Details of Biodiversity Impact Assessment

(In case the proposal involves use of more than 50 ha of NP/WS)

Project:-	Diversion of 208.087 ha of Forest land (inside buffer zone of Manas Tiger Reserve) for construction of **400 KV (Quad) Jigmelling – Alipurduar T/L**
Project Proponent:	Power Grid Corporation of India Ltd (A Govt. of India Enterprise)
Details of PA involved	Buffer zone of **"MANAS TIGER RESERVE"**

The Biodiversity Impact Assessment report forms an integral part of wildlife clearance proposal in case the project involves use of more than 50 ha area in NP/WS. However, in the instant case of diversion of 208.80 ha of forest land by POWERGRID, the project area falls in the buffer zone of Manas Tiger Reserve involving only reserved forest land. As per the Notification of Manas Tiger Reserve, the "*CORE*" and "*BUFFER*" area of the Manas Tiger Reserve is defined as below.

Core area:- **526.22 sq km** (MNP 500 sq km + Barnadi Wildlife Sanctuary 26.22 sq km)

Buffer area:- (Reserved forest of Kachugaon, Haltugaon, Chirang and Dhansiri Territorial division along the Indo-Bhutan boundary) = **2310.88 sq km**

Total area:- **2837.10 sq km**

The proposed project area (i.e. Transmission Line) is approximately **13** km away from the core area of Manas Tiger Reserve ***(i.e. from the boundary of Manas national Park)*** and involves 5 Reserved Forest under 3 Territorial Forest Divisions (under BTAD) namely Haltugaon Div *(Manas RF and Chirang RF)* Chirang Div. *(Manash RF-pt-ii & Bengtol RF) and* Kachugaon *(Ripu RF)*

Map showing aerial distance from MNP and the proposed transmission line route is enclosed.

Although the core area of Manas Tiger Reserve (i.e. the NP area) is inviolate, there is significant biotic pressure in the buffer zone due to the presence of 125 forest villages in the western buffer, a few in the eastern buffer and also having moderate to bad encroachment along with degradation of forest cover.

The proposed route of the transmission line project also involves **39 forest villages** in the buffer zone *(list enclosed).* The forest villagers are mostly involved in paddy cultivation and the density of vegetation along the transmission route corridor is also significantly low. Although the core area and some portion of the buffer zone is characterized by high biodiversity and abundance of flora and fauna but the project area (i.e. transmission line corridor) is mainly plain area having very low flora and faunal diversity. The route has been carefully selected avoiding dense vegetation area and along the existing paddy lands. Therefore, the impact on biodiversity on Manas Tiger Reserve due to the proposed transmission project is assessed as very low owing to careful route selection and involvement of very few forest area. The DFOs of the three (3) territorial divisions and the Addl. PCCF & CHD, Forest, Kokrajar have clearly mentioned in their site inspection reports about the necessity of the Project on national interest, very low impact on wildlife habitat and surrounding forest & environment and also proposed some mitigation measures *(increase of tower height etc.)* to be implemented in some sections of the route by POWERGRID.

Therefore, it is found that the impact on biodiversity on Manas Tiger Reserve due to the proposed project intervention is very minimal and can be minimized through proper mitigation measures as per guidelines.

For & On Behalf of POWERGRID

बी. पॉल चौधुरी / B. Paul Choudhury
उप महा प्रबन्धक / Dy General Manager
पावरग्रिड, उ.पू.क्षे. / POWERGRID, NER
उप केन्द्र बंगाइगाँव-सालाकाटी/Bongaigaon-Salakati S/S

NOTIFICATION OF MANAS TIGER RESERVE

GOVERNMENT OF ASSAM
DEPARTMENT OF ENVIRONMENT AND FORESTS
DISPUR ::: GUWAHATI

ORDERS BY THE GOVERNOR

NOTIFICATION

Dated Dispur, the 30th May'08.

No. FRW. 25/2008/36 : In exercise of the powers conferred under the sub-section (1) of section 38(V) of the Wild Life (Protection) Act 1972 (Central Act 53 of 1972), the Governor of Assam on the recommendation of Tiger Conservation Authority hereby declares that the area, the boundaries which are specified in the schedule below, as a tiger reserve.

THE SCHEDULE

The Name of the Project Tiger :: Project Tiger Manas (Manas National Park and Boranadi Wildlife Sanctuary alongwith the reserved forests of Kachugaon, Haltuagaon, Chirang and Dhansiri Territorial divisions of BUDOLAND TERRITURIAL AREAS DISTRICT AREA along Indo-Bhutan International Boundary.

The Name of the Districts :: Kokrajhar, Chirang, Bagsa and Udalguri.

Forest Division(s) :: Manas National Park, Orang Wildlife Division, Dhansiri Division, Kachugaon Division, Haltugaon Division and Chirang Division.

Area of the Forest Block :: Manas National Park 500 sq.km
Boranadi Wildlife Sanctuary 26.22 sq km
Reserved Forests 2310.88

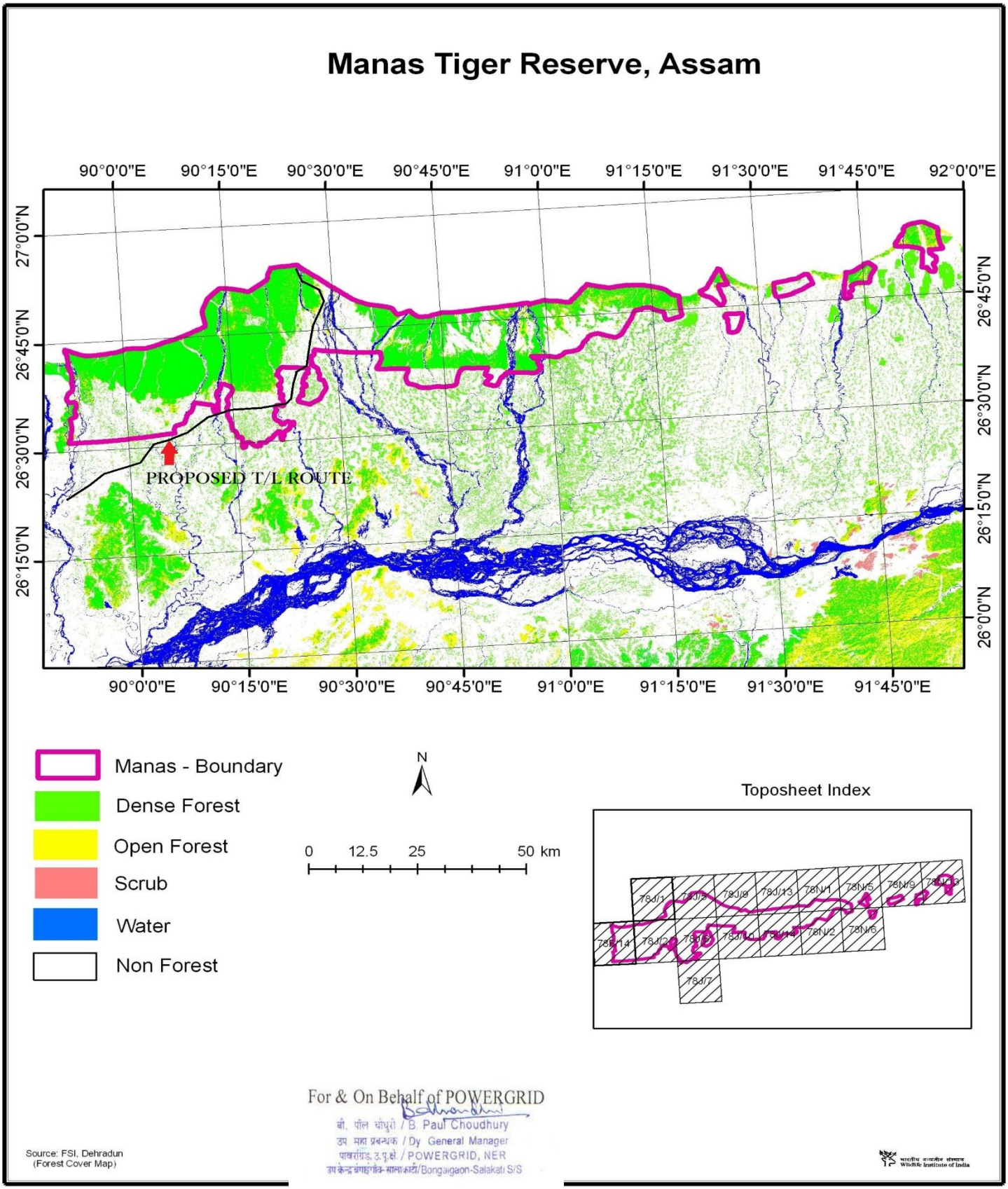
Total areas = 2837.10 sq km.

3362
Date 11/6/08

Core area 526.22. SQ kms.
Buffer area 2310.88 Sq Kms.
Total 2837.10 Sq Kms.

BOUNDARY DESCRIPTION. : From the point where the Sankosh river cuts the Indo-Bbutan International Boundary, eastwards to the point where the tri radiate pillar indicates the Assam, Bhutan and the Arunachal Boundaries. From that point eastwerds and then westwards along the southern boundaries

MAP OF MANAS TIGER RESERVE VIS-À-VIS PROPOSED T/L ROUTE



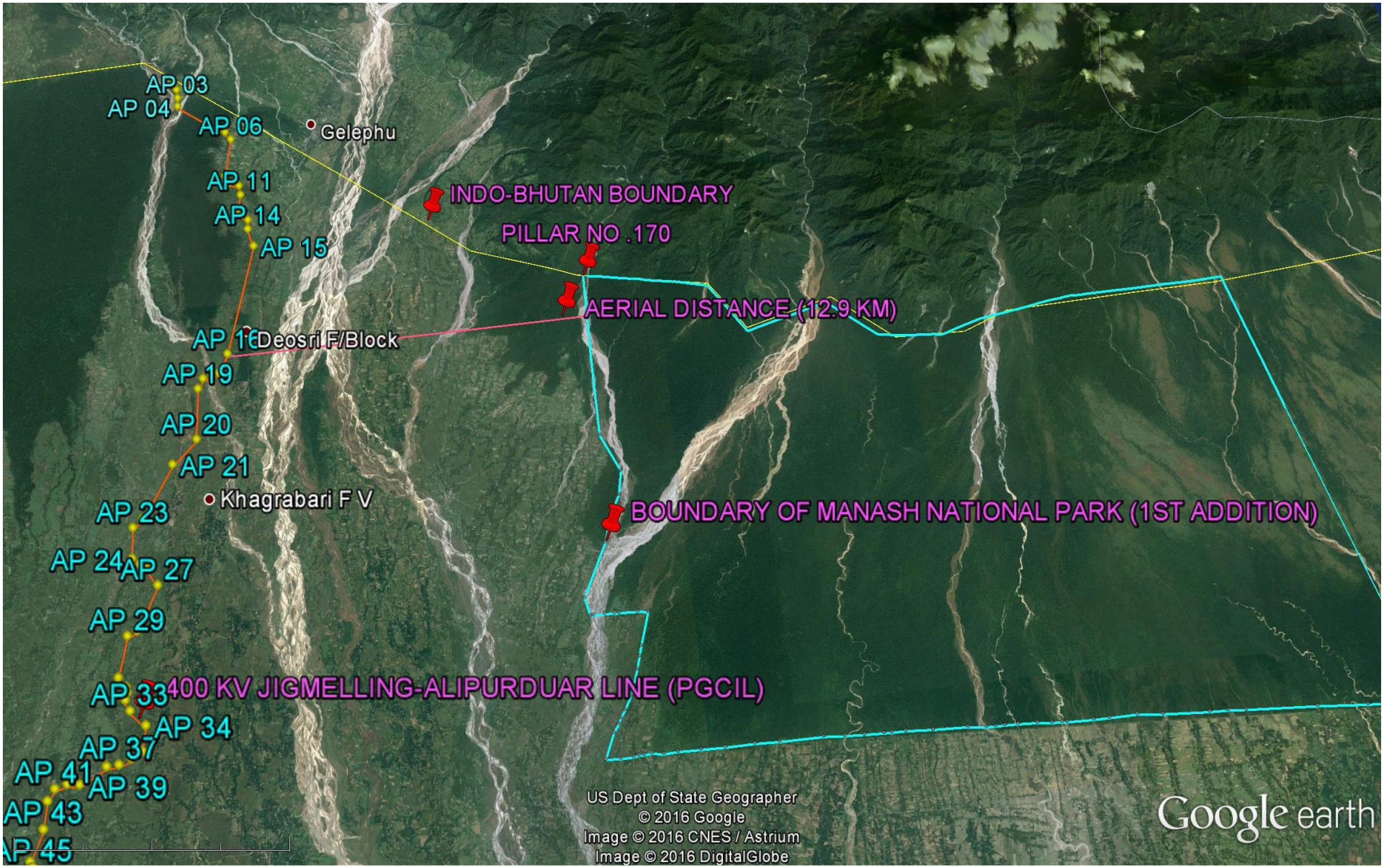
For & On Behalf of POWERGRID

बी. पॉल चौधुरी / B. Paul Choudhury
उप महा प्रबन्धक / Dy. General Manager
पावरग्रिड, उ.पू.क्षे. / POWERGRID, NER
उप केन्द्र बंगाइगांव-सालाकाटी/Bongaigaon-Salakati S/S

Source: FSI, Dehradun
(Forest Cover Map)

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

AERIAL DISTANCE FROM MANAS NATIONAL PARK (i.e. CORE AREA) TO PROPOSED T/L



For & On Behalf of POWERGRID

बी. पॉल चौधुरी / B. Paul Choudhury
उप महा प्रबन्धक / Dy. General Manager
पावरग्रिड, उ.पू.क्षे. / POWERGRID, NER
उप केन्द्र बंगाइगाँव-सालाकाटी/Bongaigaon-Salakati S/S

SITE INSPECTION REPORT OF ADDL PCCF, WESTERN ASSAM CIRCLE, BTC, KOKRAJHAR

(FOR THE FOREST LAND PROPOSED TO BE DIVERTED UNDER FCA)

PROJECT:- Construction of 400 kV transmission line from Jigmelling to Alipurduar by Power Grid Corporation of India Limited	
Forest area proposed for diversion under Wester Assam Circle, Kokrajhar (Chirang, Haltugaon & Kachugaon Division)	**: 208.807 Hectare**

A forest proposal **(REF NO:- FP/AS/TRANS/19330/2016)** for diversion of **208.807 hectare** of forest land for non-forestry purpose has been received in Western Assam Circle, BTC, Kokrajhar in *ONLINE* mode through MoEF web portal **(i.e. *forestclearance.nic.in*)** on 09-00-2017. Subsequently, the hard copies of the proposal has been also received by this office from the Deputy General Manager, POWERGRID, Salakati on 24-01-2017. The forest proposal envisages the use of forest land for construction of a 400 KV transmission line from Jigmelling to Alipurduar by Power Grid Corporation of India Limited, a Govt. of India Enterprise. In this regard, a joint site inspection has been carried out by the undersigned along with the representative of POWERGRID and concerned DFOs on **29-01-2017** as per the guideline of FCA.

Upon inspection of the site, it is found that the proposed forest land required by the User Agency falls under three (3) different Forest Divisions under Wester Assam Circle as below:-

Forest Division	Area in hectare	Reserved Forest involved	Remarks
CHIRANG	134.588	MANASH RF & BENGTOL RF	About 95% of the transmission line route in forest area passes through plain area comprising mainly of paddy field/agriculture land allotted to forest villagers.
HALTUGAON	70.082	MANASH RF & CHIRANG RF	
KACHUGAON	4.136	RIPU RF	

The salient features of the proposed diversion area as found during site inspection are:-

- The length of Transmission Line in forest area is 45.4 KM and right of way considered is 46 meter. It is found that each Angle Point (AP) along the route in forest area has been demarcated by User Agency by erecting a concrete pillar and duly numbered.
- The nearest protected area from the transmission line is Manash National Park which is appx. 13 Km from the nearest tower location in forest area.
- The major portion of the transmission line route in forest area will pass through forest villagers and agriculture activities like paddy/farming/fruit bearing trees etc. are prominent along the corridor.
- Joint tree enumeration has been carried out in all three (3) divisions and trees have been marked at site for identification.
- There is not any rare/endangered species of flora and fauna present in the proposed area for diversion
- There is not any protected archaeological/heritage sites located in the proposed area.
- The density of the forest area proposed to be diverted is varied from 20% to 35%.
- The User Agency has not violated any provision of the FCA and no work has been started without necessary clearance.

SPECIFIC RECOMMENDATIONS FOR ACCEPTANCE OF THE PROPOSAL

The construction of the Transmission line is a Govt. of India project having national interest. It will improve the overall power scenario without major damage of forest and environment provided mitigation measures are implemented by User Agency as per MoEF guideline. Therefore, the diversion of the forest land as above is recommended for acceptance.

Date : 30.01.2017

Place: KOKRAJHAR

Signature :

Name :

Designation : Addl PCCF & CHD (Forest), BTC, Kokrajhar

Office seal :

SITE INSPECTION REPORT OF DIVISIONAL FOREST OFFICER
(FOR THE FOREST LAND PROPOSED TO BE DIVERTED UNDER FCA)

PROJECT:- **Construction of 400 kV transmission line from Jigmelling to Alipurduar by Power Grid Corporation of India Limited.**

Forest area proposed for diversion under Chirang Forest Division : 135.588 Hectare

A proposal (REF NO:- FP/AS/TRANS/19330/2016)has been received by this office from the DeputyGenereal Manager of POWERGRID, Salakati for diversion (under FCA-1980) of 134.588 ha of forest land under Chirang Forest Division for non-forestry purpose. The proposal has been received in Chirang Division in the online mode through MoEF web portal on 07-11-2016. The project envisages the use of forest land for construction of a 400 KV transmission line from Jigmelling to Alipurduar. A joint site inspection has been carried out by the undersigned along with the representative of POWERGRID (*S. Kakati, Manager, Salakati and D. Baruah, Sr. Env. Officer, Guwahati)* on 05-01-2017 as per the guideline of FCA.

Upon inspection of the site, it is found that the proposed forest land required by the User Agency falls under Runikhata Forest Range of Chirang Forest Divisioncomprising of Manash RF (104.871 ha) and Bengtol RF (29.717 ha)altogether 134.588 hectare in total. The requirement of forest land as proposed by the User Agency is unavoidable and barest minimum required for the project.

The salient features of the proposed diversion area as found during site inspection are:-

- There is no plantation raised by this Division in the proposed area for diversion.
- The major portion of the transmission line route in forest area will pass through plain land and paddy field/agriculture land allotted to forest villagers.
- The section of the transmission line route from Loc AP-4 to AP-5 will pass through elephant corridor/habitat area in Manash RF which requires special protection measures like increase of tower height etc. as per MoEF guideline.
- There is not any rare/endangered species of flora and fauna present in the proposed area.
- There is not any protected archaeological/heritage sites located in the proposed area.
- The density of the forest area proposed to be diverted is appx. 35%.
- The User Agency has not violated any provision of the FCA and no work has been started without necessary clearance.

SPECIFIC RECOMMENDATIONS FOR ACCEPTANCE OF THE PROPOSAL

The construction of the Transmission line is a Govt. of India project having national interest. It will improve the overall power scenario without major damage of forest and environment provided mitigative measures are implemented by User Agency as per guideline. Therefore, the diversion of the forest land as above is recommended for acceptance.

Date ; 05/01/17

Place: CHIRANG

Signature :

Name : R. SAHA

Designation : DFO, CHIRANG Forest Division

Office seal : Divisional Forest Officer, Chirang Division, Kajalgaon

Annexure – D

SITE INSPECTION REPORT NOT BELOW THE RANK OF DCF

(For the Forest Land to be diverted under FCA)

A proposal has been received by this office from the **Deputy General Manager, Power Grid Corporation of India Limited** for diversion (under FCA-1980) of **70.083 ha** of forest land for non-forestry purpose. The project envisages the use of forest land for Construction of 400KV Transmission Line from Jigmelling (Bhutan) to Alipurduar, (WB, India). The site inspection of the Forest Land involved in the proposal has been done by me on **2nd, 8th & 20th September, 2016.**

On inspection of the site, it is found that the land required by the user agency falls under Chirang RF and Manas RF measuring 64.674 ha & 5.408ha respectively. The requirement of forest land as proposed by the user agency in Col.2 of part-I is unavoidable and is barest minimum required for the project.

Salient features of the proposed diversion area:

- There is no plantation raised by this division in the proposed area
- The major portion of the Transmission Line route in forest area will pass through plain land and paddy field / agricultural land allotted to Forest Villagers.
- The Forest Land proposed for diversion is falls under Chirang RF, which is a part of greater CHIRANG-RIPU ELEPHANT RESERVE. However most of the proposed Transmission Line Route is passing through Forest Villages, however the area is sometimes frequented by wild elephant.
- The Forest area to be diverted is mostly plain except a few stretches gently sloping.
- The density of the forest area to be diverted for the project is 20% to 30%

The user agency has not violated the provisions of Forests (Conservation) Act, 1980 and no work has been started without proper sanction.

Specific recommendation for acceptance or otherwise of the proposal:

The construction of transmission line is a Govt. of India Project and would benefit the public without major damage to the forest and is in the national interest. Therefore, the diversion proposal is recommended for acceptance.

Date:

Place: Kokrajhar

Signature

Name: **(Sri K. Brahma, DCF)**

Designation: Divisional Forest Officer
Haltugaon Division
Kokrajhar

Official seal:

Divisional Forest Officer
Haltugaon Division, Kokrajhar.

SITE INSPECTION REPORT NOT BELOW THE RANK OF DCF
(FOR THE FOREST LAND PROPOSED TO BE DIVERTED UNDER FCA)

PROJECT:- **Construction of 400 kV transmission line from Jigmelling to Alipurduar by Power Grid Corporation of India Limited.**

Forest area proposed for diversion under Kachugaon Forest Division : 4.136 Hectare

A proposal **(REF NO:- FP/AS/TRANS/19330/2016)** has been received by this office from the Deputy Genereal Manager of POWERGRID, Salakati for diversion (under FCA-1980) of **4.136** ha of forest land under Kachugaon Forest Division for non-forestry purpose. The proposal has been received in Kachugan Division in the online mode through MoEF web portal on 07-11-2016. The project envisages the use of forest land for construction of a 400 KV transmission line from Jigmelling to Alipurduar. A joint site inspection has been carried out by the undersigned along with the representative of POWERGRID on **23-11-2016** as per the guideline of FCA.

Upon inspection of the site, it is found that the proposed forest land required by the User Agency falls under Eastern Forest Range, Athiabari under RIPU RESERVE FOREST measuring 4.136 hectare in total. The requirement of forest land as proposed by the User Agency is unavoidable and barest minimum required for the project.

The salient features of the proposed diversion area as found during site inspection are:-

- The proposed diversion of forest land is allotted to notified forest village as per provision of Assam Forest Regulation Act, 1891, hence the area is excluded from Ripu-Chirang Elephant Reserve and Tiger Reserve.
- There is no plantation raised by this Division in the proposed area.
- The area consists of few nos. of *sisso* and other trees which will fall along the transmission line corridor. Otherwise most of the area is plain consisting of paddy field allotted to forest villagers.
- There is not any rare/endangered species of flora and fauna present in the proposed area.
- There is not any protected archaeological/heritage sites located in the proposed area.
- The density of the forest area proposed to be diverted is appx. 30%.
- The User Agency has not violated any provision of the FCA and no work has been started without necessary clearance.

SPECIFIC RECOMMENDATIONS FOR ACCEPTANCE OF THE PROPOSAL

The construction of the aforesaid Transmission line is a Govt. of India project having national interest. It will improve the overall power scenario without major damage of forest and environment. Therefore, the diversion of the forest land is recommended for acceptance.

Date ;

Place: KACHUGAON

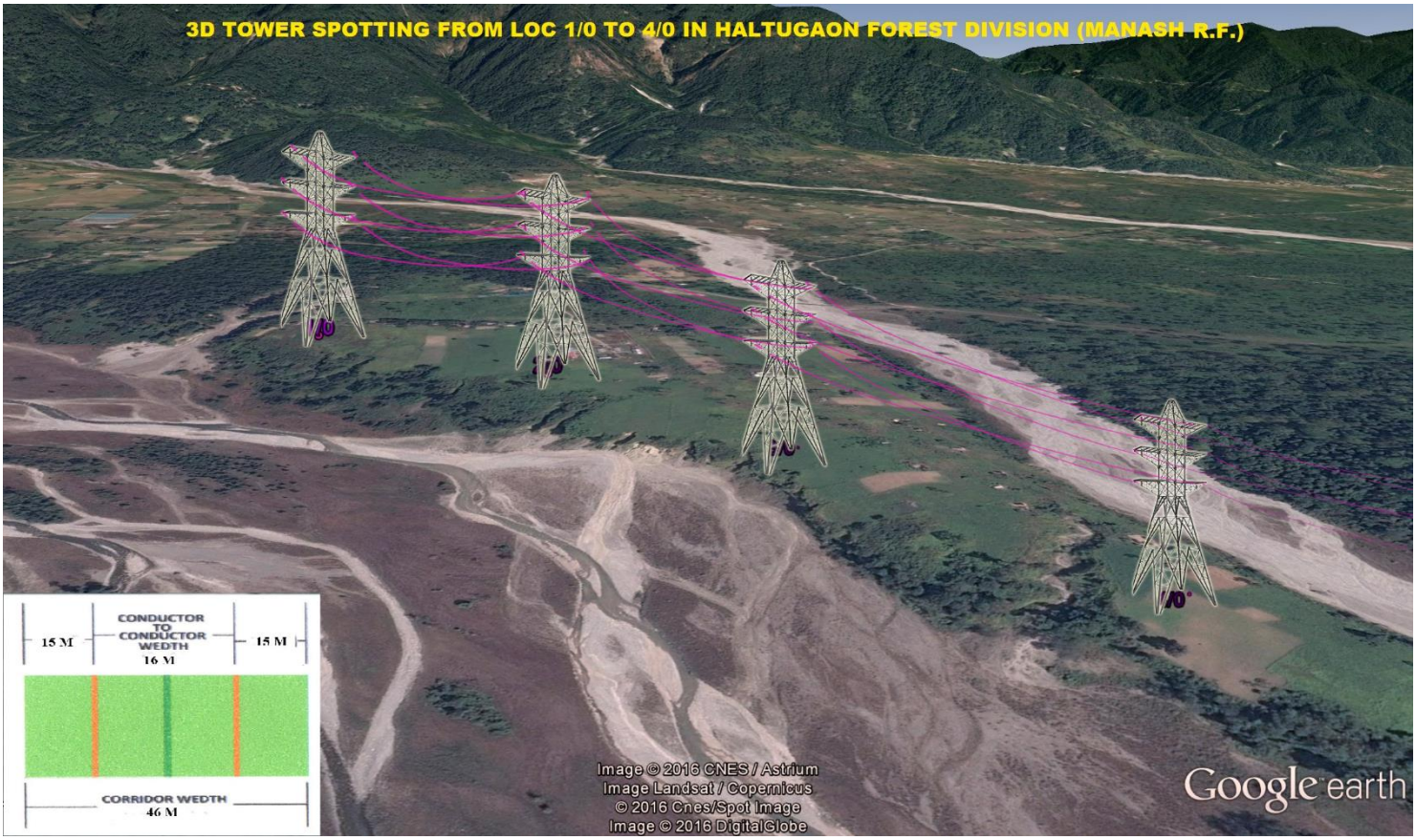
Signature :

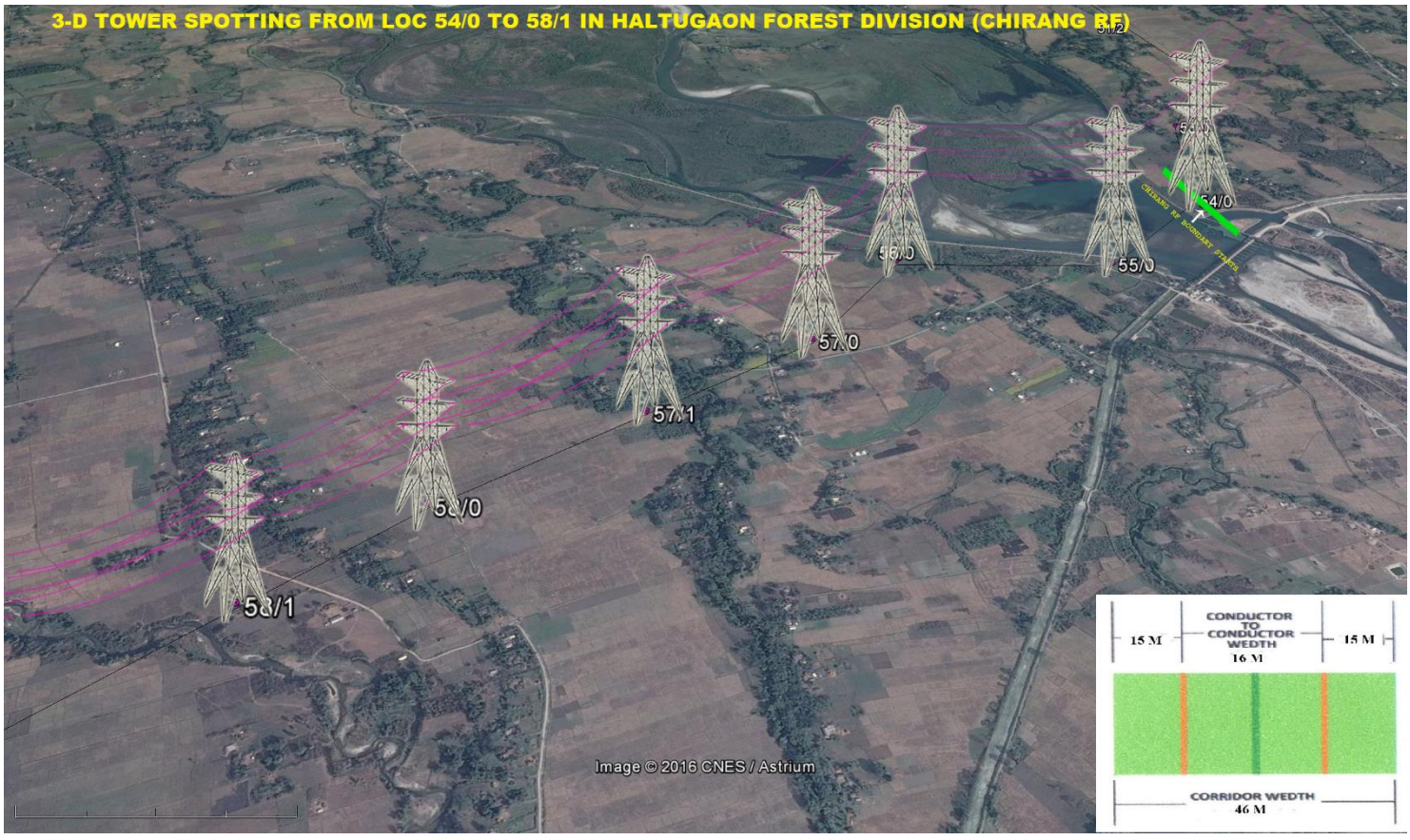
Name : **S. K. BASUMATARY**

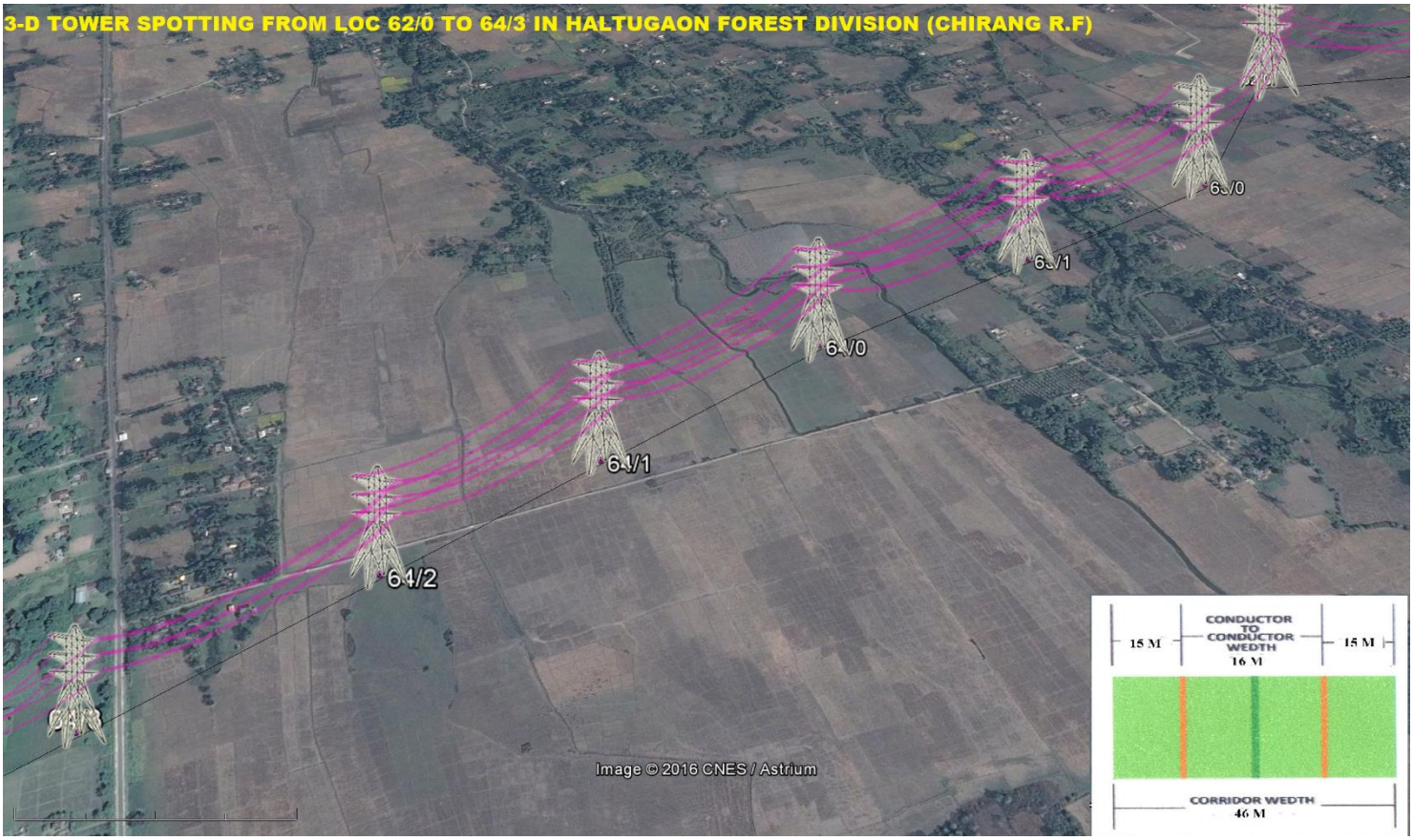
Designation : **DFO, Kachugaon Forest Division**

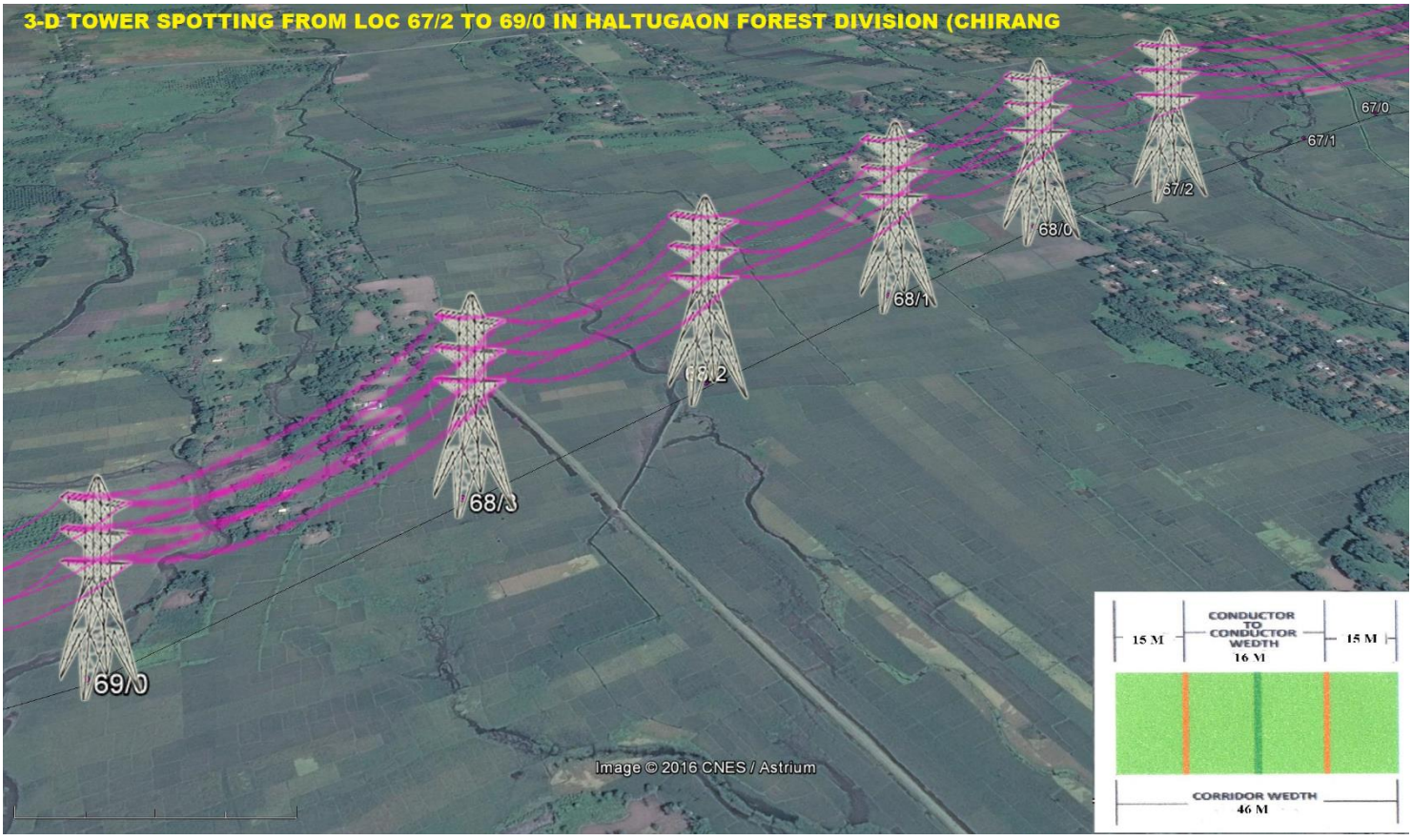
Office seal : DIVISIONSL FOREST OFFICER
KACHUGAON DIVISION, GOSSAIGAON

3 DIMENSIONAL VIEW OF SOME TOWER LOCATIONS IN PROJECT AREA






3-D TOWER SPOTTING FROM LOC 62/0 TO 64/3 IN HALTUGAON FOREST DIVISION (CHIRANG R.F)
6../0
6../1
6../0
6../1
64/2
Image © 2016 CNES / Astrium
15 M
CONDUCTOR TO CONDUCTOR WIDTH 16 M
15 M
CORRIDOR WEDTH 46 M


3-D TOWER SPOTTING FROM LOC 67/2 TO 69/0 IN HALTUGAON FOREST DIVISION (CHIRANG
67/0
67/1
67/2
68/0
68/1
68/2
68/3
69/0
Image © 2016 CNES / Astrium
15 M
CONDUCTOR TO CONDUCTOR WEDTH 16 M
15 M
CORRIDOR WEDTH 46 M

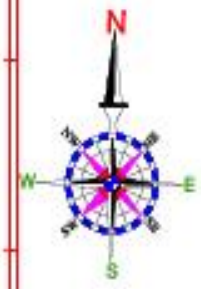
LIST OF FOREST VILLAGES/SETTLEMENTS IN THE BUFFER ZONE ALONG THE PROPOSED T/L ROUTE

S.N	Village Name	Area	Ha	Loc no	
	Chirang Forest Divison				
1	Dawaguri FV	17220.000	17.022		CHIRANG DISTRICT
2	Dolapara FV	43488.392	4.349		
3	Jiyaguri FV	59026.340	5.903		
4	Deba Damgi FV	76074.556	7.607		
5	Panbari FV	31850.223	3.185		
6	Mainaopur FV	170860.909	17.086		
7	Bromopara FV	16258.180	1.626		
8	Baitian FV	64764.060	6.476		
9	Samodwysha FV	63645.570	6.365		
10	Nakedara FV	45332.630	4.533		
11	Santipur FV	95989.820	9.599		
12	Mojabasti FV	113165.803	11.317		
13	Bardangi FV	10214.105	1.021		
14	Tongsibari FV	9680.345	0.968		
15	Khagrabari FV	108170.453	10.817		
16	Tongsidangi FV	52851.837	5.285		
17	Taykhadaisha FV	35491.794	3.549		
18	Raydwngbari FV	6890.150	0.689		
19	Salbari Molandu	6473.059	0.647		
20	Salbari FV	14874.300	1.487		
21	Raidwngbri FV	57713.571	5.771		
22	Sinaguri FV	25187.693	2.519		
23	Malandugi FV	30142.583	3.014		
24	Ranipur FV	14629.404	1.463		
25	Gandibari	22884.220	2.288		
	TOTAL		134.588		
	Haltugaon Forest Divison				KOKRAJHAR DISTRICT
1	Tukra basti FV	54080.00	5.41		
2	Aminpara FV	15953.16	1.60		
3	Utter Nandurbari FV	12756.45	1.28		
4	Thairguri FV	64548.41	6.45		
5	Basbari FV	32862.26	3.29		
6	Amlaguri FV	39528.28	3.95		
7	Deka Damra FV	127207.90	12.72		
8	Bashbari FV	79564.40	7.96		
9	East Maligaon FV	133575.10	13.36		
10	West Maligaon FV	24559.41	2.46		
11	Ouguri FV	35443.20	3.54		
12	Kashiguri FV	48254.19	4.83		
13	Guabari FV	32502.00	3.25		
	TOTAL		70.083		
	KACHUGAON FOREST DIVISION				
1	Sapkata	41360	4.136		

For & On Behalf of POWERGRID

बी. पॉल चौधुरी / B. Paul Choudhury
उप महा प्रबन्धक / Dy. General Manager
पावरग्रिड, उ.पू.क्षे. / POWERGRID, NER
उप केन्द्र बंगाइगांव-सालाकाटी/Bongaigaon-Salakati S/S

ROUTE ALIGNMENT OF 400 KV (QUAD) JIGMELLING-ALIPURDUAR T/L SHOWING FOREST AREA (BUFFER ZONE OF MTR) PROPOSED TO BE DIVERTED)



For & On Behalf of POWERGRID

बी. पॉल चौधुरी / B. Paul Choudhury
उप महा प्रबन्धक / Dy General Manager
पावरग्रिड, उ.पू.क्षे. / POWERGRID, NER
उप केन्द्र बंगाइगाँव-सालाकाटी/Bongaigaon-Salakati S/S

TOWER DETAILS OF PROPOSED TRANSMISSION LINE PROJECT			
Tower location	**Latitude**	**Longitude**	**Remarks**
1/0	26°53'39.27"N	90°25'48.87"E	**MANAS RF**
2/0	26°53'26.89"N	90°25'54.19"E	
3/0	26°53'14.69"N	90°25'56.53"E	
4/0	26°53'2.16"N	90°25'57.28"E	
4/1	26°52'54.89"N	90°26'8.39"E	**MANAS RF (PT-II)**
4/2	26°52'49.17"N	90°26'17.17"E	
4/3	26°52'42.66"N	90°26'27.14"E	
4/4	26°52'36.18"N	90°26'37.10"E	
4/5	26°52'29.67"N	90°26'47.06"E	
4/6	26°52'22.81"N	90°26'57.61"E	
5//0	26°52'16.62"N	90°27'7.13"E	
6/0	26°52'05.60"N	90°27'15.50"E	
6/1	26°51'53.78"N	90°27'14.17"E	
6/2	26°51'44.08"N	90°27'13.08"E	
6/3	26°51'32.78"N	90°27'11.81"E	
6/4	26°51'23.08"N	90°27'10.72"E	
8/0	26°51'14.17"N	90°27'9.73"E	
9/0	26°51'03.67"N	90°27'16.74"E	
10/0	26°50'58.47"N	90°27'29.46"E	
11/0	26°50'45.62"N	90°27'32.06"E	
11/1	26°50'34.06"N	90°27'30.11"E	
12/0	26°50'21.74"N	90°27'28.07"E	
12/1	26°50'15.71"N	90°27'35.88"E	
13/0	26°50'09.31"N	90°27'43.12"E	
14/0	26°49'57.43"N	90°27'43.82"E	
14/1	26°49'45.30"N	90°27'48.29"E	
15/0	26°49'33.62"N	90°27'52.61"E	
15/1	26°49'22.14"N	90°27'50.18"E	
15/2	26°49'10.63"N	90°27'47.76"E	
15/3	26°48'59.31"N	90°27'45.37"E	
15/4	26°48'48.13"N	90°27'43.01"E	
15/5	26°48'37.43"N	90°27'40.75"E	
15/6	26°48'25.96"N	90°27'38.33"E	
15/7	26°48'14.48"N	90°27'35.91"E	
15/8	26°48'2.57"N	90°27'33.38"E	
15/9	26°47'50.67"N	90°27'30.90"E	
15/10	26°47'39.36"N	90°27'28.51"E	
15/11	26°47'27.88"N	90°27'26.08"E	
16/0	26°47'17.02"N	90°27'23.79"E	
16/1	26°47'05.50"N	90°27'18.80"E	
17/0	26°46'54.07"N	90°27'13.85"E	

17/1	26°46'53.01"N	90°27'9.02"E	
18/0	26°46'49.58"N	90°26'53.50"E	
19/0	26°46'37.84"N	90°26'47.68"E	
19/1	26°46'26.16"N	90°26'48.01"E	
19/2	26°46'14.47"N	90°26'48.31"E	
19/3	26°46'2.78"N	90°26'48.64"E	
19/4	26°45'50.44"N	90°26'49.03"E	
20/0	26°45'37.49"N	90°26'49.39"E	
20/1	26°45'28.58"N	90°26'39.82"E	
20/2	26°45'19.83"N	90°26'30.43"E	
21/0	26°45'11.02"N	90°26'20.96"E	
21/1	26°45'00.02"N	90°26'14.73"E	
21/2	26°44'50.90"N	90°26'09.55"E	
21/3	26°44'41.77"N	90°26'04.40"E	
21/4	26°44'33.08"N	90°25'59.45"E	
21/5	26°44'23.16"N	90°25'53.81"E	
22/0	26°44'13.12"N	90°25'48.14"E	
23/0	26°44'04.15"N	90°25'37.02"E	
23/1	26°43'51.82"N	90°25'37.62"E	
23/2	26°43'40.13"N	90°25'38.25"E	
24/0	26°43'31.39"N	90°25'39.93"E	
25/0	26°43'23.34"N	90°25'48.97"E	
26/0	26°43'19.80"N	90°25'56.50"E	
26/1	26°43'08.68"N	90°26'4.53"E	
27/0	26°42'58.38"N	90°26'12.03"E	
27/1	26°42'47.90"N	90°26'7.24"E	
27/2	26°42'36.47"N	90°26'02.00"E	
27/3	26°42'25.89"N	90°25'57.17"E	**BENGTOL R.F**
28/0	26°42'14.13"N	90°25'51.79"E	
29/0	26°42'8.52"N	90°25'39.95"E	
29/1	26°41'57.93"N	90°25'38.12"E	
29/2	26°41'48.42"N	90°25'36.53"E	
29/3	26°41'38.15"N	90°25'34.77"E	
30/0	26°41'26.91"N	90°25'32.85"E	
31/0	26°41'16.63"N	90°25'42.74"E	
31A/0	26°41'10.70"N	90°25'45.04"E	
32/0	26°41'3.58"N	90°25'43.00"E	
33/0	26°40'52.23"N	90°25'49.36"E	
33/1	26°40'44.05"N	90°25'59.17"E	
34/0	26°40'36.11"N	90°26'08.75"E	
34/1	26°40'23.45"N	90°26'7.69"E	
35/0	26°40'11.38"N	90°26'06.7"E	
36/0	26°40'05.39"N	90°25'55.04"E	
37/0	26°40'01.20"N	90°25'41.07"E	
38/0	26°40'00.92"N	90°25'27.16"E	
38/1	26°39'56.20"N	90°25'17.47"E	
38/2	26°39'51.47"N	90°25'07.77"E	**REVENUE LAND**
39/0	26°39'46.78"N	90°24'58.12"E	
40/0	26°39'48.83"N	90°24'43.97"E	
41/0	26°39'45.66"N	90°24'30.52"E	
42/0	26°39'35.01"N	90°24'23.57"E	
42/1	26°39'22.10"N	90°24'22.81"E	

43/0	26°39'09.12"N	90°24'22.05"E	
43/1	26°39'0.84"N	90°24'18.73"E	
43/2	26°38'51.68"N	90°24'15.07"E	
44/0	26°38'40.95"N	90°24'10.80"E	
45/0	26°38'35.49"N	90°24'14.18"E	
45/1	26°38'25.58"N	90°24'8.72"E	
46/0	26°38'16.39"N	90°24'03.73"E	
46/1	26°38'6.88"N	90°24'09.69"E	
46/2	26°37'57.38"N	90°24'15.65"E	
46/3	26°37'46.62"N	90°24'22.40"E	
47/0	26°37'34.99"N	90°24'29.71"E	
47/1	26°37'24.46"N	90°24'24.02"E	
47/2	26°37'13.37"N	90°24'17.98"E	
48/0	26°37'00.35"N	90°24'10.94"E	
48/1	26°36'55.47"N	90°23'58.29"E	
48/2	26°36'51.24"N	90°23'47.37"E	
48/3	26°36'47.25"N	90°23'37.05"E	
48/4	26°36'43.36"N	90°23'26.95"E	
49/0	26°36'39.03"N	90°23'15.70"E	
50/0	26°36'40.86"N	90°23'07.13"E	
50/1	26°36'36.61"N	90°22'55.37"E	
50/2	26°36'32.68"N	90°22'44.51"E	
51/0	26°36'29.63"N	90°22'36.09"E	
51/1	26°36'16.49"N	90°22'31.91"E	
51/2	26°36'04.63"N	90°22'28.09"E	
52/0	26°35'53.03"N	90°22'24.42"E	
53/0	26°35'45.89"N	90°22'12.48"E	
54/0	26°35'36.10"N	90°22'02.73"E	**CHIRANG R.F**
55/0	26°35'32.47"N	90°21'49.37"E	
56/0	26°35'40.01"N	90°21'35.47"E	
57/0	26°35'34.99"N	90°21'23.91"E	
57/1	26°35'33.76"N	90°21'10.25"E	
58/0	26°35'32.44"N	90°20'55.14"E	
58/1	26°35'30.28"N	90°20'43.84"E	
59/0	26°35'27.36"N	90°20'28.55"E	
59/1	26°35'22.03"N	90°20'19.90"E	
60/0	26°35'15.60"N	90°20'09.46"E	
60/1	26°35'14.87"N	90°19'56.22"E	
60/2	26°35'14.15"N	90°19'42.50"E	
61/0	26°35'14.56"N	90°19'29.63"E	
61/1	26°35'17.42"N	90°19'17.28"E	
61/2	26°35'21.59"N	90°19'4.50"E	
62/0	26°35'25.80"N	90°18'51.61"E	
63/0	26°35'19.58"N	90°18'40.42"E	
63/1	26°35'18.66"N	90°18'27.68"E	
64/0	26°35'17.77"N	90°18'14.99"E	
64/1	26°35'15.85"N	90°18'3.25"E	
64/2	26°35'14.28"N	90°17'53.64"E	
64/3	26°35'12.55"N	90°17'42.99"E	
65/0	26°35'10.81"N	90°17'32.16"E	
65/1	26°35'9.16"N	90°17'18.54"E	
65/2	26°35'7.53"N	90°17'4.96"E	

66/0	26°35'5.99"N	90°16'51.95"E	
66/1	26°35'8.95"N	90°16'37.28"E	
67/0	26°35'11.72"N	90°16'23.81"E	
67/1	26°35'11.35"N	90°16'16.60"E	
67/2	26°35'10.75"N	90°16'03.79"E	
68/0	26°35'10.34"N	90°15'54.58"E	
68/1	26°35'8.48"N	90°15'43.93"E	
68/2	26°35'6.62"N	90°15'33.28"E	
68/3	26°35'4.69"N	90°15'22.31"E	
69/0	26°35'2.57"N	90°15'10.01"E	
69/1	26°35'3.70"N	90°14'56.43"E	
70/0	26°35'5.03"N	90°14'41.22"E	
71/0	26°34'57.18"N	90°14'29.85"E	
71/1	26°34'54.91"N	90°14'14.88"E	
72/0	26°34'52.86"N	90°14'1.31"E	
72/1	26°34'48.26"N	90°13'48.74"E	**REVENUE LAND**
72/2	26°34'43.66"N	90°13'36.20"E	
72/3	26°34'39.20"N	90°13'23.92"E	
73/0	26°34'34.60"N	90°13'11.32"E	
73/1	26°34'35.07"N	90°12'56.86"E	
73/2	26°34'35.61"N	90°12'41.34"E	**RIPU R.F.**
74/0	26°34'36.13"N	90°12'26.49"E	
74/1	26°34'39.62"N	90°12'14.08"E	
74/2	26°34'43.32"N	90°12'00.99"E	**REVENUE LAND**
75/0	26°34'46.21"N	90°11'50.80"E	
75/1	26°34'44.66"N	90°11'35.05"E	
75/2	26°34'43.32"N	90°11'21.43"E	
76/0	26°34'42.10"N	90°11'07.66"E	
77/0	26°34'39.74"N	90°10'53.16"E	
77/1	26°34'44.38"N	90°10'38.20"E	
77/2	26°34'48.38"N	90°10'25.20"E	
77/3	26°34'52.41"N	90°10'12.24"E	
78/0	26°34'56.44"N	90°09'59.32"E	
78/1	26°34'52.89"N	90°09'49.18"E	
78/2	26°34'48.79"N	90°09'37.33"E	
78/3	26°34'45.21"N	90°09'27.01"E	
78/4	26°34'41.76"N	90°09'17.13"E	
79/0	26°34'38.11"N	90°09'06.63"E	
79/1	26°34'29.44"N	90°08'57.13"E	
80/0	26°34'19.81"N	90°08'46.57"E	
80/1	26°34'09.57"N	90°08'41.37"E	
80/2	26°33'59.34"N	90°08'36.21"E	
81/0	26°33'49.06"N	90°08'31.01"E	
82/0	26°33'37.03"N	90°08'28.31"E	
82/1	26°33'30.94"N	90°08'21.34"E	
82/2	26°33'24.86"N	90°08'14.42"E	
83/0	26°33'15.95"N	90°08'04.24"E	
84/0	26°33'03.47"N	90°08'00.50"E	
85/0	26°32'56.94"N	90°08'05.43"E	
86/0	26°32'46.46"N	90° 8'9.38"E	
86/1	26°32'35.81"N	90°08'02.96"E	
86/2	26°32'24.45"N	90°07'56.74"E	

87/0	26°32'12.90"N	90°07'50.50"E	
87/1	26°32'08.53"N	90°07'37.28"E	
88/0	26°32'04.20"N	90°07'24.10"E	
88/1	26°31'55.74"N	90°07'13.44"E	
88/2	26°31'47.37"N	90° 07'02.82"E	
88/3	26°31'39.37"N	90°06'52.65"E	
88/4	26°31'31.37"N	90°06'42.49"E	
89/0	26°31'23.30"N	90°06'32.30"E	
89/1	26°31'24.58"N	90°06'21.57"E	
89/2	26°31'25.85"N	90°06'10.75"E	
90/0	26°31'27.40"N	90°05'55.90"E	
90/1	26°31'24.14"N	90°05'42.41"E	
90/2	26°31'20.86"N	90°05'29.89"E	
91/0	26°31'17.45"N	90°05'16.87"E	
91/1	26°31'19.43"N	90°05'7.36"E	
91/2	26°31'22.24"N	90°04'54.01"E	
91/3	26°31'25.02"N	90°04'40.65"E	
91/4	26°31'27.83"N	90°04'27.29"E	
92/0	26°31'30.7"N	90°04'14.0"E	
92/1	26°31'29.25"N	90°04'01.80"E	
92/2	26°31'27.87"N	90°03'49.63"E	
93/0	26°31'26.50"N	90°03'37.60E"	
93/1	26°31'23.83"N	90°03'25.47"E	
93/2	26°31'21.11"N	90°03'13.19"E	
95/0	26°31'18.8"N	90°03'02.50"E	
95/1	26°31'8.79"N	90°02'55.60"E	
95/2	26°30'58.81"N	90°02'48.67"E	
96/0	26°30'49.10"N	90°02'42.10"E	
96/1	26°30'41.35"N	90°02'32.37"E	
96/2	26°30'34.49"N	90°02'24.02"E	
96/3	26°30'26.76"N	90°02'14.69"E	
97/0	26°30'18.60"N	90°02'04.70"E	
97A/0	26°30'17.80"N	90°01'51.70"E	
97B/0	26°30'22.00"N	90°01'45.60"E	
97C/0	26°30'29.10"N	90°01'34.70"E	
98/0	26°30'28.90"N	90°01'34.60"E	
99/0	26°30'25.10"N	90°01'12.10"E	
99/1	26°30'16.55"N	90°01'02.51"E	
99/2	26°30'08.30"N	90°00'53.08"E	
99/3	26°30'00.18"N	90°00'43.80"E	
101/0	26°29'51.90"N	90°00'34.10"E	
101/1	26°29'52.28"N	90°00'21.66"E	
101/2	26°29'52.51"N	90°00'08.01"E	
101/3	26°29'52.74"N	89°59'54.85"E	
101/4	26°29'53.00"N	89°59'41.14"E	
102/0	26°29'53.09"N	89°59'27.28"E	
103/0	26°29'43.54"N	89°59'18.01"E	
103/1	26°29'37.72"N	89°59'06.74"E	
103/2	26°29'31.61"N	89°58'54.85"E	
103/3	26°29'25.80"N	89°58'43.55"E	
103/4	26°29'20.50"N	89°58'33.24"E	
103/5	26°29'15.16"N	89°58'22.88"E	

103/6	26°29'09.70"N	89°58'12.24"E	
103/7	26°29'04.52"N	89°58'02.22"E	
103/8	26°28'59.37"N	89°57'52.20"E	
104/0	26°28'54.26"N	89°57'42.25"E	
104/1	26°28'55.40"N	89°57'29.32"E	
104/2	26°28'56.50"N	89°57'16.75"E	
104/3	26°28'57.65"N	89°57'03.83"E	
105/0	26°28'58.79"N	89°56'51.08"E	
106/0	26°29'00.94"N	89°56'38.39"E	
107/0	26°28'52.09"N	89°56'28.06"E	
108/0	26°28'41.19"N	89°56'24.07"E	
108/1	26°28'34.79"N	89°56'13.19"E	
108/2	26°28'29.08"N	89°56'03.55"E	
108/3	26°28'22.33"N	89°55'52.08"E	
108/4	26°28'16.15"N	89°55'41.57"E	
109/0	26°28'10.09"N	89°55'31.31"E	
110/0	26°28'01.84"N	89°55'23.30"E	
110/1	26°28'00.61"N	89°55'10.93"E	
111/0	26°27'59.39"N	89°54'58.92"E	
111A/0	26°27'50.37"N	89°54'53.57"E	
112/0	26°27'42.61"N	89°54'43.81"E	
113/0	26°27'35.88"N	89°54'43.89"E	
114/0	26°27'27.57"N	89°54'34.12"E	
115/0	26°27'21.11"N	89°54'21.62"E	
116/0	26°27'11.91"N	89°54'15.50"E	
117/0	26°26'59.64"N	89°54'16.57"E	
GE 1	26°26'55.90"N	89°54'16.65"E	
GE 2	26°26'54.28"N	89°54'16.72"E	
118/0	26°26'52.98"N	89°54'16.76"E	
118/1	26°26'44.37"N	89°54'18.67"E	
118/2	26°26'35.78"N	89°54'20.62"E	
119/0	26°26'24.69"N	89°54'23.16"E	
120/0	26°26'20.48"N	89°54'30.59"E	
120/1	26°26'14.76"N	89°54'41.63"E	
121/0	26°26'8.61"N	89°54'53.64"E	
122/0	26°26'0.95"N	89°54'54.85"E	
123/0	26°25'53.34"N	89°54'45.97"E	
124/0	26°25'42.68"N	89°54'46.28"E	
125/0	26°25'34.87"N	89°54'47.02"E	
126/0	26°25'23.89"N	89°54'41.98"E	
GE 3	26°25'21.17"N	89°54'43.35"E	
GE 4	26°25'19.43"N	89°54'44.25"E	
127/0	26°25'17.26"N	89°54'45.38"E	
128/0	26°25'10.29"N	89°54'47.91"E	
129/0	26°24'59.65"N	89°54'41.23"E	
129/1	26°24'58.91"N	89°54'29.7"E	
129/2	26°24'58.08"N	89°54'16.40"E	
129/3	26°24'57.29"N	89°54'03.80"E	
130/0	26°24'56.60"N	89°53'52.99"E	
130/1	26°24'48.22"N	89°53'43.44"E	
131/0	26°24'39.80"N	89°53'33.85"E	
131/1	26°24'28.22"N	89°53'30.32"E	

131/2	26°24'15.38"N	89°53'26.43"E	
131/3	26°24'04.43"N	89°53'23.12"E	
131/4	26°23'52.69"N	89°53'19.51"E	
131/5	26°23'43.13"N	89°53'16.64"E	
131/6	26°23'34.02"N	89°53'13.89"E	
132/0	26°23'22.78"N	89°53'10.47"E	
133/0	26°23'15.70"N	89°52'59.26"E	
134/0	26°23'19.53"N	89°52'47.85"E	
135/0	26°23'21.96"N	89°52'41.60"E	
135/1	26°23'23.23"N	89°52'27.96"E	
135/2	26°23'24.36"N	89°52'15.51"E	
135/3	26°23'25.52"N	89°52'02.59"E	
136/0	26°23'26.59"N	89°51'50.47"E	
136/1	26°23'19.46"N	89°51'39.76"E	
137/0	26°23'12.28"N	89°51'29.02"E	
138/0	26°23'14.10"N	89°51'20.91"E	

For & On Behalf of POWERGRID

बी. पॉल चौधुरी / B. Paul Choudhury
उप महा प्रबन्धक / Dy General Manager
पावरग्रिड, उ.पू.क्षे. / POWERGRID, NER
उप केन्द्र बंगाइगाँव-सालाकाटी/Bongaigaon-Salakati S/S

FLORA AND FAUNA OF MANAS TIGER RESERVE

Biomes

There are two major biomes present in Manas:

- **The grassland biomes** : habitat of pygmy hog, Indian rhinoceros (re-introduced in 2007 after extinction due to heavy poaching during the Bodo uprising), bengal florican, wild Asian buffalo, etc.
- **The forest biomes** : habitat of slow loris, capped langur, wild pig, sambar, great hornbill, Malayan giant squirrel or black giant squirrel, etc.

Flora

Vegetation: The monsoon forests of Manas lie in the Brahmaputra Valley semi-evergreen forests eco-region. The combination of Sub-Himalayan Bhabar Terai formation with riverine succession leading up to the Himalayan subtropical broadleaf forests makes it one of the richest biodiversity areas in the world.

The main vegetation types are:

- Sub-Himalayan Light Alluvial Semi-Evergreen forests in the northern parts.
- East Himalayan mixed Moist and Dry Deciduous forests (the most common type).
- Low Alluvial Savanna Woodland, and
- Assam Valley Semi-Evergreen Alluvial Grasslands which cover almost 50% of the park.

Much of the riverine dry deciduous forest is at an early successional stage. It is replaced by moist deciduous forest away from water courses, which is succeeded by semi-evergreen climax forest in the northern part of the park. A total of 543 plants species have been recorded from the core zone. Of these, 374 species are dicotyledons (including 89 trees), 139 species monocotyledons and 30 are Pteridophytes and Gymnosperms.

The park's common trees include *Aphanamixis polystachya*, *Anthocephalus chinensis*, *Syzygium cumini*, *Syzygium formosum*, *Syzygium oblatum*, *Bauhinia purpurea*, *Mallotus philippensis*, *Cinnamomum tamala*, *Actinodaphne obvata*, *Bombax ceiba*, *Sterculia villosa*, *Dillenia indica*, *Dillenia pentagyna*, *Careya arborea*, *Lagerstroemia parviflora*, *Lagerstroemia speciosa*, *Terminalia bellirica*, *Terminalia chebula*, *Trewia polycarpa*, *Gmelina arborea*, *Oroxylum indicum* and *Bridelia* spp. The grasslands are dominated by *Imperata cylindrica*, *Saccharum naranga*, *Phragmites karka*, *Arundo donax*, *Dillenia pentagyna*, *Phyllanthus emblica*, *Bombax ceiba*, and species of *Clerodendrum*, *Leea*, *Grewia*, *Premna* and *Mussaenda*.

Fauna

The sanctuary has recorded 55 species of mammals, 380 species of birds, 50 of reptiles, and 3 species of amphibians. Out of these wildlife, 21 mammals are India's Schedule I mammals and 31 of them are threatened.

The fauna of the sanctuary include *Indian elephants, Indian rhinoceros, gaurs, Asian water buffaloes, barasingha, Indian tigers, Indian leopards, clouded leopards, Asian golden cats, dholes, capped langurs, golden langurs, Assamese macaques, slow-loris, hoolock gibbons, smooth-coated otters, sloth bears, barking deers, hog deers, black panthers, sambar deers and chitals.*

The park is well known for species of rare and endangered wildlife that are not found anywhere else in the world like the Assam roofed turtle, hispid hare, golden langur and pygmy hog.

The Manas hosts more than 450 species of birds.[6] It has the largest population of the endangered Bengal florican to be found anywhere. Other major bird species include *great hornbills, jungle fowls, bulbuls, brahminy ducks, kalij pheasants, egrets, pelicans, fishing eagles, crested serpent-eagles, falcons, scarlet minivets, bee-eaters, magpie robins, pied hornbill, grey hornbills, mergansers, harriers, Indian Peafowl, ospreys and herons.*

A SHORT NOTE ON CONSERVATION VALUE OF PROTECTED AREA

Wildlife Proposal details	Diversion of 208.087 ha of PA **(inside buffer zone of Manas Tiger Reserve)** for construction of 400 KV (Quad) Jigmelling -Alipurduar T/L
Project Proponent:	Power Grid Corporation of India Ltd (A Govt. of India Enterprise)
Details of PA involved	"MANAS TIGER RESERVE" (Buffer Zone)
Protected area under Haltugaon Forest Division	**70.083 ha** (Manas RF 5.408 ha and Chirang RF 64.674 ha)

As per the Notification of Manas Tiger Reserve (notified by GoA on 30th May, 2008) the boundary of the Manas Tiger Reserve is defined as below.

Core area:- **526.22 sq km** (MNP 500 sq km + Barnadi Wildlife Sanctuary 26.22 sq km)

Buffer area:- (Reserved forest of Kachugaon, Haltugaon, Chirang and Dhansiri Territorial division along the Indo-Bhutan boundary) = **2310.88 sq km**

Total area:- **2837.10 sq km**

The proposed project area (i.e. Transmission Line) is approximately **13** km away from the core area of Manas Tiger Reserve ***(i.e. from the boundary of Manas National Park)*** and involves 2 Reserved Forests under Haltugaon Forest Division namely MANAS and CHIRANG. Total protected area under Haltugaon Division is **70.083 ha.**

Conservation Values of core area of Manas Tiger Reserve

The combination of Sub-Himalayan Bhabar Terai formation with riverine succession leading up to Sub-Himalayan mountain forest makes **Manas** as one of the richest biodiversity areas in the world.

- A total of 543 plants species have been recorded from the core zone of the National Park. Of these, 374 species are dicotyledons (including 89 trees), 139 species monocotyledons and 30 are Pteridophytes and Gymnosperms.

- The Park supports an impressive diversity and biomass of large wildlife species. Herbivores density in the grassland ecosystems of Manas rivals that of some East African grasslands (Eisenberg & Seidensticker 1976).

- Manas contains 22 of India's Schedule I (Wildlife Protection Act, 1972) mammals and at least 33 of its animals listed as threatened, by far the greatest number for any protected area in the country. Many are typical of Southeast Asian rain forest and have their westernmost distribution there, while other species are at the easternmost point of their range.

- Manas National Park is also a part of the Chirang-Ripu Elephant Reserve, declared in the year 2003 by Government of Assam, with an area of 2600 sq. km. The Manas National Park is perhaps the largest remaining safe home for elephants in entire Himalayan foothills in Assam. The Park plays a vital role in trans-boundary movement of elephants along the northern West Bengal, Bhutan and Arunachal Pradesh.

- The park is known for its rare and endangered endemic wildlife such as the Assam Roofed Turtle, Hispid Hare, Golden Langur and Pygmy Hog.

- Manas is famous for its population of the Wild water buffalo.

- Over 450 species of birds including migrants have been recorded and about 350 breed in the area, 16 being endemic (Deb Roy, 1991) including the threatened Bengal FloricanHoubaropsis bengalensis, a rare bustard. The Bengal Floricans of the National Park were estimated at 80 individuals with 24 male territories in the Park in 1988 (Narayan et al., 1989); this is a fifth of the world population.

Habitat

Manas National Park is located in the Eastern Himalaya foothills. The Manas river is the main river, a major tributary of Brahmaputra river which flows through the west of the park, further it splits into two separate rivers, the Beki and Bholkaduba. Manas and five other small rivers flow through the National Park which lies on a wide low-lying alluvial terrace below the foothills of the outer Himalaya. The river also acts an international border dividing India and Bhutan.

The northern portion is represented by the 'Bhabar' formation, which is very porous due to the deep deposits of coarse detritus overlain by sandy loam and then a thin layer of humus. The 'Terai' tract in the south consists of fine alluvial deposits with underlying pans. Here, the water table lies very near to the surface.

There are two major biomes present in Manas, the grassland biome and the forest biome. The main vegetation types are:

- Sub-Himalayan Light Alluvial Semi-Evergreen forests in the northern parts.
- East Himalayan mixed Moist and Dry Deciduous forests (the most common type).
- Low Alluvial Savanna Woodland, and
- Assam Valley Semi-Evergreen Alluvial Grasslands which cover almost 50% of the Park.

Much of the riverine dry deciduous forest is at an early successional stage. It is replaced by moist deciduous forest away from water courses, which is succeeded by semi-evergreen climax forest in the northern part of the park.

Flora and Fauna

The Park's common trees include Aphanamixis polystachya, Anthocephalus chinensis, Syzygium cumini, S. formosum, S. oblatum, Bauhinia purpurea, Mallotus philippensis, Cinnamomum tamala, Actinodaphne obvata, Bombax ceiba, Sterculia villosa, Dillenia indica, D. pentagyna, Careya arborea, Lagerstroemia parviflora, L.speciosa, Terminalia bellirica, T. chebula, Trewia polycarpa, Gmelina arborea, Oroxylum indicum and Bridelia spp.

The Grasslands are dominated by Imperata cylindrica, Saccharum naranga, Phragmites karka, Arundo donax, Dillenia pentagyna, Phyllanthus emblica, Bombaxceiba,and species of Clerodendrum, Leea, Grewia, Premna & Mussaenda

The sanctuary has recorded 55 species of mammals, more than 450 species of birds, 50 of reptiles, and 3 species of amphibians. Out of these wildlife, 21 mammals are India's Schedule I mammals and 31 of them are threatened.

The fauna of the sanctuary include Asian Elephants, Indian Rhinoceros, Gaurs, Asian Water Buffaloes, Barasingha, Tigers, Leopards, Clouded Leopards, Asian golden cat, Capped Langurs, Golden Langurs, Assamese Macaques, Slow Loris, Hoolock Gibbons, Smooth-coated Otters, Sloth Bears,Barking Deer, Hog Deer, Sambar Deer and Chital.

The park is well known for its rare and endangered wildlife like the Assam Roofed Turtle, Hispid Hare, Golden Langur and Pygmy Hog.

Divisional Forest Officer
Hallugaon Division Kokrajhar

Manas have the largest population of endangered Bengal Florican. The major other birds includes Giant Hornbills, Jungle Fowls, Bulbuls, Brahminy Ducks, Kalij Pheasants, Egrets, Pelicans,Fishing Eagles, Serpent Eagles, Falcons, Scarlet Minivets, Bee-Eaters, Magpie Robins, Pied Hornbills, Grey Hornbills, Mergansers, Harriers, Ospreys and Herons.

Conservation value of Buffer zone of Manas Tiger Reserve

Although the core area of Manas Tiger Reserve **(i.e. the N P area)** is inviolate, there is significant biotic pressure in the buffer zone **(2310.88 sq km)** due to the presence of 125 forest villages in the western buffer, a few in the eastern buffer and also having moderate to bad encroachment along with degradation of forest cover.

Furthermore, the buffer area comprising of Reserved Forests falls within the jurisdiction of forest chief of Bodoland Territorial Council (Addl. PCCF) whereas the core area is under the control of Chief Wildlife Warden Assam.

The buffer zone is managed as a ***'multiple use area'*** with twin objectives of providing habitat supplement to the spill over population of wild animals from the core conservation unit, and to provide site specific eco-development inputs to surrounding villages for relieving the impact on the core. No relocation is visualized in the buffer area, and forestry operations, Non-Timber Forest Produce (NTFP) collection and other rights and concessions to the indigenous communities are permitted in a regulated manner to complement the initiatives in the core unit.

The floral and faunal diversity of significant portion of buffer zone of Manas Tiger Reserve is equally high as of the core area with high conservation value except the areas covered by forest villages. The main wildlife habitat is restricted to the dense forest areas mainly in northern boundary of the buffer zone connecting with BHUTAN. Significant portion of the buffer zone is plain area with human habitations comprising of forest villages. Therefore, presence of wildlife habitat in the areas surrounded by forest villages is very low since these areas are mostly covered by paddy cultivation with minimum tree cover.

The project area of **(70.083 ha)** falling in Haltugaon Forest Division also comprises of 13 forest villages and all the transmission tower locations falls in the paddy field/plain areas used by the villagers for cultivation purpose. From the **KML** file of the route and also during field verification with the User Agency, it has been found that there will be very minimum impact on the wildlife with minimum tree cutting involved in the project area. The route has been carefully selected avoiding dense forest/habitation areas and mainly along the existing paddy lands. ***Therefore, the impact on biodiversity on Manas Tiger Reserve (buffer zone) due to the proposed transmission project is assessed as very low which can be minimized through proper mitigation measures as per guidelines.***

Divisional Forest Officer
Haltugaon Division Kokrajhar

A SHORT NOTE ON CONSERVATION VALUE OF PROTECTED AREA

(w.r.t proposed diversion area in RIPU RF under Kachugaon Forest Division)

Wildlife Proposal details	Diversion of 208.087 ha of PA **(inside buffer zone of Manas Tiger Reserve)** for construction of 400 KV (Quad) Jigmelling – Alipurduar T/L
Project Proponent:	Power Grid Corporation of India Ltd (A Govt. of India Enterprise)
Details of PA involved	"MANAS TIGER RESERVE" (Buffer Zone)
Protected area under Kachugaon Forest Division	**4.136 ha** (RIPU RF)

As per the Notification of Manas Tiger Reserve (notified by GoA on 30th May, 2008) the boundary of the Manas Tiger Reserve is defined as below.

Core area:- **526.22 sq km** (MNP 500 sq km + Barnadi Wildlife Sanctuary 26.22 sq km)

Buffer area:- (Reserved forest of Kachugaon, Haltugaon, Chirang and Dhansiri Territorial division along the Indo-Bhutan boundary) = **2310.88 sq km**

Total area:- **2837.10 sq km**

The proposed project area (i.e. Transmission Line) is approximately **13** km away from the core area of Manas Tiger Reserve ***(i.e. from the boundary of Manas National Park)*** and involves 1 Reserved Forests under KACHUGAON Forest Division namely RIPU RF. Total protected area proposed for diversion under KACHUGAON Division is **4.136 ha.**

Conservation Values of core area of Manas Tiger Reserve

The combination of Sub-Himalayan Bhabar Terai formation with riverine succession leading up to Sub-Himalayan mountain forest makes **Manas** as one of the richest biodiversity areas in the world.

- A total of 543 plants species have been recorded from the core zone of the National Park. Of these, 374 species are dicotyledons (including 89 trees), 139 species monocotyledons and 30 are Pteridophytes and Gymnosperms.

- The Park supports an impressive diversity and biomass of large wildlife species. Herbivores density in the grassland ecosystems of Manas rivals that of some East African grasslands (Eisenberg & Seidensticker 1976).

- Manas contains 22 of India's Schedule I (Wildlife Protection Act, 1972) mammals and at least 33 of its animals listed as threatened, by far the greatest number for any protected area in the country. Many are typical of Southeast Asian rain forest and have their westernmost distribution there, while other species are at the easternmost point of their range.

- Manas National Park is also a part of the Chirang-Ripu Elephant Reserve, declared in the year 2003 by Government of Assam, with an area of 2600 sq. km. The Manas National Park is perhaps the largest remaining safe home for elephants in entire Himalayan foothills in Assam. The Park plays a vital role in trans-boundary movement of elephants along the northern West Bengal, Bhutan and Arunachal Pradesh.

DIVISIONSL FOREST OFFICER
KACHUGAON DIVISION, GOSSAIGAON

- The park is known for its rare and endangered endemic wildlife such as the Assam Roofed Turtle, Hispid Hare, Golden Langur and Pygmy Hog.

- Manas is famous for its population of the Wild water buffalo.

- Over 450 species of birds including migrants have been recorded and about 350 breed in the area, 16 being endemic (Deb Roy, 1991) including the threatened Bengal FloricanHoubaropsis bengalensis, a rare bustard. The Bengal Floricans of the National Park were estimated at 80 individuals with 24 male territories in the Park in 1988 (Narayan et al., 1989); this is a fifth of the world population.

Habitat

Manas National Park is located in the Eastern Himalaya foothills. The Manas river is the main river, a major tributary of Brahmaputra river which flows through the west of the park, further it splits into two separate rivers, the Beki and Bholkaduba. Manas and five other small rivers flow through the National Park which lies on a wide low-lying alluvial terrace below the foothills of the outer Himalaya. The river also acts an international border dividing India and Bhutan.

The northern portion is represented by the 'Bhabar' formation, which is very porous due to the deep deposits of coarse detritus overlain by sandy loam and then a thin layer of humus. The 'Terai' tract in the south consists of fine alluvial deposits with underlying pans. Here, the water table lies very near to the surface.

There are two major biomes present in Manas, the grassland biome and the forest biome. The main vegetation types are:

- Sub-Himalayan Light Alluvial Semi-Evergreen forests in the northern parts.
- East Himalayan mixed Moist and Dry Deciduous forests (the most common type).
- Low Alluvial Savanna Woodland, and
- Assam Valley Semi-Evergreen Alluvial Grasslands which cover almost 50% of the Park.

Much of the riverine dry deciduous forest is at an early successional stage. It is replaced by moist deciduous forest away from water courses, which is succeeded by semi-evergreen climax forest in the northern part of the park.

Flora and Fauna

The Park's common trees include Aphanamixis polystachya, Anthocephalus chinensis, Syzygium cumini, S. formosum, S. oblatum, Bauhinia purpurea, Mallotus philippensis, Cinnamomum tamala, Actinodaphne obvata, Bombax ceiba, Sterculia villosa, Dillenia indica, D. pentagyna, Careya arborea, Lagerstroemia parviflora, L.speciosa, Terminalia bellirica, T. chebula, Trewia polycarpa, Gmelina arborea, Oroxylum indicum and Bridelia spp.

The Grasslands are dominated by Imperata cylindrica, Saccharum naranga, Phragmites karka, Arundo donax, Dillenia pentagyna, Phyllanthus emblica, Bombaxceiba,and species of Clerodendrum, Leea, Grewia, Premna & Mussaenda

The sanctuary has recorded 55 species of mammals, more than 450 species of birds, 50 of reptiles, and 3 species of amphibians. Out of these wildlife, 21 mammals are India's Schedule I mammals and 31 of them are threatened.

The fauna of the sanctuary include Asian Elephants, Indian Rhinoceros, Gaurs, Asian Water Buffaloes, Barasingha, Tigers, Leopards, Clouded Leopards, Asian golden cat, Capped Langurs, Golden

DIVISIONSL FOREST OFFICER
KACHUGAON DIVISION, GOSSAIGA

Langurs, Assamese Macaques, Slow Loris, Hoolock Gibbons, Smooth-coated Otters, Sloth Bears,Barking Deer, Hog Deer, Sambar Deer and Chital.

The park is well known for its rare and endangered wildlife like the Assam Roofed Turtle, Hispid Hare, Golden Langur and Pygmy Hog.

Manas have the largest population of endangered Bengal Florican. The major other birds includes Giant Hornbills, Jungle Fowls, Bulbuls, Brahminy Ducks, Kalij Pheasants, Egrets, Pelicans,Fishing Eagles, Serpent Eagles, Falcons, Scarlet Minivets, Bee-Eaters, Magpie Robins, Pied Hornbills, Grey Hornbills, Mergansers, Harriers, Ospreys and Herons.

Conservation value of Buffer zone of Manas Tiger Reserve w.r.t of proposed diversion area (4.136 ha in Kachugaon Forest Division)

Although the core area of Manas Tiger Reserve **(i.e. the N P area)** is inviolate, there is significant biotic pressure in the buffer zone **(2310.88 sq km)** due to the presence of 125 forest villages in the western buffer, a few in the eastern buffer and also having moderate to bad encroachment along with degradation of forest cover.

Furthermore, the buffer area comprising of Reserved Forests falls within the jurisdiction of forest chief of Bodoland Territorial Council (Addl. PCCF) whereas the core area is under the control of Chief Wildlife Warden Assam.

The buffer zone is managed as a ***'multiple use area'*** with twin objectives of providing habitat supplement to the spill over population of wild animals from the core conservation unit, and to provide site specific eco-development inputs to surrounding villages for relieving the impact on the core. No relocation is visualized in the buffer area, and forestry operations, Non-Timber Forest Produce (NTFP) collection and other rights and concessions to the indigenous communities are permitted in a regulated manner to complement the initiatives in the core unit.

The floral and faunal diversity of significant portion of buffer zone of Manas Tiger Reserve is equally high as of the core area with high conservation value except the areas covered by forest villages. The main wildlife habitat is restricted to the dense forest areas mainly in northern boundary of the buffer zone connecting with BHUTAN. Significant portion of the buffer zone is plain area with human habitations comprising of forest villages. Therefore, presence of wildlife habitat in the areas surrounded by forest villages is very low since these areas are mostly covered by paddy cultivation with minimum tree cover.

The project area of **(4.136 ha)** falling in Kachugaon Forest Division also comprises of **one (1)** forest village namely SAPKATA FV and all the transmission tower locations (4 nos) fall in the paddy field/plain areas used by the villagers for cultivation purpose. During field verification with the User Agency, it has been found that there will be very minimum impact on the wildlife with minimum tree cutting involved in the project area. There is neither any elephant habitat nor tiger habitat in the proposed project site. The transmission line route has been carefully selected avoiding dense forest/habitation areas and mainly along the existing paddy lands.

Therefore, the impact on biodiversity on Manas Tiger Reserve (buffer zone) as well as the proposed project area under Kachugaon Forest Division due to the proposed transmission project is assessed as very low which can be minimized through proper mitigation measures as per guidelines.

DIVISIONAL FOREST OFFICER,
KACHUGAON DIVISION, GOSAIGAON

A SHORT NOTE ON CONSERVATION VALUE OF PROTECTED AREA
(w.r.t. proposed diversion area in CHIRANG Division)

Wildlife Proposal details (Ref FP/AS/TRANS/19330/2016)	Diversion of 208.087 ha of PA **(inside buffer zone of Manas Tiger Reserve)** for construction of 400 KV (Quad) Jigmelling –Alipurduar T/L
Project Proponent:	Power Grid Corporation of India Ltd (A Govt. of India Enterprise)
Details of PA involved	"MANAS TIGER RESERVE" (Buffer Zone)
Protected area under Forest Division Chirang	**134.588 ha** (Manas RF-pt-II104.871 ha and Bengtol RF 29.717 ha)

As per the Notification of Manas Tiger Reserve (notified by GoA on 30th May, 2008) the boundary of the Manas Tiger Reserve is defined as below.

Core area:- **526.22 sq km** (MNP 500 sq km + Barnadi Wildlife Sanctuary 26.22 sq km)

Buffer area:- (Reserved forest of Kachugaon, Haltugaon, Chirang and Dhansiri Territorial division along the Indo-Bhutan boundary) = **2310.88 sq km**

Total area:- **2837.10 sq km**

The proposed project area (i.e. Transmission Line) is approximately **13** km away from the core area of Manas Tiger Reserve ***(i.e. from the boundary of Manas National Park)*** and involves 2 Reserved Forests under CHIRANG Forest Division namely ***MANAS RF-pt-II***and ***BENGTOL RF***. Total protected area proposed for diversion under CHIRANG Division is **134.588 ha**.

Conservation Values of core area of Manas Tiger Reserve

The combination of Sub-Himalayan BhabarTerai formation with riverine succession leading up to Sub-Himalayan mountain forest makes **Manas** as one of the richest biodiversity areas in the world.

- A total of 543 plants species have been recorded from the core zone of the National Park. Of these, 374 species are dicotyledons (including 89 trees), 139 species monocotyledons and 30 are Pteridophytes and Gymnosperms.

- The Park supports an impressive diversity and biomass of large wildlife species. Herbivores density in the grassland ecosystems of Manas rivals that of some East African grasslands (Eisenberg &Seidensticker 1976).

- Manas contains 22 of India's Schedule I (Wildlife Protection Act, 1972) mammals and at least 33 of its animals listed as threatened, by far the greatest number for any protected area in the country. Many are typical of Southeast Asian rain forest and have their westernmost distribution there, while other species are at the easternmost point of their range.

- Manas National Park is also a part of the Chirang-Ripu Elephant Reserve, declared in the year 2003 by Government of Assam, with an area of 2600 sq. km. The Manas National Park is perhaps the largest remaining safe home for elephants in entire Himalayan foothills in Assam. The Park plays a vital role in trans-boundary movement of elephants along the northern West Bengal, Bhutan and Arunachal Pradesh.

Divisional Forest Officer
Chirang Division
Kajalgaon

Turtle, Hispid Hare, Golden Langur and Pygmy Hog.

- Manas is famous for its population of the Wild water buffalo.

- Over 450 species of birds including migrants have been recorded and about 350 breed in the area, 16 being endemic (Deb Roy, 1991) including the threatened Bengal FlorianHoubaropsisbengalensis, a rare bustard. The Bengal Floricans of the National Park were estimated at 80 individuals with 24 male territories in the Park in 1988 (Narayan et al., 1989); this is a fifth of the world population.

Habitat

Manas National Park is located in the Eastern Himalaya foothills. The Manas river is the main river, a major tributary of Brahmaputra river which flows through the west of the park, further it splits into two separate rivers, the Beki and Bholkaduba. Manas and five other small rivers flow through the National Park which lies on a wide low-lying alluvial terrace below the foothills of the outer Himalaya. The river also acts an international border dividing India and Bhutan.

The northern portion is represented by the 'Bhabar' formation, which is very porous due to the deep deposits of coarse detritus overlain by sandy loam and then a thin layer of humus. The 'Terai' tract in the south consists of fine alluvial deposits with underlying pans. Here, the water table lies very near to the surface.

There are two major biomes present in Manas, the grassland biome and the forest biome. The main vegetation types are:

- Sub-Himalayan Light Alluvial Semi-Evergreen forests in the northern parts.
- East Himalayan mixed Moist and Dry Deciduous forests (the most common type).
- Low Alluvial Savanna Woodland, and
- Assam Valley Semi-Evergreen Alluvial Grasslands which cover almost 50% of the Park.

Much of the riverine dry deciduous forest is at an early successional stage. It is replaced by moist deciduous forest away from water courses, which is succeeded by semi-evergreen climax forest in the northern part of the park.

Flora and Fauna

The Park's common trees include Aphanamixispolystachya, Anthocephaluschinensis, Syzygiumcumini, S. formosum, S. oblatum, Bauhinia purpurea, Mallotusphilippensis, Cinnamomumtamala, Actinodaphneobvata, Bombaxceiba, Sterculiavillosa, Dilleniaindica, D. pentagyna, Careyaarborea, Lagerstroemia parviflora, L.speciosa, Terminalia bellirica, T. chebula, Trewiapolycarpa, Gmelinaarborea, Oroxylumindicum and Bridelia spp.

The Grasslands are dominated by Imperatacylindrica, Saccharumnaranga, Phragmiteskarka, Arundodonax, Dilleniapentagyna, Phyllanthus emblica, Bombaxceiba,andspecies of Clerodendrum, Leea, Grewia, Premna & Mussaenda

The sanctuary has recorded 55 species of mammals, more than 450 species of birds, 50 of reptiles, and 3 species of amphibians. Out of these wildlife, 21 mammals are India's Schedule I mammals and 31 of them are threatened.

The fauna of the sanctuary include Asian Elephants, Indian Rhinoceros, Gaurs, Asian Water Buffaloes, Barasingha, Tigers, Leopards, Clouded Leopards, Asian golden cat, Capped Langurs, Golden Langurs, Assamese Macaques, Slow Loris, Hoolock Gibbons, Smooth-coated Otters, Sloth Bears,Barking Deer, Hog Deer, Sambar Deer and Chital.

Divisional Forest Officer
Chirang Division
Kajalgaon

Hare, Golden Langur and Pygmy Hog.

Manas have the largest population of endangered Bengal Florican. The major other birds includes Giant Hornbills, Jungle Fowls, Bulbuls, Brahminy Ducks, Kalij Pheasants, Egrets, Pelicans,Fishing Eagles, Serpent Eagles, Falcons, Scarlet Minivets, Bee-Eaters, Magpie Robins,.Pied Hornbills, Grey Hornbills, Mergansers, Harriers, Ospreys and Herons.

Conservation value of Buffer zone of Manas Tiger Reserve w.r.t of proposed diversion area (134.588 ha in Chirang Forest Division)

Although the core area of Manas Tiger Reserve **(i.e. the NP area)** is inviolate, there is significant biotic pressure in the buffer zone **(2310.88 sq km)** due to the presence of 125 forest villages in the western buffer area, a few in the eastern buffer area and also having moderate to bad encroachment along with degradation of forest cover.

Furthermore, the buffer area comprising of the Reserved Forests falls within the jurisdiction of forest chief of Bodoland Territorial Council (Addl. PCCF, Kokrajhar) whereas the core area is under the control of Field Director, Manas Tiger Reserve/Chief Wildlife Warden, Assam.

The buffer zone is managed as a ***'multiple use area'*** with twin objectives of providing habitat supplement to the spill over population of wild animals from the core conservation unit, and to provide site specific eco-development inputs to surrounding villages for relieving the impact on the core. No relocation is visualized in the buffer area, and forestry operations, Non-Timber Forest Produce (NTFP) collection and other rights and concessions to the indigenous communities are permitted in a regulated manner to complement the initiatives in the core unit.

The floral and faunal diversity of significant portion of buffer zone of Manas Tiger Reserve is equally high as of the core area with high conservation value except the areas covered by forest villages. The main wildlife habitat is restricted to the dense forest areas mainly in northern boundary of the buffer zone connecting with BHUTAN. Significant portion of the buffer zone is plain area with human habitations comprising of forest villages. Therefore, presence of wildlife habitat in the areas surrounded by forest villages is very low since these areas are mostly covered by paddy cultivation with minimum tree cover.

The project area of **(134.588 ha)**falling in Chirang Forest Division also comprises of **25** forest villages and all the transmission tower locations falls in the paddy field/plain areas ***(except from Location AP-4 to AP-5)*** used by the villagers for cultivation/agriculture purpose. The section from AP-4 to AP-5 comprising of appx. 8 no towers is passing through dense forest area in of MANAS RF and requires special protection measures like increase of tower height as per Wildlife guideline due to presence of elephant habitat in this area.The same has been agreed by the User Agency and also noted in the site inspection report of DFO, Chirang. For the remaining portion of the route, study of KML file/Topo-map and field verification with User Agency reveals that there will be very minimum impact on the wildlife habitat with minimum tree cutting involved in the project area. There is neither any elephant habitat/corridor/tiger spotting in this section of route. The route has been carefully selected avoiding dense forest/habitation areas and mainly along the existing paddy lands of Forest Villages.

Therefore, it is summarised that the overall impact on biodiversity on Manas Tiger Reserve (buffer zone) due to the proposed transmission project is assessed as very low which can be minimized through proper mitigation measures as per guidelines.

DFO, Chirang Forest Division
Kajalgaon

LIKELY IMPACT OF THE PROJECT ON PROTECTED AREA

(Interms of section 29 and/or section 35(6) of the Wildlife(Protection)Act, 1972

Wildlife Proposal details (Ref FP/AS/TRANS/19330/2016)	Diversion of 208.087 ha of PA(inside buffer zone of Manas Tiger Reserve) for construction of 400 KV (Quad) Jigmelling – Alipurduar T/L
Project Proponent:	Power Grid Corporation of India Ltd (A Govt. of India Enterprise)
Details of PA involved	"MANAS TIGER RESERVE" (Buffer Zone)
Protected area under CHIRANG Forest Division	134.588 ha (Manas RF-pt-II 104.871 ha and Bengtol RF 29.717 ha)

- The proposed project area (i.e. Transmission Line) is appx.13km away from the core area of Manas Tiger Reserve *(i.e. from the boundary of Manas National Park)* and falls within the buffer zone of Manas Tiger reserve.

- Thus, itinvolves two (2) Reserved Forest under CHIRANG Forest Division namely MANAS RF-pt-II and BENGTOL RF which are included in the buffer zone of Manas Tiger Reserve by Notification of Govt. of Assam. Total protected area proposed by User Agency for wildlife clearance under CHIRANG Division is 134.588 ha.

- Although the core area of Manas Tiger Reserve (i.e. the NationalPark area) is inviolate, the buffer zone (2310.88 sq km)signifies the presence of 125 forest villages,mostly in the western buffer area, a few in the eastern buffer area and also having moderate to bad encroachment along with degradation of forest cover. Furthermore, the buffer area comprising of Reserved Forests falls within the jurisdiction of forest chief of Bodoland Territorial Council (Addl. PCCF, Kokrajhar) whereas the core area is under the control of Field Director, Manas Tiger Reserve/Chief Wildlife Warden Assam.

- The buffer zone is managed as a *'multiple use area'* with twin objectives of providing habitat supplement to the spill over population of wild animals from the core conservation unit, and to provide site specific eco-development inputs to surrounding villages for relieving the impact on the core. No relocation is visualized in the buffer area, and forestry operations, Non-Timber Forest Produce (NTFP) collection and other rights and concessions to the indigenous communities are permitted in a regulated manner to complement the initiatives in the core unit.

- The project area of (134.588 ha) falling in Chirang Forest Division also comprises of 25 forest villages and all the transmission tower locations falls in the paddy field/plain areas (except from Location AP-4 to AP-5) used by the villagers for cultivation/agriculture purpose. *The section from Loc-AP-4 to AP-5 comprising of appx. 8 no. towers is passing through dense forest area in MANAS RF and requires special protection measures like increase of tower height as per Wildlife guideline due to presence of elephant habitat in this area.* The same has been agreed by the User Agency and also noted in the site inspection report of DFO, Chirang. For the remaining portion of the route, study of KML file/Topo-map and field verification with User Agency reveals that there will be very minimum impact on the wildlife habitat with minimum tree cutting involved in the project area. There is neither any elephant habitat/corridor/tiger

spotting in this section of route. The route has been carefully selected avoiding dense forest/habitation areas and mainly along the existing paddy lands of Forest Villages.

- The major construction activity envisages in the said project are as follows:-
    - ❖ Construction of Tower Foundation (An average of 15 M x 15 M tower base and activities involves excavation of soil and concreting)
    - ❖ Construction of Pile Foundation near river locations (involves piling work/deep boring etc.)
    - ❖ Erection of transmission towers (involves joining of tower members/lattice structure)
    - ❖ Stringing of conductor wires between adjacent towers.

The User Agency envisages to carry out the above activities by engaging suitable Contractor. For tower foundation works, local gangs/manpower are usually engaged as petty Contractor and temporary makeshift camps are set nearby the construction site till completion of work. Tower erection and stringing of conductor is generally carried out by specialised gangs and construction camps are also required to be set up for this purpose. Major impacts of the above mentioned project activities on the nearby wildlife habitat/forest *(Interms of section 29 and/or section 35(6) of the Wildlife (Protection) Act, 1972)* is not envisaged due to the following reasons:-

- ❖ The project area is significantly far away (13 km) from the National Park boundary and also away from the dense forest areas of the buffer zone.
- ❖ The project area/tower locations mostly fall in paddy field/plain area which are being used by forest villagers for cultivation/agriculture purpose. The project site involves 25 forest villages.
- ❖ Therefore, there is no significant wildlife habitations found at the project site like elephant habitat/tiger habitat etc. which may be impacted by the project activities except the area falling between Loc-AP4 to AP-5 which is an elephant habitatand requires special protection measures like increase of tower height as per Wildlife Guideline and the same has been agreed by the User Agency.
- ❖ The chance of any unlawful activity like destroy, exploit, or remove any wildlife from a National Park, destroy or damage the habitat or any wild animal as envisaged under *Section 29 and/or section 35(6) of the Wildlife (Protection) Act, 1972* is also minimum due to safe location of the project site from the dense forest area/core area of the Manas Tiger Reserve.
- ❖ The construction activity will be carried out under strict vigilance from the User Agency as well as by Forest Department so that no violations of Wildlife/Forest laws takes place.

Therefore, it is summarised that the overall impact on biodiversity on Manas Tiger Reserve (buffer zone) due to the proposed transmission project is assessed as very low which can be minimized through proper mitigation measures as per guidelines.

DFO, Chirang Forest Division
BTAD, Kajalgaon

A SHORT NOTE ON CONSERVATION VALUE OF PROTECTED AREA
(w.r.t. proposed diversion area in CHIRANG Division)

Wildlife Proposal details (Ref FP/AS/TRANS/19330/2016)	Diversion of 208.087 ha of PA**(inside buffer zone of Manas Tiger Reserve)** for construction of 400 KV (Quad) Jigmelling –Alipurduar T/L
Project Proponent:	Power Grid Corporation of India Ltd (A Govt. of India Enterprise)
Details of PA involved	"MANAS TIGER RESERVE" (Buffer Zone)
Protected area under Forest Division Chirang	**134.588 ha** (Manas RF-pt-II104.871 ha and Bengtol RF 29.717 ha)

As per the Notification of Manas Tiger Reserve (notified by GoA on 30th May, 2008) the boundary of the Manas Tiger Reserve is defined as below.

Core area:- **526.22 sq km** (MNP 500 sq km + Barnadi Wildlife Sanctuary 26.22 sq km)

Buffer area:- (Reserved forest of Kachugaon, Haltugaon, Chirang and Dhansiri Territorial division along the Indo-Bhutan boundary) = **2310.88 sq km**

Total area:- **2837.10 sq km**

The proposed project area (i.e. Transmission Line) is approximately **13** km away from the core area of Manas Tiger Reserve ***(i.e. from the boundary of Manas National Park)*** and involves 2 Reserved Forests under CHIRANG Forest Division namely ***MANAS RF-pt-II***and ***BENGTOL RF***. Total protected area proposed for diversion under CHIRANG Division is **134.588 ha**.

Conservation Values of core area of Manas Tiger Reserve

The combination of Sub-Himalayan BhabarTerai formation with riverine succession leading up to Sub-Himalayan mountain forest makes **Manas** as one of the richest biodiversity areas in the world.

- A total of 543 plants species have been recorded from the core zone of the National Park. Of these, 374 species are dicotyledons (including 89 trees), 139 species monocotyledons and 30 are Pteridophytes and Gymnosperms.

- The Park supports an impressive diversity and biomass of large wildlife species. Herbivores density in the grassland ecosystems of Manas rivals that of some East African grasslands (Eisenberg &Seidensticker 1976).

- Manas contains 22 of India's Schedule I (Wildlife Protection Act, 1972) mammals and at least 33 of its animals listed as threatened, by far the greatest number for any protected area in the country. Many are typical of Southeast Asian rain forest and have their westernmost distribution there, while other species are at the easternmost point of their range.

- Manas National Park is also a part of the Chirang-Ripu Elephant Reserve, declared in the year 2003 by Government of Assam, with an area of 2600 sq. km. The Manas National Park is perhaps the largest remaining safe home for elephants in entire Himalayan foothills in Assam. The Park plays a vital role in trans-boundary movement of elephants along the northern West Bengal, Bhutan and Arunachal Pradesh.

- The park is known for its rare and endangered endemic wildlife such as the Assam Roofed Turtle, Hispid Hare, Golden Langur and Pygmy Hog.

- Manas is famous for its population of the Wild water buffalo.

- Over 450 species of birds including migrants have been recorded and about 350 breed in the area, 16 being endemic (Deb Roy, 1991) including the threatened Bengal FloricanHoubaropsisbengalensis, a rare bustard. The Bengal Floricans of the National Park were estimated at 80 individuals with 24 male territories in the Park in 1988 (Narayan et al., 1989); this is a fifth of the world population.

Habitat

Manas National Park is located in the Eastern Himalaya foothills. The Manas river is the main river, a major tributary of Brahmaputra river which flows through the west of the park, further it splits into two separate rivers, the Beki and Bholkaduba. Manas and five other small rivers flow through the National Park which lies on a wide low-lying alluvial terrace below the foothills of the outer Himalaya. The river also acts an international border dividing India and Bhutan.

The northern portion is represented by the 'Bhabar' formation, which is very porous due to the deep deposits of coarse detritus overlain by sandy loam and then a thin layer of humus. The 'Terai' tract in the south consists of fine alluvial deposits with underlying pans. Here, the water table lies very near to the surface.

There are two major biomes present in Manas, the grassland biome and the forest biome. The main vegetation types are:

- Sub-Himalayan Light Alluvial Semi-Evergreen forests in the northern parts.
- East Himalayan mixed Moist and Dry Deciduous forests (the most common type).
- Low Alluvial Savanna Woodland, and
- Assam Valley Semi-Evergreen Alluvial Grasslands which cover almost 50% of the Park.

Much of the riverine dry deciduous forest is at an early successional stage. It is replaced by moist deciduous forest away from water courses, which is succeeded by semi-evergreen climax forest in the northern part of the park.

Flora and Fauna

The Park's common trees include Aphanamixispolystachya, Anthocephaluschinensis, Syzygiumcumini, S. formosum, S. oblatum, Bauhinia purpurea, Mallotusphilippensis, Cinnamomumtamala, Actinodaphneobvata, Bombaxceiba, Sterculiavillosa, Dilleniaindica, D. pentagyna, Careyaarborea, Lagerstroemia parviflora, L.speciosa, Terminalia bellirica, T. chebula, Trewiapolycarpa, Gmelinaarborea, Oroxylumindicum and Bridelia spp.

The Grasslands are dominated by Imperatacylindrica, Saccharumnaranga, Phragmiteskarka, Arundodonax, Dilleniapentagyna, Phyllanthus emblica, Bombaxceiba,andspecies of Clerodendrum, Leea, Grewia, Premna & Mussaenda

The sanctuary has recorded 55 species of mammals, more than 450 species of birds, 50 of reptiles, and 3 species of amphibians. Out of these wildlife, 21 mammals are India's Schedule I mammals and 31 of them are threatened.

The fauna of the sanctuary include Asian Elephants, Indian Rhinoceros, Gaurs, Asian Water Buffaloes, Barasingha, Tigers, Leopards, Clouded Leopards, Asian golden cat, Capped Langurs, Golden

The park is well known for its rare and endangered wildlife like the Assam Roofed Turtle, Hispid Hare, Golden Langur and Pygmy Hog.

Manas have the largest population of endangered Bengal Florican. The major other birds includes Giant Hornbills, Jungle Fowls, Bulbuls, Brahminy Ducks, Kalij Pheasants, Egrets, Pelicans,Fishing Eagles, Serpent Eagles, Falcons, Scarlet Minivets, Bee-Eaters, Magpie Robins,.Pied Hornbills, Grey Hornbills, Mergansers, Harriers, Ospreys and Herons.

Conservation value of Buffer zone of Manas Tiger Reserve w.r.t of proposed diversion area (134.588 ha in Chirang Forest Division)

Although the core area of Manas Tiger Reserve **(i.e. the NP area)** is inviolate, there is significant biotic pressure in the buffer zone (**2310.88 sq km)** due to the presence of 125 forest villages in the western buffer area, a few in the eastern buffer area and also having moderate to bad encroachment along with degradation of forest cover.

Furthermore, the buffer area comprising of the Reserved Forests falls within the jurisdiction of forest chief of Bodoland Territorial Council (Addl. PCCF, Kokrajhar) whereas the core area is under the control of Field Director, Manas Tiger Reserve/Chief Wildlife Warden, Assam.

The buffer zone is managed as a ***'multiple use area'*** with twin objectives of providing habitat supplement to the spill over population of wild animals from the core conservation unit, and to provide site specific eco-development inputs to surrounding villages for relieving the impact on the core. No relocation is visualized in the buffer area, and forestry operations, Non-Timber Forest Produce (NTFP) collection and other rights and concessions to the indigenous communities are permitted in a regulated manner to complement the initiatives in the core unit.

The floral and faunal diversity of significant portion of buffer zone of Manas Tiger Reserve is equally high as of the core area with high conservation value except the areas covered by forest villages. The main wildlife habitat is restricted to the dense forest areas mainly in northern boundary of the buffer zone connecting with BHUTAN. Significant portion of the buffer zone is plain area with human habitations comprising of forest villages. Therefore, presence of wildlife habitat in the areas surrounded by forest villages is very low since these areas are mostly covered by paddy cultivation with minimum tree cover.

The project area of **(134.588 ha)**falling in Chirang Forest Division also comprises of **25** forest villages and all the transmission tower locations falls in the paddy field/plain areas ***(except from Location AP-4 to AP-5)*** used by the villagers for cultivation/agriculture purpose. The section from AP-4 to AP-5 comprising of appx. 8 no towers is passing through dense forest area in of MANAS RF and requires special protection measures like increase of tower height as per Wildlife guideline due to presence of elephant habitat in this area.The same has been agreed by the User Agency and also noted in the site inspection report of DFO, Chirang. For the remaining portion of the route, study of KML file/Topo-map and field verification with User Agency reveals that there will be very minimum impact on the wildlife habitat with minimum tree cutting involved in the project area. There is neither any elephant habitat/corridor/tiger spotting in this section of route. The route has been carefully selected avoiding dense forest/habitation areas and mainly along the existing paddy lands of Forest Villages.

Therefore, it is summarised that the overall impact on biodiversity on Manas Tiger Reserve (buffer zone) due to the proposed transmission project is assessed as very low which can be minimized through proper mitigation measures as per guidelines.

DFO, Chirang Forest Division
Kajalgaon

LIKELY IMPACT OF THE PROJECT ON PROTECTED AREA

(In_terms of section 29 and/or section 35(6) of the Wildlife (Protection) Act, 1972

Wildlife Proposal details (Ref FP/AS/TRANS/19330/2016)	Diversion of 208.087 ha of PA **(inside buffer zone of Manas Tiger Reserve)** for construction of 400 KV (Quad) Jigmelling -Alipurduar T/L
Project Proponent:	Power Grid Corporation of India Ltd (A Govt. of India Enterprise)
Details of PA involved	"MANAS TIGER RESERVE" (Buffer Zone)
Protected area under Haltugaon Forest Division	**70.083 ha** (Manas RF 5.408 ha and Chirang RF 64.674 ha)

- The proposed project area (i.e. Transmission Line) is appx. **13** km away from the core area of Manas Tiger Reserve ***(i.e. from the boundary of Manas National Park)*** and falls within the buffer zone of Manas Tiger reserve.

- Thus, it involves two (2) Reserved Forest under Haltugaon Forest Division namely MANAS RF and CHIRANG RF which are notified as buffer zone of Manas Tiger Reserve by Govt. of Assam. Total protected area proposed for wildlife clearance under Haltugaon Division is **70.083 ha**.

- Although the core area of Manas Tiger Reserve **(i.e. the National Park area)** is inviolate, the buffer zone (**2310.88 sq km)** signifies the presence of 125 forest villages, mostly in the western side, a few in the eastern side and also having moderate to bad encroachment along with degradation of forest cover. Furthermore, the buffer area comprising of Reserved Forests falls within the jurisdiction of forest chief of Bodoland Territorial Council (Addl. PCCF) whereas the core area is under the control of Chief Wildlife Warden Assam.

- The buffer zone is managed as a ***'multiple use area'*** with twin objectives of providing habitat supplement to the spill over population of wild animals from the core conservation unit, and to provide site specific eco-development inputs to surrounding villages for relieving the impact on the core. No relocation is visualized in the buffer area, and forestry operations, Non-Timber Forest Produce (NTFP) collection and other rights and concessions to the indigenous communities are permitted in a regulated manner to complement the initiatives in the core unit.

- The project area of **(70.083 ha)** falling in Haltugaon Forest Division also comprises of 13 forest villages and all the transmission tower locations falls in paddy field/plain areas used by the forest villagers for cultivation/agriculture purpose. From the **KML** file of the route and also during field verification with the User Agency, it has been found that there will be very minimum impact on the wildlife with minimum tree cutting involved in the project area. The route has been carefully selected avoiding dense forest/habitation areas and mainly along the existing paddy lands. Therefore, the impact on biodiversity on Manas Tiger Reserve (buffer zone) due to the proposed transmission project is assessed as very low which can be minimized through proper mitigation measures as per guidelines.

- The major construction activity envisages in the said project are as follows:-
    - Construction of Tower Foundation (An average of 15 M x 15 M tower base and activities involves excavation of soil and concreting)
    - Construction of Pile Foundation near river locations (involves piling work/deep boring etc.)
    - Erection of transmission towers (involves joining of tower members/lattice structure)
    - Stringing of conductor wires between adjacent towers.

The User Agency envisages to carry out the above activities by engaging suitable Contractor. For tower foundation works, local gangs/manpower are usually engaged as petty Contractor and temporary makeshift camps are set nearby the construction site till completion of work. Tower erection and stringing of conductor is generally carried out by specialised gangs and construction camps are also required to be set up for this purpose. Major impacts of the above mentioned project activities on the nearby wildlife habitat/forest (*In_terms of section 29 and/or section 35(6) of the Wildlife (Protection) Act, 1972*) is not envisaged due to the following reasons

- The project area is significantly far away (13 km) from the National Park boundary and also away from the dense forest areas of the buffer zone.
- The project area/tower locations mostly fall in paddy field/plain area which are being used by forest villagers for cultivation/agriculture purpose. The project site involves 13 forest villages.
- Therefore, there is no significant wildlife habitations found at the project site which may be impacted by the project activities.
- The chance of any unlawful activity like destroy, exploit, or remove any wildlife from a National Park, destroy or damage the habitat or any wild animal as envisaged under ***Section 29 and/or section 35(6) of the Wildlife (Protection) Act, 1972*** is also minimum due to safe location of the project site from the dense forest area/core area of the Manas Tiger Reserve.
- The construction activity will be carried out under strict vigilance from the User Agency as well as by Forest Department so that no violations of Wildlife/Forest laws takes place.

Divisional Forest Officer
Haltugaon Division Kokrajhar

LIKELY IMPACT OF THE PROJECT ON PROTECTED AREA

(In terms of section 29 and/or section 35(6) of the Wildlife (Protection) Act, 1972

Wildlife Proposal details (Ref FP/AS/TRANS/19330/2016)	Diversion of 208.087 ha of PA **(inside buffer zone of Manas Tiger Reserve)** for construction of 400 KV (Quad) Jigmelling – Alipurduar T/L
Project Proponent:	Power Grid Corporation of India Ltd (A Govt. of India Enterprise)
Details of PA involved	"MANAS TIGER RESERVE" (Buffer Zone)
Protected area under Kachugaon Forest Division	**4.136 ha** (RIPU RF)

- The proposed project area (i.e. Transmission Line) is appx. **13** km away from the core area of Manas Tiger Reserve ***(i.e. from the boundary of Manas National Park)*** and falls within the buffer zone of Manas Tiger reserve.

- Thus, it involves only one (1) Reserved Forest under Kachugaon Forest Division namely RIPU RF. which has been included in the buffer zone of Manas Tiger Reserve by Govt. of Assam. Total protected area proposed for wildlife clearance under Kachugaon Division is **4.136 ha**.

- Although the core area of Manas Tiger Reserve **(i.e. the National Park area)** is inviolate, the buffer zone (**2310.88 sq km)** signifies the presence of 125 forest villages, mostly in the western side, a few in the eastern side and also having moderate to bad encroachment along with degradation of forest cover. Furthermore, the buffer area comprising of Reserved Forests falls within the jurisdiction of forest chief of Bodoland Territorial Council (Addl. PCCF) whereas the core area is under the control of Field Director/Chief Wildlife Warden, Assam.

- The buffer zone is managed as a ***'multiple use area'*** with twin objectives of providing habitat supplement to the spill over population of wild animals from the core conservation unit, and to provide site specific eco-development inputs to surrounding villages for relieving the impact on the core. No relocation is visualized in the buffer area, and forestry operations, Non-Timber Forest Produce (NTFP) collection and other rights and concessions to the indigenous communities are permitted in a regulated manner to complement the initiatives in the core unit.

- The project area of **(4.136 ha)** falling in Kachugaon Forest Division also comprises of one(1) forest village and all the transmission tower locations falls in paddy field/plain areas used by the forest villagers for cultivation/agriculture purpose. From the field verification with the User Agency, it has been found that there will be

DIVISIONSL FOREST OFFICER
KACHUGAON DIVISION, GOSSAIGAON

very minimum impact on the wildlife with minimum tree cutting involved in the project area. There is neither any elephant habitat nor any tiger habitat in the proposed project site. The route has been carefully selected avoiding dense forest/habitation areas and mainly along the existing paddy lands. Therefore, the impact on biodiversity on Manas Tiger Reserve (buffer zone) due to the proposed transmission project is assessed as very low which can be minimized through proper mitigation measures as per guidelines.

- The major construction activity envisages in the said project are as follows:-
  - ❖ Construction of Tower Foundation (An average of 15 M x 15 M tower base and activities involves excavation of soil and concreting)
  - ❖ Construction of Pile Foundation near river locations (involves piling work/deep boring etc.)
  - ❖ Erection of transmission towers (involves joining of tower members/lattice structure)
  - ❖ Stringing of conductor wires between adjacent towers.

  The User Agency envisages to carry out the above activities by engaging suitable Contractor. For tower foundation works, local gangs/manpower are usually engaged as petty Contractor and temporary makeshift camps are set nearby the construction site till completion of work. Tower erection and stringing of conductor is generally carried out by specialised gangs and construction camps are also required to be set up for this purpose.

- Major impacts of the above mentioned project activities on the nearby wildlife habitat/forest ***(In_terms of section 29 and/or section 35(6) of the Wildlife (Protection) Act, 1972)*** is not envisaged due to the following reasons

  - ❖ The project area is significantly far away (13 km) from the National Park boundary and also away from the dense forest areas of the buffer zone.
  - ❖ The project area/tower locations mostly fall in paddy field/plain area which is being used by forest villagers for cultivation/agriculture purpose. The project site involves only one (1) forest village namely SAPKATA FV.
  - ❖ Therefore, there is no significant wildlife habitations found at the project site which may be impacted by the project activities.
  - ❖ The chance of any unlawful activity like destroy, exploit, or remove any wildlife from a National Park, destroy or damage the habitat or any wild animal as envisaged under ***Section 29 and/or section 35(6) of the Wildlife (Protection) Act, 1972*** is also minimum due to safe location of the project site from the dense forest area/core area of the Manas Tiger Reserve.
  - ❖ The construction activity will be carried out under strict vigilance from the User Agency as well as by Forest Department so that no violations of Wildlife/Forest laws take place.

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