



SOLAR PROJECT FEASIBILITY REPORT

Site Name	Badvel
Mandal	B Koduru, Bramhamgari Matam and Badvel
District	YSR Kadapa
Capacity	1400 MW



New and Renewable Energy Development Corporation of AP. Ltd.

Address: No. 12-464/5/1, River Oaks Apartment, CSR Kalyana Mandapam Road,
Tadepalli, Guntur District - 522 501, Andhra Pradesh. Website: www.nredcap.in

Contact: Mr. K Srinivas, GM - +91 90005 50963
Mr. C B Jagadeeswara Reddy, DGM - +91 94402 66636



Location:

The proposed solar park details are tabulated below.

SI No	Particulars	Description
1	Project Location	B Koduru
2	Mandal / District	B Koduru, Bramhamgari Matam and Badvel/ YSR Kadapa
3	State	Andhra Pradesh
4	Geographical coordinates	14.850121° 79.002153°
5	Meteorological data source	Meteonorm 7.3
6	Land availability	7000 Acres
9	Land quality	Mix of barren and agricultural lands
10	Location access	State Highway 56 connecting Badvel – Markapuram is passing through the site.
11	Nearest domestic airport	Kadapa – 65Km.
12	Nearest International airport	Chennai, Karnataka– 280 Kms
13	Nearest railway station	Kadapa Railway Station at 60 Kms
14	Nearest port	Chennai – 280 Kms
15	Available APTransco Substations	Existing Kadapa 400/220 KV Powergrid Substation – 65 Kms Existing Porumalilla 220/132 kV APTransco Substation – 10 Kms

Table 1: Summary of project details.

B Koduru site is located in Koduru, Bramhamgari Mattam and Badvel mandals of YSR Kadapa District with Karnataka state as its boundary towards south.



Approach and Logistics

State highway 57, from Mydukuru – Badvel is at 10 Kms from nearest solar block.



Route map showing approach roads to Badvel site is given below:

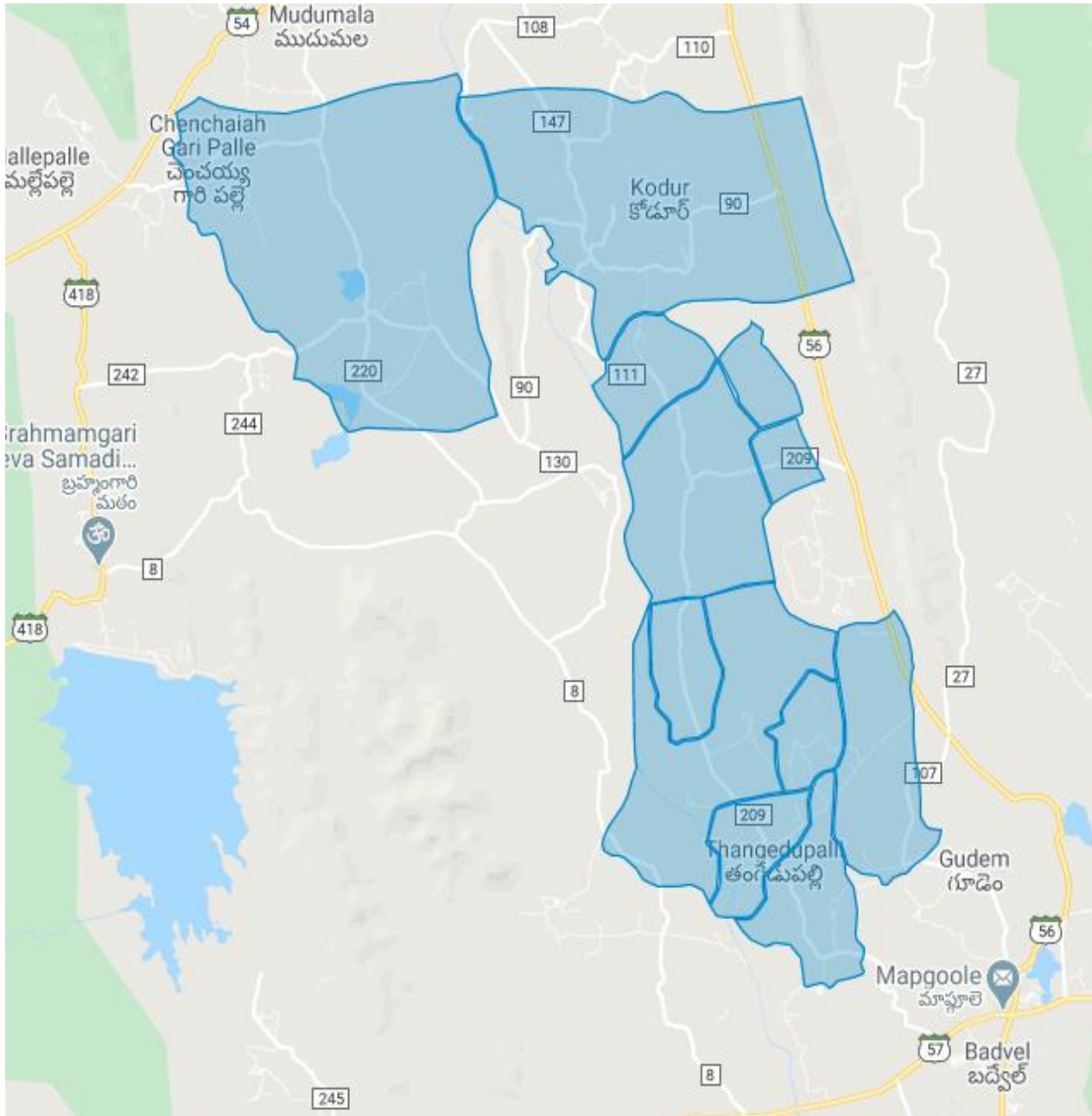


Figure 2: Route map of Badvel site.

The proposed site is spread across stretch of 12 villages with 01 village in Bhamhamgari Matam mandal, 10 villages in B Koduru mandal and balance 02 villages in Badvel mandal of YSR Kadapa District of Andhra Pradesh.

Satellite image showing the above village boundaries is given in figure below:

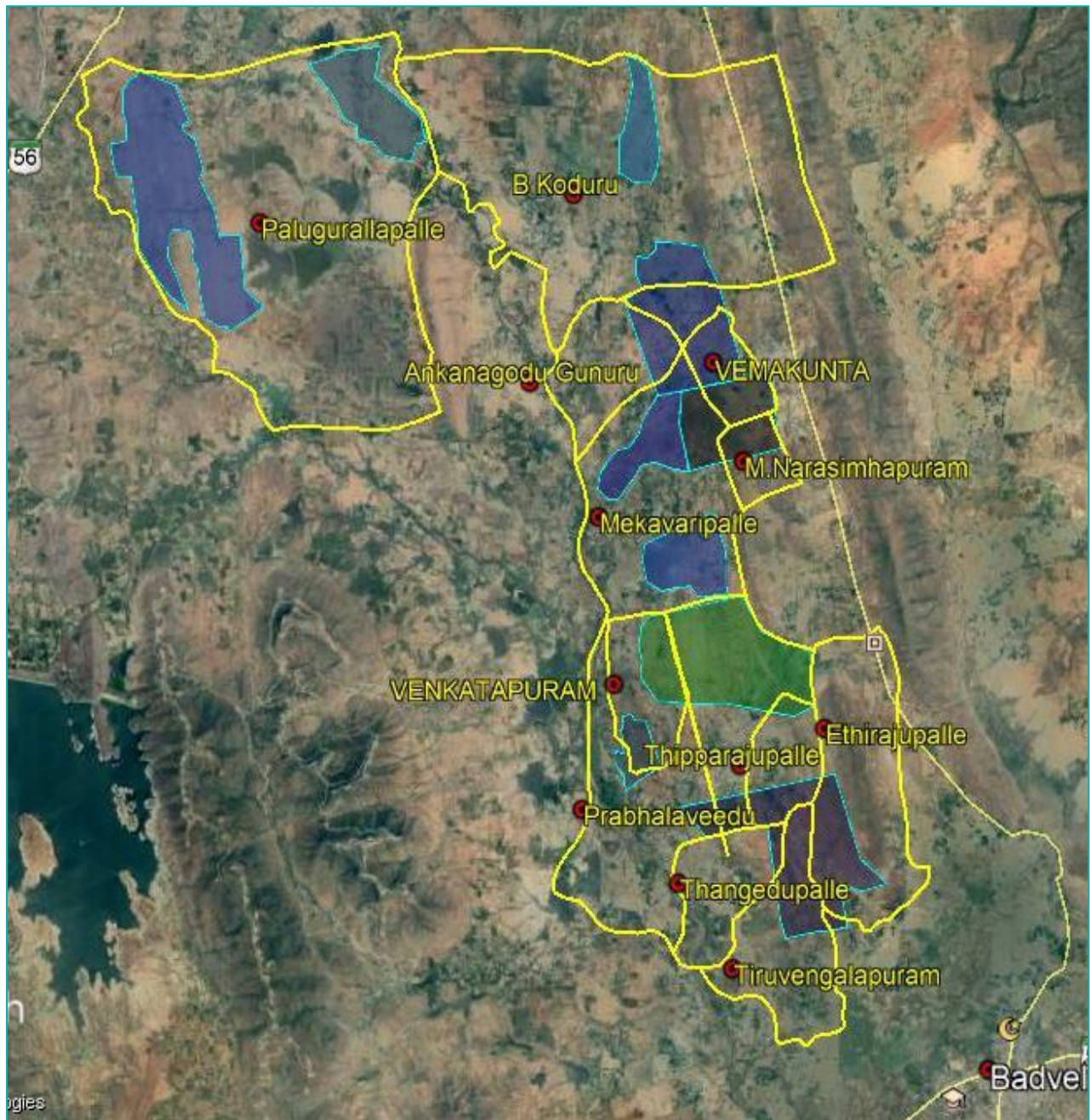


Figure 3: Satellite image of Badvel site



The total land availability in the above mentioned villages is around 22,108 Acres which includes open land, hills, habitations, streams, and roads. Table below shows the complete extent of land available at each village including habitation, forest land, open lands, hills, rivers, and streams.

SI No	Village Name	Assigned	Government	Private	Grand Total
1	Pallugurallapalli	366	795	742	1903
2	B Koduru	1399	1738	2384	5521
3	Ankana Godugunuru	353	187	708	1248
4	Vemakunta	234	702	159	1096
5	Mekavaripalli	445	2150	167	2762
6	M Narasimha Puram	50	287	104	441
7	Venkatapuram	438	199	618	1255
8	Prabalaveedu	492	1298	1294	3085
9	Tipparaju Palle	215	350	119	684
10	Ethirajupalle	758	514	628	1899
11	Thangedupalle	245	169	525	939
12	Tiruvengalapuram	212	318	746	1275
Grand Total		5208	8706	8193	22108

Table 2: Summary of extent of land at villages.

Topographical analysis has been done considering the 5 meter contour interval and drainage network of the above mentioned villages and found that out of 22,108 acres available, **about 7,000 Acres of land will be useful for solar park** after leaving the undulations in topology, village habitations and stream.



However, the exact village wise land extent and land classifications for the project can be known by detailed survey and digital mapping.

Water Source:

A major reservoir at Bharmhasagar is at a distance of 15 kms from site with the gross storage capacity of 17.74 TMC. This reservoir will serve the operational needs of the entire solar park by laying water pipelines.

For additional sources of water, a detailed hydrological studies has to be carried out at site.

Topology:

From the contour drawing it is understood that land available in the above said villages are mostly plain with streams towards east side.

Contour map of the proposed site is given below:

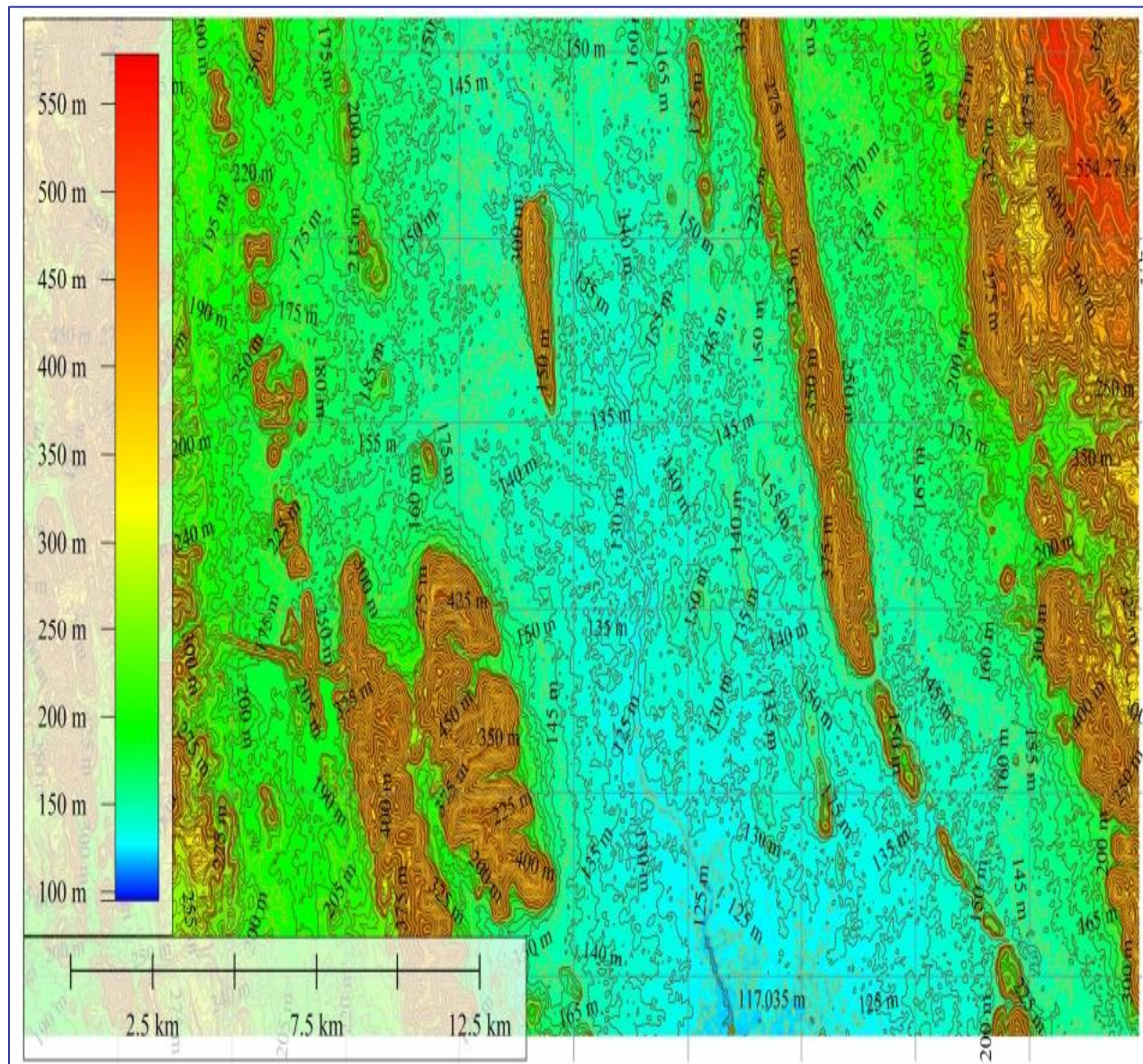


Figure 4: Contour map of Badvel site

Boundary coordinates of the proposed site is given in annexure. Figure below shows the useful area of the proposed solar park leaving the village habitations, wind turbines and streams.

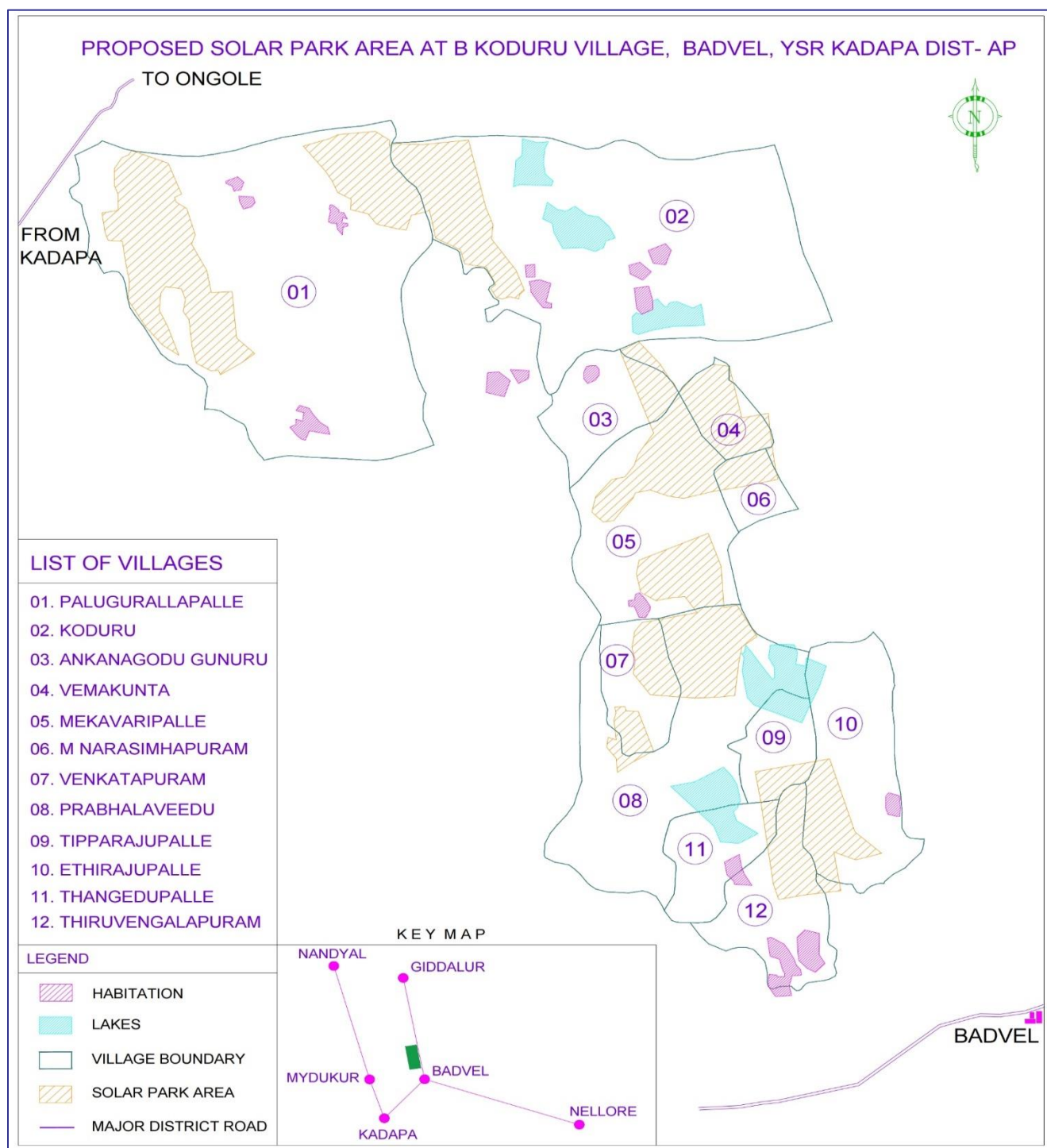


Figure 5: Useful area for solar project



Energy Estimates:

For the proposed Ultra Mega solar park area, annual energy production has been estimated using PVsyst 7.0.5 simulation software for multi-crystalline PV modules of Canadian Solar 350Wp and irradiation data from Meteonorm 7.3. The table below shows the simulation results of Annual energy production.

Month	GlobHor kWh/m ²	DiffHor kWh/m ²	T_Amb °C	Earray MWh	E_Grid MWh	PR Ratio	CUF %
January	148.8	60.1	24.86	53134	52508	0.794	23.53%
February	155.9	62.96	27.36	52794	52189	0.784	25.89%
March	196.4	71.67	30.39	61954	56233	0.707	25.19%
April	197.3	82.07	32.3	58556	57865	0.765	26.79%
May	193.4	89.32	33.45	54865	49558	0.697	22.20%
June	149.6	90.9	30.4	42741	42218	0.775	19.55%
July	138.3	79.85	29.71	39662	39148	0.775	17.54%
August	140.6	92.87	28.75	41948	41420	0.782	18.56%
September	143.9	76.7	28.17	44702	44137	0.780	20.43%
October	144.8	79.3	27.6	47274	46682	0.786	20.91%
November	135.2	64.54	25.28	46841	46261	0.794	21.42%
December	134.6	59.36	24.19	48368	44494	0.744	19.93%
	1878.8	909.64	28.54	592839	572713	0.765	21.83%

Table 3: Annual Energy Generation Estimates of Badvel site

The annual CUF for typical 300 MW block of solar park at P90 is estimated at 21.33% per year with the annual generation of 5,58,973 MWh which is matching with the generation results of existing solar parks in the state of Andhra Pradesh.

Conclusion:

From the initial study, it is found that the proposed site at Badvel is best fit for setting up the Ultra Mega Solar Park.



Annexure

BOUNDARY COORDINATES OF BADVEL SITE

Block	Easting	Northing	Zone
I	274533.85	1648919.24	44P
I	274478.10	1648827.63	44P
I	274346.41	1648766.88	44P
I	274201.51	1648535.22	44P
I	274201.83	1648167.56	44P
I	274270.93	1647986.99	44P
I	274272.31	1647641.88	44P
I	273960.71	1647583.66	44P
I	274023.14	1647155.59	44P
I	274082.20	1647000.03	44P
I	274355.17	1646980.36	44P
I	274414.95	1646556.99	44P
I	274458.75	1646290.95	44P
I	274486.47	1646176.29	44P
I	274488.95	1646051.68	44P
I	274465.48	1645732.89	44P
I	274801.89	1645161.19	44P
I	275129.71	1644764.47	44P
I	275447.27	1644547.64	44P
I	275232.67	1645159.81	44P
I	275068.89	1645503.63	44P
I	275097.80	1645871.24	44P
I	275189.80	1646011.77	44P
I	275495.36	1645967.77	44P
I	275574.22	1645737.51	44P
I	275530.73	1645480.24	44P
I	275641.26	1645312.38	44P
I	275699.64	1644745.36	44P
I	275786.60	1644374.60	44P
I	276058.43	1644219.15	44P
I	276063.51	1644210.38	44P
I	276210.66	1644226.60	44P
I	276248.77	1644130.20	44P
I	276646.01	1644377.88	44P
I	276913.80	1644582.13	44P
I	276562.01	1644914.64	44P
I	276475.96	1645904.12	44P
I	276074.81	1645883.74	44P
I	275988.85	1646349.51	44P
I	275691.25	1646922.26	44P
I	275763.88	1647118.04	44P
I	275599.92	1647678.38	44P

Block	Easting	Northing	Zone
I	275363.75	1647918.99	44P
I	275498.94	1647991.01	44P
I	275242.01	1648649.19	44P
I	274533.85	1648919.24	44P
II	280142.70	1647587.11	44P
II	280290.30	1647643.00	44P
II	280407.47	1647048.59	44P
II	280888.01	1646798.71	44P
II	280968.10	1646501.99	44P
II	281192.83	1646455.40	44P
II	281384.47	1646432.24	44P
II	281572.33	1646053.11	44P
II	281471.09	1645973.87	44P
II	281584.53	1645775.16	44P
II	281699.20	1645748.34	44P
II	281840.71	1645795.88	44P
II	282015.15	1645749.56	44P
II	282035.88	1645848.30	44P
II	282122.99	1645934.48	44P
II	281960.90	1646364.36	44P
II	281487.09	1647030.99	44P
II	281518.26	1647333.16	44P
II	281378.89	1647701.73	44P
II	281044.60	1649141.55	44P
II	280158.19	1649046.29	44P
II	279679.19	1649067.55	44P
II	279512.77	1649027.30	44P
II	279521.89	1649138.93	44P
II	279240.69	1649329.52	44P
II	278520.08	1649257.25	44P
II	278344.76	1649167.50	44P
II	277850.98	1649012.19	44P
II	278278.64	1648479.08	44P
II	278412.93	1648261.64	44P
II	278512.10	1648023.33	44P
II	278776.09	1647878.39	44P
II	278766.62	1647656.47	44P
II	279099.89	1647567.56	44P
II	279265.89	1647346.69	44P
II	279679.88	1647244.68	44P
II	279840.26	1647220.57	44P
II	279937.29	1647534.22	44P



I	275394.36	1647816.58	44P
Block	Easting	Northing	Zone
III	284621.39	1642885.01	44P
III	284617.88	1642884.39	44P
III	284314.34	1642423.78	44P
III	284246.45	1642197.24	44P
III	284062.29	1641948.28	44P
III	283809.12	1641890.73	44P
III	283500.58	1641521.70	44P
III	283426.03	1641194.97	44P
III	283643.55	1640986.32	44P
III	283847.20	1641012.66	44P
III	284033.45	1641262.70	44P
III	284218.67	1641488.67	44P
III	284266.33	1641607.43	44P
III	284550.73	1641669.32	44P
III	284919.19	1641533.10	44P
III	285207.22	1641490.85	44P
III	285740.75	1641632.04	44P
III	286385.94	1641751.18	44P
III	287025.48	1641898.32	44P
III	286969.06	1642164.14	44P
III	286864.37	1642969.04	44P
III	286838.67	1643309.11	44P
III	286324.84	1643206.15	44P
III	286324.84	1643206.15	44P
III	286083.34	1644308.19	44P
III	285770.49	1644351.92	44P
III	285450.10	1644153.36	44P
III	285106.28	1643742.53	44P
III	284746.83	1644356.44	44P
III	284324.28	1644844.16	44P
III	283978.29	1644622.91	44P
IV	285978.61	1639155.29	44P
IV	285924.82	1640035.46	44P
IV	285675.37	1640744.10	44P
IV	284338.61	1640169.61	44P
IV	284286.69	1639884.02	44P
IV	284287.53	1639875.34	44P
IV	284372.86	1639477.29	44P

Block	Easting	Northing	Zone
IV	284665.09	1639306.26	44P
IV	284969.03	1639368.42	44P
IV	285224.87	1639390.61	44P
IV	285459.31	1639051.23	44P
IV	284397.94	1638838.56	44P
IV	284254.85	1638646.66	44P
IV	284200.16	1638292.99	44P
IV	284265.41	1638038.69	44P
IV	284225.99	1637746.35	44P
IV	284556.64	1637294.60	44P
IV	285111.26	1637248.11	44P
IV	285437.33	1637226.81	44P
V	284323.52	1636937.35	44P
V	284093.59	1636952.93	44P
V	284062.12	1637040.90	44P
V	283868.62	1637031.97	44P
V	283894.60	1636902.70	44P
V	283852.50	1636759.88	44P
V	283897.37	1636331.76	44P
V	283737.79	1636386.24	44P
V	283716.19	1636170.36	44P
V	283894.13	1635937.52	44P
V	283921.91	1635639.34	44P
V	284199.59	1635848.06	44P
V	284375.34	1635950.82	44P
V	284617.40	1636099.75	44P
V	284323.52	1636937.35	44P
VI	286582.09	1635650.85	44P
VI	286691.13	1635012.54	44P
VI	286933.58	1633247.50	44P
VI	287037.96	1632920.12	44P
VI	287514.72	1633017.09	44P
VI	288237.56	1633110.53	44P
VI	288102.09	1633937.69	44P
VI	288525.77	1633769.19	44P
VI	289026.12	1633908.90	44P
VI	288510.75	1634365.58	44P
VI	288021.09	1635926.40	44P