1
2. RISK GUIDELINES	2
3. RISK ASSESSMENT RESULTS AND CONCLUSIONS	3
3.1 Proposed Caltex Terminal	4
3.2 Existing Terminals	4
3.3 Cumulative Risk	4



1. BACKGROUND

Caltex Oil (Australia) Pty Ltd plan to consolidate its operations in North Fremantle by the extension of its Bracks Street Terminal. This will involve the shut down of the Ampol Terminal (Port Beach Road), shut down of an existing Caltex, Port Beach Road Terminal (Ex-Golden Fleece), and termination of lease of the Knutsford Street storage tanks in East Fremantle. The modifications to the existing terminal being essentially replacement of the above storage facilities.

The design throughput of the terminal is presently 274,000 T/annum and after consolidation will be 352,000 T/annum of refined petroleum products (including Ampol distribution).

A risk analysis of the proposed extension together with existing oil storage facilities in North Fremantle was requested by the Environmental Protection Authority (EPA) as a condition of approval. Industrial Risk Management Pty Limited was appointed by Caltex to undertake this analysis.

The study objectives were as follows:

- a) To perform a preliminary risk assessment of the Caltex Terminal in North Fremantle including existing and proposed development as a supporting document to the Environmental Impact Statement.
- b) To assess to the satisfaction of the Environmental Protection Authority of Western Australia whether the risk guidelines adopted by the EPA can be met by the proponent.
- c) To perform risk assessment of the British Petroleum and Ampol Oil Storage terminals in North Fremantle.



- d) To provide EPA with information on the cumulative risk levels in the North Fremantle area around the fuel oil storage facilities.

Originally, the study was also to include the Shell oil storage terminal in North Fremantle. Unfortunately, Shell refused to provide any information regarding the terminal operation or storage. It was indicated, however, that they would conduct an internal study of their facilities in the area.

2. RISK GUIDELINES

Risk guidelines have been established by the Environmental Protection Authority, Western Australia, in Bulletin 278. The following is an excerpt from the guidelines relevant to new industrial installations and cumulative risk impacts:

"An individual risk level in residential zones of less than 1 in a million a year is so small as to be acceptable to the Environmental Protection Authority".

"An individual risk level in residential zones exceeding 10 in a million per year is so high as to be unacceptable to the Environmental Protection Authority".

"Where the preliminary risk level in residential zones has been calculated to be in the range 1 in a million to 10 in a million a year, the Authority will call for further evaluation of the risks associated with the project. The Authority may then be prepared to recommend that the project be acceptable subject to certain planning and technical requirements".

"Where a number of hazardous industries or activities exist in a region, it is appropriate for a cumulative risk and hazard analysis for existing and proposed developments in the regions to be undertaken before assessing new developments in the region. No extra risk would be acceptable where the cumulative risk of existing industry, combined with the assessed risk of the proposed new industry, exceeds the risk levels proposed for new industry".



The New South Wales Department of Planning have developed additional risk guidelines for the analysis of hazards in terms of risk of injury and domino effects. "Hazardous Industry Planning advisory paper No.4, Risk Criteria for Land Use Safety Planning".

With regard to injury risk criteria for heat radiation it is stated that "Incident heat flux at residential areas should not exceed 4.7 kW/m^2 at frequencies of more than 50 chances in a million".

With regard to criteria for risk of damage to property and of accident propagation it is stated that "Incident heat flux radiation at neighbouring potentially hazardous installations or at land zoned to accommodate such installations should not exceed a risk of 50 in a million per year for the 23 kW/m^2 heat flux".

3. RISK ASSESSMENT RESULTS AND CONCLUSIONS

3.1 Proposed Caltex Terminal

It was found that the risk presented by the Proposed Caltex Terminal fell well within the limits of acceptability. Neither the 10^{-6} p.a. risk of fatality contour nor the 4.7 kW/m^2 at 50×10^{-6} p.a. contour encroach on any residential area or dwelling, the closest public meeting place, the surf lifesaving club also falls outside these contours although the car park is partially affected in the case of the 4.7 kW/m^2 contour at 50×10^{-6} p.a..

The 23 kW/m^2 at 50×10^{-6} p.a. contour, contained mainly within the site boundaries, does not encroach on any surrounding industrial sites. This indicates that the risk of a fire spreading to other sites (domino effect) is also at an acceptable level.



3.2 Existing Terminals

For the BP Terminal, calculations show that the 1×10^{-6} p.a. individual risk contour partially covers the adjacent Department of Agriculture office on the corner of Tydeman road. The heat radiation contour 4.7 kW/m^2 at 50×10^{-6} p.a. falls upon the boundary of this office area but does not encroach upon it.

In the case of the Ampol terminal and Caltex 'Golden Fleece' depot the results meet the criteria and these will be closed down if the proposed Caltex Development takes place.

The only installation examined which has risk levels encroaching upon residential areas is the Knutsford Street Distillate Storage Facility in East Fremantle. It is envisaged however that this facility would be taken out of service by Caltex if the proposed modifications to the Bracks Street Terminal are accepted and completed.

3.3 Cumulative Risk

The levels of individual risk for each facility have been reproduced on an overall map of the North Fremantle area. Figure 1 indicates the present situation with terminals and storage depot.

Figure 2 represents the levels of individual risk for the North Fremantle area with the proposed Caltex consolidation in Bracks Street North Fremantle. In this figure the Ampol Terminal and the Caltex "Golden Fleece" Storage Depot would be shut down along with the Knutsford Street Storage Depot.



With respect to :

- a) Caltex existing terminal in Bracks Street
 - b) Ampol existing terminal in Port Beach Road
 - c) BP existing terminal
 - d) Caltex "Golden Fleece" storage facility on Port Beach Road
 - e) Caltex proposed Bracks Street terminal expansion.
-
- 1) All EPA requirements are met. Cumulative risk levels for individual risk at residential areas, including the existing and proposed Caltex development are less than one in a million per year. There is no net increase in cumulative risk to residential areas due to the proposed development.

 - 2) The consolidation of operations at the Caltex Bracks Street terminal will result in an overall reduction in cumulative risk in the Fremantle area due to:
 - ~ Closure of the Ampol terminal
 - ~ Closure of the "Golden Fleece" storage depot
 - ~ Handover of the Knutsford Street depot and the pipeline running through Fremantle to Federal Government.

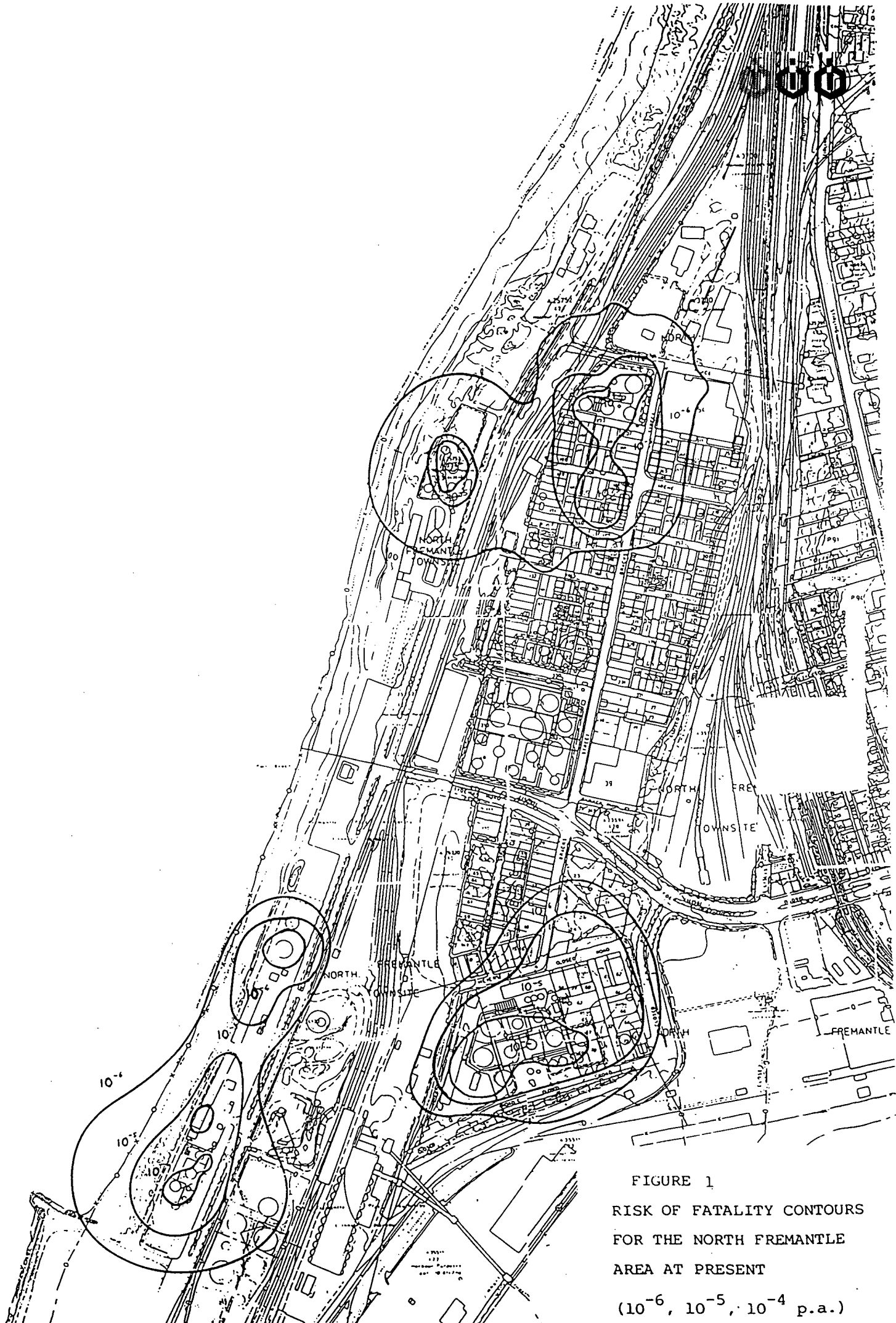


FIGURE 1
RISK OF FATALITY CONTOURS
FOR THE NORTH FREMANTLE
AREA AT PRESENT
(10^{-6} , 10^{-5} , 10^{-4} p.a.)



FIGURE 2
RISK OF FATALITY CONTOURS
FOR THE NORTH FREMANTLE AREA
AFTER THE PROPOSED CONSOLIDATION
(10^{-6} , 10^{-5} , 10^{-4} p.a.)

APPENDIX E

**CALTEX OIL
MARKETING AND OPERATIONS MANUAL - VOLUME 3
FIRE SAFETY AND ENVIRONMENTAL CONTROL
CONTENT OUTLINE**

MARKETING OPERATIONS MANUAL	I N D E X	PART	1
	FIRE CONTROL	PAGE	1

		<u>PART</u>	<u>SECTION</u>	<u>PAGE</u>
1.1.0	<u>THE NATURE OF FIRE</u>	1	1	1
1.1.1	<u>THE BASIC FACTS</u>			
1.1.2	<u>THE FIRE TRIANGLE</u>			
1.1.3	<u>FLASH POINT</u>	1	1	2
1.1.4	<u>PETROLEUM VAPOURS</u>			
1.1.5	<u>LIQUIFIED PETROLEUM GAS</u>			
1.1.6	<u>EXPLOSIONS</u>	1	1	3
1.1.7	<u>CLASSES OF LIQUIDS</u> (Defined in AS1940 - 1976)			
APPENDIX	1 <u>SALIENT POINTS CONCERNING LP GAS FIRES & ESCAPES</u>	1	1	1
APPENDIX	1 <u>RECOMMENDED STEPS IN THE PREVENTION OF LP-GAS FIRES & ESCAPES</u>	1	1	2
APPENDIX	1 <u>SMOKING MUST BE PROHIBITED LEAKAGE OF LPG WITHOUT FIRE</u> <u>LEAKAGE OF LPG WHICH IS ON FIRE</u>	1	1	33.
APPENDIX	1 <u>SERIOUS EXPOSURE OF LPG EQUIPMENT FROM ADJACENT FIRE</u>	1	1	43.
APPENDIX	1	1	1	52.
1.2.0	<u>FIRE PREVENTION</u>	1	2	1
1.2.1	<u>THE BASIC THEORY</u>			
1.2.2	<u>PRESENCE OF AIR</u>			
1.2.3	<u>CONTROL OF VAPOUR</u>			
1.2.4	<u>CONTROL OF IGNITION SOURCES</u>			
1.2.5	<u>PRINCIPLES OF FIRE PREVENTION</u>			
1.2.6	<u>MATCHES AND NAKED LIGHTS</u>	1	2	2
1.2.7	<u>SMOKING</u>			
1.2.8	<u>HOT WORK</u>			
1.2.9	<u>COMBUSTIBLE RUBBISH</u>			
1.2.10	<u>OPEN TOPPED CONTAINERS</u>			

EFFECTIVE DATE : AUGUST 1, 1982

REPLACES PAGE DATED : COMPLETE REISSUE

MARKETING OPERATIONS MANUAL	I N D E X	PART	1
	FIRE CONTROL	PAGE	2

		<u>PART</u>	<u>SECTION</u>	<u>PAGE</u>
1.2.11	<u>ELECTRICAL EQUIPMENT</u>	1	2	3
1.2.12	<u>CLASSIFICATION OF HAZARDOUS AREAS</u>			
1.2.13	<u>DESCRIPTION OF AREA CLASSIFICATIONS</u>	1	2	4 & 5
1.2.14	<u>MAJOR FLAMMABLE LIQUID ESCAPE</u>	1	2	6
1.2.15	<u>INTRINSIC SAFETY</u>			
1.2.16	<u>ENGINE TYPE REQUIREMENTS FOR PUMPING FLAMMABLE LIQUIDS AND FOR HAZARDOUS LOCATIONS</u>	1	2	7, 8 & 9
1.2.17	<u>ELECTRIC MOTORS</u>	1	2	10
1.2.18	<u>ILLUSTRATIONS</u>	1	2	11 TO 19
1.2.19	<u>OUTSIDE CONTRACTORS</u>	1	2	20
1.2.20	<u>OTHER FLAMMABLES</u>			
1.2.21	<u>YARD PUMP VENTS</u>			
1.2.22	<u>STORAGE OF SAMPLES</u>			
1.2.23	<u>CLEANING FLUIDS</u>			
1.2.24	<u>FARM STORAGE TANKS - PETROLS</u>			
1.2.25	<u>PUMPING EQUIPMENT</u>	1	2	21
1.2.26	<u>UNDERGROUND TANK VENTS</u>			
1.2.27	<u>PRECAUTIONS DURING DELIVERY</u>			
1.2.28	<u>SWITCH LOADING</u>	1	2	22 & 23
1.2.29	<u>SWITCH LOADING PROCEDURES</u>			
1.2.30	<u>MOBILE EQUIPMENT</u>	1	2	24
1.2.31	<u>HOUSEKEEPING</u>			
1.3.0	<u>TYPES OF FIRES</u>	1	3	1 & 2
1.3.1	<u>CLASSES DEFINITION</u>			

EFFECTIVE DATE : AUGUST 1, 1982	REPLACES PAGE DATED : COMPLETE REISSUE
---------------------------------	--

MARKETING OPERATIONS MANUAL	I N D E X	PART	1
	FIRE CONTROL	PAGE	3

		<u>PART</u>	<u>SECTION</u>	<u>PAGE</u>
1.4.0	<u>FIRE EXTINGUISHMENT</u>	1	4	1
1.4.1	<u>THE BASIC THEORY</u>			
1.4.2	<u>STARVING A FIRE</u>			
1.4.3	<u>SMOTHERING A FIRE</u>			
1.4.4	<u>COOLING A FIRE</u>	1	4	2
1.5.0	POTENTIAL HAZARDS AND INDICATIVE RESPONSE	1	5	1
1.5.1	ORGANIZATION - FIGHTING THE FIRE			
1.5.2	ESTIMATING THE SITUATION			
1.5.3	FIGHTING THE FIRE - PROCESS UNITS	1	5	2
1.5.4	FIGHTING THE FIRE - FIXED CONE ROOF TANKS	1	5	3
1.5.5	PROVISION OF FOAM-FIXED ROOF TANKS	1	5	4 & 5
1.5.6	FIGHTING THE FIRE - FLOATING ROOF TANKS	1	5	6
1.5.7	PROVISION OF FOAM-FLOATING ROOF TANKS			
1.5.8	FIGHTING THE FIRE - PRESSURIZED STORAGE	1	5	7
1.5.9	FIGHTING THE FIRE - PIPELINES	1	5	8
1.5.10	FIGHTING THE FIRE - LOADING RACKS			
1.5.11	FIRE PREVENTION - LOADING RACKS			
1.5.12	FIGHTING THE FIRE - TANK TRUCK AND OTHER VEHICLES	1	5	9
1.5.13	FIGHTING THE FIRE - DRUM FILL FACILITIES			
1.5.14	FIGHTING THE FIRE - PUMP MANIFOLD			
1.5.15	FIGHTING THE FIRE - SERVICE STATIONS	1	5	10
1.5.16	FIGHTING THE FIRE-BARGES			
1.5.17	FIGHTING THE FIRE - PETROLEUM WHARVES	1	5	11
1.5.18	FIGHTING THE FIRE - WAREHOUSES AND BUILDINGS	1	5	12

EFFECTIVE DATE : AUGUST 1, 1982

REPLACES PAGE DATED : COMPLETE REISSUE

MARKETING OPERATIONS MANUAL	I N D E X	PART	1
	FIRE CONTROL	PAGE	4

		<u>PART</u>	<u>SECTION</u>	<u>PAGE</u>
1.5.19	FIGHTING THE FIRE - NATURAL GROUND COVER	1	5	13
1.6.0	<u>STATIC ELECTRICITY</u>	1	6	1
1.6.1	<u>THE NATURE OF STATIC ELECTRICITY</u>			
1.6.2	<u>GENERATION OF STATIC ELECTRICITY</u>			
1.6.2	<u>ILLUSTRATIONS</u>	1	6	2
1.6.3	<u>POTENTIALLY HAZARDOUS PRODUCTS</u>	1	6	3, 4 & 5
	<u>SCHEDULE 'A'</u>	1	6	6
1.6.4	<u>AVOIDING STATIC GENERATION</u>	1	6	7
1.6.5	<u>MECHANISM OF STATIC ACCUMULATION</u>			
1.6.6	<u>SPARKING POTENTIAL</u>	1	6	8
1.6.7	<u>CONDUCTIVITY OF PETROLEUM PRODUCTS</u>	1	6	9
1.6.8	<u>MECHANISM OF STATIC DISCHARGE</u>	1	6	10
1.6.9	<u>PREVENTION OF STATIC DISCHARGE</u>	1	6	11, 12 & 13
1.6.9	<u>ILLUSTRATIONS</u>	1	6	14
1.6.10	<u>CONTROL OF FLAMMABLE MATERIALS</u>	1	6	15
1.6.11	<u>SPLASH FILLING</u>			
1.6.12	<u>EARTHING AND BONDING - CONNECTIONS</u>	1	6	16
1.6.13	<u>RAIL TANK CAR BONDING</u>			
1.6.13	<u>ILLUSTRATIONS</u>	1	6	17

EFFECTIVE DATE : AUGUST 1, 1982

REPLACES PAGE DATED : COMPLETE REISSUE

MARKETING OPERATIONS MANUAL	I N D E X	PART	1
	FIRE CONTROL	PAGE	5

		<u>PART</u>	<u>SECTION</u>	<u>PAGE</u>
1.6.14	<u>DRUM FILLING</u>	1	6	18
1.6.15	<u>RELAXATION TIME BEFORE DIPPING</u>			
1.6.16	<u>BELT DRIVE STATIC GENERATION</u>	1	6	19
1.6.17	<u>CONCLUSION</u>			
1.7.0	<u>FIRE FIGHTING FACILITIES - TERMINALS/DEPOTS</u>	1	7	1
1.7.1	<u>FACILITIES TO BE PROVIDED</u>			
1.7.2	<u>WATER SUPPLY</u>			
1.7.3	<u>WATER PRESSURE</u>	1	7	2
1.7.4	<u>WATER RETICULATION</u>			
1.7.5	<u>HYDRANT SYSTEM</u>	1	7	3
1.7.6	<u>FIRE PUMPS</u>			
1.7.7	<u>SYSTEM SCHEMATICS</u>	1	7	4, 5, 6 & 7
1.7.9	<u>FIRE EXTINGUISHERS</u>			
1.7.10	<u>MAINTENANCE OF EXTINGUISHERS</u>	1	7	8
1.7.11	<u>SAND BINS</u>	1	7	9
1.7.12	<u>FIRE BLANKETS</u>			
1.7.13	<u>ASSESSMENT SPECIFIC FACILITIES</u>			
1.7.14	<u>MINIMUM COMPANY STANDARDS & PROCEDURES</u>	1	7	10 & 11
1.7.15	<u>TANK FARM CONSTRUCTION</u>	1	7	12
APPENDIX	<u>I FIRE EXTINGUISHER INSPECTION REPORT</u>	1	7	-
1.8.0	<u>FIRE FIGHTING FACILITIES - DEPOTS</u>	1	8	1 & 2
1.8.1	<u>DEPOT CLASSIFICATIONS</u>			
1.8.2	<u>ASSESSMENT SPECIFIC FACILITIES</u>			
1.8.3	<u>PROVISION/MAINTENANCE RESPONSIBILITIES</u>			
APPENDIX	<u>I FIRE FIGHTING EQUIPMENT/FACILITIES SCHEDULE</u>	1	8	-

EFFECTIVE DATE : AUGUST 1, 1982

REPLACES PAGE DATED : COMPLETE REISSUE

MARKETING OPERATIONS MANUAL	I N D E X	PART	1
	FIRE CONTROL	PAGE	6

		<u>PART</u>	<u>SECTION</u>	<u>PAGE</u>
1.9.0	<u>FIRE FIGHTING FACILITIES - AIRPORT DEPOTS</u>	1	9	1
1.9.1.	<u>CLASSIFICATIONS</u>			
1.9.2.	<u>ASSESSMENT SPECIFIC FACILITIES</u>			
1.9.3	<u>PROVISION/MAINTENANCE RESPONSIBILITIES</u>			
1.9.4	<u>TRAINING/INSPECTIONS</u>			
1.10.0	<u>FIRE FIGHTING FACILITIES - SERVICE STATIONS</u>	1	10	1
1.10.1	<u>ASSESSMENT OF FACILITIES</u>			
1.10.2	<u>PROVISION/MAINTENANCE RESPONSIBILITIES</u>			
1.10.3	<u>PREPAREDNESS/TRAINING</u>			
1.11.0	<u>WORK PERMITS AND RESPONSIBLE OFFICER</u>	1	11	1
1.11.1	<u>NOTIFICATION OF INTENDED WORKS OR OPERATIONS</u>			
1.11.2	<u>INSPECTION OF SITE</u>			
1.11.3	<u>ISSUING OF WORK PERMITS</u>	1	11	2
1.11.4	<u>HANDLING OF WORK PERMITS</u>	1	11	3
1.11.5	<u>PERMIT CONDITIONS</u>			
1.11.6	<u>PRECAUTIONS TO BE TAKEN IN PREPARING AN AREA FOR HOT WORK</u>	1	11	4
1.11.7	<u>PRECAUTIONS TO BE OBSERVED BY PERSONNEL ENGAGED IN HOT WORK</u>	1	11	5 & 6
1.12.0	<u>FIRE TRAINING, DRILLS AND REPORTS</u>	1	12	1
1.12.1	<u>BASIC POLICY</u>			
1.12.2	<u>TERMINAL PREPAREDNESS</u>			
1.12.3	<u>STAFF TRAINING</u>			
1.12.4	<u>FIRE DRILLS</u>			
1.12.5	<u>FIRE DRILL REPORTS</u>	1	12	2
1.12.6	<u>DEPOT PREPAREDNESS</u>	1	12	3
1.12.7	<u>SERVICE STATIONS PREPAREDNESS</u>			
1.12.8	<u>OFFICE - STAFF PREPAREDNESS</u>			

EFFECTIVE DATE : AUGUST 1, 1982	REPLACES PAGE DATED : COMPLETE REISSUE
---------------------------------	--

MARKETING OPERATIONS MANUAL	I N D E X	PART	1
	FIRE CONTROL	PAGE	7

		<u>PART</u>	<u>SECTION</u>	<u>PAGE</u>
1.12.9	<u>MOTIVATION</u>	1	12	4 & 5
1.12.10	<u>FIRE REPORT (S.R.21)</u>			
APPENDIX	I	1	12	1
	<u>FIRE DRILL REPORT</u>			

MARKETING OPERATIONS MANUAL	I N D E X	PART	2
	SAFETY CONTROL	PAGE	1

		<u>PART</u>	<u>SECTION</u>	<u>PAGE</u>
2.1.0	<u>SAFETY PRINCIPLES</u>	2	1	1
2.1.1	<u>GENERAL</u>			
2.1.2	<u>PARTICIPATION</u>			
2.1.3	<u>SEGREGATION</u>			
2.1.4	<u>RESPONSIBILITY</u>			
2.1.5	<u>SAFETY COMMITTEES</u>	2	1	2
2.1.6	<u>SAFETY OFFICER</u>			
2.1.7	<u>DUTIES OF A SAFETY OFFICER</u>	2	1	3
2.1.8	<u>AUTOMOTIVE EQUIPMENT</u>	2	1	4
2.1.9	<u>PHYSICAL FITNESS OF DRIVERS</u>	2	1	5
2.1.10	<u>MISCELLANEOUS PROTECTIVE EQUIPMENT</u>	2	1	6
2.1.11	<u>SECURITY</u>			
2.1.12	<u>SAFETY NOTICE BOARDS - TERMINALS</u>	2	1	7
2.1.13	<u>TRUCK SAFETY SIGN</u>			
2.1.12	<u>ILLUSTRATIONS</u>	2	1	8
2.2.0	<u>SAFE PRACTICES AND ACCIDENT PREVENTION</u>	2	2	1 & 2
2.2.1	<u>INTRODUCTION</u>			
2.2.2	<u>SAFE PRACTICES/YARD/PLANT</u>			
2.2.3	<u>SAFE PRACTICES/WAREHOUSES</u>	2	2	3 & 4
2.2.4	<u>SAFE PRACTICES - OTHER BUILDINGS</u>	2	2	5
2.2.5	<u>SAFE PRACTICES - STORAGE TANKS</u>			
2.2.6	<u>SAFE PRACTICES - SANDBLASTING TANKS IN SERVICE</u>	2	2	6, 7 & 8

EFFECTIVE DATE : AUGUST 1, 1982

REPLACES PAGE DATED : COMPLETE REISSUE

MARKETING OPERATIONS MANUAL	I N D E X	PART	2
	SAFETY CONTROL	PAGE	2

		<u>PART</u>	<u>SECTION</u>	<u>PAGE</u>
2.2.7	<u>SAFE PRACTICES - PIPELINES AND VALVES</u>	2	2	9 & 10
2.2.8	<u>SAFE PRACTICES - SEPERATOR PITS</u>			
2.2.9	<u>PERSONAL SAFETY</u>			
2.2.10	<u>PRODUCT HANDLING</u>	2	2	11, 12 & 13
2.2.11	<u>LOADING OF PRODUCT</u>	2	2	14
2.2.12	<u>CLEANING MOBILE TANKS</u>	2	2	15 & 16
2.2.13	<u>CLEANING STORAGE TANKS</u>	2	2	17 TO 22
2.2.14	<u>ENTERING STORAGE TANKS AFTER CLEANING</u>	2	2	20
2.2.15	<u>BREATHING EQUIPMENT - RESPIRATORS</u>	2	2	20
2.2.16	<u>PRECAUTIONS IN OFFICES, LABORATORIES, ETC.</u>	2	2	23 & 24
2.2.17	<u>DRIVING TECHNIQUES - ALL DRIVERS</u>	2	2	25, 26 & 27
APPENDIX	I	2	2	1 TO 5
	<u>INTERNAL CLEANING OF STORAGE TANKS</u>			
2.3.0	<u>SAFETY AWARDS</u>	2	3	1 & 2
2.3.1	<u>GENERAL</u>			
2.3.2	<u>PERSONNAL ACCIDENTS - TERMINALS</u>			
2.3.3	<u>ROAD SAFETY - ALL DRIVERS</u>	2	3	3 & 4
2.3.4	<u>AWARDS - CATEGORISED AND DEFINED</u>	2	3	5
APPENDIX	I	2	3	1
	<u>CALTEX TERMINAL CLASSIFICATIONS</u>			
	<u>GOLDEN FLEECE TERMINALS CLASSIFICATIONS</u>			

EFFECTIVE DATE : AUGUST 1, 1982

REPLACES PAGE DATED : COMPLETE REISSUE

MARKETING OPERATIONS MANUAL		I N D E X		PART	2	
		SAFETY CONTROL		PAGE	3	
				<u>PART</u>	<u>SECTION</u>	<u>PAGE</u>
2.4.0	<u>EMERGENCIES - NATURAL DISASTERS</u>	2	4		1	
2.4.1	<u>GENERAL</u>					
2.4.2	<u>EARTHQUAKE</u>					
2.4.3	<u>TIDAL WAVES</u>					
2.4.4	<u>VOLCANIC ERUPTIONS</u>					
2.4.5	<u>FLOODS</u>					
2.4.6	<u>CYCLONES</u>	2	4		2	
2.4.7	<u>ADDITIONAL PROCEDURES</u>					
2.4.8	<u>EMERGENCY PROCEDURE FOLDER</u>	2	4		3	
APPENDIX	1	2	4		1 & 2	
	<u>EARTHQUAKE REPORT PRO FORMA</u>					
2.5.0	<u>RECORDS AND REPORTS</u>	2	5		1 TO 6	
2.5.1	<u>GENERAL</u>					
2.5.2	<u>SAFETY FORMS</u>					
2.5.3	<u>REPORTS/SUBMISSION SCHEDULE</u>					
2.5.4	<u>PREPARATION OF SAFETY REPORTS</u>					
2.5.5	<u>CLASSIFICATION OF ACCIDENTS - DEFINITIONS</u>	2	5		7 TO 10	
	<u>INTRODUCTION</u>			PREFACE	1 & 2	
	<u>PUBLIC RELATIONS</u>					
	<u>WAIVER OF COMPLIANCE</u>			PREFACE	3	
	<u>DISTRIBUTION LIST</u>			PREFACE	4 & 5	
APPENDIX	1	2	5		1 & 2	
	<u>SUMMARY OF SAFETY REPORTS - SUBMISSION SCHEDULE</u>					
APPENDIX	1	2	5		3 TO 15	
	ILLUSTRATIONS					
EFFECTIVE DATE : AUGUST 1, 1982				REPLACES PAGE DATED : COMPLETE REISSUE		

		<u>PART</u>	<u>SECTION</u>	<u>PAGE</u>
3.1.0	<u>ENVIRONMENTAL PRINCIPLES</u>	3	1	1
3.1.1.	<u>GENERAL</u>			
3.1.2.	<u>DEFINITIONS</u>			
3.1.3	<u>COMMITTEES</u>	3	1	2
3.1.4	<u>STATUTORY AUTHORITIES</u>	3	1	3
3.1.5	<u>NOTIFICATION OF AN OIL SPILL</u>	3	1	4 & 5
APPENDIX	I	3	1	1 & 2
	<u>PROCEDURES TO BE TAKEN IN THE EVENT OF AN OIL SPILL OR ACCIDENTAL DISCHARGE OF OIL INTO NEW SOUTH WALES WATERS</u>			
3.2.0	<u>ORGANISATION</u>	3	2	1 & 2
3.2.1	<u>AREA OF RESPONSIBILITY</u>			
3.2.2	<u>CALTEX PERSONNEL</u>			
3.2.3	<u>ALLOCATION OF RESPONSIBILITY</u>	3	2	3
3.2.4	<u>SUPPLEMENTARY PERSONNEL - MARINE OIL SPILLS</u>	3	2	4 & 5
3.2.5	<u>GOVERNMENTAL RELATIONSHIPS/PERSONNEL</u>			
3.2.6	<u>TRAINING</u>			
APPENDIX	I	3	2	1
	<u>OPERATIONS COMMANDERS - STAFF LIST</u>			
APPENDIX	I	3	2	2
	<u>CALTEX SHORE REPRESENTATIVE (for Marine Oil Spills)</u>			
APPENDIX	II	3	2	1 TO 4
	<u>P.I.E.C.E. CONTROLLERS</u>			
APPENDIX	III	3	2	1
	<u>CHARACTERISTICS OF OIL SPILLS</u>			
	<u>SPREADING</u>			
	<u>EVAPORATION</u>			

MARKETING OPERATIONS MANUAL	I N D E X	PART	3
	ENVIRONMENTAL CONTROL	PAGE	2

		<u>PART</u>	<u>SECTION</u>	<u>PAGE</u>
APPENDIX III		3	2	2 & 3
	<u>BIODEGRADATION</u>			
	<u>DISPERSION</u>			
	<u>ABSORPTION</u>			
3.3.0	RESOURCES	3	3	1
3.3.1	<u>EQUIPMENT AND MATERIALS</u>			
3.3.2	<u>INVENTORIES</u>			
APPENDIX I		3	3	1 TO 4
	<u>EQUIPMENT AND MATERIALS</u>			
3.4.0	<u>CALTEX ACTION PLAN</u>	3	4	1
3.4.1	<u>BASIC PLAN</u>			
3.4.2.	<u>PREVENTION REVIEW</u>	3	4	2, 3 & 4
3.4.3	<u>PLANNING FOR ACTION</u>	3	4	5
3.4.4	<u>ACTION STATIONS</u>	3	4	6, 7 & 8
3.4.5	<u>CLEAN-UP PRACTICES</u>	3	4	9, 10 & 11
APPENDIX I		3	4	1
	ILLUSTRATIONS			
APPENDIX II		3	4	1
	<u>ANTI-POLLUTION CONTROLS</u>			
3.5.0	COMMUNICATIONS	3	5	1
3.5.1	<u>COMPANY PERSONNEL DIRECTORY - APPENDIX I</u>			
3.5.2	<u>RADIO TELEPHONE COASTAL COMMUNICATION NETWORK - APPENDIX II</u>			
3.5.3	<u>GOVERNMENT CONTRACTS - APPENDIX III</u>			
APPENDIX I		3	5	1 TO 6
	<u>COMPANY & DISTRIBUTOR PERSONNEL DIRECTORY</u>			

EFFECTIVE DATE : AUGUST 1, 1982	REPLACES PAGE DATED : COMPLETE REISSUE
---------------------------------	--

MARKETING OPERATIONS MANUAL	I N D E X	PART	3
	ENVIRONMENTAL CONTROL	PAGE	3

		<u>PART</u>	<u>SECTION</u>	<u>PAGE</u>
APPENDIX II	<u>RADIO TELEPHONE COASTAL COMMUNICATION NETWORK</u>	3	5	1
APPENDIX III	<u>GOVERNMENT CONTACTS</u>	3	5	1
3.6.0	<u>LEGAL AND FISCAL REQUIREMENTS</u>	3	6	1
3.6.1	<u>LEGAL PROCEDURES - GENERAL</u>			
3.6.2	<u>ACCOUNTING PROCEDURES - GENERAL</u>			
3.7.0	<u>RECORDS AND REPORTS</u>	3	7	1 & 2
3.7.1	<u>OIL SPILL LOG SHEET - FORM O.S.L.1</u>			
3.7.2	<u>POLLUTION REPORT - S.501</u>	3	7	3 & 4
APPENDIX I	<u>OIL SPILLAGE</u>	3	7	1 & 2
APPENDIX III	<u>ILLUSTRATIONS</u>	3	7	1 & 2

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ENVIRONMENTAL PROTECTION AUTHORITY
1 MOUNT STREET PERTH