SubSea International

Australia Inc

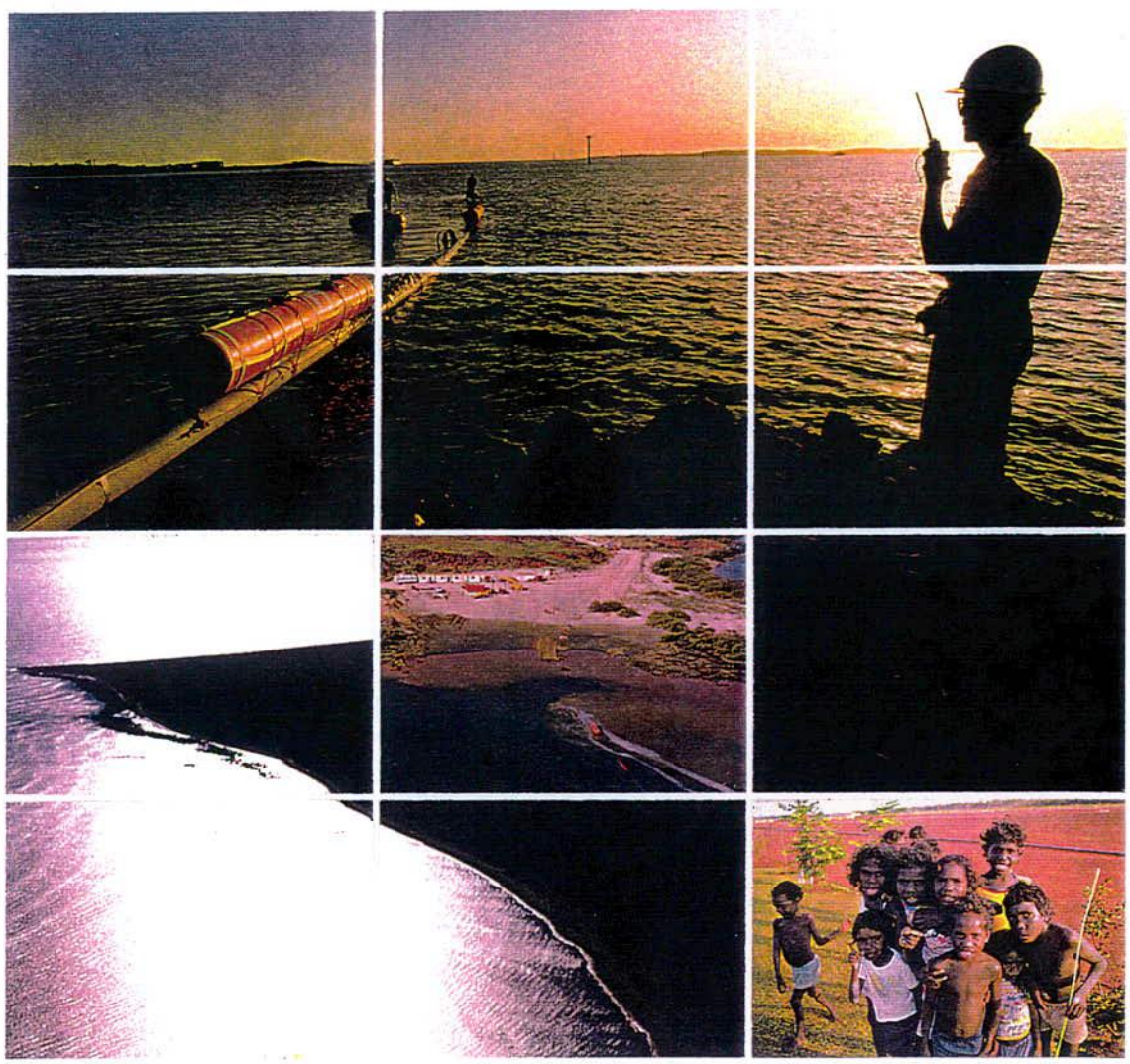
STAG DEVELOPMENT PROJECT

INSTALLATION OF PRODUCT EXPORT SYSTEM

CONSULTATIVE ENVIRONMENTAL REVIEW

SHOREBASED PIPELINE FABRICATION SITE

PA-P-PP-01248



Offshore Engineering ▪ Project Management
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SUBSEA INTERNATIONAL (Australia) Inc

STAG DEVELOPMENT PROJECT

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Revision	Description	Date	Prep	QA	Check	Approved SSI	Approved Client
A	Preliminary Issue	26.02.97	HW	PS	GW	MR	
A1	Issued for Comment	28.02.97	HW	PS	MR	MR	
A2	Issued for Use	17.03.97	HW	PS	MR	MR	

RECORD OF AMENDMENTS

Revision	Pages	Details	Revised	Check	Date
A	ALL	Preliminary Issue	HW	MR	26.02.97
A1	ALL	Issued for Comment	HW	MR	28.02.97
A2	ALL	Issued for Use	HW	MR	17.03.97

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LIST OF ABBREVIATIONS AND ACRONYMS

AMSA	Australian Marine Science Association
CER	Consultative Environmental Review
cfm	Cubic feet per minute
CV	Command Vessel
DEP	Department of Environmental Protection
DMR	Department of Main Roads
DOLA	Department of Land Administration
E	East
EMP	Environmental Management Plan
EPA	Environmental Protection Authority
ha	Hectare
kg	Kilogram
km	Kilometre
kVA	Kilovoltamp
kW	Kilowatt
lpm	litres per minute
lt	Litre
LTV	Lead Tow Vessel
m	Metre
mm	Millimetre
MPa	Mega Pascal
MSW	Metres of seawater
N	North
NDT	Non Destructive Testing
NE	NorthEast
Nm	Newton metre
psi	Pounds per square inch
QA	Quality Assurance
Qty	Quantity
ROV	Remotely Operated Vehicle
rpm	Revolutions per minute
S	South
sp	Species
SW	SouthWest
UCS	Unconfined Compressive Strength
V	Volt
W	West

1.0 REQUEST FOR PUBLIC SUBMISSIONS

1.1 Invitation to Comment

The Environmental Protection Authority (EPA) invites people to make a submission on this proposal.

SubSea International Australia Inc (the proponent) proposes to construct a pipeline fabrication site within the existing Mardie Station Pastoral Lease and existing Vacant Crown Land Reserve approximately 45km SouthWest of Dampier.

In accordance with the Environmental Protection Act, SubSea International Australia Inc has prepared a Consultative Environmental Review which describes the proposal and its likely effect on the environment.

The CER is available for public review for four (4) weeks from 24 March 1997 closing on 21 April 1997.

After receipt of submissions from the public and Government agencies, the EPA will prepare an assessment report with recommendations to the Government, taking into account issues raised in 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 alternative approaches.

It is useful if you can suggest ways to improve the proposal.

All submissions received by the EPA will be acknowledged. Submissions will be treated as public documents and may be quoted in full or in part unless specifically marked confidential.

Why not join a group?

If you prefer not to write your own comments, it may be worthwhile joining a group interested in making a submissions on similar issues.

Joint submissions may help to reduce the work for an individual or group while increasing the pool of ideas and information.

If you form a small group (up to 10 people) you may wish to indicate the names of all participants.

If you group is larger, please indicate how many people your submission represents.

1.2 Developing a submission

You may agree or disagree with, or comment on general or specific issues discussed in the CER.

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 points in the CER:

- clearly state your point of view;
- indicate the source of your information or argument if this is applicable;
- 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 CER;
- if you discuss sections of the CER, keep them distinct and separate, so there is no confusion about which section you are considering;
- attach any factual information you want to provide and give details of the source. Make sure your information is accurate.

Remember to include:

- Your name,
- address,
- date, and
- whether you want your submission to be confidential

THE CLOSING DATE FOR SUBMISSIONS IS: 21 APRIL 1997

Submissions should be addressed to:

The Environmental Protection Authority
'Westralia Square'
141 St Georges Terrace
PERTH WA 6000

Attention: Ms Juliet Cole (Phone: 09-222 7000)
(Fax: 09-322 1598)

2.0 EXECUTIVE SUMMARY

2.1 The Proposal

SubSea International Australia Inc (the proponent) proposes to construct a pipeline fabrication site within the existing Mardie Station Pastoral Lease and existing Vacant Crown Land Reserve, approximately 45km SouthWest of Dampier.

The site will be used for the fabrication, testing and launching of offshore petroleum product export pipelines. Expected site utilisation of one (1) month per year is anticipated.

Access to the fabrication site will be via a public road to be constructed by the Shire of Roebourne and is not within the scope of this CER, but is referred to where appropriate.

The fabrication site will comprise both permanent and temporary facilities which may be summarised as follows:

Permanent Facilities

- Graded and gravel covered facilities area measuring 150 metres by 150 metres.
- Graded fabrication corridor 2,500 metres long by 20 metres wide, gravel covered over 10 metres width with installed railway track over the full length.
- Boundary fencing of facilities area and fabrication corridor.
- Pipeline launch ramp, approximately 50 metres long by 10 metres wide.
- Installed water tank, reticulation and septic system.

Temporary Facility

- Site offices, ablution block, accommodation and store containers.
- Site equipment and equipment service facilities.

Site pipeline production activities will include:

- Delivery of pipe joints and fabrication materials to site.
- Weld up and testing of pipe joints into a continuous pipeline up to 2,500 metres long.
- Installation of pipeline buoyancy and ballast chains.
- Pressure testing of pipeline prior to launch.
- Launching of pipeline with subsequent towing of the pipeline to the offshore site.

Other potential future uses of the fabrication site may include:

- Recovery and repair of seismic streamers.

2.2 Proposal Characteristics Summary Table

The following summary table presents the characteristics of the proposal.

PRELIMINARY RELEVANT ENVIRONMENTAL FACTORS	EPA ENVIRONMENTAL OBJECTIVE(S)	POTENTIAL IMPACTS	PROPOSED MANAGEMENT OF RELEVANT FACTOR	PREDICTED OUTCOME
BIOPHYSICAL				
Declare rare and priority flora	To protect Declared Rare Flora and Priority Flora, consistent with the provisions of the Wildlife Conservation Act (1950)	Implementation of the proposal will involve some clearing of native vegetation which may impact on declared rare and priority flora.	CALM to comment on the presence of likely rare and priority flora on site. Astron Engineering to undertake rare and priority flora survey. If found, management of rare and priority fauna to be addressed in EMP	If found to occur on site, proponent commits to ensure declared rare and priority flora habitat is retained wherever possible.
Vegetation communities	To ensure the abundance, diversity, geographical distribution and productivity of vegetation communities are protected.	Implementation of the proposal will involve some clearing of native vegetation.	Liaise with CALM and Dept. of Agriculture re control of identified weeds. Liaise with CALM re preferred species for regeneration and active planting. Undertake regeneration and active planting works.	Vegetation communities within the development area will be enhanced via active replanting.
Declared rare fauna	To protect Threatened Fauna and Priority Fauna species consistent with the provisions of the Wildlife Conservation Act (1950)	Clearing as a result of site development may impact on declared rare fauna habitat.	CALM to comment on the presence of likely threatened and priority fauna on site. Astron Engineering to undertake fauna survey. If found, management of threatened and priority fauna to be addressed in EMP.	If found to occur on site, proponent commits to ensure declared rare fauna habitat is retained wherever possible.

PRELIMINARY RELEVANT ENVIRONMENTAL FACTORS	EPA ENVIRONMENTAL OBJECTIVE(S)	POTENTIAL IMPACTS	PROPOSED MANAGEMENT OF RELEVANT FACTOR	PREDICTED OUTCOME
BIOPHYSICAL (Cont)				
Terrestrial fauna	Regionally significant fauna is adequately protected	Regionally significant terrestrial fauna may be adversely effected by the development.	Undertake control of foxes and feral cats over site. Introduce shelter belt of trees and permanent water on site.	Regionally significant fauna will be encouraged through provision of enhanced vegetation and permanent water.
Dunes	Maintain the integrity, function and environmental values of the due and foreshore systems.	The integrity, function and environmental values of the dune and foreshore systems may be adversely effected by the development.	Exclude all vehicular and foot traffic over dune area, except over designated roads and pedestrian access paths.	Existing low dunes within the development area will be protected by installation of suitable boundary delineation temporary fencing .
SOCIAL SURROUNDINGS				
Heritage (indigenous and non-indigenous cultures)	Comply with statutory requirements in relation to areas of cultural or historical significance.	Development may disturb heritage sites of significance.	Identify the existence of significant archaeological remains over site. Exclude all site personnel from identified heritage sites. Ensure non interference with identified sites.	Identified cultural and historical significant sites within the development area will not be disturbed or interfered with in any way.
Recreation	Maintain the quality of the area, where possible, for recreational activities.	During periods of site activities (30-60 days/year) recreational activities along the immediate site foreshore may be restricted.	Provide boat ramp for public use adjacent to site. Liaise with the Shire of Roebourne to facilitate management of the coastal reserve.	The quality of existing recreational facilities adjacent to the proposed development area will be enhanced.

2.3 Environmental Resources

The proposed pipeline fabrication area and near shore pipeline launch zone lies within or close to diverse ecological zones including semi arid grasslands, clay/salt pans, coastal dunes, fringing mangrove assemblages, beach areas and intertidal reef communities.

The proposed access road and pipeline fabrication areas will be located on semi arid grasslands which are very widely spread within the Pilbara region and have an inherent resilience.

The marine environment in the area is subject to occasional catastrophic events resulting from the passage of cyclones, extreme tides and floods from the Yanyare River and numerous local creek systems.

The representative marine biota is well adapted to the harsh environmental conditions associated with the inshore areas into which pipeline launching will occur.

Several sites of Aboriginal significance have been identified within 5.0 km of the proposed development areas and preservation of these areas is essential.

Human activities within the immediate vicinity are generally limited to day visits from the local communities of Pannawonica and Karratha together with some overnight camping during the winter months. Recreational pursuits undertaken in the vicinity of the site include fishing, mud crabbing, beach combing and four wheel drive vehicle activities.

2.4 Environmental Management

2.4.1 Operational Management

SubSea will undertake to prepare and implement a comprehensive and rigorous environmental management plan for each pipeline fabrication project to minimise the risk of adverse ecological or social impacts that may result from future pipeline fabrication projects undertaken on the proposed site. Specific measures that are proposed and that will be implemented include:

(i) Site Access

• Dust Creation	Road formation will be undertaken by the Shire of Roebourne. Dust suppression methods will be used on access roads during periods of heavy use associated with fabrication site activities and will be the responsibility of SubSea.
• Clay Pan Stabilisation	Where the road crosses the existing clay pan, an approved causeway will be constructed. Through drainage will be provided.
• Flora Impact	No mangrove communities intersect the proposed access roadway. The presence of rare and priority flora along the proposed access road will be determined prior to commencement of works.

(ii) Fabrication Site Management

• Mangrove and Adjacent Scrub Belt Preservation	These areas will be marked off with star pickets and flagging. No site personnel will take any motorised vehicle into the area nor interfere in any way with soil or vegetation. Site development and fabrication activities will not occur closer than 150 metres from established mangroves. Approved dust suppression methods will be used over the facilities area and fabrication corridor.
• Line Pipe Coatings	All line pipe coating will be conducted off site at an approved location in Dampier or Perth. If epoxy paint coatings have to be stripped from pipe surfaces on site, only an approved system will be used. No residues will be allowed to remain on site.
• Line Pipe Grit Blasting	If required, only DEP approved mobile grit blasting systems will be used on site.
• Painting	All paints and solvents will be stored in an approved container. No spray painting will be undertaken on site.
• Fuels & Oils	Both fuel and oil containers will be of an approved type and installed with a contingent containment system in case of spillage. No fuel or oil soil contamination will occur on site. Waste oil will be collected in approved containers and removed from site. No fuel or oils will remain on site during periods when the site is unattended.
• Fluids and Residues	Fluid chemicals and residues will not be released into the site environment. All fluid chemicals and residues will be disposed of in an approved manner at an approved site.

• Site Waste	All site solid waste will be removed from site and disposed of in an approved manner at an approved location. Use of site toilets will be mandatory. A site septic system will be used for domestic waste only.
• Intertidal Area	Disturbance to the intertidal area will be minimised. All areas will be reinstated to ground level on completion of project work. Pipelines will be launched in the "off bottom" mode to minimise effects to the benthic communities.
• Near Shore Activities	During the launching phase of pipelines, primary installation vessels will at all times remain more than 1000 metres from the high water mark. All vessels will operate in accordance with AMSA guidelines and regulations for ocean going vessels. Pipeline drag chains will not be deployed to the seabed any closer than 1000 metres from the high water mark. The effect of pipeline drag chains on the benthic communities will be limited to +\- 5.0 metres from the launch/tow route centre line for all future pipeline fabrication and launch projects.
• Offshore Activities	All pipeline launching, towing and installation aids will be recovered to the fabrication site for reuse. As per AMSA codes, no waste will be discharged to the marine environment unless specifically approved by the EPA. The only pollutant which will require disposal approval relates to pipeline chemical inhibitors which will be addressed on an case by case basis as is the current method of approval consideration by the EPA.
• Ethnographic and Archaeological Considerations	Pending a detailed ethnographic and archaeological survey of the area, any identified sites will be clearly defined. Interference with and access to these areas will not be permitted.
• Community Involvement	The proponent will undertake to provide information and encourage members of the local community to become involved in the project.

• Vehicular Activity	No vehicles other than approved construction and support machines will be permitted on site without the express permission of the Project Manager. All construction machine activity will be restricted to those areas specifically formed for their use.
• Site Buildings	All site buildings will be designed to be removed from site by road vehicles. All foundations will be flush with ground level.
• Erosion Control	All site developments will be undertaken to minimise wind and water erosion. Effective dust management systems are to be implemented. Approved forms of soil stabilisation are to be incorporated within the site development plan. Extensive tree and shrub planting will be undertaken to supplement existing scrub buffer zones.
• Site Audits	The site Project Manager or his delegate will conduct a weekly audit to ensure compliance with the site environmental management plan. Site audit reports will be signed by the Project Manager and maintained on site for inspection by the EPA as required.
• EPA Access	The EPA's representative will have access to the site at all times during operational activities.
• Site Management	Environmental management of the site will be the responsibility of the Project Manager or his delegated site representative. A specific environmental management plan for each pipeline fabrication project will be prepared and implemented by SubSea.

2.4.2 Environmental Monitoring

SubSea intends to undertake additional environmental studies to promote effective environmental management and to thereby establish baseline data to monitor any future environmental effects resulting from site activities. Specific studies that are proposed include:

(i) Terrestrial survey of representative and significant fauna and rare or priority fauna within the grassland zone.

(ii) Baseline study of exotic plant and weed types within the proposed development area.

(iii) Marine survey of significant flora and fauna within the inshore zone over a distance of approximately 1,200 metres seaward of the pipeline launch point.

(iv) Follow-up marine surveys of the inshore zone after future pipeline launchings.

2.5 Potential Environmental Effects

It is concluded that normal pipeline fabrication and towing operations will cause no long term adverse impacts upon the terrestrial and/or marine environments.

Although access road and site development work will require clearing of approximately 50 ha of grassland areas, it is considered that the extent and resilience of the grassland zone will offset any potential adverse effects.

The proponent also intends to implement extensive revegetation and buffer zone plantings of local species to generally improve the proposed development area.

Special consideration has been given to the protection and preservation of the fringing mangrove community and associated onshore scrub buffer zone.

The proponent will work closely with the Shire of Roebourne to ensure protection and preservation of the low dune ridge to the west of the fabrication corridor. The Shire of Roebourne will be responsible for the management of the Vacant Crown Land Reserve and associated high dune zone extending generally east to west behind the "40 Mile" beach. This dune zone is not within the development area but will be effected by increased visitors utilising the proposed access road.

2.6 Conclusion

The proponent has previously demonstrated that the shore based pipeline fabrication, launch and tow method for offshore pipeline installations is a safe, low risk, and cost effective methodology.

The site under consideration, and described process methods, present a wide range of commercial, social and environmental benefits to the state.

The facility will also actively encourage the incorporation of other innovative technologies associated with marginal oil field developments. Considerable export opportunities may be realised as this technology is developed, proven and packaged.

The principal environmental concerns associated with the development proposal relate to protection of the inshore reef communities, fringing mangrove assemblage and local coastal major dunes outside the development area. Risks of significant damage to these areas is considered minimal.

The proponent will implement a comprehensive site Environmental Management Plan to ensure that the proposed development does not cause adverse ecological or social impacts.

Accordingly it is submitted that the proposal should be approved.

3.0 INTRODUCTION

3.1 Background

Offshore oil and gas pipelines are generally installed utilising one of the following methods:

- Continuous lay of rigid pipe from a moored barge and attendant support vessels.
- Continuous lay of flexible or rigid pipe from a dynamically positioned reel ship.
- Shore based pipeline fabrication and towing of the pipeline to the offshore site.

SubSea considers that the establishment of a permanent onshore pipeline fabrication and launching facility within the Pilbara region may be of commercial advantage to the company as well as providing significant commercial and social benefits to the local Pilbara community and broader community of Western Australia.

A detailed desk-top study, together with engineering scoping studies, were undertaken by SubSea, commencing in March 1996, to locate a coastal site suitable for development as a dedicated pipeline fabrication and launch facility within the Pilbara region.

Possible development sites were considered; on land adjacent to the Port of Dampier near King Bay, on land comprising East Intercourse Island, near Dampier, on coastal land on Urala Station, southwest of Onslow, and on coastal land on Mardie Station together with adjacent Vacant Crown Land, southwest of Dampier.

The most suitable site proved to be that associated with land on Mardie Station and adjacent Vacant Crown Land approximately 15km east of Cape Preston within the Shire of Roebourne. The site selection assessment criteria are listed in Section 5.0 of the CER.

Development proposals were submitted to the EPA in June and July 1996. In December 1996 the EPA set a level of assessment for the proposal as Consultative Environmental Review (CER) and this was duly advertised on December 7, 1996.

The Shire of Roebourne Council provided in principle support to the development proposal at the Council meeting of December 16, 1996.

Dedication of the proposed access road as a public road was acknowledged to DOLA by the Shire of Roebourne on February 27, 1997.

Agreement to development of the proposed site was obtained from the Leasee of Mardie Station on March 12, 1997.

3.2 The Proponent

SubSea International Australia Inc, as the proponent of the CER, seeks to establish a world class pipeline fabrication launch and tow facility to service the perceived growth of pipeline installation projects associated with the continued development of the NorthWest Shelf's petroleum reserves.

Appendix A to this CER provides a detailed profile of the proponent and identifies its relationship with Dresser Industries as the parent company.

3.3 Project Commitments And Timing

SubSea has a commitment to commence fabrication for the first pipeline to be fabricated on site no later than August 1, 1997.

To meet this deadline, pipeline fabrication site earthworks will need to commence in June 1997.

Prior to June 1997, SubSea will be undertaking site preparatory work including terrestrial and marine surveys such that engineering work may progress in accordance with the project schedule. During this time legislative requirements for site establishment will also be addressed.

SubSea is progressing the necessary approvals for fabrication site use with DOLA and it is anticipated that the required approvals will be granted such that site earthworks may commence by June 1997.

The Shire of Roebourne will be responsible for construction of the public access road which will service both the "40 Mile" beach area and the proposed fabrication site. Environmental considerations associated with the access road are not included in the scope of this CER.

3.4 Legislative Requirements

This proposal must comply with the Environmental Protection Act, 1986. SubSea first referred the proposal to establish a shore based pipeline site to the Environmental Protection Authority (EPA) for their consideration in June 1996. The draft environmental review application was revised and reissued to the EPA in July 1996. The EPA determined that the proposal warranted formal assessment under provisions of the Act and set the level of assessment at Consultative Environmental Review (CER) which was duly advertised on December 7, 1996..

In addition, the proposal must comply with the Aboriginal Heritage Act, 1972 to ensure the protection of all Aboriginal sites that may exist within the proposed fabrication site boundaries.

The principal state and federal laws that apply to the establishment of the proposed pipeline fabrication site are as follows:

Petroleum (Submerged Lands) Act, 1982

Environmental Protection Act, 1986

Land Acquisition and Public Works Act 1902

Native Title Act 1993 (Commonwealth)

Aboriginal Heritage Act, 1972

Pollution of Waters by Oil and Noxious Substances Act 1987

Implementation of the proposal to establish the fabrication site will be consistent with the requirements of all relevant Acts and regulations.

3.5 Scope And Structure Of The CER

This CER describes the proposed establishment of a shore based pipeline fabrication site and near-shore pipeline launch and towing zone.

This CER is intended to provide the government agencies and the public with relevant information describing the existing site environment and the activities that the proponent intends to carry out on that site.

The CER identifies the environmental resources that may be affected by the proposal, assesses the potential environmental impacts and defines the environmental management program that will be implemented to minimise potentially adverse environmental effects.

The CER has been structured in accordance with the Guidelines provided by the Department of Environmental Protection (DEP) which have been included as Appendix B to this CER.

4.0 NEED FOR THE PROPOSAL

Oil is a strategic material, vital to the economic welfare of Australia. It is a recognised fact that with the depletion of the Bass Strait petroleum reserves, the offshore oil and gas reserves associated with Western Australia's NorthWest Shelf will play an enhanced role in maintaining Australia's current self sufficient status in oil production.

Enhanced seismic survey techniques have in recent years, served to identify and delineate a number of marginal oil fields within Western Australia's offshore waters. The degree of marginally is a function of the market price of the crude and of course the cost to produce the oil. The economics of previously defined marginal prospects is being continually reassessed as new production methods and technologies drive down the oil production costs.

The manufacture and installation of offshore petroleum pipelines via the shore based fabrication and tow to site method will facilitate the development of marginal, and other, offshore petroleum deposits.

The establishment of the proposed shore based pipeline fabrication site will facilitate the building and installing of offshore petroleum pipelines in the safest, most cost effective manner possible. The benefits may be summarised as follows:

4.1 Greater Efficiencies

Reduced environmental risks and effects through the process of shore based pipe building and tow compared to the traditional barge lay of pipeline.

Reduced costs of manufacture utilising a shore base rather than an offshore work barge.

Potential to incorporate further innovative technology more easily at the shore site rather than on an offshore foreign flagged work barge.

Enhanced working conditions for personnel compared to the offshore alternative.

Enhanced logistic functions by achieving fabrication onshore.

4.2 Improved Processes

The establishment of a dedicated shore based site for pipeline fabrication will:

Greatly facilitate the introduction of further process improvements and techniques through build and tow method refinement.

Encourage the set-up of associated support industries and services within the region to support onshore fabrication of marine pipelines (ie. coating plants, NDT contractors, etc).

Ensure that established Western Australian companies will be able to tender for major pipeline contracts from a highly competitive cost base provided through the proposed shore based fabrication site.

4.3 Improved Quality

It is an acknowledged fact that the quality of pipeline fabrication welding undertaken within the protective confines of a dedicated shore base is superior to that which can be achieved offshore. This is particularly true for duplex stainless steel pipelines.

Enhanced controls inherent within the shore based pipeline build and tow method virtually ensures a higher quality installed product offshore, since deleterious factors including: weather, sea states, process contaminants and logistic considerations may be mitigated through higher levels of control and planning.

SubSea can demonstrate that greater personnel safety may be expected as a result of implementing the proposed shore based build and tow method rather than the traditional barge lay approach.

4.4 Innovative Technologies

The establishment of a dedicated shore based pipeline fabrication site will nurture a raft of innovative development work which can only benefit the industry, in particular, and the broader community of Western Australia, in general. A summary of the innovations associated with the proposed method include:

Progressing the offshore hook-up of pipelines via Remotely Operated Vehicles (ROV's) rather than the traditional method using divers.

Utilising ROV's to flood and pig the pipeline after installation and using ROV's to recover all pipeline buoyancy and ballast chain.

Moving a significant portion of offshore project works (ie. expenditure) to an onshore site and thereby benefiting the local community

Identifying other potential site uses, seismic streamer maintenance for example.

Working closely with state and local government agencies to identify potential community spin-offs from the development of the site. Given that SubSea is able to commit to develop the access road to the coast in the available time-frame, it is highly likely that the Shire of Roebourne will undertake to include additional infrastructure to support and enhance the recreational potential of the area for the benefit of the general community.

Direct benefits that will accrue to the community from the proposed pipeline fabrication site include the following:

The Western Australian Government or nominated agency will be the recipient of lease monies paid by SubSea in respect of site use.

The proponent intends to spend in the order of $800,000 developing the site including road and other head works. All capital improvements will be relinquished by the proponent and vest with the state or nominated agency after completion of the access road, if required, and at the expiration of the lease period in respect of the fabrication site itself.

The fabrication site will provide a wide range of employment opportunities to the people of Western Australia, and in particular, the residents of the Pilbara region. Of the funds generated by this project, 74% will be disbursed within Western Australia, 19% within other Australian states and only 7% disbursed overseas.

SubSea considers it likely that pipeline project work suited to the proposed site will, over the next five (5) years, require other fabrication and launching projects being carried out there. Given the identified local content percentages, this represents a significant contribution to the economy of Western Australia.

The proposed site and associated innovative pipeline installation methods will encourage the formulation and development of locally derived technologies. This outcome not only reduces the resource sector's dependence on "foreign solutions", but also stimulates value added technology suitable for export to petroleum sectors outside Australia.

The proposed fabrication and pipeline installation technology will facilitate the use of complimentary technologies including the use of flexible pipe product and diver-less flowline connection systems.

There is significant potential to export valued added petroleum production technology from the state of Western Australia.

5.0 CONSIDERATION OF ALTERNATIVES

In February 1996, SubSea undertook an extensive desktop study and series of site surveys in an effort to locate a suitable shore based pipeline fabrication site in the Pilbara region to support present and future offshore gas and oil reticulation developments associated with the NorthWest Shelf.

The assessment criteria were based upon the following:

Advice gained from state and local government agencies as to the preferred location of the proposed site.

Reasonable proximity to established commercial infrastructure.

Existing site road access suitable for upgrade, or potential to form a new road for access purposes.

Willingness of the recognised descendants of traditional Aboriginal people to negotiate aspects of site access and use.

Suitable near shore bathymetry to facilitate pipeline launching and tow commencement.

Proximity to known offshore petroleum reserves.

Optimal site orientation with respect to land gradients, prevailing winds and near shore currents.

Absence of local sites which have been previously identified and classified as significant by the Aboriginal Affairs Department.

A preference for special lease or sub-leased pastoral land outside the Port of Dampier rather than industrial land within the port's limits. Launching and towing of long pipelines, within one of the busiest Australian ports, is a less than ideal location to transport fabricated pipe strings to offshore locations.

The willingness of the pastoral Leasee(s) to agree to participate in the development and review management plans associated with the pipeline fabrication site.

The willingness of state and local government instrumentalities to provide early "in principle" planning approval for the intended works to enable planning and consultations to proceed.

Selection of a site essentially devoid of established trees or shrubs, having inherent soil stability, the absence of near shore mud flats or fringing coral reefs and offering a resilient ecosystem that would remain largely unaffected by the proposed development of the fabrication site.

Possible alternative sites that were considered include:

Coastal land leased by the Dampier Port Authority adjacent to King Bay within the Port of Dampier.

Coastal land on East Intercourse Island within the Port of Dampier.

Coastal land on the Urala Station Pastoral Lease South of Onslow.

The selected site on Mardie Station Pastoral Lease Land and Vacant Crown Land, as proposed, fulfilled the assessment criteria to a far greater extent than the proposed alternatives.

In view of the above criteria, there is no viable alternative shore based pipeline fabrication site within the Shire of Roebourne or adjacent coastal regions.

6.0 DESCRIPTION OF OPERATIONS

6.1 Summary of Project Characteristics

The following table provides a list of project characteristics.

PROJECT ASPECTS	DESCRIPTION
Site Utilisation	30 days per year (minimum) 60 days per year (maximum)
Life of Project	10 years
Workforce on Site	20
Area of Disturbance: Facilities Area Fabrication Corridor Launch Ramp Intertidal Zone	 2.25ha 5.00ha 0.05ha 1.00ha
Estimated In-Fill Materials: Sand Cut & Fill Crushed Rock/Gravel	 14,000m^3 3,700m^3
Maximum Cut Depth on Fabrication Corridor	1.5m
Maximum Fill Depth on Fabrication Corridor	1.5m
Water Required: Road Dampening Pipe Pressure Testing Domestic Use	 120,000 lt/project 60,000 lt/project 10,000 lt/project

6.2 Location

The proposed pipeline fabrication facilities area, fabrication site corridor and pipeline launch ramp lie on the coast approximately 45km SouthWest of Dampier and 15km east of Cape Preston as shown in Fig. 1 in Attachment A to Section 6 of this CER.

The development of the site will include the following:

i) Establishment of a 50 metre wide road reserve extending approximately 8,900 metres north from the NorthWest Coastal Highway through the coast and hence 2,500 metres west to the proposed facilities area. Reference should be made to Fig. 2 in Attachment A to Section 6 of this CER. Formation of a 10 metre wide gravel access road and fencing of the road reserve. Establishment of the access road is contingent upon the current boundary between Mardie and Karratha Stations being rationalised by the leasee's and DOLA. Road works will be undertaken by the Shire of Roebourne and as such are not included in the scope of this CER.

ii) Grading , compacting and gravel surfacing of a 150 metre by 150 metre facility area on Vacant Crown Land at the termination of the access road.

iii) Assuming boundary rationalisation, the annexation from the Mardie Station pastoral lease and Vacant Crown Land of a portion of land 2,700 metres long wide extending northeast to southwest from the facilities area as shown in Fig. 5 in Attachment A to Section 6 of this CER. This portion of land is referred to as the fabrication corridor. It would be graded over a width of 20 metres, then compacted and gravel covered over a 10 metre width. A standard gauge railway will extend over the length of the fabrication corridor and would terminate 20 metres above high water mark. The fabrication corridor will include a boundary fence continuous with the access road boundary fence and be designed limit uncontrolled vehicular access onto Mardie Station. Extensive shrub planting and reticulation would be established to adequately screen and improve the facilities area and fabrication corridor.

Site operations proposed for the site include the following:

Delivery of linepipe joints to site with weld up of joints on rail bogeys followed by; weld inspection, pipe joint coating and pipeline pressure testing.

The fully fabricated pipeline, up to 2,500 metres long, will then be fitted with buoyancy modules, ballast chains and navigational aids.

Support rollers will be installed in the intertidal zone, tow vessels will be positioned offshore and the pipeline tow cable brought to shore.

The pipeline will then be launched at mid tide using the tow vessel winches. During the transition of the pipeline from bogey support to rollers, the bogeys will be recovered within the fabrication corridor.

The pipeline will progress through the intertidal zone supported on rollers clear of the seabed. At a distance of 1,000 metres beyond high water mark, the pipeline will clear support rollers and the ballast chains will then be deployed to the seabed. The pipeline will then be towed in the "off-bottom" mode to the offshore installation site.

Reference should be made to; the engineering drawings in Section 6.0, Attachment C and to typical site activity photographs in Section 6.0, Attachment B of this CER.

It is envisaged that the fabrication site will be utilised for periods of between thirty (30) and sixty (60) days per year. For the remainder of the year, the site will be left vacant. During periods of pipeline fabrication, portable support plant, site offices and amenities will be located within the facilities area. During periods of non-use, all portable plant, site offices and amenities will be removed from the facilities area. The proposed railway will remain on site during periods of non-use.

SubSea seeks to negotiate and secure a ten (10) year lease for the facilities area and fabrication corridor with a an option for lease extension.

Formation of the access road will be partially or fully funded by SubSea and will be established by the Shire of Roebourne as a public road and gazetted as such.

6.2 Decision Making Authorities, Involved Agencies And Interest Groups

The following list identifies the decision making Authorities, Agencies involved, and interest groups consulted in respect of the proposed development.

Department of Environmental Protection (Consultation commenced in June, 1996)

Department of Land Administration

Aboriginal Affairs Department (Consultation commenced June, 1996)

- Liaison in respect of Aboriginal Heritage issues relevant to development
- Identification of existing Aboriginal significant sites relevant to development

Department of Resource Development (Consultation commenced in April, 1996)

- Liaison in respect of proposal development

Shire of Roebourne (Consultation commenced in April, 1996)

Ministry for Transport (Consultation commenced in December 1996)

Ministry for Planning (Consultation commenced in December, 1996)

Mardie and Karratha Station Leasees (Consultation commenced in May, 1996)

- Agreement to facilitate development on Mardie and Karratha Station leasehold land.

Roebourne Land Council (Consultation commenced in November, 1996)

- Protocol discussions and introduction of the proponent.

Native Title Claimants (Consultation commenced in February, 1997)

- Negotiations with the representatives of the identified claimant group under Native Title Claim WC 96/89

Local Community (Consultation commenced in December 1996)

- Responses from, and discussions with, members of the Pilbara community resulting from advertising and planning information made available through the Shire of Roebourne's offices in Karratha.

6.3 Site Operations Summary

6.3.1 Overview

The proposed fabrication site will be utilised to weld up 12 metre long pipe joints to form continuous pipeline lengths up to 2,500 metres long.

The site will be used on an ad hoc basis dependant on the frequency of offshore projects requiring intra or inter field pipelines and the competitive pricing of shore based pipeline building versus other methods including barge lay of rigid pipe or vessel lay of flexible pipe.

Apart from the rail track and associated crushed rock ballast together with boundary fencing, the facilities area and fabrication corridor will be cleared of facilities on completion of each pipeline project. The site will be left free of all construction materials, support equipment, buildings and pipeline launching aids.

6.3.2 Site Set-up Operations and Decommissioning Overview

Set up of the site will be undertaken in four (4) identifiable phases.

Phase 1 - Site Preparations

Site earthworks and fencing associated with; the formation of the facilities area, railway and pipeline fabrication corridor and pipeline launching ramp. Installation of pipeline launch railway.

Phase 2 - Site Mobilisation

Truck transport of all site support equipment and amenities. (Refer to CER Appendix D for a list of typical equipment).

Truck transport of 12 metre linepipe joints.

Mobilisation of site personnel.

Phase 3 - Site Operations

Weld-up of pipeline, installation of buoyancy, ballast, and navigation aids onto the fabricated pipeline.

Launch of the pipeline and tow-away.

Phase 4 - Site Demobilisation

Demobilisation of site personnel.

Truck transport from site of all site support equipment and amenities.

Long term routine inspection and maintenance of site facilities.

It should be noted that for subsequent utilisations of the fabrication site, only Phases 2, 3 and 4 will be undertaken.

6.4 Detailed Site Operations (Phase 3)

Attachment B to Section 6.0 of this CER provides photographs which illustrate typical fabrication and pipeline launching activities that will be carried out on site.

Attachment C to Section 6.0 of this CER provides engineering drawings which illustrate typical site installations and operations activities.

The following point summary itemises the sequence of site operational events to achieve build, launch and preparation for tow-away of a typical pipeline string.

i) Receipt of linepipe, welding consumables and jointing materials

ii) Rectification of pipe ends by grinding and wire brushing

iii) Rectification of damage to pipeline coatings by dressing and in-fill of compatible material

iv) Cleaning and gauging of pipe joint internals

v) Alignment of first/next pipe in welding station and weld-up of second/subsequent pipe

vi) Radiographic Non Destructive Testing (NDT) inspection of pipeline welds.

vii) Installation and testing of welded joint protective shrink wrap sleeve and in-fill mastic material as required.

viii) Transport of welded pipe 12 metres down rail track.

ix) Repeat steps (v), to (viii) until complete pipe string is fabricated.

x) Pressure testing of pipeline using fresh water only.

xi) Install pipeline trailing head, tow head, buoyancy, ballast and navigation aids.

xii) Position lead tow vessel at 1,200 metre mark offshore and run floating tow rope to shore.

(xiii) Launch pipeline string and progress out to 1,200 metre mark. Relocate lead tow vessel to 2,400 metre mark.

(xiv) Launch balance of pipeline string until aft towhead is at 1,200 metre mark. Aft control vessel to take up trailing position.

(xv) ROV survey of bundle in the off-bottom mode prior to tow away.

(xvi) Commencement of pipeline tow to site.

6.5 Operational Discharges

Discharges to the environment at the site during operations will include; pipeline rust and scale, pipeline pressure test water and domestic effluent. All discharges to the environment, as noted below, will be contained and disposed of in an approved manner.

6.5.1 Actual Discharges

- Pressure Test Water

  Prior to the launch of the pipeline, it is necessary to undertake a pressure test of the pipestring and tow heads. Only potable drinking water will be used as the test medium without additives. Discharge will be to the ground.

- Domestic Effluent

  An approved septic system with leach drains will be used for treatment of domestic effluent. The septic system receiving tank will be emptied by a licensed waste management contractor and the waste disposed of in an approved manner.

6.5.2 Potential Discharges

Proposed site activities have the potential to result in environmental discharges unless properly contained. All potential contaminants will be contained and disposed of in an approved manner. Refer to Section 8 of this CER where potential discharges are discussed in detail.

6.6 Cyclone Contingencies

Under normal operating circumstances, pipeline fabrication and launch activities will not be undertaken during the cyclone season extending from November to March. No plant, equipment or materials will remain on site following demobilisation.

In the event that a future project requires site utilisation in the months from November to April, the proponent will;

Inform the DEP and the Shire of Roebourne of proponent's intent to utilise the site for future pipeline projects during the cyclone season.

Prepare a project specific Environmental Management Plan which will include detailed site evacuation and contingency plans in the event of a declared cyclone approaching closer than 200 nautical miles from the fabrication site.

SECTION 6.0

ATTACHMENT A

LOCATION MAPS, AERIAL AND TERRESTRIAL SITE PHOTOGRAPHS AND PHOTOGRAPH KEY DRAWING

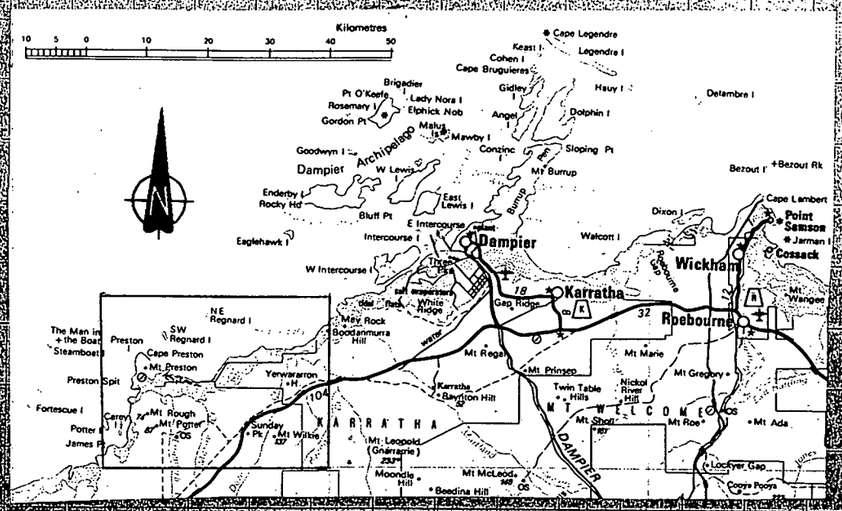
Existing Site maps, Photographs & Photograph Key Drawing

Attachment A Overview

This Attachment provides 1:50,000 and 1:100,000 map references together with aerial photographs of the proposed site.

Drawing PA-F-TQ-96-117 provides an overview of the proposed access road, facilities area and fabrication corridor.

Drawing PA-F-TQ-96-120 provides an orientational key to colour photographs numbered 1 to 15 as included in this Attachment. These photographs provide a comprehensive overview of the landscape associated with the proposed development and clearly identify the proposed facilities area, pipe string storage area, fabrication corridor and launchway.



North East Regnard Island (Nature Reserve)

ABORIGINAL HERITAGE SITE P07272

PROPOSED FABRICATION SITE

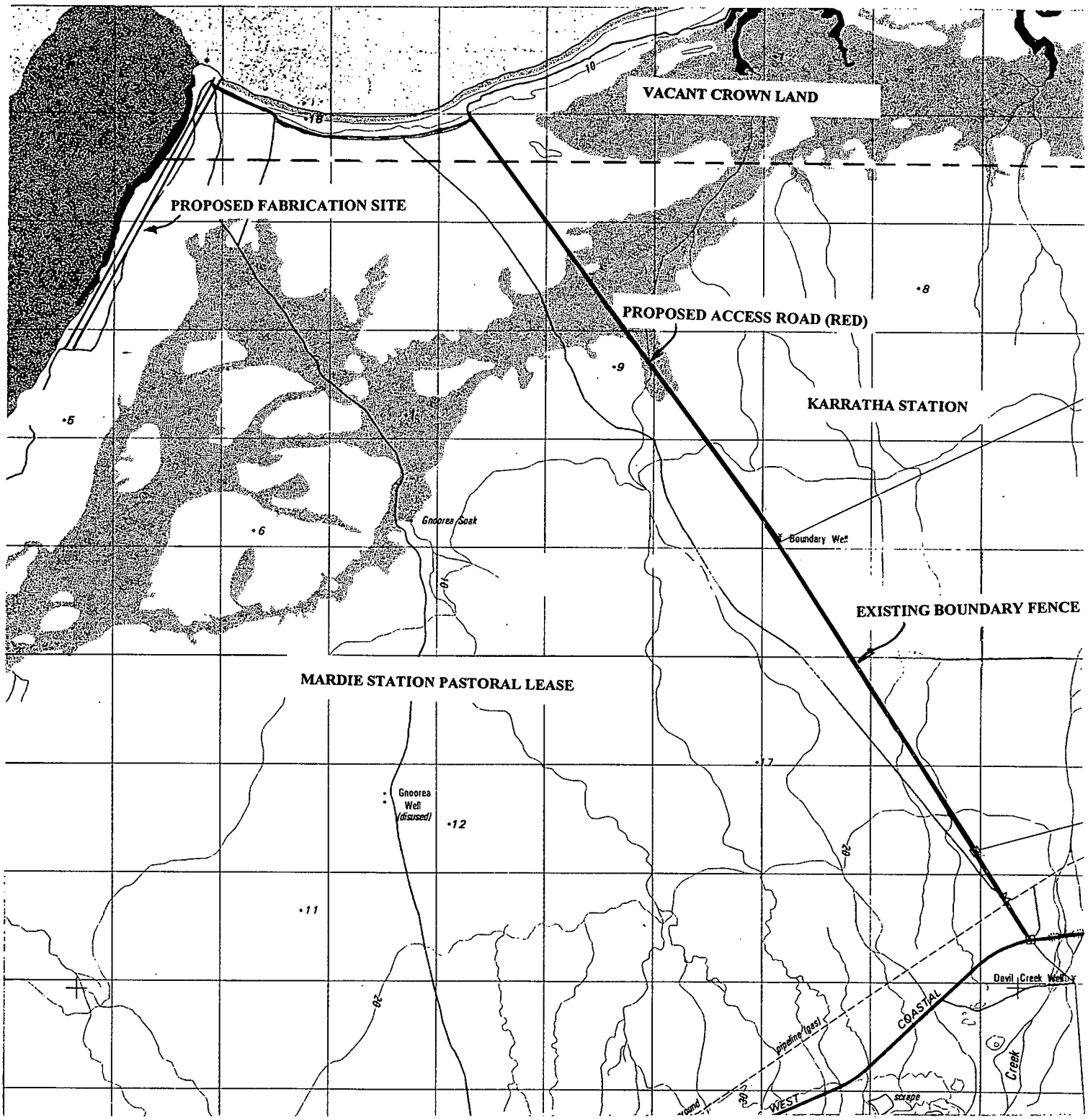
PROPOSED ACCESS ROAD (RED)

PROPOSED WATER SOURCE

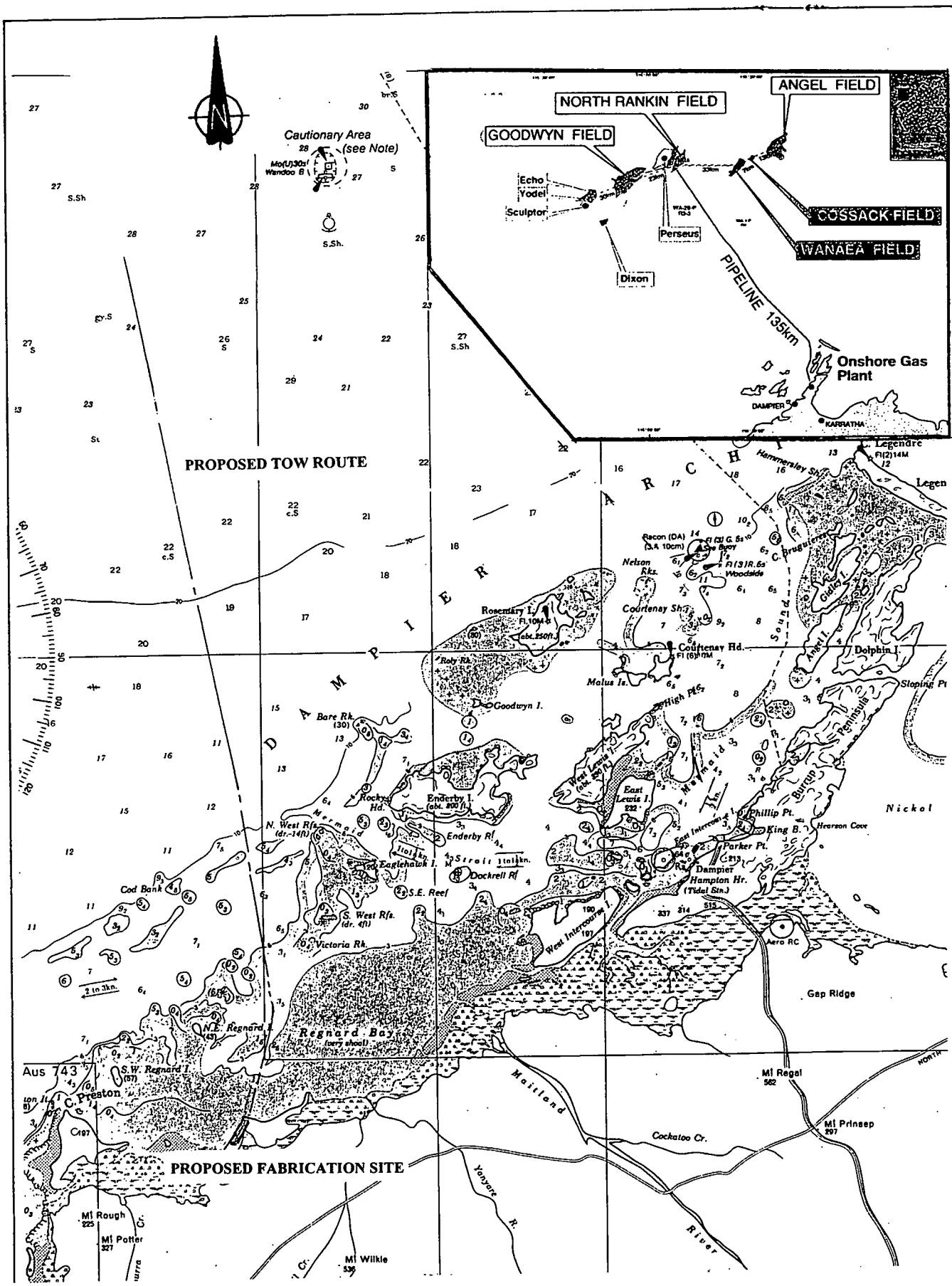
ABORIGINAL HERITAGE SITE P00308

Title: Excerpt From 1:100,000 Topographical Map For Preston Ref: 2156	
Scale: 1cm = 1km as per grid	**Date: Current as of 1987**

Fig 1



Title: Excerpt From 1:50,000 Topographical Map For Mount Wilke Ref: 2156-2	
Scale: 2cm = 1km as per grid	Date: Current as of 1987



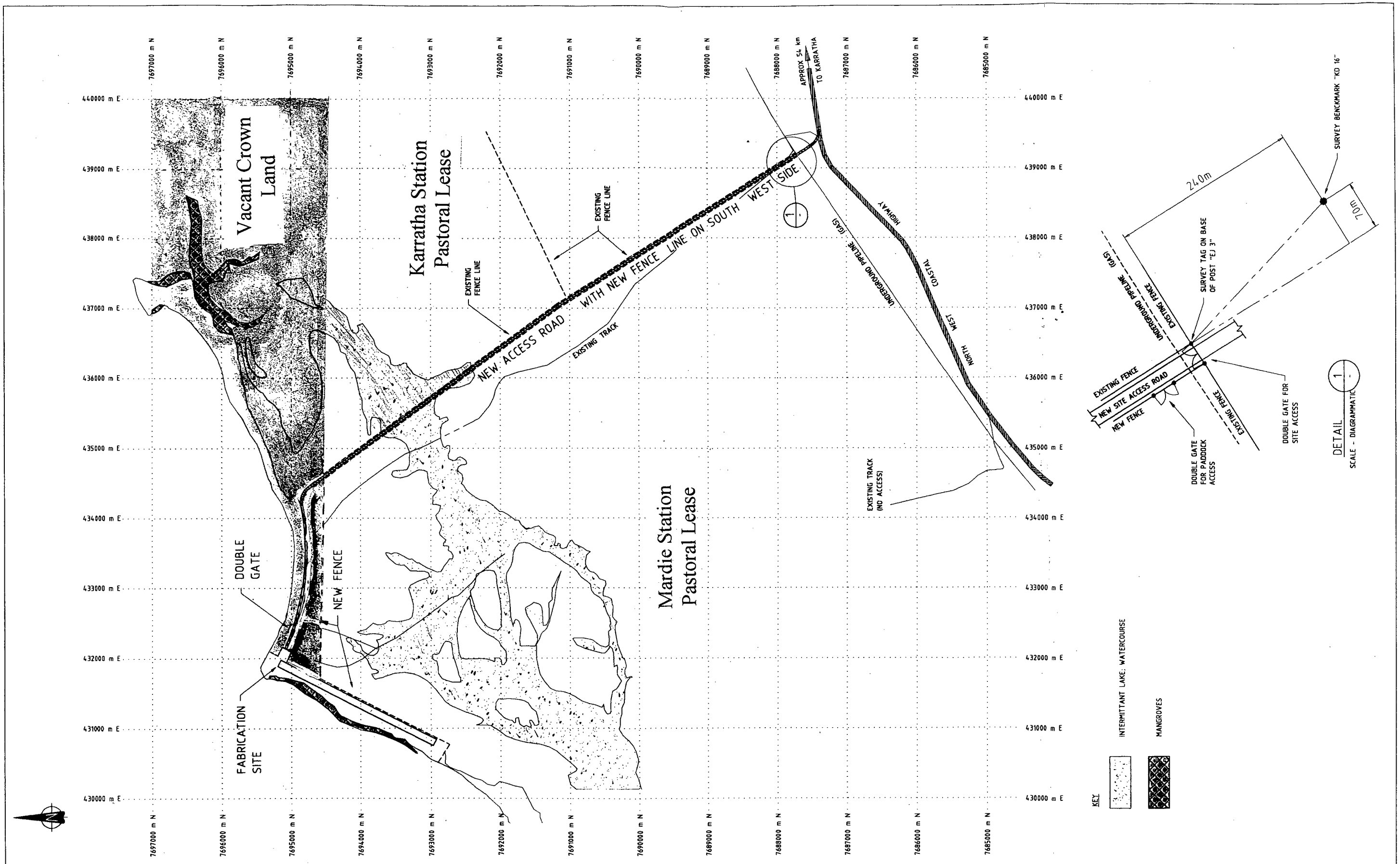
Title: Excerpt From Chart AUS 327, Port Walcott to Montebello Islands		
Scale: 1:300,000	Sounding: Fathoms	Date: Current as of 1967

Fig 3

SubSea

Title: Composite Aerial Photograph		
Scale: 1cm = 350m	Northpoint: Top of Photo	Date: 1984

Fig 4



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TOLERANCES
UNLESS OTHERWISE STATED

GENERAL	± 1	mm
HOLE POSITION	± 1	mm
HOLE CTRS	± 1	mm
ANGULAR	± 0.5°	deg

DRAWING No | TITLE
REFERENCE DRAWINGS

REV	DESCRIPTION	DATE	DRN	CHK ENG	APPR ENG	CLIENT
01	ISSUED FOR CHECKING	22.5.96	MEW			

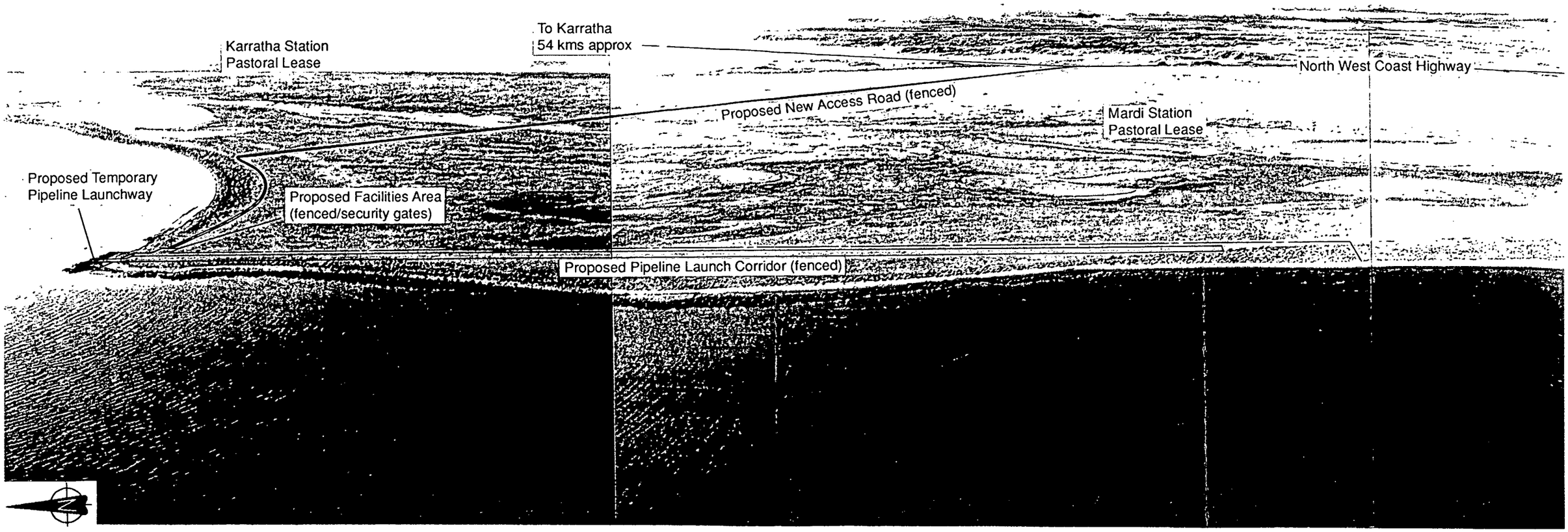
REVISIONS | APPROVAL

SubSea International (Australia) Inc. 10 BELMONT AVENUE BELMONT W.A. 6104 TEL:- (09)277 1234 FAX:-(09)277 1080

PROPOSED PIPELINE FABRICATION SITE
ACCESS FROM NORTH WEST COASTAL HIGHWAY
THROUGH MARDI STATION PASTORAL LEASE

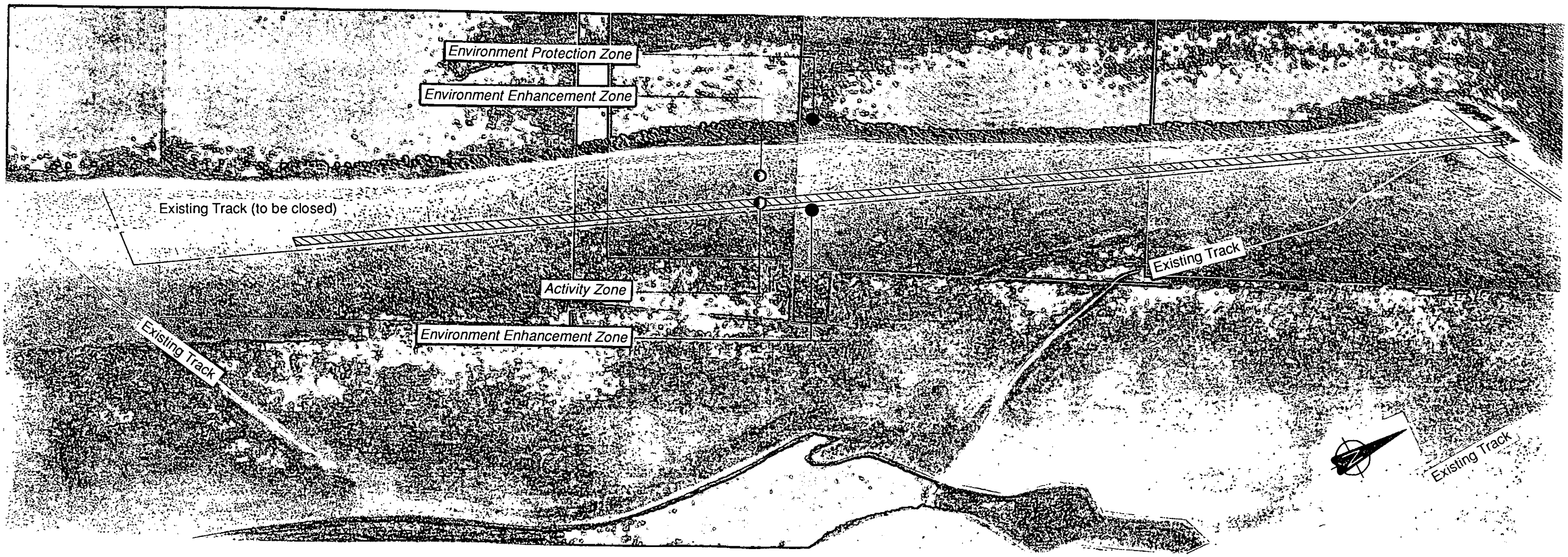
SCALE (A1)	SHEET OF	DRAWING No	REV No
As Shown	1 - 1	PA - F -TQ - 96 -117	01

Fig 5



Title: Composite Aerial Photograph of Proposed Development Area		
Scale: Variable. Corridor length is 2,500 metres	View: Due East	Date: 2/7/96

Fig 6



Title: Composite Aerial Photograph of Proposed Development Site		
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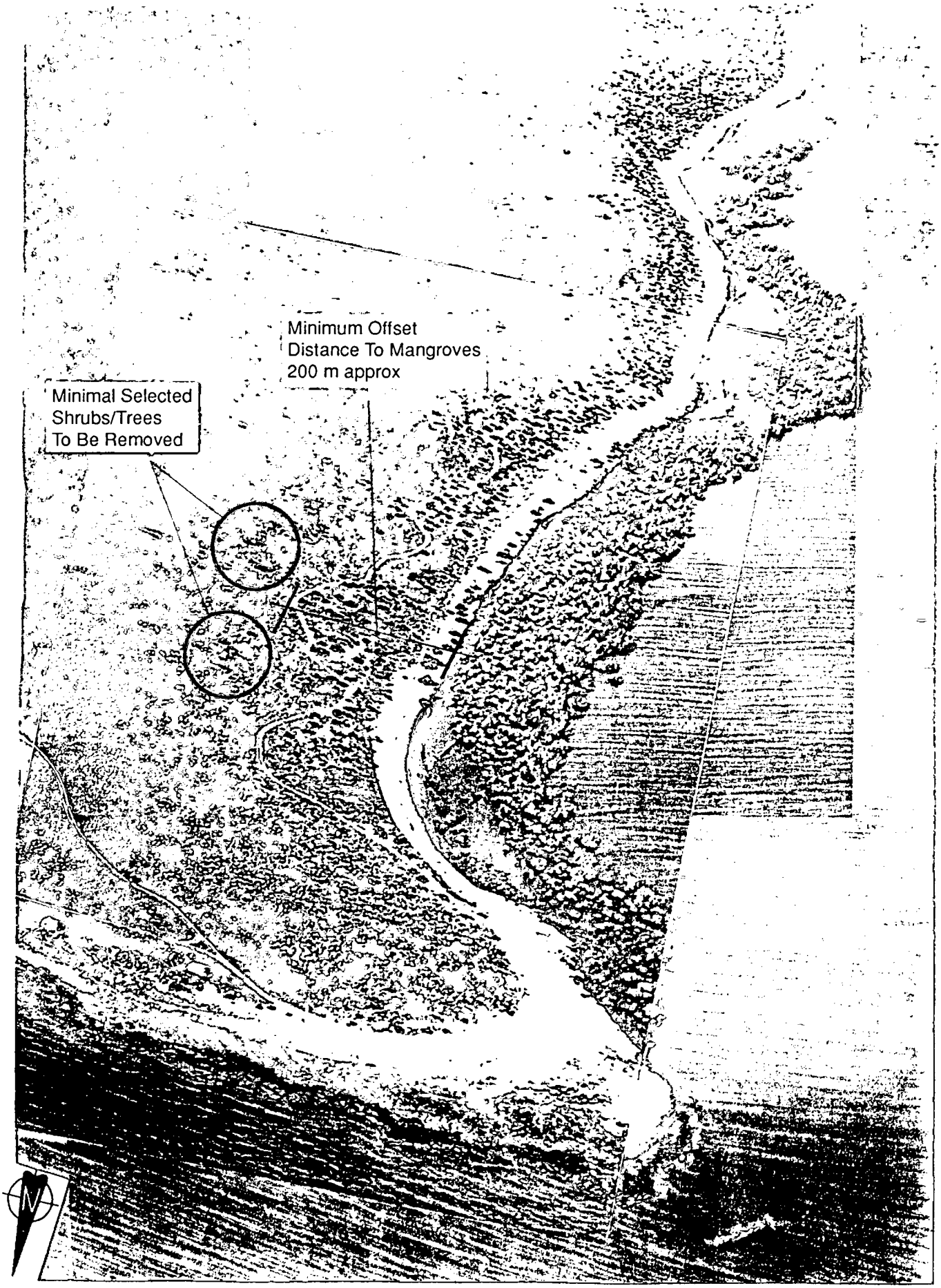
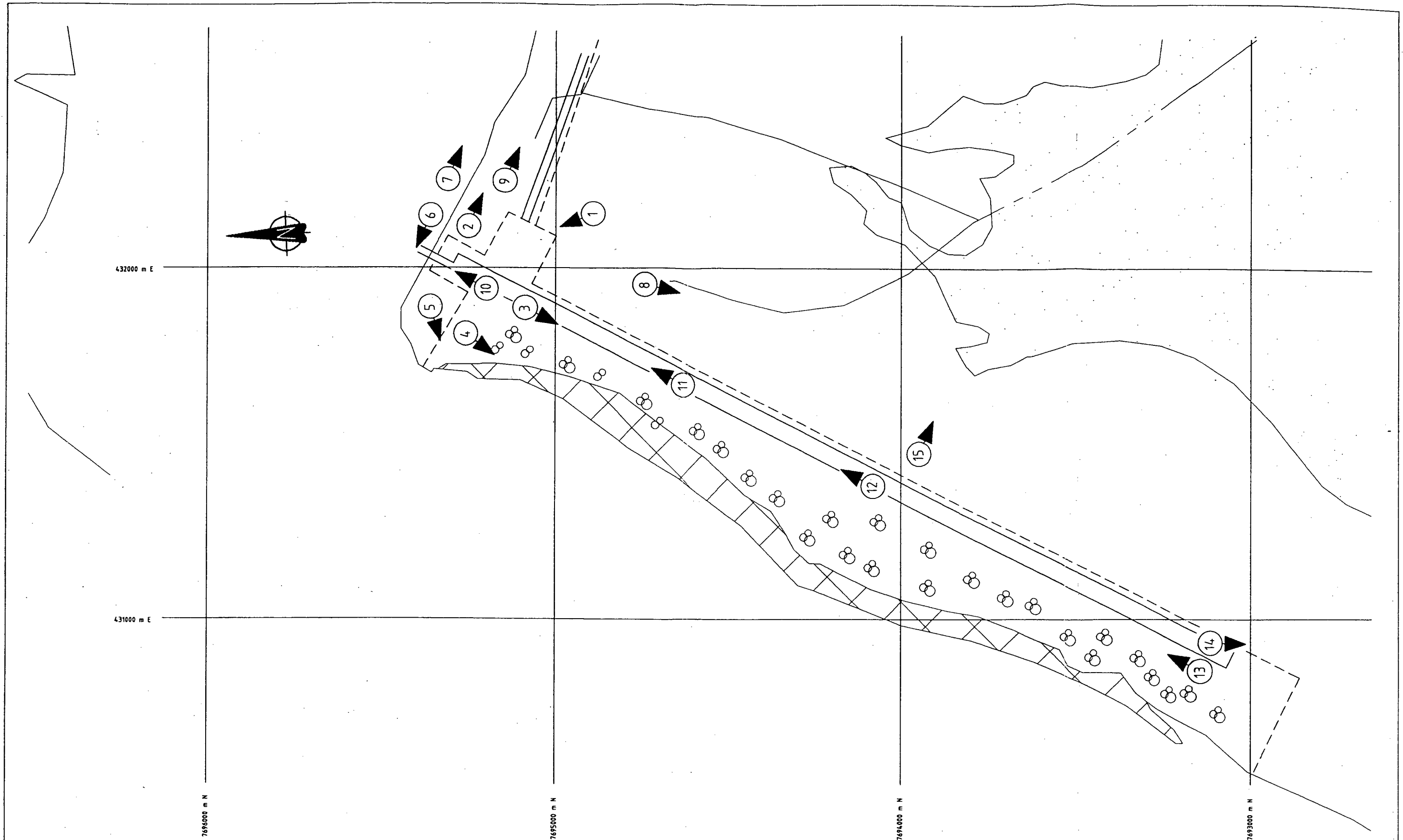
Fig 7



Title: Composite Aerial Photograph of Proposed Development Site		
Scale: Variable	View: Due South	Date: 2/7/97

Fig 8



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GENERAL	± 1	mm
HOLE POSITION	± 1	mm
HOLE CTRS	± 1	mm
ANGULAR	± 0.5°	deg

DRAWING No | TITLE
REFERENCE DRAWINGS

ISSUED FOR CHECKING | 01 | 22/5/96 | MEW
DESCRIPTION | REV | DATE | BY | CHK | APPR | CLIENT
REVISIONS | APPROVAL

SubSea International (Australia) Inc. 10 BELMONT AVENUE BELMONT W.A. 6104 TEL:- (09)277 1234 FAX:-(09)277 1860

PROPOSED PIPELINE FABRICATION SITE
ON MARDIE STATION PASTORAL LEASE
FABRICATION SITE
PHOTOGRAPH REFERENCE KEY

SCALE (A1)	SHEET OF	DRAWING No	REV No
1:5000	1 - 1	PA - F -TQ - 96 -120	01

Fig 9

PHOTO NO. 1 View West across proposed Site Facilities area

PHOTO NO. 2 View North/North East along shoreline at high tide mark

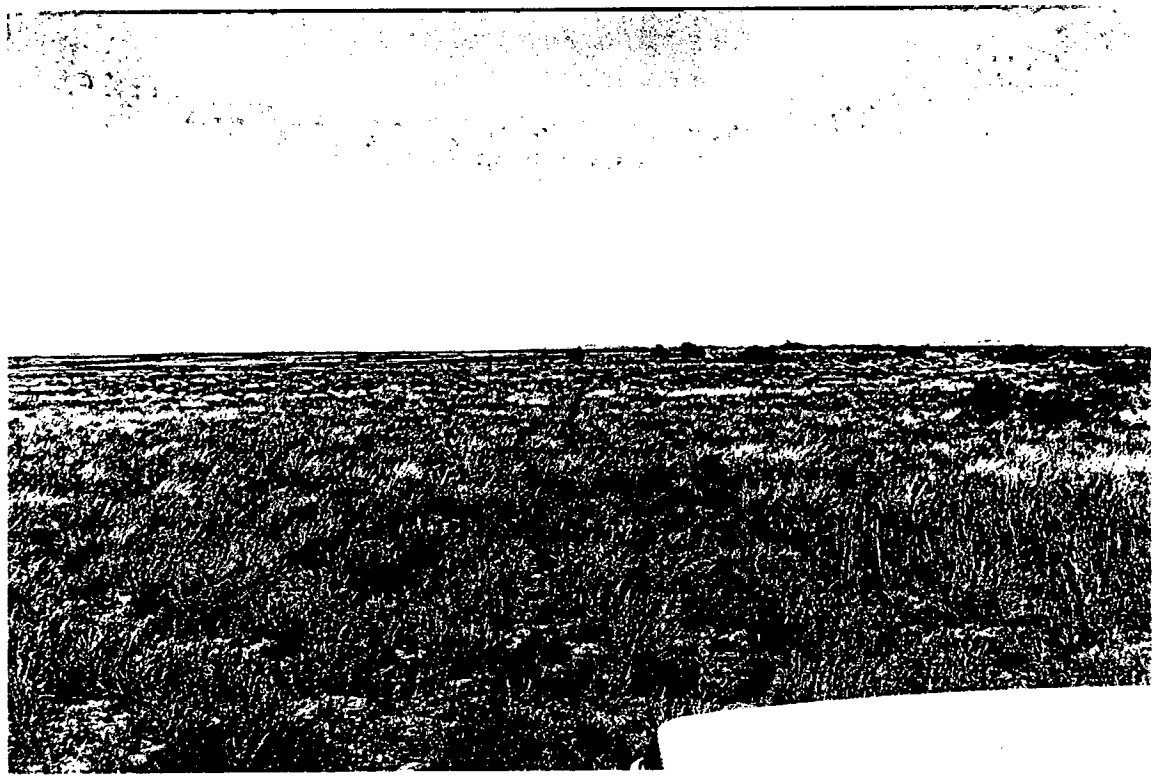

PHOTO NO. 3 View South/East down proposed pipe string storage area. Three shrubs in distance to be removed during site works

PHOTO NO. 4 View South/East showing fringing mangroves in the inter tidal area

PHOTO NO. 5 View South/South East of Westerly extent of fringing mangroves in the inter tidal area

PHOTO NO. 6 View West/South West across tidal platforms over which temporary launch way will be established

PHOTO NO. 7 View North/North East across rock platforms exposed at low tide

PHOTO NO. 8 View East/South East down existing track which passes across distant clay pan

PHOTO NO. 9 View North/North East towards distant coastal dune. Note that the dune system does not extend into the proposed facilities area

PHOTO NO. 10 View West/North West down proposed temporary launchway

PHOTO NO. 11 View West North/West 500 metres down proposed pipestring storage area

PHOTO NO. 12 View West North/West 1000 metres down proposed pipestring storage area

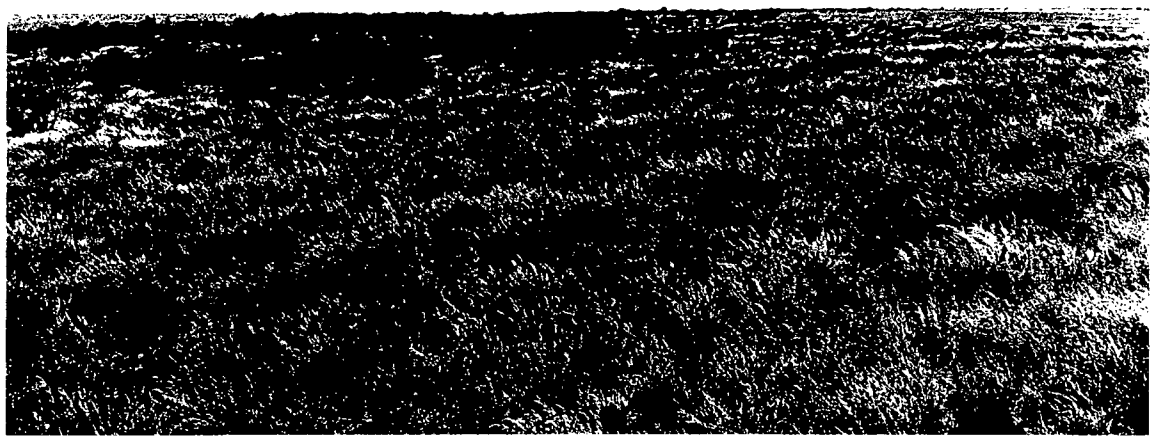

PHOTO NO. 13 View West North/West 2500 metres down proposed pipestring storage area

PHOTO NO. 14 View East South/East at proposed end point of pipestring storage area

PHOTO NO. 15 View North/North East at 1000 metre point on proposed pipestring storage area, out across clay pans.

SECTION 6.0

ATTACHMENT B

PHOTOGRAPHS OF TYPICAL FABRICATION AND PIPELINE LAUNCHING ACTIVITIES

Typical Fabrication and Pipeline Launching Activities

Attachment B Overview

Included in Attachment B are photographs which illustrate the extent of fabrication activities that will be undertaken on site.

Photo No. 16	Illustrates the layout of the fabrication corridor as proposed. On the actual site, the corridor will extend over a distance of approximately 2,500 metres.
Photo No. 17	Illustrates the weld up of individual pipe strings into the full pipeline length during the launching phase of pipeline installation.
Photo No. 18	Illustrates the application of pipeline joint coatings. These are shrink wrap tubes set via propane torch.
Photo No. 19	Illustrates the installation of buoyancy modules used to keep the bundle in the "surface" or "off bottom" mode during the pipeline bundle tow.
Photo No. 20	Illustrates the installation of pipeline bundle ballast chains during the fabrication process. These chains counteract buoyancy to keep the pipeline stable during the launching process and in the "off bottom" mode during the tow to the installation site.
Photo No. 21	Illustrates the trailing tow head being progressed down the launchway during the launching process. Note the flagging tape to delineate the mangrove areas as a "no go" zone.
Photo No. 22	Illustrates the pipeline Lead Tow Vessel (LTV) with the launch wire running to shore from the offshore anchorage.
Photo No. 23	Illustrates the pipeline tow Command Vessel (CV) from which all pipeline towing activities are coordinated and monitored.
Photo No. 24 & 25	Illustrates the preferred launchway configuration that will be utilised at the proposed site. In this case, launch corridor support of the pipeline is achieved via bogeys set on rail tracks. Support rollers will be used to support the pipeline across the intertidal and near shore launch zones.

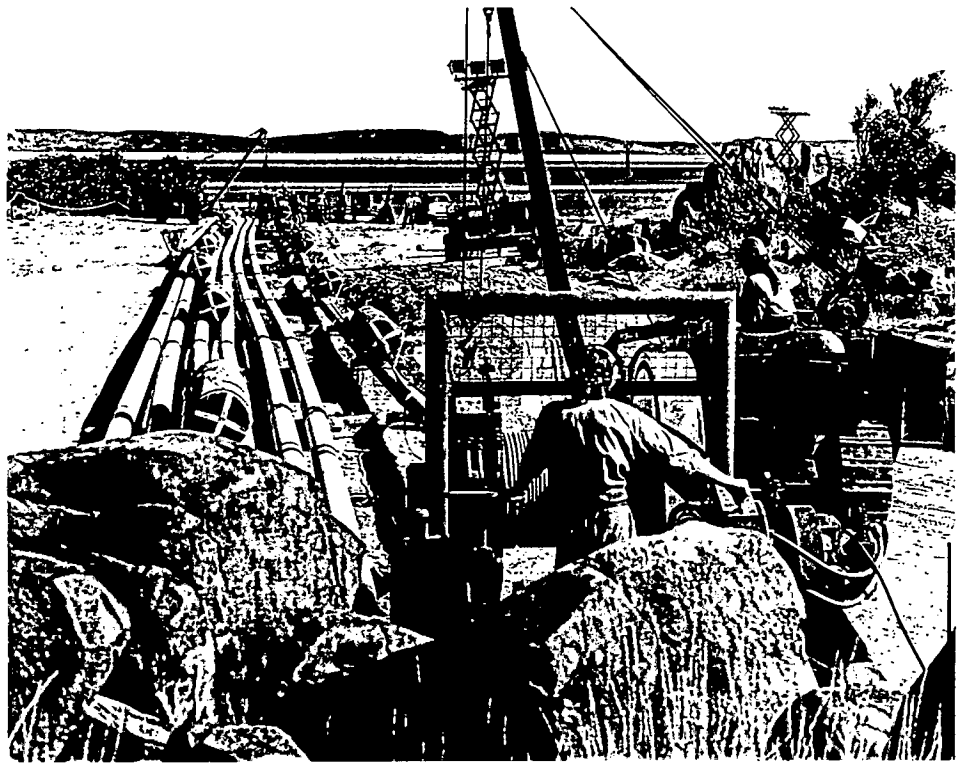

PHOTO NO. 16 View of Typical Fabrication Site Layout

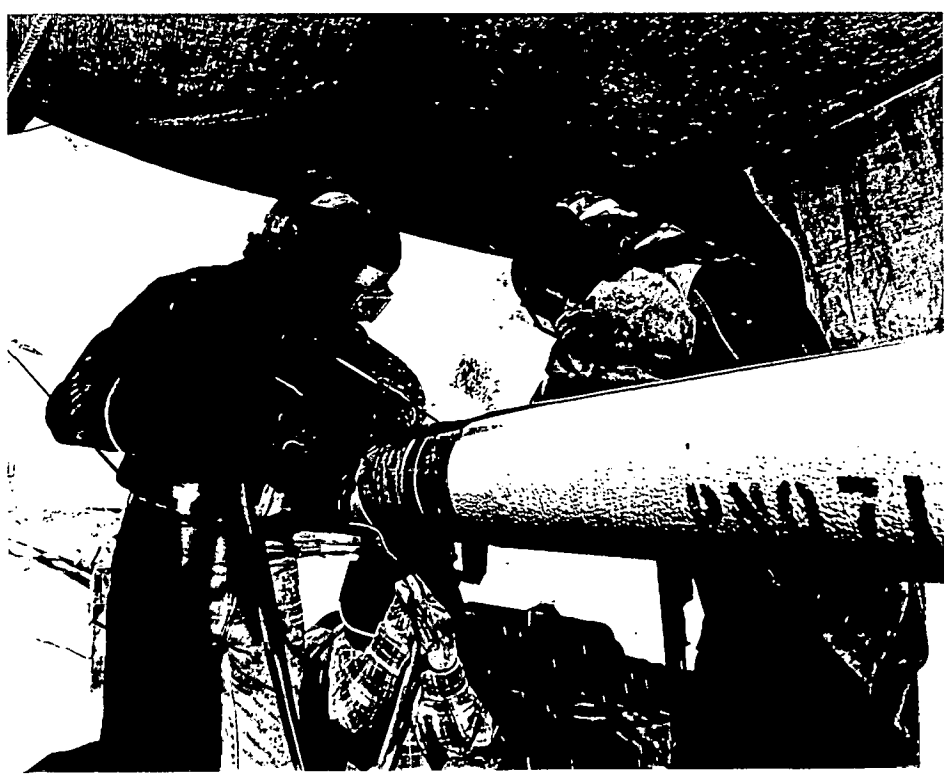

PHOTO NO. 17 Site Welding Activities

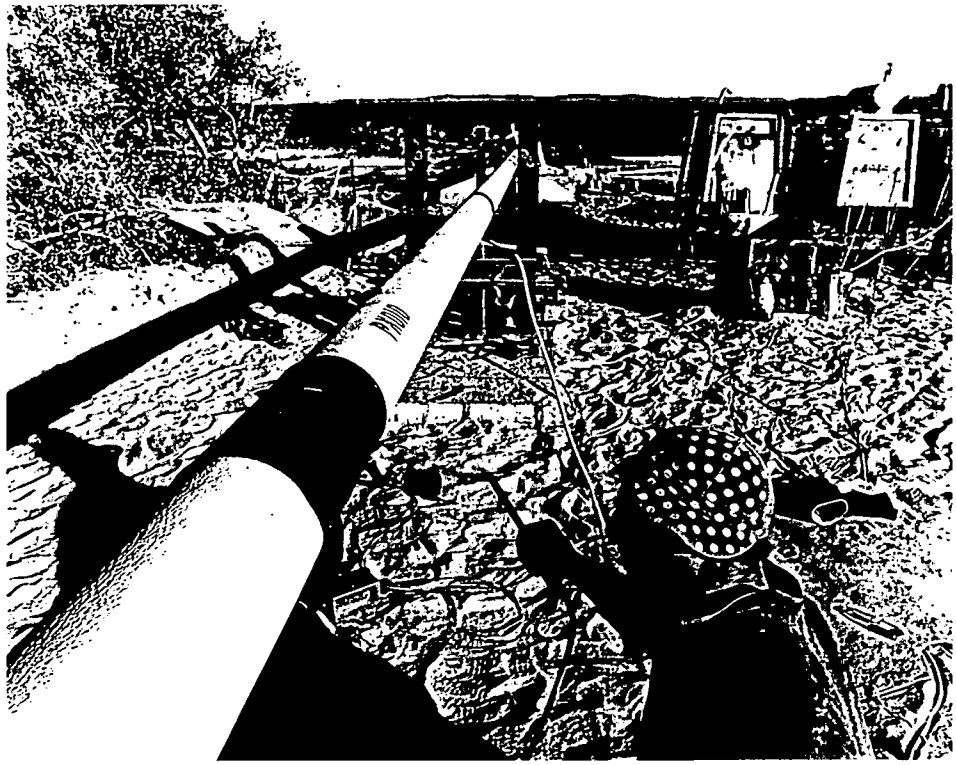

PHOTO NO. 18 Site Joint Coating Activities

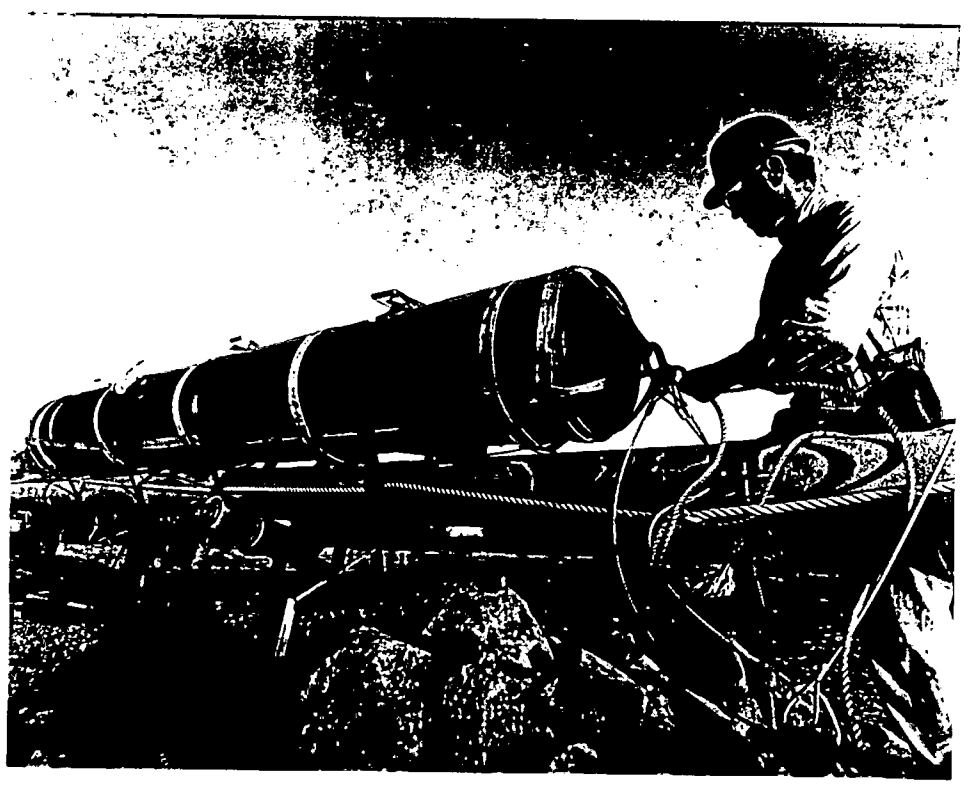

PHOTO NO. 19 Site Rigging Activities: Installing Buoyancy Modules

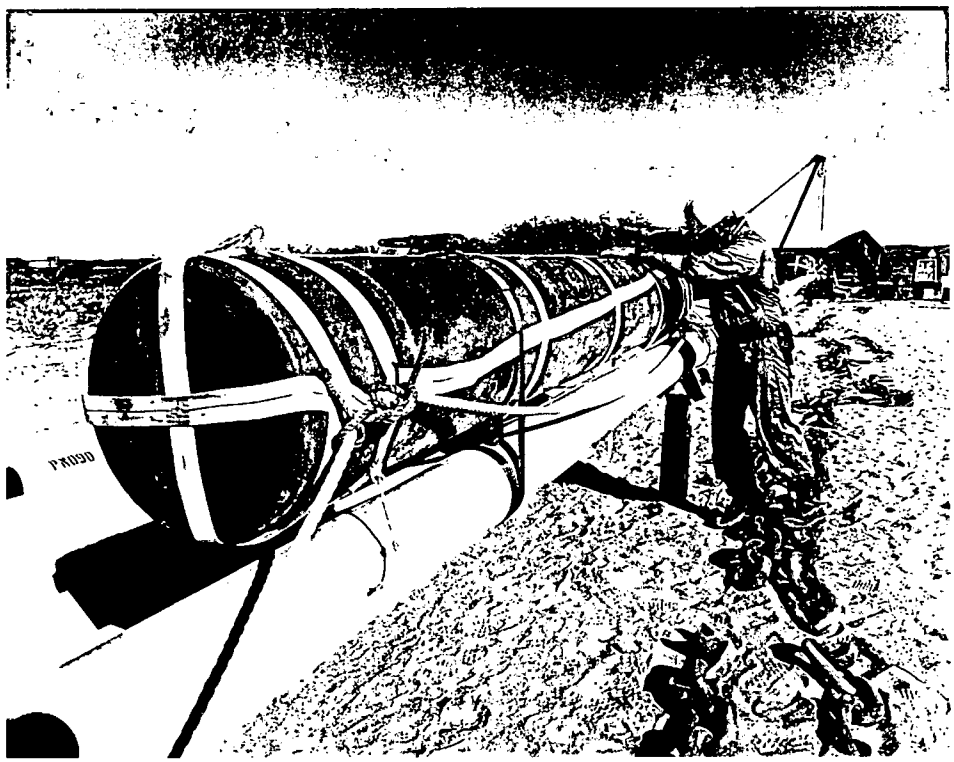

PHOTO NO. 20 Site Rigging Activities: Installing Ballast Chains

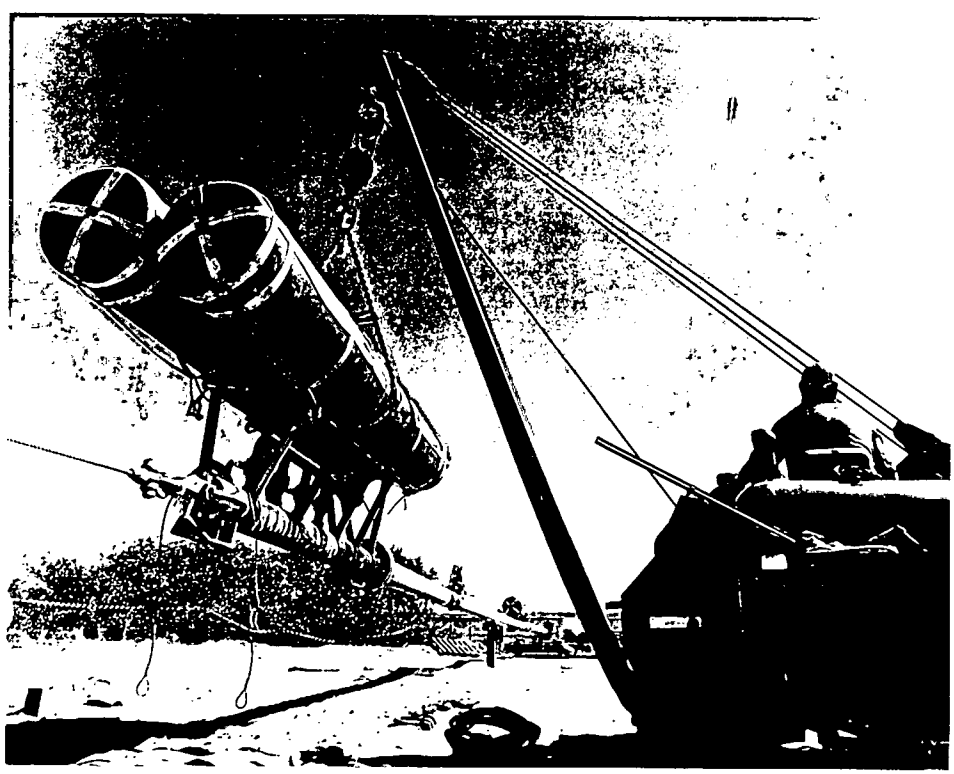

PHOTO NO. 21 Pipeline Launching Activities

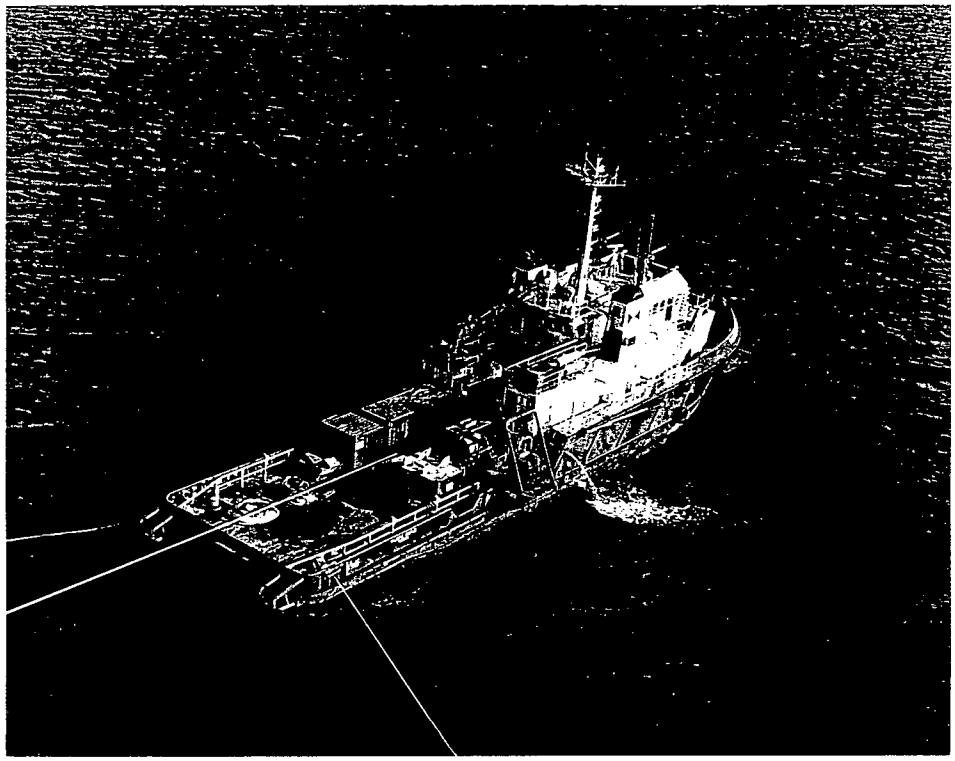

PHOTO NO. 22 Pipeline Launching Activities: Lead Tow Vessel Anchored Offshore in Deep Water

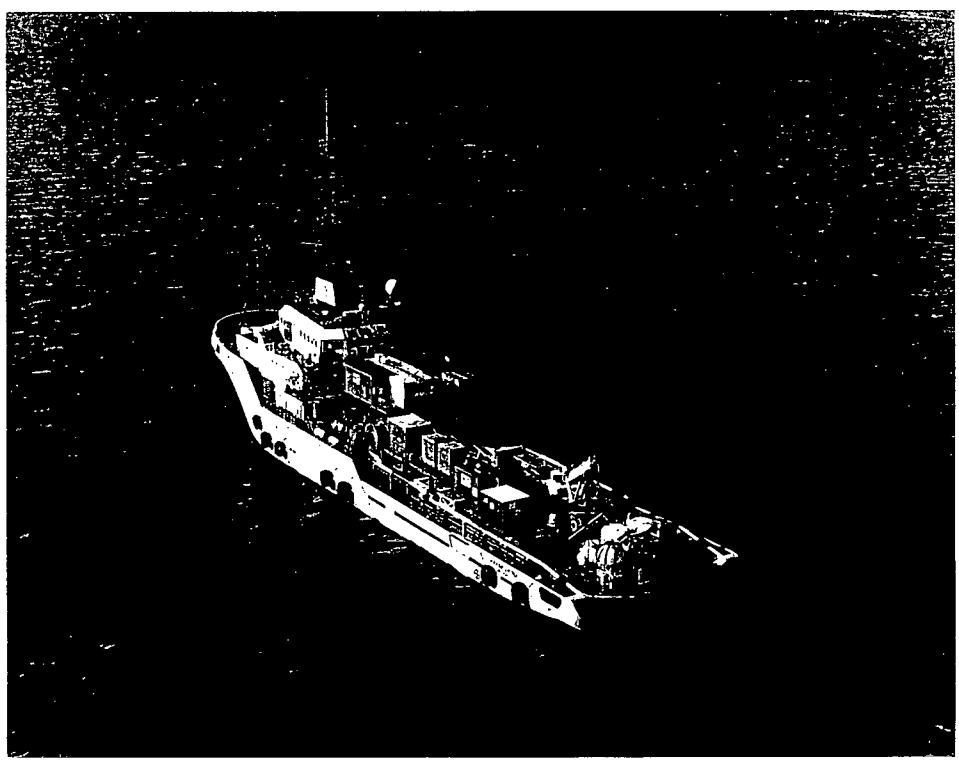

PHOTO NO. 23 Pipeline Tow Command Vessel: Standing By

PHOTO NO. 24

Alternative Launchway Configuration
Illustrating Light Rail Installations

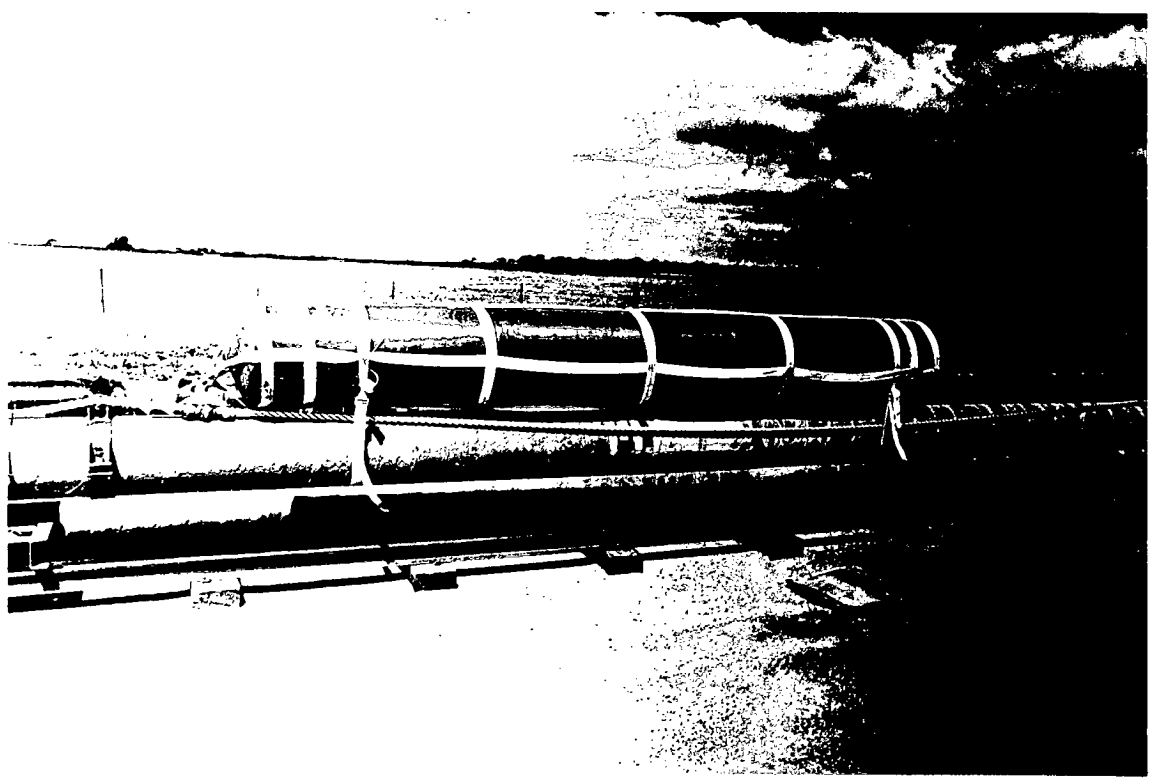

PHOTO NO. 25

Alternative Launchway Configuration
Illustrating Light Rail Installations

SECTION 6.0

ATTACHMENT C

ENGINEERING DRAWINGS

PA-F-TQ-96-122	**PIPELINE LAUNCH ROUTE**
PA-F-TQ-96-123	**PIPELINE PRE-LAUNCH CONFIGURATION**
PA-F-TQ-96-124	**INTERTIDAL ZONE ROLLERS & FOUNDATION CLAMPS**
PA-F-TQ-96-191	**BUOYANCY MODULE & CHAIN DEPLOYMENT**
PA-F-TQ-96-192	**TOW HEAD & TRAILING HEAD TOWING ARRANGEMENT**

Attachment C Overview

The following engineering drawings illustrate typical installed hardware and proposed site processes.

PA-F-TQ-96-122 Illustrates the intertidal support rollers which will be established over a maximum distance of 1,000 metres in the intertidal and subtidal zones. These roller stations will ensure that the pipeline is stable during the launch sequence and that contact of the pipeline with the seabed will not occur.

PA-F-TQ-96-123 Illustrates in an elevation view, the transition of the pipeline from the fabrication site to the extent of the near shore zone.

PA-F-TQ-96-124 Illustrates the proposed design of the intertidal and near shore pipeline support roller stations. It should be noted that;

- Roller stations will be designed to be easily removed during periods when the site is not being used.
- Roller stations, in combination with pipeline buoyancy modules, will keep the launched pipeline clear of the seabed at all times over the initial 1000 metre interval.
- When not in use, roller station foundations will be covered by a protective anchor cap.

PA-F-TQ-96-191 Illustrates the proposed assembly of the pipeline during the launch sequence. It should be noted that;

- Drag chains are retained up on the bundle during transit across the intertidal and near shore zones.
- Drag chains are released by inshore divers beyond the 1,000 metre interval. At this time, drag chains will contact the seabed.

PA-F-TQ-96-192 Illustrates the pipeline bundle assembly in the "ready for tow" mode beyond the final support roller. It should be noted that;

- Drag chains will provide stability of the pipeline bundle so that it will not be displaced by current or wave effects.
- Drag chain effects on the seabed will be limited to a 10 metre wide corridor over the extent of the tow route to the final installation location.

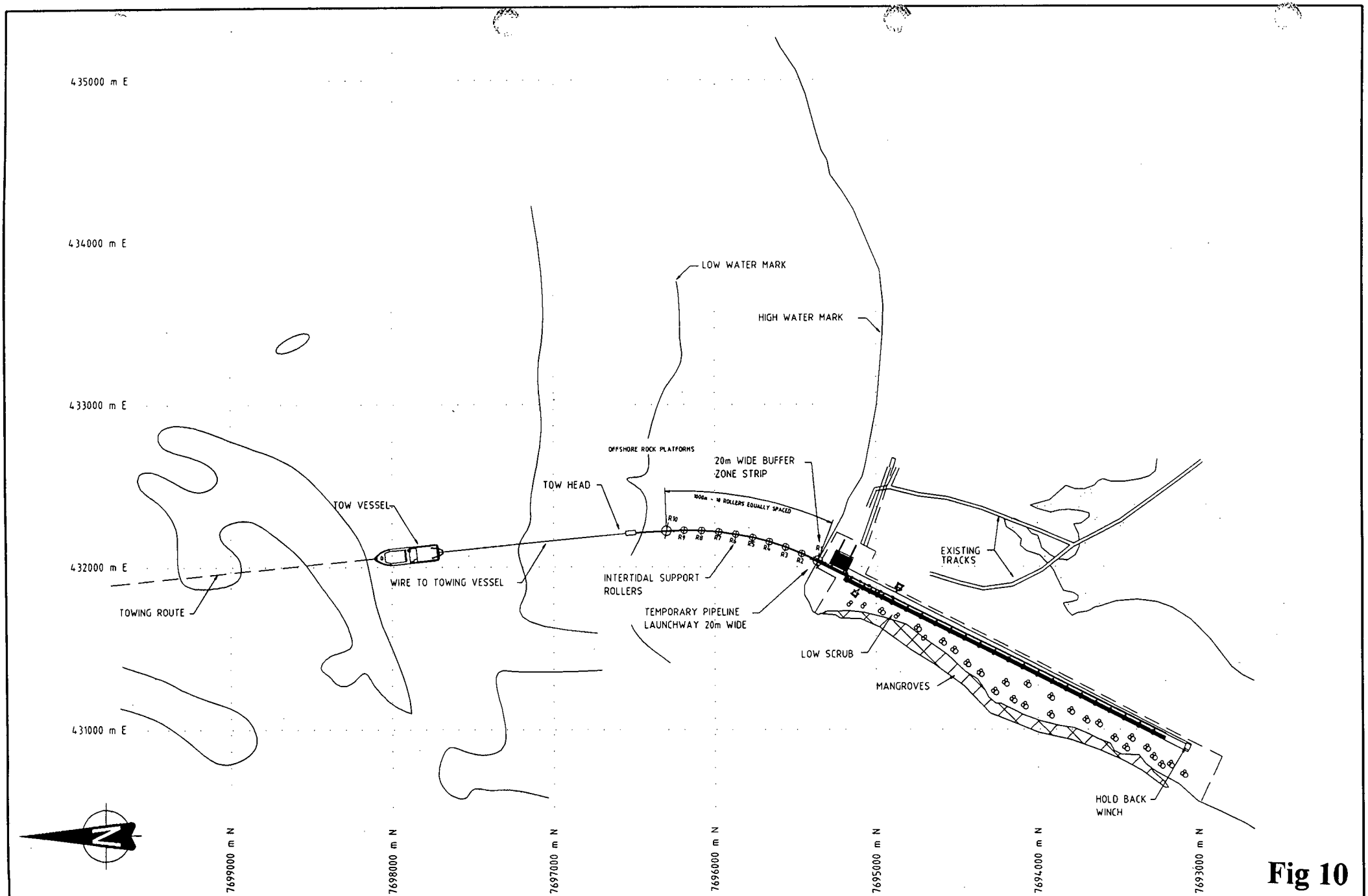

Fig 10

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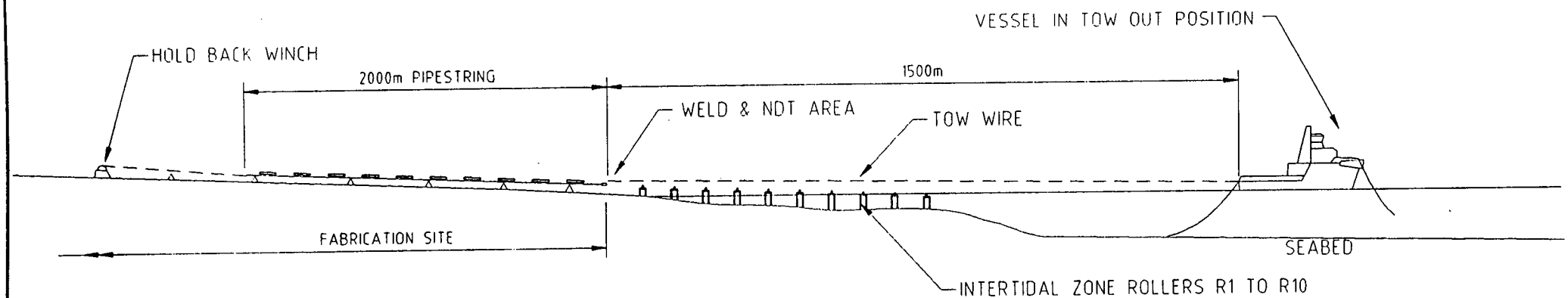
10 BELMONT AVENUE BELMONT WA 6104 TEL:- (09)277 1234 FAX:-(09)277 1080

TITLE	PROPOSED PIPELINE FABRICATION SITE PIPELINE LAUNCH ROUTE			PROJECT No.	REV No
				DRAWING No	01
DRN	BR	CHKD	APPROVED	DATE 17.7.96	PA-F-TQ-96-122



ONSHORE OPERATIONS

1. LOAD 2000m STRING ONTO ROLLERS
2. ATTACH HOLD BACK WINCH
3. ATTACH TOWHEAD USING HYDROTIGHT EQUIPMENT
4. COMPLETE VALVE CHECKS
5. ATTACH BUOYANCY & CHAINS,
6. COMPLETE COMMUNICATION CHECKS WITH VESSEL
7. ATTACH TOW WIRE & MOUSE SHACKLE
8. WINCH OPERATOR TO BE IN COMMUNICATION WITH VESSEL
   5t MAXIMUM HOLD BACK TENSION
9. PERSONNEL TO CHECK ROLLERS, WEBBING, BUOYANCY & CHAINS
10. COMPLETE CHECK LIST - ONSHORE REP
11. NOTIFY TOW MASTER WHEN PIPESTRING IS AT WELD STATION
12. SECURE PIPESTRING & RELEASE HOLD BACK
13. LOAD 2nd PIPESTRING (2000m) & ATTACH HOLD BACK WINCH
14. COMPLETE WELD ALIGNMENT
15. REPEAT STEPS 5 TO 15

VESSEL OPERATOR

1. TOW VESSEL TO RUN ANCHORS,
2. TOW WIRE RUN ASHORE
3. ESTABLISH COMMUNICATION WITH FABRICATION SITE
4. WINCH PIPESTRING DOWN LAUNCH WAY
5. MONITOR TOW WIRE TENSION
6. SLACK TOW WIRE TENSION TO 2t WHEN PIPESTRING IS AT WELD STATION

Fig 11

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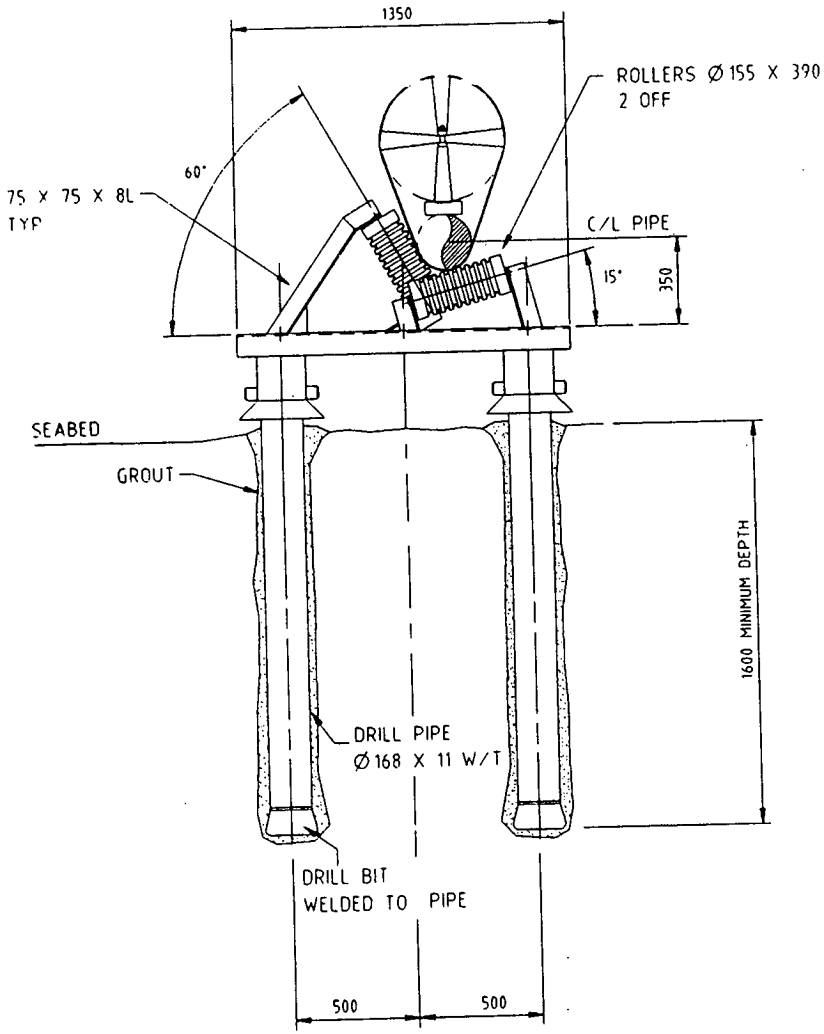
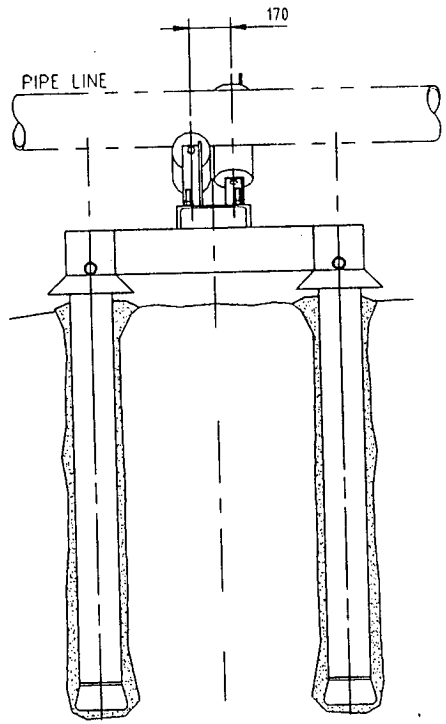
TITLE	PROPOSED PIPELINE FABRICATION SITE PRE-LAUNCH CONFIGURATION			PROJECT No.	REV No
				DRAWING No	01
DRN	BR	CHKD	APPROVED	DATE 17.7.96	PA-F-TQ-96-123



END ELEVATION



SIDE ELEVATION

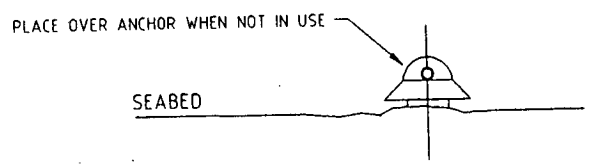
INSTALLATION METHOD

DRILLING AND GROUTING

1. DEPLOY INSHORE DRILL RIG TO ANCHOR LOCATION .
2. SET DRILL MAST INTO TEMPLATE AND CHECK CLEARANCE.
3. DRILL 1ST HOLE TO TARGET DEPTH IE TOP OF DRILL STRING CASING TO BE 250 MM MINIMUM ABOVE CAPROCK SURFACE.
4. START PUMPING GROUT WHEN DRILL BIT IS WITHIN 100MM OF TARGET DEPTH.
5. WHEN TARGET DEPTH IS REACHED, CEASE DRILLING AND CONTINUE PUMPING GROUT UNTIL SMALL VOLUME 'RETURNS' ARE VISIBLE SEABED.
6. DISCONNECT AND RAISE SUB-ASSEMBLY.
7. TOP UP GROUT LEVEL IF ANY SEEPAGE OR GROUT LOSS HAS OCCURRED.
8. REPEAT ABOVE SEQUENCES FOR 2ND,3RD & 4TH HOLES.
9. PLACE ROLLER FRAME OVER DRILL STRING
10. INSERT LOCATING PINS AND CHECK HEIGHT, PACK ROLLERS UP TO REQUIRED IF NECESSARY

NOTE:

1: CONFIGURATION SHOWN IS TO BE USED FOR ROLLER STATION R1 TO R10



ANCHOR CAP

Fig 12

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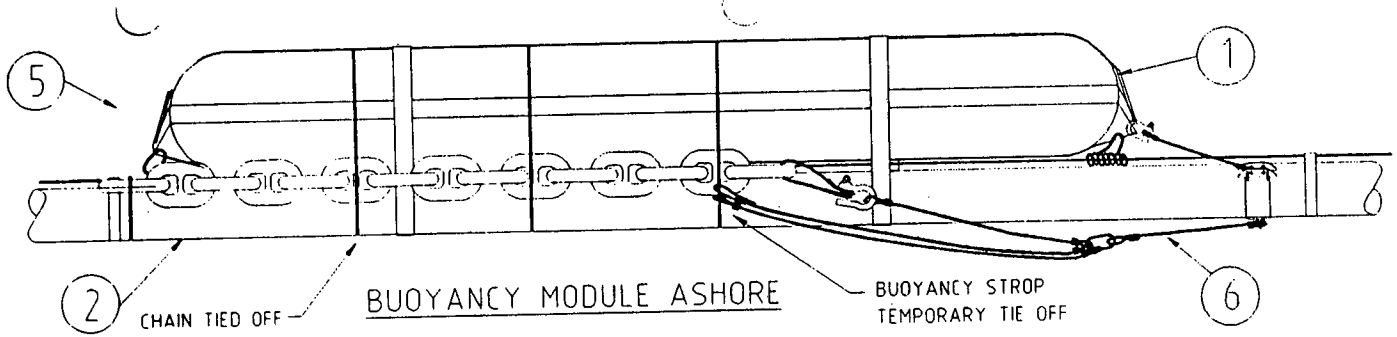
TITLE	PROPOSED PIPELINE FABRICATION SITE INTERTIDAL ZONE ROLLER AND CAPS					PROJECT No.	REV No
						DRAWING No	01
						PA-F-TQ-96-124	
DRN	BR	CHKD		APPROVED		DATE 17.7.96	



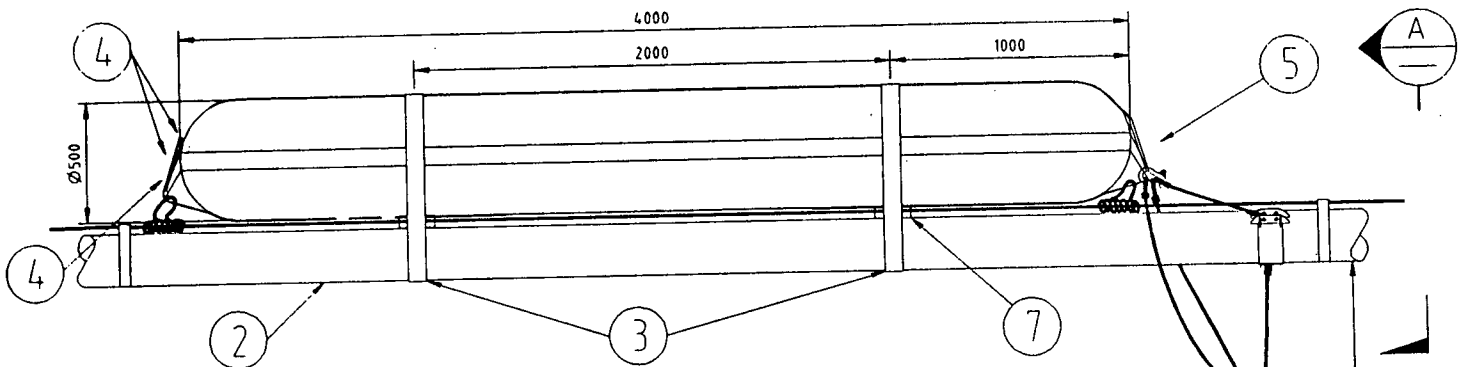
BUOYANCY MODULE ASHORE

INSTALLATION SEQUENCE

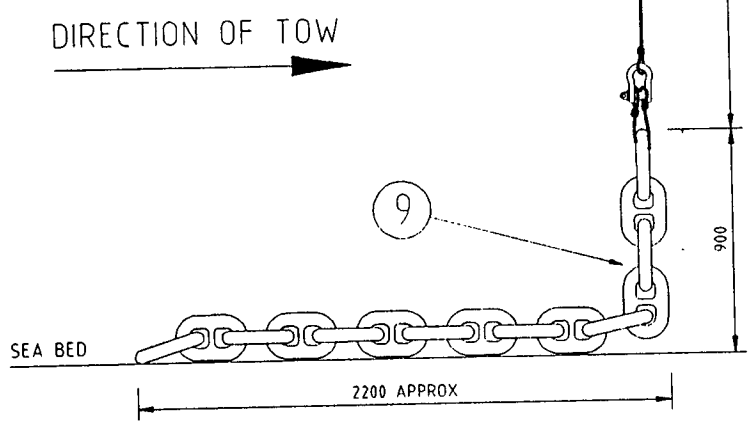
1. TENSION THE 20mm POLYPROP ALONG THE PIPELINE
2. INSTALL THE SHELL CLAMP
3. LIFT THE MODULE INTO PLACE AND CARGO STRAP INTO PLACE
4. USING THE CRANE LIFT THE CHAIN UP AND TIE OFF ALONGSIDE THE BUOYANCY

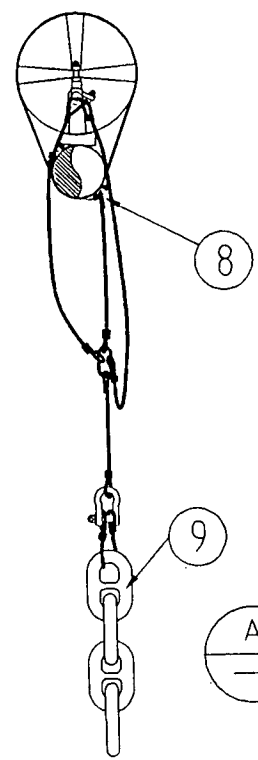
NOTES:

1. DRAG CHAINS ARE ONLY TO BE DEPLOYED IN DEEP WATER BEYOND ROLLER STATION R10



BUOYANCY MODULE & CHAIN DEPLOYED





A VIEW

ITEM	DESCRIPTION
1	BUOYANCY MODULE
2	Ø 220 PIPE STRING
3	CARGO STRAP 50mm WIDTH X 4m lg
4	BUOYANCY WEBBING EYE'S EACH END
5	3 1/4t SWL BOW SHACKLE
6	CHAIN STRAP
7	150 x 75 x 50 THK POLYURETHANE BLOCK
8	CLAMP
9	CHAIN

Fig 13

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TITLE PROPOSED PIPELINE FABRICATION SITE
BUOYANCY MODULE & CHAIN DEPLOYMENT

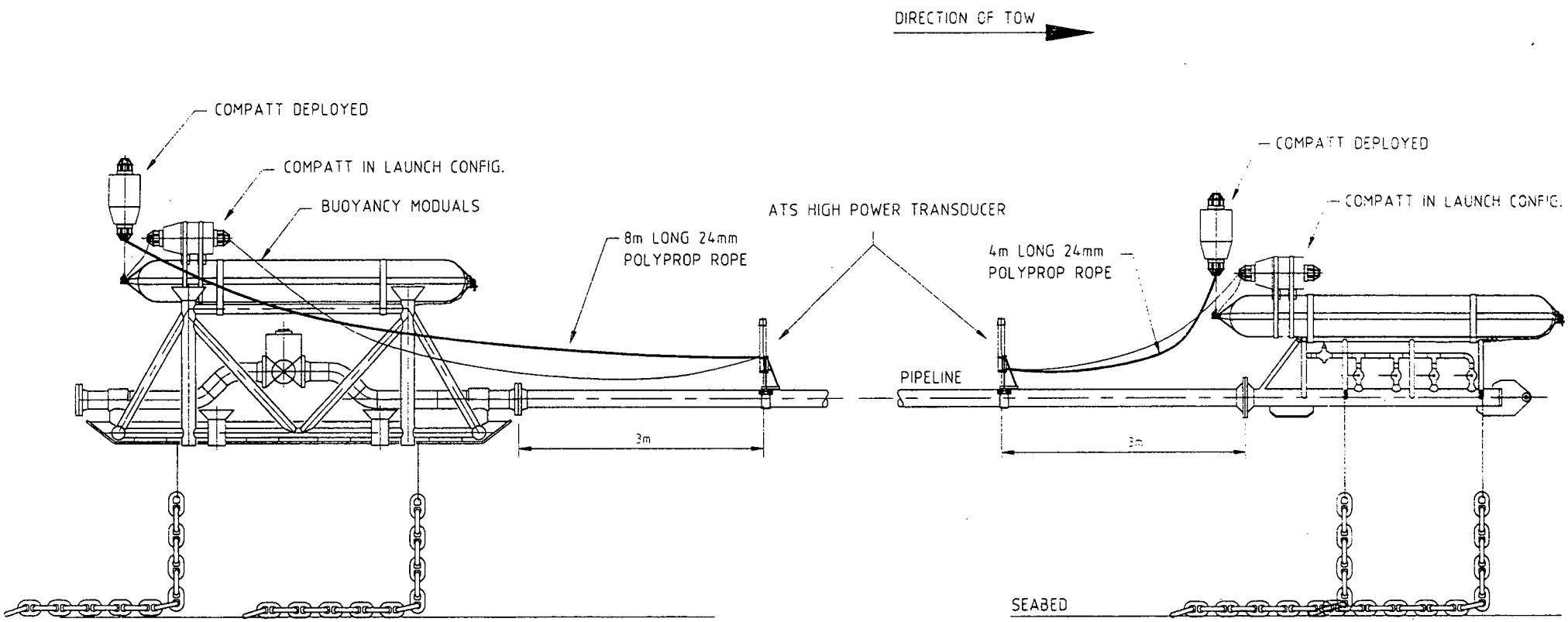
DRN BR | CHKD | APPROVED | DATE 17.7.96

PROJECT No.

DRAWING No PA-F-TQ-96-191

REV No 01

NOTE:
ON COMPLETION OF PIPELINE TOW, TOW HEADS, BUOYANCY, CHAINS AND SURVEY BEACONS ARE RECOVERED AND RETURNED TO SHORE



TOW TAIL

TOW HEAD

Fig 14

PROPRIETARY INFORMATION

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10 BELMONT AVENUE BELMONT WA 6104 TEL:- (09)277 1234 FAX:-(09)277 1080

TITLE	PROPOSED PIPELINE FABRICATION SITE TOW HEAD AND TAIL TOWING ARRANGEMENT			PROJECT No.	REV No
				DRAWING No	01
DRN BR	CHKD	APPROVED	DATE 17.7.96	PA-F-TQ-96-192	

SECTION 6.0

ATTACHMENT D

PROPOSED DRILL RIG FOR INSTALLATION OF INTERTIDAL PIPELINE LAUNCH SUPPORT ROLLERS

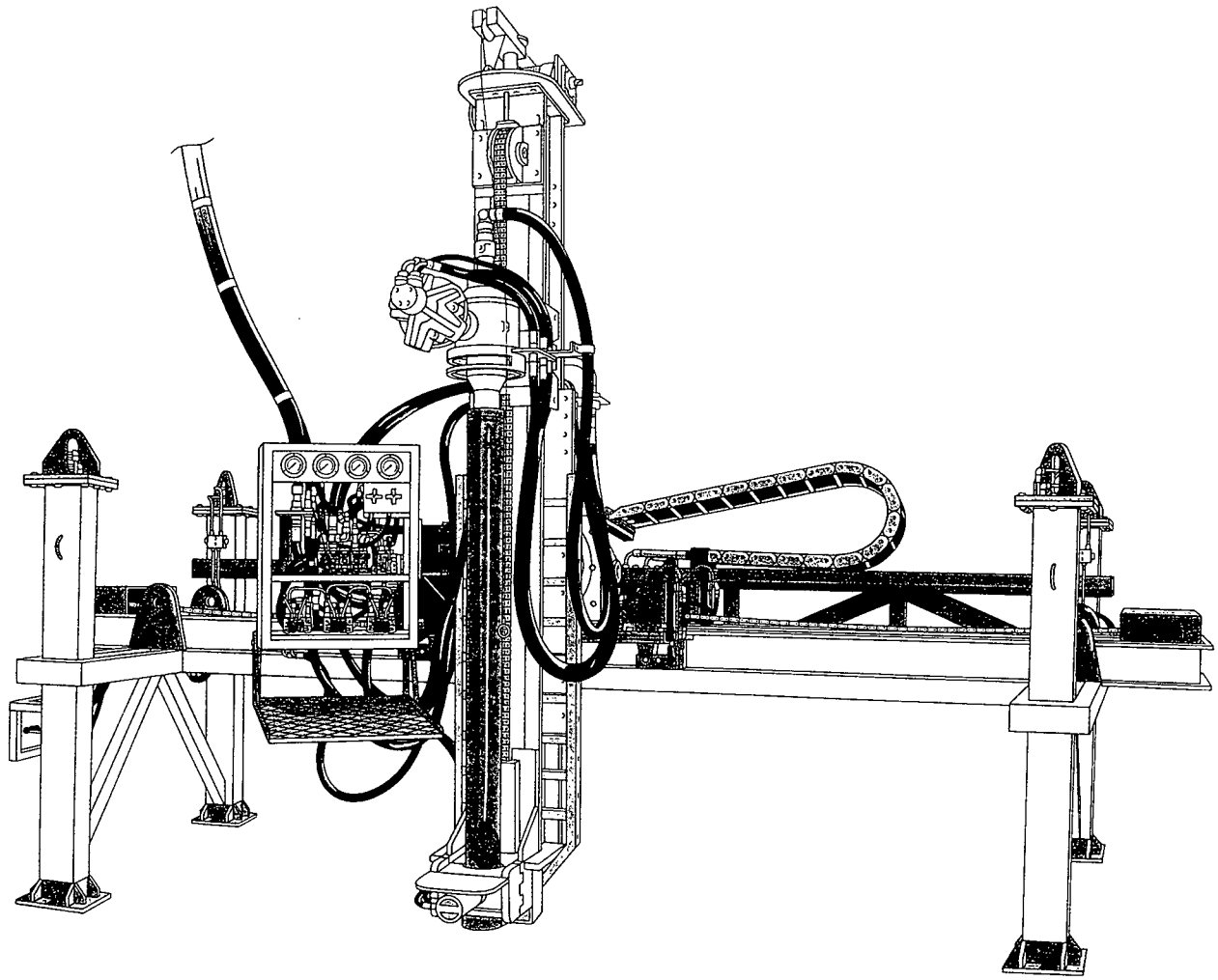
Installation of Pipeline Roller Supports

Attachment D Overview

Attachment D to this Section illustrates the compact drilling rig that will be deployed to install roller foundations. The rig will be deployed from a shallow draft barge and be supported by ground crew or divers as required.

It should be noted that no artificial cutting fluids will be used during the drilling process. Use of grout and foundation cement will be controlled to avoid spillage.

PLATFORM
UNDERWATER DRILLING RIG



Drilling Operations

A platform based drill rig was built for operations off minimal size vessels. The rig has the same drill mast as the crawler based rig mounted on a frame. The frame has hydraulic levelling capacity along with a 3.5m mast traverse capacity. This rig is deployed from a stern A-frame.

The drill strings or drill casing can vary from 25mm to 250mm depending on the client's requirements. SubSea believes that the versatility of the rig surpasses most current underwater drilling units currently being used.

Specifications

Height	:	*4.0m*
Weight	:	*8 tonnes*
Length	:	*7.0m*
Width	:	*2.6m*
Tracking capacity	:	*1.5m/leg*
Mast traverse	:	*3.5m*
Mast dump	:	*2.0m*
Power supply	:	*250lpm @ 240 bar powered by 440V 110 kW motor*
Rotary head	:	*3.6:1 reduction*
Torque	:	*6200 Nm*
Rotation	:	*0 - 100 rpm*
Motor	:	*Calzoni MRP 600*
Drill Mast		
Stroke	:	*3.0m*
Pull down	:	*20 tonnes*
Pull out	:	*30 tonnes*
Umbilical		
Supply	:	*38mm*
Return	:	*50mm*
Water	:	*50mm*
Case drain	:	*38mm*

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SubSea

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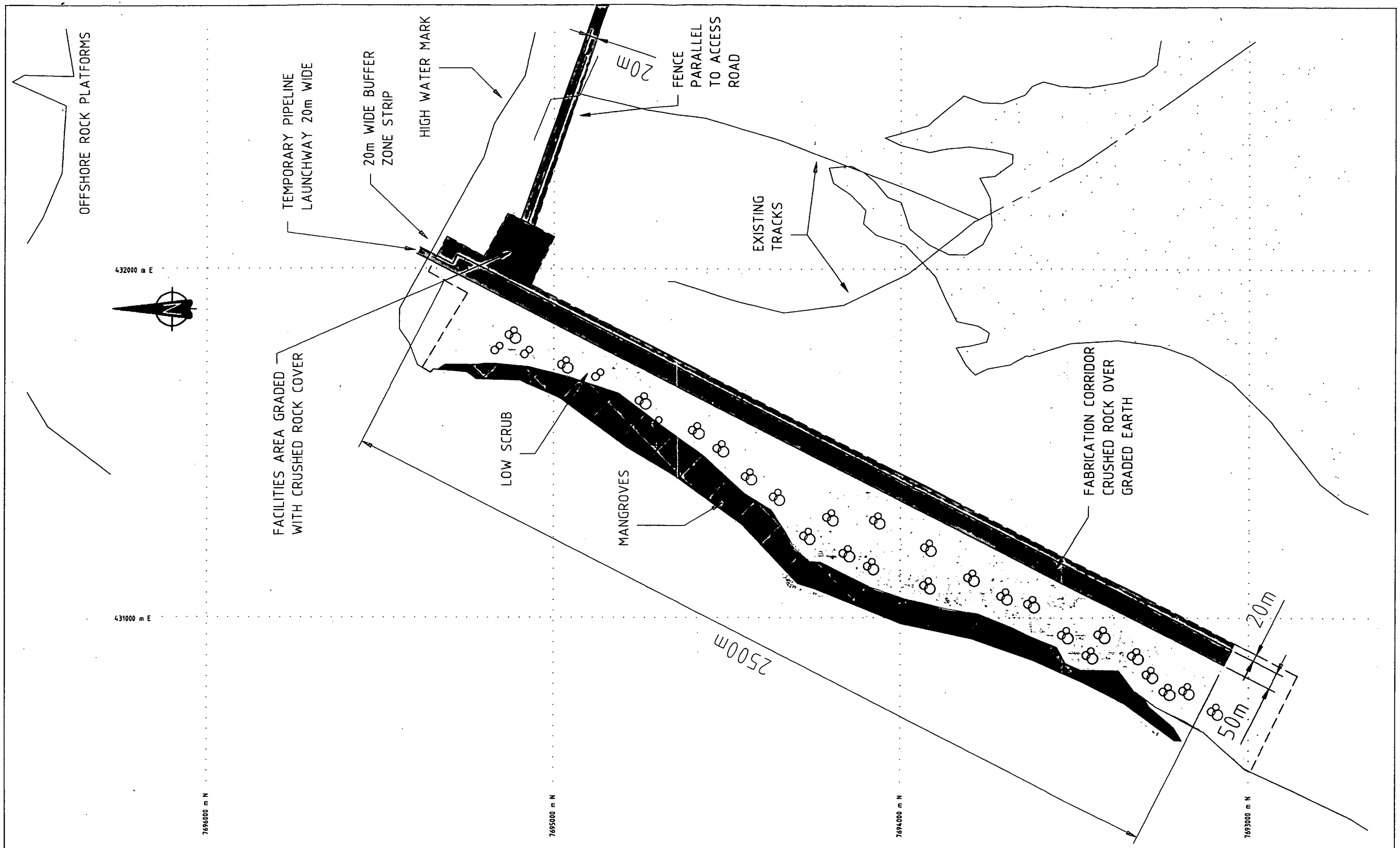
Fig 15

SECTION 6.0

ATTACHMENT E

ADDITIONAL PROPOSED SITE LAYOUT DRAWINGS

PA-F-TQ-96-118	**Fabrication Site Layout Plan**
PA-F-TQ-96-119	**Fabrication and Launch Area Plan**



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TOLERANCES UNLESS OTHERWISE STATED		
GENERAL	± 1	mm
HOLE POSITION	± 1	mm
HOLE CTRS	± 1	mm
ANGULAR	± 0.5°	deg

DRAWING No	TITLE
REFERENCE DRAWINGS	

REV	DESCRIPTION	DATE	DRN	CHK (INI)	APPR (INI)	CLIENT
01	ISSUED FOR CHECKING	22/5/96	MEW			

REVISIONS — APPROVAL

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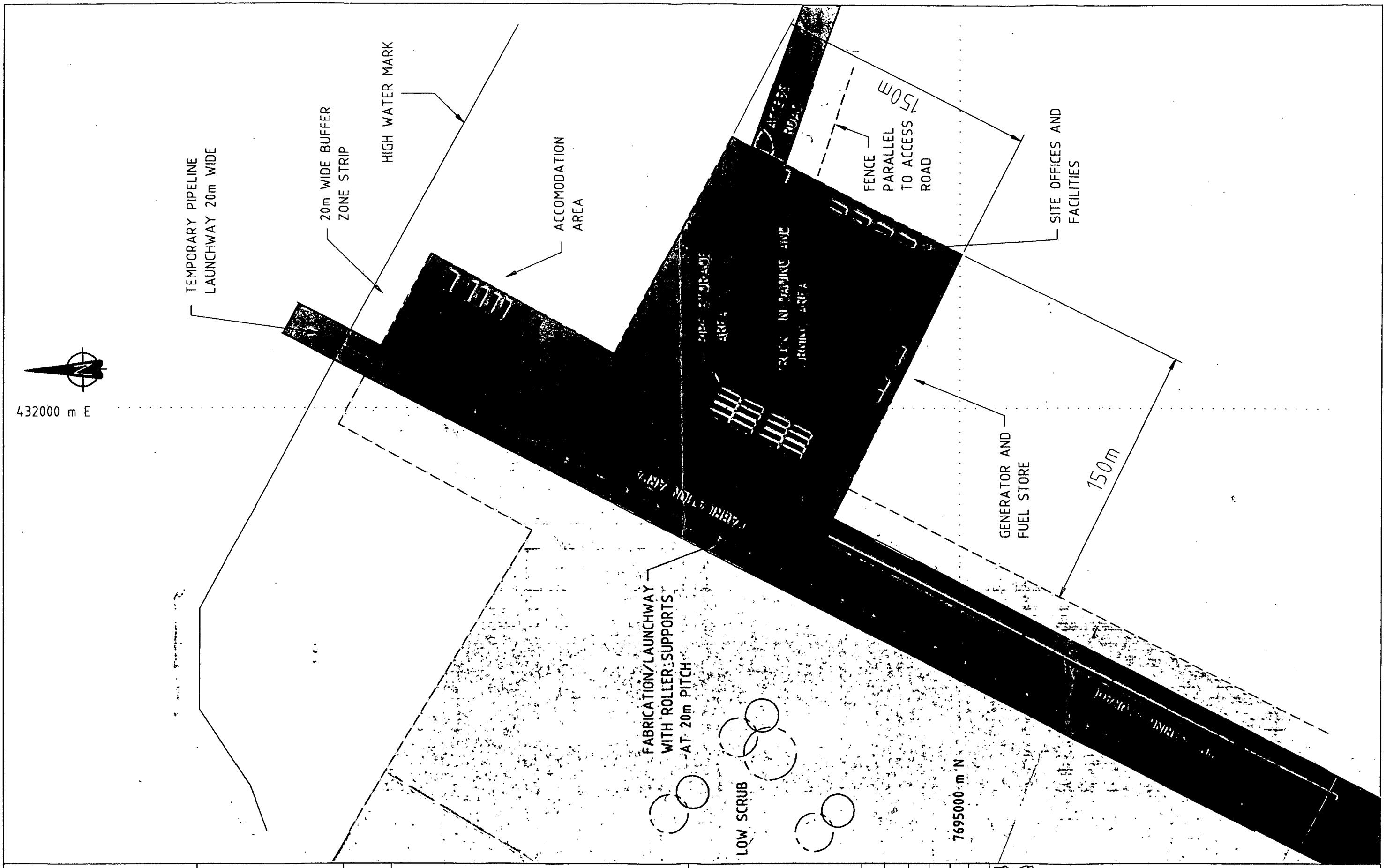
PROPOSED PIPELINE FABRICATION SITE
ON MARDIE STATION PASTORAL LEASE
FABRICATION SITE
LAYOUT PLAN

SCALE (A1)	SHEET	OF	DRAWING No	REV No
As Shown	1	1	PA - F -TQ - 96 -118	01

Fig 16



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TOLERANCES UNLESS OTHERWISE STATED		
GENERAL	± 1	mm
HOLE POSITION	± 1	mm
HOLE CTRS	± 1	mm
ANGULAR	± 0.5°	deg

DRAWING No	TITLE
REFERENCE DRAWINGS	

REV	DESCRIPTION	DATE	DRN	CHK ENG	APPR PRO	CLIENT
01	ISSUED FOR CHECKING	22/5/96	MEW			

REVISIONS / APPROVAL

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PROPOSED PIPELINE FABRICATION SITE
ON MARDIE STATION PASTORAL LEASE
FABRICATION SITE
FABRICATION AND LAUNCH AREA PLAN

SCALE (A1)	SHEET OF	DRAWING No	REV No
As Shown	1 - 1	PA - F -TQ -96 -119	01

Fig 17

7.0 DESCRIPTION OF THE ENVIRONMENT

This section provides a summary of the physical, biological and social environment within or proximate to the proposed development area, particularly those elements that are vulnerable to possible impact from the proposed development program. The information presented has been obtained from a review of previous information that has been compiled to describe the regional environment, supported by four field surveys of the area by the proponent.

7.1 Physical Environment

7.1.1 Climate

Mardie Station occupies the southern extent of the Pilbara region, and has the semi-arid climate characteristics of the region. Summers (November to April) are typically very hot with maximum temperatures generally above 30°C and occasionally over 40°C. Winters (May to October) are temperate (15°C to 27°C). Rain events are uncommon, usually being associated with cyclones or thunderstorm events. The "wet season" extends from January to July, with the heaviest falls occurring early in the season (February and March).

Average annual rainfall (267mm at Onslow) is greatly exceeded by average evaporation rate (3,166mm at Onslow).

The wind climate at the fabrication site is dominated by three meteorological processes: the formation of summer monsoonal depressions; the winter migration of high pressure systems into the more northerly latitudes; and the generation of diurnal land/sea breezes by coastal temperature gradients.

Southerly winds dominate the annual wind pattern. Summer winds include a strong westerly component generated by the monsoonal lows. Superimposed upon this pattern, diurnal land/sea breezes usually act to enhance the wind speed in the afternoon and reduce it during the night and early morning. The resultant wind direction oscillates from southerly or south-easterly in the morning to westerly in the afternoon. With the intermittent breakdown of the monsoonal condition, the diurnal pattern becomes dominant and strong offshore breezes occur. This summer condition essentially operates between October and March, with transitional periods having variable winds during September and April.

The winter regime is dominated by winds from the east, as high pressure systems migrate into the high latitudes and exert strong influences across the region. Gradient intensification storms, caused by pressure squeezing between high and low pressure systems, often cause protracted strong easterly wind sequences. The diurnal heating and cooling of the land at this time generally acts to enhance and reduce the easterlies, with winds being strongest in the morning and moderating in the afternoon.

Tropical cyclones occur in the region from November to April, and mostly between January and April. An analysis of the occurrence of tropical cyclones passing within the 150km of the proposed fabrication area indicates a frequency of two cyclones per year with a range of zero to four. *(WNI, Science & Engineering, 1996)*

Cyclones in the Pilbara region have mean wind speeds of up to 110km/h and durations of between 4h and 16h. Wind speeds may exceed 260km/h. The diameter of the strong wind zone usually ranges from 100 - 300km, sometimes greater. Winds rotate clockwise towards the eye, and because cyclone paths are highly erratic and totally unpredictable, winds can affect an area from any direction.

Cyclones may be accompanied by strong tidal surges due to wind and reduced atmospheric pressure. Surges of 3m have been recorded near Onslow.

Thunder squalls and tornados (water spouts) can also occur during summer, generating local gusts of over 150km/h. Gradient intensification storms occur predominantly during winter, resulting in easterly gales up to 140km/h. However, they can also occur during summer, when they strengthen the prevailing winds up to 60km/h. *(Bowman et al, 1990)*

7.1.2 Oceanography

The oceanography of the proposed site's near shore water is typical of the Pilbara coastline. The tides are semi-diurnal and at Onslow the mean spring range is 1.9m and the mean neap range is 0.5m. Shelf waves and atmospheric pressure also influence seas levels. Shelf waves have periods of 5 - 30 days causing 0.1 - 0.5m variations in sea levels *(Steedman Limited, 1986)*.

In the shallow inshore areas associated with the proposed fabrication site, the surface water movements are caused predominantly by tidal currents and wind stress. Tidal currents in the region tend to be lower than elsewhere within the Pilbara region. However, there are localised strong currents in tidal channels associated with islands in the Dampier Archipelago. Within shoal areas located in the tidal streams, tidal currents during spring tides are as high as 1.0m/s (2 knots). In more open areas, tidal currents are less than 0.3m/s (0.7 knots.)

Offshore from the proposed site, the Leeuwin current causes a general southerly drift parallel to the continental shelf (100 fathom isobath) and generally offshore surface water currents are substantially modified by wind.

Oceanic swell does not directly impact the fabrication site coastline due to the presence of offshore reefs. During the winter, the passage of cold fronts through the southern latitudes generates a persistent swell from the southwest. In summer, the swell is more variable and tends to be more westerly, however both swell conditions are dissipated by the offshore reefs.

The wave climate of inshore waters is dominated by local wind effects, with little or no swell effect. Seas generated in this area are of moderate to short wavelength. Prevailing land and sea-breezes and winds generate seas that are generally less than 1m in height with periods of less then 5s.

The high energy environment of the submerged reefs 10 nautical miles to the north of the fabrication site is reflected by the coarse rippled sediments and bare pavement that characterise the seafloor in this area. In comparison, areas in the lee of the reefs and shallows have find grained sediments that are easily resuspended under the lower energy of wind waves. This is typical of the Pilbara coastline, where inshore areas are rarely affected by swell energy and wind is the dominant resuspending agent *(Forde, 1985)*.

Oceanographic studies conducted by the EPA in Mermaid Sound, offshore Dampier, determined that onshore to offshore density currents are a significant transport process in bottom water during winter *(Forde, 1985)*. These currents are generated when strong easterly winds act to increase the density of inshore waters by both lowering temperature and increasing salinity through evaporation. This water then outflows from the shallows as a high density jet along the gently sloping bottom. This density current is considered to have as important role in the distribution of nutrients from onshore to offshore areas, and therefore the ecology of shelf waters.

7.1.3 Geology and Geomorphology

The proposed fabrication site lies in the geological region known as the Dampier sub-basin which in turn lies within the Carnarvon Basin.

The basal geology is sedimentary, being comprised of limestone with Holocene (Trella limestone) and Pleistocene (coastal limestone) origins together with deposits of generally non-lithified Holocene sediments. *(Playford et al, 1975)*

The fabrication site itself presents a base rock of Trella limestone with laminations of coastal limestone and conglomerates apparent at the shoreline. (Refer to CER Section 6.0, Attachment A, Photograph No. 2).

The gradient of the fabrication corridor rises in a south westerly direction as indicated on the contour drawing included as Attachment A to Section 7.0 of this CER.

In the near shore zone, the coastal limestone and conglomerates have been weathered to form a wave cut rock platform with interspersed sand channels. Within 1.2 nautical miles seaward into Regnard Bay from the proposed pipeline launch point, the marginal extent of the wave cut platform is apparent.

A further 3 nautical miles to seaward, the remnants of previously existing but now inundated reefs exist in association with SW Regnard, NE Regnard and Eaglehawk Island which have a Northeast to SouthWest orientation and appear to be an extension of the Cape Preston geological unit and are themselves the remnants of a previous coastline. (Refer to CER Section 7.0, Attachment C of this CER).

Exposed rock platforms in the intertidal zone associated with the proposed site are comprised of well cemented calcareous conglomerates, samples of which have presented UCS values typically in the range of 22 to 24 MPa. Based upon this information, SubSea has concluded that the proposed method of pipeline roller supports across the intertidal zone will be consistent with the rock types into which foundations will be set.

Location drawings and structural details of the proposed intertidal support launchway rollers have been included in Section 6.0, Attachment C of this CER.

The proposed site facilities area and pipeline fabrication corridor is generally comprised of Holocene sediments interspersed with stone shingle, possibly resulting from the weathering of conglomerates. It is assumed that the exposed coastal limestone weathered reef, apparent at high water mark, extends inland below the existing land surface south along the orientation of the fabrication corridor to a depth of between 1 and 4 metres below the existing land surface.

The geology of the soils underlying the facilities area and fabrication corridor appear to be ideally suited to the intended layout and installation of the proposed facilities.

7.2 Marine Biological Environment

The marine habitats associated with the site's near shore waters are identified in Attachment B to Section 7.0 of this CER.

7.2.1 Intertidal and Shallow Water Habitats

The major intertidal and shallow water habitats represented within and near the proposed pipeline launching corridor are as follows:

i) Sandy beaches and intertidal spits

ii) Intertidal beach and rock platforms

iii) Intertidal reefs

iv) Subtidal sand flats

These habitats may be cross referenced to the maritime chart excerpts as included in Attachment C to Section 7.0 of this CER and may be described as follows:

i) Sandy beaches and Intertidal Spits.

The "40 mile beach" is a sandy beach built upon a weathered limestone base. This beach is relatively short and gently sloping and consists of well sorted medium sediments to the high water mark, with a graduation to fine sands in the supratidal region. Accumulations of shell and coral fragments may be found along the high tide mark. The sand beach is approximately 4km long and is defined by low rocky headlands at the eastern and western ends.

To the west of the western headland, a large intertidal mud flat, exists comprised of find sediments. Inshore of this mud flat an established mangrove community is flourishing.

As with most of the intertidal zones in the Pilbara region, very few species are able to withstand the harsh desiccating environment which occurs between periods of tidal immersion. The fauna associated with beaches to the east of the fabrication site is limited to a few species of ghost crabs together with colonies of amphipods associated with algae detritus.

Foraging birds including oyster catchers and gulls were observed along the beach front.

There is no evidence of turtle nesting activities along the beach which commences approximately 0.5km east of the proposed pipeline launching point.

ii) Intertidal Beach Rock Platforms.

The intertidal beach rock platforms which extend north, northeast and northwest from the proposed pipeline launch point are prone to drying and therefore support a much less diverse distribution of flora and fauna normally associated with submerged reefs.

A preliminary inshore survey of the intertidal rock platform was undertaken by the proponent in July 1996. The transect covered a distance of 200 metres over a width of 10 metres from the highwater mark, on a bearing of 20 degrees, and closely followed the proposed pipeline launch corridor. The purpose of the preliminary survey was to:

- Ascertain the presence of coral reef assemblages along the inshore tow route.
- Determine the presence of sea grass swards along the inshore tow route.
- Ascertain the extent of sessile marine fauna along the inshore tow route.
- Determine the suitability of the inshore launch route from a technical viewpoint.

Observations concluded that:

- The zone is devoid of extensive coral reef areas with the only evidence of coralline fauna restricted to isolated coral colonies generally less than 300mm in diameter.
- No seagrass swards were evident, however localised accumulations of macro algae were present with general accumulations of filamentous algae present on most rock surfaces.

- Sessile marine fauna along the inshore tow route corridor was generally restricted to bivalve molluscs and isolated soft and hard corals.

The proponent has committed to undertake a detailed study of the inshore tow route corridor over a width of 10 metres, extending between the highwater mark and 1,200 metres to seaward.

Reference should be made to Section 11 of this CER where this survey commitment is described in detail.

Reference should be made to Section 6.0, Attachment C of this CER which illustrates the means by which SubSea intends to transport the launched pipelines across the intertidal rock platforms. This process will greatly reduce any environmental damage to the benthic groups since the pipeline will be fully supported on rollers during the launch phase.

Intertidal rollers supports will either be installed using hand operated pneumatic rock breakers to set foundations for light weight pipe launching support, or for heavy weight pipes, the drill rig as shown in Section 6.0, Attachment D will be used to set the more substantial foundations required.

Setting of project specific support roller foundations in the intertidal area will be fully addressed in the Environmental Management Plan to be produced by the proponent for each future pipeline project.

iii) Subtidal Reefs

As described in ii) above, it is the proponent's intent to undertake a detailed marine survey of representative fauna and flora in association with the bathymetric and sidescan survey of the tow route. This work will undertaken in late March 1997. The data collected will form the baseline survey of marine biota as evidenced at the present time. The survey will be undertaken at extreme low water, associated with the spring tides, when approximately 600 metres of the inshore tow route can be traversed through water no deeper than 0.3 metres. The following 600 metres of tow route, which traverses the subtidal reefs, will be undertaken by snorkel diver. The purpose of the survey will be to determine the presence of rare and priority marine flora and fauna existing on the subtidal reefs intersected by the 10 metre wide tow corridor. Still photography will be used to document the transect zone. The work will be undertaken by suitably qualified professionals and the resultant data will be used to:

- Provide baseline ecological data against which future survey results will be compared to monitor the effects of subsequent pipeline launches on the subtidal reefs.

- Provide specific data, such that the mode of pipeline launch as either surface or off-bottom launch, may be engineered to minimise potential environmental damage to the intertidal and subtidal reef zones.

Survey work undertaken on similar intertidal reefs within the Pilbara region suggest that the expected marine flora will be typified by find turf algae and occasional macro algae types. Benthic fauna can be expected to consist of isolated coralline and encrusting types with typical distributions of molluscs. *(Bowman et al, 1990)*

Local knowledge attests to the presence of boney fish, sharks and rays.

iv) Subtidal Sand Flats

There are extensive shallow subtidal sand flats to the north and northeast of the proposed pipeline launchway. These areas support significant numbers of Stingrays and Fiddler Sharks which in turn indicates a productive invertebrate fauna. Parrot fish and Tusk fish are generally the predominant resident fish in these area and are indicative of a food chain based upon algae turf and invertebrates (predominantly crustaceans and molluscs). *(Bowman et al, 1990)*

7.3 Terrestrial Biological Environment

7.3.1. Site Flora

The semi-arid climate characteristic of the Pilbara region is evident in the vicinity of the proposed fabrication site by the predominance of grasslands, ground covers and succulents which constitute coverage of the entire development site area. There is a notable absence of trees and shrubs in the area with only three (3) species of *Acacia* recorded.

Kapok bush, *(Aerva javanica)* and Buffel grass *(Cenchrus ciliaris)* are introduced weed types which are widely distributed across the proposed fabrication site.

The following table identifies the plant types represented on site as collected by the proponent in July 1996 and identified by the Western Australian Herbarium.

Sample No	Botanical Name	Type	General Distribution
1	*Acacia bivenosa*	Shrub	Common
2	*Acacia coriacea*	Shrub/Tree	Common
3	*Stipa sp.*	Ground Cover	Common
4	*Ptilotus exaltatus*	Ground Cover	Common
5	*Senna glutinosa ss. ? glutinosa*	Ground Cover	Common
6	*Triodia ? angusta*	Ground Cover	Common
7	*Ptilotus helipteroides*	Ground Cover	Common
8	*Ptilotus aeruoides*	Ground Cover	Common
9	*Enchylaena tomentosa*	Ground Cover	Common
10	*Cenchrus ciliaris*	Ground Cover	Common
11	*Acacia sp.*	Shrub	Common
12	*? Pterocciulon*	Ground Cover	Common
13	*Steptoglossa sp.*	Ground Cover	Common
14	*Rhynchasia minima*	Ground Cover	Common
15	*Evolvlus alsemoides*	Ground Cover	Common
16	*Alyogyne pinoniana*	Ground Cover	Common
17	*Aerva javanica*	Bush	Common
18	*Cenchrus ciliaris*	Ground Cover	Common

Development work will necessitate the removal of low lying ground cover perennial and annual grasses, succulents and herbs which constitute almost the entire development site area. These vegetative types are listed as above. It should be noted that all plant types have general distribution and are considered common.

In addition, five (5) shrubs *(Acacia coriacea)*, as clearly seen in the aerial photographs (presented as Figure 8 in Attachment A to Section 6.0 of the CER), will be removed. These low trees have a general distribution and are considered common.

Prior to undertaking site earthworks, the proponent will also undertake a terrestrial flora survey to:

- Determine the presence of rare and priority fauna within the boundaries of the proposed development site.
- Determine the presence of noxious weeds, other than those identified, to assist in the management of same.

This work will be undertaken by a recognised professional consultancy group.

It should also be noted that it is the proponent's intent to undertake significant vegetation regeneration and site specific planting of indigenous local shrub and tree species as a measure to prevent site erosion and generally improve the aesthetics of the area.

7.3.2 Site Fauna

The most evident fauna associated with the site is collectively the seabirds. A total of 65 bird species are known to inhabit the offshore and coastal environments between the Exmouth Gulf and Dampier. The offshore islands in the region support very important nesting areas, where ground nesting can occur largely unmolested. *(Bowman et al, 1990).* Evidence of feral cat and fox activity near the proposed fabrication corridor would probably preclude the successful breeding of seabirds on the coastal strip near the proposed site, and may contribute to the noted absence of ground and perching birds in the area.

The arid hinterland beyond the sand beach known as the "40 Mile" appears to support sparse populations of macropods and reptiles both of which are in evidence close to the proposed fabrication site.

A recognised professional consultancy group will be engaged to determine the presence of threatened or priority fauna within the boundaries of the fabrication site.

7.3.3 Ecological Considerations

The marine environmental resources of the region are acknowledged as being rich and diverse. The local inshore area supports some recreational fishing, however this is limited by the absence of a suitable boat launching facility into the waters of Regnard Bay.

The primary producing habitat in the immediate vicinity is the mangrove and associated mud flat community located to the west of the proposed fabrication corridor. This is viewed by the proponent as the critical ecological component in the vicinity of the proposed development.

The role of mangroves as exporters of nutrient in the form of leaf litter and other detritus is well documented as is the nursery habitat provided by the mangroves themselves. The nitrogen-fixing algae mat on salt flats backing the mangroves further to the west is also recognised as an important source of primary nutrients *(Paling, 1987)*

The marine and coastal ecology of the region is subject to highly variable environmental conditions. Wave energy and water clarity vary markedly in the area. Cyclones crossing the coast, extreme tidal variations and floods from the Fortescue, Yanyare and Maitland Rivers cause dramatic environmental disturbances.

As a result, it may be anticipated that substantial fluctuations occur in the distribution and abundance of many of the area's marine resources, and it is likely that the ecosystem has a high degree of resilience to occasional catastrophic impact, with representative species adapted for fairly rapid population recovery. *(Bowman et al, 1990)*

The proposed pipeline fabrication corridor and facilities area does not include a high dune zone, however immediately west of the mangroves, there is a belt of leather leaved wattles *(Acacia coriacea)* associated with the gentle rising slope extending up from the high tide mark. Reference should be made to Figure 8 in Section 6 of this CER.

Local knowledge gained from Aboriginal people who have visited the site, indicate that this belt of wattles is less well established than it was previously and there is abundant evidence of dead and dying trees at the southern end of the belt. In addition, the presence of feral cats and foxes have probably adversely effected the native fauna in the immediate area.

The proponent intends to enhance this area with extensive plantings of *Acacia coriacea*, reticulation of same and undertake to limit the population numbers of feral cats and foxes whilst site operations are underway.

One kilometre to the east of the proposed pipeline fabrication corridor and facilities area, an extensive dune line extends approximately four (4) kilometres further east and parallel to the "40 Mile" beach. Since this dune area is not within the proposed pipeline fabrication or facilities area, it is not considered in this CER. Management of this sensitive ecological area will be undertaken in association with development of the public access road to be undertaken by the Shire of Roebourne.

7.3.4 Conservation Status

No known conservation zones or reserves exist within the immediate area.

7.4 Social Environment

The coastal region adjacent to the proposed development site is sparsely populated with the exception of Dampier, and Karratha being 35km northwest and 50km northwest respectively.

The main non-government economic activities in these towns is closely tied to petroleum exploration and production, mining and pastoral support together with tourism, recreation and fishing.

7.4.1 Recreational Activities

The beach extending east from the fabrication site, known as the "40 Mile", is one of the only four readily accessible sandy beaches in the Pilbara region. It is evident that the 4.0km length of the crescent sandy beach is utilised for recreational activities by day visitors comprising of local residents from Karratha and Pannawonica and tourists travelling the state.

In the months between April and October, the "40 Mile" beach is also accessed by visitors who use the area as a base for extended visits. Camping trailers and tents may be evident along and behind the dunes at the western end of the beach during this period.

No visitor facilities are present in the area at this time, although the Shire of Roebourne have placed rubbish receptacles within the area and rubbish is collected on a regular basis.

The recreational activities associated with the "40 Mile" beach are primarily beach fishing, and beach combing.

No facilities are provided to enable the launching of small boats along the beach.

There is evidence that the "40 Mile" beach is popular as a swimming area but it is not extensively used for other water contact sports.

Public access to the "40 Mile" beach is currently achieved via a formed track which enters the Mardie Station lease west of the Devil Creek bridge on the North West Coastal Highway. It then crosses through Karratha Station lease land and finally into Vacant Crown Land on the coast foreshore. The existing track generally requires four wheel drive vehicle access, although access using two wheel drive vehicles may be possible on occasions. The track was formed by the Department of Main Roads (DMR), approximately 20 years ago to enable DMR access to sand deposits on the coast. A large quantity of sand was excavated from the dune system and this can be clearly seen from the aerial photograph presented as Figure 4 in Section 6 of this CER. The excavated pit lies in the centre of the photograph within the dune structure.

7.4.2 Pastoral Lease Considerations

The current access track from the North West Coastal Highway through to the coast generally follows the existing fence line on the Mardie and Karratha Station boundaries. The track is situated on the western side of the boundary fence and is therefore on Mardie Station as per the existing boundary.

It should be noted that the existing boundary fence has been realigned in the past ten (10) years is not the boundary currently recognised by DOLA.

It is anticipated that the boundary between Mardie and Karratha Stations will be rationalised to be consistent with the existing fence line.

The track through to the "40 Mile" beach formed by the Department of Main Roads (DMR) within the last twenty years was not fenced on its western side. Consequently current access to the coast enables the public to encroach onto Mardie Station both in the immediate area and to areas further west along the coast.

The Leasee of Mardie Station has suffered fence damage and resulting stock management difficulties due to uncontrolled access by the public onto areas of Mardie Station due to the existing access track being unfenced on the western side.

These incursions present particular problems for the Leasee in the areas of Mardie Station up to 8km west of the "40 Mile" beach site.

In addition, the incursions can exacerbate other land management problems including soil erosion, mangrove community damage and weed infestation.

The current Leasee of Mardie Station is in favour of formalising road access to the coast. This will be achieved by:

- The formation of a public road following the existing boundary fence line through to the "40 Mile" beach.
- Fully fencing the road reserve, proposed pipeline facilities area and pipeline fabrication corridor to exclude the public from open access onto Mardie Station.
- Appropriate signage to notify the public of the Mardie Station boundaries.

7.4.3 Aboriginal Heritage Considerations

The descendants of the Aboriginal groups acknowledged as the original inhabitants of Mardie and Karratha Station are known as the Yaburara and Coastal Mardudhunera people.

These acknowledged descendants of the traditional inhabitants are known locally as the Cosmos group and are an active association comprising less than twenty adults who have an elected representative committee of four women to negotiate issues arising out of Heritage and Native Title legislation.

The Cosmos group have lodged a Native Title Application (WC 96/89) as the claimant group over an area which includes the proposed development area on Mardie and Karratha Stations. The proponent is currently addressing Aboriginal issues with the claimants in respect of site access and use.

The Aboriginal Affairs Department have notified the proponent that two significant Aboriginal sites have been identified in the area. The sites are known as the Noorea Soak (Site No. P00308) and 40 Mile Eastern Dunes (Site No. P07272) and are in excess of 5km away from the proposed development area.

The two sites are shown on Figure 1 as presented in Section 6 of this CER.

As per the requirements of the Aboriginal Heritage Act, 1972 the proponent will undertake site archaeological and ethnographic survey work, using suitably qualified professionals, to determine the impact of proposed development work on documented Aboriginal sites of heritage significance.

7.4.4 Commercial and Recreational Fisheries

There is no evidence that the inshore area is used on a regular basis as a commercial fishing zone.

Local residents and tourists visitors undertake recreational fishing from the beach itself and also take mud crabs from the inshore waters associated with the mangrove communities to the west.

7.4.5 Tourism

Currently no facilities to support tourist activities are available at the "40 Mile" beach location apart from rubbish receptacles and clearance of same.

The access track into the "40 Mile" beach from the North West Coastal Highway is not an all weather access and is limited to four wheel drive access only especially after periods of rain.

It appears that the area does have tourist potential as is evidenced by current use during the winter period.

The proponent considers that formation of the access road to be undertaken by the Shire of Roebourne, together with; fencing, landscaping, and tree planting of buffer zones, to be undertaken by the proponent, will do much to enhance the area for tourist use.

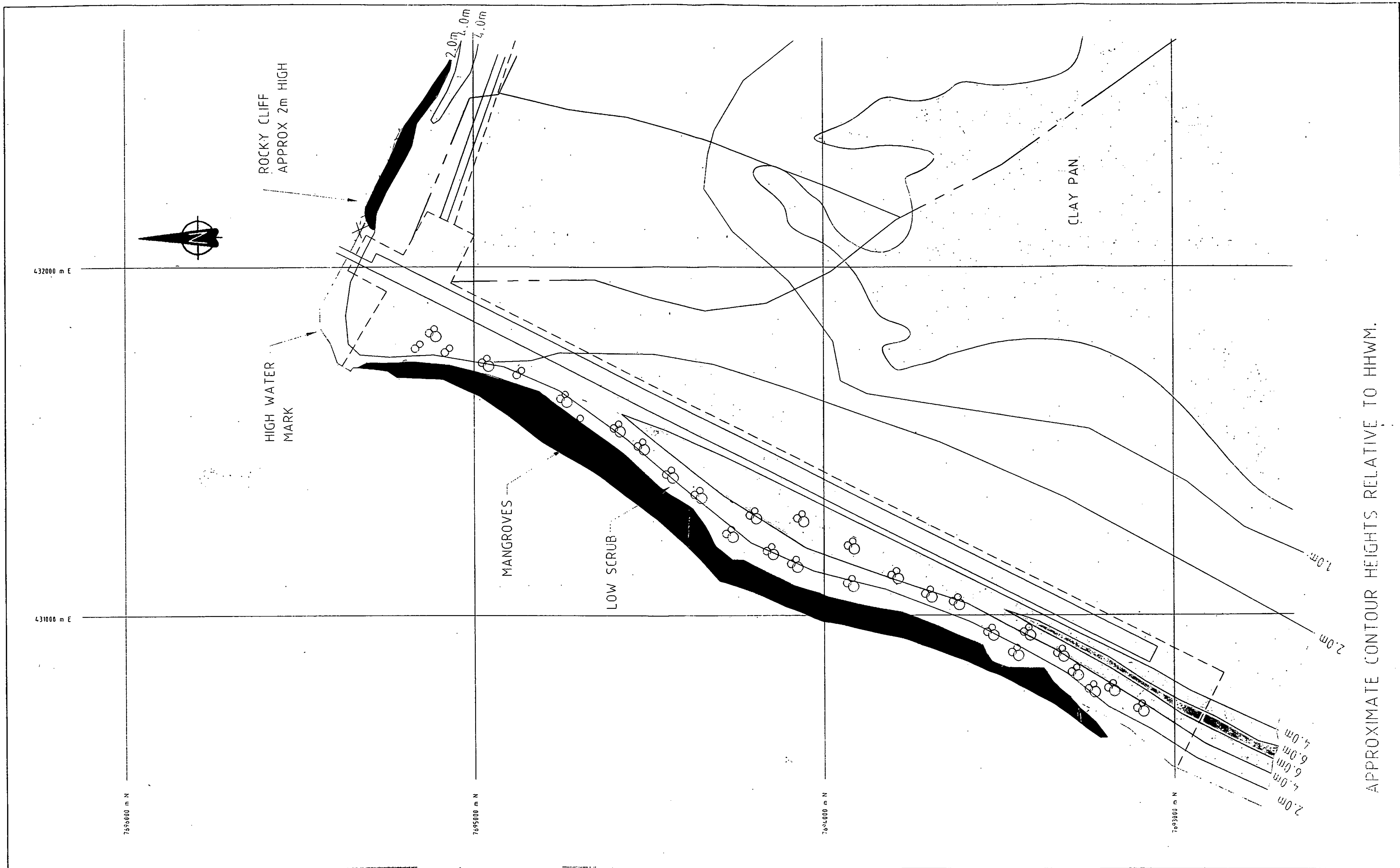
The Shire of Roebourne is also considering development of this portion of the coast to provide improved amenities for local visitors and tourists. Development may include designated camping and picnic areas, car parking areas, bar-b-que facilities and construction of an ablution block. These considerations are not part of the scope of this CER, but will be progressed by the proponent in conjunction with the Shire of Roebourne to generally improve public amenities in the interests of the local community.

SECTION 7.0

ATTACHMENT A

DRAFT SITE CONTOUR MAP

PA-F-TQ-96-121 **DRAFT SITE CONTOUR MAP**



TOLERANCES
UNLESS OTHERWISE STATED

GENERAL	± 1	mm
HOLE POSITION	± 1	mm
HOLE CTRS	± 1	mm
ANGULAR	± 0.5°	deg

DRAWING No	TITLE
REFERENCE DRAWINGS	

DESCRIPTION	REV	DATE	DRN	CHK ENG	APPR ENG	CLIENT
ISSUED FOR CHECKING	01	22/5/96	MEW	W	W	
REVISIONS		APPROVAL				

SubSea International (Australia) Inc. 10 BELMONT AVENUE BELMONT W.A. 6104 TEL:- (09)277 1234 FAX:-(09)277 1080

PROPOSED PIPELINE FABRICATION SITE
ON MARDIE STATION PASTORAL LEASE
FABRICATION SITE
DRAFT CONTOUR MAP

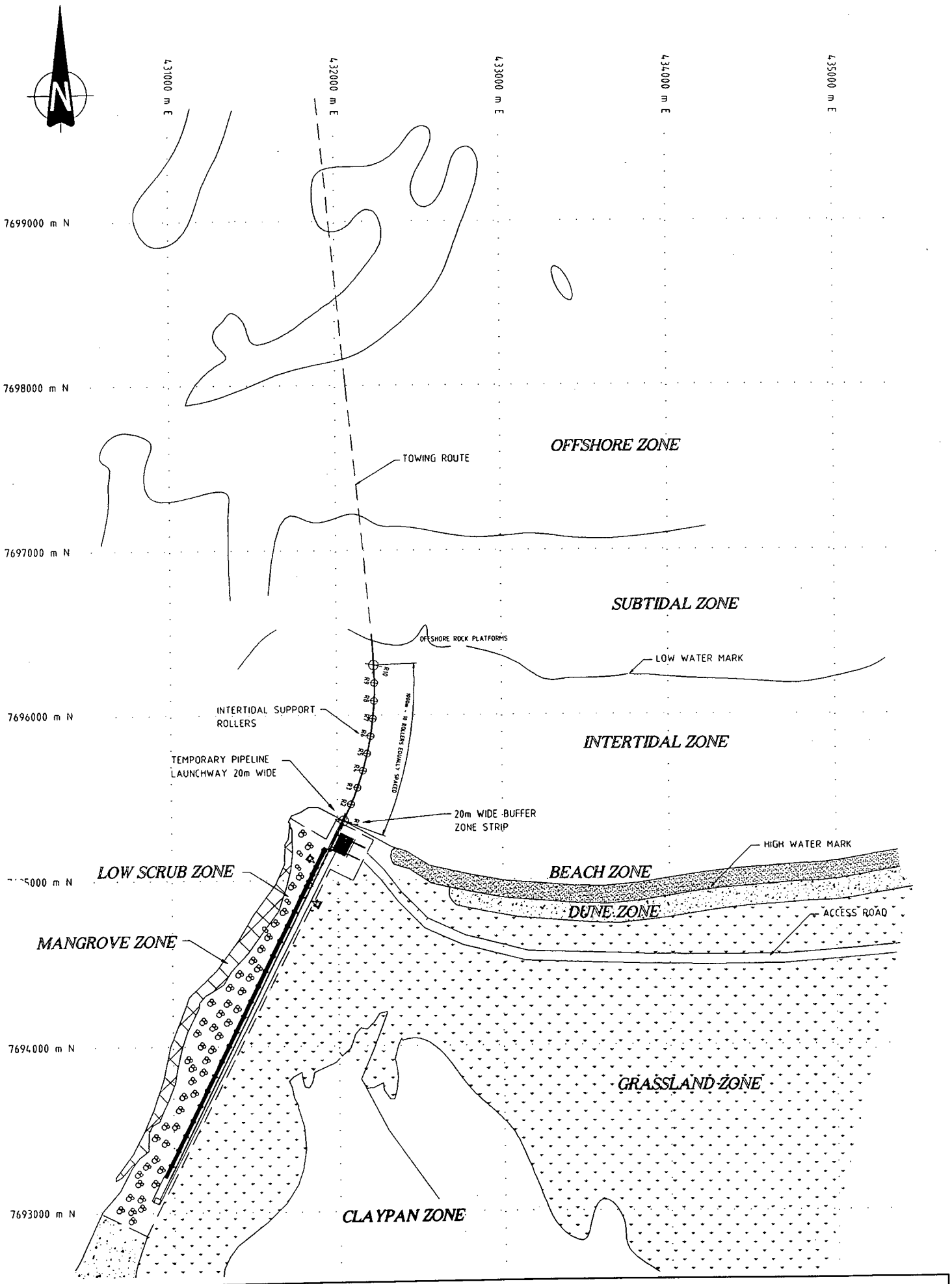
SCALE (A1)	SHEET OF	DRAWING No	REV No
As Shown	1 - 1	PA - F - TO - 96 - 121	01

Fig 18

SECTION 7.0

ATTACHMENT B

IDENTIFIED ECOLOGICAL ZONES IN PROXIMITY TO THE DEVELOPMENT SITE



Title: Defined Ecological Zones Adjacent to Proposed Site

Scale: As Shown	**Source: Derived from Fig. 4 and Site Visits in July 96, Sept 96 and Mar 97**

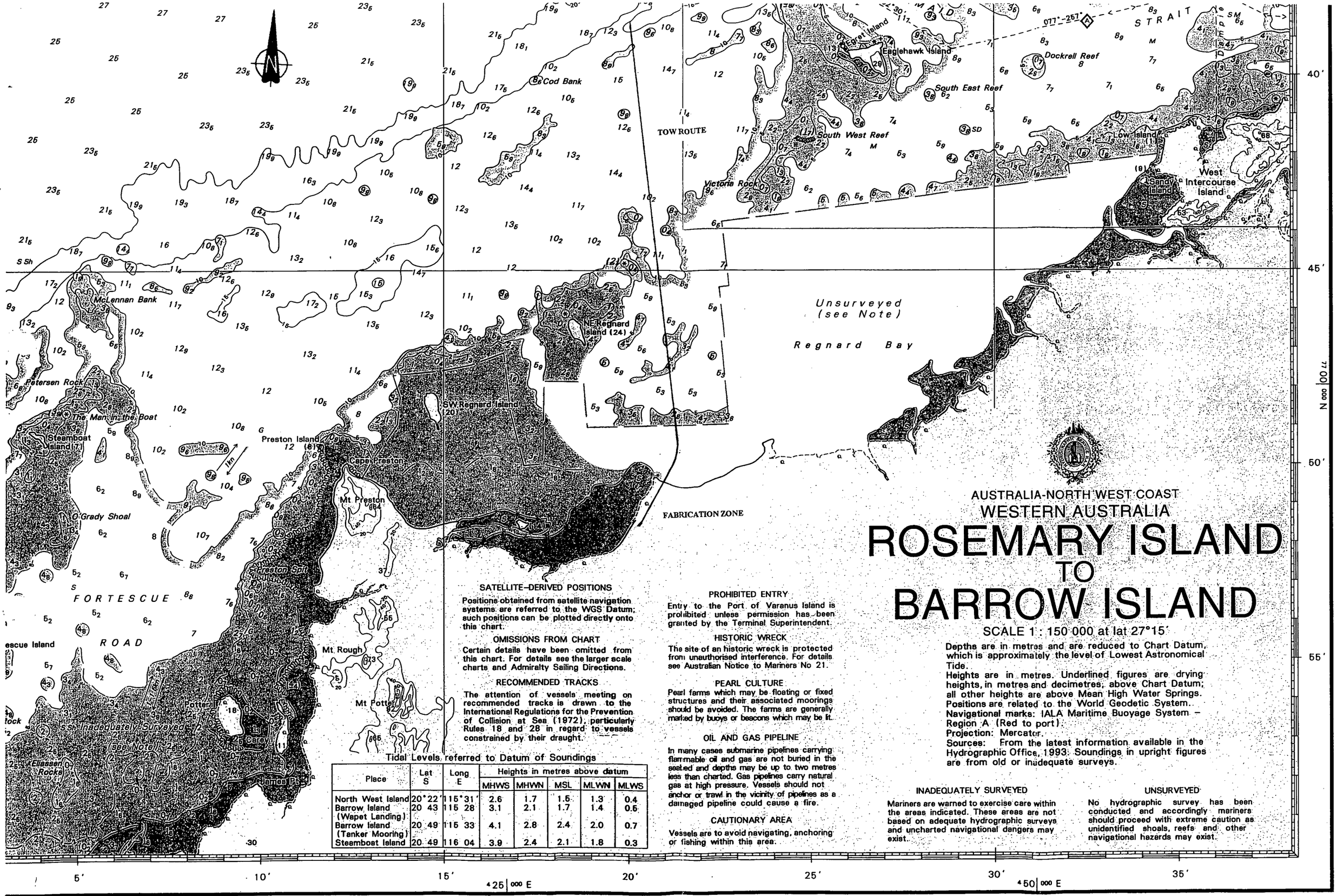
Fig 19

SECTION 7.0

ATTACHMENT C

BATHYMETRIC CHARTS

ROSEMARY ISLAND TO BARROW ISLAND (AUS 742)
PORT WALCOTT TO MONTEBELLO ISLAND (AUS 327)



SATELLITE–DERIVED POSITIONS

Positions obtained from satellite navigation systems are referred to the WGS Datum; such positions can be plotted directly onto this chart.

OMISSIONS FROM CHART

Certain details have been omitted from this chart. For details see the larger scale charts and Admiralty Sailing Directions.

RECOMMENDED TRACKS

The attention of vessels meeting on recommended tracks is drawn to the International Regulations for the Prevention of Collision at Sea (1972), particularly Rules 18 and 28 in regard to vessels constrained by their draught.

Tidal Levels referred to Datum of Soundings

Place	Lat S	Long E	Heights in metres above datum				
			MHWS	MHWN	MSL	MLWN	MLWS
North West Island	20°22′	115°31′	2.6	1.7	1.5	1.3	0.4
Barrow Island (Wapet Landing)	20 43	115 28	3.1	2.1	1.7	1.4	0.6
Barrow Island (Tanker Mooring)	20 49	115 33	4.1	2.8	2.4	2.0	0.7
Steamboat Island	20 49	116 04	3.9	2.4	2.1	1.8	0.3

PROHIBITED ENTRY

Entry to the Port of Varanus Island is prohibited unless permission has been granted by the Terminal Superintendent.

HISTORIC WRECK

The site of an historic wreck is protected from unauthorised interference. For details see Australian Notice to Mariners No 21.

PEARL CULTURE

Pearl farms which may be floating or fixed structures and their associated moorings should be avoided. The farms are generally marked by buoys or beacons which may be lit.

OIL AND GAS PIPELINE

In many cases submarine pipelines carrying flammable oil and gas are not buried in the seabed and depths may be up to two metres less than charted. Gas pipelines carry natural gas at high pressure. Vessels should not anchor or trawl in the vicinity of pipelines as a damaged pipeline could cause a fire.

CAUTIONARY AREA

Vessels are to avoid navigating, anchoring or fishing within this area.

AUSTRALIA-NORTH WEST COAST

WESTERN AUSTRALIA

ROSEMARY ISLAND TO BARROW ISLAND

SCALE 1 : 150 000 at lat 27°15′

Depths are in metres and are reduced to Chart Datum, which is approximately the level of Lowest Astronomical Tide.
Heights are in metres. Underlined figures are drying heights, in metres and decimetres, above Chart Datum; all other heights are above Mean High Water Springs.
Positions are related to the World Geodetic System.
Navigational marks: IALA Maritime Buoyage System – Region A (Red to port).
Projection: Mercator.
Sources: From the latest information available in the Hydrographic Office, 1993. Soundings in upright figures are from old or inadequate surveys.

INADEQUATELY SURVEYED

Mariners are warned to exercise care within the areas indicated. These areas are not based on adequate hydrographic surveys and uncharted navigational dangers may exist.

UNSURVEYED

No hydrographic survey has been conducted and accordingly mariners should proceed with extreme caution as unidentified shoals, reefs and other navigational hazards may exist.

DEPTHS IN METRES

(1033.3 x 653.3mm)
Dig Ed 1994

Aus742

Fig 20

AUSTRALIA–NORTH WEST COAST
WESTERN AUSTRALIA

PORT WALCOTT TO MONTEBELLO ISLANDS

FROM LATEST INFORMATION AVAILABLE IN R.A.N. HYDROGRAPHIC OFFICE 1967.

Positions are related to the Australian Geodetic Datum (1966).

Soundings in hairline are from earlier or incomplete surveys.

Topography from the Royal Australian Survey Corps to 1966

All heights are expressed in feet above Mean High Water Springs.

IALA Maritime Buoyage System
Region A (Red to port)

SOUNDINGS IN FATHOMS

Feet Metres Fms

Fig 21

8.0 ASSESSMENT OF POTENTIAL ENVIRONMENTAL IMPACTS AND EFFECT MITIGATION OVERVIEW

This section of the CER reviews and assesses the potential impacts of both the proposed site development and future site operations.

Potential impacts upon the biological and social environment are discussed.

8.1 Effects Of Development And Operations On The Biophysical Environment

The following sub-sections of the CER identify potential environmental impact agents and summarises the possible resulting extent of those agents on the local environment.

8.1.1 Terrestrial Environment

Dust Creation: Heavy trucks shipping pipe joints into the site and other vehicular traffic, will create dust from the surface of the access road. The resulting dust plume may have an adverse effect on the surrounding vegetation. Dust creation will be suppressed through application of water prior to and during transport of materials to site. The water will be drawn from the well marked on Figure 1 in Section 6.0 of this CER. Water will be applied via road tanker to limit dust depositing on the adjacent grassland. This grassland community is relatively homogenous, extensive and resilient and unlikely to suffer adverse effects from dust in the long term.

Clay Pan Instability: The proposed access road will cross an existing clay pan via an approved causeway.

Unless the causeway is appropriately designed, drainage of the clay pan may adversely effected. The Shire of Roebourne will be responsible for the design and installation of suitable culverts as per the relevant standards.

Mangrove Degradation: To the west of the 2,500 metre fabrication corridor exists a 2,500 metre extent of fringing mangroves. Site works involving vehicle incursions and dust creation may adversely effect the mangrove community, if vehicles are allowed to drive over exposed mangrove pneumatophores or dust plumes are allowed to settle on the mangrove assemblages. These effects will be mitigated by excluding all vehicles from the mangrove area, by using water to suppress dust in the fabrication corridor and by washing down mangroves with fresh water on completion of site fabrication activities.

Adjacent Scrub Zone: Immediately west of the 2,500 metre fabrication corridor exists a belt of low scrub which forms a buffer zone between the fabrication corridor and mangrove community. Site earthworks and vehicle incursions may adversely effect this zone, if vehicles are allowed to drive into the scrub zone. This effect will be mitigated by excluding all vehicles from the scrub zone and will be offset by active replanting of *Acacia coriacea* in this zone.

Grassland Zone: The establishment of the access road, facilities area and fabrication corridor over a portion of the grassland area presents the following potential environmental impacts:

- displacement of previously undetected rare or priority fauna and flora.
- reduction of habitat through removal of grassland and establishment of facilities
- residue accumulations created from grit blasting and wire brushing
- paint and solvent release into the environment through spillage
- fuel and oil release into the environment through spillage
- process fluids and chemical release into the environment
- solid process waste and domestic effluent release into the environment
- site earth works may result in erosion of the grassland zone due to prevailing wind effects
- site activities may exacerbate weed infestation problems
- site activities may increase the hazard of grassland fires
- site buildings and facilities may create hazards during the cyclone season.

Each of these potential impacts will be addressed as per the proponent's commitments and managed within the project's Environmental Management Plan.

Dune Zone	Although the dune zone lies outside the proposed development zone, increased public access via the proposed new access road will result in the potential for increased degradation to the coastal dunes due to unrestricted vehicular access. It is anticipated that the Shire of Roebourne will develop the management plan for the foreshore areas including the dune zone to effectively manage coastal dune preservation.

8.1.2. Marine environment

The primary environmental impact on the marine environment that may result from the launching of pipelines will be due to the emergency deployment of pipeline drag chains.

Under normal launching conditions, pipeline drag chains will not be deployed closer than 1,000 metres from shore, and the pipeline will float clear of the seabed in this interval.

As a contingency procedure, and only to provide short term stability of the pipeline if the launch is halted midway through the process, drag chains may have to be deployed closer to shore than the specified 1,000 metre mark.

In this case, the environmental effects may be summarised as follows:

Intertidal Zone (0-500 metres)	The launching of pipelines across the wave cut platforms may adversely effect the environment due to dragging chains and pipe impact during launch.
Subtidal Zone (500-1,000 metres)	Proximity of pipeline tow vessels to within 1,000 metres of the coast line may increase risks of vessel foundering. Pipeline drag chains may adversely effect benthic organisms.
Offshore Zone (1,000 metres +)	Pipeline drag chains may adversely effect benthic organisms.

The likelihood of contingent deployment of drag chains under normal pipeline launching conditions is extremely small since this event would signal the development of a significant risk scenario effecting the successful launch and subsequent installation of an offshore pipeline.

This risk will be mitigated by strictly observing the proposed limiting environmental conditions prior to commencement of pipeline launch.

The limiting environmental conditions are as follows:

- Windspeed less than 10 knots.
- Significant wave height less than 0.5 metres.
- Observed cross current less than 0.2 metres/second.

8.1.3 Social Environment

Ethnographic and Archaeological Considerations	Site works may serve to disturb Aboriginal significant sites previously not catalogued.
Recreational Considerations	Site works and future activities may adversely effect the recreational benefits provided on the adjacent sandy beach and shore rock platforms.

8.1.4 Commercial Environment

Fishing	Pipeline launching activities may adversely effect commercial fishing activities.
Grazing	Site works and future activities may adversely effect grazing lease activities.

8.1.5 Potential Discharges

The following potential discharges have been identified and the control process described.

▪ Site Solid Wastes	All site solid waste will be contained within closed receptacles and disposed of in an approved manner at an approved location.
▪ Paints & Solvents	All paints and solvents will be stored in an approved container. No spray painting will be undertaken on site.
▪ Grit Blasting	If required, only approved mobile grit blasting systems will be used on site.
▪ Line Pipe Coatings	All line pipe coat applications will be conducted off site at an approved location. If epoxy paint coatings, rust or other adhesions have to be stripped from pipe surfaces on site, only an approved system will be used. No residues will be allowed to remain on site.
▪ Oil Spills and Discharges from Tow Vessels	Tow vessels will not progress closer than 1,200 metres offshore from the high water mark. As per AMSA codes, no shipborne wastes will be discharged to the marine environment unless approved. The only pollutant which will require disposal approval relates to pipeline chemical inhibitors (if used) for which disposal will be addressed on a case by case basis under a separate licence application.

Oil spills may only occur as a result of a tow vessel running aground during the launching of the pipeline. The likelihood of this event is extremely small since:

i) The vessel master will have detailed bathymetry charts of the tow route available at all times. The proponent undertakes to complete a high resolution bathymetric and sidescan sonar charting of inshore waters associated with the launching zone and sidescan sonar charting for inshore waters associated with the launching zone and offshore areas which collectively form the pipeline tow route.

ii) Launching of the pipeline will be undertaken at high tide resulting in maximum under keel clearances for the tow vessel and launched pipeline assembly.

iii) Launching of the pipeline will only be undertaken where; sea states are less than 0.5 metres; wind speeds less than 10 knots, and; cross currents are less than 0.2 metres/second.

iv) Launching of the pipeline will only be undertaken with a second tow vessel standing by. This vessel will be utilised to assist the primary vessel as required.

9.0 ENVIRONMENTAL MANAGEMENT

9.1 Introduction

The proposed site development and future pipeline fabrication and launch operations will be designed to be conducted to minimise the risk of adverse impact upon the recognised and valued resources associated with the proposed works site. Specific elements of the environmental management program include the following:

- adopting stringent industry and government standards procedures and safeguards for appropriate environmental protection;
- undertaking to initiate further terrestrial & marine biological studies to gain baseline data on existing biota;
- implementing an environmental management plan to minimise site environmental impacts;
- ensuring the workforce is appropriately trained and are familiar with their individual management responsibilities;
- liaising with fishing and pastoral concerns and with the broader community to minimise potential operational conflicts;
- undertaking to accept appropriate responsibility for adverse environmental consequences that may result from site activities;
- implementing a monitoring program to confirm management aspects as presented in this CER.

This section of the CER details these undertakings.

9.2 Site Development And Operational Management

The proposed site development and operational activities will not cause significant adverse impact upon the terrestrial and marine environment. This will be achieved through the implementation of a site specific environmental management plan, training and induction of all site personnel and adherence to industry and government standards, procedures and safeguards.

9.2.1. Terrestrial Management

Road and facilities formation will lead to reduction of the existing grassland habitat. The total area of development will result in the laying of 18 ha of crushed rock for road and facilities area pavements and the creation of an additional 38 ha of buffer zone within the total development area of approximately 56 ha. The vast areas of surrounding grassland will provided the necessary grassland buffers which will naturally compensate for the areas developed.

The proponent will undertake to complete a terrestrial fauna survey of the proposed access road, facilities area and fabrication corridor prior to commencement of earthworks.

During periods of intensive transport of pipeline materials into the site, the access road will be watered sufficiently to achieve effective dust suppression. Water will be pumped from the existing well as shown on Figure 1 in Section 6 of this CER.

Clay pan stabilisation will be achieved by the formation of an approved causeway with provision for adequate drainage to ensure viability of the clay pan zone. This work will be undertaken in accordance with the relevant standards by the Shire of Roebourne.

Mangrove preservation will be achieved by erecting suitable flagging tape to designate the area as a total "no-go" zone. Fabrication corridor dust suppression methods will be employed if prevailing conditions create significant dust intrusion into the mangrove community. Vehicle use along the fabrication corridor will be minimised.

The adjacent scrub zone will be protected by declaring this a "no-go" zone for vehicles. Significant tree planting and reticulation will be undertaken to improve this zone.

Site inductions for all personnel will be mandatory and include environmental management responsibilities.

Site operational procedures to protect the environment will include; the exclusion of grit blasting systems other than approved equipment; storage of all paints and solvents in approved storage containers; designated and approved fuel and oil storage areas with approved contingent containment systems; all process fluids; residues and solid wastes to be contained and disposed of in an approved manner; and all domestic wastes to be disposed of through an approved septic treatment system.

Erosion mitigation methods will include extensive revegetation works including provision for reticulation and works alignment to lessen effects of prevailing winds.

Weed infestation of species other than Kapok bush and Buffel grass, which are already very widespread in the development area, will be controlled by regular inspection and approved herbicide spot spraying of the facilities area and fabrication zone.

Adequate fire breaks around the site and provision for fire control equipment to be present on site.

All site facilities, excluding rail track and foundations will be removed from site during periods when fabrication work is not being undertaken.

9.2.2 Marine Management

Baseline marine fauna and flora, identification and distribution data will be obtained during a detailed survey of the intertidal and subtidal zones associated with the proposed pipeline tow route. A total of 1,200 metres to tow route will be surveyed seaward from the launch point. Resurvey will be undertaken after each subsequent pipeline tow to ascertain the extent of environmental effects from drag chains. The tow corridor width will be carefully controlled and

limited to ± 5.0 metres from the corridor centre line. Intertidal support rollers will be installed to reduce the impact of the launched pipeline within the intertidal zone, or alternatively, pipeline launching will only be undertaken at high tide, in a surface floating mode. Pipeline drag chains will not be deployed closer to shore than 1,000 metres from the high water mark unless required as a contingency procedure to stabilise the pipeline during unforseen delays to the pipeline launch sequence.

Pipeline tow vessels will not approach closer than 1,000 metres to the coast. An attendant support vessel will always be present during pipeline launching. The proponent will undertake to complete detailed inshore bathymetric surveys to identify possible navigation hazards.

The impact of towing the pipeline through the offshore zone (ie. >1,200 metres) and its effect on benthic communities is considered to be insignificant.

9.2.3. Social Environment Management

Ethnological and archaeological survey work will be undertaken by appointed professionals approved by the descendants of the recognised traditional inhabitants of Karratha and Mardie stations. Development work will progress only after consultation with the descendants of the traditional inhabitants.

The development proposal will be advertised locally and the general community invited to comment. The proponent will undertake to offset perceived negative effects on recreational activities at the "40 Mile" beach with infrastructure to support recreational activities. This work will be undertaken in association with the Shire of Roebourne.

9.2.4 Commercial Environmental Management

Proposed pipeline launching activities will be publicly announced and advertised to notify professional fishermen of the pipeline transit date and time.

The proponent will implement site works to ensure that grazing lease activities are not adversely effected by the development. These works will include; site boundary fences to prevent incursions by the public onto the lease hold land; formed access road along the existing Karratha/Mardie station boundary fence, (subject to boundary rationalisation); and boundary signage as appropriate.

9.3 Monitoring Program

SubSea propose to undertake additional environmental studies to assist with appropriate environmental management and to confirm predictions made in this CER. Specific studies that are proposed include:

a) Baseline terrestrial survey of the proposed access road route, facilities area and fabrication corridor prior to commencement of earthworks. This terrestrial survey will be undertaken to determine the presence of rare and priority flora and threatened and priority fauna within these development areas.

b) Baseline intertidal marine survey by qualified consultants over a distance of some 1,200 metres from the launch point. This marine survey will be undertaken to determine the extent of regionally significant marine flora and fauna within the inshore pipeline tow route zone extending from high water mark to 1,200 metres to seaward.

c) Follow-up inshore marine surveys will be undertaken after successive pipeline launches to enable environmental effects to be quantified. If the independent consultant's report concludes that the pipeline launch method is adversely effecting the inshore environment, then the launching method, including intertidal activities, will be modified for all future pipeline launching activities to minimise the perceived environmental impact.

The pre-launch and post launch surveys will be conducted for each pipeline fabrication and launch project.

No further pipeline fabrication and launch activities will be conducted if the inshore environmental impact of these activities proves to be significantly negative.

9.4 Environmental Impacts Analysis

Description	Source	Quality/Composition	Quantity	Treatment and/or Discharge Point	Predicted Environmental Effects	Mitigating Actions
Dust	Vehicles	Creation of Dust.	3 day period.	Surrounding Grasslands.	Negligible effect on surrounding grasslands.	Road tanker water dampening of road prior to pipe transport.
Clay/Salt Pan Drainage Retention	Road Building	Limiting Drainage.	300 metre interval on proposed road.	N/A	May adversely effect existing clay pan and salt pan habitats.	Suitable culverts to be installed under road.
Dust	Site Equipment	Creation of Dust.	30 day period.	Surrounding scrub zone.	Negligible effects on surrounding zone.	Road tanker water dampening of works area.
Dust	Site Equipment	Creation of Dust.	30 day period.	Surrounding mangroves.	Negligible due to planned dampening.	Fresh water washdown of mangroves on project completion.
Clearing of Site	Site Equipment	Removal of Grassland area.	7.25ha	N/A	Negligible due to adjoining board expanses of similar environment.	Pre works surveys of existing fauna / flora.

Description	Source	Quality/Composition	Quantity	Treatment and/or Discharge Point	Predicted Environmental Effects	Mitigating Actions
Vehicle tyres	Site Equipment	Vehicle Incursions.	Nil	Adjoining scrub and mangrove zones.	Nil.	Areas will be flagged off as "no go" zones for vehicles.
Grit and Rust Residues	Site Equipment	Grit and Rust Residues.	Variable (<10kg)	Rust to ground and grit contained within cleaning system.	None.	Iron oxide quantities will be small, all grit will be retained in an approved system.
Paints and Solvents	Site Equipment	Paints and Solvents.	Nil	To ground.	Nil	Approved storage container on site, no paint spraying.
Fuels and Oils	Site Equipment	Fuels and Oils	Nil	To ground.	Nil	Approved containment system under storage tanks.
Fresh Water	Site Processes	Potable Water	65,000 lt (total)	To ground.	Nil.	No additives in water.

Description	Source	Quality/Composition	Quantity	Treatment and/or Discharge Point	Predicted Environmental Effects	Mitigating Actions
Sewage, Gray Water	Site Processes	Sewage, Gray Water	1,000 litres per day	Treated via septic tank and leach drains.	May induce vegetation growth over leach drains.	Tank will be pumped out on a regular basis ie. once per year.
Solid Wastes	Site Processes	Paper, Wood, Steel, Plastic Containers.	Variable	Offsite disposal.	Nil.	Waste will be stored in skips and disposed of at an approved location off site.
Fires	Site Processes	Grassland Wildfire.	Variable	Ground.	Nil.	Fire fighting equipment to be available on site with adequate fire breaks prepared before construction activities commence.
Vehicle Tyres	Site Processes	Vehicle Incursions.	Variable	Low dune areas.	Nil.	All site vehicles will be excluded from dune areas.

Description	Source	Quality/Composition	Quantity	Treatment and/or Discharge Point	Predicted Environmental Effects	Mitigating Actions
Launching of Pipelines	Drag Chains	Damage to rock platform.	10 metres wide by 1,200 metres long.	N/A.	Damage to existing marine flora and fauna.	Drag chains will not be deployed in the 0 to 1,200 metre interval under normal launch operations. Site specific marine flora and fauna surveys to be undertaken prior to commencement of works.
Preparation of Launch Ramp	Earthmoving machines	Removal of rocks and soil.	10 metres wide by 30 metres long.	N/A.	Nil.	Construction will be undertaken in accordance with consultant's recommendations.
Interference with Aboriginal Sites of Significance	Site Personnel and Equipment Activities	N/A	Nil.	N/A	Nil.	Survey to establish existence of sites. All sites will be designated "no go" zones.
Interference with Recreational Activities	Site Processes	N/A	30 days per year.	N/A	Activities may preclude some recreational activities.	Site activities will be advertised in local newspapers.

Description	Source	Quality/Composition	Quantity	Treatment and/or Discharge Point	Predicted Environmental Effects	Mitigating Actions
Interference with Commercial Fishing Activities	Pipeline Launching	N/A	30 days per year.	N/A	Launching may interfere with fishing activities.	Site activities will be advertised in local newspapers.
Interference with Grazing Activities	Site Processes	N/A	30 days per year.	N/A	Activities may preclude some grazing activities.	Site agreement will be gained from Leasees of adjoining pastoral stations.

10.0 CONCLUSIONS

Site development plans and operational activities proposed by SubSea will cause minimal adverse impacts on either the marine or terrestrial environments or local communities of Karratha, Dampier and Pannawonica. Considerable benefit will derive from the proposed development for both the local communities and the State.

The principal environmental concern relates to adequate protection of the adjacent mangrove community, the coastal dune system and the intertidal zone. The risks of damage to these zones is extremely small and are likely to be localised and of little long term ecological or social significance.

All site activities can be appropriately managed to minimise the small risk and deleterious impacts on the environment.

SubSea has previously demonstrated a very strong commitment to environmental management and propose to implement comprehensive and rigorous measurers to ensure that the proposed site works and operations do not cause adverse ecological or social impacts. Accordingly it is submitted that the proposal should be approved.

11.0 SUMMARY OF COMMITMENTS

SubSea is committed to comply with all legislation and regulatory requirements pertaining to the access and future use of the proposed pipeline fabrication site. In addition, SubSea commits to adopt industry and government standards and guidelines to ensure site development and operational activities are conducted in a safe manner.

11.1 Commitments Overview

SubSea commits to comply with the management proposals as described in this CER.

The following section lists all operational, terrestrial and marine management commitments that will be met by the proponent. Those commitments shown in bold are those key non-operational commitments which are presented in the Summary Table, Section 11.2.

11.1.1 Operational Management

i) The proponent will comply with all relevant laws, regulations and conditions in relation to site development and use.

ii) **A site specific Environmental Management Plan (EMP) will be developed for site preparation work and all site pipeline fabrication and operational activities. The management plan will identify all personnel responsibilities, induction procedures, impact mitigation activities and audit procedures necessary to implement the plan. A specific environmental management plan will be prepared for each pipeline fabrication and launch project and submitted to the DEP for review and approval prior to the commencement of site works.**

11.1.2 Terrestrial Management

i) Watering of the access road to suppress dust created during periods of pipe stock transportation into the site.

ii) Ensuring that claypan through drainage is provided under the proposed access road. (Shire of Roebourne responsibility).

iii) Delineating the adjacent mangrove areas as total "no-go" zones by erecting flagging tape.

iv) Delineating the adjacent scrub buffer zone as a vehicle "no-go" zone.

v) Site specific control management of:

- Grit blasting equipment (Approved systems only)
- Approved storage of paints and solvents
- Approved fuel and oil storage areas with contingent leak containment systems
- Process fluids and residues together with solid waste will be stored and disposed of offsite in an approved manner at an approved location.
- Domestic wastes to be disposed of via an approved septic system

vi) **Erosion control will be achieved via revegetation of local grasses, shrubs and trees. Reticulation will be installed to facilitate regeneration.**

vii) A weed control program will be implemented for the facilities area and fabrication corridor.

viii) Fire abatement and control measures will be implemented on site during project work.

ix) All temporary site facilities and equipment will be removed on completion of site operational works.

x) The proponent will undertake to assist the Shire of Roebourne with management of the dune area.

xi) **The proponent will undertake a baseline terrestrial study to identify existing fauna types and distributions prior to commencement of works.**

xii) **The proponent will undertake a detailed archaeological and ethnographic survey of the site to determine the presence or otherwise of significant Aboriginal sites.**

11.1.3 Marine Management

i) **Marine communities associated with the intertidal zone over a 1,200 metre distance seaward from the launching point will be surveyed and documented prior to commencement of site work. Subsequent surveys will be undertaken following each pipeline launch to determine the impact of pipeline launches on the benthic communities.**

ii) All track and intertidal pipeline launching support fixtures will be designed to minimise environmental impact and be able to be removed flush with the seabed on completion of the pipeline launch.

iii) Pipeline tow vessels will not approach closer to shore than 1,000 metres from the pipeline launch point. An attendant vessel will be present at all time during the pipeline launch.

SubSea will notify the public of all pending pipeline launches and tow route locations.

11.2 Commitments Summary Table

Issue	Objective	Commitment	By Whom	Timing	Agencies Involved	Specification (Performance Indicator)
Environmental Management Plan (EMP)	Implement an effective EMP	Develop and implement an effective EMP	Proponent	Pre-construction and on-going	DEP	EMP developed and implemented to EPA requirements.
Dust Suppression	Minimise dust created by pipe transport vehicles and site vehicles	Utilise water tankers to suppress dust during periods of heavy road and site use	Proponent	During construction and on-going	DEP and Shire of Roebourne	As per Shire of Roebourne recommendations.
Erosion Control	Reduce erosion in fabrication site due to soil disturbance	Reticulate and revegetate areas disturbed by earthworks	Proponent in conjunction with Skillshare (Karratha Group)	During construction and on-going	DEP and CALM	As per CALM guidelines
Terrestrial Flora Survey	Determine the presence and extent of rare and priority flora and protect same if evident	Undertake required surveys. Protect species found	Astron Environmental (Karratha) and Proponent	Pre-construction	DEP and CALM	Part (IV) Environmental Protection Act 1986) and Wildlife Conservation Act (1950)

Issue	Objective	Commitment	By Whom	Timing	Agencies Involved	Specification (Performance Indicator)
Terrestrial Fauna Survey	Determine the presence and extent of threatened and priority fauna and protect same if evident	Undertake required survey. Protect species found	Astron Environmental (Karratha) and Proponent	Pre-construction	DEP and CALM	Part (IV) Environmental Protection Act 1986) and Wildlife Conservation Act (1950)
Significant Archaeological Sites	Determine the presence and extent of archaeological sites within the proposed development area	Undertake required surveys. Protect sites found	Quartermaine Consultants and Proponent.	Pre-construction	Aboriginal Affairs Department	Aboriginal Heritage Act (1972)
Marine flora and fauna	Determine the presence of regionally significant marine flora and fauna in the intertidal and subtidal zones over a distance of 1,200 metres from the high water mark	Undertake required surveys. Monitor impact of pipeline launching activities.	Astron Environmental (Karratha)	Pre-construction	DEP and CALM	Part (IV) Environmental Protection Act 1986)

12.0 CONSULTATIONS

Agencies and groups consulted in the preparation of this CER included the following:

- Department of Environmental Protection
- Department of Land Administration
- Department of Resource Development
- Aboriginal Affairs Department
- Native Title Tribunal
- Ministry of Planning
- Ministry of Transport
- Shire of Roebourne
- Mardie Station Leasee
- Karratha Station Leasee

13.0 REFERENCE AND ACKNOWLEDGMENTS

13.1 References

Bowman, Bishaw, Gorham 1990 Petroleum Exploration. Permit Areas EP342 and TP/9 Rowley Shelf, Western Australia CER. Lasmo Oil (Australia) Ltd.

Forde M.J. 1985. Technical Report on suspended matter in Mermaid Sound, Dampier Archipelago. Technical Bulletin 215, Environmental Protection Authority, Perth.

Playford P.E., R.N. Cope, A.E. Cockbain, G.H. Low and D.C. Lowry, 1975. Phanerozoic In: Western Australia Geological Survey. The Geology of Western Australia. Memoir 2, WA Geological Survey, Perth.

Steedman Limited 1986. Storm Wind and Surge Analysis, Exmouth Gulf, Western Australia. Department of Marine and Harbours, Fremantle.

WNI Science and Engineering 1996. Final Design Criteria for Stag Development. Apache Energy Ltd. Perth

13.2 Acknowledgments

SubSea gratefully acknowledges permission obtained from Bowman, Bishaw and Gorham to use portions of their CER report R10140, "Petroleum Exploration in Permit Areas EP342 and TP/9 Rowley Shelf, Western Australia", dated September 1990.

14.0 APPENDICES

Appendix A **Proponent Company Overview**
Appendix B **CER Guidelines (Assessment 1065)**
Appendix C **Aboriginal Affairs Department Advice**
Appendix D **Fabrication Site Equipment List**

APPENDIX A

Proponent Company Overview

(NOT INCLUDED IN THIS COPY)

APPENDIX B

Consultative Environmental Review Guidelines (Assessment No 1065)

Environmental Protection Authority

PIPELINE FABRICATION SITE, NEAR MARDIE PASTORAL STATION, DAMPIER. (ASSESSMENT NO. 1065)

CONSULTATIVE ENVIRONMENTAL REVIEW GUIDELINES

Overview

SubSea International propose to construct a pipeline fabrication site within the Mardie pastoral station, approximately 45 kilometres southwest of Dampier. The site will be used to weld 12 metre long steel pipe joints into 2500 metre long pipe strings and transported offshore to oil and gas extraction facilities. The site consists of a facilities area of 150 by 150 metres and a fabrication corridor 2500 metres long by 70 metres wide. This proposal also includes the near shore "tow-zone" which extends 1200 metres beyond the high water mark. The Environmental Protection Authority (EPA) has required a Consultative Environmental Review (CER) be prepared to identify and manage the potential environmental impacts from this proposal.

All environmental reviews have the objective of protecting the environment, and environmental impact assessment is deliberately a public process in order to obtain broad ranging advice. The review requires the proponent to describe the proposal, receiving environment, potential environmental impacts and the management of the issues arising from the environmental impacts, so that the environment is protected to an acceptable level.

Throughout the assessment process it is the objective of the EPA to assist the proponent to improve the proposal such that the environment is protected in the best manner possible. The DEP will co-ordinate, on behalf of the EPA, relevant government agencies and the public in providing advice about environmental matters during the assessment of the CER for this proposal.

The primary purpose of the CER is to provide information on the proposal to the EPA within the regional framework. The aim of this document is to emphasise those relevant environmental factors which have the potential to impact on the physical and biological environment of pipeline fabrication site and surrounds.

Objectives of the CER

The objectives of the CER are to:

- adequately describe all components of the proposal, so that the Minister for the Environment can consider approval of a well-defined project;
- provide the basis of the proponent's environmental management program, which shows that the environmental issues resulting from the proposal can be acceptably managed; and

- communicate clearly with the public (including government agencies), so that the EPA can obtain informed public comment to assist in providing advice to government.

Contents of the CER

The fundamental contents of the CER should include:

- a brief introduction of the proponent, the project and location. A map/plan, which both clearly indicates the nature and extent of the initial project and the works proposed, and a regional map should also be included which identifies the proposal within a social and regional setting;
- a summary table which clearly presents the characteristics of the proposal;
- details of decision making authorities and involved agencies;
- reference to the description of the receiving environment which may be impacted, including the marine environment;
- discussion of the relevant environmental factors;
- discussion of the management of the factors raised including commitments to appropriate action;
- a description of and summary of an environmental management program, including the key commitments, monitoring work and the auditing of the program which will provide the basis for the operation of the site in an acceptable manner.

The language used in the body of the CER should be kept simple and concise, considering the audience includes non-technical people, and any extensive, technical detail should either be referenced or appended to the CER. The CER will form the legal basis of the Minister for the Environment's approval of the proposal and, hence, should include a description of all the main and ancillary components of the proposal, including options if necessary.

Environmental Management

The EPA considers that the proponent should approach environmental management of the proposal in terms of best practise. Best practice environmental management includes:

- an overall objective to reduce as far as practicable potential impacts on the environment;
- development of an environmental policy;
- agreed environmental objectives;
- management of environmental objectives;
- involving the public as appropriate;
- audit performance against agreed indicators;
- regular reporting to the EPA (or nominated agency); and
- commitment to a quality assured management system and continuous improvement.

Factors can be determined from a consideration, called scoping, of the potential impacts from the various components of the proposal on a receiving environment, including people. Relevant environmental factors are those which have the potential to have significant environmental impacts and accordingly may require the EPA to report on to the Minister for the Environment. The CER should focus on these relevant factors for the proposal, as have been identified in consultation with the EPA and relevant public and government agencies.

A description of the project component and the receiving environment should be referenced to the discussion of the factor. The technical basis for measuring the impact and any objectives or standards for assessing and managing each factor should be provided.

The EPA considers that the proponent should provide, within the body of the document, a table which describes the potential environmental impacts, with regards to the relevant environmental factors (those upon which the EPA is likely to report on to the Minister for the Environment). The following elements should be addressed in the table:

(a) identification of the characteristics of the proposal;

(b) nominated environmental management objectives(s) for those aspects which require management;

(c) description of the existing environment;

(d) potential impacts of the proposal on the environment;

(e) environmental management response or commitment to manage impacts to meet the above objective(s); and

(f) likely impact of application of this response.

The factors from which the key environmental factors are derived (and their corresponding objectives) at this stage should be set out under the following categories :

- biophysical;
- pollution; and
- social surroundings.

A range of factors identified and the EPA's management objective for these factors have been listed in Attachment 1. The following list are the key preliminary environmental factors that the EPA have identified in this assessment:

Biophysical

- declared rare and priority flora;
- vegetation communities;
- declared rare fauna;
- terrestrial fauna;
- marine fauna;
- dunes - this relates to the erosion and stability of dunes and foreshore areas.

Social Surroundings

- Indigenous and non-indigenous cultures; and
- recreation.

Further key environmental factors may be identified during the preparation of the CER, and on-going consultation with the EPA and relevant agencies is recommended. Minor issues which can be readily managed as part of normal operations for similar projects may be briefly described. Information used to reach conclusions should be properly referenced, including personal communications. Assessments of the significance of an impact should be soundly based and the assessment should lead to a discussion of the management of the issue.

Specific Issues

In discussing the environmental factors identified above, the CER should cover the specific issues listed below:

Impact on:

- near-shore (up to 1200m) marine habitats both during construction and installation of infrastructure and transport of pipeline;
- existing recreational use of beach and marine areas;
- coastal management by increasing beach access;
- dunes and the stability of the dune systems;
- vegetation communities and mangroves systems in particular, and outline the measures to be taken to protect the mangrove communities;
- intertidal areas;
- existing local residents and communities including the impact of traffic, dust and noise;
- any identified areas of Aboriginal and European heritage, which would involve carrying out an Aboriginal heritage survey;
- marine and terrestrial flora and fauna at the fabrication site and transport corridor; and
- noxious weed management.

Public Consultation

A description should be provided of the public participation and consultation activities undertaken by the proponent in preparing the CER. It should describe the activities undertaken, the dates, the groups/individuals involved and the objectives of the activities. Cross reference should be made with the description of environmental management of the issues which should clearly indicate how community concerns have been addressed. Those concerns which are dealt with outside the EPA process can be noted and referenced.

Environmental Management Commitments

The method of implementation of the proposal and all commitments made by the proponent in the CER will become *legally enforceable* under the environmental conditions of the Minister for the Environment's approval. Specific commitments to protect the

environment, typically related to the key issues, should be separately listed, numbered and take the form of:

- who would do the work;
- what the work is;
- when the work would be carried out; and
- what agencies would be involved.

These key commitments show that the proponent is committed to actionable and auditable management of the environmental issues.

Other commitments show that the proponent is dedicated to good environmental management of the project, and the EPA expects that the proponent will audit these commitments by internal processes under an Environmental Management System. The commitments define the goals/objectives for the environmental management program and procedures (the details of how the commitment will be met), which should be described in as much detail as possible. The EPA acknowledges that, with the implementation of best practice and continuous improvement for the project, the procedures may need to be modified, or added to, in regular updates to the environmental management program.

An example of a typical commitment is:

Issue	Objective	Commitment	Timing (Phase)	Whose requirements	Specification (Performance Indicator)
EMP	Implement effective EMP	Develop and implement an effective EMP	Pre-construction and on-going	EPA	EMP developed and implemented to requirements of EPA.

PIPELINE FABRICATION SITE PROPOSAL

CONSULTATIVE ENVIRONMENTAL REVIEW

FINAL GUIDELINES

PRELIMINARY RELEVANT ENVIRONMENTAL FACTORS	ENVIRONMENTAL OBJECTIVE(S)	PROPOSED MANAGEMENT OF RELEVANT FACTOR
BIOPHYSICAL		
Declared rare and priority flora	To protect Declared Rare Flora and Priority flora, consistent with the provisions of the Wildlife Conservation Act (1950).	Managed under Part IV of the Environmental Protection Act (1986) and in accordance with the requirements of the Wildlife Conservation Act (1950).
Vegetation communities	To ensure the abundance, diversity, geographical distribution and productivity of vegetation communities are protected.	Managed under Part IV of the Environmental Protection Act (1986).
Declared rare fauna	To protect Threatened Fauna and Priority fauna species consistent with the provisions of the Wildlife Conservation Act (1950).	Managed under Part IV of the Environmental Protection Act (1986) and in accordance with the requirements of the Wildlife Conservation Act (1950).
Terrestrial fauna	Regionally significant fauna is adequately protected.	Managed under Part IV of the Environmental Protection Act (1986).
Marine fauna	Regionally significant marine fauna is adequately protected.	Managed under Part IV of the Environmental Protection Act (1986).
Dunes	Maintain the integrity, function and environmental values of the dune and foreshore systems.	Managed under Part IV of the Environmental Protection Act (1986).
SOCIAL SURROUNDINGS		
Heritage (indigenous and non-indigenous cultures)	Comply with statutory requirements in relation to areas of cultural or historical significance.	To comply with the appropriate Acts.
Recreation	Maintain the quality of the area, where possible, for recreational activities.	In view of the increase public access to sensitive marine and coastal areas, access and foreshore management measures need to be implemented.

APPENDIX C

Aboriginal Affairs Department Advice As To The Extent And Location Of Aboriginal Sites Within The Proposed Development Area

ABORIGINAL AFFAIRS DEPARTMENT

PILBARA REGIONAL OFFICE
BOULEVARDE CENTRE
WILSON STREET
PO BOX 560, PORT HEDLAND
WESTERN AUSTRALIA 6721
TELEPHONE (091) 731 066
FACSIMILE (091) 731 141

OUR REF: P0084 LWsubse.doc

YOUR REF: Fax QS-96-1443

DATE: 18 June 1996

Mr Harry Wyeth
Marketing Manager
Sub Sea International
P.O Box 154
Cloverdale W.A 6105

Dear Mr Wyeth

RE: SHORE BASED FABRICATION SITE

I refer to your fax of the 12 April 1996, reguarding the above proposal and provide you with the following information and recommendations in respect to Aboriginal cultural heritage and the Aboriginal Heritage Act.

A search of our Register system has been undertaken on land within the 1:250,000 map SF 5002, between metric grid coordinates 430690 and 435695.

This search indicates that there are 2 listed Aboriginal sites known to this Department within that area of land and the result is set out on Attachment 1.

It is possible also that sites that have not yet been entered on the Register system may exist. The *Aboriginal Heritage Act 1972 (as amended)* (the Act) protects all Aboriginal sites in Western Australia whether they are known to this Division or not.

It is not the role of the Department to give approvals, but rather to ensure that all the heritage issues have been addressed. The procedures to follow are outlined below.

Prior to your proposed development/activity, so that no site is damaged or altered (which would result in a breach of Section 17 of the Act) it is recommended that you engage suitably qualified consultants to conduct ethnographic and archaeological surveys of the area. This should ensure that all Aboriginal interest groups are consulted so that all sites on the designated land are avoided or identified. Such a survey would involve archival research, consultations and on the ground inspections. This Division is not able to recommend individual consultants, however contact details of the professional associations whose members do conduct surveys are enclosed. A survey should also ensure that the provisions of the Act are met.

It is our preference that any development plans are modified to avoid damaging or altering any site. If this is not possible and in order to avoid a breach of the Act, the land owner should submit a Notice in writing under Section 18 of the Act to the Aboriginal Cultural Material Committee, c/o Aboriginal Affairs Department, seeking the Minister for Aboriginal Affairs' prior written consent to use the land. A form to lodge a Notice under Section 18 is available from the Division.

Please do not hesitate to contact me if the Department can be of further assistance.

Yours sincerely

Louis Warren
Senior Regional Officer

att: Attachment 1.
Extract of 1:250,000 map SF5004 showing area searched.
Index to Abbreviations used in Site File Information.
Professional Anthropological and Archaeological Organisations in WA.

ATTACHMENT 1

RESULTS OF REGISTER SEARCH:
[AREA]
1:250,000 map SF 5002, between metric grid coordinates 430 E 690 N and 435 E 695 N.

The Aboriginal sites tabled below do not necessarily represent a complete record of all sites in your area of interest. The information should be used solely for the purpose of planning the development/activity identified.

All Aboriginal sites in our Register System have been designated into either the OPEN ("O") Access Code or the NOT OPEN ("R", "X", "D", "S" and "U") Access Codes. These access codes signify the degree of openness or confidentiality of the information relating to each site.

Access to view site files with "Open" information is available on request, while those sites with a "Not Open" Access are not available to view without the prior approval of Aboriginal informants.

A list of known sites on the above land that have been placed into the OPEN Access Code is provided below for purposes under the Act. Should you wish to see more detailed information on these site files please contact the Cataloguer for an appointment to view the relevant site files.

TABLE 1:
SITES WITH OPEN ACCESS CODE (An index to abbreviations used follows.)

Site No	S	A	D	SI	Map No	Met	Met	Re	E	Ethn	Arch	C	M	R	B	S	F	T	P	E	G	Q	A	M	O	N	Site Name
P00308	I	O	-	O	SF5002	43	69	r	-	---	ARC	-	-	-	-	-	-	-	-	-	G	-	-	-	O	-	NOOREA SOAK.
P07272	I	O	-	O	SF5002	43 5	69 5	r	-	---	ARC	-	-	-	-	-	-	-	-	-	?	-	A	M	-	-	40 MILE - EASTERN DUNES

The NOT OPEN Access Codes signify varying levels of sensitivity of the information. Regarding information on these sites, we are only able to provide you with the details that follow in Table 2.

Approval from the relevant Aboriginal communities, original informants (or their descendants) or the custodians of the site is required prior to viewing the more detailed site information. The Cataloguer can provide you with the relevant contact names on request. (Should none of the above contacts be available for consultation, access is at the discretion of the Registrar of Aboriginal Sites.)

N/A

INDEX TO ABBREVIATIONS USED IN SITE FILE INFORMATION

SITENo:	Division of Heritage & Culture Aboriginal Sites' Number
S: (STATUS of site)	P = Permanent Register I = Interim Register S = Stored Data
A: (ACCESS CODE to information)	O = OPEN Access R = RESTRICTED Access X = Refer to Aboriginal community for details S = SIGNIFICANT U = UNCERTAIN Insufficient information currently held to allocate code.
D:	D = DANGEROUS to enter
Si:	Significance of site.
MAP:	Number of 1:250,000 scale Map Sheet
METGRID:	Metric Grid Reference (either 4- or 6-figures) A 6-figure grid ref. = site located within $1km^2$* A 4-figure grid ref. = site located within $10km^2$* * But also see Position Reliability
POS: (POSITION RELIABILTY)	r = reliable (within $1km^2$) a = approximate (probably within $1km^2$) d = doubtful (possibly within $10km^2$ area) u = unknown e = extensive area (site itself covers more than $1km^2$), and the grid reference supplied is at the centre of the site.
CATEGORY:	ETH = Ethnographic (Aboriginal informant) ARC = Archaeological (physical archaeological features)
SITE TYPE:	C = Ceremonial M = Mythological R = Repository/Cache B = Skeletal material/Burial S = Man-made structure F = Fish trap T = Modified tree P = Painting E = Engraving G = Grinding Grooves/Patches Q = Quarry A = Artefacts M = Midden O = Other (eg. Camp, Water Source, Rockshelter etc.) N = Not an Aboriginal Site

ABORIGINAL AFFAIRS DEPARTMENT
HERITAGE & CULTURE DIVISION

PROFESSIONAL ANTHROPOLOGICAL AND ARCHAEOLOGICAL ORGANISATIONS IN WA

- for advice on consultants to undertake Aboriginal Heritage Assessment Surveys.

[Note: For advice on the conduct of surveys including legislative requirements contact the Aboriginal Affairs Department and refer to the draft "Guidelines for Aboriginal Heritage Assessment in Western Australia"]

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APPENDIX D

Fabrication Site Equipment List

Fabrication Site Equipment List

The following provisional equipment list is considered appropriate for the shore based pipeline fabrication site.

Equipment	Qty
Welding Stations	2
Pipe Alignment Frames	3
Roller Stations	100 or 125
Side Booms (11 tonne & 7 tonne)	1 of each
Pipe Handling Cradles	3
Welding Machines (Lincoln AS400)	4
Welding set-up jigs & clamps	4 sets
Crane (12 tonne)	1
Front end loader	1
Rigging for pipe handling	4 sets
Generator (35 kVA)	4
Holiday Detector	2
Compressor (80 cfm @ 120 psi)	2
Hold back winch (15 tonne)	1
Hold back pipe fixtures	3
Site Offices	3
Site Telephone	1
Site Fax Machine	1
Site Portable Transceivers	5
Site Darkroom	1
Site Lighting	3 sets
Bulk fuel storage (850 lt)	1
NDT Equipment (Radiography)	2 sets
Pipe wrapping materials	170/220 shrink sleeves
Accommodation Modules	2
Ablution Block	1
Meal Rooms	1
Water Tank and Reticulation	1
Stores container/workshop	2
Site utility vehicle	2
Site sedan vehicle	1
Pipe bevelling unit	1
Pull through gauge	2
Pipe cleaning soft pig	2
Pressure test flanges	2
Pressure Testing Equipment	1 set
Propane torches	2
Interconnect cables/hoses (pressure)	2 sets
Load cell (3000 kg) digital read out	2
Ultrasonic thickness gauge	2
Magnetic particle testing equipment	1 set
Digitemp recorders	4
Buoyancy modules rated to 100 msw (5 tonne)	170/220
Ballast chain segments	170/220