vedanta

The Lanjigarh development story:

Vedanta's perspective

“

The Government of India and the Orissa Government should take a keen interest to set up at least a large alumina plant because we have got a heavy deposit of bauxite in Niyamgiri and Sijimalli of Kalahandi district.

Several discussions have been held at the State and Central level. But there has not been any alumina plant. If there is an alumina plant, then a minimum of 40,000 people can be sustained out of the different kinds of earnings. From that, sir, I am suggesting some permanent measures. This is a chronic problem”

Mr Bhakta Charan Das, Kalahandi MP, speech to the Lok Sabha, India’s National Parliament, 28 November 1996

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About this report

Vedanta Aluminium Ltd has set up and is operating a 1 million ton alumina refinery at Lanjigarh, in the district of Kalahandi, Odisha State, India, based on a memorandum of understanding (MoU) signed with the Government of Odisha. Up to 150 million tons of bauxite for the plant will be supplied by the Orissa Mining Corporation (OMC), a Government of Odisha-owned enterprise.

Although the Alumina Refinery Project was commissioned in 2007 and the mining project was cleared by the Supreme Court of India in 2008, OMC has not yet been able to start the mining project mainly due to the rejection of the final clearance by the Ministry of Environment and Forest (MoEF).

For a second time, the future of the mining of bauxite on the Niyamgiri hill ranges is subject to review by the Indian Supreme Court and is consequently subjudice. Hence Vedanta is not commenting on issues related to the mining project and this report is restricted to giving an account of Vedanta's stewardship of its Lanjigarh refinery.

The report has been drafted to provide a broad response to issues raised by NGOs and others and specifically the issues raised by Amnesty International in its reports titled *"Generalisations, Omissions and Assumptions: The failings of Vedanta's Environmental Impact Assessments for its bauxite mine and alumina refinery in India's state of Orissa"* published in 2011, and *"Don't Mine us out of Existence: Bauxite Mine and Refinery Devastate Lives in India"* published in 2010. These two reports cover a range of issues including that:

- Pollution associated with the Lanjigarh Alumina Refinery has seriously undermined human rights, including the right to health and a healthy environment, and the right to water.
- The proposed bauxite mining project threatens the survival of a protected indigenous community.
- India's Government bodies have failed to respect and protect the human rights of communities as required under international human rights laws.
- The companies involved in the mines and refinery projects have ignored community concerns, breached State and National Regulatory framework, and failed to adhere to accepted international standards and principals in relation to the human rights impact of business.

We want to make this report accessible to a wide range of stakeholders as well as to respond to Amnesty's challenges, most of which are technical and detailed. Amnesty has made a large number of comments on the policies and practices of the Indian Government and the State of Orissa as well as the mining project of OMC, but again this report is confined to the issues related with the alumina refinery only. The report is structured into two distinct parts:

1. This first part is a general introductory section that sets a context by giving background information about the company and our industry, the history of the Lanjigarh Project and a broad response to Amnesty's concerns.
2. The second part gives a detailed response, point by point, to all the issues raised by Amnesty in its *"Generalisations, Omissions and Assumptions"* report.

Throughout both sections of the report we have given references to other sources of information which readers may like to consult, and provided detailed appendices. We have also sought to include maps, diagrams and photographs to assist the reader to understand the issues and gain a holistic picture of the challenges we have undertaken to address.

Statement by president and Chief Operating Officer Dr Mukesh Kumar, Vedanta Aluminium, Lanjigarh

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The purpose of this report is to present a clear context and holistic contextual perspective to our stakeholders on the Lanjigarh refinery operations, including human rights aspects, environmental and safety management practices, community interventions and stakeholder engagement. The report will present broad information about the Vedanta Group, and detailed information about the operations and procedures practiced at its Lanjigarh Alumina Refinery.

Amnesty International has raised concerns about Vedanta's Lanjigarh operations primarily on human rights and the economic, social and environmental issues impacting on the local community around the refinery. It has particularly criticised the scope of Environmental Impact Assessments (EIAs) used in the development of the refinery. This report – apart from addressing these concerns – also presents a comprehensive view on these matters with new data that has not been in public domain until now.

In a region where inhabitants have witnessed virtually no major development interventions since Independence, the Lanjigarh Project is regarded by the local population as presenting a significant opportunity for progress and growth. As a company with its roots in India with global operations, Vedanta acknowledges its duty to value the socio-economic landscape of the region, local culture and traditions, which it has endeavoured to safeguard and protect. Additionally, in its operations the company has ensured best in class technology and processes for our refinery with minimum environmental impact.

Today we have more than 2,500 employees and contractors, of whom a significant majority are locals. We have also created significant livelihood opportunities around our plant through various contractors/suppliers. Our community programmes target the key concerns of the locality such as health, education, empowerment of women and basic infrastructure development and we have made significant improvements on these fronts, which are evident from the statistical data published by the Government. To accelerate the process of development, and to avoid duplicating projects that are run by the State Government, Lanjigarh Project Area Development Foundation (LPADF) has been formed as required by the directives of the Honourable Supreme Court of India. The company will contribute 5% of its profit from the Lanjigarh Project before interest and tax or USD 2.2 million per year, whichever is more, for the development of the area.

In November 2010, the UK-based independent consulting agency URS Scott Wilson undertook an extensive review of the sustainability performance of the alumina refinery and its associated operations and most of the observations made by them have already been dealt with.

In due course, we further aligned our policies and standards with international standards and best practices. In line with our goals, we have undertaken a comprehensive gap analysis on Environment, Health, Safety and Social (EHS&S) performance of the Lanjigarh operations by engaging Environmental Resources Management with respect to the IFC Performance Standards, OECD Guidelines and ICMM Sustainable Development Framework and are working on the Environmental and Social Action Plan (ESAP) to address the identified gaps.

I strongly believe that we have and can further make a significant contribution to the lives of the people of Lanjigarh and surrounding areas and can act as a catalyst and fulcrum to the development of the region. At Lanjigarh, we have built a major hospital and established mobile health units to provide hard-to-reach areas with an effective mechanism for accessing healthcare, treating malaria, gastroenteritis and viral infections among many other diseases and injuries sustained in arduous daily lives.

We offer this report to Amnesty and other stakeholders with a positive outlook and are open to engagement and feedback/suggestions on the growth and development journey of Lanjigarh.

Dr Mukesh Kumar

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Executive summary

EXECUTIVE SUMMARY OF THE REPORT

About Vedanta

Vedanta Resources plc is a London-listed diversified FTSE 100 metals and mining group, with extensive interests in aluminium, copper, zinc, lead, silver, iron ore, commercial energy and very recently in oil and gas. Our foot print is spread over eight countries through several dozen operations, largely in India and Africa.

Vedanta's mission is *"to be a world class, diversified resources company providing superior returns to our shareholders with high-quality assets, low-cost operations, and sustainable development."* Our Code of Business Conduct sets out the basics by which we do business and it is aligned to international standards including a specific policy statement on how we will strive to uphold fundamental human rights. We have adopted best in class international standards for both our business and sustainability practices. In 2011 we adopted the International Finance Corporation's (IFC) sustainability standards and have since aligned our business operations to them.

As an India-rooted company and operating mostly in developing countries, we clearly understand the need for national development where we operate and we seek to make our own distinct contribution through our business activities and wider community contributions. We know that our industry cannot do business without the support of the local community and we are committed to minimising our negative impacts on the community and to promote development far beyond the immediate impact of our business. This has been the approach of Vedanta around the world and in Lanjigarh.

India and aluminium

Aluminium is an essential metal in the modern world and its consumption is growing faster than any other of the Earth's major minerals. It is vital to the wider developmental aims of countries such as India, where 40% of consumption is committed to the development of the country's electrical supply industry. The Indian aluminium market is growing, yet per capita consumption is extremely low (currently Germany consumes 26 times the volume of aluminium per capita than India). With over 7% growth per annum, one of the highest in the world, India's aluminium production is poised for even further growth. India has abundant raw material deposits to produce aluminium, most of which are in Odisha. Coupled with India's efficiency in operating large manufacturing plants and the availability of trained technical manpower, there is an excellent case to put forward for encouraging this vital industry, which produces extensive job opportunities locally and in the wider economy.

Development in Orissa

Since India's independence in 1947, the state of Odisha has been recognised as one of the poorest regions within the country. As early as the late 1980s, the Indian Government saw the need to take positive action aimed at creating a sustainable economy for the people of Odisha. Within Odisha the western districts of Kalahandi and Koraput, where the Lanjigarh Project is located, are some of the poorest areas of the State, where it has been estimated that about half of the population live on less than one US dollar per day. Due to severe drought conditions in the 1980s and 1990s, starvation and death compelled people to migrate for survival. In the mid-1990s it was recognised that the state's mineral wealth represented the most viable route to achieving rapid economic improvements.

Vedanta's willingness to invest in Lanjigarh has been welcomed by the Government of India and the State of Odisha, and from its very inception Vedanta has known that the refinery project is not the only contribution to development we must make in Odisha. We have recognised that industrial development needs to be complemented by rural and other forms of development for those, including the Dongria Kondh and Kutia Kondh – the two tribal communities living around the plant, that may not benefit directly or indirectly from the refinery's activities.

The Lanjigarh Project

Against this background, the first steps to establish the Lanjigarh Project were taken in April 1997 when Sterlite Industries and the Government of Odisha signed an MoU to create an integrated mining and refining project in Kalahandi. An MoU was also signed between Sterlite Industries and Orissa Mining Corporation (OMC) for the supply of bauxite from nearby deposits, beginning with the bauxite deposits on the edge of Niyamgiri hills. In 2004, the MoEF gave permission to Vedanta to set up the alumina refinery.

The project consultation process

Once the strategic decision had been taken that there should be a project at Lanjigarh, extensive community consultations took place based on a series of "rapid" then "comprehensive" Environmental Impact Assessments (EIAs) mandated by the regulatory requirements of the country. It is these documents that Amnesty has questioned in detail, but they form part of a legally mandated process that involved extensive consultations with more than 5,000 people, including representatives from the Dongria Kondh and Kutia Kondh communities. The outcome of the EIAs and the wider community consultations led to modifications to the initially proposed project plans, such as relocating the source of water for the refinery to a river situated more than 60km from the project site in order to avoid using local water resources, and a further strengthening of the red mud pond with superior reinforcing to the reservoir structure to protect local water sources and improve safety.

The refinery

The site of the refinery was selected in principle based on a feasibility study carried out by independent consultants, who addressed a range of macro-economic, development and local issues such as the need to keep the displacement of families to a minimum.

A key test of the company's values and competence is how well it operates a plant like the refinery and to meet its ambitious vision of being a world class operation. At Lanjigarh, Vedanta has aligned its operations to global technical standards in the industry. The refinery now employs approximately 2,500 people directly (about 550 Vedanta employees and 1,950 contractors). Women make up 16% of the total staff, which in itself is a precedent in the industry in terms of providing equal opportunities and a key company policy with human rights implications.

Similarly Lanjigarh has a young workforce with almost three quarters of its employees being 20 to 35-years-old and our youngest employee being 20 years of age. The majority of our staff are local inhabitants and belong to the District of Kalahandi and other adjoining areas close to the refinery. Beyond our direct workforce we estimate there are about 1,900 workers employed by our contractors who are involved in providing a wider range of goods and services such as haulage.

All salaries for Vedanta employees exceed the standards set by the Orissa Minimum Wage Act. We monitor supplier conformity with legal standards and strictly prohibit all forms of child labour. For the local community, the downstream employment opportunities are developed in the form of small shops and stores, taxi driving, cafes etc. Along with these livelihoods the area has seen the creation of demand for essential food supplies such as vegetables, which has assisted in supporting the farmers around the refinery.

Assuming that the refinery is supporting around 4,400 jobs directly and in its supply chain, it is not unreasonable in a developing country to presume that these jobs themselves support similar numbers in the wider community too, which would currently mean around 8,000 to 9,000 jobs in Kalahandi and beyond. [1]

In addition to the economic and social impacts generated from the activities of the refinery, we have developed extensive community outreach programmes in education, healthcare, economic and cultural development. These are designed to help the local community within 50km of the refinery gain development benefits from our presence.

[1] Based on a simple and conservative job multiplier for a developing country, that for every job in the plant and its value chain there is probably one in the community among farmers, stall holders, taxi drivers and others

Relations with the community

When the refinery was established, 121 families were physically displaced. These have all been resettled in the Niyamgiri Vedanta Nagar Resettlement Colony, with 76 family members being employed with the company as permanent employees. Compensation in lieu of employment is being provided to the remaining families. A further 1,745 people affected by the refinery but not physically displaced have also been compensated at varying degrees commensurate with the extent of the impact sustained by the setting up of the refinery. In all cases compensation went substantially beyond the legal requirements.

Our approach to community development requires us to consult, evaluate and understand the need of the community and, based on what has been learned, make a major commitment of resources to assist the local population in both mitigating the adverse impacts of the refinery (construction and operations) as well as helping them improve their quality of life.

Our community engagement vision is to ensure:

"Sustainable development of the local community living in the core and periphery habitations and emerging as a responsible corporate partner of the government and the people at large"

We have a professional community team under the auspices of the Corporate Social Responsibility (CSR) Department, which is supported by outreach workers who focus on the wellbeing and welfare of communities around the refinery. Our primary areas of development focus are:

- Health and sanitation: We have built a hospital (currently catering to the health needs of approximately 200 people per day), provided mobile health clinics and at regular intervals organised health and awareness camps in collaboration with the Government Health Department on malaria and HIV/AIDS (20,000 people attended the latter).

- Education and child nutrition: We have set up 36 childcare centres and support a nutritional meals service for about 1,000 pre-primary education centres and created a centralised meal serving centre for nearly 275 schools. We have also built Lanjigarh's first English language senior secondary school and are in the process of developing the first degree science college in the Lanjigarh district.

- Sustainable livelihoods: We have been working with farmers to increase production, introducing new and superior varieties of crops with higher yields, such as organic cotton. Through self-help groups (SHG), we have helped about 600 women, including large numbers of Dongria Kondh women, to create and sell leaf plates to the local market, providing them with a monthly income of at least US$35.

- Infrastructure development: As and where needed, for example providing tube wells for facilitating easy access to potable water and the construction of river/flood check dams such as the Bhatguda Dam.

Our welfare and community empowerment interventions are regularly reviewed by independent experts and auditors and we firmly believe that measurable improvements in the lives of the community can be illustrated as an outcome of such programmes. For example, we have helped raise the child immunisation rate in Kalahandi to about 71% in 2008 from 35% in 2005-06, reduce child malnutrition from 58% in 2005-06 to about 30% in 2008, and raise school attendance rates to 86% in 2008 from 45% in 2005-06.

Source: AISD, Ranchi & XISS, Ranchi, July, 2008

Benchmarking our performance against the UN's Millennium Development Goals we have concluded that while significant progress has been made in relation to these key development indicators, scope remains for progress in community empowerment. Following the order of the Indian Supreme Court (the ultimate judicial body of the country) in 2008, a Special Purpose Vehicle (SPV) called the Lanjigarh Project Area Development Foundation (LPADF) was created. It requires Vedanta to contribute 5% of the annual profits of the project before interest and tax or US$2.2 million, whichever is greater, to local community programmes each year.

The future of the refinery

The refinery represents about US$1 billion of investment for Vedanta. It was built on the economic assumption that bauxite would be readily available from the Niyamgiri Hills and other nearby sources and that it could in due course expand to increase capacity and achieve greater bauxite utilisation. The refinery represents the only major industrial project of the impoverished Kalahandi District and any uncertainty about its future and economically sustainable operations may threaten the livelihoods of about 8,000-9,000 people who are dependent on the refinery, as well as the future of the community interventions that have been developed.

The dilemma is: *"Can a large-scale industrial complex live side by side with bottom-up rural development, the conservation of the vast majority of the Niyamgiri Hills and the culture of the Dongria Kondh?"* We believe it can and indeed the project could be a highly effective agency for ensuring the success of all-round local development.

Amnesty's critique of the Lanjigarh Project

Amnesty's critique of the Lanjigarh Project is based on its commitment to ensure that, *"every person enjoys all the human rights enshrined in the Universal Declaration of Human Rights and other international human rights instruments".* Vedanta has a profound respect for the Universal Declaration of Human Rights and related instruments such as those of the International Labour Organization (ILO), which constitute the foundation for human wellbeing and quality of life.

Vedanta seeks to conduct its business in accordance with its principles. We believe that our regard for labour rights, women's rights and our opposition to child labor in our business, the supply chain and the community demonstrate this commitment.

The UN and the wider world has been developing a new appreciation of the rights of indigenous and tribal peoples over the past 20 years and there are still some uncertainties concerning their exact social and cultural identity. The Indian Constitution does not recognise indigenous people as such, however it does recognise Scheduled and Primitive Tribes as vulnerable groups who are given special protection under the law. We work within the Indian law and in addition recognise the Dongria Kondh as a tribal group that need special protection and consideration. We are also developing our practice in respect of such groups in India and elsewhere using the IFC sustainability standards which we have adopted at a group and unit level to ensure good practice. These standards provide many useful guidelines even if they need some adaptation for the Indian context.

Amnesty's critique of the environmental impact assessments (EIAs)

The core of Amnesty's approach is based on a sustained criticism of the project EIAs that make up the main documents that form the basis for its planning and consulting with the local community.

In Amnesty's view, the nature and scale of consultations with the local populace were inadequate and they lack human rights. While being very substantial, EIAs are "environmental" impact assessments and Amnesty agrees that they are not tools for a human rights appraisal. To better judge the project in these respects, Amnesty would need considerably more information than is contained in the EIAs and Vedanta acknowledges that much of the necessary information needed is not in the public domain.

We are determined to provide more facts and information to all our stakeholders on the Lanjigarh Project; we do so in **The detailed response to Amnesty's "Generalisations, Omissions and Assumptions"** of this report and we have also developed the Lanjigarh micro site www.lanjigarhproject.vedantaaluminium.com, including the URS Scott Wilson reports at www.vedantaresources.com/uploads/vedantasummaryreport0812.pdf. We want to show that we have not developed the project solely on the basis of the EIAs but have used a wide range of additional material, much of it from independent consultants, to help us to plan and execute what we do.

Managing responsibly at Vedanta

When we develop a project like Lanjigarh we take the following factors into consideration:

- India's legal framework
- The requirements of the EIAs
- Company policy and standards
- Stakeholder engagement
- Performance and risk assessment
- The way forward and potential for improvements

In **The detailed response to Amnesty's "Generalisations, Omissions and Assumptions"** of this report we apply this approach comprehensively to each of the claims that Amnesty has made about the project EIAs and hopefully begin to show how we have sought to manage the project in a responsible manner. Also in **The detailed response to Amnesty's "Generalisations, Omissions and Assumptions" Report** and in a detailed technical appendix, we have provided an indication of how issues of concern to Amnesty about water, dust and noise pollution are monitored and managed with reference to community concerns.

Dialogue with Amnesty

Since Amnesty has taken an interest in the Lanjigarh Project, we have sought to engage with it. We believe that the criticisms it makes based on the limited data available to it, notably in the EIAs and elsewhere, means that we need to give much more information about the initiatives taken by Vedanta in the field of social and environmental management to mitigate the adverse impact, if any, of the refinery. We hope that this report, which begins to present a much wider range of information, will be a step towards improving the quality of our dialogue.

Our continuing journey

We firmly believe that responsible stewardship, building strong relations and adding value to people are the vital underpinning to any long-term sustainability strategy and we have been continuously evolving our approach. We have a robust sustainability governance structure led by the board-appointed Sustainability Committee, chaired by senior independent director Naresh Chandra. The committee oversees and reviews sustainability performance and the Committee chairman regularly updates the board on the ensuing progress made. Mr Chandra is also a member of the Audit Committee.

The Sustainability Committee's mandate covers all aspects of sustainable development, including policies, commitments and the approval of the company's Sustainable Development Report report. In addition, it reviews compliance of the law and expected international standards of governance and outlines initiatives required to institutionalise a sustainability culture through the involvement of employees at every level of the business. It is also integral to corporate risk assessment and management and advises the board on performance, has approved our sustainability policies – including human rights issues – and monitors the implementation of the management framework. The chief sustainability officer (CSO) provides information and updates to the committee on international standards and best practices, including industry benchmarks.

As noted in the Sustainability Committee Report in our Annual Report (see http://www.vedantaresources.com/investor-relations.aspx), over the last year the committee oversaw the following programmes:

- Accident reduction and the prevention of harm to employees and contractors
- Water use reduction
- Energy and carbon use reduction
- Clean development mechanism programmes
- Implementation of URS Scott Wilson report recommendations
- Waste management

In addition the committee approved the following seven new sustainability policies and amended our existing Health Safety and Environment (HSE) policy:

- Biodiversity
- Water
- Energy and carbon
- Supplier and contractor management
- Social
- Human rights
- HIV/Aids

We have further strengthened the management of sustainability by incorporating an Executive Committee Sustainability Subcommittee, which is charged with driving key sustainability issues and processes through the business, and is chaired by our CEO M.S Mehta.

Developments at Lanjigarh

The developments in our sustainability policy and practice are being applied to VAL at Lanjigarh. To ensure that global best practices are adopted in the spheres of environment, health and safety, several audits are illustrated in the following exhibit have been undertaken by independent reviewers and audit agencies at Lanjigarh.

Independent audits undertaken by VAL – Lanjigarh

- Socio-economic survey by Asian Institute of Sustainable Development (AISD) and Xavier Institute of Social Service (XISS) – 2006
- Social Audit of Impact of CSR Initiatives by AISD and XISS – 2008
- Independent Environmental and Social (E & S) Review and compliance with Equator Principles by Environmental Resources Management (ERM) – 2009
- Assessment Report on Compliance and Stakeholder Concerns by ERM – 2010
- Environment, Health and Safety (EHS) Audit by URS-URS Scott Wilson – 2010
- Independent Environmental and Social Performance Review with reference to IFC, OECD, ICMM and applicable Indian Guidelines by ERM – 2012

Environmental Resources Management (ERM) was commissioned to undertake an independent Environmental and Social (E&S) performance review of the Lanjigarh refining facility. The review was performed to assess the environmental and social performance of the operational plant with respect to the IFC Performance Standards, Organization for Economic Co-operation and Development (OECD) Guidelines and the Sustainable Development Framework of the International Council for Mining and Metals (ICMM) in order to develop an Environmental and Social Action Plan (ESAP) to address the identified gaps. ERM submitted its report in February 2012.

Way Ahead

Vedanta respects human rights as well as the culture of the local communities and seeks to ensure absolute compliance to all national laws and relevant international standards concerning them. We believe the project is in the interest of the country, the region, and the local inhabitants. There are dilemmas to be faced, but the key question is: *"Can the contending parties come together and make a partnership for development work?"* Vedanta is ready to play its part.

Conclusions:

Amnesty's questioning of our human rights and environmental performance challenged us to critically evaluate policies and practices that require improvement, so that the adverse effects of industrial operations on the local ecology and society can be minimised, if not eliminated.

By developing this detailed report we have reviewed all major aspects of the Lanjigarh Project in a comprehensive manner and have concluded that:

- The Lanjigarh Project is critical at the national, state and local level owing to its role in the social and economic wellbeing especially of the local community and the scale of contributions that it is financially making to society at large. As the sole major industry with almost the entire local community depending upon it for their livelihood; the Lanjigarh Alumina Refinery can well be construed as an engine of economic growth and sustenance for the region. It is creating jobs, promoting education, introducing/ facilitating healthcare services and facilities and in the process ensuring community development for local people, including the vulnerable Dongria Kondhs and Kutia Kondhs.

- While our processes, planning and consultation have been in line with all Indian national laws, we understand the need for continuous improvement, aligned to the development needs of the local community. We believe that Vedanta has behaved responsibly and will continue to do so with greater stakeholder participation in both its operations as well as development interventions. Today, across India we have 149such NGO/government/ community partnerships with which we are investing over US$38 million a year to support and supplement our community welfare and development projects. You can find case studies of many ensuing success stories available on our website http://www.vedantaresources.com/sustainability/.

- Vedanta respects the human rights and culture of the local people and accordingly our business activity and community programmes are commensurate with the principles of the Universal Declaration of Human Rights and should fully support them being lived out in all respects.

Part 1
General overview of the Lanjigarh Project

About Vedanta

Vedanta Resources plc is a London-listed FTSE 100 diversified metals and mining group, with extensive interests in aluminium, copper, zinc, lead, silver, iron ore, commercial energy and very recently in oil and gas. Vedanta has listed and unlisted operating subsidiaries across India, Africa, Europe and Australia, with about 100,000 full-time employees and contractors.

Since it was formed in 2003, the group has grown more than 10-fold through acquisitions and expansion of its existing operations. At the time of listing, Vedanta had operations only in two countries; today the company's operations have expanded to eight countries, which the group considers an opportunity for cross-cultural learning and as well as an opportunity to generate superior growth.

Mission and values

Our mission is *"to be a world class, diversified resources company providing superior returns to our shareholders with high-quality assets, low-cost operations, and sustainable development"*. Sustainability is one of our core values. In pursuing our operations in the industry, and in developing countries in particular, we must embrace an ethic of responsibility and a commitment to sustainability. This means an open engagement with the chronic problems of our global society and the many individual local communities in which we operate.

As a diversified natural resource company with oil, mining, refining and power businesses, we have a significant footprint across India and in communities located in countries as diverse as Ireland, South Africa, Australia, Namibia, Liberia, Zambia and Sri Lanka. While in 2008 our community engagement policy included around 400 villages, today it encompasses approximately 1,000 villages and benefits the lives of 3.1 million people.

To find more about Vedanta's business performance and activities go to http://www.vedantaresources.com/ and for our sustainability and corporate responsibility performance and activity for the group as a whole, see our Sustainable Development Report which describes our holistic approach to sustainable development and the recent developments we have made in developing our Governance and Sustainability Framework. It can be found at http://www.vedantaresources.com/sustainability/our_strategy.html

Corporate responsibility and human rights

We believe that the materials we produce bring substantial benefits to humanity at large but at the same time acknowledge that the metals and mining industry has inherent health and environmental challenges to the locality in which it operates. It is our responsibility to minimise all adverse impacts such as the displacement of local residents while maximising the benefits to them, for example by job creation and community outreach programmes in health and education. These are particularly important since most of our operations are typically located in rural areas and in developing countries. In this context a commitment to law in every jurisdiction, wider corporate responsibility and human rights also assumes paramount importance.

With evolving international understanding and regulations creating a clearer focus on human rights, we amended our Code of Business Conduct in 2011 to include a specific commitment to human rights, which is as follows:

"At Vedanta, upholding people's fundamental rights is central in our everyday business operations. At a minimum Vedanta will comply with all applicable local, state and national laws regarding human rights and workers' rights where the company does business.

All our businesses are compliant with the applicable regulations, strive to uphold all labour rights and are aligned with national and international regulations. All employees are required to comply with our human rights policy."

To see the full Code of Business Conduct go to http://www.vedantaresources.com/sustainability/human_rights.html and the Vedanta Group Human Rights Policy, also available on our website and presented as Appendix 1.

As can be seen, our human rights policy covers a wide range of issues both in the workplace as well as the community. Consequently we have developed a supporting range of group "Operating" and "Technical" standards guiding employees in dealing with the human rights aspects on critical matters such as stakeholder engagement, land resettlement, cultural heritage and grievance mechanisms. Vedanta Aluminium operates within this group policy framework and approaches its engagement with society and environmental responsibly, paying due regards to the commitments and principles stipulated within it.

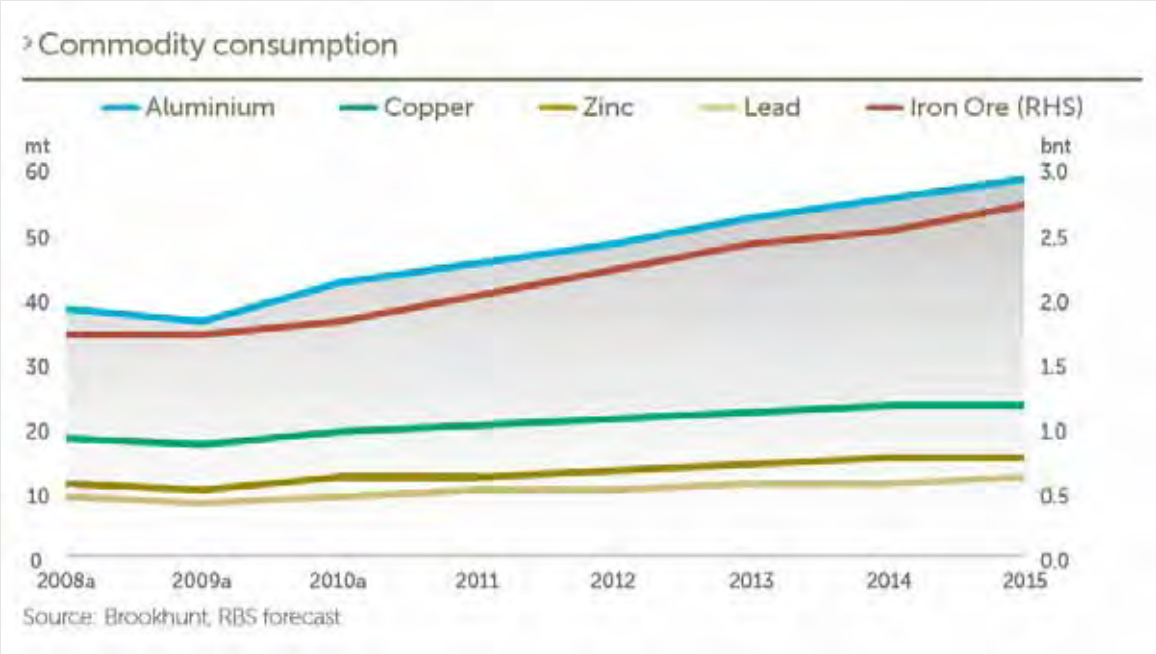
Our business model is based on growth, value creation and continuous improvement in all aspects of what we do, which also includes our social and environmental programmes and practices. As the company has grown, our engagement with society around the world has also rapidly evolved. Consequently, we have further aligned our operations with international best practice and standards as our guidance on social issues as well as industrial organisation. For example, we have used the 2012 International Financial Corporation (IFC) performance standards based on the "Equator Principles" as the basis for our sustainability framework, which is mandatory for all subsidiaries of the group to adhere to, covering the entire lifecycle of our operations. [2]

[2] The IFC is a subsidiary component of the World Bank Group and the largest international global development group that is focused solely on the private sector. The purpose of the IFC is to "create opportunity for people to escape poverty and improve their lives by: Promoting open and competitive markets in developing countries, Supporting companies and other private sector partners where there is a gap, Helping to generate productive jobs and deliver essential services to the underserved"

India, aluminium and development in Orissa

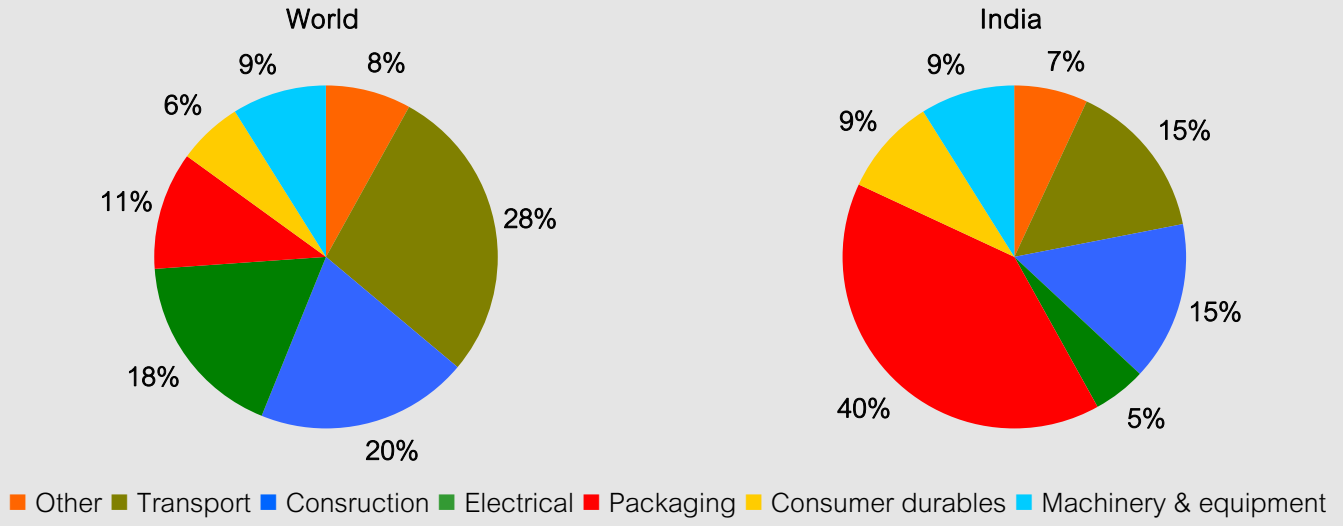
To understand the Lanjigarh operations of Vedanta Aluminium Ltd in Odisha, it is important to understand the importance of aluminium to the wider development of India as a whole. As steel was the dominant metal used in the late 19th and 20th centuries, so aluminium is poised to become the most important metal of the 21st century. As Chart 3 below shows, consumption is growing faster than any other ferrous or non-ferrous metal. Over the past 25 years annual consumption of aluminium has grown at 3%, whereas iron ore consumption has grown at only 1.8%, and the demand is consistently rising.

Chart 3. Summary of consumption trends for five of the Earth's most heavily mined metals. Trends for aluminium and iron are the only two that show significant growth over the time period and into the future.



Aluminium has many characteristics that make it attractive to use in a wide variety of products, and the fact that it is light and strong, does not corrode and is almost infinitely recyclable; are just some. Charts 4a and 4b on the next page show the main uses of the metal in India in 2008 compared with the rest of the world.

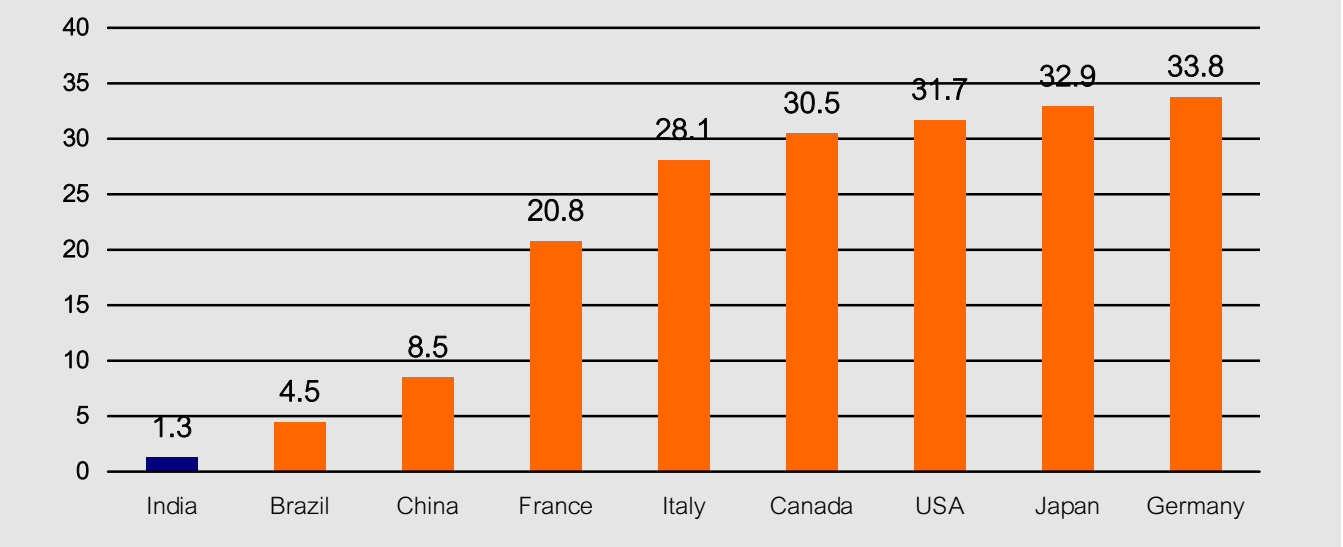
Charts 4a and 4b. 4a (left) depicting the use of aluminium worldwide. 4b (right) depicting the use of aluminium in India.
Source: EAA, USGS, Indastats, CRU, Hindalco from the Aluminium Mission Plan 2010-2020



A comparison of these two charts shows that India is using 40% of its aluminium production to support the growth of its electrical power supply through the construction of pylons, for example. The Government of India has a national priority to massively expand power supply for the country generally and in rural areas in particular, and aluminium is vital to achieving that goal. The metal is also used in the transport infrastructure ranging from railway wagons to buses, trucks, cars and two-wheeled vehicles; these are two industrial sectors vital to the wider development objectives for the country.

However, compared to the rest of the world, India uses very little aluminium per capita of its population, as **Chart 5** below shows. As a result demand is bound to rise given the thrust of the wider development agenda.

Chart 5. Per capita aluminium consumption rates worldwide.
Source:Aluminium Mission Plan 2010-2020



To cope with the growing demand for aluminum, India.is determined to develop the domestic aluminium industry both as a support for its wider development agenda and because of the benefits that the industry itself brings in terms of economic growth. Two primary factors are fees and taxes paid to government and the direct and indirect jobs created by the industry itself, not to mention the wider number of jobs created in the economy through electrical supply and indirect dependence on the use of the metal.

Job creation is an absolute priority development goal for India and there are various estimates as to the job multiplier effect of the industry, which the Aluminium Association of India describes as:

"The aluminium industry is very labour intensive and aluminium production generates huge employment opportunities. A 350kt smelter, with matching upstream and downstream facilities, will generate direct employment for over 10,000-12,000 people with indirect employment for 30,000-36,000 people in associated industries like transport, construction, power etc… Projections based on the assumption that the primary will grow at least to cater to the estimated domestic demand completely indicate that the employment potential of the aluminium industry in India, can be around 6.4 million people in the year 2020. Assuming that each wage earner supports a family of five people on average, the aluminium industry would support almost 0.5% of the Indian population."

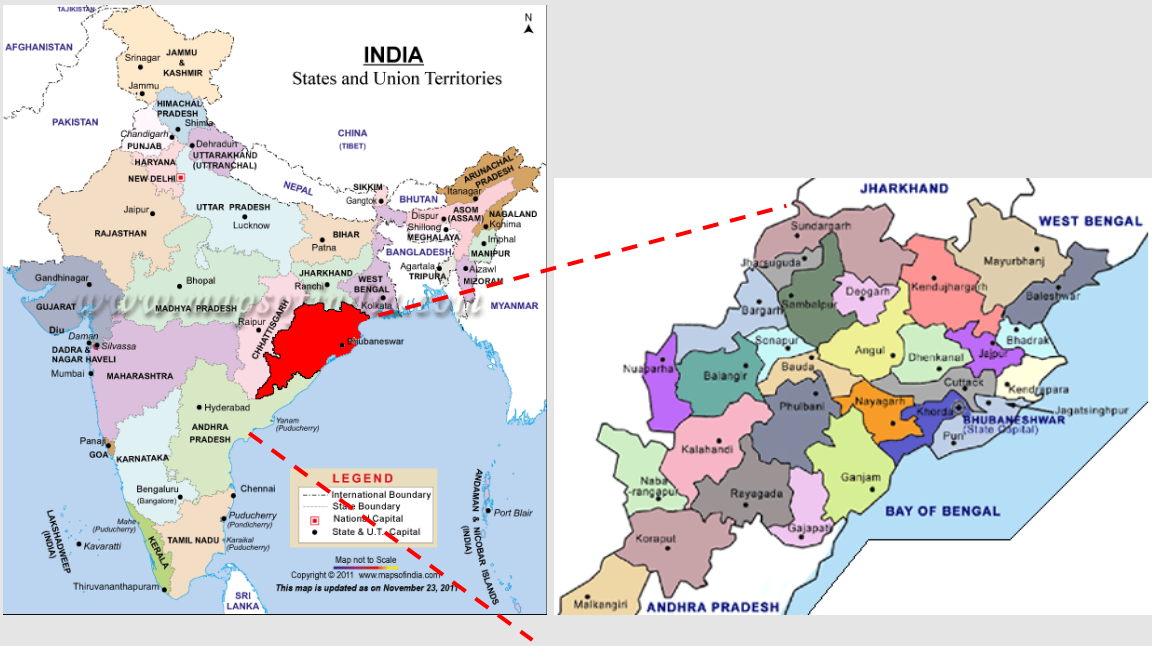
Against this background of a national need for aluminium, India is also aware of its extensive reserves of bauxite, the raw material from which aluminium is made. It is estimated that the country may have as much as 3 billion metric tons, of which about half have been identified as proven reserves. In addition, the country also possesses the requisite reserves of coal and abundant supplies of labour, and other enabling conditions to make it a very effective producer of aluminium compared to other countries. This could be the basis for a very successful aluminium industry and – more importantly – in the long run, the base for the production and export from India of value-added aluminium products.

The importance of Odisha in the aluminium industry

Within this general scenario, Odisha holds a very special position. Its geology means it is one of India's major sources of bauxite, estimated at 1,742 million metric tons or about 60% of all national reserves. Maps 1 and 2 below show the position of Odisha in relation to the rest of India and the location of the Kalahandi district.

Map 3, on the following page, shows the Rayagada-Koraput belt of deposits stretching down through Odisha to the northern part of Andhra Pradesh. The VAL Lanjigarh plant is marked in the northern portion of the belt sited next to an estimated deposit of 77 million metric tons, while other significant deposits are situated within a 60km radius of the operations. Transportation of large volumes of raw bauxite to refineries is a key cost and environmental factor, which necessitates the location of refineries to be closer to the source of the ore.

Maps 1 and 2. Map 1 (left), highlighting the geographical location of the state of Orissa (in red) in relation to the rest of India. Map 2 (right) highlighting the geographical location of the district of Kalahandi, where Lanjigarh is located, in relation to other districts within Orissa.



The bauxite of the Rayagada-Koraput belt can be regarded as relatively environmentally friendly as it is predominantly "gibbstic" in nature, which means it is amenable to low temperature/low pressure digestion, and it is also low in reactive silica, which reduces the cost and energy needed to produce alumina – the refined ore from which aluminium is made.

Appendix 2 shows in a diagrammatic form how bauxite is refined to produce alumina and then aluminium. Furthermore, there is little overburden covering the bauxite deposits, which makes it easy to remove from the site and easier to restore the area at the end of mining. Currently Vedanta produces nearly 50% of India's total aluminium production of 1.45 million tonnes. Our project in Lanjigarh is the newest investment of its type in India which, if allowed to expand to full capacity of 6 metric million tonnes per annum (MMTPA), is destined to support the production of around 2.5 million tonnes of aluminium, which in turn will allow India to expand aluminium production by nearly 200%.

Map 3. Geographical distribution of bauxite deposits in south west Orissa.

National Highway, State Highway, Roads
Alumina Refinery
Railway line
Railway stations
State Boundary
Bauxite deposit

A combination of India's broader development agenda, the rich deposits of ore in Orissa and the economic opportunity they represent, have fuelled the intents of the Governments of India and Odisha to develop this critical asset. There is also a very strong social agenda based on the need to address the extreme poverty that exists in rural Orissa and the Kalahandi district of Odisha in particular. Consequently developing the extensive bauxite deposits in the region is seen by government and many ordinary Indians nationally and locally as a major contribution to the country's development.

Economic and social conditions in Odisha

According to the 2001 census, Odisha is one of the least developed States of India. [3] At that time it had a population of about 42 million people, of which approximately 47% were living below the poverty line as compared with a national average of 27%. The trends of poverty alleviation have also been slow. In the last quarter of the 20th Century the pace of reduction of poverty in Odisha at about 9.7% was considerably less than the national average and within Odisha, the Kalahandi District where the Lanjigarh Project is located is one of the poorest in the State (see below).

In addition, about 37% of the land mass of Odisha is forests and they are vital for many tribal people as they are often their main source of livelihood. In the 1990s, about 23.5% of the state's population were classified as tribal peoples, of which the Kondh (Also known as Kondha or Khond) are the most populous, numbering about one million people. Of their economic condition, the US State Department's Report on Human Rights in India says:

"According to the Ministry of Tribal Affairs 2009-10 annual report, there are more than 700 Scheduled Tribes in the country, and the 2001 census revealed the population of scheduled as 84.3 million, approximately 8 per cent of the total population. Activists claimed that approximately half of the indigenous population lived in extreme poverty, compared to 27% of the total population."

United States State Department Report on Human Rights (2010)

This background of extreme poverty has meant that from the early days of independence, local community and political leaders have been pressing for investment in industrial development, seeing it as vitally important to reducing the chronic impoverishment of the area. On 28 November 1996 the MP for the Kalahandi Lok Sabha Constituency, Bhakta Charan Das, delivered a speech in the Lower House of the Indian Parliament pointing out the devastation caused by drought in the district and the lack of infrastructure development saying that:

"The Government of India and the Orissa Government should take a keen interest to set up at least a large alumina plant because we have got a heavy deposit of bauxite in Niyamgiri and Sijimalli of Kalahandi district.

Several discussions have been held at the State and Central level. But there has not been any alumina plant. If there is an alumina plant, then a minimum of 40,000 people can be sustained out of the different kinds of earnings. From that, sir, I am suggesting some permanent measures. This is a chronic problem."

Source: Lok Sabha Debates Session III (Winter) Thursday, November 1996

The problems of Kalahandi

Within the State of Odisha, the Kalahandi District where the VAL refinery is located is one of the least developed regions (**Map 4** below shows the location of the refinery).

[3] For 2011 Census data on Orissa go to : http://censusindia.gov.in/2011-prov-results/data_files/orissa/Data%20Sheet-%20Orissa-Provisional.pdf, Please note that data on poverty has not been published.

Map 4. The geographical location of the Vedanta Refinery site in relation to the district of Kalahandi.

The district covers an area of 7,920 sq km and according to the 2001 census has a population of over 1.3 million people with more than 90% of the population identified as rural. Just over 600,000 people in the district were classified as workers of which nearly 500,000 were agricultural labourers or "cultivators". Child labour and elements of harmful child labour were thought to be endemic.[4] School attendance was also recorded to be abysmally low, with basic healthcare being at the minimum (see below for progress made) and during the 1996-97 droughts it was reported that 57% of children were underweight.[5] In the 2001 census, literacy rates were on average 45% for Kalahandi as opposed to 63% for the state of Orissa as a whole. Within Kalahandi, the Lanjigarh Block, where the project is located, recorded a male literacy rate of 43% and a female literacy rate of 15%.[6]

The people of the district, including the Dongria Kondh inhabiting the Niyamgiri Hills of neighbouring Rayagada District, have traditionally led a life characterised by relentlessly hard physically work just to ensure their basic survival. They have not yet managed to provide themselves with much beyond the bare minimum of necessities required for the sustenance of life. In addition to the endemic economic problems of the region, natural disasters such as the periodic droughts and consequent lack of food have brought starvation and stories of children being sold to buy for food for the rest of the family. (http://en.wikipedia.org/wiki/Kalahandi_district#Kalahandi_Syndrome)

[4] Source District Statistical Handbook Kalahandi 2007

[5] Source "Nutritional status of preschool children in the drought affected Kalahandi district of Orissa" Indian Journal of Medical Research, March 2000 by Mahapatra, A, Et al

[6] Source District Statistical Handbook Kalahandi 2007

Under these circumstances the setting up of the Alumina Refinery in Kalahandi would normally have been welcomed as a positive development. About 8,000 direct and indirect jobs were created in the construction period and a permanent workforce of around 2,500 direct jobs have been generated at the refinery, of which 70% belong to the State of Odisha. However we acknowledge that many of the poor and unskilled populace, particularly the Dongria Kondh of the hill country, do not possess the requisite basic necessary skills to gain employment in a major industrial enterprise. That is why Vedanta has created community initiatives including skill development and education that generate income, as well as the settled population of the Kalahandi and Rayagada Districts.

What about the alternative view of development?

There is a worldwide debate about what constitutes "sustainable development" and many development NGOs are deeply concerned about those populations that are excluded from conventional large-scale industrial development projects such as Lanjigarh. They favour small scale "bottom-up" initiatives with small farmers and women's groups for example. Vedanta's response to their concerns is clear: modern development must be both, it cannot be either/or, and we need both forms of development to progress at the same time. Those who lead on industrial development like Vedanta must pay attention to the development needs of those members of the local community that do not directly benefit from our investment. And those who work with the vulnerable communities such as the Dongria Kondh need to work with us and companies like us to help bring sustainable development to people living in very isolated regions.

The Lanjigarh Project was always conceived as an integrated project; one in which the refinery would add value to the local raw bauxite, and thereby add economic and social value to the local community in a way that a mine on its own does not. Mines tend to be capital intensive projects with little capacity to create jobs or other economic and social benefits. We have consistently operated on the principle that our refinery at Lanjigarh must not only contribute to the wider development of India through its products but must also contribute to the development of all people in the locality, not just those who gain employment with us and our suppliers.

This report is an attempt to give a comprehensive account of our policies and practices in this respect and also to illustrate how, based on our values and experience, we go far beyond legal requirements to respond to our neighbours' concerns and to ensure they do gain benefits from our presence in their locality.

The Lanjigarh Project

Before proceeding to address Amnesty's detailed points on the Lanjigarh Project in **The detailed response to Amnesty's "Generalisations, Omissions and Assumptions"** of the report, this section provides a broad overview of the project including its inception and the rationale behind it, the benefits that have been accrued by the local community and how community concerns have been addressed. This is a very simplified version of the extremely complex process of setting up the Vedanta Alumina Refinery at Lanjigarh over the past decade, but we hope that it will facilitate the reader's wider understanding of how the refinery project has been developed and how it has impacted the local communities.

From the late 1970s to the early 1990s, the extensive bauxite deposits of Odisha and Andhra Pradesh, popularly known as the "East Coast Bauxite Deposits of India", were identified. With the growing national need for aluminium and the prevailing extensive chronic poverty in the region where majority of the bauxite deposits are located, the National and State Governments were determined to develop the bauxite assets of the State. The question was how? Based on the Forest Conservation Act of 1980 and the 1986 Environmental (Protection) Act, the national government issued detailed guidance in 1994 in the form of a mandatory Environmental Impact Assessment (EIA) protocol that set out in detail what any development project sponsor must do to gain government approval for a project. These acts do not forbid mining and related projects; rather they set up a framework for regulating them.

To accelerate the slow pace of decision making in the country, the government allowed for the submission of a "rapid" EIA as an interim measure to be provided, but it was to be followed up by a "comprehensive" EIA at a later date. In addition the Government, through the Ministry of Environment and Forests, strengthened this process over the years. The EIA process is discussed in great detail in **The detailed response to Amnesty's "Generalisations, Omissions and Assumptions"** of the document as its strengths and weaknesses are central to Amnesty's concerns. Working within this regulatory framework, Sterlite Industries (part of the Vedanta Group), entered into a Memorandum of Understanding (MoU) with the Government of Odisha in April 1997 to record in principle the decision to establish an integrated bauxite mining and refining project in Kalahandi. OMC, on behalf of Government of Odisha, committed to provide 150 million tonnes of bauxite to the Vedanta refinery.

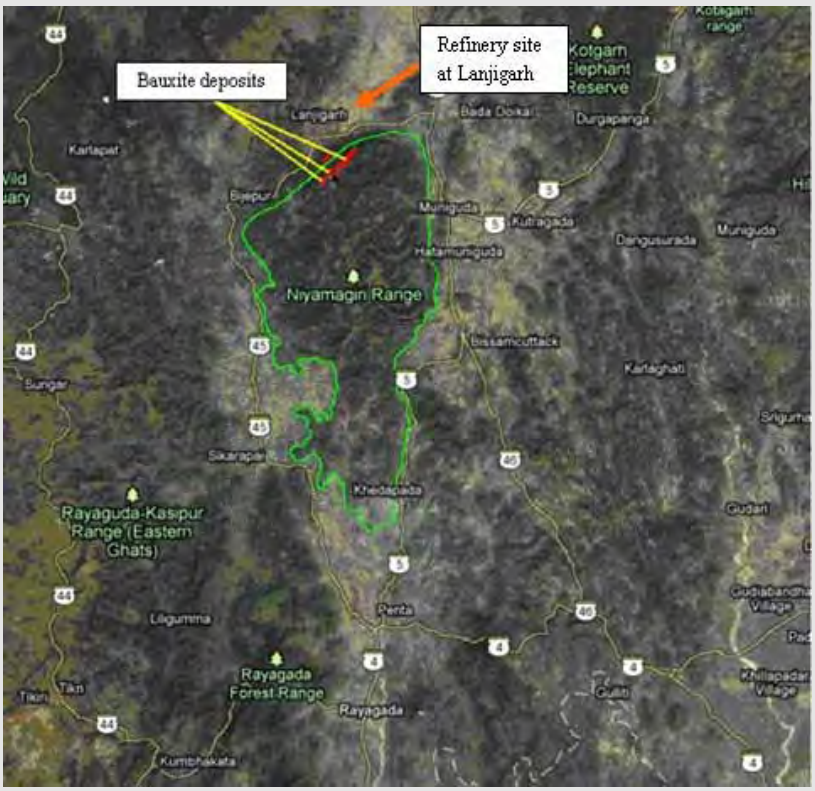
With the signing of the MoU, OMC got the mining rights from the Ministry of Mines of the Government of India to develop the Niyamgiri bauxite deposits and in 2004 based on this an agreement was signed between OMC and Vedanta. Vedanta and the OMC could then move forward with the process of determining the precise site selection for both the mine and the refinery. With respect to the refinery this process was under taken for Vedanta by Development Consultants PVT Ltd.[7] Once a site had been identified in principle, rapid EIAs for the proposed refinery site and the mine were able to be developed and submitted to government in 2002. This was a public document open to wider scrutiny and the primary basis for the public consultations that followed.

[7] Consulting Engineers 24B, Park Street, Kolkata-700016

The Dongria Kondh

The refinery is adjacent to the Niyamgiri Hills, while the proposed mine about 5km away is on the edge of the hills. Map 5 below shows the location of the refinery and the proposed mine in relation to the Niyamgiri Hills. The hills are important as they are the traditional home of the Dongria Kondhs, which constitute one of the two sections of the most preponderant Kondh Tribe of Odisha, which in India is a Scheduled Tribe with special protections under the constitution. Box 1 provides a discussion of the status of the Dongria Kondh. It is the potential impact of the mine on them and their way of life that has been a central concern of NGOs such as Amnesty, Survival International and Action Aid.

Map 5. Shows the maximum extent of the Niyamgiri Hills and the position of the bauxite deposits.



Box 1. The definition of indigenous and tribal peoples

The ILO convention 107 on Indigenous and Tribal Populations, which India has signed, commits governments to act to protect and promote the interests of their people. It defines them in the following way;

"(a) members of tribal or semi-tribal populations in independent countries whose social and economic conditions are at a less advanced stage than the stage reached by the other sections of the national community, and whose status is regulated wholly or partially by their own customs or traditions or by special laws and regulations.

(b) members of tribal or semi-tribal populations in independent countries which are regarded as indigenous on account of their descent from the populations which inhabited the country, or a geographical region to which the country belongs, at the time of conquest or colonisation and which, irrespective of their legal status, live more in conformity with the social, economic and cultural institutions of that time than with the institutions of the nation to which they belong."

Also for the purposes of the convention, *"the term semi-tribal includes groups and persons who, although they are in the process of losing their tribal characteristics, are not yet integrated into the national community".*

For its part Amnesty says*: "The Niyamgiri Hills are home to the Dongria Kondh, an 8,000 strong adivasi (Indigenous) community…"* The Indian Government specifically defines the Dongria Kondh as a "Tribal People" not an indigenous one and the term "adivasi" has no specific legal status, with its connotation being strictly confined to the domain of social usage. The Indian Constitution is unambiguous that "Scheduled Castes & Scheduled Tribes" have a distinct identity and are entitled to special protection.

From the perspective of Vedanta, we view the Dongria Kondh as a socially and culturally distinct yet backward community with their own culture and identity within the framework of Indian law and want to deal with them appropriately so that their development is in a manner and timeframe that respects their unique culture as well as being commensurate with their material and other needs.

Although the presence of Dongria Kondh community around the Lanjigarh refinery itself is extremely limited, they are covered within the geographical framework of Vedanta's wider community programme that covers an area up to 50km from the plant. No physical displacement of any members of the Dongria Kondh community has happened as a result of the development of the refinery nor has it been envisaged either by Vedanta or the OMC; which has adjusted its plans to make sure that is the case.

Vedanta recognises that the socio-economic situation of the Dongria Kondh is characterised by poverty and lack of access to sustainable livelihoods that is beyond what is usual, even in this poor region. They have major development needs and while they have a distinct way of life and cosmology relating to their lives in the forest, they are becoming more acculturated and want a better life. In the *"Don't Mine us out of Existence"* report, Amnesty itself records this trend when it quotes a Dongria Kondh man interviewed as follows:

"…a Dongria Kondh man in one of the hamlets near the proposed mine site told Amnesty International that the Dongria Kondh also wanted schools that were closer to them (as their children currently have to stay away from home in a hostel to attend school), a hospital, and a small road, which would make it easier for them to travel to the plains. He said however, "We should not have to ask for or get this from the company, the government should provide us with these things as it provides for other places." Pages 24/25.

Consequently Vedanta has been directly engaged with the Dongria Kondh through the community empowerment interventions initiated by the Lanjigarh Project aimed at improving their quality of life and some brief examples are set out below.

We have worked with the NGO Project Sashakti to assist us in effectively engaging the local women folk, resulting in the successful engagement of 600 women in self-help groups.

We have set up a hospital and have facilitated the local community with mobile health units (MHUs) to provide isolated and inaccessible regions that suffer from a greater vulnerability to endure the hardships of epidemics with an effective mechanism for accessing healthcare by treating malaria, gastroenteritis and viral infections among other diseases and injuries sustained in arduous daily lives.

With the NGO Udyogini we have supported around 80 skills development programmes with 50 self-help groups covering around 500 women.

Project Jeebika, involving approximately 468 Dongria Kondh and other tribal women, is a classic illustration of livelihood enhancement for the tribal community through the sewing of leaf plates that are sold locally, which has increased the income levels of each member to around US$30 per month.

Aligned to the cultural belief of the Dongria Kondh that water from a still source may have been affected by sorcery and witchcraft, Vedanta has provided a perennial running water supply to 200 households in the Trilochanpur Gram Panchayat at Lanjigarh by channelling stream water to village common points. This has also, to a considerable extent, reduced the drudgery of the tribal women who used to walk large distances to fetch clean and potable water.

Along with facilitating access for Dongria Kondh children to basic education by setting up childcare centres and collaborating with the Government Education Department, we have also sponsored two young people from the community to enable them to continue into higher education in Bhubaneswar, the state capital of Odisha.

Dongria culture, traditions and music are also important to the ongoing development of the community, Vedanta participated in the first-ever album of music released in October 2010.

Vedanta can help directly with simple infrastructure projects, but in more complex or culturally sensitive matters we seek to work in partnership with specialist NGOs that have a greater understanding of the practical needs of the community.

From our engagement with, and studies of, the Dongria Kondh traditions and culture including their social needs and religious beliefs, we know that the customary mode of living within the community is changing from the traditional to a more modern one, a phenomenon that is also being witnessed by other tribal and forest dwelling communities of Eastern India. The Dongria Kondh is often in conflict with the Forest Department over conservation practices that are increasingly constraining its traditional slash-and-burn agriculture and the tribe also has many social problems, not least serious alcoholism amongst the men of the community. Consequently the influence of Vedanta's outreach and the wider effect of the presence of the refinery need to be positive to help the Dongria Kondh adapt to the modern world (including the influence of TV) in a manner and time frame that enables them to retain the best of their culture and gain the benefits of development.

The consultation process for establishing the project

The timeline of major events concerning the setting up of the Vedanta Lanjigarh Alumina Refinery, including the genesis of seeking regulatory approvals and the community consultations carried out for the purpose, have been stipulated in the following tables.

Table 1. Timeline of events concerning the establishment of the refinery and mine in Orissa

Date	Activity
April 1997	Sterlite enters into an agreement with Government of Orissa to set up an Alumina Refinery in Lanjigarh and rights to Niyamgiri bauxite granted to OMC
March 2002	Sterlite's proposal for Alumina Refinery with captive power plant at Lanjigarh submitted to the Government
August 2002	Sterlite Industries commissions Environmental Impact Assessments report
February – March 2003	First round of Public Hearings are conducted in Lanjigarh and Muniguda for both proposed refinery and mine
March 2003	Sterlite submits an application to the MoEF seeking environmental clearance for the Lanjigarh refinery
June 2003	Sterlite enters into a fresh agreement with the Government of Orissa to set up the 1Mt per annum Alumina Refinery and 3Mt per annum bauxite mining facilities. In addition, the installation of a 4x25MW captive power plant, at an aggregate investment of USD750 million Foundation stone laid for setting up the plant at Lanjigarh
April 2004	All the permissions belonging to Sterlite Industries (India) Ltd are transferred to Vedanta Aluminium Ltd and an agreement is signed between OMC and VAL
September 2004	MoEF grants approval for the setting up of the 1Mt per annum Alumina Refinery project at Lanjigarh with 75MW power plant capacity subject to the conditions stipulated
November 2004	The Supreme Court, as a result of Central Empowered Committee report, commences hearings of petitions against mining at Niyamgiri
December 2004	The Supreme Court launches enquiry into allegations of environmental malpractice through CEC. Conclusions submitted Feb 2007
October 2007	VAL submits an application to MoEF for the expansion of the project within the same footprint from 1 to 5Mt per annum of Alumina and power generation from 75MW to 300MW

Date	Activity
November 2007	Supreme Court of India, as a result of findings of CEC investigation, puts a halt to mining project and proposes the establishment of a special purpose vehicle (SPV) to administer development through consultation and develop rehabilitation package for Niyamgiri mine project
March 2008	MoEF issues the Terms of Reference for the preparation of the Environment Impact Assessment Report of the proposed expansion
August 2008	VAL and OMC accept the Supreme Court proposal of SPV and are subsequently granted clearance for mining project infrastructure development. SPV will invest US$2.2 million or 5% of profits before tax annually for rehabilitation of local tribes
March 2009	Amnesty International sends mission to Niyamgiri hills to meet with local communities
April 2009	MoEF grants clearance for mine project go ahead after approval from Supreme Court
May 2009	Local communities file petition against MoEF decision to approve mine to the National Environment Appellate Authority, which directs a review by a special committee
2009-2010	Ongoing interactions between VAL and MoEF, the State Pollution Control Board and other parties take place
October 2010	The MoEF issues directions to VAL to maintain the status quo on expansion and to undertake no more construction until matters are resolved. Many more interactions with a variety of agencies consequently take place
November 2010	VAL asks the MoEF to consider the expansion again and issue the Environmental Clearance but the Ministry responds with a request for a fresh proposal to obtain consent An independent report is commissioned to review sustainability practices in Lanjigarh from international consultancy firm URS Scott Wilson, whose report includes 29 recommendations for Vedanta to improve practices
June 2011	Report is published by URS Scott Wilson into progress made on the 29 recommendations made six months previously. Significant improvements are made on the recommendations reported

In addition to the ongoing legal processes that are part of taking the project forward there was a legally mandated public consultation process as indicated earlier to involve the community. The main features of these are set out in the Table 2 below, which highlights the large-scale formal meetings held.

Table 2. Chronology of public consultations concerning the proposed refinery site in Lanjigarh.	
Major community informed consultation and participation campaigns held for Vedanta Alumina Refinery in Lanjigarh	
26.06.2002	Special Gram Sabha at Batelima Gram Panchayat Special Gram Sabha at Lanjigarh Gram Panchayat
09.07.2002	Lanjigarh Panchayat Samiti meeting
07.02.2003	Public hearing for Alumina Refinery & Bauxite Mining Project at Lanjigarh
17.03.2003	Public hearing for Bauxite Mining Project at Muniguda
06.10.2004	Special Gram Sabha at Lanjigarh for acquisition of land for Alumina Refinery Project Special Gram Sabha at Chhatrapur Gram Panchayat for acquisition of land for Alumina Refinery Project Special Gram Sabha at Champadeipur Gram Panchayat for acquisition of land for Alumina Refinery Project
08.08.2006	Special Gram Sabha at Paikranipinda for acquisition of land for Alumina Refinery Project Special Gram Sabha at Ambodala for acquisition of land for Alumina Refinery Project
27.10.2006	Special Gram Sabha at Nutan Batelima for acquisition of land for Alumina Refinery Project
10.11.2006	Zilla Parishad meeting at Rayagada
2009	Public hearing for expansion of Alumina Refinery Capacity from 1Mt to 6Mt per annum
2012	Gram Sabha in Rengopalli, Bandhugurha and Kothdwar for displacement

These consultations were based on the publicly available project plans in the "rapid" and "comprehensive" EIAs as they provide comprehensive details about the potential environmental and social ramifications of the proposed project. As part of its disclosure and dissemination principles Vedanta, through public hearings and community consultations, informed the local population including the Dongria Kondhs of the benefits and other critical information concerning the proposed project and sought their opinions, views and suggestions concerning the same. For example:

- In respect of the refinery the initial proposal was for a flat bed belt to carry the bauxite to the refinery from the hills. That was replaced with structure piped conveyor to minimise disruption to normal farming practices.

- Water supply was also of great concern to the community and the company pledged to secure water from the Tel river more than 60km away to ensure there was no additional pressure on local supplies. With this additional source, in an emergency scenario like the 1996-97 drought, we can provide supplementary support to the community.

As part of the formal process of consultation required by law set out in Table 2, nearly 3,000 people have voluntarily supported the project and have approved its operations by inscribing their signatures/ thumb impressions. The approach was supplemented by a wide range of other contacts with the community and their representative bodies.

From the moment the permission for the refinery was given, the company began working on key environmental, social and economic issues consistent with its own philosophy of sustainable industrialisation. We are now sharing what we have done, not only to strengthen our claim of having effectively engaged with the local and tribal communities but nationally as well as internationally to demonstrate our approach towards stakeholder engagement, starting with the process of how the refinery site was selected. The next part of this section depicts a broad overview of our approach, while the discussion of Amnesty's concerns about the EIAs is dealt with in detail in the The detailed response to Amnesty's "Generalisations, Omissions and Assumptions" of the report.

The process of refinery site selection

It has already been said that Kalahandi is one of the most backward regions of India and the Government of Odisha was looking for an industrial project in the district to eradicate the chronic poverty and acute food insecurity that its inhabitants were enduring. As the Lanjigarh bauxite deposit was earmarked for the proposed alumina refinery, the plant needed to be located in close proximity to the mines (all resource-based plants are located close to the raw material source). The deposit is partly located in Rayagada District and partly in Kalahandi, on the boundary of the two districts.

A number of studies were undertaken for site selection. The key criteria for site selection included the following:

1. Plant to be located in Kalahandi District to provide maximum economic benefits to the people of Kalahandi and particularly Lanjigarh

2. Minimisation or avoidance of any forest land involvement in the plant

3. Minimisation of physical displacement of people/families

4. Minimisation of acquisition of agricultural land

5. Minimum disturbance to natural resources such as river, streams, monuments, etc

6. Proximity to railway, grid power, water source, etc

After making detailed studies, the site was selected for which an EIA Report was prepared following the guidelines issued by the MoEF. The site was characterised by a few shortcomings (especially from the viewpoint of logistics) as it required additional capital expenditure but was relatively positive in terms of social aspects. Nearly 80% of the land acquired for the project was non-agricultural land and only 121 families were required to be physically displaced.

With regards to the local environment, the report provides comprehensive land use and soil assessments, and is committed to avoiding using superior agricultural and forest lands. The dominant social issue, reflecting the major concerns of the times, was to be able to find a site with the minimum loss of worked agricultural land and the displacement of the local population.

Entrance to the relocation village for displaced persons of the Lanjigarh Alumina Refinery

The choice of site meant that only 121 families were directly displaced by the refinery and, of that number, 76 families had at least one member who opted to take employment with the company. A further 1,846 people were judged to have been economically displaced by the establishment of the refinery and measures to mitigate these adverse implications have been discussed in the following section.

Avoiding negative impacts such as loss of agricultural land and displacement is seen as an absolute minimum requirement for any major industrial project. However, much more is expected of a company responsible for major investments such as our refinery. Consequently we, as many Indian companies do, have sought to incorporate a much broader approach to thinking about our actions and hope that this report goes some way to explaining what that is.

The total land progressively acquired for the site between 2004 and 2010 is recorded as 2,060 acres, of which about 78% has been from private owners and 22% from the Government. The composition of the acquired land constituted 80% non-agricultural, 12% semi-agricultural, 6% totally agricultural and 2% residential. As mentioned earlier, the site is not completely ideal for the purpose for which it was acquired, but it is a reasonable site and we felt that, with investment and careful planning, the environmental and social risks could be effectively managed This was the first study leading to the establishment of the refinery and all the subsequent EIAs were built on it and expanded its scope and content. In addition the company has gone well beyond what was required by the EIAs as the next two sections illustrate.

View of the refinery with Niyamgiri Hills in the background

The management of the refinery

Our Code of Business Conduct says it is a basic requirement for Vedanta to adhere to and be fully compliant with the respective law of the land and our Lanjigarh Project is no exception. The code is a primary framework that is clear and precise about issues like land acquisition, displaced and affected people, environmental standards, labour law and a range of other issues of allied concern.

The EIAs are a specific part of this regulatory framework, focused on the process of setting up a new enterprise, and we are fully committed to meeting the requirements. However, for us, they are a minimum. From our experience and our values, we know we must go beyond compliance and meeting community needs to obtain the requisite "social licence to operate", and we do so in large part by drawing on wider international best practice standards. In addition we are committed to the quality management principle of continuous improvement not only in our systems engineering and business practices but also in our wider environmental and social responsibilities. The following paragraphs illustrate our approach in respect of managing the refinery, dealing with those that were displaced and otherwise affected, and our commitment to the community.

A fundamental test of a company's values and professionalism is how it runs its owned and operated business in terms of economic, social and environmental responsibilities.

With respect to basic industrial processes as described in Appendix 2 we are producing alumina at the global class standards. We have obtained ISO 9001-2008, ISO 14001-2004, OHSAS 18001-2007 and EN 50001-2011 accreditation from BSI. Having implemented a zero effluent discharge system, we have a goal to become a zero waste operation and are investing to continuously reduce our environmental footprint (air emissions, water discharge and noise pollution). We are seeking to make maximum use of our raw material and are planning to extract minerals such as iron ore and vanadium from the "red mud" waste while significantly reducing the amount of water contained within it. Appendix 2 gives more detail on these issues.

In social matters, the refinery employs a total of about 2,500 workers, of whom 550 are VAL employees and around half of those are graduates and professional staff. The remaining 1,950 staff work for contractors in jobs such as raw material loading, catering, maintenance, gardening, fire protection and security. For VAL employees we have a pro-active equal opportunities policy covering people of all castes and faiths. Women make up 16% of our staff, and 70% of the staff comes from Kalahandi and Odisha and their average age is 28 with our youngest employee at 20 years of age. Our education and training programmes for employees are extensive and our total spending on them in the financial year 2010-2011 amounted to approximately US$68,300 (INR 3.4 million).

As is typical in an isolated industrial enterprise like ours in India, we provide a wide range of services such as housing, healthcare, education for children and families plus sports and recreational facilities as well as opportunities for religious observance. We have not sought to put a dollar value on these benefits to the workers and their families as we consider the provision of such services and utilities as our obligation, but they are substantial.

Beyond our direct workforce we estimate there are 1,900 jobs with our contractor firms, which offer a wide range of goods and services such as haulage. We have policies and systems in place to set standards for performance and key aspects of human rights such as compliance with minimum wages as fixed by the Government of Odisha, the right to free association and the prohibition of child labour. Table 3 below sets out the salary levels of manual workers for both VAL and our contractors. Salaries at VAL are always the State minimum or above and we have stated the maximum enhancement given, not averages.

VAL ensures that all its contractors and partners meet the minimum wage requirements set out by the Government of Odisha. The average wages paid by various contractors and partners working in VAL compared with the monetary remuneration paid by contractors in general is shown below:

Table 3. Salary Levels at Lanjigarh and minimum wage levels in Orissa source: http://labour.nic.in/wagecell/Wages/OrissaWages.pdf

Employment status	Minimum-Maximum contractors (US$ per day)	Orissa Minimum wages (US$ per day)
Unskilled worker	1.7-2.7	1.7
Semi-skilled worker	1.9-2.9	1.9
Skilled worker	2.4-5.1	2.4

For a developing country, a very modest wider job multiplier for the measure would be that there is one job in the community for every job created in the company and its supply chain. This would mean that the refinery is in all probability already supporting at least 8,000-9,000 jobs locally.[8] These jobs – known as downstream employment – would be for farmers, taxi drivers, stall holders, restaurants and personal services. We need to publish more data on this issue but the refinery is already the engine that is pulling a local economic development train. A wide range of jobs takes economic benefit from our expenditure as a company and the further expenditure of our employees and that of the employees of our suppliers.

If the refinery expansion goes ahead, additional jobs will be created with an associated multiplier. However it is the value-added work of refining, smelting and ultimately manufacturing products that developing countries such as India increasingly need to capture.

[8] There are studies of the job multipliers of international companies in developing countries e.g. Unilever in Indonesia and South Africa, SABMiller in Africa and Coca-Cola in China. However we do not have figures for our industry in India

Relations with the community

It is Vedanta's impact on the wider community that is the central concern for external stakeholders and the focus of the Amnesty report. With regards to this project, there are three distinct communities to be considered:

1. Those who are directly impacted by the physical footprint of the mine and refinery who are displaced or are deemed to be otherwise affected by its activities

2. The wider "fence line" community of people who could be affected by operations

3. Communities up to 50km from the refinery, including the Dongria Kondh, who are the focus of our programmes

Those displaced or otherwise directly impacted by the refinery

It has already been said that the 121 displaced families were compensated at levels above the minimum required stipulations mandated by pertinent laws. They were rehoused in a modern resettlement colony and 76 have been employed and are on the company payroll. Another 1,745 people were deemed to have been "affected" by the development and they too were compensated at levels beyond the minimum; 12 took jobs with the company while 86 were given extensive free training to help them into self employment. Twelve households living on the land but without proof of title were also included in these programmes.

The benefits for the fully displaced families are substantial and their status is defined by law. They have very largely come from within the boundary of the new refinery, whereas those deemed "affected" are often living just beyond it. Appendix 3 gives a brief account of this programme.

The wider community

The wider community is vital to the success of any business like ours. They are, as indicated earlier, our "social licence to operate". The government can give us a legal licence but unless we can win the goodwill of our neighbours and demonstrate effectively to them that they too can benefit from our presence, they can critically hinder our activities.

At one level this can be seen as a purely pragmatic risk management strategy, but for us a company with strong Indian roots, working in our homeland, we feel a strong obligation for our business to be a force for good and development in the community as well as being a commercial success. It is the practical manifestation of our view that we must add to India's development, not only through our business activities, but also through active "bottom-up" community programmes.

Our community engagement vision is:

"Sustainable development of the local community living in the core and periphery habitations and emerging as a responsible corporate partner of the government and the people at large"

Since the earliest days of the project we have had a professional community outreach department with staff specialised in diverse areas including a professional anthropologist. They are supported by a network of outreach workers recruited from the Dongria Kondh and the Kutia Kondh. They support 468 women in the leaf plate making project in Dongria Kondh villages. In addition to the jobs we have created directly, our strategic areas of focus in community development are:

Infrastructure development:

In addition to the general improvements to local roads, rail, water and power systems for business reasons, this has included extensions to rural areas through the building of 50km of approach roads to isolated villages, culverts, dams, check dams, 43 tube wells, eight community centres and seven places of worship. We have also invested extensively in the development of the Lanjigarh township. Access to water is a key issue in this drought-prone area and the 2007 District Statistical Handbook records that at that time there were no villages in Lanjigarh that had access to tube wells and other sources of piped water.

Education, sports and culture

We have supported 31 tribal schools in getting their first computers and in addition have also built the only English language school in the Lanjigarh area with 400 students, of which roughly half are from tribal families.

In our sincere quest to preserve, conserve and promote local culture forms, we also collaborate by participating in regional and tribal fairs and festivals such as Chhatar Yatra and the famous festival – Jagannath Rath Yatra.

We have set up 36 childcare centres and have collaborated with the Government of Odisha to provide fortified food supplements to children in 400 pre-primary schools (known as Anganwadi) in Kalahandi and around 1,000 similar centres in Rayagada District. We have also set up a one-of-a-kind mid-day meal kitchen centre in collaboration with the GoO at Lanjigarh, which in the first phase will cater for food requirements by providing a free lunch to children in more than 166 schools.

Health and sanitation

We have partnered with the Government Health Department to significantly upgrade the Lanjigarh hospital and have also built our own on-site hospital for staff. This also provides free services for the community, catering to the health needs of approximately 200 patients a day, of whom over 50% are from the tribal community. MHUs are providing healthcare services to the hill top villages inhabited by a majority Dongria Kondh population as such regions are a considerable distances from health set-ups. We also run health awareness and education camps over a wide area to promote interventions on child feeding, vaccinations, family planning, and protection against malaria and communicable diseases.

As the paragraphs below demonstrate, we are making significant progress in improving the general state of health in our intervention area, which is evident from the improved performance of the beneficiaries. The hospital houses the only equipment for detecting sickle cell anaemia in Odisha, which was seen as a priority due to the high prevalence of this disease in the region.

Sustainable livelihood

Our programme of support for sustainable livelihoods covers several strands. Firstly we work with farmers to improve their agriculture. We have a vegetable growing project – Project Sabuj – with 150 farmers in 13 villages, sunflower cultivation with 150 farmers in eight villages and, for the first time in Kalahandi, the commercial production of organic cotton with 150 farmers in eight villages covering approximately 200 acres of land. To empower the women and provide the segment of population with opportunities for economically beneficial engagement, we have developed and implemented Project Sashakti. This supplements women's self-employment and by providing sewing machines and skills training specifically to the tribal women we have built on their traditional skills to make and market leaf plates that are sold in surrounding districts.

All this work includes a degree of environmental awareness and the protection of natural resources and biodiversity. For us this work is not philanthropy or old style benevolent paternalism, instead it is seen as discharging our obligations to meet our commitment for social and economic wellbeing of the communities we work with. It other words, it is community investment and development and we want to see real returns on our input.

By working with others in key projects, we have helped achieve measurable improvement in community wellbeing through active partnerships. For example with our help:

- The rate of child immunisation in Kalahandi rose from 35% to 71% between 2005 and 2008
- Child malnutrition dropped from 58% in 2005 to 31% in 2008
- School attendance rates increased from 45% in 2005 to 70% in 2008 while dropout rates have reduce from 70% to 20% over the same period
- We can also measure the increase in the incomes of the farmers and women we work with and they are significant for a district where half the population use to live on less than US$1 per day.

We have subjected our community programmes to review by the non-profit Xavier Institute of Social Service (XISS) to independently verify what has been achieved and help us improve our performance in future. The Executive Summary of their recommendations and conclusions with important statistical data is presented in Appendix 4. The reader will see that not only did the Institute evaluate the existing programmes but that it also asked local people what they expected of the programmes in future. The reader can see in detail not only the scope and effectiveness of our programmes, but also the community perspective on the programmes and what they would like us to do in future.

In addition, we have reviewed our programmes in light of the priorities set by the Millennium Development Goals (MDG)[9] as an important international benchmark of social performance and Appendix 5 gives a simple overview of our own assessment. For example, we contribute to all the eight MDGs such as eradicating poverty and hunger, empowering women and combating HIV/AIDS, malaria and other diseases, etc. We have helped double the local immunisation rate and 20,000 people have attended the HIV/AIDS awareness workshops we sponsor. As part of our planning for future engagement and to understand the needs of the poorest in a district that has a history of drought and famine, we have commissioned an independent study to critically assess and analyse the dynamics of food insecurity and vulnerability in Lanjigarh, which gave a vital insight into the lives of the poor.

In 2008, when the Supreme Court of India reviewed the project and gave permission for it to go ahead, it ordered that a Special Purpose Vehicle (SPV) should be created to support the economic, social and environmental development of local communities including those of the Dongria Kondh. This provision is in addition to the programmes already established and supported by the company. One of the major propellants for the remarkable transformation that the social and economic landscapes of Lanjigarh have undergone is the constructive and consultative community engagement exercises that we undertake. Chart 6 below depicts the feedback loop we use to develop the community projects we design and implement.

Chart 6. Diagrammatic depiction of Vedanta's community development methodology concerning participation and feedback of consultations.

Key to this approach is local community stakeholder engagement. This means talking to local people including the Dongria Kondhs, listening to what they say and helping them achieve their aspirations where we can. We do this on a regular basis. Chart 6 describes how our planning and stakeholder engagement system works. We often bring in outside experts to do extensive studies to help us and the community address problems such as social inclusion, water conservation and biodiversity, as the next section of this part of the report shows. Vedanta does not claim to be the expert in all these needs but we have progressively developed processes of creative, inclusive problem solving, often in partnerships with NGOs.

The issues touched on here are extensive and deserve much greater consideration, and typically they are not covered in the EIAs as the types of initiative we have been describing go far beyond the compensation that is required by law. Some of this material will be touched on again in the next section. But the reader can also review the VAL website at http://www.vedantaresources.com/sustainability/community_approach.html.

In addition we have established an open grievance process for the community in Lanjigarh, which enables a wide range of problems to be brought to our attention for resolution. Box 2 below explains how the system works.

[9] http://www.un.org/millenniumgoals/

The grievance system is our commitment to the community that we will listen to any of their concerns, whether they are about how our business operates or how community programmes are developed and implemented. All these concerns are logged and accordingly explicit responses are developed as an expression of Vedanta's local accountabilities.

Box 2. Grievance Process for Vedanta, Lanjigarh

In light of the outcomes of various public hearings, VAL has established a standardised process to deal with public grievances concerning their operations as of 22 April 2011. Members of all local communities are invited, every Friday, to come to the VAL CSR office and lodge their grievance officially with the respective corporate official e.g. Employment, CSR, Land, Development. The official registers each complaint and action takes place after review.

Grievances concerning the following areas are covered by this grievance mechanism:

- Land related matters
- Displacement and project disturbance
- Information sharing
- CSR and community development
- Contract labour
- Environmental and entrepreneurial development

Between April 2011 and January 2012, we have spoken to 634 people and helped them resolve their concerns. The key issues that have been discussed are as follows:

- 421 – One-time payment issues referring to the differences between the 2003 and 2006 Government of Orissa R&R policy. For these we have facilitated meetings with government officials.
- 154 – Requests for employment, some of which we could help with and others not.
- No issues with regard to the proposed OMC mine were recorded.

This mechanism is a recommendation that was highlighted by the first URS Scott Wilson report from November 2010. From this report it was suggested that VAL ought to take action to:

"Establish and strengthen a simple and accessible grievance mechanism by which villagers can identify any concerns about the operation of the refinery by using the village coordinators already deployed by VAL"

In the July 2011 URS Scott Wilson Progress Report, progress towards this recommendation was said to be "substantially completed" with only a few minor adjustments to be made to improve the service. For example, it was noted that while many local stakeholders were aware of the grievance mechanism that they were entitled to use, more work could be done to ensure that everyone in the community was made more aware. Also it was noted that a clearer distinction could be made between those grievances that required attention by public agencies and those that were a concern to VAL officials. As a result of this report we have already made headway towards initiating these improvements to provide local stakeholders with a reliable, effective and trustworthy grievance mechanism.

The future of the refinery

The Lanjigarh refinery represents about US$1 billion of investment for Vedanta. It was built on economic assumptions that bauxite would be readily available from nearby sources and that it could in due course expand to improve capacity and utilisation. Both developments have been blocked and the economic sustainability of the situation is under regular review.

The refinery represents Kalahandi's only major industrial project and if it does not stay open, the existing 8,000-9,000 or so livelihoods will be lost as will all of our community engagement investments. We believe this would be bad for the company, bad for the community near the refinery and also for the Dongria Kondh. We are committed to helping them develop in a manner and at a pace that is appropriate and have the resources to do so over the next two decades at least. We believe it can and indeed will become a highly effective agency for ensuring the success of such an approach.

Amnesty's critique of the Lanjigarh Project

Amnesty International's critique of the Lanjigarh Project is based on its Vision and Mission which is:

"Amnesty International's vision is of a world in which every person enjoys all the human rights enshrined in the Universal Declaration of Human Rights and other international human rights instruments. Amnesty International's mission is to undertake research and action focused on preventing and ending grave abuses of these rights."

Source: Statute of Amnesty International as amended by the 29th International Council meeting in Antalya, Turkey, 9-14 August 2009

As mentioned earlier, Amnesty has produced two reports on the project: *"Don't Mine Us Out of Existence: Bauxite mine and refinery devastate lives in India"* published in 2010, and *"Generalisations, omissions and assumptions: The failings of Vedanta's Environmental Impact Assessments for its bauxite mine and alumina refinery in India's state of Orissa"* published in July 2011. Both reports exemplify Amnesty's fundamental approach, which is to hold the Government of India, the Indian court system and civil service, the Government of Orissa, the Orissa Mining Corporation and Vedanta to internationally agreed standards created by the United Nations (UN) and its relevant subsidiary bodies such as the International Labour Organisation (ILO).

It has sought to do this in two ways. Firstly, by visiting the area three times between 2008 and 2009 and collecting largely anecdotal evidence from local people and secondly, through a careful review of the public documentation of the projects mainly contained in the EIAs that have been developed by the company.

This process has helped Amnesty develop its case but Vedanta's position is that the process is not complete and that important data that should have been taken into consideration has not been.

However, we acknowledge that Amnesty has not in the past been able to gain access to all the data needed to obtain a balanced view of the history, current performance and future development of the project because much of the information we now present in this report, particularly in The detailed response to Amnesty's "Generalisations, Omissions and Assumptions" Report and the Appendices, has not been previously been in the public domain.

A respect for UN standards of human rights at Vedanta

The early stages of the Lanjigarh Project from the late 1990s onward were developed in conformity with Indian law. In many respects this is consistent with international standards based on the Universal Declaration of Human Rights (like labour law, for example) and we believe our practices in respect of labour law fully meet what is stated in the Universal Declaration and ILO standards and in many cases exceed them.

For example, India is a signatory to the 1979 international "Convention on the Elimination of all forms of Discrimination against Women" and at Vedanta we have developed an equal opportunities policy for our employees and carry the spirit of this convention into our work in the local community.

Amnesty has not raised the issue of child labour, and harmful child labour in particular, which can be a real problem in Kalahandi where school attendance is still poor. The company is firmly committed within its own business, throughout its supply chain and in the wider community, to combating harmful child labour. We are also combating it through our community programmes of expanding school places, and making school meals and other services widely available in the community. These community contributions provide for a child's right to life and an education, bringing a human rights dimension to them.

These are classes of human rights that are well-established and understood, and Vedanta has long taken them on board and holds itself accountable to them. Other examples of India's and our own understanding of human rights commitments are still evolving, as they are in the UN system itself. For example, India has ratified ILO Convention number 107 quoted earlier in the report but not ILO convention 169. The UN Declaration on the Rights of Indigenous People 2007[10] deals with their proprietary rights to land in much clearer language than both the previous ILO conventions and Amnesty cites this Declaration in both its reports. Article 26 (2) says:

"Indigenous peoples have the right to own, use, develop and control the lands, territories and resources they possess by reason of traditional ownership or other traditional occupation or use, as well as those which they have acquired."

The Declaration does not have the legal force of a convention and it emerged after 20 years of debate at the UN, but is yet to be ratified by a number of national governments. Amnesty is consistent in saying that governments must lead on human rights and we agree but in the case of the 2007 declaration, India has endorsed it but along with many other countries in a similar situation like Indonesia, done so with reservations. The Indian ambassador to the UN is reported in the press release by the UN as saying:

"India had consistently favoured the promotion and protection of indigenous peoples' rights. The fact that the working group had been unable to reach consensus was only reflective of the extreme complexity of the issues involved. While the Declaration did not define what constituted indigenous peoples, the issue of indigenous rights pertained to peoples in independent countries who were regarded as indigenous on account of their descent from the populations which inhabited the country, or a geographical region which the country belonged, at the time of conquest or colonization or the establishment of present State boundaries and who, irrespective of their legal status, retained some or all of their socio-economic, cultural and political institutions. Regarding references to the right to self-determination, it was his understanding that the right to self-determination applied only to peoples under foreign domination and that the concept did not apply to sovereign independent States or to a section of people or a nation, which was the essence of national integrity."

For its part, the UK has issued a statement that it would not accept the concept of "collective rights". It is often not clear to companies what role they should play in a practical situation in a country like India, especially when government is directly involved in initiating and participating in major projects like Lanjigarh. However, at Vedanta we have our own approach based on our values and relevant international standards as The detailed response to Amnesty's "Generalisations, Omissions and Assumptions" of the report shows.

With regard to the role of business, Amnesty says in the *"Generalisations, Omissions and Assumptions"* report:

"However there is an emerging consensus on corporate responsibility for human rights that companies as a minimum must respect all human rights. This position was articulated by Professor John Ruggie, the UN special

[10] Source: http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf

representative of the secretary general, on the issue of human rights and transnational corporations and other business enterprises, in his 2011 report to the Human Rights Council" Source: Amnesty report page 11

This represents current thinking on the role of business in society and affects a wide range of businesses, not just extractive industries but pharmaceutical, consumer goods and telecommunications companies too, each of which will have a different human rights profile.

Amnesty's approach

Amnesty is an advocate for the human rights of the poor, it seeks to hear their story and review and criticise a project based on all the relevant documentation, reviewed from their perspective, and in the case on Lanjigarh the key documents are the EIAs. This is a legitimate approach and Amnesty does not seek to have a balanced view of the company's case and feels it must challenge its validity. In the *"Don't Mine Us Out of Existence"* report (page 83) Amnesty says;

"Vedanta Resources has made public commitments to sustainable development. However, the approach taken both by the SPV (Special Purpose Vehicle set up by the Supreme Court) and Vedanta Resources appears to focus only on the potential benefits associated with the mining and refinery projects and on corporate-sponsored development activities, while ignoring the negative impacts of the mine and refinery on local communities. Initiatives such as assisting with local medical care can be very beneficial; however, they do not give licence to continue with practices that cause harm to human health and wellbeing."

We do assert the value of what we do through our business and our community programmes because they are lifting people out of the grinding poverty that leads to early deaths, which is a terrible waste of human life On the other hand, we do acknowledge that risks exist, as in any project, but we believe we have a framework to address these and this is discussed in great detail in the next part of the report. However, the company needs to articulate the broad economic case for the project in terms of jobs, taxes and wider local development because some NGOs including Amnesty ignore it completely.

Our social interventions can be dismissed but water wells, health systems, education provision, welfare and livelihood development have actual practical value for a large section of the population and profound human rights significance too. They are an integral part of our two-pronged approach to development and do need to be given proper consideration in an all-round assessment of the project. Economic considerations and social development were primary drivers for the project and many of those goals are being met.

To asses this project properly it is also important to understand is how risk is managed in large complex projects such as a bauxite mine and refinery. All modern industrial activities, whether they are the Channel Tunnel, nuclear power station or oil refinery, have elements of risk. Every time we step on a train or airplane we take a risk with technology. Project sponsors such as Vedanta cannot begin to insure projects like the refinery unless those risks are clearly identified and a management plan put in place to address them. These risks are not only to the plant and people who work there, but to the surrounding community too. Failure to manage any of these risks can lead to a loss of a local licence to operate. There is a huge business incentive to get this right and at Lanjigarh the company has brought some of the most modern thinking to site management.

Amnesty's critique of the EIAs

Amnesty's report "Generalisations, Omissions and Assumptions" is in essence a sustained critique of the main source of public documentation for the project: the EIAs. This is different to an all-round critique of the project as it is restricted to what is in these documents. On page 14 of the report, at the start of its Conclusions section, Amnesty states the following:

"Amnesty International's analysis of the Vedanta EIAs for the Lanjigarh refinery and proposed Niyamgiri mine demonstrates that they fail to do what they are supposed to do – which is assess the potential environmental and social impacts of the company's mining and refining operations. The EIAs are also inadequate to ensure that the company is fulfilling its responsibilities to respect human rights. While the EIAs are not intended as tools to assess human rights impact, Vedanta carried out no other impact assessments process in relation to human rights, even after serious human rights problems were brought to the company's attention."

The Indian Government's mandatory system of EIAs and public consultation must be followed by all companies like Vedanta. EIAs are very substantial documents and Appendix 6 provides the reader with the Table of Contents for the Rapid Environmental Impact Assessment of the refinery done by Tata AIG, risk management services in 2002. While the range of issues covered is extensive we can absolutely agree with Amnesty that, since the law was conceived in 1994 and updated since – most notably in 2001 – EIAs are far from comprehensive in all the matters that concern it. Because of its dependence on the EIAs as a source of information, Amnesty cannot know the full extent of the company's engagement with the issues that concern it. Much of the material necessary to have a balanced view of how the refinery has developed has not previously been available.

Transparency

Throughout both Amnesty reports there is constant criticism that there is a lack of transparency in the materials that form the background to the project and there is truth in this claim. With respect to how government agencies have followed through in supervising Vedanta's compliance with the EIAs and related matters, Amnesty says:

"Neither the nature nor extent of both the actual and potential water and air pollution associated with the refinery has been disclosed to local communities. Although over 20 reports have been prepared by the OSPCB (the Orissa State Pollution Control Board) between 2006 and 2009, neither the reports nor their substantive content have ever been shared with communities by the authorities. Amnesty International obtained the reports under India's 2005 Right to Information Act".

Source: Don't Mine us out of Existence" page 73

We have made an attempt to upload the relevant reports submitted to government agencies to the public domain and want the local community to be aware of risks to water and air and know how to bring issues to our attention through the grievance system and other means. As part of transparency, in November 2010 the independent consultancy URS Scott Wilson undertook an extensive review of the refinery operation and 29 key points were made for improvement and change. By December 2011, the recommendations for more than 20 of the points had been accomplished. Lanjigarh updates can be seen at: "http://www.vedantaaluminium.com/empowering-lanjigarh.htm"

The detail of these claims are dealt with in the second section of the report, but the issue of transparency raised by these comments needs to be addressed. The situation with regard to company transparency is similar. On page 7 of the "Generalisation, Omissions and Assumptions" report, Amnesty states the basis of its critique of the project to be:

"The primary purpose of EIAs is to establish pre-project environmental baseline information and consider project-related environmental threats.

In this report, Amnesty International examines whether the EIAs produced by or for Vedanta's subsidiaries and joint ventures in Orissa to gain clearances for the Lanjigarh refinery and the Niyamgiri mine are consistent with the specifications required in Indian regulations. The report also considers how far these EIAs could have enabled the company to anticipate and address the consequences of its proposed activities on the human rights of the people affected by them.

"The report considers the five EIAs produced for Vedanta from 2002 to 2008 by three different consultancies (see Box 3, below).

Box 3. The EIAs for Vedanta's refinery and mine in Orissa

- The 2002 Lanjigarh refinery EIA: Tata AIG Risk Management Services Ltd, 2002a.
- The 2002 Niyamgiri mine EIA: Tata AIG Risk Management Services Ltd, 2002b.
- The 2005 Lanjigarh refinery EIA: Vimta Labs, 2005a.
  (The contents page of which can be found in Appendix 6)
- The 2005 Niyamgiri mine EIA (By OMC): Vimta Labs, 2005b.
- The 2008 Lanjigarh refinery expansion EIA: Global Experts, 2008.

We agree with Amnesty that that the EIAs are an incomplete basis for judging the total impact of the project. They focus primarily on the environmental aspects of the project, which do include human rights aspects such as protecting water supplies and some key social ones such the displacement of local people. However, they do not include wider corporate responsibility initiatives and few if any economic considerations, which are also important aspects of all-round sustainability. It is wrong to assert or assume that the absence from the EIAs of certain topics like wider human rights means that the company does not acknowledge their importance or does nothing about them.

However, to make this case, a wider range of materials must be made available and referred to. The type of materials the company has produced, usually in conjunction with independent agencies, includes those set out in Table 4 below. There are many other reports and publications produced by Vedanta itself that are relevant to Amnesty's concerns, such as the assessment of our social interventions in relation to the Millennium Development Goals presented in Appendix 5. We have recently prepared another EIA in March 2012 for the expansion project and this will also available in the public domain.

Table 4: Vedanta Aluminium Ltd, Lanjigarh: List of reports/studies beyond EIAs

Sl.No	Description of Report	Agency Name	Date of preparation
1	Information on Rural Drinking Water Supply to Kalahandi District	Orissa Government	Jan 2006
2	Socio Economic Study of Villages around VAL, Lanjigarh	AISD, Ranchi & XISS, Ranchi	May 2006
3	Report on Soil Erosion study at the Niyamdangar plateau proposed Lanjigarh bauxite mines	Orissa Univ of Agriculture and Technology, Bhubhneswar	October 2006
4	Wildlife Management Scheme of the Project Impact Area of Bauxite Mines and Refinery	Chief Wildlife Warden, Govt. of Orissa	May, 2007
5	Socio Economic Impact Evaluation of CSR Interventions of VAL Lanjigarh	AISD, Ranchi & XISS, Ranchi	July 2008
6	Social Anthropological and Economical Assessment of Dongria Kondhs	AISD, Ranchi & XISS, Ranchi	July 2008
7	Ground Water Quality around VAL Lanjigarh	NGRI, Hyderabad	August 2008
8	Impact of Food Security and Vulnerability on Livelihood (Lanjigarh Block)	Human Development, Kalahandi	2011
9	Rainwater Harvesting and Recharge	IATES	2011
10	Rehabilitation and Resettlement Status Report	Vedanta	Dec 2011

Managing responsibly at Vedanta

For Vedanta, the EIAs are a legally required minimum for the project development and the process of public consultation. The EIAs do assume that once an issue has been identified, such as potential air or water pollution, that the company will comply with applicable laws and report to appropriate public bodies such as the Orissa State Pollution Control Board, which it does. However, as was said above, the process could be more comprehensive in its coverage.

There are other factors to be taken into account in judging this project and Table 5 below sets them out for consideration. This is the framework of ideas the company brings to Lanjigarh and any similar major project. They are interactive sources of influence on the development of the project.

The next section of the report uses the headings set out below to respond to the detailed questions raised by Amnesty on a wide range of issues in the "Generalisations, Omissions and Assumptions" report, to make the company's wider case in response to Amnesty's concerns over the future of the project.

Table 5. Factors affecting project development

Key Factors for Consideration	Comment	Transparency
1. The legal framework	Detailed environmental, labour, community and other rights, legislation such as compensation for displacement and pollution levels	Report to government is partially available with documentation located in various ministries
2. The EIAs	The basic legal framework on which project planning and public consultation is based Linked to a wider legal framework for implementation	Complete
3. Company policy and relevant international standards	The company has values, business principles and policies on the issues raised above and many more such as child labour, women's empowerment and supplier codes These would include all the community contributions and responses to stakeholder engagement International standards are drivers in key areas such as plant design, training and a range of human rights and other issues such as labour laws and community contributions and the MDGs	Available in principle but not in detail for Lanjigarh. Not made explicit until 2011
4. Stakeholder engagement	Formal processes based on the EIAs and local ones devised by the company help change policy and practice	Local reports documented and accessible
5. Performance and assessment	When problems occur such as a pipe leak a response is vital and this affects our plans for future practice and investment. We monitor water, air and soil quality in great detail	Not made explicit until 2011
6. The way forward	The company has created a sustainability framework and we are committed to being held accountable to it	Available. Complete and comprehensive post 2011

The future of dialogue with Amnesty

Since Amnesty has taken an interest in the Lanjigarh Project the company has sought to engage with it. Our chief executive met with Amnesty on 26th July 2010 after the Publication of the *"Don't Mine us out of Existence"* report and there has been regular contact since then. This report is part of a sustained effort on our part to raise the quality of dialogue with all our stakeholders.

Amnesty's approach to criticising the project is very focused; it is not making large claims about the economic and social value of the project. Rather it is seeking to ensure it is carried out properly with full respect being shown for those affected. To do that it has based its comments on the documentation available and has attempted to present its views based on the facts of the case. This is to be welcomed as it provides a firm basis for discussion, but we disagree on some issues as indicated in this response. However, it is our responsibility to try and get all the relevant facts on the table and this report is a step towards doing that and we would also like to be responsive in the future.

Society at large in India and around the world will make their own judgement about the case but it is best dealt with in open dialogue. We hope the second section of the report helps make the debate about the issues clearer and that we can move forward to develop a practical approach for the future of the project.

Our continuing journey

While debate on some of the issues connected with Lanjigarh Project has continued over the past few years, Vedanta on its part remain committed to drive and grow its business in a socially and environmentally responsible manner for the benefit of all its stakeholders – not only in terms of size and international span, but also in terms of how we conceptualise, and manage our interaction with society and the physical environment. We are a successful business in economic terms but we are also seeking to achieve long-term business sustainability through effectively managing our environmental impacts and building strong relationships with the people our business touches. Chart 7 below shows the importance for Vedanta of long-term sustainability-based responsible stewardship by the business, building strong relations with others and adding value to the people with whom we interact.

Chart 7. The factors supporting long-term sustainability

For Vedanta, the discussion of human rights is located within our approach to sustainability as a whole. Respect for human rights is fundamental to how we demonstrate responsible stewardship, build strong relationships and add value to people. It has been implicit in how we think and what we do, but we need to be more explicit in our accounting for the human rights dimension of who we are and what we do in future.

Over the past few years we have learned from our experience in Lanjigarh and our wider engagement with society at home and abroad, and have revised and developed our policies and practice in India and beyond. This has occurred at the group level and on the ground in Lanjigarh. We want to move into the future with a framework of

ideas and a firm foundation of policies that represents the best in international thinking about long-term sustainability and human rights. To do this we have revised and developed our group-wide management framework for sustainability and launched specific initiatives in Lanjigarh that will integrate our approach to sustainability locally and address gaps in our past performance.

These will not be our last such changes, as our understanding of sustainability and human rights is continually developing and we will keep our policies and practices under review and develop them in part from what we learn from our interactions with stakeholders.

Developments at group level

With this perspective in mind, we have reviewed and revised our Mission, Vision and Values and Code of Conduct to give appropriate prominence to our commitment to sustainability. We have enshrined sustainability at the highest possible level in the governance structures of the company. On 17 March 2011 the old Health, Safety and Environment (HSE) committee was given a wider remit and renamed as the Sustainability Committee, one of five committees (Audit, Executive, Remuneration and Nomination) that advises the board on company policies and practice. Its mandate is broad, including:

"To recommend to the board, group sustainability policies, clearly setting out the commitments of the group to manage matters of sustainable development effectively.

To advise the Board to enable it to discharge its responsibilities, having regard to the law and the expected international standards of governance.

To outline initiatives required to institutionalise a sustainability culture through involvement of employees at all levels."

The committee also reviews the performance of group companies in regard to sustainability and sets performance targets. It is presided over by a non-executive director Mr N Chandra, who also sits on the Audit Committee to integrate risk management policy-making throughout the group. The other two members on the committee are group CEO MS Mehta and Jeyakumar Janakaraj, CEO of KCM. The committee has oversight of three areas of sustainability – health and safety, environment and empowering communities – all of which have human rights aspects to them.

For example, for each of the key areas of sustainability we have also said we want to demonstrate responsible stewardship, build strong relationships and add value:

Responsible stewardship

We are committed to providing a safe, secure and healthy workplace for all employees by using best technologies and practices, backed by our belief that all work-related illnesses and injuries are preventable. We aim to develop, implement and maintain health and safety management systems aligned with our commitments and beliefs, and consistent with the world class standards, to protect the lives and health of our employees. We aim to use best in class practices to ensure year-on-year environmental performance improvements with a particular focus on reducing waste by improving recycling rates and maintain environmentally sound operations in three key areas: biodiversity and land management, climate change, and water and energy. These issues, along with those such as air quality, can have important implications for the lives of the people in communities close to our operations as well as for the wider society and the planet.

Building strong relationships

We aim to enhance the quality of life and the socio-economic wellbeing of those communities in and around our operations and to contribute towards developing empowered and sustainable societies with particular focus on two key areas: social investment (health, education and livelihoods) and bio investment (water harvesting, agriculture and social forestry). We aim to be active partners with communities in the vicinity of our operations and partnerships with each community are tailored to that community's specific needs and profile. Our community partnerships such as those at Lanjigarh are long term and provide a forum for stakeholders, including the community itself, government and NGOs to come together to discuss the company's operations.

Adding value

For each stakeholder, depending on their circumstances, relationship to Vedanta or interest, we will try to find ways to add value. This can be financial in the case of dividends or non-financial in the case of technical support. For example:

- Our commitment to responsible stewardship to IFC standards will provide assurance to the lenders that we have a management system in place to address all the sustainability risks. These include the health of our workers, safety, the environment including biodiversity, social risks including human rights, cultural heritage and the rights of vulnerable social groups, and an ongoing stakeholder engagement plan (developed using a participatory approach) that will result in overall benefit to ourselves and each of the stakeholder groups we work with.

- Our shareholders can expect better quality returns as they know we are managing our risk and operating responsibly so that we do not attract negative attention. Rather we will have good solid relationships that will lead to value creation over the longer term.

With regard specifically to empowering communities, some of these changes were prompted by what we learned from the URS Scott Wilson review of group policies and their application in Lanjigarh (see below) and our own need as a business to bringing coherence and transparency to our worldwide commitment to sustainability which the board is determined to drive forward within the Vedanta Group. As part of the World Bank Group, IFC has developed these standards in conjunction with investors and a wide range of stakeholders as an international benchmark of good stewardship over a wide range of sustainability issues encompassing a human rights perspective. Including reference to:

- Complying with or exceeding the legislative requirements in all jurisdictions in which it operates to develop systems to identify, manage, and mitigate risks and adverse impacts on communities and environment.

- Avoid involuntary resettlement where feasible and consider displacement only when business requirements make it unavoidable.

- Respecting the social, economic, cultural and human rights of communities; preserving the culture and heritage of the local communities and socially vulnerable groups and seek broad-based support for operations.

- Consulting and informing stakeholders in matters that affect them.

- Adopt sustainable development as an integral part of the business plan and put in place an appropriate institutional structure to plan and implement community development initiatives prioritising local needs and ensuring long-term sustainable benefits to communities.

As part of this new approach to coherence and transparency across the group worldwide, in 2011 we also published eight new policy statements on:

- Biodiversity
- Energy and carbon
- HIV/AIDS
- HSE
- Social policy
- Waste water management
- Supplier and contractor sustainability
- Human rights (a copy of which is Appendix 1)

All of these policies can be found at http://www.vedantaresources.com/sustainability/our_policies.html and they represent a step change in how we document and explain our approach to sustainability, corporate responsibility and human rights. Both internally and externally we are determined that our approach to all these issues will be more transparent and that we can use this transparency as a basis for quality engagement with stakeholders. They are all being applied to the Lanjigarh Project.

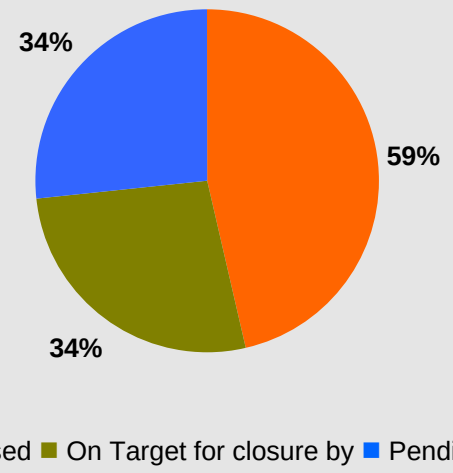
Behind these new policy statements we have created a series of technical and management standards that will be mandatory for all Vedanta subsidiaries, operations and sites. They will cover the whole lifecycle of a project from planning to closure and human rights issues will be integrated into them.

Developments at Lanjigarh

We attach immense significance to successful development of the Lanjigarh Project and we have taken note of the point, through interactive dialogue with our investors and other stakeholders, that we need to address some issues and be much more transparent about our policies and actions.

We also noted that independent, third party advice and comment were needed to give credibility to our responses. Consequently in November 2010, a report was commissioned into the sustainability of our operations in Lanjigarh from the independent consultants URS Scott Wilson, which can be seen on our website,[11] and as a result of which 29 recommendations were made. Their progress can be seen in **Chart 8**. We have acted upon all of them and in December 2011 a second progress report on these recommendations was submitted by URS Scott Wilson, and key points for both the group level and Lanjigarh are summarised in **Appendix 7**.

Chart 8. Graphic summary of progress from 17th of Nov. 2010 (first publication of Scott Wilson recommendations) and Dec. 2011 (Scott Wilson Progress Report)



In addition to the work of URS Scott Wilson and in light of developments at group level, VAL commissioned the independent consultants Environmental Resources Management (ERM) in 2011 to review its polices, procedures and performance with respect to the IFC Performance Standards, OECD Guidelines and ICMM Sustainable Development Framework, and develop an Environmental and Social Action Plan (ESAP) to address the identified gaps. **Appendix 8** provides a summary of recommendations on key issues it made in its report, presented in February 2012.

[11] Go to: http://www.vedantaresources.com/uploads/vedantasummaryreport0812.pdf

There are 11 issues in total that are reviewed; some are of specific importance to Amnesty such as community safety and relations with the tribal communities, but there are others such as standards for the contractor worker accommodation and local content in the project's activities which, in spite of being a cause of concern for activist groups, assumes paramount significance from the standpoint of industrial welfare. Central recommendations for the future are the need for the following:

1. An integrated environmental and social management plan

2. A stakeholder engagement plan

A central theme of the review is the need to build on what has been done in the past and give it greater integration and focus for the future; in large part by effective stakeholder engagement helping guide the way forward. For example with the Dongria Kondh, ERM recommend the development of a *"Tribal Development Plan (TDP) consolidating all the initiatives currently being undertaken" and that this should, "place a long term vision and development agenda for operating in an area where there is a significant tribal and hence vulnerable community. The plan should have the objective of providing long term benefits and development impacts on such communities, while also integrating measures to protect their rights, culture and internal organisations and structure. Livelihood enhancement and informed participation should be core elements of such a plan."*

The management of VAL at Lanjigarh have accepted the recommendations of the report as they build on previous work. In addition, VAL has expanded the degree of transparency in which it operates and this includes even greater independent third party review and auditing to track and report on progress.

The future of the project

It seems to us that Amnesty's position that the project should be developed and taken forward in a manner that respects the human rights of all concerned is – apart from being consistent with international regulations and national law – a very basic and fundamental principle of industrial operations anywhere in the world. Vedanta accepts this view and we hope that this report has helped Amnesty to better understand our approach to the project.

We believe that the Lanjigarh Project is very much in the best interests of India as a whole and the local region in particular. It can bring together modern "top down" industrial development with the type of thoughtful "bottom-up" development needed for the Dongria Kondh and other socio-economically vulnerable sections of the society inhabiting the core and buffer villages of the project.

We have been aiming to achieve do this and are committed to doing more constructively and in collaboration for the welfare and wellbeing of the local communities. Without the project, the future for the area looks as bleak as ever. Lanjigarh is the only investment of its type in this part of India and its sponsors are committed to making it the flagship enterprise for economic and social transformation in the region.

The key question is: "Can the contending parties come together and make a partnership for development work?" Vedanta is absolutely ready to play its part, we want to move beyond conflict to constructive engagement and we believe we have much to offer. We invite Amnesty and others to a dialogue about the creation and sharing of value, standards and measures for local progress.

With commitment, belief and resources, this will be a world class development project that meets all of the stakeholders' objectives.

Conclusions

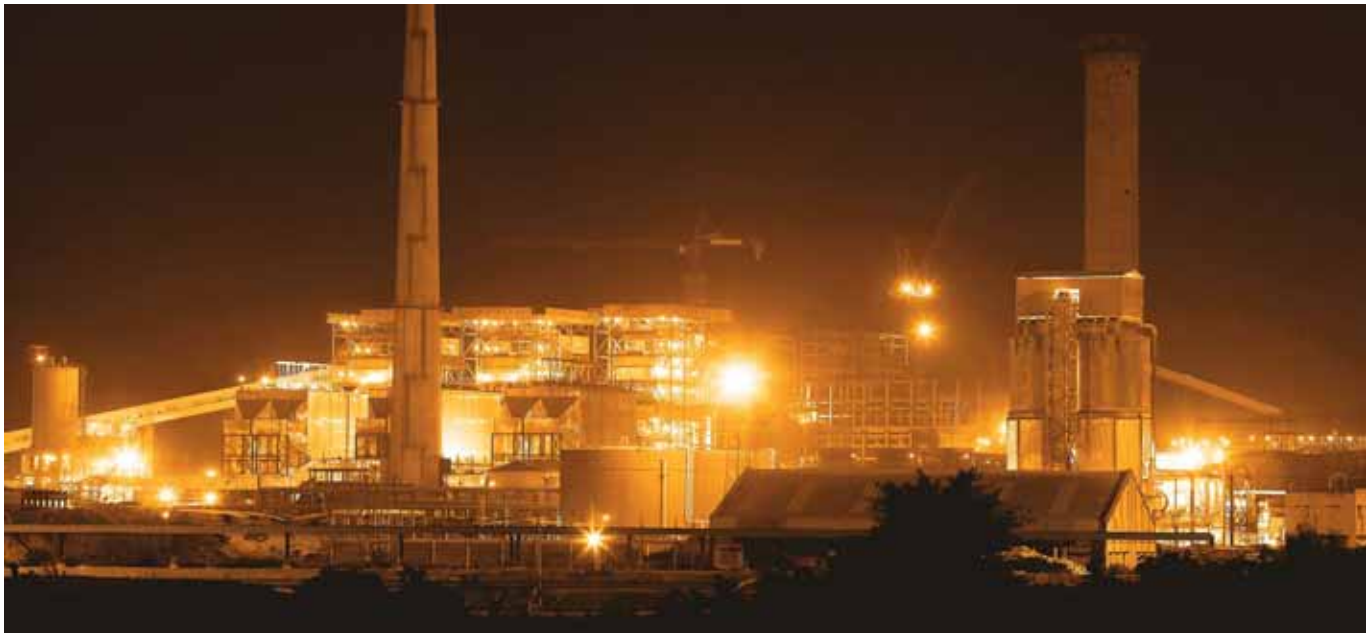
In responding to Amnesty's challenge by developing this detailed report we have reviewed all aspects of the Lanjigarh Project in great detail and have concluded that:

- The economic case for the Lanjigarh Project is extremely strong and credible at the national, state and local levels. It is the economic engine that is pulling the vehicle of local social development. It is creating jobs, promoting education, healthcare and community development for local people including the Dongria Kondh.

- While our processes, planning and consultation have been in line with all the applicable national regulations, we understand the need for continuous improvement, aligned to the developments, thinking and techniques taking place worldwide. Today, across India we have 149 such NGO/government/community partnerships and have invested more than US$38 million per year in supporting development projects. You can find case studies on our website http://www.vedantaresources.com/sustainability/.

- Vedanta respects the human rights and culture of the local people and accordingly our programmes are aligned to promote and preserve them as we believe that their distinctive traditions form the fabrics of their social existence.

Part 2
The detailed response to Amnesty's "Generalisations, Omissions and Assumptions" Report



Introduction

This second section of the report provides a detailed response to each of the conclusions set out in Amnesty's publication *"Generalisations, Omissions and Assumptions".* We have taken each of the points raised by Amnesty in the Conclusions section of that report, which runs from pages 14 to 18, and answered them in detail. Within these pages there is a separate table of brief points on page 16, and we have addressed this separately towards the end of this section.

Our approach to developing this response has been set out general terms in the first part of this report. We are responding to what Amnesty says in its opening statement of the Conclusions section of their report and that is:

"Amnesty International's analysis of Vedanta's EIAs for the Lanjigarh refinery and proposed Niyamgiri mine demonstrates that they fail to do what they are supposed to do – which is to assess the potential environmental and social impacts of the company's mining and refining operations. The EIAs are also inadequate to ensure that the company is fulfilling its responsibilities to respect human rights. While the EIAs are not intended as tools to assess human rights impact, Vedanta carried out no other impact assessment process in relation to human rights, even after serious human rights problems were brought to company's attention.

In allowing the company to construct and operate the refinery on the basis of these EIAs, the Indian government failed to fulfil its duty to protect the human rights of people who are and who will be affected by the refinery. The same consideration would apply to the expanded refinery and the mine, although clearance for each of these developments to proceed has been withheld by India's Minister of the Environment"

Despite the EIAs being substantial and complex instruments as Part 1 and Appendix 6 shows, we can agree with Amnesty that they cover social aspects in a limited manner and contain no direct reference to human rights as such. The EIAs did not require project sponsors to address the wide range of social, cultural and human rights issues Amnesty is interested in.

It is fair to say that standards and guidelines keep on evolving and that EIAs are based on the thinking of their day and are above all environmental impact assessments. While they have been developed over the years and do now cover certain key social issues, such as the displacement of local populations, they do not provide a comprehensive economic, social and environmental analysis of a project. In addition, Amnesty itself has acknowledged that EIAs are not designed to identify and review human rights issues, particularly as currently defined international standards do not fully address the human rights aspects of key environmental issues such as access to water.

However the EIAs are only one part of a national system of regulation, established by the Indian Government, to address certain vital issues that will arise in a project like Lanjigarh and all other similar projects in India. When the government set up the EIA system it knew that EIAs would sit within a wider framework of law covering many issues including human rights concerns such as the rights of tribal peoples, women and child workers. The government expects that project sponsors would take such laws and regulations into account, in any given set of local circumstances.

Vedanta and OMC, like any private or public sponsor of a major development project, must meet all the requirements of the EIAs but only as the first step on the ladder to having a project approved. Appendix 9 gives a list of the 69 laws and other legal requirements that Vedanta has registered as being generally applicable to the company in India and there are others that are applicable in specific sets of circumstances such as the interaction with people covered by the Scheduled Tribes acts.

Amnesty's report is, in many ways, a critique of the Indian EIA process in general, not just the project at Lanjigarh. Amnesty can criticise the Indian system but that is very different to critiquing what the company actually does, on the ground, in Lanjigarh. To do that, as we said in the first section of this report, Amnesty needs much more data than the EIAs provide. In this second part of the report we seek to show how the issues raised by Amnesty look when viewed in a wider perspective of law and company policy, practice and stakeholder feedback.

Our general approach

In Part 1 of this report, we set out our sustainability framework, which is derived from our mission and values. It is the basis on which a project like Lanjigarh should be managed and our performance judged. Also in Part 1 we acknowledged that much of the data needed to take a wider view of the project was not in the public domain and should be. In this part of the report, each of Amnesty's concerns summarised in the Conclusions section of the "Generalisations, Omissions and Assumptions" report is reviewed against the key components of this wider framework of ideas and practice, specifically:

1. Understanding the context of the issue

2. Understanding how the issue is addressed in Indian law

3. Meeting the requirements of the EIAs

4. Following company policy and relevant international standards

5. Listening to stakeholders and responding to what the engagement is telling us

6. Monitoring performance and making future plans

7. Knowing where we are on the journey towards world class standards and being transparent in our assessment

Each of the points in this framework is applied in depth to each of Amnesty's reported concerns about "generalisations", "omissions" and "assumptions" and they are discussed separately below within a wider presentation of the facts. In part, due to the way Amnesty's concerns are expressed, and in part due to the overlapping nature of the issues, there is an element of duplication in the responses below but we have tried to minimise that without detracting from giving a full response to each point.

However, discussion is still generally focused on the EIA process rather than the performance of the refinery today. There are other issues raised throughout both reports but particularly in *"Don't Mine us out of Existence"* about the current operations of the refinery and how they impact the lives of the people living nearby and we comment on these below.

The health impact of the refinery: the importance of technical analysis

In *"Don't Mine us out of Existence"* Amnesty says:

"The pollution documented by the OSPCB (Orissa Pollution Control Board), along with the repeated and consistently expressed concerns of the communities about dust and water contamination, raise significant concerns about the health impacts of pollution on the local population. Testimonies recorded by Amnesty International indicate that people's access to the water resources that they have traditionally relied on has been diminished because of their fears about the pollution of water and effects on their health. People have reported adverse health impacts and that they experience the environment that they live in as extremely uncomfortable because of dust and other emissions from the refinery."

Vedanta is directly accountable to the OSPCB for its environmental performance at Lanjigarh and, in consultation with it, we have set in place extensive monitoring and reporting processes to mitigate the adverse environmental impact – if any – of the refinery on the community. There is a strong mechanism (Right to Information) in force for anyone seeking any information relating to public wellbeing, which is embedded within the legislative framework of the country and can be utilised to provide all requisite facts relating to the Vedanta Lanjigarh Alumina Refinery.

It is worth noting that at no time has the OSPCB felt the need to take any action against Vedanta for a failure to meet the pollution standards required by Indian law, which is indicative of the commitment to legal compliance of the Refinery. It has in fact received a number of prestigious awards for its operations, such as a National Award for Excellence in Water Management and National Award for Excellence in Energy Management, which gives support to the claim of the refinery to having best practice environmental performance in its Lanjigarh operations.

Unlike its critique of the EIAs, which is based on a review of documentation, a large part of Amnesty's concerns about local pollution is based on anecdotal evidence from local people and many of the complaints have already been investigated by the OSPCB as well as other regulatory bodies. In addition, we are always entirely open to hearing any complaints through our grievance system described in Part 1 of the report. When grievances are logged through our system, they are categorised into one of five themes to ensure that each grievance is directed to the appropriate official within the company or Government. These themes are:

- Issues of compensation for land acquisition – These make up by far the lion's share of the grievances logged, 68% (421 in absolute terms) of those recorded between April 2011 and January 2012. Of these 421 grievances, 99% (408) were found to be the responsibility of the Government and the remaining 1% Vedanta.

- Issues of employment – The next most common grievance to enter our systems at around 23% (144). Of these, 8% were found to be attributable to Vedanta, the rest were the responsibility of the Government.

- Issues of land use – In total these issues made up 4% (28) of the total number of grievances received, 10 of which (36%) were the responsibility of Vedanta.

- Issues of development – 10 grievances relating to development in the area were lodged and half of these were found to be the responsibility of the Government and half Vedanta.

- Other – Some grievances were unable to be placed into one of the above categories but only accounted for 3% of the total grievances lodged.

We have frequently facilitated meetings on grievances with Government and the local community to ensure redress and secure a satisfactory conclusion to the recorded grievances.

We are absolutely transparent about all data relating to the environmental performance of the refinery. However much of is highly technical and Appendix 10 has been prepared by the management of the refinery to show in precise detail how environmental impacts on the local community are monitored and managed. It provides detailed technical data on the following issues, all of which have been raised as concerns by Amnesty. They are:

- Water quality
- Soil quality
- Noise
- Ecology and biodiversity
- Waste disposal, including red mud and fly ash

It is our knowledge of the systems that underpins the data in Appendix 10 on which we base our view that not only is Lanjigarh well managed within a strong sustainability framework, but in terms of its day-to-day performance with regard to the local community it also performs well. We would not claim to be best in class on all matters cited above but we are a responsible and well managed business which responds to local people's concerns where necessary.

Amnesty's concerns in detail

In this section of the report we look in detail at the main concerns raised by Amnesty in its report "Generalisations, Omissions and Assumptions: The failings of Vedanta's Environmental Impact Assessments for its bauxite mine and alumina refinery in India's state of Orissa". We quote directly from the "Conclusions" section of the report and respond using the framework set out above in the section on "Our General Approach"

1. Generalisations on affected communities

Amnesty's claims

"Generalisations on affected communities: The assessments do not accurately portray who will be affected by the projects. Through reliance on out-dated government data, the assessments homogenise and mask the affected populations. In reality, communities affected by the project have distinct characteristics in relation to labour, livelihoods, culture, and gender divisions. The assessments also fail to acknowledge the existence of some affected communities, particularly the Dongria Khond, whose villages or hamlets may not be listed in official government records."

Setting the context:

Over the last two decades, regulatory procedures and legislative mechanisms concerning the environmental impact of large projects in India has evolved considerably. Lanjigarh has seen multiple developments in the regulatory framework during various phases of the project and Vedanta has sought to comply in detail with all of them. We have also taken into account other factors influencing performance and they are set out below.

Indian law

In 2006, the Ministry of Environment and Forest (MoEF) produced a set of guidelines for EIAs in the Environmental Impact Assessment Notification. Meeting the requirements stipulated in the various notifications constitutes a mandatory legal framework and projects that fail to follow them are unlikely to be granted environmental clearance by the MoEF. However these guidelines make no mention of how to address the concerns expressed by Amnesty above.

Nevertheless a wide range of Indian laws such as that relating to Scheduled Tribes, the Resettlement and Rehabilitation Policy – 2003 of the Government of India, were the cornerstone for rehabilitating the displaced and compensating the affected populations. And those relating to air, water, noise pollution and the disposal of hazardous waste were all taken into account in the development of the project, as were laws relating to local consultation and engagement processes.

What the EIAs said

In order to assess the impacts of the refinery and mine proposals, demographic data was required. In this case the most up-to-date available data was used. For the 2005 Comprehensive Environmental Impact Assessment for the Refinery at Lanjigarh, 2001 Indian census data was used, while for the mine's EIA of 2002, this data was not available and a 1991 census was used instead. The impacts of the project, at both production and operation phases, were analysed for the whole community, 42.77% of whom were found to be members of India's Scheduled Tribes. In the Refinery Project, most of the members inhabiting the peripheral area belonged to the Kutia Kondh community in the Niyamgiri hills, but a detailed analysis of their living conditions and culture was not undertaken at that time. Vedanta subsequently undertook its own extensive studies of the Kondh people.

Vedanta policies and standards

Vedanta followed its policies and standards operating at the time the project was developed and launched which, like Indian national and UN international standards, have continued to be developed. Our new Sustainability Framework, published in 2011, takes an important step towards addressing the issue raised here by Amnesty International. It includes the commitment that we will:

"Comply with or exceed the legislative requirements in all jurisdictions in which (we) operate & develop systems to identify, manage and mitigate risks and adverse impacts on communities and environments. We will also strive to uphold labour and human rights aligned with national and international regulations as applicable"

Also in our newly published sustainability policies we have committed to an important set of guidelines and industry standards from the International Finance Corporation, of which Performance Standard 8 (Cultural Heritage) clause 6 includes: *"Where a project may affect cultural heritage, the client will consult with affected communities within the host country who use, or have used within living memory, the cultural heritage for longstanding cultural purposes to identify cultural heritage of importance, and to incorporate into the client's decision-making process the views of the affected communities on such cultural heritage"*

http://www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/pol_PerformanceStandards2006_PS8/$FILE/PS_8_CulturalHeritage.pdf

Stakeholder engagement

It was through the stakeholder engagement programme of the project, required both by law and our own policies and standards, that the distinct needs of the local communities were identified and accordingly responded to. For instance, issues such as healthcare, education and other economic assistance were established as being of importance to the local populace including the Dongria and Kutia Kondhs on the basis of the consultations and deliberations that were held prior to the drafting and submission of the EIAs.

After the dire need for health services to be offered to the majority of the region's inhabitants was highlighted, mobile health units (MHUs) were facilitated for hard-to-reach communities. Likewise schools were built to provide quality education for the children of the tribal communities, most of whom are first generation school-goers.

Performance and risk assessment

We have made a commitment to improve our practices in identifying sites of cultural heritage, which we have incorporated into our Sustainable Development Report of 2011 and our technical and management standards. We have also made the commitment to have our policies benchmarked against the Performance Standards of the International Finance Corporation, the private arm of the World Bank. Particularly pertinent in this case are PS 1 and 7. Clause 12 of PS 1 requires that

"As part of the Assessment, the client will identify individuals and groups that may be differentially or disproportionately affected by the project because of their disadvantaged or vulnerable status. Where groups are identified as disadvantaged or vulnerable, the client will propose and implement differentiated measures so that adverse impacts do not fall disproportionately on them and they are not disadvantaged in sharing development benefits and opportunities."

Clause 1 of PS 7 states that:

"The client will identify through a process of Social and Environmental Assessment all communities of Indigenous Peoples who may be affected by the project within the project's area of influence, as well as the nature and degree of the expected social, cultural (including cultural heritage), and environmental impacts on them, and avoid adverse impacts whenever feasible."

We have taken on board the recommendations of the URS Scott Wilson Report, both in its original publication and the progress reports, and have begun to take remedial action wherever required concerning our management systems and documentation processes relating to new projects.

The way forward

At Vedanta we believe we have managed the establishment of the refinery at Lanjigarh in a way that is consistent with our policies and the international standards we have adopted, despite a difficult social and political environment. In order to do this we not only used the most up-to-date data available but we also commissioned independent reports and studies to assess the impact that would be made. From these it was recognised that more must be done beyond that which was required by the EIAs. Consequently, such an initiative was beyond the requirements of Indian law.

Today we hold ourselves to international standards in matters of this kind. We recognise that this means applying more stringent standards to our operations than is sometimes required by local law. The interplay between host-country law and international law has always been contentious and trying to balance the necessity to comply with both is not always as straight-forward as it ought to be. Managing this has been a challenge that we have had to deal with. In terms of the refinery we are happy with our approach and our management.

2. Generalisations on the usefulness of technology for environmental control

Amnesty's claims:

"Generalisations on the usefulness of technology for environmental control: Any technology is liable to fail if it is not sensitive to the local context, or if not used according to a well-specified environmental management plan. The EIA reports appear to be underpinned by an unchallenged assumption that technology will overcome natural conditions. They do not discuss inherent pollution risks associated with locating a mine or a refinery next to a river. The refinery EIAs fail to discuss risks of water pollution during construction, nor is there any concern for the decommissioning of large waste ponds. The reliance on technology is also reflected in the failure to provide for continuous monitoring, which would have enabled early detection of spills. This has already proved to be a problem, as revealed in Orissa State Pollution Control Board reports of pollution from the refinery."

Setting the context:

All large natural resource-based projects of this kind require the use of modern technologies to ensure best utilisation of the resources compatible with environmental safeguards. As Amnesty pointed out, there is an implied risk associated with using any technology for any purpose, whether it is opening a mine, boarding a plane or driving a car. An EIA, in many cases, does require, directly and indirectly, an assessment of the best way to mitigate both the risk and the potential impact of the risk. In this context technology is a vital component of this assessment. Impact assessments are only one platform for broad discussion of technology's role as a mitigator of environmental risk. Nevertheless there are some specific challenges here that can be addressed. All companies operating in our field have systems in place to manage these risks and to react if an incident occurs. VAL-Lanjigarh is no exception. It is certified to ISO 9001, 14001, OSHAS 18001 and EN 50001, which demonstrate its credentials in the sphere of industrial safety and environmental management.

Indian law

We are accountable to a range of regulatory authorities – including the Orissa Pollution Control Board and the MoEF – for our performance in respect of technology-related issues such as air, water and noise pollution. For example, it is required that ambient water quality assessments are submitted twice a year to MoEF, and the Orissa State Pollution Control Board requires the same once a month. These submissions have been, and will continue to be, made accurately and on time.

As a responsible industrial employer, we have responded to concerns presented both by the community and the regulators. To date significant failures of technology and systems have not been reported or action taken against the company by the regulators.

What the EIAs said

The EIA for the refinery at Lanjigarh acknowledges the risk of its proximity to a river. The following is a direct quote from the EIA:

"Measures such as minimisation of water consumption, reuse of water and avoiding excavation in monsoon seasons, wherever feasible will be taken to minimise the impact on water resources and quality."

In public meetings prior to the construction of the refinery, it became apparent that local people were concerned about the impact the refinery's water needs would have on local water sources. As a result Vedanta chose to source its water not from the local area, but from the River Tel, located more than 60km away. High concentration slurry disposal technology was also implemented to reduce the refinery's water needs. It was also decided that, in order to minimise impact on the quality of local water sources, that state-of-the-art reuse technologies would be used to reduce waste water discharge.

Waste water from various plant processes is discharged into a custom-made process water lake and recycled back into the plant. The government-approved Refinery EIA states that *"adequate systems and processes shall be installed for collection and recycling of different types of liquid effluents and efforts to be made to have a zero discharge system in place"*, which has been implemented successfully. In this way technology is used not to overcome natural conditions, but to protect them.

In terms of monitoring, the EIAs include not only stipulations for monitoring throughout (although brief, the implied policies are extensive and include the positioning of monitoring stations and baseline data), but also after the operational phase of the refinery is complete. The following is an extract from the Refinery EIA stipulating how water features will be monitored:

- Total water usage, waste water generated and waste water recycled shall be monitored;
- Ground water quality monitoring and water level monitoring shall be carried out every month on wells around ash pond and red mud pond. Number and locations of bore wells for sampling may be decided in consultation with MoEF and OPCB. The parameters for monitoring may be the same as done for the EIA study (as presented in chapter-3.0) or may be decided in consultation with MoEF and OPCB;
- Continuous monitoring of SPM, SO2, NOx and CO is proposed for the calciner and boiler stacks. Concentrates of SPM will also be monitored on a regular basis at the outlets of coal and bauxite handling area dust separation system;
- Characteristics of water in the central sump shall be monitored to check compliance with the wastewater discharge standard for land application;
- Ambient air quality will be monitored for SPM, RPM, SO2, NOx, CO and Pb at locations prescribed by MoEF or OPCB; and
- Noise level within the plant at the noisy areas and at various points at the plant boundary will be monitored to check compliance with relevant ambient and work area noise level standards.

It is also worth mentioning that construction of the refinery has been completed and so the main concern for Vedanta regarding the potential pollution of local water sources refers to its operational phase and after decommissioning. The EIAs also include a Disaster Management Plan that stipulates procedure in the event of a catastrophe, including drought.

Vedanta policies and standards

The following are components of the Vedanta 2011 Sustainable Development Policy document on water management as an example:

- Apply a zero discharge philosophy wherever possible;
- Treat all wastewater to international best practice standards before discharging to the environment through the application of best available techniques (BAT) where possible and we will ensure that water/wastewater storage facilities are engineered and maintained;
- Determine baselines and develop ongoing monitoring of water quality;

It is also worth mentioning that when it comes to mitigating risks, the IFC has its own set of guidelines they recommend the clients to follow that outline which technologies are most suitable for mitigating risks. In this light we are committed to aligning ourselves with industry best practice such that technology becomes the integral pillar of our risk management strategy.

The International Association of Impact Assessment states that monitoring is an integral component of any assessment, and the following comes from the IFC Guidelines for Performance Standard 3 – Pollution Prevention and Abatement, which is applicable to both the refinery and the mine:

"Large projects with potentially significant emissions and/or high impacts, however, may require impacts on the surrounding environment (i.e., changes in ambient levels) to be monitored, in addition to the implementation of control measures."

Also applicable is the following excerpt from the same document:

"During the design, construction, operation and decommissioning of the project (the project life-cycle) the client will consider ambient conditions and apply pollution prevention and control technologies and practices (techniques) that are best suited to avoid or, where avoidance is not feasible, minimize or reduce adverse impacts on human health and the environment while remaining technically and financially feasible and cost-effective."

Performance and risk assessment

In order to abide by these international standards, it was decided during construction that the use of LDPE (a plastic sheeting to seal off impounded water) to mitigate the risks of polluting groundwater from the process water lake was not enough, despite the EIAs clearance. Following our risk assessment, HDPE (a higher quality material) was used instead; it is the same plastic used in the distribution pipes of natural gas, water, corrosion resistant lining for steel pipelines and facial reconstructive surgery.

While monitoring of the environmental implications of our operations is an integral component of our practices at Lanjigarh, our communication of the result of this monitoring is something that we have recognised is not adequately addressed and consequently we have put in place programmes and initiatives to help tackle this. In future reports and on our website we plan to further align our reporting with international best practice standards, specifically those of the IFC.

The way forward

We believe the role we play in the development of the immediate locality as well as the nation is extremely positive and although refining has certain inherent negative impacts, we have tried to minimise them with the help of best in class technology and by continuously improving our performance.

3. Review of comments on risks to human rights

Amnesty's comments:

"Omission of any consideration of risks to human rights: The assessments fail to identify or address serious risks to human rights. There are no baseline studies to accurately represent who will be affected by the projects, and how the exploitation of natural resources and associated environmental pollution may impact upon the health, livelihoods and culture of the women, men and children of these communities. The cultural and spiritual value of the land to some affected communities is not addressed."

Setting the context:

Amnesty has observed that the EIAs are not "a tool" for assessing human rights impacts (see the introduction) and, as this is the case, it is easy to criticise them for this omission. However we reiterate what we said in the first part of the report that the absence of a discussion of an issue like human rights in the EIAs does not mean that the Government and the project sponsors do not care about them or recognise that there are human rights aspects to many of our policies and practices.

Indian law

In 1989 the Government of India (GoI) enacted the Scheduled Caste and Scheduled Tribes (Prevention of Atrocities) Act. In 2006 they enacted the Scheduled Tribes and Other Traditional Forest Dwellers Act, which provides a framework to record the rights of forest dwellers and to allow them to cultivate certain amounts of forests for their own use (4 hectares). It also places the responsibility of conservation of "community forest resources" on the vulnerable group in question. The Act has invited criticism from western NGOs and some in India for failing to provide for forest dwellers in the same way as indigenous peoples are treated, in accordance with international treaties.

The EIA Notification of 1994, outlining the specific requirements for submission of an application for environmental clearance to the MoEF, does not include human rights as a necessary consideration of EIAs.

What the EIAs said

While the EIAs are predominantly environmentally focused, there are important socio-economic components. For these components the focus in the EIAs is predominantly a developmental one, considering, almost exclusively, the economic benefits for local communities of the anticipated increase in employment opportunities arising from the project. Although broad in terms there is a commitment made by Vedanta within the Refinery EIA that *"The cultural values of the tribal area and peoples will be preserved to the maximum extent."* In addition Amnesty states that the assessments fail in that: *"There are no baseline studies to accurately represent who will be affected by the projects, and how… environmental pollution may impact upon the health, livelihoods and culture of the women, men and children of these communities".*

The EIA outlines in detail the number of people who are anticipated to be affected physically, i.e. by losing their homestead land. This represents a basic baseline set of figures for comparison with future figures. The risk of negative impacts of the associated pollution on the health of all communities has also been covered within the framework of the EIAs; perhaps not to the extent Amnesty would like, but they are not totally negligent.

The EIA for the refinery also concedes that there could be a negative socio-economic impact on the livelihoods of those in the surrounding area as a result of increased migration into the region. This negative impact then feeds into the overall impact analysis for the refinery.

Vedanta policies and standards

In response to the development of Indian laws and international standards as the background to this project and others, we have established a set of policies specifically regarding human rights that will ensure compliance with international best practices on such issues.

- Respect and preserve the culture and heritage of the local communities including socially vulnerable groups which are impacted by our operations and work towards developing a constructive relationship with such groups and local communities, seeking broad-based support for our operations;
- Respect the social, economic, cultural and human rights of communities and will regularly communicate social performance in an accurate, transparent and timely manner;
- Work with government agencies to develop a common understanding and agreement to protect human rights in the event of any unforeseen situations. We will ensure protection of our people, equipment and assets.

The company recognises that the UN Universal Declaration of Human Rights sets a benchmark for how to address human rights issues generally and the UN system is constantly developing its approach to the issue of indigenous peoples in particular.

Stakeholder engagement

In developing the Lanjigarh Project we have relied on stakeholder engagement as a key tool for involving the local community in a "bottom-up" approach to local development. We have developed standards and practices with regard to what we have heard from our local stakeholders, supported by our own studies and experience from other locations. Over the period of time, the structure and approach to engaging with identified stakeholders representing a cross-section of the local population has been made robust through progressive documentation and dissemination techniques.

Performance and risk assessment

The EIA for the refinery contained accurate maps and aerial photographs of the area that included Dongria Khond villages and there was a limited assessment of the social structure and income sources of the local population.

A recommendation of the URS Scott Wilson Report was that Vedanta ought to:

"Adopt a specific human rights policy demonstrating its commitment to the UN Declaration of Human Rights and procedures to ensure its implementation. This should be communicated to all stakeholders via its web site"

We complied with this recommendation prior to the deadline by which it had been initially expected to be achieved. Nevertheless we realise that unless this policy is closely adhered to, it is worthless and so we are committed to reviewing our adherence to it as well as the efficacy of the policy itself.

A full copy of this policy is included here, signed by the company CEO:

Vedanta will strive to:

- To be compliant with labour laws of the country we operate in. Uphold human rights aligned with national and international regulations as applicable;
- Ensure that our employees are fairly and reasonably paid and remuneration structure is compliant with statutory obligations of the jurisdiction we operate in. Our operations will be based on zero tolerance for any form of forced, compulsory or child labour directly or through contracted labour. We recognise and respect employee rights to associate freely and to collective bargaining. We promote fair working conditions as guided by international conventions wherever applicable;
- Be an equal opportunity employer and all employees will be treated with respect and dignity and judged solely on their performance irrespective of their race, religion, caste, gender, age, disability, HIV/AIDS status, and other characteristic;
- Respect and preserve the culture and heritage of the local communities including socially vulnerable groups which are impacted by our operations and work towards developing a constructive relationship with such groups and local communities, seeking broad-based support for our operations;
- Respect the social, economic, cultural and human rights of communities and will regularly communicate social performance in an accurate, transparent and timely manner;
- Work with government agencies to develop a common understanding and agreement to protect human rights in the event of any unforeseen situations. We will ensure protection of our people, equipment and assets.

Each Vedanta business shall sign up to this policy which shall be implemented throughout the business. We will measure and report progress against this policy and review performance on a period basis to ensure ongoing management of human rights. The content and implementation of this policy will be reviewed periodically and actions taken accordingly including the sharing of good practices throughout the Vedanta organisation.

Signed by:

MS Mehta
CEO, Vedanta Resources plc

Date: *21st September 2011*

4. Comments on displacement and migration

Amnesty's comments:

"Omissions on displacement and migration: The assessments do not accurately portray who will be affected by displacement, land loss and migration. Where they acknowledge the broad need for 'resettlement', they give minimal details on how this will be in done in a just manner or how people who are landless but who rely on common land for their livelihoods, or on labouring on the land of others, will be compensated for their loss."

Setting the context:

There are two issues here: the first is the resettlement and compensation available to those directly and indirectly impacted by the project; the second is a much wider issue of internal migration in India. The first issue is defined within a clear framework of law, the second has some limited regulation as there is free movement of peoples within India. Our analysis of the impacts of the project has concluded that in both the construction phase and the operation of the project, migration into Kalahandi will take place.

Indian law

Article 4 Section 2 subsection d) of the Forest Rights Act states that *"no forest rights holders shall be resettled… except (when)… a resettlement or alternatives package has been prepared and communicated that provides a secure livelihood for the affected people…"*

The Orissa Resettlement and Rehabilitation Policy defines a Displaced Family, 2006 (i.e. after the Refinery EIA was approved) as "a family ordinarily residing in the project area prior to the date of publication of notification under the provisions of the relevant Act and on account of acquisition of his/her homestead land is displaced from such area or required to be displaced." There is no legal stipulation in state legislation to include those who are affected indirectly by way of loss of employment through land use change. http://old.cseindia.org/programme/industry/mining/pdf/Orissa_R&R.pdf.

Indian legislation states that resettlement is to be done in accordance with State legislation.

The Forest (Conservation) Act and Rules of 1981 also requires the following information as part of a submission for any proposed project:

Details of displacement of people due to the project:

1. Total number of families involved in displacement.

2. Number of scheduled caste/scheduled tribe families involved in displacement.

3. Detailed rehabilitation plan.

There are also laws affecting inter-state migrant workers mentioned in the Labour Laws covered by Appendix 1.

What the EIAs said

EIAs require a summary of the nature of displacement and a plan of rehabilitation according to domestic law. In accordance with this stipulation, Vedanta has adopted a Resettlement and Rehabilitation (R&R) Plan for displaced individuals in line with the most up-to-date relevant legislation at the time, which in this case would not be the 2006 Orissa Resettlement and Rehabilitation Policy but that of 2003. Also in accordance with this legislation, the design of the Refinery was such that displacement was kept to a minimum. This R&R Plan is supplementary to the EIAs. It is acknowledged in the Refinery EIA that there will be an initial disapproval of these impacts by local communities but that these grievances will be offset by improvements in living standards as a result of resettlement to communities with better infrastructure. These impacts feed into the overall assessment of the impacts of the project. In other words the assessments do not *comprehensively* address the impacts of resettlement, but only because this is not a necessary requirement of an environmental impact analysis.

Vedanta policies and standards

One of the driving forces behind the planning of the refinery was to minimise the displacement of families and we managed to reduce this number to only 121, 76 of which had a family member take a job in the refinery while the remainder were helped to find other sources of income as there was no eligible member for employment. A further 1,846 people were deemed to have been affected by the project and a compensation programme was set in place and detailed data is available. In addition, as stated in Part 1 of the report, the size of the proposed mine lease area was reduced to avoid any relocation of Dongria Kondh villages or displacement of any person.

IFC PS5 (Land Acquisition and Involuntary Resettlement) applies to physical and/or economic displacement for land use rights acquired through expropriation in accordance with domestic legislation.

Economic Displacement (i.e. loss of livelihood regardless of physical loss of land) is required by PS5 to be compensated for by:

- Prompt financial compensation for economically displaced persons for loss of assets or access to assets at full replacement cost.
- In cases where land acquisition affects commercial structures, compensation for the affected business owner for the cost of re-establishing commercial activities elsewhere, for lost net income during the period of transition, and for the costs of the transfer and reinstallation of the plant, machinery or other equipment.
- Provision of replacement property (e.g., agricultural or commercial sites) of equal or greater value, or cash compensation at full replacement cost where appropriate, to persons with legal rights or claims to land which are recognised or recognisable under the national laws.
- Compensation for economically displaced persons who are without legally recognisable claims to land. The company is not required to compensate or assist opportunistic settlers who encroach on the project area after the cut-off date.
- Provision of additional targeted assistance (e.g., credit facilities, training, or job opportunities) and opportunities to improve or at least restore their income-earning capacity, production levels, and standards of living to economically displaced persons whose livelihoods or income levels are adversely affected
- Provision of transitional support to economically displaced persons, as necessary, based on a reasonable estimate of the time required to restore

As Part 1 of the report (and Appendix 3 in particular) shows, the company has met its legal obligations to those that were directly displaced by the refinery and those who are deemed as being affected by it due to a loss of land and other factors. In respect of displacement we have met the law and gone beyond it.

Our 2011 Social Policy that was published following advice from the URS Scott Wilson Report contains the following commitment:

- Avoid involuntary resettlement where feasible and consider displacement only when business requirements make it unavoidable. We seek to adopt and implement best possible measures to improve or at least restore quality of lives and standards of living of displaced persons in particular and communities in general;

Migration is another matter and with respect to the refinery we estimate that the majority of the people working in the refinery will originate from Orissa. It was very difficult to recruit highly skilled workers in Kalahandi due to the conditions found in the district, however our schools interventions and our skills development programmes will hopefully help remedy this problem over time.

Informal migration to set up shops and other informal sector businesses to support our workforce and the growing local community is an issue and one that we will address through our community engagement policies and our livelihoods development programme in particular.

Throughout the development of this project we have ensured that all Indian laws are upheld. At the time of its publication the EIA for the refinery contained within it all the necessary requirements of the Orissa R & R Policy of 2003. Vedanta has ensured that as few displacements were necessary as possible in the construction of the refinery at Lanjigarh. Where it was necessary, those affected were compensated for in a way that is consistent with the international standards outlined above.

Stakeholder engagement

We are in constant contact with all those covered by our displacement programmes and more emphasis is laid on livelihoods as it is absolutely within our development strategy not just to create jobs within the business and its local value chain, but also through outreach work to help a wide range of people in the community such as local farmers and Dongria Kondh women to develop their capacity to earn a better living. Help in improving living standards in the community is a top request to us from local stakeholders (along with improved education, healthcare and infrastructure).

Also as part of our revised policies is the following component:

- Consult and inform stakeholders in matters that affect them. We will regularly communicate social performance in an accurate, transparent and timely manner to stakeholders.

The accompanying technical standards to this document state a commitment to live up to international standards in terms of public consultations regarding the acquisition of new sites for future projects.

Performance and risk assessment

Our resettlement plan for the Lanjigarh Project was consistent with both domestic law and IFC international standards. Our identification of those affected by the project and our plan to rehouse and compensate them was consistent with the relevant state legislation. Those whose land rights were not legally bound were included and they were compensated for their losses. We are also committed to encouraging sustainability in community livelihoods by providing employment opportunities to those affected as well as one-off financial payments. The issue has been raised because of its omission from the EIAs, something that is not a legal obligation. However the refinery application, including both the EIA and R & R Plan, was granted approval by state regulators, which suggests compliance with legal stipulations.

The way forward

As part of Vedanta's sustainability framework, we have developed a standardised approach to community consultation and disclosure on new developments that reflects the IFC guidelines and performance measures. We are committed to better communication with all our stakeholder groups, including information on the impacts we have on communities, environmental or otherwise. We see this as a key pillar of our sustainability business model.

5. Comments on gender

Amnesty's comments:

"Omission of gender: The assessments are devoid of any gendered analysis of the impacts of the projects or the proposed mitigation measures. Specific impacts on women are not identified, for example:

- *Displacement without adequate compensation because of lack of formal land ownership*
- *Loss of access to common grazing land and livelihood*
- *Lack of personal safety and increased insecurity associated with an influx of migrant population, greater vulnerability to harassment and prostitution, and decreased space for women to congregate safely."*

Setting the context:

Women's societal status in Kalahandi is very complex. Generally their wages are extremely low in the rare instances when they are in a position to earn – about 60 US cents a day, 75% of the rate for men. Close to the project in Lanjigarh, about 43% of men are literate and 15% of women. In the Dongria Kondha society, women have a lot of equality with men but they are responsible for a great deal of agricultural work and have a hard life.

What the EIAs Said

As with human rights the EIAs did not require analysis of project impacts by gender and relevant data is not presented. In the EIA for the refinery provisions are included to increase the employment rate of women in the area as well as provide equal wages and healthcare provisions. Provisions for safety in society, again while not mentioned in the EIA, are part of Vedanta's wider CSR initiatives. In this way we acknowledge the issue as being very important, even if it is not dealt with in the EIAs.

Vedanta policies and standards

Some of the families displaced by the refinery had no clear land title, but we treated them as if they did. Unfortunately we don't have separate data on households headed by women.

Amnesty's concerns are about the impact of the project on the lives of women in the community and there is a recognition of their special needs in our CSR and community outreach initiatives because we are very aware of their situation in Kalahandi.

In Lanjigarh there are three programmes of particular note:

1. Project Trupti – One of the most problematic everyday components of local women's lives is the fetching and carrying of water, something that has to be done at least once a day. This would sometimes take up to four hours but was vital for survival. Vedanta, upon entering the region, undertook an initiative to provide the communities with water by diverting the path of a perennial stream, treating it and piping it to villages on the slopes of the Niyamgiri Hills. Training to maintain the treatment facility was also provided to community members, thereby preventing an overdependence on Vedanta and more such projects are planned.

2. Project Jeebika – Under this project women, mostly from tribal communities, are provided with skills-upgrading training to help them earn a living wage from minor forest products. By providing these tribal women with direct access to markets to sell their wares, thereby eliminating any middlemen, to date 498 women have experienced a significant improvement in livelihood.

3. Project Shashakti – This project aimed to provide women in communities in the vicinity of Vedanta's operations with a space where they could feel safe and experience collective security. Fifty five self-help groups in 26 villages have managed to provide 600 women with communal spaces as well as subsequent skills training and access to local NGOs.

India is a signatory to the 1979 UN Convention on the Elimination of all Forms of Discrimination against Women and Vedanta accepts all the references to the rights of women contained in the UN Universal Declaration of Human Rights.

Guideline 26 of the IFC Performance Standard 1 (Social and Environmental Assessment and Management Systems) states that to gain investment from the IFC, corporate entities are required to recognise that:

"A project may have different impacts on women and men, due to their differentiated socioeconomic roles and their varying degrees of control over and access to assets, productive resources, and employment opportunities. There may be norms, societal practices, or legal barriers that impede the full participation of persons of one gender (usually women, but potentially men) in consultation, decision-making, or sharing of project benefits."

In recognition of this it is suggested by the IFC that impacts of gender discrimination should be incorporated into assessments and mitigation measures should be outlined within. An example given is ensuring that both men and women are provided with equal land titles.

It is also suggested, in Guideline 27, that outreach measures should specifically look into the issues of education and health in relation to gender, for which there is a strong tie to other development indicators such as poverty. Within our own business we have an equal opportunities policy that is designed to create opportunities for women among others; 16% of VAL's workforce is female and we ensure there is no wage discrimination.

Stakeholder engagement

The initiatives detailed above have emerged from our stakeholder engagement processes and through direct contact with women in the community. The women are often very interested in health and education provision for their children but we have also been able to ensure women have access to (and time to utilise) NGOs, which can act as an intermediaries to pass on any proposals for initiatives designed to help the women.

The 55 self-help groups, established under Project Shashakti, are attended by members of the Vedanta CSR team regularly, thereby encouraging communication between women in the area surrounding Vedanta's Lanjigarh Project.

Vedanta recognises the value of keeping these lines of communications open, especially given the role mothers take in family decision-making in this culture, and so it is seen not just as an act of social-responsibility but also as an act of responsible business.

Performance and risk assessment

These initiatives encouraged the empowerment of women through income generation, skills creation and infrastructure development. We are committed to continuing the focus on this segment.

The 55 self-help groups in the Kalahandi district, part of Project Shashakti, have become increasingly popular and successful, and provide vital support to about 26,700 women. As the popularity of this scheme continues to be demonstrated, we will encourage their growth through our dedicated support in all possible ways.

Vedanta has also built a major hospital in Lanjigarh that provides better access to healthcare for Vedanta employees as well as to others in the community. In addition we have established a fleet of mobile health units to provide hard-to-reach members of the local communities with access to healthcare. The entire cost of these units is borne by Vedanta.

Furthermore Vedanta has developed programmes such as:

- Health/awareness camps - providing health education that, as Guideline 27 of the IFC Performance Standard 1 suggests, not only has a hugely beneficial impact on the local community's health but also goes some way to indirectly address the issue of gender development disparities.

- Computer aided learning programme - providing children with basic computer literacy training.

The way forward

We have achieved certain major milestones in the fields of health, education and female empowerment but we recognise there is more to do to help bridge the gender divide and to improve basic health and education in the area and this is one of the drivers in our latest initiative. By developing strategies that have a beneficial impact on as many areas of the community as possible we can ensure that we can achieve as much as possible with the resources that are available.

6. Omissions of information and detail

Amnesty's comments:

"Omission of information and detail: The assessments lack of detail and information regarding the overall environmental impact of both the refinery and mine. The mining EIAs largely ignore the environmental consequences of the mine, and how the environmental impact of mining could be minimised. There is no detailed investigation of the actual vegetation of the proposed mining area, nor of those locations affected by road and conveyor belt transport, or affected by the dumping of overburden waste. Local streams and water bodies have not been investigated despite being clearly visible on detailed topographical maps."

Setting the context:

The Lanjigarh Project has two elements – the mine and the refinery – and therefore very different environmental footprints. As earlier communicated, the Bauxite Mining Project in Niyamgiri Hill ranges belongs to the Orissa Mining Corporation (OMC), a Government of Orissa undertaking. The matter is subjudice in the highest court of the country, the Honourable Supreme Court of India. Therefore Vedanta has been advised to refer all the queries on the proposed mining project to the Government of Orissa and Orissa Mining Corporation and we have refrained from commenting on the current status of the mining project.

Indian law

It is a requirement of the Environmental Protection Act that EIAs in India include an Environmental Management Plan, an Overburden Plan, a Monitoring Plan and a Disaster Management Plan for 29 categories of industries including mining.

The Forest (Conservation) Act and Rules of 1981 sets out the members of the relevant committee and stipulates the necessary credentials of projects that will have an affect on forest. However, no forest land is involved in the Refinery Project except some land that was earmarked for supplementing the livelihood of the displaced people by developing a village forest (popularly known as Grameen Jungle Jogya Jameen).

Vedanta policy and standards

To give further impetus to our environmental concerns, it is worth stating here that we are committed to minimising the impact of our operations and biodiversity is an integral component of this commitment. We have made the following policy:

- Prevent where possible, minimise and mitigate biodiversity risks throughout our businesses. We will manage and use land in our operations in a manner that allows biodiversity conservation needs to be integrated with business needs through the project lifecycle, including decommissioning, closure and rehabilitation;
- Comply with, and exceed where possible, the local, regional and national legislative requirements on land management and biodiversity conservation, and applicable international conventions where applicable in all jurisdictions in which it operations;
- Identify and assess biodiversity status and value before the start of a new project and monitor impacts over the project lifecycle;
- We will consider the impact on ecosystem services;
- Work towards the conservation of threatened/rare and endemic species and high priority conservation areas, and support local, national and global conservation initiatives. We will provide information and raise awareness among our employees and other stakeholders to enhance knowledge and understanding of biodiversity and conservation issues, where applicable.

This was also suggested by URS Scott Wilson during its independent review in 2010.

7. Assumptions on livelihoods

Amnesty's comments:

"Assumptions on livelihoods: A broad assumption is made that people who have historically been involved with a set of activities for their livelihood and sustenance can alter their practices in response to the encroachment of major industrial projects. While some individuals may be able to make this change, the disturbance could lead to poverty, marginalisation and alienation of some communities. Indigenous and dalit communities are among those most likely to lack the necessary qualifications for any new jobs that are provided. The assessments do not reflect the importance of forest resources for local livelihoods, nor do they reflect how a loss or change in access to forest goods will affect the capacity of people to meet their subsistence requirements."

Setting the context:

Orissa, as one of the most underdeveloped states in India, is blessed with a large variety of high quality mineral wealth. It is a resource rich state with deposits of several minerals besides bauxite. However, the general pattern of industrialisation in India has been for these minerals to be mined by companies whose refinery operations exist elsewhere in the country. For this reason the State of Orissa has been strongly committed to seeing more companies relocate to the state to begin operations there so that the economic benefits of the resource extraction can be felt locally.

One of the more important aspects of this regional economic regeneration is its impact on employment. According to the 2001 Indian census, Orissa's employment rate was less than 40%, with 14.5 million of the 36.7 million registered as workers. This did not include subsistence farmers. For this reason both employment and skills development are key policy drivers for the State of Orissa and encouraging private investment.

However about 23% of the State's population is classed as tribal peoples such as the Dongria and Kutia Kondh, and Amnesty is right to say that these peoples are very unlikely to have the educational qualifications necessary to gain employment with the project.

Indian law

India is acutely aware of the need to alleviate rural poverty and create employment for rural communities and in 2005 passed the National Rural Employment Guarantee Act, which seeks to create a universal right to employment. Vedanta has paid due regard to the spirit and the letter of this act, both in respect of the refinery, the planned mine and the wider community.

There is also a very clear framework of law to cover the rights of those displaced by the project and otherwise affected by it and Part 1 of the report gives an account of how they have been treated.

In addition, Article 3 section 1 subsection b) of the FRA, 2006 explicitly provides forest dwelling scheduled tribes with:

"Community rights such as nistar, by whatever name called, including those used in erstwhile princely states Zamindari or other such princely regions."

As well as, subsection c:

"Right of ownership, access to collect, use and dispose of minor forest products which has traditionally been collected within or outside village boundaries."–).

The Act also provides for the responsibilities of these rights holders through their legitimate governance institutions (Gram Sabha) in Article 3 section 5 subsection d):

"(they are empowered to) ensure that the decisions taken in the Gram Sabha to regulate access to community forest resources and stop any activity which adversely affects the wild animals, forest and the biodiversity are complied with."

What the EIAs said

Employment predictions for the mine and the refinery are made in their respective EIAs. The mine is predicted to employ about 750 people (250 directly and 500 indirectly through contractors, for example). The refinery is expected to generate a further 750 jobs but an indirect employment generation of up to 2,000 is also predicted as a result of the economic development of the area surrounding Lanjigarh (examples of this level of development have already been demonstrated with a hotel, an English language school and an airport security service in the vicinity of the Lanjigarh Refinery). As at 31 March 2012, VAL Lanjigarh employed approximately 3,000 direct and contract labour, of which the majority are local to Orissa.

Vedanta policy and standards

While Indian legislation has been formed in such a way as to provide for the rights of scheduled castes and tribes, the way this conforms with international definitions of "indigenous people" is unclear. Throughout the "Don't Mine us out of Existence" document, Amnesty International refers to the Dongria Khond as an indigenous community, citing their social label of "adivasi", which loosely translates as "original peoples". However this is not a legal term and the Dongria Khond, who are identified as a scheduled tribe, are dealt with as such in the legislation. While it is not necessarily legitimate to apply it to the Indian case, the IFC guidelines help manage relationships with indigenous people. In those instances within it that are applicable, Vedanta shall ensure that they are abided by. For an overview of the debate on the legal status of scheduled tribes in relation to the international definition of indigenous people, see Box 1 on page 29.

It is also worth noting that Principle 3 of the International Council on Mining and Metals states that members will *"Respect the culture and heritage of local communities, including indigenous people."*

Our own recruitment and supplier selection practices have tried, where ever possible, to create employment locally and we have our own livelihoods development programme described in Part 1 of the report to promote employment and income enhancement in the community. We have extensive programmes with local farmers, Dongria Kondh women and others to promote greater employment and income enhancement.

In addition, we have incorporated certain elements into our newly developed policies in order to address the above concerns, regarding tribal communities in particular. We have committed to:

- Respect the social, economic, cultural and human rights of communities and will regularly communicate social performance in an accurate, transparent and timely manner;
- Adopt sustainable Development as an integral part of the business plan and put in place an appropriate institutional structure to plan and implement community development initiatives prioritizing local needs and ensuring long term sustainable benefits to communities.

We have only been active in livelihood development for about six years but are proud of the positive impact on communities close to our operations, firstly through our business practices and secondly through our CSR programmes. Various CSR projects that focus on skills development are operational in and around Lanjigarh such as Project Jabeeki, which provides women in particular with self-help groups that allow a forum for the development of skills in the construction of plates made from leaves for purchase in local markets, providing them with a sustainable and reliable source of income.

We encourage farmers in the community to grow crops organically and adhere to cultural practices through Project Jaibik. We also provide local farmers with training to adopt best agricultural practices by providing high yield seeds, and advanced agricultural techniques for example through Project Sabuj. This helps increase crop yield and therefore income for the most prevalent occupation in the area.

Stakeholder engagement

Throughout all our formal and company-led stakeholder engagement processes, the community has made it a primary demand that the company does its utmost to enable local people to increase their job opportunities and enhance their income generation. Firstly in terms of the company's direct employment, through its supply chain, by caring for the displaced and the otherwise affected populations, and through wider community initiatives. Vedanta is committed to continue this in future.

We have acknowledged that livelihood development for the Dongria Kondh is a special case because their way of life is so interconnected with the forest lands, and as such requires special forms of intervention. There are those in the tribe and working with the tribe who want us to work to improve their economic wellbeing and we are willing to do so. The study we commissioned from the Asian Institute for Development, which was published in 2008, presented highly detailed information not only on the social and religious life of the tribe but also its economy and its economic assets. We believe this baseline material provides an excellent basis for a Tribal development plan.

We will continue to further improve our process to consult and inform stakeholders in matters that affect them and regularly communicate to them on social performance in an accurate, transparent and timely manner.

Performance and risk assessment

Our assessment of the impacts we had on tribal communities conformed to the regulations of Indian law at the time of the publication of the EIAs. Since then these laws have evolved. Nevertheless we have developed initiatives to facilitate the economic development of communities such as Dongria Kondh and we are constantly reviewing them to ensure that this is done in a way that is sensitive to their cultural idiosyncrasies.

The way forward

We have subjected our work on livelihoods in the community to scrutiny by outside agencies such as the Xavier Institute of Social Service (see Appendix 4) and based our interventions on studies by the Asian Institute for Sustainable Development. Our progress report by URS Scott Wilson has acknowledged some of the achievements we have made in this regard through our CSR initiatives to support livelihoods.

With the formal commitment of resources in excess of US$2 million per year to community development made in the Supreme Court's SPV provisions, we have a long-term perspective of being able to plan for a rolling and expanding programme of local economic development extending for decades in the future and we believe much could be achieved.

8. Assumptions on location

Amnesty's comment:

"Assumptions on location: The choice of location for the refinery just next to the Vamsadhara river is highly questionable, because it increases the potential consequences of any spill or other polluting event. This problem is compounded by the proposed six-fold expansion in production, the consequent increase in red mud storage area, and the failure to measure the quality of river water, deemed unnecessary because it was assumed there would be zero emissions. Since the EIAs were produced, inspection reports have revealed that spills have occurred."

Setting the context:

Part 1 of the report discusses at length the initial process of site selection, which was driven by a combination of macro factors such as access to bauxite reserves and communications infrastructure as well as micro factors such as the need to minimise the displacement of local populations and the loss of good agricultural land. The existence of the Vamsadhara river was considered a risk at the time of site selection and accordingly modern techniques were put in place to control water supply and water is being brought from the Tel river over 60km away.

Indian law

Submissions of water quality monitoring findings to OSPCB are mandatory every month, a requirement that we have maintained throughout the project. Likewise the MoEF requires similar findings twice annually.

Article 24 section 1 of The Water (Prevention and Control of Pollution Act), 1974 states that

"(a) no person shall knowingly cause or permit any poisonous, noxious or polluting matter determined in accordance with such standards as may be laid down by the State Board to enter (whether directly or indirectly) into any [stream or well or sewer or on land]; or

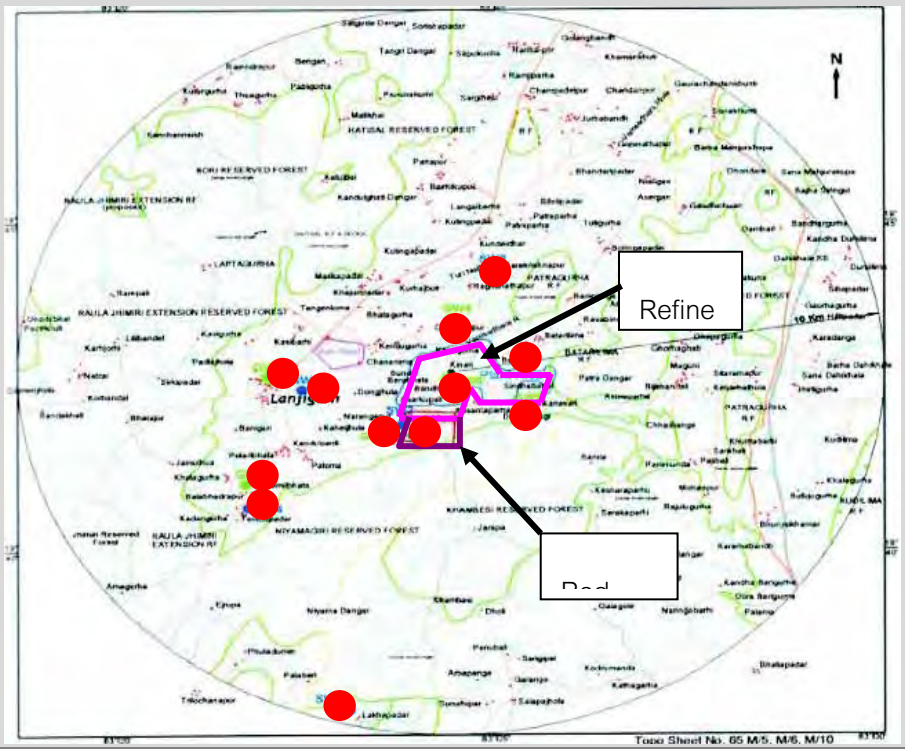
(b) no person shall knowingly cause or permit to enter into any stream any other matter which may tend, either directly or in combination with similar matters, to impede the proper flow of the water of the stream in a manner leading or likely to lead to a substantial aggravation of pollution due to other causes or of its consequences."

What the EIAs said

In order to minimise our environmental impact on the area surrounding Lanjigarh, we have committed to sourcing our water from the Tel river located more than 60km away rather than the nearby Vamshadhara river. This part of the project proposal is a component of our Comprehensive Environmental Impact Assessment for the refinery and was a stipulation of discussions with the Orissa State Water Management Department following the submission of our Rapid Environmental Impact Assessment. We are therefore expected to have no negative impact on local water sources in a volumetric context.

The potential impact we could have on local water sources stems from our potential as a source of pollution. As a result of this we are compelled to carry out constant water quality monitoring as part of our Environmental Management Plan. This monitoring will take place at 11 strategic locations to ensure that our impact on water is as low as possible as well as constant on-site monitoring. Map 6 is a topographical map extracted from the refinery EIA of the area surrounding the proposed refinery site with the locations of each of the 12 water quality monitoring stations. Between 2008 and 2012 there has been no record of change in water quality from these monitoring stations; during this period the refinery has been fully operational albeit not at the proposed extended capacity. Beyond these 12 monitoring stations, water quality monitoring also takes place at the Vamshadhara river both upstream and downstream of our operations and since the refinery has been operational there has been no recorded incidence of water quality change.

Map 6. Topographical map of the Lanjigarh refinery with the positions of each of the 12 water quality monitoring stations, signified by the red dots.



We have committed to ensuring our refinery emits zero waste and zero effluent discharge and to this end we have implemented techniques to treat water to a level acceptable for reuse in the refinery, recycled our fly ash (of which the refinery produces around 200,000 tonnes per year) for the manufacture of bricks and monitoring of our waste management programmes including regular reports submitted to both the Orissa State Pollution Control Board and the Ministry of Environment and Forests.

Vedanta policy and standards

Assessment of project location is a mechanism used as a specific example by the IFC of a management practice that can help reduce the project's environmental impact – Article 11 PS3.

We are fully committed to meeting all the requirements of local laws and regulations in respect of how the refinery operates on its site and to go well beyond them in risk management. Additionally the policies that we have applied to the establishment of the refinery at Lanjigarh have conformed to many of the guidelines laid out by the IFC in PS1 and 3. For example, we have sought to minimise the environmental impacts of our operations by adopting state-of-the-art technologies to help us reach our target of complete waste water reuse.

In a journey of continuous improvement, to bring further focus, Vedanta has incorporated other policies in the management of water and site allocation that are relevant here. The following are our ongoing commitments in relation to our management of water:

Vedanta strives to:

- Understand our water footprint at all our projects and operations, and will maintain a water balance that minimises the amount of freshwater consumed by re-using as much water as possible in our processes and encouraging rainwater harvesting where we can;
- Comply with applicable national, regional and local regulations; identify water conservation projects through reduction, recycling and reuse and monitor progress against water consumption reduction targets across our businesses. We will avoid pollution of surface water, ground water and other water resources arising from our operations;
- Apply a zero discharge philosophy wherever possible;
- Treat all wastewater to international best practice standards before discharging to the environment through the application of best available techniques (BAT) where possible and we will ensure that water/wastewater storage facilities are engineered and maintained;
- Participate in local or regional water catchment planning activities to secure sustainable water resources for Vedanta operations and the activities of other users outside of the organisation;
- Determine baselines and develop ongoing monitoring of water quality;
- Work with communities and communicate with all our stakeholders on the progress and performance of water conservation and water management.

At Lanjigarh, in addition to zero effluent discharge, we are also striving to implement a zero waste policy.

Stakeholder engagement

Kalahandi is a water stressed area and local stakeholders are extremely concerned about protecting the quantity and quality of water available in the area. We actively monitor our impact on local water courses and any problem that arises can be brought to our attention immediately through the grievance procedure and we have pledged to give an immediate response.

The final commitment in our Water Management Policy is to improve the way we are engaging with our local stakeholders in terms of our environmental monitoring in particular.

Performance and risk assessment

The URS Scott Wilson Progress Report has recognised that we have gone some way to implementing a standardised approach to community consultation that is in line with the above IFC principles (and more besides). Going forward, the unit will develop an integrated Environmental and Social Management Plan (ESMP) and a Stakeholder Engagement Plan (SEP). These documents will track environmental and social performance and will be live documents.

We have not had any reported incidences of pollution of local water sources and we have a strict monitoring regime in place to ensure that if any such event were to occur, we would be made aware of it as quickly as possible so that we can react in the appropriate manner and with the appropriate level of action.

The way forward

Our self-set guidelines, outlined above, will help inform our forward thinking strategy so that we can ensure that the refinery at Lanjigarh remains an exemplary performer in Indian water conservation. The refinery is the first in India to use certain water conservation technologies and we believe that setting the model for progressive refinery operations in regards to waste management and water conservation is something we should be very proud of and we will continue to encourage the adoption of such a model throughout the country.

9. Assumptions on air pollution

Amnesty's comments:

"Assumptions on air pollution: The air pollution monitoring stations are not located in or near to the villages closest to the mine and refinery sites. Moreover, these stations are not in the locations that the EIAs predict will be the most likely to be affected by pollution. Therefore, not only is the information about current pollution incomplete, but the inadequate monitoring structure ensures that the true air pollution levels will not be adequately captured in future. In terms of air emissions from the refinery, only a narrow range of pollutants are being monitored compared to what would be considered leading practice, and the number of sources of pollution examined is limited. This means it will be impossible to detect high levels of many air pollutants. The failure to assess air pollution from dust and odour is an additional weakness."

Setting the context:

The refinery sits at the foot of the escarpment of the Niyamgiri Hills. The locations for each of the monitoring stations were a strategic decision. Prevailing wind data was collected and from this it was possible to assess the average annual wind direction and strength.

Indian law

As is the case with water, ambient air quality assessments are required by both the MoEF and the OSPCB.

The Air (Prevention and Control of Pollution) Act 1981, in a similar way to the Water (Prevention and Control of Pollution Act) 1974, requires applicants for environmental clearance of projects to submit air quality monitoring systems, as well as ambient air pollution concentration levels, to enable data to be benchmarked.

Again, similar to water, international laws pertaining to air pollution focus almost entirely on the transboundary effect of air-borne pollutants and are therefore not applicable in this scenario.

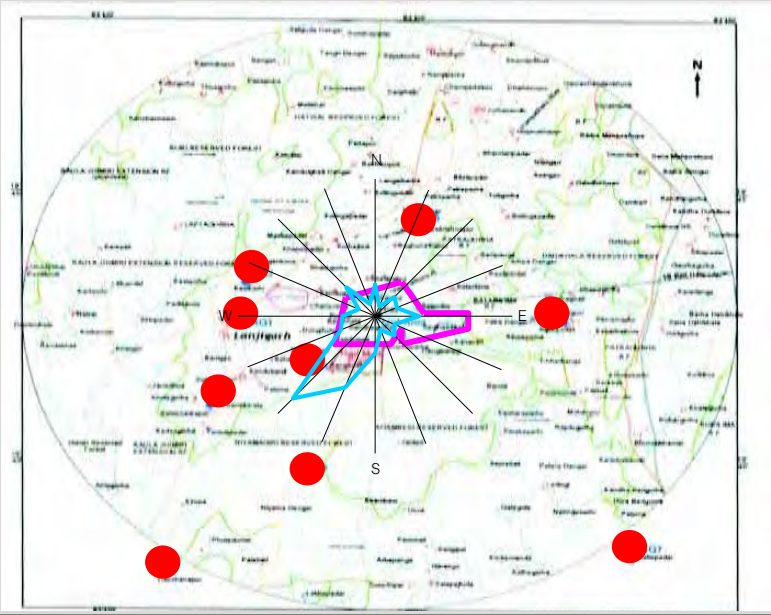
The only legal stipulation concerning the inclusion of odours in EIAs is if they are anticipated to be a problem, like a brewery for example. However, this is not the case for the refinery processes.

What the EIAs said

Location of monitoring stations: For the refinery there were nine air quality monitoring stations each within 10km of the site covering 360 degrees for the baseline data. After consultation with OSPCB this number was dropped to seen. The monitoring is conducted by an independent party on a quarterly basis and a subsequent six locations are monitored on a weekly basis by the Environment Department and onsite monitoring takes place daily.

The locations for each of the monitoring stations were a strategic decision. Prevailing wind data was collected and from this it was possible to assess the average annual wind direction and strength. From this study it was found that the prevailing winds were more often than not south/south westerly. It was therefore decided, given that those locations lying to the south west of the refinery were most likely to suffer any consequences of air-borne emissions, it would be sensible to have a high concentration of monitoring stations in this direction. Mine monitoring has not yet been started as the project has not commenced. Map 7, below, contains a superimposition of this prevailing wind data, as well as the sites of the air quality monitoring stations to illustrate why the locations were chosen.

Map 7. Topographical map of the Lanjigarh refinery with the positions of each of the nine baseline air quality monitoring stations, signified by the red dots. Superimposed on top of the map is a wind-rose signifying the direction of the prevailing winds as calculated by the EIA baseline study.



Pollutants measured: These stations monitor Suspended Particular Matter (those which are over 10 microns in diameter), Respirable Particular Matter (those which are under 10 microns in diameter and therefore transferable into the bloodstream via the lungs), sulphur dioxide and nitrogen oxide. These pollutants were chosen because they are expected to be emitted by the refinery and therefore require more significant attention than others. Continuous online stack monitoring systems have been installed in all the stacks for monitoring SOx, NOx, SPM, CO.

Dust & odour: Dust is measured as indicated by Suspended Particular Matter. The way this is achieved is by measuring total particular matter concentrations, extracting and measuring the concentration of respirable matter and subtracting this from the total suspended matter finding. For the refinery this is one of the pollutants monitored. Given that it was identified as the main air pollutant of concern for the mine, careful monitoring will also take place there. Five potential sources of dust were identified for the mine: drilling, blasting, transportation, backfilling and primary crushers. For each of these, careful attention has been paid to finding a solution that minimises the dust emissions. For example, sprinkler systems have been placed along the conveyor belt for bauxite and wet drilling is used to reduce the dust emissions from these sources. Odour is not included in the EIAs. However, no issue has been reported through our grievance process on this matter.

Vedanta policy and standards

We have formalised our commitment to reducing the impact of our operations on local communities in our sustainability policies. For example, our HSE policy contains the commitment to:

- Improve and enhance environmental conditions and avoid, reduce or mitigate the environmental impacts to neighbouring communities in areas that we operate including air and water emissions and noise;

In our sustainability report (published in 2011), we have renewed our commitment to our five key priorities, one of which is “Continue to manage and minimise our impact on air, water and land – many of our companies have reported that their specific water and energy consumption levels are now at their lowest in their history”. It was also recognised that while our commitment to this and the other four priority areas has been demonstrable, we have failed to formalise these commitments into our practices thoroughly and so this is one of our key commitments going forward.

Some of the preventative measures to reduce our impact on local air quality have already been outlined. However, this list is by no means exhaustive. Other initiatives include:

- the construction of tarmac roads leading to and from the railway station to eliminate the dust emissions from transport
- using railways for freight as much as possible to reduce the number of lorries required in operations
- the installation of dust suppression systems such as electro static precipitators, industrial vacuum cleaning systems, dry fog systems, bag filters, etc
- our greenbelt development programme, which has involved the planting of 300,000 native varieties of saplings variety in and around our operations to reduce the impact of dust.

IFC PS3 (Resource Efficiency and Pollution Prevention) provides a set of criteria by which we hope to be able to benchmark our own operations:

"The client will avoid the release of pollutants or, when avoidance is not feasible, minimize and/or control the intensity and mass flow of their release. This applies to the release of pollutants to air, water, and land due to routine, non-routine, and accidental circumstances with the potential for local, regional, and transboundary impacts."

There is also a set of specific guidelines accompanying this document that we hope to utilise to ensure we are consistent with these principles.

Stakeholder engagement

The improvements we have made to our grievance mechanism at Lanjigarh is enough to ensure that any issues that arise in relating to the management of our air-borne pollutant levels in the local communities. This mechanism is under constant review for improvement to ensure that this is the case.

Going forward we are making headway in addressing the way we communicate our environmental impact as a consequence of the URS Scott Wilson Progress Report.

Performance and risk assessment

Technically we have maintained our practices in such a way as to conform to national legislation and the international standards used by the IFC. There is a considerable in-depth assessment of the effects of noise from both projects on communities as well as ecosystems nearby and careful mitigation measurements are in place to reduce the impact. Likewise our impact as a result of air-borne pollutants is carefully monitored and this will be made publicly available on our website as part of our Global Reporting Initiative strategy.

The way forward

Our key priority for future development in this area comes from the communication of our air quality (and other environmental) measurements. We hope to have a bi-directional system of communication with local communities to ensure they are fully integrated into our environmental management program. We are constantly assessing and improving the way this is done and our progress will be published on our website for public review. We encourage scrutiny of our performance by all stakeholders so we can ensure our impacts are fully understood and in line with our vision.

Response to the table on page 16 of generalisations omissions assumptions entitled “Summary of failings in Vedanta’s EIAs to meet India’s regulatory requirements”

In this section we assess the comments raised by Amnesty in the special table on page 16 of the report. We consider each one individually, but given the nature of the comments there will be some repetition with the previous section.

Amnesty’s comments	Vedanta’s response
“There is no substantive discussion of alternative sites for the mine and refinery In accordance with EIA Notifications 1994 and 2006”	The district of Kalahandi was chosen as the location of the refinery after an MoU was signed between Government of Orissa and Sterlite Industries to utilise the bauxite resources of Kalahandi. As the selected area was falling under a scheduled area, the land was acquired by a public sector company Orissa Industrial Infrastructure Development Corporation (OIDCO), a Government of Orissa undertaking as exchange of land by private entrepreneurs is not allowed in scheduled areas. Lanjigarh was found to be close to natural deposits of bauxite that were gibbstic in form (and therefore required less energy intensive processing) and by establishing a refinery here we could ensure that the direct and indirect economic benefits of extraction would not be felt in another part of the country. It was established in the EIAs that by choosing to implement this project in Lanjigarh, we would be able to minimise the acquisition of forest land and agricultural land. The area also provided good transport links to ports and inland by train. Once the area was chosen, and in accordance with the commensurate guidelines of the MoEF, the EIA was prepared to assess the expected impact of the project. While it was found that there were some economic drawbacks to the proposal for the refinery in Lanjigarh, the project was given the go-ahead with certain technological and capital provisos, such as laying new railway tracks to improve capacity and investment in state-of-the-art technologies to minimise environmental impacts.
“The cumulative impacts of mining and refining activities in close proximity are not drawn out In accordance with EIA Notification 2006”	The EIAs submitted to state and national government for clearance for the mine and the refinery projects were submitted in 2002 and 2005 respectively. As a result they gained clearance prior to the EIA Notification of 2006. Nevertheless there were numerous studies conducted collaboratively between VAL, MoEF and the Orissa Mining Corporation outlining environmental and social impacts separately including our resettlement and rehabilitation plan, geotechnical and hydrological studies, CSR activities, and socio-economic studies of the Project Affected People (PAPs). The results of these studies have informed our decision making in many areas of this project, including action plans and mitigation measures.

Amnesty's comments	Vedanta's response
"Choice of air quality sampling locations does not include all affected sites In accordance with MoEF's Terms of Reference for Refinery"	Nine locations were chosen to collect baseline data on ambient air quality, each within 10km of the proposed location for the refinery. After the EIA for the refinery was approved it was decided in collaboration with the OSPB that only seven strategically placed sites would be required for sufficient monitoring of air quality by a third party because of prevailing winds and the findings of our baseline study. In addition to these quarterly air quality monitoring reports we have a constant monitoring station on-site at the refinery to provide adequate forewarning of any anomalous pollutant data. Please see page 81, for a more in depth discussion of this allegation outlining the other preventative measures in relation to air pollution and our air quality sampling location rationale.
"Not all sources of emissions and pollutants are clearly identified In accordance with EIA Notifications 1994 and 2006; MoEF's 2008 Terms of Reference for Refinery Expansion"	When the baseline data for all environmental impacts was collated, possible air pollutants from all sources (power plant, calciners etc.) were considered for inclusion in the Environmental Impact Analysis from the refinery. There are three proposed stacks from which air pollutants will be omitted, two in the calcination plant and one in the power plant. The emission rates from each of these stacks are outlined thoroughly in Annex V of the Refinery EIA. The volumetric flow rate for the stacks was calculated (using the stack area and the exit velocity) to be 82.89Nm3/sec. The air pollutants identified for consideration in the EIAs are by far the most significant ones.
"Dust and odour are not acknowledged as potential sources of pollution In accordance with EIA Notifications 1994 and 2006"	Dust as a source of pollution is included in the EIA for the refinery under the name SPM – i.e. suspended particular matter that over 10 microns in diameter. Odour, as mentioned, above is not a requirement of an EIA unless it is anticipated to be an impact, which it does not in this case. To date we have received no odour complain via the grievance mechanism.
"No ongoing monitoring of dust or odour mitigation measures is proposed In accordance with MoEF's 2004 Terms of Reference for Refinery"	Please see page 81, for a more in-depth consideration of this allegation. Dust is monitored at seven locations within 10km of the refinery. Mitigation measures include the construction of a tarmac road, greenbelt development, encouraging freight transport via train, etc. The following is an excerpt from the 2005 Refinery EIA:

Potential impact	Probable source	Mitigataging measure
Increase in SPM in ambient air	Vehicular traffic	All motorable roads in the plant area will be paved to reduce dust emissions
Increase in SPM in ambient air	Coal and lime handling area	Covered conveyors will be provided in transportation of coal, lime and bauxite and dry fog dust suppression system is plan next at dust generating areas

Amnesty's comments	Vedanta's response
"There is insufficient discussion and justification of design criteria for the red mud and fly ash ponds, and the exact location of expanded ponds is not specified In accordance with MoEF's 2008 Terms of Reference for Refinery Expansion"	MoEF's Terms of Reference 2008 is applicable for the expansion project only, which is still under consideration. Existing red mud and ash ponds have been designed by India's top institute in the sphere of Industrial Sciences – the Indian Institute of Science (IIS), Bangalore. Presently, the company is using high concentration slurry disposal (HCSD), a state-of-the-art technology for both red mud and ash disposal. Lanjigarh unit has a maintenance programme for red mud and fly ash ponds. This includes: • The pipelines and the pond area are regularly inspected and properly maintained as an integral part of the plant maintenance program. • Ground water quality is regularly monitored on quarterly basis through a third party. • Water quality reports are submitted to MoEF on a six-monthly basis and to OSPCB on a monthly basis. • In addition, as part of governance, OSPCB collects Water Quality Samples on a regular basis.

Amnesty's comments	Vedanta's response
"No means are suggested for monitoring continuous and incremental pollution In accordance with the EIA Notification 2006"	The EIAs submitted to state and national government for clearance for the mine and the refinery projects were submitted in 2002 and 2005 respectively. As a result they gained clearance prior to the EIA Notification of 2006. Nevertheless both of the original EIAs lay out various details when it comes to pollution monitoring in their Environmental Management Plans. Strategically placed monitoring stations are proposed to assess the projects' continuous impact on local air, water and noise pollutant levels. The following is the relevant excerpt from the Refinery EIA: "5.2.1 Post Project Environmental Monitoring. – This Refers to Monitoring of Ongoing Operations (Please note: this title is a semantic error, the following refers to continuous project monitoring) We are of the view that this refers to 'Project Environmental Monitoring', which is important in terms of evaluating the performance of pollution control equipment installed in the project. The sampling and analysis of the environmental attributes will be as per the guidelines of CPCB/OPCB. The frequency of sampling will be as per the directives of Orissa Pollution Control Board. The following attributes are covered in the project environmental monitoring in and around the project site: • Total water usage, waste water generated and waste water recycled shall be monitored; • Ground water quality monitoring and water level monitoring shall be carried out every month on wells around ash pond and red mud pond. Number and locations or bore wells for sampling may be decided in consultation with MoEF and OPCB. The parameters for monitoring may be the same as done for the EIA study (as presented in chapter-3.0) or may be decided in consultation with MoEF and OPCB; • Continuous monitoring of SPM, SO2, NOX and CO is proposed for the calciner and boiler stacks. Concentrations of SPM will also be monitored on regular basis at the outlets of coal and bauxite handling area dust separation system; • Characteristics of water in the central sump shall be monitored to check compliance with the wastewater discharge standard for land application; • Characteristics of cooling tower blowdown and treated sewage shall be monitored to check compliance with the wastewater discharge standard for land application; • Ambient air quality will be monitored for SPM, RPM, SO2, NOX,CO and Pb at locations prescribed by MoEF or OPCB; and • Noise level within the plant at the noisy areas and at various points at the plant boundary will be monitored to check compliance with relevant ambient and work area noise level standards.
"No detailed hydrological maps are provided to show information about surface water In accordance with MoEF's 2008 Terms of Reference for Refinery Expansion"	The EIA for the refinery's expansion is still under consideration and if it is found by the OSPCB or the MoEF that this is the case we will actively pursue ways to mitigate this. Nevertheless, geohydrological studies were conducted by independent parties for this project, separately from the EIAs. The independent parties were: • The National Geo-Physical Research Institute, Hyderabad • The Institute of Advanced Environment and Technological Sciences, Bhubaneswar – part of a rainwater harvesting study It was also found that there would be no impact on lower aquifers as a result of the project.

Amnesty's comments	Vedanta's response
"No adequate information is provided on water usage In accordance with EIA Notifications 1994 and 2006"	The following is an excerpt for the original 2005 Refinery EIA: *"Water Requirement* *Water requirement will be met entirely from the river Tel near Kesinga Town, located more than 60km from the plant site. A two-stage pumping facility with a 65km long pipeline of 700mm diameter will be required to meet the water requirement. Daily requirement for the plant and associated facilities will be about 30,000m3. This is about 1-2% of the flow during lean season. Hence, drawdown of water from Tel River will not have any adverse impact on the downstream users."* The decision to source water from the Tel river instead of the Vamshadhara came as a result of careful consideration of the impact the project would have on the local communities' water resources (usage as a function of percentage of extracted water of total flow during lean season). Due to continuous innovation adopted by us, we have already reduced our water consumption by more than 40%. The monthly water consumption in December 2008 was 645,257m3, which was reduced to 385,061m^3 in 2011.
"No details are provided of water availability in the Tel river to supply all the refining and mining complex's needs In accordance with EIA Notification 2006"	The 2005 EIA mentions details about water availability and requirement. As mentioned, water requirements will be met entirely from the river Tel near Kesinga Town, located more than 60km from the plant site. Daily requirements for the plant and associated facilities will be less than 30,000m3 per day. This is about 1-2%of the flow during lean season. VAL has entered into a withdrawal agreement with the Department of Irrigation, Government of Orissa.
"No acknowledgement is given of the impacts caused by transportation of bauxite from other mines to the refinery or the impacts of the conveyor belt used to transport ore from Niyamgiri to the refinery In accordance with EIA Notifications 2006 and MoEF's 2008 Terms of Reference for Refinery Expansion"	When it became apparent that the refinery would require bauxite from locations beyond the Niyamgiri mine, an EIA considering the impact of the transportation of the bauxite was conducted. The EIA for the refinery was conducted in anticipation that no surplus bauxite would be required. While we recognise now that this was perhaps somewhat presumptuous, at the time we had no reason to suspect this would not be the case. For example, the mine had been granted clearance after submission of its Environmental Impact Assessment. As soon as we were forced to outsource bauxite from other mines, we submitted a supplementary EIA to the MoEF for approval and only after obtaining approval from MoEF did transportation of bauxite commence. If the proposed mine is started, we will get the bauxite using state-of-the-art pipe conveyor technology.
"No detailed and specific information is given on land use by local communities and numbers of villages and population to be displaced In accordance with EIA Notifications 1994 and 2006 and MoEF's 2008 Terms of Reference for Refinery Expansion"	The EIA for the refinery was submitted for scrutiny prior to the Orissa Resettlement and Rehabilitation Policy, passed in 2003. As a result of this, the refinery's resettlement and rehabilitation plan was in accordance with the 2003 policy, whereby physically displaced persons were offered either employment for one family member or cash in-lieu of said employment. There are certain elements that address the mitigation of forced displacement through plot choice and as a result only 121 families were displaced. Each was provided with housing in a specially designed community nearby and of the 121, 75 chose to have a family member gain employment. For specific information regarding the resettlement, see Appendix 3. The land acquisition process provides a socio-economic survey of every single person effected by the project.
"There is no reference to the cultural significance of the Niyamgiri Hills to the Dongria Kondh In accordance with EIA Notifications 1994 and 2006"	The mining project is on the edge of the Niyamgiri Hills but is not the responsibility of Vedanta. It is a fact that the cumulative impacts of mining and refining activities on Dongria Kondh culture are not drawn out. However, this is different to saying they were not considered by Vedanta as part of its general approach to the project.

Conclusion

From the above, it can be established that Vedanta Alumina Refinery at Lanjigarh is complying with the National and International regulations/guidelines through industry best practices and same has been acknowledged by independent consultant URS Scott Wilson as depicted in the exhibit below:

Abstract of URS Scott Wilson Recommendations regarding Lanjigarh (March 2012 Report)

- We are pleased to report that significant progress has been made since our last visit and the plant has embraced the IFC Standards. We were impressed with the enthusiasm of those involved in implementing the sustainability framework and other initiatives here and we are pleased to be able to close out more recommendations
- Presumably due to the not-always justified substantial amount of criticism that had been levelled at the Lanjigarh Project, we had discerned a degree of defensiveness towards some of the issues identified and the action needed to address our recommendations in our previous two visits to the Plant. We are pleased to confirm that Lanjigarh now appears to have embraced fully the IFC Standards and is actively engaged in implementing the Corporate Sustainability Framework

Appendices

Appendix 1. Vedanta's Human Rights Policy

Human Rights Policy

At Vedanta Resources plc, we are committed to the principles of sustainable development including protecting human life, health and environment, - promoting social well-being and adding value to the communities in which we operate. Protecting and respecting human dignity is central to our every day business operations. We will conduct our businesses in a fair and equitable manner, meeting our social responsibilities as a direct and indirect employer and we will respect the human rights of all our stakeholders respecting the United Nations Declaration on Human Rights.

Vedanta will strive to:

- To be compliant with labour laws of the country we operate in. Uphold human rights aligned with national and international regulations as applicable;
- Ensure that our employees are fairly and reasonably paid and remuneration structure is compliant with statutory obligations of the jurisdiction we operate in. Our operations will be based on zero tolerance for any form of forced, compulsory or child labour directly or through contracted labour. We recognise and respect employee rights to associate freely and to collective bargaining. We promote fair working conditions as guided by international conventions wherever applicable;
- Be an equal opportunity employer and all employees will be treated with respect and dignity and judged solely on their performance irrespective of their race, religion, caste, gender, age, disability, HIV/AIDS status, and any other characteristic;
- Respect and preserve the culture and heritage of the local communities including socially vulnerable groups which are impacted by our operations and work towards developing a constructive relationship with such groups and local communities, seeking broad-based support for our operations;
- Respect the social, economic, cultural and human rights of communities and will regularly communicate social performance in an accurate, transparent and timely manner;
- Work with government agencies to develop a common understanding and agreement to protect human rights in the event of any unforeseen situations. We will ensure protection of our people, equipment and assets

Each Vedanta business shall sign up to this policy which shall be implemented throughout the business. We will measure and report progress against this policy and review performance on a periodic basis to ensure ongoing management of human rights. The content and implementation of this policy will be reviewed periodically and actions taken accordingly including the sharing of good practices throughout the Vedanta organisation.

Signed by:

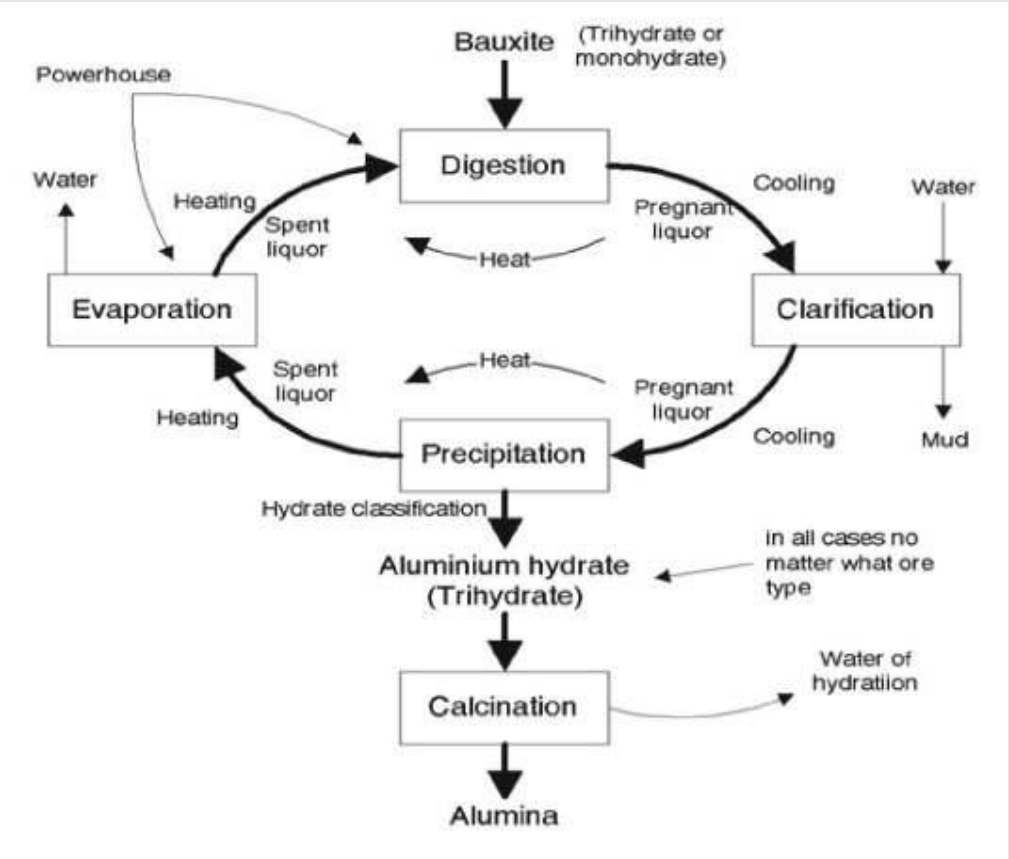
MS Mehta
CEO, Vedanta Resources plc

Date: *21st September 2011*

21st September 2011

Appendix 2. Alumina refinery

Bauxite only contains between 30 and 54% alumina, or aluminium oxide, the compound from which aluminium is produced. The Bayer process of Alumina refining requires bauxite to be ground and digested by applying heat, pressure and caustic soda solution. Alumina dissolves in this solution and the impurities, which include silica, various types of iron oxides and titanium dioxide, are then filtered out in the clarification process, producing red mud. As the filtrate cools, aluminium hydroxide precipitates which, when heated, returns to alumina to be converted into aluminium.



The refinery that conducts these operations in Lanjigarh is relatively new and as a result the process is achieved using state of the art, energy efficient equipment. Nevertheless with Vedanta's aim of making the Lanjigarh refinery a zero waste refinery, the process is being reviewed and partnerships with various research organisations like the National Institute of technology and the Institute of Minerals and Materials Technology are in place to assess the feasibility of improving the discharge of the operations by extracting the iron ore and titanium. By making these commitments, Vedanta hopes to minimise its impacts on local water sources and reduce the refinery's own water requirements (which have dropped by 40% since inception). The Lanjigarh refinery is the only Alumina refinery in the country, and one of only a few worldwide, to have successfully implemented such rigorous standards of waste discharge and water use.

Appendix 3. Resettlement and Rehabilitation Process

Vedanta's proposal for a Refinery in Lanjigarh was designed with the purpose of minimising the number of necessary resettlements. Nevertheless, as with any large infrastructure projects, privately owned land had to be purchased by the company for the refinery's construction. However the impact was minimised strategically and consequently only 121 families required relocation as a result, and the acquisition of agricultural land was similarly minimised.

Legislation regarding Rehabilitation and Resettlement had not been formalised by this stage at the national level but the Government of the State of Orissa, in 2003, outlined a framework specifically for this project in Lanjigarh that was in line with other Rehabilitation and Resettlement policies in various other states. Displaced families were offered fulltime employment for one member within Vedanta, or a cash lump sum in lieu of employment to go someway to compensate them for the rehabilitation process. The policy in this matter stated that families who were set to lose over 2/3rds of their land as a result of the resettlement process were to be compensated USD3,774 in lieu of employment, while those who were to lose less than 2/3rds were to be provided with USD1,887. These figures, as they ought to be, are significantly greater than the true commercial value of the real estate.

Of the 121 families, 76 chose to have a family member employed in the company with the remaining 45 opting for the cash in-lieu of employment. An 18 month training programme was put in place for those that chose employment comprising of 12 months Technical Training and 6 months Behavioural Training. For some, the Technical Training programme was to last 18 months, dependent on the employment class. During this training period accommodation costs were borne by the company and a stipend of USD28 was provided per month to trainees. After training was completed, graduates were inducted into the Vedanta employment payroll. We are sad to say that one individual failed to complete the training course. Nevertheless we are proud that this programme has managed to help 75 families resettle with a fixed and reliable source of income that will dramatically improve their livelihoods.

Simultaneously, a resettlement colony was established that provided those displaced families with facilities including black-top roads, full drainage, sewerage and drinking water facilities, street lighting, a community centre, a school, a cremation ground, Dherani temples, a playground and more besides. Families who were to be displaced were given the opportunity to move to this new establishment where they were provided with 0.04 hectares with a house measuring 484 square feet. Naturally families had the option to relocate themselves, foregoing the opportunity of resettlement. Those families that chose this option were provided with a lump sum of USD943. It is a credit to the sophistication of the resettlement facility established by Vedanta that of the 121 families presented with this option, only 5 chose to self-relocate.

It was also recognised by the R&R policy that there would be those affected by the project itself but not requiring direct resettlement from land acquisition. In the case of the Lanjigarh Refinery it was found that 1846 individuals would fall into this category, most of whom were affected through the loss of agricultural land but not homestead. As with the resettled, the Project Affected Persons (PAPs) were divided into two categories, those that lost over 2/3rds of their agricultural land and those that lost less than 2/3rds of their agricultural land. Of these 1846 individuals, 1372 were provided with a one off monetary compensation according to their eligibility criteria. A further 110 PAPs entered into our employment training scheme and as of December 2011, 87 of these had completed the training course and had begun work as full Vedanta employees.

Our policy for Rehabilitation and Resettlement, which at the time of project development and execution was not a mandatory requirement by national or regional law, was praised by many as one of the most people-friendly R&R policies in the country. The fact that we have been so intricately involved in the process of developing national and regional policies to standardise the methodology concerning this issue is a an accolade that we are extremely proud of.

The entrance to the resettlement colony established by Vedanta containing schools, community centre, black-top roads, temples, drainage etc. The colony can be found within the village of Lanjigarh

Appendix 4. Executive Summary of Xavier Institute of Social Services Report of Vedanta's community programmes

Executive Summary

Introduction

To assess the impact of its sustained CSR activities and to draw future CSR strategy, VAL decided to carry out a Socio Economic Impact Evaluation Study in all villages which were situated around the plants and the proposed mining sites. **Asian Institute for Sustainable Development, Ranchi** was requested to conduct the survey. Study covered 89 villages located in the above mentioned area.

Disclaimer

Although this report was prepared under the funding of Vedanta Alumina Limited, Lanjigarh, VAL bears no responsibility for, nor is in any way committed to, the views and recommendations expressed herein.

1. CSR Intervention During 2006-2008

Vedanta Aluminium Limited (VAL), Lanjigarh under its Corporate Social Responsibility (CSR) has taken up initiatives on five focused areas viz. Sustainable Livelihood, Education, Health and Sanitation, Sports, Culture and Youth Development and Environmental Development to bring about qualitative improvements in the lives of the communities residing around plants and mining sites. Besides these three core areas, VAL – CSR has also promoted infrastructure development, sports and youth welfare programmes. In this report, we have briefly discussed the CSR interventions in all the above mentioned areas during 2006-2008.

A. Sustainable Livelihood Programme

Programme began with SHG formation and savings mobilization has spread to 58 villages. Altogether 58 farmers SHGs and 31 women SHGs, 13 youth groups for Pisciculture are functioning at present. Soil testing activities are being conducted in 46 villages. Remunerative agriculture in terms of commercial vegetable, oilseeds and improved paddy cultivation has been spread to 56 villages covering nearly 750 farmers directly and another 1000 farmers indirectly. Remunerative agriculture, Piscicultures, Medicinal Plant cultivation, women income generating activities have enhanced the household income by 255% during 2007-08 over 2005-06.

Savings and credit activities of SHGs were consolidated but SHG requires further empowerment in terms business development and countering the social evils.

Altogether 2400 persons were immensely benefited by sustainable livelihood programmes.

i. Impact of SLP

- Project has enhanced the farmers' annual income by 255.34% during 2007 over their annual income of 2005. Growth was more visible among poor farmers (324%) than relatively well of farmers (155%).
- The employment days for farming households has been increased from 120 days during 2005-06 to nearly 250 days during 2007-08.
- Cultivation of vegetable has also enriched the nutrition level of household diet. For the household members vegetables have become the source of rich vitamin and various minerals which was dearer during pre-project period.
- Formation of SHG has increased the social solidarity, mutual help among SHG members. As members have started saving the money, the money used to spend on

alcoholic drink has gradually been declining. These two aspects have been paving the way for larger social transformation in the coming days.

- During 2007-08, village youths jointly took up the fishery project in 13 villages. Individual group members have earned on an average Rs. 3000/- from the pisciculture.
- Income generation programme of women SHGs had also increased household income on and average by Rs. 500-1000 per month.
- The net sown area has increased by 200% which means farmers are practicing double cropping in a year.
- Area under surface irrigation has increased by 35% through stream diversion method and surface water harvesting strategy.
- Around 20% beneficiaries were benefited by provision of community pump sets for lifting water from rivers.
- 100% beneficiaries are now using improved seeds and cultivation technologies.
- 20% beneficiaries have adopted organic amendments.
- 70-80% beneficiaries are availing support from the agriculturist appointed by VAL.
- Nearly 780 acres of land brought under commercial vegetable cultivation.
- Risk of crop failure has been reduced by nearly 50% due improved cultivation technique, plant protection measurement and other support services.
- Agriculture lean months have been reduced from earlier 6 months (2005-06) to nearly 3 months (2007-08).
- Average household savings went up by Rs. 2500/-.

ii. Satisfaction of Beneficiaries

Beneficiaries satisfaction was measured in three point scale viz. Highly satisfactory, Moderately satisfactory and Not satisfactory.

- Beneficiaries were found to be highly to moderately satisfied with the SLP.
- Nearly 60% beneficiaries were highly satisfied with the agriculture input services (fertilizer, seeds, and pesticides), agriculture trainings, fishery.
- Around 50% beneficiaries were found to be highly satisfied with Field Supervision & Assistance, Soil Testing, SHG support, Leaf plate, Phenyl making etc.
- Mushroom cultivation, Medicinal plant cultivation and goatry received lesser response because of less programme coverage in terms of beneficiary numbers.

B. Education Programme

In order to improve the education system in Lanjigarh, VAL organized Child care Centre Education Guarantee Scheme School, renovation and upgradation existing primary and middle schools. Currently it is running 34 Child Care Centres, 1 EGS, adopted 400 Anganwadis, providing Mid Day Meal to 14,120 children, and organizing interschool awareness programmes, exhibitions and competitions. **Student's attendance rate in VAL intervened centers ranged from 80-90% against national average 65% and Orissa average 64%.**

i. Impact on Access to Education

- Nearly 91% respondents felt that their access to Child Care Centre has increased after VAL's intervention.

- Nearly 75% respondents felt that their access to Education Guarantee Scheme School (EGSS) has increased after VAL's intervention.
- Nearly 71% respondents felt that their access to Mid Day Meal has increased after VAL's intervention.
- Nearly 80% respondents felt that their access to Educational Awareness Programme has increased after VAL's intervention.
- Nearly 67% respondents felt that their access to Extra Curricular Activities has increased after VAL's intervention.
- Nearly 52% respondents felt that their access to Better Teaching facilities has increased after VAL's intervention.
- Nearly 46% respondents felt that their access to Sports and Games has increased after VAL's intervention.

ii. Improvement in Quality of Education Facilities

Respondents have given a very clear and distinct opinion about improvement in quality of education facilities that has taken place due to VAL's intervention. Quality of intervention was measured in terms of Quality of education imparted and regularity of teaching staffs in the centre, Interesting methods of teaching-learning, Cognitive, sensory, language and emotional development of child, Quality and quantity of supplementary food provided by the centre, and Mid Day Meal. It was reported that before VAL's intervention, quality of above mentioned educational facilities were low. But quality of the same has improved significantly after the VAL's intervention.

iii. People's satisfaction about Education Services Provided by VAL

- Survey findings showed people were highly satisfied about Child Care Centre, EGSS, Mid Day Meal, and Educational Awareness Programme.
- Similarly, people were moderately satisfied about Extra Curricular Activities, Better Teaching and Sports and Games facilities provided by VAL.

iv. Villager's expectations

1. Appointment of adequate number of regular teachers in the schools.
2. Up gradation of Anganwadi workers. But they are employee of Government's ICDS programme.
3. Establishment of more number of AWC and Child care Centre (ICDS's responsibility).
4. Repairing of school building.
5. More scholarship facility.
6. Supply of sufficient supplement food.
7. Low work load on children.

C. Health and Sanitation Programme

CSR intervention on health and sanitation began with extending its dispensary facility to villagers. Around 24,600 persons were given full treatment through MHU in 2007-08 alone. Besides this, VAL also conducted Rural Health camps through Mobile Health Unit (MHU), Health Awareness programmes on TB, AIDS, Anti Alcoholism, Family Planning and participated in government run Take Home ration programme during 2005-06 to 2007-08.

Besides this, VAL has installed Tube well in different villages for safe drinking water, arranged awareness programme on TB, AIDS, Anti alcoholism, Family Planning etc.

During 2007-08 VAL participated in ICDS's 4221 children and 1672 pregnant and lactating women were covered and lactating women were covered under the programme.

i. Impact on Health and Sanitation Programme

- It has been found that peoples awareness level about causes of diseases have increased substantially during pre project period to current year 2007-08. People are now more aware about plausible causes of Malaria, Anaemia, TB, Child malnutrition, Diarrhea, and STD & AIDS.
- People's awareness level about preventive heath measures have increased from before the VAL intervention period to after the intervention period. People are now two to three times more aware about preventive measures viz. Immunization, TT vaccine, balanced diet, STD & AIDS, Malaria, Water borne diseases, and Diarrhea.
- People are now more aware about the benefits of Family planning, Ante and post natal care, Infant feeding (below 6 months), Colostrums feeding, Mother and child health, Benefits of institutional delivery, Exclusive breast feeding, Complementary feeding after 6 months, Safe delivery practices (ask about FIVE cleans) and the ill effects of alcoholism.
- IMR has been reduced from 200 per thousand (2005-06) to 75 per thousand live birth (2008).
- Child malnutrition has reduced 58% in 2005-06 to 31% in 2008.
- Immunization rate has increased from 35% (2005-06 to 71% (2008).
- Maternal mortality has been reduced from 1.1% (2005-06) to 0.8% (2008).

ii. People's satisfaction about Health Services Provided by VAL

Survey also investigated about people's satisfaction about various health services provided by the VAL.

- It was found that Awareness programme was most satisfying (80% respondents were satisfied) followed by Mobile clinic (71% respondents were satisfied), Safe Drinking Water facilities (67% respondents were satisfied), Rural Health camp (64% respondents were satisfied).
- On the other hand people were moderately satisfied about Take Home Ration, Dispensary facilities, Family planning facilities, and Sanitation drive.

iii. Villager's expectations

a. More frequent mobile clinic service should be ensured.

b. Regular and proper distribution of medicines should be ensured.

c. Availability of doctor once in a week in Child Care Centre should be ensured..

d. Proper distribution of IFA tablets & regular checkup of pregnant women should be ensured in association with government health services.

e. Sufficient distribution of Take Home ration should be ensured.

f. Village wise sanitation drive should be pursued.

g. ANM visits should be regularized but this is not in the hands of VAL.

h. Improvement in Primary Health Centre (PHC) Services.

i. Rural Health Camp should be organized more regularly.

D. Infrastructure, Sports and Environment

- VAL began with construction of 10 km Black Tar road linking Lanjigarh with Dahikhal and repairing nearly 12 kms road between Lanjigarh and Bishwanathpur in 2005-06. In these years VAL constructed 24 concrete roads inside the villages, 15 temples, 18 drains, 12 school building/ Anganwadi/ EGSS.
- VAL has been supporting youth activities, various sports events and even sponsored talented persons to participate in international meet.
- On environmental side, VAL has been planting 2,09,300 plants during past three years, maintain one plantation nursery and also organizing awareness campaign regularly for past 3 years.

i. Impact on Infrastructure Development

- Impact of importance to infrastructure development programme may not be truly assessed by people's opinion. Due to increase in vehicular movement road condition worsened during last monsoon season. VAL has undertaken the task of reconstructing the high standard roads connecting Munniguda on one side and Biswanathpur on another side. Construction work was going on during the survey. Incomplete work influences people's opinion and response biases could not be avoided.
- However, infrastructure development was assessed by the civil engineers deputed by the survey team. According to their opinion, quality of infrastructure development was significantly better than the normal work quality of our country.
- Intra village concrete road were so well constructed that people had been using it multifarious activities like common function area, grain drying place and evening meeting place.
- Similarly wide drains were so good that even such can be compared with metropolitan cities' drainage system.
- Tube well, community centers, Child care centre building etc. were other tangible proofs of quality improvement in infrastructure development.

ii. People's Problems

People have pointed out following problems regarding education facilities:

a. Incomplete road construction at many places.

b. Lack of electricity on hill top villages.

c. Inadequate tube well facilities.

d. Lack of irrigational facilities.

iii. Villager's expectations

a. Speedy completion of road construction.

b. Pursuing government for total electrification of villages.

c. Repairing of damaged tube wells (built by government) to ensure more drinking water facilities.

d. Expansion of irrigational facilities through check dam, canal, and pump set etc.

e. Repairing of government school building.

f. Construction of common toilets in every village.

E. Sports, Culture and Youth Development

- 1000 students participated in Pradeshika Khel Khud Ssamaraha in Kalahandi.
- Surtargini Football tournament was arranged and 14 teams participated.
- Vedanta Football cup was organized and 25 village teams participated.

- Vedanta cricket cup was organized and 21 village team participated.
- Women football match was organized to promote women empowerment in Lanjigarh.
- Several cultural competition on song and dances were organized.

F. Environment

- 2,09,300 plant saplings were planted in 71 hectares of land .

G. Overall Impact of CSR Activities

1. During its intervention VAL has generated 2090 days industrial employment for local people.
2. Nearly 2400 persons were benefited directly or indirectly through commercial vegetable farming.
3. Health programme is covering nearly 14,000 people in Lanjigarh.
4. Entire Lanjigarh block is benefited by health and sanitation infrastructure created by VAL.
5. Malarial death has dropped from 80% to 20%.
6. Child mortality has dropped from 40% to 16%.
7. Quality education has been provided which has reduced the drop rate from 70% to 20%.
8. Quality of Mid day Meal, and Take Home ration has improved significantly.
9. Road connectivity with nearest towns has improved and still under the process of further improvement.
10. Several villages and main roads are electrified. Remaining villages are under the process of electrification.

2. Recommendations

On the basis of Socio Economic Evaluation Study, we recommend the following:

A. For Sustainable Livelihood Programme

i. SHGs are formed and saving habits are promoted by VAL initiatives but members have little understanding about how to make SHG growth oriented and how to manage its affairs. Therefore intensive training on SHG management should be organized.

ii. On an average nearly 200 kgs DAP, 200 kgs Urea and 100 kgs MOP are required per acre of vegetable cultivation in a year. VAL should ensure 50% of the fertilizer to farmers with nominal cost particularly to weaker sections for at least two years to make them self sufficient.

iii. Training on IGA activities with business development strategy need to be organized particularly for women and youths.

iv. Bank linkages for IGA business credit need to be promoted so that women and youth can take up new IGA.

v. Farmers centre in the spirit of E- choupal in each village can be tried out for creating better linkages between VAL and the farmers.

vi. Supply of agricultural implements may be introduced.

vii. Charges for soil testing should be nominal.

viii. Direct market linkage need to be developed.

B. For Health and Sanitation Programme

i. Mobile Clinic service has become much popular but its frequency of village visit should be increased. Ideally Mobile Clinic should visit a village twice in a week.

ii. Regular and proper distribution of medicines should be ensured.

iii. Availability of doctor once in a week in Child Care Centre should be ensured.

iv. Proper distribution of IFA tablets & regular checkup of pregnant women should be ensured in association with government health services.

v. Sufficient distribution of Take Home Ration should be ensured.

vi. Village wise sanitation drive should be pursued vigorously.

vii. VAL should pursue government health department for the regular visit of ANM.

viii. VAL should pursue government health department for bringing quality improvement in Primary Health Centre (PHC) Services.

ix. Rural Health Camp should be organized more regularly.

C. For Education and Sports Programme

i. VAL should pursue government education department for the appointment of adequate number of regular teachers in the schools.

ii. VAL should pursue ICDS department to up grade the skill of Anganwadi workers.

iii. VAL should VAL should pursue government education department for repairing of school building.

iv. VAL may introduce more scholarship facility.

D. For Infrastructure Development Programme

i. Speedy completion of road construction.

ii. Pursuing government for total electrification of villages.

iii. Repairing of damaged tube wells (built by government) to ensure more drinking water facilities.

iv. Expansion of irrigational facilities through check dam, canal, and pump set etc.

v. Construction of common toilets in every village.

Appendix 5 – MDGs

We have looked to the Millennium Development Goals as a way of informing our corporate social responsibility strategy. Each of the targets is time specific with certain measurement criteria that we hope to benchmark our own progress against. In recognition of our commitment to these worthwhile targets we have designed certain programmes in the hope that we might have a positive impact towards them.

We hope that we can be part of the global fight against poverty in the best way we can. Whether it be providing high numbers of unskilled jobs to help impoverished people earn a living that will help them improve their livelihoods, or designing community outreach programmes to educate on health and sanitation practices, we hope to play our part.

Goal	Target	Vedanta's initiative	Beneficiaries	Project progress
Goal 1. Eradicate extreme poverty and hunger	Halve the population of people whose income is less than $1 a day	Project Sabuj – Commercial Vegetable Cultivation for farmers	150 farmers covering 150 acres as of October 2011	Providing technical support in through HYV seeds and equipment. In total we have contributed almost $140,000 and total earnings have been $1.685 million to farmers since 2006.
		Project Jeebika – Leaf Plate Making Enterprise	498 women attending Self Help Groups	Through this project we have helped a section of unemployed women obtain a profitable source of income through skills upgrade training and market linkages.
		Employment	The communities in and around the Refinery and mine. See page 29.	We ensure through our own policies that no unskilled worker employed on site earns less than $2 a day and that none of our subcontractors pay less than $1 a day. By targeting an area of low unemployment for project development we can have the greatest impact on this MDG
Goal 2. Achieve Universal Primary Education	Ensure that every child completes primary education	Support of community education infrastructure development	The communities in and around the Refinery and mine.	We have 83 child care centres, 36 bridge schools (non formal education centres to encourage under performing children back into education), 28 formal company run schools, 37 adult education centres. Also skill-based training activities that benefit 140,000 children, young people and adults. In Lanjigarh between 2001 and 2007, the number of children enrolled in primary schools has gone up almost 70%, the number of caste students has gone up by almost 65% and the number of tribe students has more than doubled.

Goal	Target	Vedanta's initiative	Beneficiaries	Project progress
Goal 3. Empowering Women	Promote Gender Equality and Empower women	Project Shashakti – Providing Women Self Help Groups	650 women in Kalahandi (26,791 nationwide)	Creating locally viable women enterprises to educate on business skills.
		Project Jeebika – Leaf Plate Making Enterprise	498 women attending Self Help Groups	Through this project we have helped a section of unemployed women obtain a profitable source of income through skills upgrade training and market linkages.
Goal 4. Reduce Child mortality	Reduced mortality of children under 5 by 2/3rds	Supporting immunisation and nutrition programmes	Mobile Health Units providing health care to remote communities and nutrition programmes in schools	Our Mid-day Meals project, due to launch this year, will provide 250,000 children with a meal for lunch nationwide, between 2005 and 2008 child mortality has dropped from 58% to 31%
Goal 5. Improve Maternal Health	Reduce the maternal/mortality ratio by ¾	Supporting our Mobile Health Units and provide family planning clinics	5 family planning camps have been established to improve education on maternal health all mothers in the community. We have also established the VAL hospital in Lanjigarh to cater for child birth	Maternal mortality has fallen from 1.1% in 2005 to 0.8% in 2008
Goal 6. Combating HIV, AIDS, malaria & other diseases	Halt and reverse the spread of HIV, AIDS, malaria and other diseases	Intensive malaria, diarrhoea. Dengue fever and regular health check ups through MHUs, health camps and Vedanta hospital	The communities in and around the Refinery and mine.	Immunisation rates have more than doubled between 2006 and 2008
		An HIV Awareness workshops	The communities in and around the Refinery and mine.	20,000 people attended HIV awareness workshops
		Project Trupti – Providing potable water	Remote communities whose water supplies are often of a very low quality	200 Tribal Families

Appendix 6 – Contents pages for mandatory EIA and Summary of practice in India and Rapid EIA for Aluminium Refinery

The Government of India enacted the Environmental Protection Act on the 23rd of May 1986 which made EIAs a mandatory component of any development project. Standardisation of the process requires the following:

1. Screening

2. Scoping and consideration of Alternatives

3. Baseline data collection

4. Impact prediction for Air, Water, Land, Ecology, Socioeconomic

5. Assessment of alternatives, delineation of mitigation measures and Environmental Impact Statement

6. Public Hearing

7. Environmental Management Plan including steps to be taken for addressing issues in public hearing

8. Decision Making

9. Monitoring the clearance conditions mainly by State Pollution control Boards

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Appendix 7 – the 29 Recommendations of the URS Scott Wilson Report of July 2011 and our progress towards them as of November 2011

Key:

 Recommendation complete/closed

 In progress/on track

 Needs higher priority

 Not due yet/depend up on external factors

Corporate level recommendations

Recommendation		URS – SW July 2011 status	URS – SW March 2012 status	URS – SW comments on open recommendations
2.5.2	The preamble to the Code, "How We Do Business", should include reference to local communities as a key element affecting Vedanta's reputation along with customers, shareholders, competitors and suppliers.	✓	✓	
2.5.3	Adopt internal procedures to ensure that all requests for information from stakeholders (including investors, NGOs, international organisations and the press) are dealt within a timely manner. We see this as an important part of a wider programme to inform and communicate with all stakeholders. To assist with transparency Vedanta should maintain a register of enquiries and responses and provide a summary in their Annual Sustainability Report/website.	→	✓	Sustainability Framework links to other communication channels (press/NGO)
2.5.4	Revise the wording of the Value statement on Sustainability to state: "We aim to contribute to the social and economic welfare of the communities where we work and to protect and conserve the environment."	✓	✓	
2.5.6	Develop a series of policies to realise the aims stated for each of the four sustainability areas (environmental stewardship, nurturing people, health and safety and empowering communities). The policy statements should be succinct, should reflect best international practice and reflect a commitment to continuous improvement. Annual targets for progress and reporting should be considered wherever possible. Noise should be included as a policy issue.	↑	→	Still to see proposed Guidance documents (especially Human Rights, Biodiversity and IPs)
2.5.7	The title of the HSE Committee should be changed to the Sustainable Development Committee and its terms of reference expanded to reflect the breadth of its role covering all aspects of the environmental and social sustainability of the Group.	→	✓	
2.5.8	The corporate Sustainability Development Committee should continue to ensure that subsidiary companies take a consistent approach to promoting sustainable development in accord with international best practice by monitoring performance, lesson learning and dissemination of best practice. Appoint an appropriately qualified Chief Sustainability Officer with international experience to direct and coordinate the HSE, CSR and related functions. The CSO will act through single points of contact in each subsidiary company.	→	✓	Level of fatalities of concern, although implementing a suitable range of actions to address occupational H&S

Recommendation		URS – SW July 2011 status	URS – SW March 2012 status	URS – SW comments on open recommendations
2.5.9	Keep under review the full range of HSE and CSR competencies required across the business and consider the need for additional training, as appropriate, in relation to the IFC Performance Standards and Guidelines, human rights, vulnerable groups and the GRI Mining and Metals Sector Supplement.	↑	→	Some practical training still needed on implementing IFC requirements for M&A and new ESIAs
2.5.13	Report, where possible, on Group environmental and social performance as a whole and seek to benchmark performance against industry best practice and seek assurance from appropriate bodies with industry and sustainability expertise.	→	→	Results of the external benchmarking study
2.5.16	Adopt a specific human rights policy demonstrating its commitment to the UN Declaration of Rights and procedures to ensure its implementation. This should be communicated to all stakeholders via its web site.	→	✓	Guidance documents being prepared as per 2.5.6 Policies
2.5.24	Undertake an audit of Group and Company environmental and social performance against international standards (IFC, ICMM, OECED) after 12 months of implementing the recommendations in this report (i.e. January 2012). Recommendations which are not implemented will be included in a Remedial Action Plan and their compliance reviewed every 6 months.	–	→	Agree suggested extension to deadline needed to ensure exercise has full value. VR to prepare shortlist of potential service providers and consider scope/extent of the audit.

Company Level Recommendations

Recommendation		URS – SW July 2011 status	URS – SW March 2012 status	URS – SW comments on open recommendations
2.5.11	Develop a policy and implementation practices to more proactively manage land in their ownership in order to maximise environmental gains and promote biodiversity. This would include the development of environmental management plans for all non-operational land and the carrying out of habitat surveys for all new sites prior to development.	↑	→	Still need to check BAPs available/being prepared for the high risk sites
2.5.12	Communicate environmental monitoring regimes at plants and regularly report to stakeholders, including local communities, on their environmental performance, benchmarking this against international standards (e.g. IFC Guidelines) and reporting in their 2012 Sustainability Report.	↑	→	Available SEPs reviewed and generally acceptable, but will need to see VAL-L example once complete. Routine/ annual 'disclosure' to project affected stakeholders still to be widely actioned outside of Sesa Goa.
2.5.15	Produce and test EIAs and EMPs against the IFC Performance Standards and ICMM best practice and define clear links between the EIAs, EMPs and Environmental Management Systems. Specifically EIAs should be expanded in relation to biodiversity and habitat identification, the identification of cultural heritage (scheduled and non-scheduled sites) and social and human rights impacts. Vedanta should commission independent reviews of one or more major EIAs each year in order to ensure compliance with IFC Standards.	→	→	VR need a more robust initial screening mechanism in their process. Also will need to check Liberia EIA/BALCO coal block extension EIA against IFC standards as they progress
2.5.17	Develop a standardised approach to community consultation for new developments which responds to IFC guidance and communicate this to all stakeholders via its web site.	↑	✓	VR should consider developing 'Broad Community Support' indicators to determine success of consultations

Recommendation		URS – SW July 2011 status	URS – SW March 2012 status	URS – SW comments on open recommendations
2.5.20	Adopt a specific policy in relation to engagement with and assistance to social groups that may be vulnerable to change and communicate this to all stakeholders on its web site.	↑	→	Need for Indigenous Peoples or equivalent guidance and company procedure for dealing with complex issues like "FPIConsent"
2.5.22	In developing new sites adopt a standardised approach to the identification of sites of cultural heritage value involving formal documentary sources, site surveys and community consultation.	↑	✓	Covered elsewhere (e.g. screening comments in 2.5.15 above)
2.5.23	Maintain a register of major social and labour incidents at their plants and report to VRL	→	✓	Notification procedure and corrective/ preventive actions fatalities and other significant incidents

Lanjigarh Level Recommendations

Recommendation		URS – SW July 2011 status	URS – SW March 2012 status	URS – SW comments on open recommendations
3.3.20	Undertake a systematic gap analysis of the EMS against the Industry Best practice criteria and update it accordingly.	↑	→	Will need to check progress on new ESMP/SEP recommended by ERM
3.3.3	Notwithstanding the current problems arising from equipment storage, VAL seek to improve site housekeeping with particular regard to ensuring the correct segregation, collection and disposal of waste materials and the fitness for purpose of the refinery's storm water drainage systems.	✓	✓	
3.3.32	Develop suitable and sufficient retrenchment plans to mitigate the adverse impacts of future suspension or closure of the refinery on both direct and indirect employees.	↑	→	Policy and annexure reviewed but could be developed more especially in regard to mitigating local community impacts
3.3.48	Undertake a gap analysis for contractors' labour accommodation against IFC/EBRD guidance and any serious deficiencies addressed. VAL should therefore amend its contractual documentation to specify minimum expectations for contractors in regard to labour accommodation, and then enforce contractors' adherence to its specified requirements.	↑	✓	Existing situation validated and arrangements in hand to apply suitable standards to extension project contractors once given Court go-ahead
3.3.63	Undertake a gap analysis against the occupational and community health and safety requirements set out in the Lender's Industry Best Practice criteria (specifically the IFC's General and applicable sector EHS Guidelines) and take appropriate measures to address any outstanding gaps.	–	→	As per 3.3.20 above
3.3.79	Review the draft Disaster Management Plan against recognised industry guidance (such as the ICMM/UNEP publication "Good practice in emergency preparedness and response," 2005) and upgrade its emergency prevention and response arrangements including improved drill and simulation exercises.	↑	✓	Need to check ongoing actions – e.g. public consultation and involvement

Recommendation		URS – SW July 2011 status	URS – SW March 2012 status	URS – SW comments on open recommendations
3.4.3	If the expansion of the refinery is to proceed, a supplementary report be prepared to augment and update the existing EIA, thus meeting international best practice. This report would be used to guide further development and would be made available to key stakeholders.	–	–	May need to review depending upon Court decision
4.5.5	Review the issue of sporadic dust nuisance, seek to reduce such pollution and monitor both dust emissions and incidence of respiratory infections in the immediate locality of the refinery.	→	✓	Rail freight progressively replacing road transport and reducing dusts
4.5.8	Establish and strengthen a simple and accessible grievance mechanism by which villagers can identify any concerns about the operation of the refinery by using the village coordinators already deployed by VAL.	→	✓	Subject to CB findings re on-going local opposition etc
4.6.8	Give further consideration to accelerating livelihood training programmes for villagers via self-help and business start-up support, especially in those villages close to the refinery and monitor local employment creation in these villages and the Lanjigarh block.	↑	✓	
4.6.12	Work together with local government to develop and publicise an integrated rural development strategy for the area.	–	✓	Integrated development plan reviewed and generally acceptable

Appendix 8 – ERM Recommendations

Issue	Measure and/or Corrective Actions	Reference	Outcome	Responsibility	Time Frame
Integrated Environnemental & Social Management Plan	It is recommended that an integrated environment and social management plan (ESMP) be developed for the Lanjigarh project. This integrated ESMP should build upon/strengthen the existing management systems/plans. This gap assessment has identified specific issues that would need either further studies or review of existing strategies. The ESMP needs to include the outcomes of these studies. Additional plans to be developed (like detailing the Environment Management Plan, b) developing new Resettlement Action Plan for new land acquisition, c) updating traffic Management Plan, d) Influx Management Plan, e) Biodiversity Management Plan, f) Tribal Development Plan, h) Stakeholder Engagement and Disclosure Plan etc). The ESMP needs to take into consideration the commitment and requirements of the Vedanta sustainability management system, policies and technical standards that have been recently developed and adopted.	S. No. 1.3 of Table 3.1	Integrated ESMP for the Lanjigarh project	EHS and Social Team	6 months
Environment and Social Management System (ESMS)	Align the existing integrated Environment and Social Management System (ESMS) with VAL corporate sustainability policies/guidelines and technical standards. Provide a time bound action plan for closure of gaps and monitor the implementation of the ESMS through a third party.	S. No. 1.5 of Table 3.1	Updated and approved policies and implementation plan	EHS Team	4 months
Labour/ Worker Camp Guidelines	Formulate a standard for minimum requirements for all contractor managed accommodation services and facilities in accordance to the IFC Guidance on Worker Accommodation	S. No. 2.4 & 2.5 of Table 3.1	Labour/ Worker Camp Guidelines	EHS Team	2 months

Issue	Measure and/or Corrective Actions	Reference	Outcome	Responsibility	Time Frame
Organisational Capacity	Strengthen senior leadership with personnel having demonstrated experience on key functions and critical issues like community/stakeholder engagement, CSR, HR and EHS management. This team could also become the Sustainability team of the company, discussing strategic issues and ensuring there is synergies between various departments for compliance to the Vedanta policies and standards and IFC Performance standards. Initiate Succession Planning for the organisation.	Refer section 1.6 of PS 1	Organisational structure and additional positions	COO	6 months
Local Content	Include in the Stakeholder engagement programme a long term strategy for local content (for current operations and any future expansions) which can successfully and transparently demonstrate: 1. VAL's commitment to the maximising local content in its project operations both in terms of employment and other opportunities like contracts/services etc; 2. Its efforts in increasing employability of people by building skills/capacities of people through trainings; 3. Its commitment to parity in wages of contractor and full time employees (for different skill sets) and safe and healthy working conditions; 4. That all employees (permanent, contractor, casual etc) have access to grievance systems; 5. A regional development approach to managing employment and other benefits arising from the project. The local employment strategy should also get reflected into the tribal development plan suggested subsequently.	S. No. 2.6 of Table 3.1	Local employment plan	Social Team and Contractor teams.	

Issue	Measure and/or Corrective Actions	Reference	Outcome	Responsibility	Time Frame
Sustainable Waste Management Plan & Resource Efficiency and Pollution Prevention	Commit to developing and implementing a Sustainable Waste Management Plan/Program for the entire life cycle of the project that complies with local regulations and conditions as well as the EHS Guidelines. Specifically demonstrate progress on management and utilization of fly ash, red mud and other such waste projected to be generated	S. No. 3.7 of Table 3.1	Sustainable waste management plan covering the project lifecycle.	Environmental Team	3 months.
	Implement time bound strategies to reach "Zero Waste" and "Zero Discharge" objectives with focus on; 1. Fly ash utilization plan, with annual targets and finally to achieve 100% utilization by 2015; 2. Plans for utilization of red mud and extraction of heavy metal and iron along with annual targets 3. Options for red mud storage/use in the long run. *Include:* • Mobile emissions due to transportation of raw materials and final products for GHG emission estimation; • Set annual targets for GHG emission reduction • Formulate time bound action plans for alternative and/or technological improvements *Meet* the 25% greenbelt development condition as per EC condition and monitor the survival rate of the species planted *Implement* the rainwater harvesting scheme for further reduction in total specific water consumption *Integrate* the phase-out strategies for HCFCs based air conditioners and refrigerators				3-4 years
Community Health & Safety	Assess the Community Health and Safety issues and aspects of the project linked to traffic, railways (like derailment of railway rakes and potential spillage of hazardous materials and linked environmental damage and exposures to VAL staff and community), influx and potential health impacts of communities. Include health monitoring indicators (for the community) in the current framework for internal monitoring Develop strategy for communication on emergency scenario (also including red mud pond, process water lake, ash pond) and associated impacts which could have potential impact on community. Conduct regular off-site mock-drills. Ensure operationalization of the local emergency control centre (LECC) outside the plant boundary along with infrastructural facilities as listed in the DMP.	S. No. 4.4 & 4.5 of Table 3.1	Community health and safety plan Evidence of operational mechanisms/ systems	H & S Team	6 months

Issue	Measure and/or Corrective Actions	Reference	Outcome	Responsibility	Time Frame
Land and Resettlement	Undertake a retrospective process documentation of the land acquisition and resettlement process that has been undertaken till date to review and document the process of LA and R&R (aspects like the socio- economic survey and impact assessment, valuation of land and assets, redressal of grievance, dealings with squatters/ encroachers/ customary land users, community engagement etc should be covered in this process documentation).	S. No. 5.1 & 5.2 of Table 3.1	Process documentation Study	The social and land teams	5 months
	Undertake (through a third party) a Resettlement Audit to assess the success of the resettlement programme, efficacy of livelihood restoration programmes and any pending/open issues linked to the earlier LA and R&R process. Develop a time bound action plan for closure of issues identified in the audit. The reference framework for the audit should be the requirements of IFC PS 5		Land and Resettlement Audit Report along with a road map for gap closure		4 months
	Develop/prepare a Social Impact Assessment and Resettlement Action Plan based on the PS 5 requirements for the planned acquisition of 218 acres of land belonging to the 3 villages around the red mud pond area. Carry out resettlement based on the provisions/outcomes of this RAP. Monitor the implementation of RAP through an external/third party		SIA and RAP for additional land currently being acquired		Before any land is acquired and before any construction activity.
	Update (with special emphasis tribes/vulnerable communities, *refer to section on indigenous communities*) the livelihoods generation/ restoration plan/initiatives on the basis of the above findings. Develop an implementation and monitoring plan for livelihood restoration activities		Livelihood restoration and implementation plan/programme		

Issue	Measure and/or Corrective Actions	Reference	Outcome	Responsibility	Time Frame
Grievance Management 1) Employee Grievances 2) Community/ Stakeholder Grievances	Update the existing Grievance Handling Procedure consolidating the formal and informal channels of grievance redressal and management for the permanent as well as contractor employees. Improve the existing Grievance Mechanism by: • Clarifying accountabilities for timely response, closure and follow-up of all grievances that are obtained; • Tracking/analysing grievances to assess generic community concerns and/or support; • Recording and following up on actions taken within a time bound manner to redress grievances; • Enabling prioritization of grievances on the basis of severity of concern, vulnerability of the grievant etc; • Additional capacity building and awareness to ensure that the grievance process is communicated and reachable to a larger group of stakeholders • Ensuring that the current mechanism is culturally oriented vis-à-vis the social setting of the project; and • Including closure and follow-up of grievances as key performance indicators for responsible departments. Feedback the GR process should be reviewed by the management	S. No. 5.4 of Table 3.1	Updated Grievance Management plan/procedure	EHS and social Team	2 months

Issue	Measure and/or Corrective Actions	Reference	Outcome	Responsibility	Time Frame
Stakeholder Engagement	Build upon the existing engagements and develop a long term stakeholder engagement and communication programme that is proactive, includes stakeholder at all levels and is based on a stakeholder influence analysis. The Stakeholder Engagement programme should: • Identify stakeholders and map their influence levels; • Clearly state/define the purpose of engagement • Identify the forums of engagement and define/suggest tools and methods that will be used; • Designate responsible personnel and staff in charge of/leading the stakeholder engagement programme; • Define parameters that would be monitored to assess/evaluate success of the engagement programme • Suggest reporting mechanism –time frame and frequency for reporting The Stakeholder Engagement Programme should clearly identify and propose engagement methods and tools for tribal and vulnerable groups that is culturally appropriate and acceptable to such groups/communities. This Stakeholder Engagement plan should be informed and linked to the GR process and the outcomes of other assessments like the land and R&S audit, tribal development plan, community health and safety plan etc.	1.12, & 5.3 of Table 3.1	Engagement Plan		

Issue	Measure and/or Corrective Actions	Reference	Outcome	Responsibility	Time Frame
Tribal Community	Undertake an audit/ assessment of its existing programmes and initiatives for these tribal/vulnerable groups/communities to assess its effectiveness and identify gaps/improvement areas. Based on the outcome of the above assessment, prepare/develop a Tribal Development Plan (TDP) consolidating all the initiatives currently being undertaken and suggesting a road map/implementation plan for the other identified impact and their mitigation measures focussed on the tribal groups The Tribal Development Plan should not only mitigate impacts, but strategically should place a long term vision and development agenda for operating in an area where there is a significant tribal and hence vulnerable community. The plan should have the objective of providing long term benefits and developmental impacts on such communities, while also integrating measures to protect their rights, culture and internal organisations and structure. Livelihood enhancement and informed participation should be the core elements of such a plan. The Plan should be developed through intensive consultation with tribal groups and its implementation and monitoring should include representation of these groups and their institutions. Develop and implement a consultation/engagement plan for these tribal/vulnerable groups which is culturally appropriate and demonstrates VALs commitment to free, prior and informed engagement with these groups and communities. These engagement plan should be a part of the larger Stakeholder Engagement developed for the project	S. No. 7.1 of Table 3.1	Audit report and road map and a TDP demonstrating road map for implementation of impact mitigation strategies/ measures Engagement Plan for Tribal/ vulnerable groups	Social team	6 months

Appendix 9 - Register of relevant Indian Legislation

LEGAL & OTHER REQUIREMENT REGISTER

Rev 2	Revision Date:	Document No.
Sl. No	Classification Laws	Applicable Acts/ Regulations
1	LABOUR LAWS	Employees Provident Funds And Miscellaneous Provisions Act, 1952 and Employees' Provident Funds Scheme, 1952
2		Employees Provident Funds And Miscellaneous Provisions Act, 1952, Employees' Provident Funds Scheme, 1952 and Employees Deposit-Linked Insurance Scheme, 1976
3		Employees Provident Funds And Miscellaneous Provisions Act, 1952, Employees' Provident Funds Scheme, 1952 and Employees' Pension Scheme, 1995
4		Employees Provident Funds And Miscellaneous Provisions Act, 1952 and Employees Deposit-Linked Insurance Scheme, 1976
5		Employees Provident Funds And Miscellaneous Provisions Act, 1952 and Employees' Pension Scheme, 1995
6		Employment Exchanges (Compulsory Notification of Vacancies) Act, 1959 and Employment Exchanges (Compulsory Notification of Vacancies) Rules, 1960
7		Equal Remuneration Act, 1976 and Equal Remuneration Rules, 1976
8		Industrial Employment (Standing Orders) Act, 1946 and Orrisa Industrial Employment (Standing Orders) Rules, 1946
9		Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979 and Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Central Rules, 1980
10		Orissa Industrial Establishments (National and Festival) Holidays Act, 1969 and Orissa Industrial Establishments (National and Festival) Rules, 1972
11		Payment of Bonus Act, 1965 and Payment of Bonus Rules, 1975
12		Payment of Gratuity Act, 1972 and Payment of Gratuity (Central) Rules, 1972
13		Payment of Wages Act, 1936 and Orissa Payment of Wages Rules, 1936
14		Supreme Court Guidelines on Prohibition of Sexual Harassment of Women at Work place
15		The Maternity Benefit Act, 1961 and Orissa Maternity Benefit Rules, 1965
16		Child Labour (Prohibition & Regulation) Act, 1986 and Child Labour ((Prohibition & Regulation) Rules, 1993
17		Contract Labour (Regulation and Abolition Act), 1970 and Orissa Contract Labour (Regulation and Abolition) Rules, 1975
18		Contract Labour (Regulation and Abolition Act), 1970 and Orissa Contract Labour (Regulation and Abolition) Rules, 1975
19		Factories Act, 1948 and Orissa Factories Rules, 1950 (Welfare Provision)

Rev 2	Revision Date:	Document No.
Sl. No	Classification Laws	Applicable Acts/ Regulations
20	INDUSTRIAL Laws	Factories Act, 1948 and Orissa Factories Rules, 1950(Safety, Health & Preliminary Approvals)
21		The Orissa Factories(Control of Major Accident Hazard) Rules, 2001
22		The Manufacture, Storage & Import Of Hazardous Chemicals Rules, 1989 (Safety), Amended 2000
23		Motor Vehicles Act, 1988, Orissa Motor Vehicles Rules, 1993
24		Supreme Court Guidelines on Transporting School Children by Bus
25		Prevention of Food Adulteration Act, 1954 and Orissa Prevention of Food Adulteration Rules, 1959
26		Orissa Minerals (Prevention of theft, smuggling and other unlawful activities) Act, 1988 and Orissa Minerals (Prevention of theft, smuggling and other unlawful activities) Rules, 1990
27		Legal Metrology Act, 2009
28		Orissa Industries (Facilitation) Act, 2004 and Orissa Industries (Facilitation) Rules, 2005
29		The Industries (Development and Regulation) Act, 1951 and Registration and Licensing of Industrial Undertakings Rules, 1952
30		Indian Stamp Act, 1899
31		Atomic Energy Act, 1962 and Atomic Energy (Radiation Protection) Rules, 2004
32		Indian Wireless Telegraphy Act, 1933 and Indian Telegraph Act, 1885
33		Electricity Act, 2003 and Indian Electricity Rules, 1956
34		Petroleum Act, 1934 and Petroleum Rules, 2002
35		Indian Standard Code of Practice for Selection, Installation and Maintenance of Portable First Aid Fire Extinguishers
36		Orissa Fire Service Act, 1993
37		The Private Security Agencies (Regulation) Act, 2005 and The Private Security Agencies Central Model Rules, 2006
38		Boilers Act, 1923 and Orissa Boiler Attendant's Rules, 1956
39		Boilers Act, 1923 and Orissa Boiler Operation Engineers' Rules, 1958
40		Indian Boilers Act, 1923 and Indian Boiler Regulations, 1950
41		Orissa Electricity (Duty) Act, 1961 and Orissa Electricity (Duty) Rules, 1961

Rev 2	Revision Date:	Document No.
Sl. No	Classification Laws	Applicable Acts/ Regulations
42	ENVIRONMENTAL LAWS	Public Liability Insurance Act,1991 and Public Liability Insurance Rules, 1991
43		The Environment (Protection) Act, 1986 and Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008
44		Air (Prevention and Control of Pollution) Act, 1981 and Air (Prevention and Control of Pollution) Rules 1982
45		Environment (Protection) Act, 1986 and Environment (Protection) Rules, 1986 and Environment Impact Assessment, 2006
46		Environment (Protection) Act, 1986 and Noise Pollution (Regulation and Control) Rules, 2000
47		Environment (Protection) Act,1986 and Environment (Protection) Rules,1986
48		Water (Prevention And Control Of Pollution) Cess Act, 1977 and Water (Prevention And Control Of Pollution) Cess Rules, 1978
49		Water (Prevention and Control of Pollution) Act, 1974 and Water (Prevention and Control of Pollution) Rules, 1975
50		Environment (Protection) Act, 1986 and Manufacture, Storage and Import of Hazardous Chemical Rules, 1989
51		Environment (Protection) Act, 1986 and Batteries (Management and Handling) Rules, 2001
52		The Environment (Protection) Act, 1986 and The Noise Pollution (Regulation and Control) Rules, 2000
53		Environment (Protection) Act, 1986 and Bio Medical Waste (Management and Handling) Rules
54	FINANCIAL LAWS	Foreign Exchange Management (Borrowing or Lending in Foreign Exchange) Regulations, 2000
55		Foreign Exchange Management (Export of Goods and Services) Regulations, 2000
56		Foreign Trade (Development And Regulation) Act, 1992 And Foreign Trade (Regulation) Rules, 1993 And Foreign Trade Policy, 2009-2014, Foreign Trade Procedures, 2009-2014
57	TAXATION LAWS	Income Tax Act, 1961 and Income Tax Rules, 1962
58		Orissa State Tax On Professions, Trades, Callings And Employments Act, 2000 and Orissa State Tax On Professions, Trades, Callings And Employments Rules, 2000
59		Central Excise Act, 1944 and Cenvat Credit Rules, 2004
60		Central Excise Act, 1944 and The Central Excise Rules, 2002
61		Customs Act, 1962 - Import Exim Policy - 2002-2007
62		Finance Act, 1994 and Service Tax Rules, 1994
63		Orissa Value Added Tax Act, 2005 and Orissa Value Added Tax Rules, 2005
64		Central Sales Tax Act, 1956 and Central Sales Tax (Registration and Turnover) Rules, 1957
65		Orissa Entry tax Act 1999 And Orissa Entry tax rules 1999
66	INFORMATION & TECHNOLOGY	Copyright Act, 1957 & Copyright Rules, 1958
67		Information Technology Act, 2000
68	LOCAL LAWS	The Orissa GramaPanchayats Act, 1964 & Orissa GramaPanchayat Rules, 1968
69	CORPORATE LAWS	Companies Act, 1956

APPENDIX 10

DETAILED ANALYSIS OF THE REFINERY'S ENVIRONMENTAL PERFORMANCE

The regulatory framework

Although the origins of Environmental Impact Assessment (EIA) in India can be traced back to 1976-1977, the mechanism was not adequately effective. The system lacked the necessary legislative support until the Government of India (GoI) enacted the Environmental (Protection) Act on 23 May 1986 with an objective to provide an Act for the protection and improvement of the environment.

To achieve this objective, a notification was issued on 27 January 1994 and Environmental Impact Assessments were made mandatory for any development project. The objective of an EIA was primarily to harmonise developmental interventions with corresponding environmental concerns by assessing the potential environmental problems that may arise as a consequence of a particular development project and identifying mitigation measures required to address them in advance. The EIA process also helps in communicating the decision to the following concerned groups having interests in such projects.

1. Project proponents

2. Regulatory agencies

3. All stakeholders and interest groups

Although MoEF notification 1994 has identified detailed information required from the project proponents on a range of environmental aspects to effectively assess the environmental concerns for the proposed Development Project, the need for an EIA manual was felt necessary to make all the concerned people aware about the data requirement and also to streamline the process. Accordingly an EIA manual was issued by the MoEF in 2001, which has clearly defined the EIA cycle and procedures to be followed. The following EIA process has been recommended for all development projects.[1]

1. Screening

2. Scoping and consideration of alternatives

3. Baseline data collection

4. Impact prediction for air, water, land, biological, socio-economic

5. Assessment of alternatives, delineation of mitigation measures and Environmental Impact statement

6. Public hearing

7. Environmental Management Plan including steps to be taken for addressing issues raised in public hearing

8. Decision making

9. Monitoring the clearance conditions mainly by State pollution control boards.

The main objective for assessment of alternatives was to ensure that state-of-the-art technologies from an environmental viewpoint are selected for the optimum economic benefits to be percolated to the community at large. Once the site and technology is selected, it is the responsibility of the Project Proponent to come up with an Environmental Management Plan (EMP) which is a crucial input to monitor the terms of clearance with an objective to achieve continuous environmental improvements.

[1] EIA manual 2001, issued by MoEF.

The Environmental Clearance for the existing alumina refinery at Lanjigarh was granted under EIA notification 1994 based on the Rapid EIA Report prepared by Tata AIG in August 2002. Immediately after obtaining Environmental Clearance in 2004, VAL also constituted a Comprehensive EIA which was prepared in September 2005 based on one year data to be used as baseline data for further monitoring.

Refinery technology

The Lanjigarh Alumina refinery project has been built based on proven technology that is more than a century old called the Bayer's Process, which is in use worldwide in the extraction of alumina from bauxite. The process of extraction of alumina is the same but the operating conditions may vary from plant to plant depending upon the mineralogical characteristics of the bauxite to be used as a feed stock. The Lanjigarh Alumina refinery was designed by world renowned engineering consultants, Worley Parsons of Australia and Engineers India Limited (a Government of India undertaking) after analyzing all the technological options available. Based on the laboratory tests, past experience and the mineralogical characteristics of East Coast bauxite the process of low temperature and low pressure digestion was selected for the following reasons:

1. Low temperature and low pressure process ensures minimum energy consumption minimizing greenhouse emissions

2. Low pressure digestion process ensures maximum recovery of alumina in comparison to atmospheric digestion used for similar bauxite refineries like NALCO, Damanjodi ensuring optimum utilization of natural resources.

3. Use of high rate thickeners ensures disposal of red mud at high solid concentration resulting in a reduction of land required for the disposal of red mud disposal as well as minimizing the caustic content of the final red mud

4. Use of pipe conveyors for powdery materials like alumina minimises fugitive dust.

5. Use of automatic filtration systems helps in avoiding exposure of caustic to human beings

6. Use of gas suspension calciners fitted with high efficiency electrostatic precipitators helps in minimising the emission from stacks.

7. Adequate green belt around each process unit helps minimise noise pollution as well as giving better environmental conditions inside the plant.

8. Centralised control room helps in optimum utilisation of human resources besides effective control for better energy and resource management.

9. Zero discharge system helps in minimising the dependency of plant on external water sources and developing better relationships with the community by not discharging any treated or untreated effluent to outside water bodies.

10. Use of environmental friendly systems like bag filters, dry fog system, wet scrubbing system, pneumatic transportation of waste like fly ash from power plant, vacuum dust collection systems, vacuum road sweepers, water sprinkling systems etc. for various material handling helps in maintaining a clean and dust free environment inside and outside the plant area.

11. Steel lined sumps and concrete drains and floors help in avoiding ground water contamination.

Throughout the EIA process we hope to have demonstrated that all possible options were considered and that the most appropriate technologies were adopted throughout the operations to minimise the environmental impact of the development project being proposed.

Alternative plant location

Kalahandi is one of the most under-developed areas of the country and the Government of Odisha (GoO) looked to industry as a way of alleviating poverty in the area. As the Lanjigarh bauxite deposit was earmarked for the proposed alumina refinery, the plant was required to be located close to the mines (all resource-based plants are located close to the raw material source). The deposit is partly located on the boundary between the districts of Rayagada and Kalahandi (see Figure 1).

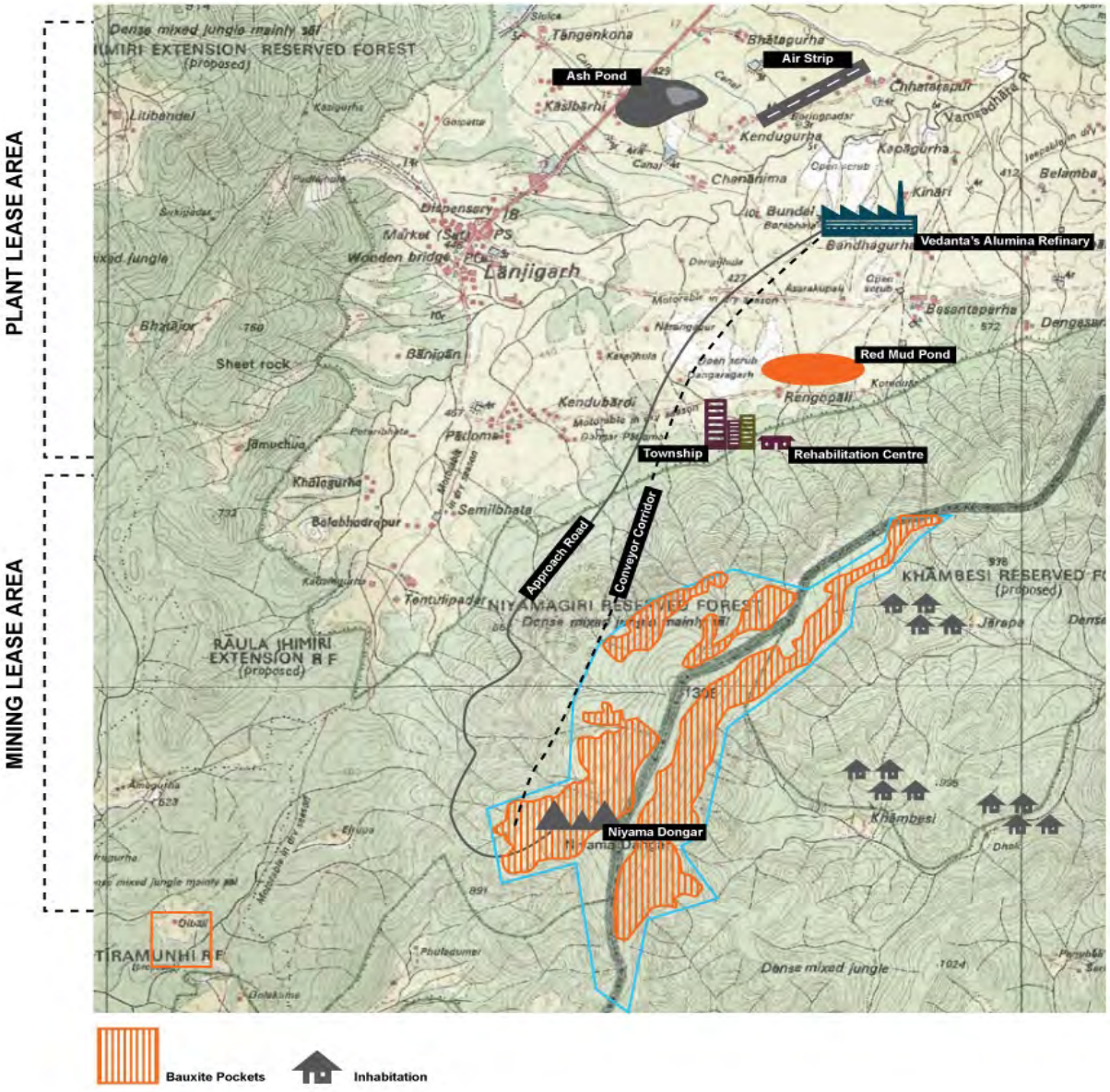

Figure 1: Key plan of Bauxite Mines and Alumina Refinery

A number of studies were undertaken for site selection. The key criteria for site selection included the following.

1. Plant to be located in Kalahandi District to provide maximum economic benefits to the people of Kalahandi and particularly Lanjigarh

2. Minimisation or avoidance of any Forest Land involvement in the plant

3. Minimisation of physical displacement of people / families

4. Minimising acquisition of agricultural land

5. Minimum disturbance to natural resource like river, streams, monument etc.

6. Proximity to railway, grid power, water source etc.

After detailed studies, we selected the site for which EIA Report was prepared that conformed to the guidelines issued by the MoEF. Nevertheless the selected site was characterised by some shortcomings (especially from a logistical perspective) as it required additional capital expenditure to create facilities including:

- water supply system

- electricity supply for black start

- laying more than 16km of railway line

- large site grading cost due to rocky terrain

- high logistical cost for equipment and machineries

- no connectivity with the state or national highways,

It was also selected for posing minimal impact from a social perspective. Nearly 80% of the land acquired for the project was non-agricultural land and only 121 families were requiring physical displacement. Hence, all due diligence were exercised prior to selecting the site.

Environmental setting

The Alumina refinery is located at Lanjigarh in the Kalahandi District of Odisha and is about 5km from the PML area on the Niyamgiri Hills and is situated in Revenue Villages of Kinari, Bhorbhata, Bundel, Kothdwar, Bandhagurha and Sindhabahal of Lanjigarh Tehsil in Kalahandi District. The plant is located by the side of Lanjigarh – Dahikal road, which connects State Highway SH-6 (Bhawanipatna – Rayagada). The Red Mud Pond is located in the Revenue Villages of Kothdwar, Rengopalli and Naryanpur. The Ash Pond is located in the Revenue Villages of Lanjigarh, Kasibadi and Kenduguda. Similarly, the Staff Township is located in the Revenue Village of Jagannathpur. The NiyamDanagar forms a topographical high land in the area with an elevation of 1300 m above MSL. Niyamgiri plateau (1210m), BamandebDongar (1033m) and Niyamgiri hill (1306 m) are the major elevated land features in the area. The valleys are mostly narrow and well dissected.

The nearest town is Bhawanipatna, which is situated at a distance of 65km by road. The nearest railway station is at Muniguda Blocks, which falls within the administrative jurisdiction of Rayagada District situated at a distance of about 25km by road.

Table 1: Geographical Data for the VAL Alumina Refinery

Sl. No.	Particulars	Details
1	Latitude	19o 43' 01" North
2	Longitude	83o 24' 26" East
3	Elevation above MSL	420 M
4	Climatic Conditions (IMD – Bhawanipatna	Annual Max Temp – 41.8o C Annual Min. Temp – 12.8o C Annual Total rainfall – 1229.5 mm
5	Present land use at the plant site	Mostly barren land, partially rain fed agricultural land
6	Nearest highway	State Highway (SH 6) about 10 km East
7	Nearest Railway Station	Muniguda (25 km SE)
8	Nearest Airstrip	Utkela (80 km NW)
9	Nearest Village	Basantaparha Village (0.4 km, S)
10	Nearest Town	Lanigarh (4.2 km)
11	Nearest City	Bhawanipatna (65 km NW)
12	Hills / Valleys	No hills / valleys on the plant site
13	Ecologically sensitive zones	No important monuments
14	Historical Places	Nil
15	Defense Installations	Nil
16	Reserve Forests in 10 km	Bori R.F at 5.2 km, NW Hatisal R.F at 3.5 km NW RaulaJhimiri at 5.2 km WNW Niyamgiri at 3.5 km SW Khambesi R.F. at 2.0 km S Kudilima R.F. at 9.7 km SE Patragruha R.F. at 6.4 km ESE Batarilima R.F. at 2.3 km E Dahikhala R.F. at 4.0 km ENE Patragruha R.F. at 2.2 Km Nimgiri R.F. at 9.0 km S

Baseline data and Environmental Monitoring

Figure 2: Continuous ambient air quality monitoring station

1. Air emissions

As part of the EIA study, the baseline ambient air monitoring data was collected from nine locations within a 10km radius of the plant site. The monitoring locations were selected based on the following considerations:

a. Meteorological conditions on synoptic basis

b. Topography of the study area

c. Likely impact areas

The locations of all the monitoring stations are shown in Figure 5 and it was ensured that monitoring stations should cover 3600 areas to ensure that all possible wind directions were monitored.

Since the the EIA study, as part of the EMP, regular monitoring is being carried out at seven locations as per the advice of OSPCB based on the EIA monitoring data. Monitoring is done quarterly at all the locations by a third party (M/s SGS, Bhubaneswar).

In addition to the aforementioned considerations, one continuous monitoring station has been installed within the plant premises and 6 locations are monitored on a weekly basis by the Environment Department.

The Ambient Air Quality Monitoring results from 2008-2010 show no degradation in air quality with the mean dust level concentration of around 200µg/m3 within the plant which is considerably below the ambient air limit of 500µg/m3. The monitoring results in the surrounding villages – namely Balbhadrapur, Rengopali, Kasibari, Rehabilitation Colony and Chattrapur – indicate suspended dust concentration well within the stipulated limit (100µg/m3) for residential area.

The Maximum, Minimum and Average values of Suspended Particulate matter, SO2 and NOX in and around the plant after commissioning of the refinery and baseline data collected before start of the project as given in the EIA report have been stated in two separate tables.

The National Ambient Air Quality Standards was revised and accordingly VAL started monitoring from the year 2011. The Suspended Particulate matter was divided into two categories, namely Particulate matter <10µm and Particulate Matter <2.5µm. Analysis values indicate dust concentrations well within the limits in all the locations.

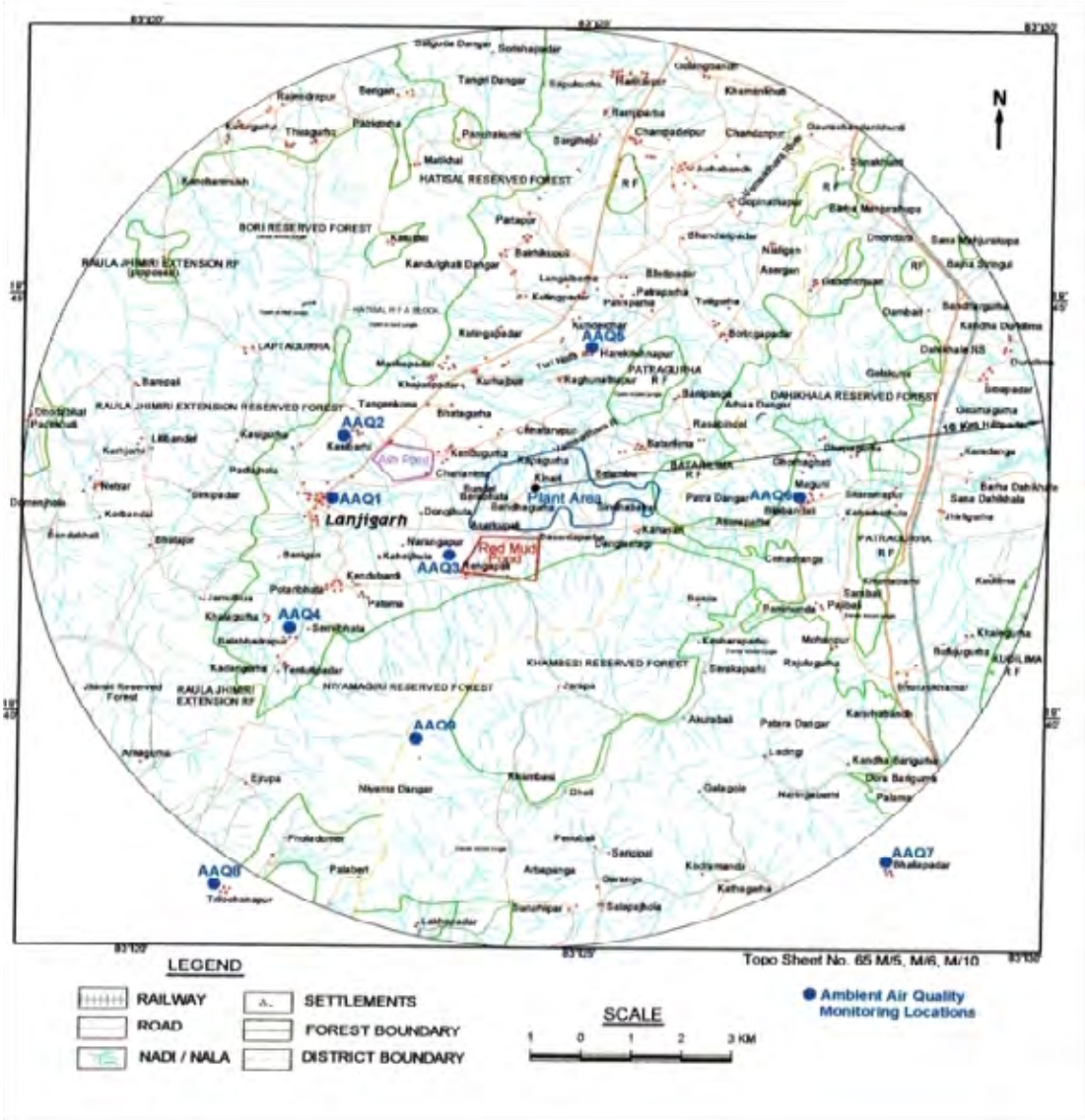

Figure 3: Ambient Air Quality Monitoring Location

AAQM reports are submitted to MOeF on a six monthly basis and to OSPCB on a monthly basis. A copy of reports submitted to MOeF (June 2011) and to OSPCB (October 2011) is enclosed as Annexure.

Table 2: Ambient air monitoring data for ambient air from 2008 to 2010

				2008			2009			2010		
Sampling Location	Parameter	Unit	Norm	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG
Project office-Industrial	SPM	$\mu g/m^3$	500	241.30	103.40	185.45	328.50	94.61	205.99	279.91	107.64	202.35
	SO2	$\mu g/m^3$	120	12.60	8.06	10.75	19.10	6.42	8.80	9.10	5.81	7.26
	NOx	$\mu g/m^3$	120	23.60	14.50	18.06	20.10	8.09	11.44	11.24	7.69	9.28
Balbhadrapur-Residential	SPM	$\mu g/m^3$	200	90.75	41.20	61.37	86.90	32.60	60.64	87.29	34.51	61.40
	SO2	$\mu g/m^3$	80	9.80	5.00	6.77	5.21	4.04	4.80	6.53	3.62	4.77
	NOx	$\mu g/m^3$	80	12.20	6.86	8.90	7.50	5.43	6.23	7.35	4.33	5.58
Rengopali-Residential	SPM	$\mu g/m^3$	200	128.50	60.96	100.72	140.90	65.23	94.47	102.49	43.18	74.41
	SO2	$\mu g/m^3$	80	13.60	7.00	10.24	8.30	6.49	7.22	7.46	3.98	5.19
	NOx	$\mu g/m^3$	80	28.50	10.84	18.59	15.30	7.12	9.30	8.41	5.77	7.33
Kasibari - Residential	SPM	$\mu g/m^3$	200	69.40	32.81	49.77	80.40	36.10	67.48	84.15	43.02	68.52
	SO2	$\mu g/m^3$	80	9.80	4.80	6.21	6.00	4.58	5.23	6.24	4.19	5.13
	NOx	$\mu g/m^3$	80	14.60	6.93	9.94	7.50	5.01	6.39	7.38	5.37	6.51
Rehab colony – Residential	SPM	$\mu g/m^3$	200	150.90	54.87	108.14	132.60	49.53	79.25	89.64	32.18	67.95
	SO2	$\mu g/m^3$	80	9.80	6.00	7.74	8.30	5.90	6.63	6.29	4.05	5.24
	NOx	$\mu g/m^3$	80	15.30	8.40	11.60	12.80	6.95	9.25	8.18	4.98	6.93
Chatrapur - Residential	SPM	$\mu g/m^3$	200	173.90	60.90	123.89	140.50	70.90	108.83	138.64	42.18	88.59
	SO2	$\mu g/m^3$	80	13.10	7.26	10.53	8.70	6.02	7.32	8.01	4.87	6.74
	NOx	$\mu g/m^3$	80	25.60	9.50	18.95	13.90	8.43	10.00	9.38	5.34	8.21

Note : The above data already collected and verified by the State Pollution Control Board

As a part of continual improvement to minimise dust pollution, VAL has adopted the following measures:

a. Commissioning of railway sidings to transport feed raw material (coal, caustic and bauxite) and finished products

b. Concreting of internal roads in a phased manner.

c. Installation of dust suppression systems -- water sprinkler, dry fog system, Electro Static Precipitator (ESP), bag filters and industrial vacuum cleaning system.

d. Greenbelt Development: VAL has developed the program. As part of the same, 300,000 saplings have been planted to date. Majority of the saplings have been planted around red mud ponds and fly ash ponds. The saplings are primarily local species (examples include Acacia, Nilotica, Eucalyptus, Neem, and Casurina) and help in mitigating the dust pollution.

Table 3: Baseline ambient air monitoring data

Location	Parameter	Unit	Max	Min	Avg
Lanjigarh	SPM	$\mu g/m^3$	142.8	105.2	117.6
	RPM	$\mu g/m^3$	55.2	33.1	47.1
	SO2	$\mu g/m^3$	10.3	5.7	7.4
	Nox	$\mu g/m^3$	13.8	7.6	10.2
Kasibarhi	SPM	$\mu g/m^3$	129.5	98.3	110.1
	RPM	$\mu g/m^3$	46.1	27.1	39.4
	SO2	$\mu g/m^3$	10.2	5.4	7.6
	Nox	$\mu g/m^3$	12.7	7.4	10.1
Niyamgiri Vedanta Nagar	SPM	$\mu g/m^3$	122.1	96.5	107.5
	RPM	$\mu g/m^3$	43.0	30.2	37.6
	SO2	$\mu g/m^3$	10.1	5.3	7.4
	Nox	$\mu g/m^3$	12.9	7.6	10.4
Balbhadrapur	SPM	$\mu g/m^3$	116.9	94.0	103.5
	RPM	$\mu g/m^3$	40.1	21.2	32.9
	SO2	$\mu g/m^3$	9.1	5.6	7.0
	Nox	$\mu g/m^3$	11.5	6.8	8.9
Harekrishnapur	SPM	$\mu g/m^3$	112.8	87.3	98.6
	RPM	$\mu g/m^3$	41.6	23.1	34.0
	SO2	$\mu g/m^3$	8.5	5.3	6.6
	Nox	$\mu g/m^3$	11.7	6.9	8.9
Bijabandali	SPM	$\mu g/m^3$	131.2	105.6	116.5
	RPM	$\mu g/m^3$	49.7	29.3	41.9
	SO2	$\mu g/m^3$	10.5	5.8	7.7
	Nox	$\mu g/m^3$	13.9	8.9	10.9
Bhaliapadar	SPM	$\mu g/m^3$	110.9	88.7	98.9
	RPM	$\mu g/m^3$	38.7	19.2	29.3
	SO2	$\mu g/m^3$	9.7	5.8	7.2
	Nox	$\mu g/m^3$	13.2	7.4	10.0
Trilochanapur	SPM	$\mu g/m^3$	69.2	41.5	53.2
	RPM	$\mu g/m^3$	29.4	12.9	20.5
	SO2	$\mu g/m^3$	9.3	5.5	6.8
	Nox	$\mu g/m^3$	12.2	6.2	9.1
Hill Top (Mine)	SPM	$\mu g/m^3$	60.0	39.3	47.2
	RPM	$\mu g/m^3$	25.6	11.5	18.1
	SO2	$\mu g/m^3$	8.2	5.1	6.4
	Nox	$\mu g/m^3$	10.7	6.3	8.5

(Source: Comprehensive EIA report, Vimta Labs, Sept 2005)

Table 4: Ambient air monitoring data for 2011

Sampling Location	Parameter	Unit	Norm	Max	Min	Avg
Project office- Industrial	PM10	$\mu g/m^3$	100	83.52	36.72	61.81
	PM2.5	$\mu g/m^3$	60	47.30	11.91	28.30
	SO2	$\mu g/m^3$	80	7.88	6.42	7.16
	NOx	$\mu g/m^3$	80	9.28	7.58	8.18
Balbhadrapur- Residential	PM10	$\mu g/m^3$	100	42.15	28.56	34.88
	PM2.5	$\mu g/m^3$	60	16.57	9.08	11.95
	SO2	$\mu g/m^3$	80	5.37	3.76	4.55
	NOx	$\mu g/m^3$	80	6.22	4.19	5.12
Rengopali- Residential	PM10	$\mu g/m^3$	100	70.29	29.76	44.51
	PM2.5	$\mu g/m^3$	60	30.67	9.08	16.68
	SO2	$\mu g/m^3$	80	5.01	3.79	4.37
	NOx	$\mu g/m^3$	80	5.86	4.21	5.03
Kasibari – Residential	PM10	$\mu g/m^3$	100	46.33	30.94	36.76
	PM2.5	$\mu g/m^3$	60	36.59	9.73	19.73
	SO2	$\mu g/m^3$	80	5.49	4.28	4.85
	NOx	$\mu g/m^3$	80	6.14	4.64	5.45
Rehab colony – Residential	PM10	$\mu g/m^3$	100	49.68	22.51	35.56
	PM2.5	$\mu g/m^3$	60	19.83	10.02	13.35
	SO2	$\mu g/m^3$	80	5.49	4.19	4.92
	NOx	$\mu g/m^3$	80	7.02	4.76	5.96
Chatrapur – Residential	PM10	$\mu g/m^3$	100	55.68	30.28	41.85
	PM2.5	$\mu g/m^3$	60	32.16	10.24	18.48
	SO2	$\mu g/m^3$	80	7.28	6.11	6.56
	NOx	$\mu g/m^3$	80	8.65	7.28	7.97

Note : The above data already collected and verified by the State Pollution Control Board

2. Water quality

As part of the EIA study, the baseline water quality data was collected from 11 locations (six ground water and five surface water) within a 10km radius of the plant site. Physio-chemical, heavy metal and bacteriological parameters were also examined to assess the effect of industrial activities on surface and ground water.

Figure 4: Process Water Lake

Please refer to **Figure 5** below for the 11 water quality monitoring locations.

Post the EIA study, as part of the EMP, regular monitoring is being carried out at 15 locations. Frequency of monitoring is quarterly and is carried out by a third party (M/s SGS, Bhubaneswar). We are also monitoring some key parameters on a daily basis in six locations for ground water and four locations for surface water.

As can be seen from the analytical data mentioned in the following tables, the surface or ground water does not show any signs of contamination in 2011 in the parameters like pH and Alkalinity, BOD, COD, etc. or any significant difference from the analysis done in 2008. The baseline data collected before start of the project as given in the EIA report is given in the form of two tables. A comparison with the baseline data does not indicate any indication of pollution of whether surface or ground water arising out of the operation of the refinery.

Water Quality Reports are submitted to the MoEF on a six monthly basis and to the OSPCB on a monthly basis. Copy of reports submitted to MoEF (June 2011) and OSPCB (October 2011) is enclosed as Annexure.

In addition, as part of the obligatory governance mechanism, OSPCB collects water quality samples on a regular basis. To date, we have not received any show-cause notice from OSPCB alleging our operations to have a deteriorating impact of water quality.

As part of maintenance program, storm water drains, pipeline carrying various process slurries and liquids are monitored and maintained on a regular basis.

Figure 5: Surface and ground water sampling locations

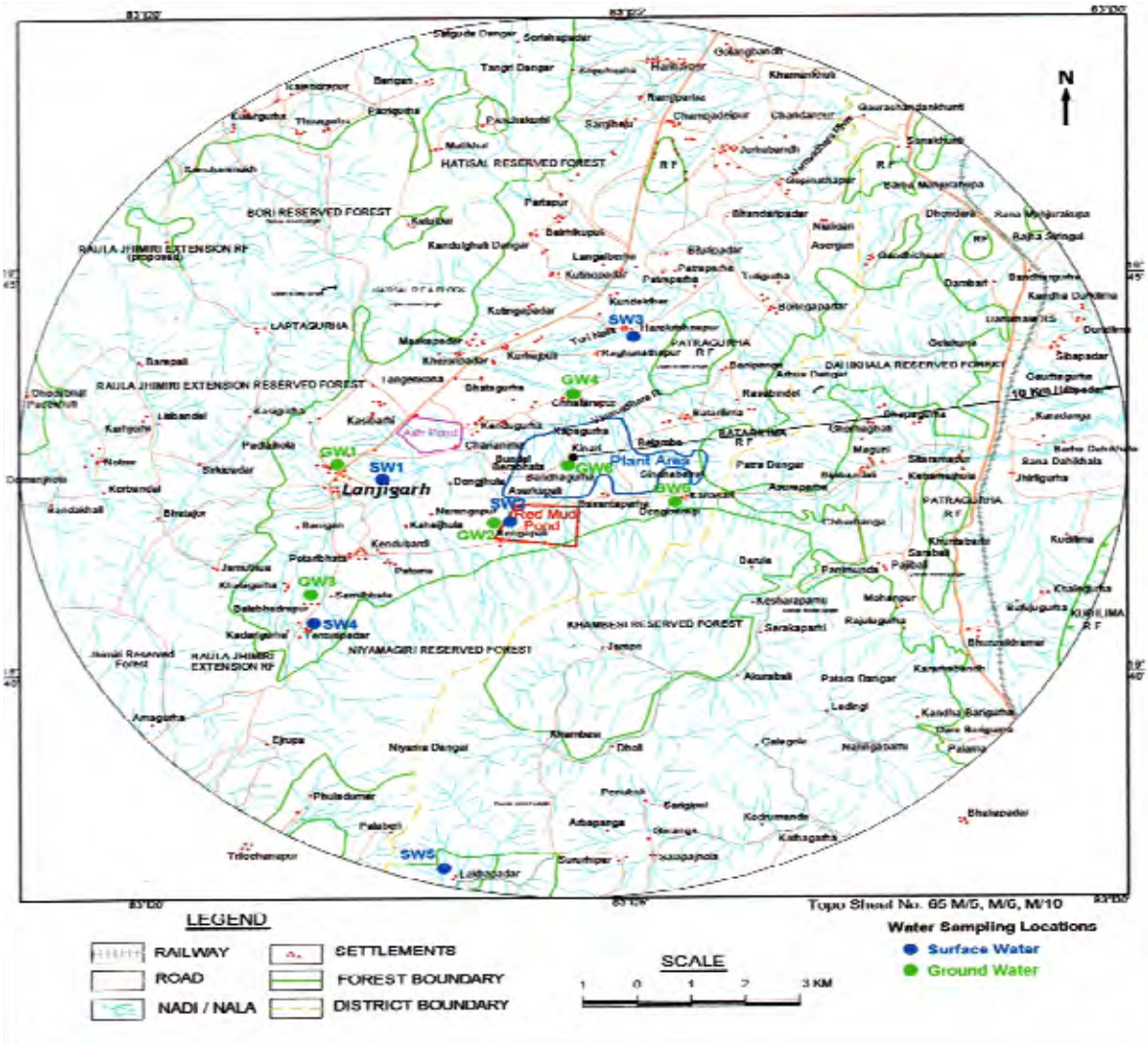

Table 5: Comparison of pre-monsoon surface water quality in 2008 and 2011

		Tentulipadar		Kendubadi		Rengopali		Lanjigarh		Chatrapur	
		2008	2011	2008	2011	2008	2011	2008	2011	2008	2011
1	Alkalinity (mg/l)	24.9	18.38	32.6	11.89	21.3	16.22	56.4	57.29	68.2	85.92
2	Aluminum (mg/l)	<0.01	0.28	<0.01	0.94	<0.01	0.24	<0.01	0.35	<0.01	0.4
3	Arsenic (mg/l)	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005
4	Biochemical Oxygen Demand	2.7	<2.0	2.6	<2.0	2.9	<2.0	3.4	<2.0	12.6	<2.0
5	Chemical Oxygen Demand	13.2	5.6	14.8	9.4	12.6	5.6	28.6	5.6	34.5	11
6	Calcium (mg/l)	12.6	4.4	9.8	2.4	11.8	5.6	21.1	14.8	22.4	6.4
7	Chloride (mg/l)	10.6	2.96	8.8	2.96	8.1	3.7	12.9	5.19	19.3	37.05
8	Chromium (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
9	Color (Haz.unit)	1	5	1	10	1	5	1	10	1	15
10	Conductivity	110.6	40.2	98	25.2	80	34.5	146	138.2	173	588
11	Copper (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
12	Dissolved Oxygen (mg/l)	4	4.8	4.2	5.1	4.1	5.5	4.4	5.7	4.6	6.2
13	Feacal Count (MPN/100ml)	<0.2	17/ 100mL	<0.2	<2/ 100mL	<0.2	<2/ 100 mL	<0.2	14/ 100mL	<0.2	<2/ 100 mL
14	Fluoride (mg/l)	<0.1	<0.10	<0.1	<0.10	<0.1	<0.10	<0.1	0.14	<0.1	0.47
15	Iron (mg/l)	0.02	0.36	0.02	1.17	0.03	0.24	0.04	0.65	0.04	0.85
16	Lead (mg/l)	<0.01	0.03	<0.01	0.06	<0.01	0.05	<0.01	0.04	<0.01	0.06
17	Magnesium (mg/l)	8.7	1.7	10.2	1.46	7.6	1.94	16.2	6.32	16.8	3.4
18	Manganese (mg/l)	<0.01	0.01	<0.01	0.07	<0.01	0.01	<0.01	0.08	<0.01	0.08
19	Mercury (mg/l)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
20	MPN Coliform Count (MPN/100ml)	10	90/ 100mL	15	30/ 100 mL	7	110/ 100 mL	14	170/ 100mL	15	<2/ 100mL
21	Nitrate (mg/l)	0.3	<0.50	0.3	2.98	0.3	3.4	0.4	2.56	0.7	4.29
22	Odour	UO	Unobjectionable	UO	Unobjectionable	UO	Unobjectionable	UO	Unobjectionable	UO	Unobjectionable
23	pH	7	6.95	6.9	7.31	7.2	7.45	7.4	7.35	8	7.85
24	Phosphate (mg/l)	<0.1	<0.25	<0.1	<0.25	<0.1	<0.25	<0.1	<0.25	<0.1	<0.25
25	Poly Aromatic Hydrocarbon	ND	ND (DL:0.0001 mg/l)	ND	ND (DL:0.0001 mg/l)	ND	ND (DL:0.0001 mg/l)	ND	ND (DL:0.0001 mg/l)	ND	ND (DL:0.0001 mg/l)
26	Residual Chlorine (mg/l)	NIL	<0.1	NIL	<0.1	NIL	<0.1	NIL	<0.1	NIL	<0.1
27	Selenium (mg/l)	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005
28	Sulphate (mg/l)	1.5	6.7	2.1	6.7	3.6	3.57	5.9	4.94	6.3	8.14
29	Temperature (0c)	28	27.3	28.4	28.2	29.2	34.5	30.5	30.1	31.4	31.4
30	Total Dis. Solids (mg/l)	69	32	58	24	66	32	128	94	153	432
31	Total Hardness (mg/l)	38	18	25	12	41	15	59	63	66	30
32	Turbidity (NTU)	6	7.35	8	24.6	9	8.61	16	17.7	27	53.5

Note: The above data already collected and verified by the State Pollution Control Board

Table 6: Comparison of pre-monsoon ground water quality in 2008 and 2011

Sr No	Parameters	Plant site 2008	Plant site 2011	Lanjigarh 2008	Lanjigarh 2011	Rengopali 2008	Rengopali 2011	Chtrapur 2008	Chtrapur 2011	Chanalima 2008	Chanalima 2011	Red Mud Pond 2008	Red Mud Pond 2011	Process Water Lake 2008	Process Water Lake 2011	Ash Pond 2008	Ash Pond 2011	Bate-lima 2011	Bandha-guda 2011
1	Alkalinity (mg/l)	110.3	75.67	62.1	378.35	83.5	70.27	89.6	248.63	73	64.86	61.4	59.46	108.7	324.3	79	102.7	151.34	91.89
2	Almunium (mg/l)	0.03	0.17	0.02	0.17	0.02	0.2	0.02	0.18	0.03	0.18	0.02	0.66	0.03	0.18	0.05	0.72	0.17	0.17
3	Anionic Ion(mg/l)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.50	<0.05	<0.05
4	Arsenic (mg/l)	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005
5	Boron (mg/l)	<0.05	0.06	<0.05	<0.05	<0.05	0.05	<0.05	0.07	<0.05	0.06	<0.05	<0.05	<0.05	0.06	<0.05	0.05	0.07	<0.05
6	Calcium (mg/l)	30.4	19.6	29.6	<86.24	64	12.54	40.8	42.34	26.2	12.54	36.9	12.54	52.6	58.02	32.4	14.9	50.96	23.52
7	Chloride (mg/l)	14.8	9.63	21.3	37.05	29.6	8.15	11.6	55.56	7	5.93	7.3	7.41	8	7.41	6.2	7.41	33.34	14.82
8	Chromium (mg/l)	<0.05	<0.01	<0.05	<0.01	<0.05	<0.01	<0.05	<0.01	<0.05	<0.01	<0.05	<0.01	<0.05	<0.01	<0.05	0.01	<0.01	<0.01
9	Coliform Count (MPN/100ml)	Nil	<2/100 mL	Nil	<2/100 mL	Nil	<2/100 mL	Nil	<2/100 mL	Nil	<2/100 mL	Nil	<2/100 mL	Nil	<2/100 mL	Nil	<2/100 mL	<2/100 mL	<2/100 mL
10	Color (Hz.U)	1	10	1	5	1	10	2	10	1	5	2	20	1	10	1	10	5	10
11	Conductivity (µs/cm)	460	200	168	765	279	134.6	346	718	120	125.3	160	114.7	320	555	146	144.8	381	221
12	Copper (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
13	Feacal Count (MPN/100ml)	Nil	<2/100 mL	Nil	<2/100 mL	Nil	<2/100 mL	Nil	<2/100 mL	Nil	<2/100 mL	Nil	<2/100 mL	Nil	<2/100 mL	Nil	<2/100 mL	<2/100 mL	<2/100 mL
14	Fluoride (mg/l)	0.25	0.14	0.2	0.19	0.2	0.13	0.46	0.19	0.18	0.1	0.22	0.28	0.4	0.34	0.1	0.1	0.24	0.18
15	Iron (mg/l)	0.04	0.78	0.03	0.28	0.03	2.28	0.03	1.14	0.02	0.37	0.03	8.43	0.02	0.82	0.02	50.49	0.35	0.65
16	Lead (mg/l)	<0.01	0.1	<0.01	0.01	<0.01	0.02	<0.01	<0.005	<0.01	0.03	<0.01	0.08	<0.01	0.01	<0.01	0.07	0.01	0.06
17	Magnesium (mg/l)	11.9	9.53	8.9	39.53	19.3	19.05	16	13.34	10.7	5.24	7.3	5.72	23.5	30.48	13.5	6.67	6.19	9.05
18	Manganese (mg/l)	<0.01	0.02	<0.01	0.71	<0.01	0.02	<0.01	0.06	<0.01	0.01	<0.01	0.26	<0.01	0.02	<0.01	0.36	0.06	0.03
19	Mercury (mg/l)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
20	Nitrate (mg/l)	0.5	1.56	2.6	18.4	16.28	4.55	0.6	39.63	2.18	31.86	0.3	<0.50	0.4	<0.50	0.8	7.9	20.5	4.38
21	Odour	UO	Unob-jectio-nable	UO	Unob-jectio-nable	UO	Unob-jectio-nable	UO	Unob-jectio-nable	UO	Unob-jectio-nable	UO	Unob-jectio-nable	UO	Unob-jectio-nable	UO	Unob-jectio-nable	Unob-jectio-nable	Unob-jectio-nable
22	Pesticide (mg/l)	Absent	ND (DL:0.0001)	Absent	ND (DL:0.0001)	Absent	ND (DL:0.0001)	Absent	ND (DL:0.0001)	Absent	ND (DL:0.0001)	Absent	ND (DL:0.0001)	Absent	ND (DL:0.0001)	Absent	ND (DL:0.0001)	ND (DL:0.0001)	ND (DL:0.0001)
23	PH	7.1	6.98	7.2	7.21	7	6.88	7.3	6.8	7.1	6.65	6.7	6.92	7.1	7.15	6.8	6.53	6.75	6.87
24	Phosphate (mg/l)	<0.1	<0.25	<0.1	<0.25	<0.1	<0.25	<0.1	<0.25	<0.1	<0.25	<0.1	<0.25	<0.1	<0.25	<0.1	<0.25	<0.25	<0.25
25	Poly Aromatic Hydrocarbon	ND	ND(DL: 0.0001)	ND	ND(DL: 0.0001)	ND	ND(DL: 0.0001)	ND	ND(DL: 0.0001)	ND	ND(DL: 0.0001)	ND	ND(Dl:0.0001)	ND	ND(Dl:0.0001)	ND	ND(Dl:0.0001)	ND(Dl:0.0001)	ND(Dl:0.0001)
26	Residual Chlorine (mg/l)	Nil	<0.1	Nil	<0.1	Nil	<0.1	Nil	<0.1	Nil	<0.1	Nil	<0.1	Nil	<0.1	Nil	<0.1	<0.1	<0.1
27	Selenium (mg/l)	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005
28	Sulphate(mg/l)	5.9	4.34	2.4	20.15	7.3	3.35	10.4	21.29	4.4	3.44	3.2	4.84	2.8	5.64	4.2	2.96	12.28	10.14
29	Taste	Agree-able	Agree-able	Agree-able	Agree-able	Agree-able	Agree-able	Agree-able	Agree-able	Agree-able	Agree-able	Agree-able	Agree-able	Agree-able	Agree-able	Agree-able	Agree-able	Agree-able	Agree-able
30	Temp (0c)	30	29.3	29	27.4	29	28.7	30	28.9	29	28.8	30	27.3	30	28.5	30	26.4	28.7	26.8
31	Total Dissolved Solid (mg/l)	292	160	136	488	180	148	244	456	88	118	101	102	226	368	104	152	278	172
32	Total Hardness (mg/l)	139	88.2	68.9	378.28	189	109.76	71.4	160.72	64.5	52.92	69.7	54.88	256	270.48	59.3	64.68	152.88	96.04
33	Turbidity (NTU)	2	5.78	3	3.55	3	23.8	3	12.5	2	1.86	4	120	2	12.9	3	944	2.06	6.6

Note : The above data already collected and verified by the State Pollution Control Board

Table 7 A: Baseline surface water quality

	Unit	SW1	SW2	SW3	SW4	SW5
pH		8.3	8	8.1	8.4	7.7
Colour	Hazen	1	1	1	1	1
Temp	oC	26.4	27.4	26.5	27.8	28
Turbidity	NTU	5	6	3	5	
Conductivity	µS/cm	491	463	501	243	305
Total Dissolved Solids	mg/l	296	280.3	302.4	148.4	187.6
Dissolved Oxygen	mg/l	5.1	5.4	5.9	5.9	5.8
Total Coliform	MPN/100ml	15	12	10	12	18
Total Hardness as CaCO3	mg/l	205.2	171.7	128.3	152.3	115.4
BOD	mg/l	3.1	3.8	3.1	3.2	3.1
COD	mg/l	8.2	8.5	8.2	8.1	8
Total Alkalinity	mg/l	233.1	225.4	148.3	161.4	171.3
Calcium as Ca2+	mg/l	32.8	30.5	13.2	23.9	21.4
Magnesium as Mg 2+	mg/l	27.2	22.4	19.8	16.1	14.3
Sodium as Na	mg/l	17.2	16.5	11.6	11.2	8.4
Potassium as K	mg/l	4.6	3.2	2.7	1.9	2.2
Chlorides as Cl	mg/l	51.8	43.4	42.1	34.2	34.6
Sulphates as SO4 2-	mg/l	18.2	11.6	21.2	12.4	11.2
Fluorides as F	mg/l	0.62	0.47	0.31	0.38	0.39
Nitrates as NO3	mg/l	5.2	2.6	5.4	4.2	1.3
Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury as Pb	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc as Zn	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Boron as B	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium a Cr	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Anionic Detergents	mg/l	ND	ND	ND	ND	ND
Insecticides and Pesticides	mg/l	ND	ND	ND	ND	ND

(Source: Comprehensive EIA report, Vimta Labs, Sept 2005)

Table 7 B: Baseline ground water quality

Parameter	Unit	GW1	GW2	GW3	GW4	GW5	GW6
pH	–	8.5	8.1	8.4	8.3	8.3	7.9
Colour	Hazen	4	2	4	3	2	4
Taste	–	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
Odour	–	UO	UO	UO	UO	UO	UO
Conductivity	µS/cm	465	417	254	301	405	305
Turbidity	NTU	5	2	2	2	2	2
Residual Chlorine as Cl2	mg/l	Nil	Nil	Nil	Nil	Nil	Nil
Total Dissolved Solids	Mg/l	281.3	251.6	153.2	181.3	245.1	185.3
Dissolved Oxygen	mg/l	5.2	5.2	5.4	5.8	5.7	5.5
Total Coliform count	MPN/100ml	Nil	+Nil	Nil	Nil	Nil	Nil
Total Feacal coliform	MPN/100ml	Nil	Nil	Nil	Nil	Nil	Nil
Total Hardness as CaCO3	mg/l	236.1	181	121.3	149	201	151
Total Alkalinity as CaCO3	mg/l	242	189	120	180	180	152
Calcium as Ca2+	mg/l	42.4	41.6	24	33.6	51.2	31.2
Magnesium as Mg2+	mg/l/	30.5	25.4	14.9	16	18	18.0
Chlorides as Cl	mg/l	42.7	43.7	34.5	31.8	51.2	30.7
Sulfates as SO42-	mg/l	8.2	19.9	7.8	8.1	8.6	27.5
Fluorides as F	mg/l	0.32	0.8	1.3	0.67	0.9	0.44
Nitrates as NO3	mg/l	24.7	28.6	10.5	24.8	27.6	12.6
Phosphorous asPO4	mg/	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Boron as B	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic as As	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Manganese as Mn	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron as Fe	mg/l	0.24	0.21	0.28	0.26	0.12	0.27
Chromium as Cr	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aluminium as Al	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PAH	mg/l	Nil	Nil	Nil	Nil	Nil	Nil
Anionic detergents	mg/l	Nil	Nil	Nil	Nil	Nil	Nil
Insecticides & Pesticides	mg/l	Nil	Nil	Nil	Nil	Nil	Nil

(Source: Comprehensive EIA report, Vimta Labs, Sept 2005)

3. Soil quality

As part of the EIA study to assess the baseline soil quality, sampling locations were selected in and around the plant site representing various land use conditions. Physical, chemical and heavy metal concentrations were also determined. A total of 10 samples within a 10km radius of the plant site were collected and analysed.

Please refer the map below for the 10 soil quality monitoring locations.

Post the EIA study, as part of the EMP, regular monitoring is carried out at 10 locations. Frequency of monitoring is six-monthly and is carried out by a third party (M/s SGS, Bhubaneswar).

The analysis of soil samples collected from different locations given in the succeeding table have more or less consistent readings in 2011 as compared to those analysed in 2008, indicating no soil contamination. The baseline data collected before start of the project as highlighted in the EIA report given in the second table following this paragraph also does not indicate any change in soil characteristics.

Soil quality reports are submitted to MOEF on a six monthly basis and to OSPCB on a monthly basis. Copy of reports submitted to MOEF (June 2011) and to OSPCB (October 2011) is enclosed as Annexure.

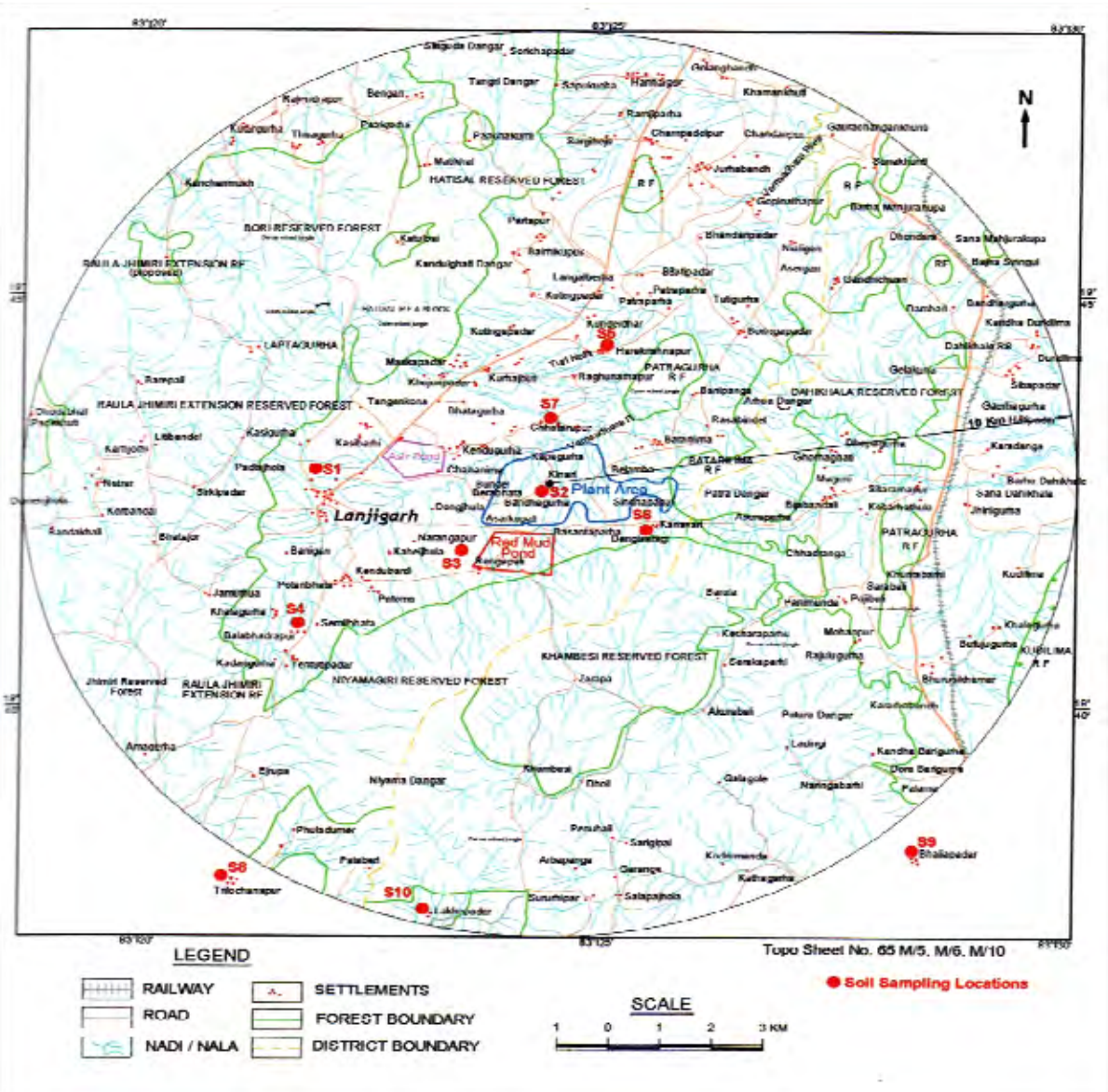

Figure 6: Soil sampling locations

Table 8: Comparison of soil characteristics in 2008 and 2011

			Plant Site		Lanjigarh		Rengopali		Chatrapur		Chanalima		Red Mud Pond		Ash Pond		Process Water Lake		Bundel		Niyamagiri Vedanta Nagar	
Sl. No	Parameter	Unit	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011
1	Available Nitrogen (As N)	mg/kg	343.0	168.2	276.0	153.7	313.2	129.1	324.4	144.7	319.3	151.3	338.4	164.4	258.0	159.5	261.8	150.3	289.0	139.3	295.6	143.6
2	Available Phosphorus (as P)	mg/kg	88.0	22.7	106.8	16.7	83.2	21.8	70.9	31.1	108.8	22.1	78.8	23.6	98.1	18.3	80.8	16.8	113.0	143.0	100.0	18.7
3	Available Potassium (as K)	mg/kg	9.2	0.8	18.7	1.6	17.5	0.9	77.4	2.1	19.0	2.2	5.8	1.2	6.6	1.5	13.8	1.4	62.3	1.2	29.3	1.2
4	Boron	mg/kg	36.7	72.3	24.4	35.8	24.6	55.9	100.4	44.7	9.0	52.7	19.1	69.5	31.9	49.3	17.5	58.4	17.5	61.6	31.7	37.0
5	Bulk Density	g/cc	1.3	1.4	1.4	1.47	1.3	1.6	1.3	1.5	1.4	1.5	1.2	1.3	1.2	1.3	1.3	1.5	1.4	1.5	1.3	1.3
6	Chlorides as Cl	mg/kg	63.7	37.0	92.0	44.4	42.5	37.0	56.6	44.4	42.5	29.6	113.2	88.6	42.5	37.0	70.8	37.0	35.4	44.5	70.8	28.3
7	Clay	%	4.2	30.8	6.2	21.4	5.2	18.4	4.2	40.9	5.2	33.1	12.5	25.4	15.5	35.1	14.5	37.5	11.5	25.7	11.5	28.3
8	Colour		Brown	Light Brown	Grey	Light Brown	Red-dish Brown	Light Brown	Red-dish Brown	Light brown	Grey	Light brown	Grey	Light brown	Red-dish Brown	Light brown	Brown	Light brown	Red-dish Brown	Light brown	Red-dish Brown	Light brown
9	Copper as Cu	mg/kg	13.5	33.8	12.3	28.0	8.3	25.1	22.7	19.1	8.6	37.8	14.1	40.0	20.5	20.6	19.3	22.2	10.8	27.3	23.4	34.3
10	Electrical Conductivity (5% w/v aqueous solution)	micromho/cm	49.2	28.4	45.1	50.1	37.5	77.9	154.3	34.8	30.9	30.4	79.4	23.2	15.4	21.7	29.7	26.2	81.4	65.1	43.7	18.1
11	Magnesium (Available)	mg/kg	1.1	225.3	1.1	576.4	2.1	42.1	0.8	152.4	1.5	63.8	0.9	131.8	<0.50	482.3	1.6	93.8	1.4	77.5	0.8	103.1
12	Organic Matter	%	0.9	1.0	0.6	0.9	0.7	1.2	0.7	0.8	0.7	0.9	0.9	1.6	0.6	1.0	0.6	1.2	0.7	0.9	0.8	1.2
13	pH (5% w/v aqueous solution)		6.6	6.6	5.9	6.0	5.9	5.6	7.4	6.4	6.5	6.7	5.7	6.5	6.2	5.5	6.1	5.5	7.0	5.6	6.7	5.5
14	Sand	%	80.8	57.2	82.8	66.4	84.8	64.4	89.8	54.2	85.8	57.2	80.5	40.7	79.5	50.4	79.5	45.6	85.5	54.7	82.5	52.4
15	Silt	%	15.0	12.1	11.0	12.3	10.0	17.2	6.0	4.9	9.0	9.7	7.0	33.9	5.0	14.5	6.0	16.9	3.0	19.6	6.0	19.3
16	Zinc	%	43.0	80.4	68.0	67.3	43.8	74.9	329.7	70.9	27.6	62.3	43.4	90.3	39.1	70.3	50.8	67.7	34.0	60.3	21.5	86.2

Note : The above data already collected and verified by the State Pollution Control Board

Table 9: Baseline soil characteristics

Parameter	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Soil Type	Clay	Clay loam	Clay loam	Clay	Clay	Silty Clay	Silty Clay	Silty Clay	Clay	Clay
Colour	Gray	Light Brown	Red	Reddish Brown	Brown	Brown	Brown	Brown	Red	Brown
pH (40% aq. Solution, soil-water extract)	6.6	5.6	7.2	7.0	6.1	6.7	7.2	5.6	6.5	6.7
Electrical Conductivity (1:5 soil-water extract, micro siemens/cm)	530	610	570	160	365	325	420	480	460	530
Bulk Density, gm/cc	1.2	1.0	1.3	1.2	1.0	1.3	1.2	1.1	1.2	1.3
Sand (%)	18	31	28	15	18	13	12	16	21	23
Silt (%)	34	37	36	40	29	41	48	40	31	34
Clay (%)	48	32	36	45	53	46	40	44	48	43
Organic Matter (%)	0.89	0.33	1.95	0.63	0.6	0.12	1.03	1.19	1.26	0.82
Available Nitrogen as N (kg/ha)	140	90	512	126	110	130	480	480	495	165
Available Phosphorus as P (kg/ha)	52	21	82	26	35	42	71	78	85	23
Available Potassium as K (kg/ha)	332	287	366	174	367	268	285	322	196	209
Available Magnesium as Mg (mg/kg)	180	140	225	70	231	90	120	170	413	215
Chloride as Cl, mg/kg	44.4	80.1	119.7	187.0	122.0	60.0	50.2	37.0	57.7	80.1
Copper (Cu), mg/kg	28.8	33.0	26.8	15.4	30.9	55.4	17.6	26.4	31.0	25.8
Zinc (Zn), mg/kg	66.4	62.0	70.4	35.7	55.7	39.6	45.9	47.8	78.9	55.4
Boron (B) , mg/kg	25.3	30.3	26.4	17.4	29.1	30.6	22.3	17.9	25.6	24.5

(Source: Comprehensive EIA report, Vimta Labs, Sept 2005)

4. Noise monitoring

As part of the EIA study, baseline noise monitoring was carried out at 10 locations within 10km radius of the plant site for both day and night time.

Please refer the map below for the noise monitoring locations.

Post the EIA study, as part of the EMP, regular monitoring is carried out at 10 locations. Frequency of monitoring is quarterly and is carried out by a third party (M/s SGS, Bhubaneswar). In addition, an in-house noise monitoring exercise is also being carried out especially around high noise area/sources for performance monitoring of acoustic enclosures installed.

The following table depicts the ambient noise levels monitored in various villages located around the plant site. As compared to the noise levels monitored in 2008, the levels recorded in 2011 are significantly lower in most of the locations. The baseline data collected before the start of the project as given in the EIA Report has been depicted in the second table following this paragraph which also displays comparable readings indicating no increase in ambient noise levels due to operation of the refinery.

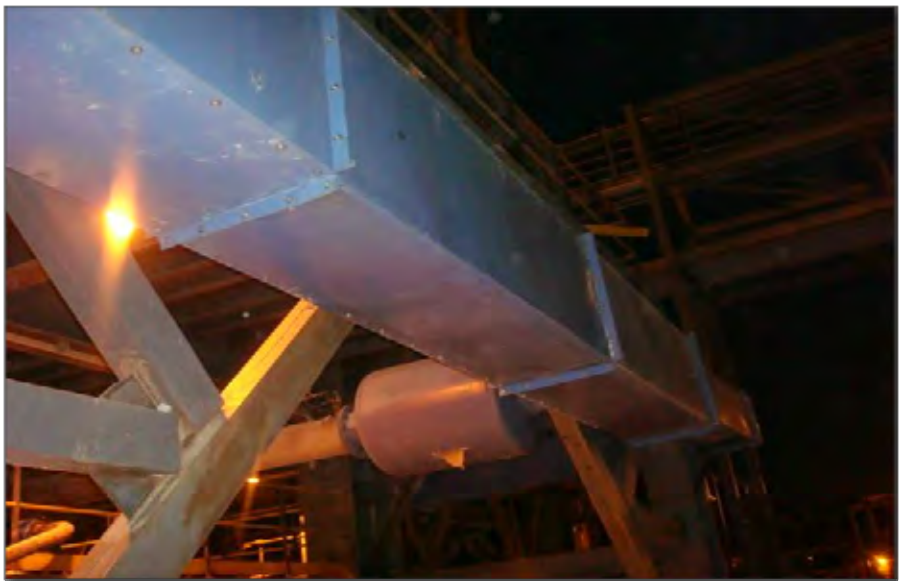

Figure 7: Silencers and acoustics for noise control

Table 10: Comparison of noise monitoring data in 2008 and 2011

		2008	2011
Sr. No.	Location	Leq	Leq
1	Plant Site	62.9	57
2	Lanjigarh	50.6	36
3	Niyamgiri Vedanta nagar	48.1	38
4	Balabadrapur	47.7	36
5	Harikrishnapur	47.1	43
6	Kasibarhi	47.2	48
7	Chhatrapur	43.9	37
8	Basanthpada	51.7	47
9	Maskapadar	45.9	47
10	Rengopalli	47.7	41

Note: The above data already collected and verified by the State Pollution Control Board

Noise Monitoring Reports are submitted to MoEF on a six monthly basis and to OSPCB on a monthly basis. Copy of reports submitted to MoEF (June'11) and to OSPCB (Oct'11) is enclosed as Annexure.

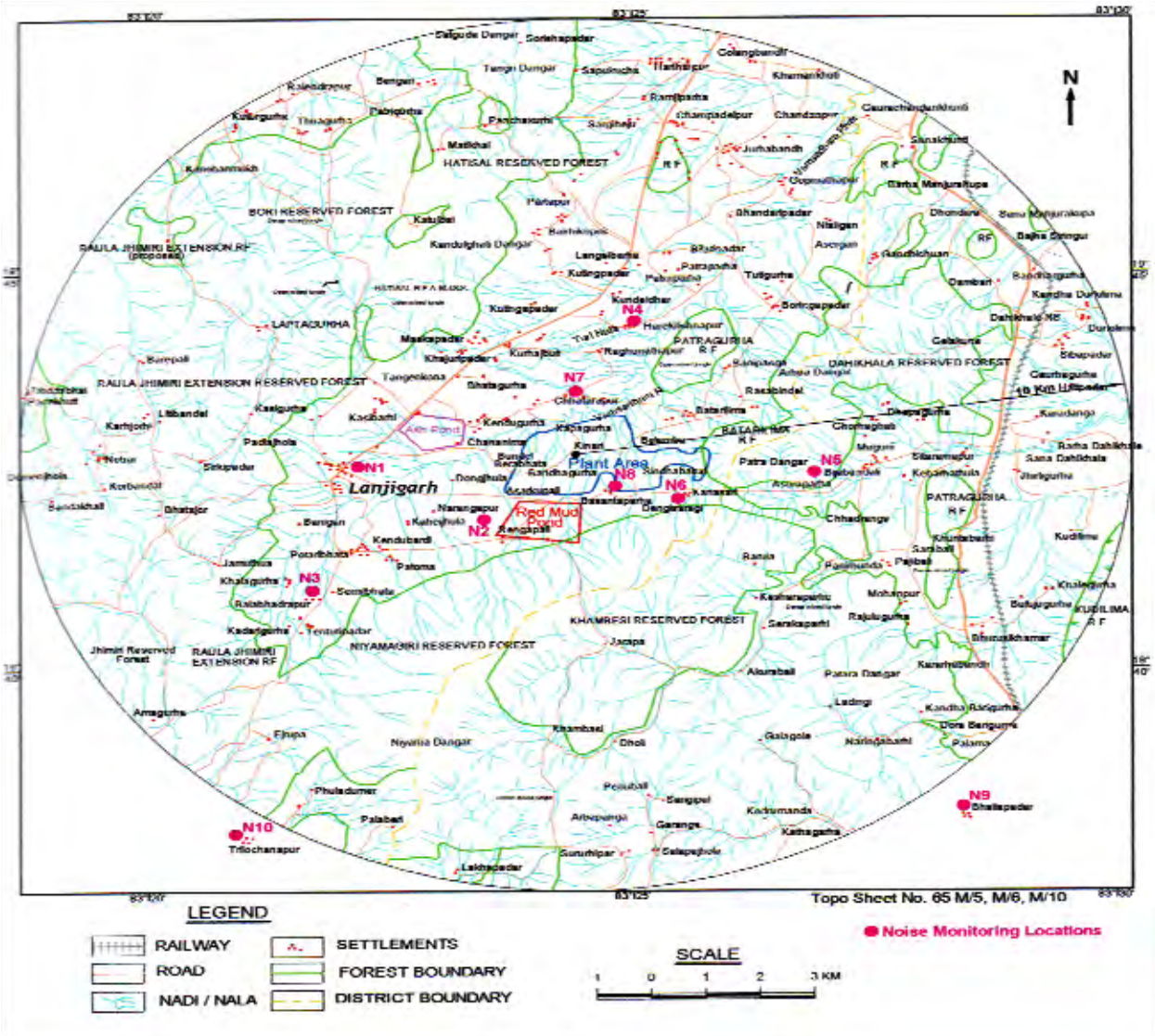

Figure 9: Noise monitoring locations

Table 11: Baseline noise data

Sr. No.	Location	Summer Leq	Winter Leq
1	Lanjigarh	45.3	46.7
2	Niyamgiri Vedanta Nagar	50.3	46.6
3	Balabhadrapur	46.9	49.8
4	Harekrishnapur	47.7	50.7
5	Bijabandali	46.3	47.4
6	Kanasari	45.2	48.9
7	Chhatrapur	49.8	53.3
8	Basantaparha	47.7	46.8
9	Bhaliapadar	47.7	46.8
10	Trilochanapur	41.7	43.6

(Source: Comprehensive EIA report, Vimta Labs, Sept 2005)

5. Ecological studies

As part of the EIA studies, following aspects were covered in the ecological studies that were carried out for the project: -

a. To assess the nature and distribution of vegetation

b. To assess the distribution of animal life spectra

c. To understand the productivity of water bodies

d. To assess the biodiversity and to understand the resource potential

e. To ascertain migratory routes of flora and fauna and possibility of breeding grounds.

Please refer the map below for the ecological studies monitoring locations.

Key observations of the ecological studies:

451 plant species were recorded. No critically endangered species were observed within a 20km radius. No wildlife sanctuaries, national parks or biospheres are present within a 20km radius of the plant site. 112 faunal species were recorded, which are mostly local migrant species. There are no migratory paths recorded in the study area.

EMP for Ecological Studies included the following:

a. Increase awareness among locals to protect the animals

b. Check poaching and hunting

c. Develop a thick green belt.

In view of the EMP, we have developed a robust greenbelt development programme.

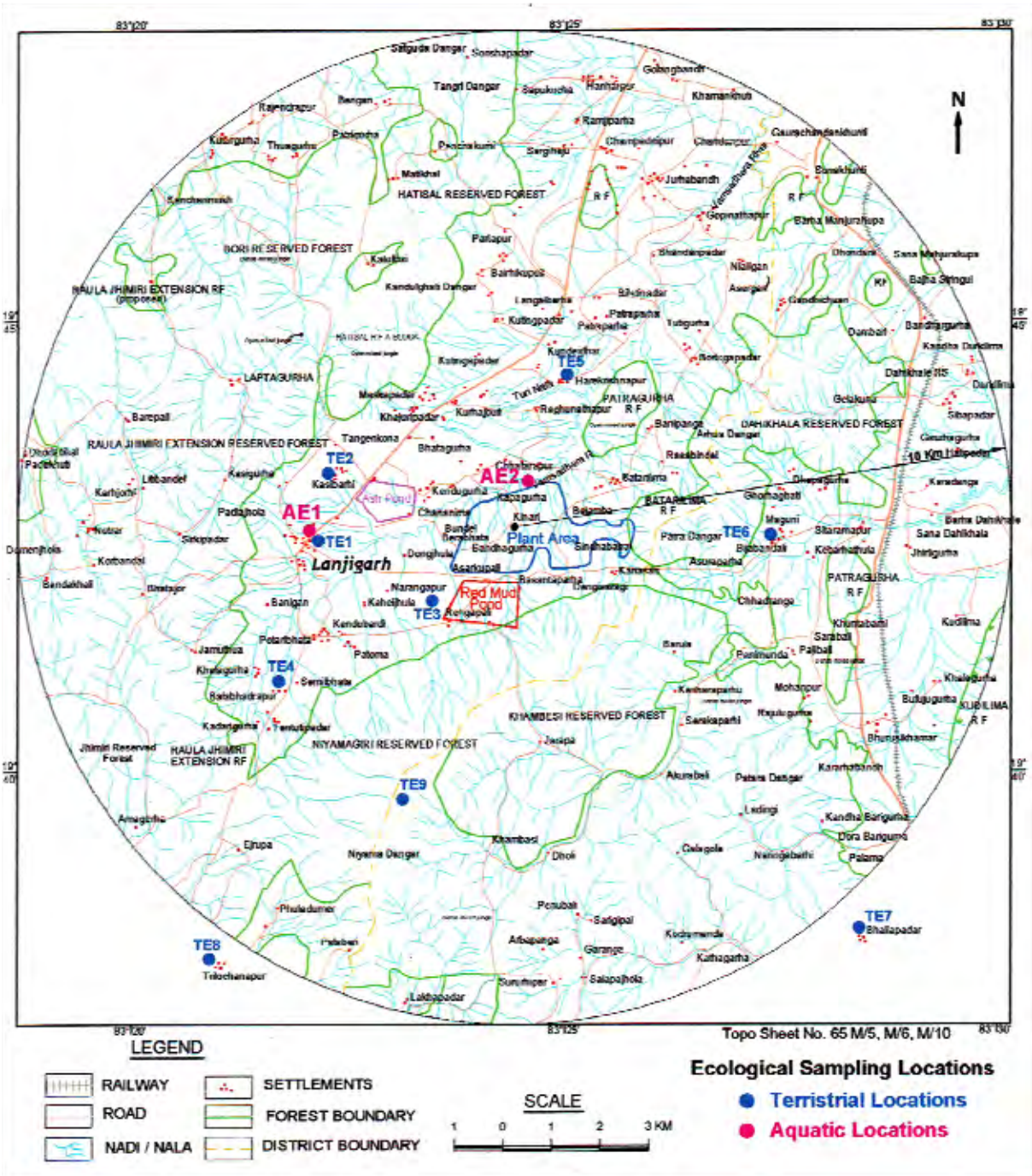

Figure 9: Ecological sampling locations

6. Waste disposal

The key wastes generated as part of the refinery are red mud and fly ash. The EIAs have identified these wastes and have proposed detailed sketch for their handling and storage.

a. Red mud management

Approximately, 1 to 1.5 million tons per annum of red mud is generated. The management includes transportation, handling and storage. Legal approvals for the same have been obtained by OSPCB.

The red mud is transported through a pipeline using state of the art technology of high concentration slurry disposal to the ponds located outside the refinery premises. The Red Mud Ponds (RMP) have an HDPE liner and are approved by OSPCB.

The Red Mud Management Programme includes:

- The pipelines and the pond area are regularly inspected and are properly maintained; this is an integral part of the plant maintenance programme.
- Ground water quality is regularly monitored. As mentioned in the water quality section, there are five monitoring wells that are monitored on a quarterly basis through a third party.
- Water quality reports are submitted to MoEF on a six monthly basis and to OSPCB on a monthly basis. Copy of reports submitted to MOEF (June 2011) and to OSPCB (Oct 2011) is enclosed as Annexure.
- In addition, as part of governance, OSPCB collects water quality samples on a regular basis. To date, we have not received any show-cause notice from OSPCB on deterioration of water quality in the region.

b. Fly ash management

Approximately 0.2 million tons per annum of fly ash ares generated from the Captive Power Plant (CPP) located at Lanjigarh. The fly ash is transported through a pipeline using high concentration slurry disposal technique to the ponds located outside the refinery premises.

Figure 10: Vanadium recovery from Red Mud

Figure 11: Fly ash being utilised for making bricks

The fly ash management programme includes:

- The pipelines and the pond area are regularly inspected and maintained. In fact, they are an integral part of the plant maintenance program. Copy of maintenance records are enclosed for reference.
- Ground water quality is regularly monitored. As mentioned in the water quality section, there are five monitoring wells that are monitored on a quarterly basis through third party.
- Water quality reports are submitted to MoEF on a six monthly basis and to OSPCB on a monthly basis. Copy of reports submitted to MOEF (June 2011) and to OSPCB (October 2011) is enclosed as Annexure 2.
- In addition, as part of governance, OSPCB collects water quality samples on a regular basis. To date, we have not received any show-cause notice from OSPCB on deterioration of water quality.
- To utilise the fly ash, units have been developed to manufacture fly ash bricks and the same is utilised in civil construction

VAL has envisaged a vision to become a zero waste refinery by 2015. Towards the attainment of the same, VAL has entered into agreement with two of the country's premier research organisations – the National Institute of Technology (NIT), Rourkela, Odisha and the Indian Institute of Minerals and Materials Technology (IMMT), Bhubaneswar, Odisha. These collaborations aim at assessing the feasibility of extracting iron and titanium from the red mud waste and economic utilisation of fly ash.

Decommissioning/closure of waste disposal sites

As mentioned in the preceding sections of this chapter, VAL has envisaged a vision to become a zero waste refinery by 2015. VAL plans to review the waste storage facilities in 2015 and accordingly formulate the decommissioning/closure plan of waste disposal sites.

7. Environmental management

EMP is an integral part of EIA. Besides EIA, MoEF and SPCB have proposed a number of conditions for effective monitoring of operations including Environmental emissions as a part of environmental clearance and/or consent to establish and/or consent to operate. Monthly data is submitted to SPCB which also conducts physical inspection at site on a quarterly basis. Additionally six month data is submitted to MoEF and they also make regular assessments of the information furnished to them for identifying their authenticity through site inspections. The Environmental Management Mechanism in India is extremely robust and we as an environmentally conscious company we are committed to comply with all the requirements put forth by the MoEF. Accordingly we have initiated a large number of improvement projects to make our Alumina Refinery as benchmark refinery which can be used as a replicable model elsewhere in the country as well as world.[2]

Conclusion

VAL's plans to construct an Alumina Refinery at Lanjigarh were prompted by the availability of huge deposits of bauxite and was intended to eliminate the chronic socio-economic predicaments of stark poverty and acute food insecurity that often resulted in malnutrition and even starvation. The location was finalised in consultation with the state government in view of the fact that setting up an industry in such a backward, underdeveloped and isolated area would help improve the socio-economic stats of the region as well as bring the tribal folk of the locality to the mainstream.

As per the government regulations, VAL prepared the EIA report and applied for the Environmental Clearance for the 1 MMTPA refinery, which it was subsequently granted by the MoEF. Separate social studies have also been carried out to critically analyse the social risks involved in the project so that appropriate mitigation measures can be drawn to eliminate them.

VAL has been complying with all the legal and statutory requirements. Periodic compliance reports are being submitted to OSPCB and MoEF. The officials from OSPCB and MoEF are verifying the same through visits to the refinery.

To be precise, all possible efforts, some even beyond the prevailing obligatory requirements are being made to ensure that the villages located at the periphery of the plant premises are not subject to suffering owing to environmental degradation. As part of the sincere endeavor of VAL to downscale and eliminate (where possible) pollution, industrial wastes/ effluents are being recycled, massive afforestation drives are being organised under the auspices of its Greenbelt Development Programme and continuous monitoring of its environment is being carried out.

[2] Technological Improvement Report for Energy Conservation and Resource Utilization for Converting into Benchmarked Refinery, April 2011

Introduction

Further Information

We value your feedback and welcome comments on this report

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