Kupe Gas Project

Assessment of Effects on the Environment

Executive Summary Document

December 2004

Origin energy

delivering the goods

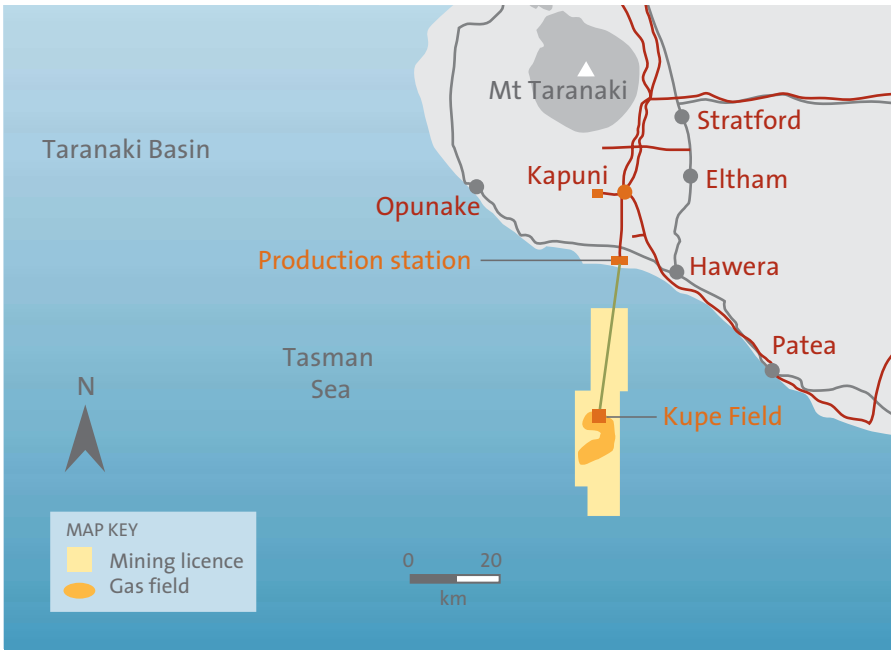

Figure 1: The project area.

Introduction

Origin Energy an Australian registered and owned public company operating throughout Australia and New Zealand is proposing to develop the Kupe Field on behalf of the Joint Venture participants Origin Energy Resources (Kupe) Ltd (50%), Genesis Power Limited (31%), New Zealand Oil and Gas Limited (15%) and Mitsui E & P (New Zealand) Limited (4%).

The development known as the Kupe Gas Project will extract natural gas and light oil from the gas field situated approximately 30km offshore southwest of Hawera, in Petroleum Mining Licence 38146 (PML 38146).

By introducing a new and alternative supply of gas, the Kupe Gas Project will make a significant contribution towards meeting New Zealand's gas supply for between 15 and 20 years.

If approved, the Kupe Gas Project will provide the New Zealand gas supply network with approximately 230 petajoules of natural gas, as well as Liquefied Petroleum Gas (LPG) and 16 million barrels of light oil (condensate). There is also the potential to produce crude oil during the life of the field.

An Assessment of Effects on the Environment (AEE) has been prepared for the Kupe Gas Project and will form the core regulatory approvals document to support the Resource Consent Process. The document has been developed in close consultation with government agencies, local councils, and the community including iwi and relevant stakeholders.

genesis energy
NZ OIL GAS
MEP
Mitsui E&P New Zealand Limited
Origin energy

Project description

The Kupe Gas Project will comprise:

- An unmanned offshore platform constructed above the Kupe Field production wells and supporting up to six wellheads;
- A subsea pipeline to bring the raw gas and liquids to shore (the offshore raw gas pipeline);
- Three 50mm subsea utility lines to carry chemicals to the platform, and a power cable with an embedded communications cable;
- A Horizontal Directional Drilled (HDD) shore crossing linking the offshore and onshore components;
- An onshore production station located at the southern end of Inaha Road;
- An onshore raw gas pipeline from the HDD site to the production station;
- A sales gas pipeline from the production station to the Kapuni Gas Treatment Plant where natural gas will be injected into the existing NGC transmission network;
- Storage of LPG at the production station and transport via trucks directly to retail customers; and
- Either a condensate pipeline from the production station to the Kapuni Gas Treatment Plant, or transport of condensate via trucks from the production station to the Omata Tank Farm, at New Plymouth.

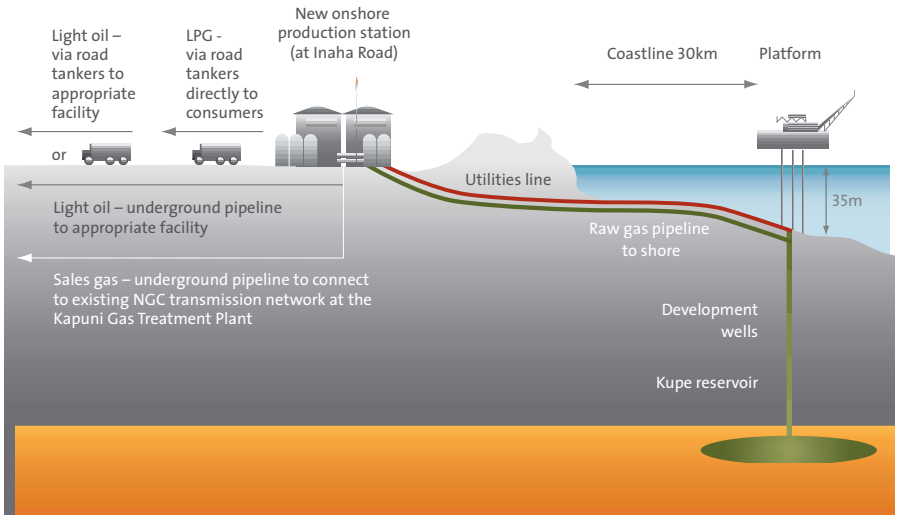

Figure 2: Kupe Gas Project infrastructure.

Community consultation

Origin has developed and is implementing an extensive consultation plan to ensure that stakeholders including iwi and nearby communities are kept informed about the Kupe Gas Project and can be involved in the approvals process.

Consultation activities to date have included:

- Setting up an office and information centre in central Hawera;
- Holding face-to-face meetings with interested groups or individuals to discuss specific issues or concerns;
- Distributing regular 'Fact Sheets' introducing, explaining and providing updates on the project;
- Establishing a dedicated website, email address and toll free phone number;
- Holding community information sessions in the local area;
- Briefing both regional and national media to assist in informing the community about the nature of the project;
- Landowners letters, one-on-one briefings and land access negotiations; and
- Meetings with New Zealand Government agencies.

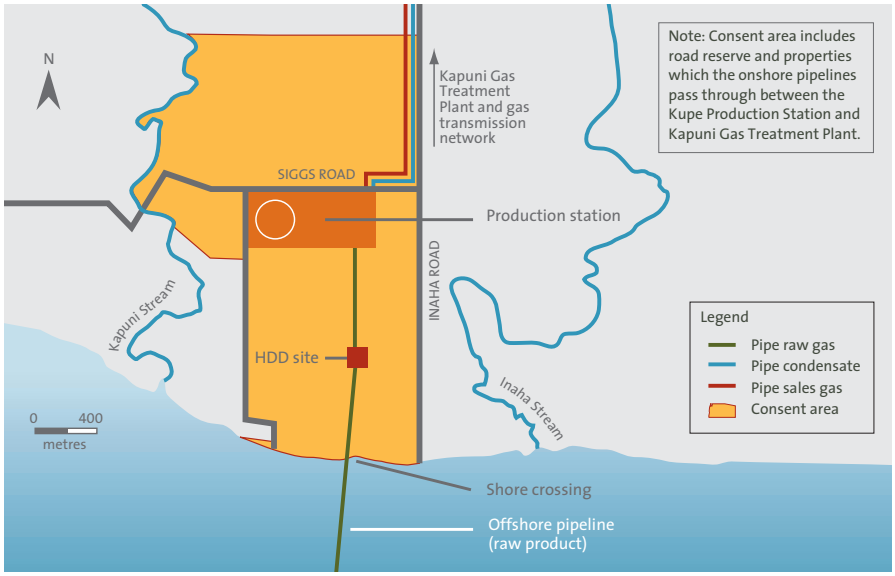

Figure 3: Kupe Gas Project South Taranaki District Council land use consent area.

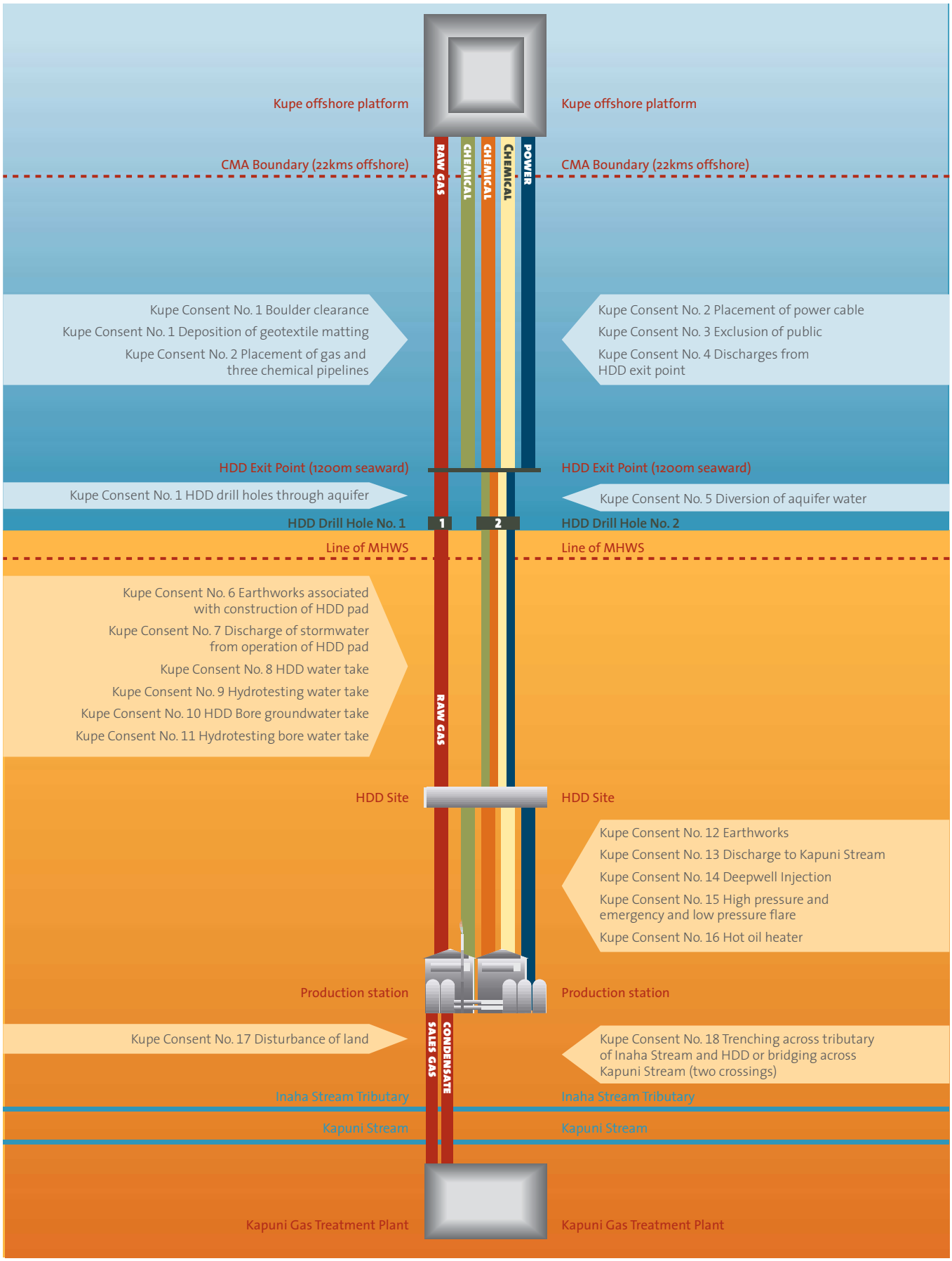

Figure 4: Kupe Gas Project Taranaki Regional Council Resource Consent Applications.

Previous consultation with regulatory authorities, groups and individuals within the community of the Kupe Gas Project Area have raised a number of important items that have been integrated into the project planning. These include:

- Incorporation of appropriate New Zealand safety requirements into the design of the platform, pipelines and the production station;
- Appropriate siting of the onshore pipelines and the production station to minimise environmental and community effects;
- Consideration of the cultural sensitivities in the design and siting of the Kupe Gas Project components; and
- Management measures for specific environmental issues.

Origin will continue to work with the community throughout the life of the Kupe Gas Project to ensure that all issues are managed effectively to minimise the effects on the environment and community.

Environmental approvals process

The Kupe Gas Project AEE presents a summary of relevant project information, legislation and the findings of specialist environmental investigations associated with the Kupe Gas Project. Figure 3 shows the areas for which land use consent is being sought from the South Taranaki District Council. Figure 4 diagrammatically shows the components of the Kupe Gas Project and related resource consent applications to the Taranaki Regional Council.

The resource consent applications are to be lodged in December 2004. After lodgement, there are a number of opportunities for the community to gain further information on the Kupe Gas Project and be involved in the council's decision making process. Figure 5 illustrates the main stages and timeframes involved in processing resource consents and highlights the opportunities for public involvement in the process.

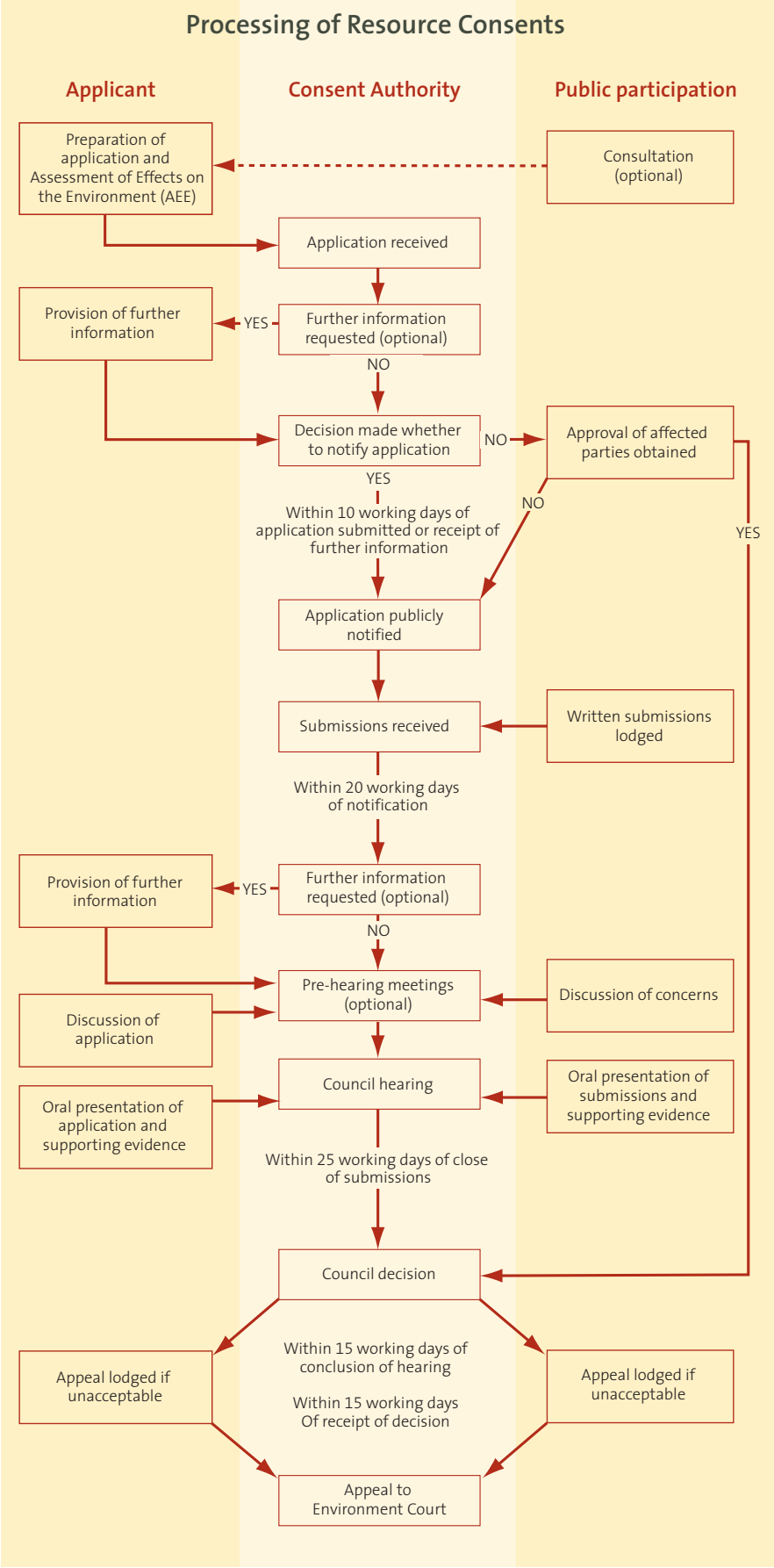

Figure 5: Processing of resource consents and opportunities for public involvement.

Summary of environmental issues

Marine ecology

The Kupe Gas Project has avoided adverse effects on the near shore coastal area by drilling under the seabed to approximately 1200 metres offshore using the HDD technique. HDD avoids the need to trench through the cliff, beach, intertidal zone, and nearshore subtidal zone, with pipe laying operations commencing at a water depth of approximately 10m.

Temporary seabed disturbance will occur during construction of the offshore platform, offshore raw gas pipeline and accompanying utility lines (power cable and chemical injection pipelines). The clearing or movement of boulders within the pipeline corridor may result in adverse effects on species in the pipeline corridor through either direct removal or due to crushing. Trenching operations may result in the burial of some organisms due to sedimentation, however, the effects of sedimentation are expected to be short-term, localised and minimal as species in this habitat have evolved in the presence of continual disturbance and high turbidity.

Recovery of biota along the pipeline corridor and in the platform area will begin as soon as construction ceases with full recovery expected within several years. It is considered unlikely that any kelp forests will be adversely affected by the installation of the pipeline, however this will be confirmed prior to construction commencing. If kelp forests could be damaged then mitigation measures will be prepared and implemented.

The operation of the offshore raw gas pipeline and platform will result in both positive and potentially adverse environmental effects. The positive effects relate to the local increase in biodiversity and productivity resulting from an increase in permanent habitat created by the presence of the pipeline and platform. Negative effects could include the loss of biodiversity associated with any oil spills. The offshore raw gas pipeline will carry quantities of condensate and oil with the normal gas flow. Implementation of an oil spill contingency plan will minimise effects in the unlikely event of a spill from the offshore platform or pipeline.

Set-netting, lining and lobster potting are the main commercial fishing activities inshore of the proposed offshore platform location. Fishing restrictions created during the construction phase are likely to have a minor effect on these operations for a short time. Throughout construction and operation, an exclusion zone will be applied, prohibiting anchoring and trawling immediately on either side of the offshore pipeline and in a small area around the platform.

Geology

Throughout construction and operation, seismic events, lahar inundation or volcanic ash fall may result in rupture of the onshore sales gas pipeline or possible production station failure, spills, fire or explosions. The magnitude and resultant effect of such events are largely unpredictable in the long term and can be major, regardless of the presence of a production station. Specialised project design will minimise the adverse environmental effects arising as a result of such events.

Figure 6: Example of construction of a production station (BassGas Project).

Surface water and groundwater quality

Potential construction effects on surface and groundwater water quality include a risk of increased sedimentation and contamination from drilling mud. During operation there is a risk of leaks and spills.

A series of management procedures will be developed to minimise the potential effects on water quality, including:

- Site specific earthwork control plans for construction of the HDD shore crossing and production station;
- A pipeline construction management plan;
- A management plan for the production station operation incorporating a spills response plan, water treatment system and a sediment control plan; and
- A pipeline operation management plan incorporating procedures for routine monitoring, contingency plans, and pipeline easement management.

The implementation of these management plans will ensure that the potential adverse effects on surface water and groundwater quality will be minor.

It is proposed that produced water and formation water will be disposed of by deep well injection into the Matemateaonga Formation below the freshwater/saline water interface. Of the alternative options available (discharge to the sea, discharge to the ground, or discharge to surface water) deep well injection is considered to pose the least risk of adverse environmental effects.

Aquatic flora and fauna

There will be no long-term adverse effects on freshwater ecology during construction and operation of the HDD shore crossing, or during operation of the pipeline. Construction of a waterway crossing for the onshore sales gas pipeline may involve some removal of aquatic vegetation and release of sediment, however mitigation measures include undertaking waterway crossings during low flow conditions, and trenching in stages across the stream. Potential adverse effects associated with operation of the production station include taking water from Inaha Stream and discharge of treated storm water from the fire-water pond to the Kapuni Stream. Mitigation measures applied during construction and operation will reduce these effects to a negligible level.

Terrestrial flora and fauna

The Kupe Gas Project Area contains limited amounts of native vegetation and habitat for native fauna, which are primarily contained within the coastal strip and the riparian areas of the Kapuni and Inaha Streams. It is expected that the effect on these areas will be negligible to minor. The largest potential effect is disruption to the cliffs, which is eliminated through the use of the HDD technique. Native vegetation in the Kupe Gas Project Area is already heavily disturbed, and as far as practical further disturbance will be avoided through implementation of a number of mitigation measures.

Archaeology

A review of known sites in the Kupe Gas Project Area and a detailed site inspection, as well as consultation with local hapu, has revealed no significant archaeological sites on either the production station or at the HDD shore crossing site. No known archaeological sites have been identified within the onshore pipeline corridor. However there remains potential for sites to be found during construction. To minimise any effects, consultation will be undertaken with tangata whenua prior to construction, and workshops will be conducted for contractors on the recognition and recovery of archaeological sites and monitoring of earthworks during construction. Further sampling of the archaeological sub-surface features in the area of the production station and the HDD shore crossing and a walkover survey of the pipeline route will also be undertaken in consultation with relevant hapu.

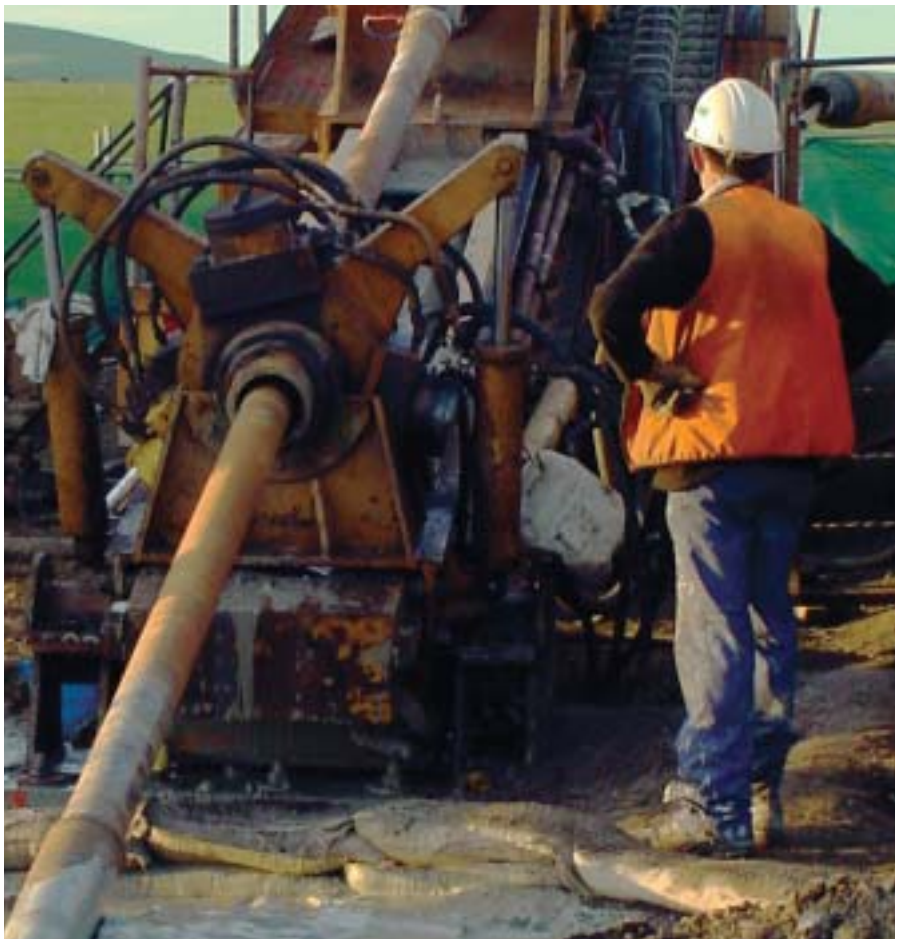

Figure 7: This machine is a type of drill rig that is proposed to be used in a drilling program that will avoid environmental disturbances near the shoreline.

Air

Air quality in the South Taranaki region is generally high and the predominantly rural nature of the region means that biogenic emissions (e.g. from livestock) and sea salt are the main contributors to emissions. The South Taranaki climate is generally windy, with an average to high number of sunshine hours, moderate temperatures and regular rainfall throughout the year.

The main air emissions from the Kupe Gas Project will be dust and machinery exhaust during construction, and emissions from the production station during operation. modelling of production station emissions found that all predicted air pollutant concentrations will be well below the guidelines set by the Regional Air Quality Plan for Taranaki and the National Environmental Standards. Dust control measures, and good design and operational procedures will further minimise any emissions resulting from the Kupe Gas Project. The discharges to air that will emanate from the production station are of such a small amount as to be minor in the locality. There is confidence in these findings given that the predicted air quality effects for the Kupe Gas Project are consistent with the measured on-ground experience of air emissions during the construction and operation of similar projects (e.g. pipelines, production stations) in the South Taranaki region.

Noise

The potential sources of noise associated with the Kupe Gas Project include construction activities, production station operation and eventual decommissioning. The noise impact of construction works is predicted to be moderate to significant but temporary, and the noise impact of the operational phase of the production station is expected to be moderate. A number of dwellings will be affected by these noise sources and discussions are being held with these landowners to mitigate these potential noise impacts.

The next closest dwellings will be potentially affected by noise from the construction of the production station operation however it is considered that they will be adequately buffered by distance from the 24 hour HDD shore crossing construction site. Other dwellings are located further than 1km from the proposed site of the production station and are separated by distance such that construction noise limits will be complied with. Additional noise mitigation will also ensure that any operational noise emissions from the production station comply with appropriate notional boundary limits. Any noise impacts from construction works will be mitigated by ensuring Contractors abide by the management methods set out in NZS6803:1999 Acoustics – Construction Noise. Stringent noise controls will be implemented as part of the detailed design of the production station.

Traffic

Construction traffic has the potential to add a maximum of 81 heavy vehicles (trucks) and 220 car or light vehicles per day and a maximum of 78 heavy vehicles and 40 car/light vehicles per day during operation. Traffic generated during operation of the production station can be expected to have a significant impact on Lower Inaha Road. Origin will upgrade Siggs Road and Inaha Road, as well as the Inaha/South Road (SH45) intersection to increase safety for other road users around the heavy vehicles using the site. In addition, Origin will impose a 50km/hr speed restriction on all its vehicles and construction vehicles using the southern end of Inaha Road, which will minimise noise, dust and the risk of accidents.

Visual impact

The proposed location for the production station and onshore pipelines is in a relatively homogeneous landscape of open pasture with occasional boxthorn hedging and shelter trees. The HDD shore crossing is the only onshore component to be located near the coast. The visual effect of the HDD shore crossing site will be temporary and minimal, with the only potential long term visual change being the loss of some short sections of boxthorn hedging through the HDD drilling site. The HDD shore crossing will create no visual disturbance to the existing cliff landscape as the pipeline is drilled beneath the cliffs from above.

There are 15 residential dwellings with potential views into the production station. The production station will be quite apparent from two of the residences (90 Rainie Road and 191 Lower Inaha Road) due to their elevation, orientation and location of screening vegetation. Written approvals have been obtained from these two property owners.

A Landscape Plan, to be approved by the South Taranaki District Council, will be prepared for the site. Screen planting of vegetation (probably Norfolk Pine and native species) will mitigate views of many of the lower structures within the production station for most dwellings identified as having views into the site. Other measures to reduce the overall scale and visibility of the complex include the use of:

- Materials and neutral colours for buildings and structures to create some harmony with the surrounding landscape;
- Non-reflective materials for the exterior of columns and storage tanks; and
- Limited signage of a non-reflective type.

Night lighting will be low to the ground where possible, shielded to reduce light spill and able to be switched off in areas where it is not required.

Figure 8: Composite photo showing the view of the proposed production station from 90 Rainie Road.

Land use and socioeconomic

The effect on amenity for residents at the southern end of Inaha Road is likely to be greatest during the construction phase. Adverse effects on the local community and economy will be minor during the operational stage and may increase temporarily during the decommissioning stage.

The Kupe Gas Project will have a number of positive benefits for the Taranaki region and across New Zealand, including increased capital investment, greater local spending, enhanced job opportunities and improved security of gas supply. Mitigation measures to address the adverse effects are readily able to be implemented to ensure these effects are no more than minor.

Environmental management

The environmental aspects of the Kupe Gas Project will be managed according to the Origin Energy Health, Safety and Environment Management System (HSEMS). The HSEMS will form the overarching environmental management requirements for all activities undertaken during the design, construction, operation and decommissioning of the Kupe Gas Project.

An overall Environmental Management Framework for the Kupe Gas Project will address the environmental management actions and commitments outlined in this AEE and will incorporate the requirements of the resource consents granted for the project. Within this framework is the development of site-specific Environmental Management Plans (EMPs) for onshore works and offshore works. The development and implementation of these EMPs will ensure that specific environmental issues are managed effectively. The overall framework for environmental management associated with the Kupe Gas Project is shown in Figure 9.

Health and safety

Origin is actively committed to all aspects of Health, Safety and Environment Management as it relates to its business. As such, all aspects of the Kupe Gas Project will be implemented in accordance with the HSEMS. Under the HSEMS, the company is committed to:

- Eliminating or effectively managing hazards and practices in the business that could cause accidents, injury or illness to people, damage to property or unacceptable impacts on the environment;
- Assisting all employees to meet their health, safety and environmental obligations;
- Meeting all relevant legislation; and
- Conducting all activities mindful that the decisions made should recognise both short and long term economic, environmental and community considerations.

A number of potential hazards will be introduced into the existing environment with the development of the Kupe Gas Project. Potential hazards have been evaluated and mitigation measures have been identified. Robust management plans together with appropriate design will minimise the potential risks to the environment, workers, and the local community.

Conclusion

The Kupe Gas Project will provide a valuable alternative source of gas, to help secure New Zealand's future energy supply. As existing gas reserves decline, and with energy prices increasing, the Kupe Gas Project will help meet the expected growth in demand in gas resources.

The potential environmental, social and economic effects of the Kupe Gas Project described in this AEE demonstrate that the adverse effects of the Kupe Gas Project proceeding are minimal. The Kupe Gas Project will bring significant benefits socially and economically to both the Taranaki region and New Zealand as a whole. Kupe Gas Project benefits include the creation of jobs and use of local services throughout the construction and operational phases of the Kupe Gas Project, as well as benefits to the broader population to be realised through a more diverse and competitive supply of gas.

Figure 9: Kupe Gas Project Environmental Management Plan Framework.

For more information about the Kupe Gas Project contact Origin Energy:

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- Write to:
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  P.O. Box 611
  Hawera, Taranaki 4800
- Visit the Kupe Gas Project website:
  www.originenergykupe.co.nz

How to view or obtain a copy of the document

Origin will provide copies of the AEE document for viewing at the following key locations:

Regional and District Council

Taranaki Regional Council
47 Cloten Road, STRATFORD

South Taranaki District Council
Princes Street, HAWERA

Origin offices

Project Office, Hawera
57A Victoria Street, HAWERA

Melbourne
Level 21, 360 Elizabeth Street,
MELBOURNE, AUSTRALIA

Public Libraries – South Taranaki

Hawera
High Street, HAWERA

Eltham
High Street, ELTHAM

Opunake
Tasman Street, OPUNAKE

Patea
Old Council Building,
Egmont Street, PATEA

In addition, the AEE will be available to download from the Kupe Gas Project website www.originenergykupe.co.nz

Members of the public will be able to request a summary document in hard copy, or a copy of the complete AEE on CD-Rom by ordering from the website, freecall number, or directly from the Origin Project office in Hawera. Please note that hard copies of the full AEE will be available for $75.

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