



# Environmental Monitoring Report

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Project Number: 45224-003  
July 2017  
Part A: Main Report (Pages 1-20) and Annexures

Period: October 2016 – March 2017

## IND: Rajasthan Renewable Energy Transmission Investment Program - Tranche 1

Subprojects: 400 kv D/C LILO of Jodhpur – Merta Transmission Line to Bhadla (ICB-6)

Submitted by  
Rajasthan Rajya Vidyut Prasaran Nigam Limited, Jaipur

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From: "TA.CE.CONTRACTS@RVPN.CO.IN" <TA.CE.CONTRACTS@RVPN.CO.IN>  
To: "gmahajan@adb.org" <gmahajan@adb.org>, "pmishra@adb.org" <pmishra@adb.org>  
Date: 07/04/2017 03:04 PM  
Subject: monitoring reports

kfa

Regards,

J.P.Ramawat  
TA to CE (Contracts),  
RVPN, Jaipur  
Mobile : +91-9413345569

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From: J P RAMAWAT <jpramawat1967@gmail.com>  
To: gmahajan@adb.org  
Cc: pawasthi@adb.org  
Date: 07/27/2017 04:03 PM  
Subject: Revised EMP

KFA the revised EMP for the ICB-6 (LILO Bhadla Line).

J P Ramawat  
Mob. 9413345569



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# Environmental Safeguards Document

## Environment Monitoring Report

### 400 kv D/C LILO of Jodhpur – Merta Transmission Line to Bhadla (ICB-6)

**Project Number: 45224 (IND)**

**Period – October 16– March 17.**

**Reporting - 05 June 2017**

## India: Rajasthan Renewable Energy Transmission Investment Program

Prepared for Asian Development Bank by Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPNL), Government of Rajasthan.

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## Environment Monitoring Report

### Compliance Status & Monitoring Report of Environment Safeguards

Period: October 2016-March 2017

Submitted by: Rajasthan Rajya Vidyut Prasaran Nigam Limited, Rajasthan

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#### Abbreviations

AP's	Affected Persons
C/o	Construction of
Deptt.	Department
Distt.	District
FCA	Forest Conservation Act
GIS	Gas Insulated Switchgear
GoI	Govt of India
GRC	Grievance Redressal Committee
Ha.	Hectare (10,000 sq. m. land)
IE Rule	Indian Electricity Rule
MOEFCC	Ministry of Forest, Environment and Climate Change
MPAF	Main Project Affected Family

## Project Information

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### A.1. General

I	Name of Project	<b>Rajasthan Renewable Energy Transmission Investment Program</b>
II	Loan Number	Loan 3052-IND: Rajasthan Renewable Energy Transmission Investment Program - Tranche 1
II	Name of Monitoring/Reporting Agency and address	RRVPNL/New Power House , Jodhpur – 342003
III	Monitoring Period (Season/month)	October'2016 to March'2017
IV	Report No.	03
V	Report for the period	October'2016 to March'2017
VI	Date of reporting	05 June, 2017

### A.2. Subproject details

	List of sub-projects	Name of the Project site
I	400 KV D/C Bhadla to Jodhpur Transmission Line. (ICB 6)- 199.221 Kms	400kV D/C TWIN ACSR Moose Transmission Line from BHADLA (Jaisalmer) to JODHPUR -MERTA LILO POINT under specification No. RRVPN / ADB / Tranche 1/ICB-6 (Supply & Service contract) to M/s Tata Projects Ltd.

### A.3. Overall Project Progress, Agreed Milestones and Implementation Schedules

S No	Name of sub-project	Progress as on date of Report	Implementation Schedule
1	<b>Detailed Survey including Check survey.</b>	199.221 Kms	100% completed
2	<b>Foundation including backfilling.</b>	545 Nos	2 Balance. 99.64 % completed. Balance shall be completed by May'2017
3	<b>Erection.</b>	521 Nos	26 Balance. 95.25 % completed. Balance shall be completed by June'2017
4	<b>Stringing.</b>	72.671 Kms	126.55 Kms. 36.50% completed. Balance shall be completed by September'2017

**B.1: Compliance Status with National/State/Local Statutory Environmental Requirements and international standards**

S No	Legal Requirements/Acts/Rules/Guidelines	Applicable Attributes	RRVPNL's Compliance Status
1	The Water (Prevention and Control of Pollution) Act, 1974 as amended;	Water Pollution	We are adopting all type of preventive measures to avoid such pollution. Testing has been conducted at site and reports submitted.
2	The Air (Prevention and Control of Pollution) Act, 1981	Air Pollution	All type of preventive measures are being adopted to avoid such pollution. Testing has been conducted at site and reports submitted.
3	The Environment (Protection) Act, 1986	Construction Practices	Testing has been conducted at site and reports submitted.
4	The Environment Impact Assessment Notification, 1994 as amended	EMP monitoring	Testing has been conducted at site and reports submitted.
5	The Hazardous Wastes (Management and Handling) Rules, 1989 as amended	Transformer Oil	Not applicable
6	The Ozone Depleting Substances (Regulation and Control) Rules, 2000	Cleaning of electrical contacts using HFCs etc.	Not applicable
7	The Batteries (Management and Handling) Rules, 2001 as amended	Batteries	Not applicable
8	The Indian Forest Act, 1927 as amended	Reserve Forest areas, Right of way	Forest Land is not involved; we have avoided the forest area in complete Line. Line is more than 1.0 Kms away from Forest Land.
9	The Wild Life (Protection) Act, 1972 as amended	Critical habitats	Line selection has been done in a manner to avoid wild life. Line is more than 4-5 Kms away from such wild life.
10	The Biological Diversity Act, 2002	Wetland	No Wetland is involved.
11	The Forest (Conservation) Act, 1980 as amended	Construction work in forest areas	Forest Land is not involved; we have avoided the forest area in complete Line. Line is more than 1.0 Kms away from Forest Land.
12	The National Environmental Policy, 2006 of GoI	Construction Practices	GOI norms for environmental management followed for all construction work
13	Other State Level Acts	Compensation	Crop Compensations to the affected Persons are disbursed as per RRVPNL and state Revenue department.
14	Other International levels conventions and treaties	Biodiversity, GHG emissions	Not being affected.

**B.2: General Implementation Status****B.2.1. Forest Clearance**

SNo.	Measures/ stipulation	Compliance Status
<b>I</b>	<b>Sub-Project #</b>	
1	Right of Way/ land required	23 Mtr either side of the central line, corridor width 46 mtrs, as per approved RVPNL tower schedule.
2	Clearance from trees	8.840 Kms, as per approved RVPNL tower schedule.
3	Forest area and Nos. of trees.	No Forest land is being involved. No trees being affected during the Foundation and erection work. During the stringing work no trees shall be cut, only trimming of branches shall be done.
4	Damage to forest	No damage shall be done to forest area.
5	Wild life sanctuaries	No Wild life is involved in Project. Line is more than 4-5 Kms away from such wild life areas.

**B.2.2. Fulfillment of commitments made during Public Hearing/Consultation**

S.No.	Query/Apprehension	Commitment	Compliance Statement
<b>I</b>	<b>Sub-project #</b>		
1	Compensation for crop	As per EPC contractor bid	All damaged Crops are compensated as per the norms of RVPNL/State Revenue Department.
2	Compensation for land damages	As per EPC contractor bid	Land is not being damaged during the construction of Line.
3	Compensation for pathways, channels for waterway.	Restoration after erection by EPC contractor	As on date, all preventive practices were followed to avoid affecting such ways. If affected, they shall be restored properly.
4	Nuisance due to dust, noise, vibrations, labor during construction	As per EMP implemented by EPC contractor	All necessary preventive actions are being adopted to avoid such nuisance. No reported dust, noise, vibrations, and labor problems.

**B.2.3. ADB Stipulations/ safeguarding measures on Environment.**

SNo.	Product Activity/Stage	Parameter to be monitored	Compliance Status
<b>I</b>	<b>Sub-Project #</b>		
	<b>Construction</b>		
1	Archeological site/ monument safety	Chance find	Not involved
2	Public places, schools, ponds, airport, railway etc.	Distance 500 m away	No school, ponds, airports have been affected Proposal for the obtaining Clearance from Railway line crossing has been submitted and measures are adopted to avoid any disturbance in railway Tracks.
3	Safeguard against critically endangered Flora and fauna.	Avoid	We have strictly avoided the Flora and Fauna.
4	Rain and Flood prone area.	Avoid	We have avoided the Flood zone area in the entire transmission line.
5	Environmental parameters for air, noise, land and water during project construction	Environmental Monitoring Plan	Testing has been conducted at site and reports submitted.



**B.2.4 Record of complaints (regarding environment safeguard measures) and their resolution**

Sr.No	Complainant Name and address	Date of receipt	Subject/Issue	Date of resolution	Remarks
I	<b>Sub-Project #</b>				
	As on date no complaint has been received				

**B.2.5. Staffing, Institutional Arrangements and Grievance Redress**

S.No.	Parameters	Commitment	Compliance Statement
1	Numbers of Staff deputed/employed for environment safeguards	One at site.	03 safety Officers have been deputed for the safeguard of environment.
2	PIU established as per proposed institutional mechanism	Date	05.05.2015
3	GRC formation	Date	30.10.2015
4	Grievance Redress Mechanism followed	Proper record	No Tree cutting involved, Currently no environment related grievances received.

**B.2.6. Other measures:**

I	<b>Sub-Project #</b>
1	Environment Testing of Air, Water, Noise, Soil has been conducted.
2	Social survey work has been completed after discussing with all the affected farmers/persons.
3	Quality improvement initiatives are adopted for the betterment of individual and work.
4	Good quality water is being provided for drinking, cooking and bathing purpose.
5	Safety Induction programs are being conducted for the role of safety in Transmission line.

**B2.8 Annexures**

I	<b>Sub-Project #</b>
1	Photographs of the following –Foundation work, Erection work, Stringing work, drinking water, Environment Testing work, Social Survey with affected persons.
2.	Tata Projects Limited Letter no. 115 dated 03.01.2017 for submission of Environment Testing Reports to RVPNL.
3.	Baseline Report of Environmental Parameters (Pre-construction)
4.	Report of Environmental Parameters (During-construction)

### B.3: Status of Implementation of Environment Management Plan (EMP) and Environment Monitoring Plan (EMoP)

#### B3.1. Environment Management Plan and Status on Implementation

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
<b>Pre-construction</b>								
Temporary use of land	Impact to the existing environment	Selection of lands adhering to local laws and regulations Construction facilities should be placed at least 500 m away from water bodies, natural flow paths, important ecological habitats and residential areas	water and air quality	Route has been selected in a manner to avoid the interference of such amenities.	545	Excess soil after foundation kept on bund of field, same is regular practice at site.	Need to maintain up to completion of project	RRVPNL
Substation location and design	Noise generation Exposure to noise, Nuisance to neighboring properties	Substation designed to ensure noise will not be a nuisance.	Expected noise emissions based on substation design, noise levels	Not Applicable				
	Disturbance to the adjacent lands and the people due to cut and fill operations	Maintained adequate clearance, construction of retaining structures, minimise cut and fill operations adjoining to the dwellings	Setbacks to houses and other structures					
Location of transmission towers and transmission line alignment and design	Exposure to safety related risks	Setback of dwellings to overhead line route designed in accordance with permitted level of power frequency and the regulation of supervision at sites.	Tower location and line alignment selection with respect to nearest dwellings	Tower Locations have been selected to avoid the overhead crossing of households/dwellings. Line is minimum 500 Mtr away from such dwelling area.	199.221KM	46 Mtr corridors from center of tower is maintained during survey work to avoid houses & for 500 mtr for water reserve.	Need to maintain up to completion of project.	RRVPNL
	Impact on water bodies / land/ residences	Consideration of site location to avoid water bodies or agricultural	Site location, line alignment	All the water bodies/dwellin	545 Nos	46 Mtr corridor from center of tower is	Need to maintain up to	RRVPNL

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
		land as much as possible.  Careful site selection to avoid existing settlements	selection (distance to dwelling, water and/or agricultural land)	gs are more than 500 mtrs away from the Line.		maintained during survey work to avoid houses & for 500 mtr for water reserve	comple tion of project.	
Equipment specifications and design parameters	Release of chemicals and harmful gases in receptors (air, water, land)	PCBs free substation transformers or other project facilities or equipment.	Transformers and specifications and compliance with setback distances ("as-built" diagrams)	Not Applicable				
Encroachment into precious ecological areas	Loss of precious ecological values/ damage to precious species	Avoid encroachment by careful site and alignment selection and reconnaissance before final siting of activities. Minimise the RoW wherever possible	Floral and faunal habitats loss	Route has been selected in a manner to avoid such encroachments.  No ecological area is been involved		Entire line passing away from flora & funa / forest area/ NOC had taken before starting of project.	Non	RRVPNL
Involuntary resettlement or land acquisition	Loss of lands and structures	Compensation paid for temporary/ permanent loss of productive land	Public complaints	No land is damaged during the construction of TL. Compensation shall be paid for the cultivated crop damaged		Land Acquisition not done in project for carrying out the work.	Crop compen sationo nly paid to affected land owners	RRVPNL
Encroachment into farmland	Loss of agricultural productivity	Use existing tower footings/towers wherever possible  Avoid siting new towers on farmland wherever possible	Tower location and line alignment selection  Design of Implementation of crop and tree compensation (based on affected area)	Compensation is implemented for the crop/tree damaged during construction activity.  Avoided		545	Non	RRVPNL

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
		Farmers compensated for any permanent loss of productive land and trees that need to be trimmed or removed along RoW.	Statutory approvals for tree trimming /removal	During foundation and erection work no trees are involved.		545	Non	RRVPNL
Interference with drainage patterns/Irrigation channels	Temporary flooding hazards/loss of agricultural production	Appropriate sighting of towers to avoid channel interference  Appropriate provision or excess soil dug up from the foundations/trenches	Site location and line alignment selection	Towers are being selected/spotted in a manner to avoid such channels		545	Non	RRVPNL
Explosions/Fire	Hazards to life	Design of substations to include modern fire control systems/firewalls.  Provision of firefighting equipment to be located close to transformers, power generation equipment.	Substation design compliance with fire prevention and control codes	Not applicable		NA		
<b>Construction</b>								
Removal or disturbance to other public utilities	Public inconvenience	Advance notice to the public about the time and the duration of the utility disruption  Use of well trained and experienced machinery operators to reduce accidental damage to the public utilities  Restore the utilities immediately to overcome public inconvenience	Disruption to other commercial and public activities / Public complaints	As on date there has been no disruption.  If any, there shall be advance information published into the local newspaper for electric utility shutdown.		521	Advance published in local News papers	RRVPNL
Acquisition of cultivable lands	Loss of agricultural productivity	Avoid farming season wherever possible for the project activities.  Ensure existing irrigation facilities are maintained in working condition	Land area of agriculture loss  Usage of existing utilities	We have avoided the work for the locations where there is farming	545	Nil	Nil	RRVPNL

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
		Protect /preserve topsoil and reinstate after construction completed  Repair /reinstate damaged bunds etc. after construction completed  Compensation for temporary loss in agricultural production.	Status of facilities (earthwork in m <sup>3</sup> )  Implementation of crop compensation (amount paid, dates, etc.)	season.  Where required, compensation has been provided to the farmers for the loss of cultivated crop.  Top soil is restored during the back filling work.				
Temporary outage of the electricity	Loss of power supply to the local community when distribution lines crossing the new transmission line are switched off	Advance notice to the public about the time and the duration of the utility disruption  Restore the utilities immediately to overcome public inconvenience	Power disruption to houses and commercial premises of power disruption	As on date there has been no disruption.  If any, there shall be advance information published into the local newspaper for electric utility shutdown.	521	Nil	Nil	RRVPNL
Equipment layout and installation	Noise and vibrations	Selection of construction techniques and machinery to minimize ground disturbance.	Construction techniques and machinery	All locations are more than 500 mtr away from the residential areas and all activities have been carried out during the	F- 545 Nos E – 521 Nos S-72.671 Kms	Nil	Nil	RRVPNL/TPL

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective) day time.	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
	SF6 leakage during storage and erection of Switchgear	Record of all substation switchgear, storage cylinders located within secure casings	Switchgear casings and substation bounding	Not applicable				
Substation construction	Loss of soil	Fill for the substation foundations obtained by creating or improving local drain system.	Borrow area sighting (area of site in m <sup>2</sup> and estimated volume in m <sup>3</sup> )	Not applicable				
	Interference in drainage of rain and waste water at site	Removal of silt and trash choking the drainage of the substation land	Drains choked with rain/water due to silt and trash	Not applicable				
	Water pollution	Construction activities involving significant ground disturbance (i.e. substation land forming) not undertaken during the monsoon season.	Water Quality (pH, BOD/COD, Suspended solids, other) during major earthworks	Not applicable				
Construction schedules	Noise nuisance to neighboring properties	Minimize construction activities undertaken during the night and local communities informed of the construction schedule.	Timing of construction (noise emissions, [dB(a)])	All Construction activities are being carried out during day time. All the locations are more than 500 mtrs away from the residential area.	F- 545 Nos E – 521 Nos S-72.671 Kms	Nil	Nil	RRVPNL/TPL
Provision of facilities for construction workers	Nuisance to wildlife if the line construction crosses their migratory path	Restrict construction work during the known period of migration by any wildlife in the area	Timing of Construction	No wild life area involved in the TL		Nil	Nil	RRVPNL/TPL
	Contamination of receptors (land, water, air)	Construction workforce facilities to include proper sanitation, water supply and waste disposal facilities.	Amenities for Workforce facilities	All workmen are provided clean water for drinking/cooking/bathing.	Always	Nil	Nil	RRVPNL/TPL

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
				Proper rented/tent accommodation are provided for their shelter Proper sanitation facilities are provided for all the workmen.				
Surplus earthwork/soil	Runoff to cause water pollution, solid waste disposal	Excess fill from tower foundation excavation to be reused on site or disposed of next to roads or around houses, in agreement with the local community or landowners.	Location and amount (m <sup>3</sup> ) of fill disposal Soil disposal locations and volume (m <sup>3</sup> )	Excess soil is dumped on the bund of field and also dumped to path after discussing with the local persons as per requirement.	545	Need to maintain the same practice up to completion of project.	Nil	RRV/PNL/TPL
Air Pollution	Loose dust might blow in the area causing dusty conditions	Damping of dust by sprinkling of water within the work area and stack the loose soil and contain it with covers if required.	Soil stacking locations, access roads, tower locations, substation site	Sprayed water to minimize dust releasing in case of windy and dry weather.  Excavated earth is covered.	Always	-	-	RRV/PNL/TPL
Wood/vegetation harvesting, cut and fill operations	Loss of vegetation and deforestation	Construction workers prohibited from harvesting wood in the project area during their employment.	Illegal wood /vegetation harvesting (area in m <sup>2</sup> , number of incidents reported)	LPG cylinder provided to Labor for cooking purpose.	Always			RRV/PNL/TPL
	Effect on fauna	Prevent work force from disturbing the flora, fauna including hunting of animal and fishing in water bodies.	Habitat loss	Training program conducted to	Always			RRV/PNL/TPL

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
		Proper awareness programme regarding conservation of flora, fauna including ground vegetation to all drivers, operators and other workers.		create awareness among the workers and staff to conserve the flora and fauna.				
Site clearance	Vegetation	Marking of vegetation to be removed prior to clearance, and strict control on clearing activities to ensure minimal clearance.	Vegetation marking and clearance control (area in m <sup>2</sup> )	Vegetation land not involve through the TL.	Always			RRVPNL/TPL
	Soil erosion and surface runoff	Construction near seasonal rivers, erosion and flood-prone areas (if any) should be restricted to the dry season.  Provision and maintenance of drains and retention ponds. Treat clearing and filling areas against flow acceleration and construction work should be carefully designed to minimise obstruction or destruction to natural drainage.	Soil erosion	No soil erosion involve during the construction activity of tower foundation.	Always			RRVPNL/TPL
Mechanised construction	Noise, vibration and operator safety, efficient operation	Construction equipment to be well maintained.	Construction equipment - estimated noise emissions and operating schedules	Construction equipment is regularly maintained and time to time we maintain a test check of all the machineries	Always	Work carried out with the standard norms.	Need to maintain same practice up to completion of project.	RRVPNL/TPL
	Noise, vibration, equipment wear and tear	Proper maintenance and turning off plant not in use.						
Construction of roads for accessibility	Increase in airborne dust particles	Existing roads and tracks used for construction and maintenance access to the site wherever possible.	Access roads, routes (length and width of access roads)	Existing road/path only used for the construction	F- 545 Nos E – 521 Nos S-72.671 Kms	Only existing path is used for construction	Need to maintain same practice	RRVPNL/TPL
	Increased land							



Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
	requirement for temporary accessibility	New access ways restricted to a single carriageway width within the Row.		activity.		activity.	up to completion of project	
Transportation and storage of materials	Nuisance to the general public	<p>Transport loading and unloading of construction materials should not cause nuisance to the people by way of noise, vibration and dust</p> <p>Avoid storage of construction materials beside the road, around water bodies, residential or public sensitive locations</p> <p>Construction materials should be stored in covered areas to ensure protection from dust, emissions and such materials should be bundled in environment friendly and nuisance free manner</p>	Water and Air Quality	<p>Dropping material in the road collected.</p> <p>Construction material stored at high level ground level at construction site.</p> <p>Construction waste removed from the construction site after work completion.</p>	Always			RRV/PNL/TPL
Trimming/cutting of trees within RoW	<p>Fire hazards</p> <p>Loss of vegetation and deforestation</p>	<p>Trees allowed growing up to a height within the RoW by maintaining adequate clearance between the top of tree and the conductor as per the regulations.</p> <p>Trees that can survive trimming to comply with statutory distance should be lopped and not felled</p> <p>Felled trees and other cleared or pruned vegetation to be disposed of as authorised by the statutory bodies.</p>	<p>Species-specific tree retention as approved by statutory authorities (average and maximum tree height at maturity, in metres)</p> <p>Disposal of cleared vegetation as approved by the statutory</p>	<p>The tree and bushes coming within the 26 Meter either side of central line has to be trimmed up height required for the clearance.</p> <p>No vegetation filed involved during the construction</p>	Always	Compensation of same should be given in time.	Non	RRV/PNL/TPL

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
			authorities (area cleared in m <sup>2</sup> )	activity.				
Health and safety ADD PPE	Injury and sickness of workers and members of the public	Contract provisions specifying minimum requirements for construction camps from water bodies, reserved areas etc.  Contractor to prepare and implement a health and safety plan and provide workers with required personal protective equipment (PPE) at site. Contractor to arrange for health and safety awareness programmes	Contract clauses (number of incidents and total lost-work days caused by injuries and sickness)	Conducting training courses and meeting for the workers on safety and environmental hygienic Providing personal safety devices for workers safety boots, helmet ,gloves, mask and protective cloths	Always	All work is carrying out with PPE.	Non	RRVPNL/TPL
Nuisance to nearby properties	Losses to neighboring land uses/ values	Contract clauses specifying careful construction practices.  As much as possible existing access ways will be used.  Productive land will be reinstated following completion of construction  Compensation will be paid for loss of production, if any.	Contract clauses Design basis and layout  Reinstatement of land status (area affected, m <sup>2</sup> ) Implementation of Tree/Crop compensation (amount paid)	Excavated material is used for filling ground itself.  Access roads always used for construction activity. Compensation paid against the crop damaged to farmers.	F- 545 Nos E – 521 Nos S-72.671 Kms			RRVPNL/TPL
<b>Operation and Maintenance Phase</b>								
Electric shock	Death or injury to the	Security fences around substation	Proper					

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
	workers and public	Establishment of warning signs  Careful design using appropriate technologies to minimise hazards	maintenance of fences and sign boards  Usage of appropriate technologies (lost work days due to illness and injuries)	Not Applicable				
Noise generation	Nuisance to the community around the site	Provision of noise barriers near substation sites	Noise level	Not Applicable				
Soil Erosion	Removal of top soil	Planting of buffer zone species suitable for arid climate.	Turbidity of water (Visual Inspection)	Not Applicable				
Maintenance of Transmission line	Exposure to electromagnetic interference	Transmission line design to comply with the limits of electromagnetic interference from overhead power lines	Required ground clearance (metres)	Not Applicable				
Substation maintenance	Exposure to electromagnetic interference	Substation design to comply with the limits of electromagnetic interference within floor area	Required vibrations level, instrumentation	Not Applicable				
Oil spillage	Contamination of land/nearby water bodies	Substation transformers located within secure and impervious bundled areas with a storage capacity of at least 110% of the capacity of oil in transformers and associated reserve tanks.	Substation bounding ("as-built" diagrams)	Not Applicable				
Operation of Switchgear	Leakage of SF6 gas	Record of all substation switchgear located within secure casings	Switchgear casings and Substation bounding	Not Applicable				

### B.3.2 Environment Monitoring Plan and Status on Implementation

Environmental component	Project stage	Parameters to be monitored	Sampling Location	Monitoring Frequency	Regulatory Standards for parameter	Agency responsible for implementation	Agency responsible for supervision	Test Results	Observations/Comments	Actions for Compliance	Further follow-up required
<b>1.Air Quality</b>	A. Pre construction stage (Baseline development)	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>x</sub> , SPM, CO (Visible dust)	Different loc in the TL	One time	Spot check using field portable instruments	RRVPNL	RRVPNL				
					National Air quality standards of CPCB [PM10 or PM2.5]	RRVPNL	RRVPNL				
	B. Construction Stage	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>x</sub> , SPM, CO (Visible dust)	Different loc in the TL	Every one month of construction period	Spot check using field portable instruments						
					National Air quality standards of CPCB [PM10 or PM2.5]	TPL	RRVPNL		Testing has been conducted at site and reports submitted.		
	C. Operation Stage (Testing and Commissioning)	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>x</sub> , SPM, CO (Visible dust)	Different loc in the TL	One time during commissioning	Spot check using field portable instruments	RRVPNL	RRVPNL		Not Applicable		
					National Air						

Environmental component	Project stage	Parameters to be monitored	Sampling Location	Monitoring Frequency	Regulatory Standards for parameter	Agency responsible for implementation	Agency responsible for supervision	Test Results	Observations/Comments	Actions for Compliance	Further follow-up required
<b>2. Water Quality</b>	A. Pre construction stage (Baseline development)	EC, TSS, DO, BOD, P <sup>H</sup> Oil and grease, Pb,	Nearest well along the TL	One time	National water quality standards of CPCB	RRVPNL	RRVPNL				
	B. Construction Stage	EC, TSS, DO, BOD, P <sup>H</sup> Oil and grease, Pb,	Nearest well along the TL	One time during cable laying	National water quality standards of CPCB	TPL	RRVPNL		Testing has been conducted at site and reports submitted.		
	C. Operation Stage	EC, TSS, DO, BOD, P <sup>H</sup> Oil and grease, Pb,	Nearest well along the TL	One time during commissioning	National water quality standards of CPCB	RRVPNL	RRVPNL		Not Applicable		
<b>3. Noise/ Vibration</b>	A. Pre construction stage (Baseline development)	Noise level [dB(A)]	Different loc in the TL	One time	CPCB standards for Noise and vibrations	RRVPNL	RRVPNL				
	B. Construction Stage	Noise level [dB(A)]	Different loc in the TL	Every one month of construction	CPCB standards for Noise	TPL	RRVPNL		Testing has been conducted		

Environmental component	Project stage	Parameters to be monitored	Sampling Location	Monitoring Frequency	Regulatory Standards for parameter	Agency responsible for implementation	Agency responsible for supervision	Test Results	Observations/Comments	Actions for Compliance	Further follow-up required
				period	and vibrations						
	C. Operation Stage	Noise level [dB(A)]	Different loc in the TL	One time during commissioning	CPCB standards for Noise and vibrations	RRVPNL	RRVPNL	Not Applicable			
4. Soil	A. Pre construction stage (Baseline development)	Visible spills and/or soil staining, Oil & grease	1 location along the TL	One time	Hazardous Waste Management rules	RRVPNL	RRVPNL				
	B. Construction Stage	Visible spills and/or soil staining, Oil & grease	1 location along the TL	One time	Hazardous Waste Management rules	TPL	RRVPNL	Testing has been conducted at site and reports submitted.			
	C. Operation Stage	Visible spills and/or soil staining, Oil & grease	1 location along the TL	One time during commissioning	Hazardous Waste Management rules	RRVPNL	RRVPNL	Not Applicable			
SF6	Operation Stage	Volumetric loss from GIS equipment	Substation equipment, circuit breakers	Online monitoring by data loggers	As per Approved Specifications of Equipment	RRVPNL	RRVPNL	Not Applicable			

**Abbreviations:**

SO<sub>2</sub>- Sulphur Dioxide; NO<sub>2</sub>- Nitrogen Dioxide; CO- Carbon Monoxide; EC – Electric Conductivity;

Pb – Lead; PM<sub>2.5</sub>- Particulate Matter <2.5; PM<sub>10</sub>- Particulate Matter <10; TSPM- Total suspended Particulate Matter;

EC - Electrical Conductivity; DO - Dissolved Oxygen; TSS - Total Suspended Solids;

SF<sub>6</sub> – Sulphur Hexafluoride gas

BOD - Biological Oxygen Demand; ORP – Oxidation Reduction Potential

NAAQS - National Ambient Air Quality Standards specified by CPCB, GoI;

NWQS - National Water Quality Standards specified by CPCB, GoI.

**Annexure 1: Photographs regarding EMP issues  
Photographs taken during the different work at site.**



1.1 Testing of Air Quality



1.2 Testing of Noise



1.3 Testing of Soil Quality



1.4 Testing of water Quality





1.5 Storage of equipment and material



1.6 Storage of ACSR Conductor Drums.



1.7 Usage of Safety Net during erection work.



1.8 Usage of adequate water for Foundation curing work





1.9 Stringing work in progress



1.10 Labour Shelter Camp with sufficient water for Bathing, Drinking, cooking.

**Annexure 2:**  
**Tata Projects Limited Letter no. 115 dated 03.01.2017 for submission of Environment Testing Reports**

o/c.

  
**TATA**

Ref: TPL/T & D/ICB 6/16-17/ 115  
The Superintending Engineer (T&C-Kankani)  
Rajasthan Rajya Vidyut Prasaran Nigam Ltd.,  
Jodhpur, Rajasthan-342006

Date: 03<sup>rd</sup> Jan '17

Sub: Construction of 400 kV D/C Twin ACSR Moose Transmission Line from 400/220 kV Pooling station Bhadla (Jaisalmer) to LILO point at 400kV S/C Jodhpur Meerta Line.(Package-ICB-06). Submission of Test Certificates of Air, Water, Soil and Noise for onward submission to ADB.

Ref: RVPNL Letter no. RVPN/SE/CONTRACTS)/XEN-1/(CONTRACTS)/ICB 6/D. 526 dated 02.11.2016

Dear Sir,

In regards to the subject line, we request your good self to kindly forward the attached original Test Reports to ADB. The Test reports attached are:

1. **Ambient Air** at several locations across the Line - Report No. VEL/A/1612/14001, VEL/A/1612/14002, VEL/A/1612/14003, VEL/A/1612/14004, VEL/A/1612/14005, VEL/A/1612/14006.
2. **Ambient Noise** at several locations across the Line- Report No. VEL/N/1612/14001, VEL/N/1612/14002, VEL/N/1612/14003, VEL/N/1612/14004, VEL/N/1612/14005, VEL/N/1612/14006, VEL/N/1612/14007, VEL/N/1612/14008.
3. **Ground Water** at several locations across the Line- Report No. VEL/W/1612/14001, VEL/W/1612/14002, VEL/W/1612/14003, VEL/W/1612/14004, VEL/W/1612/14005.
4. **Soil** at several locations across the Line- Report No. VEL/TCL/S/1612/14001, VEL/TCL/S/1612/14002, VEL/TCL/S/1612/14003, VEL/TCL/S/1612/14004, VEL/TCL/S/1612/14005.

Thanking you and assuring you the best of our services at all the times.

Yours faithfully  
For Tata Projects Limited

  
(P.P. Singh Rathore)  
RCM

CC:

1. The Executive Engineer-TA to Chief Engineer-Contracts, RRVPNL, Jaipur.
2. The Executive Engineer-T&C, KAKANI, RRVPNL, Jodhpur.
3. The Assistant Engineer-T&C, KAKANI, RRVPNL, Jodhpur

**TATA PROJECTS LIMITED**

Registered Office : "Mithona Towers-1" 1-7-80 to 87 Prenderghast Road Secunderabad - 500 003 Telangana India  
Phone +91-40-6623 8801 Fax 6617 2535  
CIN U45203AP1979PLC057431 e-mail tpl@tataprojects.com www.tataprojects.com

**Annexure 3**  
**Baseline Test Reports (Tests done during IEE assessment in 2011-2012)**

**Location of Sampling Inside the Bhadla Solar Park (November 2011)**

S. No	Component	No. of Sample	Report Reference No.	Sampling Location
1 and 2	Air Monitoring and Noise Monitoring	6	AN - 1	Near Munna Ram's tube well
			AN - 2	Near Sarpanch (Mathar Khan's House) Churon Ki Basti
			AN - 3	GSS Bhadla Substation land
			AN - 4	Near ArniyokiNadi
			AN - 5	Near PannukiNadi
			AN - 6	Near Mile stone of 0 km Bhadla Fanta on Nachna – Bhikampur road
3	Water Analysis	3	WS - 1	Munna Ram's tube well
			WS - 2	Govt. tube well Churon Ki Basti
			WS - 3	Water tank at Kamrudeen House in GamnokiBasti
4	Soil Analysis	3	SS - 1	GSS Bhadla Substation land
			SS - 2	Near ArniyokiNadi
			SS - 3	Near PannukiNadi

**Location of Sampling along the associated Grid Substations (November 2011)**

S. No	Component	No. of Sample	Report Reference No.	Sampling Location
1 and 2	for Air and Noise Monitoring	4 each	SS-1	GSS Sub Station Land, Khasara No. 8, Village: Bhadla, Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur
			SS - 2	400 KVA GSS Site, Village: Meyon Ki Dhani, Post: Ramgarh, Jaisalmer
			SS - 3	Near SE office 400 KVA (RRVPLN), Village: Akal, Post: Jodha, Jaisalmer
			SS - 4	GSS 400 kVA Site, Village: Kakani, Post and Tehsil: Luni, Jodhpur
3	Water Analysis	4	SS-1	Water sample collected from Bore well of Munna Ram Ji, Village: Bhadla (Khasra No.9), Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur
			SS - 2	Water sample collected from Govt. Bore well (Nearest Bore well GSS Ramgarh), Village and Post: Sonu, Tehsil: Ramgarh, District Jaisalmer
			SS - 3	Water sample collected from Govt. Bore well inside 400 KVA GSS (RRVPLN), Village: Akal, Post: Jodha, Jaisalmer
			SS - 4	Water sample collected from Open Well of Babu Singh Champavat, Village: Kakani, Post and Tehsil: Luni, Jodhpur
4	Soil Analysis	4	SS-1	Soil sample collected from the land of proposed GSS Sub Station, Khasara No. 8, Village: Bhadla, Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur
			SS - 2	Soil sample collected from the proposed Ramgarh GSS 400 KVA, Village and Post: Sonu, Tehsil: Ramgarh, District Jaisalmer
			SS - 3	Soil sample collected from the land of proposed GSS 400 KVA (RRVPLN), Village: Akal, Post: Jodha, Jaisalmer
			SS - 4	Soil sample collected from the land of Proposed GSS 400 KVA, Village: Kakani, Post and Tehsil: Luni, Jodhpur

**Location of Sampling along the Tranche -1 transmission lines (December 2011 to January 2012)**

S. No	Component	No. Of Sample	Sample No.	Sampling Location
1 and 2	for Air and Noise	17 each	Sample No. 1	Village: JajiwalGehlotan, Post: Jajiwal via Mandor, District Jodhpur
			Sample No. 2	Village and Post: Umed Nagar, Tehsil: Osiyan, District Jodhpur

	Monitoring		Sample No. 3	Near 44 No. Railway crossing, Bhikamkhor, Tehsil: Osiyan, District Jodhpur
			Sample No.4	Village: Amla (Near Kichan), Post and Tehsil: Phalodi, District Jodhpur
			Sample No.5	Village: Khirwa, Post: HidaGol, Tehsil: Phalodi, District Jodhpur)
			Sample No.6	Village: Kanasar, Post: Bap, Tehsil: Phalodi, District Jodhpur)
			Sample No. 7	(Village and Post: Askandra, Tehsil: Pokharan, District Jaisalmer)
			Sample No. 8	Village and Post: Tadana, Tehsil and District Jaisalmer)
			Sample No. 9	Village: Nirudeen Ki Dhani, District Jaisalmer)
			Sample No.10	Village: Nehdai, District Jaisalmer
			Sample No.11	Village: Tanusar, District Jaisalmer
			Sample No.12	Village: Joga, District Jaisalmer
			Sample No. 13	Village: Parewer, District Jaisalmer
			Sample No. 14	Village: Asda, District Jaisalmer
			Sample No. 15	Village: Hadda, District Jaisalmer
			Sample No.16	Hamira Rly Station, Village: Thaiyat, District Jaisalmer)
			Sample No.17	Village: BhaguKaGaon, District Jaisalmer
3	Water Analysis	7	Sample No. 1	Water sample collected from Pond, Village: JajiwalGehlotan, Post: Jajiwal via Mandor, District Jodhpur
			Sample No. 2	Water sample collected from Bore well of Sukh Ram S/o ShriBhagirathRam, Village: Sirmandi, Post and Tehsil: Osiyan, District Jodhpur
			Sample No. 3	Water sample collected from Bore well of Manish S/o ShriPannaLalJi, Village: Amla, Post and Tehsil: Phalodi, District Jodhpur
			Sample No.4	Water sample collected from Govt. Bore well, Village and Post: Askandra, Tehsil: Pokharan, District Jaisalmer
			Sample No.5	Water sample collected from Water Tank of Babu Singh S/o ShriBagh Singh, Village: Tanusar, Jaisalmer
			Sample No.6	Water sample collected from Govt. Bore well, Village: Joshiyan (Hadda), Post: Kanod, Tehsil: and District: Jaisalmer
			Sample No.7	Water sample collected from Govt. Bore well, Village and Post: BhaguKaGaon, Tehsil and District: Jaisalmer
4	Soil Analysis	7	Sample No. 1	Soil sample collected from the Pond of Village: JajiwalGehlotan, Post: Jajiwal via Mandor, District Jodhpur
			Sample No. 2	Soil sample collected from the land of Sukh Ram S/o ShriBhagirath Ram, Village: Sirmandi, Post and Tehsil: Osiyan, District Jodhpur
			Sample No. 3	Soil sample collected from the land of Manish S/o ShriPannaLalJi, Village: Amla, Post and Tehsil: Phalodi, District Jodhpur
			Sample No.4	Soil sample collected from the land of Padam Singh S/o ShriChandan Singh Ji, Village and Post: Askandra, Tehsil: Pokaran, District Jaisalmer
			Sample No.5	Soil sample collected from the land of Babu Singh S/o ShriBagh Singh, Village: Tanusar, Jaisalmer)
			Sample No.6	Soil sample collected from the land of BheraramJi S/o ShriManglaramJi Village: Hadda, Post: Kanod, Tehsil and District Jaisalmer
			Sample No.7	Soil sample collected from the land of Barkat Khan S/o ShriJalu Khan, Village and Post: BhaguKaGaon, Tehsil and District: Jaisalmer

#### A. AMBIENT AIR QUALITY MONITORING REPORT

##### i.Ambient Air Quality Monitoring Report for Solar Park at Bhadla (November 2011)

S. No	Site	Particulate Matter (PM 2.5)	Particulate Matter (PM 10)	Sulphur Dioxide (SO2)	Oxide Of Nitrogen (NOX)	Carbon Monoxide as (CO)
AN -1	Near House of Munna Ram Ji	26.5 µg / m3	53.1 µg / m3	6.2 µg / m3	9.3 µg / m3	573 µg / m3

AN -2	Near House of Mathar Khan (Sarpanch), Chudon Ki Basti	31.4 µg / m3	58.6 µg / m3	6.3 µg / m3	9.1 µg / m3	458 µg / m3
AN -3	GSS Sub Station Land	24.1 µg / m3	47.5 µg / m3	6.0 µg / m3	9.0 µg / m3	373 µg / m3
AN -4	Arniya Ki Nadi	29.4 µg / m3	56.8 µg / m3	6.3 µg / m3	9.2 µg / m3	458 µg / m3
AN -5	Panna Ki Nadi	25.3 µg / m3	50.8 µg / m3	6.0 µg / m3	9.0 µg / m3	458 µg / m3
AN -6	0 km Mile stone of Bhadla at Badhla Fanta	21.4 µg / m3	43.6 µg / m3	6.0 µg / m3	9.0 µg / m3	373 µg / m3
	Standard Value	60 µg / m3	100 µg / m3	80 µg / m3	80 µg / m3	2000 µg / m3
	Methods of Measurement	Gravimetric Method	Gravimetric Method	Improved West and Gaeke Method	Modified Jacob and Hochheiser Method	IS: 5182 – 1975 Part X

#### ii.Ambient Air Quality Monitoring Report for Grid Substations (November 2011)

Sample No	Site	Particulate Matter (PM 2.5)	Particulate Matter (PM 10)	Sulphur Dioxide (SO2)	Oxide of Nitrogen (NOX)	Carbon Monoxide as (CO)
SS - 1	GSS Sub Station Land, Khasara No. 8, Village: Bhadla, Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur	24.1 µg / m3	47.5 µg / m3	6.0 µg / m3	9.0 µg / m3	373 µg / m3
SS - 2	400 KVA GSS Site, Village: Meyon Ki Dhani, Post: Ramgarh, Jaisalmer	27.3 µg / m3	57.7 µg / m3	6.5 µg / m3	9.3 µg / m3	573 µg / m3
SS - 3	Near SE office 400 KVA (RRVPL), Village: Akal, Post: Jodha, Jaisalmer	32.6 µg / m3	65.8 µg / m3	6.3 µg / m3	9.7 µg / m3	687 µg / m3
SS - 4	GSS 400 kVA Site, Village: Kakani, Post and Tehsil: Luni, Jodhpur	20.5 µg / m3	44.6 µg / m3	6.0 µg / m3	9.0 µg / m3	458 µg / m3
	Standard Value	60 µg / m3	100 µg / m3	80 µg / m3	80 µg / m3	2000 µg / m3
	Methods of Measurement	Gravimetric Method	Gravimetric Method	Improved West and Gaeke Method	Modified Jacob and Hochheiser Method	IS: 5182 – 1975 Part X

#### iii.Ambient Air Quality Monitoring Report along 3 nos. 440 KV Transmission Lines (December 2011 to January 2012)

Sam ple No	Site	Particulate Matter (PM 2.5)	Particulate Matter (PM 10)	Sulphur Dioxide (SO2)	Oxide of Nitrogen (NOX)	Carbon Monoxide as (CO)
1	Near NageshwarMahadev Temple, Village: JajiwalGehlotan, Post: Jajiwalvia Mandor, District Jodhpur	33.6 µg / m3	65.5 µg / m3	6.3 µg / m3	9.7 µg / m3	458 µg / m3
2	Near 33 KVA Sub Station, Village and Post: Umed Nagar, Tehsil: Osiyan, District Jodhpur	36.2 µg / m3	70.5 µg / m3	6.6 µg / m3	9.8 µg / m3	573 µg / m3
3	Near 44 No. Railway crossing, Bhikamkhor, Tehsil: Osiyan, District Jodhpur	39.5 µg / m3	62.3 µg / m3	6.8 µg / m3	10.1 µg / m3	687 µg / m3
4	Near house of Manish S/o ShriPannaLalJi, Village: Amla (Near Kichan), Post and Tehsil: Phalodi, District Jodhpur	24.1 µg / m3	52.3 µg / m3	6.2 µg / m3	9.5 µg / m3	458 µg / m3
5	Near NayaTalab, Village: Khirwa, Post:	22.6 µg / m3	47.8 µg / m3	6.1 µg / m3	9.3 µg / m3	458 µg / m3

Sam ple No	Site	Particulate Matter (PM 2.5)	Particulate Matter (PM 10)	Sulphur Dioxide (SO <sub>2</sub> )	Oxide of Nitrogen (NO <sub>x</sub> )	Carbon Monoxide as (CO)
	HidalGol, Tehsil: Phalodi, District Jodhpur)					
6	(Near house of Gopal S/o ShriPrem Pal Vishnoi, Village: Kanasar, Post: Bap, Tehsil: Phalodi, District Jodhpur)	30.5 µg / m <sup>3</sup>	62.3 µg / m <sup>3</sup>	6.3 µg / m <sup>3</sup>	9.8 µg / m <sup>3</sup>	573 µg / m <sup>3</sup>
7	Crossing point at Askandra – Nachna Road, Village and Post: Askandra, Tehsil: Pokharan, District Jaisalmer	41.5 µg / m <sup>3</sup>	76.6 µg / m <sup>3</sup>	7.6 µg / m <sup>3</sup>	11.9 µg / m <sup>3</sup>	687 µg / m <sup>3</sup>
8	Near Stone Quarry, Nachna – Tadana Road, Village and Post: Tadana, Tehsil and District Jaisalmer)	24.0 µg / m <sup>3</sup>	52.6 µg / m <sup>3</sup>	6.7 µg / m <sup>3</sup>	9.6 µg / m <sup>3</sup>	458 µg / m <sup>3</sup>
9	Near Nirudeen Ki Dhani, District Jaisalmer)	18.6 µg / m <sup>3</sup>	41.4 µg / m <sup>3</sup>	6.0 µg / m <sup>3</sup>	9.0 µg / m <sup>3</sup>	344 µg / m <sup>3</sup>
10	Near PandiDungari, Village: Nehdai, District Jaisalmer	21.8 µg / m <sup>3</sup>	49.4 µg / m <sup>3</sup>	6.1 µg / m <sup>3</sup>	9.3 µg / m <sup>3</sup>	344 µg / m <sup>3</sup>
11	Near house of Babu Singh S/o ShriBagh Singh, Village: Tanusar, District Jaisalmer	23.0 µg / m <sup>3</sup>	52.4 µg / m <sup>3</sup>	6.2 µg / m <sup>3</sup>	9.6 µg / m <sup>3</sup>	458 µg / m <sup>3</sup>
12	Village: Joga, Post: Saiiwa, Tehsil and District Jaisalmer	25.7 µg / m <sup>3</sup>	59.8 µg / m <sup>3</sup>	6.2 µg / m <sup>3</sup>	9.5 µg / m <sup>3</sup>	458 µg / m <sup>3</sup>
13	Near Tulsiram Ki Dhani, Village: Parewer, Tehsil and District Jaisalmer)	28.0 µg / m <sup>3</sup>	62.4 µg / m <sup>3</sup>	6.5 µg / m <sup>3</sup>	9.7 µg / m <sup>3</sup>	573 µg / m <sup>3</sup>
14	Near house of Fajal Khan S/o ShriViram Khan, Village: Asda, Post: Deva, Tehsil and District Jaisalmer	32.0 µg / m <sup>3</sup>	62.5 µg / m <sup>3</sup>	6.3 µg / m <sup>3</sup>	9.8 µg / m <sup>3</sup>	573 µg / m <sup>3</sup>
15	Near Mile Stone KM. 3, Village: Hadda, Post: Kanod, Tehsil and District Jaisalmer	34.2 µg / m <sup>3</sup>	71.7 µg / m <sup>3</sup>	6.8 µg / m <sup>3</sup>	10.9 µg / m <sup>3</sup>	687 µg / m <sup>3</sup>
16	Near Hamira Rly Station, Village: Thaiyat, District Jaisalmer	31.9 µg / m <sup>3</sup>	67.1 µg / m <sup>3</sup>	6.8 µg / m <sup>3</sup>	9.7 µg / m <sup>3</sup>	573 µg / m <sup>3</sup>
17	Near house of Barkat Khan S/o ShriJalu Khan, Village and Post: BhaguKaGaon, Tehsil and District Jaisalmer	23.0 µg / m <sup>3</sup>	56.2 µg / m <sup>3</sup>	6.3 µg / m <sup>3</sup>	9.5 µg / m <sup>3</sup>	573 µg / m <sup>3</sup>
	Standard Value	60 µg / m <sup>3</sup>	100 µg / m <sup>3</sup>	80 µg / m <sup>3</sup>	80 µg / m <sup>3</sup>	2000 µg / m <sup>3</sup>
	Methods of Measurement	Gravimetric Method	Gravimetric Method	Improved West and Gaeke Method	Modified Jacob and Hochheiser Method	IS: 5182 – 1975 Part X

## B. AMBIENT NOISE MONITORING REPORT

### i.Ambient Noise Monitoring Report for Solar Park (November 2011)

S. No	Site	Ld (Day Equivalent)	Ln (Night Equivalent)	Ldn (Day-Night Equivalent)
AN -1	Near House of Munna Ram	47.15	41.57	49.16
AN -2	Near House of Mathar Khan (Sarpanch), Chudon Ki Basti	47.35	41.87	49.42
AN -3	GSS Sub Station Land	45.45	41.00	48.15
AN -4	Arniya Ki Nadi	47.53	41.71	49.40
AN -5	Panna Ki Nadi	47.47	40.77	48.87
AN -6	0 km Mile stone of Bhadla at	44.20	40.31	47.27

	Badhla Fanta			
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**ii.Ambient Noise Monitoring Report for Grid Substations (November 2011)**

Sample No	Site	Ld (Day Equivalent)	Ln (Night Equivalent)	Ldn (Day-Night Equivalent)
SS - 1	GSS Sub Station Land, Khasara No. 8, Village: Bhadla, Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur	45.45	41.00	48.15
SS - 2	400 KVA GSS Site, Village: Meyon Ki Dhani, Post: Ramgarh, Jaisalmer	48.58	41.94	50.01
SS - 3	Near SE office 400 KVA (RRVPLN), Village: Akal, Post: Jodha, Jaisalmer	52.31	42.31	52.31
SS - 4	GSS 400 kVA Site, Village: Kakani, Post and Tehsil: Luni, Jodhpur	53.17	41.75	52.74

**iii.Ambient Noise Monitoring Report for Along the 3 400 kV transmission lines (December 2011 to January 2012)**

Sample No	Site	Ld (Day Equivalent)	Ln (Night Equivalent)	Ldn (Day-Night Equivalent)
1	Village: JajiwalGehlotan, Post: Jajiwal via Mandor, District Jodhpur	47.18	41.61	49.20
2	Village and Post: Umed Nagar, Tehsil: Osiyan, District Jodhpur	52.82	43.64	53.11
3	Near 44 No. Railway crossing, Bhikamkhor, Tehsil: Osiyan, District Jodhpur	49.73	41.23	50.29
4	Village: Amla (Near Kichan), Post and Tehsil: Phalodi, District Jodhpur	54.09	42.03	53.51
5	Village: Khirwa, Post: HidalGol, Tehsil: Phalodi, District Jodhpur)	51.05	41.88	51.34
6	Village: Kanasar, Post: Bap, Tehsil: Phalodi, District Jodhpur)	48.00	44.12	51.07
7	(Village and Post: Askandra, Tehsil: Pokharan, District Jaisalmer)	49.90	43.03	51.21
8	Village and Post: Tadana, Tehsil and District Jaisalmer)	52.64	42.43	52.57
9	Village: Nirudeen Ki Dhani, District Jaisalmer)	44.38	40.87	47.71
10	Village: Nehdai, District Jaisalmer	50.58	42.08	51.14
11	Village: Tanusar, District Jaisalmer	49.67	41.20	50.24
12	Village: Joga, District Jaisalmer	47.29	41.42	49.13
13	Village: Parewer, District Jaisalmer	49.94	41.74	50.62
14	Village: Asda, District Jaisalmer	47.82	41.59	49.47
15	Village: Hadda, District Jaisalmer	48.06	41.79	49.68
16	Hamira Rly Station, Village: Thaiyat, District Jaisalmer)	52.63	42.40	52.55
17	Village: BhaguKaGaon, District Jaisalmer	49.20	41.86	50.27

All results are in Decibel (dB) Unit

**Ambient Air Quality Standards in respect of Noise**

Area Code	Category of Area/Zone	Limits in dB(A) Leq *	
		Day Time	Night Time
(A)	Industrial area	75	70



(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

Note

1. Day time shall mean from 6.00 a.m. to 10.00 p.m.
2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
3. Silence zone is defined as an area comprising not less than 100 metres around hospitals, educational institutions and courts. The silence zones are zones which are declared as such by the competent authority.

4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

\*dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

A "decibel" is a unit in which noise is measured.

"A", in dB(A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq : It is an energy mean of the noise level, over a specified period.

Source: Ministry of Environment and Forests Notification, New Delhi, the 14 February, 2000 S.O. 123(E)

### C. ANALYSIS REPORT OF SOIL

#### i. Analysis Report of Soil for Solar Park (November 2011)

Parameters (Unit)	Unit	SS -1: GSS Sub Station	SS -2 Near Arniya Ki Nadi	SS - 3: Near Pannu Ki Nadi
Color	Visual Comparison	Light Brown	Light Brown	Light Brown
pH (1:5)	-	7.87	7.86	7.56
Conductivity(1:5)	( $\mu$ S/cm)	141	132	291
Moisture	(%)	6.1	4.8	5.3
Chlorides as Cl	(%)	0.004	0.002	0.004
Sulphate as SO <sub>4</sub>	(%)	0.005	0.001	0.005
Total Carbonates	(%)	0.05	0.04	0.05
Total Soluble Solids	(%)	0.064	0.036	0.136
Total Organic Matter	(%)	0.13	0.04	0.11
Nitrogen as N	(%)	0.07	0.03	0.09
Phosphorus as P	(%)	< 0.0005	< 0.0005	< 0.0005
Potassium as K	(%)	0.012	0.013	0.025
Zinc	Mg / 100 Gm	BDL	BDL	BDL
Copper	Mg / 100 Gm	BDL	BDL	BDL
Chromium	Mg / 100 Gm	BDL	BDL	BDL
Cadmium	Mg / 100 Gm	BDL	BDL	BDL
Nickel	Mg / 100 Gm	BDL	BDL	BDL
Lead	Mg / 100 Gm	BDL	BDL	BDL

BDL\* - Below Detectable Limit

#### ii. Analysis Report of Soil for Grid Substations (November 2011)

Parameters (Unit)	Unit	SS -1 Bhadla GSS	SS -2 Ramgarh GSS	SS -3 Akal GSS	SS 4 Jodhpur GSS at Kakani
Color	Visual Comparison	Light Brown	Light Brown	Light Brown	Light Brown
pH (1:5)	-	7.87	7.25	7.71	7.64
Conductivity(1:5)	( $\mu$ S/cm)	141	823	203	388
Moisture	(%)	6.1	6.5	7.2	6.8

Chlorides as Cl	(%)	0.004	0.037	0.005	0.01
Sulphate as SO <sub>4</sub>	(%)	0.005	0.016	0.002	0.003
Total Carbonates	(%)	0.05	0.04	0.05	0.02
Total Soluble Solids	(%)	0.064	0.33	0.072	0.122
Total Organic Matter	(%)	0.13	0.14	0.07	0.08
Nitrogen as N	(%)	0.07	0.09	0.04	0.04
Phosphorus as P	(%)	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Potassium as K	(%)	0.012	0.04	0.024	0.012
Zinc	Mg / 100 Gm	BDL	BDL	BDL	BDL
Copper	Mg / 100 Gm	BDL	BDL	BDL	BDL
Chromium	Mg / 100 Gm	BDL	BDL	BDL	BDL
Cadmium	Mg / 100 Gm	BDL	BDL	BDL	BDL
Nickel	Mg / 100 Gm	BDL	BDL	BDL	BDL
Lead	Mg / 100 Gm	BDL	BDL	BDL	BDL

BDL\* - Below Detectable Limit

### iii. Analysis Report of Soil along Transmission lines (December 2011 to January 2012)

Sample No		1	2	3	4	5	6	7
Parameters (Unit)	Unit	Results JajiwalGehl otan, Jodhpur	Village: Sirmandi, Jodhpur	Village: Amla, Jodhpur	Village Askandra, Jaisalmer	Village: Tanusar, Jaisalmer	Results Village: Hadda, Jaisalmer	Village: BhaguKaG aon, Jaisalmer
Color	Visual Comparison	Grey	Light Brown	Light Brown	Light Brown	Light Brown	Light Brown	Light Brown
pH (1:5)	-	7.58	7.33	7.31	7.23	7.12	7.7	7.06
Conductivity(1:5)	(μS/cm)	406	340	424	110	2520	146	1795
Moisture	(%)	2.64	2.06	2.49	0.06	1.98	0.30	0.34
Chlorides as Cl	(%)	0.007	0.016	.016	0.003	0.005	0.004	0.072
Sulphate as SO <sub>4</sub>	(%)	0.014	0.012	0.004	0.008	0.156	0.009	0.068
Total Carbonates	(%)	13.88	1.17	6.95	2.91	21.96	11.56	22.54
Total Soluble Solids	(%)	0.201	0.158	0.165	0.136	1.199	0.108	0.708
Total Organic Matter	(%)	0.187	0.037	0.091	0.026	0.029	0.034	0.004
Nitrogen as N	(%)	0.020	0.013	0.021	0.008	0.005	0.009	0.119
Phosphorus as P	(%)	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Potassium as K	(%)	0.007	0.003	0.004	0.002	0.015	0.003	0.007
Zinc	Mg / 100 Gm	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Copper	Mg / 100 Gm	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium	Mg / 100 Gm	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cadmium	Mg / 100 Gm	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Nickel	Mg / 100 Gm	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Lead	Mg / 100 Gm	BDL	BDL	BDL	BDL	BDL	BDL	BDL

All results are on dry basis.

BDL - Below Detectable Limit

## D. ANALYSIS OF WATER QUALITY

### i. Analysis of Water Quality Within Solar Park (November 2011)

**Water sample collected from Govt. Bore well, ChuronkiBasti**

Parameter	Concentration	Standard Drinking water Specification as per IS –10500:1991 as amendment up to 3 July 2010		Protocol (Test Method)
		Desirable Limit	Permissible Limit in absence of alternate source	
Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	7.97	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	588.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.06 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	443.86 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	2,674.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	136.00 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	60.76 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO4	137.03 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	8.54 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.31 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C6H5OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	372.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
Bacteriological Characteristics				
Coliform Organisms	19 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

**Water sample collected from Cement Tank (Kharuddin S/o ShriKalu Khan, GamnokiBasti)**

Parameter	Concentration	Standard Drinking water Specification as per IS –10500:1991 as amendment up to 3 July 2010		Protocol (Test Method)
		Desirable Limit	Permissible Limit in absence of alternate	

			source	
<b>Essential Characteristics-Physical Parameter</b>				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 - 1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	7.81	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
<b>Essential Characteristics-Chemical Parameters</b>				
Total Hardness as CaCO <sub>3</sub>	552.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.08 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	851.74 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
<b>Desirable Characteristics-Chemical Parameters</b>				
Dissolved Solids	2,652.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	118.40 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	62.72 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO <sub>4</sub>	147.94 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO <sub>3</sub>	8.94 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.21 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	292.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
<b>Bacteriological Characteristics</b>				
Coliform Organisms	12 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

## ii. Analysis of Water Quality Along the Grid Substation Sites (November 2011)

Sample No : SS-1: Water sample collected from Bore well of Munna Ram Ji, Village: Bhadla (Khasra No.9), Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur (for GSS Bhadla)

Parameter	Concentration	Standard Drinking water Specification as per IS – 10500:1991 as amendment up to 3 July 2010	Protocol (Test Method)
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		Desirable Limit	Permissible Limit in absence of alternate source	
<b>1.1.1.1.1 Essential Characteristics-Physical Parameter</b>				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 - 1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	7.40	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
<b>Essential Characteristics-Chemical Parameters</b>				
Total Hardness as CaCO <sub>3</sub>	548.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.10 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	775.76 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
<b>Desirable Characteristics-Chemical Parameters</b>				
Dissolved Solids	2,532.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	110.40 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	66.64 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO <sub>4</sub>	166.34 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO <sub>3</sub>	7.56 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.33 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	404.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
<b>Bacteriological Characteristics</b>				
Coliform Organisms	6 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

Sample No. SS – 2: Water sample collected from Govt. Bore well (Nearest Bore well GSS Ramgarh), Village and Post: Sonu, Tehsil: Ramgarh, District Jaisalmer

Parameter	Concentration	Standard Drinking water Specification as per IS – 10500:1991 as amendment up to 3 July 2010		Protocol (Test Method)
		Desirable Limit	Permissible Limit in absence of alternate source	
1.1.1.1.2 Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983

Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	8.05	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
<b>Essential Characteristics-Chemical Parameters</b>				
Total Hardness as CaCO <sub>3</sub>	276.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.05 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	495.85 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
<b>Desirable Characteristics-Chemical Parameters</b>				
Dissolved Solids	1,785.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	70.40 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	24.50 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO <sub>4</sub>	113.49 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO <sub>3</sub>	12.93 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.47 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	268.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
<b>Bacteriological Characteristics</b>				
Coliform Organisms	7 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

Sample No. SS – 3: Water sample collected from Govt. Bore well inside 400 KVA GSS (RRVPLN), Village: Akal, Post: Jodha, District Jaisalmer

Parameter	Concentration	Standard Drinking water Specification as per IS – 10500:1991 as amendment up to 3 July 2010		Protocol (Test Method)
		Desirable Limit	Permissible Limit in absence of alternate source	
1.1.1.1.3 Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	8.36	6.5 – 8.5	-	IS: 3025 Part 11 - 1984

<b>Essential Characteristics-Chemical Parameters</b>				
Total Hardness as CaCO <sub>3</sub>	120.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.03 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	61.98 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
<b>Desirable Characteristics-Chemical Parameters</b>				
Dissolved Solids	977.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	27.20 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	12.74 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO <sub>4</sub>	131.75 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO <sub>3</sub>	2.25 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	0.83 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	0.2 Mg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	204.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
<b>Bacteriological Characteristics</b>				
Coliform Organisms	6 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

Sample No. SS – 4: Water sample collected from Open Well of Babu Singh Champavat Village: Kakani, Post and Tehsil: Luni, District Jodhpur

Parameter	Concentration	Standard Drinking water Specification as per IS – 10500:1991 as amendment up to 3 July 2010		Protocol (Test Method)
		Desirable Limit	Permissible Limit in absence of alternate source	
1.1.1.1.4 Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	8.30	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	108.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.02 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	7.99 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986

Desirable Characteristics-Chemical Parameters				
Dissolved Solids	181.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	33.60 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	5.88 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO <sub>4</sub>	27.22 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO <sub>3</sub>	2.79 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	0.18 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	124.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
Bacteriological Characteristics				
Coliform Organisms	3 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

iii. Analysis Report of Water Along the 3 nos. 400 kV transmission lines (December 2011 to January 2012)

iv.

Sample No. 1 (Water sample collected from Pond, Village: JajiwalGehlota, Post: Jajiwal via Mandor, District Jodhpur)

Parameter	Concentration	Standard Drinking water Specification as per IS –10500:1991 as amendment up to 3 July 2010		Protocol (Test Method)
		Desirable Limit	Permissible Limit in absence of alternate source	
Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	2.3	5	10	IS: 3025 Part 10 - 1984
pH	7.75	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	100.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.02 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	57.98 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	580.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984



Calcium as Ca	30.40 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	5.88 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO <sub>4</sub>	33.30 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO <sub>3</sub>	8.12 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.00 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	192.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
<b>Bacteriological Characteristics</b>				
Coliform Organisms	80 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

CFU-Colony Forming Unit

Sample No. 2: (Water sample collected from Bore well of Sukh Ram S/o ShriBhagirath Ram, Village: Sirmandi, Post and Tehsil: Osiyan, District Jodhpur)

Parameter	Concentration	Standard Drinking water Specification as per IS –10500:1991 as amendment up to 3 July 2010		Protocol (Test Method)
		Desirable Limit	Permissible Limit in absence of alternate source	
1.1.1.1.5 Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	7.88	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	588.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.08 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	591.82 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	3,619.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	113.60 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	74.48 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994

Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO <sub>4</sub>	185.06 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO <sub>3</sub>	16.82 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.50 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	260.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
<b>Bacteriological Characteristics</b>				
Coliform Organisms	16 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

CFU-Colony Forming Unit

Sample No. 3: (Water sample collected from Bore well of Manish S/o ShriPannaLalJi, Village: Amla, Post and Tehsil: Phalodi, District Jodhpur)

Parameter	Concentration	Standard Drinking water Specification as per IS –10500:1991 as amendment up to 3 July 2010		Protocol (Test Method)
		Desirable Limit	Permissible Limit in absence of alternate source	
1.1.1.1.6 Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	7.13	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	300.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.04 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	127.96 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	1,245.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	73.60 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	28.42 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO4	77.41 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986

Nitrate as NO <sub>3</sub>	19.66 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.16 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	352.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
<b>Bacteriological Characteristics</b>				
Coliform Organisms	18 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

CFU-Colony Forming Unit

Sample No.4: (Water sample collected from Govt. Bore well, Village and Post: Askandra, Tehsil: Pokharan, District Jaisalmer)

Parameter	Concentration	Standard Drinking water Specification as per IS –10500:1991 as amendment up to 3 July 2010		Protocol (Test Method)
		Desirable Limit	Permissible Limit in absence of alternate source	
1.1.1.1.7 Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	7.78	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	600.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.11 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	404.87 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	3,081.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	104.00 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	83.30 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO4	152.63 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	173.00 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.30 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991

C6H5OH				
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	340.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
<b>Bacteriological Characteristics</b>				
Coliform Organisms	13 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

CFU-Colony Forming Unit

Sample No.5: (Water sample collected from Water Tank of Babu Singh S/o ShriBagh Singh, Village: Tanusar, District Jaisalmer)

Parameter	Concentration	Standard Drinking water Specification as per IS –10500:1991 as amendment up to 3 July 2010		Protocol (Test Method)
		Desirable Limit	Permissible Limit in absence of alternate source	
1.1.1.1.8 Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	7.39	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	344.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.04 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	33.98 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	748.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	97.60 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	24.50 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO4	49.97 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	13.95 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	0.55 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C6H5OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992

Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	240.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
<b>Bacteriological Characteristics</b>				
Coliform Organisms	23 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

CFU-Colony Forming Unit

Sample No.6 (Water sample collected from Govt, Bore well, Village: Joshiyan (Hadda), Post: Kanod, Tehsil: and District: Jaisalmer)

Parameter	Concentration	Standard Drinking water Specification as per IS – 10500:1991 as amendment up to 3 July 2010		Protocol (Test Method)
		Desirable Limit	Permissible Limit in absence of alternate source	
1.1.1.1.9 Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	7.71	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	396.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.09 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	427.87 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	3,161.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	84.80 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	45.08 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO4	173.52 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	0.74 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.72 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C6H5OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986

Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	452.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
<b>Bacteriological Characteristics</b>				
Coliform Organisms	10 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

CFU-Colony Forming Unit

Sample No.7: (Water sample collected from Govt. Bore well, Village and Post: BhaguKaGaon, Tehsil and District: Jaisalmer)

Parameter	Concentration	Standard Drinking water Specification as per IS – 10500:1991 as amendment up to 3 July 2010		Protocol (Test Method)
		Desirable Limit	1.1.1.1.10 Permissible Limit in absence of alternate source	
1.1.1.1.11 Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	8.22	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	120.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	< 0.01 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	129.96 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	1,455.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	24.00 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	14.70 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO4	121.67 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	0.32 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.86 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C6H5OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C

Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	364.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
<b>Bacteriological Characteristics</b>				
Coliform Organisms	26 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

#### Significance of Water analysis

Parameter	Results	Desirable Limit	Permissible Limit in absence of alternate source	Instrument Detection Limit	Undesirable effect outside the Desirable Limit
Color, Hazen Units	< 1	5	25	1	Above 5 consumer acceptance decreases
Turbidity, NTU	< 1	5	10	1	Above 5 consumer acceptance decreases
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	0.1 Mg / L	To be applicable when water is chlorinated
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	0.02 Mg / L	Encrustation in water supply structure and adverse effects on domestic use
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	0.01 Mg / L	Beyond this limit taste/appearance are affected, has adverse effect on domestic uses and water supply structures
Phenolic Compounds as C6H5OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	0.001 Mg / L	Beyond this, it may cause objectionable taste and odour
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	0.2 µg / L	Beyond this, the water becomes toxic
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	0.005 Mg / L	Beyond this, the water becomes toxic
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	0.005 Mg / L	Beyond this, the water becomes toxic
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	0.005 Mg / L	Beyond this, the water becomes toxic
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	0.02 Mg / L	Beyond this, the water becomes toxic
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	0.01 Mg / L	Beyond this, the water becomes toxic
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	0.02 Mg / L	Beyond this limit it can cause astringent taste and an opalescence in water
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	0.1 Mg / L	Beyond this limit it can cause a light froth in water
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	0.02 Mg / L	May be carcinogenic above this limit
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	0.01 Mg / L	Beyond this limit undesirable taste and odour after chlorination take place Toxic
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	0.005 Mg / L	Beyond this limit taste becomes unpleasant Cumulative effect is reported to cause dementia
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	0.02 Mg / L	-

**Annexure 4: Report of Environmental Parameters (During- construction)**

**(Attached as PDF file)**





Ref: TPL/T & D/ICB 6/16-17/ 115

Date: 03<sup>rd</sup> Jan '17

The Superintending Engineer (T&C-Kankani)  
Rajasthan Rajya Vidyut Prasaran Nigam Ltd.,  
Jodhpur, Rajasthan-342006

**Sub:** Construction of 400 kV D/C Twin ACSR Moose Transmission Line from 400/220 kV Pooling station Bhadla (Jaisalmer) to LILO point at 400kV S/C Jodhpur Meerta Line.(Package-ICB-06). Submission of Test Certificates of Air, Water, Soil and Noise for onward submission to ADB.

Ref: RVPNL Letter no. RVPN/SE/CONTRACTS)/XEN-1/(CONTRACTS)/ICB 6/D. 526 dated 02.11.2016

Dear Sir,

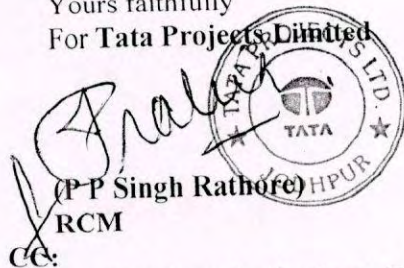
In regards to the subject line, we request your good self to kindly forward the attached original Test Reports to ADB. The Test reports attached are:

1. **Ambient Air** at several locations across the Line - Report No. VEL/A/1612/14001, VEL/A/1612/14002, VEL/A/1612/14003, VEL/A/1612/14004, VEL/A/1612/14005, VEL/A/1612/14006.
2. **Ambient Noise** at several locations across the Line- Report No. VEL/N/1612/14001, VEL/N/1612/14002, VEL/N/1612/14003, VEL/N/1612/14004, VEL/N/1612/14005, VEL/N/1612/14006, VEL/N/1612/14007, VEL/N/1612/14008.
3. **Ground Water** at several locations across the Line- Report No. VEL/W/1612/14001, VEL/W/1612/14002, VEL/W/1612/14003, VEL/W/1612/14004, VEL/W/1612/14005.
4. **Soil** at several locations across the Line- Report No. VEL/TCL/S/1612/14001, VEL/TCL/S/1612/14002, VEL/TCL/S/1612/14003, VEL/TCL/S/1612/14004, VEL/TCL/S/1612/14005.

Thanking you and assuring you the best of our services at all the times.

Yours faithfully

For Tata Projects Limited

  
(P.P. Singh Rathore)  
RCM

CC:

1. The Executive Engineer-TA to Chief Engineer-Contracts, RRVPNL, Jaipur.
2. The Executive Engineer-T&C, KAKANI, RRVPNL, Jodhpur.
3. The Assistant Engineer-T&C, KAKANI, RRVPNL, Jodhpur





# Vardan EnviroLab

Regd. Off: D-142, Sushant Lok-III, Golf Course Extension Road, Sector-57, Gurgaon (Hr) Tel: 0124-4291036  
Laboratory: Samaspur, Opposite Amity School, Sector-51, Gurgaon (Hr)  
Branch Off: J-3, Subhash Marg, C-Scheme, Jaipur (Rajasthan) Tel: 0141-4026275  
(ISO 9001|ISO 14001|OHSAS 18001|MoEF & CC Recognized|NABL Accredited|HSPCB & RSPCB Approved)

## Test Certificate

Sample Number: VEL/TPL/A/01  
Issued To: M/s Tata Projects Limited  
Construction of 400 kV /DC Quad ACSR Moose  
Bhadla- Jodhapur ICB 6 Transmission Line-  
RVPNL Project (200135)

Report No.: VEL/A/1612/14001  
Format No.: 5.10 F-01  
Party Reference No.: NIL  
Reporting Date: 17/12/2016

Sample Description : Ambient Air Quality Monitoring

### General Information:-

Client Representative	: Mr.Prateek Singh
Sample collected by (Name & Designation)	: Mr.Tarun Singh
Type of Project	: Construction Project
Sampling Location	: Bhadla village
Latitude	: 27° 32' 05.7" N
Longitude	: 071° 54' 34.0"E
Date of commencement of monitoring	: 13/12/2016
Date of end of monitoring	: 14/12/2016
Sampling Duration	: 24 Hrs
Instrument Used	: RDS& FPS
Instrument Calibration Status	: Calibrated
Meteorological condition	: Clear Sky
Sampling & Analysis Protocol	: IS-5182& CPCB Guidelines

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	Limits Max.*
1.	Particulate Matter (PM <sub>2.5</sub> )	CPCB Guidelines (PM <sub>2.5</sub> sampler-Gravimetric)	25.12	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS: 5182 (P-23), 2006&CPCB Guidelines	52.78	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS: 5182 (P-6), 1975 Reffirmed-1998	10.23	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS: 5182 (P-2), 2001	7.09	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS:5182 (P-10), 1999	<0.50	mg/m <sup>3</sup>	4

\*NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

Note:-On the Basis of Monitoring & analysis, the results found are well within Max Permissible limit

2018







# Vardan EnviroLab

Regd. Off: D-142, Sushant Lok-III, Golf Course Extension Road, Sector-57, Gurgaon (Hr) Tel: 0124-4291036  
Laboratory: Samaspur, Opposite Amity School, Sector-51, Gurgaon (Hr)  
Branch Off: J-3, Subhash Marg, C-Scheme, Jaipur (Rajasthan) Tel: 0141-4026275  
**(ISO 9001|ISO 14001|OHSAS 18001|MoEF & CC Recognized|NABL Accredited|HSPCB & RSPCB Approved)**

## Test Certificate

Sample Number:

VEL/TPL/A/02

Issued To:

M/s Tata Projects Limited

Construction of 400 kV /DC Quad ACSR Moose  
Bhadla- Jodhapur ICB 6 Transmission Line-  
RVPNL Project (200135)

Report No.:

VEL/A/1612/14002

Format No.:

5.10 F-01

Party Reference No.:

NIL

Reporting Date:

17/12/2016

Sample Description : Ambient Air Quality Monitoring

### General Information:-

Client Representative

Sample collected by (Name & Designation)

Type of Project

Sampling Location

Latitude

Longitude

Date of commencement of monitoring

Date of end of monitoring

Sampling Duration

Instrument Used

Instrument Calibration Status

Meteorological condition

Sampling & Analysis Protocol

: Mr.Prateek Singh

: Mr.Tarun Singh

: Construction Project

: Khirawa Village

: 27° 03' 27.7" N

: 072° 30' 12.6"E

: 13/12/2016

: 14/12/2016

: 24 Hrs

: RDS & FPS

: Calibrated

: Clear Sky

: IS-5182& CPCB Guidelines

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	Limits Max.*
1.	Particulate Matter (PM <sub>2.5</sub> )	CPCB Guidelines (PM <sub>2.5</sub> sampler-Gravimetric)	23.10	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS: 5182 (P-23), 2006&CPCB Guidelines	50.60	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS: 5182 (P-6), 1975 Reffirmed-1998	10.89	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS: 5182 (P-2), 2001	6.34	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS:5182 (P-10), 1999	<0.50	mg/m <sup>3</sup>	4

\*NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

Note:-On the Basis of Monitoring & analysis, the results found are well within Max Permissible limit

*[Signature]*







# Vardan EnviroLab

Regd. Off: D-142, Sushant Lok-III, Golf Course Extension Road, Sector-57, Gurgaon (Hr) Tel: 0124-4291036  
Laboratory: Samaspur, Opposite Amity School, Sector-51, Gurgaon (Hr)  
Branch Off: J-3, Subhash Marg, C-Scheme, Jaipur (Rajasthan) Tel: 0141-4026275  
(ISO 9001|ISO 14001|OHSAS 18001|MoEF & CC Recognized|NABL Accredited|HSPCB & RSPCB Approved)

## Test Certificate

Sample Number:

VEL/TPL/A/03

Issued To:

M/s Tata Projects Limited  
Construction of 400 kV /DC Quad ACSR Moose  
Bhadla- Jodhapur ICB 6 Transmission Line-  
RVPNL Project (200135)

Report No.:

VEL/A/1612/14003

Format No.:

5.10 F-01

Party Reference No.:

NIL

Reporting Date:

17/12/2016

Sample Description :

Ambient Air Quality Monitoring

### General Information:-

Client Representative

Sample collected by (Name & Designation)

Type of Project

Sampling Location

Latitude

Longitude

Date of commencement of monitoring

Date of end of monitoring

Sampling Duration

Instrument Used

Instrument Calibration Status

Meteorological condition

Sampling & Analysis Protocol

: Mr.Prateek Singh

: Mr.Tarun Singh

: Construction Project

: Noore Ki Burj

: 27° 25' 01.4" N

: 072° 02' 37.0"E

: 13/12/2016

: 14/12/2016

: 24 Hrs

: RDS & FPS

: Calibrated

: Clear Sky

: IS-5182& CPCB Guidelines

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	Limits Max.*
1.	Particulate Matter (PM <sub>2.5</sub> )	CPCB Guidelines (PM <sub>2.5</sub> sampler-Gravimetric)	21.81	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS: 5182 (P-23), 2006&CPCB Guidelines	49.78	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS: 5182 (P-6), 1975 Reaffirmed-1998	9.09	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS: 5182 (P-2), 2001	6.45	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS:5182 (P-10), 1999	<0.50	mg/m <sup>3</sup>	4

\*NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]16.11.2009

Note:-On the Basis of Monitoring & analysis, the results found are well within Max Permissible limit







# Vardan EnviroLab

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Laboratory: Samaspur, Opposite Amity School, Sector-51, Gurgaon (Hr)  
Branch Off: J-3, Subhash Marg, C-Scheme, Jaipur (Rajasthan) Tel: 0141-4026275  
(ISO 9001 | ISO 14001 | OHSAS 18001 | MoEF & CC Recognized | NABL Accredited | HSPCB & RSPCB Approved)

## Test Certificate

Sample Number: VEL/TPL/A/04  
Issued To: M/s Tata Projects Limited  
Construction of 400 kV /DC Quad ACSR Moose  
Bhadla- Jodhapur ICB 6 Transmission Line-  
RVPNL Project (200135)

Report No.: VEL/A/1612/14004  
Format No.: 5.10 F-01  
Party Reference No.: NIL  
Reporting Date: 17/12/2016

Sample Description : Ambient Air Quality Monitoring

### General Information:-

Client Representative	: Mr.Prateek Singh
Sample collected by (Name & Designation)	: Mr.Tarun Singh
Type of Project	: Construction Project
Sampling Location	: Shekhasav Village
Latitude	: 27° 16' 43.2" N
Longitude	: 072° 12' 26.1" E
Date of commencement of monitoring	: 13/12/2016
Date of end of monitoring	: 14/12/2016
Sampling Duration	: 24 Hrs
Instrument Used	: RDS & FPS
Instrument Calibration Status	: Calibrated
Meteorological condition	: Clear Sky
Sampling & Analysis Protocol	: IS-5182 & CPCB Guidelines

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	Limits Max.*
1.	Particulate Matter (PM <sub>2.5</sub> )	CPCB Guidelines (PM <sub>2.5</sub> sampler-Gravimetric)	21.78	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS: 5182 (P-23), 2006 & CPCB Guidelines	47.56	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS: 5182 (P-6), 1975 Reaffirmed-1998	10.67	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS: 5182 (P-2), 2001	7.12	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10), 1999	<0.5	mg/m <sup>3</sup>	4

\*NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

Note:-On the Basis of Monitoring & analysis, the results found are well within Max Permissible limit







# Vardan EnviroLab

Regd. Off: D-142, Sushant Lok-III, Golf Course Extension Road, Sector-57, Gurgaon (Hr) Tel: 0124-4291036  
Laboratory: Samaspur, Opposite Amity School, Sector-51, Gurgaon (Hr)  
Branch Off: J-3, Subhash Marg, C-Scheme, Jaipur (Rajasthan) Tel: 0141-4026275  
ISO 9001 | ISO 14001 | OHSAS 18001 | MoEF & CC Recognized | NABL Accredited | HSPCB & RSPCB Approved

## Test Certificate

Sample Number:  
Issued To:

VEL/TPL/A/05  
M/s Tata Projects Limited  
Construction of 400 kV /DC Quad ACSR Moose  
Bhadla- Jodhapur ICB 6 Transmission Line-  
RVPNL Project (200135)

Report No.:  
Format No.:  
Party Reference No.:  
Reporting Date:

VEL/A/1612/14005  
5.10 F-01  
NIL  
17/12/2016

Sample Description : Ambient Air Quality Monitoring

### General Information:-

Client Representative  
Sample collected by (Name & Designation)  
Type of Project  
Sampling Location  
Latitude  
Longitude  
Date of commencement of monitoring  
Date of end of monitoring  
Sampling Duration  
Instrument Used  
Instrument Calibration Status  
Meteorological condition  
Sampling & Analysis Protocol

: Mr. Prateek Singh  
: Mr. Tarun Singh  
: Construction Project  
: Amla Village  
: 27° 05' 35.3" N  
: 072° 28' 39.9" E  
: 13/12/2016  
: 14/12/2016  
: 24 Hrs  
: RDS & FPS  
: Calibrated  
: Clear Sky  
: IS-5182 & CPCB Guidelines

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	Limits Max.*
1.	Particulate Matter (PM <sub>2.5</sub> )	CPCB Guidelines (PM <sub>2.5</sub> sampler-Gravimetric)	23.34	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS: 5182 (P-23), 2006 & CPCB Guidelines	53.56	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS: 5182 (P-6), 1975 Reaffirmed-1998	10.67	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS: 5182 (P-2), 2001	6.67	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10), 1999	<0.50	mg/m <sup>3</sup>	4

\*NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

Note:- On the Basis of Monitoring & analysis, the results found are well within Max Permissible limit

*Signature*







# Vardan EnviroLab

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Laboratory: Samaspur, Opposite Amity School, Sector-51, Gurgaon (Hr)  
Branch Off: J-3, Subhash Marg, C-Scheme, Jaipur (Rajasthan) Tel: 0141-4026275  
(ISO 9001|ISO 14001|OHSAS 18001|MoEF & CC Recognized|NABL Accredited|HSPCB & RSPCB Approved)

## Test Certificate

Sample Number: VEL/TPL/A/06  
Issued To: M/s Tata Projects Limited  
Construction of 400 kV /DC Quad ACSR Moose  
Bhadla- Jodhapur ICB 6 Transmission Line-  
RVPNL Project (200135)

Report No.: VEL/A/1612/14006  
Format No.: 5.10 F-01  
Party Reference No.: NIL  
Reporting Date: 17/12/2016

Sample Description : Ambient Air Quality Monitoring

### General Information:-

Client Representative : Mr.Prateek Singh  
Sample collected by (Name & Designation) : Mr.Tarun Singh  
Type of Project : Construction Project  
Sampling Location : Bhikamkhor Village  
Latitude : 26° 50' 08.8" N  
Longitude : 073° 05' 23.7" E  
Date of commencement of monitoring : 13/12/2016  
Date of end of monitoring : 14/12/2016  
Sampling Duration : 24Hrs  
Instrument Used : RDS & FPS  
Instrument Calibration Status : Calibrated  
Meteorological condition : Clear Sky  
Sampling & Analysis Protocol : IS-5182& CPCB Guidelines

## TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	Limits Max.*
1.	Particulate Matter (PM <sub>2.5</sub> )	CPCB Guidelines (PM <sub>2.5</sub> sampler-Gravimetric)	39.45	µg/m <sup>3</sup>	60
2.	Particulate Matter (PM <sub>10</sub> )	IS: 5182 (P-23), 2006&CPCB Guidelines	63.89	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (NO <sub>2</sub> )	IS: 5182 (P-6), 1975 Reffirmed-1998	11.23	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (SO <sub>2</sub> )	IS: 5182 (P-2), 2001	7.67	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (CO)	IS:5182 (P-10), 1999	<0.50	mg/m <sup>3</sup>	4

\*NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]16.11.2009

Note:-On the Basis of Monitoring & analysis, the results found are well within Max Permissible limit



NOTE: a)The results listed refer only to the tested samples & applicable parameters  
b)The results of our lab will be restricted to the invoice amount only





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## Test Certificate

Sample Number: **EL/TPL/N/01** Report No.: **VEL/N/1612/14001**  
Name & Address of Client: **M/s Tata Projects Limited** Format No.: **5.10 F-01**  
Construction of 400 kV /DC Quad ACSR Moose Bhadla- Jodhapur ICB 6 Transmission Line-RVPL No.: **NIL**  
Project (200135) Reporting Date: **17/12/2016**  
Sample Description: **AMBIENT NOISE LEVEL MONITORING** Receipt Date: **14/12/2016**

### General Information:-

Client Representative : Mr. Prateek Singh  
Sample collected by : Mr. Tarun Singh  
Sampling Location : Bhadla village  
Latitude : 27° 32' 05.7'' N  
Longitude : 071° 54' 34.0'' E  
Instrument Used : Sound Level Meter  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 13-14/12/2016  
Surrounding Activity : Human, Vehicular and Other Activities  
Scope of Monitoring : Internal Use  
Control measure if Any : --  
Sampling & Analysis Protocol : CPCB Guidelines & IS-9989  
Sampling Duration : 24 Hrs  
Parameter Required : As per work order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	<b>L<sub>eq</sub></b>	CPCB Guidelines/ IS 9989	45.23	40.42	dB(A)
<b>CPCB Noise Standards</b>					
2.	<b>Industrial Area</b>		75	70	dB(A)
3.	<b>Commercial Area</b>		65	55	
4.	<b>Residential Area</b>		55	45	
5.	<b>Sensitive Area</b>		50	40	

Note: - On the basis of Monitoring carried out, Noise levels are found well within tolerance level as described for Residential Area







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## Test Certificate

Sample Number:	<b>VEL/TPL/N/02</b>	Report No.:	<b>VEL/N/1612/14002</b>
Name & Address of Client :	<b>M/s Tata Projects Limited</b>	Format No.:	<b>5.10 F-01</b>
	Construction of 400 kV /DC Quad ACSR Moose Bhadla- Jodhapur ICB 6 Transmission Line- RVPNL Project (200135)	Party Reference No.:	<b>NIL</b>
		Reporting Date:	<b>17/12/2016</b>
Sample Description :	<b>AMBIENT NOISE LEVEL MONITORING</b>	Receipt Date:	<b>14/12/2016</b>

### General Information:-

Client Representative	: Mr. Prateek Singh
Sample collected by	: Mr. Tarun Singh
Sampling Location	: Khirawa Village
Latitude	: 27° 03' 27.7" N
Longitude	: 072° 30' 12.6" E
Instrument Used	: Sound Level Meter
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 13-14/12/2016
Surrounding Activity	: Human, Vehicular and Other Activities
Scope of Monitoring	: Internal Use
Control measure if Any	: --
Sampling & Analysis Protocol	: CPCB Guidelines & IS-9989
Sampling Duration	: 24 Hrs
Parameter Required	: As per work order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L <sub>eq</sub>	CPCB Guidelines/ IS 9989	51.56	41.47	dB(A)
<b>CPCB Noise Standards</b>					
2.	Industrial Area		75	70	dB(A)
3.	Commercial Area		65	55	
4.	Residential Area		55	45	
5.	Sensitive Area		50	40	

**Note:** - On the basis of Monitoring carried out, Noise levels are found well within tolerance level as described for Residential Area







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## Test Certificate

Sample Number:	VEL/TPL/N/03	Report No.:	VEL/N/1612/14003
Name & Address of Client :	M/s Tata Projects Limited	Format No.:	5.10 F-01
	Construction of 400 kV /DC Quad ACSR Moose	Party Reference	NIL
	Bhadla- Jodhapur ICB 6 Transmission Line-	No.:	
	RVPNL Project (200135)	Reporting Date:	17/12/2016
Sample Description :	AMBIENT NOISE LEVEL MONITORING	Receipt Date:	14/12/2016

### General Information:-

Client Representative	: Mr.Prateek Singh
Sample collected by	: Mr. Tarun Singh
Sampling Location	: Noore Ki Burj Village
Latitude	: 27° 25' 01.4'' N
Longitude	: 072° 02' 37.0''E
Instrument Used	: Sound Level Meter
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 13-14/12/2016
Surrounding Activity	: Human, Vehicular and Other Activities
Scope of Monitoring	: Internal Use
Control measure if Any	: --
Sampling & Analysis Protocol	: CPCB Guidelines & IS-9989
Sampling Duration	: 24 Hrs
Parameter Required	: As per work order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L <sub>eq</sub>	CPCB Guidelines/ IS 9989	48.41	41.98	dB(A)
CPCB Noise Standards					
2.	Industrial Area		75	70	dB(A)
3.	Commercial Area		65	55	
4.	Residential Area		55	45	
5.	Sensitive Area		50	40	

Note: - On the basis of Monitoring carried out, Noise levels are found well within tolerance level as described for Residential Area

*Done*







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## Test Certificate

Sample Number: **VEL/TPL/N/04** Report No.: **VEL/N/1612/14004**  
Name & Address of Client: **M/s Tata Projects Limited** Format No.: **5.10 F-01**  
**Construction of 400 kV /DC Quad ACSR Moose Bhadla- Jodhapur ICB 6 Transmission Line- RVPNL Project (200135)** Party Reference No.: **NIL**  
Reporting Date: **17/12/2016**  
Receipt Date: **14/12/2016**  
Sample Description : **AMBIENT NOISE LEVEL MONITORING**

### General Information:-

Client Representative : Mr. Prateek Singh  
Sample collected by : Mr. Tarun Singh  
Sampling Location : Shekhasav Village  
Latitude : 27° 16' 43.2'' N  
Longitude : 072° 12' 26.1'' E  
Instrument Used : Sound Level Meter  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 13-14/12/2016  
Surrounding Activity : Human, Vehicular and Other Activities  
Scope of Monitoring : Internal Use  
Control measure if Any : --  
Sampling & Analysis Protocol : CPCB Guidelines & IS-9989  
Sampling Duration : 24 Hrs  
Parameter Required : As per work order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L <sub>eq</sub>	CPCB Guidelines/ IS 9989	49.52	41.23	dB(A)
CPCB Noise Standards					
2.	Industrial Area		75	70	dB(A)
3.	Commercial Area		65	55	
4.	Residential Area		55	45	
5.	Sensitive Area		50	40	

Note: - On the basis of Monitoring carried out, Noise levels are found well within tolerance level as described for Residential Area

*Signature*







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## Test Certificate

Sample Number: **VEL/TPL/N/05** Report No.: **VEL/N/1612/14005**  
Name & Address of Client : **M/s Tata Projects Limited** Format No.: **5.10 F-01**  
**Construction of 400 kV /DC Quad ACSR Moose Bhadla- Jodhapur ICB 6 Transmission Line- RVPNL Project (200135)** Party Reference No.: **NIL**  
Reporting Date: **17/12/2016**  
Receipt Date: **14/12/2016**  
Sample Description : **AMBIENT NOISE LEVEL MONITORING**

### General Information:-

Client Representative : Mr. Prateek Singh  
Sample collected by : Mr. Tarun Singh  
Sampling Location : Amla Village  
Latitude : 27° 05' 35.3'' N  
Longitude : 072° 28' 39.9'' E  
Instrument Used : Sound Level Meter  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 13-14/12/2016  
Surrounding Activity : Human, Vehicular and Other Activities  
Scope of Monitoring : Internal Use  
Control measure if Any : --  
Sampling & Analysis Protocol : CPCB Guidelines & IS-9989  
Sampling Duration : 24 Hrs  
Parameter Required : As per work order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	$L_{eq}$	CPCB Guidelines/ IS 9989	54.23	43.60	dB(A)
CPCB Noise Standards					
2.	Industrial Area		75	70	dB(A)
3.	Commercial Area		65	55	
4.	Residential Area		55	45	
5.	Sensitive Area		50	40	

Note: - On the basis of Monitoring carried out, Noise levels are found well within tolerance level as described for Residential Area

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## Test Certificate

Sample Number: VEL/TPL/N/06 Report No.: VEL/N/1612/14006  
Name & Address of Client: M/s Tata Projects Limited Format No.: 5.10 F-01  
Construction of 400 kV /DC Quad ACSR Moose Party Reference: NIL  
Bhadla- Jodhapur ICB 6 Transmission Line- No.:  
RVPNL Project (200135) Reporting Date: 17/12/2016  
Sample Description : AMBIENT NOISE LEVEL MONITORING Receipt Date: 14/12/2016

### General Information:-

Client Representative : Mr. Prateek Singh  
Sample collected by : Mr. Tarun Singh  
Sampling Location : Bhikamkhor Village  
Latitude : 26° 50' 08.8'' N  
Longitude : 073° 05' 23.7'' E  
Instrument Used : Sound Level Meter  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 13-14/12/2016  
Surrounding Activity : Human, Vehicular and Other Activities  
Scope of Monitoring : Internal Use  
Control measure if Any : --  
Sampling & Analysis Protocol : CPCB Guidelines & IS-9989  
Sampling Duration : 24 Hrs  
Parameter Required : As per work order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L <sub>eq</sub>	CPCB Guidelines/ IS 9989	49.78	41.12	dB(A)
CPCB Noise Standards					
2.	Industrial Area		75	70	dB(A)
3.	Commercial Area		65	55	
4.	Residential Area		55	45	
5.	Sensitive Area		50	40	

Note: - On the basis of Monitoring carried out, Noise levels are found well within tolerance level as described for Residential Area

*Done*







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## Test Certificate

Sample Number: **VEL/TPL/N/07** Report No.: **VEL/N/1612/14007**  
 Name & Address of Client: **M/s Tata Projects Limited** Format No.: **5.10 F-01**  
 Construction of 400 kV /DC Quad ACSR Moose Bhadla- Jodhapur ICB 6 Transmission Line- RVPNL Project (200135) Party Reference No.: **NIL**  
 Reporting Date: **17/12/2016**  
 Receipt Date: **14/12/2016**  
 Sample Description : **AMBIENT NOISE LEVEL MONITORING**

### General Information:-

Client Representative : Mr. Prateek Singh  
 Sample collected by : Mr. Tarun Singh  
 Sampling Location : Umed Nagar Village  
 Latitude : 26°35'53.4"N  
 Longitude : 73°05'23.7"E  
 Instrument Used : Sound Level Meter  
 Instrument Calibration Status : Calibrated  
 Meteorological condition during monitoring : Clear Sky  
 Date of Monitoring : 13-14/12/2016  
 Surrounding Activity : Human, Vehicular and Other Activities  
 Scope of Monitoring : Internal Use  
 Control measure if Any : --  
 Sampling & Analysis Protocol : CPCB Guidelines & IS-9989  
 Sampling Duration : 24 Hrs  
 Parameter Required : As per work order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	$L_{eq}$	CPCB Guidelines/ IS 9989	52.55	43.56	dB(A)
<b>CPCB Noise Standards</b>					
2.	Industrial Area		75	70	dB(A)
3.	Commercial Area		65	55	
4.	Residential Area		55	45	
5.	Sensitive Area		50	40	

**Note:** - On the basis of Monitoring carried out, Noise levels are found well within tolerance level as described for Residential Area

*[Signature]*

