AMENDED PROPOSED REVISED ACCESS ARRANGEMENT INFORMATION
22 MARCH 2005

ANNEXURE 2: DESCRIPTION OF AND JUSTIFICATION FOR FORECAST NEW FACILITIES INVESTMENT

DAMPIER TO BUNBURY NATURAL GAS PIPELINE

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1. JUSTIFICATION OF STAY-IN-BUSINESS CAPEX 2005-2010

1.1 Operator divides its forecast New Facilities Investment into:

(a) expansion CAPEX; and

(b) stay-in-business CAPEX.

1.2 Expansion CAPEX is the capital expenditure expected to be incurred in expanding the gas transportation capacity of the DBNGP. Expansion CAPEX is usually:

(a) large – it is for pipeline looping and additional compression; and

(b) infrequent – it is required only when shippers require additional capacity.

1.3 Expansion CAPEX during the Access Arrangement Period is estimated to be $910.5 million, and comprises $692.2 million for pipeline looping, and $218.3 million for compression. This is an exceptionally large program. It is to be undertaken over a fairly short time – the Access Arrangement Period – because major shippers have requested additional capacity, and the prior owners of the DBNGP were unable to finance expansion of the pipeline to provide that capacity.

1.4 Stay-in-business CAPEX comprises, by and large, a relatively large number of recurring capital projects of relatively small value.

1.5 These two broad classes of CAPEX are shown in Table 1.

Table 1: Forecast New Facilities Investment 2005-2010 ($m nominal)

CAPEX	2005	2006	2007	2008	2009	2010
Expansion						
Pipeline looping	88.913	275.193	0.000	226.844	101.276	0.000
Compression	100.502	117.791	0.000	0.000	0.000	0.000
Stay-in-business	13.157	13.967	7.300	9.006	10.062	9.293
Total	202.571	406.951	7.300	235.850	111.338	9.293

1.6 The individual capital projects which comprise stay-in-business CAPEX are listed in Tables 2a and 2b.

Table 2a: Stay-in-business CAPEX ($m nominal)

Capital project	2005	2006	2007	2008	2009	2010
Pipeline, main line valves and facilities						
CCVTs and GEA upgrades	0.210	0.216	0.221	0.227	0.233	0.000
DBNGP emergency simulation	0.000	0.000	0.000	0.000	0.233	0.000
Design changes to control systems	0.526	1.618	0.000	0.000	0.000	0.000
Easement encroachment management	0.526	0.539	0.553	0.567	0.582	0.596
Gas supply chain - design changes	0.368	0.377	0.000	0.000	0.000	0.000
Hazardous area audits implementation	0.210	0.216	0.221	0.227	0.233	0.239
Induced voltage and CP system upgrades	0.263	0.539	0.830	0.567	0.000	0.000
MLV and repeater site earthing upgrades	0.736	0.755	0.000	0.000	0.000	0.000
MLV fuel gas cabinets replacement	0.263	0.270	0.000	0.000	0.000	0.000
Odorant storage facilities upgrades	0.000	0.216	0.221	0.000	0.000	0.000
Phasing out of bypass odorisers	0.158	0.162	0.000	0.000	0.000	0.000
Pipeline efficiency monitoring	0.000	0.270	0.000	0.000	0.000	0.000
Pipeline integrity - lateral pigging facilities	0.631	0.647	0.664	0.681	0.698	0.716
Sulphur deposition management	0.210	0.216	0.221	0.227	0.233	0.000
Compressor stations and related facilities						
Compressor station airstrip upgrading	0.526	0.000	0.000	0.000	0.000	0.000
Compressor station facilities improvement	1.578	0.000	0.000	0.000	0.000	0.000
Compressor station on-line monitoring	0.210	0.216	0.221	0.227	0.233	0.239
Compressor station water treatment upgrade	0.421	0.431	0.442	0.227	0.233	0.477
CS9 stormwater drainage upgrade	0.210	0.000	0.000	0.000	0.000	0.000
Fire and gas systems	0.000	0.431	0.442	0.000	0.000	0.000
LM500 stations drainage upgrade	0.368	0.377	0.000	0.000	0.000	0.000
Solar Mars 90 compressed air supply upgrade	0.000	0.809	0.830	0.000	0.000	0.000
Solar Mars 90 control system upgrade	0.316	0.324	0.000	0.000	0.000	0.000
Solar Mars 90 HMI upgrade	0.000	0.539	0.553	0.000	0.000	0.000
Solar Mars 90 surge control upgrade	0.158	0.162	0.000	0.000	0.000	0.000

Table 2b: Stay-in-business CAPEX (continued) ($m nominal)

Capital project	2005	2006	2007	2008	2009	2010
SCADA and communications						
Microwave system replacement/upgrade	0.263	0.000	0.000	4.469	5.816	4.939
South West communications transfer	0.789	0.809	0.000	0.000	0.000	0.000
SCADA master station upgrade	0.000	0.216	0.000	0.000	0.000	0.000
SCADA emergency backup	0.263	0.270	0.000	0.000	0.000	0.000
Metering						
Additional gas chromatographs	0.158	0.162	0.166	0.000	0.000	0.000
Design changes and compliances	0.526	0.539	0.000	0.000	0.000	0.000
Meter station cabinets and marshalling boxes	0.263	0.270	0.000	0.000	0.000	0.000
Meter station equipment shelters	0.000	0.108	0.000	0.000	0.000	0.000
Flow computer upgrades	0.210	0.216	0.000	0.000	0.000	0.000
Computer equipment and systems						
Customer reporting system upgrades	0.053	0.054	0.055	0.057	0.058	0.060
IT Infrastructure	1.378	0.863	0.664	0.681	0.698	0.716
Plant and equipment						
Engineering tools and equipment	0.210	0.216	0.221	0.227	0.233	0.239
Field tools and equipment	0.053	0.054	0.055	0.057	0.058	0.060
Motor vehicles	0.263	0.270	0.277	0.284	0.291	0.298
Buildings and grounds						
Corporate head office modifications	0.105	0.108	0.111	0.113	0.116	0.119
Jandakot Depot improvement	0.105	0.108	0.111	0.113	0.116	0.119
Total (Tables 2a and 2b)	13.157	13.967	7.300	9.006	10.062	9.293

1.7 Forecast expenditures for each of the other capital projects listed in Tables 2a and 2b are considered and substantiated as New Facilities Investment (against the tests in section 8.16 of the Code) in the paragraphs which follow. In each case, the expenditure is for the construction, development or acquisition of assets during the Access Arrangement Period to enable the provision of Services using the DBNGP.

1.8 As a general submission applicable to all of the capital projects listed above, the assets to be created:

(a) are required to maintain levels of service being afforded on the DBNGP;

(b) contribute to lower costs of providing services, particularly where they facilitate improved equipment availability without an increase in manpower; and

(c) are required to maintain the safety and integrity of Services provided using the pipeline.

2. DESCRIPTION AND JUSTIFICATION OF FORECAST NEW FACILITIES INVESTMENT

CCVTs and GEAs

2.1 Closed Circuit Vapour Turbines ("CCVTs") and Gas Engine Alternators ("GEAs") are the primary means of electric power generation at DBNGP compressor stations and remote main line valve ("MLV") sites. Much of the equipment in question was installed before, or during, the Stage 1 expansion of pipeline capacity in 1991. It is technologically obsolete, and has deteriorating reliability. Furthermore, replacement components are now difficult to obtain.

2.2 There are 24 CCVTs and 34 GEAs installed on the DBNGP, and a programme of progressive replacement is to be initiated during the Access Arrangement Period.

2.3 Without power generation at compressor stations and MLV sites, Operator will have difficulty in maintaining the integrity and contracted capacity of services on the pipeline.

2.4 Accordingly, the investment in supply chain design changes is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

DBNGP emergency simulation

2.5 The DBNGP is a critical link in the energy supply chain in south western Australia. The importance of that link will increase as pipeline capacity is expanded for electric power generation and industrial use during the Access Arrangement Period. With expanded capacity, greater volumes of gas being transported, and increased numbers of users, pipeline operation will become more complex. The frequency of transient conditions and extreme events is likely to increase, requiring that pipeline operators respond quickly and precisely to the unusual circumstances. Furthermore, pipeline operation to maintain gas deliveries will become more complex in times of emergencies elsewhere in the energy supply chain.

2.6 In these circumstances, the proper training of pipeline operators is essential to maintaining the safety and integrity of the DBNGP, and to ensuring the reliability of the energy supply chain of which it is a part. As part of its continuing to provide this training, Operator is intending to invest in a pipeline training simulator which will allow operators to practice responses to a wide range of pipeline incidents and system emergencies.

2.7 Accordingly, the investment in the simulator is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Design changes to control systems

2.8 Unexpected supply interruptions have occurred at delivery points at Alcoa of Australia's Wagerup refinery, and at other delivery points on other pipelines that were owned by the prior owners of the DBNGP (and supplied partly through the DBNGP). These interruptions were the result of unplanned pressure control valve closures.

2.9 Operator is proposing to apply the learning from these supply interruptions by reviewing the configuration and settings of pressure control valves at other delivery points. Where necessary, Operator will reconfigure control systems to minimise the risk of unplanned supply interruption.

2.10 This work is required primarily for maintenance of the integrity and contracted capacity of services on the DBNGP. However, the avoidance of unplanned supply interruption may also have implications for the maintenance of the integrity of downstream facilities, and for the safety of personnel operating those facilities.

2.11 Accordingly, the investment is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Easement encroachment management

2.12 As other human activity encroaches on the DBNGP, additional measures will be required to protect the pipeline and to ensure compliance with AS2885 and the Safety Case.

2.13 AS2885 provides methodologies for pipeline risk assessment. These methodologies have been applied, encroachment risks identified and mitigation measures recommended.

2.14 During the Access Arrangement Period, the following protective measures will be carried out on sections of the DBNGP at risk from further encroachment of other human activity:

(a) slabbing;

(b) additional markers and signage;

(c) further fencing of facilities; and

(d) increasing the depth of cover over the pipe.

2.15 These measures are necessary to ensure the safety of the general public, and to maintain the integrity of services provided using the pipeline.

2.16 Accordingly, the investment in protective measures is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Gas supply chain – design changes

2.17 The DBNGP has now been in service for more than 20 years. The pipeline was designed during the early 1980s, and major construction was completed in 1984. Since then, its capacity has been progressively expanded with the addition of compressors and, more recently, with looping. The initial compression-based enhancements were in 1985 and 1991. In these circumstances, pipeline facilities and systems (of which the pressure control systems referred to above are a specific example) may no longer be adequate to the current gas transportation task.

2.18 Operator has therefore undertaken a review of the entire gas supply chain, from receipt points to delivery points, to identify potential causes of supply interruption, and a large number of recommendations have been made for design changes and other measures to mitigate the risks. Some of these recommendations involve only procedural changes (for example, allowing any field officer to operate any valve). Some involve minor modifications to equipment, such as placing identifying codes on critical isolation valves, while others (for example, creation of a single SCADA screen to provide an overview of the Kwinana area) require more substantial modifications.

2.19 Operator expects that implementation of these recommendations will result in the improved reliability of services provided using the DBNGP. That is, their implementation is required primarily for maintenance of the integrity and contracted capacity of services on the pipeline.

2.20 Accordingly, the investment in supply chain design changes is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Hazardous area audits implementation

2.21 The age of the principal facilities and systems comprising the DBNGP has been noted above. Operator is concerned that either:

(a) older equipment is no longer compliant with current safety standards; and

(b) older equipment has deteriorated to the point where it is still operational but represents a safety risk (for example, electrical switchgear which may now arc during use in areas where gas may be present).

2.22 Operator is therefore proposing to continue, during the Access Arrangement Period:

(a) safety auditing of potentially hazardous areas;

(b) identification of actions to mitigate the risks identified; and

(c) modification or replacement of equipment which is found to be unsafe.

2.23 This work is to be undertaken to ensure the continued safety of, primarily, maintenance personnel and contractors working on the DBNGP.

2.24 Accordingly, the investment in hazardous area audit implementation is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Induced voltage and CP upgrades

2.25 Where electric power lines are located close to a gas transmission pipeline, a significant potential difference may exist between the power lines and the pipeline. The possibility of this potential difference existing, and the hazard it creates is recognised in pipeline design, and protection is provided through, for example, appropriate earthing.

2.26 The original design for the DBNGP anticipated protection against potential differences as high as 1,500 volts AC. However, current standards require a much lower voltage tolerance.

2.27 Furthermore, as other human activity encroaches on the DBNGP corridor, and an increasing number of power lines cross the pipeline, the likelihood of high induced potential differences rises, exacerbating the problem of non-compliance with current standards.

2.28 In these circumstances, Operator proposes reviewing power line crossings and, where necessary, enhancing existing pipeline earthing facilities, or adding new facilities, to achieve compliance with current standards.

2.29 The main line between Dampier and Bunbury is externally protected against corrosion by a fusion bonded epoxy powder coating, and further corrosion protection is provided by an impressed current cathodic protection system.

2.30 After some 20 years in service, the DBNGP remains reasonably well protected by its external coating. However, annual monitoring has revealed evidence of some coating failure at points along the pipeline. The incidence of corrosion resulting from coating failure can be reduced by providing additional cathodic protection.

2.31 Investment in induced voltage protection, and in additional cathodic protection, is now required if Operator is to maintain the safety and integrity of the pipeline, and is to continue to provide Services, over the long term.

2.32 Accordingly, the investment in induced voltage protection, and in additional cathodic protection, is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

MLV and repeater site earthing upgrades

2.33 Earthing systems are installed for the protection of equipment and personnel at all sites supplied with electric power.

2.34 Their metallic components are subject to corrosion, and the maximum physical life of earthing systems is about 15 years.

2.35 Earthing systems at 24 sites between Dampier Facilities and MLV91 have lives approaching 15 years, and systems at 10 of those sites are expected to require replacement during the Access Arrangement Period.

2.36 A risk assessment undertaken for the Safety Case required under the pipeline licence revealed that the earthing systems at some sites had deteriorated to the point where they posed an unacceptable risk to personnel.

2.37 Investment in new earthing systems is now required if Operator is to maintain the safety and integrity of the pipeline, and continue to provide Services in accordance with its current contractual obligations.

2.38 Accordingly, the investment in earthing systems is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

MLV fuel gas cabinets replacement

2.39 Steel cabinets providing weather protection for the valves and gauges that form part of the fuel gas supply systems at main line valve sites, and cable marshalling boxes at those sites, have been in place since the 1980s and are now extremely corroded. They require replacement.

2.40 Investment in new cabinets is now required if Operator is to maintain the safety and integrity of the pipeline, and continue to provide Services in accordance with its current contractual obligations.

2.41 Accordingly, the investment in earthing systems is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Odorant storage facilities upgrades

2.42 Operator delivers odorised gas to shippers at a number of delivery points on the DBNGP (principally in the Perth metropolitan area). As the volume of gas delivered increases over the Access Arrangement Period, requirements for odorant storage at those delivery points are expected to exceed the design capacities of existing storage facilities.

2.43 Operator therefore expects to upgrade odorant storage facilities, by installing larger tanks and pumps, during the Access Arrangement Period.

2.44 Investment in new odorant storage facilities is now required if Operator is continue to provide Services in accordance with its current contractual obligations.

2.45 Accordingly, the investment in odorant storage facilities is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Phasing out of bypass odorisers

2.46 At six sites along the DBNGP, gas flowing through bypass pipework can be odorised from underground odorant storage vessels. These vessels impose a significant risk to the environment. Were a vessel to be damaged, odorant may leak out into groundwater supplies. Were the use underground odorant storage to be proposed today, it would not be approved by the Environmental Protection Authority.

2.47 Operator therefore proposes to replace the underground bypass odorisers with above-ground odorant injection facilities during the Access Arrangement Period.

2.48 Investment in the new odorant injection facilities is now required if Operator is to maintain the safety and integrity of the pipeline, and continue to provide Services in accordance with its current contractual obligations.

2.49 Accordingly, the investment in odorant injection facilities is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Pipeline efficiency monitoring

2.50 Minor modifications made to pipeline facilities – in particular, to compressor units – in the course of major maintenance, as a result of equipment replacement, or to deliver operating efficiencies tend to have the effect of reducing, over time, the design capacity of the pipeline.

2.51 The DBNGP now has a history of some 20 years of these minor modifications which may have reduced the capacity available to shippers.

2.52 Operator is therefore proposing to install, during the Access Arrangement Period, instrumentation, computer equipment and software for monitoring the efficiency of compressor operations with a view to restoring the capacity of the DBNGP to its design capacity.

2.53 This investment in efficiency monitoring equipment will ensure that Operator is able to continue to provide Services in accordance with its current contractual obligations.

2.54 Accordingly, the investment in efficiency monitoring equipment is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Pipeline integrity - lateral pigging facilities

2.55 The pipeline licences that apply to the DBNGP (PL40, PL41 and PL47) require that, every five years, the licensee confirm that the pipeline is rateable to the maximum allowable operating pressures ("MAOP") stipulated in those licences.

2.56 To be able to provide the required confirmations of MAOP, Operator must regularly inspect the interior of the pipeline by pigging. However, the following laterals do not have facilities for the launching and receival of pigs:

(a) Alcoa Kwinana;

(b) Alcoa Pinjarra;

(c) Alcoa Wagerup;

(d) lateral from MLV155 to MLV157; and

(e) the Kwinana West lateral (excluding the Rockingham lateral).

2.57 Pipeline licensing serves, among other things, to ensure that facilities are maintained to a standard consistent with providing for the safety of shippers and the general public, and a pipeline operator who fails to comply with the requirements of its pipeline licence risks having its operation closed down.

2.58 Investment in lateral pigging facilities is now required if Operator is to maintain the safety of the pipeline, and continue to provide services in accordance with its current contractual obligations.

2.59 Accordingly, the investment in lateral pigging facilities is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Sulphur deposition management

2.60 The deposition, on the internal components of pipeline equipment, of elemental sulphur from sulphur compounds in the gas stream has been a problem for the DBNGP for many years. Elemental sulphur generally forms at pressure regulation points such as pressure controllers and fuel control valves on gas turbines. It also affects metering equipment. To date, the problem has been managed through increasing the frequency of maintenance carried out on equipment likely to be affected by sulphur deposition.

2.61 In recent years, minor changes in gas composition have exacerbated the sulphur deposition problem. With the broadening of the gas quality specification, higher levels of sulphur are likely to be introduced into the gas stream.

2.62 Operator now proposes to replace sulphur damaged equipment – principally filters and turbine meters – at affected sites on the DBNGP.

2.63 Without these replacements, there will be an increased risk of unplanned interruptions to gas supplies to particular shippers, impacting Operator's ability to maintain integrity and contracted capacity of services. Also, there is a greater risk that incorrect meter readings will occur, making compliance with the metering and invoicing provisions of contracts difficult to achieve.

2.64 Accordingly, the investment to be made is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Compressor station airstrip upgrading

2.65 Airstrips at CS1 and CS5 were upgraded during the period from 2000 to 2004, providing safer landing strips for larger aircraft. This work was undertaken to allow maintenance crews to be flown in on a regular basis, and to allow manning in times of peak capacity utilisation. It was necessary to minimise supply interruption in circumstances where the pipeline capacity is fully contracted. Furthermore, allowed manning in emergency situations, and allowed flying doctor access to the sites.

2.66 Further upgrade work is now planned for the airstrips at CS2, CS3, CS4, and CS6.

2.67 The work involved will include the following:

(a) lengthening of the strips; and

(b) the purchasing and installation of lights for night landing.

2.68 In addition to its facilitating minimisation of supply interruption in circumstances where the pipeline capacity is fully contracted, this work is required to meet the requirements of the aviation safety regulator.

2.69 Accordingly, the investment to be made is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Compressor station facilities improvement

2.70 Pipeline field staff are based at certain compressor station sites along the DBNGP. However, given the distance between compressor stations and the need to ensure security of supply on the pipeline, there is a need to improve the conditions and working environment of employees to meet the Operator's safety standards.

2.71 Compressor station facilities, many of which were built in 1984, have deteriorated. Building maintenance is increasing, given the increase in operational assets at these sites.

2.72 In addition, working space at some sites is at a premium.

2.73 It has therefore been identified that the following upgrade work needs to be undertaken during the Access Arrangement Period:

(a) upgrade of some of the accommodation units at some of the sites

(b) improving the intrinsic safety at all sites;

(c) upgrading the control rooms at CS2, CS4 and CS7.

2.74 The enhancements will provide more working space for operational requirements, and improved accommodation. Improvements in accommodation will provide better living conditions for the field operational staff, focusing on cooking, and ablution areas. Intrinsic safety audits are a requirement under AS 2885; and initial audits conducted have indicated upgrading is required in order to bring the sites up to compliance.

2.75 Accordingly, the investment to be made is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Compressor station on-line monitoring

2.76 Operator expects the capacity of the DBNGP to be fully contracted, or close to fully contracted for firm type capacities, during the Access Arrangement Period. In these circumstances, unplanned equipment failures will impact directly on Operator's ability to continue to provide services in accordance with its contractual obligations.

2.77 Operator is therefore proposing to install vibration monitoring equipment on compressor units, and to provide on-line visibility of signals from that equipment.

2.78 Vibration is a key indicator of the current operating condition of a compressor unit. A unit that is vibrating excessively can be expected to fail in the near future.

2.79 On-line vibration monitoring should allow the early dispatch of maintenance crews to compressor units behaving abnormally, resulting in fewer failures and greater reliability of gas transportation service. In effect, investment in the monitoring equipment is necessary to maintain the integrity and contracted capacity of services.

2.80 Accordingly, the investment to be made in vibration monitoring equipment is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Compressor station water treatment upgrade

2.81 Reverse osmosis water purification units installed at CS1, 2, 3, 4, 5, 6, 7 and 8 between 1984 and 1991 will reach the ends of the design lives during the Access Arrangement Period. In some cases the units have already deteriorated and are close to the point where water supplies may not meet health and safety standards. The existing water purification units are, therefore, to be replaced with new water treatment units.

2.82 In addition, to ensure the quality of water quality which meets health and safety standards, Operator will install new pipework, valves and pumps.

2.83 Accordingly, the investment to be made is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

CS9 stormwater drainage upgrade

2.84 Stormwater drainage at CS9 has been found to be inadequate. The drainage system is unable to cope with heavy rainfall, and the runoff has the potential to cause significant erosion which has the potential to undermine pipework and structures installed at the station.

2.85 Were undermining to occur, gas flow through CS9 may have to be restricted so that facilities can be made safe and the problem rectified.

2.86 Investment in the upgrading of the CS9 stormwater drainage system is now required if Operator is to maintain the safety and integrity of the pipeline, and continue to provide Services in accordance with its current contractual obligations.

2.87 This upgrade will require diversion of bulk water to areas of the site that are not prone to erosion.

2.88 Accordingly, the investment is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Fire and gas systems

2.89 Operator's fire and gas systems, which provide gas detection and protection against fire at compressor stations, were reviewed in 2004 by the Western Australian Safety and Technical Regulator in accordance with current safety requirements.

2.90 As a result of that review, the Safety and Technical Regulator identified a need to upgrade fire suppression equipment at compressor stations which had been extended or modified as part of the Stage 3A capacity expansion project.

2.91 This was the case, notwithstanding the fact that the Stage 3A compression plant was built in accordance with design standards applying at the time.

2.92 In addition, older compressor stations on the DBNGP (those at which LM500 gas turbine compressor units were installed) were originally equipped with halon gas fire protection systems. In the event of fire, the compressor building would be flooded with halon gas and the fire extinguished. In the absence of fire, accidental halon release would displace air in the compressor building, making entry into the building unsafe. The risk of accidental halon release, and employee asphyxiation, was judged higher than the risk associated with a fire in a compressor building, and the halon protection systems were decommissioned before the DBNGP was sold by the State of Western Australia in 1998.

2.93 Compression plant installed as part of an expansion of pipeline capacity in 1991 was equipped with fire and gas detection systems, and with fire suppression capability using carbon dioxide. Compression plant subsequently installed, for the Stage 2 and 3A expansions of pipeline capacity was equipped with fire and gas detection, but not with fire suppression. These systems are managed by programmable logic controller ("PLCs"), which are due for replacement in the next 5 years.

2.94 Sites to be upgraded include CS2, CS4 and CS7.

2.95 The investment to be made is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

LM500 stations drainage upgrade

2.96 At LM 500 compressor stations, drainage is via leach drains. As a result, any oil spilled onto the floors of station buildings during engine changes and compressor overhauls passes into the ground via this drainage system.

2.97 There is therefore a potential to contaminate the ground with oil.

2.98 This risk does not meet the environmental requirements of the pipeline licence, and drainage facilities at LM500 stations must be upgraded to eliminate it.

2.99 Accordingly, the investment is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Solar Mars 90 compressed air supply upgrade

2.100 Dryers in the compressed air supply systems that deliver clean, dry air to Solar Mars 90 gas turbines for sealing and cooling are difficult to maintain in a condition of high reliability. Without reliable air supplies to the gas turbines, the turbine/compressors themselves are unreliable, and the reliability of the gas transportation service provided using the DBNGP is reduced.

2.101 Operator is therefore proposing to redesign and rebuild the dryers and pressure reduction facilities of the compressed air supply systems to improve the reliability of the Solar Mars 90 units. This work is necessary to maintaining the integrity and contracted capacity of services.

2.102 Accordingly, the investment is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Solar Mars 90 control system upgrade

2.103 Solar Mars 90 series gas turbine compressor units were installed on the DBNGP in the early 1990s. Their control systems use proprietary computing and communications hardware and software.

2.104 This proprietary hardware and software is not compatible with the generic computing and communications platforms in use today, and is becoming increasingly difficult to maintain as components for the hardware are no longer available and the software is no longer supported.

2.105 Operator is therefore proposing to upgrade computing and communications hardware and software on its four Solar Mars 90 units so that it is both compatible with current industry standards, and the units are more accessible for the purpose of remote operation.

2.106 Investment in the in the upgrade of the Solar Mars 90 control systems is necessary to maintaining the reliability of gas transportation services provided using the DBNGP. It is necessary to maintaining the integrity and contracted capacity of services.

2.107 Accordingly, the investment to be made is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Solar Mars 90 HMI upgrade

2.108 Like the unit control systems, the human-machine interfaces ("HMI") in the control rooms at compressor stations equipped with Solar Mars 90 units use proprietary hardware and software, and they are also becoming increasingly difficult to maintain as components for the hardware are no longer available and the software is no longer supported.

2.109 Operator is therefore proposing to upgrade HMI hardware and software for its four Solar Mars 90 so that it is compatible with current industry standards.

2.110 Investment in the upgrade of the Solar Mars 90 HMI is necessary to maintaining the reliability of gas transportation service provided using the DBNGP. It is necessary to maintaining the integrity and contracted capacity of services.

2.111 Accordingly, the investment to be made is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Solar Mars 90 surge control upgrade

2.112 Surge control equipment on the Solar Mars 90 units is, like the unit control systems and HMI, obsolete and now difficult to maintain. Parts are difficult to obtain from the specialist manufacturer (Petrotech), and the control system uses proprietary hardware and software.

2.113 Operator is therefore proposing to upgrade surge control on its four Solar Mars 90 units to the standard of its most recently installed Solar Mars compressor units, and to replace proprietary hardware and software with generic programmable logic controllers (similar to those used on the newer units).

2.114 Investment in the in the upgrade of Solar Mars 90 surge control is necessary to maintaining the reliability of gas transportation service provided using the DBNGP. It is necessary to maintaining the integrity and contracted capacity of services.

2.115 Accordingly, the investment to be made is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Microwave system replacement/upgrade

2.116 Replacement of the DBNGP's microwave communications system was effectively deferred from the period of the Original Access Arrangement. Work forming part of the major feasibility study required to identify a replacement communications system was undertaken in 2000 and 2001, but the project was not progressed to completion.

2.117 In its Draft Decision dated 21 June 2001, the Regulator accepted the forecast of capital expenditure for the upgrade of the microwave system proposed in the Original Access Arrangement. In respect of this expenditure, the Regulator required:

(a) results of a feasibility study that the then owner of the DBNGP indicated it would carry out in 2000, before the Regulator would allow actual expenditure on the system upgrade to be added to the capital base; and

(b) consideration of alternatives in the study: in the absence of a study demonstrating that a microwave system was the most cost effective communication system, the Regulator suggested that a satellite system could have a lower initial cost, and lower maintenance costs.

2.118 The existing analogue microwave system was built on the basis of criteria set in 1980, and has now been in service for some 20 years. The technology is based around voice circuits with limited high bandwidth data transmission capability, and no digital data transmission capability. This obsolete technology:

(a) has limited capability to transmit data required by both Operator and shippers under the third party access regime of the Code, and this has necessitated innovative but complex and expensive solutions to particular communications problems; and

(b) is becoming increasingly more difficult and expensive to maintain as replacement components cease to be available from suppliers and equipment manufacturers.

2.119 Operator notes that the investigations that were undertaken in 2000 and 2001 showed that the satellite option is technically flawed in that it would not provide all the necessary services for voice communication, and would not meet reliability and availability requirements for pipeline control. In addition the operating costs of satellite services to compressor stations, main line valve sites and meter stations were likely to be significantly higher than for a microwave radio bearer. Satellite was, however, a short term solution to communication with compressor stations given the high incremental costs of providing increased bandwidth on the existing microwave system.

2.120 These investigations now need to be revived, and the work of replacing the microwave system progressed to completion.

2.121 The existing microwave system is the principal communications system along the DBNGP between Dampier and Perth. It was originally built to provide the communications needed for the remote operation of pipeline facilities. That original purpose remains, but has now been supplemented by a need to communicate the information required for operation of the open access regime of the Code. As the system becomes increasingly obsolete, the risk of Operator being unable maintain the safety, integrity and contracted capacity of services increases. Investment in microwave system replacement is therefore important, particularly as the volume of communications traffic will increase as the DBNGP is expanded during the Access Arrangement Period.

2.122 The investment to be made in a replacement for the existing microwave system is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

South West communications transfer

2.123 Operator currently relies on Western Power Corporation for provision of communications infrastructure south of Perth. Communications with pipeline facilities takes place over Western Power's digital microwave network. These communications are critical to the operation of the open access regime of the Code. Nearly all of the major delivery points on the DBNGP are located south of Perth.

2.124 Operator is extremely uncertain as to how long Western Power will remain in its current organisational form, and will have the capacity within its digital microwave system to meet Operator's communication needs. Operator anticipates that restructuring and refocusing of the electricity utility will result in the ultimate owner of the digital microwave system asking Operator to transfer its communications to a commercial communications carrier such as Telstra (via its TPIP network), or to a provider of equivalent services using satellite.

2.125 Operator has therefore provided for investigation of alternatives to the Western Power digital microwave network for its South West communications needs, and for transfer of its communications to a new carrier, during the Access Arrangement Period.

2.126 If Operator is unable to continue using the Western Power network, the investment required to transfer its communications to another carrier will be essential to maintaining the safety and integrity of the gas transportation service provided using the DBNGP.

2.127 The investment to be made in a South West communications transfer is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

SCADA master station upgrade

2.128 Master station protocols and data storage are to be upgraded during the Access Arrangement Period to maintain the high level of reliability of the DBNGP SCADA system.

2.129 This work is required primarily for maintenance of the integrity and contracted capacity of services on the pipeline.

2.130 Accordingly, the investment required is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

SCADA emergency backup

2.131 The DBNGP is remotely operated from a control centre located in GHD House in Adelaide Terrace, and a very limited backup facility has been established at the Jandakot maintenance depot.

2.132 The backup facility is being progressively developed so that complete SCADA functionality is available at Jandakot in the event of Operator being unable to operate the pipeline from GHD House.

2.133 During the Access Arrangement Period, Operator proposes to expand the data storage capability at Jandakot to provide full backup of historical operating data captured by the SCADA system.

2.134 Further development of the SCADA backup facility is required primarily for maintenance of the integrity and contracted capacity of services on the pipeline.

2.135 Accordingly, the investment required is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Additional gas chromatographs

2.136 The broadening of gas quality specification for the DBNGP (as a result of the removal of the minimum LPG requirement) will require modifications to existing chromatographs which measure gas composition at MLV 30, CS and Kwinana Junction.

2.137 In addition, three new chromatographs will be required to provide complete gas quality monitoring throughout the DBNGP system and to ensure compliance with the broadened specification.

2.138 Without the additional gas chromatography capability, Operator will have difficulty in maintaining the integrity and contracted capacity of services on the pipeline.

2.139 Accordingly, the investment in supply chain design changes is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Design changes and compliances (meter stations)

2.140 This project is an aspect of the planned work described earlier under the heading "Hazardous area audits implementation". The earlier project was concerned with the identification of hazards associated with pipeline facilities. The focus of this project is hazards arising at meter stations.

2.141 Operator is proposing to continue, during the Access Arrangement Period, with:

(a) safety auditing of potentially hazardous areas at meter stations on the DBNGP;

(b) identification of actions to mitigate the risks identified; and

(c) modification or replacement of equipment which is found to be unsafe.

2.142 This work is to be undertaken to ensure the continued safety of, primarily, maintenance personnel and contractors working on the DBNGP.

2.143 Accordingly, the investment is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Meter station cabinets and cable marshalling boxes

2.144 Steel cabinets providing weather protection for the valves, gauges, and related equipment at meter stations, and steel boxes for the marshalling of cables, have, in many cases, been in place since the 1980s and are now extremely corroded. They require replacement.

2.145 Investment in new cabinets and marshalling boxes is now required if Operator is to maintain the safety and integrity of the pipeline, and continue to provide Services in accordance with its current contractual obligations.

2.146 Accordingly, the investment is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Meter station equipment shelters

2.147 At larger meter stations (for example, Alcoa Wagerup), a steel roof supported by steel pillars covers above ground pipework containing the primary gas measurement equipment. This roofing serves to protect valves, gauges and related equipment from direct exposure to the elements, and provides protection from the sun and rain for crews carrying out accuracy verification tests and maintaining the metering.

2.148 Some of these shelters have now been in place for nearly 20 years. They are badly corroded (particularly in the Kwinana area and the South West), and are potentially hazardous for crews working beneath them.

2.149 Operator is therefore proposing to commence replacement of the shelters during the Access Arrangement Period. The primary reason for the investment to be made is the maintenance of safe working conditions for employees and contractors. There is also a small added benefit from the weatherproofing of equipment to a lesser standard than would otherwise be the case.

2.150 Accordingly, the investment in meter station equipment shelters is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur

Flow computer upgrades

2.151 Meter station flow computer software, which is critical to accurate gas measurement, is scheduled to be upgraded during the Access Arrangement Period.

2.152 New versions of the software also facilitate the automation of, and improved methods for, the Accuracy Verification Tests Operator is obliged to carry out in accordance with the terms and conditions of its standard shipper contracts.

2.153 Operator's investment in flow computer software upgrades is necessary to maintaining the integrity and contracted capacity of services.

2.154 Accordingly, the investment to be made is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Customer Reporting System upgrade

2.155 New shipper contracts that were negotiated by the current owners in 2004 require Operator to maintain its Customer Reporting System ("CRS") and enhance its functionality. CRS must now have the functionality to:

(a) issue notices to shippers;

(b) provide details of the available spot capacity on at regular intervals throughput the day;

(c) notify shippers of any related party transactions for spot capacity;

(d) provide information on hourly and daily quantities delivered to shippers; and

(e) make available details relating to the interconnection of the DBNGP with the distribution system.

2.156 The shipper contracts also anticipate that, in the future, CRS becomes the means of facilitating capacity trading, and of recording and reporting transfers of capacity on the DBNGP. (Currently there is no central facilitation of capacity trading; bilateral trading arrangements are a matter for the shippers directly involved).

2.157 CRS will also require modification as:

(a) new shippers contract for transportation service using the DBNGP, and as new delivery points are added to the pipeline; and

(b) additional data (in particular data pertaining to nominations, overruns, imbalances and peaking behaviour) are to be provided to the gas market manager in accordance with the market rules governing full retail contestability in the Western Australian gas market.

2.158 Further investment in CRS will be required if Operator is to continue to provide services in accordance with its contractual obligations. Accordingly, that investment is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

IT infrastructure

2.159 The prior owner of the DBNGP maintained its own corporate systems for accounting and finance (PeopleSoft), human resources management (Chris), and maintenance management (Maximo). These systems, and the hardware platform that supports them, are now operated by Epic Energy Corporate Shared Services Pty Ltd

("EECSS"), which currently provides information technology and information processing services to Operator under a Transitional Services Agreement with Operator (and DBNGP (WA) Nominees Pty Ltd).

2.160 On termination of the Transitional Services Agreement, information technology and information processing services for Operator and DBNGP (WA) Nominees Pty Ltd (the "DBNGP companies") are expected to be provided by Alinta Network Services Pty Limited ("ANS") under an Operating Services Agreement.

2.161 Operator expects that ANS will provide the equivalent of the corporate systems and the supporting platform currently provided by EECSS. This will require some further investment in computing and communications hardware, and a much larger investment in:

(a) modification of the ANS corporate systems (accounting and finance, human resources, asset and maintenance management) to provide information processing for DBNGP companies;

(b) transfer of DBNGP data to the modified ANS corporate systems; and

(c) development of reporting and other utilities for the DBNGP companies within the ANS corporate systems environment.

2.162 In addition, Operator will need to develop a stand-alone computing environment for its management of DBNGP operations. Key drivers for the creation of this stand-alone environment are the ring fencing obligations imposed on Operator by the Code, and by the undertaking given by Alinta Limited and others to the Australian Competition and Consumer Commission under section 87B of the Trade Practices Act 1974.

2.163 Operator anticipates having to set up a small hardware platform and network which will provide the DBNGP companies with a secure environment:

(a) for the management of all DBNGP legal, regulatory, commercial and technical data and documentation;

(b) with capability to access data and reports for the DBNGP companies in ANS corporate systems;

(c) supporting the use of standard Microsoft Office products; and

(d) supporting the CRS.

2.164 Operator also intends to create an independent web site for DBNGP operations.

2.165 Planned investment in this IT infrastructure, in addition to the initial investment, investment in software upgrades (in 2006 and 2009), and hardware replacement investment. Operator has adopted the standard industry practice of and replacement cycle of three years desktop and notebook computers, and other items of computing equipment subject to rapid obsolescence.

2.166 Operator's investment in IT infrastructure is essential to its providing the gas transportation service of the DBNGP. It is necessary to maintaining the integrity and contracted capacity of services.

2.167 Accordingly, the investment to be made in IT infrastructure is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Engineering Tools and Equipment

2.168 This item of forecast expenditure is part of the Operator's continuous improvement activity.

2.169 It involves expenditure for the purposes of:

(a) updating worn, broken and outdated tools; and

(b) purchasing new tools.

2.170 As the reliable performance of the pipeline becomes more and more critical, new ideas and teams are developed to look more closely at the performance of all areas of operation. To enable this, new software, enhanced software to upgraded versions, improved/new internal inspection tooling equipment is required to improve the efficient and reliable operation of the pipeline which is aimed at maintaining the Services on the pipeline.

2.171 In addition to field maintenance tools and equipment, inspection and testing tools used by the Engineering and Technical Specialists will be required to be maintained during this period. This includes the following:

(a) pipeline integrity and testing tools and equipment;

(b) internal inspection and boroscoping tools and equipment;

(c) thermography test equipment; and

(d) special software and drives.

2.172 Accordingly, the investment to be made is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Field Tools and Equipment

2.173 As is the case with the immediately preceding forecast investment, this item of forecast expenditure is part of the Operator's continuous improvement activity.

2.174 Again, it involves expenditure for the purposes of:

(a) updating worn, broken and outdated tools; and

(b) purchasing new tools.

2.175 The following items have been earmarked for acquisition or manufacture:

(a) gas detectors - required for gas monitoring to ensure safe working environments.

(b) electrical meters - required to test calibration of operational equipment.

(c) the manufacturing of new tools specific to plant required to improve efficiency of conducting activities.

2.176 Accordingly, the investment to be made is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Motor Vehicles

2.177 Operator owns and operates a fleet of vehicles used for maintenance activities on the DBNGP.

2.178 These vehicles are continuously in service transporting maintenance crews to remote locations along the pipeline. To ensure their reliability, and the safety of the crews which use them, Operator has a policy of replacing all motor vehicles at regular intervals.

2.179 In accordance with its replacement policy, Operator is proposing to replace six vehicles in each year of the Access Arrangement Period.

2.180 Without the vehicle replacements, Operator will have difficulty in maintaining the integrity and contracted capacity of services on the pipeline.

2.181 Accordingly, the investment in supply chain design changes is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.

Corporate head office modifications

2.182 With the sale of the DBNGP to its new owners in 2004, the following capital projects have been identified as being required during the Access Arrangement Period:

(a) establishment of a stand-alone office for Operator which is ring fenced from the operations of any other system operator (such as Alinta Network Services), and from any of its shareholders; and

(b) additional office space to cater for the increased corporate support that will need to be provided given the significant expansion program being proposed. This will involve the establishment of new work stations and the upgrade of existing work stations.

2.183 The separate office is required for Operator in order to comply with the Operator's obligations contained in the Undertakings given to the ACCC at the time of acquisition in accordance with the provisions of the Trade Practices Act 1974.

Jandakot Depot improvement

2.184 As part of the recent acquisition of the DBNGP by the current owners, a decision has been made to relocate certain staff based at the previous owner's corporate head office to the Jandakot depot. This is primarily because increased operational requirements requires an increase in field operational staff which requires support from Operator's field operational base at the Jandakot depot.

2.185 The project will include the following capital works:

(a) an increase in office space, supply storage space and amenities; and

(b) an upgrade to the standing facilities to enhance the ability to support the field operations.

2.186 As the organisation grows and changes, there will be a requirement to continue to revise the plans for Jandakot depot.

2.187 Accordingly, the investment to be made is New Facilities Investment which is expected to satisfy the test in section 8.16(a)(ii)(C) of the Code when it is forecast to occur.