



5. MITIGATION MEASURES AND ENHANCEMENT

5.1. Introduction

An important element of the environmental assessment process is to prevent or reduce the significant impacts of development by the use of mitigation measures. An introduction to the design of mitigation measures is given in Section 4.2.4.

The approach adopted by NLNG is that, wherever possible, efforts should be made to prevent or repress environmental and social effects. Consequently, the main mitigation efforts have been directed at preventative and repressive measures. Mitigation measures presented in this chapter of the report represent actions that are commitments for NLNG. The means of implementing these commitments is through the detailed actions outlined in the ESHMP for NLNG*Six* which is discussed in Chapter 6.

This chapter starts by assessing the “no-project” option, which is the first step in mitigation. Next, the mitigation measures are described and listed in detail in the Mitigation and Enhancement Table (see Table 5.1).

5.2. No project option

The first step in mitigation assessment is to consider the “no project” option and the relocation of the development elsewhere. This is considered below.

Nigeria has large resources of natural gas available for utilisation. Whilst there have been studies to examine the utilisation of this resource and there are examples of where the gas is used, such as for power generation in Lagos, this use is relatively small because of the relatively low level of industrialisation and the wide geographical population spread. The NLNG*Six* project provides an opportunity for the further development of this resource, which will provide substantial beneficial revenues for Nigeria, adding to those generated from the existing NLNG *Base*, *Extension* and *Plus* projects. With the “no project” option, the level of utilisation of the natural gas will be restricted to the *Base*, *Extension* and *Plus* projects level.

The NLNG*Six* project will also use oil-associated gas, which is currently flared. The capture of flared gas by NLNG*Six* will add to that of Trains 3, 4 and 5 and will ensure that Nigeria does not waste (by flaring) what is a potentially valuable natural resource. Reduction in flaring due to gas capture by liquefaction plant will also result in very significant environmental improvements through lower the levels of greenhouse gas emissions in the Delta. The “no project” option would mean that further capture of associated flared gas would not be available. Other options for the use of flared associated natural gas include continuation of current levels of flaring, gas re-injection and the use of the gas by local industries, etc.

Relocation of this particular project (NLNG*Six*) elsewhere in the Delta is not a feasible option since it was particularly designed as an add-on to the existing infrastructure on Bonny Island.

5.3. Mitigation of environmental, social and health impacts

Table 4.10 provides a list of the environmental, social and health impacts that were identified by this ESHA for NLNG*Six*. The impacts have been considered in terms of their extent, duration and significance. The core of this chapter is Table 5.1, which extends Table 4.10 by formulating mitigation and enhancement measures. NLNG recognises the importance of including effective mitigation in the project and accepts that all of the mitigation actions identified in Table 5.1 represent commitments by the company.

The provision of appropriate pollution abatement, treatment and environmental control facilities in the design of the *Base* project, the *Expansion* project and the *Plus* project has substantially reduced the potential environmental effects. The maintenance of these facilities will be essential



to ensure continuing compliance with the HSE Premises for design and operations. The HSE-MS provides the framework for this ongoing environmental management. Although the operation of these pollution control facilities and implementation of the HSE-MS may not be considered to be specific mitigation items, they have been identified in Table 5.1 where they are relevant for impact prevention or repression.

NLNG recognises its role in improving the natural, social and health environment on Bonny Island and is eager to identify all opportunities for enhancing positive effects or to identify opportunities to add benefits for local people. Thus, where negligible impact, no impact or positive impacts have been identified and opportunities for enhancement have been identified, these are also described in the Mitigation Table (see Table 5.1) and described below. NLNG accepts that their proposals for enhancement measures represent commitments by the company.

In the description of mitigation measures below, any potential impact, which was assessed in Chapter 4 as having negligible or no impact, or as being positive, requires no mitigation. Where the potential for added value has been identified for these items, these opportunities are described as enhancement measures and are discussed in Sections 5.3.1, 5.3.2 and 5.3.3 for construction, operation and stakeholder issues respectively. Where there is no mitigation and no opportunity for enhancement for these issues, they are omitted from the discussion below.

Each potential impact, assessed in Chapter 4, is presented in bold in the following sections with a unique code originating from Table 4.10 preceded by an M for Mitigation or an E for Enhancement.

5.3.1. Mitigation measures during construction

❖ **MC3 - Health Implications of Presence of a Large Construction Workforce and other Migrants**

| | | | |
|---------------------------------|-------|------------------------|----------|
| Impact rating before mitigation | Major | Residual impact rating | Moderate |
|---------------------------------|-------|------------------------|----------|

NLNG will use the newest industry guidelines on HIV/AIDS to adjust the NLNG policy on sexually transmitted infections, including HIV/AIDS. The aim will be to improve, strengthening and extend the coverage of the current health promotion programme to include the surrounding communities. There is relatively poor general awareness of sexually transmitted diseases and their mode of prevention, particularly within shanty town communities. These are the key places where commercial sex workers operate and everyone, including the commercial sex workers themselves, local people and NLNG workers are vulnerable and need both education and protection.

❖ **MC4 - Uncontrolled Urban Development (Growth of Shanty Towns)**

| | | | |
|---------------------------------|----------|------------------------|----------|
| Impact rating before mitigation | Moderate | Residual impact rating | Moderate |
|---------------------------------|----------|------------------------|----------|

It is important for NLNG to decide what its position is in relation to the shanty towns and their communities. This means reviewing their role in the initial influx of people into Bonny, the initial development of shanty towns close to the LNG plant and its labour camp and formulating their current views on the future of the shanty towns. NLNG will consult widely with local authorities, local people and all interested parties on this matter before they decide their stance. NLNG will then communicate its position to both local people and its own staff so that everyone knows what their stance is.

NLNG will work with local authorities (Bonny Local Government) and the Joint Industries Committee (JIC) to try and control unwanted rural development through planning and management actions. When the Master Plan for Bonny [26], commissioned by the JIC, comes into effect, it should help in land-use management.



The same health promotion programme that is available in Finima and Bonny Town will be made available to people living in the shanty towns. This is particularly important in light of HIV/AIDS and water-borne diseases, which are most prevalent in the shanties.

❖ **MC5 - Food Demand and Effects on Natural Resources**

| | | | |
|---------------------------------|----------|------------------------|-------|
| Impact rating before mitigation | Moderate | Residual impact rating | Minor |
|---------------------------------|----------|------------------------|-------|

Finima Nature Park was created to protect for the local people a large area of forest to the south and east of New Finima. The Nature Park is already a local success story, employing local people as wardens and training them in forest and conservation skills. There is also a small tree nursery used to supply planting stock for gap-filling in the forest. NLNG will build on this very encouraging start to the project by further stimulating community involvement, for example the further involvement of local schools in hands-on, *in situ* projects, conservation education schemes, and other nature conservation initiatives.

NLNG will examine if it is feasible to assert control over the sterile zone to the south east of the plant site in such a way that forest-degrading activities, such as timber felling and collection of firewood, can no longer take place. This will protect the forest from further exploitation and depletion and, more importantly, will permit vital natural regeneration of forest tree species.

❖ **EC6 - Natural and Social Environmental Degradation**

| | | | |
|---------------------------------|------------|------------------------|------------|
| Impact rating before mitigation | Negligible | Residual impact rating | Negligible |
|---------------------------------|------------|------------------------|------------|

NLNG will assess in more detail the situation with regards to waste dumping and water contamination from human wastes in and around the shanty towns. They will then discuss with representatives of Finima community ways of improving the situation, so that there is also reduced potential for health problems related to poor waste management and poor sanitation.

NLNG will promote the waste management and sewage management aims and goals of the Bonny Masterplan [26], particularly for Finima and Bonny Town, by engaging in discussions with the Local Government Authority.

❖ **MC7 - Decommissioning of Camps, Leading to Economic Burst**

| | | | |
|---------------------------------|-------|------------------------|----------|
| Impact rating before mitigation | Major | Residual impact rating | Moderate |
|---------------------------------|-------|------------------------|----------|

NLNG will anticipate both social and environmental issues resulting from the decommissioning of camps and will draw up plans to ensure a timely implementation of the decommissioning of both labour and contractor camps at the end of the construction phase.

NLNG will actively help people to anticipate the changes which accompany disbanding of the NLNG and contractor workforce (e.g. promoting the existing micro credit scheme programme, running awareness programmes in the communities, stimulating the use of existing learning and education opportunities (like the new vocational school which will start in 2004)

5.3.2. Mitigation measures during operations

❖ **MO2 - Increase in the Number of NLNG Vessels**

| | | | |
|---------------------------------|----------|------------------------|----------|
| Impact rating before mitigation | Moderate | Residual impact rating | Moderate |
|---------------------------------|----------|------------------------|----------|

All ships and ship movements for NLNG will adhere to NLNG's policies on marine operation which comply with international MARPOL procedures. All marine operations will be dealt with in the separate environmental impact assessment, which is being undertaken for the NLN*Six* Channel Deepening Project. This includes ballast waters, incidental spillages, and emergencies, as well as a fisheries study. Several measures are given in EX2 and EX3 which are designed to



assist fisherfolk to continue to fish in a sustainable manner and to provide new opportunities, both in fishing techniques and in financing new projects (through the micro-credit scheme) (see Section 5.3.3).

❖ **MO3 - Safety/Sterile Zone**

| | | | |
|---------------------------------|------------|------------------------|------------|
| Impact rating before mitigation | Negligible | Residual impact rating | Negligible |
|---------------------------------|------------|------------------------|------------|

NLNG will control access to the sterile zone. Controlling access to this area will have a positive effect on forest regeneration since damaging activities, such as timber removal and burning, will be prevented. This is likely to reverse the current state of forest degradation in the area, potentially leading to reinstatement of production of various previously collected forest products.

❖ **MO4 - Denial of Access to NLNG Private Roads**

| | | | |
|---------------------------------|----------|------------------------|------------|
| Impact rating before mitigation | Moderate | Residual impact rating | Negligible |
|---------------------------------|----------|------------------------|------------|

NLNG, as a matter of policy, will enforce a strict no access to the safety zone (10^{-5} risk contour). This will be done by gating and fencing the safety zone. NLNG will also identify effective ways of controlling access to the sterile zone (10^{-6} risk contour), which may involve patrolling the area and its boundaries. Since roads to the east and south east of the NLNG Plant site lie within the sterile zone, access to these roads by the general public will be restricted.

❖ **MO6 - Increased Emissions**

| | | | |
|---------------------------------|----------|------------------------|------------|
| Impact rating before mitigation | Moderate | Residual impact rating | Negligible |
|---------------------------------|----------|------------------------|------------|

Emissions from Train 6 will be monitored through NLNG's existing air quality monitoring programme which includes both the plant site and ambient conditions remote from the plant site, including Bonny Town and Finima. The results will be assessed regularly to ensure continuing compliance with WHO, EU and FEPA guidelines.

❖ **MO8 - Lighting Within the Estuary**

| | | | |
|---------------------------------|------------|------------------------|------------|
| Impact rating before mitigation | Negligible | Residual impact rating | Negligible |
|---------------------------------|------------|------------------------|------------|

Although there are no reasons for mitigation, lighting within the estuary will be included in the scope of the EIA for the Channel Deepening project.

5.3.3. Stakeholder Issues

❖ **MX1 - Outstanding Issues in Finima**

NLNG will continue to work with the communities to achieve all outstanding mitigation and enhancement measures. This will include those agreements made in 2000 between NLNG and the Amayanabo of Grand Bonny Kingdom (see Appendices 16 and 17).

Through its Community Relations Programme, NLNG will ensure that currently good community relations with the Finima people are built upon and further strengthened. NLNG will do this by maintaining regular, good communication with community representatives and by continuing their support for community development, in close cooperation with the appropriate local bodies, including Finima Development Committee.

❖ **EX2 - The Exclusion Zone and Fishing**

Although the results of the previously commissioned fish catch study [30] did not indicate the need for specific compensation to fisherfolk for restricted access to the exclusion zone around the



jetties, NLNG will continue to work with BECC to sustain the level of support presently given to fishermen, so that they can undertake fishing activities well outside the exclusion zone. The fisherwomen will not be excluded from this initiative. NLNG has already started this process with the supply of boat engines to the cooperative. This assistance is expected to continue in an ongoing, annual programme of providing fishing gear and equipment.

To ensure that fishing remains sustainable in and around Bonny, NLNG, in conjunction with BECC, will encourage fisherfolk to learn new techniques and skills, through provision of training, and to set up mariculture/aquaculture projects, using ponds, pens and cages, as appropriate. This will involve capacity building and encouraging people to make use of funding for such projects through the existing micro-credit scheme (see item EX3 below).

NLNG, in conjunction with BECC, will set up a regular discussion programme with fisherfolk on a six-monthly basis, to share knowledge and to provide feedback on commissioned studies such as the current fish catch studies and any future such studies. These meetings will provide the opportunity for fisherfolk to bring their concerns to the attention of NLNG and to discuss ways of overcoming any unforeseen problems. These meetings will provide a particularly useful platform for addressing any issues resulting from the forthcoming ESHA for the Channel Deepening Project for NLNGSix.

❖ **EX3** - *Increasing Difficulty of Local People to Make a Living*

To assist people in making adjustments to their livelihoods and occupations as a result of changes such as over-exploitation of fisheries and the forest surrounding Bonny and the NLNG plant site, or as a result of market forces accompanying the changes in population numbers due to decommissioning at the end of the project, NLNG will re-invigorate and modify the micro-credit scheme. The revived scheme will be simpler, more effective and easier to manage. It will target businesses which contribute to sustainable development on Bonny, including projects related to fishing and agriculture.

NLNG, in consultation with BKDC and BECC, will support indigene farmers and fisherfolk in the more sustainable production and marketing of locally collected and produced foods. This will include the provision of funding (through the micro-credit scheme (noted above)) and extension services, such as training and hands-on experience for interested entrepreneurs, to give them the necessary skills and experience to establish cottage industries to process and store farm, forest and fish products. It would be hoped that such support would enable these practices to develop from subsistence level to truly commercial operations, which will contribute to economic sustainability on Bonny. Such enterprises could well combine with the aquaculture technologies and skills outlined in EX2b.

❖ **MX4** - *Pressure on Health Facilities*

NLNG will expand the ongoing health campaigns and monitoring and will carry out an annual health status monitoring exercise of selected health indicators, including: morbidity, mortality, infant mortality etc, using readily available data from hospitals, Local Government records, etc. The purpose of this work will be to provide the necessary background health information on which to assess changes of health status over time and to provide baseline information on (a) the status of health of the local indigenous population and (b) the status of health of immigrants in shanty villages.

NLNG will also commission a survey of the condition and status of existing health facilities (including infrastructure and personnel) on Bonny Island and their current workload. The survey will also address waiting lists for medical care. This information will be used to identify deficiencies and inefficiencies in healthcare provision on Bonny. It will also identify deficiencies in availability of equipment and necessary medical supplies.

NLNG will use the above survey results to identify any gaps in provision and to fill those gaps by the provision of locum doctors, part-time nurses, medical supplies and medical equipment.



❖ **MX5 - Degradation of Ibani Culture, Language and Customs**

To counter the declining use of the Ibani language by local people, particularly youngsters, NLNG will sponsor the teaching of Ibani language in primary schools by provision of two language teachers who will spend approximately half a day per month per school. The aim will be to enthuse youngsters in their own tongue so that the use of the Ibani language will be revived.

To assist and promote the Ibani language and culture, NLNG will support the establishment of an Ibani Cultural Centre on Bonny Island for the research and promotion of local cultural values. NLNG will do this by provision of appropriate building materials for local people so that they can design and construct their own centre in a fitting style. NLNG will also provide funding for the salary of a Centre manager for the first five years. It is likely that this initiative could couple with initiatives to explore the development of ecotourism on Bonny Island, so that the Centre could also provide an introduction to Ibani culture and art for visitors to the area.

❖ **MX6 - Job Opportunities for Local People**

Job opportunities and contracting opportunities associated with the operation of Train 6 will be small. However, for any additional openings as a result of the commissioning of Train 6, NLNG will make due consideration for adequate representation from suitably qualified local Bonny indigenes, in line with NLNG's employment standards and policies.

❖ **MX7 - Emergency Response Plan**

NLNG will set up effective communication as part of its Community Relations Programme to ensure that the communities neighbouring the LNG plant know that NLNG have an Emergency Response plan in place and that the design and operation of the plant are designed in such a way that the surrounding communities will not suffer from incidents.

5.3.4. Explanation of the Mitigation and Enhancement Table

The Mitigation and Enhancement Table that was drawn up for the NLNGSix EIA report (see Table 5.1) extends the Impacts Table (see Table 4.10). It should be read as follows:

- The numbering in the first column refers to the Impact number given in Table 4.10
- The second column describes the impact as in Table 4.10
- The third column gives the degree of significance as rated in Table 4.10
- The fourth column provides a unique numbering for mitigation and enhancement measures. Only those impacts that require mitigation or that have opportunities for enhancement are numbered. Each number is denoted with either an M for Mitigation or an E for Enhancement.
- In the fifth column the actual mitigation or enhancement measure is described. This is still in general terms and these measures are further elaborated upon in the ESHMP (see Table 6.1)
- The sixth column rates the residual impact, i.e. the impact that may still remain after the proposed mitigation is fully implemented.
- The seventh and eighth column identifies who is responsible for implementing the described mitigation or enhancement and when this implementation should be completed.

| Table 5.1: Mitigation and Enhancement Table for the NLNGSix project | | | | | | | |
|---|---|--------------------------|---|--|------------------------|---|--|
| | Impact | Rating before mitigation | | Description of mitigation | Residual impact rating | Responsibility | Timing |
| C1 | A very small area will permanently be required as space for the plant site. The road to the east of the plant which currently runs through this area needs to be moved by several meters. | No impact | --- | No mitigation required | No impact | NA | NA |
| C2 | NLNG's presence has a positive effect on general health and well-being of people in the community. | Positive | --- | Opportunities for enhancement further to MC3 and MX4 | Positive | NA | NA |
| C3 | As a result of the ongoing presence of the construction workforce and other migrants the risk of sexually transmitted diseases (e.g. HIV/AIDS) will have increased, despite the existing NLNG awareness and prevention programmes. | Major | MC3 | NLNG should use the newest industry guidelines on HIV/AIDS to adjust the NLNG policy on sexually transmitted infections, including HIV/AIDS, which should result in strengthening the current health promotion programme and in extending the ongoing HIV/AIDS prevention programme to include the surrounding communities. | Moderate | Chief Medical Officer (PSM), reporting to NLNG Production Division General Manager (PD) | Before the end of 2004 |
| C4 | The fact that the development of shanty towns alongside the Mobil air strip road (also known as the liaison road) remains uncontrolled and not managed leads to changes in moral attitudes within the indigenous community (e.g. attitudes to commercial sex, crime, violence, etc.) For this reason and others the community leadership is not in favour of these villages being present on what is traditionally regarded as Finima land. | Moderate | MC4a MC4b MC4c | MC4a NLNG should consolidate, formulate and communicate its position in relation to the shanty towns and their future MC4b NLNG as a member of the Joint Industry Committee will work with local authorities (Bonny Local Government) to try and control unwanted rural development in light of the Bonny Master Plan. MC4c People living in the shanty towns need to have access to the same health promotion programme that is available in Finima and Bonny. This is particularly important in light of HIV/AIDS and water borne diseases, which are most prevalent in the shanty towns. | Moderate | NLNG Sustainable Development Co.Cmt. (SDCC) NLNG Sustainable Development Co.Cmt (SDCC) NLNG Community Relations Manager (ERC) with support from the Chief Medical Officer (PMS) | In the second half of 2004 In the second half of 2004 Continuous programme |

| Table 5.1: Mitigation and Enhancement Table for the NLNGSix project | | | | | | | |
|---|--|------------|---------------------------|---|----------------|---|---|
| Impact | Rating before mitigation | | Description of mitigation | Residual impact rating | Responsibility | Timing | |
| C5 | Because of the incremental effect of the continuing demand for food, there is an impact on fisheries, forest products and agricultural products. This has led to degradation of the forest close to the NLNG Plant and has resulted in food, fish and other products being taken from further away. | Moderate | MC5a | The creation of the Finima nature park has set aside a large area of forest which is currently protected. NLNG should stimulate community involvement, for example the further involvement of local schools through hands on <i>in situ</i> education on nature conservation. | Minor | NLNG Community Relations Manager (ERC) with support from Head of Environment (HSEQ/1) | In the third quarter of 2004 |
| | | | MC5b | Asserting control over the sterile zone will limit access and hence reduce activities which are damaging to the forest. | | NLNG Production Division Manager (PD) | Before the start up of Train 6 |
| C6 | Generation of untreated sewage and dumping of solid waste in and around shanty towns will not increase per se, but the effects of it in the receiving environment will be incremental (e.g. build up of residues in soil and sediments; accumulation of waste in areas close to the settlements). This continues to have the potential to propagate water borne and food borne diseases (e.g. possibility of raw sewage or faeces-tainted runoff getting into streams used for washing and bathing). | Negligible | EC6a | NLNG will assess the situation with regard to sewage and waste accumulation in and around the shanty towns in more detail and discuss possibilities for improvement with representatives of the Finima community. | Negligible | NLNG Community Relations Manager (ERC) with support from Head of Environment (HSEQ/1) | In the second half of 2004 |
| | | | EC6b | NLNG will work with the Local Government Authority to promote and achieve the goals set out in the Bonny Master Plan for sewage treatment and waste management, particularly in Bonny Town and New Finima. | | | |
| C7 | The decommissioning of camps and contractor areas will lead to an outflow of people, which has an adverse effect on the local economy (e.g. restaurants, shops, etc.) and may lead to the loss of income (rents, opportunities for contracting, etc.) | Major | MC7a | NLNG should anticipate both social and environmental issues resulting from the decommissioning of camps and should make plans which allow for a timely implementation of camp decommissioning at the end of the constructions phase. | Moderate | NLNG Head of Projects (PEO) and the EPC contractor | Planning before the start of construction |
| | | | MC7b | NLNG should actively help people to anticipate changes accompanying disbanding of the NLNG and contractor workforce (e.g. promoting the existing micro credit scheme programme, running awareness programmes in the communities, stimulating the use of existing learning and education opportunities like the new vocational school which will start in 2004). | | NLNG Community Relations Manager (ERC) | Start in the second half of 2004 |
| C8 | The decommissioning of camps and contractor areas will lead to an outflow of people, which reduces the pressure on the (social) infrastructure and the cost of living. | Positive | --- | This needs no mitigation or enhancement. | Positive | NA | NA |

| Table 5.1: Mitigation and Enhancement Table for the NLNGSix project | | | | | | | |
|---|--|--------------------------|------------|---|------------------------|---|--------|
| | Impact | Rating before mitigation | | Description of mitigation | Residual impact rating | Responsibility | Timing |
| C9 | The decommissioning of camps and contractor areas will lead to an outflow of people who are most likely not indigenous to Bonny Island, which will have a positive effect on the restoration and preservation of traditional values, languages, customs, etc. | Positive | --- | Opportunities for enhancement further to MX5 | Positive | NA | NA |
| C10 | The decommissioning of camps and contractor areas means that land will be reinstated which increases the availability of and access to natural resources. | Positive | --- | Opportunities for enhancement possibly linked to EX3 | Positive | NA | NA |
| O1 | Associated gas feed to the plant will reduce ambient methane and carbon dioxide in the delta, reducing the region's contribution to global warming. | Positive | --- | This is a positive effect. All possible opportunities for the capture of associated gas will be explored. | Positive | NA | NA |
| O2 | Increased movement of NLNG ships for Train 6 will continue to restrict fishing in that area of the channel. Ballast and other discharges from NLNG vessels and incidental spillage could have some effect on aquatic water quality. In addition ballast discharges could import species alien to the Niger delta. Both of these could damage the natural environment and could reduce the level of income and financial flows for local fishermen. | Moderate | MO2 | Train 6 operations related ships and ship movements will adhere to NLNG's policies on marine operations which comply with international MARPOL procedures. All marine operations will be dealt with in a separate environmental impact assessment that is undertaken for the channel deepening project. This includes ballast waters, incidental spillage and emergencies as well as a fisheries study. With regard to the level of income for fisherfolk there are opportunities for enhancement in relation to EX2 and EX3. | Moderate | NLNG Head of Environment (HSEQ/1), being the focal point for the channel deepening EIA. | NA |
| O3 | The extension of the sterile zone may reduce access to the forest for resource exploitation. | Negligible | --- | Reduced resource exploitation is a negligible negative impact. However, controlling access to the sterile zone might also have a positive effect. Degrading activities can no longer take place within the sterile zone and thus the forest is effectively protected from depletion. Natural regeneration may diminish the current state of degradation. This opportunity for enhancement ties into management action MO4b. | Negligible | NA | NA |

| Table 5.1: Mitigation and Enhancement Table for the NLNGSix project | | | | | | | |
|---|--|--------------------------|------|--|------------------------|--|--------------------------------|
| | Impact | Rating before mitigation | | Description of mitigation | Residual impact rating | Responsibility | Timing |
| O4 | Because the road between the eastern site boundary and the current lay down area is in the extended safety zone as well as part of the road next to the fence of the lay down area (to the south east), people would be exposed to potential danger and for that reason they can no longer use these roads. | Moderate | MO4a | NLNG should enforce a strict policy of no access to the safety zone (10^{-5} risk contour). This should be done by gating and fencing the safety zone. | Negligible | NLNG Head of Security (PDS) | Before the start up of Train 6 |
| | | | MO4b | NLNG will identify effective ways of controlling access to the sterile zone (10^{-6} risk contour). | | NLNG Production Division Manager (PD) | Before the start up of Train 6 |
| O5 | The expansion of NLNG's operations with a sixth train could create opportunities for contracting and procurement and may lead to employment | Positive | --- | Opportunities for enhancement further to MX6 | Positive | NA | NA |
| O6 | Various emissions from power generation, acid gas incinerator and waste incinerator will adversely affect air quality | Moderate | MO6 | Emissions from Train 6 will be monitored through NLNG's routine air quality monitoring programme which includes areas remote from the plant site (including Bonny Town and Finima). The results will be assessed regularly to ensure continuing compliance with WHO, EU and FEPA guidelines. | Negligible | NLNG Head of Environment (HSEQ/1) | Start up of Train 6 |
| O7 | Operational and traffic noise could disturb wildlife and cause them to avoid forested areas close to heavily used roads and the plant site. | No impact | --- | No mitigation required | No impact | NA | NA |
| O8 | More frequent lighting within the estuary may affect the quality of the estuarine habitat. | Negligible | MO8 | Although there are no obvious reasons for mitigation, lighting will be included in the scope of the channel deepening EIA | Negligible | NA | NA |
| X1 | A number of mitigation measures resulting from earlier EIA's, have previously been agreed by NLNG but local people do not feel that these have been fully implemented. Furthermore community representatives feel that there are still items outstanding from the Agreement between NLNG and the Amayanabo of Grand Bonny Kingdom, dated May 2000. | NA | MX1a | NLNG will fulfil its promises to the representatives of the local community and will implement all previously agreed mitigation and enhancement. | NA | NLNG Community Relations Manager (ERC) | Start mid 2004 |
| | | | MX1b | NLNG should build on the improving community relations with the local people and should continue to provide support for community development in close cooperation with the appropriate bodies. | | NLNG Community Relations Manager (ERC) | Ongoing (Continuous programme) |

| Table 5.1: Mitigation and Enhancement Table for the NLNGSix project | | | | | | | |
|---|--|--------------------------|------|--|------------------------|--|--|
| | Impact | Rating before mitigation | | Description of mitigation | Residual impact rating | Responsibility | Timing |
| X2 | The exclusion zone around the jetties is perceived by fishermen as an acceptable restriction in access to 'their' fishing grounds. | NA | EX2a | Although the fish catch study did not indicate any need for compensation, NLNG will work with BECC to assist the Bonny Indigenous Fishermen Cooperative (representing the Bonny Kingdom fishermen) in obtaining the right supplies and materials (e.g. boat engines, fishing gear, etc.), so that they can undertake fishing activities well outside the exclusion zone. This enhancement measure will not exclude the fisherwomen. | NA | NLNG Community Relations Manager (ERC) | Started, first project to be finished in 2003, thereafter on an annual basis |
| | | | EX2b | To promote sustainable development NLNG in conjunction with BECC will encourage, where feasible, fisherfolk to engage in mariculture/aquaculture using pen and cage culture. | | NLNG Community Relations Manager (ERC) | Start in the second half of 2004 |
| | | | EX2c | NLNG should start a dialogue programme, on a structured and six-monthly basis, through BECC (as the official body designated by the Bonny Kingdom) in order to share knowledge with the fisherfolk (and initially to inform them about the results of the fish catch study). | | NLNG Community Relations Manager (ERC) | Ongoing on a six monthly basis |
| X3 | Local people are worried that it is more difficult to gain a livelihood with their traditional occupations such as collecting forest products, growing certain crops and fishing. In general they are concerned that they need to adjust their livelihoods to cope with demographic and societal dynamics. | NA | EX3a | NLNG must revive and adjust the micro credit scheme, so that it can become an even more effective instrument for occupational readjustments and for business projects that contribute to sustainable development. | NA | NLNG Community Relations Manager (ERC) | To start in 2004 |
| | | | EX3b | NLNG, in consultation with BKDC and BECC, will support indigene farmers and fisherfolk through funding and provision of extension services to identified agricultural and fisheries entrepreneurs to produce more food and to establish cottage industries to process and store farm, fisheries and forest products. This is expected to move these practices from mere subsistence to commercial levels, which will ensure economic sustainability further to EX2b. | | | |

| Table 5.1: Mitigation and Enhancement Table for the NLNGSix project | | | | | | | |
|---|---|----|--|------------------------|--|-------------------------------------|--|
| Impact | Rating before mitigation | | Description of mitigation | Residual impact rating | Responsibility | Timing | |
| X4 | Stakeholders feel that there has been an increase in prevalence of communicable diseases (malaria, tuberculosis, waterborne diseases, etc.) as a result of the ongoing presence of a large number of non indigenes. This has put considerable pressure on health facilities (both human and infrastructural). | NA | <p>MX4a NLNG will instigate an annual monitoring programme of selected health indicators, including data on morbidity, mortality, infant mortality, etc., to be based on readily available data within Bonny Local Government Area.</p> <p>MX4b NLNG will commission a survey of existing health facilities and their work load, identify deficiencies and inefficiencies and will implement intervention programmes on the basis of this.</p> <p>MX4c NLNG will assist by:</p> <ul style="list-style-type: none"> • the provision of locum doctors • the provision of part time nurses • the provision of drugs • the provision of medical equipment | NA | NLNG Community Relations Manager (ERC) with support of the Chief Medical Officer (PMS) | Starting in the second half of 2004 | |
| X5 | Local people feel that the influx of non indigenes has had an adverse effect on their traditional language and culture and they are worried their traditions and customs will not recuperate. | NA | <p>MX5a NLNG will sponsor the teaching of Ibani language in a limited number of primary schools</p> <p>MX5b NLNG will support the establishment of an Ibani cultural centre for research and continuity of cultural values</p> | NA | NLNG Community Relations Manager (ERC) | As soon as possible | |
| X6 | The NLNG project has employed a very large number of people since its start and Bonny indigenes feel that they have not benefited sufficiently from employment with NLNG either through contracts for local businesses or through direct employment in construction or operation of the plant. | NA | MX6 Although limited, Train 6 will have a positive effect on job opportunities. Any additional openings – for construction activities or operations, for contracts or direct employment – occasioned by Train 6 will be filled with due consideration for adequate representation from the Bonny indigenes in line with NLNG's employment standards and policies and consistent with Federal Government guidelines on employment. | NA | NLNG Production Division Manager (PD) | Before the start of construction | |

| Table 5.1: Mitigation and Enhancement Table for the NLNGSix project | | | | | | | |
|---|--|--------------------------|------------|--|------------------------|--|---------------------|
| | Impact | Rating before mitigation | | Description of mitigation | Residual impact rating | Responsibility | Timing |
| X7 | Stakeholders do not know what to do in case of emergency and they are worried that there is insufficient emergency services and evacuation capacity to cope with a major incident. | NA | MX7 | NLNG will set up effective communication as part of its community relations programme to ensure that the surrounding communities know that such a plan is in place and understand that the design of the plant and the operational procedure are designed in such a way that the surrounding communities will not suffer from incidents. | NA | NLNG Community Relations Manager (ERC) | As soon as possible |