Environmental Monitoring Report

(June-2014)

FOR

Industrial Building of Panasonic India Ltd

At

Jhajjar, Haryana

Submitted by:

M/s Panasonic India Ltd

INDUSTRIAL PLOT NO-1, VILLAGE- BID DADRI

JHAJJAR (HARYANA)

Environmental Monitoring

INTRODUCTION

M/s Panasonic India Pvt Ltd granted its Environmental clearance on 19/12/2011. And revise EC letter reference no-SEIAA/HR/2013/295, dated 17.06.2013.This project has been granted environmental clearance by the State Environmental Impact Assessment Authority, Haryana.

AMBIENT AIR QUALITY MONITORING

Ambient Air Quality Monitoring Stations

Ambient air quality monitoring has been carried out at two locations, one being near the gate no-1 (factory main gate), other are near utility area of the site to assess the ambient air**.** This will enable to have a comparative analytical understanding about air quality and the changes in the air environment in the study area with respect to the condition prevailing.

Details of Ambient Air Quality Monitoring Stations

S. No.	Location Code	Location Name/ Description	Environmental Setting
1.	AAQ-1	Near Gate No-1 (Main gate)	Industrial unit
2.	AAQ-2	Utility Area (Parking)	Industrial unit

AAQ-1: Near Factory Main Gate

The sampler was placed near factory main gate and was free from any obstructions. Surroundings of the sampling site represent Industrial unit.

AAQ-2: Utility Area

The sampler was placed near Utility area in the factory.

Ambient Air Quality Monitoring Methodology

Monitoring was conducted in respect of the following parameters:

- Particulate Matter 2.5 (PM 2.5)
- Particulate Matter 10 (PM 10)
- Sulphur Dioxide (SO_2)
- Oxides of Nitrogen (NO_x)

The duration of sampling of PM2.5, PM10, SO_2 and NOx was 8 hourly continuous sampling per day and CO was sampled for 8 hours continuous. The monitoring was conducted for one day at each location. This is to allow a comparison with the National Ambient Air Quality Standards. The air samples were analyzed as per standard methods specified by Central Pollution Control Board (CPCB) and IS: 5182.

Fine Particulate Sampler FPS instruments have been used for monitoring Particulate Matter 2.5 (PM2.5 i.e. <2.5 microns), and Respirable Dust Sampler APM 860 was used for sampling Respirable fraction (<10 microns), gaseous pollutants like SO2, and NOx. Bladder and Aspirator bags were used for collection Carbon monoxide samples.

Techniques used for Ambient Air Quality Monitoring

S. No.	Parameter	Technique	Technical Protocol
1	Particulate Matter 2.5	Fine Particulate Sampler APM 550, Gravimetric Method	IS-5182 (Part-IV)
2	Particulate Matter 10	Respirable Dust Sampler APM 450, with cyclone separator, Gravimetric Method	IS-5182 (Part-23)
3	Sulphur dioxide	Modified West and Gaeke	IS-5182 (Part- II)
4	Oxides of Nitrogen	Jacob & Hochheiser	IS-5182 (Part-VI)

Ambient Air Quality Monitoring Results

The detailed on-site monitoring results of PM 2.5, PM 10, SO_2 and NO_x are presented in Table.

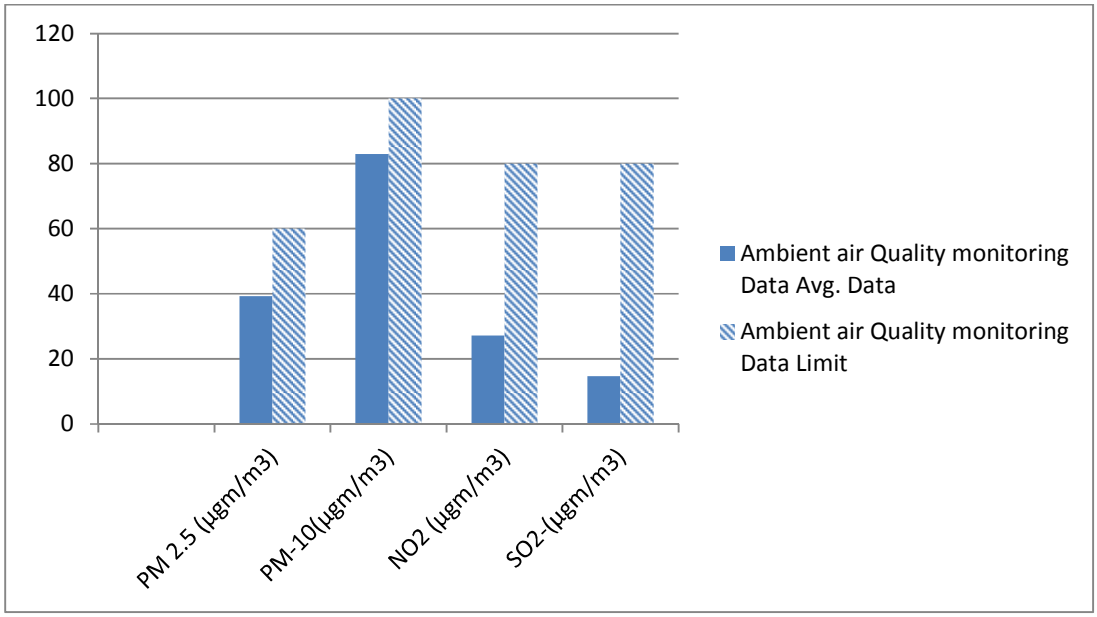
Ambient Air Quality Monitoring Results

Ambient Air Quality Result							
Sr. No.	Parameter	Feb-14		May-14		Avg. Data	Limit
		Q1	Q2	Q1	Q2		
1	PM 2.5 (µgm/m3)	39.16	40	37.58	40.37	39.27	60
2	PM-10(µgm/m3)	79.62	84.31	81.14	86.53	82.9	100
3	NO2 (µgm/m3)	27.34	26.61	26.57	28.37	27.22	80
4	SO2-(µgm/m3)	14.73	15.77	13.64	14.89	14.75	80

Discussion on Ambient Air Quality in the Study Area

PM-10 pollution levels at the factory area not exceed the permissible limit of 100 µg/m^3 (for residential, rural and other areas as stipulated in the National Ambient Air Quality Standards). Whereas PM2.5, SO_2, NOx was observed within the corresponding stipulated limits (Limit for PM2.5 is 60 µg/m^3, SO_2 and NOx: 80 µg/$m^{3)}$at all monitoring locations. Station wise variation of ambient air quality parameters has been pictorially shown in Figure.

Location-wise Variation of Ambient Air Quality monitoring



Stack Monitoring

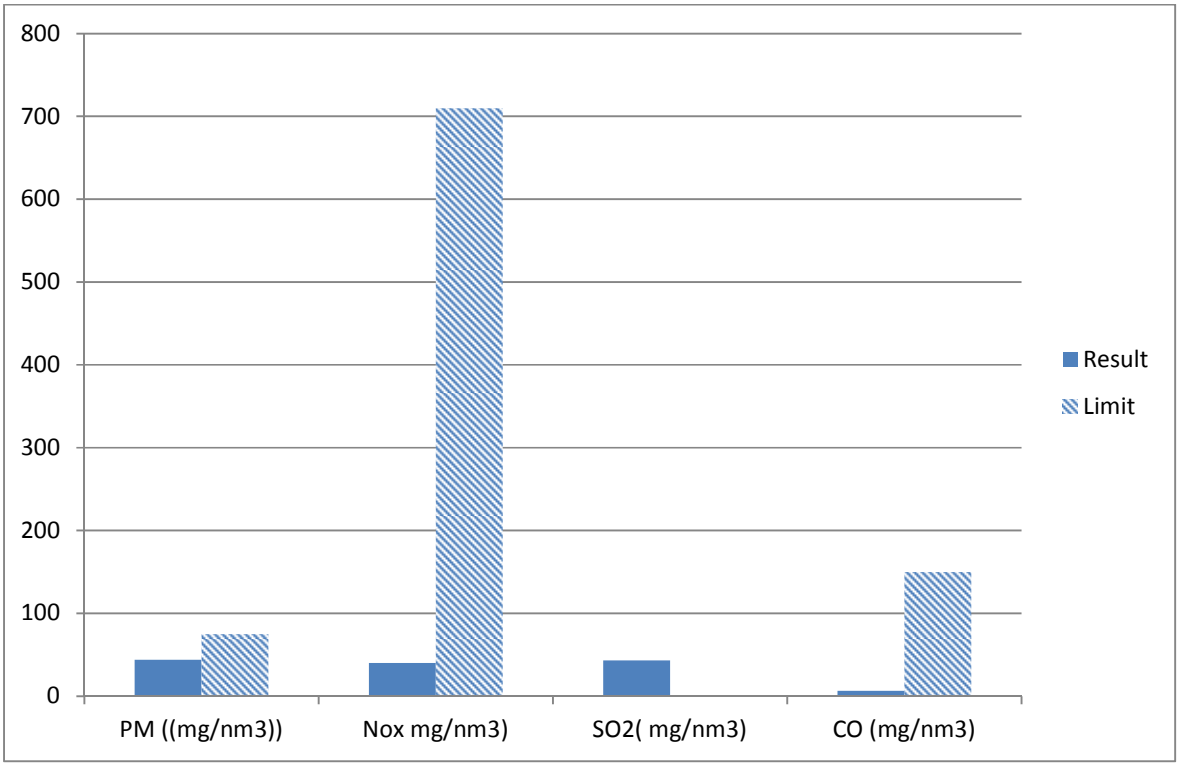
Details of Stack Monitoring Stations

S. No.	Location Code	Location Name/ Description	Present Land use
1.	DG1	Aircon unit DG-1-750 KVA	AC & Washing unit
2.	DG2	Aircon unit DG-2-750 KVA	AC & Washing unit
3.	DG3	Washing unit-1- 750 KVA	Washing Unit
4.	DG4	Welding unit -1-500KVA	AC & Washing unit
5.	DG5	Welding unit -2-500KVA	Welding Unit
6.	DG6	Welding unit -3-500KVA	Welding Unit
7.	DG7	Aircon unit DG-3-380 KVA	AC & Washing unit
8.	DG8	B-block unit DG-1-250 KVA	Admin Block Area
9.	DG9	A unit DG-1-160 KVA	Factory Common Facility Area

DG Stack monitoring Result

DG Stack Monitoring Result Data										
Sr. No.	1	2	3	4	5	6	7	8	9	Limit (mg/ nm3)
Feb-14										
DG Cap. (KVA)	750-1	750-II	750-III	500-I	500-II	500-III	380	250	160-I	
Location	C-1	C-1	C-1	D	D	D	C-1	B	A	
PM ((mg/nm3))	48.75	42.3	53.25	43.2	38.2	42.1	33.6	36.5	25.3	75
Nox mg/nm3)	47.2	47.2	49.3	36.2	42.3	37.52	35.2	36.3	30.2	710
SO2(mg/nm3)	51.2	50.2	51.25	43.5	47.5	40.3	36.5	33.5	32.5	_
CO (mg/nm3)	7.24	8.2	6.75	7.25	6.45	7.74	5.48	5.3	4.2	150
May-14										Limit as same above
DG Cap. (KVA)	750-1	750-II	750-III	500-I	500-II	250-II	380	250-I	160-I	
Location	C-1	C-1	C-1	D	D	B	C-1	B	A	
PM ((mg/nm3))	47.84	41.7	30.4	42.1	37.6	35.6	36.4	40.3	26.4	
Nox mg/nm3)	49.3	45.4	33.6	37.8	45.4	38.4	37.6	35.68	31.6	
SO2(mg/nm3)	52.5	51.1	36.1	45.2	49.3	34.7	35.3	38.7	34.1	
CO (mg/nm3)	6.89	7.1	3.25	7.48	6.95	5.9	6.1	6.86	3.9	

Different DG Stack monitoring result variation



AMBIANT NOISE MONITORING

Ambiant Noise Monitoring Locations

The main objective of noise monitoring in the study area is to assess the present ambient noise levels in factory site due to various operational allied activities and increased vehicular movement and machine. A preliminary reconnaissance survey has been undertaken to identify the major noise generating sources in the area. Ambient noise monitoring was conducted at one location at the main gate of the factory, as given in Table.

Details of Ambient Noise Monitoring Stations

S. No.	Location Code	Location Name/ Description	Present Land use
1	N1	Near Factory Main Gate	Industrial Unit

Methodology of Noise Monitoring

Noise levels were measured using integrated sound level meter manufactured by Quest Technologies. The integrating sound level meter is an integrating/ logging type with Octave filter attachment with frequency range of 31.5 to 16000 Hz. This instrument is capable of measuring the Sound Pressure Level (SPL), Leq and octave band frequency analysis. Noise level monitoring was carried out continuously for 24-hours with one hour interval starting at 6.00 am hrs to 6.00 am hrs next day. The noise levels were monitored on working day only. During each hour Leq were directly computed by the instrument based on the sound pressure levels. Lday (Ld), Lnight (Ln) and Ldn values were computed

using corresponding hourly Leq.

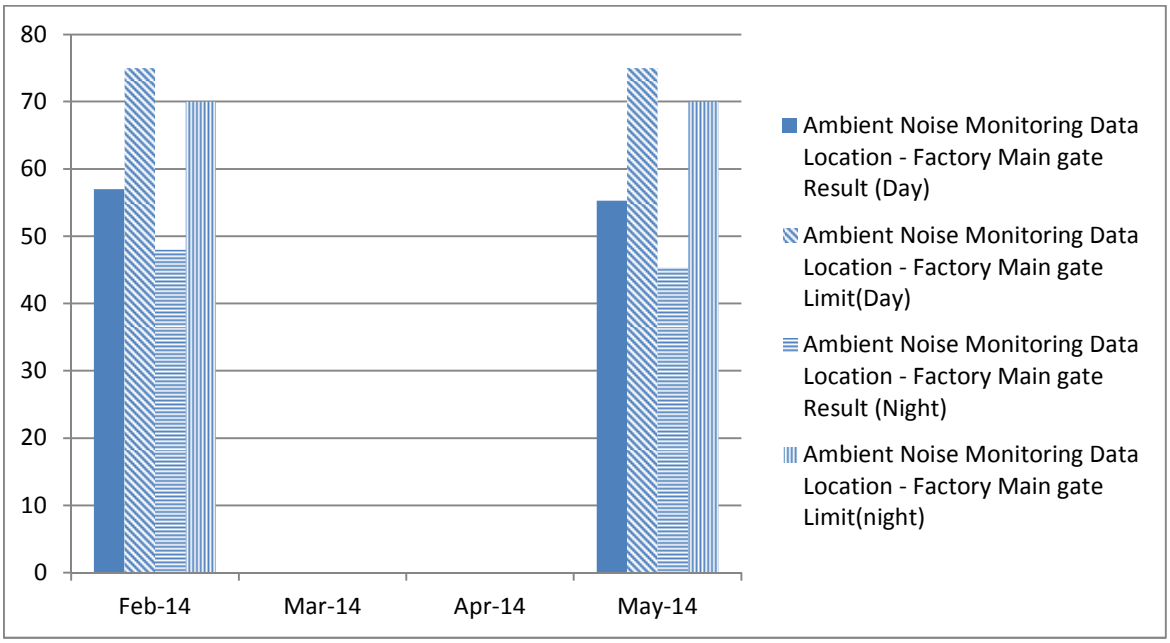
Ambient Noise Monitoring Results

The location wise ambient noise monitoring results is summarized in Table. The location-wise variation of noise levels are graphically presented in Figure.

Ambient Noise Monitoring Result

Ambient Noise Monitoring Data				
Location - Factory Main gate				
	Result (Day)	Limit(Day)	Result (Night)	Limit(night)
Feb-14	57.01	75	48.01	70
May-14	55.28	75	45.37	70

Day –Night Variation of Ambient Noise Level result



Discussion on Ambient Noise Levels in the Study Area

Day Time Noise Levels (L-day):

The day time noise level at all the locations were found to within limits prescribed for Industrial Building area i.e. 75 dB(A).

Night Time Noise Levels (L-night):

The night time noise level at all the locations were found to within limit prescribed for Industrial Building i.e. 70 dB (A).

GROUNDWATER QUALITY MONITORING

Groundwater Quality Monitoring Locations

Keeping in view the importance of groundwater as an important source of drinking water to the local population, sample of ground water was collected from company bore well for the assessment of impacts of the project on the groundwater quality.

The sample was analyzed for various parameters details of water sampling locations are given in Table.

Details of Water Quality Monitoring location

S. No.	Location Code	Location Name/ Description
1.	W-1	Bore well

Methodology of Groundwater Quality Monitoring

Sampling of ground water was carried out on February & May-2014. Samples were collected as grab sample and sampling forms are filled in as per the sampling plan. The preservative sample were properly added to preserve as per standard operating procedures (SOP) and stored immediately in ice boxes, which were ensured for appropriate temperatures. Sample for chemical analysis was collected in polyethylene carboys. Sample collected for metal content were acidified to <2 pH with 1 ml HNO_3. A sample for bacteriological analysis was collected in sterilized glass bottles.

Soon after the completion of sampling, chain of custody sheets for the samples are filled in and then they were transported by road to Vardan Envirolab, Gurgaon for further analysis. Proper care was taken during packing and transportation of samples. After ensuring the same the samples were forwarded immediately for analysis.

The samples were analyzed as per the standard procedures specified in 'Standard Methods for the Examination of Water and Wastewater' published by American Public Health Association (APHA) and CPCB. The analytical techniques and the test methods adopted for testing of ground water are given in Table.

Groundwater Quality Monitoring Results

The detailed groundwater quality monitoring results are presented in Table.

Groundwater Quality Monitoring Results

S. No.	Parameter	Feb-14	May-14
1	pH (at 25 0C)	7.66	7.66
2	Colour (Hazen Unit)	<5.0	<5.0
3	Turbidity (NTU)	<1.0	<1.0
4	Odour	Agreeable	Agreeable
5	Taste	Agreeable	Agreeable
6	Chloride as Cl (mg/l)	671.79	580.5
7	Total Hardness as CaCO3 (mg/l)	657.2	496.5
8	Calcium as Ca (mg/l)	76.47	112.5
9	Sulphate as SO4 (mg/l)	118.5	78.6
10	Total Dissolved Solids (mg/l)	1478.1	1180.7
11	Alkalinity as CaCO3, (mg/l)	431.16	428.37
12	Iron as Fe (mg/l)	0.34	0.31
13	Fluoride as F (mg/l)	0.87	0.75
14	Magnesium as Mg (mg/l)	113.34	52.44
15	Nitrate as NO3 (mg/l)	4.5	12.5
16	Sodium (mg/l)	75	78
17	Potassium(mg/l)	23	21

Discussion on Groundwater Quality in the Study Area

The ground water quality in the factory area bore well area is observed to having total alkalinity 386.00 mg/L respectively from sources. Total dissolved solids in the ground water from bore well is 1584.00 mg/L and RO drinking water is 61.50mg/L which is lower than the prescribed limit of 500 mg/L

Waste water Quality Monitoring Locations

Sample of waste water was collected from the project site for the assessment of impacts of the project on discharge point.

Waste water sample was collected from factory ETP & STP location. The details of waste water sampling locations are given in Table.

Details of Waste Water Quality Monitoring

S. No.	Location Code	Location Name/ Description
1.	WW 1	From the STP Outlet
2.	WW 2	From the ETP Outlet

STP Outlet Result

S. No.	Parameter	Result (Feb-14), mg/l	Result (May-14), mg/l	Limit
1.	pH (at 25 ^{0}C)	7.69	7.84	6.5~8.5
2.	COD	65.20	62.40	250 mg/l
3.	BOD (3 Days at 27 ^{0}c)	18.90	17.90	30 mg/l
4.	Total Suspended Solids	8.00	9.00	100 mg/l
5.	Oil and Grease	<0.40	<0.40	10 mg/l

ETP Outlet Result (Feb-14)

S. No.	Parameter	Result (Feb-14), mg/l	Result (May-14), mg/l	Limit
1.	pH (at 25 ^{0}C)	7.15	7.38	6.5~8.5

2.	COD	52.84	51.92	250 mg/l
3.	BOD (3 Days at 27 ^{0}c)	17.10	19.30	30 mg/l
4.	Total Suspended Solids	6.50	7.50	100 mg/l
5.	Oil and Grease	<0.40	<0.40	10 mg/l

SOIL MONITORING

Soil Monitoring Locations

The objective of the soil monitoring is to identify the impacts of ongoing project activities on soil quality and also predict impacts, which have arisen due to execution of various constructions allied activities. Accordingly, a study of assessment of the soil quality has been carried out

To assess impacts of ongoing project activities on the soil in the area, the Physico-chemical characteristics of soils were examined by obtaining soil samples from selected points and analysis of the same. Single sample of soil was collected from the project site for studying soil characteristics, the location of which is listed in Table.

Details of Soil Quality Monitoring Location

S. No.	Location Code	Location Name/ Description
1.	S1	Project Area

Methodology of Soil Monitoring

The sampling has been done in line with IS: 2720 & Methods of Soil Analysis, Part-1, 2nd edition, 1986 of American Society for Agronomy and Soil Science Society of America. The homogenized samples were analyzed for physical and chemical characteristics (physical, chemical and heavy metal concentrations).

The samples have been analyzed as per the established scientific methods for Physico-chemical parameters. The heavy metals have been analyzed by using Atomic Absorption Spectro-photometer and Inductive Coupled Plasma Analyzer.

Soil Monitoring Results

Single sample of soil is collected from the site to check the quality of soil of the study area .The Physico-chemical characteristics of the soil, as obtained from the analysis of the soil sample, are presented in Table.

Physico-Chemical Characteristics of Soil in the Study Area

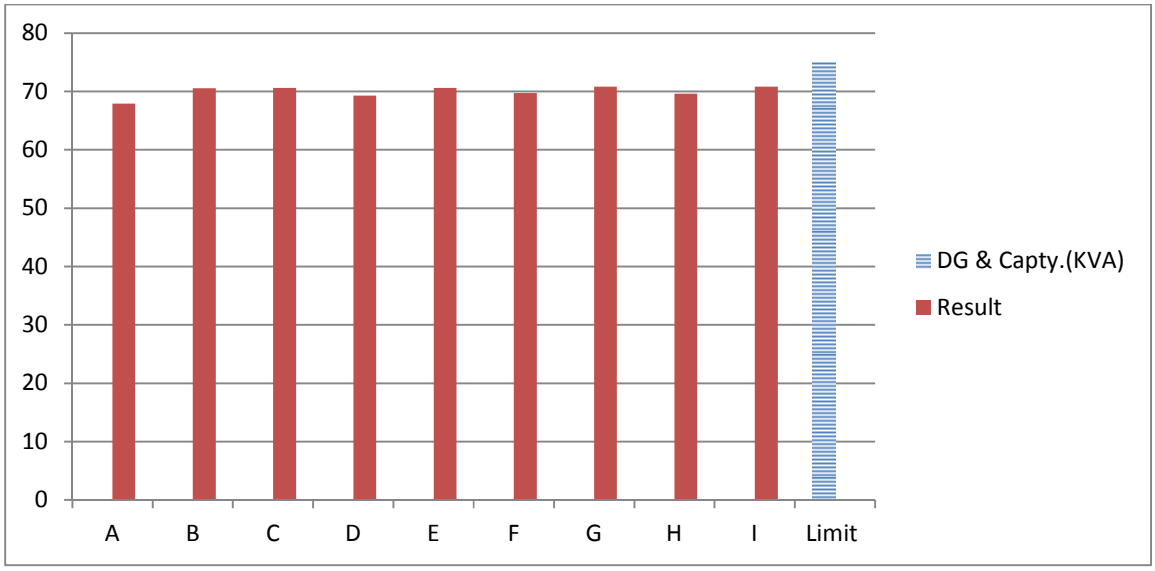
Soil Testing Result (Gardening Area)				
S. No.	Parameter	Feb-14	May-14	Test-Method
1	pH (at 25 0C)	8.25	8.17	IS : 2720 (P-26,1987)
2	Colour	yellowish brown	yellowish brown	USDA
3	Moisture Content (%)	19.3	16.5	IS:14767,2000
4	Water holding capacity (gm/cc)	22.5	21.3	USDA
5	Chloride (mg/100gm)	35.6	34.2	USDA
6	Organic Matter (%)	0.7	0.8	IS:2720 (P-22, 1972)
7	Physical Appearance	Silty Loam	Silty Loam	…….
8	Calcium, Meq/100g	4.1	3.2	USDA, Titration Method
9	Phosphate , Kg/hect.	7.2	6.2	IS10158-1982 Reaffirmed Aug 2009
10	Electrical conductivity , µmhos/cm	381	372	IS14767-2000 Reaffimed2006
11	Nitrogen as No3, Kg/hect	21.32	20.27	IS114684-1999 Reaffimed2008
12	Potassium,Kg/hect	4.62	5.3	USDA, Extraction Method

DG Noise Monitoring Result for May-2014

DG noise level in the Study Area

DG Noise Monitoring Result (dB)										
Sr. No.	A	B	C	D	E	F	G	H	I	Limit
DG & Capty.(KVA)	C1-750-1	C1-750-2	C1-750-3	C1-380-1	D-500-1	D-500-2	D-500-3	C1-750-4	A-160-1	75
Result	67.9	70.5	70.6	69.3	70.6	69.7	70.8	69.6	70.8	

Day - Variation of DG Noise Level result



Discussion on Soil Characteristics in the Study Area

The soil in study area is characterized by moderate organic content. The soil quality in the project area has not been affected by the project activities.

Conclusion

All environment monitoring results of ambient air, water, stack monitoring, noise and waste water result under permissible limit as per define CPCB standard limit.