

**INVESTMENT PROPOSAL**  
FOR THE BONNY MINOR NAG RESERVOIRS DEVELOPMENT PROJECT

**The Shell Petroleum Development Company of Nigeria Limited**

**Summary Information**

Business unit and company	The Shell Petroleum Development Company of Nigeria Limited (SPDC)		
Group equity interest	100% in SPDC, whereas SPDC is the Joint Venture (JV) operator of an unincorporated JV with a 30% interest.		
Other shareholders / partners	Nigeria National Petroleum Company (NNPC: 55%), Total: 10%, Nigeria Agip Oil Company (NAOC: 5%) in SPDC-JV.		
Business or Function	Exploration & Production (EP)		
Amount	US\$ 38.99mln Shell share (i.e. US\$ 129.95mln 100% JV), 50/50, MOD.		
Project	Bonny Minor NAG Reservoirs Development Project		
Main commitments \$ mln (MOD)	<b>Description</b>	<b>JVUS \$mln (100%)</b>	<b>US \$mln (Shell Share)</b>
See Table 1 for expenditure phasing.	<b>CAPEX:</b>		
	Drilling 4nos conventional NAG wells	55.23	16.57
	Completion	21.08	6.32
	Testing	6.82	2.05
	Loc prep	14.61	4.38
	Recompletion (if any)	9.41	2.82
	4nos carbon steel flowlines and hook-up	12.59	3.78
	Facilities (extension of remote manifold)	8.43	2.53
	<b>OPEX:</b>		
	Pre-GIP approval expenses	0.87	0.26
	SCD	0.91	0.27
	<b>Total</b>	129.95	38.99
Source and form of financing	This investment will be financed from JV funding. Shell share capital expenditure will be met by SPDC's own cash flow and/or the existing shareholder facility.		
Summary cash flow	<p style="text-align: center;"><b>Bonny NAG Minor reservoir Devt Project -Cashflow (Shell Share PSV RV-RT)</b></p>		
Summary economics	Shell Share, RT-10	NPV7% (USD mln)	VIR7%
	Base case	26.0	0.78
	Low Realization Forecast	20.8	0.73
	High Realization Forecast	39.0	0.93
			RTEP
			>50%
			>50%
			>50%

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### ***Section 1: The proposal (management summary)***

This Investment Proposal (approval for a funding of US\$38.99mln Shell share i.e. US\$ 129.95mln–100% JV) is required for the execution of the Bonny Minor NAG Reservoirs Development Project.

Four new wells will be drilled to develop 162 Bscf of Non-Associated Gas from six gas reservoirs. Two of these wells are planned to each drain two reservoirs in sequence, thus a later recompletion to the upper reservoirs is required. About 7.6 Bscf of the total gas to be developed will be dedicated to running the Bonny Oil and Gas Terminal (BOGT) as fuel gas. The NAG production will be via the Bonny NAG Plant to NLNG T1 – 6 from Q2 2013 for about ten years before the wells will quit production. These wells will make use of available free capacity resulting from the decline in production of the existing wells.

The project was initiated post DG 1 on the 15<sup>th</sup> of May 2007 and taken through the Assess and Select phases between May and October 2007. In a combined Project Assurance Reviews (PARs 2 and 3) held 24<sup>th</sup> of October 2007, the supported development concept was drilling of three gas wells (two smart and one conventional well) and the extension of the BNAG manifold at Oloma. However because emphasis was on early gas, the Decision Review Board (DRB) at the Decision Gate 3 (DG3) of January 2008 supported the alternative concept of drilling 4 conventional gas wells. The DG3 of April 2009 approved the FDP concept of:

- 1 Drilling 4 conventional wells and installing downhole gauges and V-monitors for all wells.
- 2 Installing 2nos 6" x 2km and 2nos 8" x 7km flowlines from the wellheads to Oloma NAG manifold.
- 3 Extending the Oloma manifold by the installation an additional manifold skids (4nos x 6" lig x 14" hdrs x 1500# CS skids).

In August 2009, the Project Team presented a schedule with execution in 2012/2013 mainly driven by rig availability in line with the BP09 approved LTDS. Coinciding with this is the production forecast showing that some of the existing NAG wells will be quitting around 2012/2013.

The project is targeting drilling the first well by October 2012 and first gas is expected April 2013.

Table 1 contains the project expenditure phasing.

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**Table 1: Total Project Expenditure Phasing (US \$mln MOD JV 100%)**

Activity	100% Total	2010	2011	2012	2013	2014	2015	2016
<b>Total (\$mln)</b>	129.95	0.87	19.83	33.37	62.28			13.60
<b>CAPEX:</b>								
Drilling	55.23		15.79	12.98	26.46			
Completion	21.08			6.94	14.15			
Testing	6.82			2.25	4.58			
Loc prep	14.61			1.68	8.84			4.09
Recompletion (if any)	9.41							9.41
Flowlines and Hook-up	12.59		3.89	5.01	3.69			
Facilities	8.43			4.28	4.14			
<b>OPEX:</b>								
Pre-GIP approval expenses (FEED / Detailed Design (including front-end loading like ESHIA, Geotechnical surveys, ROW surveys)		0.87						
SCD	0.91		0.15	0.24	0.42			0.10

### Section 2: Value proposition and strategic and financial context

The project will supply 4 – 92 MMscf/d gas to NLNG T1-6 in addition to making available 2 MMscf/d fuel gas to run the Bonny Oil and Gas Terminal (BOGT) from Q2, 2013. The gas supply is expected to last for 10 years.

### Summary Economics

The project economic evaluation was done on a full life cycle basis (to include 2010 Pre-GIP approval expenses viz. FEED/Detailed Design, ESHIA, Geotechnical surveys and ROW surveys) and expectation production forecasts. The base case returned an NPV7% of \$26.0mln, with a VIR7% of 0.78 at RV-RT11. Sensitivities were carried out in consideration of possible loss of fiscal incentive (CITA without AGFA incentive), license expiration in end 2019 and the Petroleum Industry Bill. Summarized results of the analyses are shown in table 2 below. Figures 2 to 5 shows sensitivities around current fiscal terms, PIB terms, profitability and project parameters.

**Table 2: Economic Grid (Shell Share)**

#### EP Summary Economics Grid

PV Reference Date: 1/7/2011	NPV (S/S \$ mln)		VIR	RTEP	UTC (RT \$/boe)		Payout-Time (RT)	Maximum Exposure (RT)
Cash flow forward from: 1/1/2010	0%	7%	7%	%	0%	7%		AT (S/S \$ mln)
<b>Base Case</b>								
SV (\$50/bbl & \$1.43/MMBtu)	29.7	20.1	0.60	57.9	7.3	8.2		
RV (\$60/bbl & \$1.68/MMBtu)	37.7	26.0	0.78	70.1	7.3	8.2	2014	19.9 (2013)
HV (\$80/bbl & \$2.19/MMBtu)	54.0	38.0	1.13	92.7	7.4	8.2		
BEP (RT \$/MMBtu)					0.5	0.6		
<b>Sensitivities (using RV)</b>								
Low Capex (P10)		27.7	0.97	>50			2014	16.4 (2013)
High Capex (P90)		23.3	0.55	>50			2014	25.0 (2013)
Low Reserves (P90)		20.8	0.73	>50			2014	16.5 (2013)
High Reserves (P10)		39.0	0.93	>50			2014	25.2 (2013)
Licence expiration end 2019		25.6	0.77	>50			2014	19.9 (2013)
CITA only		7.3	0.22	19.6			2016	27.4 (2013)
1.5% cost markup due to BVA* issues		23.8	0.68					
PIB IAT** version 9 terms		-5.7	-0.17					

\*Benchmarked, verified and approved (BVA) by NNPC

\*\* Inter-Agency Terms (IAT)

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### Key Project Parameter Data Ranges

(Shell Share)

	Unit	Bus Plan (BP09)	Low	Mid	High
CAPEX (MOD)	US\$ mln	34.5	32.7	38.5	48.1
Investment OPEX (MOD)	US\$ mln		0.45	0.54	0.67
Production Volume	mln boe	8.2	6.2	7.9	12.2
Start Up Date	mm/yyyy	Jan-12	Apr-13	Apr-13	Apr-13
Production in first 12 months	mln boe	2.0	1.4	1.4	1.6

### Base case Economics assumptions:

- NAG will be sold to NLNG T1-6 at \$1.68/Mmbtu RT-11
- Condensate treated and sold as oil at \$61.6/bbl RT-11
- Project was evaluated under CITA fiscal regime with AGFA incentives
- ARPR (31-12-2009) OPEX estimate for Bonny GP used for evaluation.
- SCD treated as OPEX
- FEED/Detailed Design (including front-end loading like ESHIA, Geotechnical surveys, ROW surveys) treated as OPEX
- 10% of total project CAPEX RT cost assumed as abandonment cost
- GHV of 1150 btu/scf
- NDDC levy of 3% of total expenditure
- Education tax of 2% assessable profit

### PIB IAT (version 9) Economics assumptions:

- Royalty rates based on proposals for existing fields (20% for gas)
- Gas Netback prices (double sales export price) for Royalty and Allowances
- National Hydrocarbon Tax (NHT) rate 50% and CIT 30%
- No production allowances as fields are already producing
- 20% of overseas cost (30% of SPDC spend) is non-deductible for NHT taxable income
- Further 5% disallowance of costs due to Benchmark, Verified, Approval conditions
- Withholding tax (WHT) of 7.5%

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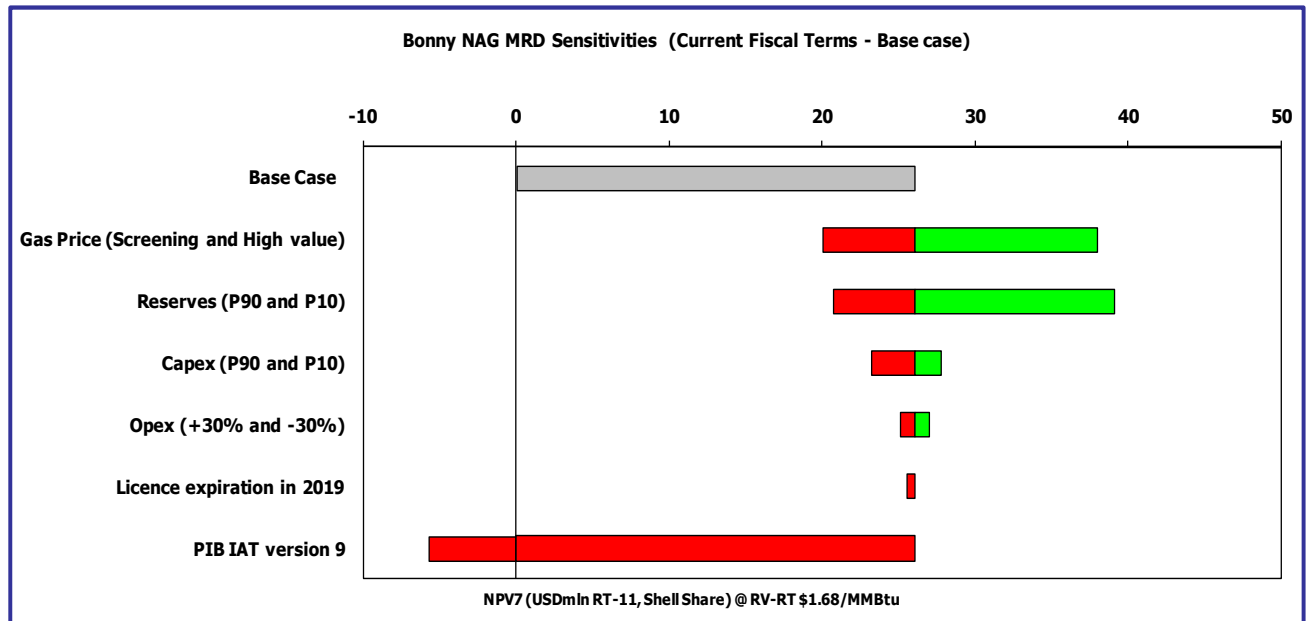


Figure 1: Tornado chart of Bonny NAG MRD Project (Current Fiscal Terms – Base Case)

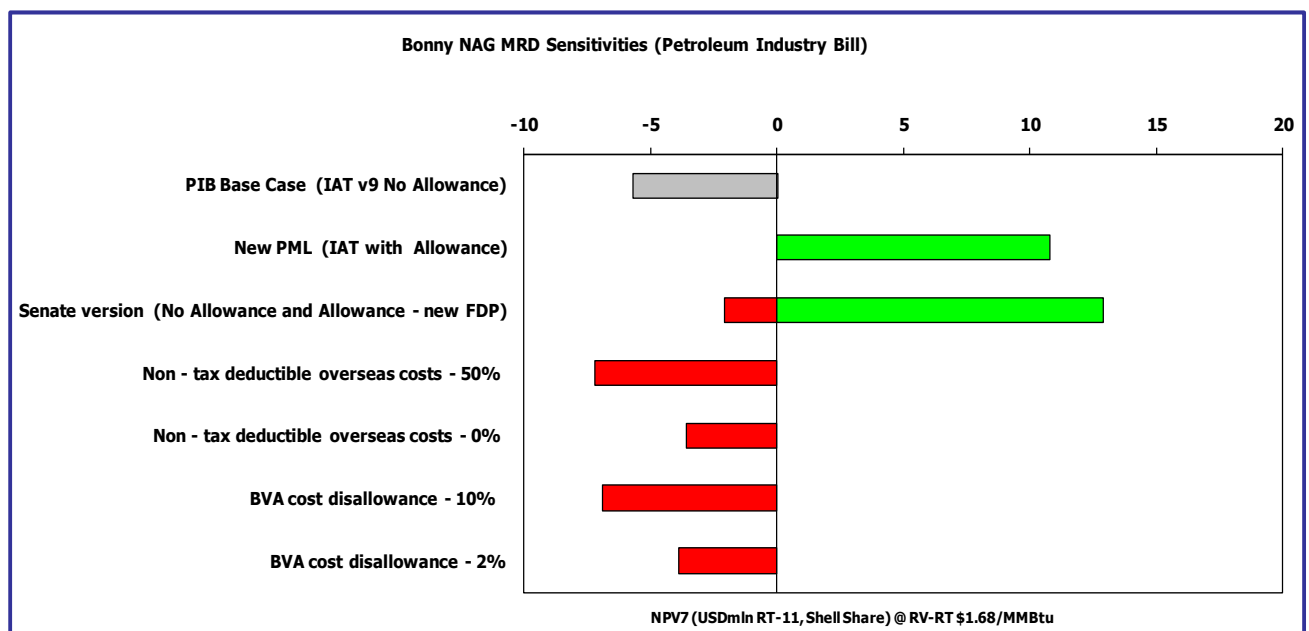


Figure 2: Chart of Bonny NAG MRD Project with sensitivities of PIB terms

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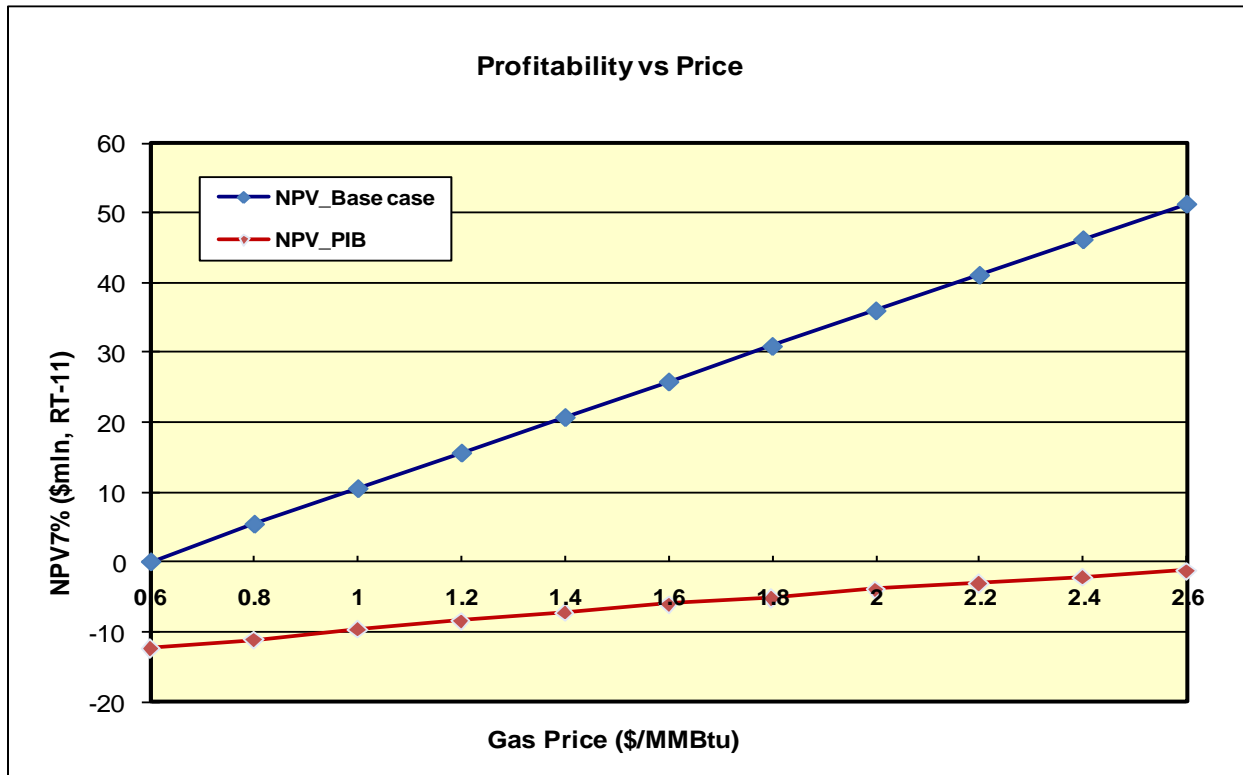


Figure 3: Bonny NAG MRD Project Profitability vs Price Plot

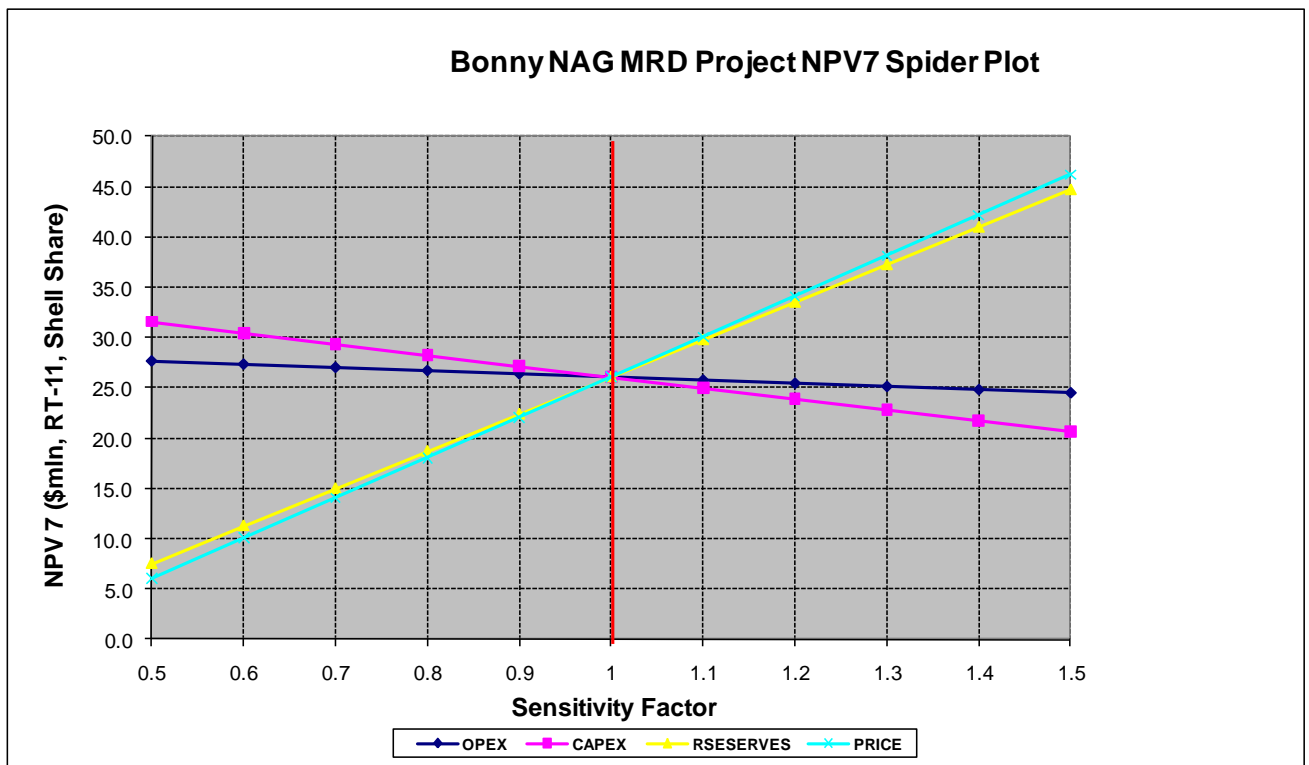
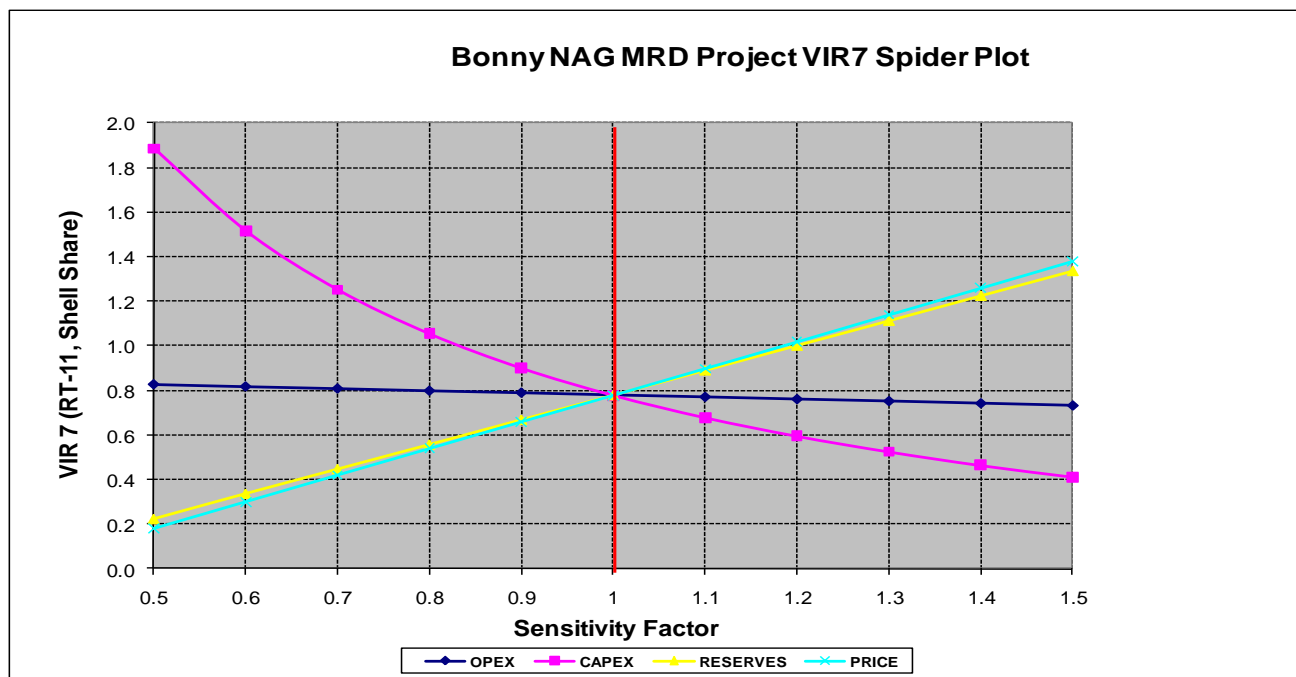


Figure 4: Bonny NAG MRD Project NPV7 Spider Plot (Current Fiscal Terms – Base Case)

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**Figure 5: Bonny NAG MRD Project VIR7 Spider Plot (Current Fiscal Terms – Base Case)**

### *Section 3: Risks, opportunities and alternatives*

<u>RISKS</u>	<u>MITIGATION MEASURES</u>
Volume Uncertainty	The volume uncertainty associated with this development results from structural and petrophysical uncertainties identified and analysed in the course of this project. This uncertainty is taken into account in the range of scenarios evaluated and the low case is also economic. (see table 2).
Insecurity of the waterways	The general insecurity and current tension (hostage-taking, vandalism, disruptions, etc) in the Niger Delta may persist or repeat in the future. This may affect the project, especially execution and operation, with consequent project delays and cost overrun. Continuous stakeholder engagement and flexible project management (e.g. acceleration of critical activities) are proposed as preventive and recovery mechanisms against this threat.
Procurement delays and cost escalation	Robust economic models have been built and sensitivity studies performed on the integrated project and these results are favourable. However, unanticipated cost escalation and delays could erode project value. Securing the approval for this investment proposal in 2010 will enhance placing order for the procurement of long lead materials and equipment (in time for the main construction works planned from Q3 2011) and will mitigate these potential threats and ensure project value is realised. These early procurements will be carried out through SPDC's Supply Chain Management (SCM).
Legacy SCD Issues in the Bonny Node	Some legacy SCD projects from the previous developments in the area have been identified. If unresolved, these could result in community

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	disturbances during the execution phase of the project, with consequent project delays and cost overrun. This threat will be mitigated by continuous stakeholder engagement and ensuring that other benefits to the communities e.g. employment opportunities and provision of contract services are agreed upon before commencement of project execution. Also key legacy projects are being addressed. For instance Oloma water scheme is completed though not functional due to lack of power. Similarly, NAPIMS has approved SPDC termination of the non performing contractor who was handling Oloma, Ayaminima, Epelema, Minima & Sangamabie interdependency electrical project. NAPIMS has also supported quick fix to enable the community have light/repair of faulty gensets for these communities whilst SPDC commence the process of re- awarding the contract to a new contractor. The Bonny Integrated Business Complex Project has also kicked off and progressing well.
Inability to secure ESHIA approval within scheduled timeframe	Though Project categorization received from the FMEV in November 2007 rated it a category 1 project, which requires 2 seasons sampling. Further engagement of regulators is being done to limit data sampling to the 1 season already completed, since robust data exists in the Bonny Area.
Execution of Petroleum Industry Bill (PIB)	Planned changes to the country's management of the oil and gas industry and in particular the fiscal terms are being considered by the National Assembly. Proposed fiscal changes disfavour existing dry gas fields such as this and the development would only be profitable if proposed wording on Production Allowances for new Field Development Plans are included in the final PIB. Sustained lobbying is being carried out with the legislators to encourage the adoption of these provisions.

### Opportunities

- Unique attraction offered by the Bonny Minor NAG Reservoirs Development Project stems from its proximity to existing gas infrastructure (Bonny NAG plant and Oloma NAG manifold).
- Opportunity to prolong the service life of the existing Bonny NAG Plant by maintaining production through it post 2013 for the next 10 years (excluding downtime) thereby making the plant available for future gas developments in the Node.
- Reduction of footprint and environmental impact through the use of selective completion wells.
- Provision of some 155 Bscf of short-term gas supply to militate against supply shortfall at NLNG.
- Maintaining synergies with other on-going projects in the Bonny node i.e. the Bonny Flowstation AG Solution Project.
- Sustainability of 7.6 Bscf fuel gas supply to Bonny Terminal for the next 10 years.

### Alternatives

1. The alternative concept will involve the drilling of three gas wells in the six target reservoirs (two smart wells and one conventional) and the extension of the Oloma NAG manifold by the installation of an additional manifold skid. This concept was not selected because the project schedule and the smart well contractual process were misaligned, with the latter potentially delaying the former.



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2. The other alternative will involve sidetracking Bonny well 27T in addition to drilling of three conventional wells (two in Bonny North and one in Bonny). The economics evaluation shows that the FDP concept returns marginally higher NPV / VIR than this concept because of consequent drop in UR in spite of the seeming drop in well and flowline costs.

#### ***Section 4: Corporate structure, and governance***

The existing corporate structure and arrangements of SPDC-JV (with SPDC as operator) will be used as the vehicle for the investment and operations.

An SPDC Decision Review Board (DRB) will continue to advise.

#### ***Section 5: Functional Support and consistency with Group and Business Standards***

This proposal complies with the Group Business Principles, policies and standards. This project has benefited from full functional support covering ESHIA, Field Development Planning, OR&A and SCD. Besides contributing to SPDC's supply commitment to NLNG and extending fuel gas supply to the Bonny Terminal, the project will contribute to sustainable development of Nigerian people within the node. Additionally, there will be a focus on Nigerian Content Development (NCD). The Finance, Supply Chain Management, Legal, and Treasury/Tax functions will provide functional support for this proposal.

#### ***Section 6: Project management, monitoring and review***

The Medium Projects and Discipline Engineering team under UIG/T/PM is managing the project post DG-3. The project team is adequately resourced. The Major Project Services Team UIG/T/PS and the Corporate Matrix Technical Support Team UIG/T/PM support the Project Quality Management Systems. This project has been matured in line with the Opportunity Realisation Process (ORP) and has undergone the necessary Project Assurance Reviews - PARs 2 & 3 and par4 were 24<sup>th</sup> October 2007 and 16<sup>th</sup> – 17<sup>th</sup> December 2010 respectively. Estimate and Schedule Assurance Review (ESAR 2/3) was done 30<sup>th</sup> September, 2010. Key decisions have been reviewed and are supported by the Decision Review Board (DRB) at the Decision Gate 3 (DG3) of April 2009, in August 2009 in an engagement meeting with the Decision Executive and in November 2009 by the DRB. Value delivery will be ensured through regular reviews (PERT) and GWDP.

#### ***Section 7: Budget provision***

In BP10, the project is in the base programme but under Alternative Funding together with all other export gas projects. In BP09, in order to commence and progress definition of the project whilst awaiting IP approval, a provision of F\$0.872 was made in the 2010 JV Budget to cover completion of FEED and Detail Design, ESHIA wet season sampling and delivery of ESHIA report. The cost of full preparation survey and requirement for acquisition was also included in the 2010 JV Budget.

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### ***Section 8: Group financial reporting impact***

The financial impact of this proposal on Shell Group financial is as outlined in the table below-

US\$ Million	Prior Years	2011	2012	2013	2014	2015	Post 2015
<b>Total Commitment</b>	<b>0.26</b>	<b>5.95</b>	<b>10.01</b>	<b>18.69</b>	<b>0.00</b>	<b>0.00</b>	<b>4.08</b>
<b>Cash Flow</b>							
SCD Expenditure		0.05	0.07	0.13			0.03
Pre-FID Expenditure	0.26						
Capital Expenditure		5.90	9.94	18.56			4.05
Operating Expenditure		0.18	0.30	2.57	2.64	1.92	13.37
Cash flow From Operations		2.05	4.87	16.89	16.49	8.17	31.48
Cash Surplus/(Deficit)		(3.86)	(5.06)	(1.67)	16.49	8.17	27.43
<b>Profit and Loss</b>							
NIBIAT +/-		0.19	0.32	9.37	10.33	4.75	24.41
<b>Balance Sheet</b>							
Avg Capital Employed		2.02	6.74	14.95	17.39	12.60	8.12

### ***Section 9: Disclosure***

Material disclosures, if any, will be done in line with the Group and SPDC Disclosure policies and guidelines.

### ***Section 10: Financing***

The project will be funded with JV funding and Shell share capital expenditure will be met by SPDC's own cash call.

### ***Section 11: Taxation***

The income tax from the project will be in accordance with Petroleum Profit Tax Rate and relevant income tax applicable.

### ***Section 12: Key Parameters***

This investment proposal seeks approval for US\$38.99mln Shell share (i.e. US\$ 129.95mln 100% JV), 50/50, MOD for the implementation of the Bonny Minor NAG Reservoirs Development Project.

### ***Section 13: Signatures***

This Proposal is submitted to UIG for approval.

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Supported by:

For shareholder approval:

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Bos, Bernard (FUI/F)

Date ...../...../.....

.....

Craig, Ian (UIG)

Date ...../...../.....

*Initiator:*

*Oputa, Nkenamchi Benedict (UIG/T/PM)*

*Project Manager (UIG/T/PM)*