



Letter No: AAP/E&F/EC/2015/28

Date: 30/05/2015

To

The Director (S)  
Eastern Regional Office  
Ministry of Environment & Forests  
A/3, Chandrashekharapur  
Bhubaneswar - 750 023 (Odisha)

Sub: Submission of Six Monthly Compliance from October 14 to March 15.  
Ref: Environmental Clearance Letter No: J-11011/136/2009-IA.I (1), dated 29/11/2012.

Dear Sir,

As a part of the compliance to the Environmental Clearance accorded by MoEFCC to Aditya Aluminium for 0.72 MTPA Smelter and 1650 MW CPP at Lapanga in Sambalpur district, please find enclosed herewith the six monthly compliance reports of aluminium smelter and captive power plant for the period October 14 to March 2015.

Kindly acknowledge receipt of the reports.

Thanking You

Yours faithfully  
For Aditya Aluminium

Bibhu Prasad Mishra  
President & COO

CC to: 1. The Member Secretary, SPCB, Bhubaneswar- for kind information  
2. The Regional Officer, SPCB, Sambalpur - for kind information

**ADITYA ALUMINIUM**  
(A Unit of Hindalco Industries Ltd.)  
SMELTER & POWER  
At/P.O. : Lapanga  
Sambalpur 768 212, Odisha  
Telephone +91 663 2114424  
Fax +91 663 2590434

**REGISTERED OFFICE**  
Century Bhavan, 3rd Floor, Or. Annie  
Besant Road, Worli, Mumbai 400 030  
Telephone +91 22 6662 6666

Website www.hindalco.com  
E mail hindalco@adityabirla.com  
Corporate Identity No. L27020MH1958PLC011238

**STATUS OF IMPLEMENTATION OF CONDITIONS STIPULATED IN ENVIRONMENTAL CLEARANCE FOR 7,20,000 TPA ALUMINIUM SMELTER& 1650 MW CAPTIVE POWER PLANT FOR ADITYA ALUMINIUM BY M/S HINDALCO INDUSTRIES AT LAPANGA, SAMBALPUR, ORISSA.**

**REF: Environmental Clearance Letter No: J-11011/136/2009-IA.I (1), Dated 29<sup>TH</sup>November 2012 From MOEF, GOI.**

Sr. No.	Specific Conditions	Compliance
i)	The streams passing through the project site shall not be disturbed w.r.t their quantity and quality of flow	The streams passing through the project site will not be disturbed.
ii)	Alumina shall be obtained from those refineries, which have been accorded environmental clearance by the Ministry of Environment and Forests.	The Alumina is obtained from Utkal Alumina International Limited (UAIL), Rayagada Distt and it has been accorded environmental clearance from MoEF.
iii)	The gaseous emissions (PM, SO <sub>2</sub> , NO <sub>x</sub> , PAH, HC, VOCs and Fluoride) from various process units shall confirm to the standards prescribed by the concerned authorities from time to time. The SPCB may specify more stringent standards for the relevant parameters keeping in view the nature of the Industry and its size and location. At no time the emissions level should go beyond the prescribed standards. In the event of failure of any pollution control system adopted by the unit, the respective unit should not be restarted until the control measures are rectified to achieve the desired efficiency. The particulate emissions from the bake oven plant shall not exceed 50 mg/Nm <sup>3</sup> .	Online Monitoring equipments have been installed at the outlet of following stacks for monitoring of gaseous emissions etc. a) GTC- 1 Nos b) FTC – 2 Nos c) CPP – 4 Nos
iv)	Particulate fluoride emissions should not be more than 0.65 mg/Nm <sup>3</sup> and fugitive particulate fluoride emissions from pot room should not be more than 1.85 mg/Nm <sup>3</sup> .	Online monitoring equipment at Gas Treatment Centre (GTC) and Fume Treatment Centre (FTC) installed for monitoring of Hydrogen Fluoride (HF), Particulate Matter (PM).
v)	The poly aromatic hydrocarbons (PAH) from the carbon plant (anode bake oven) should not exceed 2 mg/Nm <sup>3</sup> .The data on PAH should be monitored quarterly and report submitted regularly to the Ministry/Regional Office at Bhubaneswar and SPCB.	The poly aromatic hydrocarbons (PAH) from the carbon plant (anode bake oven) are being monitored on quarterly basis and found within the standard. The monitoring report is enclosed as <b>Annexure-1</b> .
vi)	In plant, control measures like fume extraction and dust extraction system for controlling fugitive emissions from all the materials handling/transfer points shall be provided to control dust emissions.	Fume Extraction Centre (FTC) in Anode Baking furnace, Gas Treatment Plant (GTC) in potlines and bag filters in raw material handling, GAP, Anode Baking, Roding areas, bath recycling, carbon recycling area, butts recycling area, cathode sealing shop etc in smelter area and coal handing, ash handling

	<p>Fugitive Fluoride emissions from the pot room and in the forage around the smelter complex and the data submitted regularly to the Ministry Regional Office at Bhubaneswar and SPCB.</p> <p>Further dry scrubbing system to control the emissions from the pot lines should be provided.</p>	<p>plant in captive power plant is installed to control fugitive dust emissions.</p> <p>HF analyzer for Fugitive fluoride monitoring in potroom is under installation and forage around the smelter is being monitored on quarterly basis.</p> <p>Dry scrubbing system in GTC is installed in smelter to control fugitive emission.</p>
vii)	<p>Electrostatic Precipitators (ESP) will be provided to Captive Power Plant (CPP) to control particulate emissions below 50 mg/Nm<sup>3</sup>.</p> <p>The company shall provide bag filters, dry scrubbing system and dust suppression system to control all the emissions including fluoride emissions from all melting and casting units. Tar, Dust and fluoride in the fumes shall be controlled in baking furnace by providing dry scrubber.</p> <p>The emissions shall conform to the standards prescribed by the Ministry CPCB/SPCB whichever is more stringent.</p>	<p>Electrostatic Precipitators (ESP) of 99.98% efficiency is installed in Captive Power Plant (CPP) to restrict particulate emissions below 50 mg/Nm<sup>3</sup>.</p> <p>Gas Treatment Centre (GTC) and bag filters are provided in all material handling &amp; transfer points.</p> <p>Fume treatment plant (FTP) is installed in Anode Baking Furnace 1 &amp; 2 to treat the tar, dust &amp; gaseous and particulate fluorides.</p> <p>The standards prescribed by the Ministry / CPCB/ SPCB is being adhered.</p>
viii)	<p>Provision for installation of FGD shall be provided for future use.</p>	<p>Space has been kept for installation of FGD, in future if required.</p>
ix)	<p>Three tri-flue and one bi-flue stack of 275 m height with flue gas velocity not less than 22 m/s shall be installed and provided with continuous online monitoring equipment's for SO<sub>2</sub>, NO<sub>x</sub>, and PM<sub>10</sub>.</p>	<p>Two (02) numbers of tri-flue stacks of 275 m height is installed in phase-I.</p> <p>Continuous monitoring equipment is installed for monitoring of SO<sub>2</sub>, NO<sub>x</sub>, and PM at unit # 1, 2, 3 &amp; 4 of CPP.</p>
x)	<p>Adequate dust extraction system such as cyclones/ bag filters and water spray system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided.</p>	<p>08 nos. of dust extraction systems (DE) and Dry fog system installed in coal handling plant and 04 nos. of bag filters installed in ash handling system of Captive Power Plant.</p>
xi)	<p>Utilization of 100% fly ash generated shall be made from 4<sup>th</sup> year of operation. Status of implementation shall be reported to the Regional Office of the Ministry from time to time.</p>	<p>Presently, 100% of Ash generated is being utilized by means of supplying to M/s Ultratech Cements, Jharsuguda &amp; M/s OCL, Bargarh for cement manufacturing and in Road construction works near to our Plant area(by L&amp;T). Balance is utilized for filling the low lying areas inside the Plant with the approval of SPCB and subsequently utilized for development of greenbelt.</p> <p>Status of utilization of Ash is enclosed as <b>Annexure-2</b>.</p>

xii)	Fly ash shall be collected in dry form and storage facility (silos) shall be provided. Unutilized ash shall be disposed-off in the ash pond in the form of slurry. Mercury and other heavy metals (Ag, Hg, Cr, Pb etc) will be monitored in the bottom ash as also in the effluent emanating from the existing ash pond. No ash shall be disposed-off in low laying area.	Fly ash & bottom ash are being collected in dry form and Silos of adequate capacity have been installed. The unutilized ash will be stored in ash disposal area through high concentration slurry disposal (HCSD) system.  Monitoring of Mercury and other heavy metals (Ag, Hg, Cr, Pb etc) is being done for fly ash and bottom ash. Bottom ash analysis report is enclosed as <b>Annexure-3</b> .
xiii)	Fluoride (as F) consumption shall be less than 10 kg/ton of Aluminium produced as specified by the CREP.	Fluoride consumption is maintained within the standard.
xiv)	<p>Anode butts generated from the pots shall be cleaned and recycled to the Anode Plant.</p> <p>The spent pot lining generated from the smelter shall be properly treated in spent pot lining treatment plant to remove fluoride and cyanide and disposed-off in secured landfill.</p> <p>The location and design of the land fill site shall be approved by the SPCB as per the Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008. Leachate collection facilities shall be provided to the secured land fill facilities (SLF).</p> <p>The dross shall be recycled in the cast house.</p> <p>STP sludge shall be utilized as manure for greenbelt development.</p> <p>All the used oil and batteries shall be sold to the authorized recyclers/ re-processors.</p>	<p>Anode butts generated from the pots is being cleaned and recycled completely.</p> <p>After generation of the spent pot lining (SPL) from the smelter, it will be properly treated before disposal in the secured landfill/ supplied to CHWTSDF. However, efforts are being made for utilization of SPL in the cement kilns of different units of Ultratech Cements Ltd.</p> <p>The location and design of the land fill site has been prepared as per the Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008 and approved from SPCB.</p> <p>Dross will be sold to the authorized recyclers/reprocessors and we are in the process of establishment dross recycling unit inside the plant. Application submitted to SPCB to issue the consent to establish and to CPCB for issue of permission under Rule-11 of the Hazardous Waste Management rule for utilization of Dross.</p> <p>STP is commissioned at township and sludge is being used for greenbelt development.</p> <p>The used oil and batteries will be sold to the authorized recyclers/reprocessors.</p>
xv)	As proposed, spent pot lining waste shall also be provided to cement and steel industries for further utilization.	No SPL is generated till date, However efforts are being made for utilization of SPL in the cement kilns of different units of Ultratech Cements Ltd. We are in the process of getting an agreement with Ultratech Cements for Utilization our SPL in their Cement plants.

xvi)	Ash pond shall be lined with HDP/LDPE lining or any other suitable impermeable media such that no leachate takes place at any point of time. Adequate safety measures shall also be implemented to protect the ash dyke from getting breached. Ash pond water shall be recirculated and reused.	All precautionary measures are being taken so that no leachate from the ash pond takes place, and adequate safety measures are also being implemented.
xvii)	Cycle of concentration (CoC) of 5.0 shall be adopted.	Water Balance of CPP is being optimized gradually, so as to maintain a CoC of 5.
xviii)	Regular monitoring of ground water shall be carried out by establishing a network of existing wells and constructing new piezometers.  Monitoring around the ash pond area shall be carried out particularly for heavy metals (Hg, Cr, As, Pb) and records maintained and submitted to the regional office of this Ministry. The data so obtained should be compared with the baseline data so as to ensure that the ground water quality is not adversely affected due to the project.	Regular monitoring of ground water is being done at baseline locations of EIA.  Monitoring of heavy metals (Hg, Cr, As, Pb) around the Ash pond area will be carried out as soon as it is in operation and records will be maintained and compared with the baseline data.  The monitoring report of ground water at baseline location as per EIA is enclosed as <b>Annexure-4</b> .
xix)	Regular ground water monitoring shall be carried out by installing peizometers all around the secured land fill site in consultation with the SPCB, Central Ground Water Authority and State Ground Water Board and data submitted to the Ministry's Regional Office and SPCB.	Regular ground water monitoring will be carried out by installing peizometers all around the secured land fill site after establishment of the SLF in consultation with the SPCB, Central Ground Water Authority and State Ground Water Board and data will be submitted to the Ministry's Regional Office and SPCB after establishment of secured land fill site.
xx)	Total water requirement for the expansion from Hirakud Reservoir shall not exceed 5,200 m <sup>3</sup> /hr and prior permission for the existing and proposed expansion shall be obtained from the concerned department before commissioning of the plant.  All the effluent including from the cooling tower and de-mineralization plant shall be treated in the effluent treatment plant and treated effluent shall be recycled/reutilized in the process in smelter and CPP and also for fire protection, dust suppression, greenbelt development etc.  Domestic effluent shall be treated in sewage treatment plant (STP) and treated domestic waste water will be used for greenbelt development.	No additional fresh water will be sourced from Hirakud Reservoir for the proposed expansion. The water requirement will not exceed 52.73 cusec as approved.  The Effluent from the cooling towers and de-mineralization plant is being treated in Double Stage RO based effluent treatment plant and is being recycled/reutilized in the process of CPP.  Separate Sewage Treatment Plant (STP) is installed @ capacity 25 m <sup>3</sup> /hr for Smelter & Captive Power Plant.  The STP of 300 KLD capacity is Installed at Township area and the treated water being used for greenbelt development.

xxi)	No effluent shall be discharged outside the premises of smelter during non-monsoon period and shall be discharged during the monsoon period only after treatment and meeting the norms of the OSPCB/CPCB.	We are operating a Double Stage RO based effluent treatment plant (ETP) of 300 m <sup>3</sup> /hr capacity (150m <sup>3</sup> /hr at present) and therefore will not discharge effluents outside without treatment.
xxii)	Greenbelt of adequate width and density around the project site shall be developed in 33% area in consultation with the DFO as per the CPCB guidelines having density of 2,000 trees/Ha.	Aditya Aluminium has already started development of Greenbelt inside the Core plant & Township areas. Around 1,10,000 saplings planted and a Central Nursery has been established inside the project area having a capacity to raise 2 lakhs saplings.
xxiii)	Occupational Health Surveillance of the workers should be done on a regular basis and records maintained as per the Factories Act.	Occupational Health Surveillance of the workers is being done as per the Odisha Factories Act.
xxiv)	The company shall develop rain water structures in the township area for recharge of ground water in consultation with the Central Ground Water Authority/Board.	Rain water harvesting structure is being made in few buildings at township area and a pond is planned in township area for rain water recharge.
xxv)	Rehabilitation and Resettlement Action Plan as prepared and submitted to the State Govt. shall be implemented as per the R & R Policy of the State Government.  All the recommendations mentioned in the R&R Plan shall be strictly followed including suitable employment and other facilities to all the oustees.	Rehabilitation and Resettlement Action Plan is being implemented as per the R & R policy, 2006 of the State Govt.  All the recommendations are being followed/complied.
xxvi)	All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the Aluminium Sector shall be strictly implemented.	All the conditions of CREP guideline for Aluminium sector is being followed.
xxvii)	The company shall adopt well laid down corporate policy and identified and designate responsible officers at all levels of its hierarchy for ensuring adherence to the policy and compliance with environmental clearance, environmental laws and regulations.	The company has adopted a well laid down corporate policy. The Corporate Environment Policy is approved by the Board of Directors and already submitted to MoEF.
xxviii)	All the commitments made to the public during public hearing /public consultation meeting held on 2 <sup>nd</sup> march 2012 should be satisfactorily implemented and a separate budget for implementing the same should be allocated and information submitted to the Ministry's Regional Office at Bhubaneswar.	All the commitments made to the public during public hearing/ public consultation meeting held on 2 <sup>nd</sup> march 2012 is under gradual implementation. Budget is not a constraint for implementation of the commitments.
xxix)	At least 5% of the total cost of the project shall be earmarked for towards the Enterprise Social Commitment and item-wise details along with time bound action plan should be prepared and submitted to the Ministry's office at Bhubaneswar. Implementation of such program	As the expansion will be carried out in two phases i.e. Aluminium Smelter from 0.26 MTPA to 0.36 MTPA & Captive Power Plant from 650 MW to 900 MW in phase I and later upgradation will be made for smelter to 0.72 MTPA and Captive Power Plant to 1650 MW in phase II.

	should be ensured accordingly in a time bound manner.	The details of the CSR activities undertaken upto March 2015 are attached as <i>Annexure-5</i> .
xxx)	The company shall provide housing for construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. the housing may be in the form of temporary structures to be ensured accordingly in a time bound manner.	All necessary infrastructure and facilities are being provided to the workers from time to time.
xxxi)	The company shall submit within three months their policy towards Corporate Environment Responsibility which should inter-alia address (i) standard operating process/procedure to being into focus any infringement/deviation/violation of environmental or forests norms/conditions, (ii) Hierarchical system or administrative order of the company to deal with environmental issues and ensuring compliance to the environmental clearance and (iii) system of reporting of non-compliance/violation environmental norms to the Board of Directors of the company and/or stakeholders or shareholders.	The Corporate Environment Policy prepared and approved by the Hindrance Board of Directors, Organizational Structure for Hindalco Corporate Environment, Deployment of Corporate Policy in manufacturing Plants & communication of Policy as regards Corporate Environment and already submitted to MoEF.
<b>GENERAL CONDITIONS</b>		
i)	The project authorities must strictly adhere to the stipulations made by the OSPCB and the State Government.	We will follow the stipulations made by OSPCB and the State Government.
ii)	No further expansion or modification in the plant shall be carried out without prior approval of the Ministry of Environment and Forests.	We will not carry out expansion or modification in the plant without prior approval of MoEF.
iii)	The gaseous emissions from various process units shall conform to the load/mass based standards notified by this Ministry on 19 <sup>th</sup> May, 1993 and standards prescribed from time to time. The SPCB may specify more stringent standards for the relevant parameters keeping in view the nature of the industry and its size and location.	We have noted and accepted the stipulated condition.
iv)	At least four number of ambient air quality monitoring stations shall be established in the downward direction as well as where maximum ground level concentration of SPM, SO <sub>2</sub> and NO <sub>x</sub> are anticipated in consultation with the OSPCB. Data on ambient air quality and stack emission should be regularly submitted to this Ministry including its Regional Office at Bhubaneswar and Orissa State Pollution Control Board once in Six months.	Installation of four (04) CAAQMS completed and commissioned.  All the stack emission and ambient air monitoring stations will be synchronized with the webserver of the SPCB, CPCB and MoEF shortly.  The six-monthly compliance is being submitted to the concerned authorities regularly.

v)	The overall noise levels in and around the plant area should be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz 75 dBA (daytime) and 70 dBA (nighttime).	The overall noise levels in and around the plant area is within the prescribed standards and it is made possible by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation.  The overall noise level is within the standard, regular monitoring is being done.  All necessary PPEs are provided to the workers and engineers working in the factory.
vi)	Occupational Health Surveillance of the workers should be done on a regular basis and records maintained as per the Factories Act.	Occupational Health Surveillance of the workers is being done as per the Factories Act.
vii)	The company shall develop surface water harvesting structures to harvest the rain water for utilization in the lean season besides recharging the ground water table.	The company has developed surface water harvesting structures to store water in the lean season and it will harvest the rain water during rainy season in the same reservoirs.
viii)	The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA report. Further the company must undertake socio-economic development activities in the surrounding villages like community development programmes, drinking water supply and health care etc.	We have noted and accepted all the conditions and will comply in a time bound manner.  The economic development activities are going on regularly as a part of our corporate social responsibility. Details of the CSR, R&R activities undertaken is attached as <b>Annexure-5</b> .  A team of personnel are working dedicatedly for peripheral development work like conducting health camps, community developed programmes, formation SHG groups, supply of drinking water and other common infrastructural development works.
ix)	Requisite fund shall be earmarked towards capital cost and recurring cost/annum for environment pollution control measures to implement the conditions stipulated by the Ministry of Environment & Forests as well the State Government. An implementation schedule for implementing all the conditions stipulated herein shall be submitted to Regional Office of the Ministry at Bhubaneswar. The funds so provided shall not be diverted for any other purpose.	Requisite fund has been kept towards capital cost and recurring cost/annum for environment pollution control measures and the fund will not be diverted for any other expenditure.
x)	A copy of the clearance letter shall be send by the proponent to concerned Panchayat, Zillaparishad/Municipality corporation, urban	Copy of the clearance letter has already been communicated to all concerned as mentioned in the condition. Scanned copy of



	local body and the local NGO, if any from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter also be put on the web site of the company by the proponent.	the letter is also displayed in our official website.
xi)	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitoring data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MoEF at Bhubaneswar. The respective zonal office of CPCB and SPCB. The criteria pollutant levels namely' PM10, SO2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the project shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.	<p>The status of compliance is being submitted to the Regional office of the MOEF regularly on 1st June and 1st Dec respectively.</p> <p>The monitoring is being done for ambient air quality, Ambient Noise, Water, Soil and Meteorological etc at all the baseline locations after operation of the plant.</p> <p>Installation of continuous stack emission monitoring equipment's completed and commissioned. Four (04) CAAQMS installed and commissioned.</p> <p>All the stack emission and ambient air monitoring stations will be synchronized with the web server of the SPCB, CPCB and MoEF shortly.</p>
xii)	The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitoring data (both in hard & soft copies as well as by e-mail) to the Regional Office of MOEF, the respective Zonal Offices of CPCB and the SPCB. The Regional office of this Ministry at Bhubaneswar. CPCB/SPCB shall monitor the stipulated conditions.	<p>We are submitting the six monthly compliance reports of the stipulated environmental conditions (both in hard &amp; soft copies as well as by e-mail) to the Regional Office of MOEF, the respective Zonal Offices of CPCB and the SPCB.</p> <p>The monitoring data in respect of AAQ, water, soil, noise, meteorological etc is enclosed as <b>Annexure - 6</b>.</p>
xiii)	The environmental statement for each financial year ending 31 <sup>st</sup> March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Office at Bhubaneswar.	The environmental statement for each financial year ending 31 <sup>st</sup> March 2014 in Form-V is submitted to the concerned authorities of SPCB and MoEF.
xiv)	The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at website of the Ministry of Environment & Forest at	Information to Public has been made through advertisement of the environmental clearance in two widely circulated daily newspapers i.e. "The New Indian Express" on 04-12-2012 & "The Samaja" on 05-12-2012,

	<p>http/www.envfor.nic.in. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the Regional office at Bhubaneswar.</p>	<p>within seven days of receiving the clearance letter.</p> <p>The copy of the advertisement was submitted to the Ministry's Regional Office at Bhubaneswar vide our office letter no. AAP/E&amp;F/786, dated 07-12-2012.</p>
<p>xv)</p>	<p>The authorities shall inform the regional office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.</p>	<p>Financial closure for Phase-1(Smelter of 0.36 MTPA and CPP of 1650 MW capacity) of the Project is completed on 17th September 2012 and operation of Phase-1 is under progress. Four Units(4 x 150 MW) of CPP and 171, out of 360 Pots are in operation.</p>

Encl: As above



(Authorized Signatory)





Ref.: VCSPL/15/R-230

Date: 01.05.2015

## STATIONARY EMISSION MONITORING REPORT

1. Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Date of Sampling : 28.04.2015
3. Sampling Location : ST-1: Stack attached to ABF I FTC I
4. Name of sampling Instrument : Vayubodhan Stack Sampler VSS 2
5. Sample Collected by : VCSPL in presence of Aditya Aluminium representative
6. Date of Analysis : 29.04.2015 to 01.05.2015

Parameters	Unit of Measurement	Methodology	Analysis Results
			ST-1
Stack Temperature	<sup>0</sup> C	Stack Sampler	95.0
Velocity of Flue Gas	m/sec	Stack Sampler	7.8
Concentration of Particulate Matter as PM	mg/Nm <sup>3</sup>	Gravimetric	31.6
Sulphur dioxide as SO <sub>2</sub>	mg/Nm <sup>3</sup>	IPA- Thorin method	40.0
Oxides of Nitrogen as NO <sub>x</sub>	mg/Nm <sup>3</sup>	Modified Jacob & Hochheiser (Na-Arsenite)	28.0
Particulate Fluoride	mg/Nm <sup>3</sup>	Gravimetric	0.22
Gaseous Fluoride	mg/Nm <sup>3</sup>	Ion Electrode method	0.96
Total Fluoride as F	mg/Nm <sup>3</sup>	Calculation	1.18
Tar Fumes	mg/Nm <sup>3</sup>	Extraction followed by Gas Chromatography	ND
Poly Aromatic Hydrocarbon as PAHs	µg/Nm <sup>3</sup>	Gas Chromatography	6.0

Note: ND: Not Detected.

**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.



Ref.: VCSPL/15/R-231

Date: 01.05.2015

## STATIONARY EMISSION MONITORING REPORT

1. Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Date of Sampling : 28.04.2015
3. Sampling Location : **ST-2: Stack attached to ABF II FTC II**
4. Name of sampling Instrument : Vayubodhan Stack Sampler VSS 2
5. Sample Collected by : VCSPL in presence of Aditya Aluminium representative
6. Date of Analysis : 29.04.2015 to 01.05.2015

Parameters	Unit of Measurement	Methodology	Analysis Results
			ST-2
Stack Temperature	$^{\circ}\text{C}$	Stack Sampler	107.0
Velocity of Flue Gas	m/sec	Stack Sampler	11.3
Concentration of Particulate Matter as PM	$\text{mg}/\text{Nm}^3$	Gravimetric	27.4
Sulphur dioxide as $\text{SO}_2$	$\text{mg}/\text{Nm}^3$	IPA- Thorin method	40.0
Oxides of Nitrogen as $\text{NO}_x$	$\text{mg}/\text{Nm}^3$	Modified Jacob & Hochheiser (Na-Arsenite)	22.0
Particulate Fluoride	$\text{mg}/\text{Nm}^3$	Gravimetric	0.24
Gaseous Fluoride	$\text{mg}/\text{Nm}^3$	Ion Electrode method	1.04
Total Fluoride as F	$\text{mg}/\text{Nm}^3$	Calculation	1.28
Tar Fumes	$\text{mg}/\text{Nm}^3$	Extraction followed by Gas Chromatography	ND
Poly Aromatic Hydrocarbon as PAHs	$\mu\text{g}/\text{Nm}^3$	Gas Chromatography	3.0

Note: ND: Not Detected.

*B.K. Mishra*  
B. K. Mishra, B.Sc. Engg. (Chem)  
GOVT. ANALYST  
(GAZETTE No. 834 Dt. 12-04-2013)

For Visiontek Consultancy Services Pvt. Ltd.

**NAME OF THE INDUSTRY:- Aditya Aluminium**

**SATUS OF UTILIZATION OF COAL ASH (FLY ASH AND BOTTOM ASH), For the year 2014-15**

Sl.No.	Month	Year	Coal Consumption (Metric Tonne)	Power Installed Capacity	Power Generated MW	Qunatity of Fly Ash generated (MT)	Quantity of Bottom Ash generated (MT)	Total Ash Generated	Disposal Method	Brick manufacturing (MT)	Supplied to industries for cement/asbestos/tiles	Mine Void Filling(MT)	Utilization in Wmbankment /Dyke Raising(MT)	Road Making	Land development	Small land filling	Aggregates	Agriculture/Horticulture Sector	Total Ash Utilized (MT)	%of utilization
1	April	2014	47570	150	90	17126	1902	19028	Dry disposal	0	0	0	3000	0	0	0	0	0	3000	15.8
2	May	2014	61750	150	90	22230	2470	24700	do	0	0	0	7000	0	0	0	0	0	7000	28.3
3	June	2014	78645	300	170	28313	3145	31458	do	0	2487.68	0	0	0	0	28970.32	0	0	31458.00	100.0
4	July	2014	48816	300	170	17574.4	1952	19526.4	do	0	4298.48	0	0	0	0	15227.92	0	0	19526.4	100.0
5	August	2014	61725	300	170	22221	2469	24690	do	0	3175.56	0	0	0	0	21514.44	0	0	24690	100.0
6	September	2014	86017	300	170	30966.8	3440	34406.8	do	0	6772.20	0	0	0	0	27634.60	0	0	34406.8	100.0
7	October	2014	109238	300	170	39326.2	4369	43695.2	do	0	7915.24	0	0	0	0	35779.96	0	0	43695.2	100.0
8	November	2014	94153	300	170	33895.2	3766	37661.2	do	0	6153.63	0	0	0	0	31507.57	0	0	37661.2	100.0
9	December	2014	115492	300	250	41115.8	5081	46196.8	do	0	26624.41	0	0	0	0	19572.39	0	0	46196.80	100.0
10	January	2015	127612	300	260	44154.34	4906.04	49060.38	do	0	26889.38	0	0	0	0	22171	0	0	49060.38	100.0
11	February	2015	119048	300	290	40062.96	4451.44	44514.4	do	0	28374.44	0	0	0	0	16139.96	0	0	44514.4	100.0
12	March	2015	127566	300	290	47792.259	5310.251	53102.51	do	0	34132.64	0	0	0	0	18969.87	0	0	53102.51	100.0
		Total	1077632			384777.959	43261.731	428039.7			146823.66		10000			237488.03			394311.7	



## FLY ASH ANALYSIS REPORT

1. Name of Industry : M/s Hindalco Industries Limited  
(Unit- Aditya Aluminium), Lapanga.
2. Sampling Location : BA-01: CPP Bottom Ash Silo
3. Date of Sampling : 18.12.2014
4. Date of Analysis : 19.12.2014 to 25.12.2014
5. Sample Collected By : VCSPL Representative in presence of Aditya Aluminium Representative.

Sl. No.	Parameters	Unit	Analysis Results
			BA-01
<b>A. Chemical Analysis</b>			
1	Na <sub>2</sub> O	%	0.15
2	MgO	%	1.12
3	Al <sub>2</sub> O <sub>3</sub>	%	22.4
4	SiO <sub>2</sub>	%	56.4
5	P <sub>2</sub> O <sub>5</sub>	%	0.016
6	SO <sub>3</sub>	%	1.16
7	K <sub>2</sub> O	%	0.85
8	CaO	%	3.92
9	TiO <sub>2</sub>	%	-
10	MnO	%	0.14
11	Fe <sub>2</sub> O <sub>3</sub>	%	7.8
<b>B. Heavy Metals Analysis</b>			
1	Hg	%	<0.001
2	As	%	<0.001
3	Pb	%	0.026
4	Cr	%	< 0.002
5	V	%	<0.001
6	Fe	%	5.38
7	Co	%	<0.001
8	Cu	%	0.042
9	Ni	%	0.078
10	Zn	%	0.054
11	Sr	%	--
12	Ba	%	<0.001



For Visiontek Consultancy Services Pvt. Ltd



Ref.: VCSPL/15/R- 098(I)

Date: 19.12.2014

### GROUND WATER QUALITY ANALYSIS REPORT

1. Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga.
2. Sampling location : GW-1: Lapanga Village; GW-2: Pandiol Village;
3. Date of sampling : 11.12.2014
4. Date of analysis : 13.12.2014 to 19.12.2014
5. Sample collected by : VCSPL Representative in presence of Aditya Aluminium Representative

Sl. No	Parameter	Testing Methods	Unit	Standard as per IS - 10500:1991	Analysis Results	
					GW-1	GW-2
1	pH Value	APHA 4500H <sup>+</sup> B	--	6.5-8.5	7.12	7.06
2	Colour	APHA 2120 B, C	Hazen	5	CL	CL
3	Taste	APHA 2160 C	--	Agreeable	AL	AL
4	Odour	APHA 2150 B	--	U/O	U/O	U/O
5	Conductivity	APHA 2510-B	µs/cm	--	160.2	126.4
6	Turbidity	APHA 2130 B	NTU	5	0.3	0.4
7	Total Dissolved Solids	APHA 2540 C	mg/l	500	180.0	154.0
8	Total Hardness (as CaCO <sub>3</sub> )	APHA 2340 C	mg/l	300	128.0	112.0
9	Total Alkalinity	APHA 2320 B	mg/l	200	108.0	92.0
10	Calcium (as Ca)	APHA 3500Ca B	mg/l	75	34.37	31.26
11	Magnesium (as Mg)	APHA 3500Mg B	mg/l	30	10.31	8.26
12	Residual, free Chlorine	APHA 4500Cl, B	mg/l	0.2	ND	ND
13	Boron (as B)	APHA 4500B, B	mg/l	1	<0.001	<0.001
14	Chloride (as Cl)	APHA 4500Cl <sup>-</sup> B	mg/l	250	24.0	20.0
15	Sulphate (as SO <sub>4</sub> )	APHA 4500 SO <sub>4</sub> <sup>2-</sup> E	mg/l	200	9.13	6.09
16	Fluoride (as F)	APHA 4500F <sup>-</sup> C	mg/l	1.0	0.048	0.042
17	Nitrate (as NO <sub>3</sub> )	APHA 4500 NO <sub>3</sub> <sup>-</sup> E	mg/l	45	2.51	1.79
18	Sodium as Na	APHA3500-Na	mg/l	--	15.5	12.8
19	Potassium as K	APHA 3500-K	mg/l	--	1.6	0.94
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	APHA 5530 B,D	mg/l	0.001	<0.001	<0.001
21	Cyanide (as CN)	APHA 4500 CN <sup>-</sup> C,D	mg/l	0.05	<0.03	<0.03
22	Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	0.2	<0.2	<0.2
23	Cadmium (as Cd)	APHA 3111 B,C	mg/l	0.01	<0.001	<0.001
24	Arsenic (as As)	APHA 3114 B	mg/l	0.05	<0.001	<0.001
25	Copper (as Cu)	APHA 3111 B,C	mg/l	0.05	<0.001	<0.001
26	Lead (as Pb)	APHA 3111 B,C	mg/l	0.05	<0.001	<0.001
27	Manganese (as Mn)	APHA 3500Mn B	mg/l	0.1	<0.001	<0.001
28	Iron (as Fe)	APHA 3500Fe, B	mg/l	0.3	0.26	0.28
29	Chromium (as Cr <sup>+6</sup> )	APHA 3500Cr B	mg/l	0.05	<0.002	<0.002
30	Selenium (as Se)	APHA 3114 B	mg/l	0.01	<0.001	<0.001
31	Zinc (as Zn)	APHA 3111 B,C	mg/l	5	<0.001	<0.001
32	Aluminium as( Al)	APHA 3500Al B	mg/l	0.03	<0.001	<0.001
33	Mercury (as Hg)	APHA 3500 Hg	mg/l	0.001	<0.001	<0.001
34	Mineral Oil	APHA 5220 B	mg/l	0.01	<0.001	<0.001
35	Pesticides	APHA 6630 B,C	mg/l	Absent	Absent	Absent
36	E.Coli	APHA 9221-F	MPN/100 ml	Shall not be detectable in any 100 ml sample	Absent	Absent
37	Total Coliforms	APHA9221-B	MPN/100 ml	Shall not be detectable in any 100 ml sample	<1.8	<1.8



For Visiontek Consultancy Services Pvt. Ltd.



Ref.: VCSPL/15/R- 098(II)

Date: 19.12.2014

## GROUND WATER QUALITY ANALYSIS REPORT

1. Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga.
2. Sampling location : GW-3: Bamloi Village; GW-4: Tilaimal Village; GW-5: Thelkoloi Village; GW-6: Ghichamura Village; GW-7: Gumkarama Village; GW-8: Chaltikra Village.
3. Date of sampling : 12.12.2014
4. Date of analysis : 13.12.2014 to 19.12.2014
5. Sample collected by : VCSPL Representative in presence of Aditya Aluminium Representative

Sl. No.	Parameter	Testing Methods	Unit	Standard as per IS -10500:1991	Analysis Results					
					GW-3	GW-4	GW-5	GW-6	GW-7	GW-8
1	pH Value	APHA 4500H <sup>+</sup> B	--	6.5-8.5	6.82	6.94	6.98	7.05	7.12	7.06
2	Colour	APHA 2120 B, C	Hazen	5	CL	CL	CL	CL	CL	CL
3	Taste	APHA 2160 C	--	Agreeable	AL	AL	AL	AL	AL	AL
4	Odour	APHA 2150 B	--	U/O	U/O	U/O	U/O	U/O	U/O	U/O
5	Conductivity	APHA 2510-B	µs/cm	--	134.2	138.2	164.2	137.5	172.2	168.4
6	Turbidity	APHA 2130 B	NTU	5	0.4	0.5	0.4	0.6	0.8	0.6
7	Total Dissolved Solids	APHA 2540 C	mg/l	500	158.0	164.0	182.0	163.0	185.0	168.0
8	Total Hardness (as CaCO <sub>3</sub> )	APHA 2340 C	mg/l	300	116.0	118.0	124.0	116.0	124.0	118.0
9	Total Alkalinity	APHA 2320 B	mg/l	200	95.0	100.0	106.0	96.0	104.0	98.0
10	Calcium (as Ca)	APHA 3500Ca B	mg/l	75	31.26	32.06	33.27	32.06	33.27	32.06
11	Magnesium (as Mg)	APHA 3500Mg B	mg/l	30	9.23	9.23	9.96	8.75	9.96	9.23
12	Residual, free Chlorine	APHA 4500Cl, B	mg/l	0.2	ND	ND	ND	ND	ND	ND
13	Boron (as B)	APHA 4500B, B	mg/l	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
14	Chloride (as Cl)	APHA 4500Cl <sup>-</sup> B	mg/l	250	20.0	22.0	28.0	23.0	30.0	24.0
15	Sulphate (as SO <sub>4</sub> )	APHA 4500 SO <sub>4</sub> <sup>2-</sup> E	mg/l	200	7.17	8.26	8.91	7.39	8.48	7.83
16	Fluoride (as F)	APHA 4500F C	mg/l	1.0	0.038	0.056	0.064	0.037	0.034	0.046
17	Nitrate (as NO <sub>3</sub> )	APHA 4500 NO <sub>3</sub> <sup>-</sup> E	mg/l	45	1.97	2.0	2.19	1.91	2.05	1.9
18	Sodium as Na	APHA3500-Na	mg/l	--	12.8	14.2	18.0	14.8	19.6	15.2
19	Potassium as K	APHA 3500-K	mg/l	--	0.9	1.1	1.4	1.1	1.5	1.2
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	APHA 5530 B,D	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
21	Cyanide (as CN)	APHA 4500 CN <sup>-</sup> C,D	mg/l	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
22	Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
23	Cadmium (as Cd)	APHA 3111 B,C	mg/l	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
24	Arsenic (as As)	APHA 3114 B	mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
25	Copper (as Cu)	APHA 3111 B,C	mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
26	Lead (as Pb)	APHA 3111 B,C	mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
27	Manganese (as Mn)	APHA 3500Mn B	mg/l	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28	Iron (as Fe)	APHA 3500Fe, B	mg/l	0.3	0.24	0.28	0.3	0.32	0.25	0.26
29	Chromium (as Cr <sup>6+</sup> )	APHA 3500Cr B	mg/l	0.05	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
30	Selenium (as Se)	APHA 3114 B	mg/l	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
31	Zinc (as Zn)	APHA 3111 B,C	mg/l	5	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
32	Aluminium as( Al)	APHA 3500Al B	mg/l	0.03	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
33	Mercury (as Hg)	APHA 3500 Hg	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
34	Mineral Oil	APHA 5220 B	mg/l	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
35	Pesticides	APHA 6630 B,C	mg/l	Absent	Absent	Absent	Absent	Absent	Absent	Absent
36	E.Coli	APHA 9221-F	MPN/100 ml	Shall not be detectable in any 100 ml sample	Absent	Absent	Absent	Absent	Absent	Absent
37	Total Coliforms	APHA9221-B	MPN/100 ml	Shall not be detectable in any 100 ml sample	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8



For Visiontek Consultancy Services Pvt. Ltd.



# CSR 2014 - 2015

## Our Focus Areas



**Education**



**Health**



**Livelihood**



**Infrastructure**



**Social Issues**

# Affected Villages

<b>Plant Area</b>	<b>GP</b>	<b>Villages</b>
<b>Core Plant</b>	<b>Bomaloi</b>	<b>Bomaloi</b>
		<b>Tileimal</b>
		<b>Dharropani</b>
	<b>Lapanga</b>	<b>Lapanga</b>
		<b>Khadiapalli</b>
	<b>Ghichamura</b>	<b>Derba</b>
	<b>Nisanbhanga</b>	<b>Pandaloi</b>
<b>Ash Pond</b>	<b>Jangala</b>	<b>Bhoipalli</b>
		<b>Jangala</b>
	<b>Katarbaga</b>	<b>Bhalududia (Katarbaga Mauza)</b>
		<b>Ludhapalli</b>

# Resettlement & Rehabilitation

- **Aims at total implementation of Odisha R&R Policy, 2006.**
- **Perceives R&R as a people centered development process .**
- **Ensure restoration of socio-cultural, economic and physical wellbeing of the DPs.**
- **Assure a better access to improved quality of life- Income, Health, Education, Entertainment and Safety.**



# Features of R&R colony

- Each Displaced Person / Family is being given 0.10 Acre of Land with about 820 Sq. Ft. constructed house therein.
- Each House consists of:
  - ✓ Entrance Sitting Place
  - ✓ Three Living Rooms
  - ✓ One Verandahs
  - ✓ Kitchen
  - ✓ Separate Toilet and Bath
  - ✓ Cowshed
  - ✓ Washing Platform
- Each houses connected with electricity and piped water supply through overhead tank.
- Allocated Separate space for grave yard, market yard, Children' play ground and worship place.
- Construction of road, drainage, community center, Primary school building, first aid center, Anganwadi center, borewell and pond under process.



# Status of DP list

<b>Sl. No</b>	<b>Village</b>	<b>Hamlet</b>	<b>No of DPs as on 01.01.2012</b>	<b>Remark</b>
1	<b>Derba</b>	Dhudkabahal	45	
2	<b>Tileimal</b>	Situpada	16	
		Mareipada	24	
3	<b>Bomaloi</b>	Biripada	15	
		Nuapada	82	
		Mundapada	35	
4	<b>Katarbaga</b>	Bhalududia	147	
5	<b>Jangala</b>	Parekhapada-1	19	
		Parekhapada-2	14	
		Khamaripada	12	
6	<b>Bhoipalli</b>		12	
7	<b>Ludhapalli</b>		12	
	<b>Total</b>		<b>433</b>	

**Updated DP List from District Administration is still awaited**

# R&R Colonies Status as on Date.

Sl. No	Particulars	Pandaloi	Ludhapali	Total	
1	Total DP numbers	217	216	433	
2	DPs opted for Self Relocation	25	25	50	433
3	DPs opted for House	192	191	383	
4	DP shifted	141	177	318	383
5	DP agreed but yet to be shifted	16	14	30	
6	DP not agreeing to shift	21	0	21	
7	DP likely to be excluded from DP list	14	0	14	
8	Houses Constructed	192	194	386	



# DP Employment Status as on Date.

Sl. No	Particulars	Pandaloi	Ludhapali	Total	
1	No. of DPs opted for employment	47	31	78	
2	No. of DPs Already Employed	15	8	23	78
3	Completed ITI with AAP expenses , now wants to opt out.	1	0	1	
3	No. of DPs Under Training	5	15	20	
4	Balance DP to be sent for training	17	6	23	
5	DP continuing ITI with own expenses	1	3	4	
6	DP continuing Diploma with own expenses	2	0	2	
7	DP continuing B.Tech(Elect.) with own expenses	2	0	2	
8	DP completed BA B.Ed	1	0	1	
9	DP are likely to be excluded from the DP list with New Boundary wall layout, Subject to approval of the RPDAC	2	0	2	

## DPs Cash In Lieu of Employment Status as on Date.

<b>1</b>	<b>No. of DPs opted for Cash in Lieu of employment</b>	<b>168</b>	<b>185</b>	<b>353</b>	
2	No. of DPs Already have received Cash In Lieu Of Employment	92	82	174	<b>353</b>
3	Fund deposited with Spl. LAO	41	62	103	
4	Balance DPs to get Cash In Lieu Of Employment	35	41	62	
5	DPs are likely to be excluded from DP list with New Boundary wall layout, Subject to approval of the RPDAC	14	0	14	



# Status of Delivery of R&R Benefits

SI No.	Particulars	No of DPS
<b>Total No of DPs displaced so far - 383</b>		
1	House Warming Puja	383
2	Food to the DP family on the Day of Shifting	383
3	Welcome kit received	373
4	Free Transportation facility/ Cash in lieu of Free Transportation	375
5	Maintenance Allowance	363
6	Ganga Bhoj to Head of the Core Family ( Graveyard Rituals)	125
7	Name Plate to DPs after shifting	202
8	Identity to DPs after shifting	160
9	School Uniform/ Bag/ Umbrella to DP children	150

# Corporate Social Responsibility



Perceived CSR as a participatory development process creating value for the community through building capabilities of the people in periphery to have increased access to a better health, education, livelihood and infrastructural facilities.

# Areas of Intervention

- **Health**
- **Education**
- **Sustainable Livelihood (Focus on Women Empowerment)**
- **Infrastructural development**
- **Social Issues (Special Support for Sports & Cultural activities)**

# Health



- ❖ Conducted so far **94** Health Camps and treatment and free medicine for common ailment provided to more than **20386** patients in all the affected villages with medicine distribution worth **Rs.26,96,298/-**.
- ❖ Community Dispensary has been opened, while covering 03 Gram Panchayats, for health consultancy to our stakeholders.
- ❖ Dengue Prevention & Control Drive was organised in coordination with District Health Department.



# Health Contd....



- ❖ Mega Blood Donation Camp was Organised with the support of Redcross.
- ❖ Provided drinking water facilities in all affected villages, **covering 92 Hamlets**, through water tanker through out the summer. From 2012 approximate expenditure incurred up to **Rs.1.2 Crores**.
- ❖ Many Health awareness camps on Healthy Baby Competition, Tuber Colossi's, Reproductive health, Immunization, Nutrition, Girl Child Health Care, Healthy practices, Health Awareness through video shows, Adolescent Girl & Menopause Health Care, Health & Hygiene training, Competition for cleanliness and hygiene, Observation of Mothers day, Observation world AIDS Day, Wall painting on Good Health Topics, were organised for Men, Women, Pregnant women , Children and Adolescent Girls.



# Education

- **Augmenting School Infrastructure:**

- ❖ Constructed 15 class rooms in 5 new school building in Katarbaga, Ghichamura, Dhorropani and Jangala High schools.
- ❖ Renovation of school building of Gumkarma, Bomaloi and Tileimal.
- ❖ Renovation of drinking water source and approach road of different schools.



# Education Contd...

- ❖ KALIKA Free Coaching Centre for Primary School Students.
- ❖ Conducting School Sports, Many Competitions and Observing Special/National Days etc.
- ❖ Providing Educational Aids, Books, Copies, Bags etc. etc to Primary school children.



# Sustainable Livelihood (Women Empowerment)

Reorganizing and Strengthening existing Self Help Groups. Till now regularized 30 and newly started 06 SHGs in six Gram Panchayat and introduced standard operating procedure of SHG.

Book Keeping, Capacity building Training are being conducted on a regular basis. Distributed Books, Boxes, Mats etc. to all 37 SHGs. Imparted different Livelihood Training to almost 30 SHGs..





# Sustainable Livelihood (Women Empowerment)



# Infrastructural development

- Construction of CC Road from Lapanga to Dhaorropani.
- Development of village internal roads in Bomaloi, RohidasPada and Khadiapalli
- Creation and renovation of water bodies in the village. So far excavated and renovated 16 no of ponds.
- Installation of 15 No of tube-well



# Social Issues

1. **Construction of temple for village Deity of Bag family of Bomaloi (in progress)**
2. **Construction of Bhoga-Griha at Bomaloi.**
3. **Levelling of Puja-ground of Dhoropani.**
4. **Donation to cultural group/village institution in different Puja occasion.**
5. **Support to youth groups to conduct different sports events like football and Cricket tournament.**

**Expenditure on CSR during last three years Rs. 3.5 Crore (Approx)**

**THANK YOU**

ANALYSIS REPORT  
(OCTOBER-2014 to JANUARY-2015)

ON  
ENVIRONMENTAL MONITORING

AT



**HINDALCO INDUSTRIES LIMITED  
(UNIT: ADITYA ALUMINIUM)**

**At/Po: Lapanga,  
Beside SH-10,  
Dist-Sambalpur (Odisha)**

*Prepared by:-*



**VISIONTEK CONSULTANCY SERVICES PVT. LTD.**  
*(An Enviro Engineering Consulting Cell)*

Plot No.-108, District Centre, Chandrasekharpur, Bhubaneswar -16,

Tel. : 91-674-2744594, 3250790

E-mail : visiontekin@gmail.com, visiontekin@yahoo.co.in,

Visit us at: [www.vcspl.org](http://www.vcspl.org)



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9	Bottom Ash Analysis Report	72-73



## **METHODOLOGY OF ENVIRONMENTAL MONITORING STUDY**

### **1.0 INTRODUCTION :**

M/s Visiontek Consultancy Services Pvt. Ltd. carried out the environmental monitoring for the HINDALCO INDUSTRIES LIMITED (Unit- Aditya Aluminium), Sambalpur.

Environmental monitoring was carried out at various locations within 10 km the study area. The Monitoring was carried out with respect to the qualities of Meteorology, Ambient Air, Water, Soil, Noise, Forage Fluoride, Fly Ash & Bottom Ash.

### **2.0 STUDY PERIOD:**

The study was conducted during month of Oct-2014 to Jan-2015 i.e. from period 14.10.2014 to 15.01.2015.

### **3.0 METHODOLOGY:**

The environmental monitoring was carried out as per the standard methodology of Bureau of Indian Standard (IS: 8829), (IS: 5182), APHA, (IS: 2720), CPCB and (IS: 3812).

### **4.0 SELECTION OF MONITORING LOCATIONS:**

The location for Meteorology, Ambient Air Quality, Water Quality, Soil, Noise, Forage Fluoride, Fly Ash & Bottom Ash has been selected by Aditya Aluminium representative.

### **4.1 METEOROLOGICAL SAMPLING:**

Meteorological station installed at project site at a height of 2-7 ft above ground level for measurement of parameters like Wind speed, Wind Direction, Temperature, Humidity, Barometric Pressure rainfall & wind rose on hourly basis continuously for the study period by using Automated Davis make Weather station.



The detailed meteorological data collected during study period is given in the Annexure-1.

#### 4.2 AMBIENT AIR QUALITY:

The ambient air quality of the study region was monitored at eight locations selected within the study area. The parameters monitored were Particulate Matter (size less than 10 µg or PM<sub>10</sub>), Particulate matter (size less than 2.5 µg or PM<sub>2.5</sub>), Sulphur dioxide (SO<sub>2</sub>), Oxides of Nitrogen (NO<sub>x</sub>), Carbon Monoxide (CO), Ozone (O<sub>3</sub>), Ammonia (NH<sub>3</sub>), Nickel (Ni), Lead (Pb), Arsenic (As), Benzene (C<sub>6</sub>H<sub>6</sub>), Benzo(a)Pyrene (BaP) and Fluoride. Respirable Dust Sampler (APM 460BL) of ENVIROTECH make, FPS (APM) of ENVIROTECH make, Organic Vapour Sampler, ENVIROTECH make, model APM 850 were used for monitoring of ambient air quality at all the identified locations. The methods of sample collection and analysis are outlined in the table as shown below:

#### **AMBIENT AIR QUALITY ANALYSIS METHOD**

SL. NO.	PARAMETER	ANALYSIS METHOD
1.	Particulate Matter (size less than 10 µg or PM <sub>10</sub> ), µg/m <sup>3</sup>	Gravimetric method
2.	Particulate matter (size less than 2.5 µg or PM <sub>2.5</sub> ), µg/m <sup>3</sup>	Gravimetric method
3.	Sulphur di-oxide (SO <sub>2</sub> ), µg/m <sup>3</sup>	Improved west & Gaeke method
4.	Oxides of Nitrogen (NO <sub>x</sub> ), µg/m <sup>3</sup>	Jacob and Hochheiser Modified method
5.	Carbon Monoxide (CO), mg/m <sup>3</sup>	NDIR Spectroscopy method
6.	Ozone (O <sub>3</sub> ), µg/m <sup>3</sup>	Chemical Method
7.	Ammonia (NH <sub>3</sub> ), µg/m <sup>3</sup>	Indophenol Blue Method
8.	Benzene (C <sub>6</sub> H <sub>6</sub> ), µg/m <sup>3</sup>	Absorption & Desorption followed by GC analysis
9.	Benzo(a) Pyrene (BaP), ng/m <sup>3</sup>	Solvent extraction followed by GC analysis.



10.	Nickel (Ni) , ng/m <sup>3</sup>	AAS method after sampling
11.	Lead (Pb), µg/m <sup>3</sup>	AAS method after sampling
12.	Arsenic( As), ng/m <sup>3</sup>	AAS method after sampling
13.	Fluoride as F	Ion Selective method after sampling

#### 4.2.1 AMBIENT AIR QUALITY SAMPLING STATIONS:

Details of the sampling locations are given below.

Field ID	Location
AAQ1	Gumkarma
AAQ2	Ghichamura
AAQ3	Tileimal
AAQ4	Bomaloi
AAQ5	Kapulas
AAQ6	Phulchanghai
AAQ7	Khadiapali
AAQ8	Thelkolai

The detailed air quality report is given in the **Annexure-2**.

#### 4.3 WATER QUALITY:

Water quality monitoring was carried out at eighteen locations out of which ten locations of surface water, eight were of ground water. Samples were collected manually during study period. Considering several possibilities of interference the poly tetrafluoroethylene (PTFE) sample bottles were used. These bottles were sterilized properly before being used for water sample collection.

The methodology for sample collection, preservation and analysis was as per Standard methods for the Examination of Water and Wastewater, 22<sup>nd</sup> Edition, APHA.

#### WATER QUALITY ANALYSIS METHOD

SL.NO.	PARAMETER	ANALYSIS METHOD
1	pH Value	Potentiometric
2	Colour	Visible comparison method
3	Taste	Threshold Test
4	Odour	Human receptor
5	Conductivity	Conductivity Meter
6	Turbidity	Nephelometric
7	Total Dissolved Solids	Gravimetric



8	Total Hardness (as CaCO <sub>3</sub> )	EDTA Titrimetric
9	Total Alkalinity	Titrimetric
10	Calcium (as Ca )	EDTA Titrimetric
11	Magnesium (as Mg)	Calculation from TH & Ca
12	Residual, free Chlorine	Titrimetric
13	Boron (as B)	Curcumin spectrophotometric
14	Chloride (as Cl )	Titrimetric (Argentometric)
15	Sulphate (as SO <sub>4</sub> )	Nephelometry
16	Fluoride (as F)	Fluoride Ion Meter
17	Nitrate (as NO <sub>3</sub> )	Cadmium reduction method
18	Sodium as Na	Flame Photometry
19	Potassium as K	Flame Photometry
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	Distillation followed by Spectrophotometric
21	Cyanide (as CN)	Distillation followed by Titrimetric
22	Anionic Detergents (as MBAS)	Gas Chromatography
23	Cadmium (as Cd)	AAS Method
24	Arsenic (as As)	AAS Method
25	Copper (as Cu)	AAS Method
26	Lead (as Pb)	AAS Method
27	Manganese (as Mn)	AAS Method
28	Iron (as Fe)	Phenanthroline Spectrophotometric
29	Chromium (as Cr <sup>+6</sup> )	AAS Method
30	Selenium (as Se)	AAS Method
31	Zinc (as Zn)	AAS Method
32	Aluminium as( Al)	AAS Method
33	Mercury (as Hg)	AAS Method
34	Mineral Oil	Gas Chromatography
35	Pesticide	Gas Chromatography
36	E. Coli	Multiple Tube Method
37	Total Coli form	Multiple Tube Method

#### 4.3.1 SURFACE WATER SAMPLING LOCATION :

Detail of the sampling location is given below:

Field ID	Location
SW-1	Hirakud Reservoir
SW-2	Lapanga Pond
SW-3	Matwadinadi
SW-4	Bamloi Pond
SW-5	Bhedan River
SW-6	Bhedan river near Katikela
SW-7	Matwadinadi-D/s
SW-8	Hirakud Reservoir near Gurupalli Village
SW-9	Salepali Village
SW-10	Sanamal

The detailed surface water analysis report is mentioned in **Annexure-3**.

#### 4.3.2 GROUND WATER SAMPLING LOCATION:

Details of the sampling locations are given below:



Field ID	Location
GW-1	Lapanga Village
GW-2	Pandiol Village
GW-3	Bamloi Village
GW-4	Tilaimal Village
GW-5	Thekoloji Village
GW-6	Ghichamura Village
GW-7	Gumkarma Village
GW-8	Chaltikra Village

The detailed ground water analysis report is mentioned in **Annexure-4**.

#### 4.4 SOIL QUALITY:

Soil Samples were collected as per standard procedure from ten locations.

Sampling was done from soil depth of about one foot.

Locations of soil quality are as follows:

##### 4.4.1 SOIL QUALITY SAMPLING LOCATION:

Field ID	Location
S-1	Project Site
S-2	Thekoloji
S-3	Ghichamura
S-4	Lapanga
S-5	Bamloi
S-6	Tileimal
S-7	Jangala
S-8	Gurupali
S-9	Gumkarama
S-10	Bhadarpalli

The detailed soil quality analysis report is given in **Annexure-5**.

#### 4.5 NOISE LEVEL MONITORING:

Noise Levels were recorded at eight locations covered in 10 km radius of the study area. The readings were taken in every hour for 24 hours at each location during the study period for day and night time. Day time is considered from 0600 hrs to 2200 hrs and night time is considered from 2200 hrs to 0600 hrs.

Location of Noise level monitoring stations is as follows:

##### 4.5.1 NOISE LEVEL SAMPLING STATIONS:

Field ID	Location
----------	----------



N1	Gumkarma
N2	Ghichamura
N3	Bomaloi
N4	Tileimal
N5	Thelkoi
N6	Lapanga
N7	Lapanga Railway Station
N8	Jangala

The detailed noise measurement data is given is **Annexure-6**.

#### 4.6 FORAGE FLUORIDE:

Leaf samples were collected from six locations around the periphery.

Locations of Forage fluoride are as follows:

##### 4.6.1 FORAGE FLUORIDE SAMPLING LOCATIONS:

Field ID	Location
FF-1	Gumkarama
FF-2	Ghichamura
FF-3	Bomloi
FF-4	Tileimal
FF-5	Lapanga
FF-6	Gurupali

The detailed forage fluoride analysis report is given in **Annexure-7**.

#### 4.7 FLY ASH & BOTTOM ASH:

The Fly ash was collected from CPP silo area & Boiler Plant. The components studied were chemical & heavy metals analysis of two identified samples.

The methods of sample collection is as per IS: 6491 & IS: 3812 for analysis.

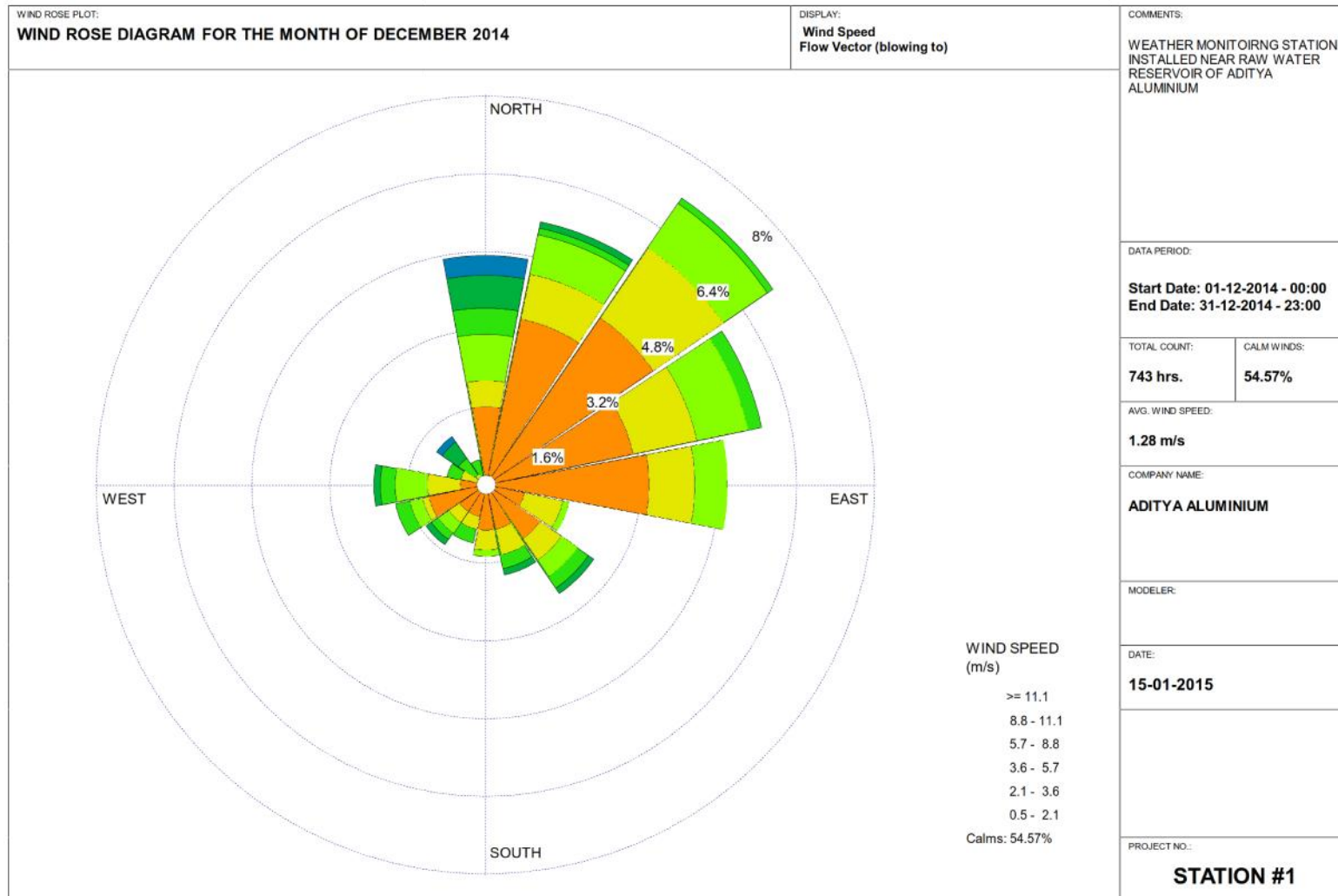
Location of Fly Ash & Bottom Ash is as follows:

##### 4.7.1 FLY ASH & BOTTOM ASH SAMPLING LOCATIONS:

Field ID	Location
FA-01	CPP Silo Area
BA-01	Boiler Unit III & IV

The detailed fly ash & bottom ash analysis report is given in Annexure-8(A&B).

**Figure below represents Wind rose diagram of the study period (December-2014)**



**Summary of micro-meteorological observations of the study area (December-2014)**

Meteorological Data for the Month of December 2014								
Dates	Temperature		Relative Humidity		Wind Speed		Wind Dir	Rainfall
	*C		%		km/h		Deg	mm
	max	min	max	min	Total		Predominate	
12/1/2014	29.5	14.1	95.3	26.8	9.0	0	275.0	0
12/2/2014	29.3	13.3	95.4	19	8.0	0	268.0	0
12/3/2014	27.9	13.4	87.3	19	11.0	0	205.0	0
12/4/2014	27.8	12.4	92.3	19	6.0	0	227.5	0
12/5/2014	28.6	12.8	91.8	27	3.0	0	256.0	0
12/6/2014	29.5	13.4	95.4	29.9	4.0	0	231.0	0
12/7/2014	28.5	13.5	98.2	27.4	3.0	0	235.5	0
12/8/2014	29.3	12.9	96.2	25	1.0	0	253.0	0
12/9/2014	28.9	13.9	94.7	31.5	4.0	0	216.0	0
12/10/2014	28.6	13.7	95.6	31	3.0	0	232.5	0
12/11/2014	27.3	14.9	89.4	27.3	4.0	0	251.0	0
12/12/2014	24.5	15.8	81.5	50.5	4.0	0	209.5	0
12/13/2014	23.5	18.2	89.4	54.5	3.0	0	241.5	0
12/14/2014	23.8	17.3	93.1	49.9	4.0	0	261.5	0
12/15/2014	28.6	12.2	97.9	37	4.0	0	244.0	0
12/16/2014	26.3	17.3	91.2	35	12.0	0	206.5	0
12/17/2014	23.9	11.9	77.3	12.9	16.0	0	182.0	0
12/18/2014	25.2	8.8	90.2	22.8	4.0	0	250.0	0
12/19/2014	25.7	8.9	93.9	19	4.0	0	226.5	0
12/20/2014	25.4	9.3	88.0	23.2	8.0	0	261.5	0
12/21/2014	25.1	10.6	91.3	28.4	4.0	0	239.0	0
12/22/2014	26.4	10.3	98.4	25.9	3.0	0	248.0	0
12/23/2014	26.3	10.0	97.9	25.7	3.0	0	244.5	0
12/24/2014	27.1	10.9	97.6	21.7	4.0	0	222.5	0
12/25/2014	25.8	12.0	87.1	26.0	11.0	0	216.5	0
12/26/2014	24.4	10.2	84.5	26.7	12.0	0	216.0	0
12/27/2014	23.3	9.8	87.9	20.5	8.0	0	209.5	0
12/28/2014	24.3	7.8	89.8	19.0	4.0	0	224.5	0
12/29/2014	25.7	8.0	89.8	19.0	4.0	0	224.0	0
12/30/2014	27.7	11.5	83.8	31.2	11.0	0	281.0	0
12/31/2014	21.9	16.8	97.1	57.5	6.0	0	247.5	0.2

**Annexure-1**

**MICRO-METEOROLOGY DATA**





## METEOROLOGICAL DATA

1. Name of the Industry : **M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga**
2. Sampling Location : **Near Raw Water Reservoir**
3. Data Recorded By : **VCSPL Representative in presence of Aditya Aluminium Representative**

Date	Time	Temp°C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
01.12.2014	0:00	19.1	65.5	0.0	275.0	0.0
	1:00	17.6	78.8	0.0	273.0	
	2:00	17.0	78.5	0.0	285.0	
	3:00	16.2	85.2	0.0	285.0	
	4:00	15.3	89.0	0.0	282.0	
	5:00	14.9	91.6	0.0	280.0	
	6:00	14.2	92.6	0.0	275.0	
	7:00	14.1	95.3	0.0	275.0	
	8:00	14.7	87.9	0.0	275.0	
	9:00	18.3	61.2	0.0	211.0	
	10:00	22.3	46.7	0.0	330.0	
	11:00	25.5	38.7	0.0	347.0	
	12:00	27.4	34.4	0.0	176.0	
	13:00	28.5	26.8	3.0	183.0	
	14:00	29.1	27.3	9.0	129.0	
	15:00	29.2	27.0	6.0	231.0	
	16:00	29.5	27.3	8.0	331.0	
	17:00	28.9	34.4	1.0	49.0	
	18:00	26.7	40.8	3.0	46.0	
	19:00	24.4	55.7	0.0	350.0	
20:00	22.8	62.0	0.0	350.0		
21:00	21.2	72.7	0.0	350.0		
22:00	20.7	71.9	0.0	350.0		
23:00	19.8	75.6	0.0	272.0		
<b>Max</b>		<b>29.5</b>	<b>95.3</b>	<b>9.0</b>	<b>--</b>	
<b>Min</b>		<b>14.1</b>	<b>26.8</b>	<b>0.0</b>	<b>--</b>	

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.





Ref.:VCSPL/15/R-112(ii)

Date:02.12.2014

### METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Sampling Location : Near Raw Water Reservoir
3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp <sup>o</sup> C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
02.12.2014	0:00	18.6	79.4	0.0	272.0	0.0
	1:00	17.9	85.7	0.0	279.0	
	2:00	17.1	84.8	0.0	282.0	
	3:00	16.1	89.8	0.0	282.0	
	4:00	16.1	86.9	0.0	283.0	
	5:00	15.7	87.9	0.0	283.0	
	6:00	14.7	89.8	0.0	282.0	
	7:00	14.2	91.5	0.0	282.0	
	8:00	13.3	95.4	0.0	279.0	
	9:00	16.1	79.8	0.0	255.0	
	10:00	20.3	55.8	0.0	286.0	
	11:00	23.6	45.8	0.0	183.0	
	12:00	26.5	27.2	1.0	180.0	
	13:00	27.5	20.5	8.0	183.0	
	14:00	28.9	19.0	3.0	296.0	
	15:00	29.3	19.0	6.0	149.0	
	16:00	28.7	27.8	8.0	81.0	
	17:00	28.1	31.6	6.0	22.0	
	18:00	26.3	36.8	1.0	42.0	
	19:00	24.4	44.7	1.0	77.0	
	20:00	22.9	36.5	0.0	124.0	
	21:00	21.4	55.0	0.0	264.0	
	22:00	20.3	58.0	0.0	182.0	
	23:00	18.1	67.3	0.0	295.0	
<b>Max</b>		<b>29.3</b>	<b>95.4</b>	<b>8.0</b>	<b>--</b>	
<b>Min</b>		<b>13.3</b>	<b>19.0</b>	<b>0.0</b>	<b>--</b>	

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.



Ref.:VCSPL/15/R-112(iii)

Date:03.12.2014

## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Sampling Location : Near Raw Water Reservoir
3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp°C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
03.12.2014	0:00	17.5	62.7	0.0	261.0	0.0
	1:00	17.2	67.9	0.0	261.0	
	2:00	16.2	67.0	0.0	262.0	
	3:00	15.3	81.2	0.0	262.0	
	4:00	14.8	84.7	0.0	262.0	
	5:00	14.1	83.5	0.0	262.0	
	6:00	13.9	82.0	0.0	262.0	
	7:00	13.4	86.3	0.0	262.0	
	8:00	13.4	87.3	0.0	262.0	
	9:00	16.7	59.0	0.0	262.0	
	10:00	21.2	44.5	0.0	38.0	
	11:00	23.3	34.9	0.0	63.0	
	12:00	24.7	33.0	4.0	100.0	
	13:00	25.7	29.1	8.0	64.0	
	14:00	26.7	27.5	11.0	84.0	
	15:00	27.6	22.4	6.0	144.0	
	16:00	27.9	19.0	6.0	149.0	
	17:00	27.8	19.0	8.0	127.0	
	18:00	26.4	26.4	1.0	128.0	
	19:00	24.1	41.4	0.0	97.0	
20:00	22.3	37.0	0.0	108.0		
21:00	22.0	45.1	1.0	79.0		
22:00	19.6	55.8	0.0	293.0		
23:00	18.9	56.8	0.0	295.0		
<b>Max</b>		<b>27.9</b>	<b>87.3</b>	<b>11.0</b>	<b>--</b>	
<b>Min</b>		<b>13.4</b>	<b>19.0</b>	<b>0.0</b>	<b>--</b>	

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.



Ref.:VCSPL/15/R-112(iv)

Date:04.12.2014

## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Sampling Location : Near Raw Water Reservoir
3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp <sup>o</sup> C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
04.12.2014	0:00	16.6	65.2	0.0	252.0	0.0
	1:00	16.5	76.8	0.0	347.0	
	2:00	15.4	68.9	0.0	285.0	
	3:00	14.8	77.1	0.0	285.0	
	4:00	14.1	81.2	0.0	286.0	
	5:00	13.1	92.3	0.0	286.0	
	6:00	12.9	91.3	0.0	280.0	
	7:00	12.4	89.1	0.0	280.0	
	8:00	12.6	86.9	0.0	275.0	
	9:00	15.4	61.7	0.0	227.0	
	10:00	18.7	48.4	0.0	228.0	
	11:00	22.3	33.0	0.0	0.0	
	12:00	25.6	19.0	0.0	251.0	
	13:00	26.9	25.9	1.0	183.0	
	14:00	27.8	20.2	1.0	194.0	
	15:00	27.8	19.0	6.0	193.0	
	16:00	27.8	19.0	4.0	245.0	
	17:00	27.4	30.8	3.0	97.0	
	18:00	24.9	40.6	3.0	33.0	
	19:00	22.1	54.9	0.0	31.0	
20:00	20.7	58.1	0.0	31.0		
21:00	20.1	58.2	0.0	8.0		
22:00	18.7	60.6	0.0	8.0		
23:00	17.6	66.4	0.0	8.0		
<b>Max</b>		<b>27.8</b>	<b>92.3</b>	<b>6.0</b>	<b>--</b>	
<b>Min</b>		<b>12.4</b>	<b>19.0</b>	<b>0.0</b>	<b>--</b>	

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.



## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Sampling Location : Near Raw Water Reservoir  
 3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp°C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
05.12.2014	0:00	16.4	80.8	0.0	293.0	0.0
	1:00	15.2	82.0	0.0	273.0	
	2:00	14.7	86.1	0.0	273.0	
	3:00	14.1	88.2	0.0	208.0	
	4:00	13.8	85.8	1.0	217.0	
	5:00	13.8	85.2	0.0	223.0	
	6:00	13.4	90.6	0.0	354.0	
	7:00	12.8	91.8	0.0	316.0	
	8:00	13.2	88.2	0.0	245.0	
	9:00	15.4	75.6	0.0	227.0	
	10:00	18.5	63.0	1.0	201.0	
	11:00	21.6	46.6	1.0	251.0	
	12:00	24.7	34.0	0.0	344.0	
	13:00	27.2	28.7	0.0	261.0	
	14:00	28.2	27.0	1.0	340.0	
	15:00	28.6	27.7	1.0	83.0	
	16:00	28.1	29.0	3.0	4.0	
	17:00	27.3	33.7	3.0	104.0	
	18:00	25.7	36.8	3.0	91.0	
	19:00	23.8	46.0	0.0	62.0	
20:00	21.6	59.8	0.0	354.0		
21:00	20.3	63.9	0.0	354.0		
22:00	19.6	67.7	0.0	353.0		
23:00	18.1	72.6	0.0	304.0		
<b>Max</b>		<b>28.6</b>	<b>91.8</b>	<b>3.0</b>	<b>--</b>	
<b>Min</b>		<b>12.8</b>	<b>27.0</b>	<b>0.0</b>	<b>--</b>	

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.



Ref.:VCSPL/15/R-112(vi)

Date:06.12.2014

## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Sampling Location : Near Raw Water Reservoir  
 3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp <sup>o</sup> C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
06.12.2014	0:00	17.1	78.4	0.0	292.0	0.0
	1:00	16.4	81.5	0.0	276.0	
	2:00	15.9	89.8	0.0	293.0	
	3:00	15.1	89.1	0.0	214.0	
	4:00	14.4	92.6	0.0	213.0	
	5:00	14.2	94.0	0.0	218.0	
	6:00	13.6	95.4	0.0	247.0	
	7:00	13.6	94.0	0.0	230.0	
	8:00	13.4	95.4	0.0	232.0	
	9:00	15.4	81.4	0.0	237.0	
	10:00	18.7	64.6	1.0	242.0	
	11:00	21.7	51.6	3.0	206.0	
	12:00	24.6	40.0	3.0	254.0	
	13:00	27.1	33.8	1.0	259.0	
	14:00	28.4	31.1	0.0	59.0	
	15:00	29.5	29.9	0.0	28.0	
	16:00	28.4	31.0	1.0	16.0	
	17:00	27.8	39.4	4.0	64.0	
	18:00	25.7	49.5	0.0	70.0	
	19:00	23.7	57.3	0.0	29.0	
	20:00	22.1	65.4	0.0	8.0	
	21:00	20.6	72.2	0.0	340.0	
	22:00	19.4	75.2	0.0	336.0	
23:00	18.7	81.8	0.0	265.0		
<b>Max</b>		<b>29.5</b>	<b>95.4</b>	<b>4.0</b>	<b>--</b>	
<b>Min</b>		<b>13.4</b>	<b>29.9</b>	<b>0.0</b>	<b>--</b>	

*B.K. Mishra*  
 B. K. Mishra, B.Sc. Engg. (Chem)  
 GOVT. ANALYST  
 (GAZETTE No. 834 Dt. 12-04-2013)

For Visiontek Consultancy Services Pvt. Ltd.



Ref.:VCSPL/15/R-112(vii)

Date:07.12.2014

## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Sampling Location : Near Raw Water Reservoir  
 3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp <sup>o</sup> C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
07.12.2014	0:00	17.5	82.6	0.0	204.0	0.0
	1:00	16.7	89.0	0.0	289.0	
	2:00	16.0	92.5	0.0	241.0	
	3:00	15.6	94.1	0.0	341.0	
	4:00	14.7	96.2	0.0	214.0	
	5:00	14.1	97.9	0.0	203.0	
	6:00	13.9	98.2	0.0	234.0	
	7:00	13.6	97.9	0.0	234.0	
	8:00	13.5	89.8	0.0	240.0	
	9:00	14.8	81.8	1.0	194.0	
	10:00	17.2	73.7	1.0	237.0	
	11:00	21.0	51.9	0.0	242.0	
	12:00	24.1	37.7	3.0	264.0	
	13:00	26.6	32.3	0.0	247.0	
	14:00	27.6	29.5	3.0	247.0	
	15:00	28.5	27.4	1.0	309.0	
	16:00	27.9	28.9	1.0	74.0	
	17:00	27.3	30.3	3.0	83.0	
	18:00	25.3	43.9	3.0	108.0	
	19:00	23.7	48.6	1.0	5.0	
20:00	20.9	68.9	0.0	5.0		
21:00	20.1	69.1	0.0	5.0		
22:00	19.5	66.0	0.0	348.0		
23:00	17.5	83.3	0.0	256.0		
<b>Max</b>		<b>28.5</b>	<b>98.2</b>	<b>3.0</b>	<b>--</b>	
<b>Min</b>		<b>13.5</b>	<b>27.4</b>	<b>0.0</b>	<b>--</b>	

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
 GOVT. ANALYST  
 (GAZETTE No. 834 Dt. 12-04-2013)

For Visiontek Consultancy Services Pvt. Ltd.



## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Sampling Location : Near Raw Water Reservoir
3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp <sup>o</sup> C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
08.12.2014	0:00	16.0	86.6	0.0	269.0	0.0
	1:00	15.5	87.9	0.0	288.0	
	2:00	15.3	91.6	0.0	288.0	
	3:00	14.4	94.9	0.0	258.0	
	4:00	13.7	96.2	0.0	228.0	
	5:00	13.6	95.4	0.0	204.0	
	6:00	13.4	96.2	0.0	357.0	
	7:00	13.2	95.4	0.0	232.0	
	8:00	12.9	95.4	0.0	232.0	
	9:00	14.7	81.7	0.0	252.0	
	10:00	17.5	68.1	1.0	254.0	
	11:00	20.9	54.3	1.0	196.0	
	12:00	24.4	38.8	0.0	206.0	
	13:00	26.7	31.9	1.0	206.0	
	14:00	28.2	27.0	1.0	276.0	
	15:00	29.1	25.0	1.0	225.0	
	16:00	29.3	27.4	0.0	321.0	
	17:00	27.9	28.7	1.0	67.0	
	18:00	26.2	39.4	1.0	87.0	
	19:00	23.8	55.0	0.0	4.0	
20:00	21.6	60.6	0.0	344.0		
21:00	20.5	65.5	0.0	348.0		
22:00	19.4	70.9	1.0	343.0		
23:00	18.2	75.3	0.0	286.0		
<b>Max</b>		<b>29.3</b>	<b>96.2</b>	<b>1.0</b>	<b>--</b>	
<b>Min</b>		<b>12.9</b>	<b>25.0</b>	<b>0.0</b>	<b>--</b>	

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.



Ref.:VCSPL/15/R-112(ix)

Date:09.12.2014

## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Sampling Location : Near Raw Water Reservoir  
 3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp <sup>o</sup> C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
09.12.2014	0:00	16.9	80.2	0.0	282.0	0.0
	1:00	15.9	88.0	0.0	218.0	
	2:00	15.9	84.5	0.0	247.0	
	3:00	15.8	88.1	0.0	237.0	
	4:00	15.2	90.6	1.0	211.0	
	5:00	14.5	93.2	0.0	213.0	
	6:00	14.4	91.9	0.0	213.0	
	7:00	13.9	94.7	0.0	256.0	
	8:00	13.9	92.8	0.0	203.0	
	9:00	15.6	79.1	1.0	214.0	
	10:00	18.5	64.2	1.0	234.0	
	11:00	22.6	48.5	0.0	286.0	
	12:00	26.2	37.5	0.0	337.0	
	13:00	27.3	34.6	0.0	183.0	
	14:00	28.2	33.5	1.0	271.0	
	15:00	28.9	32.4	1.0	66.0	
	16:00	28.1	31.5	4.0	62.0	
	17:00	27.6	33.0	3.0	91.0	
	18:00	26.2	43.4	1.0	74.0	
	19:00	24.3	48.1	0.0	91.0	
20:00	22.9	56.1	0.0	26.0		
21:00	20.7	74.6	0.0	351.0		
22:00	20.2	71.4	0.0	351.0		
23:00	18.3	81.2	0.0	264.0		
<b>Max</b>		<b>28.9</b>	<b>94.7</b>	<b>4.0</b>	<b>--</b>	
<b>Min</b>		<b>13.9</b>	<b>31.5</b>	<b>0.0</b>	<b>--</b>	

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.





## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Sampling Location : Near Raw Water Reservoir  
 3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp <sup>o</sup> C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
10.12.2014	0:00	17.2	84.3	0.0	262.0	0.0
	1:00	16.3	92.9	0.0	242.0	
	2:00	15.6	92.8	0.0	241.0	
	3:00	15.2	95.1	0.0	221.0	
	4:00	14.7	95.4	0.0	228.0	
	5:00	14.2	95.6	0.0	231.0	
	6:00	14.2	95.5	0.0	234.0	
	7:00	13.9	95.4	0.0	234.0	
	8:00	13.7	95.0	0.0	235.0	
	9:00	15.4	77.4	0.0	217.0	
	10:00	18.7	61.6	0.0	314.0	
	11:00	22.3	45.5	0.0	254.0	
	12:00	25.8	41.2	0.0	53.0	
	13:00	28.2	31.9	0.0	331.0	
	14:00	28.6	33.1	0.0	76.0	
	15:00	28.6	32.4	1.0	105.0	
	16:00	28.3	31.0	3.0	81.0	
	17:00	27.9	34.4	3.0	64.0	
	18:00	26.2	43.8	1.0	12.0	
	19:00	24.2	50.0	0.0	38.0	
20:00	22.3	61.9	0.0	355.0		
21:00	21.4	65.7	0.0	350.0		
22:00	20.3	74.5	0.0	45.0		
23:00	18.7	82.6	0.0	271.0		
<b>Max</b>		<b>28.6</b>	<b>95.6</b>	<b>3.0</b>	<b>--</b>	
<b>Min</b>		<b>13.7</b>	<b>31.0</b>	<b>0.0</b>	<b>--</b>	

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.



## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Sampling Location : Near Raw Water Reservoir  
 3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp <sup>o</sup> C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
11.12.2014	0:00	17.9	85.2	0.0	269.0	0.0
	1:00	17.2	85.8	1.0	207.0	
	2:00	16.6	84.8	1.0	279.0	
	3:00	16.6	86.7	0.0	182.0	
	4:00	16.0	85.7	0.0	224.0	
	5:00	15.8	86.0	0.0	213.0	
	6:00	15.6	86.9	0.0	231.0	
	7:00	15.2	89.4	0.0	204.0	
	8:00	14.9	86.9	0.0	208.0	
	9:00	16.2	70.5	0.0	251.0	
	10:00	18.6	59.0	1.0	218.0	
	11:00	21.7	42.9	3.0	223.0	
	12:00	23.8	35.1	4.0	258.0	
	13:00	25.4	28.4	3.0	251.0	
	14:00	26.7	27.6	1.0	273.0	
	15:00	27.0	27.3	3.0	227.0	
	16:00	27.3	28.6	1.0	261.0	
	17:00	26.5	32.2	0.0	275.0	
	18:00	25.0	42.2	0.0	275.0	
	19:00	22.8	44.8	0.0	273.0	
20:00	21.7	57.4	0.0	0.0		
21:00	20.2	62.9	0.0	306.0		
22:00	20.3	57.2	0.0	306.0		
23:00	19.5	67.4	0.0	282.0		
<b>Max</b>		<b>27.3</b>	<b>89.4</b>	<b>4.0</b>	<b>--</b>	
<b>Min</b>		<b>14.9</b>	<b>27.3</b>	<b>0.0</b>	<b>--</b>	

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.



## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Sampling Location : Near Raw Water Reservoir  
 3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp <sup>o</sup> C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
12.12.2014	0:00	18.7	75.8	0.0	206.0	0.0
	1:00	18.0	76.7	1.0	197.0	
	2:00	17.7	77.3	0.0	208.0	
	3:00	17.1	76.3	0.0	199.0	
	4:00	17.2	75.1	0.0	225.0	
	5:00	16.2	79.8	0.0	200.0	
	6:00	16.1	81.5	0.0	207.0	
	7:00	15.9	79.2	0.0	206.0	
	8:00	15.8	81.0	0.0	211.0	
	9:00	16.8	69.4	3.0	240.0	
	10:00	18.2	71.1	1.0	207.0	
	11:00	20.4	51.4	1.0	285.0	
	12:00	22.7	53.9	4.0	251.0	
	13:00	22.9	55.7	3.0	321.0	
	14:00	23.9	51.9	1.0	293.0	
	15:00	24.1	50.7	1.0	328.0	
	16:00	24.5	50.5	0.0	24.0	
	17:00	24.4	56.6	0.0	28.0	
	18:00	23.4	58.0	0.0	26.0	
	19:00	22.5	63.1	0.0	26.0	
20:00	21.2	70.0	0.0	353.0		
21:00	20.9	72.5	0.0	348.0		
22:00	20.0	76.4	0.0	307.0		
23:00	19.9	76.1	0.0	307.0		
<b>Max</b>		<b>24.5</b>	<b>81.5</b>	<b>4.0</b>	<b>--</b>	
<b>Min</b>		<b>15.8</b>	<b>50.5</b>	<b>0.0</b>	<b>--</b>	

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.



## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Sampling Location : Near Raw Water Reservoir
3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp <sup>o</sup> C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
13.12.2014	0:00	18.7	75.8	0.0	206.0	0.0
	1:00	18.0	76.7	1.0	197.0	
	2:00	17.7	77.3	0.0	208.0	
	3:00	17.1	76.3	0.	199.0	
	4:00	17.2	75.1	0.0	225.0	
	5:00	16.2	79.8	0.0	200.0	
	6:00	16.1	81.5	0.0	207.0	
	7:00	15.9	79.2	0.0	206.0	
	8:00	15.8	81.0	0.0	211.0	
	9:00	16.8	69.4	3.0	240.0	
	10:00	18.2	71.1	1.0	207.0	
	11:00	20.4	51.4	1.0	285.0	
	12:00	22.7	53.9	4.0	251.0	
	13:00	22.9	55.7	3.0	321.0	
	14:00	23.9	51.9	1.0	293.0	
	15:00	24.1	50.7	1.0	328.0	
	16:00	24.5	50.5	0.0	24.0	
	17:00	24.4	56.6	0.0	28.0	
	18:00	23.4	58.0	0.0	26.0	
	19:00	22.5	63.1	0.0	26.0	
	20:00	21.2	70.0	0.0	353.0	
	21:00	20.9	72.5	0.0	348.0	
	22:00	20.0	76.4	0.0	307.0	
	23:00	19.9	76.1	0.0	307.0	
<b>Max</b>		<b>23.5</b>	<b>89.4</b>	<b>3.0</b>	<b>--</b>	
<b>Min</b>		<b>18.2</b>	<b>27.3</b>	<b>0.0</b>	<b>--</b>	

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.



## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Sampling Location : Near Raw Water Reservoir  
 3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp°C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
14.12.2014	0:00	19.3	86.3	0.0	206.0	0.0
	1:00	19.1	89.3	0.0	296.0	
	2:00	18.5	93.1	0.0	249.0	
	3:00	18.4	85.6	3.0	293.0	
	4:00	18.4	79.4	1.0	240.0	
	5:00	18.3	80.4	0.0	184.0	
	6:00	17.7	86.1	0.0	183.0	
	7:00	17.7	81.2	0.0	208.0	
	8:00	17.7	83.2	0.0	217.0	
	9:00	18.1	80.5	0.0	218.0	
	10:00	19.4	73.1	1.0	262.0	
	11:00	20.3	72.1	1.0	217.0	
	12:00	20.9	65.1	4.0	256.0	
	13:00	22.1	58.7	3.0	327.0	
	14:00	22.2	61.6	4.0	282.0	
	15:00	23.1	50.8	4.0	313.0	
	16:00	23.8	49.9	3.0	238.0	
	17:00	23.5	53.1	1.0	269.0	
	18:00	22.4	63.8	3.0	286.0	
	19:00	21.2	69.2	4.0	320.0	
	20:00	19.9	72.9	3.0	275.0	
	21:00	19.0	76.2	3.0	297.0	
	22:00	18.1	81.2	0.0	292.0	
	23:00	17.3	85.8	0.0	261.0	
<b>Max</b>		<b>23.8</b>	<b>93.1</b>	<b>4.0</b>	<b>--</b>	
<b>Min</b>		<b>17.3</b>	<b>49.9</b>	<b>0.0</b>	<b>--</b>	

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.



## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Sampling Location : Near Raw Water Reservoir  
 3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp <sup>o</sup> C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
15.12.2014	0:00	16.3	90.6	0.0	348.0	0.0
	1:00	15.8	94.3	0.0	208.0	
	2:00	14.9	96.2	0.0	217.0	
	3:00	14.4	95.4	1.0	228.0	
	4:00	13.7	97.9	0.0	251.0	
	5:00	13.4	97.9	0.0	251.0	
	6:00	13.1	97.9	0.0	297.0	
	7:00	12.6	97.8	1.0	221.0	
	8:00	12.2	97.8	3.0	196.0	
	9:00	13.7	91.5	1.0	304.0	
	10:00	17.0	69.1	1.0	213.0	
	11:00	20.2	52.2	1.0	228.0	
	12:00	23.1	45.4	1.0	225.0	
	13:00	26.0	38.0	0.0	288.0	
	14:00	26.0	38.0	0.0	288.0	
	15:00	28.6	37.0	1.0	334.0	
	16:00	27.1	41.8	4.0	310.0	
	17:00	27.2	40.4	1.0	345.0	
	18:00	26.2	45.5	0.0	77.0	
	19:00	24.1	58.4	0.0	110.0	
20:00	22.5	68.6	0.0	15.0		
21:00	21.2	75.6	0.0	283.0		
22:00	20.3	69.6	1.0	288.0		
23:00	20.5	73.6	0.0	237.0		
<b>Max</b>		<b>28.6</b>	<b>97.9</b>	<b>4.0</b>	<b>--</b>	
<b>Min</b>		<b>12.2</b>	<b>37.0</b>	<b>0.0</b>	<b>--</b>	

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For Visiontek Consultancy Services Pvt. Ltd.



## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Sampling Location : Near Raw Water Reservoir  
 3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp <sup>o</sup> C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
16.12.2014	0:00	19.4	80.0	0.0	238.0	0.0
	1:00	18.3	80.2	1.0	183.0	
	2:00	18.3	79.8	0.0	234.0	
	3:00	18.2	84.7	0.0	303.0	
	4:00	18.3	81.3	0.0	203.0	
	5:00	18.3	85.6	1.0	183.0	
	6:00	17.9	87.7	0.0	210.0	
	7:00	17.8	89.0	0.0	216.0	
	8:00	17.3	91.2	0.0	273.0	
	9:00	18.1	75.4	3.0	201.0	
	10:00	20.3	62.0	4.0	218.0	
	11:00	22.1	48.6	6.0	245.0	
	12:00	23.4	45.5	6.0	249.0	
	13:00	24.8	41.3	4.0	218.0	
	14:00	25.8	39.6	4.0	262.0	
	15:00	26.3	36.2	4.0	179.0	
	16:00	26.2	35.0	9.0	172.0	
	17:00	26.1	38.0	9.0	183.0	
	18:00	25.2	42.2	4.0	182.0	
	19:00	24.0	37.7	3.0	136.0	
	20:00	22.7	44.0	0.0	255.0	
	21:00	20.7	45.9	0.0	152.0	
	22:00	20.1	47.0	9.0	182.0	
	23:00	19.4	47.4	12.0	180.0	
<b>Max</b>		<b>26.3</b>	<b>91.2</b>	<b>12.0</b>	<b>--</b>	
<b>Min</b>		<b>17.3</b>	<b>35.0</b>	<b>0.0</b>	<b>--</b>	

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For Visiontek Consultancy Services Pvt. Ltd.



## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Sampling Location : Near Raw Water Reservoir
3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp°C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
17.12.2014	0:00	18.4	51.5	16.0	182.0	0.0
	1:00	17.6	54.1	12.0	182.0	
	2:00	16.7	61.9	8.0	186.0	
	3:00	15.6	65.2	3.0	207.0	
	4:00	15.1	67.8	4.0	214.0	
	5:00	14.4	72.0	4.0	184.0	
	6:00	13.8	69.2	4.0	182.0	
	7:00	12.8	75.1	1.0	180.0	
	8:00	11.9	77.3	0.0	206.0	
	9:00	13.3	61.9	4.0	213.0	
	10:00	15.9	50.9	6.0	176.0	
	11:00	18.3	40.2	9.0	204.0	
	12:00	20.2	32.6	4.0	200.0	
	13:00	22.3	26.0	1.0	240.0	
	14:00	23.9	25.4	3.0	148.0	
	15:00	23.7	12.9	1.0	204.0	
	16:00	23.9	25.1	6.0	120.0	
	17:00	23.0	27.0	8.0	103.0	
	18:00	22.1	33.4	4.0	11.0	
	19:00	20.2	38.5	1.0	29.0	
	20:00	18.2	53.4	0.0	18.0	
	21:00	18.2	53.4	0.0	18.0	
	22:00	16.5	57.7	0.0	354.0	
	23:00	15.4	57.8	0.0	159.0	
<b>Max</b>		<b>23.9</b>	<b>77.3</b>	<b>16.0</b>	<b>--</b>	
<b>Min</b>		<b>11.9</b>	<b>12.9</b>	<b>0.0</b>	<b>--</b>	

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For Visiontek Consultancy Services Pvt. Ltd.





## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Sampling Location : Near Raw Water Reservoir
3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp°C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
18.12.2014	0:00	14.3	69.2	0.0	285.0	0.0
	1:00	13.1	74.9	0.0	285.0	
	2:00	13.7	64.7	1.0	200.0	
	3:00	12.5	75.9	1.0	264.0	
	4:00	11.7	76.4	1.0	217.0	
	5:00	11.1	80.0	3.0	218.0	
	6:00	10.5	82.6	3.0	225.0	
	7:00	9.9	87.3	1.0	278.0	
	8:00	8.8	90.2	1.0	187.0	
	9:00	10.8	76.5	3.0	230.0	
	10:00	14.4	60.2	3.0	242.0	
	11:00	17.8	45.1	4.0	182.0	
	12:00	20.6	35.0	3.0	262.0	
	13:00	22.5	29.4	3.0	228.0	
	14:00	23.4	28.1	3.0	7.0	
	15:00	24.6	24.7	3.0	341.0	
	16:00	25.2	22.8	1.0	286.0	
	17:00	24.9	25.2	3.0	261.0	
	18:00	23.3	27.0	1.0	218.0	
	19:00	20.8	32.6	1.0	228.0	
	20:00	18.8	49.4	0.0	303.0	
	21:00	17.6	57.5	0.0	258.0	
	22:00	15.4	64.7	0.0	276.0	
	23:00	14.2	60.0	0.0	285.0	
<b>Max</b>		<b>25.2</b>	<b>90.2</b>	<b>4.0</b>	<b>--</b>	
<b>Min</b>		<b>8.8</b>	<b>22.8</b>	<b>0.0</b>	<b>--</b>	

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For Visiontek Consultancy Services Pvt. Ltd.



Ref.:VCSPL/15/R-112(xix)

Date:19.12.2014

## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Sampling Location : Near Raw Water Reservoir  
 3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp°C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
19.12.2014	0:00	13.0	74.9	0.0	218.0	0.0
	1:00	11.6	77.7	0.0	207.0	
	2:00	11.1	86.1	1.0	221.0	
	3:00	10.3	84.3	0.0	216.0	
	4:00	10.4	89.8	0.0	12.0	
	5:00	9.9	87.3	1.0	241.0	
	6:00	9.9	89.8	1.0	271.0	
	7:00	8.9	93.9	1.0	193.0	
	8:00	8.9	93.9	1.0	217.0	
	9:00	10.6	81.8	0.0	214.0	
	10:00	13.7	64.7	1.0	254.0	
	11:00	17.7	44.7	3.0	223.0	
	12:00	20.9	32.0	4.0	230.0	
	13:00	22.8	27.5	4.0	249.0	
	14:00	24.1	25.5	3.0	204.0	
	15:00	24.9	19.0	3.0	292.0	
	16:00	25.6	19.0	4.0	216.0	
	17:00	25.7	20.2	1.0	220.0	
	18:00	24.2	26.0	0.0	268.0	
	19:00	21.6	31.1	1.0	258.0	
	20:00	18.7	41.2	0.0	258.0	
	21:00	17.3	52.7	0.0	348.0	
	22:00	15.8	61.7	0.0	309.0	
	23:00	14.7	58.2	0.0	290.0	
<b>Max</b>		<b>25.7</b>	<b>93.9</b>	<b>4.0</b>	<b>--</b>	
<b>Min</b>		<b>8.9</b>	<b>19.0</b>	<b>0.0</b>	<b>--</b>	

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**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.



## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Sampling Location : Near Raw Water Reservoir  
 3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp°C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
20.12.2014	0:00	13.3	71.5	0.0	258.0	0.0
	1:00	12.7	70.9	1.0	221.0	
	2:00	12.2	74.1	1.0	242.0	
	3:00	11.7	76.5	0.0	266.0	
	4:00	10.3	86.9	0.0	345.0	
	5:00	10.2	86.6	0.0	319.0	
	6:00	9.6	88.0	0.0	293.0	
	7:00	9.3	86.9	0.0	265.0	
	8:00	9.6	84.3	0.0	228.0	
	9:00	11.3	73.1	0.0	244.0	
	10:00	14.6	57.3	0.0	231.0	
	11:00	18.6	44.8	1.0	199.0	
	12:00	22.1	33.1	1.0	279.0	
	13:00	24.0	28.0	3.0	279.0	
	14:00	24.8	26.1	1.0	289.0	
	15:00	25.4	26.2	4.0	88.0	
	16:00	25.1	23.2	8.0	32.0	
	17:00	24.9	25.2	8.0	91.0	
	18:00	23.7	27.0	3.0	28.0	
	19:00	21.2	39.1	0.0	12.0	
	20:00	19.1	42.8	0.0	343.0	
	21:00	17.6	51.3	0.0	351.0	
	22:00	16.6	57.5	0.0	344.0	
	23:00	16.4	56.2	1.0	341.0	
<b>Max</b>		<b>25.4</b>	<b>88.0</b>	<b>8.0</b>	<b>--</b>	
<b>Min</b>		<b>9.3</b>	<b>23.2</b>	<b>0.0</b>	<b>--</b>	

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## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Sampling Location : Near Raw Water Reservoir  
 3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp°C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
21.12.2014	0:00	15.4	67.3	0.0	269.0	0.0
	1:00	13.7	75.5	0.0	258.0	
	2:00	13.2	80.7	0.0	259.0	
	3:00	12.4	84.3	0.0	259.0	
	4:00	11.9	86.5	0.0	203.0	
	5:00	11.3	88.8	0.0	208.0	
	6:00	10.6	89.8	0.0	214.0	
	7:00	10.6	91.3	0.0	217.0	
	8:00	10.9	89.8	0.0	347.0	
	9:00	12.4	77.5	0.0	214.0	
	10:00	14.6	66.4	0.0	220.0	
	11:00	17.6	51.4	0.0	351.0	
	12:00	20.9	37.5	0.0	320.0	
	13:00	23.3	31.1	0.0	35.0	
	14:00	25.1	30.2	0.0	80.0	
	15:00	24.0	30.0	4.0	79.0	
	16:00	24.4	29.2	3.0	176.0	
	17:00	25.1	28.4	1.0	72.0	
	18:00	23.8	34.4	0.0	340.0	
	19:00	20.9	48.5	0.0	295.0	
	20:00	18.8	59.3	0.0	333.0	
	21:00	17.6	65.5	0.0	351.0	
	22:00	16.1	71.1	0.0	354.0	
	23:00	14.8	76.8	0.0	127.0	
<b>Max</b>		<b>25.1</b>	<b>91.3</b>	<b>4.0</b>	<b>--</b>	
<b>Min</b>		<b>10.6</b>	<b>28.4</b>	<b>0.0</b>	<b>--</b>	

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For Visiontek Consultancy Services Pvt. Ltd.



## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Sampling Location : Near Raw Water Reservoir  
 3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp°C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
22.12.2014	0:00	13.9	78.3	0.0	279.0	0.0
	1:00	12.6	87.8	1.0	258.0	
	2:00	12.1	90.2	0.0	200.0	
	3:00	11.8	92.3	0.0	201.0	
	4:00	11.5	93.7	0.0	268.0	
	5:00	11.5	93.9	0.0	203.0	
	6:00	10.8	97.9	0.0	264.0	
	7:00	10.3	98.4	1.0	211.0	
	8:00	10.7	96.2	0.0	251.0	
	9:00	11.7	89.0	1.0	234.0	
	10:00	14.5	75.2	0.0	214.0	
	11:00	17.9	58.1	0.0	187.0	
	12:00	21.8	42.2	0.0	355.0	
	13:00	24.3	33.9	1.0	19.0	
	14:00	25.2	28.2	3.0	245.0	
	15:00	25.7	27.3	1.0	275.0	
	16:00	26.4	25.9	3.0	292.0	
	17:00	26.0	26.2	1.0	309.0	
	18:00	23.3	36.9	3.0	103.0	
	19:00	22.2	51.0	0.0	87.0	
20:00	19.9	63.0	0.0	8.0		
21:00	18.4	68.8	0.0	331.0		
22:00	17.1	73.5	0.0	353.0		
23:00	15.5	75.6	0.0	304.0		
<b>Max</b>		<b>26.4</b>	<b>98.4</b>	<b>3.0</b>	<b>--</b>	
<b>Min</b>		<b>10.3</b>	<b>25.9</b>	<b>0.0</b>	<b>--</b>	

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## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Sampling Location : Near Raw Water Reservoir
3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp°C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
23.12.2014	0:00	15.4	81.5	0.0	304.0	0.0
	1:00	13.7	86.9	0.0	220.0	
	2:00	12.9	89.5	0.0	220.0	
	3:00	12.3	93.0	0.0	204.0	
	4:00	11.5	96.2	0.0	207.0	
	5:00	11.3	96.2	0.0	210.0	
	6:00	11.4	93.1	0.0	241.0	
	7:00	10.7	96.2	0.0	241.0	
	8:00	10.0	97.9	0.0	244.0	
	9:00	11.2	90.5	0.0	216.0	
	10:00	14.5	71.1	1.0	245.0	
	11:00	18.5	55.9	0.0	234.0	
	12:00	22.1	43.5	0.0	360.0	
	13:00	24.5	33.7	0.0	66.0	
	14:00	25.6	25.7	3.0	264.0	
	15:00	26.2	26.4	1.0	317.0	
	16:00	26.3	27.2	1.0	350.0	
	17:00	26.0	27.6	1.0	350.0	
	18:00	24.8	36.6	1.0	64.0	
	19:00	21.9	51.2	0.0	348.0	
20:00	19.8	63.8	0.0	350.0		
21:00	18.6	70.4	0.0	350.0		
22:00	17.4	71.1	0.0	347.0		
23:00	16.1	73.3	0.0	328.0		
<b>Max</b>		<b>26.3</b>	<b>97.9</b>	<b>3.0</b>	<b>--</b>	
<b>Min</b>		<b>10.0</b>	<b>25.7</b>	<b>0.0</b>	<b>--</b>	

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 (GAZETTE No. 834 Dt. 12-04-2013)

For Visiontek Consultancy Services Pvt. Ltd.



## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Sampling Location : Near Raw Water Reservoir
3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp°C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
24.12.2014	0:00	15.6	77.3	0.0	328.0	0.0
	1:00	14.9	82.3	0.0	207.0	
	2:00	12.8	88.7	0.0	249.0	
	3:00	12.3	92.5	0.0	249.0	
	4:00	11.6	93.9	0.0	230.0	
	5:00	11.2	96.2	0.0	217.0	
	6:00	11.1	97.6	0.0	210.0	
	7:00	11.3	95.2	0.0	210.0	
	8:00	10.9	96.2	0.0	210.0	
	9:00	11.9	87.8	0.0	228.0	
	10:00	15.4	70.2	0.0	196.0	
	11:00	18.8	57.7	0.0	269.0	
	12:00	21.7	43.8	0.0	258.0	
	13:00	24.3	36.1	0.0	249.0	
	14:00	25.6	31.0	3.0	214.0	
	15:00	26.4	26.0	4.0	242.0	
	16:00	27.1	21.7	1.0	199.0	
	17:00	26.9	27.4	0.0	87.0	
	18:00	24.3	42.1	4.0	91.0	
	19:00	22.2	51.3	0.0	7.0	
20:00	20.1	63.8	0.0	326.0		
21:00	18.6	68.1	0.0	327.0		
22:00	17.4	69.6	0.0	330.0		
23:00	16.6	76.4	0.0	152.0		
<b>Max</b>		<b>27.1</b>	<b>97.6</b>	<b>4.0</b>	<b>--</b>	
<b>Min</b>		<b>10.9</b>	<b>21.7</b>	<b>0.0</b>	<b>--</b>	

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.



## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Sampling Location : Near Raw Water Reservoir
3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp°C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
25.12.2014	0:00	15.4	83.4	1.0	234.0	0.0
	1:00	15.2	84.8	0.0	296.0	
	2:00	14.4	82.3	0.0	304.0	
	3:00	13.6	87.1	0.0	252.0	
	4:00	13.8	75.9	1.0	258.0	
	5:00	13.8	80.0	0.0	242.0	
	6:00	12.9	85.7	0.0	245.0	
	7:00	12.5	84.1	0.0	220.0	
	8:00	12.0	85.2	0.0	289.0	
	9:00	12.4	83.7	1.0	192.0	
	10:00	15.6	60.8	1.0	207.0	
	11:00	19.4	44.7	1.0	207.0	
	12:00	22.7	34.0	1.0	264.0	
	13:00	25.2	27.3	1.0	269.0	
	14:00	25.7	26.0	11.0	129.0	
	15:00	25.7	26.4	11.0	183.0	
	16:00	25.8	28.5	9.0	50.0	
	17:00	25.6	28.9	6.0	56.0	
	18:00	24.6	33.5	4.0	50.0	
	19:00	22.5	43.0	1.0	42.0	
20:00	20.1	58.4	0.0	363.0		
21:00	19.5	51.0	0.0	265.0		
22:00	20.0	42.0	4.0	213.0		
23:00	19.2	34.8	4.0	194.0		
<b>Max</b>		<b>25.8</b>	<b>87.1</b>	<b>11.0</b>	<b>--</b>	
<b>Min</b>		<b>12.0</b>	<b>26.0</b>	<b>0</b>	<b>--</b>	

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For Visiontek Consultancy Services Pvt. Ltd.





## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Sampling Location : Near Raw Water Reservoir  
 3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp <sup>o</sup> C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
26.12.2014	0:00	17.5	47.6	4.0	216.0	0.0
	1:00	15.8	54.4	0.0	357.0	
	2:00	14.8	58.7	0.0	256.0	
	3:00	13.3	66.1	0.0	216.0	
	4:00	12.4	71.4	1.0	247.0	
	5:00	11.8	75.2	0.0	216.0	
	6:00	11.5	75.5	0.0	214.0	
	7:00	11.2	82.9	1.0	238.0	
	8:00	10.2	84.5	1.0	217.0	
	9:00	11.4	72.4	0.0	189.0	
	10:00	14.8	49.2	1.0	266.0	
	11:00	18.7	38.8	1.0	237.0	
	12:00	21.5	32.5	3.0	231.0	
	13:00	23.6	28.4	1.0	279.0	
	14:00	24.2	26.7	8.0	148.0	
	15:00	24.3	27.1	11.0	129.0	
	16:00	24.4	28.3	12.0	142.0	
	17:00	24.3	32.1	6.0	57.0	
	18:00	23.2	35.8	4.0	48.0	
	19:00	21.3	43.9	1.0	33.0	
20:00	19.9	41.4	0.0	241.0		
21:00	19.6	44.9	0.0	192.0		
22:00	18.8	46.7	4.0	187.0		
23:00	17.8	46.2	9.0	183.0		
<b>Max</b>		<b>24.4</b>	<b>84.5</b>	<b>12.0</b>	<b>--</b>	
<b>Min</b>		<b>10.2</b>	<b>26.7</b>	<b>0.0</b>	<b>--</b>	

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For Visiontek Consultancy Services Pvt. Ltd.



### METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Sampling Location : Near Raw Water Reservoir
3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp <sup>°C</sup>	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
27.12.2014	0:00	16.9	49.4	8.0	187.0	0.0
	1:00	15.8	51.4	1.0	227.0	
	2:00	14.3	57.1	1.0	234.0	
	3:00	13.7	61.0	1.0	217.0	
	4:00	12.8	64.4	1.0	244.0	
	5:00	11.6	77.3	1.0	199.0	
	6:00	10.6	81.6	0.0	208.0	
	7:00	10.0	86.3	0.0	207.0	
	8:00	9.8	87.9	0.0	211.0	
	9:00	10.8	76.4	0.0	169.0	
	10:00	13.6	61.7	1.0	232.0	
	11:00	16.8	46.7	1.0	182.0	
	12:00	19.6	34.4	1.0	271.0	
	13:00	21.4	29.2	1.0	183.0	
	14:00	23.2	27.0	1.0	323.0	
	15:00	23.3	27.9	0.0	145.0	
	16:00	23.2	25.3	4.0	97.0	
	17:00	22.9	20.5	4.0	196.0	
	18:00	22.2	26.5	3.0	49.0	
	19:00	19.9	41.3	1.0	36.0	
	20:00	17.8	52.2	0.0	333.0	
	21:00	16.2	59.8	0.0	345.0	
	22:00	14.9	65.0	0.0	345.0	
	23:00	13.7	70.3	0.0	345.0	
<b>Max</b>		<b>23.3</b>	<b>87.9</b>	<b>8.0</b>	<b>--</b>	
<b>Min</b>		<b>9.8</b>	<b>20.5</b>	<b>0.0</b>	<b>--</b>	

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For Visiontek Consultancy Services Pvt. Ltd.



## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Sampling Location : Near Raw Water Reservoir  
 3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp°C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
28.12.2014	0:00	12.1	79.6	0.0	249.0	0.0
	1:00	11.2	85.1	0.0	242.0	
	2:00	10.3	89.8	0.0	221.0	
	3:00	10.1	79.7	1.0	238.0	
	4:00	9.6	87.8	0.0	216.0	
	5:00	9.5	79.2	0.0	220.0	
	6:00	8.4	85.2	1.0	237.0	
	7:00	7.8	83.1	1.0	218.0	
	8:00	7.8	83.3	3.0	228.0	
	9:00	9.0	72.0	1.0	228.0	
	10:00	12.7	56.3	0.0	213.0	
	11:00	16.4	39.9	3.0	204.0	
	12:00	19.6	29.8	3.0	249.0	
	13:00	21.8	26.3	1.0	176.0	
	14:00	22.8	24.7	3.0	182.0	
	15:00	23.6	19.4	4.0	182.0	
	16:00	24.3	19.0	3.0	336.0	
	17:00	24.3	20.9	1.0	79.0	
	18:00	22.5	31.5	1.0	66.0	
	19:00	20.2	37.3	0.0	90.0	
	20:00	17.7	52.5	0.0	338.0	
	21:00	16.2	57.6	0.0	330.0	
	22:00	15.1	64.7	0.0	292.0	
	23:00	13.1	69.0	1.0	269.0	
<b>Max</b>		<b>24.3</b>	<b>89.8</b>	<b>4.0</b>	<b>--</b>	
<b>Min</b>		<b>7.8</b>	<b>19.0</b>	<b>0.0</b>	<b>--</b>	

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For Visiontek Consultancy Services Pvt. Ltd.



## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Sampling Location : Near Raw Water Reservoir  
 3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp°C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
29.12.2014	0:00	11.9	73.0	0.0	255.0	0.0
	1:00	10.4	86.1	0.0	231.0	
	2:00	10.0	81.5	1.0	237.0	
	3:00	9.9	81.5	1.0	245.0	
	4:00	9.4	80.8	0.0	203.0	
	5:00	9.1	84.3	1.0	1.0	
	6:00	8.4	88.9	0.0	245.0	
	7:00	8.0	89.8	1.0	201.0	
	8:00	8.4	82.4	1.0	216.0	
	9:00	9.5	70.2	3.0	244.0	
	10:00	12.2	57.5	4.0	230.0	
	11:00	16.1	42.8	3.0	224.0	
	12:00	20.0	31.7	1.0	326.0	
	13:00	22.6	27.0	1.0	5.0	
	14:00	23.8	25.4	1.0	175.0	
	15:00	25.2	25.7	0.0	216.0	
	16:00	25.7	19.0	3.0	208.0	
	17:00	25.4	25.1	1.0	224.0	
	18:00	24.3	27.5	3.0	190.0	
	19:00	21.7	33.5	1.0	280.0	
	20:00	19.6	40.8	0.0	268.0	
	21:00	18.8	42.6	1.0	321.0	
	22:00	17.5	50.9	0.0	16.0	
	23:00	16.7	54.1	0.0	12.0	
<b>Max</b>		<b>25.7</b>	<b>89.8</b>	<b>4.0</b>	<b>--</b>	
<b>Min</b>		<b>8.0</b>	<b>19.0</b>	<b>0.0</b>	<b>--</b>	

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For Visiontek Consultancy Services Pvt. Ltd.



## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Sampling Location : Near Raw Water Reservoir
3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp <sup>o</sup> C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
30.12.2014	0:00	15.7	65.9	0.0	218.0	0.0
	1:00	14.2	72.3	0.0	223.0	
	2:00	13.9	70.2	0.0	208.0	
	3:00	13.0	78.5	0.0	248.0	
	4:00	12.2	77.8	0.0	290.0	
	5:00	12.1	82.4	0.0	193.0	
	6:00	11.8	83.8	0.0	208.0	
	7:00	11.8	80.4	1.0	211.0	
	8:00	11.5	80.4	0.0	208.0	
	9:00	12.3	72.8	1.0	238.0	
	10:00	15.3	60.7	1.0	204.0	
	11:00	19.3	45.0	1.0	221.0	
	12:00	22.4	36.3	3.0	272.0	
	13:00	24.9	32.6	3.0	314.0	
	14:00	26.8	31.2	3.0	351.0	
	15:00	27.7	33.1	0.0	312.0	
	16:00	27.2	35.9	8.0	328.0	
	17:00	24.5	40.5	11.0	314.0	
	18:00	22.3	45.0	9.0	337.0	
	19:00	21.3	50.2	6.0	312.0	
	20:00	20.7	54.5	6.0	314.0	
	21:00	20.5	56.3	3.0	319.0	
	22:00	20.1	58.4	0.0	297.0	
23:00	19.7	62.9	1.0	313.0		
<b>Max</b>		<b>27.7</b>	<b>83.8</b>	<b>11.0</b>	<b>--</b>	
<b>Min</b>		<b>11.5</b>	<b>31.2</b>	<b>0.0</b>	<b>--</b>	

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For Visiontek Consultancy Services Pvt. Ltd.



## METEOROLOGICAL DATA

1. Name of the Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Sampling Location : Near Raw Water Reservoir
3. Data Recorded By : VCSPL Representative in presence of Aditya Aluminium Representative

Date	Time	Temp <sup>o</sup> C	Humidity in (%)	Wind Speed in Km/hr	Wind Direction in degree	Total Rain Fall in mm
31.12.2014	0:00	18.6	85.7	1.0	321.0	0.2
	1:00	17.4	92.4	1.0	275.0	
	2:00	17.4	91.8	3.0	251.0	
	3:00	17.2	93.3	1.0	265.0	
	4:00	17.0	93.6	4.0	264.0	
	5:00	16.9	92.8	1.0	238.0	
	6:00	16.8	96.1	1.0	266.0	
	7:00	17.1	97.1	1.0	264.0	
	8:00	17.4	95.4	0.0	207.0	
	9:00	17.6	93.1	3.0	216.0	
	10:00	17.9	94.8	4.0	259.0	
	11:00	18.8	90.6	4.0	193.0	
	12:00	19.1	83.8	4.0	235.0	
	13:00	20.0	73.4	3.0	224.0	
	14:00	20.6	69.1	6.0	141.0	
	15:00	21.5	62.1	4.0	244.0	
	16:00	21.9	57.5	4.0	264.0	
	17:00	21.6	61.2	1.0	210.0	
	18:00	20.8	66.2	1.0	206.0	
	19:00	20.4	64.4	1.0	208.0	
	20:00	20.1	67.3	1.0	221.0	
	21:00	19.7	71.9	1.0	273.0	
	22:00	19.6	72.4	1.0	296.0	
	23:00	19.8	76.1	0.0	268.0	
<b>Max</b>		<b>21.9</b>	<b>97.1</b>	<b>6.0</b>	<b>--</b>	
<b>Min</b>		<b>16.8</b>	<b>57.5</b>	<b>0.0</b>	<b>--</b>	

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**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.

**Annexure-2**

**AMBIENT AIR QUALITY MONITORING REPORT**





Ref.: VCSPL/15/R-113

Date: 05.02.2015

### AMBIENT AIR QUALITY MONITORING REPORT

- Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
- Sampling Location : Monitoring Station No.- AAQ 1 (Gumkarama)
- Monitoring Instruments : RDS(APM 460 BL), FPS(APM 550) Envirotech, CO Monitor, VOC Sampler
- Sample collected by : VCSPL representative in presence of Aditya Aluminium representative

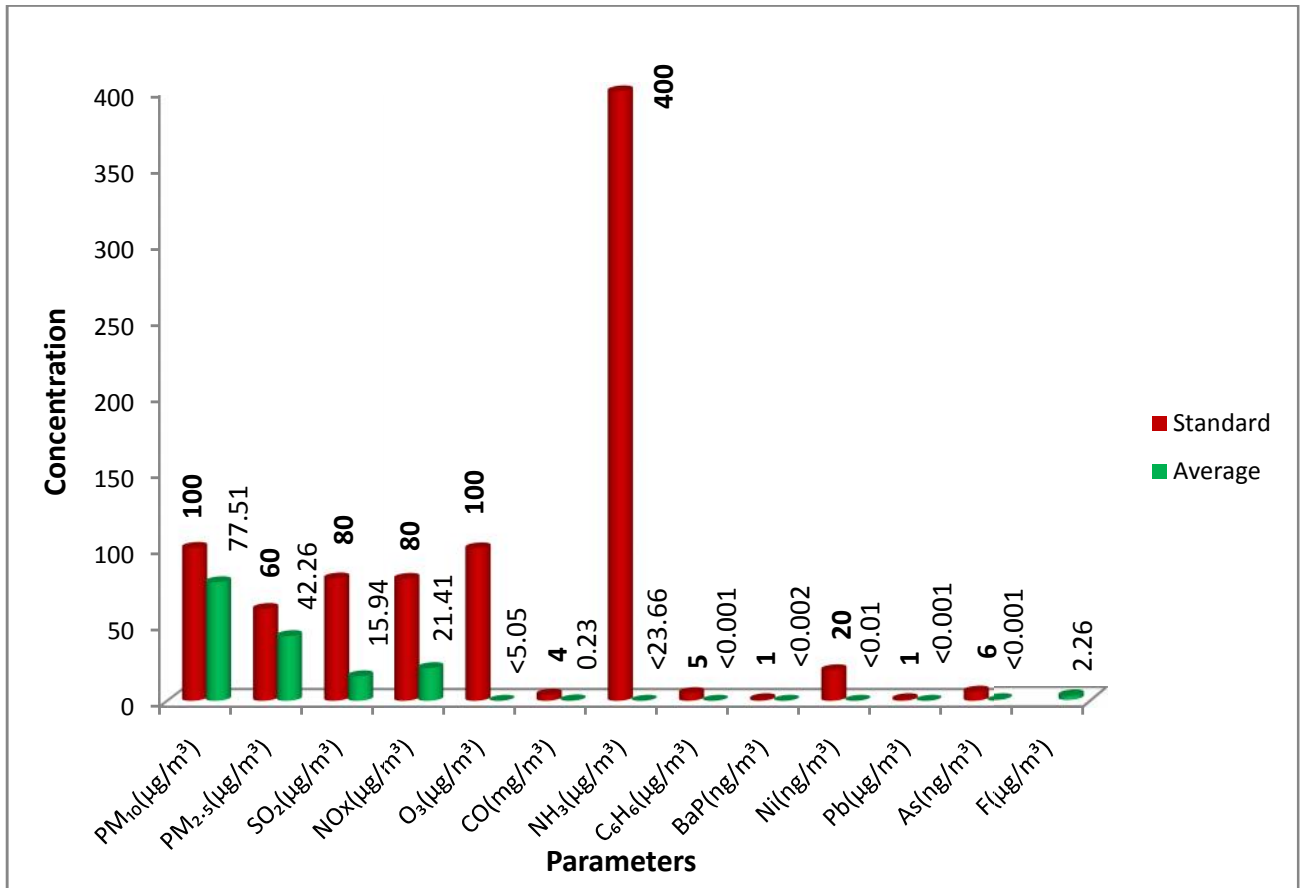
Date	PARAMETERS												
	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	F (µg/m <sup>3</sup> )
14.10.2014	72.5	40.3	13.0	17.5	<4.0	0.15	21.9	<0.001	<0.002	<0.01	<0.001	<0.001	1.67
17.10.2014	74.2	41.4	13.4	17.9	<4.0	0.16	23.3	<0.001	<0.002	<0.01	<0.001	<0.001	1.94
20.10.2014	70.4	38.2	13.4	18.4	<4.0	0.16	20.5	<0.001	<0.002	<0.01	<0.001	<0.001	1.81
23.10.2014	76.5	44.5	14.2	18.8	<4.0	0.18	23.3	<0.001	<0.002	<0.01	<0.001	<0.001	1.94
27.10.2014	64.2	32.2	13.4	18.4	<4.0	0.16	21.9	<0.001	<0.002	<0.01	<0.001	<0.001	1.81
30.10.2014	74.8	43.2	14.6	19.3	4.6	0.17	24.7	<0.001	<0.002	<0.01	<0.001	<0.001	1.94
03.11.2014	72.2	37.6	15.4	20.2	4.8	0.18	24.7	<0.001	<0.002	<0.01	<0.001	<0.001	1.81
06.11.2014	75.3	40.3	15.7	20.6	5.2	0.20	26.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.94
10.11.2014	70.9	37.1	15.4	20.6	5.4	0.18	23.3	<0.001	<0.002	<0.01	<0.001	<0.001	1.81
13.11.2014	78.2	42.5	16.1	21.1	5.2	0.21	21.9	<0.001	<0.002	<0.01	<0.001	<0.001	2.08
17.11.2014	76.5	42.3	15.7	20.6	4.8	0.20	23.3	<0.001	<0.002	<0.01	<0.001	<0.001	2.22
20.11.2014	79.4	44.6	16.1	21.5	5.3	0.22	24.7	<0.001	<0.002	<0.01	<0.001	<0.001	2.22
24.11.2014	78.6	43.1	16.5	21.5	5.4	0.22	23.3	<0.001	<0.002	<0.01	<0.001	<0.001	2.08
27.11.2014	81.5	44.8	16.9	22.0	5.4	0.24	24.7	<0.001	<0.002	<0.01	<0.001	<0.001	2.22
01.12.2014	82.5	45.6	17.7	23.8	5.5	0.28	26.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.50
04.12.2014	80.4	44.8	17.3	23.3	5.5	0.27	24.7	<0.001	<0.002	<0.01	<0.001	<0.001	2.78
08.12.2014	78.6	44.2	17.3	23.8	5.4	0.26	24.7	<0.001	<0.002	<0.01	<0.001	<0.001	2.64
11.12.2014	84.3	48.2	17.7	24.2	5.5	0.25	23.3	<0.001	<0.002	<0.01	<0.001	<0.001	2.78
15.12.2014	86.5	50.1	18.1	24.6	5.9	0.28	26.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.78
18.12.2014	85.5	47.6	17.7	24.2	6.1	0.27	24.7	<0.001	<0.002	<0.01	<0.001	<0.001	2.78
22.12.2014	87.2	49.4	18.1	25.1	6.2	0.28	27.4	<0.001	<0.002	<0.01	<0.001	<0.001	2.92
25.12.2014	89.4	50.6	18.5	25.5	6.2	0.28	26.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.92
29.12.2014	83.6	48.2	17.7	24.2	5.9	0.26	24.7	<0.001	<0.002	<0.01	<0.001	<0.001	2.78
01.01.2015	54.5	24.2	11.4	15.4	<4.0	0.18	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.08
05.01.2015	76.3	38.2	15.4	21.2	4.5	0.24	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.08
08.01.2015	78.6	40.1	16.1	21.6	5.1	0.26	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.22
12.01.2015	80.2	41.5	16.5	22.1	5.1	0.28	23.1	<0.001	<0.002	<0.01	<0.001	<0.001	2.36
15.01.2015	77.5	38.6	16.9	22.1	4.5	0.28	24.5	<0.001	<0.002	<0.01	<0.001	<0.001	2.22
NAAQ Standard	100	60	80	80	100	4	400	05	01	20	1.0	06	--
Average	77.51	42.26	15.94	21.41	<5.05	0.23	<23.66	<0.001	<0.002	<0.01	<0.001	<0.001	2.26
Testing method	Gravimetric	Gravimetric	Improved West and Gaeke method	Modified Jacob & Hochheiser (Na-Arsenite)	Chemical Method	NDIR Spectroscopy	Indo phenol blue method	Absorption & Desorption followed by GC analysis	Solvent extraction followed by Gas Chromatography analysis	AAS method after sampling	AAS method after sampling	AAS method after sampling	Ion Selective method after sampling

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.



**Figure-01: Graph showing Avg AAQ Concentration (AAQ1: Gumkarama) within study area for the month of Oct-2014 to Jan-2015**





Ref.: VCSPL/15/R-114

Date: 05.02.2015

## AMBIENT AIR QUALITY MONITORING REPORT

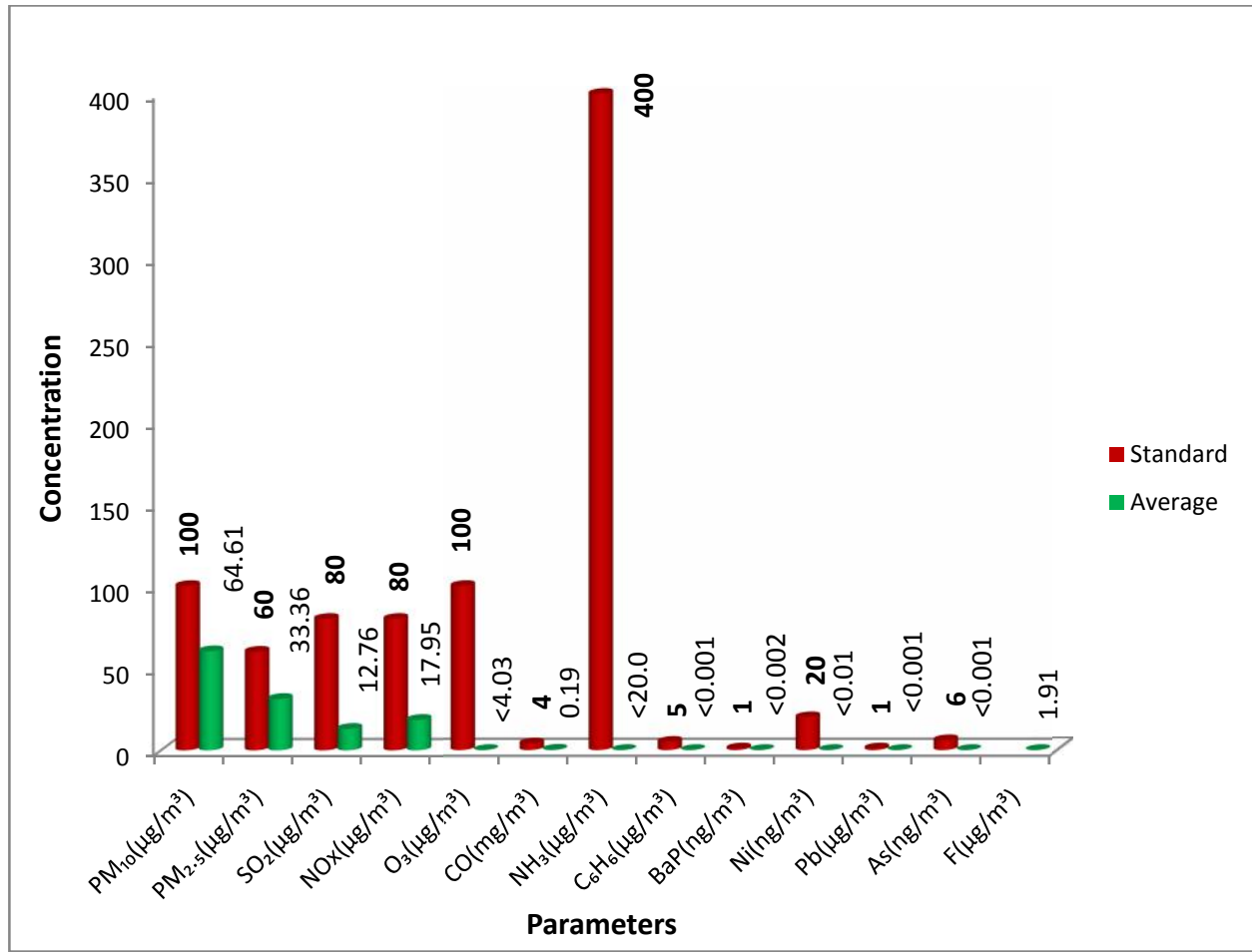
- Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
- Sampling Location : Monitoring Station No.- AAQ 2 (Ghichamura)
- Monitoring Instruments : RDS(APM 460 BL), FPS(APM 550) Envirotech, CO Monitor, VOC Sampler
- Sample collected by : VCSPL representative in presence of Aditya Aluminium representative

Date	PARAMETERS												
	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	F (µg/m <sup>3</sup> )
14.10.2014	61.4	32.3	10.6	15.7	<4.0	0.13	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	0.69
17.10.2014	61.8	31.9	11.0	16.1	<4.0	0.13	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	0.83
20.10.2014	59.8	30.6	11.0	15.7	<4.0	0.12	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.11
23.10.2014	60.7	31.1	11.4	16.1	<4.0	0.13	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.11
27.10.2014	52.1	26.2	11.0	15.4	<4.0	0.13	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.11
30.10.2014	60.2	32.2	11.8	17.0	<4.0	0.14	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.39
03.11.2014	65.5	34.3	12.6	18.4	<4.0	0.18	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.67
06.11.2014	62.1	32.5	12.2	17.5	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.81
10.11.2014	60.8	32.5	12.2	17.9	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.94
13.11.2014	63.5	34.1	12.6	17.9	<4.0	0.17	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.08
17.11.2014	64.2	33.6	12.6	18.4	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.22
20.11.2014	66.8	34.9	13.0	18.4	<4.0	0.18	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.22
24.11.2014	68.3	36.4	13.4	18.8	<4.0	0.20	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.08
27.11.2014	67.4	35.5	13.0	18.4	<4.0	0.19	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.22
01.12.2014	70.2	37.6	13.4	18.8	<4.0	0.21	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.36
04.12.2014	71.5	38.2	14.2	19.3	<4.0	0.22	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.5
08.12.2014	70.4	37.6	13.8	18.8	<4.0	0.21	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.36
11.12.2014	72.6	38.1	14.6	19.3	<4.0	0.22	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.5
15.12.2014	68.6	34.6	13.8	18.8	<4.0	0.23	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.5
18.12.2014	69.4	35.2	13.8	19.7	<4.0	0.24	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.36
22.12.2014	73.2	37.5	14.2	20.2	4.4	0.28	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.5
25.12.2014	66.4	32.6	13.4	19.3	<4.0	0.24	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.22
29.12.2014	68.9	33.9	13.8	20.2	4.4	0.26	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.22
01.01.2015	40.1	18.9	10.2	15.0	<4.0	0.15	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.67
05.01.2015	60.5	29.6	12.6	16.8	<4.0	0.22	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.81
08.01.2015	64.2	31.5	13.4	17.2	<4.0	0.22	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.94
12.01.2015	68.5	35.1	13.8	18.5	<4.0	0.23	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.94
15.01.2015	70.1	35.6	13.8	19.0	<4.0	0.25	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.08
NAAQ Standard	100	60	80	80	100	4	400	05	01	20	1.0	06	--
Average	64.61	33.36	12.76	17.95	<4.03	0.19	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.91
Testing method	Gravimetric	Gravimetric	Improved West and Gaeke method	Modified Jacob & Hochheiser (Na-Arsenite)	Chemical Method	NDIR Spectroscopy	Indo phenol blue method	Absorption & Desorption followed by GC analysis	Solvent extraction followed by Gas Chromatography analysis	AAS method after sampling	AAS method after sampling	AAS method after sampling	Ion Selective method after sampling

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.

**Figure-02: Graph showing Avg AAQ Concentration (AAQ2: Ghichamura) within study area for the month of Oct-2014 to Jan-2015**





Ref.: VCSPL/15/R-115

Date: 05.02.2015

### AMBIENT AIR QUALITY MONITORING REPORT

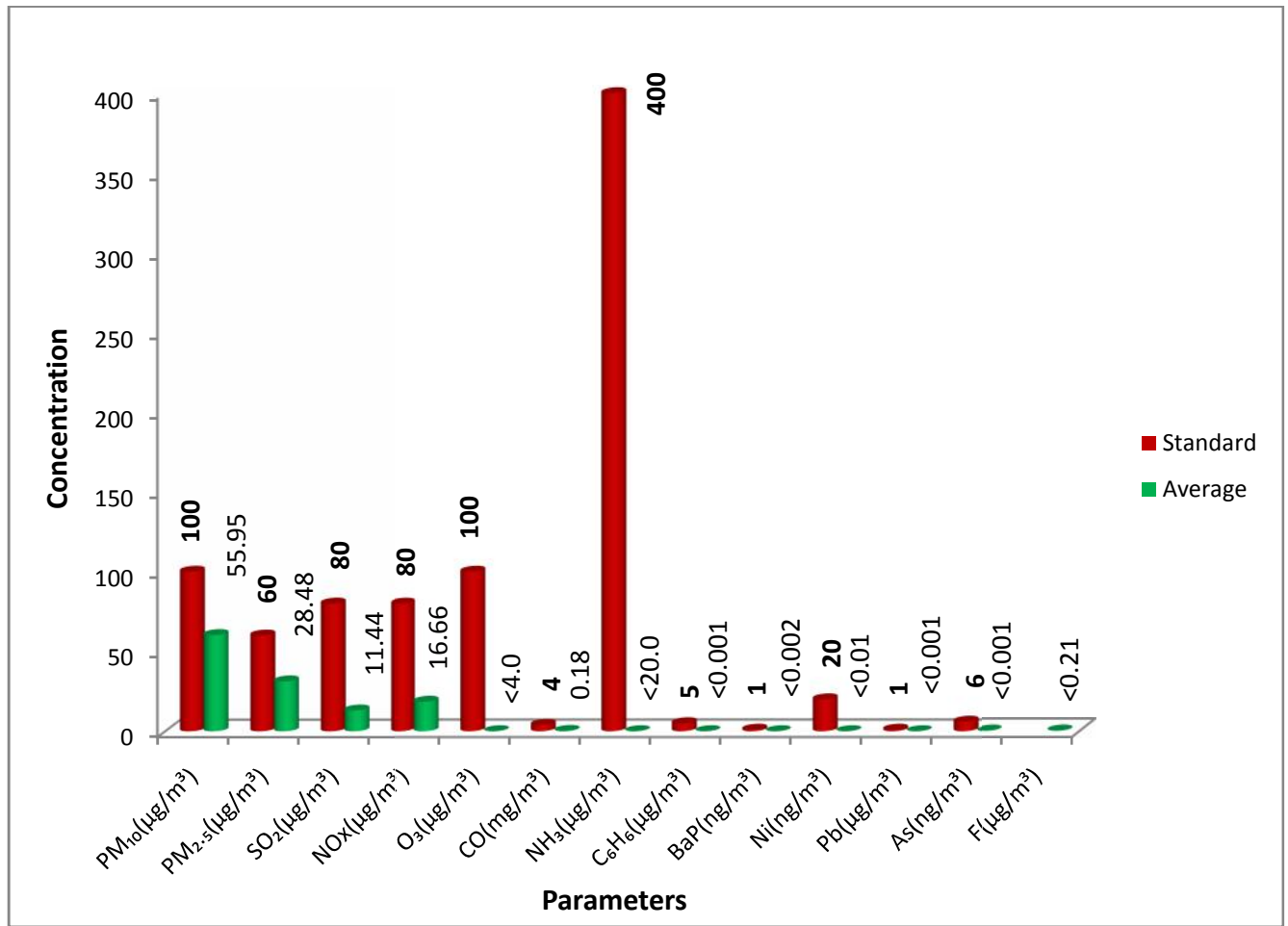
- Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
- Sampling Location : Monitoring Station No.- AAQ 3 (Tileimal)
- Monitoring Instruments : RDS(APM 460 BL), FPS(APM 550) Envirotech, CO Monitor, VOC Sampler
- Sample collected by : VCSPL representative in presence of Aditya Aluminium representative

Date	PARAMETERS												
	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	F (µg/m <sup>3</sup> )
14.10.2014	54.2	28.6	9.8	14.3	<4.0	0.12	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
17.10.2014	55.7	28.6	10.2	14.8	<4.0	0.12	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
20.10.2014	56.3	28.7	10.6	14.8	<4.0	0.13	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
23.10.2014	54.1	27.2	10.2	14.3	<4.0	0.13	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
27.10.2014	46.5	23.4	9.8	14.3	<4.0	0.12	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
30.10.2014	51.6	26.7	10.6	15.2	<4.0	0.13	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
03.11.2014	55.2	28.9	11.4	16.1	<4.0	0.15	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
06.11.2014	53.7	26.5	11.0	15.7	<4.0	0.14	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
10.11.2014	54.8	27.6	11.4	16.6	<4.0	0.15	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
13.11.2014	56.4	28.6	11.8	16.6	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
17.11.2014	55.8	28.2	11.8	17.0	<4.0	0.17	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
20.11.2014	57.3	29.6	12.2	17.5	<4.0	0.18	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
24.11.2014	56.9	29.1	11.8	17.0	<4.0	0.17	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
27.11.2014	58.1	30.2	12.2	17.5	<4.0	0.19	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
01.12.2014	60.2	30.8	12.6	18.4	<4.0	0.21	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	0.56
04.12.2014	59.5	30.1	12.2	17.9	<4.0	0.20	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	0.42
08.12.2014	57.6	29.2	11.8	17.5	<4.0	0.18	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	0.42
11.12.2014	63.5	31.5	12.6	17.9	<4.0	0.22	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	0.56
15.12.2014	62.8	32.2	12.6	18.4	<4.0	0.21	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	0.69
15.12.2014	64.6	32.6	13.0	18.8	<4.0	0.24	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	0.69
22.12.2014	60.9	31.4	12.2	18.4	<4.0	0.22	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	0.83
25.12.2014	57.2	29.6	12.2	18.4	<4.0	0.21	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	0.69
29.12.2014	56.4	29.2	11.8	17.9	<4.0	0.20	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	0.69
01.01.2015	36.8	18.1	9.4	14.1	<4.0	0.13	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
05.01.2015	52.3	25.6	11.0	16.3	<4.0	0.19	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
08.01.2015	53.6	26.8	11.0	16.8	<4.0	0.21	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
12.01.2015	55.5	28.2	11.4	16.8	<4.0	0.22	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
15.01.2015	59.2	30.1	11.8	17.2	<4.0	0.22	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
NAAQ Standard	100	60	80	80	100	4	400	05	01	20	1.0	06	--
Average	55.95	28.48	11.44	16.66	<4.0	0.18	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.21
Testing method	Gravimetric	Gravimetric	Improved West and Gaeke method	Modified Jacob & Hochheiser (Na-Arsenite)	Chemical Method	NDIR Spectroscopy	Indo phenol blue method	Absorption & Desorption followed by GC analysis	Solvent extraction followed by Gas Chromatography analysis	AAS method after sampling	AAS method after sampling	AAS method after sampling	Ion Selective method after sampling

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.

Figure-03: Graph showing Avg AAQ Concentration (AAQ3: Tileimal) within study area for the month of Oct-2014 to Jan-2015





Ref.: VCSPL/15/R-116

Date: 05.02.2015

### AMBIENT AIR QUALITY MONITORING REPORT

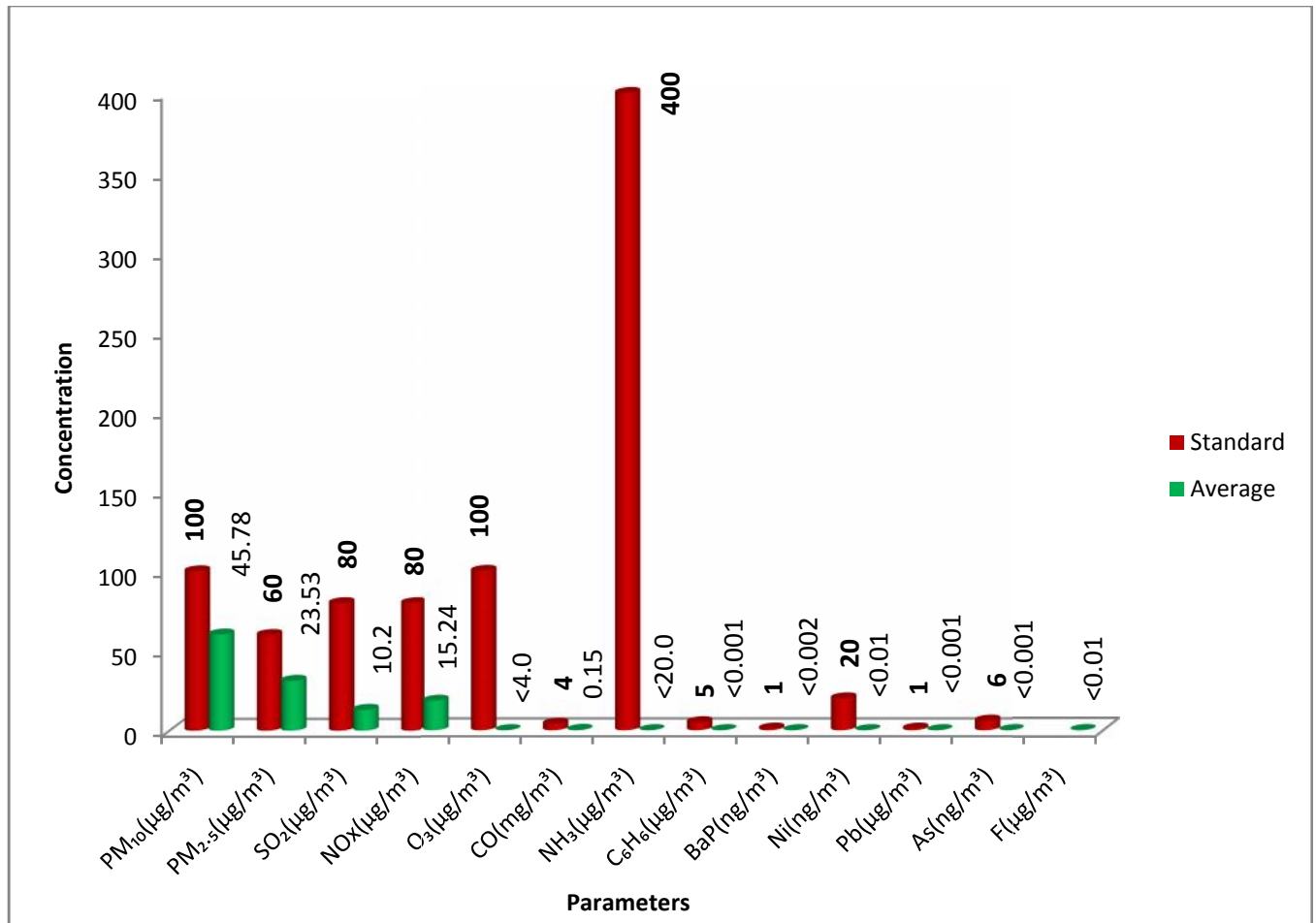
- Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
- Sampling Location : Monitoring Station No.- AAQ 4 (Bomaloi)
- Monitoring Instruments : RDS(APM 460 BL), FPS(APM 550) Envirotech, CO Monitor, VOC Sampler
- Sample collected by : VCSPL representative in presence of Aditya Aluminium representative

Date	PARAMETERS												
	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	F (µg/m <sup>3</sup> )
14.10.2014	39.7	20.3	8.3	12.5	<4.0	0.11	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
17.10.2014	40.3	20.6	8.7	13.4	<4.0	0.11	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
20.10.2014	41.1	20.8	8.7	13.4	<4.0	0.11	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
23.10.2014	42.2	21.2	9.1	13.9	<4.0	0.12	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
27.10.2014	40.7	20.5	8.7	13.4	<4.0	0.11	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
30.10.2014	42.9	21.4	9.1	13.9	<4.0	0.12	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
03.11.2014	43.5	23.2	9.4	13.9	<4.0	0.12	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
06.11.2014	40.1	20.9	9.1	13.4	<4.0	0.11	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
10.11.2014	41.4	21.3	9.1	13.9	<4.0	0.11	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
13.11.2014	42.3	21.9	9.4	13.9	<4.0	0.12	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
17.11.2014	44.5	23.1	9.8	14.3	<4.0	0.13	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
20.11.2014	46.5	23.6	9.8	14.3	<4.0	0.15	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
24.11.2014	45.8	23.5	10.2	14.8	<4.0	0.14	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
27.11.2014	49.2	25.9	10.6	15.7	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
01.12.2014	50.2	26.2	11.4	16.5	<4.0	0.18	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
04.12.2014	48.6	25.1	11.0	16.1	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
08.12.2014	49.6	25.6	11.4	16.5	<4.0	0.17	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
11.12.2014	50.6	25.9	11.8	17.0	<4.0	0.18	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
15.12.2014	47.2	24.6	11.4	16.6	<4.0	0.17	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
18.12.2014	52.1	26.8	12.2	17.9	<4.0	0.20	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
22.12.2014	49.9	25.4	11.8	17.5	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
25.12.2014	50.6	26.8	11.8	17.9	<4.0	0.18	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
29.12.2014	53.2	28.2	12.2	18.4	<4.0	0.21	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
01.01.2015	36.2	17.8	9.1	14.1	<4.0	0.13	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
05.01.2015	44.2	22.6	10.2	15.4	<4.0	0.14	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
08.01.2015	47.6	24.3	10.2	15.9	<4.0	0.15	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
12.01.2015	50.2	25.2	10.6	15.9	<4.0	0.15	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
15.01.2015	51.4	26.2	10.6	16.3	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
NAAQ Standard	100	60	80	80	100	4	400	05	01	20	1.0	06	--
Average	45.78	23.53	10.20	15.24	<4.0	0.15	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
Testing method	Gravimetric	Gravimetric	Improved West and Gaeke method	Modified Jacob & Hochheiser (Na-Arsenite)	Chemical Method	NDIR Spectroscopy	Indo phenol blue method	Absorption & Desorption followed by GC analysis	Solvent extraction followed by Gas Chromatography analysis	AAS method after sampling	AAS method after sampling	AAS method after sampling	Ion Selective method after sampling

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.

**Figure-04: Graph showing Avg AAQ Concentration (AAQ4: Bomaloi) within study area for the month of Oct-2014 to Jan-2015**





Ref.:VCSPL/15/R-117

Date: 05.02.2015

## AMBIENT AIR QUALITY MONITORING REPORT

1. Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Sampling Location : Monitoring Station No.- AAQ 5 (Kapulas)
3. Monitoring Instruments : RDS(APM 460 BL), FPS(APM 550) Envirotech, CO Monitor, VOC Sampler
4. Sample collected by : VCSPL representative in presence of Aditya Aluminium representative

Date	PARAMETERS												
	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	F (µg/m <sup>3</sup> )
15.10.2014	40.5	21.0	8.3	12.5	<4.0	0.11	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.39
18.10.2014	42.8	21.6	9.1	13.9	<4.0	0.12	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.39
21.10.2014	44.5	22.6	9.4	14.3	<4.0	0.12	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.53
24.10.2014	45.3	22.8	9.8	14.8	<4.0	0.13	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.39
28.10.2014	42.1	21.6	9.4	14.3	<4.0	0.12	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.53
31.10.2014	45.5	23.7	10.2	15.2	<4.0	0.14	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.67
04.11.2014	44.2	23.3	9.8	15.2	<4.0	0.14	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.53
07.11.2014	45.5	23.7	10.2	15.7	<4.0	0.15	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.67
11.11.2014	43.9	22.8	9.8	15.2	<4.0	0.14	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.67
14.11.2014	45.8	24.1	10.2	15.7	<4.0	0.15	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.81
18.11.2014	46.5	24.5	10.6	16.1	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.94
21.11.2014	44.3	23.7	10.2	16.1	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.22
25.11.2014	47.5	25.2	10.6	16.6	<4.0	0.17	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.22
28.11.2014	48.1	25.9	11.4	17.0	<4.0	0.18	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.08
01.12.2014	46.9	23.8	11.4	17.5	<4.0	0.19	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.08
04.12.2014	49.4	24.8	11.8	17.9	<4.0	0.20	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.22
08.12.2014	48.8	24.2	11.4	17.5	<4.0	0.21	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.50
11.12.2014	49.5	25.8	11.8	17.9	<4.0	0.22	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.22
15.12.2014	48.6	24.9	12.2	18.4	<4.0	0.21	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.08
15.12.2014	52.4	26.7	12.6	18.4	<4.0	0.24	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	22.22
22.12.2014	52.8	27.4	13.0	18.8	<4.0	0.23	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.36
25.12.2014	51.9	26.6	12.6	18.4	<4.0	0.22	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.50
29.12.2014	53.6	27.8	13.0	18.8	<4.0	0.24	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.36
01.01.2015	34.5	17.1	9.1	13.7	<4.0	0.12	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	0.83
05.01.2015	39.1	20.6	9.4	14.1	<4.0	0.13	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	0.97
08.01.2015	42.1	22.8	9.8	14.6	<4.0	0.13	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	0.97
12.01.2015	46.8	24.2	10.2	15.0	<4.0	0.14	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.25
15.01.2015	49.8	25.9	10.2	15.0	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.67
NAAQ Standard	100	60	80	80	100	4	400	05	01	20	1.0	06	--
Average	46.17	23.90	10.63	16.02	<4.0	0.17	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.51
Testing method	Gravimetric	Gravimetric	Improved West and Gaeke method	Modified Jacob & Hochheiser (Na-Arsenite)	Chemical Method	NDIR Spectroscopy	Indo phenol blue method	Absorption & Desorption followed by GC analysis	Solvent extraction followed by Gas Chromatography analysis	AAS method after sampling	AAS method after sampling	AAS method after sampling	Ion Selective method after sampling

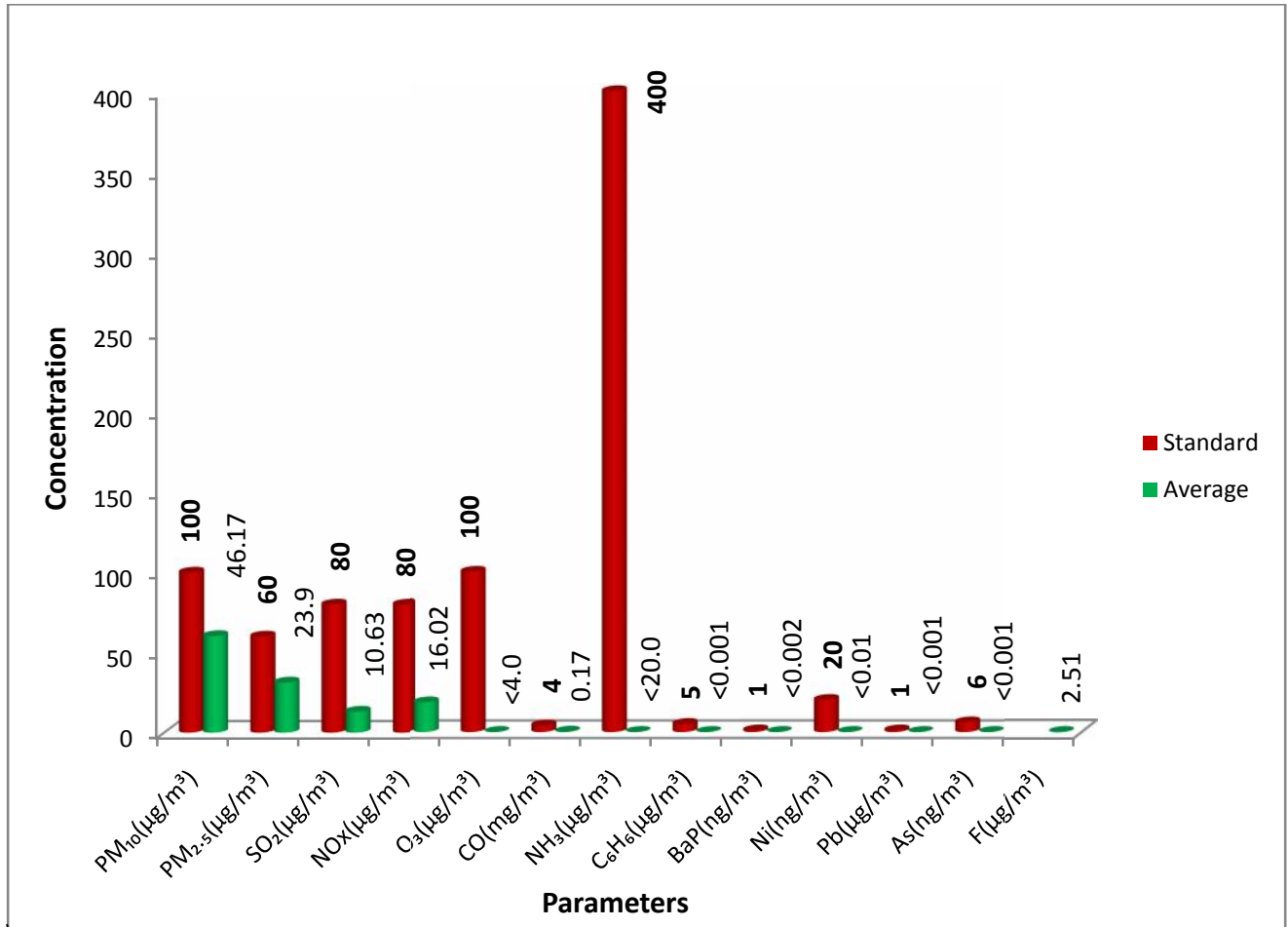
*B.K. Mishra*

**B. K. Mishra, B.Sc. Engg. (Chem)  
GOVT. ANALYST  
(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.



**Figure-05: Graph showing Avg AAQ Concentration (AAQ5: Kapulas) within study area for the month of Oct-2014 to Jan-2015**





Ref.: VCSPL/15/R-118

Date: 05.02.2015

### AMBIENT AIR QUALITY MONITORING REPORT

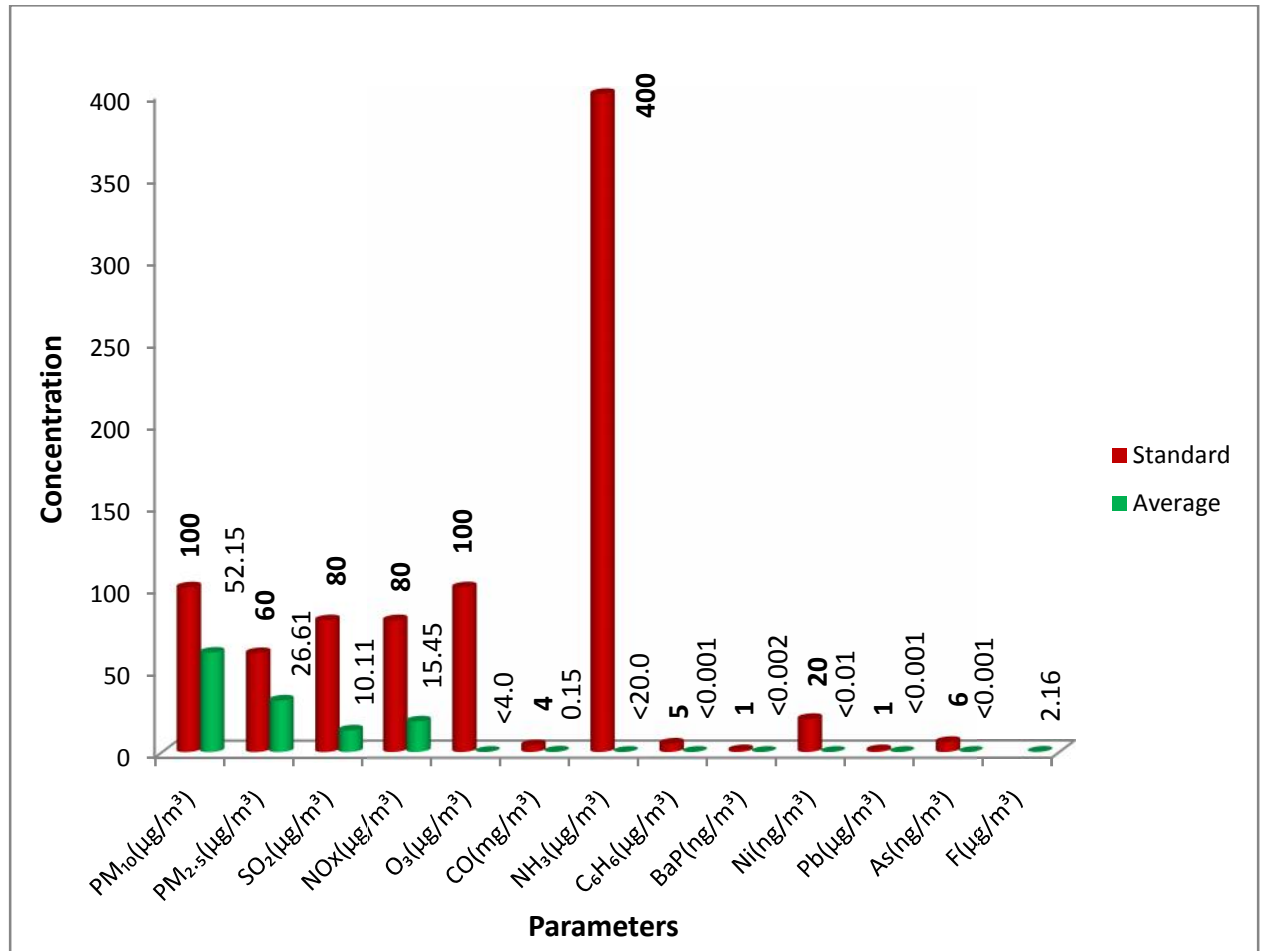
- Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
- Sampling Location : Monitoring Station No.- AAQ 6 (Phulchahal)
- Monitoring Instruments : RDS(APM 460 BL), FPS(APM 550) Envirotech, CO Monitor, VOC Sampler
- Sample collected by : VCSPL representative in presence of Aditya Aluminium representative

Date	PARAMETERS												
	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	F (µg/m <sup>3</sup> )
15.10.2014	52.1	26.4	9.4	14.3	<4.0	0.11	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.53
18.10.2014	53.6	27.1	9.8	14.8	<4.0	0.11	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.53
21.10.2014	54.3	27.7	9.8	14.8	<4.0	0.12	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.53
24.10.2014	51.6	25.9	9.4	14.3	<4.0	0.11	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.67
28.10.2014	46.8	24.2	9.4	14.3	<4.0	0.11	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.81
31.10.2014	48.5	25.3	9.4	14.8	<4.0	0.12	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.81
04.11.2014	50.7	26.8	9.4	14.8	<4.0	0.12	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.94
07.11.2014	48.6	25.1	9.1	14.3	<4.0	0.11	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.08
11.11.2014	52.5	26.1	9.4	14.8	<4.0	0.11	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.22
14.11.2014	51.6	26.2	9.1	14.3	<4.0	0.13	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.36
18.11.2014	53.5	26.9	9.4	14.8	<4.0	0.14	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.5
21.11.2014	55.8	27.8	9.8	15.2	<4.0	0.14	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.5
25.11.2014	57.2	29.4	10.2	15.7	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.5
28.11.2014	56.6	27.3	9.8	15.7	<4.0	0.15	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.36
01.12.2014	52.9	26.5	10.2	16.1	<4.0	0.14	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.5
04.12.2014	58.4	30.2	10.6	16.5	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.64
08.12.2014	55.6	28.7	10.6	16.1	<4.0	0.15	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.78
11.12.2014	50.8	26.1	10.2	15.7	<4.0	0.15	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.5
15.12.2014	54.3	27.5	10.6	16.1	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.78
15.12.2014	56.7	28.9	11.0	16.5	<4.0	0.18	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.78
22.12.2014	59.4	30.8	11.4	17.0	<4.0	0.22	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.92
25.12.2014	53.6	26.4	11.0	16.5	<4.0	0.21	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.78
29.12.2014	55.8	28.5	11.4	17.0	<4.0	0.22	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.92
01.01.2015	37.1	18.5	9.8	14.6	<4.0	0.13	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.11
05.01.2015	42.6	22.6	10.2	15.4	<4.0	0.14	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.25
08.01.2015	47.2	24.9	10.6	15.9	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.39
12.01.2015	50.2	26.3	10.6	15.9	<4.0	0.17	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.67
15.01.2015	52.2	27.1	11.4	16.3	<4.0	0.18	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.22
NAAQ Standard	100	60	80	80	100	4	400	05	01	20	1.0	06	--
Average	52.15	26.61	10.11	15.45	<4.0	0.15	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	2.16
Testing method	Gravimetric	Gravimetric	Improved West and Gaeke method	Modified Jacob & Hochheiser (Na-Arsenite)	Chemical Method	NDIR Spectroscopy	Indo phenol blue method	Absorption & Desorption followed by GC analysis	Solvent extraction followed by Gas Chromatography analysis	AAS method after sampling	AAS method after sampling	AAS method after sampling	Ion Selective method after sampling

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.

**Figure-06: Graph showing Avg AAQ Concentration (AAQ6: Phulchanghai) within study area for the month of Oct-2014 to Jan-2015**





Ref.: VCSPL/15/R-119

Date: 05.02.2015

## AMBIENT AIR QUALITY MONITORING REPORT

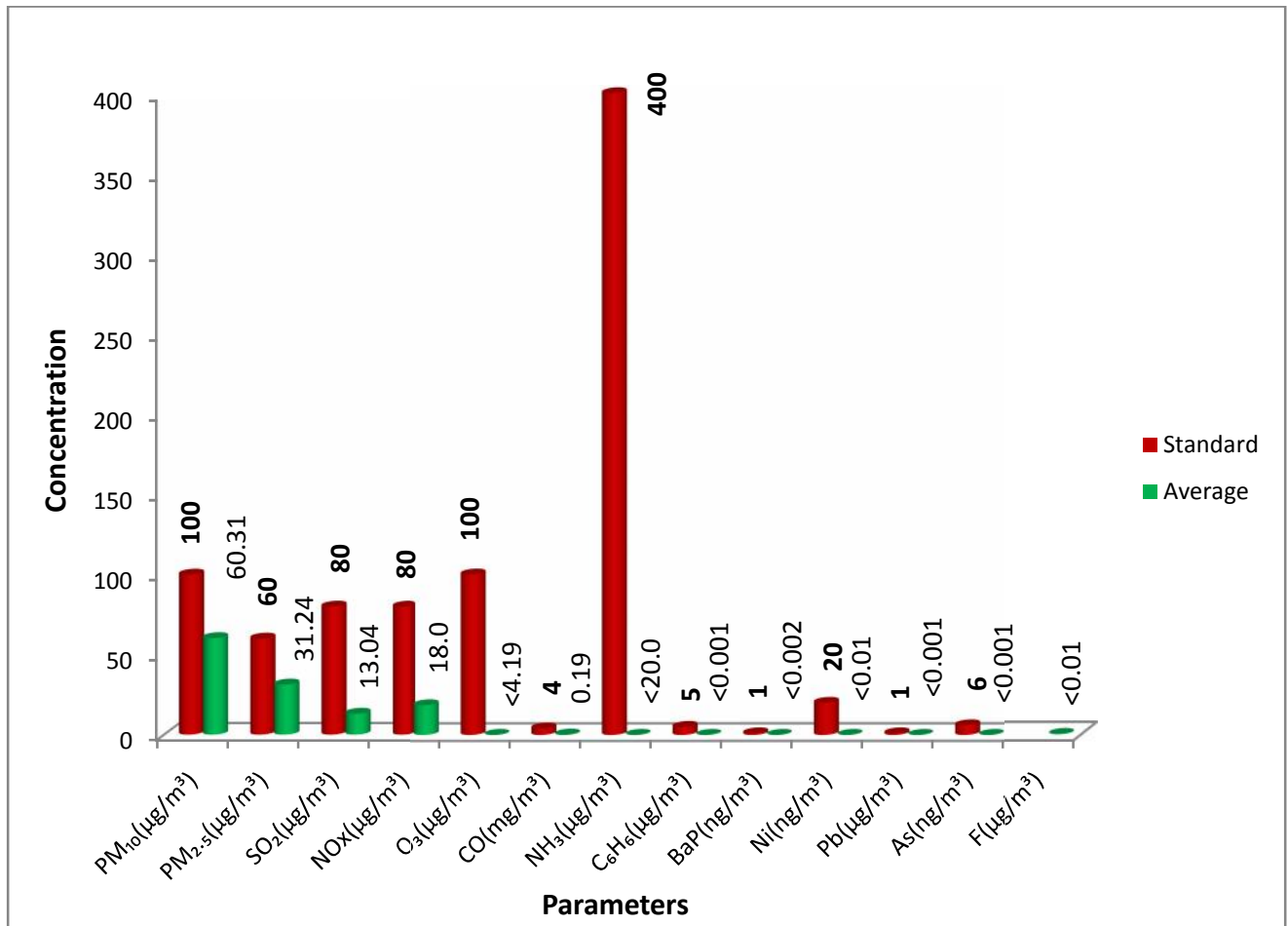
- Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
- Sampling Location : Monitoring Station No.- AAQ 7 (Khadiapali)
- Monitoring Instruments : RDS(APM 460 BL), FPS(APM 550) Envirotech, CO Monitor, VOC Sampler
- Sample collected by : VCSPL representative in presence of Aditya Aluminium representative

Date	PARAMETERS												
	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	F (µg/m <sup>3</sup> )
15.10.2014	65.4	35.1	12.2	16.6	<4.0	0.14	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
18.10.2014	59.9	30.7	11.8	16.1	<4.0	0.13	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
21.10.2014	62.2	31.6	12.2	17.0	<4.0	0.14	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
24.10.2014	65.1	33.4	12.6	17.5	<4.0	0.15	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
28.10.2014	54.2	27.5	12.2	17.0	<4.0	0.14	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
31.10.2014	58.6	29.9	12.2	17.5	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
04.11.2014	60.8	33.2	12.6	17.9	<4.0	0.18	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
07.11.2014	61.7	32.9	13.0	18.4	<4.0	0.19	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
11.11.2014	58.4	29.3	12.6	17.9	<4.0	0.17	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
14.11.2014	60.4	31.2	13.0	17.9	<4.0	0.18	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
18.11.2014	63.1	31.8	13.4	18.4	<4.0	0.19	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
21.11.2014	62.5	31.6	13.0	18.4	<4.0	0.18	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
25.11.2014	61.8	30.9	13.4	18.8	4.4	0.20	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
28.11.2014	64.3	32.5	13.8	19.3	4.6	0.22	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
01.12.2014	66.4	34.5	14.2	19.7	4.4	0.24	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
04.12.2014	69.2	36.9	14.6	20.2	4.6	0.26	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
08.12.2014	64.3	33.4	13.8	19.7	4.5	0.23	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
11.12.2014	62.9	31.8	14.2	20.2	4.4	0.24	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
15.12.2014	66.4	34.6	14.6	20.2	4.6	0.22	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
15.12.2014	65.6	34.1	15.0	21.1	4.6	0.25	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
22.12.2014	61.9	32.5	14.6	20.6	4.5	0.23	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
25.12.2014	63.7	33.6	15.0	21.1	4.6	0.24	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
29.12.2014	66.9	35.1	15.4	21.5	4.6	0.26	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
01.01.2015	41.5	20.2	9.8	15.0	<4.0	0.14	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
05.01.2015	46.2	24.2	10.6	16.8	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
08.01.2015	50.1	26.8	11.4	17.2	<4.0	0.17	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
12.01.2015	51.4	27.4	11.8	17.6	<4.0	0.18	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
15.01.2015	53.8	27.9	12.2	18.5	<4.0	0.20	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
NAAQ Standard	100	60	80	80	100	4	400	05	01	20	1.0	06	--
Average	60.31	31.24	13.04	18.50	<4.19	0.19	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	<0.01
Testing method	Gravimetric	Gravimetric	Improved West and Gaeke method	Modified Jacob & Hochheiser (Na-Arsenite)	Chemical Method	NDIR Spectroscopy	Indo phenol blue method	Absorption & Desorption followed by GC analysis	Solvent extraction followed by Gas Chromatography analysis	AAS method after sampling	AAS method after sampling	AAS method after sampling	Ion Selective method after sampling

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.

**Figure-07: Graph showing Avg AAQ Concentration (AAQ7:Khadiapali) within study area for the month of Oct-2014 to Jan-2015**





Ref.: VCSPL/15/R-120

Date: 05.02.2015

## AMBIENT AIR QUALITY MONITORING REPORT

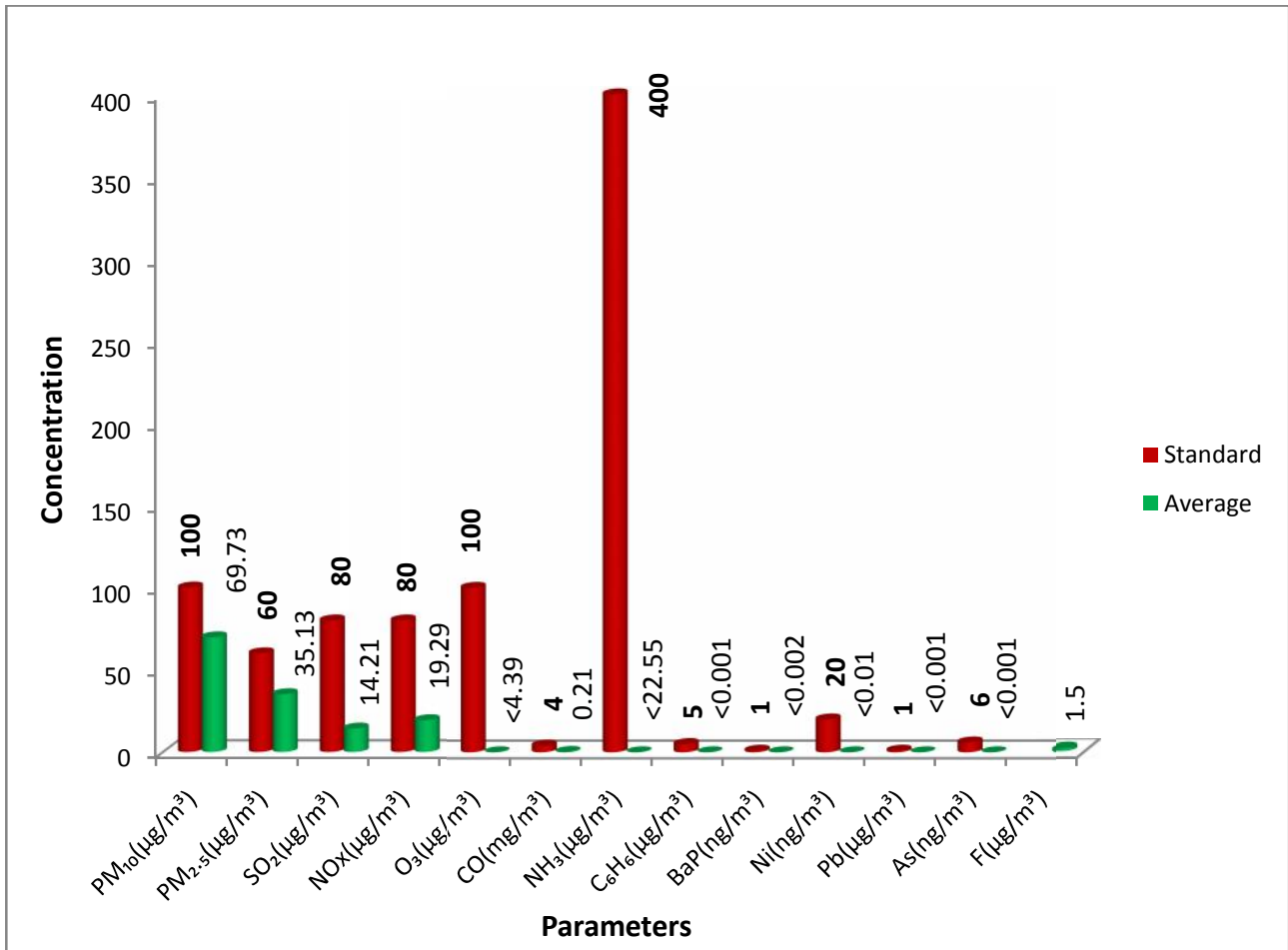
- Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
- Sampling Location : Monitoring Station No.- AAQ 8 (Thelkolai)
- Monitoring Instruments : RDS(APM 460 BL), FPS(APM 550) Envirotech, CO Monitor, VOC Sampler
- Sample collected by : VCSPL representative in presence of Aditya Aluminium representative

Date	PARAMETERS												
	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	F (µg/m <sup>3</sup> )
15.10.2014	68.5	36.8	12.6	16.6	<4.0	0.14	20.5	<0.001	<0.002	<0.01	<0.001	<0.001	0.56
18.10.2014	72.1	36.9	13.0	17.0	<4.0	0.15	21.9	<0.001	<0.002	<0.01	<0.001	<0.001	0.69
21.10.2014	70.1	35.6	13.4	17.5	<4.0	0.15	20.5	<0.001	<0.002	<0.01	<0.001	<0.001	0.83
24.10.2014	67.5	34.1	13.4	17.5	<4.0	0.14	23.3	<0.001	<0.002	<0.01	<0.001	<0.001	0.83
28.10.2014	59.8	30.4	13.4	17.5	<4.0	0.14	20.5	<0.001	<0.002	<0.01	<0.001	<0.001	0.97
31.10.2014	65.2	33.4	13.8	18.4	<4.0	0.16	21.9	<0.001	<0.002	<0.01	<0.001	<0.001	1.25
04.11.2014	70.4	37.9	14.2	18.8	4.6	0.18	23.3	<0.001	<0.002	<0.01	<0.001	<0.001	1.39
07.11.2014	66.8	34.3	13.8	18.4	4.5	0.17	23.3	<0.001	<0.002	<0.01	<0.001	<0.001	1.39
11.11.2014	64.3	33.4	13.4	18.4	4.5	0.16	21.9	<0.001	<0.002	<0.01	<0.001	<0.001	1.53
14.11.2014	67.5	35.4	13.8	18.8	4.5	0.18	20.5	<0.001	<0.002	<0.01	<0.001	<0.001	1.67
18.11.2014	71.6	36.9	14.6	19.7	4.4	0.21	23.3	<0.001	<0.002	<0.01	<0.001	<0.001	1.67
21.11.2014	68.8	35.6	14.2	19.3	4.6	0.20	21.9	<0.001	<0.002	<0.01	<0.001	<0.001	1.81
25.11.2014	72.6	37.1	14.6	19.7	4.5	0.23	23.3	<0.001	<0.002	<0.01	<0.001	<0.001	1.81
28.11.2014	75.8	38.2	15.0	20.6	4.7	0.24	23.3	<0.001	<0.002	<0.01	<0.001	<0.001	1.81
01.12.2014	73.6	34.6	15.4	20.6	4.7	0.24	24.7	<0.001	<0.002	<0.01	<0.001	<0.001	1.94
04.12.2014	71.8	36.2	15.0	20.2	4.4	0.23	21.9	<0.001	<0.002	<0.01	<0.001	<0.001	1.94
08.12.2014	74.2	34.8	15.4	21.1	4.6	0.25	23.3	<0.001	<0.002	<0.01	<0.001	<0.001	1.81
11.12.2014	76.9	35.8	15.7	21.5	4.6	0.24	24.7	<0.001	<0.002	<0.01	<0.001	<0.001	1.94
15.12.2014	80.2	37.6	16.1	22.0	4.6	0.26	26.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.81
15.12.2014	78.8	37.2	16.1	22.4	4.6	0.26	24.7	<0.001	<0.002	<0.01	<0.001	<0.001	1.94
22.12.2014	82.4	41.5	16.5	22.9	4.7	0.28	23.3	<0.001	<0.002	<0.01	<0.001	<0.001	1.67
25.12.2014	81.6	40.2	16.5	22.9	5.2	0.28	26.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.67
29.12.2014	84.5	42.8	16.9	23.3	5.2	0.29	27.4	<0.001	<0.002	<0.01	<0.001	<0.001	1.94
01.01.2015	50.2	24.6	10.6	15.4	<4.0	0.16	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.25
05.01.2015	55.3	28.5	11.4	16.3	<4.0	0.20	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.39
08.01.2015	56.9	29.4	12.2	16.8	<4.0	0.22	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.53
12.01.2015	60.8	31.6	12.6	17.2	<4.0	0.24	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.53
15.01.2015	64.2	32.9	14.2	19.4	<4.0	0.25	<20.0	<0.001	<0.002	<0.01	<0.001	<0.001	1.53
NAAQ Standard	100	60	80	80	100	4	400	05	01	20	1.0	06	--
Average	69.73	35.13	14.21	19.29	<4.39	0.21	<22.55	<0.001	<0.002	<0.01	<0.001	<0.001	1.50
Testing method	Gravimetric	Gravimetric	Improved West and Gaeke method	Modified Jacob & Hochheiser (Na-Arsenite)	Chemical Method	NDIR Spectroscopy	Indo phenol blue method	Absorption & Desorption followed by GC analysis	Solvent extraction followed by Gas Chromatography analysis	AAS method after sampling	AAS method after sampling	AAS method after sampling	Ion Selective method after sampling

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.

**Figure-08: Graph showing Avg AAQ Concentration (AAQ8:Thelkolai) within study area for the month of Oct-2014 to Jan-2015**



SURFACE WATER QUALITY REPORT







Ref.: VCSPL/15/R-121(i)

Date: 19.12.2014

## SURFACE WATER QUALITY ANALYSIS REPORT

1. Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Sampling location : SW-1: Hirakud Reservoir; SW-2: Lapanga Pond; SW-3: Matwadinadi.
3. Date of sampling : 11.12.2014
4. Date of analysis : 13.12.2014 to 19.12.2014
5. Sample collected by : VCSPL Representative in presence of Aditya Aluminium Representative

Sl. No	Parameter	Testing Methods	Unit	Standards as per IS-2296:1992 Class - 'C'	Analysis Results		
					SW-1	SW-2	SW-3
1	pH Value	APHA 4500H <sup>+</sup> B	--	6.0-9.0	7.1	7.2	7.1
2	Colour	APHA 2120 B, C	Hazen	300	CL	CL	CL
3	Taste	APHA 2160 C	--	--	AL	AL	AL
4	Odour	APHA 2150 B	--	--	U/O	U/O	U/O
5	Conductivity	APHA 2510-B	µs/cm	--	98.4	94.2	84.5
6	Turbidity	APHA 2130 B	NTU	--	1.2	0.8	1.1
7	Total Dissolved Solids	APHA 2540 C	mg/l	1500	120.0	112.0	102.0
8	Total Hardness (as CaCO <sub>3</sub> )	APHA 2340 C	mg/l	--	64.0	60.0	56.0
9	Total Alkalinity	APHA 2320 B	mg/l	--	44.0	42.0	38.0
10	Calcium (as Ca)	APHA 3500Ca B	mg/l	--	17.64	16.83	15.23
11	Magnesium (as Mg)	APHA 3500Mg B	mg/l	--	4.86	4.37	4.37
12	Residual, free Chlorine	APHA 4500Cl <sub>2</sub> B	mg/l	--	ND	ND	ND
13	Boron (as B)	APHA 4500B, B	mg/l	--	<0.001	<0.001	<0.001
14	Chloride (as Cl <sup>-</sup> )	APHA 4500Cl <sup>-</sup> B	mg/l	600	24.0	22.0	18.0
15	Sulphate (as SO <sub>4</sub> )	APHA 4500 SO <sub>4</sub> <sup>2-</sup> E	mg/l	400	11.1	9.9	10.4
16	Fluoride (as F)	APHA 4500F C	mg/l	1.5	0.12	0.14	0.16
17	Nitrate (as NO <sub>3</sub> )	APHA 4500 NO <sub>3</sub> <sup>-</sup> E	mg/l	50	3.11	3.37	3.2
18	Sodium as Na	APHA3500-Na	mg/l	--	15.5	14.2	11.5
19	Potassium as K	APHA 3500-K	mg/l	--	1.2	1.0	0.96
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	APHA 5530 B,D	mg/l	0.005	<0.001	<0.001	<0.001
21	Cyanide (as CN)	APHA 4500 CN <sup>-</sup> C,D	mg/l	0.05	<0.03	<0.03	<0.03
22	Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	1.0	<0.2	<0.2	<0.2
23	Cadmium (as Cd)	APHA 3111 B,C	mg/l	0.01	<0.001	<0.001	<0.001
24	Arsenic (as As)	APHA 3114 B	mg/l	0.2	<0.001	<0.001	<0.001
25	Copper (as Cu)	APHA 3111 B,C	mg/l	1.5	<0.001	<0.001	<0.001
26	Lead (as Pb)	APHA 3111 B,C	mg/l	0.1	<0.001	<0.001	<0.001
27	Manganese (as Mn)	APHA 3500Mn B	mg/l	--	<0.001	<0.001	<0.001
28	Iron (as Fe)	APHA 3500Fe, B	mg/l	0.5	0.22	0.18	0.24
29	Chromium (as Cr <sup>+6</sup> )	APHA 3500Cr B	mg/l	0.05	<0.002	<0.002	<0.002
30	Selenium (as Se)	APHA 3114 B	mg/l	0.05	<0.001	<0.001	<0.001
31	Zinc (as Zn)	APHA 3111 B,C	mg/l	15	<0.001	<0.001	<0.001
32	Aluminium as( Al)	APHA 3500Al B	mg/l	--	<0.001	<0.001	<0.001
33	Mercury (as Hg)	APHA 3500 Hg	mg/l	--	<0.001	<0.001	<0.001
34	Mineral Oil	APHA 5220 B	mg/l	--	<0.001	<0.001	<0.001
35	Pesticides	APHA 6630 B,C	mg/l	--	Absent	Absent	Absent
36	E.Coli	APHA 9221-F	MPN/100 ml	--	Absent	Absent	Absent
37	Total Coliforms	APHA9221-B	MPN/100 ml	5000	280	350	430

Note: CL:Colourless, AL:Agreeable, U/O:Unobjectionable, ND: Not detected.

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
 GOVT. ANALYST  
 (GAZETTE No. 034 Dt. 12-04-2013)

For Visiontek Consultancy Services Pvt. Ltd.



Ref.: VCSPL/15/R-121(ii)

Date: 19.12.2014

## SURFACE WATER QUALITY ANALYSIS REPORT

- Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
- Sampling location : SW-4: Bamloi Pond; SW-5: Bhedan river; SW-6: Bhedan river near Katikela; SW-7: Matwadinadi-D/s; SW-8: Hirakud reservoir near Gurupali village; SW-9: Salepali village; SW-10: Sanamal.
- Date of sampling : 12.12.2014
- Date of analysis : 13.12.2014 to 19.12.2014
- Sample collected by : VCSPL Representative in presence of Aditya Aluminium Representative

Sl. No.	Parameter	Testing Methods	Unit	Standards as per IS-2296:1992 Class – 'C'	Analysis Results						
					SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10
1	pH Value	APHA 4500H <sup>+</sup> B	--	6.0-9.0	7.2	7.2	7.1	7.2	7.0	7.0	7.2
2	Colour	APHA 2120 B, C	Hazen	300	CL	CL	CL	CL	CL	CL	CL
3	Taste	APHA 2160 C	--	--	AL	AL	AL	AL	AL	AL	AL
4	Odour	APHA 2150 B	--	--	U/O	U/O	U/O	U/O	U/O	U/O	U/O
5	Conductivity	APHA 2510-B	µs/cm	--	94.6	81.2	93.2	92.8	102.2	100.4	106.4
6	Turbidity	APHA 2130 B	NTU	--	1.4	1.6	0.8	1.1	1.3	1.6	1.4
7	Total Dissolved Solids	APHA 2540 C	mg/l	1500	114.0	96.0	113.0	114.0	124.0	124.0	127.0
8	Total Hardness (as CaCO <sub>3</sub> )	APHA 2340 C	mg/l	--	64.0	54.0	62.0	66.0	68.0	66.0	64.0
9	Total Alkalinity	APHA 2320 B	mg/l	--	45.0	35.0	44.0	48.0	48.0	46.0	44.0
10	Calcium (as Ca)	APHA 3500Ca B	mg/l	--	17.64	15.23	16.83	18.04	18.44	18.44	17.23
11	Magnesium (as Mg)	APHA 3500Mg B	mg/l	--	4.86	3.89	4.86	5.1	5.35	4.86	5.1
12	Residual, free Chlorine	APHA 4500Cl, B	mg/l	--	ND	ND	ND	ND	ND	ND	ND
13	Boron (as B)	APHA 4500B, B	mg/l	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
14	Chloride (as Cl)	APHA 4500Cl <sup>-</sup> B	mg/l	600	20.0	16.0	20.0	19.0	24.0	26.0	28.0
15	Sulphate (as SO <sub>4</sub> )	APHA 4500 SO <sub>4</sub> <sup>2-</sup> E	mg/l	400	11.3	9.6	8.9	10.3	10.4	9.9	10.2
16	Fluoride (as F)	APHA 4500F <sup>-</sup> C	mg/l	1.5	0.12	0.15	0.18	0.16	0.18	0.20	0.14
17	Nitrate (as NO <sub>3</sub> )	APHA 4500 NO <sub>3</sub> <sup>-</sup> E	mg/l	50	2.99	3.2	3.12	3.33	3.15	3.04	3.69
18	Sodium as Na	APHA 3500-K	mg/l	--	12.8	10.5	14.2	12.4	15.5	16.8	18.1
19	Potassium as K	APHA 3500-Na	mg/l	--	0.95	0.85	0.98	0.9	1.3	1.32	1.4
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	APHA 5530 B,D	mg/l	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
21	Cyanide (as CN)	APHA 4500 CN <sup>-</sup> C,D	mg/l	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
22	Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	1.0	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
23	Cadmium (as Cd)	APHA 3111 B,C	mg/l	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
24	Arsenic (as As)	APHA 3114 B	mg/l	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
25	Copper (as Cu)	APHA 3111 B,C	mg/l	1.5	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
26	Lead (as Pb)	APHA 3111 B,C	mg/l	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
27	Manganese (as Mn)	APHA 3500Mn B	mg/l	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28	Iron (as Fe)	APHA 3500Fe, B	mg/l	0.5	0.2	0.18	0.22	0.26	0.24	0.25	0.24
29	Chromium (as Cr <sup>+6</sup> )	APHA 3500Cr B	mg/l	0.05	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
30	Selenium (as Se)	APHA 3114 B	mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
31	Zinc (as Zn)	APHA 3111 B,C	mg/l	15	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
32	Aluminium as (Al)	APHA 3500Al B	mg/l	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
33	Mercury (as Hg)	APHA 3500 Hg	mg/l	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
34	Mineral Oil	APHA 5220 B	mg/l	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
35	Pesticides	APHA 6630 B,C	mg/l	--	Absent	Absent	Absent	Absent	Absent	Absent	Absent
36	E.Coli	APHA 9221-F	MPN/100 ml	--	Absent	Absent	Absent	Absent	Absent	Absent	Absent
37	Total Coliforms	APHA 9221-B	MPN/100 ml	5000	240	350	540	350	350	240	540

Note: CL: Colourless, AL: Agreeable, U/O: Unobjectionable, ND: Not detected.

*B.K. Mishra*  
B. K. Mishra, B.Sc. Engg. (Chem)  
GOVT. ANALYST  
(GAZETTE No. 834 Dt. 12-04-2013)

For Visiontek Consultancy Services Pvt. Ltd.

Annexure-4





Ref.: VCSPL/15/R- 098(I)

Date: 19.12.2014

### GROUND WATER QUALITY ANALYSIS REPORT

1. Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga.
2. Sampling location : GW-1: Lapanga Village; GW-2: Pandiol Village;
3. Date of sampling : 11.12.2014
4. Date of analysis : 13.12.2014 to 19.12.2014
5. Sample collected by : VCSPL Representative in presence of Aditya Aluminium Representative

Sl. No	Parameter	Testing Methods	Unit	Standard as per IS - 10500:1991	Analysis Results	
					GW-1	GW-2
1	pH Value	APHA 4500H <sup>+</sup> B	--	6.5-8.5	7.12	7.06
2	Colour	APHA 2120 B, C	Hazen	5	CL	CL
3	Taste	APHA 2160 C	--	Agreeable	AL	AL
4	Odour	APHA 2150 B	--	U/O	U/O	U/O
5	Conductivity	APHA 2510-B	µs/cm	--	160.2	126.4
6	Turbidity	APHA 2130 B	NTU	5	0.3	0.4
7	Total Dissolved Solids	APHA 2540 C	mg/l	500	180.0	154.0
8	Total Hardness (as CaCO <sub>3</sub> )	APHA 2340 C	mg/l	300	128.0	112.0
9	Total Alkalinity	APHA 2320 B	mg/l	200	108.0	92.0
10	Calcium (as Ca)	APHA 3500Ca B	mg/l	75	34.37	31.26
11	Magnesium (as Mg)	APHA 3500Mg B	mg/l	30	10.31	8.26
12	Residual, free Chlorine	APHA 4500Cl, B	mg/l	0.2	ND	ND
13	Boron (as B)	APHA 4500B, B	mg/l	1	<0.001	<0.001
14	Chloride (as Cl)	APHA 4500Cl <sup>-</sup> B	mg/l	250	24.0	20.0
15	Sulphate (as SO <sub>4</sub> )	APHA 4500 SO <sub>4</sub> <sup>2-</sup> E	mg/l	200	9.13	6.09
16	Fluoride (as F)	APHA 4500F <sup>-</sup> C	mg/l	1.0	0.048	0.042
17	Nitrate (as NO <sub>3</sub> )	APHA 4500 NO <sub>3</sub> <sup>-</sup> E	mg/l	45	2.51	1.79
18	Sodium as Na	APHA3500-Na	mg/l	--	15.5	12.8
19	Potassium as K	APHA 3500-K	mg/l	--	1.6	0.94
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	APHA 5530 B,D	mg/l	0.001	<0.001	<0.001
21	Cyanide (as CN)	APHA 4500 CN <sup>-</sup> C,D	mg/l	0.05	<0.03	<0.03
22	Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	0.2	<0.2	<0.2
23	Cadmium (as Cd)	APHA 3111 B,C	mg/l	0.01	<0.001	<0.001
24	Arsenic (as As)	APHA 3114 B	mg/l	0.05	<0.001	<0.001
25	Copper (as Cu)	APHA 3111 B,C	mg/l	0.05	<0.001	<0.001
26	Lead (as Pb)	APHA 3111 B,C	mg/l	0.05	<0.001	<0.001
27	Manganese (as Mn)	APHA 3500Mn B	mg/l	0.1	<0.001	<0.001
28	Iron (as Fe)	APHA 3500Fe, B	mg/l	0.3	0.26	0.28
29	Chromium (as Cr <sup>+6</sup> )	APHA 3500Cr B	mg/l	0.05	<0.002	<0.002
30	Selenium (as Se)	APHA 3114 B	mg/l	0.01	<0.001	<0.001
31	Zinc (as Zn)	APHA 3111 B,C	mg/l	5	<0.001	<0.001
32	Aluminium as( Al)	APHA 3500Al B	mg/l	0.03	<0.001	<0.001
33	Mercury (as Hg)	APHA 3500 Hg	mg/l	0.001	<0.001	<0.001
34	Mineral Oil	APHA 5220 B	mg/l	0.01	<0.001	<0.001
35	Pesticides	APHA 6630 B,C	mg/l	Absent	Absent	Absent
36	E.Coli	APHA 9221-F	MPN/100 ml	Shall not be detectable in any 100 ml sample	Absent	Absent
37	Total Coliforms	APHA9221-B	MPN/100 ml	Shall not be detectable in any 100 ml sample	<1.8	<1.8



For Visiontek Consultancy Services Pvt. Ltd.



Ref.: VCSPL/15/R- 098(II)

Date: 19.12.2014

## GROUND WATER QUALITY ANALYSIS REPORT

1. Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga.
2. Sampling location : GW-3: Bamloi Village; GW-4: Tilaimal Village; GW-5: Thelkoloi Village; GW-6: Ghichamura Village; GW-7: Gumkarama Village; GW-8: Chaltikra Village.
3. Date of sampling : 12.12.2014
4. Date of analysis : 13.12.2014 to 19.12.2014
5. Sample collected by : VCSPL Representative in presence of Aditya Aluminium Representative

Sl. No.	Parameter	Testing Methods	Unit	Standard as per IS -10500:1991	Analysis Results					
					GW-3	GW-4	GW-5	GW-6	GW-7	GW-8
1	pH Value	APHA 4500H <sup>+</sup> B	--	6.5-8.5	6.82	6.94	6.98	7.05	7.12	7.06
2	Colour	APHA 2120 B, C	Hazen	5	CL	CL	CL	CL	CL	CL
3	Taste	APHA 2160 C	--	Agreeable	AL	AL	AL	AL	AL	AL
4	Odour	APHA 2150 B	--	U/O	U/O	U/O	U/O	U/O	U/O	U/O
5	Conductivity	APHA 2510-B	µs/cm	--	134.2	138.2	164.2	137.5	172.2	168.4
6	Turbidity	APHA 2130 B	NTU	5	0.4	0.5	0.4	0.6	0.8	0.6
7	Total Dissolved Solids	APHA 2540 C	mg/l	500	158.0	164.0	182.0	163.0	185.0	168.0
8	Total Hardness (as CaCO <sub>3</sub> )	APHA 2340 C	mg/l	300	116.0	118.0	124.0	116.0	124.0	118.0
9	Total Alkalinity	APHA 2320 B	mg/l	200	95.0	100.0	106.0	96.0	104.0	98.0
10	Calcium (as Ca)	APHA 3500Ca B	mg/l	75	31.26	32.06	33.27	32.06	33.27	32.06
11	Magnesium (as Mg)	APHA 3500Mg B	mg/l	30	9.23	9.23	9.96	8.75	9.96	9.23
12	Residual, free Chlorine	APHA 4500Cl, B	mg/l	0.2	ND	ND	ND	ND	ND	ND
13	Boron (as B)	APHA 4500B, B	mg/l	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
14	Chloride (as Cl)	APHA 4500Cl <sup>-</sup> B	mg/l	250	20.0	22.0	28.0	23.0	30.0	24.0
15	Sulphate (as SO <sub>4</sub> )	APHA 4500 SO <sub>4</sub> <sup>2-</sup> E	mg/l	200	7.17	8.26	8.91	7.39	8.48	7.83
16	Fluoride (as F)	APHA 4500F C	mg/l	1.0	0.038	0.056	0.064	0.037	0.034	0.046
17	Nitrate (as NO <sub>3</sub> )	APHA 4500 NO <sub>3</sub> <sup>-</sup> E	mg/l	45	1.97	2.0	2.19	1.91	2.05	1.9
18	Sodium as Na	APHA3500-Na	mg/l	--	12.8	14.2	18.0	14.8	19.6	15.2
19	Potassium as K	APHA 3500-K	mg/l	--	0.9	1.1	1.4	1.1	1.5	1.2
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	APHA 5530 B,D	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
21	Cyanide (as CN)	APHA 4500 CN <sup>-</sup> C,D	mg/l	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
22	Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
23	Cadmium (as Cd)	APHA 3111 B,C	mg/l	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
24	Arsenic (as As)	APHA 3114 B	mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
25	Copper (as Cu)	APHA 3111 B,C	mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
26	Lead (as Pb)	APHA 3111 B,C	mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
27	Manganese (as Mn)	APHA 3500Mn B	mg/l	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28	Iron (as Fe)	APHA 3500Fe, B	mg/l	0.3	0.24	0.28	0.3	0.32	0.25	0.26
29	Chromium (as Cr <sup>6+</sup> )	APHA 3500Cr B	mg/l	0.05	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
30	Selenium (as Se)	APHA 3114 B	mg/l	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
31	Zinc (as Zn)	APHA 3111 B,C	mg/l	5	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
32	Aluminium (as Al)	APHA 3500Al B	mg/l	0.03	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
33	Mercury (as Hg)	APHA 3500 Hg	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
34	Mineral Oil	APHA 5220 B	mg/l	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
35	Pesticides	APHA 6630 B,C	mg/l	Absent	Absent	Absent	Absent	Absent	Absent	Absent
36	E.Coli	APHA 9221-F	MPN/100 ml	Shall not be detectable in any 100 ml sample	Absent	Absent	Absent	Absent	Absent	Absent
37	Total Coliforms	APHA9221-B	MPN/100 ml	Shall not be detectable in any 100 ml sample	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8



For Visiontek Consultancy Services Pvt. Ltd.

SOIL QUALITY ANALYSIS REPORT





Ref.: VCSPL/15/R-122

Date: 25.12.2014

## SOIL QUALITY ANALYSIS REPORT

1. Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga
2. Date of Sampling : 18.12.2014
3. Sampling Location : S-1: Project Site; S-2: Thelkolo; S-3: Ghichamura; S-4: Lapanga;  
S-5: Bamloi; S-6: Tileimal; S-7: Jangala; S-8: Gurupali; S-9: Gumkarama; S-10: Bhadarpali.
4. Date of Analysis : 19.12.2014 to 25.12.2014
5. Sample Collected By : VCSPL representative in Presence of Aditya Aluminium representative

Sl.No.	Parameters	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10
1	pH	5.46	5.65	5.66	5.58	5.74	5.46	5.68	5.64	5.42	5.55
2	Conductivity	98.6	82.4	78.6	84.2	96.4	76.4	90.2	86.6	84.2	90.8
3	Soil Texture	Sandy Loam	Clay Loamy	Clay Loamy	Sandy Loam	Sandy Loam	Clay Loamy	Sandy Loam	Sandy Loam	Sandy Loam	Clay Loamy
4	Sand	40.05	15.5	37.42	45.28	17.78	16.49	40.23	42.58	41.26	17.78
5	Silt	13.37	18.84	12.26	13.67	10.25	16.69	14.56	13.2	16.6	17.8
6	Clay	45.39	62.25	48.54	38.82	40.25	64.36	42.45	41.32	38.89	63.39
7	Bulk Density (gm/cc)	1.42	1.34	1.36	1.42	1.46	1.36	1.42	1.44	1.4	1.38
8	Exchangeable Calcium as Ca (%)	38.0	41.0	39.0	40.5	42.0	38.0	44.0	45.0	40.5	36.5
9	Exchangeable Magnesium as Mg (%)	52.63	61.68	54.28	55.92	59.21	55.92	66.61	69.08	60.86	53.45
10	Available Sodium as Na(%)	0.022	0.023	0.019	0.022	0.024	0.02	0.025	0.025	0.022	0.023
11	Available Potassium as K (%)	0.062	0.064	0.052	0.056	0.063	0.05	0.068	0.072	0.058	0.064
12	Available phosphorous as P (%)	0.016	0.018	0.024	0.022	0.018	0.022	0.018	0.02	0.018	0.022
13	Available Nitrogen as N (%)	0.15	0.18	0.17	0.11	0.13	0.14	0.18	0.17	0.16	0.15
14	Organic Matter (%)	2.84	3.12	3.06	2.42	2.54	2.68	3.12	3.02	3.18	2.96
15	Organic Carbon (%)	1.65	1.81	1.77	1.4	1.47	1.55	1.81	1.75	1.84	1.72
16	Water soluble Chlorides as Cl (%)	0.22	0.21	0.19	0.18	0.2	0.24	0.23	0.21	0.25	0.23
17	Water soluble Sulphates as SO <sub>4</sub> (%)	0.2	0.17	0.16	0.15	0.16	0.18	0.19	0.18	0.18	0.16
18	Sodium Absorption Ratio (%)	0.142	0.14	0.121	0.138	0.147	0.127	0.146	0.144	0.134	0.149
19	Aluminium as Al (%)	0.0003	0.00009	0.00006	0.00007	0.00006	0.00006	0.00005	0.00005	0.00006	0.00004
20	Total Iron as Fe (%)	0.017	0.018	0.015	0.016	0.019	0.017	0.018	0.02	0.017	0.016
21	Manganese as Mn (%)	0.0028	0.0012	0.0024	0.0021	0.0022	0.0014	0.0016	0.0017	0.0009	0.0009
22	Boron as B (%)	0.00028	0.00009	0.00012	0.00014	0.00018	0.00016	0.0002	0.00015	0.00012	0.00013
23	Zinc as Zn (%)	0.0002	0.00016	0.00012	0.00011	0.00013	0.00014	0.00014	0.00011	0.00012	0.00012
24	SiO <sub>2</sub> (%)	6.04	5.78	6.38	6.17	6.34	5.83	6.04	6.08	6.07	5.87
25	Fe <sub>2</sub> O <sub>3</sub> (%)	0.024	0.026	0.021	0.023	0.027	0.024	0.026	0.03	0.024	0.023
26	CaO (%)	53.2	57.4	54.6	56.7	58.8	53.2	61.6	63.0	56.7	51.1
27	MgO (%)	87.37	102.39	90.1	92.83	98.29	92.83	110.57	114.67	101.03	88.73
28	Al <sub>2</sub> O <sub>3</sub> (%)	0.00057	0.00017	0.00011	0.00013	0.00011	0.00011	0.00009	0.00009	0.00011	0.00008
29	FeO (%)	0.0219	0.0232	0.0194	0.0206	0.0245	0.0219	0.0232	0.0258	0.0219	0.0206
30	MnO (%)	0.0022	0.0009	0.0019	0.0016	0.0017	0.0011	0.0012	0.0013	0.0007	0.0007
31	K <sub>2</sub> O (%)	0.0744	0.0768	0.0624	0.0672	0.0756	0.06	0.0816	0.0864	0.0696	0.0768
32	P <sub>2</sub> O <sub>5</sub> (%)	0.037	0.041	0.055	0.05	0.041	0.05	0.041	0.046	0.041	0.05
33	Fluoride as F (%)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND: Not Detected.

*B.K. Mishra*  
**B. K. Mishra, B.Sc. Engg. (Chem)**  
**GOVT. ANALYST**  
**(GAZETTE No. 834 Dt. 12-04-2013)**

For Visiontek Consultancy Services Pvt. Ltd.

**NOISE LEVEL SURVEY REPORT**







## NOISE MONITORING REPORT

1. Name of Industry : M/s Hindalco Industries Ltd (Unit- Aditya Aluminium); Lapanga  
 2. Monitored By : VCSPL representative in presence of Aditya Aluminium representative

### Daytime Noise monitoring results (Noise Level in dB (A)) October-2014

TIME (6.00AM to 10.00PM)	N1:Gumkarma 20.10.2014	N2:Ghichamura 20.10.2014	N3:Bomaloi 21.10.2014	N4:Tileimal 21.10.2014	N5:Thehkoli 22.10.2014	N6:Lapanga 22.10.2014	N7:Lapanga Railway Station 23.10.2014	N8:Jangala 23.10.2014
6:25 AM	32.5	20.8	30.1	26.2	45.6	31.2	33.1	21.0
7:25 AM	34.5	21.4	33.1	28.5	43.2	32.5	35.2	22.2
8: 25 AM	38.2	22.6	34.6	29.6	42.4	35.6	37.4	24.3
9: 25 AM	46.0	24.8	41.5	32.4	48.3	40.0	40.4	25.6
10: 25 AM	50.5	29.8	46.2	35.5	60.5	45.6	50.5	35.8
11: 25 AM	54.2	32.5	47.5	36.2	68.0	50.5	59.0	36.4
12. 25 Noon	53.5	30.4	50.1	34.1	70.4	52.2	65.6	27.5
1: 25 PM	54.6	28.4	44.2	32.1	68.4	42.8	61.2	23.6
2: 25 PM	50.1	27.4	45.5	29.4	62.1	46.2	58.5	24.2
3: 25 PM	52.5	25.3	44.3	28.4	58.6	47.6	50.0	22.1
4: 25 PM	50.8	24.3	42.0	27.6	59.4	45.5	52.2	29.3
5: 25 PM	51.9	29.1	46.0	32.7	60.8	49.3	59.6	35.0
6: 25 PM	52.6	32.4	47.8	37.9	66.3	50.5	62.4	29.5
7: 25 PM	48.9	34.9	46.8	34.5	68.4	48.2	55.2	28.6
8: 25 PM	45.2	35.4	38.2	32.4	62.4	40.6	50.6	27.9
9: 25 PM	40.6	28.4	30.4	28.6	64.6	32.8	45.0	25.4

### Night time Noise monitoring results (Noise Level in dB (A)) October-2014

TIME (10.00PM to 6.00AM)	N1:Gumkarma 20.10.2014	N2:Ghichamura 20.10.2014	N3:Bomaloi 21.10.2014	N4:Tileimal 21.10.2014	N5:Thehkoli 22.10.2014	N6:Lapanga 22.10.2014	N7:Lapanga Railway Station 23.10.2014	N8:Jangala 23.10.2014
10:25 PM	40.2	23.8	28.4	24.0	52.0	30.5	43.5	23.0
11: 25 PM	39.5	23.6	26.3	23.9	50.5	28.4	40.6	22.9
12. 25 Mid Night	38.0	23.2	25.4	23.4	42.8	26.5	35.2	22.7
1: 25 AM	36.0	22.8	25.1	23.2	42.9	25.0	34.5	22.4
2: 25 AM	35.0	22.4	24.4	22.8	40.2	25.0	34.0	22.0
3: 25 AM	34.0	22.0	24.0	22.7	40.0	24.0	34.0	21.4
4: 25 AM	34.2	21.9	23.6	22.5	40.0	24.0	34.2	22.1
5: 25 AM	34.5	21.7	23.1	22.4	41.2	26.0	35.5	22.0

*B.K. Mishra*  
 B. K. Mishra, B.Sc. Engg. (Chem)  
 GOVT. ANALYST  
 (GAZETTE No. 834 Dt. 12-04-2013)

For Visiontek Consultancy Services Pvt. Ltd.

**FORAGE FLUORIDE ANALYSIS REPORT**





Ref.:VCSPL/15/R-124

Date: 05.02.2015

## FORAGE FLUORIDE ANALYSIS REPORT

1. Name of Industry : M/s Hindalco Industries Limited  
(Unit- Aditya Aluminium), Lapanga
2. Nature of Sample : Leaf for Fluoride
3. Date of Analysis : 13.12.2014 to 16.12.2014

Sl. No.	Date of Sampling	Name of the Location	Type of Species	Fluoride
				mg/kg
1	11.12.2014	Gumkarma	Grass	1.2
2	11.12.2014	Ghichamura	Grass	1.4
3	12.12.2014	Bamaloi	Dalbergiasisoo	5.1
4	12.12.2014	Tilaimal	Azadirachta indica	6.5
5	12.12.2014	Lapanga	Albiziaprocera	6.2
6	12.12.2014	Gurupali	Grass	0.8

*B.K. Mishra*  
B. K. Mishra, B.Sc. Engg. (Chem)  
GOVT. ANALYST  
(GAZETTE No. 834 Dt. 12-04-2013)

For Visiontek Consultancy Services Pvt. Ltd.

FLY ASH ANALYSIS REPORT





## FLY ASH ANALYSIS REPORT

1. Name of Industry : M/s Hindalco Industries Limited  
(Unit- Aditya Aluminium), Lapanga.
2. Sampling Location : FA-01: CPP Fly Ash Silo
3. Date of Sampling : 18.12.2014
4. Date of Analysis : 19.12.2014 to 25.12.2014
5. Sample Collected By : VCSPL Representative in presence of Aditya Aluminium Representative.

Sl. No.	Parameters	Unit	Analysis Results
			FA-01
<b>A. Chemical Analysis</b>			
1	Na <sub>2</sub> O	%	0.12
2	MgO	%	0.88
3	Al <sub>2</sub> O <sub>3</sub>	%	20.2
4	SiO <sub>2</sub>	%	52.8
5	P <sub>2</sub> O <sub>5</sub>	%	0.015
6	SO <sub>3</sub>	%	1.06
7	K <sub>2</sub> O	%	0.75
8	CaO	%	3.42
9	TiO <sub>2</sub>	%	--
10	MnO	%	0.1
11	Fe <sub>2</sub> O <sub>3</sub>	%	6.8
<b>B. Heavy Metals Analysis</b>			
1	Hg	%	<0.001
2	As	%	<0.001
3	Pb	%	0.01
4	Cr	%	< 0.002
5	V	%	<0.001
6	Fe	%	4.7
7	Co	%	<0.001
8	Cu	%	0.028
9	Ni	%	0.072
10	Zn	%	0.038
11	Sr	%	--
12	Ba	%	<0.001



For Visiontek Consultancy Services Pvt. Ltd

**BOTTOM ASH ANALYSIS REPORT**





## FLY ASH ANALYSIS REPORT

- Name of Industry : M/s Hindalco Industries Limited  
(Unit- Aditya Aluminium), Lapanga.
- Sampling Location : BA-01: CPP Bottom Ash Silo
- Date of Sampling : 18.12.2014
- Date of Analysis : 19.12.2014 to 25.12.2014
- Sample Collected By : VCSPL Representative in presence of Aditya Aluminium Representative.

Sl. No.	Parameters	Unit	Analysis Results
			BA-01
<b>A. Chemical Analysis</b>			
1	Na <sub>2</sub> O	%	0.15
2	MgO	%	1.12
3	Al <sub>2</sub> O <sub>3</sub>	%	22.4
4	SiO <sub>2</sub>	%	56.4
5	P <sub>2</sub> O <sub>5</sub>	%	0.016
6	SO <sub>3</sub>	%	1.16
7	K <sub>2</sub> O	%	0.85
8	CaO	%	3.92
9	TiO <sub>2</sub>	%	-
10	MnO	%	0.14
11	Fe <sub>2</sub> O <sub>3</sub>	%	7.8
<b>B. Heavy Metals Analysis</b>			
1	Hg	%	<0.001
2	As	%	<0.001
3	Pb	%	0.026
4	Cr	%	< 0.002
5	V	%	<0.001
6	Fe	%	5.38
7	Co	%	<0.001
8	Cu	%	0.042
9	Ni	%	0.078
10	Zn	%	0.054
11	Sr	%	--
12	Ba	%	<0.001



For Visiontek Consultancy Services Pvt. Ltd



# **Visiontek Consultancy Services Pvt. Ltd**

*(An Enviro Engineering Consulting Cell)*

Plot No.-108, District Centre, Chandrasekharpur, Bhubaneswar-16, Tel.: 91-2744594, 3250790, Fax : 91-6742744594  
E-mail : visiontekin@gmail.com, visiontekin@yahoo.co.in, Visit us at : [www.vcspl.org](http://www.vcspl.org)

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