

Environmental and Social Due Diligence Report

Project Number: 47083-004
April 2020

INDIA: Accelerating Infrastructure Investment Facility in India – Tranche 3 Spring ALT Energy Private Limited (Part 5 of 5)

Prepared by India Infrastructure Finance Company Limited for the India Infrastructure Finance Company Limited and the Asian Development Bank.

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OFFICE OF THE CHIEF ELECTRICAL INSPECTOR

Office of the Chief Electrical Inspector Udyog Bhavan, 6th Floor, Block No.18, Sector-11, Gandhinagar.

No/CEI/Gan/Certi/20784/2019

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Date : 8/7/2019

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To

Opera Wind PVT LTD
NEW BUILDING, 2ND FLOOR,
SATYAM COLONY, MAIN ROAD,
OPP. SATYAM COLONY GATE,
80 FEET ROAD,
Jamnagar GJ 361004
207, Kuber Avenue,
Near Gurudwara Circle,
Jamnagar Gujarat-361001.

Vi.Jamnagar

Ta.Jamnagar

Dist.Jamnagar, 361004

Subject Initial inspection for the electrical installation of 1 x 2800.0 KVA 0.690 KV + 1 x 50.0 KVA 0.690/0.400 KV Transformer(s) & 1 x 800.00 AMP 33.0 KV + 1 x 2500.00 AMP 0.69 KV HT Breaker(s) & 1 x 2500.0 KW 0.690 KV Wind Turbine Generator(s) & 33 KV S/C Dog Tower Line (15.00 KM) from Tower Line End BLV3 to CHR1 Wtg along with associated equipments at Opera Wind PVT LTD, Chur, ta- Jamjodhpur, Dis- Jamnagar., Chur, ta- Jamjodhpur, Dis- Jamnagar., Vi.Chur, Ta.Jamjodhpur, Dist.Jamnagar, Gujarat, 360530.

Sir,

Initial Inspection of the Electrical Installation of 1 x 2800.0 KVA 0.690 KV + 1 x 50.0 KVA 0.690/0.400 KV Transformer(s) & 1 x 800.00 AMP 33.0 KV + 1 x 2500.00 AMP 0.69 KV HT Breaker(s) & 1 x 2500.0 KW 0.690 KV Wind Turbine Generator(s) & 33 KV S/C Dog Tower Line (15.00 KM) from Tower Line End BLV3 to CHR1 Wtg at Chur, ta- Jamjodhpur, Dis- Jamnagar., Chur, ta- Jamjodhpur, Dis- Jamnagar., Vi.Chur, Jamjodhpur, Jamnagar, Gujarat, 360530 for Opera Wind PVT LTD has been carried out by EI, Rajkot on 06/07/2019 and the same is found in order in accordance with the drawing approved vide this office letter No: No/CEI/Gan/Plan/11324/2018, Date: 10/12/2018. The details of the same are as following.

Details of Installation

Equipments	Make	Capacity	Sr. No.	Voltage level/Voltage ratio (KV)
Transformer	Qingdao yunlu energy	50.0 KVA	YL18120001	0.690/0.400
HT Breaker	Schneider	2500.00 AMP	0	0.69

Transformer	KAMATH TRANSFORMER	2800.0 KVA	18KT33P008WT/154	0.690
HT Breaker	Popular switch gear	800.00 AMP	1218533-51	33.0

No	Particular	Wind Turbine Generator				Transformer			
		Make	Capacity in KW	Sr. No.	Voltage Level	Make	Capacity in KVA	Sr. No.	Voltage Ratio in KV
1	CHUR 07	Nanjing Turbine and Electric Machinery	2500.0	CF12E-2018058058	0.690	KAMATH TRANSFORMER	2800.0	18KT33P008WT/154	

Type of Line	Length of Line(KM)	Type of Conductor	Total Location No.	From Location	To Location
Single circuit OH Line	15.00	Dog	250	Tower Line End BLV3	CHR1 Wtg

As provided under the Regulation 43/32 & 43 of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulation, 2010 permission is hereby granted to energize the above installation along with the associated equipments.

Your's Faithfully

H H Khoja
CHIEF ELECTRICAL INSPECTOR
Gandhinagar

Copy forwarded to:

Applicant
Deputy Chief Electrical Inspector, West Zone - Rajkot
Electrical Inspector, Rajkot
Assistant Electrical Inspector, Jamnagar
Executive Engineer (GETCO)

"પંચ ત્યાં પરમેશ્વર"

શ્રી પાટણ ગ્રામ પંચાયત

તાલુકો : જામજોધપુર
જિલ્લો : જામનગર.



મું. પાટણ

જા.નાં.


તા. - - ૨૦૧

સ્થાપના :- L.S.G No. 2556 Dt 22-4-1955

પંચાયતના અધ્યક્ષશ્રીને સંબોધિત

દરજા નં: સ્વામી સોપેરા ટિલ્ટ પ્રા. લી. ની સંબોધનારી
દિવસે મારી ટિલ્ટ કાર્મ પાવર પ્રીન્ટર સ્થાપના
ગામના સરકારી પાટણ પર સ્થાપવા માંગે છે
અને જેમ કે આજની ગ્રામ પંચાયતની સભાના
અધ્યક્ષશ્રી દી, અને કરાવ કરાવેલ છે તેમ -
નક્કી કરવામાં આવેલ છે કે આપની સદરજુ કંપનીની
તેમજુ કાર્ય કરવા દેવા મારી સંમતિ આપીશી
છીશી અને સ્થાપના પાટણ ગામના વડુઆમી
ટિકામની લક્ષમાં લઈને આવા ટિલ્ટ કાર્મ -
સ્થાપવા અને ચલાવવાની પરવાનગી આપીશી
છીશી. તેમજ ટિલ્ટ કાર્મ મારેજુ વ્યવસ્થા કરવાની
અને તેને ચાલુ કરવાની કાર્યવાહીની પણ આ મંજૂરી
અને સંમતિ લાગુ પડે છે. અને અહીંયા થકી આપની
સોપેરા ટિલ્ટ પ્રા. લી. ની સંમતિ અને પરવાનગી
આપીશી છીશી કે તેઓ રોડ બનાવી શકશે,
પાણીની ઉપયોગ કરી શકશે તેમજ ટ્રાન્સમિશન
લાઈની સ્થાપિત કરી શકશે. અને સોપરેટ કરી
શકશે, અને તેઓને પરવાનગી આપવામાં -
આપે છે કે તેઓ ટિલ્ટ રવર્સિંગનું કાર્ય શરૂ પાડે

28-05-2019
પાટણ ગ્રામ પંચાયત

		Monthly O&M EHS Statistics Report			Format No.: O&M/ EHS / 001 Rev.no: 1 Rev Date: June 2019			
Name of the Site: Khageshri - 197.5MW				Month : Dec 2019				
Project Commencement Date : 01/05/2018 (Under operation)								
MAN-HOURS DETAILS								
A	Sl. No.	Description	Average Number/Month	No. of days Worked In Month	Man-hours worked	Over Time Performed	Total	REMARKS
	1	Envision Staff (India)	5	24	8	NA	960	
	2	Envision Staff (China)	1	24	8	NA	192	
	3	Contractors UGES/Wind care/Chinese (WTG TSA)	35	24	8	NA	6720	
	4	Subcontractor's Workmen (PSS staff)	10	24	8	NA	1920	
GRAND TOTAL OF MANHOURS WORKED DURING THE MONTH							9792	
Cumulative Safe Man Hours since Jul-2019				31856				
INCIDENT RECORD								
B	1	Details of Reportable lost time injury		0				
	2	No. of Dangerous occurrence		0				
	3	No. of First Aid Case		0		For This Month		
	4	No. of Near miss case		0		For This Month		
	5	No. of Incidents		0		For This Month		
	6	No. of Unsafe act & Condition identified		4		For This Month		
	Sl No	Name of Injured	Date of Accident	Resumed duty on	Man days lost Up to last month (1) This month (2) Total(1+2)			
	1							
	2							
	3							
Man days Lost during the month								
HSE ACTIVITY/TRAINING								
C	S.NO	Description	Total No of activity	Number of people covered	Duration	Hrs	Training man hours	
	1	Induction Training	1	0	1		1	
	2	HSE Training Conducted(on site Safety training)	3	15	3		45	
	3	Training by External Agency	3	35	8		280	
	3	Tool Box Talk Conducted	161	4	106.904		56.244	
	4	HSE Meeting conducted			1			
	5	Number of Mock drill conducted			0			
	6	Number of HSE Rewards & Recognitions given			0			
	7	Number of HSE Violation memo/ Penalties issued			0			
HSE Inspections								
D	1	High Rescue & Escape Devices			19			
	2	PPE			15			
	3	First Aid Kits			19			
	4	Fire Extinguishers			19			
	5	EHS Weekly Inspection			0			
	6	Site Vehicle Inspection			4			
ENVIRONMENT								
E	1	Total water consumed (in Liters)	Appox 7500 Ltr					
	2	Hazardous waste generated in current month	50 Kg					
	3	Cumulative hazardous waste stored at site	177 Kg					
	4	Hazardous waste disposed current month	0					
	5	Non- Hazardous waste generated in current month	0					
	6	Cumulative Non-hazardous waste stored at site	0					
	7	Non-Hazardous waste disposed current month	0					
<div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div> Service Manager Mr. Rajkumar G Date : 01/01/2019 </div> <div> HSE Manager Mr. Rajkumar. M Date : 01/01/2019 </div> </div>								



ENVIRONMENT POLICY

Scope and applicability

The Policy is applicable to all business and project/SPVs related activities of SPRNG Energy (Wind & Solar Projects). All employees, workers and contractors of SPRNG are required to adhere to this policy whilst working in the Sprng Sites

Policy Objectives and Commitment

We believe that our operations should have limited environmental impacts, which is an integral part of the value we deliver to our stakeholders.

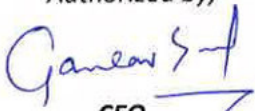
We, at Sprng, are committed to safeguard environment within the scope of our operations considering the context of the organization and strategic decisions.

Sprng is poised to attain sustainable development and prevention of pollution through implementation of best environmental practices in all aspects of business by adhering to the following practices:

- *Adopting a systematic approach for identifying risks and mitigating environmental impacts throughout the project life cycle.*
- *Utilizing and conserving all the natural resources efficiently. Disposing and recycling waste generated to prevent the pollution and other specific commitment from our operations should be through an environmentally sound manner.*
- *Voluntarily establishing, maintaining and practicing a certifiable environmental management system (ISO 14001:2015). Integrating with occupational health and safety management system (ISO 45001:2018) and supporting to quality management system (ISO 9001:2015).*
- *Ensuring that all our business activities are in compliance with applicable environmental regulations and other requirements.*
- *Ensuring that continual improvement in activities, wherever feasible. To maintain and proactively improve our management systems to minimize significant environmental aspects and risks to our stakeholders. We strive to continually improve environmental performance of our business operations.*
- *Communicating this policy to all stakeholders by suitable means, followed by a periodic review of improvements in a continuously changing business environment.*
- *Raising awareness among all our stakeholders by enhancing participation through providing education, training & resources to accomplish our environmental commitments.*
- *Sprng will ensure at all times appropriate resources are available to effectively implement the Environment policy of the company.*

We, at Sprng are committed to practice, promote and inculcate best possible standards of environment in its business.

Authorized by,


CEO

Document No. IMS-QHSE-P-04

Date. 20-04-2019

Revision. 01

SPRNG ENERGY PRIVATE LIMITED

(Formerly known as "Arinsun Energy Private Limited") CIN: U74999DL2016PTC309305

Registered Office: Unit No FF-48 A, First Floor, Omaxe Square, Plot No.14, Jasola District Centre, New Delhi- 110025

Corporate Office: Office No. 001, Ground floor, Tower P5, Pentagon, Magarpatta City, Hadapsar, Pune-411028

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OCCUPATIONAL HEALTH & SAFETY (H&S) POLICY

Scope and applicability

The Policy is applicable to all business and project/SPVs related activities of SPRNG Energy (Wind & Solar Projects). All employees, workers and contractors of SPRNG are required to adhere to this policy whilst working in the Sprng Sites

Policy Objectives and Commitment

We believe that OH&S of persons working under us are utmost importance and takes precedence in all our strategic decisions, scope of our operations considering the context of the organization.

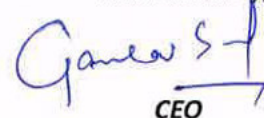
We, at Sprng, believe that Safety is Everyone's Responsibility and Line Management has a leadership role in ensuring policy implementation.

SPRNG is committed to achieve this through:

- Adopting a systematic approach for identifying risks and mitigating for occupational health and safety.
- Ensuring that all stakeholders work in healthy & safe working conditions. Also ensuring prevention of work-related injury and ill health.
- Establishing, maintaining and practicing a certifiable occupational H&S management system (ISO 45001:2018). Integrating with environmental management system (ISO 14001:2015) and supporting to quality management system (ISO 9001:2015).
- Ensuring that all activities are in compliance with applicable OH&S regulations and other requirements.
- Ensuring that continual improvement in activities, wherever feasible. To maintain and proactively improve our management systems, to minimize OH&S hazards and risks to our stakeholders. We strive to continually improve occupational health and safety performance of our business operations.
- Communicating this policy to all stakeholders by suitable means, followed by a periodic review of improvements in a continuously changing business environment.
- Developing a culture for all stakeholders to follow H&S through active participation and consultation.
- Ensuring at all times appropriate resources to effectively implement the OH&S policy of the company. We, at Sprng are committed to practice, promote and inculcate best possible standards of OH&S in its business.

We, at Sprng are committed to practice, promote and inculcate best possible standards of OH&S in its business.

Authorized by,


CEO

Document No. IMS-QHSE-P-01

Date. 20-04-2019

Revision. 01

SPRNG ENERGY PRIVATE LIMITED

(Formerly known as "Arinsun Energy Private Limited") CIN: U74999DL2016PTC309305

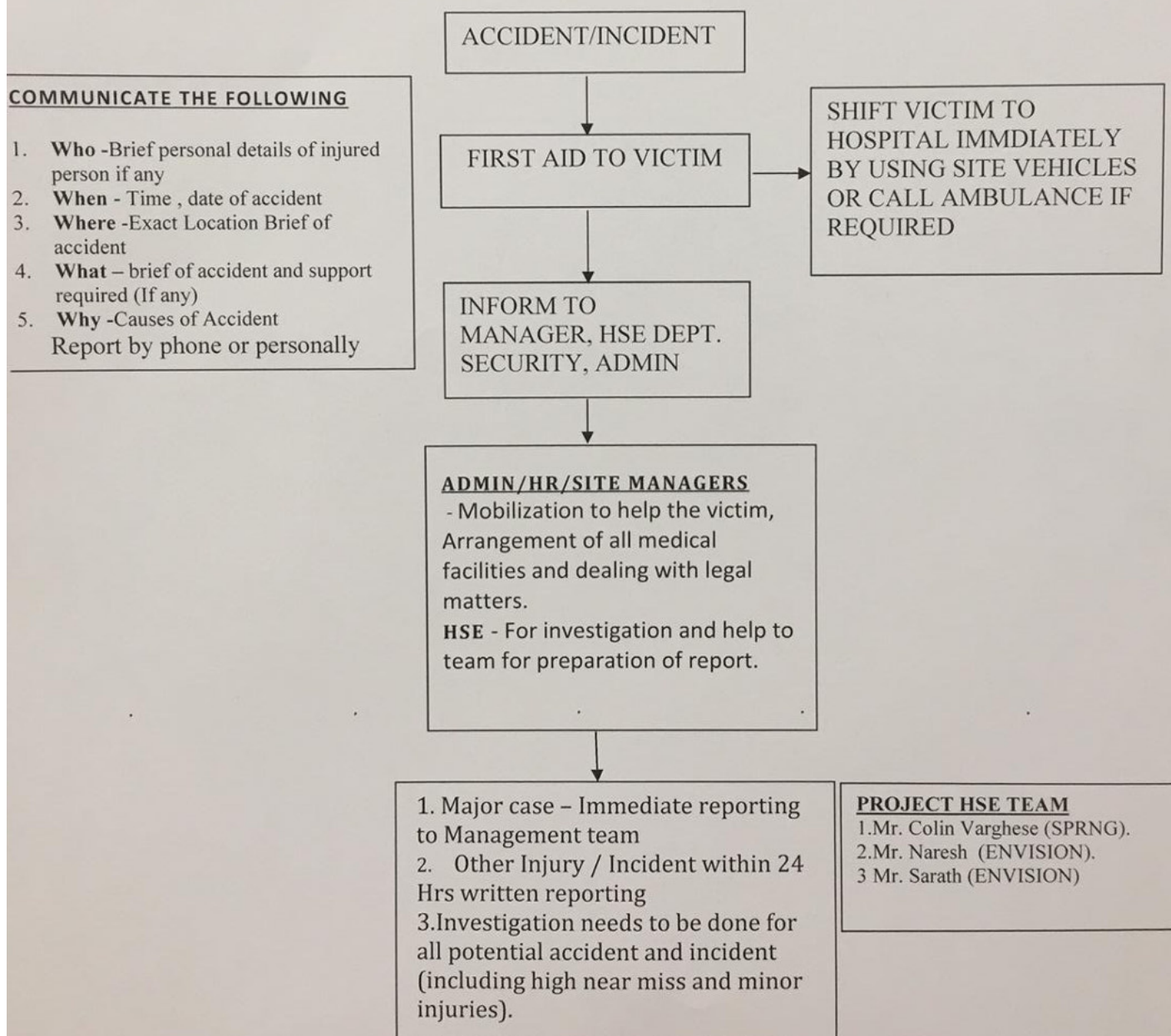
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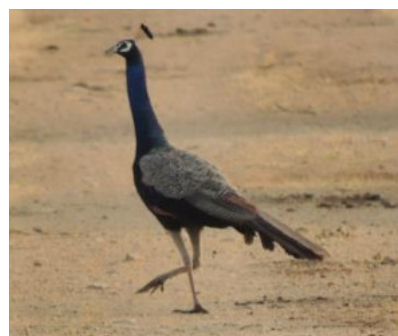
Corporate Office: Office No. 001, Ground floor, Tower P5, Pentagon, Magarpatta City, Hadapsar, Pune-411028

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APPENDIX-3

EMERGENCY RESPONSE AND COMMUNICATION FLOW CHART- Khageshri





South Asia

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BIRD AND BAT MONITORING REPORT- POST MONSOON SEASON (2nd SEASON)

FINAL REPORT ON BIRD AND BAT MONITORING FOR 197.5 MW KAGESHREE WIND POWER PROJECT, GUJARAT

**STUDY PERIOD: POST-
MONSOON SEASON**
10th – 15th October, 2018

Location:
Jamjodhpur Taluka, Jamnagar District,
Gujarat (India)

(Satapur, Chur, Mahiki, Patan, Parvada,
Malvada, Dhorionesh, Arshajar villages)

Client:
SPRNG ALT Energy Pvt. Ltd.



Date:
30-10-2018

Project: Final Bird and Bat Monitoring Report for 197.5 MW Kageshree Wind Power Project, Jamjodhpur Taluka, Jamnagar District, Gujarat

Client: SPRNG ALT Energy Pvt. Ltd.

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Project: Final Bird and Bat Monitoring Report for 197.5 MW Kageshree Wind Power Project, Jamjodhpur Taluka, Jamnagar District, Gujarat

Client: SPRNG ALT Energy Pvt. Ltd.

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Project: Final Bird and Bat Monitoring Report for 197.5 MW Kageshree Wind Power Project, Jamjodhpur Taluka, Jamnagar District, Gujarat

Client: SPRNG ALT Energy Pvt. Ltd.

EXECUTIVE SUMMARY

SPRNG ALT Energy Private Limited has engaged TUV SUD South Asia Private Limited for conducting Annual Bird and Bat Monitoring for Khageshree Wind Power Project. The second season Bird and Bat Monitoring Study was conducted in Post-Monsoon season (October, 2018) for the direct observation in the selected habitats of the study area and analysed the possible impacts on birds and bats of the proposed windfarm and suggested mitigation measures.

The main three clusters under which study was carried out are Chur, Mahiki and Parvada. Under each cluster WTG points were studied randomly for any impacts on birds and bats of the region. The habitat and vantage point surveys were undertaken in Monitoring surveys upto 15 km radius of the project area around the windfarm to identify the endangered birds and bats, migration status, disturbance leading to displacement of bird groups, barrier to movements, Collision with turbine blades and direct habitat loss.

As per the field survey, it can be concluded that no WTG point area of three clusters contains any rare, endangered and important birdlife. A total of 117 species belonging to 19 orders studied were clubbed into 10 groups for identification of overall impact on bird species. The present survey revealed that impacts due to disturbance leading to displacement of bird groups, barrier movements and direct habitat loss were recorded as low.

Bats were observed to be migrating during night time from other sources to Patan region. Around 200 bats were counted from night 6.30 pm to 7.30 pm. However, there are no endangered or Schedule-I bat species reported in the Study Area. Therefore, the impact on birds due to this project is likely to be temporary and insignificant.

The mitigation measures suggested to minimize impacts during Construction Phase on Avifauna and site-specific measures for conservation of bird and bat species during First Season Monitoring (Monsoon Season) and Second Season Monitoring (Post-Monsoon Season) along with Action Plan for implementation are given below:

General Measures

- ✓ Construction activities should be done with limited disturbance or habitat destruction.
- ✓ Waste management needs specific attention for implementation near WTG points. A designated Waste Handling and Management Plan needs to be followed at Site and

Assignment	Bird and Bat Monitoring Report for 197.5 MW Kageshree Wind Power Project, Gujarat	2 nd Season Monitoring (Post-Monsoon Season)
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Project: Final Bird and Bat Monitoring Report for 197.5 MW Kageshree Wind Power Project, Jamjodhpur Taluka, Jamnagar District, Gujarat

Client: SPRNG ALT Energy Pvt. Ltd.

supervised by SPRNG ALT. It should be ensured that Project Personnel/ Drivers/Contractord engaged at Site are not throwing any edible items/food waste/Tetrapacks near WTGs and outside project premises which will otherwise attracts birds.

- ✓ Arrangements for dustbins and proper disposal need to be carried out near WTG locations and near active Construction areas.
- ✓ Signboards need to be put up near WTGs/Parking Areas /active construction areas on temporary basis
- ✓ SPRNG ALT should monitor regularly the implementation of Waste Management Plan
- ✓ The plantation of Phoenix, Ficus and Eucalyptus trees nearer to WTG points should be avoided as these trees have large canopy and these plant species are habitat for roosting places for Bats and Birds. The locally dominant species of small herbaceous and Shrub species having less tree density such as Lantana, Butea, Acacia can be raised near WTG's

Mitigation measures to conserve Bat species

- The roosting trees identified near the Arshajar village and PTN 12 should not be disturbed due to construction activities. Around 100-200 Bats roosted to the trees near this village.
- The construction of internal roads through the village surroundings upto 600m radius should be avoided.
- The cave near the Patan village which is closer to PTN15 and PTN17 has to be protected during construction phase. Adequate care should be taken on construction waste management so that no waste is dumped near Cave which might affect habitat of bats
- The construction activities should be avoided during dawn and dusk.
- Avoid tree cutting near the WTG points where bats are observed (roosted). The WTG points studied are bit far away (more than 100 m) from the roosting habitats of Bats however in order to avoid damage during construction period, the management should take care of all trees while making internal pathways

Mitigation Measures to conserve Bird Species

- SPRNG ALT staff should monitor the project area for any presence of large animal carcasses that may attracts large number of vultures and raptors. This may lead to increase in collision frequency of Vultures. Awareness camps should be conducted immediately to all Project Personnel, Contractors on birds and bats, protection of habitats, and Waste management

Assignment	Bird and Bat Monitoring Report for 197.5 MW Kageshree Wind Power Project, Gujarat	2 nd Season Monitoring (Post-Monsoon Season)
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Project: Final Bird and Bat Monitoring Report for 197.5 MW Kageshree Wind Power Project, Jamjodhpur Taluka, Jamnagar District, Gujarat

Client: SPRNG ALT Energy Pvt. Ltd.

- Avoid construction activities near the nesting grounds of birds
- Minimizing the area's attractiveness can be through coordinated temporal and spatial land management, minimizing food resources and food availability, and adapting flash lights to avoid bringing wildlife within the rotor swept area or the area directly below the turbine.
- The habitat condition near each WTG point should be altered by clearing all the major trees and shrubs upto 50 m distance in order to reduce prey for raptors.
- Minimizing the availability of food resources around wind turbine structures, particularly with raptors
- Reduce prey vulnerability when raptors are foraging, such as removing all artificially created rock piles as they attract potential prey to live in the rocks
- Species such as *Prosopis juliflora* and *Acacia nilotica* can be removed from the open habitats. These small habitat management practices near WTG points will affect on Peafowls local foraging status and they can freely move for feeding choice and avoid frequent flights near the WTG points. The open habitats need to be maintained near the ecosensitive zones.

A detailed Action Plan for addressing the impacts identified for birds and bats in accordance with the proposed mitigation measures has been suggested to be adopted by SPRNG ALT during Construction Phase.

Assignment	Bird and Bat Monitoring Report for 197.5 MW Kageshree Wind Power Project, Gujarat	2 nd Season Monitoring (Post-Monsoon Season)
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Project: Final Bird and Bat Monitoring Report for 197.5 MW Kageshree Wind Power Project, Jamjodhpur Taluka, Jamnagar District, Gujarat

Client: SPRNG ALT Energy Pvt. Ltd.

1 INTRODUCTION

1.1 POST MONSOON SEASON SURVEY FOR BIRDS AND BATS

The present study carried out in Post Monsoon season (Oct, 2018) in and around 15 km radius of 197.8 MW Wind Power Project site. The purpose of the study is to identify the endangered birds and bats in post monsoon period. Vantage points surveys were conducted on migration status, disturbance leading to displacement of bird groups, barrier to movements, possibility of collision with turbine blades and direct habitat loss in the study area. Impact studies were conducted near the habitats of birds and bats and site-specific mitigation measures were given for in each cluster of WTG points. All WTG points are made to three clusters to understand the feeding and foraging behaviour. The main three clusters are Chur, Mahiki and Parvada. Species-specific survey and analysis methods were adopted for birds and bats. The entire study area was analysed on hypothetical cluster based analysis where the intensive surveys are concentrated in few sensitive areas identified in the previous monsoon season. The bat surveys were carried at specific habitats and during evenings and night times. Climatic conditions are attributed to migratory birds of the region therefore variations are observed accordingly. The interaction with villagers was also carried out to know the status of birds and bats in the study area.

Table 1: GPS coordinates of the critical habitats observed during the study (other than the proposed WTG points)

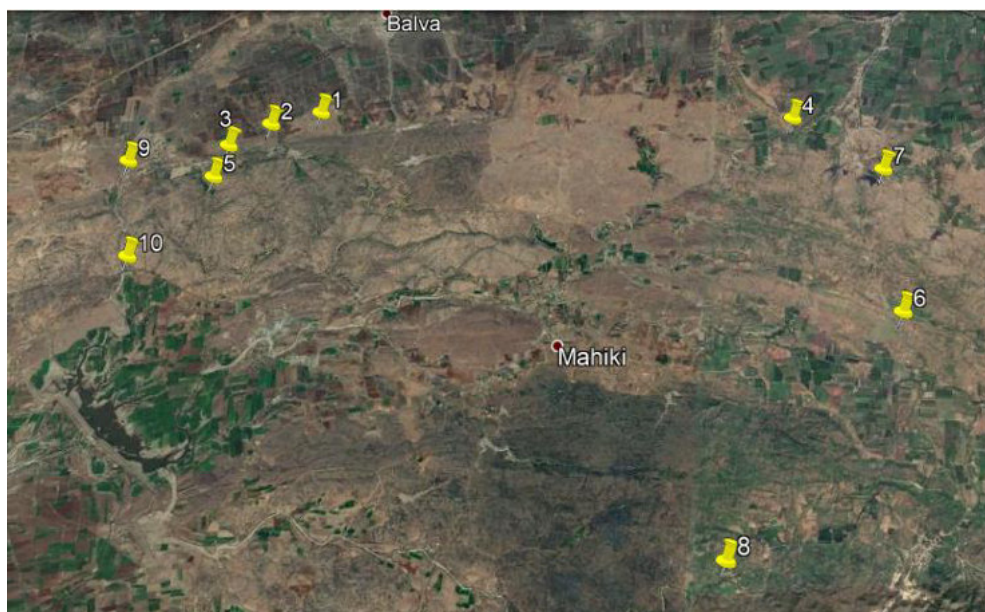
GPS Point	Latitude	Longitude
1	21°52'17.00"N	69°56'55.00"E
2	21°52'10.00"N	69°56'31.00"E
3	21°51'58.00"N	69°56'12.00"E
4	21°52'24.00"N	70° 0'50.00"E
5	21°51'41.00"N	69°56'8.00"E
6	21°50'48.00"N	70° 1'44.00"E
7	21°51'59.00"N	70° 1'35.00"E
8	21°48'54.00"N	70° 0'26.00"E
9	21°51'48.00"N	69°55'24.00"E
10	21°51'0.00"N	69°55'34.00"E

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Figure 1: Map showing Sampling points of the ecosensitive habitats identified in the proposed project area



Note: 01 to 10 are ecosensitive points identified in the study area

1.2 KEY FINDINGS OF BIRD MONITORING DURING POST-MONSOON SEASON

The analysis of data suggests that study area falling in Jamjodhpur is rich in avian diversity with 117 species belonging to 19 orders, 54 families and 94 genera. Order Passeriformes is the most dominant order with 40 species followed by Falconiformes (15 species), Ciconiiformes (12 species), Coraciiformes (6 species) and least represented by the orders Psittaciformes and Strigiformes with 1 species each. Further, the present study in Post-Monsoon season identified few more seasonal sensitive zones in the studied area with respect to birds and bats migration pattern. It was observed that majority of the birds reported belong to the Schedule-IV of Wildlife Protection Act 1972 (WPA 1972) whereas 3 species belongs to Schedule-I of WPA 1972. (Two types of vultures and Indian Peafowl) whereas House crow belong to Schedule-V.

Table 2: List of Schedule-I Specied recorded in Study Area

S.No	Common Name	Scientific Name	Local	IUCN	IWLP
1	Egyptian Vulture	<i>Neophron percnopterus</i>	V	NT	Sch-I

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2	Long-billed Vulture	<i>Gyps indicus</i>	V	CR	Sch-I
3	Indian Peafowl	<i>Pavo cristatus</i>	R	LC	Sch-I

The Indian peafowl or blue peafowl (*Pavo cristatus*), a large and brightly coloured bird, is a species of peafowl native to South Asia, but introduced in many other parts of the world. Around 300 birds were observed near all WTG points and majority of them near Mahiki Cluster. Eventhough in very few points, the habitat may get disturbed during construction activity, but it is minor when compared to the population size of the Peafowl bird species taken as a whole. The Indian peafowl lives mainly on the ground in open forest or on land under cultivation where they forage for berries, grains but also prey on snakes, lizards, and small rodents. They are found in the open early in the mornings and tend to stay in cover during the heat of the day. They are fond of dust-bathing and at dusk, groups walk in single file to a favourite waterhole to drink. When disturbed, they usually escape by running and rarely take to flight. The clutch consists of 4–8 fawn to buff white eggs which are incubated only by the female. The eggs take about 28 days to hatch. June is the peak season in Gujarat state.

The population size of Peafowls in Mahiki cluster and Chur cluster are very high. The activity period observed more during dawn and desk and specially near the open habitats. To maintain the population status and to reduce the collision frequency, few open habitats near minor trenches and streams are to be developed. Species such as Prosopis juliflora and Acacia nilotica can be removed from the open habitats. These small habitat management practices near WTG points will affect on Peafowls local foraging status and they can freely move for feeding choice and avoid frequent flights near the WTG points. The open habitats need to be maintained are near the ecosensitive zones are provided in **Figure 1**.

The same observation points were selected for flight observation of birds which are selected during monsoon season. Based on the observation, no rare, endangered, endemic bird species were found to breed nearer to any WTG points. No seasonal migratory birds observed near Satapur Reservoir basin and other minor tanks. The flight activity of the bird species (Direct observations during recorded period) are analysed for each vantage point during post monsoon season which reveals that very few birds are active in this season. The bird flight is frequently reported near the WTG points.

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1.3 POTENTIAL IMPACTS ON BIRDS IDENTIFIED DURING STUDY PERIOD

The present survey revealed that birds belong to order Passeriformes, were at moderate risk, where as birds belonging to all other orders were at lower level of risk. This is because majority of the bird groups were occurring at very low abundances, there were very few species representing some of the bird groups, and some groups were either absent in the project area or their species number were low in the project area. Moreover, majority of water birds and grassland birds would be at very low risk as there are no major wetlands and grasslands present inside or in close periphery of the project area.

Since very few species are found to breed in the project area, the disturbance leading to displacement of birds would be low. The data suggests that only 7 out of 19 orders are likely to be affected by the proposed activity. All these orders are most common species, which are abundant throughout the region.

There are no wetlands in and around project site and therefore, the project may not pose significant threat to water birds and water dependent species; it includes Ducks & Geese, Waders and Cranes. Only 8 orders are reported in this group, and all are solitary and diurnal in their habits therefore the project is less likely to be barrier to their movements.

Majority of the bird groups are prone to collision with the turbines (except Waders, Cormorants and Grebes). Total 11 orders are known to be affected by the collision in our analysis. However, many of the species are solitary, diurnal, having low flights during local movements, and their major habitats are being away from the project site, they are likely to be less affected. Moreover, no rare, endangered, endemic or threatened species are listed in this group.

Statistical analysis through software PAST shows that 11 birds are under risk with the collision activity. Indian Peafowl, House swift, Red-wattled Lapwing, Indian Robin, Red-vented Bulbul are having more risk compared to others. This may be due to more vegetation and foraging grounds available in the study area.

Around 10 orders are affected by the loss of habitat due to project. Majority of the resident birds such as order Passeriformes are likely to experience gross loss of their habitat worth the project area. All

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the species in this order can be considered as Least Concerned by IUCN and in Schedule-IV in the Wildlife Protection Act in India.

1.3.1 Impacts on Birds in Chur Cluster

This cluster has 10 proposed WTG sites. All are on the top of the hillocks. And absolutely no cumulative impact on birds from these points. Around 100-150 of Peafowls are observed in this cluster. During the present study, local migrant species such as Lapwings and Swifts were observed near BLV1 and BLV3 points. CHR 5 is the typical WTG point, where a lot of vegetation cover was observed near Temple at less than 1 km distance. Around 8 to 10 terrestrial resident birds such as Red vented Bulbul, Flowerpeckers and Bee eaters with moderate population of 50 to 60 numbers were observed near CHR5.

1.3.2 Impacts on Birds in Mahiki Cluster

The probable percentage of collision mortality near Mahiki was high because lot of vegetation near Patan region. The order Galliformes (**Peafowl**) is highly dominant over here. The high diversity of birds and population shows that sufficient foraging grounds are available here. The barrier effect on resident birds due the proposed windfams is nil except near WTG points such as STP10 and MHK3.

1.3.3 Impacts on Birds in Parvada Cluster

The habitat of this cluster has not much vegetation compared to other two clusters and is well suitable site to establish wind farm. Except habitat displacement during construction phase for 8 bird species, very low or no cumulative impacts on the birds with the proposed wind farm. However, a detailed study has been done for few birds species as tabulated here. The number represents the occurrence of the bird in the WTG sites in the proposed area. The impact given here is only expected one. As per the study, the cumulative impact due to collision is more when compared to others.

1.4 POTENTIAL IMPACTS ON BATS IDENTIFIED DURING STUDY PERIOD

During the present study in post monsoon season, habitat specific detailed studies are conducted with the help of local villagers. Two major species are directly sighted during this season. *Pteropus*

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giganteus (Indian Flying fox bat) and *Megaderma spasma* (lesser false vampire bat). These species were also observed during monsoon period.

1.5 IMPACTS ON BATS

Bats were observed to be migrating during night time from other sources to Patan region during the present study. However, very minor impacts were observed on bats during the present study. Around 200 bats were counted from night 6.30 pm to 7.30 pm however no endangered or rare bat species were encountered during the study. The Patan habitat is mainly used for roosting and for foraging, however bats are migrating far away from the site. Impacts could also occur if more disturbances created near the caves (roosting sites). Temporary and small scale construction activities in the proposed core area and related to foundation construction would involve movement of vehicle and people, digging of soil, material loading, etc. Therefore, the impact on bats due to these activities are likely to be temporary and insignificant. The impacts identified for bats are as follows:

- I. Impacts are mainly due to loss of roosting habitats, direct displacement, removal trees for laying roads to WTG points etc.
- II. Impacts on Migratory paths of certain bats.
- III. Impacts on bats of caves due to disturbance.
- IV. Impacts on bats due to noise and vibration during construction.

The critical WTG points for *Megaderma spasma* are: PTN13, PTN15 and PTN17. Moderate impact will be there for entire Mahiki cluster. The critical WTG points for *Pteropus giganteus* are: PTN8 and PTN12. Moderate impact will be there for entire Mahiki cluster.

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2 PROPOSED MITIGATION MEASURES

The mitigation measures suggested to minimize impacts during Construction Phase on Avifauna and site-specific measures for conservation of bird and bat species during First Season Monitoring (Monsoon Season) and Second Season Monitoring (Post-Monsoon Season) are given in the below table.

Table 3: Mitigation Measures for Avifauna and Specified Conservation Measures for Birds and Bats

S.No.	Mitigation Measures suggested	Implementation Status	Action Plan
GENERAL MEASURES			
1	Comply with environmental standards with respect to environmental issues	<ul style="list-style-type: none"> Being Adhered. <p>The water sprinkling is being carried out regularly for reducing fugitive dust emission (PM2.5, PM10) and proper maintenance of access roads is being done thereby minimizing to trees near access roads</p>	Need to continuously follow standards during construction phase
2	Reduce/ optimize amount and size of new roads as much as possible	<ul style="list-style-type: none"> Being adhered. The new roads formed are optimized 	Need to continuously follow during construction phase
3	Replant natural vegetation and transfer rich soil of the construction sites to nearby areas	<ul style="list-style-type: none"> Being adhered. 	Need to continuously follow during construction phase
4	Site-specific waste collection and disposal management plan should be in place to, include good site practices such as: Providing the appropriate spill kits (e.g., containing absorbent cloths and disposal containers) on-site during construction; Prohibition of dumping or burying wastes within Project site; Implementation of an on-going waste management program consisting of reduction, reuse, and recycling of materials.	<ul style="list-style-type: none"> During Site Visit, it was observed that wrapping materials of food items, food waste is dumped near WTG locations under active construction phase. The Waste Management Plan for handling Food waste 	<ul style="list-style-type: none"> Waste management needs specific attention for implementation near WTG points. A designated Waste Handling and Management Plan needs to be followed at Site and supervised by SPRNG ALT It should be ensured that Project Personnel/ Drivers/Contractorsengag

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		and for handling Hazardous Waste (Used Oil, Oil soaked cloth/Cotton, Empty Barrels) needs to be prepared and implemented at Site	ed at Site are not throwing any edible items/food waste/Tetrapacks near WTGs and outside project premises which will otherwise attracts birds <ul style="list-style-type: none"> • Arrangements for dustbins and proper disposal need to be carried out near WTG locations and near active Construction areas. • Signboards need to be put up near WTGs/Parking Areas /active construction areas on temporary basis • SPRNG ALT should monitor regularly the implementation of Waste Management Plan
SITE SPECIFIC MITIGATION MEASURES FOR CONSERVATION OF BATS			
1	The plantation of Phoenix, Ficus and Eucalyptus trees nearer to WTG points should be avoided as these trees have large canopy and these plant species are habitat for roosting places for Bats and Birds	<ul style="list-style-type: none"> • Being Adhered 	<ul style="list-style-type: none"> • Need to adhere strictly during Construction Phase
2	The roosting trees identified near the Arshajar village and PTN 12 should not be disturbed due to construction activities. Around 100-200 Bats roosted to the trees near this village. The main criteria is to avoid constructing internal roads through the village surroundings upto 600m radius. Avoid laying internal roads near the roosting habitats	<ul style="list-style-type: none"> • Being Adhered. 	<ul style="list-style-type: none"> • Regular monitoring is needed.
3	The cave near the Patan village which is closer to PTN15 and PTN17 has to be protected during construction phase.	<ul style="list-style-type: none"> • Being Adhered. The cave was not disturbed 	<ul style="list-style-type: none"> Regular monitoring is needed

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4	Adequate care should be taken on construction waste management so that no waste is dumped near Cave which might affect habitat of bats	• Being Adhered. Wastes are not dumped near the caves	Regular monitoring is needed.
5	The construction activities should not be avoided during dawn and dusk.	• Being Adhered. The construction activities are strictly implemented during day time only.	Regular monitoring is needed.
6	Avoid tree cutting near the WTG points where bats are observed (roosted).	• Being Adhered. Large Trees are not found near WTG points	Regular monitoring is needed.
7	The WTG points studied are bit far away (more than 100 m) from the roosting habitats of Bats. However, in order to avoid damage during construction period, the management should take care of all trees while making internal pathways	• Being Adhered. All roosting sites are more than 100m from the WTG points.	Regular monitoring is needed.
MITIGATION MEASURES FOR CONSERVATION OF BIRD SPECIES			
1	Project staff should monitor the project area for any presence of large animal carcasses that may attracts large number of vultures and raptors. This may leads to increase of collision frequency of Vultures	• Being Adhered.	• Awareness camps should be conducted immediately to all Project Personnel, Contractors on birds and bats, protection of habitats, and Waste management
2	The villagers should be convinced and the dumping ground of cattle carcasses could be taken at least 5-10 km away from the project site boundary.	• Yes. Awareness created to villagers.	• Monitor on regular basis
3	Avoid the nesting grounds of birds	• Being Adhered. Checked for nesting grounds for birds	• Monitor on regular basis
4	More precautionary measures should be followed to protect the bird and bat habitats, prior to commencing any construction activities	• Yes. Implemented	• Monitor on regular basis
5	Minimizing the area's attractiveness can be through coordinated temporal and spatial land management, minimizing food resources and food availability, and adapting flashlights to avoid	• Being Adhered	• Need to adhere and monitor continuously

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	bringing wildlife within the rotor swept area or the area directly below the turbine.		
6	The habitat condition near each WTG point should be altered by clearing all the major trees and shrubs upto 50 m distance in order to reduce prey for raptors.	<ul style="list-style-type: none"> • Yes. Under implementation. 	<ul style="list-style-type: none"> • Need to monitor regularly
7	<p>Reduce prey vulnerability when raptors are foraging, such as removing all artificially created rock piles as they attract potential prey to live in the rocks.</p> <p>Species such as <i>Prosopis juliflora</i> and <i>Acacia nilotica</i> can be removed from the open habitats. These small habitat management practices near WTG points will affect on Peafowls local foraging status and they can freely move for feeding choice and avoid frequent flights near the WTG points. The open habitats need to be maintained near the ecosensitive zones</p>	<ul style="list-style-type: none"> • Yes. Rock piles are avoided near WTG points. 	<ul style="list-style-type: none"> • Ensure adherence continuously

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3 CONCLUSIONS

The Bird and Bat Monitoring Study was carried out during Post Monsoon season (Oct, 2018) in and around 15 km radius of the proposed project site. No migratory or endangered birds and bats occurred during this period. Vantage points surveys were conducted on migration status, disturbance leading to displacement of bird groups, barrier to movements, possibility of collision with turbine blades and direct habitat loss in the study area. Bat surveys were carried out at specific habitats and during evenings and night times. Climatic conditions are attributed to migratory birds of the region therefore significant variations are recorded. Priority was given to interact with villagers to know the status of birds and bats in the region. Around 117 species of birds were recorded in Post-monsoon season. The Indian peafowl or blue peafowl (*Pavo cristatus*), is well dominant throughout the region and more than 300 birds observed near all WTG points. No extra site specific and species specific impacts were recommended during the present study rather a detailed Action Plan for Monitoring and compliance has been suggested for implementation at ground level by SPRNG ALT at Site.

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ANNEXURES

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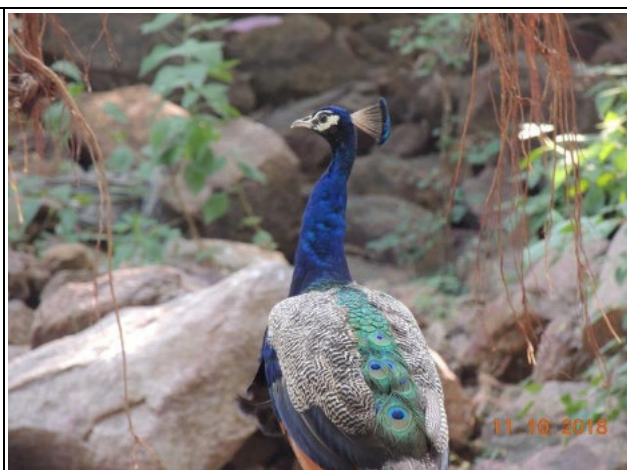
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Annexure-I: Birds and Bats recorded during Post Monsoon season of the Study Area



Indian Roller



Indian Peafowl



White Pelican



White-headed Babbler

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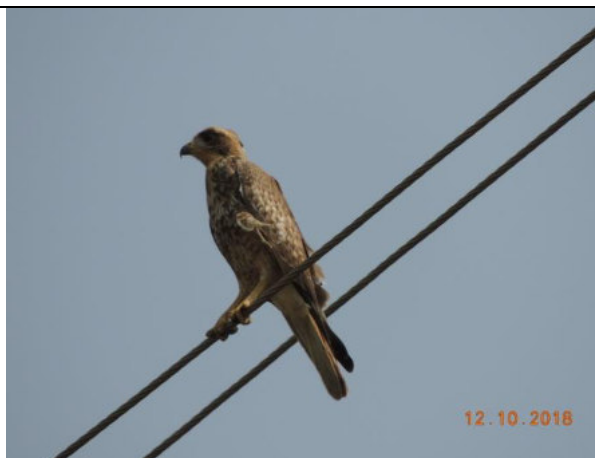
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Rock Pigeon



Great Egret



Black Kite



Tickell's Flowerpecker

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 <p>11.10.2018</p> <p>Little</p> <p>Cormorant</p>	 <p>12.10.2018</p> <p>Common Hoopoe</p>
 <p>14.10.2018</p> <p>Red-vented Bulbul</p>	 <p>10.10.2018</p> <p>Red-wattled Lapwing</p>

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Black Ibis



Oriental darter



Rose-ringed Parakeet



Oriental Magpie Robin

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Sothorn Grey Shrike



Small Bee-eater

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Eurasian Collared Dove



Grey Heron



White-breasted Kingfisher



Black winged Stilt

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Bats



Lesser vampire bat



Greater Indian fruit bat

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Annexure-2: Photographs of Field Monitoring during Post-Monsoon Season



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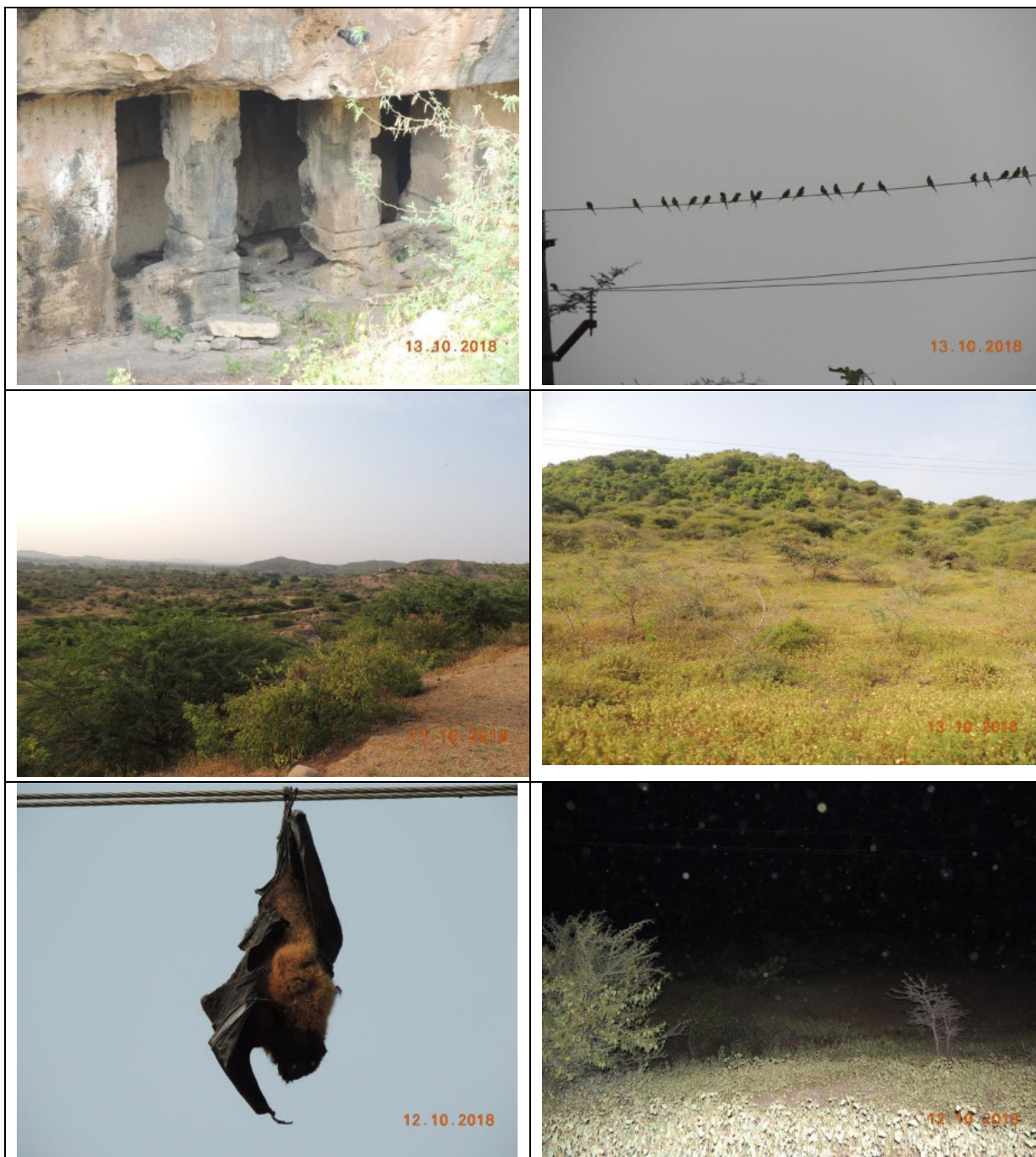
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**Compliance to ADB Observations on Environment & Social Due Diligence Report (ESDDR) of
Sprng Alt Energy Private Limited (SAEPL) – Environmental Safeguards**

S.No.	ADB Comment on Environmental Safeguards	IIFCL response/clarifications
1.	Provide a copy of the bird and bat study undertaken for this sub-project and the status of the actions taken in line with the ADB-approved EMP including the details of bird hits since commissioning of the first WTG in May 2019	<p>Copy of Final Report on Bird & Bat Monitoring for 197.5 MW Kageshree Wind Power Project – Study period: Post Monsoon Season is enclosed as Annexure A. The study concluded that Indian peafowl or blue peafowl (<i>Pavo cristatus</i>), is dominant species throughout the region. During site visit it was confirmed that the developer has taken adequate measures to counter the peafowl hits/mortality, which were detailed in the status of EMP implementation in the ESDDR.</p> <p>The status of actions undertaken as per EMP during construction and operation stage are provided in Table 4 and Table 5 in the ESDDR under status of EMP implementation under head Ecology, which are reiterated below:</p> <p>Construction phase:</p> <ul style="list-style-type: none"> • Bird & Bat studies were conducted for all four seasons through reputed external experts to assess the impacts on bird & bat because of the project activities during the construction stage. No significant impacts on birds and bats were found in the study. • Two WTG locations were shifted away from a water body near village Satapar. • Internal transmission line was rerouted to avoid Chur Mata Mandir, where trees density is high and birds (Peafowls) population is found. This rerouting avoided the impacts on avian fauna altogether. • Barricading of all the excavated pits was done to prevent animal falls. <p>Operation phase:</p> <ul style="list-style-type: none"> • The tips of the wind turbines blade and upper segments of tower are colored in orange so that the blades are visible to birds to isolate from the sky and mitigate risk of bird collisions. • The pole height used for 33 kV line increased to 13 meters instead of industry standard of 11 meters required as per Electricity Act Rule, 1956. The increment of additional 2 meters helped in reducing the possibility of collision of peafowls from transmission lines resulting in protecting them from electrocution. • Use of tower line for 33 kV Double and multi circuit lines to ensure greater conductor height (17 meters) and to avoid multiple single pole lines in same area. These interventions are effective in ensuring the reduced risks of collision and electrocution of peafowls because of transmission lines. • Insulated conductors along with insulated jumpers are provided in total eight locations falling under the most sensitive area under village Chur from peafowl perspective. Insulated sleeves are also provided on two feeders in Chur and Balva to protect peafowls from electrocution.

**Compliance to ADB Observations on Environment & Social Due Diligence Report (ESDDR) of
Sprng Alt Energy Private Limited (SAEPL) – Environmental Safeguards**

		<ul style="list-style-type: none"> • The bird guards are installed at the entire length of 83 Km of 33 kV transmission line to reduce the possibility of sitting of peafowls on 33 kV line resulting in reduced risks of fatalities from electrocution. The bird guards are also provided on DP yard and top of the transformers at all USS. • A uniform clearance is maintained between the jumpers and the pole structure to avoid short circuit if any bird sits there. <p>Developer has informed that no bird hits have been noticed since commissioning of the first WTG in May 2019 till date.</p>
2.	Ensure continued statutory compliance of the sub-project with the environmental regulations of India.	Agreed
3.	Confirming that the proposed sub-project is compliant with ADB's Safeguard Policy Statement, 2009.	Yes

**Compliance to ADB Observations on Environment & Social Due Diligence Report
(ESDDR) of Sprng Alt Energy Private Limited (SAEPL) – Social Safeguards**

Sr. No	ADB Comment on Social Safeguards	IIFCL Response/Clarifications
	ESDDR – Social Section	
1.	<p>Para 38. It is noted that the 6 hectares of private land was acquired on a willing seller - willing buyer basis. It is also noted that land acquisition was not in anticipation of ADB financing. While ADB SPS does not apply in case of negotiated land acquisition, please confirm that there was appropriate documentation of the process and that the price was adequate and fair.</p> <p>Para 53. Suggest to include in conclusion that land for the project is composed of Revenue Land and private land acquired through willing seller - willing buyer basis.</p>	<p>Para 38 confirmed</p> <p>Para 53. Changes made</p>
2.	Para 40. It states in para 38 that the project does not involve resettlement and rehabilitation, if this is so, suggest to remove: "... and that IIFCL was not involved in the rehabilitation and resettlement activities of the project."	Changes Made
3.	Para 43. Suggest to add that there is no presence of Indigenous Peoples in the project area.	Changes Made
4.	Para 53. Suggest to include in conclusion that land for the project is composed of Revenue Land and private land acquired through willing seller - willing buyer basis.	Changes Made
	IR Categorization	
1.	Section C. Comments. Suggest to revise as follows: "Land for the project is Revenue Land and private land. Private land was acquired on willing seller - willing buyer basis. Land acquisition was initiated prior to IIFCL's involvement and not in anticipation of ADB financing. There is no physical or economic displacement of people resulting from involuntary land acquisition or involuntary restriction on land use or access to legally designated parks and protected areas. The project is classified as category C."	Partial changes made. As no Involuntary land acquisition hence not including word Involuntary.
2.	Checklist, item 1, remarks. The size of private land mentioned in the checklist is 6 hectares, while in the ESDDR para 13, it is 9 hectares. Please confirm what is the size, and revise as necessary.	Changes made

Photo Plate I: Site Visit Photographs



WTGs with Painted Upper Segment of Tower & Blade Tips



Safety Instructions in Office complex



Safety Signages outside Control Room



Marking on WTG



Fire extinguishers inside WTG



First Aid Kit Inside WTG



Markings in Storage Yard



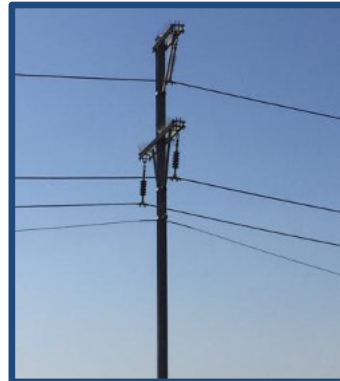
Pooling Substation area



Bird Guards on Transformer



Insulated Sleeve at Jumper



Bird Guards at transmission line



Insulated Transmission line