



Office of the General Manager
(Subhadra Area)
At/Po : Angul, Near Biju Maidan
Dist. Angul – 759122 (Odisha)
Website : www.mcl.gov.in
Email Id: gm-subhadra.mcl@coalindia.in
gmsubhadraarea@gmail.com
Phone No- 06764-296537



Ref No: MCL/GM(SA)/2024/ 898

Date: 23.10.2024

To,

Divisional Forest Officer
Angul, Forest Division

Sub: Proposal for seeking prior approval of the Central Government under Section 2 (ii) of the forest (Conservation) Act, 1980 in favour of M/s Mahanadi Coalfield Ltd. for non forestry use of 125.24 ha of forest land for Subhadra Open Cast Coal Mining Project of Subhadra Area under Angul Forest Division and District Angul of Odisha State – **Submission of compliance of conditions stipulated in "In-Principle Approval" accorded U/s 2(ii) of Forest (Conservation) Act 1980 for Subhadra Open Cast Coal Mining Project of M/s MCL.**

- Ref.No- (i) Proposal No.FP/OR/ MIN/150133/ 2021.
(ii) File no- 8-06/2023-FC, dtd-05.12.2023 -Stage-I FC granted by MoEF&CC,
New Delhi
(iii) Letter no-8504-DRP/dated-20.12.2023

Dear Sir,

Please find attached herewith the 05 sets of Compliance of Conditions stipulated in "In-Principle Approval" accorded U/s 2(ii) of Forest (Conservation) Act 1980 [Presently Van (Sanrakshan Evam Samvardhan) Adhinyam, 1980] granted by MoEF & CC vide No- 8-06/2023-FC dated 05.12.2023 in favour of Subhadra Open Cast Coal Mining Project of M/s Mahanadi Coalfields Limited for diversion of 125.24 Ha. of Forest Land for non-forestry use under Forest Division and District Angul, Odisha along with all Annexure.

This is for kind information and necessary action please.

Regards

Encl: As above

Yours faithfully

General Manager
Subhadra Area

For kind information to:

1. CMD, MCL
2. DT (Op), MCL
3. D (F), MCL
4. DT (P&P), MCL
5. GM (E&F), MCL
6. GM (P&P), MCL
7. GM (CMC), MCL
8. GM (L&R), MCL

Copy to:

1. Project Officer, Subhadra Project / SO (Min/P&P), Subhadra Area
2. SO (L&R), SO (Survey/E&F), Subhadra Area
3. Project Head, M/s SCML



Subhadra Project
Subhadra Area

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Compliance of Conditions stipulated in "In-Principle Approval" accorded U/s 2(ii) of Forest (Conservation) Act 1980 [presently Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980] by MoEF & CC vide No- 8-06/2023-FC dated 05.12.2023 for non-forestry use of 125.24 Ha. of Forest Land for Subhadra Open Cast Coal Mining of M/s. Mahanadi Coalfields Limited under Angul Forest Division in Angul District, Odisha

Sl. No.	Conditions	Compliance
1	Legal status of the diverted forest land shall remain unchanged	<ul style="list-style-type: none"> Legal status of the diverted forest land shall remain unchanged. An Undertaking to this effect is enclosed as Annexure-1
2 (a)	<p>Compensatory Afforestation The User Agency shall transfer the cost of raising and maintaining the compensatory afforestation as per the approved CA Scheme at the current wage rate in consultation with State Forest Department in the account of CAMPA of the concerned State through online portal</p>	<ul style="list-style-type: none"> Complied The cost of raising and maintaining the Compensatory Afforestation as per the approved CA Scheme amounting Rs. 9,67,67,900/- has been deposited on 07.05.2024 in the CAMPA Account no-1508258150133711 of Union Bank of India Vide UTR No-SBINR52024050720845483 as per the demand note raised by DFO, Angul vide letter no 2900-DRP/dated 20.04.2024. (Copy of demand note & payment details attached as Annexure-2)
(b)	The Govt. non-forest land and degraded revenue forest land identified for raising Compensatory Afforestation shall be notified by the State Government as RF under Section-4 or PF under Section-29 of the Indian Forest Act, 1927 or under the relevant Section (s) of the local Forest Act, as the case may be, before the Stage-II approval;	<ul style="list-style-type: none"> Complied An amount of Rs. 15,18,13,053/- (Rupees Fifteen Crore Eighteen Lakh Thirteen Thousand Fifty-Three Only) has been deposited towards govt. fees for mutation of 110.64 ha of non -forest government land and 40.255 ha of revenue forest land, totalling 150.895 Ha in the Account of Tahasildar, Angul through RTGS vide UTR no- IDFBR52024082700395017 on dated 27.08.2024 as per the demand note raised by DFO, Angul vide letter no.-6731 DPR/dated 24.08.2024.(Copy of Payment detail with corresponding Bank Account Statement are attached as Annexure-3) Copies of 05 Nos. of RoRs (Patta) for an area of 150.895 Ha. CA land issued in favour of Forest, Environment & Climate Change Dept., GoO attached as Annexure - 4a, 4b, 4c, 4d, 4e DFO, Angul has recommended for PF notification for 150.895 Ha. CA land to RCCF, Angul vide Memo no 7293 DRP/ dated 19.09.2024 (enclosed as Annexure-5) RCCF, Angul has recommended for PF

		<p>notification for 150.895 Ha. CA land to PCCF(Nodal),Bhubaneswar vide Memo no 3743 DRP/5F.FC-34/2024 dated 26.09.2024 (enclosed as Annexure-6)</p> <ul style="list-style-type: none"> • PCCF (Nodal) raised EDS vide Memo No 20003/ 9F(MG)-398/ 2022 dated 04.10.2024 on the proposal (enclosed as Annexure-7) • DFO, Angul submitted the compliance for the PF notification proposal to RCCF, Angul vide memo no 8059/ DRP/2023/ dated 21.10.2024 (enclosed as Annexure-8) • An Undertaking is enclosed stating that the PF Notification shall be obtained and shall be submitted to the Authorities as required as Annexure-9
(c)	<p>The cost of survey, demarcation and erection of permanent pillars, if required on the identified CA land, shall be deposited in advance with the Forest Department by the user agency. The CA will be maintained for 10 years. The scheme may include afforestation of indigenous species with appropriate provision for anticipated cost increase for works scheduled for subsequent years;</p>	<ul style="list-style-type: none"> • Complied • The survey & demarcation of identified CA land in 05 villages have been completed • Permanent Pillars have been posted on the boundary of CA land by User Agency according to DGPS survey coordinates • The CA Schemes including afforestation of indigenous species with appropriate provision for anticipated cost increase have been prepared by DFO, Angul & duly approved by PCCF(Nodal) which are enclosed as Annexure 10a, 10b, 10c, 10d & 10e
(d)	<p>The compensatory afforestation over Govt. non-forest land (110.705 ha) and degraded revenue forest land (40.249 ha) equal in extent to the forest land being diverted i.e. 125.248 ha shall be raised by the State Forest Department at the project cost within three years from the date of grant of Stage - II approval.</p>	<ul style="list-style-type: none"> • Complied • The approved cost for implementation of compensatory afforestation over Govt. non-forest land (110.705 ha) and degraded revenue forest land (40.249 ha) equal in extent to the forest land being diverted i.e. 125.248, amounting Rs. 9,67,67,900 (Rupees Nine Crores Sixty-Seven Lakhs Sixty-Seven Thousand Nine Hundred only) has been deposited on 07.05.2024 in CAMPA account no.1508258150133711 of Union Bank of India vide UTR No. SBINR52024050720845483. Copy of CA cost approval by PCCF(Nodal), demand raised by DFO, Angul and corresponding payment details made by MCL are enclosed as Annexure 11 • The compensatory afforestation shall be raised by State Forest Department
(e)	<p>User agency either himself or through the State Forest Department shall undertake gap planting and soil & moisture conservation activities to restock and rejuvenate the</p>	<ul style="list-style-type: none"> • Scheme for Gap Planting, Soil & Moisture Conservation Activity to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located in the

	degraded open forests (having crown density less than 0.40), if any, located in the area within 100 meter from outer perimeter of the mining lease. The plan for plantation and SMC activities will be prepared and submitted to MoEF&CC before Stage-II Clearance;	<p>area within 100 meter from outer perimeter of the mining lease has been prepared and is duly approved by RCCF, Angul. (Enclosed as Annexure-12)</p> <ul style="list-style-type: none"> • MCL shall undertake gap planting, soil & moisture conservation activities as per approved Scheme.
3 (a)	<p>NPV</p> <p>The User Agency shall transfer the funds towards the cost of Net Present Value (NPV) of the forest land being diverted under this proposal from the User Agency as per the orders of the Hon'ble Supreme Court of India dated 28.03.2008, 24.04.2008 and 09.05.2008 in Writ Petition (Civil) No. 202/1995 and the guidelines issued by this Ministry vide its letter No. 5-3/2007-FC dated 06.01.2022 read with 22.03.2022 through online portal of CAMPA account of the State Concerned</p>	<ul style="list-style-type: none"> • Complied • The cost of Net Present Value (NPV) amounting Rs. 11,99,52,367/- has been deposited in State CAMPA bearing account No- 1508258150133845 of Union Bank of India vide UTR No - SBINR52023123093007298, on dtd-30.12.2023 as per the demand order raised by DFO, Angul vide letter no-8637-DRP/dated 26.12.2023.(Enclosed copy of demand note & payment details as Annexure-13)
(b)	At the time of payment of the Net Present Value (NPV) at the present rate, the user agency shall furnish an undertaking to pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India	<ul style="list-style-type: none"> • Noted. • An Undertaking is enclosed as Annexure-14
4	The State Government shall ensure that the Singada Jhor stream shall not be disturbed and will not be used for mining in future.	<ul style="list-style-type: none"> • Noted. Shall be complied • An Undertaking is enclosed as Annexure-15
5	The safety zone along the water streams falling within the lease area shall be protecting by 50-meter buffer zone on both side. There shall be no discharge to any of the streams	<ul style="list-style-type: none"> • Noted. Shall be complied. • An Undertaking is enclosed as Annexure-16
6	The State Government shall ensure that a cluster safety zone shall be maintained between the adjoining mines.	<ul style="list-style-type: none"> • Noted. Shall be complied. • An Undertaking is enclosed as Annexure-17
7	The State Government shall ensure that the boundary of high-school falling within the boundary shall not be disturbed due to mining activities. Appropriate safe guards such as raising the boundary wall of the school, greening the school premises, regular medical check-ups of the students and other mitigation measures of mining hazards that can affect the health of school children shall be taken by the User Agency.	<ul style="list-style-type: none"> • Noted. Shall be complied. • An Undertaking is enclosed as Annexure-18

8	The State Government shall ensure that the rate of RWMP /SSWCP which was revised by the State Govt. vide letter dated 05.12.2018 will be further revised and accordingly revised plans will be submitted.	<ul style="list-style-type: none"> • Complied • Forest Environment & Climate Change Dept. GoO has revised the rate of RWMP at Rs.1,03,100/- per hectare which was intimated vide letter no. FE-DIV-MISC-0036-2021-1183/FE&CC dated 19.01.2024 to PCCF(WL) & CWLW, Odisha (enclosed as Annexure-19) • The cost of RWMP of Rs. 11,46,31,735/- has been deposited in State CAMPA account vide UTR no-SBINR52024021702946078, dtd-17.02.2024 (Demand and payment details are enclosed as Annexure-20)
9	Compensatory levies to be realized from the User Agency under the project shall be transferred/ deposited, through e-challan, in to the account of CAMPA pertaining to the State concerned through e-portal (https://parivesh.nic.in/);	<ul style="list-style-type: none"> • Complied • Copies of all e-challans wrt payment in CAMPA account are attached at appropriate places against corresponding conditions (Annexure-2, Annexure 11, Annexure-13, Annexure-20, Annexure-37)
10	The KML files of diverted area, the CA areas, the proposed SMC treatment area and the WLMP area shall be uploaded on the e-Green watch portal along with GPS Ids and all other requisite details prior to Stage II approval;	<ul style="list-style-type: none"> • During registration in e-Green watch portal, the corresponding page in the portal displays the requirement of Stage-II approval and is not permitting to upload KML File (Screenshot of corresponding page in e-Green watch portal is enclosed as Annexure- 21). • In this regard an Undertaking is enclosed as Annexure-22.
11 (a)	Following activities, as per approved plan / schemes, shall be undertaken in the lease area by the User Agency under the supervision of the State Forest Department. Approved scheme/plan shall be submitted to the Ministry along with compliance of Stage-I approval: Mitigative measures to minimize soil erosion and choking of stream shall be implemented within a period of three years with effect from the issue of Stage-II clearance in accordance with the approved Plan in consultation with the State Forest Department	<ul style="list-style-type: none"> • Noted & shall be complied • Scheme on mitigative measures to minimize soil erosion and choking of stream has been prepared and duly approved by RCCF,Angul.(Attached as Annexure-23)
(b)	Planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion in accordance with the approved scheme	<ul style="list-style-type: none"> • Noted & shall be complied • Scheme on Planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion has been prepared and is duly approved by RCCF, Angul.(Attached as Annexure-24)
(c)	Construction of check dams, retention /toe walls to arrest sliding down of the excavated material along the contour in accordance with the approved scheme	<ul style="list-style-type: none"> • Noted & shall be complied • Scheme on Construction of check dams, retention /toe walls to arrest sliding down of the excavated material along the contour has been prepared and is duly approved by RCCF, Angul. (Attached as Annexure-25)

(d)	Stabilize the overburden dumps by appropriate grading/benching, in accordance with the approved scheme, so as to ensure that angles of repose at any given place is less than 28°	<ul style="list-style-type: none"> • Noted & shall be complied • Scheme on Stabilize the overburden dumps by appropriate grading/benching, in accordance with the approved scheme, so as to ensure that angles of repose at any given place is less than 28° has been prepared and is duly approved by RCCF, Angul (Attached as Annexure-26)
12 (a)	<p>Safety Zone Management: Following activities, at project cost, shall be undertaken by the user agency for the management of safety zone as per relevant guidelines issued by the Ministry's guidelines</p> <p>User agency shall ensure demarcation of safety zone (7.5-meter strip all along the inner boundary of the mining lease area), and its fencing, protection and regeneration by erecting adequate number of 6 feet high RCC boundary pillars inscribed with DGPS coordinates with barbed wire fencing and deploying adequate number of watchers under the supervision of the State Forest Department</p>	<ul style="list-style-type: none"> • Noted & shall be complied • An Undertaking is enclosed as Annexure-27
(b)	Boundary of the safety zone of the mining lease, adjacent to habitation/roads, should be properly fenced by the user agency	<ul style="list-style-type: none"> • Noted & shall be complied • An Undertaking is enclosed as Annexure-28
(c)	Safety zone shall be maintained as green belt around mining lease and to ensure dense canopy in the area, regeneration shall be taken up in this area by the user agency at project cost under the supervision of the State Forest Department	<ul style="list-style-type: none"> • Noted & shall be complied • An Undertaking is enclosed as Annexure-29
(d)	The State Government and the user agency shall ensure that safety zone is maintained as per the prescribed norms	<ul style="list-style-type: none"> • Noted & shall be complied • An Undertaking is enclosed as Annexure-30
13	No damage shall be caused to the top-soil and the user agency will follow the top soil management plan	<ul style="list-style-type: none"> • Noted • Scheme on Top Soil Management has been prepared and is duly approved by RCCF, Angul. (Attached as Annexure-31)
14	The User Agency shall prepare a list of existing village tanks and other water bodies with GPS co-ordinates located within five km from the mine lease boundary. This list is to be duly verified by the concerned Divisional Forest Officer. The User Agency shall regularly undertake de-silting of these village tanks and other water bodies so as to mitigate the impact of siltation of such tanks/water bodies. A detailed approved plan for de-silting of	<ul style="list-style-type: none"> • Noted & shall be complied • Scheme on 'De-silting of these village tanks and other water bodies so as to mitigate the impact of siltation of such tanks/water bodies has been prepared and is duly approved by DFO, Angul and RCCF, Angul (Attached as Annexure-32)

	identified ponds and water bodies to be prepared in consultation with forest department and shall be submitted to MoEF& CC before Stage-II approval	
15	The cost of felling of trees shall be deposited by the User Agency with the State Forest Department	<ul style="list-style-type: none"> • Noted • An Undertaking is enclosed as Annexure-33
16	Trees should be felled in phased manner as per the requirement in the approved Mining Plan with prior permission of concerned DFO	<ul style="list-style-type: none"> • Noted • An Undertaking is enclosed as Annexure-34
17	The user agency shall explore the possibility of translocation of maximum number of trees identified to be felled and shall ensure that any tree felling shall be done only when it is unavoidable and that too under strict supervision of the State Forest Department	<ul style="list-style-type: none"> • Noted • An Undertaking is enclosed as Annexure-35
18	A site-specific Wildlife Management Plan shall be prepared by the State Government in consultation with the PCCF (Wildlife) for the protection and conservation of wildlife of the area. A copy of approved Plan shall be submitted to the Ministry along with the compliance of Stage-I approval. Entire cost of implementation of the provisions of the Wildlife Management Plan shall be deposited into the account of CAMPA of the State	<ul style="list-style-type: none"> • Site- Specific Wildlife Management Plan prepared by the DFO, Angul has been approved by the Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, Odisha. Letter No. 11775/CWLW-FDWC-FD-0011-2023 dated 01.10.2024 from O/o PCCF(WL) & approved Site-Specific Wildlife Conservation Plan are attached as Annexure-36) • The cost for implementation of Site Specific Wildlife Management Plan for implementation within the project impact area amounting 32,36,37,800/- has been deposited in the State CAMPA fund account no 1508258150133732 On dated 09.10.2024 vide UTR no- SBINR52024100954137921 (Demand & Payment details enclosed as Annexure-37) • 5% of the plan cost amounting Rs. 161.8188 lakhs (Rupees One crore Sixty-one Lakh Eighty-one Thousand Eight Hundred Eighty only) has been deposited on 09.10.2024 in the account of the Society "The Wildlife Odisha" maintained in the O/o PCCF(WL), Odisha, Bhubaneswar for unforeseen interventions vide RTGS no. IDFBR5202410090052 (copy of payment details enclosed as Annexure-38)
19	State Government shall complete settlement of rights, in term of the Scheduled Tribes and Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, if any, on the forest land to be diverted and submit the documentary evidence, along with compliance of Stage-I approval, as prescribed by this Ministry's letter No. 11-9/1998-FC (Pt.) dated 03.08.2009 read with 05.07.2013, in support	<ul style="list-style-type: none"> • Complied. • Certificate under Scheduled Tribes and Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, as as prescribed by Ministry's letter No. 11-9/1998-FC (Pt.) dated 03.08.2009 read with 05.07.2013 has been issued by Collector & District Magistrate, Angul vide file No. XI-02/2023, No. 874 dated

	thereof;	19.04 2024 (<u>Original Certificate along with all relevant documents consisting of 293 pages are attached as Annexure-39</u>)
20	The User Agency shall undertake mining in a phased manner after taking due care for reclamation of the mined over area. The concurrent reclamation plan as per the approved mining plan shall be executed by the User Agency from the very first year, and an annual report on implementation thereof shall be submitted to the Nodal Officer, Forest (Conservation) Act, 1980, in the concerned State Government and the concerned Regional Office of the Ministry. If it is found from the annual report that the activities indicated in the concurrent reclamation plan are not being executed by the User Agency, the Nodal Officer or the concern Addl. Principle Chief Conservator of Forests (Central) may direct that the mining activities shall remain suspended till such time, such reclamation activities area satisfactorily executed	<ul style="list-style-type: none"> • Noted • An Undertaking is enclosed as Annexure-40
21	The User Agency shall comply with the Hon'ble Supreme Court order on re-grassing, and re-grass the mining area and any other areas which may have been disturbed due to mining to restore them to a condition which is fit for growth of fodder, flora, fauna, etc. in a timely manner;	<ul style="list-style-type: none"> • Noted • An Undertaking is enclosed as Annexure-41
22	Period of diversion of the said forest land under this approval shall be for a period co-terminus with the period of the mining lease proposed to be granted under the Mines and Minerals (Development and Regulation) Act, 1957, as amended time to time and the Rules framed there-under;	<ul style="list-style-type: none"> • Noted • An Undertaking is enclosed as Annexure-42
23	The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required;	<ul style="list-style-type: none"> • Complied • Environmental clearance has been granted by MoEF & CC, Govt. of India, vide File No- IA-J-11015/72/2021-IA-II (M) dated 06.03.2024.(Attached as Annexure-43)
24	No labour camp shall be established on the forest land and the User Agency shall provide fuels preferably alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas;	<ul style="list-style-type: none"> • Noted • An Undertaking is enclosed as Annexure-44

25	The boundary of the diverted forest land, mining lease and safety zone, as applicable, shall be demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, distance from pillar to pillar and GPS coordinates	<ul style="list-style-type: none"> • Noted • An Undertaking is enclosed as Annexure-45
26	The layout plan of the mining plan/ proposal shall not be changed without the prior approval of the Central Government and the forest land shall not be used for any purpose other than that specified in the proposal;	<ul style="list-style-type: none"> • Noted • An Undertaking is enclosed as Annexure-46
27	The forest land proposed to be diverted shall under no circumstances be transferred to any other agency, department or person without prior approval of the Central Government;	<ul style="list-style-type: none"> • Noted • An Undertaking is enclosed as Annexure-47
28	No damage to the flora and fauna of the adjoining area shall be caused;	<ul style="list-style-type: none"> • Noted • An Undertaking is enclosed as Annexure-48
29	The User Agency shall submit the annual self - compliance report in respect of the above stated conditions to the State Government, concerned Regional Office and to this Ministry by the end of March every year regularly	<ul style="list-style-type: none"> • Noted • An Undertaking is enclosed as Annexure-49
30	Any other condition that the concerned Regional Office of this Ministry may stipulate with the approval of competent authority in the interest of conservation, protection and development of forests & wildlife; and	<ul style="list-style-type: none"> • Noted • An Undertaking is enclosed as Annexure-50
31	The user agency shall comply all the provisions of the all Acts, Rules, Regulations, Guidelines, Hon'ble Court Order (s) and NGT Order (s) pertaining to this project, if any, for the time being in force, as applicable to the project	<ul style="list-style-type: none"> • Noted • An Undertaking is enclosed as Annexure-51
32	Violation of any of these conditions will amount to violation of Forest (Conservation) Act, 1980 and action would be taken as prescribed in para 1.21 of Chapter 1 of the Handbook of comprehensive guidelines of Forest (Conservation) Act, 1980 as issued by this Ministry's letter No. 5-2/2017-FC dated 28.03.2019	<ul style="list-style-type: none"> • Noted • An Undertaking is enclosed as Annexure-52
33	The compliance report shall be uploaded on e-portal (https://parivesh.nic.in/)	<ul style="list-style-type: none"> • Noted & shall be complied


Project Officer
Subhadra Coal Mining Ltd., Angul


Staff Officer(Env't & Forest)
MCL Subhadra Area


महा प्रबंधक
एमसीएल, सुभद्रा क्षेत्र
General Manager
MCL, Subhadra Area



Office of the General Manager
(Subhadra Area)
At/Po :Angul, Near Biju Maidan
Dist: Angul – 759122 (Odisha)
Website :www.mcl.gov.in
Email Id: gmsubhadraarea@gmail.com



Annexure-1

UNDERTAKING

PROPOSAL NO:-FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 1 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "The legal status of forest land shall remain unchanged".

General Manager
Subhadra Area, MCL

 MCL	<p>Office of the General Manager (Subhadra Area) NEAR BIJU MAIDAN Po/Dist: Angul - 759122 (Odisha) Website: www.mcl.gov.in mail id: gmsubhadraarea@gmail.com gm-subhadra.mcl@coalindia.in Phone No-06764-296537</p>	
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Ref No: MCL/GM(SA)/2024/ 372

Date: 08.05.2024

To,

Divisional Forest Officer
Angul, Forest Division

Sub . Proposal for seeking prior approval of the Central Government under Section 2 (k) of the forest (Conservation) Act, 1980 in favour of M/s Mahanadi Coalfield Ltd. for non forestry use of 125.24 ha of forest land for Subhadra Open Cast Coal Mining Project of Subhadra Area under Angul Forest Division and District Angul of Odisha State reg.

Ref.No- (i) Proposal No.FP/OR/ MIN/150133/ 2021.

(ii) Letter no-2900-DRP/dated-20.04.2024 for Demand for payment of compensatory levies through web portal.

Dear Sir,

The cost of raising and maintaining the Compensatory Afforestation as per the approved CA scheme of Rs 8,67,67,900/- (Rupees nine crore sixty-seven lakhs sixty-seven thousand nine hundred only) has been deposited on 07.05.2024 in CAMPA account no-1608258150133711 of Union Bank of India vide UTR no- SBINR52024050720845483 as per demand raised by you vide letter no- 2900-DRP/dated-20.04.2024 for compliance of condition no 2(a) stipulated in Stage-I/ In-Principle approval of forest diversion proposal of Subhadra OCP.

The copy of the UTR including NEFT/RTGS CHALLAN for CAMPA fund is enclosed herewith for kind information and necessary action.

Regards

Encl: As above

Yours faithfully

Kripa S Singh
08/05/24

General Manager
Subhadra Area

MK

For kind information to:

1. CMD, MCL
2. DT (Op), MCL
3. D (F), MCL
4. DT (P&P), MCL
5. GM (E&F), MCL
6. GM (P&P), MCL
7. GM (CMC), MCL
8. GM (L&R), MCL

Copy to:

1. Project Officer, Subhadra Project /SO (Min/P&P), Subhadra Area
2. SO(L&R), SO (Survey/E&F), Subhadra Area
3. Project Head, M/s SCML

Transaction Details	
Unique Transaction Reference Number	9BHR52024050720845483
Value Date	07/05/2024
Related Reference Number	
Amount	55757900 INR
Commission	0
MessageType	P85

Beneficiary details	
Beneficiary Account	1508258150133711
Beneficiary Name	ORISSA CAMPA
Beneficiary IFSC Code	UBIN080336
Beneficiary Address1	PCS BANGALORE
Beneficiary Address2	
Beneficiary Address3	
Dealer Code	

Details of Payment

Remitting Customer Details	
Account Number	0000011094460922
Remitter's IFSC Code	SEIN0012068
Remitter's Name	MCL HINGULA AREA
Remitter's Address1	HINGULA AREA
Remitter's Address2	
Remitter's Address3	

Sender to Receiver's Information

ATTRATFR

Error Details

Error Code
Error Reason

Additional Details

Instruction Priority	V
Purpose Code	V
Credit Status	CREDIT CONFIRMED
Credit Time	02:05:11
Credit Date	07/05/2024

Close

AGENCY COPY

यूनियन बैंक ऑफ इंडिया Union Bank of India

NEFT/RTGS CHALLAN for CAMPA Funds

Date: 23-05-2024

Agency Name,	Melasturik Coalfields Limited
Application No.,	00100123211
MoEF/CC No. No.,	1-502023-FC
Location,	ORISSA
Address,	AMAND VDIAR, BURLA-Ganaballpur
Amount(in Rs.)	55767000/-

Amount in Words: Five Crore Fifty Seven Lakh Fifty Seven Thousand Five Hundred Rupees Only

NEFT/RTGS to be made as per following details:

Beneficiary Name:	ORISSA CAMPA
IFSC Code:	UBIN0926335
Pay to Account No.	1500205100102711 Valid only for this challan amount
Bank Name & Address:	Union Bank Of India FC Centre, 21st, 1st Floor Jallika Towers, Mission Road, Bengaluru-560027

This Challan is strictly to be used for making payment to CAMPA by NEFT/RTGS only

Note: After making the required payment through or even after 7 working days, then kindly mail a copy of id to Email: fcslr@unionbankofindia.bank, oper@ubin0903710@unionbankofindia.bank

UPI QR 520 24050 7208 45483

07 MAY 2024

 MCL	Office of the General Manager (Subhadra Area) NEAR BIJU MAIDAN Po/Dist: Angul - 759122 (Odisha) Website : www.mcl.gov.in mail Id: gmsubhadraarea@central.com gm-subhadra.mcl@coalindia.in	 G20 2023 INDIA
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Ref No: MCL/GM(SA)/2024/ 694

Date: 29.08.2024

To,

The Divisional Forest Officer
 Angul, Forest Division

Sub:- Proposal for seeking prior approval of the Central Government under Section 2 (#) of the forest (Conservation) Act, 1980 in favour of M/s Mahanadi Coalfield Ltd. for non-forestry use of 125.24 ha of forest land for Subhadra OCP Coal mining under Forest Division and District Angul of Odisha State. (Intimation regarding deposit of Rs.15, 18, 13,053/- for mutation of 150.895 Ha. of Govt Land as CA Land in favour of Forest Department for raising Compensatory Afforestation in lieu of forest land to be diverted for Subhadra OCP of MCL). - Regarding

:- Alienation of Govt. land for an area of 150.895 Ha for Compensatory Afforestation in respect of Subhadra OCP of M/s MCL.

Ref No :- (i) Proposal No. FP/OR/MIN/150133/2021
 (ii) Letter No. 3413 dt. 14.08.2024 of Tahasildar, Angul.
 (iii) Letter No. 3627 dt. 22.08.2024 of Tahasildar, Angul
 (iv) Letter No - 6731 /DRP/ dtd 24.08.2024 of DFO, Angul

Dear Sir,

In reference to the above letters, it is intimated that the Amount of Rs. 15,18,13,053/- (Rupees Fifteen Crore Eighteen Lakh Thirteen Thousand Fifty-Three) only towards the cost for mutation of 110.64 ha. of non-forest government land and 40.255 ha. of revenue forest land, totalling 150.895 ha in favour of the Forest Department for compliance of conditions stipulated in Stage-I FC has been deposited to the account of Angul Tahsil through RTGS vide UTR no:-IDFBR52024082700395017 on 27.08.2024. The payment details is enclosed herewith for your kind information & necessary action

Particulars	Amount (Rs.)	Payment Details
Payment towards mutation of 150.895 Ha. of Govt. Land in favour of Forest Department as Compensatory Afforestation Land in lieu of forest land to be diverted for Subhadra OCP of MCL	Rs. 15,18,13,053.00	Amount of Rs. 15,18,13,053.00 deposited through RTGS vide UTR no:- IDFBR52024082700395017 on 27.08.2024 in favor of Angul, Tahasil in the specified Bank Account provided by Tahasildar Angul

Further, it is requested that Tahasildar, Angul may kindly be intimated regarding above payment details with reference to his letters numbers 3413/RowDt.14.08.2024 and

3627/Rev/Dt. 22.08.2024 to take necessary action for Record Correction, Mutation of sanctioned land in favour of State Forest Department and issuance of RoR (Patta) at the earliest and to provide the money receipt of the payment.

Encl:- Bank Statement of IDFC FIRST Bank

Regards

Yours faithfully

Kripa S Singh
25/8/2024
General Manager
Subhadra Area

Copy submitted to Tahasildar, Angul with reference to Memos vide 3414, Dt 14.08.2024 and 3628, Dt 22.08.2024 with a request to take early action in this regard and provide the money receipt of the payment..

For kind information to:

1. CMD, MCL
2. D(P), MCL
3. DT(Op), MCL
4. D (F), MCL
5. DT(P&P), MCL
6. GM (E&F), MCL
7. GM (P&P), MCL
8. GM (CMC), MCL
9. GM (L&R), MCL

Copy to:

1. Project Officer, Subhadra Project (SO(Min/P&P)), Subhadra Area
2. SO(Survey/E&F), Subhadra Area
3. Project Head, M/s SCML

STATEMENT OF ACCOUNT

CUSTOMER ID : 5942069079
ACCOUNT NO : 10083415571
ACCOUNT NAME : SUBHADRA COAL MINING LIMITED
STATEMENT PERIOD : 27-08-2024 to 27-08-2024



SUBHADRA COAL MINING LIMITED,
INDUSTRY HOUSE 18TH FLOOR, 10 CAMAC STREET,
KOLKATA, KOLKATA,
KOLKATA,
700017

EMAIL ID : NAVNEET.SHARDA@ADITYABIRLA.COM
PHONE NO :

ACCOUNT BRANCH : KOLKATA
BRANCH ADDRESS : KOLKATA, WEST BENGAL
RTGS/NEFT/PSU : IFB0000101
MCLR : 700751001
ACCOUNT STATUS : ACTIVE
ACCOUNT TYPE : Secured Overdraft without DP
CURRENCY : INR

Transaction Date	Payment date	Narrative	Customer Reference No	Cheque No	Debit	Credit	Running Balance
27-08-2024 12:47:08	27-08-2024	RTGS/NEFT/PSU 408270039 5017/MANGUL TAHASILUSBINI 000007	151,819,053.00	0.00	12,431.06
27-08-2024 12:14:08	27-08-2024	RTGS/IDFC/CRIS202408278706 8798/RESSEL MINING and IND USTRIES LTD INDUSTRIES HOUGAIDFC0000008	0.00	151,800,000.00	151,831,484.06

IMPORTANT MESSAGE

- Unless the constituent notifies the bank immediately of any discrepancy found by him in this statement, it will be taken that he has found the account correct.
- 'Value date' is the effective date of Credit/Debit in the account.
- Bank does not send requests for Internet Banking Login ID, Password, Credit/Debit card numbers, or other sensitive financial information by e-mail. If you do receive a message of this type that appears to be from Bank or related to Bank product or service, please do not respond. Send a copy of the message and any related details to service@idfcfirstbank.com
- This is a system generated output and requires no signature.

----- End of the statement -----

 <p>ITUW TSA NEW DELHI 2024</p>	<p>Office of the General Manager (Subhadra Area) At/Po :Angul, Near Biju Maidan Dist Angul – 759122 (Odisha) Website :www.mcl.gov.in Email Id: gmsubhadraarea@gmail.com</p>	 <p>MCL</p>
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Annexure -4a 4b 4c 4d

UNDERTAKING

PROPOSAL NO:-FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 2(b) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that 150.895 Ha. of Govt. non-forest land and degraded revenue forest land, identified for raising Compensatory Afforestation shall be notified by the State Government as PF under the relevant Section (s) of the local Forest Act. The PF Notification will be submitted after publication by the State Govt before Stage-II approval.


General Manager
Subhadra Area, MCL
H

ଖତିୟାନ

ନୌଜା : ଗୋଡ଼ସିଙ୍ଗା
 ଥାନା : ପୁରୁଣାଲୋକ
 ଥାନା ନମ୍ବର : "1"

ଚହସିଲ : ଅନୁଗୋଳ,
 ଚହସିଲ ନମ୍ବର : ""
 ଜିଲ୍ଲା : ଅନୁଗୋଳ.

କୌଣସି ନାମ ଓ ଖୋସାଚ ବା ଖତିୟାନର କ୍ରମିକ ନମ୍ବର	ଓଡ଼ିଶା ସରକାର ପ୍ରଥମ ଭାଗ ଖୋସାଚ ନମ୍ବର 1
୧) ଖତିୟାନର କ୍ରମିକ ନଂ	2/1
୨) ପ୍ରକାର ନାମ, ପିତାଙ୍କ ନାମ, ଜାତି ଓ ବାସସ୍ଥାନ	ଜଙ୍ଗଲ, ପରିବେଶ ଓ ଜଳବାୟୁ ପରିବର୍ତ୍ତନ ବିଭାଗ, ଓଡ଼ିଶା ସରକାର

୩) ସ୍ୱରୂପ						
୪) ଦେୟ	ଜମାଦାର	ଖଜଣା	ସେସ	ନିଷ୍କାର ସେସ ଓ ଅନ୍ୟାନ୍ୟ ସେସ ଯଦି କିଛି ଥାଏ	ମୋଟ	୫) କ୍ରମବର୍ତ୍ତନଶୀଳ ଖଜଣାର ବିବରଣୀ
		0.00	0.00	0.00	0.00	

୬) ବିଶେଷ ଅନୁସଙ୍ଗ ଯଦି କିଛି ଥାଏ
 Alienation କେସ ନଂ 03/2024 (RCCMS Case No. 26-3/2024 & LRMS No. 4021/2024) ଦ୍ୱାରା ମୁଦାବର ଖାତା ନଂ 1 ରୁ

BLANK SPACE FOR STAMPING

ଅତିରିକ୍ତ ପ୍ରକାଶନ ଚାରିଖା :
 ଖଜଣା ଧାର୍ଯ୍ୟ ଚାରିଖା :



(Signature)
 ADDL. TAHASILDAR
 ANGUL

ଖଣ୍ଡପତ୍ର ନମ୍ବର : 2/1		ନାମ : ରୋହିଣୀ			ପିଲା : ଅନୁଭାବ	
ପୁର ନମ୍ବର ଓ ପଲ୍ଲୀ ନାମ	ଝିଅର ଓ ପୁଅର ନାମ	ଝିଅର ଓ ପୁଅର ବିବରଣୀ ଓ ଚୈତ୍ର	ରାଜସ୍ୱ			ମତା
			କେନ୍ଦ୍ର	ଝି	ଝାଡ଼ା	
୭	୮	୯	୧୦	୧୧	୧୨	
965/1386	ପଞ୍ଚାବ		107720		43.5931	
1 ପୁଅ			107720		43.5931	

Record Keeper

*ADDL. TAHASILDAR
ANGUL*

ଖତିୟାନ

ମୌଜା : ବୁଝୁରିପଦା
 ଥାନା : ବରଗା
 ଥାନା ନମ୍ବର : "61"

ତହସିଲ : ଅନୁଗୋଳ
 ତହସିଲ ନମ୍ବର : ""
 ଜିଲ୍ଲା : ଅନୁଗୋଳ

ଜମିଦାରଙ୍କ ନାମ ଓ ଖେତ୍ରାଂଶ ବା ଖତିୟାନର କ୍ରମିକ ନମ୍ବର : ଓଡ଼ିଶା ସରକାର ପ୍ରଥମ ଭାଗ ଖେତ୍ରାଂଶ ନମ୍ବର 1

୧) ଖତିୟାନର କ୍ରମିକ ନଂ : 2/4

୨) ପ୍ରକାର ନାମ, ପିତାଙ୍କ ନାମ, ଜାତି ଓ ବାସସ୍ଥାନ : ଜଙ୍ଗଲ, ପରିବେଶ ଓ ଜଳବାୟୁ ପରିବର୍ତ୍ତନ ବିଭାଗ, ଓଡ଼ିଶା ସରକାର

ଖ) ସେର	କରକର	ଖରଣା	ସେସ	ନିତ୍ତୀର ସେସ ଓ ଅନ୍ୟାନ୍ୟ ସେସ ଯଦି କିଛି ଥାଏ	ମୋଟ	୪) ପ୍ରମାଣିତ-ଶାଳ ଖରଣାରେ ବିବରଣୀ
		0.00	0.00	0.00	0.00	

୩) ବିଶେଷ ଅନୁପତ୍ତୀ ଯଦି କିଛି ଥାଏ : Alienation କେଶ୍ ନଂ 04/2024 (RCCMS Case No. 26-2/2024 & LRMS No. 4005/2024) ହୁକୁମି ମୁତାବକ ଖାତା ନଂ 1 ରୁ



BLANK SPACE FOR STAMPING

ADDL. TAHASILDAR
 ANGUL

ଅଭିନ ପ୍ରକାଶନ ତାରିଖ :
 ଖରଣା ଆୟତ୍ତ ତାରିଖ :

ଅଧିକାରୀଙ୍କ କ୍ରମିକ ନଂ : 2/4		ଶ୍ରେଣୀ : ମୁଦ୍ରାପତ୍ର			ଡିଭି : ପ୍ରମୁଖାଳୟ
ପୁସ୍ତକ ନମ୍ବର ଓ ଚଳନ ନମ୍ବର	ବିଷୟ ଓ ପ୍ରକାର ଖରଣା	ବିଷୟର ବିସ୍ତାରିତ ବିବରଣୀ ଓ ଚୈତ୍ର	ତରଫ		ମାତ୍ରା
			ପକ୍ଷ	ଫି	
୭	୮	୯	୧୦	୧୧	୧୨
୫/1528	ପ୍ରମୁଖାଳୟ ପତ୍ର		47261	19.1260	
1 ପୃଷ୍ଠା			47261	19.1260	

Records Keeper

ADDL. TAHASILDAR
ANGUL

ଖତିୟାନ

ମୌଜା : ଲଖା
 ଥାନା : ବରବା
 ଥାନା ନମ୍ବର : "୫୭"

ଚହସିଲ : ଅନୁଗୋଳ
 ଚହସିଲ ନମ୍ବର : ""
 ଜିଲ୍ଲା : ଅନୁଗୋଳ

ଭୂମିଦାରଙ୍କ ନାମ ଓ ଖେତ୍ରାଂଶ ବା ଖତିୟାନର କ୍ରମିକ ନମ୍ବର	ଓଡ଼ିଶା ସରକାର ପ୍ରଥମ ଭାଗ ଖେତାଟ ନମ୍ବର 1
୧) ଖତିୟାନର କ୍ରମିକ ନଂ	2/4
୨) ପ୍ରକାର ନାମ, ପିତାଙ୍କ ନାମ, ଜାତି ଓ ବାସସ୍ଥାନ	ଜଙ୍ଗଲ, ପରିବେଶ ଓ ଜଳବାୟୁ ପରିବର୍ତ୍ତନ ବିଭାଗ, ଓଡ଼ିଶା ସରକାର

ଖ) ସ୍ୱତ୍ୱ	ଲକ୍ଷକର	ଖଜଣା	ସେସ	ନିତ୍ତର ସେସ ଓ ଅନ୍ୟାନ୍ୟ ସେସ ଯଦି କିଛି ଥାଏ	ମୋଟ	୩) କ୍ରମବର୍ତ୍ତନଶୀଳ ଖାତାରେ ବିବରଣୀ
୪) ଦେୟ		0.00	0.00	0.00	0.00	

୬) ବିଶେଷ ଅନୁସଙ୍ଗ ଯଦି କିଛି ଥାଏ
 Alienation ଚେଣ୍ଟି ନଂ 05/2024 (RCCMS Case No. 26-8/2024 & LRMS No. 4026/2024) ଦୁଇଟି ମୂତାବକ ଖାତା ନଂ 2/2 ରୁ Alienation ଚେଣ୍ଟି ନଂ 05/2024 (RCCMS Case No. 26-7/2024 & LRMS No. 4025/2024) ଦୁଇଟି ମୂତାବକ ମୂତାବକ ଖାତା ନଂ 1 ରୁ

BLANK SPACE FOR STAMPING


ଅତିରିକ୍ତ ପ୍ରକାଶକ ଚାରିଖା :
 ଖଜଣା ଧାର୍ଯ୍ୟ ଚାରିଖା :



(Signature)
 ADDL. TAHASILDAR
 ANGUL

ଖତିୟାନର କ୍ରମିକ ନଂ : 2/4		ମୌଜା : ନଖା			ସିଦ୍ଧା : ଅନୁରୋଧ	
ପୁର ବସ୍ତୁର ଓ ବଳର ନାମ	ବିସମ୍ପଦ ଓ ପୁରର ସାମଗ୍ରୀ	ଦିନମାନ ବିଭାଜିତ ବିବରଣୀ ଓ ଚୈତ୍ର	ଉତ୍ତର			ମଟ୍ଟଦମ୍
			ଏକକ	ଫି	ଫେଡ୍	
୭	୮	୯	୧୦	୧୧	୧୨	
1657	ପୁରାତନ ପଟିତ		43293	1.7520		
1648/2205	ପୁରାତନ ପଟିତ		88538	3.5830		
1656/2204	ପୁରାତନ ପଟିତ		19504	7.8930		
3 ଫୁଟ			326871	13.2280		

Record Keeper


 ADDL. TAHASILDAR
 ANGUL

ଖତିୟାନ

ମୌଜା : ଯାମୁରାଡ଼ିଆ
 ଥାନା : ବରଗା
 ଥାନା ନମ୍ବର : "64"

ଚହସିଲ : ଅନୁଗୋଳ
 ଚହସିଲ ନମ୍ବର : ""
 ଜିଲ୍ଲା : ଅନୁଗୋଳ

କୌଣସି ନାମ ଓ ଖେତ୍ରର ବା ଖତିୟାନର କ୍ରମିକ ନମ୍ବର	ଓଡ଼ିଶା ସରକାର ପ୍ରଥମ ଭାର ଖେତାଟ ନମ୍ବର 1
୧) ଖତିୟାନର କ୍ରମିକ ନଂ	2/4
୨) ପ୍ରକାର ନାମ, ପିତାଙ୍କ ନାମ, ଜାତି ଓ ବାସସ୍ଥାନ	ଜଙ୍ଗଲ, ପରିବେଶ ଓ ଜଳବାୟୁ ପରିବର୍ତ୍ତନ ବିଭାଗ, ଓଡ଼ିଶା ସରକାର

୩) ସ୍ୱରୂପ						
୪) ଦେୟ	କଳବର	ଖରଣା	ସେସ	ନିୟମିତ ସେସ ଓ ଅନ୍ୟାନ୍ୟ ସେସ ଯଦି କିଛି ଥାଏ	ମୋଟ	୫) ନୁନବର୍ତ୍ତନଶୀଳ ଖରଣାର ବିବରଣୀ
		0.00	0.00	0.00	0.00	

୬) ବିଶେଷ ଅନୁସଙ୍ଗ
ଯଦି କିଛି ଥାଏ

Alienation କେଶ ନଂ 06/2024 (RCCMS Case No. 26-4/2024 & LRMS No. 4022/2024) ହୁକୁମ
 ମୁଗାବର ଖାତା ନଂ 1 ରୁ Alienation କେଶ ନଂ 06/2024 (RCCMS Case No. 26-5/2024 & LRMS
 No. 4023/2024) ହୁକୁମ ମୁଗାବର ଖାତା ନଂ 2/2 ରୁ




BLANK SPACE FOR STAMPING

ଅତିମ ପ୍ରକାଶକ ତାରିଖ :
 ଖରଣା ଆୟତ୍ତ ତାରିଖ :


 ADDL. TAHASILDAR
 ANGUL 11/09/2024

କଟିଯାଇଥିବା ପୂର୍ବକ ନଂ : 214		କୋଷ : ସାମୁଗାମିଆ			ପିଲା : ଅନୁଭାବ
ପୂର୍ବ ନମ୍ବର ଓ ବର୍ଷ ନମ୍ବର	ନିୟମ ଓ ପୁରାଣ ଖଣ୍ଡ	ନିୟମର ବିଭାଗିକ ବିବରଣୀ ଓ ଚୌକି	ରାଶି		ମଟା
			ଏକକ	ପୂ	
୭	୮	୯	୧୦	୧୧	୧୨
1107/1419	ପୁରାଣ ପଠିତ		19	578	7.9230
1117	ପୁରାଣ ପଠିତ		53	480	21.6426
1089	ପୁରାଣ ପଠିତ		12	669	5.1270
୩ ରୁ			85	727	34.6926


Record Keeper


ADDL. TAHASILDAR
ANGUL

ଖତିୟାନ

ମୌଜା : ବାଲୁଆପାଟ
 ଥାନା : ପୁରୁଣାବୋଟ
 ଥାନା ନମ୍ବର : "22"

ଚହସିଲ : ଅନୁଗୋଳ
 ଚହସିଲ ନମ୍ବର : ""
 ଜିଲ୍ଲା : ଅନୁଗୋଳ

ଜମିଦାରଙ୍କ ନାମ ଓ ଖୋସ୍ତାର
 ବା ଖତିୟାନର କ୍ରମିକ
 ନମ୍ବର

ଓଡ଼ିଶା ସରକାର ପ୍ରଥମ ଭାଗ ଖେତାଟ ନମ୍ବର 1

୧) ଖତିୟାନର କ୍ରମିକ ନଂ

2/1

୨) ପ୍ରକାର ନାମ, ପିଚାର
 ନାମ , ଜାତି ଓ ବାସସ୍ଥାନ

ଜଙ୍ଗଲ, ପରିବେଶ ଓ ଜଳବାୟୁ ପରିବର୍ତ୍ତନ ବିଭାଗ, ଓଡ଼ିଶା ସରକାର

୩) ସ୍ୱରୂପ

୪) ବେଢା	ଜମ୍ବବର	ଖରଜା	ସେସ	ନିଷ୍କାର ସେସ ଓ ଅନ୍ୟାନ୍ୟ ସେସ ଯଦି କିଛି ଥାଏ		୫) କ୍ରମବର୍ତ୍ତନଶୀଳ ଖରଜାଗ ବିବରଣୀ
				ମୋଟ		
		0.00	0.00	0.00	0.00	

୬) ବିଶେଷ ଅନୁସଙ୍ଗ
 ଯଦି କିଛି ଥାଏ

Alienation କେଶ ନଂ 07/2024 (RCCMS Case No. 26-6/2024 & LRMS No. 4024/2024) ଦୁଇମ
 ମୁଦାବବ ଖାତା ନଂ 1 ରୁ



BLANK SPACE FOR STAMPING

ଅତିରିକ୍ତ ପ୍ରକାଶନ ତାରିଖ :
 ଖରଜା ଧାର୍ଯ୍ୟ ତାରିଖ :

(Signature)
 ADDL. TAHASILDAR
 ANGUL

କର୍ମସୂଚୀର କ୍ରମିକ ନଂ : 2/1		କ୍ଷେତ୍ର : ବାଲୁଆପାଟଣା			ଠିକଣା : ଅନୁଗୋଳ	
ପୁର ନମ୍ବର ଓ ପ୍ରକାର ନାମ	ବିସମ୍ପର ଓ ପ୍ରକାର ଖରଣା	ବିସମ୍ପର ବିଭାଗିତ ବିବରଣୀ ଓ ଖଣିରାଜି	ରକର			ମଟର
			ଏକର	ଠି	ସେଣ୍ଟି	
୨	୮	୯	୧୦	୧୧	୧୨	
251/547	କୋଳ ବନ୍ଦଳ		38	036	15.3030	
283/548	କୋଳ ବନ୍ଦଳ		14	898	6.0290	
284/549	କୋଳ ବନ୍ଦଳ		8	9477	3.6210	
298/550	କୋଳ ବନ୍ଦଳ		37	589	15.2120	
4 ପୃଷ୍ଠ			99	4707	40.2550	

Record Keeper

ADDL. TAHASILDAR
ANGUL

Annexure -5

OFFICE OF THE DIVISIONAL FOREST OFFICER; ANGUL DIVISION: ANGUL

Memo No. 7293 DRP/Dated. 19-09-2024

To

The Regional Chief Conservator of Forests,
Angul Circle, Angul.

Sub: -

Proposal for Seeking prior approval of Central Government under section 2 (ii) of the forest (Conservation) Act, 1980 in favour of M/s Mahanadi Coal filed Ltd. for non-forestry use of 125.24 ha forest land for Subhadra OCP Coal mining under Angul Forest Division and District Angul of Odisha State-reg. projects of Subhadra Area.

: - Notification of forest mutated in favor of the Forest Department for the diverted forest land of protected forest under Section 33 of the Odisha Forest Act, 1972.

Ref: -

- 1) Online proposal No. FP/OR/MIN/150133/2021.
- 2) Stage-I/In-Principal No. 8-06/2023-FC dt. 05.12.2023 of Govt. of India MoEF&CC.
- 3) Memo No. 25840/FE & CC dt. 14.12.2023 of OSD-cum-SS to Govt.
- 4) Memo No. 24938 dt. 20.12.2023 of PCCF, Nodal, O/o the PCCF, O, BBSR.

With reference to the above memo numbers on the captioned subject, it is to inform you that the draft notification, along with copies of the RoRs and maps of mutated non-forest government land, extending to 150.895 hectares in the following villages—Rodasingha (43.5931 ha), Nukhuripada (19.1260 ha), Kanja (13.2280 ha), Jamugadia (34.6296 ha), and Baghuapat (40.2550 ha) is enclosed herewith in four sets, each for notification as Protected Forests under Section 33 of the Odisha Forest Act, 1972.

This is for kind information and necessary action.

- Encl: 1. Draft Notification for P.F-4 copies of each village.
2. Copy of Stage-1 approval--4 copies of each village.
3. Copy of Land Schedule-4 copies of each village.
4. Copy of RoR-4 Copies of each village.
5. GPS co-ordinate Map in tracing cloth -4 copies of each village.


Divisional Forest Officer,
Angul Division

Memo No 7294 Dated 19-09-2024

Copy forwarded to the Principal Chief Conservator of Forests, Forest Division & Nodal Officer F.C. Act O/o the P.C.C.F & HoFF, Odisha, Bhubaneswar for favour of kind information and necessary action.


Divisional Forest Officer,
Angul Division

Memo No. 7295 / Dated. 19-09-2024

Copy forwarded to the General Manager, Subhadra Area, At. /PO/Dist.- Angul, Odisha, Pin- 759122 for information and necessary action.


Divisional Forest Officer
Angul Division



OFFICE OF THE REGIONAL CHIEF CONSERVATOR OF FORESTS; ANGUL CIRCLE,
AT/PO- HAKIMPADA, ANGUL- 759143, ODISHA, Phone-06764-296010 (O), 296011(Res).

Email Id: rccfangul@gmail.com.

Memo No. 3743 /SF.FC-34/2024. dated. 26.9.24

To

The Principal Chief Conservator of Forests
(Forest Diversion & Nodal Officer, FC Act),
O/o the Principal Chief Conservator of Forests & HoFF, Odisha.


Sub:- Proposal for seeking prior approval of Central Govt. under Section 2(ii) of Forest (Conservation) Act, 1980 in favour of M/s- MCL for non-forestry use of 125.24 ha of forest land for Subhadra OCP Coal mining under Angul Forest Division in Angul District - Submission of Draft Notification Proposal.

Ref:- (i) Letter No.8-06/2023-FC dated 5.12.2023 of GoI, MoEF & CC.
(ii) Memo No.25836/FE&CC dated 14.12.2023 of Govt. of Odisha, FE & CC Department.

In inviting a reference to the letters cited above on the subject this is to inform that the Divisional Forest Officer, Angul Forest Division has submitted Draft Notification Proposal for declaration of the identified Govt. non-forest land/ Degraded Revenue Forest Land for creation of Compensatory Afforestation as Protected Forest under section-33 of Odisha Forest Act, 1972 in respect of the above project vide his Memo No.7293 dated 19.9.2024 against condition No. 2 (b) of the stage- I approval order. As per guidelines issued vide your Memo No. 9998 dated 13.5.2022 the following documents submitted by the DFO are sent herewith in three sets for favour of information and necessary action.

1. Draft Notification Proposal.
2. Copy of stage-I approval order.
3. Joint verification report with land schedule & certificate regarding non-encroachment and encumbrance, area suitable for plantation, not covered under DLC category of land, not covered under any ML/PL area, not covered under section-4(I) notification, not settled earlier in favour of any individual / community under Forest Rights Act, 2006, the land is not allotted to any other agency etc duly authenticated by the Tahasildar, Angul .
4. Alienation order of the identified non-forest land Govt. land/ Degraded Revenue Forest Land for raising CA from the Collector, Angul .
5. Copy of RoR issued by Addl. Tahasildar, Angul.
6. GPS co-ordinate map in tracing cloth.
7. Copy of enlarged cadastral sheet on tracing cloth showing clearly the transferred and mutated CA land with details of boundary description and GPS co-ordinates with pillar to pillar distance of each boundary pillar posted around the mutated CA land submitted by DFO, Angul Forest Division and Tahasildar, Angul duly authenticated by ORSAC.
8. Copy of allotment order of identified non-forest Govt. land/ Degraded Revenue Forest Land.

Encl: As above.


 Regional Chief Conservator of Forests,
 Angul.


Memo No. 3744 /dated. 26-9-24

Copy forwarded to the Divisional Forest Officer, Angul Forest Division for information and necessary action with reference to his Memo No.7294 dated 19.09.2024.


26/9/24
Regional Chief Conservator of Forests,
Angul.

Memo No. 3745 /dated. 26-9-24

Copy forwarded to the General Manager, Subhadra Area, At./PO./Dist- Angul, Odisha, Pin-759122 for information and necessary action.


26/9/24
Regional Chief Conservator of Forests,
Angul



STATE FOREST HEADQUARTERS, ODISHA
OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS & HOFF
PLOT NO.GD-2/12, ARANYA BHAWAN, CHANDRASEKHARPUR
BHUBANESWAR-751023

Es-mail: nodal.pccfhoff@odisha.gov.in

Memo No.

2003

/9F(MG)-398/2022

Dated, Bhubaneswar, the

04th

October, 2024

To

The Regional Chief Conservator of Forests,
Angul Circle, Angul

Sub: Proposal for seeking prior approval of Central Govt. Under Section 2(ii) of Forest (Conservation) Act, 1980 in favour of M/s MCL for non-forestry use of 125.24 ha of forest land for Subhadra OCP Coal mining under Angul Forest Division in Angul District – Submission of Draft Notification Proposal.

Ref: (i) Letter No.8-06/2023-FC dated 05.12.2023 of the GoI, MoEF & CC, FC Division, New Delhi communicated vide letter No.10F(Cons) 08/2023 -25836/FE&CC dated. 14.12.2023 of the State Govt.
(ii) Your Memo No.3743 dt. 26.09.2024.

In inviting a reference to the above cited correspondence on the captioned subject, I am directed to inform you that during scrutiny of the PF Notification proposal submitted, the following discrepancies have been noticed for which the said PF notification proposal could not be processed & sent to Govt. And are being returned to you now for necessary compliances :-

1. The joint verification reports of the identified CA land for raising of Compensatory Afforestation pertaining to village Jamugaria, Nukharipada, Rodasingha, Baghuapat and Kanja furnished herewith against this project has not been countersigned by the DFO, Angul Forest Division.
2. The land schedule of the identified CA land prior to mutation and after mutation in favour of the State Govt. pertaining to the above 5 nos. of villages has not been countersigned by the Tahasildar concerned.
3. Boundary description of the individual mutated CA land plot pertaining to the village Baghuapat, Jamugadia and Kanja under Angul Tahasil of Angul District needs to be furnished with due counter signature from both the DFO, Angul Division & Tahasildar, Angul Tahasil.
4. GPS Coordinate with pillar to pillar distance of the boundary pillars posted around the mutated CA land pertaining to the above 5 nos. of villages needs to be furnished with due authentication from both the DFO, Angul Division & Tahasildar, Angul Tahasil.

In view of the above, the draft PF Notification proposals submitted by you pertaining to the above 5 nos. of villages are returned herewith for necessary compliances and re-submission to this office at the earliest for processing of the proposal at this end and onward transmission to the Govt..

Encl: As above


Chief Conservator of Forests (Nodal)

Memo No. 20004 /Dt. 04.10.2024

Copy forwarded to the Divisional Forest Officer, Angul Forest Division for information & necessary action with reference to Memo No.3744 dated 26.09.2024 of the RCCF, Angul Circle. to his address.


Chief Conservator of Forests (Nodal)

Memo No. 20005 /Dt. 04.10.2024

Copy forwarded to the General Manager, Subhadra Area, MCL, At/PO/Dist-Angul, Odisha, Pin-759122 for information and necessary action with reference to Memo No.3745 dated 26.09.2024 of the RCCF, Angul Circle. to his address.


Chief Conservator of Forests (Nodal)

OFFICE OF THE DIVISIONAL FOREST OFFICER; ANGUL DIVISION; ANGUL

Memo No. 3059 /DRP/2023/Dated. 21.10.2024

To

The Regional Chief Conservator of Forests,
Angul Circle, Angul.

Sub: -

Proposal for Seeking prior approval of Central Government under section 2 (ii) of the forest (Conservation) Act, 1980 in favour of M/s Mahanadi Coal filed Ltd. for non-forestry use of 125.24 ha forest land for Subhadra OCP Coal mining under Angul Forest Division and District Angul of Odisha State-reg. projects of Subhadra Area.

Ref: -

1. Memo No. 20003 dt. 04.10.2024 of PCCF, Nodal.
2. Your memo No. 3949 dt. 18.10.2024.

With reference to the memo numbers cited above on the captioned subject, it is to inform you that the Principal Chief Conservator of Forests, Forest Diversion & Nodal Officer FC Act, O/o the PCCF Odisha, Bhubaneswar, during the scrutiny of the PF Notification proposal, noted the following discrepancies.

In context of observation point No. (1)

The joint verification reports of the identified CA land for raising of Compensatory Afforestation pertaining to village Jamugaria, Nukhuripada, Rodasingha, Baghuapat and Kanja furnished herewith against this project has not been countersigned by the DFO, Angul Forest Division.

Reply

In response to this observation, the joint verification reports of the identified CA land for raising compensatory afforestation in the villages of Jamugaria, Nukhuripada, Rodasingha, Baghuapat, and Kanja have been countersigned by the DFO, Angul Forest Division.

In context of observation point No. (2)

The land schedule of the identified CA land prior to mutation and after mutation in favour of the State Govt. pertaining to the above 5 nos. of villages has not been countersigned by the Tahasildar concerned.

Reply

In response to this observation, the land schedule of the identified CA land, both prior to and after mutation in favor of the State Government, pertaining to the above five villages, has been countersigned by the Tahasildar, Angul.

In context of observation point No. (3)

Boundary description of the individual mutated CA land plot pertaining to the village Baghuapat, Jamugaria and Kanja under Angul Tahasil of Angul District needs to be furnished with due counter signature from both the DFO, Angul Division and Tahasildar, Angul Tahasil.

Reply

In response to this observation, the boundary description of the individual mutated CA land plots pertaining to the villages of Baghuapat, Jamugaria, and Kanja under Angul Tahasil in Angul District has been countersigned by both the DFO, Angul Division, and the Tahasildar, Angul Tahasil.

In context of observation point No. (4)

GPS Coordinate with pillar-to-pillar distance of the boundary pillars posted around the mutated CA land pertaining to the above 5 nos. of villages needs to be furnished with due authentication from both the DFO, Angul Division & Tahasildar, Angul Tahasil.

Reply

In response to this observation, the GPS coordinates and pillar-to-pillar distances of the boundary pillars posted around the mutated CA land pertaining to the above five villages have been authenticated by both the DFO, Angul Division, and the Tahasildar, Angul Tahasil.

Hence, the compliance reports for the PF Notification proposal are enclosed herewith in four sets, for your kind information and necessary action.


Encl: -

As above.


Divisional Forest Officer
Angul Division


Memo No. 8060 / Dated. 21/10-2024

Copy forwarded to the Principal Chief Conservator of Forests, Forest Diversion & Nodal Officer FC Act O/O the PCCF Odisha, Bhubaneswar for favour of kind information and necessary action.


Divisional Forest Officer
Angul Division

Memo No. 8061 / Dated. 21/10-2024

Copy forwarded to the General Manager, Subhadra Area, At. /PO/Dist.- Angul, Odisha, Pin- 759122 for information and necessary action.


Divisional Forest Officer
Angul Division



Office of the General Manager
(Subhadra Area)
At/Po :Angul, Near Biju Maidan
Dist: Angul – 759122 (Odisha)
Website :www.mcl.gov.in
Email Id: gmsubhadraarea@gmail.com



Annexure-9

UNDERTAKING

PROPOSAL NO:-FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 2(b) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that 150.895 Ha. of Govt. non-forest land and degraded revenue forest land, identified for raising Compensatory Afforestation shall be notified by the State Government as PF under the relevant Section (s) of the local Forest Act and same will be submitted after publication of PF Notification by the State Govt.

General Manager
Subhadra Area, MCL

Diversion for 125.24 ha of Forest Land coming within SubhadraOpen Cast Project of MCL, Angul

Range	Seedlings Nos.	Location	Land Type	Plantation Type	Area	Fencing in meter	Cost
Bantala	13228	Kanja	Non-Forest	1000	13.228	1680	11841173
Bantala	30602	Nukhripada	Non-Forest	1600	19.126	1930	17887833
Bantala	34693	Jamugadia	Non-Forest	1000	34.693	5670	33743594
Bantala	40255	Baghuapat	Rev. Forest	1000	40.255	4600	34944699
Jarapada	8719	Rodasingha	Non-Forest	200	43.593	0	7282668
	127497				150.895	13880	105699967

OR 500/10,57,00,000/-

[Signature]
 प्रकल्प अधिकारी
 Project Officer
 MCL, Subhadra Area
 अ.प्र. वि. एन. सुभद्रा क्षेत्र

[Signature]
 Divisional Forest Officer
 Angul Division

CHECK LIST SERIAL NUMBER-18
SCHEME FOR
COMPENSATORY AFFORESTATION SCHEME
OVER AN AREA OF 13.228HA IN NON-FOREST
LAND IDENTIFIED IN THE VILLAGE KANJA,
BANTALA RANGE
UNDER
ANGUL TAHASIL
OF
DISTRICT ANGUL
IN
LIEU OF PROPOSED FOREST DIVERSION FOR 125.24
HA OF FOREST LAND COMING WITHIN SUBHADRA
OPEN CAST PROJECT
OF
M/S MCL, DIST-ANGUL

Plantation Model:

AR Plantation over ha@1000plants per ha

Prepared By


Divisional Forest Officer,
Divisional Forest Officer
Angul Division

Contents

Sl no	Description	Annexures	Page No
1	Land suitability Certificate	--	
2	Details of Scheme	--	
3	Land schedule	I	
4	ORSAC Authentication Letter	II	
5	AR Plantation @1000/ha	III	
6	Cost norm & matrix for chain link Fencing	IV	
7	Cost norm matrix for SMC (Model -C)	V	
8	Watering, Solar Borewell fitted with Drip System	VI	
MAPS			PLATE
9	Cadastral Map of CA land identified at Village Kanja (Plate-I)		Plate-I
10	DGPS map of the CA land at Kanja (Authenticated by ORSAC) (Plate-II)		Plate-II
11	Corresponding Topo map (1:50000 Scale) (Plate-III)		Plate-III
12	KML File in CD		

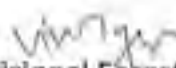
Land Suitability Certificate

The requirement of suitable non-Forest land at par with the guidelines of MoEF & CC is a vital aspect for raising Compensatory Afforestation in lieu diversion of Forest land for Non forestry purpose of a project under FC Act, 1980.

In the instant case diversion of Forest land to the extent of 125.24ha is required for the project "Subhadra Open Cast Project of M/s MCL in the district of Angul. According required exercises were undertaken in the field by Forest and Revenue Staff jointly to select suitable Non forest land/ Govt degraded forest land for the purpose of Compensatory Afforestation for the said project. Finally One patch of Non forest land over 13.228 of Kanja Village was selected in Bantala Range with suitability criteria to accommodate required no of seedlings AR plantations@1000plantations per ha . Criteria of suitability of the sites meet relevant parameters such as management point of view, free from encroachment and encumbrances, not included in Section -4(1) notification, not under DLC status of forest, non allotment of the said areas for other projects etc as narrated against this site furnished in Annexure-I. Besides soil quality , soil depth, terrain , climatic conditions etc are suitable for planting indigenous promising species for sustained growth and establishment and over and above location of the site with respect to closeness to nearby forest block of Angul Division which will ensure proper supervision, monitoring of the plantation raised under Compensatory Afforestation Scheme. Plantations activities will be as done per the approved One time Cost Norm of PCCF, Odisha and it is hoped to ensure proper greenery with improved environmental scenario after implementation of the said plantation.

Place:

Date:


Divisional Forest Officer,
Angul Division

Scheme

This scheme is for taking up Compensatory Afforestation is on identified Non forest land in Village Kanja of Bantala Range under Angul Tahasil in the District of Angul in lieu of Proposed Forest Diversion or 125.24 ha of Forest land coming within Subhadra Open Cast Project of M/s MCL, Dist-Angul.

1. Introduction: The Subhadra Open Cast Mining Lease is over an area of 1111.85 ha. Out of which Forest land located in Mining lease is 125.24ha and Non forest area is 986.61ha as per the land schedule. The User Agency M/s MCL has filed forest Diversion Proposal Vide Proposal No FP/OR/MIN/150133/2021.

On application for providing Compensatory Afforestation Land, the Collector and District Magistrate , Angul has allotted 110.640ha of Non forest Revenue land and 40.255ha of Revenue Degraded Forest area spread over in 5 patches vide his letter no dated . This scheme is meant for 13.228ha of Non forest land in village Kanja which has been jointly verified by the Revenue staff and Forest staff. The selected land schedule is coming under Bantala Range of Angul Division (Annexure-I)

Land schedule:

Land Schedule of land jointly verified by Revenue and Forest Staffs for Compensatory Afforestation								
Village	Khata No	Plot No	Total Plot Area in Hectare	Area taken for plantation in ha	Kisam	Remark	Nearest Forest Block	Approximate distance from the proposed site
Bantala Range								
Kanja	2/2	1657	1.752	1.752	PuratanaPatita	Nonforest	Nuakheta RF	0.25Km
	1	1656(p)	8.167	7.893				0.3Km
	1	1648/1(p)	7.195	3.583				0.35Km
S.toal			17.114	13.228				

2. DGPS Survey, Mapping & Authentication of CA Land.

As per the revised guidelines of Chief Executive, ORSAC, the User Agency has taken up DGPS Survey by empaneled vendors and the same has been authenticated by ORSAC vide his letter no ORSAC/DGPS-FD/1080/2022/3203(2) Dated 03/09/2022 and due endorsement has been furnished on DGPS surveyed Map. The DGPS Map, Corresponding Topo map (Survey of India map F45T2 1:50000 Scale) are enclosed to this Scheme. The KML File of the area is submitted in a CD. (Letter of Authentication by ORSAC at Annexure-II)

The Latitude / Longitude of Survey Points as per DGPS authenticated Map is furnished below.

DGPS OBSERVATION CO-ORDINATES OF BOUNDARY PILLARS			
SL.NO	MAP ID	LONGITUDE	LATITUDE
1	1	85°07'32.76280"	20°38'56.91891"
2	2	85°07'34.91549"	20°38'57.37527"
3	3	85°07'38.97949"	20°38'57.27892"
4	4	85°07'39.08182"	20°38'58.85564"
5	5	85°07'42.45130"	20°38'58.89083"
6	6	85°07'42.41153"	20°38'57.62796"
7	7	85°07'48.25243"	20°38'58.79407"
8	8	85°07'48.31709"	20°38'51.73080"
9	9	85°07'42.62337"	20°38'50.58797"
10	10	85°07'42.66013"	20°38'48.93133"
11	11	85°07'40.40450"	20°38'49.05139"
12	12	85°07'40.42536"	20°38'47.17961"
13	13	85°07'37.24973"	20°38'46.48599"
14	14	85°07'33.42153"	20°38'45.33148"
15	15	85°07'33.21290"	20°38'48.16616"
16	16	85°07'32.55840"	20°38'48.34023"

3. Topography & Soil:

The identified area in above village is having partly hilly and partly plain terrain. The soil is lateritic and gravelly but the soil depth is suitable for taking up plantation. Moreover nearby forest blocks is NUAKHETA RF. So for management point of view ,

the CA land selected here will be congenial and suitable indigenous species will be planted to ensure a successful plantation.

4. Climate

In Angul District, the wet season is oppressive and overcast whereas, the dry season is humid and mostly clear, and it is hot year round. Over the course of the year, the temperature typically varies from 13.89°C to 40.55°C and is rarely below 11.11°C or above 44.44°C.

5. Rain fall:

The annual average rainfall is 1602 mm. The maximum rainfall is received during the rainy season and particularly in the month of August.

6. Present Vegetation:

The identified land bears dry deciduous mixed vegetation. Species like Sal, Asan, Karada, Kendu, Jamu, Mango, Bahada, Mahul etc are observed.

7. Items of work to be taken up

Planting Model;

The land identified bears natural vegetation. Its tending operation will help maintaining a good forest cover adjacent to habitation. Considering the vegetation, terrain and soil of the area it is proposed to adopt a planting model of AR Plantations @1000seedlings per ha for Village-Kanja) is suggested.

Spacing

The plant density proposed for planting is @1000plants per ha. The spacing is to be 3m x 3m(Approximately to accommodate 1000seedlings per ha) . It is suggested to have the line of planting along the contour and plant to plant in adjacent row over the available blank spaces in the selected site. This will reduce the run off and encourage percolation of water and enrichment of vegetation.

Choice of Species:

Considering the soil, topography and present vegetation observed in and around, it is proposed to Plant the following indigenous and promising species on the identified land in suitable available blanks. Species proposed for planting are

- i) *Acacia Catechew (Khair)*
- ii) *Bombax Ceiba (Simili)*
- iii) *Emblica officinallis (Anla)*
- iv) *Terminalia belerica (Bahada)*
- v) *Terminalia tomentosa (Asana)*
- vi) *Mangifera indica (Aamba)*
- vii) *Pterocarpus marsupium (Bija)*
- viii) *Syzygium cumini (Jamu)*
- ix) *Azadia indica (Neem)*
- x) *Terminalia chebula(Harida)*
- xi) *Pongamia pinnata (Karanja) etc.*

It is proposed for diversion of 125.24 ha of Forest Land . The following detail is furnished in Tabular form

Description of Site	Area (in ha)	Total No of Seedlings required for planting	Remark
Bantala Range			
Compensatory Afforestation Land Identified (NFL)(Kanja)	13.228	13228	AR Mode 1000nos of seedlings/ha

8. Silvicultural Tending & Planting Technique to be adopted:

i) Survey, Demarcation and Pillar Posting:

The identified area has been surveyed & pillars posted. It is to be checked and missing pillars if any to be reposted as per Latitude / Longitude provided in the DGPS Map authenticated.

ii) Preparation of Treatment map (Digital map):

The Kml file of the area has been provided by the user agency after DGPS survey. The same will be updated with treatment design basing on physical position at the time of implementing the Plantation Scheme. The Range Officer will update the position with help of GIS cell of the Division as per requirement.

iii) Site Preparation:

After demarcation of the area, site preparation mostly clearing of invasive weeds will be taken up at planting site to be identified by field staff.

iv) Silvicultural Tending Operation:

The selected area is having scattered Sal shoots of promising vigour and of natural regeneration including some other species also. It is proposed to take up Silvicultural cleaning over the area. The activities are intended to achieve healthy growth of existing natural seedlings / saplings / coppice shoots of favored species. The operations include

- Cutting back of high stumps with preference to living stumps and having a good coppicing power.
- Cutting of climbers those are of annual nature and uprooting them wherever possible.
- Singling out of multiple coppice shoots and retaining most promising ones.
- Pruning of whippy plants available within the area.
- Dead and dying trees if any to be cut and separated from the site.

The natural seedlings available in the treatment area are to be given appropriate attention to ensure its establishment.

v) Digging of Pits (45cmx45cmx45cm):

It is proposed to dugout pits of size 45cmx45cmx45cm preferably in month of February / March. The dugout earth will be kept at pit head on both sides separately. The top soil will be kept on one side and bottom soil on another side. Soil within 30cm from ground level will be considered as top soil and rest as bottom soil. The pits will be left for weathering due to Sun & Rain.

vi) Refilling of Pits & application of organic Compounds / CDM/ FYM:

The pits will be refilled by altering the dugout soil of the pits i.e. top soil on bottom of the pit and bottom soil on top. Application of organic Compounds / CDM/ FYM & mixing the same properly before refilling is suggested. This will provide necessary nutrients to the plant as well as help in retaining soil moisture for a longer period.

vii) Transportation of Seedlings including short carriage & watering at Pit site.

In the approved cost norm, provisions have been made to plant 18month old seedlings. As seedlings will be above 1m height invariably, careful transportation of seedlings will be of paramount importance. In case of top breaking of seedlings, the benefit of 18month old seedlings will be reduced substantially. Transportation of seedlings from Nursery site to Planting site and then short carriage has to be taken up carefully. Wherever water is available, the plants are to be watered before short carriage to minimize the shock to plants during long carriage by tractors / vans etc.

viii) Planting of Seedlings:

After application of FYM/ CDM/ Organic manure, seedling will be planted carefully. The standard planting procedure is to be followed. As the pit size is of 45cm x 45cm x 45cm the following care will be taken during planting.

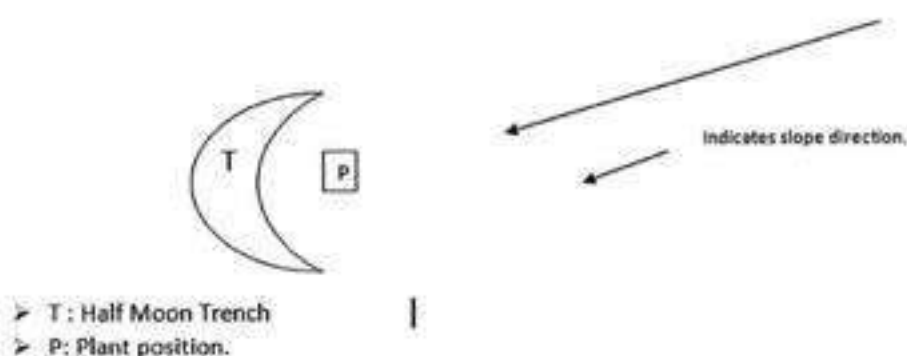
- Chemical fertilizer / insecticides to be applied as basal doze to be thoroughly mixed with soil.
- Seedlings collar zone will be at Ground Level or at best 2.5cm below the ground level. In no case it will not be more than 3cm below Ground Level.
- The Poly bags containing the seedlings are to be carefully removed. It is better to use a blade to cut open the bag so as to cause least disturbance to the ball of earth containing the seedlings.
- After planting the soil is to be compacted leaving 3" around the plant and the compact soil may be at Ground Level or 1" above the Ground level – allowance for soil settlement.
- In no case it should be a sunken around the plant.
- The planted plant should stand erect, if it is tilted due to speedy growth, a support with a stick collected locally to be provided.

ix) Casualty Replacement:

Casualty replacement is an important operation to achieve a 100% survival in a plantation. After planting there is possibility of casualty in planted seedlings. There is a provision to replace casualty up to 10% in 1st year and 10% in 2nd year operation in the approved cost norm. The same is to be carried out with good promising seedlings those can come up to a height of previous planted seedlings. During replacement in 2nd year application of fertilizers etc as in 1st year is to be followed.

x) Weeding & application of Fertilizer:

Two Weeding around the planted seedlings at a diameter of 1.00m has been prescribed in the approved cost norm. During 2nd weeding deep soil working around the plants at 1.00m diameter has also been prescribed. 1st weeding will be taken up just after one month of planting and 2nd weeding and soil working in month of September / October. As there is occasional rainfall in October, providing half-moon trench in sloppy terrain around each plant is suggested. A half-moon trench model is given below.



During weeding (1st& 2nd) there is a provision of application of fertilizer to plants. Application of NPK @30gms per plant x 2 times is suggested. In no case 2nd weeding can be delayed beyond 15th of October.

xj) Fire line Tracing & Inspection Path:

There is possibility of grasses growing up within plantation area. It is better to allow local people / VSS to cut the grasses take for stall feeding under supervision of Forest Staff. In the present case where AR is under implementation Grass growth is limited. Due to fallen dry leaves (Due to leaf shedding), there is possibility of fire hazards in February / March. It is suggested to have fire line at a width of minimum 3m all around the planting area, maintain inter partitioned line / both sides of foot path as a Fire line (minimum 3m wide in 1st year and 2m in subsequent year). These lines will be maintained as inspection path also. It will be maintained till completion of 10th year.

xii) Watch & Ward

Watch and ward is essentially required against biotic interferences like grazing and fire etc including grasses in first two years and illicit felling in subsequent years. Adequate provisions has been made in the approved cost norm. Watch & ward provisions will be implemented as per provision of cost norm.

9. Provision for watering:

The site selected contains partly hilly terrain. All total 13228nos of seedlings will be planted in the site selected depending on extent of blank area available. Watering to be explored and adhered to as per provision of one time cost norm (Annexure-VI).

10. Funding Agency


The U/A will deposit required funds as per the approved cost of the scheme.

11. Implementing Agency

Divisional Forest Officer, Angul will execute the Compensatory Afforestation Scheme.

Financial analysis and Cost involved.


Compensatory Afforestation scheme for plantation of 13228nos of seedlings over an area 13.228ha of Non Forest land in Kanja village in Angul Tahasil under Bantala Range of Angul Forest Division		
PERFORMA (Norm For 1.00ha)		
Sl No	Component	Base Rate for commencement year 2023-24
1	AR Plantation @1000plants per ha	258777
2	Watering, Solar Borewell fitted with Drip System	245476
3	SMC	39284
4	Fencing (Iron angle with chain link wire mesh)	462316
5	Entry point activity	15% of [(1)+(2)+(3)+(4)]=150878/-


प्रकल्प अधिकारी
Project Officer
MCL, Subhadra Area
प.प. सि. एम. सुभद्रा क्षेत्र


Divisional Forest Officer
Angul, Division

**Matrix for Compensatory Afforestation Scheme for Plantation of AR mode @1000nos of Seedlings over an area
1ha-Year wise (Commencement Year 2023-24)**

Year	Financial year	AR Plantation @ 1000nos seedling per ha	Watering , Solar Borewell fitted with Drip system	SMC	Fencing(Iron Angle with Chain link wire mesh/250mt per hectare	Total
0 th year	2023-24	24586	180243	0	314886	519715
1 st year	2024-25	110729	0	23401	0	134130
2 nd year	2025-26	27105	9935	3684	13369	54093
3 rd year	2026-27	20094	10433	3870	14040	48437
4 th year	2027-28	9190	10954	4062	14741	38947
5 th year	2028-29	9648	33911	4267	15478	63304
6 th year	2029-30	11578			16251	27829
7 th year	2030-31	10637			17065	27702
8 th year	2031-32	11170			17918	29088
9 th year	2032-33	11727			18813	30540
10 th year	2033-34	12313			19755	32068
GRAND TOTAL		258777	245476	39284	462316	1005853


 Project Officer
 MCL, Subhadra Area
 M.L. Tal, Tal, Subhadra Area


 Assistant Director
 MCL, Subhadra Area

Abstract for Operation of Compensatory Afforestation Scheme for Plantation of 13228Nos of Seedlings over an area 13.228ha

Sl No	Component	Norm	Unit	Rate	Total
1	AR Plantation @1000plants per ha	258777	Ha	13.228	3423102
2	Watering , Solar Borewell fitted with Drip System	245476	Ha	13.228	3247157
3	SMC	39284	Ha	13.228	519649
4	Fencing (Iron angle with chain link wire mesh)	462316	250meter	1680meter	3106764
5	Entry point activity	15% (1+2+3+4)			1544501
	Total				11841173

(One Crore Eighteen Lakh Forty one Thousand One Hundred seventy three) only


 सहाय्य अधिकारी
 Project Officer
 MCL, Subhadra Area
 एम. सि. एन. सुभद्रा क्षेत्र


 Assistant Secretary
 Divisional Forest Officer

**Calendar of Operation for Compensatory Afforestation Scheme for Plantation of 13228Nos of Seedlings over an
area 13.228ha-Year wise**

Year	Financial Year	AR Plantation @ 1000nos seedling per ha	Watering, Solar Borewell fitted with Drip system	SMC	Fencing/Iron Angle with Chain link wire mesh (1680mt along the perimeter =6.72mes of 250mt)	Entry point activity 15% (1+2+3+4+5)	Total
0 th year	2023-24	325224	2384254	0	2116034	723827	5549339
1 st year	2024-25	1464723	0	309548	0	266141	2040412
2 nd year	2025-26	358545	131420	48732	89840	94280	722817
3 rd year	2026-27	265803	138008	51192	94349	82403	631755
4 th year	2027-28	121565	144900	53732	99060	62889	482146
5 th year	2028-29	127624	448575	56445	104012	110498	847154
6 th year	2029-30	153154	0	0	109207	39354	301715
7 th year	2030-31	140706	0	0	114677	38307	293690
8 th year	2031-32	147757	0	0	120409	40225	308391
9 th year	2032-33	155125	0	0	126423	42232	323780
10 th year	2033-34	162876	0	0	132754	44344	339974
GRAND TOTAL		3423102	3247157	519649	3106765	1544500	11841173

(Signature)

प्रकल्प अधिकारी

Project Officer

Subhadra Area

प.स. 14, प.स. सुभद्रा क्षेत्र

(Signature)
DINAKARAN

Encl:

A- Documents:

- 1) The selected land schedule of Non Forest land in Kanja Village coming under Bantala Range of Angul Division attached as (Annexure-I).
- 2) ORSAC, authorization letter vide his letter no ORSAC/DGPS-FD/1080/2022/3203(2) Dated 03/09/2022as (Annexure-II).
- 3) Approved cost norm for one ha AR Plantation @1000 Plants per ha (Annexure-III).
- 4) Approved Cost norm & matrix for Chain link Fencing: (Annexure-IV)
- 5) Approved Cost norm Matrix for SMC (Model-C) is at (Annexure -V)
- 6) Approved Cost Norm Matrix for Watering, Solar Borewell fitted with Drip system (Annexure-VI)

B- Maps & Plates:

- I. Cadastral Map of CA land identified at Village Kanja (Plate-I)
- II. DGPS map of the CA land Authenticated by ORSAC) (Plate-II)
- III. Corresponding Topo map (1:50000 Scale) (Plate-III)
- IV. KML File in CD
- V. Forest Cover density map of CA land
- VI. Satellite map of CA land


Divisional Forest officer,
Divisional Forest Officer,
Angul Division
Angul, Division

JOINT VERIFICATION OF GOVT. RESERVE GOVT. LANDS FOR COMPENSATORY AFForestation
 15-11-2015, 11:30 AM

Sl. No.	RANTALA	Methala No.	Plot No.	Area (Hectares)	Total Area (Hectares)	This		Area in the Districts (Unsuitable for Reserves)	Remarks
						Area	HECT.		
1		402	001	1.772			1.752		
2		0	001P	0.153			0.093		
3		1	001UP	2.085			3.581		
						Total	13.228		

1. Certified that the above mentioned land as mentioned in columns 1, 2 & 3 is reserved parcels of 4.00 Hs. Of which having suitable and suitable for plantation for management zone of area.
2. Certified that the above Government land is not suitable for plantation is free from electric lines and encroachments.
3. Certified that the above Government land is not covered under any application.
4. Certified that the above Government land is not covered under any application.
5. Certified that the above Government land is not covered under any application.
6. Certified that the above Government land is not covered under any application.
7. Certified that the above Government land is not covered under any application.
8. Certified that the above Government land is not covered under any application.
9. Certified that the above Government land is not covered under any application.
10. Certified that the above Government land is not covered under any application.
11. Certified that the above Government land is not covered under any application.
12. Certified that the above Government land is not covered under any application.


T. Venkatesh Babu (Sd/-)
 Assistant Commissioner
 Revenue Department
 Government of Andhra Pradesh
 Warangal District
 Warangal


Y. Venkatesh Babu (Sd/-)
 Assistant Commissioner
 Revenue Department
 Government of Andhra Pradesh
 Warangal District
 Warangal



ORSAC/DGPS-FD/1080/2022/ 320.12.12

To:
The D.F.O.,
Angul Division,
Angul

Sub: Verification of DGPS Survey of Compensatory Afforestation non-forest land in Jamugaria, Kanja, Nukhuripada, Rodasingha, villages and degraded revenue forest land in Baghuapat village in Angul Tahsil in lieu of forest areas proposed for diversion for Subhadra OCP, Subhadra Area of MCL in Angul District.

Ref: Your letter no. 5950 dated 19.08.2022

Sir

With reference to the subject mentioned above, this is to inform you that, the maps and data forwarded to ORSAC by your office for verification of the DGPS survey of Compensatory Afforestation non-forest land in Jamugaria, Kanja, Nukhuripada, Rodasingha villages and degraded revenue forest land in Baghuapat village in Angul Tahsil in lieu of forest areas proposed for diversion for Subhadra OCP, Subhadra Area of MCL in Angul District has been verified by ORSAC and is certified that the map is correct at a confidence level of 95%. All the Compensatory Afforestation non-forest land comes in Jamugaria, Kanja, Nukhuripada, and Rodasingha villages and degraded revenue forest land in Baghuapat village in Angul Tahsil in Angul district. Total Compensatory Afforestation land works out to 150.954Ha. includes 40.209Ha. degraded Revenue forest and 110.705Ha. non-forest land from the submitted .shp files, against the required area of 150.895Ha. (40.255Ha. degraded Revenue forest and 110.640Ha. non-forest land) as mentioned in the submitted record. Detail Patch/village/plot wise comparative statistics of Compensatory Afforestation area is attached herewith.

Yours faithfully,

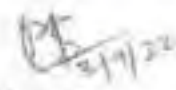
Encl: 6 hard copy maps


M. K. SANABADA
SCIENTIST - 'D'

Copy to: The General Manager (Subhadra Area), MCL, Subhadra Area, Near Biju Maidan,
Angul-759122, Odisha for information.

**STATISTICS OF COMPENSATORY AFFORESTATION LAND IDENTIFIED IN VILLAGE
JAMUGARIA, KANJA, NUKHURIPADA, RODASINGHA ALONG WITH DEGRADED REVENUE
FOREST LAND IN VILLAGE BAGHUAPAT UNDER ANGUL TAHASIL IN LIEU OF FOREST AREAS
PROPOSED FOR DIVERSION FOR SUBHADRA OCP, SUBHADRA AREA OF MCL, ANGUL
DISTRICT**

Sl. NO.	VILLAGE NAME	PLOT NO.	RISAM	ALLOTTED AREA HA.	MAP AREA HA.
1	BAGHUAPAT	251(P)	CHHOTA JUNGLE	15.393	15.082
2	BAGHUAPAT	298(P)	CHHOTA JUNGLE	15.212	15.243
3	BAGHUAPAT	283(P)	CHHOTA JUNGLE	6.029	6.035
4	BAGHUAPAT	284(P)	CHHOTA JUNGLE	3.621	3.890
A. TOTAL DEGRADED REVENUE FOREST LAND				40.255	40.249
5	JAMUGARIA	1107(p)	PURATANA PATITA	7.923	7.924
6	JAMUGARIA	1117(p)	PURATANA PATITA	21.643	21.854
7	JAMUGARIA	1089(p)	PURATANA PATITA	5.127	5.259
8	KANJA	1657	PURATANA PATITA	1.752	1.780
9	KANJA	1656(P)	PURATANA PATITA	7.893	7.691
10	KANJA	1648/1(P)	PURATANA PATITA	3.583	3.635
11	NUKHURIPADA	8(P)	PURATANA PATITA	19.126	19.129
12	RODASINGHA	065(P)	PAHADA	43.593	43.433
B. TOTAL NON-FOREST LAND				110.640	110.705
TOTAL CA LAND AREA (A+B)				150.895	150.954


 21/7/22
 Shri M. S. Jaiswal
 Member, ORRAC
 Muzaffarpur

Annexure-III

BASE COST NORM FOR COMPENSATORY AFFORESTATION (BLOCK PLANTATION) @1000 PLANTS PER HECTARE (18 months old seedlings)

WAGE RATE Rs. 311/- PER MANDAY

Sl.No.	Items of work	Preferable period of Execution	No. of Mandays	Labour Cost (In Rs.)	Material Cost(In Rs.)	Total Cost (In Rs.)
0th Year (Advance Work) Pre- Planting operation						
1	Survey, Demarcation and Pillar posting	Nov/ Dec	2	622	0	622
2	Preparation of Treatment Map (Digital Map)	Nov/ Dec	1	311	100	411
3	Site Preparation (Cleaning & removal of debris)	Nov/ Dec	12	3732	0	3732
4	Creation of 4 mt wide Inspection Path	Feb/ Mar	1	311	0	311
5	Alignment and stacking of pits	Feb/ Mar	1	311	0	311
6	Digging of pits (45cm x 45cm x 45 cm) in hard and gravelly soil	Feb/ Mar	40	12440	0	12440
7	Construction of Temporary Labour Shed, Drinking water facility and First-Aid etc.	Jan/Mar	0	0	3500	3500
	Total		57	17727	3600	21327
1st Year/ Planting Year						
1	Refilling of pits by altering the dugout soil of the pits, application of organic compounds/ CDM/ FYM & mixing the same perfectly.	June/ Jul	7.5	2332.5	5000	7332.5
2	Transportation of 18 months old polythene bag seedlings in hired truck/ tractor from the permanent / Mega Nursery to the planting site including Loading & unloading. (Average lead of 10Rkm) & stacking the seedlings @Rs. 6/- seedling. (1100 nos.)	Jul/ Aug	0	0	6600	6600
3	Watering polythene bag seedlings at stacking site of plantation.	Jul/ Aug	2	622	0	622
4	Conveyance of polythene bag seedlings on head load from the stacking site to individual dugout pits within the planting site, applying insecticide, fertilizer & planting after scooping the soil with other applied materials and pressing the soil perfectly around the planted seedling.	Jul/ Aug	22.5	6997.5	0	6997.5

5	<u>Cost of Fertilizer & Insecticide</u> (a) NPK/ Bio- fertilizer @50gms/ plant as basal dose = 50 kg @ Rs.30/- per kg =Rs. 1500.00 (b) Urea/ Vermicompost/ Mo khata/ any other fertilizers @Rs. 750.00 (c) Insecticide/ Bio-pesticides @5gms/ plant = 5 kg @ Rs.150/-per kg = Rs. 750/-	Jul/ Aug	0	0	3000	3000
6	Casualty replacement @ 10 % (100 nos.)	Jul/ Aug	2.5	777.5	0	777.5
7	1st weeding & Manuring	Aug/ Sept	12	3732	0	3732
8	2nd Weeding, Soil working (1mt. Diameter around the plants) & Manuring	Oct/ Nov	15	4665	0	4665
9	Fire line tracing & Inspection path	Feb/ Mar	3	933	0	933
10	Watch & ward including watering as per requirement	Aug-Mar	12	3732	0	3732
Total			76.5	23791.50	14600.00	38391.50
2nd Year Maintenance						
1	Transportation of 100 seedlings from Nursery to plantation site including loading, unloading & conveyance by Tractor @ Rs.6/- per seedlings	Jul	0	0	600	600
2	Casualty replacement	Jul	2.5	777.5	0	777.5
3	<u>Cost of Fertilizer & Insecticide</u> A) Cost of Insecticide/ Bio-pesticides (Themet/ Forate) @ 5 gms/ plant = 0.5 kg @s.150/-per kg = Rs.75/- B) Urea/ NPK/ Bio-fertilizers/ vermicompost/ Mo khata/ any other fertilizers = Rs.2800/-	July / Aug	0	0	2875	2875
4	Weeding (Complete weeding), Manuring & Soil working (1mt. Diameter around the plants)	Sept/ Oct	15	4665	0	4665
5	Fire line tracing (2m. Wide fire line over 400 m long) including maintenance of inspection path	Feb/ Mar	3	933	0	933
6	Watch & ward including watering as per requirement	Apr-Mar	18	5598	0	5598
7	Maintenance of Temporary Labour Shed, Drinking water facility and First-Aid etc.	Apr-Mar	0	0	1000	1000

		Total	38.5	11973.5	4475	16448.5
3rd Year Maintenance						
1	Cost of Fertilizers Urea/ NPK/ Bio-fertilizers/ Vermicompost/ Mo khata/ any other fertilizers = Rs.2800/-	July / Aug	0	0	2800	2800
2	Weeding (Complete weeding), Manuring & Soil working (1mt. Diameter around the plants)	Sept/ Oct	15	4665	0	4665
3	Fire line tracing (2m. Wide fire line over 400m long) & Inspection path	Feb/ Mar	3	933	0	933
4	Watch & ward including watering as per requirement	Apr/ Mar	18	5598	0	5598
5	Maintenance of Temporary Labour Shed, Drinking water facility and First- Aid etc.	Apr/ Mar	0	0	1000	1000
		Total	36	11196	3800	14996
4th Year Maintenance						
1	Fire line tracing (2m. Wide fire line over 400m length) & including maintenance Inspection path	Feb/ Mar	3	933	0	933
2	Watch & ward including watering as per requirement	Apr/ Mar	18	5598	0	5598
		Total	21	6531	0	6531
5th Year Maintenance						
1	Fire line tracing (2m. Wide fire line over 400m length) & including maintenance Inspection path	Feb/ Mar	3	933	0	933
2	Watch & ward including watering as per requirement	Apr/ Mar	18	5598	0	5598
		Total	21	6531	0	6531
6th Year Maintenance						
1	Fire line tracing (2m. Wide fire line over 400m length)	Feb/ Mar	3	933	0	933
2	Pruning of branches, singling out of multiple shoots	Jan/Mar	3	933	0	933
3	Watch & ward	Apr/ Mar	18	5598	0	5598
		Total	24	7464	0	7464

7th Year Maintenance

1	Fire line tracing (2m. Wide fire line over 400m length)	Feb/ Mar	3	933	0	933
2	Watch & ward	Apr/ Mar	18	5598	0	5598
Total			21	6531	0	6531

8th Year Maintenance

1	Fire line tracing (2m. Wide fire line over 400m length)	Feb/ Mar	3	933	0	933
2	Watch & ward	Apr/ Mar	18	5598	0	5598
Total			21	6531	0	6531

9th Year Maintenance

1	Fire line tracing (2m. Wide fire line over 400m length)	Feb/ Mar	3	933	0	933
2	Watch & ward	Apr/ Mar	18	5598	0	5598
Total			21	6531	0	6531

10th Year Maintenance

1	Fire line tracing (2m. Wide fire line over 400m length)	Feb/ Mar	3	933	0	933
2	Watch & ward	Apr/ Mar	18	5598	0	5598
Total			21	6531	0	6531

ABSTRACT(Showing Seedling Cost Separately)							
Sl.No.	Year	No. of Mandays	Labour Cost (In Rs.)	Material Cost (In Rs.)	Monitoring, Evaluation, Learning, Documentation and other Contingency (5%) of (4+5)	Cost of Seedlings @Rs. 50.31 per seedlings	Total Cost (In Rs.)
1	0th Year	57	17727	3600	973	0	22300
2	1st Year	76.5	23791.5	14600	1918.5	55341	95651
3	2nd Year	38.5	11973.5	4475	821.5	5031	22301
4	3rd Year	36	11196	3800	749	0	15745
5	4th Year	21	6531	0	326	0	6857
6	5th year	21	6531	0	326	0	6857
7	6th Year	24	7464	0	373	0	7837
8	7th Year	21	6531	0	326	0	6857
9	8th Year	21	6531	0	326	0	6857
10	9th Year	21	6531	0	326	0	6857
11	10th Year	21	6531	0	326	0	6857
Total		358	111338	26475	6791	60372	204976

The Costing for 10 years will be as per One time Cost Norm approved by PCCF(O) vide this letter No 1109 dated 11.11.2021.

Sl. NO.	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	XXI	Total Cost (10 Years)
	Base Norm.	22500	91631	22201	15195	6852	8857	7817	6857	6857	8857	8857											
1	2021-22	27605	106414	14520	18276	8135	8751	10502	9648	10181	12617	11160											234718
2	2022-23		23413	105456	79314	29237	8773	9109	11023	10330	12638	11160	11737										246454
3	2023-24			24586	112779	27128	20284	9100	9648	11578	12637	11170	11727	11813									258777
4	2024-25				79115	116183	26400	21099	9650	10180	12337	11160	11729	12013	12920								271716
5	2025-26					27128	112078	29063	22156	10180	10837	11783	11777	12015	12929	13078							285302
6	2026-27						28663	228182	91177	10567	10840	11189	11401	11818	12981	13175	14156						299667
7	2027-28							29036	234591	10966	11475	11172	11777	12073	12929	13578	14734	15017					314546
8	2028-29								51178	11177	11538	11646	11711	11813	12177	12175	12217	12007	13115				330273
9	2029-30									31947	11887	11811	11908	12122	12929	13578	14156	14070	14715	15011			346788
10	2030-31										11941	11806	11819	12074	12934	13575	14156	13907	14719	14651	15128		364127

Annexure-IV

Fencing for Compensatory plantation raised outside the forest area Using Angle Iron and Chain link wire mesh (250Rmt/ha)

Sl no	Item of work	Preferable period of Execution	Man days	Wages@311/-	Material cost (Rs)	Total Cost (Rs per ha)
0th Year (PPO)						
1	Earth work (excavation of hole) in Hard soil at a distance of 3mt $0.40m \times 0.40m \times 0.40m = 0.064 \times 84 = 5.376 \text{cum}$ @Rs 140/cum = Rs 753/-		2.42	752.62	0	752.62
2	Cement concrete (1:4:8) using 40mm BHG Metal $84 \times 0.40m \times 0.40m \times 0.10m = 1.344 \text{cum}$ @3755.94/cum		0	0	5047.4	5047.4
3	Angle iron pole of size 50mm x 50mm x 6mm of height 2.40mt $84 \times 2.40 = 201.60 \text{sqmt}$ @4.50/kg/sqmt = 907.20kg @69.50per kg			0	63050	63050
4	Cement concrete (1:2:4) for fixing the iron angle pole using 12 mm BHG Chips $84 \times 0.40m \times 0.40m \times 0.30m = 4.032 \text{cum}$ @5486.77/cum			0	22123	22123
5	Cost of chain link mess using 4mm Dia GI wire having gap size 50mm x 50mm 250Rmt x 2.10mt = 525sqmt @331/sqmt = Rs 173775			0	173775	173775
6	Double cost painting of iron angel pole over a coat of primer using good quality enamale paint $84 \times 2.10 \times 0.20 = 35.28 \text{sqmt}$ @Rs 108.80/sqmt.			0	3838	3838
7	Painting of GI Chain link mess $250 \times 2.10 \times 2 = 1050/10 = 105 \text{sqmt}$ @Rs 108.80/sqmt.			0	11424	11424
8	Transportation of chain link mess, Iron angle straightening and tieing of chain link mess etc @2% of the total cost			0	5600	5600
			2.42	752.62	284857.4	285610
1st year Maintenance						
9	No maintenance required	Sep/Oct	0	0	0	0
2nd year maintenance						
10	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year $1142 \times 1\% = 11.42$ say 11	Sep/Oct	0	0	11000	11000

3rd year maintenance

11	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
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4th year maintenance

12	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
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5th year maintenance

13	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
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6th year maintenance

14	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
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7th year maintenance

15	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
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8th year maintenance

16	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
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9th year maintenance

17	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
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10th year maintenance

18	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
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Total			2.42	752.62	383857.4	384610.00
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Sl no	Year	No of Person days	Labour cost @311/- per day	Material cost	Total cost
1	0th year	2.42	752.62	284857.4	285610.02
2	1st year	0	0	0	0
3	2nd year	0	0	11000	11000
4	3rd year	0	0	11000	11000
5	4th year	0	0	11000	11000
6	5th year	0	0	11000	11000
7	6th year	0	0	11000	11000
8	7th year	0	0	11000	11000
9	8th year	0	0	11000	11000
10	9th year	0	0	11000	11000
11	10th year	0	0	11000	11000
	Total	2.42	752.62	383857.4	384610

SL	Commencement MCO Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	Total Cost (in Rupees)	
	Basic Norm	285610	0	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	
1	2021-22	285610	0	12126	12734	13376	14039	14740	15478	16252	17064	17918	419331										419331
2	2022-23		299891	0	12732	13371	14039	14741	15477	16252	17065	17917	18814										440299
3	2023-24			314886	0	13388	14040	14741	15478	16251	17065	17918	18813	19755									462316
4	2024-25				330630	0	14037	14742	15478	16252	17064	17918	18814	19754	20743								485412
5	2025-26					347162	0	14739	15479	16252	17065	17917	18814	19755	20742	21780							509705
6	2026-27						364520	0	15476	16253	17065	17918	18813	19755	20742	21779	22888						535191
7	2027-28							382746	0	16250	17066	17918	18814	19754	20743	21780	22868	24032					561951
8	2028-29								401863	0	17063	17919	18814	19755	20742	21780	22868	24011	25213				590049
9	2029-30									421977	0	17916	18815	19755	20743	21779	22868	24012	25212	26474			619552
10	2030-31										443078	0	18812	19756	20743	21780	22868	24012	25218	26473	27798		650531

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Annexure-V

Cost Norms for creation of Compensatory Afforestation with Stabilization of Soil & Conservation of moisture (1000 Plants/Ha.)			
WAGE RATE RS- 311/- PER DAY			
Sl. No	Item of Works	Preferable Period of Execution	Total Cost
0th Year (Pre-Planting Operation)			
1	Nil		0
1st Year			
2	Soil Conservation measure structures like Staggered Trench, Percolation pit, Contour trench, Graded earthen bund, LBCD Wire mesh LBCD, Sub surface Dyke & WHS as per the slop & site requirement on LS	Apr/sep	20,215
2nd Year			
3	Maintenance of SMC structures @ 15 % of initial year cost	Apr/jul	3,032
3rd Year			
4	Maintenance of SMC structures @ 15 % of initial year cost	Apr/jul	3,032
4th Year			
5	Maintenance of SMC structure @ 15 % of initial year cost	Apr/jul	3,032
5th Year			
5	Maintenance of SMC structure @ 15 % of initial year cost	Apr/jul	3,032
Total:			32,343.0

Matrix for (SMC)

Sl No	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	Total Cost
	Base Norm	0	20215	3032	3032	3032	3032											
1	2021-22	0	21226	3342	3510	3685	3870											35633
2	2022-23			22287	3509	3686	3869	4064										37415
3	2023-24				23401	3684	3870	4062	4267									39284
4	2024-25					24571	3868	4064	4265	4480								41248
5	2025-26						25800	4061	4267	4478	4704							43310
6	2026-27							27090	4264	4480	4702	4939						45475
7	2027-28								28445	4477	4704	4937	5186					47749
8	2028-29									29867	4701	4939	5184	5445				50136
9	2029-30										31360	4936	5186	5443	5717			52642
10	2030-31											32928	5183	5445	5715	6003		55274

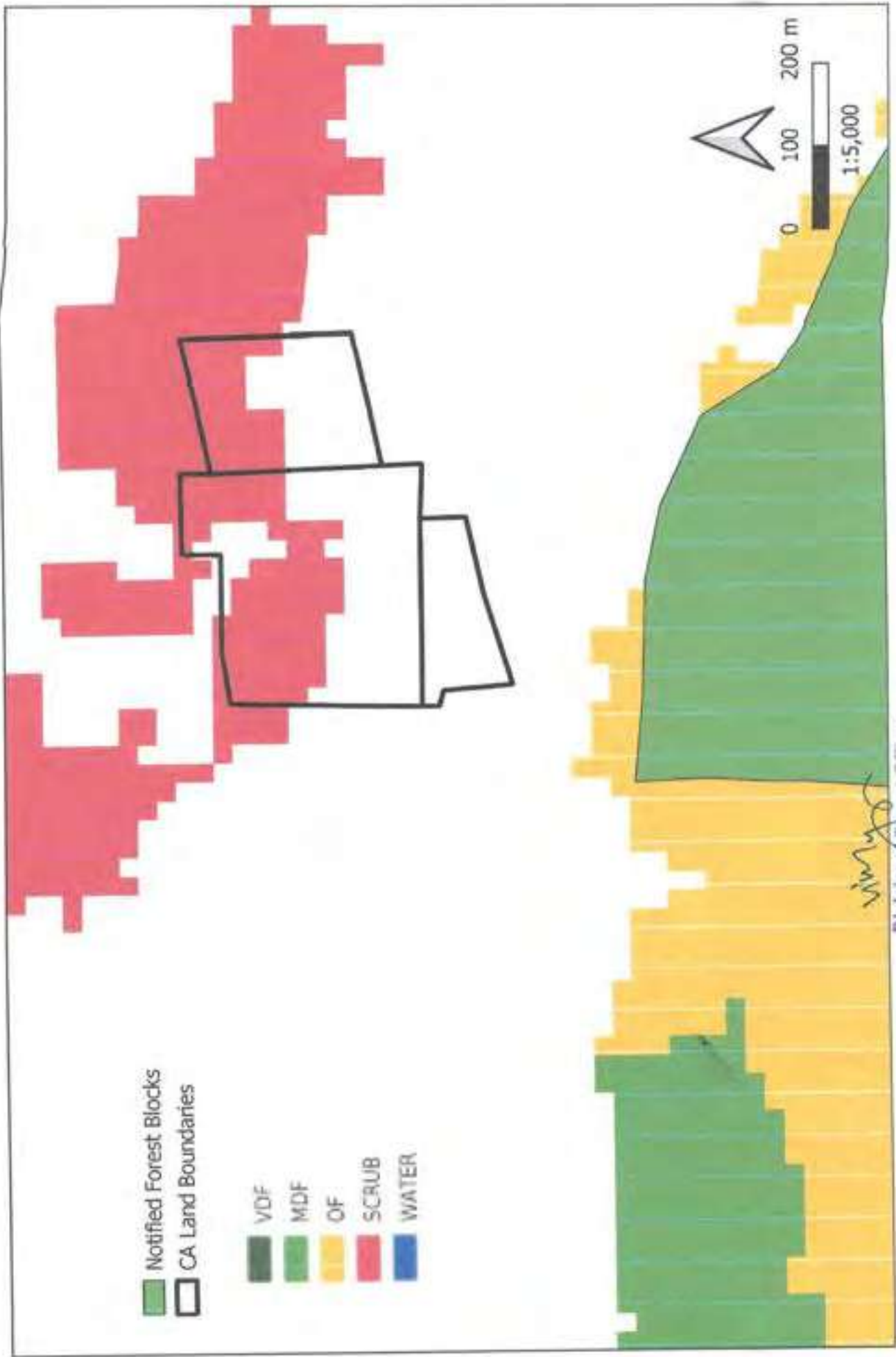
Annexure-VI		
WATERING MODEL-W -I		
Watering provision to CA Plantation		
Solar System with Bore well (1 system for 5 Ha Plantation) fitting with Drip system , Wage rate@ Rs 311/- Year of installation (0 th YEAR)		
1	Cost of Borewell	1,50,000
2	Installation of Solar panel & other System	3,00,000
3	Cost of 0.5 HP submersable motor with accessories	50,000
4	Water Storage Tank/ Flexible pipes	15,000
5	Cost of laying Drip system including all accessories, fittings etc, with 12% GST	3,02,431
	TOTAL	8,17,431
6	Cost of Water & watering per Ha. (8,17,431/5) =Rs1,63,486/-	1,63,486
1 st Year Watering		
7	No maintenance required	0
	TOTAL	0
2 nd Year Watering		
8	Maintenance of system @5% of Initial cost of installation	8,174
	TOTAL	8,174
3 rd Year Watering		
9	Maintenance of system @ 5% of initial cost of installation	8,174
	TOTAL	8,174
4 th Year Watering		
10	Maintenance of system @ 5%of initial cost of installation	8,174
	TOTAL	8,174
5 th Year Watering		
11	Maintenance of system @ 5% of initial cost of installation	8,174
	TOTAL	8,174

Abstract					
Sl. no	Year	No. person days	Labour Cost @ Rs 311/-per day	Material Cost	Total cost (Rs)
1	0 th year	0	0.0	163486.0	163486.0
3	1 st year	0	0.0	0.0	0.0
3	2 nd year	0	0.0	8174.0	8174.0
4	3 rd year	0	0.0	8174.0	8174.0
5	4 th year	0	0.0	8174.0	8174.0
6	5 th year	0	0.0	8174.0	8174.0
	Total:	0	0	196182	1,96,182

Matrix for Watering W1 (Solar Borewell) fitted with Drip System (per Ha)

Sl No.	Commencement year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	Total Cost
	Base Norm	163486	0	8174	8174	8174	8174											
1	2021-22	163486	0	9011	9463	9935	30758											222653
2	2022-23		17166 0	0	9462	9936	10432	32296										233786
3	2023-24			18024 3	0	9935	10433	10954	33911									245476
4	2024-25				189255	0	10432	10955	11502	35607								257751
5	2025-26					198718	0	10954	11503	12077	37387							270639
6	2026-27						208654	0	11502	12078	12681	39256						284171
7	2027-28							21908 7	0	12077	12682	13315	41219					298380
8	2028-29								230041	0	12681	13316	13981	43280				313299
9	2029-30									241543	0	13315	13982	14580	45444			328964
10	2030-31										25362 0	0	13981	14681	15414	47716		345412

Non-Forest Land in Kanja, Bantaka Range



Vinay

Division of Forest Officer
Angwal Division

Non-Forest Land in Kanja, Bantaka Range



Wing
Divisional Forest Officer
Angul Division

CHECK LIST SERIAL NUMBER-18

**SCHEME FOR
COMPENSATORY AFFORESTATION SCHEME
OVER AN AREA OF 34.693HA IN NON-
FOREST LAND IDENTIFIED IN THE VILLAGE
JAMUGARIA, BANTALA RANGE**

**UNDER
ANGUL TAHASIL
OF
DISTRICT ANGUL
IN
LIEU OF PROPOSED FOREST DIVERSION FOR 125.24
HA OF FOREST LAND COMING WITHIN SUBHADRA
OPEN CAST PROJECT
OF
M/S MCL, DIST-ANGUL**

Plantation Model:

AR plantation over ha @1000plants per ha

Prepared By


**Divisional Forest Officer,
Angul Division**

Contents

Sl no	Description	Annexures	Page No
1	Land suitability Certificate	--	
2	Details of Scheme	--	
3	Land schedule	I	
4	ORSAC Authentication Letter	II	
5	AR Plantation @1000/ha	III	
6	Cost norm & matrix for chain link Fencing	IV	
7	Cost norm matrix for SMC (Model -C)	V	
8	Watering, Solar Borewell fitted with Drip System	VI	
MAPS			PLATE
9	Cadastral Map of CA land identified at Villages Jamugaria		Plate-I
10	DGPS map of the CA land at Jamugaria (Authenticated by ORSAC)		Plate-II
11	Corresponding Topo map (1:50000 Scale)		Plate-III
12	KML File in CD		

Land Suitability Certificate

The requirement of suitable Non Forest land at par with the guidelines of MoEF & CC is a vital aspect for raising Compensatory Afforestation in lieu diversion of Forest land for Non forestry purpose of a project under FC Act, 1980.

In the instant case diversion of Forest land to the extent of 125.24ha is required for the project "Subhadra Open Cast Project of M/s MCL in the district of Angul. According required exercises were undertaken in the field by Forest and Revenue Staff jointly to select suitable Non-Forest land/ Govt degraded forest land for the purpose of Compensatory Afforestation for the said project. Finally One patch of Non forest land over 34.693ha of Jamugaria Village was selected in Bantala Range with suitability criteria to accommodate required no of seedlings AR Plantation @1000plantations per ha. Criteria of suitability of the site meet relevant parameters such as management point of view, free from encroachment and encumbrances, not included in Section -4(1) notification, not under DLC status of forest, non-allotment of the said areas for other projects etc as narrated against this site furnished in Annexure-I. Besides soil quality, soil depth, terrain, climatic conditions etc are suitable for planting indigenous promising species for sustained growth and establishment and over and above location of the site with respect to closeness to nearby forest block of Angul Division which will ensure proper supervision, monitoring of the plantation raised under Compensatory Afforestation Scheme. Plantations activities will be as done per the approved One time Cost Norm of PCCF, Odisha and it is hoped to ensure proper greenery with improved environmental scenario after implementation of the said plantation.

Place:

Date:


Divisional Forest Officer,
Angul Division

Scheme

This scheme is for taking up Compensatory Afforestation on identified Non forest land in Village Jamugaria of Bantala Range under Angul Tahasil in the District of Angul in lieu of Proposed Forest Diversion or 125.24 ha of Forest land coming within Subhadra Open Cast Project of M/s MCL, Dist-Angul.

1. Introduction: The Subhadra Open Cast Mining Lease is over an area of 1111.85 ha. Out of which Forest land located in Mining lease is 125.24ha and non-Forest area is 986.61ha as per the land schedule. The User Agency M/s MCL has filed forest Diversion Proposal Vide Proposal No FP/OR/MIN/150133/2021.

On application for providing Compensatory Afforestation Land, the Collector and District Magistrate, Angul has allotted 110.640ha of Non forest Revenue land and 40.255ha of Revenue Degraded Forest area spread over in 5 patches vide his letter no _____ dated _____. This scheme is meant for 34.693ha of Non forest land in village Jamugaria which has been jointly verified by the Revenue staff and Forest staff. The selected land schedule is coming under Bantala Range of Angul Division (Annexure-I)

Land schedule:

Land Schedule of land jointly verified by Revenue and Forest Staffs for Compensatory Afforestation								
Village	Khata No	Plot No	Total Plot Area in Hectare	Area taken for plantation in ha	Kisam	Remark	Nearest Forest Block	Approximate distance from the proposed site
Bantala Range								
Jamugaria	1	1107(p)	9.106	7.923	PuratanaPatita	Non forest land	Kanguli PF	1.12Km
	1	1117(P)	21.643	21.643				0.62km
	2/2	1089(p)	5.127	5.127				1.6Km
	Total		35.876	34.693				

2. DGPS Survey, Mapping & Authentication of CA Land.

As per the revised guidelines of Chief Executive, ORSAC, the User Agency has taken up DGPS Survey by empaneled vendors and the same has been authenticated by ORSAC vide his letter no ORSAC/DGPS-FD/1080/2022/3203(2) Dated 03/09/2022 and due endorsement has been furnished on DGPS surveyed Map. The DGPS Map, Corresponding Topo map (Survey of India map F45T2 1:50000 Scale) are enclosed to this Scheme. The KML File of the area is submitted in a CD. (Letter of Authentication by ORSAC at Annexure-II)

The Latitude / Longitude of Survey Points as per DGPS authenticated Map is furnished below.

DGPS OBSERVATION CO-ORDINATES OF BOUNDARY PILLARS			
SL.NO	MAP ID	LONGITUDE	LATITUDE
1	1	85°06'08.74282"	20°40'13.49507"
2	2	85°06'09.90708"	20°40'14.70949"
3	3	85°06'11.35651"	20°40'17.10756"
4	4	85°06'11.03767"	20°40'17.97251"
5	5	85°06'12.93013"	20°40'18.58537"
6	6	85°06'13.69864"	20°40'19.50553"
7	7	85°06'15.44511"	20°40'19.21669"
8	8	85°06'17.73947"	20°40'21.32217"
9	9	85°06'18.52405"	20°40'21.82830"
10	10	85°06'18.80566"	20°40'21.97581"
11	11	85°06'18.91202"	20°40'21.74480"
12	12	85°06'19.45320"	20°40'22.02300"
13	13	85°06'22.07215"	20°40'23.54191"
14	14	85°06'22.17752"	20°40'24.15357"
15	15	85°06'22.79444"	20°40'24.56032"
16	16	85°06'26.55901"	20°40'26.22717"
17	17	85°06'28.04236"	20°40'25.30528"
18	18	85°06'29.68862"	20°40'25.61998"
19	19	85°06'29.97867"	20°40'26.20145"
20	20	85°06'29.85223"	20°40'27.76197"
21	21	85°06'31.93639"	20°40'28.72254"
22	22	85°06'33.51229"	20°40'28.68166"
23	23	85°06'35.03114"	20°40'28.71448"
24	24	85°06'37.18513"	20°40'30.01096"
25	25	85°06'39.41314"	20°40'31.41705"
26	26	85°06'39.00596"	20°40'32.92451"

27	27	85°06'41.12205"	20°40'33.49177"
28	28	85°06'44.81982"	20°40'34.63293"
29	29	85°06'46.97718"	20°40'33.73718"
30	30	85°06'46.33979"	20°40'32.85658"
31	31	85°06'43.78306"	20°40'33.43453"
32	32	85°06'43.41806"	20°40'30.30260"
33	33	85°06'43.27045"	20°40'28.80662"
34	34	85°06'41.53066"	20°40'28.35324"
35	35	85°06'41.15082"	20°40'28.22167"
36	36	85°06'39.32183"	20°40'24.45433"
37	37	85°06'40.55051"	20°40'21.68219"
38	38	85°06'39.98174"	20°40'21.04588"
39	39	85°06'37.40938"	20°40'16.67318"
40	40	85°06'37.28437"	20°40'14.73544"
41	41	85°06'37.20106"	20°40'11.96993"
42	42	85°06'36.24940"	20°40'09.59999"
43	43	85°06'35.01450"	20°40'07.01985"
44	44	85°06'33.82066"	20°40'06.76355"
45	45	85°06'29.12497"	20°40'04.52463"
46	46	85°06'28.33856"	20°40'04.08203"
47	47	85°06'28.14415"	20°40'03.80175"
48	48	85°06'27.60078"	20°40'01.90509"
49	49	85°06'24.05907"	20°39'58.32660"
50	50	85°06'20.53938"	20°39'56.36000"
51	51	85°06'11.60796"	20°39'58.36159"
52	52	85°06'14.14539"	20°39'59.56687"
53	53	85°06'19.34607"	20°40'01.04850"
54	54	85°06'19.26136"	20°40'01.85440"
55	55	85°06'21.49854"	20°40'02.82397"
56	56	85°06'23.03808"	20°40'01.80792"
57	57	85°06'26.04831"	20°40'04.34788"
58	58	85°06'25.84450"	20°40'04.57194"
59	59	85°06'25.89715"	20°40'04.96436"
60	60	85°06'28.93539"	20°40'04.97620"
61	61	85°06'30.41915"	20°40'06.05875"
62	62	85°06'30.56436"	20°40'07.38116"
63	63	85°06'30.74160"	20°40'20.38187"
64	64	85°06'30.54703"	20°40'20.65923"
65	65	85°06'30.22748"	20°40'20.69734"
66	66	85°06'30.24990"	20°40'21.12208"
67	67	85°06'19.46783"	20°40'20.93671"
68	68	85°06'19.54688"	20°40'15.60308"
69	69	85°06'19.66683"	20°40'08.05798"

70	70	85°06'17.38217"	20°40'07.84277"
71	71	85°06'17.05037"	20°40'11.05908"
72	72	85°06'14.51176"	20°40'10.68601"
73	73	85°06'14.56164"	20°40'11.56491"
74	74	85°06'14.56105"	20°40'11.57162"
75	75	85°06'11.02159"	20°40'10.90757"
76	76	85°06'08.75467"	20°40'12.16106"

3. Topography & Soil:

The identified area in above village is having partly hilly and partly plain terrain. The soil is lateritic and gravelly but the soil depth is suitable for taking up plantation. Moreover nearby forest blocks is KANGULI PF. So for management point of view , the CA land selected here will be congenial and suitable indigenous species will be planted to ensure a successful plantation.

4. Climate

In Angul District, the wet season is oppressive and overcast whereas, the dry season is humid and mostly clear, and it is hot year round. Over the course of the year, the temperature typically varies from 13.89°C to 40.55°C and is rarely below 11.11°C or above 44.44°C.

5. Rain fall:

The annual average rainfall is 1602 mm. The maximum rainfall is received during the rainy season and particularly in the month of August.

6. Present Vegetation:

The identified land bears dry deciduous mixed vegetation. Species like Sal, Asan, Karada, Kendu, Jamu, Mango, Bahada, Mahul etc are observed.

7. Items of work to be taken up

Planting Model;

The land identified bears natural vegetation. Its tending operation will help maintaining a good forest cover adjacent to habitation. Considering the vegetation, terrain and soil of the area it is proposed to adopt a planting model of AR Plantation(@1000seedlings for Village-Jamugaria is suggested.

Spacing

The plant density proposed for planting is @1000plants per ha. The spacing is to be 3m x 3m(Approximately to accommodate 1000seedlings per ha) . It is suggested to have the line of planting along the contour and plant to plant in adjacent row over the available blank spaces in the selected site. This will reduce the run off and encourage percolation of water and enrichment of vegetation.

Choice of Species:

Considering the soil, topography and present vegetation observed in and around, it is proposed to Plant the following indogenous and pormising species on the identified land in suitable available blanks. Species proposed for planting are

- i) *Acacia Catechew (Khair)*
- ii) *Bombax Ceiba (Simili)*
- iii) *Emblica officinallis (Anla)*
- iv) *Terminalia belerica (Bahada)*
- v) *Terminalia tomentosa (Asana)*
- vi) *Mangifera indica (Aamba)*
- vii) *Pterocarpus marsupium (Bija)*
- viii) *Syzygium cumini (Jamu)*
- ix) *Azadia indica (Neem)*
- x) *Terminalia chebula(Harida)*
- xi) *Pongamia pinnata (Karanja) etc.*

It is proposed for diversion of 125.24 ha of Forest Land . The following detail is furnished in Tabular form

Description of Site	Area (in ha)	Total No of Seedlings required for planting	Remark
Bantala Range			
Compensatory Afforestation Land (NFL)(Jamugaria Identified	34.693	34693	AR Mode 1000nos of Seedlings/ha

8. Silvicultural Tending & Planting Technique to be adopted:

i) Survey, Demarcation and Pillar Posting:

The identified area has been surveyed & pillars posted. It is to be checked and missing pillars if any to be reposted as per Latitude / Longitude provided in the DGPS Map authenticated.

ii) Preparation of Treatment map (Digital map):

The Kml file of the area has been provided by the user agency after DGPS survey. The same will be updated with treatment design basing on physical position at the time of implementing the Plantation Scheme. The Range Officer will update the position with help of GIS cell of the Division as per requirement.

iii) Site Preparation:

After demarcation of the area, site preparation mostly clearing of invasive weeds will be taken up at planting site to be identified by field staff.

iv) Silvicultural Tending Operation:

The selected area is having scattered Sal shoots of promising vigour and of natural regeneration including some other species also. It is proposed to take up Silvicultural cleaning over the area. The activities are intended to achieve healthy growth of existing natural seedlings / saplings / coppice shoots of favored species. The operations include

- Cutting back of high stumps with preference to living stumps and having a good coppicing power.
- Cutting of climbers those are of annual nature and uprooting them wherever possible.
- Singling out of multiple coppice shoots and retaining most promising ones.
- Pruning of whippy plants available within the area.
- Dead and dying trees if any to be cut and separated from the site.

The natural seedlings available in the treatment area are to be given appropriate attention to ensure its establishment.

v) Digging of Pits (45cmx45cmx45cm):

It is proposed to digout pits of size 45cmx45cmx45cm preferably in month of February / March. The dugout earth will be kept at pit head on both sides separately. The top soil will be kept on one side and bottom soil on another side. Soil within 30cm from ground level will be considered as top soil and rest as bottom soil. The pits will be left for weathering due to Sun & Rain.

vi) Refilling of Pits & application of organic Compounds / CDM/ FYM:

The pits will be refilled by altering the dugout soil of the pits i.e. top soil on bottom of the pit and bottom soil on top. Application of organic Compounds / CDM/ FYM & mixing the same properly before refilling is suggested. This will provide necessary nutrients to the plant as well as help in retaining soil moisture for a longer period.

vii) Transportation of Seedlings including short carriage & watering at Pit site.

In the approved cost norm, provisions have been made to plant 18month old seedlings. As seedlings will be above 1m height invariably, careful transportation of seedlings will be of paramount importance. In case of top breaking of seedlings, the benefit of 18month old seedlings will be reduced substantially. Transportation of seedlings from Nursery site to Planting site and then short carriage has to be taken up carefully. Wherever water is available, the plants are to be watered before short carriage to minimize the shock to plants during long carriage by tractors / vans etc.

viii) Planting of Seedlings:

After application of FYM/ CDM/ Organic manure, seedling will be planted carefully. The standard planting procedure is to be followed. As the pit size is of 45cm x 45cm x 45cm the following care will be taken during planting.

- Chemical fertilizer / insecticides to be applied as basal doze to be thoroughly mixed with soil.

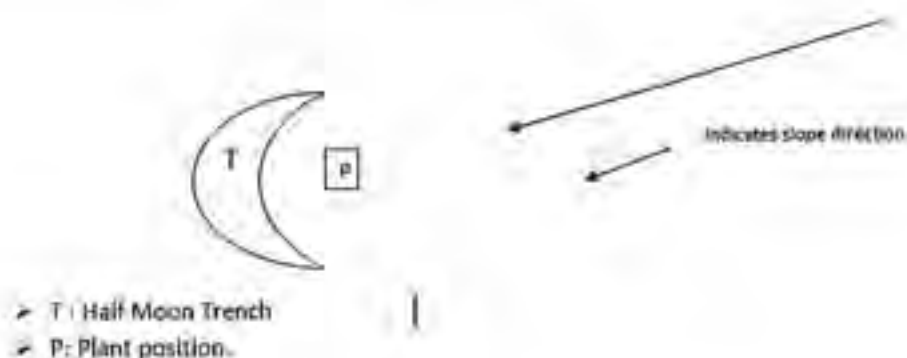
- Seedlings collar zone will be at Ground Level or at best 2.5cm below the ground level. In no case it will not be more than 3cm below Ground Level.
- The Poly bags containing the seedlings are to be carefully removed. It is better to use a blade to cut open the bag so as to cause least disturbance to the ball of earth containing the seedlings.
- After planting the soil is to be compacted leaving 3" around the plant and the compact soil may be at Ground Level or 1" above the Ground level – allowance for soil settlement.
- In no case it should be a sunken around the plant.
- The planted plant should stand erect, if it is tilted due to speedy growth, a support with a stick collected locally to be provided.

ix) Casualty Replacement:

Casualty replacement is an important operation to achieve a 100% survival in a plantation. After planting there is possibility of casualty in planted seedlings. There is a provision to replace casualty up to 10% in 1st year and 10% in 2nd year operation in the approved cost norm. The same is to be carried out with good promising seedlings those can come up to a height of previous planted seedlings. During replacement in 2nd year application of fertilizers etc as in 1st year is to be followed.

x) Weeding & application of Fertilizer:

Two Weeding around the planted seedlings at a diameter of 1.00m has been prescribed in the approved cost norm. During 2nd weeding deep soil working around the plants at 1.00m diameter has also been prescribed. 1st weeding will be taken up just after one month of planting and 2nd weeding and soil working in month of September / October. As there is occasional rainfall in October, providing half-moon trench in sloppy terrain around each plant is suggested. A half-moon trench model is given below.



During weeding (1st& 2nd) there is a provision of application of fertilizer to plants. Application of NPK @30gms per plant x 2 times is suggested. In no case 2nd weeding can be delayed beyond 15th of October.

xi) Fire line Tracing & Inspection Path:

There is possibility of grasses growing up within plantation area. It is better to allow local people / VSS to cut the grasses take for stall feeding under supervision of Forest Staff. In the present case where AR is under implementation Grass growth is limited. Due to fallen dry leaves (Due to leaf shedding), there is possibility of fire hazards in February / March. It is suggested to have fire line at a width of minimum 3m all around the planting area, maintain inter partitioned line / both sides of foot path as a Fire line (minimum 3m wide in 1st year and 2m in subsequent year). These lines will be maintained as inspection path also. It will be maintained till completion of 10th year.

xii) Watch & Ward

Watch and ward is essentially required against biotic interferences like grazing and fire etc including grasses in first two years and illicit felling in subsequent years. Adequate provisions has been made in the approved cost norm. Watch & ward provisions will be implemented as per provision of cost norm.

9. Provision for watering:

The site selected contains partly hilly terrain. All total 34693nos of seedlings will be planted in the site selected depending on extent of blank area available. Watering to be explored and adhered to as per provision of one-time cost norm (Annexure-VI).

10. Funding Agency


The U/A will deposit required funds as per the approved cost of the scheme.

11. Implementing Agency

Divisional Forest Officer, Angul will execute the Compensatory Afforestation Scheme.

Financial analysis and Cost involved.

Compensatory Afforestation scheme for plantation of 34693 nos of seedlings over an area 34.693ha of Non-Forest land in Jamugaria village of Angul Tahasil under Bantala Range of Angul Forest Division		PERFORMA (Norm For 1.00ha)	
Sl No	Component	Unit	Base Rate for commencement year 2023-24
1	AR Plantation @1000plants per ha.	Hectare	258777
2	Watering , Solar Borewell fitted with Drip System	Hectare	245476
3	SMC	Hectare	39284
4	Fencing (Iron angle with chain link wire mesh)	Per 250meters	462316
5	Entry point activity		15% of [(1)+(2)+(3)+(4)]= 150878/-


 Project Officer
 MCL, Subhadra Area
 A.C. Rd. Post, Sumeri Bazar


 Divisional Forest Officer
 Angul Forest Division

**Matrix for Compensatory Afforestation Scheme for Plantation of AR mode @1000nos of Seedlings over an area
1ha-Year wise (Commencement Year 2023-24)**

Year	Financial year	AR Plantation @ 1000nos seedling per ha	Watering, Solar Borewell fitted with Drip system	SMC	Fencing (Iron Angle with Chain link wire mesh(250mt per hectare	Total
0 th year	2023-24	24586	180243	0	314886	519715
1 st year	2024-25	110729	0	23401	0	134130
2 nd year	2025-26	27105	9935	3684	13369	54093
3 rd year	2026-27	20094	10433	3870	14040	48437
4 th year	2027-28	9190	10954	4062	14741	38947
5 th year	2028-29	9648	33911	4267	15478	63304
6 th year	2029-30	11578			16251	27829
7 th year	2030-31	10637			17065	27702
8 th year	2031-32	11170			17918	29088
9 th year	2032-33	11727			18813	30540
10 th year	2033-34	12313			19755	32068
GRAND TOTAL		258777	245476	39284	462316	1005853

[Signature]

प्रमुख अधिकारी

Project Officer

MCL Subhadra Area

यु.प्र. वि. एम. सुभद्रा क्षेत्र


[Signature]
 DIVISION OF AFForestation
 Amravati Division

Abstract for Operation of Compensatory Afforestation Scheme for Plantation of 34693Nos of Seedlings over an area 34.693ha

Sl No	Component	Norm	Unit	Rate	Total
1	AR Plantation @1000plants per ha	258777	Ha	34.693	8977750
2	Watering, Solar Borewell fitted with Drip System	245476	Ha	34.693	8516299
3	SMC	39284	Ha	34.693	1362880
4	Fencing (Iron angle with chain link wire mesh)	462316	250meter	5670meter	10485327
5	Entry point activity	15% (1+2+3+4)			4401338
	Total				33743594

(Three Crore Thirty-Seven Lakh Forty Three Thousand Five Hundred Ninety Four) Only


 Project Officer
 MCL, Subhadra Area
 एम्. एल. एम्. सुभद्रा क्षेत्र


 प्रकल्प अधिकारी
 Project Officer
 MCL, Subhadra Area
 एम्. एल. एम्. सुभद्रा क्षेत्र

Calendar of Operation for Compensatory Afforestation Scheme for Plantation of 34693Nos of Seedlings over an area 34.693ha-Year wise

Year	Financial year	AR Plantation @ 1000nos seedling per ha	Watering, Solar Borewell fitted with Drip system	SMC	Fencing (Iron Angle with Chain link wire mesh (5670mt along the perimeter =22.68times of 250mt)	Entry point activity 15% (1+2+3+4)	Total
0 th year	2023-24	852962	6253170	0	7141614	2137152	16384908
1 st year	2024-25	3841521	0	811851	0	698007	5351379
2 nd year	2025-26	940354	344675	127809	303209	257407	1973454
3 rd year	2026-27	697121	361952	134262	318428	226765	1738528
4 th year	2027-28	318829	380027	140923	334326	176115	1350220
5 th year	2028-29	334718	1176474	148035	351041	301540	2311808
6 th year	2029-30	401676	0	0	368573	115537	885786
7 th year	2030-31	369029	0	0	387034	113410	869473
8 th year	2031-32	387521	0	0	406380	119085	912986
9 th year	2032-33	406845	0	0	426679	125028	958552
10 th year	2033-34	427175	0	0	448043	131282	1006500
GRAND TOTAL		8977751	8516298	1362880	10485327	4401338	33743594



प्रकल्प अधिकारी
Project Officer
MCL, Subhadra Area
एन. वि. एन. सुभद्रा क्षेत्र



Encl:

A- Documents:

- 1) The selected land schedule of Non Forest land in Jamugaria Village coming under Bantala Range of Angul Division attached as (Annexure-I).
- 2) ORSAC, authorization letter vide his letter no ORSAC/DGPS-FD/1080/2022/3203(2) Dated 03/09/2022 as (Annexure-II)
- 3) Approved cost norm for one ha AR Plantation @1000 Plants per ha (Annexure-III).
- 4) Approved Cost norm & matrix for Chain link Fencing: (Annexure-IV)
- 5) Approved Cost norm Matrix for SMC (Model-C) is at (Annexure -V)
- 6) Approved Cost Norm Matrix for Watering, Solar Borewell fitted with Drip System. (Annexure-VI)

B- Maps & Plates:

- I. Cadastral Map of CA land identified at Villages Jamugaria (Plate-I)
- II. DGPS map of the CA land Authenticated by ORSAC) (Plate-II)
- III. Corresponding Topo map (1:50000 Scale) (Plate-III)
- IV. KML File in CD
- V. Forest Cover density map of CA land
- VI. Satellite map of CA land


Divisional Forest officer,
Angul Division

10. VERIFICATION OF LANDS FOR COMMUNITY AFFAIRS
 IN THE YEAR 2010-11

Sl. No.	Village	Serial No.	Plot No.	Area in Hectares	Area in Sq. Mtr.	% Cultivated (H.A.)		Area (in Hectares) for Irrigation with Regulation	Remarks
						Total	Net		
1		1	4	1	8	2	8	8	11
1	Bhimadole	1	11279	Purchase Patta	9.506			7.923	
2		11377	Purchase Patta	11.641			11.344		
3		10889	Purchase Patta	5.127			5.127		
							11754	31.289	

1. Certified that the above non-forest Government lands mentioned in columns 1, 2 & 3 are a compact patch of 4.00 Ha. Or more having adequate depth suitable for plant stop from management point of view.
2. Certified that the above Government land found suitable for plantation is free from encroachment and encumbrances.
3. Certified that the above Government land is not covered under 4(i) notifications.
4. Certified that the above Government land is not covered under O.C.
5. Certified that the above Government land is not allowed previously.
6. Certified that the above Government land is not covered under any M.L.R.L. area.
7. Certified that the above Government land is not situated in favour of industrial community under Section 370B.
8. Certified that the status of the above plot with non forest is or- 15.10.1980
9. Certified that the above plots are not covered under any protected reserve forest.
10. Certified that the above plots are under not only for agriculture but also for other developmental requirements.
11. Certified that the above plots have no future prospect for agriculture or industry use.
12. Certified that the above notified area contains sparse vegetation with density of 0.00 and is able to grow growth in the subsequent afforestation.

Revenue Inspector
 Khinda

T. Prasad Reddy

[Signature]

**VARANASIBABU
 ANGUL**



ORSAC/DGPS-P1/(080/2022) 35034/4 3 7 22

To

The D.F.O.,
Angul Division,
Angul

Sub: Verification of DGPS Survey of Compensatory Afforestation non-forest land in Jamugaria, Kanja, Nukhuripada, Rodasingha, villages and degraded revenue forest land in Baghuapat village in Angul Tahsil in lieu of forest areas proposed for diversion for Subhadra OCP, Subhadra Area of MCL in Angul District.

Ref: Your letter no. 5950 dated 19.08.2022

Sit

With reference to the subject mentioned above, this is to inform you that, the maps and data forwarded to ORSAC by your office for verification of the DGPS survey of Compensatory Afforestation non-forest land in Jamugaria, Kanja, Nukhuripada, Rodasingha villages and degraded revenue forest land in Baghuapat village in Angul Tahsil in lieu of forest areas proposed for diversion for Subhadra OCP, Subhadra Area of MCL in Angul District has been verified by ORSAC and is certified that the map is correct at a confidence level of 95%. All the Compensatory Afforestation non-forest land comes in Jamugaria, Kanja, Nukhuripada, and Rodasingha villages and degraded revenue forest land in Baghuapat village in Angul Tahsil in Angul district. Total Compensatory Afforestation land works out to 150.954Ha, includes 40.249Ha degraded Revenue forest and 110.705Ha non-forest land from the submitted shp files, against the required area of 150.895Ha (40.255Ha degraded Revenue forest and 110.640Ha non-forest land) as mentioned in the submitted record. Detail Patch/village/plot wise comparative statistics of Compensatory Afforestation area is attached herewith.

Yours faithfully,

Encl: 6 hard copy maps


M. K. SANABADA
SCIENTIST - 'D'

Copy to: The General Manager (Subhadra Area), MCL, Subhadra Area, Near Biju Maidan, Angul-759122, Odisha for information.

**STATISTICS OF COMPENSATORY AFFORESTATION LAND IDENTIFIED IN VILLAGE
JAMUGARIA, KANJA, NUKHURIPADA, RODASINGHA ALONG WITH DEGRADED REVENUE
FOREST LAND IN VILLAGE BAGHUAPAT UNDER ANGUL TAHASIL IN LIEU OF FOREST AREAS
PROPOSED FOR DIVERSION FOR SUBHADRA OCP, SUBHADRA AREA OF MCL, ANGUL
DISTRICT**

SL. NO.	VILLAGE NAME	PLOT NO.	KISAM	ALLOTTED AREA HA.	MAP AREA HA.
1	BAGHUAPAT	251(P)	CHHOTA JUNGLE	15.393	15.081
2	BAGHUAPAT	298(P)	CHHOTA JUNGLE	15.212	15.243
3	BAGHUAPAT	283(P)	CHHOTA JUNGLE	6.029	6.035
4	BAGHUAPAT	264(P)	CHHOTA JUNGLE	3.621	3.890
A. TOTAL DEGRADED REVENUE FOREST LAND				40.255	40.249
5	JAMUGARIA	1107(p)	PURATANA PATITA	7.923	7.924
6	JAMUGARIA	1117(p)	PURATANA PATITA	21.643	21.854
7	JAMUGARIA	1089(p)	PURATANA PATITA	5.127	5.259
8	KANJA	1657	PURATANA PATITA	1.752	1.790
9	KANJA	1656(p)	PURATANA PATITA	7.893	7.691
10	KANJA	1648/1(P)	PURATANA PATITA	3.583	3.635
11	NUKHURIPADA	8(P)	PURATANA PATITA	19.126	19.129
12	RODASINGHA	965(P)	PAHADA	43.593	43.433
B. TOTAL NON-FOREST LAND				110.640	110.705
TOTAL CA LAND AREA (A+B)				150.895	150.954


 SPM A. Sanjay
 Scientist, TRSAC
 Bhubaneswar

Annexure-III

BASE COST NORM FOR COMPENSATORY AFFORESTATION (BLOCK PLANTATION) @1000 PLANTS PER HECTARE (18 months old seedlings)

WAGE RATE Rs. 311/- PER MANDAY

Sl.No.	Items of work	Preferable period of Execution	No. of Mandays	Labour Cost (In Rs.)	Material Cost (In Rs.)	Total Cost (In Rs.)
0th Year (Advance Work) Pre- Planting operation						
1	Survey, Demarcation and Pillar posting	Nov/ Dec	2	622	0	622
2	Preparation of Treatment Map (Digital Map)	Nov/ Dec	1	311	100	411
3	Site Preparation (Cleaning & removal of debris)	Nov/ Dec	12	3732	0	3732
4	Creation of 4 mt wide Inspection Path	Feb/ Mar	1	311	0	311
5	Alignment and stacking of pits	Feb/ Mar	1	311	0	311
6	Digging of pits (45cm x 45cm x 45 cm) in hard and gravelly soil	Feb/ Mar	40	12440	0	12440
7	Construction of Temporary Labour Shed, Drinking water facility and First-Aid etc.	Jan/Mar	0	0	3500	3500
	Total		57	17727	3600	21327
1st Year/ Planting Year						
1	Refilling of pits by altering the dugout soil of the pits, application of organic compounds/ CDM/ FYM & mixing the same perfectly.	June/ Jul	7.5	2332.5	5000	7332.5
2	Transportation of 18 months old polythene bag seedlings in hired truck/ tractor from the permanent / Mega Nursery to the planting site including Loading & unloading. (Average lead of 10Rkm) & stacking the seedlings @Rs. 6/- seedling. (1100 nos.)	Jul/ Aug	0	0	6600	6600
3	Watering polythene bag seedlings at stacking site of plantation.	Jul/ Aug	2	622	0	622
4	Conveyance of polythene bag seedlings on head load from the stacking site to individual dugout pits within the planting site, applying insecticide, fertilizer & planting after scooping the soil with other applied materials and pressing the soil perfectly around the planted seedling.	Jul/ Aug	22.5	6997.5	0	6997.5

5	<u>Cost of Fertilizer & Insecticide</u> (a) NPK/ Bio-fertilizer @50gms/ plant as basal dose = 50 kg @ Rs.30/- per kg =Rs. 1500.00 (b) Urea/ Vermicompost/ Mo khata/ any other fertilizers @Rs. 750.00 (c) Insecticide/ Bio-pesticides @5gms/ plant = 5 kg @ Rs.150/-per kg = Rs. 750/-	Jul/ Aug	0	0	3000	3000
6	Casualty replacement @ 10 % (100 nos.)	Jul/ Aug	2.5	777.5	0	777.5
7	1st weeding & Manuring	Aug/ Sept	12	3732	0	3732
8	2nd Weeding, Soil working (1mt. Diameter around the plants) & Manuring	Oct/ Nov	15	4665	0	4665
9	Fire line tracing & Inspection path	Feb/ Mar	3	933	0	933
10	Watch & ward including watering as per requirement	Aug-Mar	12	3732	0	3732
Total			76.5	23791.50	14600.00	38391.50

2nd Year Maintenance

1	Transportation of 100 seedlings from Nursery to plantation site including loading, unloading & conveyance by Tractor @ Rs.6/- per seedlings	Jul	0	0	600	600
2	Casualty replacement	Jul	2.5	777.5	0	777.5
3	<u>Cost of Fertilizer & Insecticide</u> A) Cost of Insecticide/ Bio-pesticides (Themet/ Forate) @ 5 gms/ plant = 0.5 kg @s.150/-per kg = Rs.75/- B) Urea/ NPK/ Bio-fertilizers/ vermicompost/ Mo khata/ any other fertilizers = Rs.2800/-	July / Aug	0	0	2875	2875
4	Weeding (Complete weeding), Manuring & Soil working (1mt. Diameter around the plants)	Sept/ Oct	15	4665	0	4665
5	Fire line tracing (2m. Wide fire line over 400 m long) including maintenance of inspection path	Feb/ Mar	3	933	0	933
6	Watch & ward including watering as per requirement	Apr-Mar	18	5598	0	5598
7	Maintenance of Temporary Labour Shed, Drinking water facility and First-Aid etc.	Apr-Mar	0	0	1000	1000

		Total	38.5	11973.5	4475	16448.5
3rd Year Maintenance						
1	Cost of Fertilizers Urea/ NPK/ Bio-fertilizers/ Vermicompost/ Mo khata/ any other fertilizers = Rs.2800/-	July / Aug	0	0	2800	2800
2	Weeding (Complete weeding), Manuring & Soil working (1mt. Diameter around the plants)	Sept/ Oct	15	4665	0	4665
3	Fire line tracing (2m. Wide fire line over 400m long) & Inspection path	Feb/ Mar	3	933	0	933
4	Watch & ward including watering as per requirement	Apr/ Mar	18	5598	0	5598
5	Maintenance of Temporary Labour Shed, Drinking water facility and First- Aid etc.	Apr/ Mar	0	0	1000	1000
Total			36	11196	3800	14996
4th Year Maintenance						
1	Fire line tracing (2m. Wide fire line over 400m length) & including maintenance Inspection path	Feb/ Mar	3	933	0	933
2	Watch & ward including watering as per requirement	Apr/ Mar	18	5598	0	5598
Total			21	6531	0	6531
5th Year Maintenance						
1	Fire line tracing (2m. Wide fire line over 400m length) & including maintenance Inspection path	Feb/ Mar	3	933	0	933
2	Watch & ward including watering as per requirement	Apr/ Mar	18	5598	0	5598
Total			21	6531	0	6531
6th Year Maintenance						
1	Fire line tracing (2m. Wide fire line over 400m length)	Feb/ Mar	3	933	0	933
2	Pruning of branches, singling out of multiple shoots	Jan/Mar	3	933	0	933
3	Watch & ward	Apr/ Mar	18	5598	0	5598
Total			24	7464	0	7464

7th Year Maintenance

1	Fire line tracing (2m. Wide fire line over 400m length)	Feb/ Mar	3	933	0	933
2	Watch & ward	Apr/ Mar	18	5598	0	5598
	Total		21	6531	0	6531

8th Year Maintenance

1	Fire line tracing (2m. Wide fire line over 400m length)	Feb/ Mar	3	933	0	933
2	Watch & ward	Apr/ Mar	18	5598	0	5598
	Total		21	6531	0	6531

9th Year Maintenance

1	Fire line tracing (2m. Wide fire line over 400m length)	Feb/ Mar	3	933	0	933
2	Watch & ward	Apr/ Mar	18	5598	0	5598
	Total		21	6531	0	6531

10th Year Maintenance

1	Fire line tracing (2m. Wide fire line over 400m length)	Feb/ Mar	3	933	0	933
2	Watch & ward	Apr/ Mar	18	5598	0	5598
	Total		21	6531	0	6531

ABSTRACT(Showing Seedling Cost Separately)							
Sl.No.	Year	No. of Mandays	Labour Cost (In Rs.)	Material Cost (In Rs.)	Monitoring, Evaluation, Learning, Documentation and other Contingency (5%) of (4+5)	Cost of Seedlings @Rs. 50.31 per seedlings	Total Cost (In Rs.)
1	0th Year	57	17727	3600	973	0	22300
2	1st Year	76.5	23791.5	14600	1918.5	55341	95651
3	2nd Year	38.5	11973.5	4475	821.5	5031	22301
4	3rd Year	36	11196	3800	749	0	15745
5	4th Year	21	6531	0	326	0	6857
6	5th year	21	6531	0	326	0	6857
7	6th Year	24	7464	0	373	0	7837
8	7th Year	21	6531	0	326	0	6857
9	8th Year	21	6531	0	326	0	6857
10	9th Year	21	6531	0	326	0	6857
11	10th Year	21	6531	0	326	0	6857
Total		358	111338	26475	6791	60372	204976

The Costing for 10 years will be as per One time Cost Norm approved by PCCF(O) vide this letter No 1109 dated 11.11.2021.

Sl. NO.	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	Total Cost (10 Years)	
	Base Year:-	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	
1	2022-23	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	234718
2	2022-23	24421	24422	24423	24424	24425	24426	24427	24428	24429	24430	24431	24432	24433	24434	24435	24436	24437	24438	24439	24440	24441	246454
3	2023-24		25506	25507	25508	25509	25510	25511	25512	25513	25514	25515	25516	25517	25518	25519	25520	25521	25522	25523	25524	25525	258777
4	2024-25		26010	26011	26012	26013	26014	26015	26016	26017	26018	26019	26020	26021	26022	26023	26024	26025	26026	26027	26028	26029	271716
5	2025-26		27226	27227	27228	27229	27230	27231	27232	27233	27234	27235	27236	27237	27238	27239	27240	27241	27242	27243	27244	27245	285302
6	2026-27		28662	28663	28664	28665	28666	28667	28668	28669	28670	28671	28672	28673	28674	28675	28676	28677	28678	28679	28680	28681	299567
7	2027-28		29886	29887	29888	29889	29890	29891	29892	29893	29894	29895	29896	29897	29898	29899	29900	29901	29902	29903	29904	29905	314546
8	2028-29		31378	31379	31380	31381	31382	31383	31384	31385	31386	31387	31388	31389	31390	31391	31392	31393	31394	31395	31396	31397	330273
9	2029-30		32967	32968	32969	32970	32971	32972	32973	32974	32975	32976	32977	32978	32979	32980	32981	32982	32983	32984	32985	32986	346788
10	2030-31		34796	34797	34798	34799	34800	34801	34802	34803	34804	34805	34806	34807	34808	34809	34810	34811	34812	34813	34814	34815	364127

Annexure-IV

Fencing for Compensatory plantation raised outside the forest area Using Angle Iron and Chain link wire mesh (250Rmt/ha)

Sl no	Item of work	Preferable period of Execution	Man days	Wages@311/-	Material cost (Rs)	Total Cost (Rs per ha)
0th Year (PPO)						
1	Earth work (excavation of hole) in Hard soil at a distance of 3mt $0.40m \times 0.40m \times 0.40m = 0.064 \times 84 = 5.376 \text{cum}$ @Rs 140/cum = Rs 753/-		2.42	752.62	0	752.62
2	Cement concrete (1:4:8) using 40mm BHG Metal $84 \times 0.40m \times 0.40m \times 0.10m = 1.344 \text{cum}$ @3755.94/cum		0	0	5047.4	5047.4
3	Angle iron pole of size 50mm x 50mm x 6mm of height 2.40mt $84 \times 2.40 = 201.60 \text{sqmt}$ @4.50/kg/sqmt=907.20kg@69.50per kg			0	63050	63050
4	Cement concrete (1:2:4) for fixing the iron angle pole using 12 mm BHG Chips $84 \times 0.40m \times 0.40m \times 0.30m = 4.032 \text{cum}$ @5486.77/cum			0	22123	22123
5	Cost of chain link mess using 4mm Dia GI wire having gap size 50mm x 50mm 250Rmt x 2.10mt=525sqmt@331/sqmt= Rs 173775			0	173775	173775
6	Double cost painting of iron angel pole over a coat of primer using good quality enamel paint $84 \times 2.10 \times 0.20 = 35.28 \text{sqmt}$ @Rs 108.80/sqmt.			0	3838	3838
7	Painting of GI Chain link mess $250 \times 2.10 \times 2 = 1050/10 = 105 \text{sqmt}$ @Rs 108.80/sqmt.			0	11424	11424
8	Transportation of chain link mess, iron angle straightening and tying of chain link mess etc @2% of the total cost			0	5600	5600
			2.42	752.62	284857.4	285610
1st year Maintenance						
9	No maintenance required	Sep/Oct	0	0	0	0
2nd year maintenance						
10	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year $1142 \times 1\% = 11.42$ say 11	Sep/Oct	0	0	11000	11000

3rd year maintenance						
11	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
4th year maintenance						
12	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
5th year maintenance						
13	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
6th year maintenance						
14	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
7th year maintenance						
15	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
8th year maintenance						
16	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
9th year maintenance						
17	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
10th year maintenance						
18	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
Total			2.42	752.62	383857.4	384610.00

Sl no	Year	No of Person days	Labour cost @311/- per day	Material cost	Total cost
1	0th year	2.42	752.62	284857.4	285610.02
2	1st year	0	0	0	0
3	2nd year	0	0	11000	11000
4	3rd year	0	0	11000	11000
5	4th year	0	0	11000	11000
6	5th year	0	0	11000	11000
7	6th year	0	0	11000	11000
8	7th year	0	0	11000	11000
9	8th year	0	0	11000	11000
10	9th year	0	0	11000	11000
11	10th year	0	0	11000	11000
	Total	2.42	752.62	383857.4	384610

Sl. NO	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XIX	XX	Total Cost (in Rupees)		
	Base Norm	285610	0	11000	11000	11060	11000	11000	11000	11000	11000	11000											
1	2021-22	285610	0	12126	12794	13379	14039	14740	15478	16252	17064	17918	419331									419331	
2	2022-23		299891	0	12732	13371	14039	14741	15477	16252	17065	17917	18814									440299	
3	2023-24			814866	0	11569	14040	14741	15478	16251	17065	17918	18813	19755								462316	
4	2024-25				330630	0	14037	14742	15478	16252	17064	17918	18814	19754	20743								485432
5	2025-26					84712	0	14739	15479	16252	17065	17917	18814	19755	20742	21780							509705
6	2026-27						364920	0	15476	16253	17065	17918	18813	19755	20743	21778	22869						535191
7	2027-28							882745	0	16250	17066	17918	18814	19754	20743	21780	22868	24012					561961
8	2028-29								401883	0	17063	17919	18814	19755	20742	21780	22869	24011	25213				590049
9	2029-30									421977	0	17916	18815	19755	20743	21779	22860	24012	25212	26474			619552
10	2030-31										443076	0	18812	19756	20743	21780	22868	24012	25213	26473	27798		650531

Annexure-V

Cost Norms for creation of Compensatory Afforestation with Stabilization of Soil & Conservation of moisture (1000 Plants/Ha.)

WAGE RATE RS- 311/- PER DAY

Sl. No	Item of Works	Preferable Period of Execution	Total Cost
0th Year (Pre-Planting Operation)			
1	Nil		0
1st Year			
2	Soil Conservation measure structures like Staggered Trench, Percolation pit, Contour trench, Graded earthen bund, LBCD Wire mesh LBCD, Sub surface Dyke & WHS as per the slop & site requirement on LS	Apr/sep	20,215
2nd Year			
3	Maintenance of SMC structures @ 15 % of initial year cost	Apr/jul	3,032
3rd Year			
4	Maintenance of SMC structures @ 15 % of initial year cost	Apr/jul	3,032
4th Year			
5	Maintenance of SMC structure @ 15 % of initial year cost	Apr/jul	3,032
5th Year			
5	Maintenance of SMC structure @ 15 % of initial year cost	Apr/jul	3,032
Total:			32,343.0

Matrix for (SMC)

SI No	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	Total Cost
	Base Norm	0	20215	3032	3032	3032	3032											
1	2021-22	0	21226	3342	3510	3685	3870											35633
2	2022-23			22287	3509	3686	3869	4064										37415
3	2023-24				23401	3684	3870	4062	4267									39284
4	2024-25					24571	3868	4064	4265	4480								41248
5	2025-26						25800	4061	4267	4478	4704							43310
6	2026-27							27090	4264	4480	4702	4939						45475
7	2027-28								28445	4477	4704	4937	5186					47749
8	2028-29									29867	4701	4939	5184	5445				50136
9	2029-30										31360	4936	5186	5443	5717			52642
10	2030-31											32928	5183	5445	5715	6003		55274

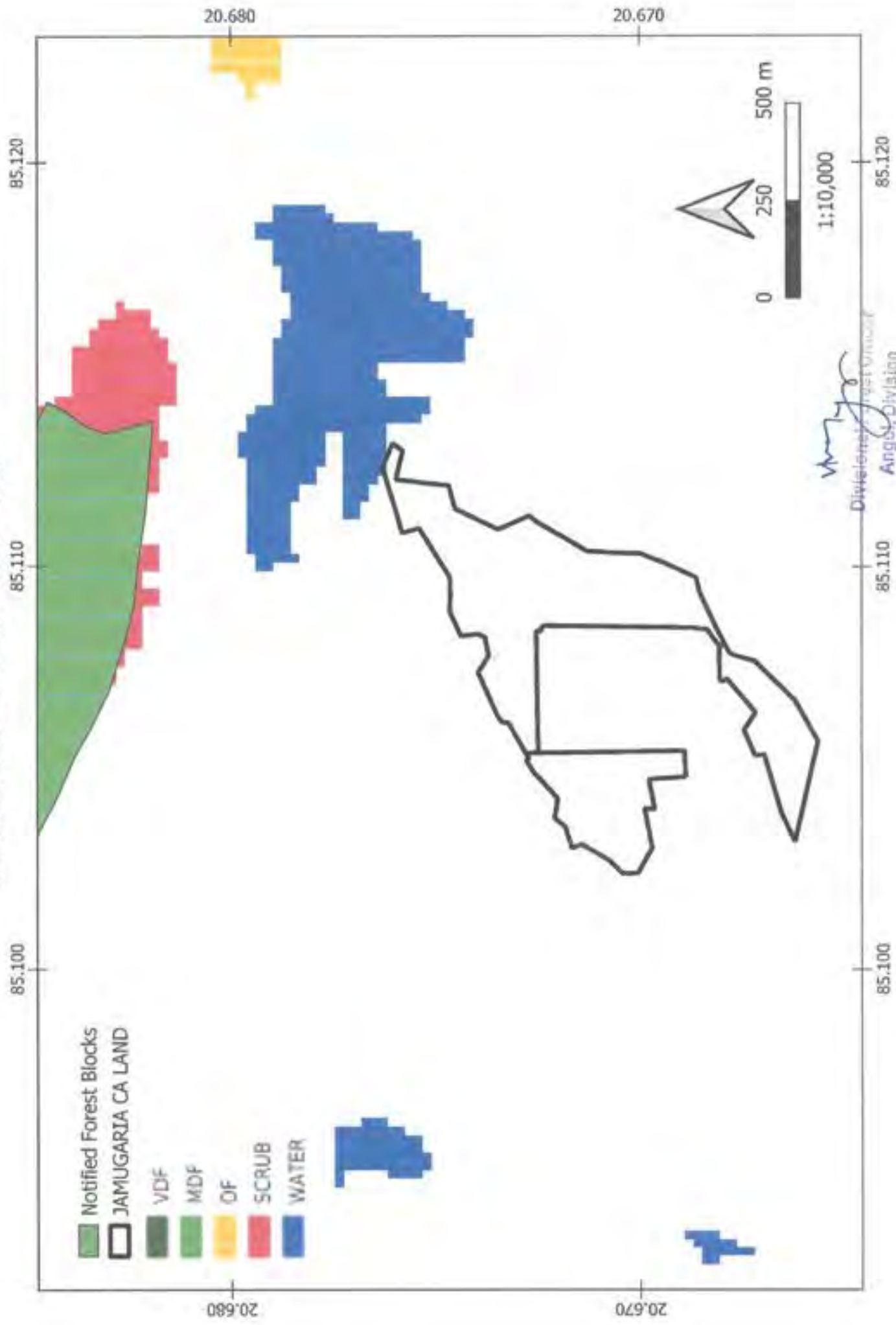
Annexure-VI		
WATERING MODEL-W-I		
Watering provision to CA Plantation		
Solar System with Bore well (1 system for 5 Ha Plantation) fitting with Drip system , Wage rate@ Rs 311/- Year of installation (0 th YEAR)		
1	Cost of Borewell	1,50,000
2	Installation of Solar panel & other System	3,00,000
3	Cost of 0.5 HP submersable motor with accessories	50,000
4	Water Storage Tank/ Flexible pipes	15,000
5	Cost of laying Drip system including all accessories, fittings etc, with 12% GST	3,02,431
	TOTAL	8,17,431
6	Cost of Water & watering per Ha. (8,17,431/5) =Rs1,63,486/-	1,63,486
1 st Year Watering		
7	No maintenance required	0
	TOTAL	0
2 nd Year Watering		
8	Maintenance of system @5% of Initial cost of installation	8,174
	TOTAL	8,174
3 rd Year Watering		
9	Maintenance of system @ 5% of initial cost of installation	8,174
	TOTAL	8,174
4 th Year Watering		
10	Maintenance of system @ 5%of initial cost of installation	8,174
	TOTAL	8,174
5 th Year Watering		
11	Maintenance of system @ 5% of initial cost of installation	8,174
	TOTAL	8,174

Abstract					
Sl. no	Year	No. person days	Labour Cost @ Rs 311/-per day	Material Cost	Total cost (Rs)
1	0 th year	0	0.0	163486.0	163486.0
3	1 st year	0	0.0	0.0	0.0
3	2 nd year	0	0.0	8174.0	8174.0
4	3 rd year	0	0.0	8174.0	8174.0
5	4 th year	0	0.0	8174.0	8174.0
6	5 th year	0	0.0	8174.0	8174.0
	Total:	0	0	196182	1,96,182

Matrix for Watering W1 (Solar Borewell) fitted with Drip System (per Ha)

Sl No.	Commencement year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	Total Cost
	Base Norm	163486	0	8174	8174	8174	8174											
1	2021-22	163486	0	9011	5463	9935	30758											222853
2	2022-23		17166 0	0	9462	9936	10432	32796										233786
3	2023-24			18024 3	0	9935	10433	10954	33911									245476
4	2024-25				18925	0	10432	10955	11502	35607								257751
5	2025-26					198712	0	10954	11503	12077	37387							270639
6	2026-27						208654	0	11502	12078	12681	39256						284171
7	2027-28							21908 7	0	12077	12682	13315	41219					298380
8	2028-29								230041	0	12681	13316	13941	43280				313299
9	2029-30									241543	0	13315	13982	14680	45444			328964
10	2030-31										25362 0	0	13981	14681	15414	47716		345412

Non-Forest Land in JAMUGARIA CA LAND



Non-Forest Land in JAMUGARIA CA LAND



CHECK LIST SERIAL NUMBER-18
SCHEME FOR
COMPENSATORY AFFORESTATION SCHEME
OVER AN AREA OF 19.126HA IN NON-FOREST
LAND IDENTIFIED IN THE VILLAGE
NUKHURIPADA BANTALA RANGE
UNDER
ANGUL TAHASIL
OF
DISTRICT ANGUL
IN
LIEU OF PROPOSED FOREST DIVERSION FOR 125.24
HA OF FOREST LAND COMING WITHIN SUBHADRA
OPEN CAST PROJECT
OF
M/S MCL, DIST-ANGUL

Plantation Model:

Block Plantation over ha@1600plants per ha

Prepared By

Divisional Forest Officer,
Angul Division

Contents

Sl no	Description	Annexures	Page No
1	Land suitability Certificate	--	
2	Details of Scheme	--	
3	Land schedule	I	
4	ORSAC Authentication Letter	II	
5	Block Plantation @1600/ha	III	
6	Cost norm & matrix for chain link Fencing	IV	
7	Cost norm matrix for SMC (Model -C)	V	
8	Watering, Solar Borewell fitted with Drip System	VI	
MAPS			PLATE
9	Cadastral Map of CA land identified at Village Nukhuripada (Plate-I)		Plate-I
10	DGPS map of the CA land at Nukhuripada (Authenticated by ORSAC) (Plate-II)		Plate-II
11	Corresponding Topo map (1:50000 Scale) (Plate-III)		Plate-III
12	KML File in CD		

Land Suitability Certificate

The requirement of suitable Non Forest land at par with the guidelines of MoEF & CC is a vital aspect for raising Compensatory Afforestation in lieu diversion of Forest land for Non forestry purpose of a project under FC Act, 1980.

In the instant case diversion of Forest land to the extent of 125.24ha is required for the project "Subhadra Open Cast Project of M/s MCL in the district of Angul. According required exercises were undertaken in the field by Forest and Revenue Staff jointly to select suitable Non forest land/ Govt degraded forest land for the purpose of Compensatory Afforestation for the said project . Finally One patch of Non forest land over 19.126ha of Nukhuripada Village was selected in Bantala Range with suitability criteria to accommodate required no of seedlings Block plantations@1600plantations per ha. Criteria of suitability of the sites meet relevant parameters such as management point of view, free from encroachment and encumbrances, not included in Section -4(1) notification, not under DLC status of forest, non allotment of the said areas for other projects etc as narrated against this site furnished in Annexure-I. Besides soil quality, soil depth, terrain, climatic conditions etc are suitable for planting indigenous promising species for sustained growth and establishment and over and above location of the site with respect to closeness to nearby forest block of Angul Division which will ensure proper supervision, monitoring of the plantation raised under Compensatory Afforestation Scheme. Plantations activities will be as done per the approved One-time Cost Norm of PCCF, Odisha and it is hoped to ensure proper greenery with improved environmental scenario after implementation of the said plantation.

Place:

Date:


Divisional Forest Officer,
Angul Division
Angul, Odisha

Scheme

This scheme is for taking up Compensatory Afforestation is on identified Non forest land in Village Nukhuripada of Bantala Range under Angul Tahasil in the District of Angul in lieu of Proposed Forest Diversion or 125.24 ha of Forest land coming within Subhadra Open Cast Project of M/s MCL, Dist-Angul.

1. Introduction: The Subhadra Open Cast Mining Lease is over an area of 1111.85 ha. Out of which Forest land located in Mining lease is 125.24ha and Non forest area is 986.61ha as per the land schedule. The User Agency M/s MCL has filed forest Diversion Proposal Vide Proposal No FP/OR/MIN/150133/2021.

On application for providing Compensatory Afforestation Land, the Collector and District Magistrate , Angul has allotted 110.640ha of Non forest Revenue land and 40.255ha of Revenue Degraded Forest area spread over in 5 patches vide his letter no dated . This scheme is meant for 19.126ha of Non-Forest land in village Nukhuripada which has been jointly verified by the Revenue staff and Forest staff. The selected land schedule is coming under Bantala Range of Angul Division (Annexure-I)

Land schedule:

Land Schedule of land jointly verified by Revenue and Forest Staffs for Compensatory Afforestation								
Village	Khata No	Plot No	Total Plot Area in Hectare	Area taken for plantation in ha	Kisam	Remark	Nearest Forest Block	Approximate distance from the proposed site
Bantala Range								
Nukhuripada	1	8(p)	24.55	19.126	PuratanaPatita	Nonforest	Balanga RF	0.6Km

2. DGPS Survey, Mapping & Authentication of CA Land.

As per the revised guidelines of Chief Executive, ORSAC, the User Agency has taken up DGPS Survey by empanelled vendors and the same has been authenticated by ORSAC vide his letter no ORSAC/DGPS-FD/1080/2022/3203(2) Dated 03/09/2022 and due endorsement has been furnished on DGPS surveyed Map. The DGPS Map,

Corresponding Topo map (Survey of India map F45T2 1:50000 Scale) are enclosed to this Scheme. The KML File of the area is submitted in a CD. (Letter of Authentication by ORSAC at Annexure-II)

The Latitude / Longitude of Survey Points as per DGPS authenticated Map is furnished below.

DGPS OBSERVATION CO-ORDINATES OF BOUNDARY PILLARS			
SL.NO	MAP ID	LONGITUDE	LATITUDE
1	1	85°02'59.65079"	20°41'16.90920"
2	2	85°03'05.78273"	20°41'16.89979"
3	3	85°03'11.88240"	20°41'16.87116"
4	4	85°03'11.98493"	20°41'14.68619"
5	5	85°03'14.05468"	20°41'14.72819"
6	6	85°03'13.99614"	20°41'11.37632"
7	7	85°03'11.63269"	20°41'11.39225"
8	8	85°03'11.62547"	20°41'09.05895"
9	9	85°03'13.90438"	20°41'09.07357"
10	10	85°03'13.93894"	20°41'03.99705"
11	11	85°03'04.62395"	20°41'04.06725"
12	12	85°02'56.90051"	20°41'04.12482"
13	13	85°02'56.81037"	20°41'07.02894"
14	14	85°02'55.30857"	20°41'07.00352"
15	15	85°02'55.24377"	20°41'12.39819"
16	16	85°02'56.74891"	20°41'13.64443"
17	17	85°02'58.31264"	20°41'15.45784"
18	18	85°02'59.38145"	20°41'16.43367"

3. Topography & Soil:

The identified area in above village is having partly hilly and partly plain terrain. The soil is lateritic and gravelly but the soil depth is suitable for taking up plantation. Moreover nearby forest blocks is BALANGA RF. So for management point of view, the CA land selected here will be congenial and suitable indigenous species will be planted to ensure a successful plantation.

4. Climate

In Angul District, the wet season is oppressive and overcast whereas, the dry season is humid and mostly clear, and it is hot year-round. Over the course of the year, the temperature typically varies from 13.89°C to 40.55°C and is rarely below 11.11°C or above 44.44°C.

5. Rain fall:

The annual average rainfall is 1602 mm. The maximum rainfall is received during the rainy season and particularly in the month of August.

6. Present Vegetation:

The identified land bears dry deciduous mixed vegetation. Species like Sal, Asan, Karada, Kendu, Jamu, Mango, Bahada, Mahul etc are observed.

7. Items of work to be taken up

Planting Model;

The land identified bears natural vegetation. Its tending operation will help maintaining a good forest cover adjacent to habitation. Considering the vegetation, terrain and soil of the area it is proposed to adopt a planting model of Block Plantations @1600seedlings per ha for Village-Nukhuripada) is suggested.

Spacing

The plant density proposed for planting is @1600plants per ha. The spacing is to be 3m x 3m(Approximately to accommodate 1600seedlings per ha) . It is suggested to have the line of planting along the contour and plant to plant in adjacent row over the available blank spaces in the selected site. This will reduce the run off and encourage percolation of water and enrichment of vegetation.

Choice of Species:

Considering the soil, topography and present vegetation observed in and around, it is proposed to Plant the following indogenous and promising species on the identified land in suitable available blanks. Species proposed for planting are

- i) *Acacia Catechew (Khair)*
- ii) *Bombax Ceiba (Simili)*
- iii) *Embllica officinallis (Anla)*
- iv) *Terminalia belerica (Bahada)*
- v) *Terminalia tomentosa (Asana)*
- vi) *Mangifera indica (Aamba)*
- vii) *Pterocarpus marsupium (Bija)*
- viii) *Syzygium cumini (Jamu)*
- ix) *Azadia indica (Neem)*
- x) *Terminalia chebula(Harida)*
- xi) *Pongamia pinnata (Karanja) etc.*

It is proposed for diversion of 125.24 ha of Forest Land. The following detail is furnished in Tabular form

Description of Site	Area (in ha)	Total No of Seedlings required for planting	Remark
Bantala Range			
Compensatory Afforestation Land Identified (NFL)(Nukhuripada)	19.126	30602	Block Plantation of 1600/ha

8. Silvicultural Tending & Planting Technique to be adopted:

i) Survey, Demarcation and Pillar Posting:

The identified area has been surveyed & pillars posted. It is to be checked and missing pillars if any to be reposted as per Latitude / Longitude provided in the DGPS Map authenticated.

ii) Preparation of Treatment map (Digital map):

The Kml file of the area has been provided by the user agency after DGPS survey. The same will be updated with treatment design basing on physical position at the time of implementing the Plantation Scheme. The Range Officer will update the position with help of GIS cell of the Division as per requirement.

iii) Site Preparation:

After demarcation of the area, site preparation mostly clearing of invasive weeds will be taken up at planting site to be identified by field staff.

iv) Silvicultural Tending Operation:

The selected area is having scattered Sal shoots of promising vigour and of natural regeneration including some other species also. It is proposed to take up Silvicultural cleaning over the area. The activities are intended to achieve healthy growth of existing natural seedlings / saplings / coppice shoots of favored species. The operations include

- Cutting back of high stumps with preference to living stumps and having a good coppicing power.
- Cutting of climbers those are of annual nature and uprooting them wherever possible.
- Singling out of multiple coppice shoots and retaining most promising ones.
- Pruning of whippy plants available within the area.
- Dead and dying trees if any to be cut and separated from the site.

The natural seedlings available in the treatment area are to be given appropriate attention to ensure its establishment.

v) Digging of Pits (45cmx45cmx45cm):

It is proposed to dugout pits of size 45cmx45cmx45cm preferably in month of February / March. The dugout earth will be kept at pit head on both sides separately. The top soil will be kept on one side and bottom soil on another side. Soil within 30cm from ground level will be considered as top soil and rest as bottom soil. The pits will be left for weathering due to Sun & Rain.

vi) Refilling of Pits & application of organic Compounds / CDM/ FYM:

The pits will be refilled by altering the dugout soil of the pits i.e., top soil on bottom of the pit and bottom soil on top. Application of organic Compounds / CDM/ FYM &

mixing the same properly before refilling is suggested. This will provide necessary nutrients to the plant as well as help in retaining soil moisture for a longer period.

vii) *Transportation of Seedlings including short carriage & watering at Pit site.*

In the approved cost norm, provisions have been made to plant 18month old seedlings. As seedlings will be above 1m height invariably, careful transportation of seedlings will be of paramount importance. In case of top breaking of seedlings, the benefit of 18month old seedlings will be reduced substantially. Transportation of seedlings from Nursery site to Planting site and then short carriage has to be taken up carefully. Wherever water is available, the plants are to be watered before short carriage to minimize the shock to plants during long carriage by tractors / vans etc.

viii) *Planting of Seedlings:*

After application of FYM/ CDM/ Organic manure, seedling will be planted carefully. The standard planting procedure is to be followed. As the pit size is of 45cm x 45cm x 45cm the following care will be taken during planting.

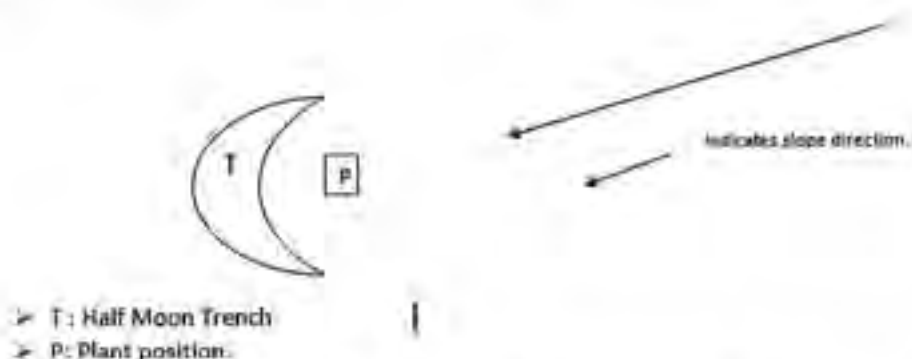
- Chemical fertilizer / insecticides to be applied as basal doze to be thoroughly mixed with soil.
- Seedlings collar zone will be at Ground Level or at best 2.5cm below the ground level. In no case it will not be more than 3cm below Ground Level.
- The Poly bags containing the seedlings are to be carefully removed. It is better to use a blade to cut open the bag so as to cause least disturbance to the ball of earth containing the seedlings.
- After planting the soil is to be compacted leaving 3" around the plant and the compact soil may be at Ground Level or 1" above the Ground level – allowance for soil settlement.
- In no case it should be a sunken around the plant.
- The planted plant should stand erect, if it is tilted due to speedy growth, a support with a stick collected locally to be provided.

ix) Casualty Replacement:

Casualty replacement is an important operation to achieve a 100% survival in a plantation. After planting there is possibility of casualty in planted seedlings. There is a provision to replace casualty up to 10% in 1st year and 10% in 2nd year operation in the approved cost norm. The same is to be carried out with good promising seedlings those can come up to a height of previous planted seedlings. During replacement in 2nd year application of fertilizers etc as in 1st year is to be followed.

x) Weeding & application of Fertilizer:

Two Weeding around the planted seedlings at a diameter of 1.00m has been prescribed in the approved cost norm. During 2nd weeding deep soil working around the plants at 1.00m diameter has also been prescribed. 1st weeding will be taken up just after one month of planting and 2nd weeding and soil working in month of September / October. As there is occasional rainfall in October, providing half-moon trench in sloppy terrain around each plant is suggested. A half-moon trench model is given below.



During weeding (1st & 2nd) there is a provision of application of fertilizer to plants. Application of NPK @30gms per plant x 2 times is suggested. In no case 2nd weeding can be delayed beyond 15th of October.

xi) Fire line Tracing & Inspection Path:

There is possibility of grasses growing up within plantation area. It is better to allow local people / VSS to cut the grasses take for stall feeding under supervision of Forest Staff. In the present case where AR is under implementation Grass growth is limited.

Due to fallen dry leaves (Due to leaf shedding), there is possibility of fire hazards in February / March. It is suggested to have fire line at a width of minimum 3m all around the planting area, maintain inter partitioned line / both sides of foot path as a Fire line (minimum 3m wide in 1st year and 2m in subsequent year). These lines will be maintained as inspection path also. It will be maintained till completion of 10th year.

xii) Watch & Ward

Watch and ward is essentially required against biotic interferences like grazing and fire etc including grasses in first two years and illicit felling in subsequent years. Adequate provisions has been made in the approved cost norm. Watch & ward provisions will be implemented as per provision of cost norm.

9. Provision for watering:

The site selected contains partly hilly terrain. All total 30602nos. of seedlings will be planted in the site selected depending on extent of blank area available. Watering to be explored and adhered to as per provision of one time cost norm (Annexure-VI).

10. Funding Agency

The U/A will deposit required funds as per the approved cost of the scheme.

11. Implementing Agency

Divisional Forest Officer, Angul will execute the Compensatory Afforestation Scheme.


Financial analysis and Cost involved.

Compensatory Afforestation scheme for plantation of 30602nos of seedlings over an area 19.126ha of Non Forest land in Nukhuripada village in Angul Tahasil under Bantala Range of Angul Forest Division

PERFORMA (Norm For 1.00ha)

Sl No	Component	Unit	Base Rate for commencement year 2023-24
1	Block Plantation @1600plants per ha	Hectare	341903
2	Watering, Solar Borewell fitted with Drip System	Hectare	245476
3	SMC	Hectare	39284
4	Fencing (Iron angle with chain link wire mesh)	Per 250meters	462316
5	Entry point activity		15% of [(1)+(2)+(3)+(4)]=163338/-


Divisional Project Officer
Angul, Odisha


Project Officer
MCL, Subhadra Area
ଓଡ଼ିଶା, ଭାରତ, ସୁନ୍ଦରୀ କ୍ଷେତ୍ର

**Matrix for Compensatory Afforestation Scheme for Block Plantation @1600nos of Seedlings over an area 1ha-
Year wise (Commencement Year 2023-24)**

Year	Financial year	Block Plantation @ 1600nos seedling per ha	Watering, Solar Borewell fitted with Drip system	SMC	Fencing (Iron Angle with Chain link wire mesh (250mt per hectare	Total
0 th year	2023-24	33626	180243	0	314886	528755
1 st year	2024-25	170588	0	23401	0	193989
2 nd year	2025-26	36023	9935	3684	13369	63011
3 rd year	2026-27	24438	10433	3870	14040	52781
4 th year	2027-28	9190	10954	4062	14741	38947
5 th year	2028-29	9648	33911	4267	15478	63304
6 th year	2029-30	12543			16251	28794
7 th year	2030-31	10637			17065	27702
8 th year	2031-32	11170			17918	29088
9 th year	2032-33	11727			18813	30540
10 th year	2033-34	12313			19755	32068
GRAND TOTAL		341903	245476	39284	462316	1088979


(Signature)
District Forest Officer
MCDL, Subhadra Area

(Signature)
प्रकाश अग्रवाल
Project Officer
MCDL, Subhadra Area
एम्. सि. एन. सुभद्रा क्षेत्र

Abstract for Operation of Compensatory Afforestation Scheme for Plantation of 30602Nos of Seedlings over an area 19.126ha

Sl No	Component	Norm	Unit	Rate	Total
1	Block Plantation @1600plants per ha	341903	Ha	19.126	6539237
2	Watering, Solar Borewell fitted with Drip System	245476	Ha	19.126	4694974
3	SMC	39284	Ha	19.126	751346
4	Fencing (Iron angle with chain link wire mesh)	462316	250meter	1930meter	3569080
5	Entry point activity	15% (1+2+3+4)			2333196
	Total				17887833


(One Crore seventy eight lakh eighty seven thousand eight hundred thirty three) Only


 प्रकल्प अधिकारी
 Project Officer
 P.C.L. Subhadra Area
 ज. प्र. एन. सुभद्रा क्षेत्र


 Divisional Forest Officer
 Angul, Odisha

Calendar of Operation for Compensatory Afforestation Scheme for Plantation of 30602Nos of Seedlings over an area 19.126ha-Year wise

Year	Financial year	Block Plantation @ 1600nos seedling per ha	Watering, Solar Borewell fitted with Drip system	SMC	Fencing (Iron Angle with Chain link wire mesh (1930mt along the perimeter =7.72times of 250mt)	Entry point activity 15% (1+2+3+4)	Total
0 th year	2023-24	643131	3447327	0	2430920	978207	7499585
1 st year	2024-25	3262667	0	447567	0	556535	4266769
2 nd year	2025-26	688976	190017	70461	103209	157899	1210562
3 rd year	2026-27	467401	199541	74018	108389	127402	976751
4 th year	2027-28	175768	209506	77690	113801	86515	663280
5 th year	2028-29	184528	648582	81610	119490	155132	1189342
6 th year	2029-30	239898	0	0	125458	54803	420159
7 th year	2030-31	203444	0	0	131742	50277	385463
8 th year	2031-32	213637	0	0	138327	52794	404758
9 th year	2032-33	224291	0	0	145236	55229	424756
10 th year	2033-34	235498	0	0	152509	58201	446208
GRAND TOTAL		6539237	4694974	751346	3569080	2332994	17887633


 Project Officer
 Subhadra Area
 (Dist. Puri)


 Divisional Forest Officer
 Angul Division

Encl:

A- Documents:

- 1) The selected land schedule of Non Forest land in Nukhuripada Village coming under Bantala Range of Angul Division attached as (Annexure-I).
- 2) ORSAC, authorization letter vide his letter no ORSAC/DGPS-FD/1080/2022/3203(2) Dated 03/09/2022 as (Annexure-II).
- 3) Approved cost norm for one ha Block Plantation @1600 Plants per ha (Annexure-III).
- 4) Approved Cost norm & matrix for Chain link Fencing: (Annexure-IV)
- 5) Approved Cost norm Matrix for SMC (Model-C) is at (Annexure -V)
- 6) Approved Cost norm & matrix of Watering, Solar Borewell fitted with Drip system is at (Annexure-VI)

B- Maps & Plates:

- I. Cadastral Map of CA land identified at Village Nukhuripada (Plate-I)
- II. DGPS map of the CA land Authenticated by ORSAC) (Plate-II)
- III. Corresponding Topo map (1:50000 Scale) (Plate-III)
- IV. KML File in CD
- V. Forest Cover density map of CA land
- VI. Satellite map of CA land


Divisional Forest officer,
Angul Division.

GOVT VERIFICATION OF NON-FOREST GOVT LAND FOR COMPLEMENTARY AFForestation										
SALVAGE OF GOVT LAND										
SANTALA		Date: 05.07.2023								
		Taluk: MURGU								
S. No	Name of Village	Khasra No	Plot No	Kusom	Area (in Ha)	Encroachment in Ha		Total	Area for Handing over to Unsettled/other Reason	Remarks
						Block	Sub			
1	2	1	4	5	6	7	8	9	10	11
1	Mukurpalle	1	8(1)	Purohita Pottita	24.352			19.126		Kusom as on 25.10.1980
							TOTAL	19.126		

1. Certified that the above non-forest Government land as mentioned in column 7, 8 & 9 is a compact patches of 4.00 Ha. Or more having adequate soil depth suitable for plantation from management point of view.
2. Certified that the above Government land found suitable for plantation is free from encroachment and encumbrance.
3. Certified that the above Government land is not covered under 4(i) notification.
4. Certified that the above Government land is not covered under DLC.
5. Certified that the above Government land is not alloted previously.
6. Certified that the above Government land is not covered under any M.L.P.L area.
7. Certified that the above Government land is not settled in favour of individual/community under F.R Act, 2000.
8. Certified that the status of the above plots was not forest as on 25.10.1980.
9. Certified that the above plots are not covered under any proposed reserve forest.
10. Certified that the above plots are unfit not only for agriculture, but also for other developmental requirements.
11. Certified that the above plots have no future potential for agrarian or industrial use.
12. Certified that the above identified area contains sparse vegetation with density of 0.02 and scrubby forest growth fit for complementary afforestation.

Handwritten signature
 M. Murugan
 11/07/2023

Handwritten signature
 M. Murugan
 11/07/2023

FARASIDDAR ARGUVA



ORSAC/DGPS-FD/1080/2022/ 52022/0 3 7 22

To

The D.F.O.,
Angul Division,
Angul

Sub: Verification of DGPS Survey of Compensatory Afforestation non-forest land in Jamugaria, Kanja, Nukhuripada, Rodasingha, villages and degraded revenue forest land in Baghuapat village in Angul Tahsil in lieu of forest areas proposed for diversion for Subhadra OCP, Subhadra Area of MCL in Angul District.

Ref: Your letter no. 5950 dated 19.08.2022

Sir

With reference to the subject mentioned above, this is to inform you that, the maps and data forwarded to ORSAC by your office for verification of the DGPS survey of Compensatory Afforestation non-forest land in Jamugaria, Kanja, Nukhuripada, Rodasingha villages and degraded revenue forest land in Baghuapat village in Angul Tahsil in lieu of forest areas proposed for diversion for Subhadra OCP, Subhadra Area of MCL in Angul District has been verified by ORSAC and is certified that the map is correct at a confidence level of 95%. All the Compensatory Afforestation non-forest land comes in Jamugaria, Kanja, Nukhuripada, and Rodasingha villages and degraded revenue forest land in Baghuapat village in Angul Tahsil in Angul district. Total Compensatory Afforestation land works out to 150.954Ha, includes 40.249Ha, degraded Revenue forest and 110.705Ha, non-forest land from the submitted shp files, against the required area of 150.895Ha, (40.255Ha, degraded Revenue forest and 110.640Ha, non-forest land) as mentioned in the submitted record. Detail Patch/Village/plot wise comparative statistics of Compensatory Afforestation area is attached herewith.

Yours faithfully,

Encl: 6 hard copy maps

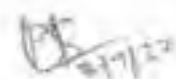

M. K. SANABADA
SCIENTIST - 'D'

Copy to: The General Manager (Subhadra Area), MCL, Subhadra Area, Near Biju Maidan,
Angul-759122, Odisha for information.

1

**STATISTICS OF COMPENSATORY AFFORESTATION LAND IDENTIFIED IN VILLAGE
JAMUGARIA, KANJA, NUKHURIPADA, RODASINGHA ALONG WITH DEGRADED REVENUE
FOREST LAND IN VILLAGE BAGHUJAPAT UNDER ANGUL TAHASIL IN LIEU OF FOREST AREAS
PROPOSED FOR DIVERSION FOR SUBHADRA OCP, SUBHADRA AREA OF MCL, ANGUL
DISTRICT**

SL. NO.	VILLAGE NAME	PLOT NO.	KISAM	ALLOTTED AREA HA.	MAP AREA HA.
1	BAGHUJAPAT	251(P)	CHHOTA JUNGLE	15.393	15.081
2	BAGHUJAPAT	298(P)	CHHOTA JUNGLE	15.212	15.243
3	BAGHUJAPAT	283(P)	CHHOTA JUNGLE	6.029	6.035
4	BAGHUJAPAT	284(P)	CHHOTA JUNGLE	3.621	3.890
A. TOTAL DEGRADED REVENUE FOREST LAND				40.255	40.249
5	JAMUGARIA	1107(p)	PURATANA PATITA	7.923	7.924
6	JAMUGARIA	1117(p)	PURATANA PATITA	21.643	21.854
7	JAMUGARIA	1089(p)	PURATANA PATITA	5.127	5.259
8	KANJA	1657	PURATANA PATITA	1.752	1.780
9	KANJA	1656(P)	PURATANA PATITA	7.893	7.691
10	KANJA	1548(1/P)	PURATANA PATITA	3.583	3.535
11	NUKHURIPADA	8(P)	PURATANA PATITA	19.126	19.129
12	RODASINGHA	953(P)	PAHADA	43.593	43.433
B. TOTAL NON-FOREST LAND				110.640	110.705
TOTAL CA LAND AREA (A+B)				150.895	150.954


 21/7/22
 Smt. N. Sambal
 District CRBAC
 Bhubaneswar

BASE COST NORM FOR COMPENSATORY AFFORESTATION (BLOCK PLANTATION) @ 1600 PLANTS PER HECTARE (18 months old seedling)						
WAGE RATE Rs-311/- PER MANDAY						
Sl. No.	Items of work	Preferable Period of Execution	No of Mandays	Labour Cost (In Rs.)	Material Cost (In Rs.)	Total cost (In Rs.)
1	2	3	4	5	6	7
0th Year (Advance work) Pre-Planting Operation						
1	Survey, Demarcation and Pillar Posting	Nov-Dec	2	622	0	622
2	Preparation of Treatment Map (Digital Map)	Nov-Dec	1	311	100	411
3	Site preparation (Cleaning & removal of debris)	Nov-Dec	12	3732	0	3732
4	Creation of 4.00 mt wide Inspection Path	Feb/Mar	1	311	0	311
5	Alignment and stacking	Feb/Mar	2	622	0	622
6	Digging of pits (45 cm X 45 cm X 45 cm) in hard and gravelly soil	Feb/Mar	64	19904	0	19904
7	Construction of Temporary Labour Shed, Drinking water facility and First-Aid etc.	Jan/Mar	0	0	3500	3500
Total			82	25502	3600	29102
1st Year/Planting Year						
1	Refilling of pits by altering the dug-out soil of the pits, application of Organic compounds/CDM/FYM & mixing the same properly.	Jun/Jul	12	3732	8000	11732
2	Transportation of 18 months old polypot seedlings in hired truck/tractor from the permanent/Mega nursery to planting site including Loading & unloading. (Average lead of 10 Rkm) & stacking the seeding @ Rs.6/- per Seedling. (1760 nos.)	Jun/Aug	0	0	10560	10560
3	Watering the polypot seedling at planting site	Jul/Aug	3	933	0	933
4	Conveyance of polypot seedling on head load from the stacking site to individual dugout pits within the planting site, applying insecticide, fertilizers & planting after scooping the soil with other applied materials & pressing the soil properly around the planted seedlings.	Jul/Aug	36	11196	0	11196
5	<u>Cost of Fertilizer & Insecticide</u> (a) NPK/Bio-fertilizer @ 50 gms/plant as basal dose= 80kg @ Rs.30/- per kg= Rs.2400.00 (b) Urea/Vermicompost/Mo Khata/any other fertilizer in two subsequent doses @ Rs. 1200.00 (c) Insecticide/Bio-pesticide @ 5 gms/plant=8 kg @ Rs. 150/- per kg= Rs. 1200.00	Jul/Aug	0	0	4800	4800
6	Casualty Replacement @ 10 % (160 nos.)	Jul/Aug	4	1244	0	1244
7	1st weeding & Manuring	Aug/Sept	15	4665		4665
8	2nd weeding, soil working (1mt, diameter around the plants) and Manuring	Oct/Nov	20	6220	0	6220
9	Fire line tracing (2 m. wide fire line over 400 m long) including maintenance of inspection path	Feb/Mar	3	933	0	933

10	Watch & Ward including watering as per requirement	Aug/Mar	12	3732	0	3732
	Total		105	32655	23360	56015
2nd Year Maintenance						
1	Transportation of 160 seedlings from Nursery to Plantation site including loading, unloading & Conveyance by Tractor @ Rs.6/- per seedlings	Jul	0	0	960	960
2	Causality replacement 10%	Jul	4	1244	0	1244
3	<u>Cost of Fertilizer & Insecticide-</u> (A) Cost of Insecticide/Bio-pesticide @ 5gms/plant=0.8kg @ Rs. 150/-per kg=Rs.120/- (B) Urea/NPK/Bio-fertilizer/Vermicompost/Mo Khata/any other fertilizer @ Rs. 4486/-	Aug/Sept	0	0	4606	4606
4	Weeding (Complete weeding), Manuring & Soil working (1 mt diameter around the plants)	Sep/Oct	20	6220	0	6220
5	Fire line tracing (2 m. wide fire line over 400 m long) including maintenance of inspection path	Feb/Mar	3	933	0	933
6	Watch & Ward including watering as per requirement	Apr/Mar	18	5598	0	5598
7	Maintenance of Temporary Labour Shed, Drinking water facility and First-Aid etc.			0	1000	1000
	Total		45	13995	6566	20561
3rd Year Maintenance						
3	Cost of Fertilizer Urea/NPK/Bio-fertilizer/Vermicompost/Mo Khata/ any other fertilizer	Sept/Oct	0	0	4486	4486
4	Weeding, Manuring & Soil working(1mt, diameter around the plants)	Sept/Oct	20	6220	0	6220
5	Fire line tracing (2m. Wide fire line over 400 m long) including maintenance of inspection path	Feb/Mar	3	933	0	933
6	Watch & Ward including watering as per requirement	Apr/Mar	18	5598	0	5598
7	Maintenance of Temporary Labour Shed, Drinking water facility and First-Aid etc.	Apr/Mar		0	1000	1000
	Total		41	12751	5486	18237
4th Year Maintenance						
1	Fire line tracing (2m. Wide fire line over 400 m long) including maintenance of inspection path	Feb/Mar	3	933	0	933
2	watch & Ward	Apr/Mar	18	5598	0	5598
	Total		21	6531	0	6531
5th Year Maintenance						
1	Fire line tracing (2m. Wide fire line over 400 m long) including maintenance of inspection path	Feb/Mar	3	933	0	933
2	watch & Ward	Apr/Mar	18	5598	0	5598
	Total		21	6531	0	6531
6th Year Maintenance						
1	Fire line tracing (2m. Wide fire line over 400 m length)	Feb/Mar	3	933	0	933
2	Pruning of branches, Singling out of multiple shoots	Jan/Mar	5	1555	0	1555
3	Watch & Ward	Apr/Mar	18	5598	0	5598
	Total		26	8086	0	8086

7th Year Maintenance						
1	Fire line tracing (2m. Wide fire line over 400 m length)	Feb/Mar	3	933	0	933
2	Watch & Ward	Apr/Mar	18	5598	0	5598
Total			21	6531	0	6531
8th Year Maintenance						
1	Fire line tracing (2m. Wide fire line over 400 m length)	Feb/Mar	3	933	0	933
2	Watch & Ward	Apr/Mar	18	5598	0	5598
Total			21	6531	0	6531
9th Year Maintenance						
1	Fire line tracing (2m. Wide fire line over 400 m length)	Feb/Mar	3	933	0	933
2	Watch & Ward	Apr/Mar	18	5598	0	5598
Total			21	6531	0	6531
10th Year Maintenance						
1	Fire line tracing (2m. Wide fire line over 400 m length)	Feb/Mar	3	933	0	933
2	Watch & Ward	Apr/Mar	18	5598	0	5598
Total			21	6531	0	6531

Year wise Abstract of Cost Norm (showing seedling cost separately)							
Sl. No.	Year	No. Person days	Labour cost @ Rs. 311/per day (Rs)	Material Cost	Monitoring, Evaluation, Learning, Documentation and other Contingency (5%) of (4+5)	Cost of Seedlings @ Rs.50.31 per seedlings	TOTAL COST
1	2	3	4	5	6	7	8
1	0th year	82	25502	3600	1398	0	30500
2	1st year	105	32655	23360	2800	88546	147361
3	2nd year	45	13995	6566	1028	8050	29639
4	3rd year	41	12751	5486	911	0	19148
5	4th year	21	6531	0	326	0	6857
6	5th year	21	6531	0	326	0	6857
7	6th year	26	8086	0	404	0	8490
8	7th year	21	6531	0	326	0	6857
9	8th year	21	6531	0	326	0	6857
10	9th year	21	6531	0	326	0	6857
11	10th year	21	6531	0	326	0	6857
	Total	425	132175	39012	8497	96596	276280

Annexure-IV

Fencing for Compensatory plantation raised outside the forest area Using Angle Iron and Chain link wire mesh (250Rmt/ha)

Sl no	Item of work	Preferable period of Execution	Man days	Wages@311/-	Material cost (Rs)	Total Cost (Rs per ha)
0th Year (PPO)						
1	Earth work (excavation of hole) in Hard soil at a distance of 3mt $0.40m \times 0.40m \times 0.40m = 0.064X$ $84 = 5.376cum$ @Rs 140/cum = Rs 753/-		2.42	752.62	0	752.62
2	Cement concrete (1:4:8) using 40mm BHG Metal $84 \times 0.40m \times 0.40m \times 0.10m = 1.344$ @ 3755.94/cum		0	0	5047.4	5047.4
3	Angle iron pole of size 50mm x 50mm x 6mm of height 2.40mt $84 \times 2.40 = 201.60sqmt$ @ 4.50/kg/sqmt = 907.20kg @ 69.50 per kg			0	63050	63050
4	Cement concrete (1:2:4) for fixing the iron angle pole using 12 mm BHG Chips $84 \times 0.40m \times 0.40m \times 0.30m = 4.032cum$ @ 5486.77/cum			0	22123	22123
5	Cost of chain link mess using 4mm Dia GI wire having gap size 50mm x 50mm 250Rmt x 2.10mt = 525sqmt @ 331/sqmt = Rs 173775			0	173775	173775
6	Double cost painting of iron angel pole over a coat of primer using good quality enamale paint $84 \times 2.10 \times 0.20 = 35.28sqmt$ @ Rs 108.80/sqmt.			0	3838	3838
7	Painting of GI Chain link mess $250 \times 2.10 \times 2 = 1050/10 = 105sqmt$ @ Rs 108.80/sqmt.			0	11424	11424
8	Transportation of chain link mess, Iron angle straightening and tying of chain link mess etc @ 2% of the total cost			0	5600	5600
			2.42	752.62	284857.4	285610
1st year Maintenance						
9	No maintenance required	Sep/Oct	0	0	0	0
2nd year maintenance						
10	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year $1142 \times 1\% = 11.42$ say 11	Sep/Oct	0	0	11000	11000

3rd year maintenance						
11	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 11	Sep/Oct	0	0	11000	11000
4th year maintenance						
12	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 11	Sep/Oct	0	0	11000	11000
5th year maintenance						
13	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 11	Sep/Oct	0	0	11000	11000
6th year maintenance						
14	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 11	Sep/Oct	0	0	11000	11000
7th year maintenance						
15	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 11	Sep/Oct	0	0	11000	11000
8th year maintenance						
16	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 11	Sep/Oct	0	0	11000	11000
9th year maintenance						
17	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 11	Sep/Oct	0	0	11000	11000
10th year maintenance						
18	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 11	Sep/Oct	0	0	11000	11000
Total			2.42	752.62	383857.4	384610.00

Sl no	Year	No of Person days	Labour cost @311/- per day	Material cost	Total cost
1	0th year	2.42	752.62	284857.4	285610.02
2	1st year	0	0	0	0
3	2nd year	0	0	11000	11000
4	3rd year	0	0	11000	11000
5	4th year	0	0	11000	11000
6	5th year	0	0	11000	11000
7	6th year	0	0	11000	11000
8	7th year	0	0	11000	11000
9	8th year	0	0	11000	11000
10	9th year	0	0	11000	11000
11	10th year	0	0	11000	11000
	Total	2.42	752.62	383857.4	384610

S. No	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XIX	Total Cost (in Rupees)	
	Base Norm	285610	0	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000								
1	2011-22	285610	0	12136	12734	13370	14039	14740	15478	16252	17064	17918	18814	19755						419931	
2	2021-23		298891	0	12732	13371	14039	14741	15477	16252	17065	17917	18814							440289	
3	2015-24			314896	0	13369	14040	14741	15478	16251	17065	17918	18813	19755						462316	
4	2014-25				330630	0	14037	14742	15472	16252	17064	17918	18814	19754	20743					485432	
5	2015-26					347182	0	14739	15479	16252	17065	17917	18814	19753	20742	21780				509705	
6	2016-27						364520	0	15476	16253	17065	17918	18813	19755	20743	21779	22869			535191	
7	2017-28							382746	0	16250	17066	17918	18814	19754	20743	21780	22868	24012		561951	
8	2018-29								401883	0	17063	17919	18814	19755	20742	21780	22869	24011	25213	590049	
9	2019-30									421977	0	17916	18815	19755	20743	21779	22869	24012	25212	26474	619652
10	2020-31										443076	0	18812	19756	20743	21780	22868	24012	25213	26473	650031

Annexure-V

Cost Norms for creation of Compensatory Afforestation with Stabilization of Soil & Conservation of moisture (1000 Plants/Ha.)			
WAGE RATE RS- 311/- PER DAY			
Sl. No	Item of Works	Preferable Period of Execution	Total Cost
0th Year (Pre-Planting Operation)			
1	Nil		0
1st Year			
2	Soil Conservation measure structures like Staggered Trench, Percolation pit, Contour trench, Graded earthen bund, LBCD Wire mesh LBCD, Sub surface Dyke & WHS as per the slop & site requirement on LS	Apr/sep	20,215
2nd Year			
3	Maintenance of SMC structures @ 15 % of initial year cost	Apr/jul	3,032
3rd Year			
4	Maintenance of SMC structures @ 15 % of initial year cost	Apr/jul	3,032
4th Year			
5	Maintenance of SMC structure @ 15 % of initial year cost	Apr/jul	3,032
5th Year			
5	Maintenance of SMC structure @ 15 % of initial year cost	Apr/jul	3,032
Total:			32,343.0

Matrix for (SMC)

SI No	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	Total Cost
	Base Norm	0	20215	3032	3032	3032	3032											
1	2021-22	0	21226	3342	3510	3685	3870											35633
2	2022-23			22287	3509	3686	3869	4064										37415
3	2023-24				23401	3694	3870	4062	4267									39284
4	2024-25					24571	3868	4064	4265	4480								41248
5	2025-26						25800	4061	4267	4478	4704							43310
6	2026-27							27090	4264	4480	4702	4939						45475
7	2027-28								28445	4477	4704	4937	5186					47749
8	2028-29									29867	4701	4939	5184	5445				50136
9	2029-30										31360	4936	5186	5443	5717			52642
10	2030-31											32928	5183	5445	5715	6003		55274

29

7	NO maintenance required	TOTAL	0
2nd Year Watering			
8	Maintenance of system @5% of initial cost of installation	TOTAL	8,174
3rd Year Watering			
9	Maintenance of system @ 5% of initial cost of installation	TOTAL	8,174
4th Year Watering			

Annexure-VI		
WATERING MODEL-W -I		
Watering provision to CA Plantation		
Solar System with Bore well (1 system for 5 Ha Plantation) fitting with Drip system , Wage rate@ Rs 311/- Year of installation (0 th YEAR)		
1	Cost of Borewell	1,50,000
2	Installation of Solar panel & other System	3,00,000
3	Cost of 0.5 HP submersable motor with accessories	50,000
4	Water Storage Tank/ Flexible pipes	15,000
5	Cost of laying Drip system including all accessories, fittings etc, with 12% GST	3,02,431
	TOTAL	8,17,431
6	Cost of Water & watering per Ha. (8,17,431/5) =Rs1,63,486/-	1,63,486
1 st Year Watering		
7	No maintenance required	0
	TOTAL	0
2 nd Year Watering		
8	Maintenance of system @5% of Initial cost of installation	8,174
	TOTAL	8,174
3 rd Year Watering		
9	Maintenance of system @ 5% of initial cost of installation	8,174
	TOTAL	8,174
4 th Year Watering		
10	Maintenance of system @ 5% of initial cost of installation	8,174
	TOTAL	8,174
5 th Year Watering		
11	Maintenance of system @ 5% of initial cost of installation	8,174
	TOTAL	8,174

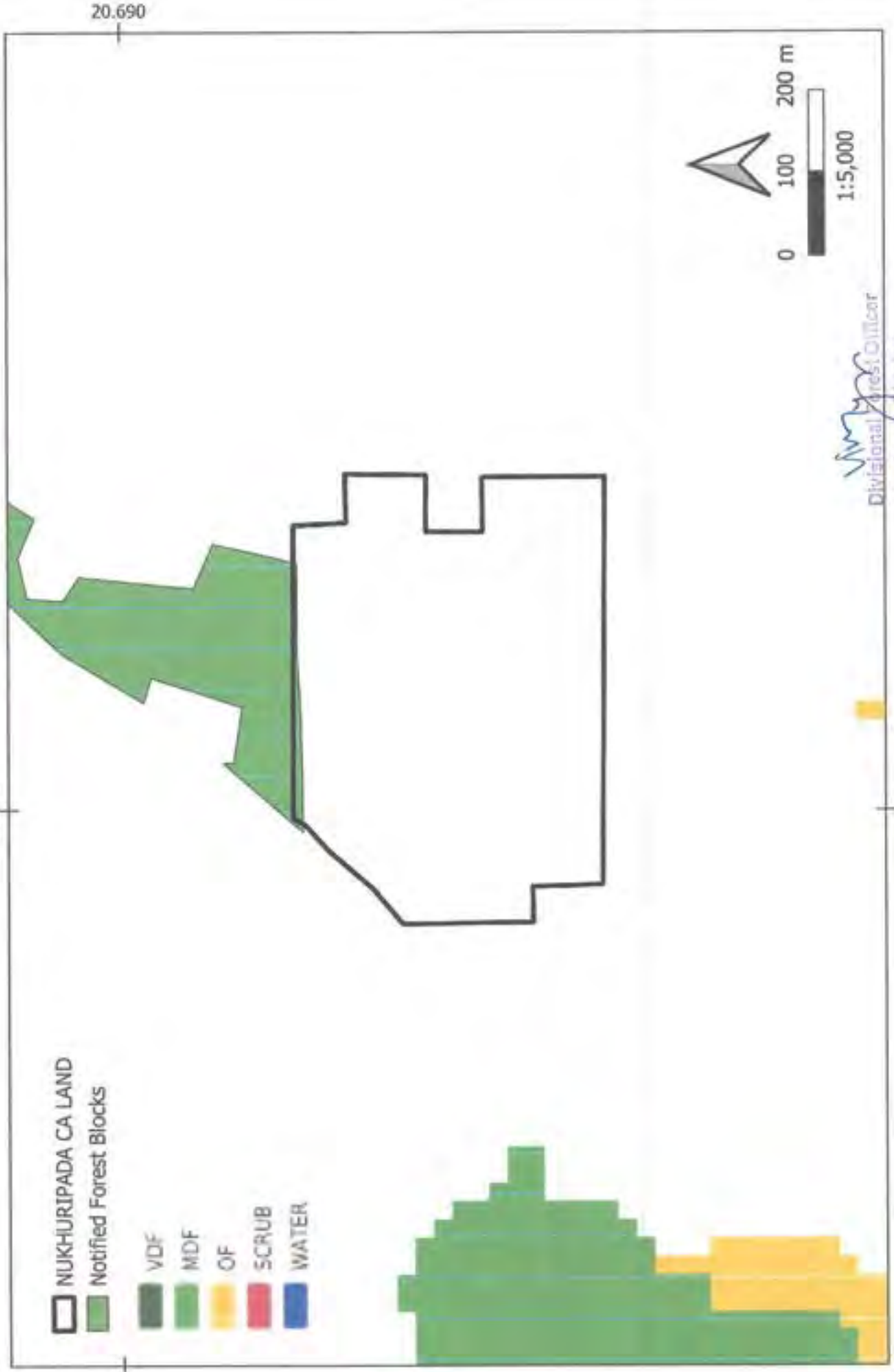
Abstract					
Sl. no	Year	No. person days	Labour Cost @ Rs 311/-per day	Material Cost	Total cost (Rs)
1	0 th year	0	0.0	163486.0	163486.0
3	1 st year	0	0.0	0.0	0.0
3	2 nd year	0	0.0	8174.0	8174.0
4	3 rd year	0	0.0	8174.0	8174.0
5	4 th year	0	0.0	8174.0	8174.0
6	5 th year	0	0.0	8174.0	8174.0
	Total:	0	0	196182	1,96,182

Matrix for Watering W1 (Solar Borewell) fitted with Drip System (per Ha)

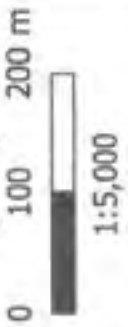
Sl No.	Commencement year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	Total Cost
	Base Norm	163486	0	8174	8174	8174	8174											
1	2021-22	163486	0	9011	9450	9935	30758											222653
2	2022-23		17166 0	0	9452	9936	10432	32296										233786
3	2023-24			18024 3	0	9935	10433	10954	33951									245476
4	2024-25				18935	0	10432	10955	11502	35607								257751
5	2025-26					198718	0	10954	11503	12077	37367							270639
6	2026-27						208654	0	11502	12078	12681	39256						284171
7	2027-28							21908 7	0	12077	12682	13315	41219					298380
8	2028-29								230041	0	12681	13316	13981	43280				313299
9	2029-30									241543	0	13315	13982	14680	45444			328964
10	2030-31										25362 0	0	13981	14681	15414	47716		345412

Non-Forest Land in Nukhripada

85.050



20.690



- NUKHURIPADA CA LAND
- Notified Forest Blocks
- VDF
- MDF
- OF
- SCRUB
- WATER

20.690

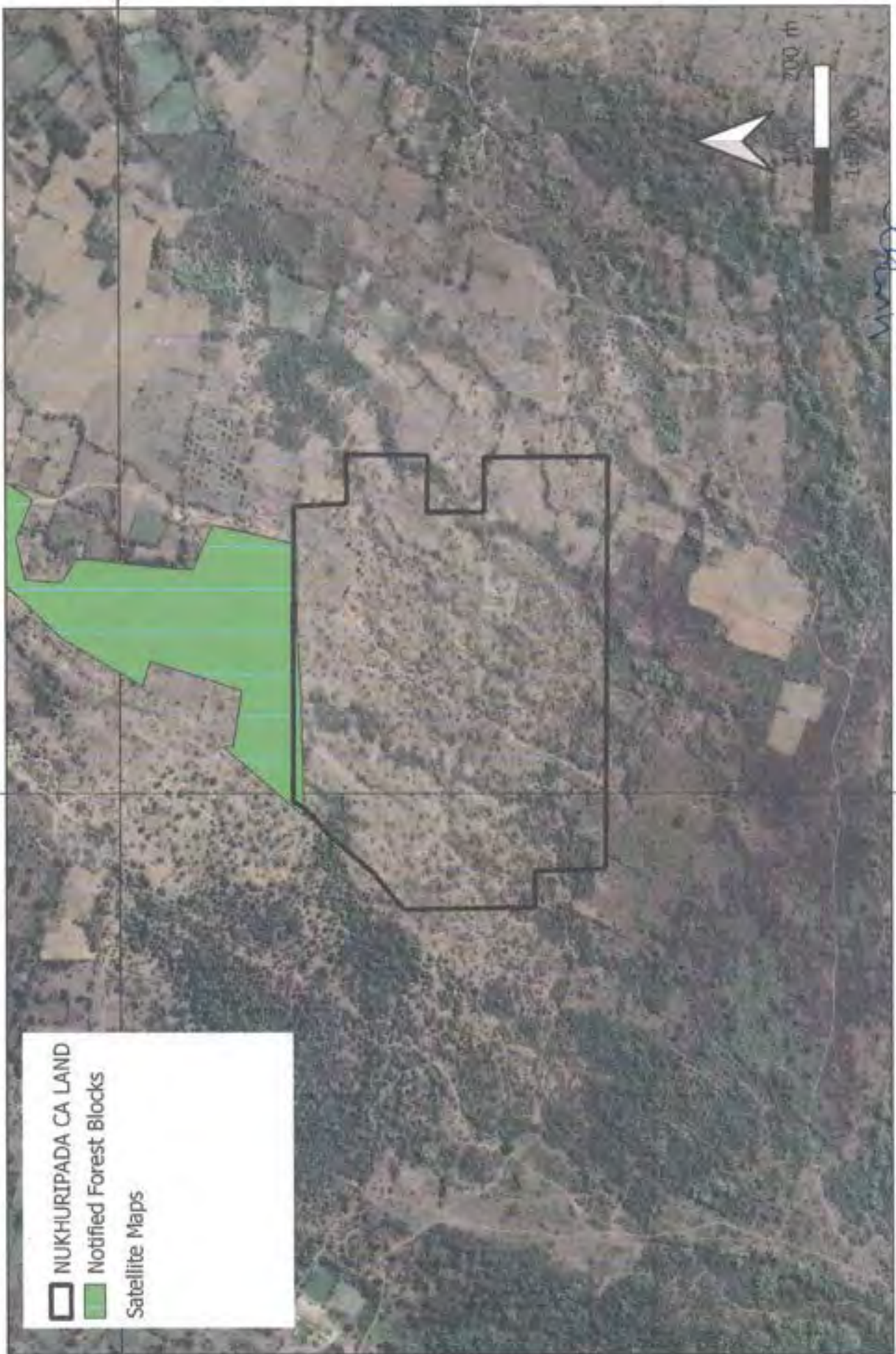
Divisional Forest Officer
Angul, Division

85.050

Non-Forest Land in Nukhripada

85.050

20.690



- NUKHURIPADA CA LAND
- Notified Forest Blocks
- Satellite Maps

20.690

85.050

[Signature]
Divisional Forest Officer
Angai, Division

CHECK LIST SERIAL NUMBER-18

SCHEME FOR

COMPENSATORY AFFORESTATION SCHEME

OVER AN AREA OF 40.255HA IN REVENUE

DEGRADED FOREST LAND IDENTIFIED IN THE

VILLAGE BAGHUAPAT, BANTALA RANGE

UNDER

ANGUL TAHASIL

OF

DISTRICT ANGUL

IN

LIEU OF PROPOSED FOREST DIVERSION FOR 125.24

HA OF FOREST LAND COMING WITHIN SUBHADRA

OPEN CAST PROJECT

OF

M/S MCL, DIST-ANGUL

Plantation Model:

AR plantation over 40.255ha @1000plants per ha

Prepared By

W. S. S. S.
Divisional Forest Officer,
Angul Division

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Sl no	Description	Annexures	Page No
1	Land suitability Certificate	--	
2	Details of Scheme	--	
3	Land schedule	I	
4	ORSAC Authentication Letter	II	
5	AR Plantation @1000/ha	III	
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MAPS			PLATE
9	Cadastral Map of CA land identified at Village Baghuapat		Plate-I
10	DGPS map of the CA land at Baghuapat, (Authenticated by ORSAC)		Plate-II
11	Corresponding Topo map (1:50000 Scale)		Plate-III
12	KML File in CD		

Land Suitability Certificate

The requirement of suitable Govt. Degraded Forest land at par with the guidelines of MoEF & CC is a vital aspect for raising Compensatory Afforestation in lieu diversion of Forest land for Non forestry purpose of a project under FC Act, 1980.

In the instant case diversion of Forest land to the extent of 125.24ha is required for the project "Subhadra Open Cast Project of M/s MCL in the district of Angul. Accordingly required exercises were undertaken in the field by Forest and Revenue Staff jointly to select suitable Non forest land/ Govt degraded forest land for the purpose of Compensatory Afforestation for the said project. Finally one patch of Revenue degraded Forest land over 40.255ha of Baghuapat Village was selected in Bantala Range with suitability criteria to accommodate required no of seedlings at the rate of 1000seedlings/ha. Criteria of suitability of the site meets relevant parameters such as management point of view, free from encroachment and encumbrances, not included in Section -4(1) notification, not under DLC status of forest, non allotment of the said areas for other projects etc as narrated against this site furnished in Annexure-I. Besides soil quality, soil depth, terrain, climatic conditions etc are suitable for planting indigenous promising species for sustained growth and establishment and over and above location of the site with respect to closeness to nearby forest block of Angul Division which will ensure proper supervision, monitoring of the plantation raised under Compensatory Afforestation Scheme. Plantations activities will be as done per the approved One-time Cost Norm of PCCF, Odisha and it is hoped to ensure proper greenery with improved environmental scenario after implementation of the said plantation.

Place:

Date:


Divisional Forest Officer,
Divisional Forest Officer
Angul Division

Scheme

This scheme is for taking up Compensatory Afforestation on identified Revenue degraded Forest land in Village Baghuapat of Bantala Range under Angul Tahasil in the District of Angul in lieu of Proposed Forest Diversion or 125.24 ha of Forest land coming within Subhadra Open Cast Project of M/s MCL, Dist-Angul.

1. Introduction: The Subhadra Open Cast Mining Lease is over an area of 1111.85 ha. Out of which Forest land located in Mining lease is 125.24ha and Non-Forest area is 986.61ha as per the land schedule. The User Agency M/s MCL has filed forest Diversion Proposal Vide Proposal No FP/OR/MIN/150133/2021.

On application for providing Compensatory Afforestation Land, the Collector and District Magistrate, Angul has allotted 110.640ha of Non forest Revenue land and 40.255ha of Revenue Degraded Forest area spread over in 5 patches vide his letter no _____ dated _____. This scheme is meant for 40.255ha of Revenue degraded forest land in village Baghuapat which has been jointly verified by the Revenue staff and Forest staff. The selected land schedule is coming under Bantala Range of Angul Division (Annexure-I)

Land Schedule:

Land Schedule of land jointly verified by Revenue and Forest Staffs for Compensatory Afforestation								
Village	Khata No	Plot No	Total Plot Area in Hectare	Area taken for plantation in ha	Kisam	Remark	Nearest Forest Block	Approximate distance from the proposed site
Bantala Range								
Baghuapat	1	251(p)	17.74	15.393	Chhotajugle	Forest land	Bhogapal RF	0.5km
	1	283(p)	6.56	6.029				0.20km
	1	284(p)	9.96	3.621				0 Km
	1	298(P)	18.600	15.212				0.3Km
	Total		52.86	40.255				

2. DGPS Survey, Mapping & Authentication of CA Land.

As per the revised guidelines of Chief Executive, ORSAC, the User Agency has taken up DGPS Survey by empanelled vendors and the same has been authenticated by ORSAC vide his letter no ORSAC/DGPS-FD/1080/2022/3203(2) Dated 03/09/2022 and due endorsement has been furnished on DGPS surveyed Map. The DGPS Map, Corresponding Topo map (Survey of India map F45T2 & F45S14 1:50000 Scale) are enclosed to this Scheme. The KML File of the area is submitted in a CD. (Letter of Authentication by ORSAC at Annexure-II)

The Latitude / Longitude of Survey Points as per DGPS authenticated Map is furnished below.

DGPS OBSERVATION CO-ORDINATES OF BOUNDARY PILLARS			
SL.NO	MAP ID	LONGITUDE	LATITUDE
1	1	84°59'45.93447"	20°42'54.63335"
2	2	84°59'57.88726"	20°42'54.23733"
3	3	84°59'59.29082"	20°42'54.18648"
4	4	85°00'02.75652"	20°42'54.92948"
5	5	85°00'03.96408"	20°42'55.73219"
6	6	85°00'04.19091"	20°42'58.37000"
7	7	85°00'04.67165"	20°42'59.66327"
8	8	85°00'09.60174"	20°42'59.80067"
9	9	85°00'10.87139"	20°42'59.82016"
10	10	85°00'12.43767"	20°43'02.09570"
11	11	85°00'15.79394"	20°43'01.58021"
12	12	85°00'18.97371"	20°43'01.31081"
13	13	85°00'20.05586"	20°43'02.35048"
14	14	85°00'23.46883"	20°43'02.20881"
15	15	85°00'26.52860"	20°43'00.98415"
16	16	85°00'29.28452"	20°43'03.65808"
17	17	85°00'34.38960"	20°43'02.26279"
18	18	85°00'38.75431"	20°43'01.18477"
19	19	85°00'40.09754"	20°43'01.27468"
20	20	85°00'42.87277"	20°42'58.31198"
21	21	85°00'41.86145"	20°42'57.22501"
22	22	85°00'42.55136"	20°42'56.61733"
23	23	85°00'36.86735"	20°42'54.59672"
24	24	85°00'23.67142"	20°42'49.02832"
25	25	85°00'19.22310"	20°42'44.08746"
26	26	85°00'16.13700"	20°42'44.25719"

27	27	85°00'19.89641"	20°42'50.82876"
28	28	85°00'17.44338"	20°42'51.51059"
29	29	85°00'09.51608"	20°42'51.42101"
30	30	85°00'07.83463"	20°42'51.46003"
31	31	85°00'07.62908"	20°42'47.41874"
32	32	85°00'02.72033"	20°42'48.39517"
33	33	85°00'02.77551"	20°42'53.05578"
34	34	84°59'57.10622"	20°42'52.79966"
35	35	84°59'53.80584"	20°42'51.68588"
36	36	84°59'53.79019"	20°42'50.01519"
37	37	84°59'49.52878"	20°42'50.82679"
38	38	84°59'47.08058"	20°42'50.92380"

3. Topography & Soil:

The identified area in above village is having partly hilly and partly plain terrain. The soil is lateritic and gravelly but the soil depth is suitable for taking up plantation. Moreover, nearby forest blocks is BHOGAPAL RF. So, for management point of view, the CA land selected here will be congenial and suitable indigenous species will be planted to ensure a successful plantation.

4. Climate

In Angul District, the wet season is oppressive and overcast whereas, the dry season is humid and mostly clear, and it is hot year round. Over the course of the year, the temperature typically varies from 13.89°C to 40.55°C and is rarely below 11.11°C or above 44.44°C.

5. Rain fall:

The annual average rainfall is 1602 mm. The maximum rainfall is received during the rainy season and particularly in the month of August.

6. Present Vegetation:

The identified land bears dry deciduous mixed vegetation. Species like Sal, Asan, Karada, Kendu, Jamu, Mango, Bahada, Mahul etc are observed.

7. Items of work to be taken up

Planting Model;

The land identified bears natural vegetation. Its tending operation will help maintaining a good forest cover adjacent to habitation. Considering the vegetation, terrain and soil of the area it is proposed to adopt a planting model of AR Plantation@1000seedlings is suggested.

Spacing

The plant density proposed for planting is @1000plants per ha. The spacing is to be 3m x 3m(Approximately to accommodate 1000seedlings per ha) . It is suggested to have the line of planting along the contour and plant to plant in adjacent row over the available blank spaces in the selected site. This will reduce the run off and encourage percolation of water and enrichment of vegetation.

Choice of Species:

Considering the soil, topography and present vegetation observed in and around, it is proposed to Plant the following indogenous and pormising species on the identified land in suitable available blanks. Species proposed for planting are

- i) *Acacia Catechew* (Khair)
- ii) *Bombax Ceiba* (Simili)
- iii) *Emblca officinallis* (Anla)
- iv) *Terminalia belerica* (Bahada)
- v) *Terminalia tomentosa* (Asana)
- vi) *Mangifera indica* (Aamba)
- vii) *Pterocarpus marsupium* (Bija)
- viii) *Syzygium cumini* (Jamu)

- ix) *Azadia indica (Neem)*
- x) *Terminalia chebula(Harida)*
- xi) *Pongamia pinnata (Karanja) etc.*

The project i.e OCP of M/s MCL is for diversion of 125.24 ha of Forest Land . The scheme is over 40.255ha of Revenue degraded forest land. The following detail is furnished in Tabular form

Description of Site	Area (in ha)	Total No of Seedlings required for planting	Remark
Bantala Range			
CA Land identified (Revenue Degraded Forest) (Baghuapat)	40.255	40255	AR Mode 1000nos of Seedlings/ha

8. Silvicultural Tending & Planting Technique to be adopted:

i) Survey, Demarcation and Pillar Posting:

The identified area has been surveyed & pillars posted. It is to be checked and missing pillars if any to be reposted as per Latitude / Longitude provided in the DGPS Map authenticated.

ii) Preparation of Treatment map (Digital map):

The Kml file of the area has been provided by the user agency after DGPS survey. The same will be updated with treatment design basing on physical position at the time of implementing the Plantation Scheme. The Range Officer will update the position with help of GIS cell of the Division as per requirement.

iii) Site Preparation:

After demarcation of the area, site preparation mostly clearing of invasive weeds will be taken up at planting site to be identified by field staff.

iv) Silvicultural Tending Operation:

The selected area is having scattered Sal shoots of promising vigour and of natural regeneration including some other species also. It is proposed to take up

Silvicultural cleaning over the area. The activities are intended to achieve healthy growth of existing natural seedlings / saplings / coppice shoots of favored species. The operations include

- Cutting back of high stumps with preference to living stumps and having a good coppicing power.
- Cutting of climbers those are of annual nature and uprooting them wherever possible.
- Singling out of multiple coppice shoots and retaining most promising ones.
- Pruning of whippy plants available within the area.
- Dead and dying trees if any to be cut and separated from the site.

The natural seedlings available in the treatment area are to be given appropriate attention to ensure its establishment.

v) Digging of Pits (45cmx45cmx45cm):

It is proposed to dug out pits of size 45cmx45cmx45cm preferably in month of February / March. The dugout earth will be kept at pit head on both sides separately. The top soil will be kept on one side and bottom soil on another side. Soil within 30cm from ground level will be considered as top soil and rest as bottom soil. The pits will be left for weathering due to Sun & Rain.

vi) Refilling of Pits & application of organic Compounds / CDM/ FYM:

The pits will be refilled by altering the dugout soil of the pits i.e. top soil on bottom of the pit and bottom soil on top. Application of organic Compounds / CDM/ FYM & mixing the same properly before refilling is suggested. This will provide necessary nutrients to the plant as well as help in retaining soil moisture for a longer period.

vii) Transportation of Seedlings including short carriage & watering at Pit site.

In the approved cost norm, provisions have been made to plant 18month old seedlings. As seedlings will be above 1m height invariably, careful transportation of seedlings will be of paramount importance. In case of top breaking of seedlings, the benefit of 18month old seedlings will be reduced substantially. Transportation of seedlings from Nursery site to Planting site and then short carriage has to be taken

up carefully. Wherever water is available, the plants are to be watered before short carriage to minimize the shock to plants during long carriage by tractors / vans etc.

viii) Planting of Seedlings:

After application of FYM/ CDM/ Organic manure, seedling will be planted carefully. The standard planting procedure is to be followed. As the pit size is of 45cm x 45cm x 45cm the following care will be taken during planting.

- Chemical fertilizer / insecticides to be applied as basal doze to be thoroughly mixed with soil.
- Seedlings collar zone will be at Ground Level or at best 2.5cm below the ground level. In no case it will not be more than 3cm below Ground Level.
- The Poly bags containing the seedlings are to be carefully removed. It is better to use a blade to cut open the bag so as to cause least disturbance to the ball of earth containing the seedlings.
- After planting the soil is to be compacted leaving 3" around the plant and the compact soil may be at Ground Level or 1" above the Ground level – allowance for soil settlement.
- In no case it should be a sunken around the plant.
- The planted plant should stand erect, if it is tilted due to speedy growth, a support with a stick collected locally to be provided.

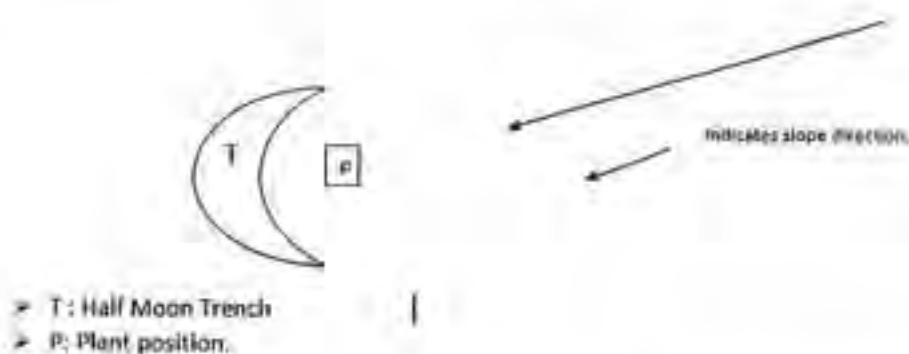
ix) Casualty Replacement:

Casualty replacement is an important operation to achieve a 100% survival in a plantation. After planting there is possibility of casualty in planted seedlings. There is a provision to replace casualty up to 10% in 1st year and 10% in 2nd year operation in the approved cost norm. The same is to be carried out with good promising seedlings those can come up to a height of previous planted seedlings. During replacement in 2nd year application of fertilizers etc as in 1st year is to be followed.

x) Weeding & application of Fertilizer:

Two Weeding around the planted seedlings at a diameter of 1.00m has been prescribed in the approved cost norm. During 2nd weeding deep soil working around the plants at 1.00m diameter has also been prescribed. 1st weeding will be taken up just after one month of planting and 2nd weeding and soil working in month of

September / October. As there is occasional rainfall in October, providing half moon trench in sloppy terrain around each plant is suggested. A half moon trench model is given below.



During weeding (1st & 2nd) there is a provision of application of fertilizer to plants. Application of NPK @30gms per plant x 2 times is suggested. In no case 2nd weeding can be delayed beyond 15th of October.

xj) Fire line Tracing & Inspection Path:

There is possibility of grasses growing up within plantation area. It is better to allow local people / VSS to cut the grasses take for stall feeding under supervision of Forest Staff. In the present case where AR is under implementation Grass growth is limited. Due to fallen dry leaves (Due to leaf shedding), there is possibility of fire hazards in February / March. It is suggested to have fire line at a width of minimum 3m all around the planting area, maintain inter partitioned line / both sides of foot path as a Fire line (minimum 3m wide in 1st year and 2m in subsequent year). These lines will be maintained as inspection path also. It will be maintained till completion of 10th year.

xii) Watch & Ward

Watch and ward is essentially required against biotic interferences like grazing and fire etc including grasses in first two years and illicit felling in subsequent years. Adequate provisions has been made in the approved cost norm. Watch & ward provisions will be implemented as per provision of cost norm.

9. Provision for watering:

The site selected contains partly hilly terrain. All total 40255nos of seedlings will be planted in the site selected depending on extent of blank area available. Watering to be adhered to as per approved one time cost norm (Annexure-VI)

10. Funding Agency

The U/A will deposit required funds as per the approved cost of the scheme.

11. Implementing Agency

Divisional Forest Officer, Angul will execute the Compensatory Afforestation Scheme.


Financial analysis and Cost involved.

Compensatory Afforestation scheme for plantation of 40255nos of seedlings over an area 40.255ha of Revenue Degraded Forest land in Baghuapat village in Angul Tahasil under Bantala Range of Angul Forest Division

PERFORMA (Norm For 1.00ha)

Sl No	Component	Unit	Base Rate for commencement year 2023-24
1	AR Plantation @1000plants per ha	Hectare	258777
2	Watering, Solar Borewell fitted with Drip System	Hectare	245476
3	SMC	Hectare	39284
4	Fencing (Iron angle with chain link wire mesh)	Per 250meters	462316
5	Entry point activity		15% of [(1)+(2)+(3)+(4)]=150878/-



Divisional Forest Officer
Angul Division


Project Officer
MCL, Subhadra Area
भ.स. वि. प्र. अ. सुभद्रा क्षेत्र

**Matrix for Compensatory Afforestation Scheme for Plantation of AR mode @1000nos of Seedlings over an area
1ha-Year wise (Commencement Year 2023-24)**

Year	Financial year	AR Plantation @ 1000nos seedling per ha	Watering, Solar Borewell fitted with Drip system	SMC	Fencing (Iron Angle with Chain link wire mesh)(250mt per hectare	Total
0 th year	2023-24	24586	180243	0	314886	519715
1 st year	2024-25	110729	0	23401	0	134130
2 nd year	2025-26	27105	9935	3684	13369	54093
3 rd year	2026-27	20094	10433	3870	14040	48437
4 th year	2027-28	9190	10954	4062	14741	38947
5 th year	2028-29	9648	33911	4267	15478	63304
6 th year	2029-30	11578			16251	27829
7 th year	2030-31	10637			17065	27702
8 th year	2031-32	11170			17918	29088
9 th year	2032-33	11727			18813	30540
10 th year	2033-34	12313			19755	32068
GRAND TOTAL		258777	245476	39284	462316	1005853


 Divisional Forest Officer
 Aligarh, Ghazipur



 Project Officer
 MCL, Subhadra Area
 एन. सि. एन. सुभद्रा क्षेत्र

Abstract for Operation of Compensatory Afforestation Scheme for Plantation of 40255Nos of Seedlings over an area 40.255ha

Sl No	Component	Norm	Unit	Rate	Total
1	AR Plantation @1000plants per ha	258777	Ha	40.255	10417068
2	Watering , Solar Borewell fitted with Drip System	245476	Ha	40.255	9881636
3	SMC	39284	Ha	40.255	1581377
4	Fencing (Iron angle with chain link wire mesh)	462316	250meter	4600meter	8506614
5	Entry point activity	15% (1+2+3+4)			4558004
	Total				34944699


(Three Crore Forty Nine Lakh Forty-Four Thousand Six hundred Ninety Nine) Only


 Project Officer
 MCL, Subhadra Area
 ग.स. सि. एल. सुभद्रा क्षेत्र


 प्रकल्प अधिकारी
 Project Officer
 MCL, Subhadra Area
 ग.स. सि. एल. सुभद्रा क्षेत्र

Calendar of Operation for Compensatory Afforestation Scheme for Plantation of 40255Nos of Seedlings over an area 40.255ha-Year wise

Year	Financial year	AR Plantation @ 1000nos seedling per ha	Watering, Solar Borewell fitted with Drip system	SMC	Fencing(Iron Angle with Chain link wire mesh(4600mt along the perimeter =18.4times of 250mt)	Entry point activity 15% (1+2+3+4+5)	Total
0 th year	2023-24	989709	7255682	0	5793902	2105894	16145187
1 st year	2024-25	4457396	0	942007	0	809910	6209313
2 nd year	2025-26	1091112	399933	148299	245990	282800	2168134
3 rd year	2026-27	808884	419980	155787	258336	246448	1889435
4 th year	2027-28	369943	440953	163519	271234	186847	1432496
5 th year	2028-29	388380	1365087	171768	284795	331504	2541534
6 th year	2029-30	466072	0	0	299018	114763	879853
7 th year	2030-31	428192	0	0	313995	111328	853516
8 th year	2031-32	449648	0	0	329692	116901	896241
9 th year	2032-33	472070	0	0	346159	122734	940963
10 th year	2033-34	495660	0	0	363492	128875	988027
GRAND TOTAL		10417066	9881635	1581380	8506614	4558004	34944699


 प्रोजेक्ट अधिकारी
 Project Officer
 MCL, Subhadra Area
 पञ्ज. सि. एल. सुभद्रा क्षेत्र


 प्रोजेक्ट अधिकारी
 Project Officer
 MCL, Subhadra Area
 पञ्ज. सि. एल. सुभद्रा क्षेत्र

Encl:

A- Documents:

- 1) The selected land schedule of Forest land Baghuapat Village coming under Bantala Range of Angul Division attached as (Annexure-I).
- 2) ORSAC, authorization letter vide his letter no ORSAC/DGPS-FD/1080/2022/3203(2) Dated 03/09/2022 as (Annexure-II).
- 3) Approved cost norm for one ha AR Plantation @1000 Plants per ha (Annexure-III).
- 4) Approved Cost norm & matrix for Chain link Fencing: (Annexure-IV)
- 5) Approved Cost norm Matrix for SMC (Model-C) is at (Annexure -V)
- 6) Approved Cost Norm Matrix for Watering, Solar Borewell fitted with Drip System. (Annexure-VI)

B- Maps & Plates:

- I. Cadastral Map of CA land identified at Villages Baghuapat, (Plate-I)
- II. DGPS map of the CA land at Baghuapat, (Authenticated by ORSAC) (Plate-II)
- III. Corresponding Topo map (1:50000 Scale) (Plate-III)
- IV. KML File in CD
- V. Forest Cover density map of CA land
- VI. Satellite map of CA land


Divisional Forest officer,
Angul Division

BEST VERIFICATION OF FOREST GOVT LAND FOR COMPENSATORY AFFORESTATION
IN CASE NO. 300/2017

Sl. No.	Village	Khasra No.	Plot No.	Khasra	Area (in Hs.)	Plantation (in Hs.)		Area (in Hs.)	Name (in Hs.) Reserved for Immediate use	Remarks
						Block	Total			
1	PAJHARA	1	1	CHHOTI JUNGLE	1.124	1	1	1.124	25.10.1980	11
2	PAJHARA	1	2	CHHOTI JUNGLE	3.028	3	3	3.028	25.10.1980	11
3	PAJHARA	1	3	CHHOTI JUNGLE	3.86	3	3	3.86	25.10.1980	11
4	PAJHARA	1	4	CHHOTI JUNGLE	18.610	18	18	18.610	25.10.1980	11
						Total	40.255			

1. Certified that the above forest Government land as mentioned in columns 7, 8 & 9 is a compact patches of 4.00 Ha. Or more having adequate soil depth suitable for plantation from management point of view.
2. Certified that the above Government land found suitable for plantation is free from encroachments and encumbrances.
3. Certified that the above Government land is not covered under 4(i) notification.
4. Certified that the above Government land is not covered under D.U.
5. Certified that the above Government land is not allotted previously.
6. Certified that the above Government land is not covered under any M.L.P.L area.
7. Certified that the above Government land is not settled in favour of individual/community under P.K. Act, 2006.
8. Certified that the status of the above plots was non forest as on 25.10.1980.
9. Certified that the above plots are not covered under any proposed reserve forest.
10. Certified that the above plots are unfit not only for agriculture, but also for other developmental requirements.
11. Certified that the above plots have no future potential for agrarian or industrial use.
12. Certified that the above identified area contains sparse vegetation with density of 0.00 and scrappy forest, grown by for compensatory afforestation.

(Signature)
VARA SIDDAR
AMGUB

(Signature)
Revenue Inspector
Pokatunga



ORSAC/DGPS-ED/1080/2022/ 52032/dt. 3.7.22

To

The D.F.O.,
Angul Division,
Angul

Sub: Verification of DGPS Survey of Compensatory Afforestation non-forest land in Jamugaria, Kanja, Nukhuripada, Rodasingha, villages and degraded revenue forest land in Baghuapat village in Angul Tahsil in lieu of forest areas proposed for diversion for Subhadra OCP, Subhadra Area of MCL in Angul District.

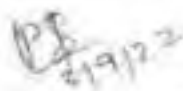
Ref: Your letter no. 5950 dated 19.08.2022

Sir

With reference to the subject mentioned above, this is to inform you that, the maps and data forwarded to ORSAC by your office for verification of the DGPS survey of Compensatory Afforestation non-forest land in Jamugaria, Kanja, Nukhuripada, Rodasingha villages and degraded revenue forest land in Baghuapat village in Angul Tahsil in lieu of forest areas proposed for diversion for Subhadra OCP, Subhadra Area of MCL in Angul District has been verified by ORSAC and is certified that the map is correct at a confidence level of 95%. All the Compensatory Afforestation non-forest land comes in Jamugaria, Kanja, Nukhuripada, and Rodasingha villages and degraded revenue forest land in Baghuapat village in Angul Tahsil in Angul District. Total Compensatory Afforestation land works out to 150.954Ha, includes 40.249Ha degraded Revenue forest and 110.705Ha non-forest land from the submitted shp files, against the required area of 150.895Ha. (40.255Ha degraded Revenue forest and 110.640Ha non-forest land) as mentioned in the submitted record. Detail Patch/village/plot wise comparative statistics of Compensatory Afforestation area is attached herewith.

Yours faithfully,

Encl: 6 hard copy maps

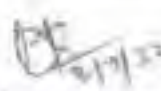

M.K. SANABADA
SCIENTIST - 'D'

Copy to: The General Manager (Subhadra Area), MCL, Subhadra Area, Near Biju Maldan,
Angul-759022, Odisha for information.

1

**STATISTICS OF COMPENSATORY AFFORESTATION LAND IDENTIFIED IN VILLAGE
JAMUGARIA, KANJA, NUKHURIPADA, RODASINGHA ALONG WITH DEGRADED REVENUE
FOREST LAND IN VILLAGE BAGHUAPAT UNDER ANGUL TAHASIL IN LIEU OF FOREST AREAS
PROPOSED FOR DIVERSION FOR SUBHADRA OCP, SUBHADRA AREA OF MCL, ANGUL
DISTRICT**

SL. NO.	VILLAGE NAME	PLOT NO.	RISAM	ALLOTTED AREA HA.	MAP AREA HA.
1	BAGHUAPAT	251(P)	CHHOTA JUNGLE	15.393	15.081
2	BAGHUAPAT	298(P)	CHHOTA JUNGLE	15.212	15.243
3	BAGHUAPAT	283(P)	CHHOTA JUNGLE	6.029	6.035
4	BAGHUAPAT	284(P)	CHHOTA JUNGLE	3.621	3.890
A. TOTAL DEGRADED REVENUE FOREST LAND				40.255	40.249
5	JAMUGARIA	1107(p)	PURATANA PATITA	7.923	7.924
6	JAMUGARIA	1117(p)	PURATANA PATITA	21.643	21.854
7	JAMUGARIA	1089(p)	PURATANA PATITA	5.127	5.258
8	KANJA	1657	PURATANA PATITA	1.782	1.780
9	KANJA	1696(P)	PURATANA PATITA	7.093	7.691
10	KANJA	1648/1(P)	PURATANA PATITA	3.583	3.635
11	NUKHURIPADA	8(P)	PURATANA PATITA	19.126	19.129
12	RODASINGHA	955(P)	PAMADA	43.593	43.433
B. TOTAL NON-FOREST LAND				110.640	110.705
TOTAL CA LAND AREA (A+B)				150.895	150.954


 Shri M. K. Samal
 Scientist, DRSAO
 Bhubaneswar

Annexure-III

BASE COST NORM FOR COMPENSATORY AFFORESTATION (BLOCK PLANTATION) @1000 PLANTS PER HECTARE (18 months old seedlings)

WAGE RATE Rs. 311/- PER MANDAY

Sl.No.	Items of work	Preferable period of Execution	No. of Mandays	Labour Cost (In Rs.)	Material Cos0(In Rs.)	Total Cost (In Rs.)
0th Year (Advance Work) Pre- Planting operation						
1	Survey, Demarcation and Pillar posting	Nov/ Dec	2	622	0	622
2	Preparation of Treatment Map (Digital Map)	Nov/ Dec	1	311	100	411
3	Site Preparation (Cleaning & removal of debris)	Nov/ Dec	12	3732	0	3732
4	Creation of 4 mt wide Inspection Path	Feb/ Mar	1	311	0	311
5	Alignment and stacking of pits	Feb/ Mar	1	311	0	311
6	Digging of pits (45cm x 45cm x 45 cm) in hard and gravelly soil	Feb/ Mar	40	12440	0	12440
7	Construction of Temporary Labour Shed, Drinking water facility and First-Aid etc.	Jan/Mar	0	0	3500	3500
	Total		57	17727	3600	21327
1st Year/ Planting Year						
1	Refilling of pits by altering the dugout soil of the pits, application of organic compounds/ CDM/ FYM & mixing the same perfectly.	June/ Jul	7.5	2332.5	5000	7332.5
2	Transportation of 18 months old polythene bag seedlings in hired truck/ tractor from the permanent / Mega Nursery to the planting site including Loading & unloading. (Average lead of 10Rkm) & stacking the seedlings @Rs. 6/- seedling. (1100 nos.)	Jul/ Aug	0	0	6600	6600
3	Watering polythene bag seedlings at stacking site of plantation.	Jul/ Aug	2	622	0	622
4	Conveyance of polythene bag seedlings on head load from the stacking site to individual dugout pits within the planting site, applying insecticide, fertilizer & planting after scooping the soil with other applied materials and pressing the soil perfectly around the planted seedling.	Jul/ Aug	22.5	6997.5	0	6997.5

5	Cost of Fertilizer & Insecticide (a) NPK/ Bio- fertilizer @50gms/ plant as basal dose = 50 kg @ Rs.30/- per kg =Rs. 1500.00 (b) Urea/ Vermicompost/ Mo khata/ any other fertilizers @Rs. 750.00 (c) Insecticide/ Bio-pesticides @5gms/ plant = 5 kg @ Rs.150/-per kg = Rs. 750/-	Jul/ Aug	0	0	3000	3000
6	Casualty replacement @ 10 % (100 nos.)	Jul/ Aug	2.5	777.5	0	777.5
7	1st weeding & Manuring	Aug/ Sept	12	3732	0	3732
8	2nd Weeding, Soil working (1mt. Diameter around the plants) & Manuring	Oct/ Nov	15	4665	0	4665
9	Fire line tracing & inspection path	Feb/ Mar	3	933	0	933
10	Watch & ward including watering as per requirement	Aug-Mar	12	3732	0	3732
Total			76.5	23791.50	14600.00	38391.50
2nd Year Maintenance						
1	Transportation of 100 seedlings from Nursery to plantation site including loading, unloading & conveyance by Tractor @ Rs.6/- per seedlings	Jul	0	0	600	600
2	Casualty replacement	Jul	2.5	777.5	0	777.5
3	Cost of Fertilizer & Insecticide A) Cost of Insecticide/ Bio-pesticides (Themet/ Forate) @ 5 gms/ plant = 0.5 kg @Rs.150/-per kg = Rs.75/- B) Urea/ NPK/ Bio-fertilizers/ vermicompost/ Mo khata/ any other fertilizers = Rs.2800/-	July / Aug	0	0	2875	2875
4	Weeding (Complete weeding), Manuring & Soil working (1mt. Diameter around the plants)	Sept/ Oct	15	4665	0	4665
5	Fire line tracing (2m. Wide fire line over 400 m long) including maintenance of inspection path	Feb/ Mar	3	933	0	933
6	Watch & ward including watering as per requirement	Apr-Mar	18	5598	0	5598
7	Maintenance of Temporary Labour Shed, Drinking water facility and First-Aid etc,	Apr-Mar	0	0	1000	1000

		Total	38.5	11973.5	4475	16448.5
3rd Year Maintenance						
1	<u>Cost of Fertilizers</u> Urea/ NPK/ Bio-fertilizers/ Vermicompost/ Mo khata/ any other fertilizers = Rs.2800/-	July / Aug	0	0	2800	2800
2	Weeding (Complete weeding), Manuring & Soil working (1mt. Diameter around the plants)	Sept/ Oct	15	4665	0	4665
3	Fire line tracing (2m. Wide fire line over 400m long) & Inspection path	Feb/ Mar	3	933	0	933
4	Watch & ward including watering as per requirement	Apr/ Mar	18	5598	0	5598
5	Maintenance of Temporary Labour Shed, Drinking water facility and First- Aid etc.	Apr/ Mar	0	0	1000	1000
Total			36	11196	3800	14996
4th Year Maintenance						
1	Fire line tracing (2m. Wide fire line over 400m length) & including maintenance inspection path	Feb/ Mar	3	933	0	933
2	Watch & ward including watering as per requirement	Apr/ Mar	18	5598	0	5598
Total			21	6531	0	6531
5th Year Maintenance						
1	Fire line tracing (2m. Wide fire line over 400m length) & including maintenance inspection path	Feb/ Mar	3	933	0	933
2	Watch & ward including watering as per requirement	Apr/ Mar	18	5598	0	5598
Total			21	6531	0	6531
6th Year Maintenance						
1	Fire line tracing (2m. Wide fire line over 400m length)	Feb/ Mar	3	933	0	933
2	Pruning of branches, singling out of multiple shoots	Jan/Mar	3	933	0	933
3	Watch & ward	Apr/ Mar	18	5598	0	5598
Total			24	7464	0	7464

7th Year Maintenance

1	Fire line tracing (2m. Wide fire line over 400m length)	Feb/ Mar	3	933	0	933
2	Watch & ward	Apr/ Mar	18	5598	0	5598
		Total	21	6531	0	6531

8th Year Maintenance

1	Fire line tracing (2m. Wide fire line over 400m length)	Feb/ Mar	3	933	0	933
2	Watch & ward	Apr/ Mar	18	5598	0	5598
		Total	21	6531	0	6531

9th Year Maintenance

1	Fire line tracing (2m. Wide fire line over 400m length)	Feb/ Mar	3	933	0	933
2	Watch & ward	Apr/ Mar	18	5598	0	5598
		Total	21	6531	0	6531

10th Year Maintenance

1	Fire line tracing (2m. Wide fire line over 400m length)	Feb/ Mar	3	933	0	933
2	Watch & ward	Apr/ Mar	18	5598	0	5598
		Total	21	6531	0	6531

ABSTRACT(Showing Seedling Cost Separately)							
Sl.No.	Year	No. of Mandays	Labour Cost (In Rs.)	Material Cost (In Rs.)	Monitoring, Evaluation, Learning, Documentation and other Contingency (5% of (4+5))	Cost of Seedlings @Rs. 50.31 per seedlings	Total Cost (In Rs.)
1	0th Year	57	17727	3600	973	0	22300
2	1st Year	76.5	23791.5	14600	1918.5	55341	95651
3	2nd Year	38.5	11973.5	4475	821.5	5031	22301
4	3rd Year	36	11196	3800	749	0	15745
5	4th Year	21	6531	0	326	0	6857
6	5th year	21	6531	0	326	0	6857
7	6th Year	24	7464	0	373	0	7837
8	7th Year	21	6531	0	326	0	6857
9	8th Year	21	6531	0	326	0	6857
10	9th Year	21	6531	0	326	0	6857
11	10th Year	21	6531	0	326	0	6857
Total		358	111338	26475	6791	60372	204976

The Costing for 10 years will be as per One time Cost Norm approved by PCCF(O) vide this letter No 1109 dated 11.11.2021.

Sl. NO.	Commencement Year	IN Rupees																	Total Cost (10 Years)					
		Base Norm	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI		XVII	XVIII	XIX	XX	
1	2021-22	22500	95351	22301	15745	8537	6837	7837	6837	6837	9837	6837	6837	10637	11169									234718
2	2022-23		22815	105456	75814	25137	8752	9189	11017	10135	10638	11169	11727											246454
3	2023-24			24386	110779	27268	50094	9190	9648	11578	10637	11170	11727	12313										258777
4	2024-25				25915	116366	28440	27099	9650	10138	11786	12169	12729	13313	13919									271716
5	2025-26					27206	122278	29883	22154	10138	11786	12169	12729	13313	13919	14574								285192
6	2026-27						28462		31877	24261	11169	12169	13408	14013	14617	15254								299567
7	2027-28							29884	34591	26866	11727	12727	14013	14617	15254	15917	16574							314546
8	2028-29								31328	28117	11727	12727	14013	14617	15254	15917	16574	17237						330273
9	2029-30									32847	148187	16173	16928	17719	18526	19374	20254	21174	22126	23119	24154	25237	26369	346788
10	2030-31										14584	155806	16173	16928	17719	18526	19374	20254	21174	22126	23119	24154	25237	364127

Annexure-IV

Fencing for Compensatory plantation raised outside the forest area Using Angle Iron and Chain link wire mesh (250Rmt/ha)

Sl no	Item of work	Preferable period of Execution	Man days	Wages @311/-	Material cost (Rs)	Total Cost (Rs per ha)
0th Year (PPO)						
1	Earth work (excavation of hole) in Hard soil at a distance of 3mt 0.40m x 0.40m x 0.40m= 0.064X 84=5.376cum @Rs 140/cum = Rs 753/-		2.42	752.62	0	752.62
2	Cement concrete (1:4:8) using 40mm BHG Metal 84x0.40mx0.40mx0.10m=1.344@3755.94/cum		0	0	5047.4	5047.4
3	Angle iron pole of size 50mm x 50mm x 6mm of height 2.40mt 84x 2.40=201.60sqmt @4.50/kg/sqmt=907.20kg@69.50per kg			0	63050	63050
4	Cement concrete (1:2:4) for fixing the iron angle pole using 12 mm BHG Chips 84x0.40mx0.40mx0.30m=4.032cum@5486.77/cum			0	22123	22123
5	Cost of chain link mess using 4mm Dia GI wire having gap size 50mm x 50mm 250Rmt x 2.10mt=525sqmt@331/sqmt= Rs 173775			0	173775	173775
6	Double cost painting of iron angel pole over a coat of primer using good quality enamale paint 84X 2.10X 0.20= 35.28sqmt@Rs 108.80/sqmt.			0	3838	3838
7	Painting of GI Chain link mess 250X 2.10X2= 1050/10=105Sqmt@Rs 108.80sqmt.			0	11424	11424
8	Transportation of chain link mess, Iron angle straighening and tying of chain link mess etc @2% of the total cost			0	5600	5600
			2.42	752.62	284857.4	285610
1st year Maintenance						
9	No maintenance required	Sep/Oct	0	0	0	0
2nd year maintenance						
10	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000

3rd year maintenance						
11	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
4th year maintenance						
12	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
5th year maintenance						
13	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
6th year maintenance						
14	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
7th year maintenance						
15	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
8th year maintenance						
16	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
9th year maintenance						
17	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
10th year maintenance						
18	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
Total			2.42	752.62	383857.4	384610.00

Sl no	Year	No of Person days	Labour cost @311/- per day	Material cost	Total cost
1	0th year	2.42	752.62	284857.4	285610.02
2	1st year	0	0	0	0
3	2nd year	0	0	11000	11000
4	3rd year	0	0	11000	11000
5	4th year	0	0	11000	11000
6	5th year	0	0	11000	11000
7	6th year	0	0	11000	11000
8	7th year	0	0	11000	11000
9	8th year	0	0	11000	11000
10	9th year	0	0	11000	11000
11	10th year	0	0	11000	11000
	Total	2.42	752.62	383857.4	384610

Sl. No	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	XXI	Total Cost (in Rupees)	
	Base Norm	285610	0	11000	11000	11000	11000	11000	11000	11000	11000	11000												
1	2021-22	285610	0	12126	12734	13070	14039	14740	15478	16252	17064	17918	18814	19755	20742	21780	22868	24012						410811
2	2022-23		296891	0	12732	13371	14039	14741	15477	16252	17065	17917	18814	19755	20742	21780	22869	24011	25213					460299
3	2023-24			314806	0	13369	14040	14741	15478	16251	17065	17918	18813	19755										462316
4	2024-25				350600	0	14037	14742	15478	16252	17064	17918	18814	19754	20743									485432
5	2025-26					347152	0	14738	15479	16252	17065	17917	18814	19755	20742	21780								509708
6	2026-27						364520	0	15476	16253	17065	17918	18813	19755	20743	21779	22869							535191
7	2027-28							382746	0	16250	17066	17918	18814	19754	20743	21780	22868	24012						561951
8	2028-29								401683	0	17063	17919	18814	19755	20742	21780	22869	24011	25213					590049
9	2029-30									421977	0	17916	18815	19755	20743	21779	22869	24012	25212	26478				619552
10	2030-31										443076	0	18812	19756	20743	21780	22868	24012	25213	26473	27798			650531

Annexure-V

Cost Norms for creation of Compensatory Afforestation with Stabilization of Soil & Conservation of moisture (1000 Plants/Ha.)

WAGE RATE RS- 311/- PER DAY

Sl. No	Item of Works	Preferable Period of Execution	Total Cost
0th Year (Pre-Planting Operation)			
1	Nil		0
1st Year			
2	Soil Conservation measure structures like Staggered Trench, Percolation pit, Contour trench, Graded earthen bund, LBCD Wire mesh LBCD, Sub surface Dyke & WHS as per the slop & site requirement on LS	Apr/sep	20,215
2nd Year			
3	Maintenance of SMC structures @ 15 % of initial year cost	Apr/jul	3,032
3rd Year			
4	Maintenance of SMC structures @ 15 % of initial year cost	Apr/jul	3,032
4th Year			
5	Maintenance of SMC structure @ 15 % of initial year cost	Apr/jul	3,032
5th Year			
5	Maintenance of SMC structure @ 15 % of initial year cost	Apr/jul	3,032
Total:			32,343.0

Matrix for (SMC)

Sl No	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	Total Cost
	Base Norm	0	20215	3032	3032	3032	3032											
1	2021-22	0	21226	3342	3510	3685	3870											35633
2	2022-23			22287	3509	3686	3869	4064										37415
3	2023-24				23401	3684	3870	4062	4267									39284
4	2024-25					24571	3868	4064	4265	4480								41248
5	2025-26						25800	4061	4267	4478	4704							43310
6	2026-27							27090	4264	4480	4702	4939						45475
7	2027-28								28445	4477	4704	4937	5186					47749
8	2028-29									29867	4701	4939	5184	5445				50136
9	2029-30										31360	4936	5186	5443	5717			52642
10	2030-31											32928	5183	5445	5715	6003		55274

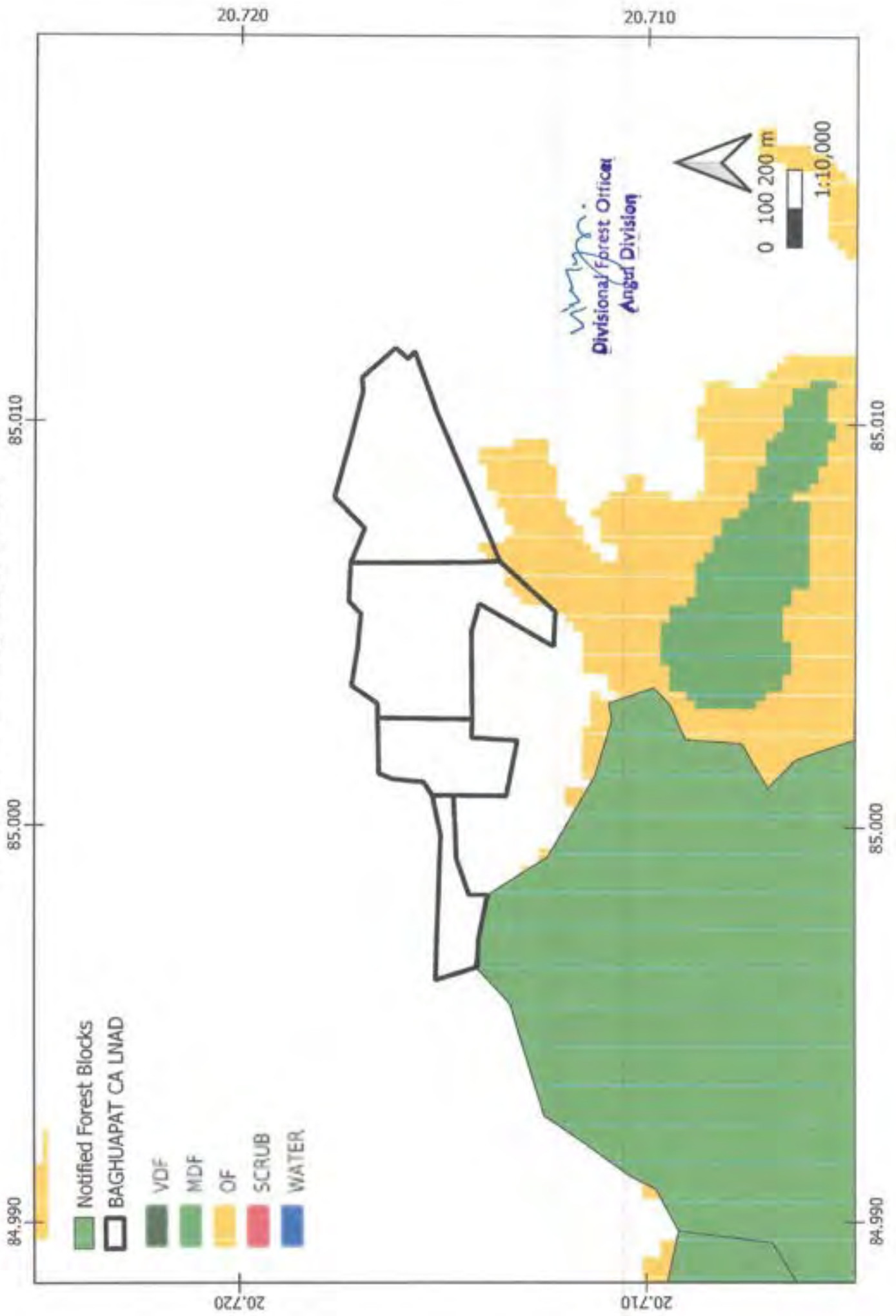
Annexure-VI		
WATERING MODEL-W -I		
Watering provision to CA Plantation		
Solar System with Bore well (1 system for 5 Ha Plantation) fitting with Drip system , Wage rate@ Rs 311/- Year of installation (0 th YEAR)		
1	Cost of Borewell	1,50,000
2	Installation of Solar panel & other System	3,00,000
3	Cost of 0.5 HP submersable motor with accessories	50,000
4	Water Storage Tank/ Flexible pipes	15,000
5	Cost of laying Drip system including all accessories, fittings etc, with 12% GST	3,02,431
	TOTAL	8,17,431
6	Cost of Water & watering per Ha. (8,17,431/5) =Rs1,63,486/-	1,63,486
1 st Year Watering		
7	No maintenance required	0
	TOTAL	0
2 nd Year Watering		
8	Maintenance of system @5% of Initial cost of installation	8,174
	TOTAL	8,174
3 rd Year Watering		
9	Maintenance of system @ 5% of initial cost of installation	8,174
	TOTAL	8,174
4 th Year Watering		
10	Maintenance of system @ 5% of initial cost of installation	8,174
	TOTAL	8,174
5 th Year Watering		
11	Maintenance of system @ 5% of initial cost of installation	8,174
	TOTAL	8,174

Abstract					
Sl. no	Year	No. person days	Labour Cost @ Rs 311/-per day	Material Cost	Total cost (Rs)
1	0 th year	0	0.0	163486.0	163486.0
3	1 st year	0	0.0	0.0	0.0
3	2 nd year	0	0.0	8174.0	8174.0
4	3 rd year	0	0.0	8174.0	8174.0
5	4 th year	0	0.0	8174.0	8174.0
6	5 th year	0	0.0	8174.0	8174.0
	Total:	0	0	196182	1,96,182

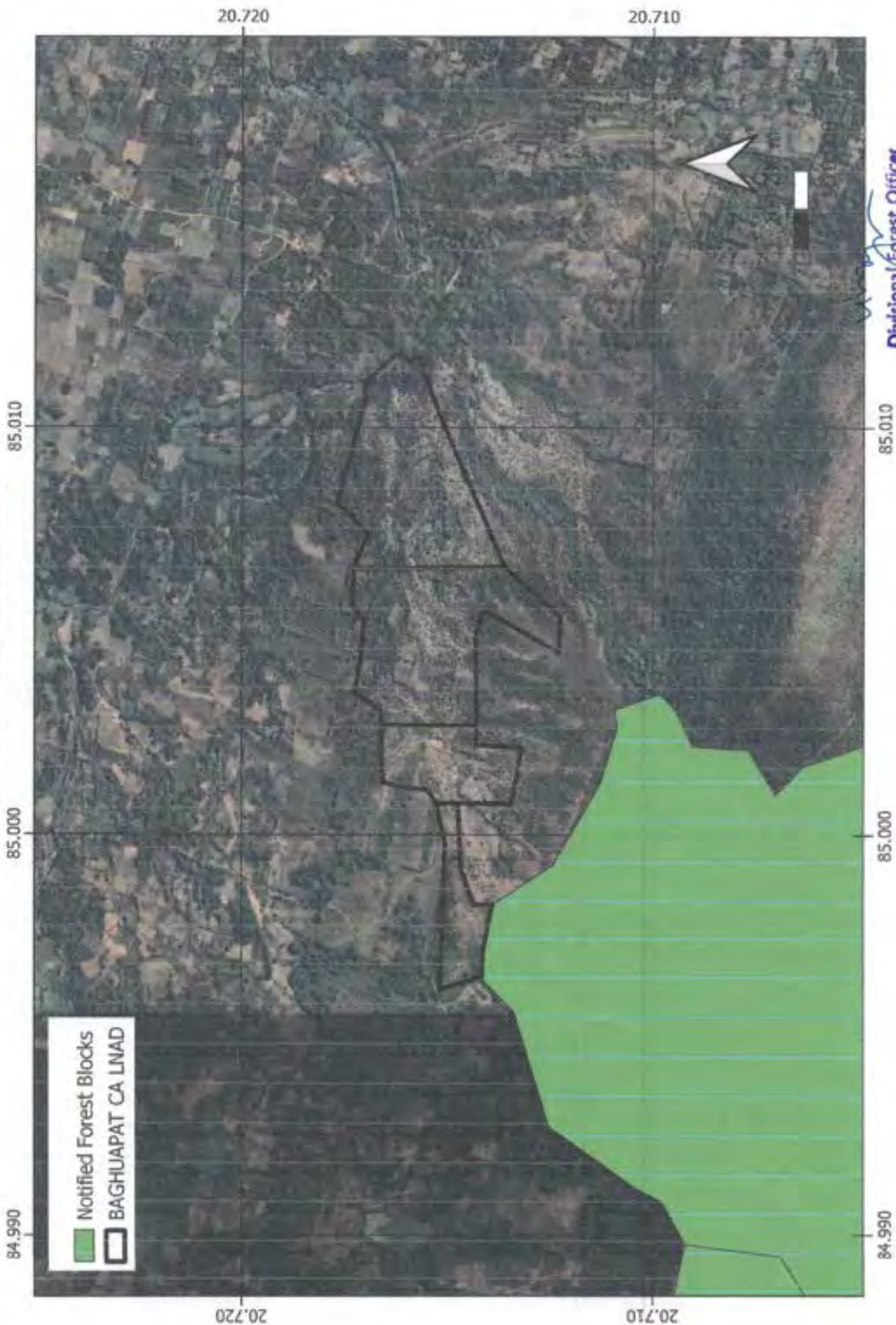
Matrix for Watering W1 (Solar Borewell) fitted with Drip System (per Ha)

Sl No.	Commencement year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	Total Cost
	Base Norm	163480	0	8174	8174	8174	8174											
1	2021-22	163486	0	8011	9463	9935	30736											222653
2	2022-23		17166 0	0	8462	9936	10432	31296										233786
3	2023-24			18024 3	0	9935	10433	10954	33911									245476
4	2024-25				18955	0	10432	10955	11502	35607								257751
5	2025-26					198718	0	10954	11503	12077	37387							270639
6	2026-27						208654	0	11502	12078	12681	39256						284171
7	2027-28							21908 7	0	12077	12682	13315	41219					298380
8	2028-29								230041	0	12681	13316	13981	43280				313299
9	2029-30									241543	0	13315	13982	14680	45444			328964
10	2030-31										25362 0	0	13983	14681	15414	47716		345412

Non-Forest Land in Baghuapat CA Land



Non-Forest Land in Baghuapat CA Land



Divisional Forest Officer
Angul Division

CHECK LIST SERIAL NUMBER-18

**SCHEME FOR
COMPENSATORY AFFORESTATION SCHEME
OVER AN AREA OF 43.593HA IN NON-FOREST
LAND IDENTIFIED IN THE VILLAGE
RODASINGHA, JARPADA RANGE**

**UNDER
ANGUL TAHASIL
OF
DISTRICT ANGUL
IN
LIEU OF PROPOSED FOREST DIVERSION FOR 125.24
HA OF FOREST LAND COMING WITHIN SUBHADRA
OPEN CAST PROJECT
OF
M/S MCL, DIST-ANGUL**

Plantation Model:

ANR mode@200 Plants/ha

Prepared By

W. S. S. S.
**Divisional Forest Officer,
Angul Division**

Contents

Sl no	Description	Annexures	Page No
1	Land suitability Certificate	--	
2	Details of Scheme	--	
3	Land schedule	I	
4	ORSAC Authentication Letter	II	
5	ANR Plantation @200/ha	III	
6	Cost norm & matrix for chain link Fencing	IV	
7	Cost norm matrix for SMC (Model -C)	V	
8	Watering, Solar Borewell fitted with Drip System	VI	
MAPS			PLATE
9	Cadastral Map of CA land identified at Village Rodasingha (Plate-I)		Plate-I
10	DGPS map of the CA land at Rodasingha (Authenticated by ORSAC) (Plate-II)		Plate-II
11	Corresponding Topo map (1:50000 Scale) (Plate-III)		Plate-III
12	KML File in CD		

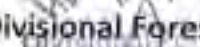
Land Suitability Certificate

The requirement of suitable Non Forest land at par with the guidelines of MoEF & CC is a vital aspect for raising Compensatory Afforestation in lieu diversion of Forest land for Non forestry purpose of a project under FC Act, 1980.

In the instant case diversion of Forest land to the extent of 125.24ha is required for the project "Subhadra Open Cast Project of M/s MCL in the district of Angul. Accordingly required exercises were undertaken in the field by Forest and Revenue Staff jointly to select suitable Non forest land/ Govt degraded forest land for the purpose of Compensatory Afforestation for the said project. Finally One patch of Non forest lands over 43.593ha of Rodasingha Village was selected in Jarpada Range with suitability criteria to accommodate required no of balance seedlings under ANR Plantation @200Seedlings per ha. Criteria of suitability of the site meets relevant parameters such as management point of view, free from encroachment and encumbrances, not included in Section -4(1) notification, not under DLC status of forest, non allotment of the said areas for other projects etc as narrated against this site furnished in Annexure-I. Besides soil quality, soil depth, terrain, climatic conditions etc are suitable for planting indigenous promising species for sustained growth and establishment and over and above location of the site with respect to closeness to nearby forest block of Angul Division which will ensure proper supervision, monitoring of the plantation raised under Compensatory Afforestation Scheme. Plantations activities will be as done per the approved One-time Cost Norm of PCCF, Odisha and it is hoped to ensure proper greenery with improved environmental scenario after implementation of the said plantation.

Place:

Date:


Divisional Forest Officer,
Angul Division

Scheme

This scheme is for taking up Compensatory Afforestation is on identified Non forest land in Village Rodasingha of Jarpada Range under Angul Tahasil in the District of Angul in lieu of Proposed Forest Diversion or 125.24 ha of Forest land coming within Subhadra Open Cast Project of M/s MCL, Dist-Angul.

1. Introduction: The Subhadra Open Cast Mining Lease is over an area of 1111.85 ha. Out of which Forest land located in Mining lease is 125.24ha and Non forest area is 986.61ha as per the land schedule. The User Agency M/s MCL has filed forest Diversion Proposal Vide Proposal No FP/OR/MIN/150133/2021.

On application for providing Compensatory Afforestation Land, the Collector and District Magistrate, Angul has allotted 110.640ha of Non forest Revenue land and 40.255ha of Revenue Degraded Forest area spread over in 5 patches vide his letter no _____ dated _____. This scheme is meant for 43.593ha of Non forest land in village Rodasingha which has been jointly verified by the Revenue staff and Forest staff. The selected land schedule is coming under Jarpada Range of Angul Division (Annexure-I)

Land Schedule:

Land Schedule of land jointly verified by Revenue and Forest Staffs for Compensatory Afforestation

Village	Khata No	Plot No	Total Plot Area in Hectare	Area taken for plantation in ha	Kisam	Remark	Nearest Forest Block	Approximate distance from the proposed site
Jarpada Range								
Rodasingha	1	965(p)	47.328	43.593	Pahad	Nonforest	Antulia RF	1.1Km

2. DGPS Survey, Mapping & Authentication of CA Land.

As per the revised guidelines of Chief Executive, ORSAC, the User Agency has taken up DGPS Survey by empaneled vendors and the same has been authenticated by ORSAC vide his letter no ORSAC/DGPS-FD/1080/2022/3203(2) Dated 03/09/2022 and due endorsement has been furnished on DGPS surveyed Map. The DGPS Map, Corresponding Topo map (Survey of India map F45S13 1:50000 Scale) are enclosed to this Scheme. The KML File of the area is submitted in a CD. (Letter of Authentication by ORSAC at Annexure-II)

The Latitude / Longitude of Survey Points as per DGPS authenticated Map is furnished below.

DGPS OBSERVATION CO-ORDINATES OF BOUNDARY PILLARS			
SL.NO	MAP ID	LONGITUDE	LATITUDE
1	1	84°47'38.56044"	20°50'58.27882"
2	2	84°47'45.96267"	20°51'04.30524"
3	3	84°47'49.47755"	20°51'05.49857"
4	4	84°47'50.76632"	20°51'05.62657"
5	5	84°47'56.43343"	20°51'06.85131"
6	6	84°47'58.69145"	20°51'07.35584"
7	7	84°48'02.10718"	20°51'08.79254"
8	8	84°48'03.82578"	20°51'07.73757"
9	9	84°48'05.40427"	20°51'06.92032"
10	10	84°48'07.57509"	20°51'06.61208"
11	11	84°48'07.57480"	20°51'05.36063"
12	12	84°48'06.50053"	20°51'05.61548"
13	13	84°48'06.11460"	20°51'04.22388"
14	14	84°48'06.99089"	20°51'03.49764"
15	15	84°48'07.74009"	20°51'02.84342"
16	16	84°48'08.03588"	20°51'02.66918"
17	17	84°48'12.68952"	20°50'58.94786"
18	18	84°48'12.41951"	20°50'58.29786"
19	19	84°48'12.16729"	20°50'57.46327"
20	20	84°48'13.05342"	20°50'54.45707"
21	21	84°48'13.21090"	20°50'52.69654"
22	22	84°48'13.05684"	20°50'50.50615"
23	23	84°48'12.37877"	20°50'50.59827"
24	24	84°48'11.92629"	20°50'50.49788"
25	25	84°48'10.36471"	20°50'48.11617"

26	26	84°48'11.37875"	20°50'47.58983"
27	27	84°48'10.82224"	20°50'47.61618"
28	28	84°48'10.23004"	20°50'46.56300"
29	29	84°48'09.50348"	20°50'46.57069"
30	30	84°48'09.01145"	20°50'45.35394"
31	31	84°48'08.68225"	20°50'45.44682"
32	32	84°48'07.33603"	20°50'44.62176"
33	33	84°48'06.90095"	20°50'44.75941"
34	34	84°48'06.68087"	20°50'44.48064"
35	35	84°48'04.81440"	20°50'44.63396"
36	36	84°48'04.73543"	20°50'44.52316"
37	37	84°48'03.85652"	20°50'44.65021"
38	38	84°48'03.05932"	20°50'44.91133"
39	39	84°48'01.39932"	20°50'45.28806"
40	40	84°48'00.46728"	20°50'45.32923"
41	41	84°47'54.97166"	20°50'48.85809"
42	42	84°47'54.94869"	20°50'49.54580"
43	43	84°47'52.63176"	20°50'51.94591"
44	44	84°47'53.77539"	20°50'53.36616"
45	45	84°47'52.42084"	20°50'55.03296"
46	46	84°47'49.25887"	20°50'54.50200"
47	47	84°47'46.35009"	20°50'54.25557"
48	48	84°47'44.66754"	20°50'54.15626"
49	49	84°47'44.10524"	20°50'54.04379"

3. Topography & Soil:

The identified area in above village is having partly hilly and partly plain terrain. The soil is lateritic and gravelly but the soil depth is suitable for taking up plantation. Moreover, nearby forest blocks is ANTULIA RF. So for management point of view, the CA land selected here will be congenial and suitable indigenous species will be planted to ensure a successful plantation.

4. Climate

In Angul District, the wet season is oppressive and overcast whereas, the dry season is humid and mostly clear, and it is hot year-round. Over the course of the year, the temperature typically varies from 13.89°C to 40.55°C and is rarely below 11.11°C or above 44.44°C.

5. Rain fall:

The annual average rainfall is 1602 mm. The maximum rainfall is received during the rainy season and particularly in the month of August.

6. Present Vegetation:

The identified land bears dry deciduous mixed vegetation. Species like Sal, Asan, Karada, Kendu, Jamu, Mango, Bahada, Mahul etc are observed.

7. Items of work to be taken up

Planting Model;

The land identified bears natural vegetations . This area has been taken to accommodate balance no. of seedlings required for the purpose of the extent of forest area to be diverted . Though this area contains good crop of different species it is required to execute various Silvicultural operations and by supplementing plantations of 200 nos of seedlings per ha with adequate protection measures. So as to ensure high density of vegetation. It will help maintaining a good forest cover adjacent to habitation. Considering the vegetation, terrain and soil of the area it is proposed to adopt a planting model of ANR Plantation is suggested.

Spacing: Since no uniform spacing can be adhered to here due to present crop density of different species the required no. of seedlings will be planted in available blanks.

Choice of Species:

Considering the soil, topography and present vegetation observed in and around, it is proposed to Plant the following indigenous and promising species on the identified land in suitable available blanks. Species proposed for planting are

- i) *Acacia Catechew (Khair)*
- ii) *Bombax Ceiba (Simili)*
- iii) *Emblica officinallis (Anla)*
- iv) *Terminalia belerica (Bahada)*
- v) *Terminalia tomentosa (Asana)*
- vi) *Mangifera indica (Aamba)*
- vii) *Pterocarpus marsupium (Bija)*
- viii) *Syzygium cumini (Jamu)*

- ix) *Azadia indica* (Neem)
- x) *Terminalia chebula*(Harida)
- xi) *Pongamia pinnata* (Karanja) etc.

The detail of land schedule below is furnished in Tabular form

Description of Site	Area (in ha)	Total No of Seedlings required for planting	Remark
Jarpada Range			
Compensatory Afforestation Land Identified (NFL)(Rodasingha)	43.593	8719	ANR @200/ha

8. Silvicultural Tending & Planting Technique to be adopted:

i) Survey, Demarcation and Pillar Posting:

The identified area has been surveyed & pillars posted. It is to be checked and missing pillars if any to be reposted as per Latitude / Longitude provided in the DGPS Map authenticated.

ii) Preparation of Treatment map (Digital map):

The Kml file of the area has been provided by the user agency after DGPS survey. The same will be updated with treatment design basing on physical position at the time of implementing the Plantation Scheme. The Range Officer will update the position with help of GIS cell of the Division as per requirement.

iii) Site Preparation:

After demarcation of the area, site preparation mostly clearing of invasive weeds will be taken up at planting site to be identified by field staff.

iv) Silvicultural Tending Operation:

The selected area is having considerable extent of Sal shoots of promising vigor of natural regeneration along with other species. It is proposed to take up Silvicultural cleaning over the area. The activities are intended to achieve healthy growth of existing natural seedlings / saplings / coppice shoots of favored species. The operations include

- Cutting back of high stumps with preference to living stumps and having a good coppicing power.
- Cutting of climbers those are of annual nature and uprooting them wherever possible.
- Singling out of multiple coppice shoots and retaining most promising ones.
- Pruning of whippy plants available within the area.
- Dead and dying trees if any to be cut and separated from the site.

The natural seedlings available in the treatment area are to be given appropriate attention to ensure its establishment.

v) Digging of Pits (45cmx45cmx45cm):

It is proposed to dugout pits of size 45cmx45cmx45cm preferably in month of February / March. The dugout earth will be kept at pit head on both sides separately. The top soil will be kept on one side and bottom soil on another side. Soil within 30cm from ground level will be considered as top soil and rest as bottom soil. The pits will be left for weathering due to Sun & Rain.

vi) Refilling of Pits& application of organic Compounds / CDM/ FYM:

The pits will be refilled by altering the dugout soil of the pits i.e., top soil on bottom of the pit and bottom soil on top. Application of organic Compounds / CDM/ FYM & mixing the same properly before refilling is suggested. This will provide necessary nutrients to the plant as well as help in retaining soil moisture for a longer period.

vii) Transportation of Seedlings including short carriage & watering at Pit site.

In the approved cost norm, provisions have been made to plant 18month old seedlings. As seedlings will be above 1m height invariably, careful transportation of seedlings will be of paramount importance. In case of top breaking of seedlings, the benefit of 18month old seedlings will be reduced substantially. Transportation of seedlings from Nursery site to Planting site and then short carriage has to be taken up carefully. Wherever water is available, the plants are to be watered before short carriage to minimize the shock to plants during long carriage by tractors / vans etc.

viii) Planting of Seedlings:

After application of FYM/ CDM/ Organic manure, seedling will be planted carefully. The standard planting procedure is to be followed. As the pit size is of 45cm x 45cm x 45cm the following care will be taken during planting.

- Chemical fertilizer / insecticides to be applied as basal doze to be thoroughly mixed with soil.
- Seedlings collar zone will be at Ground Level or at best 2.5cm below the ground level. In no case it will not be more than 3cm below Ground Level.
- The Poly bags containing the seedlings are to be carefully removed. It is better to use a blade to cut open the bag so as to cause least disturbance to the ball of earth containing the seedlings.
- After planting the soil is to be compacted leaving 3" around the plant and the compact soil may be at Ground Level or 1" above the Ground level – allowance for soil settlement.
- In no case it should be a sunken around the plant.
- The planted plant should stand erect, if it is tilted due to speedy growth, a support with a stick collected locally to be provided.

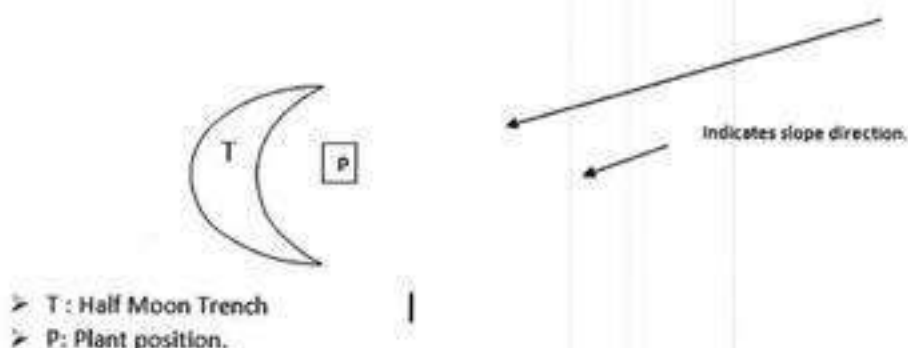
ix) Casualty Replacement:

Casualty replacement is an important operation to achieve a 100% survival in a plantation. After planting there is possibility of casualty in planted seedlings. There is a provision to replace casualty up to 10% in 1st year and 10% in 2nd year operation in the approved cost norm. The same is to be carried out with good promising seedlings those can come up to a height of previous planted seedlings. During replacement in 2nd year application of fertilizers etc as in 1st year is to be followed.

x) Weeding & application of Fertilizer:

Two Weeding around the planted seedlings at a diameter of 1.00m has been prescribed in the approved cost norm. During 2nd weeding deep soil working around the plants at 1.00m diameter has also been prescribed. 1st weeding will be taken up just after one month of planting and 2nd weeding and soil working in month of September / October. As there is occasional rainfall in October, providing half-moon

trench in sloppy terrain around each plant is suggested. A half-moon trench model is given below.



During weeding (1st& 2nd) there is a provision of application of fertilizer to plants. Application of NPK @30gms per plant x 2 times is suggested. In no case 2nd weeding can be delayed beyond 15th of October.

xi) Fire line Tracing & Inspection Path:

There is possibility of grasses growing up within plantation area. It is better to allow local people / VSS to cut the grasses take for stall feeding under supervision of Forest Staff. In the present case where AR is under implementation Grass growth is limited. Due to fallen dry leaves (Due to leaf shedding), there is possibility of fire hazards in February / March. It is suggested to have fire line at a width of minimum 3m all around the planting area, maintain inter partitioned line / both sides of foot path as a Fire line (minimum 3m wide in 1st year and 2m in subsequent year). These lines will be maintained as inspection path also. It will be maintained till completion of 10th year.

xii) Watch & Ward

Watch and ward is essentially required against biotic interferences like grazing and fire etc including grasses in first two years and illicit felling in subsequent years. Adequate provisions has been made in the approved cost norm. Watch & ward provisions will be implemented as per provision of cost norm.

9. Provision for watering:

The site selected contains partly hilly terrain. All total 8719 nos of seedlings will be planted in the site selected depending on extent of blank area available. Watering to be adhered to as per approved one time cost norm (Annexure-VI).

10. Funding Agency

The U/A will deposit required funds as per the approved cost of the scheme.

11. Implementing Agency

Divisional Forest Officer, Angul will execute the Compensatory Afforestation Scheme.

Financial analysis and Cost involved.

Compensatory Afforestation scheme for plantation of 8719nos of seedlings over an area 43.593ha of Non-Forest land in Rodasinga village in Angul Tahasil under Jarpada Range of Angul Forest Division			
PERFORMA (Norm For 1.00ha)			
Sl No	Component	Unit	Base Rate for commencement year 2023-24
1	ANR @200seedlings per ha	Hectare	105986
2	SMC	Hectare	39284
3	Entry point activity		15% of [(1)+(2)]=21790/-



प्रकल्प अधिकारी
Project Officer
MCL, Subhadra Area
पु.स. वि.स. एन. सुभद्रा क्षेत्र


Divisional Forest Officer
Angul (D.V.)

**Matrix for Compensatory Afforestation Scheme for Plantation of ANR mode @200nos of Seedlings over an area
1ha-Year wise (Commencement Year 2023-24)**

Year	Financial year	ANR mode Plantation @ 200nos seedling per ha	Watering, Solar Borewell fitted with Drip system	SMC	Fencing (Iron Angle with Chain link wire mesh (250mt per hectare	Total
0 th year	2023-24	10364	180243	0	314886	505493
1 st year	2024-25	24967	0	23401	0	48368
2 nd year	2025-26	9730	9935	3684	13369	36718
3 rd year	2026-27	8551	10433	3870	14040	36894
4 th year	2027-28	6432	10954	4062	14741	36189
5 th year	2028-29	6754	33911	4267	15478	60410
6 th year	2029-30	7092			16251	23343
7 th year	2030-31	7447			17065	24512
8 th year	2031-32	7819			17918	25737
9 th year	2032-33	8209			18813	27022
10 th year	2033-34	8621			19755	28376
GRAND TOTAL		105986	245476	39284	462316	853062

[Signature]
प्रकाश अग्रवाल

Project Officer
MCL, Subhadra Area
एन. ए. ए. ए. ए. ए. ए. ए. ए. ए.


[Signature]
Divisional Officer
Angul, Odisha

Abstract for Operation of Compensatory Afforestation Scheme for Plantation of 8719Nos of Seedlings over an area 43.593ha

Sl No	Component	Norm	Unit	Rate	Total
1	ANR mode Plantation @200seedlings per ha	105986	Ha	43.593	4620248
2	SMC	39284	Ha	43.593	1712507
3	Entry point activity	15% (1+2)			949913
	Total				7282668


(Seventy Two Lakh Eighty Two Thousand Six Hundred Sixty Eight) Only


 Divisional Forest Officer
 Angul, Division


 Project Officer
 MCL, Subhadra Area
 49, 1st. Flr. सुभद्रा क्षेत्र

Calendar of Operation for Compensatory Afforestation Scheme for Plantation of 8719Nos of Seedlings over an area 43.593ha-Year wise

Year	Financial year	ANR Plantation @ 200nos seedling per ha	SMC	Entry point activity 15% (1+2)	Total
0 th year	2023-24	451798	0	67770	519568
1 st year	2024-25	1088386	1020120	316276	2424782
2 nd year	2025-26	424160	160597	87714	672471
3 rd year	2026-27	372764	168705	81220	622689
4 th year	2027-28	280390	177075	68620	526085
5 th year	2028-29	294427	186011	72066	552504
6 th year	2029-30	309162	0	46374	355536
7 th year	2030-31	324637	0	48696	373333
8 th year	2031-32	340854	0	51128	391982
9 th year	2032-33	357855	0	53678	411533
10 th year	2033-34	375815	0	56372	432187
GRAND TOTAL		4620248	1712507	949913	7282668


 प्रमुख अधिकारी
 Project Officer
 MCL, Subhadra Area
 अ.स. सि. एन. सुभद्रा क्षेत्र


 Divisional Forest Officer
 Angul Division

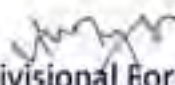
Encl:

A- Documents:

- 1) The selected land schedule of Non forest land in Rodasingha Village coming under Jarpada Range of Angul Division attached as (Annexure-I).
- 2) ORSAC, authorization letter vide his letter no ORSAC/DGPS-FD/1080/2022/3203(2) Dated 03/09/2022as (Annexure-II).
- 3) Approved cost norm for one ha ANR Plantation @200 Plants per ha(Annexure-III)
- 4) Approved Cost norm & matrix for Chain link Fencing: (Annexure-IV)
- 5) Approved Cost norm Matrix for SMC (Model-C) is at (Annexure –V)
- 6) Approved Cost Norm for Watering, Solar Borewell fitted with Drip System is at (Annexure-VI).

B- Maps & Plates:

- I. Cadastral Map of CA land identified at Village Rodasingha(Plate-I)
- II. DGPS map of the CA land at Rodasingha Village(Authenticated by ORSAC) (Plate-II)
- III. Corresponding Topo map (1:50000 Scale) (Plate-III)
- IV. KML File in CD
- V. Forest Cover density map of CA land
- VI. Satellite map of CA land


Divisional Forest officer,
Divisional Forest Officer
Angul Division
Angul, Division

ON-SITE VERIFICATION OF NON-FOREST GOVT. LAND FOR COMPENSATORY AFFORESTATION
IN (ASST. DISTRICT OFFICE, M.D.)

Sl. No.	Name of Village	Mandal No.	Dist. No.	Khasra No.	Area (in Ha.)	Block	MOP	Plantation Ha.	Total Ha.	Area (in Hectare)	Remarks	Date	
												Tahasil: ANUGUL	
1					5			5	5	27		Extent of an	
1	Rudrapur		5001	Phase	47.328			43.593	43.593			75.10 1980	

1. Certified that the above non-forest government land as mentioned in column 7, 8 & 9 is a compact patches of a (60) ha. Or more having adequate soil depth suitable for plantation from management point of view.

2. Certified that the above Government land found suitable for plantation is free from encroachment and encumbrance.

3. Certified that the above Government land is not covered under 4(T) notification.

4. Certified that the above Government land is not covered under G.C.

5. Certified that the above Government land is not already previously.

6. Certified that the above Government land is not covered under any M.L.P. area.

7. Certified that the above Government land is not settled in favour of individual/community under F.R. Act, 2006.

8. Certified that the status of the above plots was non forest as on 25.10.1980.

9. Certified that the above plots are not covered under any proposed forest lands.

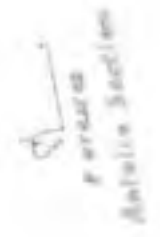
10. Certified that the above plots are suitable only for agricultural use and not for other developmental requirements.

11. Certified that the above plots have suitable potential for afforestation or reforestation.

12. Certified that the above identified area contains mature vegetation with density of 0.02 and scrubby forest growth for the purpose afforestation.



Forest Range Officer
Jairasuda Range
Jairasuda



Tahasil Section



Tahasil Officer
ANUGUL



ORSAC/DGPS-FD/1080/2022: 350332 dt. 19.08.22

To

The D.F.O.,
Angul Division,
Angul

For Verification of DGPS Survey of Compensatory Afforestation non-forest land in Jamugaria, Kanja, Nukhuripada, Rodasingha, villages and degraded revenue forest land in Baghuapat village in Angul Tahsil in lieu of forest areas proposed for diversion for Subhadra OCP, Subhadra Area of MCL in Angul District.

Ref: Your letter no. 5950 dated 19.08.2022

Sir

With reference to the subject mentioned above, this is to inform you that, the maps and data forwarded to ORSAC by your office for verification of the DGPS survey of Compensatory Afforestation non-forest land in Jamugaria, Kanja, Nukhuripada, Rodasingha villages and degraded revenue forest land in Baghuapat village in Angul Tahsil in lieu of forest areas proposed for diversion for Subhadra OCP, Subhadra Area of MCL in Angul District has been verified by ORSAC and is certified that the map is correct at a confidence level of 95%. All the Compensatory Afforestation non-forest land comes in Jamugaria, Kanja, Nukhuripada, and Rodasingha villages and degraded revenue forest land in Baghuapat village in Angul Tahsil in Angul district. Total Compensatory Afforestation land works out to **150.954Ha.** includes 40.249Ha degraded Revenue forest and 110.705Ha non-forest land from the submitted slip sheet, against the required area of 150.895Ha. (40.255Ha degraded Revenue forest and 110.640Ha non-forest land) as mentioned in the submitted record. Detail Patch/village/plot wise comparative statistics of Compensatory Afforestation area is attached herewith.

Yours faithfully,

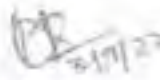
Encl: 6 hard copy maps


M. K. SANABADA
SCIENTIST - 'D'

Copy to: The General Manager (Subhadra Area), MCL, Subhadra Area, Near Biju Mohan Angul-750122, Odisha for information.

**STATISTICS OF COMPENSATORY AFFORESTATION LAND IDENTIFIED IN VILLAGE
JAMUGARIA, KANJA, NUKHURIPADA, RODASINGHA ALONG WITH DEGRADED REVENUE
FOREST LAND IN VILLAGE BAGHUAPAT UNDER ANGUL TAHASIL IN LIEU OF FOREST AREAS
PROPOSED FOR DIVERSION FOR SUBHADRA OCP, SUBHADRA AREA OF MCL, ANGUL
DISTRICT**

SL. NO.	VILLAGE NAME	PLOT NO.	KISAM	ALLOTTED AREA HA.	MAP AREA HA.
1	BAGHUAPAT	251(P)	CHHOTTA JUNGLE	15.393	15.081
2	BAGHUAPAT	296(P)	CHHOTTA JUNGLE	15.212	15.243
3	BAGHUAPAT	283(P)	CHHOTTA JUNGLE	6.029	6.035
4	BAGHUAPAT	284(P)	CHHOTTA JUNGLE	3.621	3.890
A. TOTAL DEGRADED REVENUE FOREST LAND				40.255	40.249
5	JAMUGARIA	1107(p)	PURATANA PATITA	7.923	7.924
6	JAMUGARIA	1117(p)	PURATANA PATITA	21.642	21.854
7	JAMUGARIA	1089(p)	PURATANA PATITA	5.127	5.259
8	KANJA	1657	PURATANA PATITA	1.752	1.780
9	KANJA	1658(P)	PURATANA PATITA	7.893	7.691
10	KANJA	1648/1(P)	PURATANA PATITA	3.583	3.635
11	NUKHURIPADA	8(P)	PURATANA PATITA	19.126	19.129
12	RODASINGHA	065(P)	PAHADA	43.593	43.438
B. TOTAL NON-FOREST LAND				110.640	110.705
TOTAL CA LAND AREA (A+B)				150.895	150.954


 M. M. K. Sanapala
 DIST. ORSAC
 Bhubaneswar

COST NORM FOR AIDED NATURAL REGENERATION (ANR) @200 PLANTS PER HECTARE (18 months old seedlings)						
Wage Rate Rs.311/-per Manday						
Sl. No.	Items of work	Preferable Period of Execution	No. of Mandays	Labour Cost (Rs.)	Material Cost (Rs.)	Total Cost (Rs.)
0th Year (Advance Work)						
1	Survey, Demarcation and Pilar posting	Nov/Dec	2	622	0	652
2	Preparation of Treatment Map (Digital Map)	Nov/Dec	1	311	100	411
3	Site preparation	Nov/Dec	2	622	0	622
4	Silvicultural operations including clearance of weed, cutting of climber, High stump cutting, singling of shoots & removal of cut out after drying from the field to the blank space.	Jan/Feb	15	4665	0	4665
5	Alignment and stacking for digging of pits	Feb/Mar	0.5	156		156
6	Digging of pits (45cm x 45cm x 45cm) /50cm diameter augur hole in hard & gravelly soil	Feb/Mar	8	2488	0	2488
	Total		28.5	8863.5	100	8963.5
1st Year Planting Year						
1	Refilling of pits by altering the dugout soil of the pits, application of organic compounds/ CDM/ FYM & mixing the same properly.	June/Jul	1.5	466.5	1000	1467
2	Transportation of 18 months old polypot seedlings in hired truck/ tractor from the Permanent/ Mega nursery to planting site including loading & unloading. (Average lead of 10 Rkm) & stacking the seedling @ Rs.6/- per seedling. (220 nos.)	Jul/Aug	0	0	1320	1320
3	Watering polypot seedling at stacking site of plantation	Jul/Aug	0.5	155.5	0	156
4	Conveyance of polypot seedlings on head load from the stacking site to individual dugout pits with in the planning site, applying insecticide, fertilizers & planting after scooping the soil with other applied materials and pressing the soil properly around the planted seedlings.	Jul/Aug	4.5	1399.5	0	1400
5	<u>Cost of Fertilizers & Insecticide</u> (a)NPK/ Bio-fertilizers @50gm/plant as basal dose =10kg @ Rs. 30/-per kg = Rs. 300.0 (b) Urea / Vermicompost/ Mo khata / any other fertilizers @Rs.150.0 (c)Insecticide/ Bio-pesticide @5gms/ plant= 1kg@ Rs.150/-per kg= Rs.150/-	Jul/Aug	0	0	600	600

6	Casualty Replacement @ 10% (20 nos.)	Jul/Aug	0.5	156	0	156
7	1st Weeding & Manuring	Aug/ Sept	2	622	0	622
8	2nd Weeding, Soil working (1mt. Diameter around the plants) & Manuring	Oct/Nov	3	933	0	933
9	Fire line tracing & Inspection path	Feb/Mar	3	933	0	933
10	Watch & Ward including watering as per requirement	Aug-Mar	8	2488	0	2488
Total			23	7153	2920	10073
2nd Year Maintenance						
1	Transportation of 20 seedlings from Nursery to plantation site including loading, unloading & conveyance by tractor @Rs.6/-per seedling	Jul	0	0	120	120
2	Casualty Replacement	Jul	0.5	155.5	0	155.5
3	Cost of Fertilizers & Insecticide A) Cost of Insecticide/ Bio-pesticide (Themet/Forate) @ 5gms/plant = 0.1kg@ Rs.150/- per kg =Rs.15/- B) Urea /NPK/Bio-fertilizers/ Vermicompost/ Mokhata / any other fertilizers =Rs.560/-	Jul	0	0	575	575
4	Weeding (Complete weeding), Manuring & Soil working, (1mt. Diameter around the plants)	Sept/Oct	4	1244	0	1244
5	Fire line tracing (2m. Wide fire line over 400m long) & Inspection Path	Feb/Mar	3	933	0	933
6	Watch & Ward including watering as per requirement	Apr/Mar	12	3732	0	3732
Total			19.5	6064.5	695	6759.5
3rd year Maintenance						
1	Cost of Fertilizer Urea/ NPK/ Bio-fertilizer/ Vermicompost/ Mokhata/ Any other fertilizers = Rs.560/-	Sept/Oct	0	0	560	560
2	Weeding (Complete weeding), Manuring & Soil working, (1mt. Diameter around the plants)	Aug/ Sept	4	1244	0	1244
3	Fire line tracing (2m. Wide fire line over 400m long) & Inspection Path	Feb/Mar	3	933	0	933
4	Watch & Ward including watering as per requirement	Apr/Mar	12	3732	0	3732
Total			19	5909	560	6469
4th Year Maintenance						
1	Fire Line tracing (2 m. wide fire line over 400 m long) & Inspection path	Feb/Mar	3	933	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732	0	3732

		Total		15	4665	0	4665
5th Year Maintenance							
1	Fire Line tracing (2 m. wide fire line over 400 m long) & Inspection path	Feb/Mar		3	933	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar		12	3732	0	3732
		Total		15	4665	0	4665
6th Year Maintenance							
1	Fire Line tracing (2 m. wide fire line over 400 m long) & Inspection path	Feb/Mar		3	933	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar		12	3732	0	3732
		Total		15	4665	0	4665
7th Year Maintenance							
1	Fire Line tracing (2 m. wide fire line over 400 m long) & Inspection path	Feb/Mar		3	933	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar		12	3732	0	3732
		Total		15	4665	0	4665
8th Year Maintenance							
1	Fire Line tracing (2 m. wide fire line over 400 m long) & Inspection path	Feb/Mar		3	933	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar		12	3732	0	3732
		Total		15	4665	0	4665
9th Year Maintenance							
1	Fire Line tracing (2 m. wide fire line over 400 m long) & Inspection path	Feb/Mar		3	933	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar		12	3732	0	3732
		Total		15	4665	0	4665
10th Year Maintenance							
1	Fire Line tracing (2 m. wide fire line over 400 m long) & Inspection path	Feb/Mar		3	933	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar		12	3732	0	3732
		Total		15	4665	0	4665

ABSTRACT (Showing Seedling Cost Separately)							
Sl. No.	Year	No. Person days	Labour cost @ Rs.326/- per day (RS)	Material Cost (Rs.)	MELD & Other Contingency	Seedling Cost@Rs.50.31 per seedling	Total cost (Rs.)
1	0th Year	28.5	8863.5	100	436.50	0	9400
2	1st Year	23	7153	2920	427	11068	21568
3	2nd Year	19.5	6064.5	695	240.50	1006	8006
4	3rd Year	19	5909	560	231	0	6700
5	4th Year	15	4665	0	135	0	4800
6	5th Year	15	4665	0	135	0	4800
7	6th Year	15	4665	0	135	0	4800
8	7th Year	15	4665	0	135	0	4800
9	8th Year	15	4665	0	135	0	4800
10	9th Year	15	4665	0	135	0	4800
11	10th Year	15	4665	0	135	0	4800
	Total	195	60645	4275	2280	12074	79274

*This Cost Norm is applicable for the scheme as per Office Order No. 1109/9F (Misc.) 387/2021 Dt. 08.11.2021 of PCCF & HoFF, Odisha.

Annexure-IV

Fencing for Compensatory plantation raised outside the forest area Using Angle Iron and Chain link wire mesh (250Rmt/ha)

Sl no	Item of work	Preferable period of Execution	Man days	Wages@311/-	Material cost (Rs)	Total Cost (Rs per ha)
0th Year (PPO)						
1	Earth work (excavation of hole) in Hard soil at a distance of 3mt $0.40m \times 0.40m \times 0.40m = 0.064 \times 84 = 5.376 \text{ cum}$ @Rs 140/cum = Rs 753/-		2.42	752.62	0	752.62
2	Cement concrete (1:4:8) using 40mm BHG Metal $84 \times 0.40m \times 0.40m \times 0.10m = 1.344 @ 3755.94/\text{cum}$		0	0	5047.4	5047.4
3	Angle iron pole of size 50mm x 50mm x 6mm of height 2.40mt $84 \times 2.40 = 201.60 \text{ sqmt}$ @4.50/kg/sqmt=907.20kg@69.50per kg			0	63050	63050
4	Cement concrete (1:2:4) for fixing the iron angle pole using 12 mm BHG Chips $84 \times 0.40m \times 0.40m \times 0.30m = 4.032 \text{ cum} @ 5486.77/\text{cum}$			0	22123	22123
5	Cost of chain link mess using 4mm Dia GI wire having gap size 50mm x 50mm 250Rmt x 2.10mt=525sqmt@331/sqmt= Rs 173775			0	173775	173775
6	Double coat painting of Iron angle pole over a coat of primer using good quality enamel paint $84 \times 2.10 \times 0.20 = 35.28 \text{ sqmt} @ Rs 108.80/\text{sqmt}$.			0	3838	3838
7	Painting of GI Chain link mess $250 \times 2.10 \times 2 = 1050/10 = 105 \text{ Sqmt} @ Rs 108.80/\text{sqmt}$.			0	11424	11424
8	Transportation of chain link mess, iron angle straightening and tying of chain link mess etc @2% of the total cost			0	5600	5600
			2.42	752.62	284857.4	285610
1st year Maintenance						
9	No maintenance required	Sep/Oct	0	0	0	0
2nd year maintenance						
10	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year $1142 \times 1\% = 11.42$ say 11	Sep/Oct	0	0	11000	11000

3rd year maintenance						
11	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
4th year maintenance						
12	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
5th year maintenance						
13	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
6th year maintenance						
14	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
7th year maintenance						
15	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
8th year maintenance						
16	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
9th year maintenance						
17	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
10th year maintenance						
18	Maintenance of wire mess @ 1% per running mt cost of installation in 1st year 1142X1%=11.42 say 11	Sep/Oct	0	0	11000	11000
Total			2.42	752.62	383857.4	384610.00

Sl no	Year	No of Person days	Labour cost @311/- per day	Material cost	Total cost
1	0th year	2.42	752.62	284857.4	285610.02
2	1st year	0	0	0	0
3	2nd year	0	0	11000	11000
4	3rd year	0	0	11000	11000
5	4th year	0	0	11000	11000
6	5th year	0	0	11000	11000
7	6th year	0	0	11000	11000
8	7th year	0	0	11000	11000
9	8th year	0	0	11000	11000
10	9th year	0	0	11000	11000
11	10th year	0	0	11000	11000
	Total	2.42	752.62	383857.4	384610

Sl. No.	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XIX	Total Cost (in Rupees)
	Base Month	285610	0	11000	11000	11000	11000	11000	11000	11000	11000	11000								
1	2021-22	285610	0	12126	17384	13370	14039	14740	15478	15252	17064	17918	419331							419331
2	2022-23		299891	0	12732	13371	14039	14741	15477	16252	17065	17917	18814							440299
3	2023-24			314886	0	13389	14040	14741	15478	16251	17065	17918	18813	19755						462316
4	2024-25			30030	0	14037	14742	15478	16252	17064	17918	18814	19754	20743						485432
5	2025-26					347142	0	14739	15479	16252	17065	17917	18814	19755	20742	21780				509700
6	2026-27						364520	0	15478	16253	17065	17918	18813	19755	20743	21779	22868			535191
7	2027-28							381746	0	16250	17066	17918	18814	19754	20743	21780	22868	24012		561951
8	2028-29								401883	0	17063	17919	18814	19755	20742	21780	22869	24011	25213	590049
9	2029-30									421977	0	17916	18815	19755	20743	21779	22869	24012	25212	619552
10	2030-31										443076	0	18812	19756	20743	21780	22868	24012	25213	650511

Annexure-V

Cost Norms for creation of Compensatory Afforestation with Stabilization of Soil & Conservation of moisture (1000 Plants/Ha.)

WAGE RATE RS- 311/- PER DAY

Sl. No	Item of Works	Preferable Period of Execution	Total Cost
0th Year (Pre-Planting Operation)			
1	Nil		0
1st Year			
2	Soil Conservation measure structures like Staggered Trench, Percolation pit, Contour trench, Graded earthen bund, LBCD Wire mesh LBCD, Sub surface Dyke & WHS as per the slop & site requirement on LS	Apr/sep	20,215
2nd Year			
3	Maintenance of SMC structures @ 15 % of initial year cost	Apr/jul	3,032
3rd Year			
4	Maintenance of SMC structures @ 15 % of initial year cost	Apr/jul	3,032
4th Year			
5	Maintenance of SMC structure @ 15 % of initial year cost	Apr/jul	3,032
5th Year			
5	Maintenance of SMC structure @ 15 % of initial year cost	Apr/jul	3,032
Total:			32,343.0

Matrix for (SMC)

Sl No	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	Total Cost
	Base Norm	0	20215	3032	3032	3032	3032	3032										
1	2021-22	0	21226	3342	3510	3685	3870											35633
2	2022-23			22287	3509	3686	3869	4064										37415
3	2023-24				23401	3684	3870	4062	4267									39284
4	2024-25					24571	3868	4064	4265	4480								41248
5	2025-26						25800	4061	4267	4478	4704							43310
6	2026-27							27090	4264	4480	4702	4939						45475
7	2027-28								28445	4477	4704	4937	5186					47749
8	2028-29									29867	4701	4939	5184	5445				50136
9	2029-30										31360	4936	5186	5443	5717			52642
10	2030-31											32928	5183	5445	5715	6003		55274

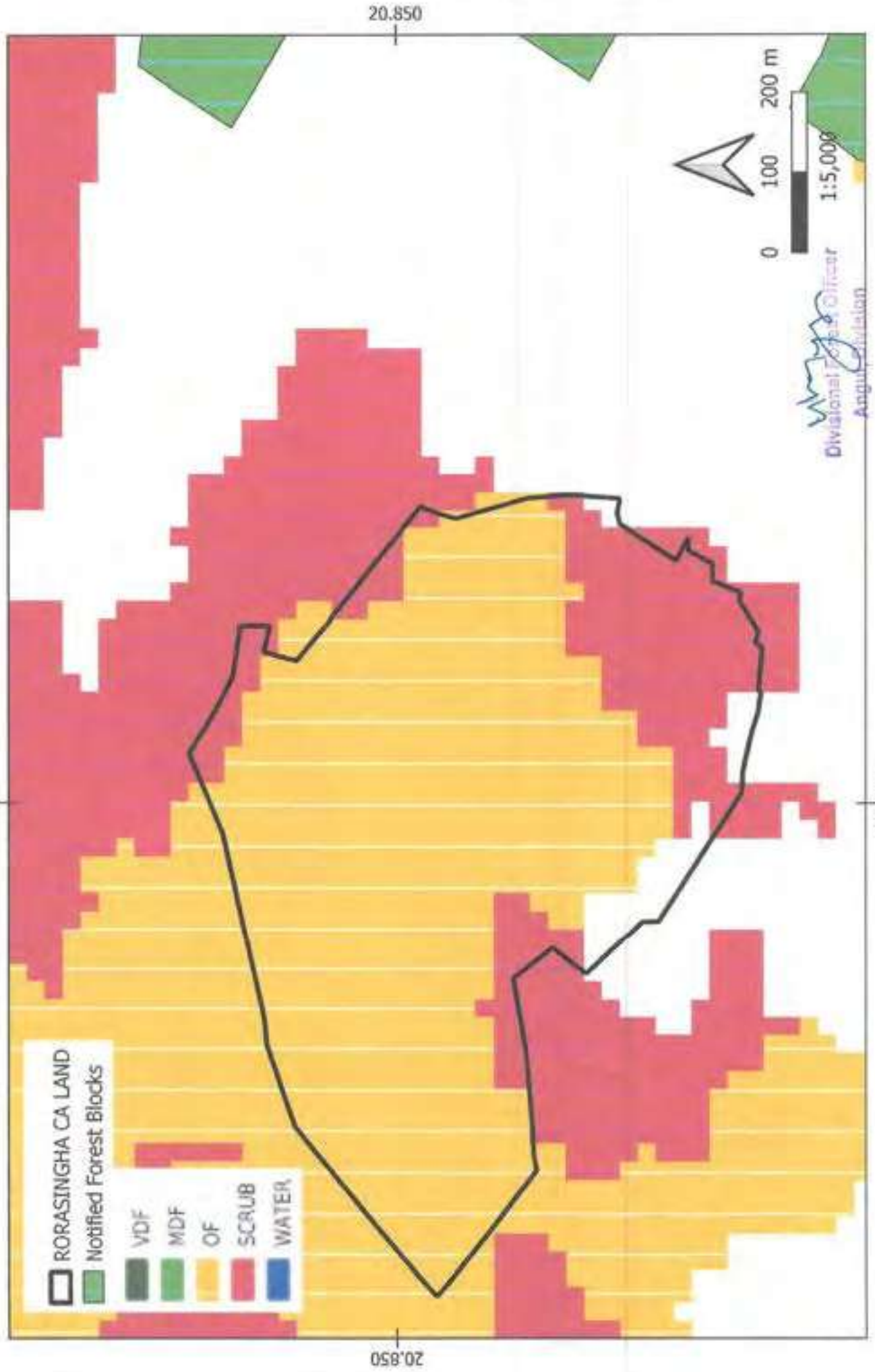
Annexure-VI		
WATERING MODEL-W -I		
Watering provision to CA Plantation		
Solar System with Bore well (1 system for 5 Ha Plantation) fitting with Drip system , Wage rate@ Rs 311/- Year of installation (0 th YEAR)		
1	Cost of Borewell	1,50,000
2	Installation of Solar panel & other System	3,00,000
3	Cost of 0.5 HP submersible motor with accessories	50,000
4	Water Storage Tank/ Flexible pipes	15,000
5	Cost of laying Drip system including all accessories, fittings etc, with 12% GST	3,02,431
	TOTAL	8,17,431
6	Cost of Water & watering per Ha. (8,17,431/5) =Rs1,63,486/-	1,63,486
1st Year Watering		
7	No maintenance required	0
	TOTAL	0
2nd Year Watering		
8	Maintenance of system @5% of initial cost of installation	8,174
	TOTAL	8,174
3rd Year Watering		
9	Maintenance of system @ 5% of initial cost of installation	8,174
	TOTAL	8,174
4th Year Watering		
10	Maintenance of system @ 5% of initial cost of installation	8,174
	TOTAL	8,174
5th Year Watering		
11	Maintenance of system @ 5% of initial cost of installation	8,174
	TOTAL	8,174

Abstract					
Sl. no	Year	No. person days	Labour Cost @ Rs 311/-per day	Material Cost	Total cost (Rs)
1	0 th year	0	0.0	163486.0	163486.0
3	1 st year	0	0.0	0.0	0.0
3	2 nd year	0	0.0	8174.0	8174.0
4	3 rd year	0	0.0	8174.0	8174.0
5	4 th year	0	0.0	8174.0	8174.0
6	5 th year	0	0.0	8174.0	8174.0
	Total:	0	0	196182	1,96,182

Matrix for Watering W1 (Solar Borewell) fitted with Drip System (per Ha)

Sl No.	Commencement year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	Total Cost
	Base Norm	163486	0	8174	8174	8174	8174											
1	2021-22	163486	0	9011	9463	9935	30758											222653
2	2022-23		17166 0	0	9463	9935	10432	32796										233786
3	2023-24			18224 5	0	9935	10433	10854	33911									245476
4	2024-25				18935	0	10432	10955	11502	35907								257751
5	2025-26					198718	0	10954	11503	12077	37987							270639
6	2026-27						208634	0	11502	12076	12681	39256						284171
7	2027-28							21908 7	0	12077	12682	13315	41219					298380
8	2028-29								230041	0	12681	13316	13961	43280				313299
9	2029-30									241543	0	13315	13962	14680	45444			328964
10	2030-31										25362 0	0	13961	14681	15414	47716		345412

Non-Forest Land in RORASINGHA



Divisional Forest Officer
Angul Division

Non-Forest Land in RORASINGHA

84.800



20.850

20.850

84.800

Divisional Forest Officer
Angul Division


MCL
**Office of the General Manager
(Subhadra Area)**

NEAR BIJU MAIDAN

Po/Dist: Angul – 759122 (Odisha)

 Website : www.mcl.gov.in

 mail id: gmsubhadraarea@gmail.com
gm-subhadra.mcl@coalindia.in

Phone No-06764-296537



Ref No: MCL/GM(SA)/2024/ 372

Date: 08.05.2024

To,

 Divisional Forest Officer
Angul, Forest Division

Sub : Proposal for seeking prior approval of the Central Government under Section 2 (ii) of the forest (Conservation) Act, 1980 in favour of M/s Mahanadi Coalfield Ltd. for non forestry use of 125.24 ha of forest land for Subhadra Open Cast Coal Mining Project of Subhadra Area under Angul Forest Division and District Angul of Odisha State reg.

Ref.No- (i) Proposal No.FP/OR/ MIN/150133/ 2021.

(ii) Letter no-2900-DRP/dated-20.04.2024 for Demand for payment of compensatory levies through web portal.

Dear Sir,

The cost of raising and maintaining the Compensatory Afforestation as per the approved CA scheme of Rs 9.67.67.900/- (Rupees nine crore sixty-seven lakhs sixty-seven thousand nine hundred only) has been deposited on 07.05.2024 in CAMPA account no-1508258150133711 of Union Bank of India vide UTR no- SBINR52024050720845483 as per demand raised by you vide letter no- 2900-DRP/dated-20.04.2024 for compliance of condition no 2(a) stipulated in Stage-I/ In-Principle approval of forest diversion proposal of Subhadra OCP.

The copy of the UTR including NEFT/RTGS CHALLAN for CAMPA fund is enclosed herewith for kind information and necessary action.

Regards

End: As above

Yours faithfully

 General Manager
Subhadra Area

MK

For kind information to:

1. CMD, MCL
2. DT (Op), MCL
3. D (F), MCL
4. DT (P&P), MCL
5. GM (E&F), MCL
6. GM (P&P), MCL
7. GM (CMC), MCL
8. GM (L&R), MCL

Copy to:

1. Project Officer, Subhadra Project /SO(Min/P&P), Subhadra Area
2. SO(L&R), SO (Survey/E&F), Subhadra Area
3. Project Head, M/s SCML

Handwritten notes and signatures in the bottom left corner, including a date that appears to be 1/10/20.

Transaction Details

Unique Transaction Reference Number	SBINR62024050720845483	
Value Date	07/05/2024	
Related Reference Number		
Amount	96767900	INR
Commission	0	
MessageType	P08	

Beneficiary details

Beneficiary Account	1508258150133711
Beneficiary Name	ORISSA CAMPA
Beneficiary IFSC Code	UBIN0996335
Beneficiary Address1	FCS BANGALORE
Beneficiary Address2	
Beneficiary Address3	
Dealer Code	

Details of Payment**Remitting Customer Details**

Account Number	00000011094460922
Remitter's IFSC Code	SBIN0012068
Remitter's Name	MCL HINGULA AREA
Remitter's Address1	HINGULA AREA
Remitter's Address2	
Remitter's Address3	

Sender to Reciever's Information**ATTN/TFR****Error Details**

Error Code

Error Reason

Additional Details

Instruction Priority	0
Purpose Code	0
Credit Status:	CREDIT CONFIRMED
Credit Time	02:05:11
Credit Date:	07/05/2024

Close

AGENCY COPY

यूनियन बैंक Union Bank
of India



NEFT / RTGS CHALLAN for CAMPA Funds

Date : 23-04-2024

Agency Name.	Mahanadi Coalfields Limited
Application No.	58156133711
MoEF/SG File No.	8-05/2023-FC
Location.	ORRISA
Address.	ANAND VIHAR, BURLASambalpur
Amount(in Rs)	05767900/-

Amount in Words: Nine Crore Sixty-Seven Lakh Sixty-Seven Thousand Nine Hundred Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	ORRISA CAMPA
IFSC Code:	UBIN0996335
Pay to Account No.	1508250150133711 Valid only for this challan amount.
Bank Name & Address:	Union Bank Of India FCS Centre, 21/1, III Floor, Jelitte Towers, Mission Road, Bengaluru-560027

- This Challan is strictly to be used for making payment to CAMPA by NEFT/RTGS only

Note: After making the required payment through ct even after 7 working days, then kindly mail a copy of id to Email: fcsblr@unionbankofindia.bank , epurssc ubin0903710@unionbankofindia.bank

58156133711



OFFICE OF THE DIVISIONAL FOREST OFFICER; ANGUL DIVISION: ANGUL.

Letter No. 2900 DRP/Dated. 20/11/24

To

The Project Officer, Mahanadi Coalfields Ltd.,
Subhadra Area, At. /PO/Dist.- Angul, Odisha, Pin- 759122.

Subj: -

Proposal for Seeking prior approval of Central Government under section 2 (ii) of the forest (Conservation) Act, 1980 in favour of M/s Mahanadi Coal filed Ltd. for non-forestry use of 125.24 ha forest land for Subhadra OCP Coal mining under Angul Forest Division and District Angul of Odisha State-reg. projects of Subhadra Area.

: - Demand for payment of compensatory levies through web portal.

Ref: -

- 1) Online proposal No. FP/OR/MIN/150133/2021.
- 2) Stage-I/In-Principal No. 8-06/2023-FC dt. 05.12.2023 of Govt. of India MoEF&CC.
- 3) Memo No. 25840/FE & CC dt. 14.12.2023 of OSD-cum-SS to Govt.
- 4) Memo No. 24938 dt. 20.12.2023 of PCCF, Nodal, O/o the PCCF, O, BBSR.
- 5) Approved CA scheme vide memo No. 8325 dt. 19.04.2024 of PCCF, Nodal.

Sir,

With reference to the above memo numbers on the captioned subject, it is to inform you that the Government of India, Ministry of Environment, Forest and Climate Change (MoEF & CC), New Delhi, has granted Stage-I/In-Principal approval vide their letter No. 8-06/2023-FC dated 05.12.2023. This approval pertains to the non-forestry use of 125.24 hectares of forest land for the Subhadra OCP Coal mining project under Angul Forest Division, Angul District of Odisha, in favor of M/s Mahanadi Coalfields Limited, in accordance with Section 2 (ii) of the Forest (Conservation) Act, 1980.

In view of the above, a Compensatory Afforestation Scheme covering an area of 150.895 hectares has been devised. This scheme encompasses 110.64 hectares of non-forest land and 40.255 hectares of degraded revenue forest land. The detailed allocation is given below.

Sl. No	Name Range	Location	Type of land	Area in Ha.
1	Bantala	Kanja	Non-Forest	13.228
2	Bantala	Nukhrpada	Non-Forest	19.126
3	Bantala	Jamugaria	Non-Forest	34.693
4	Jarapada	Rodasingha	Non-Forest	43.593
5	Bantala	Baghuapat	Rev. Forest	40.255
Total				150.895

In this connection, as per in-principle approval Point No. (2), the scheme for Compensatory Afforestation in respect of your above proposal has been technically approved by the Principal Chief Conservator of Forests, Forest Diversion & Nodal Officer, F.C. Act O/o the PCCF & HoFF, Odisha, Bhubaneswar vide his memo No. 8325 dated 19.04.2024 (copy enclosed for your reference) with a financial outlay of Rs. 9,67,67,900/- (Rupees Nine Crore Sixty-Seven Lakhs Sixty-Seven Thousand Nine Hundred only) for the commencement year 2024-25.


Hence, you are requested to deposit an amount of Rs. 9,67,67,900/- (Rupees Nine Crore Sixty-Seven Lakhs Sixty-Seven Thousand Nine Hundred only) towards the cost of Compensatory Afforestation levies through the web portal of MOEF & CC immediately and intimate the same to the undersigned for taking further action in the matter.

Yours faithfully,


Divisional Forest Officer
Angul Division


Memo No. 2901 / Dated. 20.4.24

Copy forwarded to the Regional Chief Conservator of Forests, Angul Circle for favour of kind information and necessary action with reference to memo No. 8326 dt. 19.04.2024 of PCCF, Nodal, FC Act. O/o the PCCF, Odisha, Bhubaneswar.


Divisional Forest Officer
Angul Division

Memo No. 2902 / Dated. 20.4.24

Copy forwarded to the Principal Chief Conservator of Forests, Forest Diversion & Nodal Officer, F.C. Act, O/o the Principal Chief Conservator of Forests, Odisha, Bhubaneswar for favour of kind information and necessary action with reference to your memo No. 8325 dt. 19.04.2024.


Divisional Forest Officer
Angul Division



SUBHADRA OPEN CAST COAL PROJECT

Scheme

For

**GAP PLANTING, SOIL & MOISTURE CONSERVATION ACTIVITIES
TO RESTOCK AND REJUVINATE THE DEGRADED OPEN FORESTS
(HAVING CROWN DENSITY < 0.4) WITHIN 100 M FROM OUTER
PERIMETER OF MINING LEASE**

in compliance

with

Condition No.2(e) of

Stage-I approval granted vide

Letter No.8-06/2023-FC, Dated.05.12.2023

of Govt. of India, Ministry of Environment, Forests

& Climate Change, New Delhi.

for

**Diversion of 125.24 Ha. (including 1.47 Ha. of Safety Zone)
of Forest Land within 1111.85 Ha. of ML area of Subhadra OCP**

for Non forestry use U/s-2 (ii) of FC Act-1980

**in villages Kankarei, Pirakhaman, Balichandrapur, Rajjharan,
Kaunsidhipa, Golagadia, Chhotabereni, Kumunda, Bhalugadia,
Baghuabola and Jaipur RF of Talcher and Chhendipada Tahasil,**

Angul District, Odisha.

M/s. Mahanadi Coalfields Limited

SCHEME FOR GAP PLANTING, SOIL & MOISTURE CONSERVATION ACTIVITIES TO RESTOCK AND REJUVENATE THE DEGRADED OPEN FORESTS (HAVING CROWN DENSITY LESS THAN 0.40) WITHIN 100M FROM OUTER PERIMETER OF THE MINING LEASE.

1. INTRODUCTION

Subhadra Open Cast Coal Mine is a Greenfield opencast mining project spread over a lease area of 1111.85 Ha. in Kankarei, Pirakhaman, Balichandrapur, Rajjharan, Kaunsidhipa, Golagadia, Chhotabereni, Kumunda, Bhalugadia, Baghuabol villages and Jaipur RF, Tehsil Talchler & Chhendipada, Dist-Angul, Odisha

Ministry of Coal, Government of India has allotted this coal block in favour of M/s. Mahanadi Coalfields Limited vide allotment order no. NA-103/1/2021-NA dated 18-11-2021. Mahanadi Coalfields Limited has named Utkal-A and West of Gopalprasad (west) coal block as Subhadra Open Cast Project vide their letter no. 539-H dated 26.09.2019.

As per approved Mining Plan and Mine Closure Plan, the mine life is 36 years. Out of total 1111.85 Ha. of Mining Lease area, total forest land involved in 125.24 Ha. (Revenue forest and DLC of 124.49 Ha. + Reserve forest of 0.75 Ha.)

M/s. Mahanadi Coalfields Limited submitted the Forest Diversion proposal to obtain Forest Clearance from MoEF & CC, Government of India for 125.24 Ha. of forest land U/s 2(ii) of the Forest (Conservation) Act 1980.

The Stage-I Forest Clearance over 125.24 ha of Forest Land Under Section- 2 (ii) (including 1.47 ha. of Safety Zone) of the Forest (Conservation) Act, 1980 has been granted by MoEF & CC, Government of India vide their Letter No. 8-06/2023-FC, dated 05.12.2023.

Condition No. 2(e) of FC Stage- I stipulates that User Agency or State Forest Department shall undertake gap planting and soil & moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density < 0.4), if any, located in the area within 100 m from outer perimeter of the mining lease. The plan for plantation and SMC activities will be prepared and submitted to MoEF & CC before Stage-II clearance.

2. LOCATION

The mining lease area is covered in the Survey of India Topo sheet No. F45 T1 and F45 S13 and situated between the latitude 20° 55' 56.225" N to 20° 58' 47.344" N, and longitude 84° 58' 42.383" E and 85° 0' 50.476" E. The above ML area comes within the villages namely Kankarei, Pirakhaman, Balichandrapur, Rajjharan, Kaunsidhipa, Golagadia, Chhotabereni, Kumunda, Bhalugadia, Baghuabola and Jaipur RF in Chhendipada & Talcher Tahsil, Angul Forest Division Angul District Odisha.

LOCATION MAP

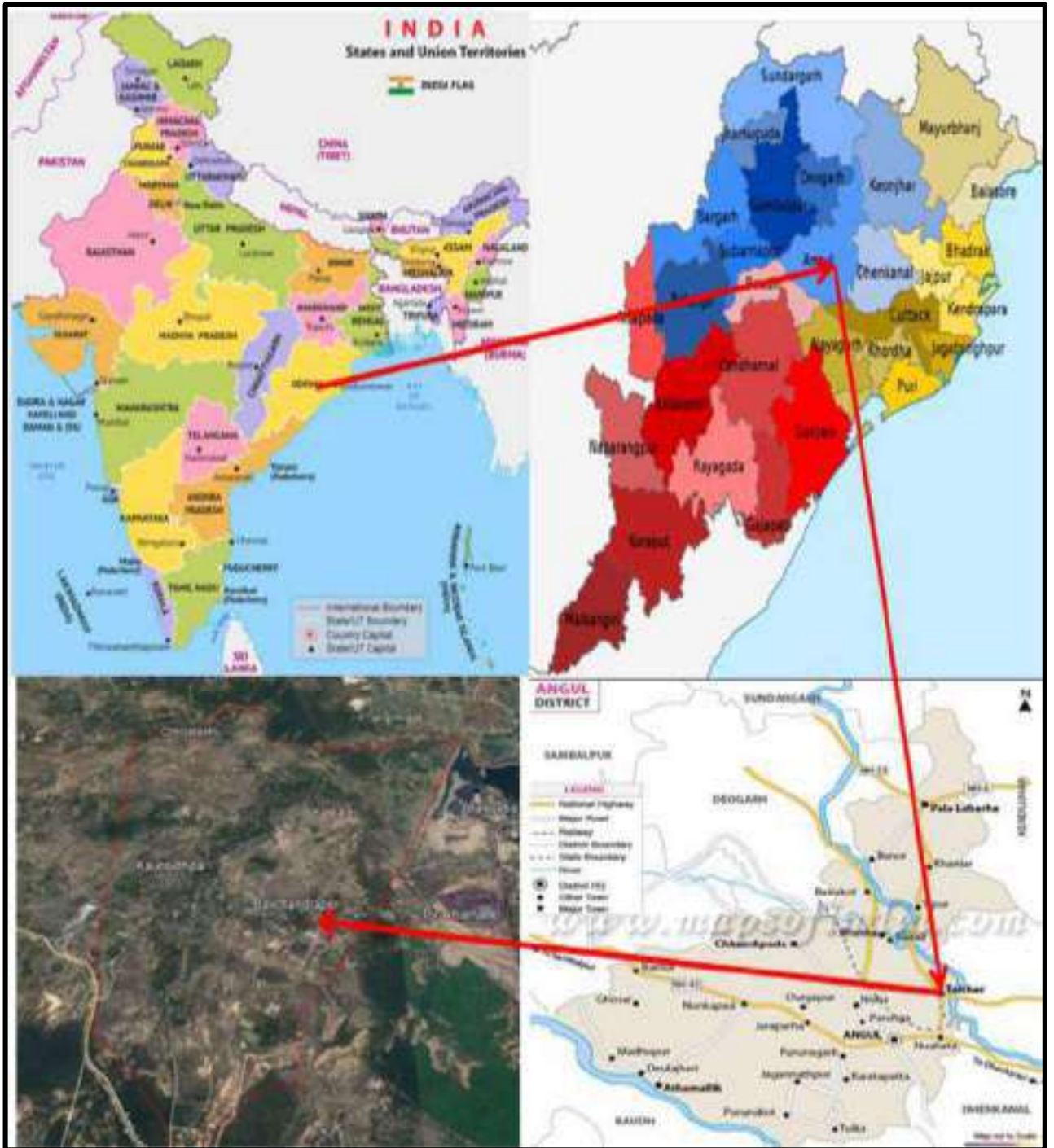


Fig-1. Location Map of Subhadra OCP, MCL

3. TOPOGRAPHY

The surface topography is gently undulating and the ground is generally being used for cultivation purposes by the villagers. Around south western part, the surface topography is mildly undulating and slopes towards north. The ground level rises towards south-eastern corner of the block with highest elevation above Mean Sea Level of about 167.50 meter.

4. LAND USE PATTERN

The proposed land use pattern of 1111.85 Ha. of mining lease area as per approved Mining Plan and Mine Closure Plan is given below:

Table 1: Purpose wise break up forest and non-forest land.

Sl. No.	Type of Land Use	Forest Land in Ha				Total Forest Land in Ha (3+4+5+6)	Non-Forest Land in Ha		Total non-forest land in Ha (8+9)	Total Land in Ha (7+10)
		RF	PRF	Rev. forest	DLC		Govt. land	Private land		
1	2	3	4	5	6	7	8	9	10	11
1	Mining Excavation Area	0.71	0.00	33.82	55.00	89.53	225.73	566.02	791.75	881.28
2	Safety Zone 7.5Mtr along Mining lease boundary	0.04	0.00	0.77	0.66	1.47	5.56	4.76	10.32	11.79
3	Infrastructure	0.00	0.00	13.00	21.24	34.24	47.83	61.43	109.26	143.50
4	Others (Top soil dump, Coal stock Yard, External dump, Nalla diversion)	0.00	0.00	0.00	0.00	0.00	10.54	64.74	75.28	75.28
5	Rationalisation area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.75	0.00	47.59	76.90	125.24	289.66	696.95	986.61	1111.85

5. DETAILS OF FOREST LAND WITHIN THE MINING LEASE AREA

Forest land to be worked for mining and allied purpose -123.77 Ha

Area set aside for Safety Zone 1.47 Ha

125.24 Ha

6. SOIL TYPE

The areas are filled up with colluvial soil with sand, silt deposits and clay of older alluvium, older and younger floodplain deposits. In most of the area the soil is moderately coarse in

nature, whereas it is loamy in the cultivated land. The area has three nalas namely Singada Jhor, Ghurudia nala and Masani Jhor. The soil has been deposited in the valley area mostly from these nalas. There were two periods of glacial advance and retreat during the deposition of Talcher sediments.

7. CLIMATE

The lease area lies in sub-tropical region where climate is characterized by an oppressively hot summer and cool winter. Summer is typically from April to July when monthly temperature ranges from a maximum of 45.50 degree centigrade during day time to a minimum of 15 Degree Centigrade at night time. Winter is from November to February when the maximum temperature during daytime goes to 37 Degree Centigrade and minimum temperature at night- becomes as low as 6.70 Degree Centigrade. The average annual rainfall as recorded at IMD observatory at Angul is 1277 mm.

8. DRAINAGE

Brahmani River, flowing approximately north to south along the eastern boundary of the Talcher Coalfields, provides the main drainage of the region. This river is fed by seasonal nalas, viz. Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor and a few small nalas. From the eastern boundary of the block, the Brahmani river lies eastward at a distance of about 20 km.

Singada Jhor flows eastward and forms major part of the northern boundary of the block. Downstream Singada Jhor merges into Brahmani River at the north eastern part of the Coalfields. Sinhajori nala, Ghurudia nala and Masani jhor flowing from south to north within the block feed Singada jhor for most part of the year and control the drainage pattern of the block. Small ponds and dug wells are common in this block and are utilized for irrigation and drinking purpose.

9. BOUNDARY DESCRIPTION OF ML AREA

The boundary description of the mining lease area is described below:

North: Singada Jhor, Jaipur R.F and Balabhadra OCP (A greenfield coal mine project) of MCL

East: Hingula Coal Mine of MCL

South: State Highway 63, Jindal Power Plant and Durgapur R.F.

West: Utkal B1 Coal Block, Utkal C Coal Block

10. SURVEY AND DEMARCATION OF BOUNDARY FOR PROPOSED GAP PLANTATION AND SOIL MOISTURE CONSERVATION

After survey, it is found that the total forest area involved within 100 metre outer perimeter of the Mining Lease area of Subhadra OCP is 38.2096 Ha. The village-wise details of forest land measuring 38.2096 Ha. is given below:

The only feasibility of taking up plantation in the Durgapur RF (14.0844 Ha.) and Jaipur RF (14.6789 Ha) located adjacent to the Subhadra OCP, remaining area within 100-meter outer perimeter is not feasible for plantation due to existence of mines, Industry, state Highway and other Infrastructure.

Table 2: Area within 100 meter outer Perimeter of Mine Lease Area of Subhadra OCP

Total Area within 100 meter outer Perimeter of Mine Lease Area of Subhadra OCP							
Sl. No	Village Name	Direction	Village wise Forest and Non-Forest Area within 100 meter Outer Perimeter (in Ha).			Existence of Mines/industry/State Highway and Other Infra Structures	Feasibility to Undertake Gap Plantation/SMC (in Ha)
			Forest Area	Non forest Area	Total Area (in Ha.)		
1	Golagadia	Western	1.6855	7.2101	8.8956	Utkal Coal Block B1	0
2	Kaunshidhipa	Western	0.2281	13.5495	13.7776	Utkal Coal Block B1	0
3	Raijharan	South Western	4.0872	8.9874	13.0746	Utkal Coal Block B1 & C, SH-63	0
4	Kankarai	Southern	0	1.1624	1.1624	JSPL & SH-63	0
5	Balichandrapur	South Eastern	1.0798	24.0845	25.1643	Hingula Coal Block, SH-63, JSPL	0
6	Pirakhaman	Eastern	0	7.4511	7.4511	Hingula Coal Block	0
7	Nisha PF	Eastern	1.4433	0	1.4433	Hingula Coal Block	0
8	Bhalugadia	Eastern	0.9224	22.3101	23.2325	Hingula Coal Block	0
9	Kumunda	Northern	0	18.635	18.635	Balabhadra Coal Block, Singhadajhor	0
10	Chhotatabareni	Northern	0	5.825	5.825	Singhadajhor	0
11	Sandhapal	Northern	0	15.173	15.173	Ramachandi Coal Block, Singhadajhor	0
12	Jaypore RF	Northern	14.6789		14.6789		14.6789
13	Durgapur RF	South Western	14.0844	0	14.0844		14.0844
	Total		38.2096	124.3881	162.5977		28.7633

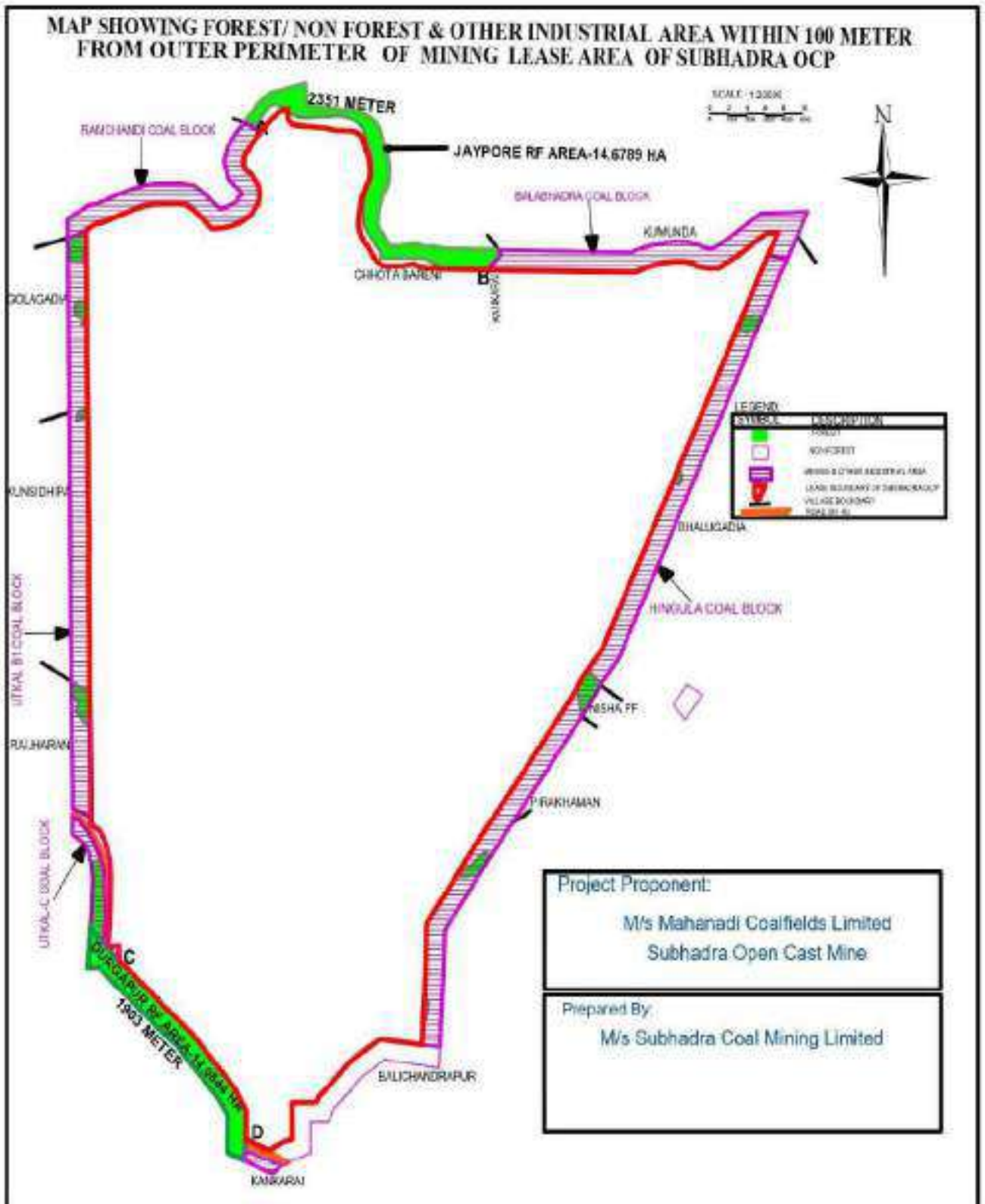


Fig-2. Map showing forest/non-forest & other industrial areas within 100 meters from outer perimeter of Subhadra OCP attached as Annexure-II.

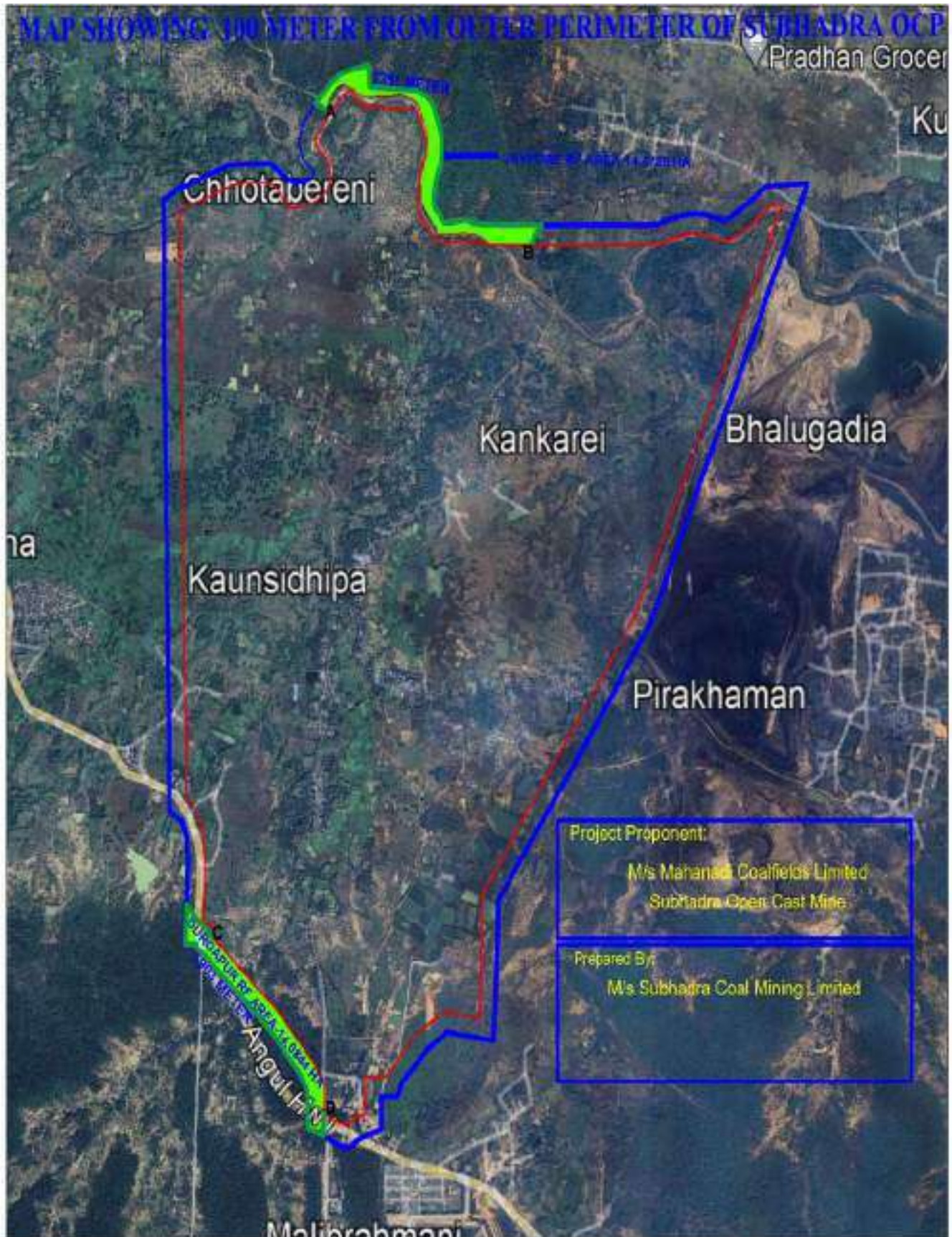


Fig-3. Satellite Image Showing 100 meters from outer perimeter of Subhadra OCP attached as Annexure-III and KML file submitted in pen drive.

11. DESCRIPTION OF THE EXISTING VEGETATION

The proposed site for gap plantation has dense growth of weeds like *Cromolena odoratum* *Lantama camra* etc. along with sparsely available *Sal* with its associates. The available growth is degraded due to biotic pressure like grazing and fire wood collection.

Choice of species

As far as possible, care shall be taken to select indigenous species for plantation.

The list of species to be adopted for the plantation is as follows:

SI.No	Local Name	Botanical Name
1	Amla	<i>Emblica officinalis</i>
2	Bamboo	<i>Dendrocalamus strictus</i>
3	Karanja	<i>Pongamia pinnata</i>
4	Asan	<i>Terminalia alata</i>
5	Sisoo	<i>Dalbergia sisoo</i>
6	Gambhar	<i>Gmelina arborea</i>
7	Neem	<i>Azadirachta indica</i>
8	Harida	<i>Terminalia chebula</i>
9	Bahada	<i>Terminalia bellirica</i>
10	Kasi	<i>Bridelia retusa</i>

12. OBJECTIVE OF THE SCHEME

The main objective of the present scheme is to fulfill the Condition No.2 (e) of the Stage-I approval granted vide Letter No 8-06/2023-FC dt.05.12.2023 of MoEF & CC, Government of India to undertake “**gap planting and soil & moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density < 0.4), if any, located in the area within 100 m from outer perimeter of the mining lease. The plan for plantation and SMC activities will be prepared and submitted to MoEF & CC before Stage-II clearance**”. The steps to be followed are as under:

- To re-stock and rejuvenate the degraded forest land by ANR plantation within 100m from the outer perimeter of the lease area.
- To Demarcate and fence the area in ground to dispense with biotic interferences.
- To improve the micro edaphic conditions by undertaking suitable soil and moisture conservation measures within the ANR Plantation.

- d) To create awareness among the local villagers for protection and maintenance of this plantation and the adjoining forest for ensuring enrichment of the ecosystem in general.

13. PROPOSED TECHNIQUE

To achieve the above objectives, it has been proposed to take up ANR plantation @ 200 plants/ha at a spacing of 2.5 mt X 2.5 mt in identified permanent gaps. The following items of works prescribed in the scheme will be taken up, the detailed expenditure statement of which is enclosed in **Annexure-I**.

To achieve the above objectives, the following items of work are mainly prescribed to be taken up:

14. SURVEY AND DEMARCATION OF BOUNDARY

The boundary of this lease area is as details below:

North: Singda Jhore

South: Durgapur RF

East: Hingula Coal Block

West: Utkal-B-1 & C Coal Block

Land Schedule of the forest area within 100m from outer perimeter of the Mining Lease of Subhadra OCP of M/s Mahanadi Coalfields Ltd. is as under:

Location	Length of Outer Perimeter (in mtr)	Area in Ha.
Jaypore RF	2351 (A-B)	14.6789
Durgapur RF	1903 (C-D)	14.0844
Total	4254	28.7633

The cost of fencing over ML boundary safety zone over 11.79 ha. will be implemented by User agency to fence 15.876 Km length of safety zone perimeter. The area proposed for 100 m gap plantation over 28.7633 ha. as proposed is adjacent to ML boundary line safety zone. Hence one side fencing will be common for both purposes. So there is need of fencing one side of the proposed area over 4254 mtr. Map showing within 100 mtr. Outer perimeter of ML area attached as **Annexure-II**.

The GPS reading of the above identified area is as mentioned below.

GPS reading of 28.7633 Ha of land is identified for ANR Plantation with 200 plants per Ha will be raised

Jaypore RF

Sl.No	Longitude	Latitude
1	84°59'13.63"	20°58'45.10"
2	84°59'12.55"	20°58'45.50"
3	84°59'11.49"	20°58'45.90"
4	84°59'12.79"	20°58'47.57"
5	84°59'14.42"	20°58'49.19"
6	84°59'16.48"	20°58'50.83"
7	84°59'19.52"	20°58'51.62"
8	84°59'22.84"	20°58'52.45"
9	84°59'23.01"	20°58'48.76"
10	84°59'27.10"	20°58'48.44"
11	84°59'29.03"	20°58'48.22"
12	84°59'31.06"	20°58'48.17"
13	84°59'33.05"	20°58'47.95"
14	84°59'34.47"	20°58'47.34"
15	84°59'35.57"	20°58'46.81"
16	84°59'36.06"	20°58'46.12"
17	84°59'36.68"	20°58'45.40"
18	84°59'37.47"	20°58'43.01"
19	84°59'37.74"	20°58'42.59"
20	84°59'38.15"	20°58'41.09"
21	84°59'38.36"	20°58'40.40"
22	84°59'38.57"	20°58'38.80"
23	84°59'38.49"	20°58'37.03"
24	84°59'38.17"	20°58'35.79"
25	84°59'37.46"	20°58'34.47"
26	84°59'37.17"	20°58'34.17"
27	84°59'36.56"	20°58'31.11"
28	84°59'36.56"	20°58'29.69"
29	84°59'36.98"	20°58'28.73"
30	84°59'37.62"	20°58'28.19"
31	84°59'38.29"	20°58'26.97"
32	84°59'38.91"	20°58'26.22"
33	84°59'40.61"	20°58'26.21"
34	84°59'43.83"	20°58'26.68"
35	84°59'45.21"	20°58'26.19"
36	84°59'46.29"	20°58'26.04."
37	84°59'46.83"	20°58'26.27"
38	84°59'48.71"	20°58'25.92"
39	84°59'49.82"	20°58'25.92"
40	84°59'52.68"	20°58'25.92"
41	84°59'57.18"	20°58'25.86"
42	84°59'59.20"	20°58'25.84"
43	84°59'59.59"	20°58'25.23"
44	84°59'57.22"	20°58'22.59"

Durgapur RF

SI.No	Longitude	Latitude
1	84°58'50.09"	20°56'29.34"
2	84°58'47.94"	20°56'31.55"
3	84°58'46.86"	20°56'32.20"
4	84°58'44.64"	20°56'34.75"
5	84°58'44.55"	20°56'32.76"
6	84°58'44.21"	20°56'28.13"
7	84°58'46.63"	20°56'28.16"
8	84°58'46.66"	20°56'27.72"
9	84°58'50.33"	20°56'24.61"
10	84°58'52.97"	20°56'22.14"
11	84°58'57.96"	20°56'18.08"
12	84°59'01.08"	20°56'15.53"
13	84°59'03.46"	20°56'13.01"
14	84°59'06.42"	20°56'09.56"
15	84°59'09.02"	20°56'07.01"
16	84°59'10.52"	20°56'04.40"
17	84°59'10.51"	20°55'58.45"
18	84°59'13.59"	20°55'57.26"
19	84°59'14.02"	20°56'00.53"

The identified degraded forest lands will be surveyed clearly with reference to the village maps and reserve forest boundary and demarcated by posting R.C.C. pillars at every corner/turning point of boundary line and the Scheme proposes financial implication for the same is included in the Cost Norms for ANR Plantation. **(Annexure-I)**

15. REGENERATION CLEANING AND TENDING OPERATION

The operation aims at tending (climber cutting, cleaning, double shoot cutting, pruning etc.) of the existing crop for the growth of promising principal species of the locality (Sal with associates) for ensuring better growth of the plants. It includes removal of inferior, diseased, malformed, dead, dying and defective tree growth and disposal of them by distributing it among the local VSS members. Apart from it, weed eradication is also an integral part as they interfere with the growth of both planted species and natural regeneration. The detailed operation to be carried out is as follows-

- i) Cutting of herbs and shrubs interfering with the growth of the promising species.
- ii) Cutting back of top broken pole crops interfering with growth of well-formed pole crops.
- iii) Cutting back of malformed and diseased species.
- iv) Cutting of climbers up to hand's reach.

- v) Sharp cutting of high stumps at a height of 0.5 mtr above the ground level to get a smooth stool with least damage to the cortex layer. This will promote growth of new stool shoots as well as root collar shoots of species having coppicing vigor.
- vi) Singling out the coppice shoots coming out from stools and retaining two to three most promising ones.
- vii) Pruning of the branches of the pole crops up to hand's reach.

During the 1st year, climber cutting, and cutting of high stumps, weeds and malformed and diseased species will be done. In the next two years, cutting back of malformed individuals and singling of coppice shoots in case of desired species will be done in the subsidiary silvicultural activities.

16. PLANTING & POST-PLANTING

The area will be re-stocked by raising plantation @ 200 plants per hectare in ANR (Assisted Natural regeneration) model. Taking into consideration, the site-specific soil condition, existing indigenous species growing there and the bonafied requirement of the local people, the species have been proposed to be planted in the area as mentioned in Point No.16 below.

The main objective of the present scheme is to raise gap plantation in degraded forest as well as to apply soil & moisture conservation measures, restock & rejuvenate degraded forest within 100 m. in the outer perimeter of Mining lease of Subhadra OCP such Plantations will act as a Transition Crop to support the main crop of the lease area.

Hence, the main objective of the present scheme is as follows: -

- i) To afforest the degraded forest land and to restore the degraded forest lands by ANR model.
- ii) Clearly demarcating and fencing with brush wood the area to dispense with the biotic interferences.
- iii) To improve the micro edaphic conditions by undertaking suitable soil and moisture conservation measures.
- iv) To protect the area against encroachment, illicit felling, fire incidences, grazing and all other forms of biotic interference.
- v) To create awareness among the local villagers for protection and maintenance of plantation for ensuring enrichment of the ecosystem and replacement of the degraded areas with natural green cover.

17. SELECTION OF SITE FOR GAP PLANTING

The above degraded forest land is situated in the 100m outer perimeter of the mining lease of Subhadra OCP of M/s Mahanadi Coalfields Ltd. in Angul District of Odisha. The proposed area has been selected considering proximity of the mining lease area. The main purpose of the plantation will be to involve the local VSS. The VSS member will have a share in the usufruct in future which will cater to their need, so far as bonafide requirement of fuel wood and small timber is concerned. The topography of the site is sloppy in nature. The soil is mostly rocky / sandy loam type at patches and depth of the soil is of limited extent. The gap plantation will be carried out over an area of 28.7633 Ha in Jaypore RF and Durgapur RF as shown in the table above.

18. RAISING OF NURSERY

Seedlings required for the plantation shall be raised in the nursery of Forest Dept. which will meet the requirement. The Nursery should have a capacity of raising adequate seedlings. The selection of saplings will be undertaken in consultation with the Forest Department. All the infrastructures will be provided by the User Agency. Work will commensurate one and half year before the year of plantation. About 10% extra seedlings shall be raised to compensate casualty in the nursery. Standard nursery practices shall be followed for raising seedlings in polyplots.

19. ALIGNMENT AND STACKING

Alignment, stacking and pitting will be taken up in the month of March-April, Pits of size 45cmX 45cm X 45cm will be dug maintaining a spacing of 2.5 mt x 2.5 mt @ 200 plants per hectare.

20. PLANTING

The seedlings will be planted in dug out pits of 45 cm³ maintaining a spacing of 2.5 mt between the pits @ 200 seedlings per hectare. Plantation should be taken up after first regular shower of monsoon and should be completed by end of August. NPK/DAP fertilizer @ 50 gms per plant should be given as basal dose. Anti- termite and insecticide like @ 5 gms. per plant should be applied per pit. Foreign earth shall be provided in each pit to enrich the growth of seedlings within a marked period. Casualty replacement when required during the planting year and in the second year should be undertaken for which the seedlings shall be raised.

21. WEEDING, SOIL WORKING AND MANURING

For establishment and better growth of the planted seedlings, weeding, soil working and manuring are necessary. It is proposed to carry out two weeding, soil working and manuring added with vermin compost @ 200 gm/plant during the first year and second year of plantation. Weeding and manuring for the first and second year shall be carried out during

September–October Urea 70 gm & NPK 50 gm and the second one during September–October along with soil working during which 70 gms of vermi compost shall be added to the soil per plant. First weeding shall be for entire area weeding and the second weeding should be strip weeding. The weeding of third year will be for entire area and weeding shall be carried out during August.

22. APPLICATION OF INSECTICIDES

The plantation site after planting with good seedlings may in course of time get infested with diseases owing to influx of insects and pests into the area which usually cause heavy damage to the soft, tender and avidly growing parts of the plant that affects the rate of growth and sometimes causes wide spread casualty of the seedlings. To avoid such incidences, foliar spray and ground application of insecticides at regular intervals usually on a sunny day in the fore noon shall be done.

23. FIRE LINE TRACING AND MAINTENANCE

Fire causes irreparable damage to the plantation and the forest growth during fire season and to prevent such fire out-breaks in the area, the plantation area shall be divided into suitable blocks by tracing fire lines. Boundaries of the plantation patches and these block lines will be scrapped of forest growth to a width of 3.0 mt. during Feb-March and the cut back materials and the dry leaves stacked along these fire lines shall be burnt under direct supervision. This operation is highly essential, and the scheme proposes to carry this operation for the first three years

The detailed cost estimate of various operations to be taken up in ANR plantation has been furnished in **Annexure-I**.

24. POINTS OF IMPORTANCE

While taking up plantation, the following vital points shall be taken up for consideration:

- All care to be taken to raise healthy seedlings of minimum 45 cm and 20% extra of the required stock is raised. One & half year seedlings are to be used for planting in area. Pitting shall be invariably done during February – March. In hilly areas, pits shall be dug along the contours. Planting shall be done on the onset of monsoon and should not be delayed. The gradient of the site is 1:10 which is considered as level ground with slight undulating at places.
- Basal dose of 70 grams Urea and 50-200 gms of Vermi Compost of NPK and 5 grams of granular insecticide be applied at the time of planting. Casualty replacement, weeding and soil working, application of fertilizer and insecticides shall be taken up as per the provisions in the cost- norm at the proper time. Engaging requisite watchers as per norm who shall take up tracing of inspection path and fire line and maintenance of fence and provide watch and ward for the entire life of plantation i.e 10 years.

- All-out efforts be taken to keep the plantation free from grazing, fire and other biotic interference.

25. SOIL CONSERVATION MEASURES

The sites selected for restocking and rejuvenation by afforestation are degraded forest lands and the slope of the identified area varies from steep to moderate with undulating topography and gullies are formed due to heavy erosion. Therefore, soil conservation measure is indispensable and is to be appropriately designed. Taking into consideration the degradation of the area due to soil erosion.

26. WATCH AND WARD

To protect the area against grazing, fire accident and other biotic interference it is proposed in the cost estimate for ANR Plantation to engage watchers for ten years from the year of plantation.

27. MOTIVATION OF PEOPLE

As per Govt. resolution of 2011, the villagers of the adjoining village, i.e. Kankarei, Pirakhaman, Balichandrapur, Raijharan, Kaunsidhipa, Golagadia, Chhotabereni, Kumunda, Bhalugadia, and Baghuabola are to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the above villages and resolution regarding support to plantation activities will be made. To motivate the people in this direction, they will be provided with incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure on this score.

28. EXECUTING AGENCY

The work will be executed by the User Agency i.e. M/s Mahanadi Coalfields Limited through dedicated departments manned by technically qualified persons with outsourced man and machinery as and when required. To facilitate this, the user agency shall establish its own executing and supervision cells along with required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department.



29. INSPECTION, MONITORING AND EVALUATION

Inspection, Monitoring and evaluation of the scheme is carried out by Forest division, Angul for successful implementation Scheme.

30. REQUIREMENT OF FUNDS

The total cost of the implementation of proposed scheme will be **Rs. 2,35,89,067.00 (Rupees Two crores Thirty-five lakhs Eighty-nine thousand Sixty-seven) only**, details are as under-

TOTAL COST OF GAP PLANTING, SOIL & MOISTURE CONSERVATION WITHIN 100 MTR. FROM OUTER PERIMETER OF SUBHADRA OCP COAL MINES OF M/s. MAHANADI COALFIELDS LTD (1111.85 Ha.) TO RESTOCK AND REJUVANATE DEGRADED FOREST.

As per base cost- Rs 311.00

1	ANR Plantation with 200 seedlings per Ha over 28.7633 ha @ Rs1,11,286.00 per ha (for the year 2024-25) × 28.7633 ha.	32,00,952.60
2	Watering (Solar Bore well) fitted with Drip System @ Rs 2,34,221.00 per ha (for the year 2024-25) × (28.7633-ha. <i>3.2mils</i>)	67,36,968.88 <i>7,02,663</i>
3	SMC @41,248.00 per ha. (for the year 2024-25) × 28.7633 ha.	11,86,428.60
4	Fencing (Bamboo Twig) for the year 2024-25 @ Rs 1,15,725.00 for 250 RMT over 4254m. (Rs.1, 15,725+250m. × 4254m.)	19,69,177.00
5	Special SMC for the restoration and rejuvenation of the Singhada Jhore Nallah	40,00,000.00
Sub Total (1)		1,70,93,527.08 <i>70,59,221.20</i>
6	15% of the total cost for motivation of VSS / People involved.	25,64,029.06 <i>10,58,883.19</i>
Sub Total (2)		1,96,57,556.14 <i>81,18,104.38</i>
Add 20% escalation		39,31,511.23 <i>16,23,620.87</i>
Grand Total (1+2)		2,35,89,067.37 <i>97,41,725</i>

(Rupees Two crore Thirty Five lakh Eighty-nine thousand Sixty-seven only) *97,41,725*

Express Ninety Seven Lakh Forty One Thousand Seven Hundred Twenty Five



M/s Mahanadi Coalfields Ltd.
General Manager
MCL, Subhadra Area

Countersigned



Vitish
Divisional Forest Officer
Divisional Forest Officer
Angul Division

[Signature]
Project Head
Mahanadi Coal Mining Ltd., Angul

[Signature]
Staff Officer (Survey)
MCL, Subhadra Area

Approved for Rs. 97,41,725/-

[Signature]
Regional Chief Conservator
of Forests, Angul Circle.

 MCL	<p>Office of the SO (P&P) (Subhadra Area) NEAR BIJU MAIDAN Po/Dist: Angul - 759122 (Odisha) Website : www.mcl.gov.in mail id: gmsubhadraarea@gmail.com gm-subhadra.mcl@coalindia.in</p>	
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UNDERTAKING FOR GAP PLANTING AND SOIL & MOISTURE CONSERVATION ACTIVITIES TO RESTOCK AND REJUVENATE THE DEGRADED OPEN FORESTS (HAVING CROWN DENSITY LESS THAN 0.40) WITHIN 100 METER FROM OUTER PERIMETER OF THE MINING LEASE.

I do, hereby give undertaking to bear additional cost, if any required for Gap Planting and Soil & Moisture Conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40) within 100 meter from outer perimeter of the mining lease over and above the approved cost that may be required to do so as per due approval from competent forest authorities.


Divisional Forest Officer
Angul, Division


General Manager
Subhadra Area


Annexure-1

**ANR base Cost Norm for Compensatory Afforestation
@ 200 Plants/ Ha. with 10 year Maintenance
Wage rate @ ₹311/- per Manday**

Sl. No.	Items of Work	Preferable Period of Execution	No. of Mandays	Labour Cost (₹)	Material Cost (₹)	Total Cost (₹)
0th Year (Advance work) Pre-Planting Operation						
1	Survey, Demarcation and Pillar posting	Nov/Dec	2	622	0	622
2	Preparation of Treatment Map (Digital Map)	Nov/Dec	1	311	100	411
3	Site preparation	Nov/Dec	2	622	0	622
4	Silvicultural operations including clearance of weed, cutting of climber, high stump cutting, singling of shoots & removal of cut out after drying from the field to blank space	Jan/Feb	15	4665	0	4665
5	Alignment and stacking for digging of pits	Feb/Mar	0.5	156	0	156
6	Digging of pits (45cm x 45cm x 45cm) in hard & gravelly soil	Feb/Mar	8	2488	0	2488
	Total		28.5	8863.5	100	8963.5
1st Year/Planting Year						
1	Refilling of pits by altering the dug-out soil of the pits, application of organic compounds / CDM/ FYM & mixing the same perfectly	Jun/Jul	1.5	460.5	1000	1467
2	Transportation of 18 months old polythene bag seedlings in hired truck/tractor from the Permanent/Mega nursery to planting site including loading & unloading. (Average lead of 10 Rkm) & stacking the seedlings @ Rs.6/- per seedling. (220 nos.)	Jul/Aug	0	0	1320	1320
3	Watering polythene bag seedlings at stacking site of plantation	Jul/Aug	0.5	155.5	0	156
4	Conveyance of polythene bag seedlings on head load from the stacking site to individual dugout pits within the planting site, applying insecticide, fertilizers & planting after scooping the soil with other applied materials & pressing the soil perfectly around the planted seedlings.	Jul/Aug	4.5	1399.5	0	1400
5	Cost of Fertilizer & Insecticide	Jul/Aug	0	0	600	600
	(a) NPK/Bio-fertilizer @ 50 gms/plant as basal dose = 10kg @ Rs.30/- per kg = Rs.300/-					

Sl. No.	Items of Work	Preferable Period of Execution	No. of Mandays	Labour Cost (₹)	Material Cost (₹)	Total Cost (₹)
	(b) Urea/Vermicompost/Mo Khata/any other fertilizer @ Rs.150/-					
	(c) Insecticide/ Bio-pesticide @ 5 gms/plant = 1 kg @ Rs.150/- per kg = Rs.150/-					
6	Casualty Replacement @ 10% (20 nos.)	Jul/Aug	0.5	156	0	156
7	1st Weeding & Manuring	Aug/Sep	2	622	0	622
8	2nd Weeding, Soil working (1mt. diametre around the plants) & Manuring	Oct/Nov	3	933	0	933
9	Fire line tracing & inspection path	Feb/Mar	3	933	0	933
10	Watch & Ward including watering as per requirement	Aug-Mar	8	2488	0	2488
	Total		23	7153	2920	10073
2nd Year Maintenance						
1	Transportation of 20 seedlings from Nursery to plantation site including loading, unloading & conveyance by Tractor @Rs.6/- per seedling	Jul	0	0	120	120
2	Planting of Casualty replacement	Jul	0.5	155.5	0	155.5
3	Cost of Fertilizer & Insecticide-	Jul	0	0	575	575
	A) Cost of Insecticide/Bio-pesticide(Themet/Foret)@5gms/plant = 0.1Kg @ Rs.150/- per kg = Rs.15/-					
	B) Urea/NPK/Bio-fertilizer/Vermicompost/ Mo Khata/any other fertilizer @Rs.560/-					
4	Complete Weeding, Manuring & Soil working, (1mt. diametre around the plants)	Sep/Oct	4	1244	0	1244
5	Fire line tracing (2 m. wide fire line over 400 m long) & inspection path	Feb/Mar	3	933	0	933
6	Watch & Ward including watering as per requirement	Apr-Mar	12	3732	0	3732
	Total		19.5	6064.5	695	6759.5
3rd Year Maintenance						
1	Cost of fertilizer Urea/NPK/Bio-fertilizer/ Vermicompost/Mo Khata/any other fertilizer = Rs.560/-	Sep/Oct	0	0	560	560
2	Complete Weeding, Manuring & Soil working, (1mt. diametre around the plants)	Aug/Sep	4	1244	0	1244

Sl. No.	Items of Work	Preferable Period of Execution	No. of Mandays	Labour Cost (₹)	Material Cost (₹)	Total Cost (₹)
3	Fire line tracing(2m. wide fire line over 400m long) & inspection path	Feb/Mar	3	933	0	933
4	Watch & Ward including watering as per requirement	Apr/Mar	12	3732	0	3732
	Total		19	5909	560	6469
4th Year Maintenance						
1	Fire line tracing (2m. wide fire line over 400m long) & inspection path	Feb/Mar	3	933	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732	0	3732
	Total		15	4665	0	4665
5th Year Maintenance						
1	Fire line tracing (2 m. wide fire line over 400 m length) & inspection path	Feb/Mar	3	933	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732	0	3732
	Total		15	4665	0	4665
6th Year Maintenance						
1	Fire line tracing (2 m. wide fire line over 400 m length) & inspection path	Feb/Mar	3	933	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732	0	3732
	Total		15	4665	0	4665
7th Year Maintenance						
1	Fire line tracing (2 m. wide fire line over 400 m length) & inspection path	Feb/Mar	3	933	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732	0	3732
	Total		15	4665	0	4665
8th Year Maintenance						
1	Fire line tracing (2 m. wide fire line over 400 m length) & inspection path	Feb/Mar	3	933	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732	0	3732
	Total		15	4665	0	4665
9th Year Maintenance						
1	Fire line tracing (2 m. wide fire line over 400 m length) & inspection path	Feb/Mar	3	933	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732	0	3732
	Total		15	4665	0	4665

Sl. No.	Items of Work	Preferable Period of Execution	No. of Mandays	Labour Cost (₹)	Material Cost (₹)	Total Cost (₹)
10th Year Maintenance						
1	Fire line tracing (2 m. wide fire line over 400 m length) & inspection path	Feb/Mar	3	933	0	933
2	Watch & Ward including watering as per requirement	Apr/Mar	12	3732	0	3732
	Total		15	4665	0	4665

Year wise Abstract of Cost Norm (Showing Seedling Cost separately)

Sl. No.	Year	No. of Mandays	Labour Cost ₹311/- per day	Material Cost (₹)	MELD and other contingency 5% of (4+5+6)	Cost of Seedling @₹50.31 per Seedlings	Total Cost (₹)
1	0th year	28.5	8863.5	100	436.5	0	9400
2	1st year	23	7153	2920	427	11068	21568
3	2nd year	19.5	6064.5	695	240.5	1006	8006
4	3rd year	19	5909	560	231	0	6700
5	4th year	15	4665	0	135	0	4800
6	5th year	15	4665	0	135	0	4800
7	6th year	15	4665	0	135	0	4800
8	7th year	15	4665	0	135	0	4800
9	8th year	15	4665	0	135	0	4800
10	9th year	15	4665	0	135	0	4800
11	10th year	15	4665	0	135	0	4800
	Total:	195	60645	4275	2280	12074	79274

Matrix for ANR Plantation for Compensatory Afforestation @ 200 Seedlings/ Ha. with 10 year maintenance

Sl. No.	Comment Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	XXI	Total Cost (10Yrs)		
	Base Norm	9400	21588	8006	6700	4800	4800	4800	4800	4800	4800	4800													
01	2021-22	9400	32646	8825	7706	5834	6136	6432	6754	7082	7446	7819												56131	
02	2022-23		9670	23778	9357	8144	6126	6432	6754	7082	7447	7818	8210											100008	
03	2023-24			10064	24907	9730	8551	6432	6754	7082	7447	7819	8209	8621										105686	
04	2024-25				10882	26215	10017	8679	6754	7082	7447	7819	8210	8619	9052										112086
05	2025-26					11425	27526	10728	9428	7082	7447	7819	8210	8621	9060	9505									116862
06	2026-27						11967	28832	12284	9689	7447	7819	8210	8621	9052	9503	9980								122684
07	2027-28							12597	30347	11827	10384	7819	8210	8621	9062	9505	9978	10479							128829
08	2028-29								3227	31884	12418	10914	8210	8621	9062	9505	9980	10477	11003						135271
09	2029-30									13888	33457	13009	11460	8621	9052	9505	9980	10479	11001	11553					142005
10	2030-31										14582	35130	13881	12033	10052	9505	9980	10479	11003	11551	12151				148137

Add on Model - Watering Provision

Watering Model W-I: Bore well fitted with Solar & Drip System

Solar system with Bore well (1 system for 5 Ha Plantation) fitted with Drip system, Wage rate @ Rs.311/-			
Year of Installation (0th Year)			
1	Cost of Bore well	1,50,000	
2	Installation of Solar panel & other System	3,00,000	
3	Cost of 0.5 HP submersible motor with accessories	50,000	
4	Water Storage Tanks/ Flexible pipes	15,000	
5	Cost of laying Drip system including all accessories, fittings etc. with 12% GST	3,02,431	
	Total	8,17,431	
6	Cost of Water & watering per Ha. (8,17,431/ 5)= Rs. 1,63,486/-		1,63,486
1st Year Watering			
7	No maintenance required	0	
	Total		0
2nd Year Watering			
8	Maintenance of system @ 5% of initial cost of installation		8,174
	Total		8,174
3rd Year Watering			
9	Maintenance of system @ 5% of initial cost of installation		8,174
	Total		8,174
4th Year Watering			
10	Maintenance of system @ 5% of initial cost of installation		8,174
	Total		8,174
5th Year Watering			
11	Maintenance of system @ 5% of initial cost of installation		8,174
	Total		8,174

Abstract

Sl. No	Year	No. person days	Labour cost @ Rs. 311/-per day	Material Cost	Total cost (Rs.)
1	0th year	0	0.0	163486.0	163486.0
2	1st year	0	0.0	0.0	0.0
3	2nd year	0	0.0	8174.0	8174.0
4	3rd year	0	0.0	8174.0	8174.0
5	4th year	0	0.0	8174.0	8174.0
6	5th year	0	0.0	8174.0	8174.0
	Total	0	0	196182	1,96,182

Matrix for Watering Model-W-I (Solar bore well) fitted with Drip System (per Ha)

Sl. No.	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	Total Cost
	Base Norm	163486	0	8174	8174	8174	8174											
1	2021-22	163486	0	9011	9463	9935	10432											202327
2	2022-23		171660	0	9462	9936	10432	10954										212444
3	2023-24			180243	0	9935	10433	10954	11502									223067
4	2024-25				189255	0	10432	10955	11502	12077								234221
5	2025-26					198718	0	10954	11503	12077	12681							245933
6	2026-27						208854	0	11502	12078	12681	13315						258230
7	2027-28							219087	0	12077	12682	13315	13981					271142
8	2028-29								230041	0	12681	13316	13981	14680				284699
9	2029-30									241543	0	13315	13982	14680	15414			298934
10	2030-31										253620	0	13981	14681	15414	16185		313881

Matrix for Soil & Moisture Conservation (SMC) works

Sl. No.	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	Total Cost
	Base Norm	0	20215	3032	3032	3032	3032											
1	2021-22	0	21226	3342	3510	3685	3870											35633
2	2022-23		0	22287	3509	3686	3869	4064										37415
3	2023-24			0	23401	3684	3870	4062	4267									39284
4	2024-25				0	24571	3868	4064	4265	4480								41248
5	2025-26					0	25800	4061	4267	4478	4704							43310
6	2026-27						0	27090	4264	4480	4702	4939						45475
7	2027-28							0	28445	4477	4704	4937	5186					47749
8	2028-29								0	29867	4701	4939	5184	5445				50136
9	2029-30									0	31360	4936	5186	5443	5717			52642
10	2030-31										0	32928	5183	5445	5715	6003		55274

Add on Model - Fencing Provision

Fencing Model F-I: Provision of fencing with Bamboo Twigs and thorns.

WAGE RATE Rs.311/- PER DAY

Sl. No	Items of work	Preferable Period of Execution	Man days	Wages	Material cost(Rs)	Total Cost (Rs. per Ha.)
0th Year Maintenance						
1	NIL		0	0	0	0
1st Year Maintenance						
1	Taking an average perimeter of 250 Rmt/Ha. @ 93.85/ mt. (Half bundle Bamboo Twigs/mt @ 120/Bundle) Labour: Material = 40:60 (approx)	Sept./Oct	30	9330	14133	23463.0
2	Bamboo Poles of 8" height at a distance of 2mt spacing to be fixed (2" under soil & 2" above soil) 250/2 = 125+1= 126 Nos. of Bamboo Poles 1 Bamboo (approx) 24" height = 3 poles 126/3 = 42 Bamboos @ 200/Bamboo	Sept./Oct		0	8400	8400.0
3	Preparation of Bamboo poles, Digging of holes of 2 ft. depth & fixing Bamboo poles @ 20 poles/ MD	Sept./Oct	6.5	2021.5		2021.5
4	Cost of Bamboo for tying the Bamboo twigs row fence with double side two strand Bamboo batten (One 6" above ground and other one 4 ft" above ground)(250x2)/ 24= 21 Bamboo @ 200/ Bamboo	Sept./Oct		0	4200	4200.0
5	Making Bamboo batten, Finishing the Batten & Tying the same on double strand on Coir rope etc. @ Rs.11/ Rmt.	Sept./Oct	9	2799		2799.0
6	Cost of coir rope @ Rs.0.125 kg/ Rmt 500x 0.125 kg= 62.5 kg @ Rs.70/Kg	Sept./Oct		0	4375	4375.0
7	Making one Bamboo Twigs gate with Bamboo frame			0	500.5	500.5
TOTAL			45.5	14150.5	31608.5	45759.0
Rate per running mt. $45759 / 250 = 183/\text{Rmt}$						
2nd Year Maintenance						
1	Repair & Maintenance of Bamboo Twigs fence including Material cost	Feb./Mar	20	6220	1500	7720
Rate per running mt. $7720 / 250 = 30.88$ or say Rs. 31-Rmt						

3rd Year Maintenance						
1	Repair & Maintenance of Bamboo Twigs fence including Material cost	Feb./Mar	20	6220	5675	11895
Rate per running mt. $11895/250 = 47.58$ or say Rs. 48-Rmt						
4th Year Maintenance						
1	Repair & Maintenance of Bamboo Twigs fence including Material cost	Feb./Mar	20	6220	5675	11895
Rate per running mt. $11895/250 = 47.58$ or say Rs. 48-Rmt						
5th Year Maintenance						
1	Repair & Maintenance of Bamboo Twigs fence including Material cost	Feb./Mar	20	6220	5675	11895
Rate per running mt. $11895/250 = 47.58$ or say Rs. 48-Rmt						

Abstract

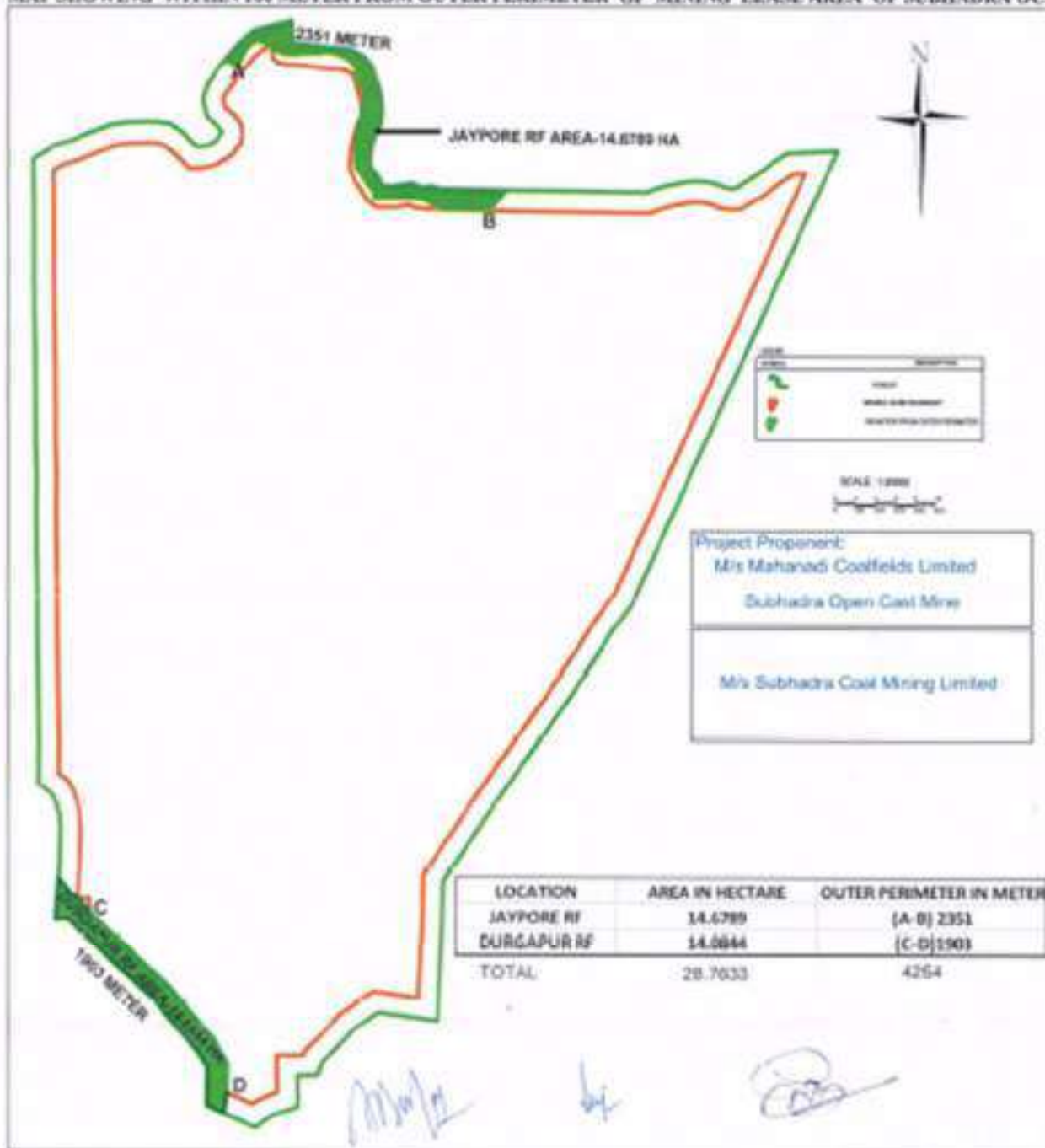
Sl. No	Year	No. person days	Labour cost @ Rs. 311/-per day	Material Cost	Total cost (Rs.)
1	0th year	0.0	0.0	0.0	0.0
2	1st year	45.5	14150.5	31608.5	45759.0
3	2nd year	20.0	6220.0	1500.0	7720.0
4	3rd year	20.0	6220.0	5675.0	11895.0
5	4th year	20.0	6220.0	5675.0	11895.0
6	5th year	20.0	6220.0	5675.0	11895.0
Total:		125.5	39030.5	50133.5	89164.0

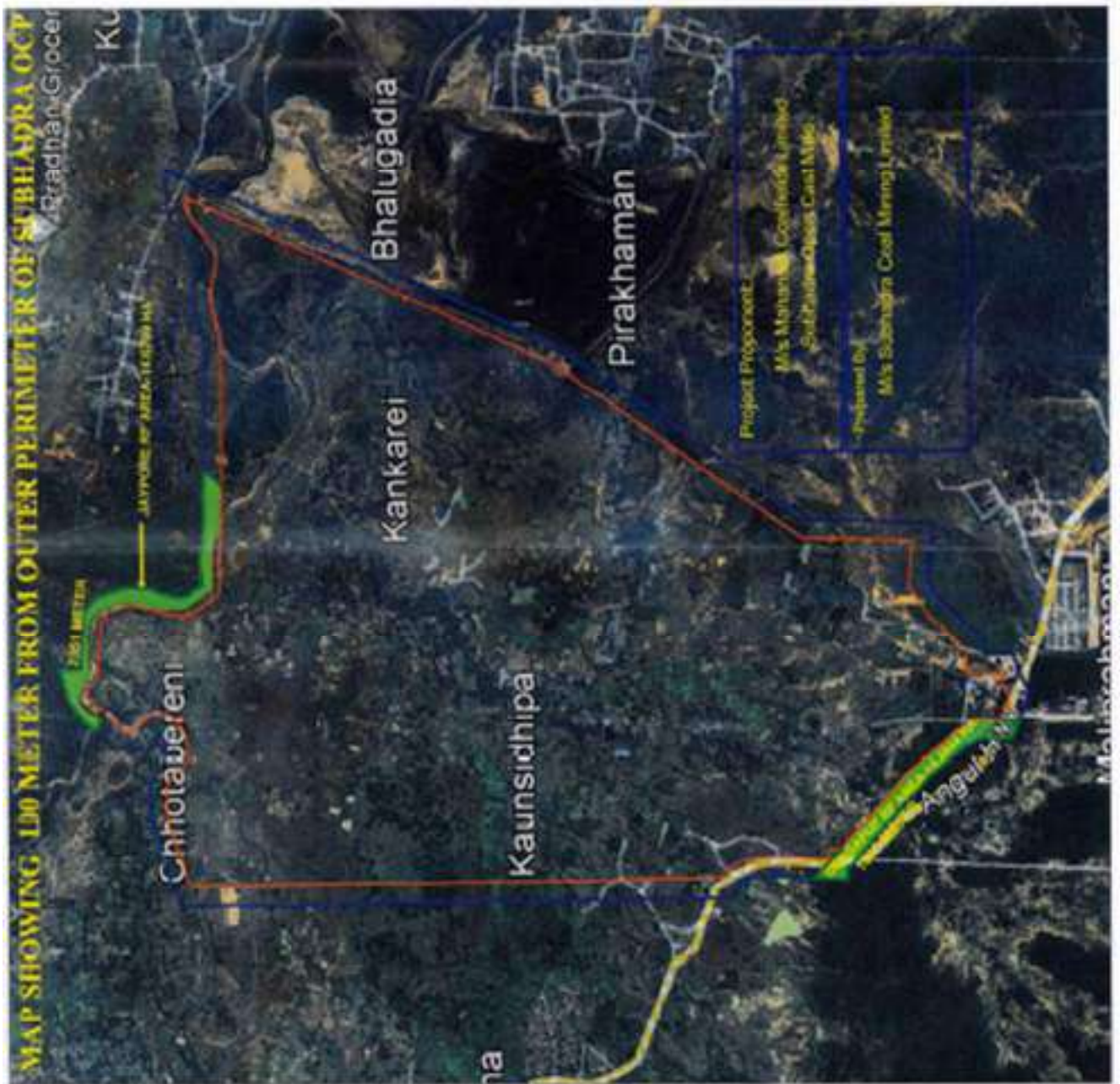
Model : F-1

Matrix for Fencing (Bamboo Twigs and thorn)

Sl. No.	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	Total Cost
	Base Norm	0	45759	7720	11895	11895	11895											
1	2021-22	0	48047	8511	13770	14458	15181											99967
2	2022-23		0	50449	8937	14459	15181	15940										104966
3	2023-24			0	52971	9384	15182	15940	16737									110214
4	2024-25				0	55620	9853	15941	16737	17574								115725
5	2025-26					0	58401	10346	16738	17574	18453							121512
6	2026-27						0	61321	10863	17575	18453	19376						127588
7	2027-28							0	64387	11406	18454	19376	20345					133968
8	2028-29								0	67606	11976	19377	20345	21362				140666
9	2029-30									0	70986	12575	20346	21362	22430			147699
10	2030-31										0	74535	13204	21363	22430	23552		155084

MAP SHOWING WITHIN 100 METER FROM OUTER PERIMETER OF MINING LEASE AREA OF SUBHADRA OCP





OFFICE OF THE DIVISIONAL FOREST OFFICER; ANGUL DIVISION; ANGUL.

Letter No. 8637 DRP/Dated. 26.12.23

To

The Project Officer, Mahanadi Coalfields Ltd.,
Subhadra Area, AL/PO/Dist.- Angul, Odisha, Pin- 759122.

Sub: -

Proposal for Seeking prior approval of Central Government under section 2 (ii) of the forest (Conservation) Act, 1980 in favour of M/s Mahanadi Coal filed Ltd. for non-forestry use of 125.24 ha forest land for Subhadra OCP Coal mining under Angul Forest Division and District Angul of Odisha State-reg. projects of Subhadra Area.
:- Demand of Net Present Value (NPV).

Ref: -

- 1) Proposal No. FP/OR/MIN/150133/2021.
- 2) Stage-I/in-Principle No. 8-06/2023-FC dt. 05.12.2023 of Govt. of India MoEF&CC.
- 3) Memo No. 25840/FE & CC dt. 14.12.2023 of OSD-cum-SS to Govt.
- 4) Memo No. 24938 dt. 20.12.2023 of PCCF, Nodal, O/o the PCCF, O. BBSR.
- 5) This office letter No. 8504 DRP/dt. 20.12.2023.

Sir,

With reference to the above cited memo No. on the captioned subject, it is to inform that the Govt. of India MOEF & CC, New Delhi have accorded Stage-I/in-Principle approval vide letter No. 8-06/2023-FC dt. 05.12.2023 for non-forestry use of 125.24 ha forest land for Subhadra OCP Coal mining under Forest Division and District Angul of Odisha in favour of M/s Mahanadi Coalfields Limited under Section 2 (ii) of the Forest (Conservation) Act, 1980 subject to compliance of certain conditions as laid down therein so as to consider the case for Stage-II (final) forest clearance.

Hence, as per the condition No. 3 (a) of the approval order by Govt. MoEF & CC, you are requested to deposit an amount of = **Rs 11,99,52,367/-** towards the cost of NPV for approved non forestry use of **125.24** ha of forest land for Subhadra OCP Coal mining as per the calculation given through online portal of CAMPA account of the State concerned immediately and intimate the same to the undersigned for taking further action in the matter.

Forest land involved	125.24 ha
Density of forest land	35% Open forest category
Eco value class	III
Rate of NPV applicable	Rs. 9,57,780/- per ha

Amount of NPV to be deposited Rs. 9,57,780/- X 125.24 ha =Rs. 11,99,52,367.20 or **Rs. 11,99,52,367/-** (Rupees Eleven Crore ninety-nine lakh fifty-two thousand three hundred sixty-seven) only

(PTO)

Further, as per the condition No. 3 (b) of the approval order by GoI, MoEF & CC, at the time of payment of the Net Present Value (NPV) at the present rate, the user agency shall furnish an undertaking to pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India.

Yours faithfully


Divisional Forest Officer
Angul Division

Memo No. 8638 / Dated. 26.12.23

Copy forwarded to the Regional Chief Conservator of Forests, Angul Circle for favour of information and necessary action with reference to memo No. 24937 dt. 20.12.2023 of PCCF, Nodal FC Act, O/o the PCCF, Odisha, Bhubaneswar.


Divisional Forest Officer
Angul Division

Memo No. 8639 / Dated. 26.12.23

Copy forwarded to the Principal Chief Conservator of Forests, Forest Diversion & Nodal Officer, F.C. Act, O/o the Principal Chief Conservator of Forests, Odisha for favour of information and necessary action with reference to his memo No. 24935 dt. 20.12.2023.


Divisional Forest Officer
Angul Division

Memo No. 8640 / Dated. 26.12.23

Copy forwarded to the Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, Odisha for favour of information and necessary action with reference to his memo No. 24936 dt. 20.12.2023 of PCCF, Nodal FC Act, O/o the PCCF, Odisha, Bhubaneswar.


Divisional Forest Officer
Angul Division



MCL

Office of the General Manager
(Subhadra Area)
NEAR BIJU MAIDAN
Po/Dist: Angul – 759122 (Odisha)
Website : www.mcl.gov.in
mail id: gmsubhadraarea@gmail.com
gm-subhadra.mcl@coalindia.in
Phone no-06764-296537



Ref No: MCL/GM(SA)/2024/ 89

Date: 04.01.2024

To

The Project Head
M/s SCML (MDO)
Camp: Bhubanpur, Parang
Near Pitabali Temple
Angul-759143
Mail Id: scml@adityabirla.com

Sub: NPV deposited in CAMPA account in respect to compliance of Stage-I/In-Principle approval of forest diversion proposal of Subhadra OCP.

Ref No: Letter no-8637-DRP/dated-26.12.2023 demand raised by DFO, Angul

Dear Sir,

It is intimated that, the NPV of Rs 11,99,52,367/- has been deposited in CAMPA account no-1508258150133845 of Union Bank of India vide UTR no- SBINR52023123093007298 (copy enclosed) as per demand raised by DFO, Angul vide Letter no-8637-DRP/dated-26.12.2023 for compliance of condition stipulated in Stag-I/ In-Principle approval of forest diversion proposal of Subhadra OCP.

Encl: As above

Yours faithfully,

Kaipa S Singh
General Manager
Subhadra Area (MCL)
04/01/2024

Forwarded for kind information to:

- (1) CMD, MCL – The Authority
- (2) DT (OP), MCL
- (3) DF, MCL
- (3) DT (P&P), MCL
- (4) GM (E&F), MCL
- (5) GM (P&P), MCL
- (6) GM(CMC), MCL

Copy to:

- (1) PO, Subhadra Project/ SO (Min/P&P), Subhadra Area
- (2) SO(L&R), Subhadra Area
- (3) SO (Survey/E&F), Subhadra Area

AGENCY COPY

यूनियन बैंक Union Bank
of India



NEFT / RTGS CHALLAN for CAMPA Funds

Date : 29-12-2023

Agency Name.	Mahanadi Coalfields Limited
Application No.	58150133845
MoEF/SG File No.	8-06/2023-FC ✓
Location.	ORRISA
Address.	ANAND VIHAR, BURLASambalpur
Amount(in Rs)	119852367/-

Amount in Words: Eleven Crore Ninety-Nine Lakh Fifty-Two
Thousand Three Hundred and Sixty-Seven Rupees Only

NEFT/RTGS to be made as per following
details:

Beneficiary Name:	ORRISA CAMPA
IFSC Code:	UBIN0996335
Pay to Account No.	1508258150133845 Valid only for this challan amount.
Bank Name & Address:	Union Bank Of India FCS Centre, 21/1, III Floor, Jelitta Towers, Mission Road, Bengaluru-560027

- This Challan is strictly to be used for making
payment to CAMPA by NEFT/RTGS only

Note: After making the required payment through cha
even after 7 working days, then kindly mail a copy of
id to Email: fcsblr@unionbankofindia.bank, epurse@
ubin0903710@unionbankofindia.bank

LBTRNR5L023123095007298

Transaction Details		
Unique Transaction Reference Number	SBINR52023123093007298	
Value Date	30/12/2023	
Related Reference Number		
Amount	119952367	INR
Commission	0	
MessageType	P08	

Beneficiary details	
Beneficiary Account	1508258150133845
Beneficiary Name	ORISSA CAMPA
Beneficiary IFSC Code	UBIN0996335
Beneficiary Address1	BANGALURU
Beneficiary Address2	
Beneficiary Address3	
Dealer Code	

Details of Payment

Remitting Customer Details	
Account Number	00000011094460922
Remitter's IFSC Code	SBIN0012068
Remitter's Name	MCL HINGULA AREA
Remitter's Address1	HINGULA AREA
Remitter's Address2	
Remitter's Address3	

Sender to Reciever's Information	
ATTN//8062023FC	



Error Details	
Error Code	
Error Reason	

Additional Details	
Instruction Priority	0
Purpose Code	0
Credit Status:	CREDIT CONFIRMED
Credit Time	01:12:09
Credit Date:	30/12/2023

Close



Office of the General Manager
(Subhadra Area)
At/Po :Angul, Near Biju Maidan
Dist: Angul – 759122 (Odisha)
Website :www.mcl.gov.in
Email Id: gmsubhadraarea@gmail.com



Annexure-14

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 3 (b) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake "To pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India".

General Manager
Subhadra Area, MCL



Office of the General Manager
(Subhadra Area)
At/Po :Angul, Near Biju Maidan
Dist: Angul – 759122 (Odisha)
Website :www.mcl.gov.in
Email id: gmsubhadraarea@gmail.com



Annexure-15



UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 4 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "The Singhada Jhor stream shall not be disturbed and will not be used for mining in future".

General Manager
Subhadra Area, MCL

 ITUW TSA NEW DELHI 2024	Office of the General Manager (Subhadra Area) At/Po :Angul, Near Biju Maidan Dist: Angul – 759122 (Odisha) Website : www.mcl.gov.in Email Id: gmsubhadraarea@gmail.com	 MCL
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Annexure-16

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No.5 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "The safety zone along the water streams falling within the lease area shall be protected by 50-meter buffer zone on both sides. There shall be no discharge to any of the streams".



General Manager
Subhadra Area, MCL





Office of the General Manager
(Subhadra Area)
At/Po :Angul, Near Biju Maidan
Dist: Angul – 759122 (Odisha)
Website :www.mcl.gov.in
Email Id: gmsubhadraarea@gmail.com



Annexure-17

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 6 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "A cluster safety zone shall be maintained between the adjoining mines".

General Manager
Subhadra Area, MCL



Office of the General Manager
(Subhadra Area)
At/Po :Angul, Near Biju Maidan
Dist: Angul – 759122 (Odisha)
Website :www.mcl.gov.in
Email Id: gmsubhadraarea@gmail.com



Annexure-18

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 7 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that 'The boundary of high-school falling within the boundary shall not be disturbed due to mining activities. Appropriate safe guards such as raising the boundary wall of the school, greening the school premises, regular medical check-ups of the students and other mitigation measures of mining hazards that can affect the health of school children shall be taken by the User Agency'.

General Manager
Subhadra Area, MCL

By e-Mail/Post

GOVERNMENT OF ODISHA

FOREST, ENVIRONMENT & CLIMATE CHANGE DEPARTMENT

No.FE-DIV-MISC-0036-2021- 1183 /FE&CC,Date 19.01.24

From

Shri Lingaraj Otta

OSD-cum-Special Secretary to Government

To

The Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden,
Odisha, Bhubaneswar.

Sub.

Revision of cost norm of Regional Wildlife Management Plan for the entire Mining Lease area for implementation of effective mitigative measures to address adverse impact on wildlife & their habitat as well as Human-Wildlife Interface at regional level-regd.

Sir,

With reference to the proposal submitted vide your File No. CWLW-FDWC-MISC-0030-2021 on the captioned subject, I am directed to intimate that after careful consideration of your proposal, the Government in Forest, Environment & Climate Change Department have been pleased to revise the cost norm of Regional Wildlife Management Plan @ Rs.1,03,100/- per hectare for the entire Mining Lease area for implementation of effective mitigative measures to address adverse impact on wildlife & their habitat as well as Human-Wildlife Interface at regional level.

This is for favour of kind information and necessary action.

Yours faithfully,

19/01/2024

OSD-cum-Special Secretary to Government

Memo No. 1184 /FE&CC, Date 19.01.24

Copy forwarded to the PCCF & HoFF, Odisha, Bhubaneswar for kind information and necessary action.

19/01/2024

OSD-cum-Special Secretary to Government





MCL

**Office of the General Manager
(Subhadra Area)**

NEAR BIJU MAIDAN

Po/Dist: Angul – 759122 (Odisha)

Website : www.mcl.gov.in

mail Id: gmsubhadraarea@gmail.com

gm-subhadra.mcl@coalindia.in

Phone No-06764-296537



Ref No: MCL/GM(SA)/2024/ 128

Date: 19.02.2024

To,

Divisional Forest Officer
Angul, Forest Division

Sub : Proposal for seeking prior approval of the Central Government under Section 2 (ii) of the forest (Conservation) Act, 1980 in favour of M/s Mahanadi Coalfield Ltd. for non forestry use of 125.24 ha of forest land for Subhadra OCP Coal mining under Angul Forest Division and District Angul of Odisha State reg. Project of Subhadra Area.

- Demand of Regional Wildlife Management plan (RWMP)

Ref.No- (i) Proposal No.FP/OR/ MIN/150133/ 2021.

(ii) Letter no-858-DRP/dated-25.01.2024

Dear Sir,

The cost of the Regional Wildlife Management Plan of Rs 11,46,31,735/- (Rupees eleven crore forty-six lakhs thirty-one thousand seven hundred thirty-five only) has already been deposited on 17.02.2024 in CAMPA account no-1508258150133119 of Union Bank of India vide UTR no-SBINR52024021702946078 as per demand raised vide letter no- 858-DRP/dated-25.01.2024 for compliance of condition no 08 stipulated in Stage-I/ In-Principle approval of forest diversion proposal of Subhadra OCP.

The copy of the UTR including NEFT/RTGS CHALLAN for CAMPA fund is enclosed herewith for kind information and necessary action.

Regards

Encl: As above

Yours faithfully

19/02/2024

General Manager
Subhadra Area

For kind information to:

1. CMD, MCL
2. DT (Op), MCL
3. D (F), MCL
4. DT (P&P), MCL
5. GM (E&F), MCL
6. GM (P&P), MCL
7. GM(CMC), MCL
8. GM(L&R), MCL

Copy to:

1. Project Officer, Subhadra Project /SO(Min/P&P), Subhadra Area
2. SO(L&R), Subhadra Area
3. SO (Survey/E&F), Subhadra Area
4. Project Head, M/s SCML

2/9/24, 11:13 AM

AGENCY COPY

यूनियन बैंक Union Bank
of India

NEFT / RTGS CHALLAN for CAMPA Funds
Date : 09-02-2024

Agency Name.	Mahanadi Coalfields Limited
Application No.	58150133119
MoEF/SG File No.	8-06/2023-FC
Location.	ORRISA
Address.	ANAND VIHAR, BURLASambalpur
Amount(In Rs)	114531735/-

Amount In Words: Eleven Crore Forty-Six Lakh Thirty-One Thousand Seven Hundred and Thirty-Five Rupees Only

NEFT/RTGS to be made as per following details;

Beneficiary Name:	ORRISA CAMPA
IFSC Code:	UBIN0996335
Pay to Account No.	1508256150133119 Valid only for this challan amount.
Bank Name & Address:	Union Bank Of India FCS Centre, 21 st , III Floor, Jelitta Towers, Mission Road, Bengaluru-560027

- This Challan is strictly to be used for making payment to CAMPA by NEFT/RTGS only

Note: After making the required payment through ch even after 7 working days, then kindly mail a copy of it to Email: fcsblr@unionbankofindia.bank, epurse@ubin0903710@unionbankofindia.bank

chall 535682 dt 17-2-24

SRI NARAYAN MOHAN MAHENDRAPUR BR.



https://forestsde.../neft_ChallanCorp.aspx?pic=MIN15

Transaction Details	
Unique Transaction Reference Number	DDINR52024021702046070
Value Date	17/02/2024
Related Reference Number	
Amount	114631735 INR
Commission	0
MessageType	P00

Beneficiary details	
Beneficiary Account	1500250150133119
Beneficiary Name	ORISSA CAMPA
Beneficiary IFSC Code	UBIN0006336
Beneficiary Address1	BANGALORE
Beneficiary Address2	
Beneficiary Address3	
Dealer Code	

Details of Payment

Remitting Customer Details	
Account Number	00000011094460922
Remitter's IFSC Code	SBIN0012068
Remitter's Name	MCL HINGULA AREA
Remitter's Address1	HINGULA AREA
Remitter's Address2	
Remitter's Address3	

Sender to Reciever's Information

ATTN/IFR



Error Details

Error Code
Error Reason

Additional Details

Instruction Priority: 0
 Purpose Code: 0
 Credit Status: CREDIT CONFIRMED
 Credit Time: 12:02:42
 Credit Date: 17/02/2024

Close

OFFICE OF THE DIVISIONAL FOREST OFFICER, ANGUL DIVISION, ANGUL.

Letter No. 858 DRP/Dated. 25.01.24

To

The Project Officer, Mahanadi Coalfields Ltd.,
Subhadra Area, At. /PO/Dist.- Angul, Odisha, Pin- 759122.

Sub: -

Proposal for Seeking prior approval of Central Government under section 2 (ii) of the forest (Conservation) Act, 1980 in favour of M/s Mahanadi Coal filed Ltd. for non-forestry use of 125.24 ha forest land for Subhadra OCP Coal mining under Angul Forest Division and District Angul of Odisha State-reg. projects of Subhadra Area.
:- Demand of Regional Wildlife Management Plan (RWMP).

Ref: -

- 1) Proposal No. FP/OR/MIN/150133/2021.
- 2) Stage-I/In-Principle No. 8-06/2023-FC dt. 05.12.2023 of Govt. of India MoEF&CC.
- 3) Memo No. 25840/FE & CC dt. 14.12.2023 of OSD-cum-SS to Govt.
- 4) Memo No. 24938 dt. 20.12.2023 of PCCF, Nodal, O/o the PCCF, O, BBSR.
- 5) This office letter No. 830 dt. 24.01.2024.

Sir,

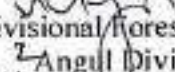
In continuation to this office memo No. under reference (5) on the captioned subject, it is to inform that the Ministry of Environment, Forest and Climate Change (MOEF & CC), Government of India, New Delhi, has granted Stage-I/In-Principle approval vide letter No. 8-06/2023-FC dated 05.12.2023 for the non-forestry use of 125.24 hectares of forest land for the Subhadra Open Cast Project (OCP) Coal mining. This approval falls under the jurisdiction of the Forest Division and District Angul in Odisha, in favour of M/s Mahanadi Coalfields Limited, in accordance with Section 2 (ii) of the Forest (Conservation) Act, 1980.

As per Condition No. 08 of the Stage-I/In-Principle approval from MOEF & CC, it is imperative that an amount of Rs. 11,46,31,735/- (Rupees eleven crore forty-six lakhs thirty-one thousand seven hundred thirty-five only) be deposited. This calculation is based on the rate of Rs. 1,03,100/- per hectare, applying to the total mining lease area of 1111.85 hectares (Forest land 125.24 ha. + Non forest land 986.61 ha). This deposit is allocated towards the cost of the Regional Wildlife Management Plan.

Hence, you are requested to deposit the required payment through the online portal of CAMPA account of the respective State. Once the transaction is complete, please intimate to the undersigned for taking further necessary action.

This is for information and necessary action.

Yours faithfully


Divisional Forest Officer
Angul Division


Memo No. 859 / Dated. 25.01.24

Copy forwarded to the Regional Chief Conservator of Forests, Angul Circle for favour of information and necessary action with reference to this office memo No. 831 dt. 24.01.2024.


Divisional Forest Officer
Angul Division


Memo No. 860 / Dated. 25.01.24

Copy forwarded to the Principal Chief Conservator of Forests, Forest Diversion & Nodal Officer, F.C. Act, O/o the Principal Chief Conservator of Forests, Odisha for favour of information and necessary action with reference to this office memo No. 832 dt. 24.01.2024.


Divisional Forest Officer
Angul Division

Memo No. 860 / Dated. 25.01.24

Copy forwarded to the Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, Odisha for favour of information and necessary action with reference to this office memo No. 833 dt. 24.01.2024.


Divisional Forest Officer
Angul Division



FCA Projects, Diverted Land, CA Land Management

Registration of FCA Projects

Help

In this section you can register a missing FCA project. *

Select State * OR:

If Stage Clearance Year *

- Select --

FCA Project File Number *

Select Project Type *

- Select Project Type -

Project file number has to be same as per GOI format

Enter FCA Project Name (English) *

Purpose of Diversion *

Total Land Diverted (In Hect) *

User Agency Name *

User Agency Address *

User Agency Contact Number

User Agency E-Mail

User Agency Website

Remarks

Register Diversion Project under FC Act



Office of the General Manager
(Subhadra Area)
At/Po :Angul, Near Biju Maidan
Dist: Angul – 759122 (Odisha)
Website :www.mcl.gov.in
Email Id: gmsubhadraarea@gmail.com



Annexure- 22

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No.10 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "The KML files of diverted area, the CA areas, the proposed SMC treatment area and the WLMP area shall be uploaded on the e-Green watch portal along with GPS Ids and all other requisite details after Stage II approval".

General Manager
Subhadra Area, MCL



SUBHADRA OPEN CAST COAL PROJECT

Scheme

For

**MITIGATIVE MEASURES TO MINIMIZE SOIL
EROSION AND CHOKING OF STREAMS**

in compliance

with

Condition No.11(a) of

Stage-I approval granted vide

Letter No.8-06/2023-FC, Dated.05.12.2023

of Govt. of India, Ministry of Environment, Forests

& Climate Change, New Delhi.

for

Diversion of 125.24 Ha. (including 1.47 Ha. of Safety Zone)

of Forest Land within 1111.85 Ha. of ML area of Subhadra OCP

for Non forestry use U/s-2 (ii) of FC Act-1980

**in villages Kankarei, Pirakhaman, Chhotabereni, Balichandrapur,
Raijharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuabola, Kumunda
and Jaipur RF of Chhendipada and Talcher Tahasil,**

Angul District, Odisha.

M/s. Mahanadi Coalfields Limited

SCHEME FOR MITIGATIVE MEASURES TO MINIMIZE SOIL EROSION AND CHOKING OF STREAM SHALL BE IMPLEMENTED WITHIN A PERIOD OF THREE YEARS WITH EFFECT FROM THE ISSUE OF STAGE-II CLEARANCE IN ACCORDANCE WITH THE APPROVED PLAN IN CONSULTATION WITH THE STATE FOREST DEPARTMENT.

1. INTRODUCTION

Subhadra Open Cast Coal Mine is a Greenfield opencast mining project spread over a lease area of 1111.85 Ha. in Kankarei, Pirakhaman, Chhotabereni, Balichandrapur, Rajjharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuaboli, Kumunda villages and Jaipur RF, Chhendipada & Talcher Tahasil, Dist-Angul, Odisha.

Ministry of Coal, Government of India has allotted this coal block in favour of M/s. Mahanadi Coalfields Limited vide allotment order no. NA-103/1/2021-NA dated 18-11-2021.

As per approved Mining Plan and Mine Closure Plan, the mine life is 36 years. Out of total 1111.85 Ha. of Mining Lease area, total forest land involved in 125.24 Ha. (Revenue forest and DLC of 124.49 Ha. + Reserve forest of 0.75 Ha.)

Mahanadi Coalfields Limited has named Utkal-A and West of Gopalprasad (west) coal block as Subhadra Open Cast Project vide their letter no. 539-H dated 26.09.2019.

M/s. Mahanadi Coalfields Limited submitted the Forest Diversion proposal to obtain Forest Clearance from MoEF & CC, Government of India for 125.24 Ha. of forest land U/s 2(ii) of the Forest (Conservation) Act 1980. The Stage-I Forest Clearance approval over 125.24 ha of Forest Land Under Section- 2 (ii) (including 1.47 ha. of Safety Zone) of the Forest (Conservation) Act, 1980 has been granted by MoEF & CC, Government of India vide their Letter No. 8-06/2023-FC, dated 05.12.2023, where in it has been stipulated as per **Condition No. 11 (a) for undertaking Mitigative measures to minimize soil erosion and choking of stream shall be implemented within a period of three years with effect from the issue of Stage-II clearance in accordance with the approved plan in consultation with the State Forest Department.**

2. LOCATION

The mining lease area is covered in the Survey of India Topo sheet No. F45T1 and F45S13 and situated between the latitude $20^{\circ} 55' 56.225''$ N to $20^{\circ} 58' 47.344''$ N, and longitude $84^{\circ} 58' 42.383''$ E and $85^{\circ} 0' 50.476''$ E. The above ML area covering villages are Kankarei, Pirakhaman, Chhotabereni, Balichandrapur, Rajjharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuabola Kumunda and Jaipur RF in Chhendipada & Talcher Tahasil, Angul Forest Division Angul District Odisha.

LOCATION MAP

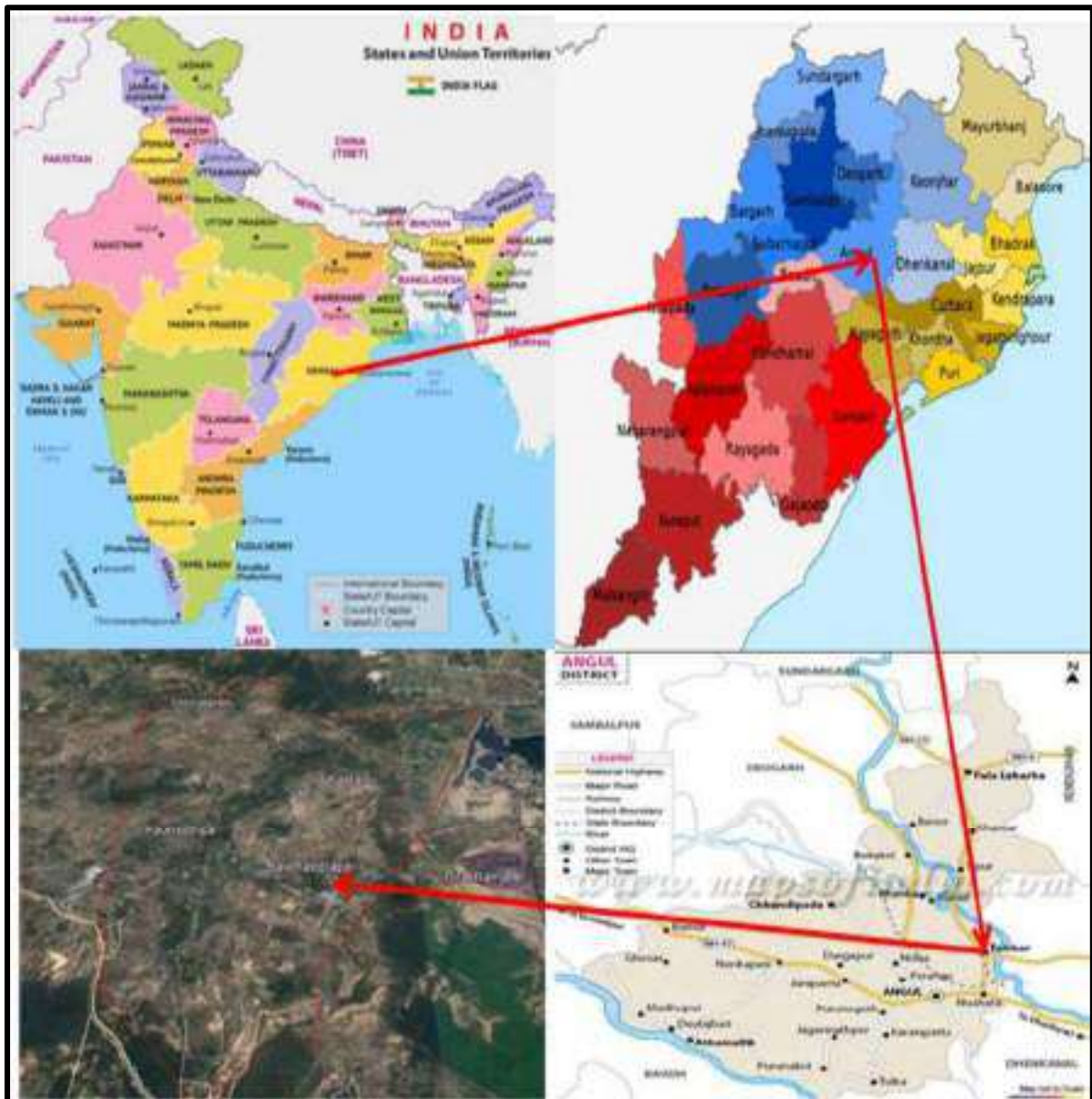


Fig-1. Location Map of Subhadra OCP, MCL

3. TOPOGRAPHY

The surface topography is gently undulating and the ground is generally being used for cultivation purposes by the villagers. Around south western part, the surface topography is mildly undulating and slopes towards north. The ground level rises towards south-eastern corner of the block with highest elevation above Mean Sea Level of about 167.50 meter.

4. LAND USE PATTERN

The proposed land use pattern of 1111.85 Ha. of mining lease area as per approved Mining Plan and Mine Closure Plan is given below:

Table 1: Purpose wise break up forest and non-forest land

Sl. No.	Type of Land Use	Forest Land in Ha				Total Forest Land in Ha (3+4+5+6)	Non-Forest Land in Ha		Total non-forest land in Ha (8+9)	Total Land in Ha (7+10)
		RF	PRF	Rev. forest	DLC		Govt. land	Private land		
1	2	3	4	5	6	7	8	9	10	11
1	Mining Excavation Area	0.71	0.00	33.82	55.00	89.53	225.73	566.02	791.75	881.28
2	Safety Zone 7.5Mtr along Mining lease boundary	0.04	0.00	0.77	0.66	1.47	5.56	4.76	10.32	11.79
3	Infrastructure	0.00	0.00	13.00	21.24	34.24	47.83	61.43	109.26	143.50
4	Others (Top soil dump, Coal stock Yard, External dump, Nalla diversion)	0.00	0.00	0.00	0.00	0.00	10.54	64.74	75.28	75.28
5	Rationalisation area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.75	0.00	47.59	76.90	125.24	289.66	696.95	986.61	1111.85

5. DETAILS OF FOREST LAND WITHIN THE ML AREA

Forest land to be worked for mining and allied purpose-123.77 Ha

Area set aside for Safety Zone

1.47 Ha

125.24 Ha

6. SOIL TYPE

The areas are filled up with colluvial soil with sand, silt deposits and clay of older alluvium, older and younger floodplain deposits. In most of the area the soil is moderately coarse in nature whereas it is loamy in the cultivated land. The area has three nalas namely Singada Jhor, Ghurudia nala and Masania nala. The soil has been deposited in the valley area mostly from these nalas. There were two periods of glacial advance and retreat during the deposition of Talcher sediments.

7. CLIMATE

The lease area lies in sub-tropical region where climate is characterized by an oppressively hot summer and cool winter. Summer is typically from April to July when monthly temperature ranges from a maximum of 45.50 degree centigrade during day time to a minimum of 15 Degree Centigrade at night time. Winter is from November to February when the maximum temperature during daytime goes to 37 Degree Centigrade and minimum temperature at night- becomes as low as 6.70 Degree Centigrade. The average annual rainfall as recorded at IMD observatory at Angul is 1277 mm.

8. DRAINAGE

Brahmani River, flowing approximately north to south along the eastern boundary of the Talcher coalfield, provides the main drainage of the region. This river is fed by seasonal nalas, viz. Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor and a few small nalas. From the eastern boundary of the block, the Brahmani River lies eastward at a distance of about 20 km.

Singada Jhor flows eastward and forms major part of the northern boundary of the block. Downstream Singada Jhor merges into Brahmani River at the north eastern part of the coalfield. Sinhajori nala, Ghurudia nala and Masani jhor flowing from south to north within the block feed Singada jhor for most part of the year and control the drainage pattern of the block. Small ponds and dug wells are common in this block and are utilized for irrigation and drinking purpose.

9. EXISTING VEGETATION

The forest growth available in the area resembles Northern Tropical Dry Deciduous Forest. Sal (*Shorea robusta*) is the most dominant tree with Mahula (*Madhuca indica*), Chara (*Buchanania lanzan*), Jamu (*Pisidium guajava*), Teak (*Tectona grandis*), Tala (*Borassus flabellifer*), Neem (*Azadirachta indica*) as common associates.

The vegetation of the applied area is composed of Sal (*Shorea robusta*), Mahula (*Madhuca indica*), Chara (*Buchanania lanzan*), Jamu (*Pisidium guajava*), Teak (*Tectona grandis*), Tala (*Borassus flabellifer*), Neem (*Azadirachta indica*), Arjuna (*Terminalia arjuna*), Gambhari (*Gmelina arborea*), Harida (*Terminalia chebula*), Kaju (*Anacardium occidentale*), Mango (*Mangifera indica*), Kadamba (*Anthocephalus chinensis*), Nala (*Arundo donax* Linn) etc. **Sal (*Shorea robusta*)** is the pre-dominant species.

10. FACTORS RESPONSIBLE FOR SOIL EROSION & CHOKING OF STREAMS

The mining activities and overburden dumps are the major source of drainage of soil and other substances for choking of any drainage system existing down below. The forms of erosion observed in this region include mainly rill and gully. The storm water runoffs from the uplands, mine faces and OB dump slope areas carry substantial quantity of solids in the lower order streamlets and choke the higher order streams. These lower order streamlets and gullies have high erosion capacity due to steep gradient and transportation of rock fragments with high velocity of the stream and deposition of same in the connecting high order streams due to velocity drop. Streams can also erode by undercutting their banks resulting in mass-wasting processes like slumps or slides. When the undercut material falls into the stream, the fragments are transported and deposited down below in the stream bed. The other mode of sediment transportation is very negligible.

11. OBJECTIVES OF THE SCHEME

The objectives are as follows: -

- i) To fulfil Condition No.11 (a) of the Stage-I approval granted vide Letter No.8-06/2023-FC dated 05.12.2023 of MoEF & CC, Government of India to undertake “**Mitigative measure to minimize soil erosion & choking of stream shall be implemented within a period of 3 years with effect from the issue of Stage-II clearance in accordance with the approved plan in consultation with State Forest Department**”.
- ii) To prevent erosion of top soil.
- iii) To prevent obstruction of existing natural water course.
- iv) Proper Management of overburden deposited so as to prevent siltation in the down below streams.
- v) To prevent overflow of eroded soils from the mining areas to the natural streams.

12. PROPOSED METHODOLOGY

To achieve the above objectives, it has been proposed to take up both biological and structural works to prevent erosion of surface soil and water conservation. The vegetative method is to be adopted mostly around the OB dumping sites and along the proposed diversion of Ghurudia Nala & Masania Nala. The structural works are suggested around OB dumping sites in the lower reaches.

13. MEASURES ALREADY ADOPTED

It is a fresh mining lease and no mining activities have been taken place so far. Hence all the measures proposed in this scheme shall be taken up after grant of Stage -II forest clearance, handing over other forest land by forest dept. & during the course of mining operation.

14. MEASURES PROPOSED

The details of proposed mitigative measures to minimize soil erosion and choking of streams in Mining Lease of Subhadra OCP in favour of M/s Mahanadi Coalfield Limited over an area of 1111.85 hectare in village Kankarei, Pirakhman Chhotabereni, Balichandrapur, Raijharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuabola ,Kumunda and Jaipur RF in Talcher Range, Angul Forest Division, Angul District Odisha are given below:

a. Biological Measures

i) Plantation

In order to minimise soil erosion in the mining lease area of Subhadra OCP. Two (2) types of measures are proposed i.e., i) plantation & ii) structural measures. In this connection it is proposed to take up plantation on 84.21 Ha at six (6) different locations as per the map given as **Annexure-I**. The location-wise area details are given below.

Proposed Plantation Area

Sl.No	Location	Area (in Ha.)
1	Singada Jhor (50 mt. strip across North Side)	6.82
2	Singada Jhor (50 mt. strip across South Side)	26.82
3	Diverted Ghrudia Nala (50 mt. across East Side)	19.36
4	Diverted Masania Nala (50 mt. across West Side)	11.43
5	Safety Zone	11.79
6	Within Infrastructure area	8.00
Total Area		84.21

The list of species proposed for plantation is as follows:

Sl. No.	Local Name	Botanical Name	Family
1	Gamhar	<i>Gmelina arborea</i>	<i>Verbenaceae</i>
2	Harida	<i>Terminalia chebula</i>	<i>Combretaceac</i>
3	Mahula	<i>Madhuca indica</i>	<i>Sapotaceae</i>
4	Jamun	<i>Syzygium cumini</i>	<i>Myrtaceae</i>
5	Babul	<i>Acacia nilotica</i>	<i>Leguminoceae</i>
6	Neem	<i>Azadirachta indica</i>	<i>Meliacea</i>
7	Kurum	<i>Adina cordifolia</i>	<i>Rubiaceae</i>
8	Siris	<i>Albizia lebbek</i>	<i>Leguminoceae</i>
9	Sissoo	<i>Dalbergia latifolia</i>	<i>Fabaceae</i>
10	Bahada	<i>Treminalia belerica</i>	<i>Combretaceac</i>
11	Karanja	<i>Pongamia pinnata</i>	<i>Papilionaceae</i>
12	Asan	<i>Terminalia tomentosa</i>	<i>Combretaceae</i>
13	Amla	<i>Emblica officinalis</i>	<i>Combretaceae</i>
14	Mundi	<i>Mitragyna parviflora</i>	<i>Rubiaceae</i>

15	<i>Kusum</i>	<i>Schleichera oleosa</i>	<i>Sapindaceae</i>
16	<i>Sunari</i>	<i>Cassia fistula</i>	<i>Fabaceae</i>
17	<i>Kasi</i>	<i>Bridelia retusa</i>	<i>Phyllanthaceae</i>

It is proposed to go for block plantation @ 1000 plants per Hectare. Planting shall be done during July in pre-dug pits of size 45 cm X 45 cm X 45 cm. A basal dose of N.P.K fertiliser shall be applied at the time of planting, besides mixing with insecticides to prevent termites & insects. Fruit bearing trees and bamboo rhizomes shall not be planted in close proximity. A minimum distance of 2.5 mt X 2.5 mt shall be maintained on every fourth plants in planting either of the species. Care should be taken to complete the planting during July while rains are still on during first or second week of July.

ii) Weeding

For establishment and better growth of the planted seedlings, timely weeding, soil working and manuring are necessary. It is proposed to carry out two weeding's, soil working and manuring during the first year and second year of plantation and one weeding and soil working during third year. During first year and second year, first weeding and manuring shall be carried out during August-September and the second one during September-October along with soil working after rains. First weeding shall be around the plants and the second one will be done in strip. In the third year the weeding will be done around the plants, which will be carried out during August.

After each weeding, intensive soil working will be done around each plant at a radius of 0.5mtr, followed by manuring of @ 50 grams NPK per plant in ring form.

iii) Application of Insecticides

The plantation site, after planting with good and healthy seedlings, may cause influx of insects, which usually eat and damage the tender leaves and shoots of the plants. To get rid of such insect attack, application of insecticides will be taken up in required doses at desired intervals. Spraying of insecticides shall be done preferably in a sunny day in the forenoon as per requirement.

The approved base cost norm for Block Plantation (Core Plantation) @ 1000 seedling per hectare with 10 years maintenance is given at **Annexure-I**

b. Structural Measures

Vegetative means of erosion control are the most feasible and economic measures. However, as the pressure on land is increasing, it is necessary to bring even highly eroded land for utilization. In this type of land, vegetative measures only are not adequate to keep down the erosion. Some

structural measures are required to be undertaken along with vegetative measures. Structural measures, therefore, serve as supplementary to vegetative measures. The approved Mining Plan and Mine Closure Plan has prescribed some structural measures to be undertaken to minimise soil erosion which are enlisted below:

i) Construction of Retaining wall

It is proposed to construct Retaining wall around the temporary external OB dump area with a length 9252 meter as per the approved mining plan.

ii) Construction of Garland drain

From the outer side of the retaining wall a shallow trench (1.0 m wide x 1.50 m deep) will be dug around the temporary external OB Dump area for storage of run-off accumulated for draining surface water before it is flown to the natural water course. The proposed Garland drain will be having a for length of 6750 meter.

iii) Terracing of OB Dump Slope

It is proposed to construct berm & terraces over a length of 25010 m. on the proposed Dumps considering the volume of OB materials & the area earmarked for dumping. The slope of individual terrace should be within the permissible range considering the angle of repose of the soil and space available, thereby maintaining the angle of repose at less than 28°. The terracing will be done through the internal resources by deploying the operating mining equipment. All these operations will be carried out after sufficient deposition of OB. When OB dump will partially mature, the work will be executed.

iv) Construction of Settling Tanks

It is proposed to construct 2 nos. of settling tanks at North-East (Settling tank no-1) & North - West corner (Settling tank no-2) for sedimentation of run-off water that will come out of garland drain.

v) De-siltation of Settling Tank

The de-silting works of the settling tank will be taken up at regular intervals to prevent sedimentation and choking of streams. This de-silting of settling tank will provide space and base to hold the sediment laden runoff thereby allowing settling and clear water to flow down. This de-silting work will be preferably undertaken once in a year before & after monsoon. The implementation of the plans will be site specific in nature depending upon the severity of the sedimentation and choking of stream.

The location of different structural measures proposed above from sl no i) to sl no iv) are shown in a map which is attached as **Annexure-II**. Further the structural measures that are proposed to be undertaken in order to minimise soil erosion and choking of streams are dealt in detail including the financial forecasts for the corresponding structural measures and do form part of other schemes e.g.

- a) In compliance to Condition No. 11(c) - “Construction of Check Dams, Retention / Toe-walls to arrest sliding down of the excavated material along the contour”
- b) In compliance to Condition No. 11(d) – “Stabilize the Overburden Dumps by appropriate grading/ benching in accordance with the approved schemes so as to ensure that angels of repose at any given place is less than 28° .

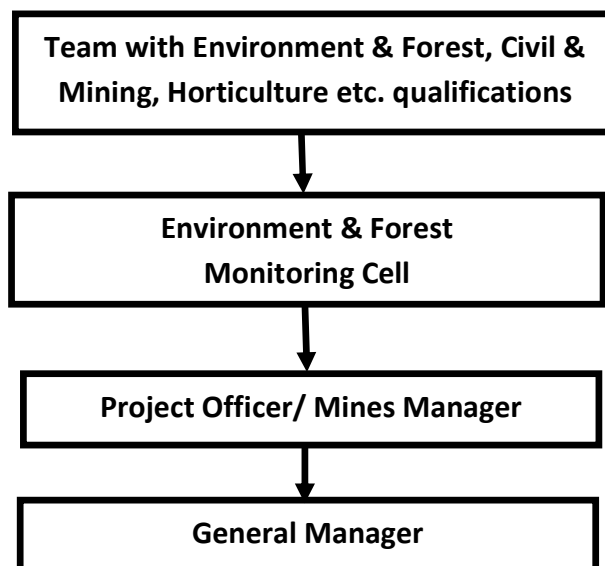
15. MOTIVATION OF PEOPLE

The villagers / VSS Committee members of the adjoining villages are to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the adjoining villages and resolution will be passed to support plantation activities. For motivation of the villagers/ VSS Committee members, they will be provided incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure for this purpose.

16. EXECUTING AGENCY

The work will be executed by the User Agency i.e. M/s Mahanadi Coalfields Limited through dedicated departments manned by technically qualified persons with outsourced man and machinery as and when required. To facilitate this, the user agency shall establish its own executing and supervision cells along with required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department.

EXECUTING AGENCY



17. INSPECTION, MONITORING AND EVALUATION

Proper inspection, monitoring and evaluation will be done in-house by designated authorities of MCL under supervision of Forest Department.

18. REQUIREMENT OF FUNDS

The total cost for implementation of the proposed interventions will be Rs 7,18,68,258.00 (Rupees Seven Crores Enghteen Lakhs Sixty eight Thousand Two Hundred Fifty eight only). It is to mention that the total cost required for the implementation of the scheme is based on approved cost norm /approved matrices of State Forest Dept. given as Annexure -III as per below details.

- a) Core Plantation Base Cost Norm for Compensatory Afforestation @1000 seedlings /Ha with 10-year Maintenance, Wage Rate @ Rs. 311.00 per Manday and Matrix for Core Plantation for Compensatory Afforestation @1000 seedlings /Ha with 10-year maintenance.
- b) Add on Model -Watering Provision Watering Model W-I: Borewell fitted with Solar & Drip system and Matrix for Watering Model W-I: (Solar Borewell) fitted with Drip system. (Per Ha)
- c) Cost Norm for Soil & Moisture Conservations (SMC) Works Wage rate @ 311/- per Manday and Matrix for Soil & Moisture Conservations (SMC) Works.

This budget will be subject to increase in amount considering the increase in cost of materials and labour charges. However, escalation factor @ 20% has been considered over and above the estimate.

FINANCIAL FORECAST

(Wage Rate @ Rs. 311.00 according to Base Cost Norm and Rate/ Ha. for the year 2024-25 as per approved Matrix)

Sl. No.	Description of the Work	Fund Required (in Rs.)
1	Biological Measures	
A	Block Plantation (@1000 nos of seedlings/ha.) over 84.21ha. @ Rs 2,71,7,16/- per ha. (Rate / Ha. as per approved matrix for 2024-2025)	2,28,81,204.00
B	Watering (Solar Bore well) fitted with Drip System @ Rs 2,34,221.00 per ha. (Rate / Ha. as per approved matrix for the year 2024-25) * 84.21ha. <i>10 units.</i>	1,97,23,750.00 <i>23,42,210.</i>
C	SMC @ Rs 41,248.00 per ha. (Rate / Ha. as per approved matrix for the year 2024-25) x 84.21 ha	34,73,494.00
D	Special SMC for the restoration and re-juvenation of the Singhada jhore Nallah	80,00,000.00
	Sub Total	5,20,78,448.00 <i>2,20,90,908</i>
2	15% of the total cost for motivation of VSS / People involved	78,11,767.00 <i>43,04,536.20</i>
	Sub Total	5,98,90,215.00 <i>3,30,01,444.20</i>
3	Price escalation @ 20%	1,19,78,043.00 <i>66,00,288.34</i>
	Grand Total (1+2+3)	7,18,68,258.00 <i>3,96,01,733</i>

(Rupees Seven crore Eighteen Lakhs Sixty-Eight Thousand Two Hundred Fifty Eight only)

Rupees Three Crore Ninety Six Lakh One Thousand Seven Hundred Thirty Three



Note: The above-mentioned expenditure has already been included in the budget of Environment Management Plan (EMP) as well as approved Mining Plan and Mine Closure Plan.

M/s Mahanadi Coalfields Ltd. do hereby undertake to execute the item of works mentioned in this scheme and incur the approved amount in a phased manner as per approved Mining Plan and Mine Closure Plan/Environment Management Plan (EMP).


M/s Mahanadi Coalfields Ltd
सुभद्रा क्षेत्र
General Manager
MCL, Subhadra Area


Project Head
Subhadra Coal Mining Ltd., Angul


Staff Officer (Survey)
MCL, Subhadra Area

Countersigned

Divisional Forest Officer
Angul Division
Angul, Division
APPROVED for Rs. 7,96,01,733/-

Regional Chief Conservator
of Forests, Angul Circle. 11



MCL

Office of the SO (P&P)
(Subhadra Area)
NEAR BIJU MAIDAN
Po/Dist: Angul – 759122 (Odisha)
Website : www.mcl.gov.in
mail id. gmsubhadraarea@gmail.com
gm-subhadra.mcl@coalindia.in



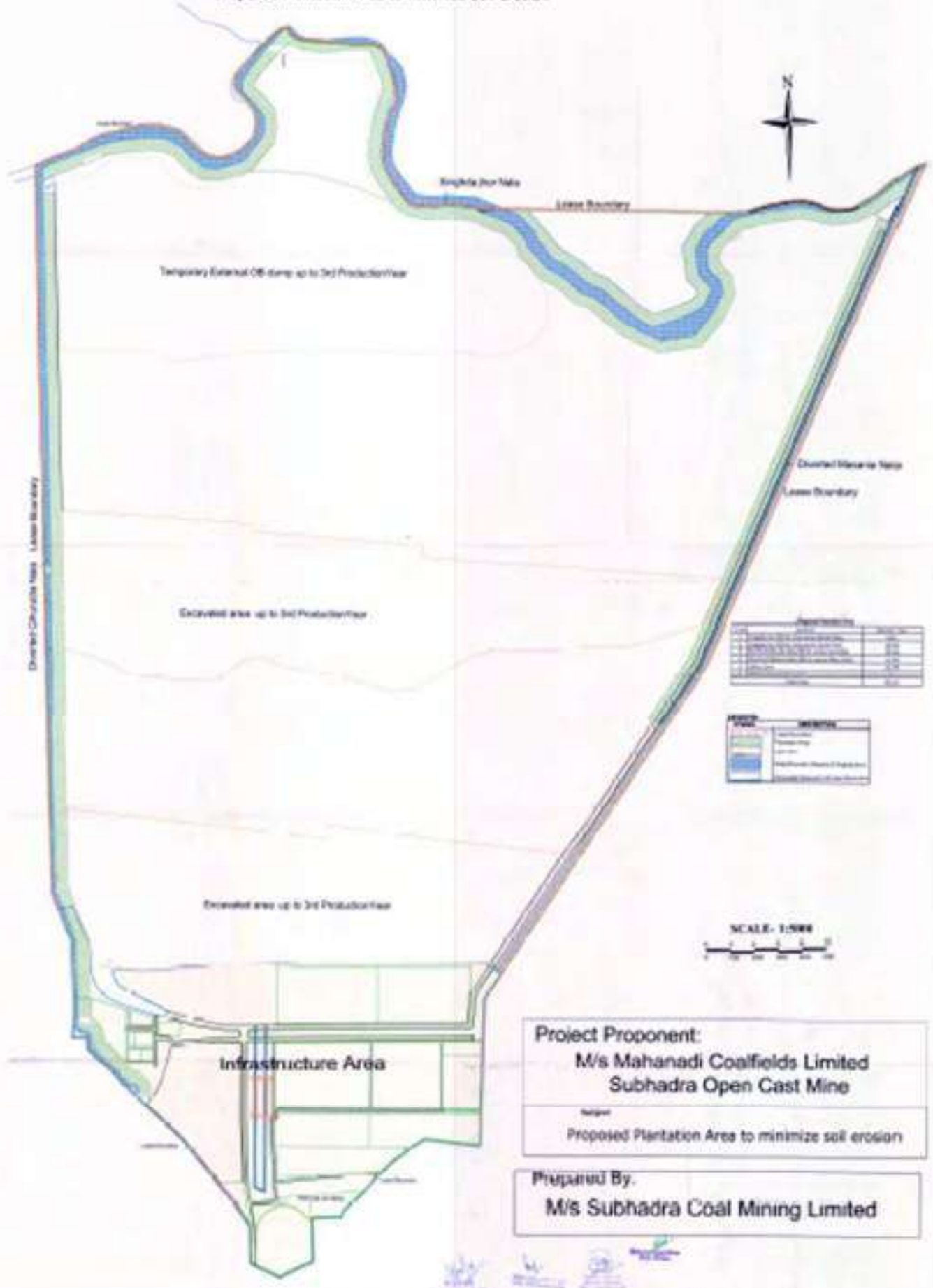
UNDERTAKING FOR MITIGATIVE MEASURES TO MINIMIZE SOIL EROSION AND CHOKING OF STREAM SHALL BE IMPLEMENTED WITHIN A PERIOD OF THREE YEARS WITH EFFECT FROM THE ISSUE OF STAGE-II CLEARANCE IN ACCORDANCE WITH THE APPROVED PLAN IN CONSULTATION WITH THE STATE FOREST DEPARTMENT

I do, hereby undertake to carry out Mitigative Measures to minimize soil erosion and choking of stream shall be implemented within a period of three years with effect from the issue of stage-ii clearance in accordance with the approved plan in consultation with the state forest department. .


Divisional Forest Officer
Angul, Division


General Manager
Subhadra Area


Proposed Plantation Area to Minimize Soil Erosion

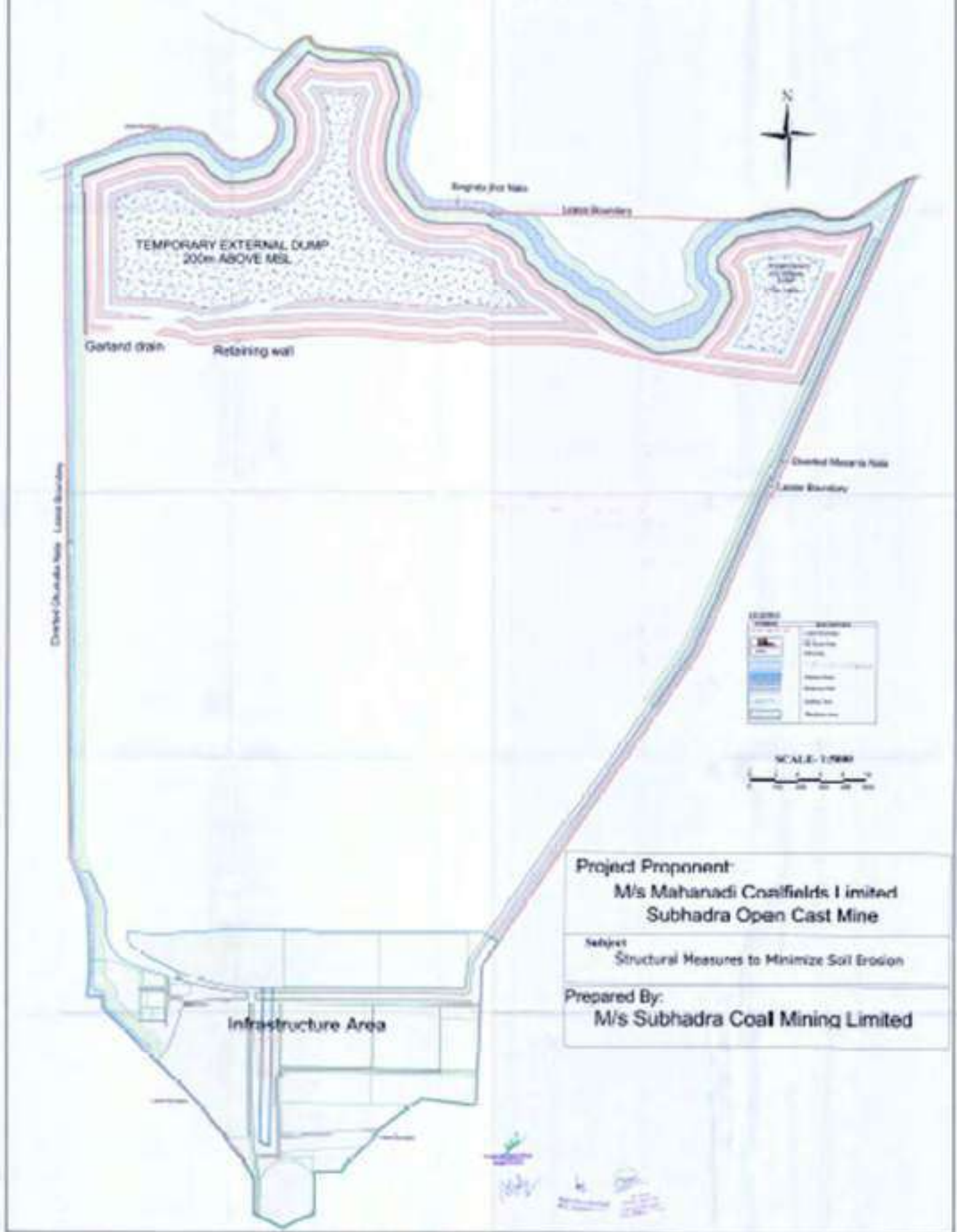


Project Proponent:
M/s Mahanadi Coalfields Limited
Subhadra Open Cast Mine

Prepared By:
M/s Subhadra Coal Mining Limited



Structural Measures to Minimize Soil Erosion



TEMPORARY EXTERNAL DUMP
200m ABOVE MSL

Gofard drain Retaining wall

Checked/Checked-in MSL - Lease Boundary

Right-of-Way Checked/Checked-in MSL



Checked/Checked-in MSL
Lease Boundary

LEGEND	
[Symbol]	[Description]
[Symbol]	[Description]
[Symbol]	[Description]
[Symbol]	[Description]
[Symbol]	[Description]
[Symbol]	[Description]
[Symbol]	[Description]
[Symbol]	[Description]
[Symbol]	[Description]
[Symbol]	[Description]

SCALE: 1/5000
0 20 40 60 80 100

Project Proponent
M/s Mahanadi Coalfields Limited
Subhadra Open Cast Mine

Subject
Structural Measures to Minimize Soil Erosion

Prepared By:
M/s Subhadra Coal Mining Limited

Infrastructure Area

**Core Plantation Base Cost Norm for Compensatory Afforestation
@ 1000 Seedlings / Ha. with 10 Year Maintenance
Wage rate @ ₹311/- per Manday**

Sl. No.	Items of Work	Preferable Period of Execution	No. of Mandays	Labour Cost (₹)	Material Cost (₹)	Total Cost (₹)
0th Year (Advance work) Pre-Planting Operation						
1	Survey, Demarcation and Pillar posting	Nov/Dec	2	622	0	622
2	Preparation of Treatment Map (Digital Map)	Nov/Dec	1	311	100	411
3	Site preparation (Cleaning & removal of debris)	Nov/Dec	12	3732	0	3732
4	Creation of 4.00 mt wide Inspection Path	Feb/Mar	1	311	0	311
5	Alignment and stacking of pits	Feb/Mar	1	311	0	311
6	Digging of pits (45cm x 45cm x 45cm) in hard & gravelly soil	Feb/Mar	40	12440	0	12440
7	Construction of Temporary Labour Shed, Drinking water facility and First Aid etc.	Jan/Mar	0	0	3500	3500
	Total		57	17727	3600	21327
1st Year/Planting Year						
1	Refilling of pits by altering the dugout soil of the pits, application of organic compounds / CDM/ FYM & mixing the same properly	Jun/Jul	7.5	2332.50	5000	7332.50
2	Transportation of 18 months old polythene bag seedlings in hired truck /tractor from the Permanent/Mega nursery to planting site including loading & unloading. (Average lead of 10 Rkm) & stacking the seedlings @ Rs.6/- per seedling. (1100 nos.)	Jul/Aug	0	0	6600	6600
3	Watering polypot seedlings at planting site	Jul/Aug	2	622	0	622
4	Conveyance of polypot seedlings on head load from the stacking site to individual dugout pits within the planting site, applying insecticide, fertilizers & planting after scooping the soil with other applied materials & pressing the soil properly around the planted seedlings.	Jul/Aug	22.5	6997.50	0	6997.50
5	Cost of Fertilizer & Insecticide	Jul/Aug	0	0	3000	3000
	(a) NPK/Bio-fertilizer @ 50 gms/plant as basal dose = 50kg @ Rs.30/- per kg = Rs.1500/-					

Sl. No.	Items of Work	Preferable Period of Execution	No. of Mandays	Labour Cost (₹)	Material Cost (₹)	Total Cost (₹)
	(b) Urea/Vermicompost/Mo Khata/any other fertilizer in two subsequent doses @ Rs. 750/-					
	(c) Insecticide/ Bio-pesticide @ 5 gms/plant =5 kg @ Rs.150/- per kg = Rs. 750/-					
6	Casualty Replacement @ 10% (100 nos.)	Jul/Aug	2.5	777.5	0	777.5
7	1st Weeding & Manuring	Aug/Sep	12	3732	0	3732
8	2nd Weeding, Soil working (1mt. diametre around the plants) & Manuring	Oct/Nov	15	4665	0	4665
9	Fire line tracing (2 m. wide fire line over 400 m. long) including maintenance of inspection path	Feb/Mar	3	933	0	933
10	Watch & Ward including watering as per requirement	Aug-Mar	12	3732	0	3732
	Total		76.50	23791.50	14600.00	38391.5
2nd Year Maintenance						
1	Transportation of 100 seedlings from Nursery to plantation site including loading, unloading & conveyance by Tractor @Rs.6/- per seedling	Jul	0	0	600	600
2	Casualty replacement- 10%	Jul	2.5	777.5	0	777.5
3	Cost of Fertilizer & Insecticide-	Jul/Aug	0	0	2875	2875
	A) Cost of Insecticide/Bio-pesticide@5gms/plant = 0.5 Kg @ Rs.150/- per kg = Rs.75/-					
	B) Urea/NPK/Bio-fertilizer/Vermicompost/ Mo Khata/any other fertilizer @Rs.2800/-					
4	Complete Weeding, Manuring & Soil working, (1mt. diametre around the plants)	Sep/Oct	15	4665	0	4665
5	Fire line tracing (2 m. wide fire line over 400 m long) including maintenance of inspection path	Feb/Mar	3	933	0	933
6	Watch & Ward including watering as per requirement	Apr-Mar	18	5598	0	5598
7	Maintenance of Temporary Labour Shed, Drinking water facility and First Aid etc.	Apr-Mar		0	1000	1000
	Total		38.5	11973.5	4475	16448.5

Sl. No.	Items of Work	Preferable Period of Execution	No. of Mandays	Labour Cost (₹)	Material Cost (₹)	Total Cost (₹)
3rd Year Maintenance						
1	Cost of fertilizer (Urea/NPK/Bio-fertilizer/ Vermicompost/Mo Khata/any other fertilizer)	Jul/Aug	0	0	2800	2800
2	Complete Weeding, Manuring & Soil working, (1mt. diametre around the plants)	Sep/Oct	15	4665	0	4665
3	Fire line tracing(2m. wide fire line over 400m long)including maintenance of inspection path	Feb/Mar	3	933	0	933
4	Watch & Ward including watering as per requirement	Apr-Mar	18	5598	0	5598
5	Maintenance of Temporary Labour Shed, Drinking water facility and First Aid etc.	Apr-Mar	0	0	1000	1000
	Total		36	11196	3800	14996
4th Year Maintenance						
1	Fire line tracing (2m. wide fire line over 400m long)including maintenance of inspection path	Feb/Mar	3	933	0	933
2	Watch & Ward including maintenance of vegetative fencing	Apr-Mar	18	5598	0	5598
	Total		21	6531	0	6531
5th Year Maintenance						
1	Fire line tracing (2 m. wide fire line over 400 m long) including maintenance of inspection path	Feb/Mar	3	933	0	933
2	Watch & Ward	Apr-Mar	18	5598	0	5598
	Total		21	6531	0	6531
6th Year Maintenance						
1	Fire line tracing (2 m. wide fire line over 400 m length)	Feb/Mar	3	933	0	933
2	Pruning of branches. Singling out of multiple shoots	Jan-Mar	3	933	0	933
3	Watch & Ward	Apr-Mar	18	5598	0	5598
	Total		24	7464	0	7464
7th Year Maintenance						
1	Fire line tracing (2 m. wide fire line over 400 m length)	Feb/Mar	3	933	0	933
2	Watch & Ward	Apr-Mar	18	5598	0	5598
	Total		21	6531	0	6531

Sl. No.	Items of Work	Preferable Period of Execution	No. of Mandays	Labour Cost (₹)	Material Cost (₹)	Total Cost (₹)
8th Year Maintenance						
1	Fire line tracing (2 m. wide fire line over 400 m length)	Feb/Mar	3	933	0	933
2	Watch & Ward	Apr-Mar	18	5598	0	5598
	Total		21	6531	0	6531
9th Year Maintenance						
1	Fire line tracing (2 m. wide fire line over 400 m length)	Feb/Mar	3	933	0	933
2	Watch & Ward	Apr-Mar	18	5598	0	5598
	Total		21	6531	0	6531
10th Year Maintenance						
1	Fire line tracing (2 m. wide fire line over 400 m length)	Feb/Mar	3	933	0	933
2	Watch & Ward	Apr-Mar	18	5598	0	5598
	Total		21	6531	0	6531

Year wise Abstract of Cost Norm (Showing Seedling Cost separately)

Sl. No.	Year	No. of Mandays	Labour Cost (₹)	Material Cost (₹)	MELD and other contingency (5% of (4+5))	Cost of Seedling @₹50.31 per Seedlings	Total Cost (₹)
1	0th year	57	17727.0	3600.0	973.0	0.0	22300.0
2	1st year	76.5	23791.5	14600.0	1918.50	55341.00	95651.00
3	2nd year	38.5	11973.5	4475.0	821.50	5031.00	22301.00
4	3rd year	36.0	11196.0	3800.0	749.00	0.00	15745.00
5	4th year	21.0	6531.0	0.0	326.00	0.00	6857.00
6	5th year	21.0	6531.0	0.0	326.00	0.00	6857.00
7	6th year	24.0	7464.0	0.0	373.00	0.00	7837.00
8	7th year	21.0	6531.0	0.0	326.00	0.00	6857.00
9	8th year	21.0	6531.0	0.0	326.00	0.00	6857.00
10	9th year	21.0	6531.0	0.0	326.00	0.00	6857.00
11	10th year	21.0	6531.0	0.0	326.00	0.00	6857.00
	Total:	358.0	111338.0	26475.0	6791.0	60372.0	204976.0

Matrix for Core Plantation for Compensatory Afforestation @ 1000 Seedlings/ Ha. with 10 year maintenance

Sl. No.	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	XXI	Total Cost (10Yrs)		
	Base Norm	22300	96661	22361	15745	6857	6857	7837	6857	6857	6857	6857													
01	2021-22	22300	100434	24595	18226	8336	8751	10602	9648	10131	10637	11189												234718	
02	2022-23		23416	106456	25814	19137	8752	9189	11027	10130	10638	11189	11727												246564
03	2023-24			24596	110729	27105	20094	9190	9648	11578	10637	11170	11727	12313											258777
04	2024-25				25815	118286	28480	21189	9660	10130	12157	11189	11729	12313	12829										271716
05	2025-26					27106	122078	29883	22154	10133	10637	12786	11727	12315	12829	13575									285302
06	2026-27						28481	128182	31377	22882	10640	11189	13403	12313	12831	13575	14254								299867
07	2027-28							29884	134591	32946	24425	11772	11727	14073	12829	13578	14254	14967							314546
08	2028-29								31378	141221	34880	28646	11731	12313	14777	13575	14257	14967	15715						330273
09	2029-30									32947	148387	38323	28828	12318	12829	13516	14254	14970	15715	16501					346788
10	2030-31										34594	158808	38139	28274	12834	13575	14282	14967	15719	16501	17326				364127

Add on Model - Watering Provision

Watering Model W-I: Bore well fitted with Solar & Drip System

Solar system with Bore well (1 system for 5 Ha Plantation) fitted with Drip system, Wage rate @ Rs.311/-			
Year of Installation (0th Year)			
1	Cost of Bore well	1,50,000	
2	Installation of Solar panel & other System	3,00,000	
3	Cost of 0.5 HP submersible motor with accessories	50,000	
4	Water Storage Tanks/ Flexible pipes	15,000	
5	Cost of laying Drip system including all accessories, fittings etc. with 12% GST	3,02,431	
	Total	8,17,431	
6	Cost of Water & watering per Ha. (8,17,431/ 5)= Rs. 1,63,486/-		1,63,486
1st Year Watering			
7	No maintenance required	0	
	Total		0
2nd Year Watering			
8	Maintenance of system @ 5% of initial cost of installation		8,174
	Total		8,174
3rd Year Watering			
9	Maintenance of system @ 5% of initial cost of installation		8,174
	Total		8,174
4th Year Watering			
10	Maintenance of system @ 5% of initial cost of installation		8,174
	Total		8,174
5th Year Watering			
11	Maintenance of system @ 5% of initial cost of installation		8,174
	Total		8,174

Abstract

Sl. No	Year	No. person days	Labour cost @ Rs. 311/-per day	Material Cost	Total cost (Rs.)
1	0th year	0	0.0	163486.0	163486.0
2	1st year	0	0.0	0.0	0.0
3	2nd year	0	0.0	8174.0	8174.0
4	3rd year	0	0.0	8174.0	8174.0
5	4th year	0	0.0	8174.0	8174.0
6	5th year	0	0.0	8174.0	8174.0
	Total	0	0	196182	1,96,182

Matrix for Watering Model-W-1 (Solar bore well) fitted with Drip System (per Ha)

Sl. No.	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	Total Cost
	Base Norm	163486	0	8174	8174	8174	8174											
1	2021-22	163486	0	9011	9463	9935	10432											202327
2	2022-23		171660	0	9462	9936	10432	10954										212444
3	2023-24			180243	0	9935	10433	10954	11502									223067
4	2024-25				188255	0	10432	10955	11502	12077								234221
5	2025-26					196718	0	10954	11503	12077	12681							245933
6	2026-27						208654	0	11502	12076	12681	13315						258230
7	2027-28							219087	0	12077	12682	13315	13981					271142
8	2028-29								230041	0	12681	13316	13981	14680				284699
9	2029-30									241543	0	13315	13982	14680	15414			298934
10	2030-31										253620	0	13981	14681	15414	16185		313881

Cost Norm for Soil & Moisture Conservation (SMC) Works

Wage rate @ ₹311/- per Manday

Sl. No.	Items of Work	Preferable Period of Execution	Total Cost (₹)
0th Year (Pre-Planting Operation)			
1	Nil		0
1st Year			
2	Soil Conservation measure structures like Staggered Trench, Percolation pit, Contour trench, Graded earthen bund, LBCD, Wire mesh LBCD, Sub surface Dyke & WHS as per the slope & site requirement on LS	Apr/Sep	20,215
2nd Year			
3	Maintenance of SMC structures @ 15 % of initial year cost	Apr/Jul	3,032
3rd Year			
4	Maintenance of SMC structures @ 15 % of initial year cost	Apr/Jul	3,032
4th Year			
5	Maintenance of SMC structures @ 15 % of initial year cost	Apr/Jul	3,032
5th Year			
5	Maintenance of SMC structures @ 15 % of initial year cost	Apr/Jul	3,032
Total			32,343.0

ABSTRACT

Sl. No.	Year	No. of Mandays	Labour Cost ₹311/- per day	Material Cost (₹)	Total Cost (₹)
1	0th year	0.0	0.0	0.0	0.0
2	1st year	0.0	0.0	20,215.0	20,215.00
3	2nd year	0.0	0.0	3,032.00	3,032.00
4	3rd year	0.0	0.0	3,032.00	3,032.00
5	4th year	0.0	0.0	3,032.00	3,032.00
6	5th year	0.0	0.0	3,032.00	3,032.00
Total		0.00	0.00	32,343.0	32,343.0

Note:

Different types of SMC structures may be taken up as per the scope & requirements of the plantation site out of the design & specification of different structures annexed along this document.

Sl. No.	Commencement Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV
	Base Norm	0	20215	3032	3032	3032	3032									
1	2021-22	0	21226	3342	3510	3685	3870									
2	2022-23		0	22287	3509	3686	3869	4064								
3	2023-24				0	23401	3684	3870	4062	4267						
4	2024-25				0	24571	3868	4064	4265	4480						
5	2025-26					0	25800	4061	4267	4478	4704					
6	2026-27						0	27090	4264	4480	4702	4939				
7	2027-28							0	28445	4477	4704	4937	5186			
8	2028-29								0	29867	4701	4939	5184	5445		
9	2029-30									0	31360	4936	5186	5443	5717	
10	2030-31										0	32928	5183	5445	5715	6003



SUBHADRA OPEN CAST COAL PROJECT

***Scheme
For***

**PLANTING OF ADEQUATE DROUGHT HARDY PLANT SPECIES AND
SOWING OF SEEDS, IN THE APPROPRIATE AREA WITHIN THE
MINING LEASE TO ARREST SOIL EROSION**

in compliance

with

Condition No.11(b) of

Stage-I approval granted vide

Letter No.8-06/2023-FC, Dated.05.12.2023

of Govt. of India, Ministry of Environment, Forests

& Climate Change, New Delhi.

for

**Diversion of 125.24 Ha. (including 1.47 Ha. of Safety Zone)
of Forest Land within 1111.85 Ha. of ML area of Subhadra OCP
for Non forestry use U/s-2 (ii) of FC Act-1980**

**in villages Kankarei, Pirakhaman, Chhotabereni, Balichandrapur,
Raijharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuabola, Kumunda
and Jaipur RF of Chhendipada and Talcher Tahasil,
Angul District, Odisha.**

M/s. Mahanadi Coalfields Limited

SCHEME FOR PLANTING OF ADEQUATE DROUGHT HARDY PLANT SPECIES AND SOWING OF SEEDS, IN THE APPROPRIATE AREA WITHIN THE MINING LEASE TO ARREST SOIL EROSION IN SUBHADRA OCP OF M/S MAHANADI COALFIELDS LTD. IN ANGUL FOREST DIVISION OF ANGUL DISTRICT OF ODISHA.

1. INTRODUCTION

Subhadra Open Cast Coal Mine is a Greenfield opencast mining project spread over a lease area of 1111.85 Ha. in Kankarei, Pirakhaman, Chhotabereni, Balichandrapur, Raijharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuabol, Kumunda villages and Jaipur RF, Chhendipada & Talcher Tahasil, Dist-Angul, Odisha..

Ministry of Coal, Government of India has allotted this coal block in favour of M/s. Mahanadi Coalfields Limited vide allotment order no. NA-103/1/2021-NA dated 18-11-2021.

As per approved Mining Plan and Mine Closure Plan, the mine life is 36 years. Out of total 1111.85 Ha. of Mining Lease area, total forest land involved in 125.24 Ha. (Revenue forest and DLC of 124.49 Ha. + Reserve forest of 0.75 Ha.)

Mahanadi Coalfields Limited has named Utkal-A and West of Gopalprasad (west) coal block as Subhadra Open Cast Project vide their letter no. 539-H dated 26.09.2019.

M/s. Mahanadi Coalfields Limited submitted the Forest Diversion proposal to obtain Forest Clearance from MoEF & CC, Government of India for 125.24 Ha. of forest land U/s 2(ii) of the Forest (Conservation) Act 1980. The Stage-I Forest Clearance approval over 125.24 ha of Forest Land Under Section- 2 (ii) (including 1.47 ha. of Safety Zone) of the Forest (Conservation) Act, 1980 has been granted by MoEF & CC, Government of India vide their Letter No. 8-06/2023-FC, dated 05.12.2023, where in it has been stipulated as per The Stage-I Forest Clearance approval over 125.24 ha of Forest Land Under Section- 2 (ii) (including 1.47 ha. of Safety Zone) of the Forest (Conservation) Act, 1980 has been granted by MoEF & CC, Government of India vide their Letter No. 8-06/2023-FC, dated 05.12.2023, where in it has been stipulated as per **Condition No. 11 (b) for planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion in accordance with the approved scheme.**

2. LOCATION

The mining lease area is covered in the Survey of India Topo sheet No. F45T1 and F45S13 and situated between the latitude 20° 55' 56.225" N to 20° 58' 47.344" N, and longitude 84° 58' 42.383" E and 85° 0' 50.476" E. The above ML area covering villages are Kankarei, Pirakhaman, Chhotabereni, Balichandrapur, Raijharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuabola Kumunda and Jaipur RF in Chhendipada & Talcher Tahasil, Angul Forest Division Angul District Odisha.

LOCATION MAP

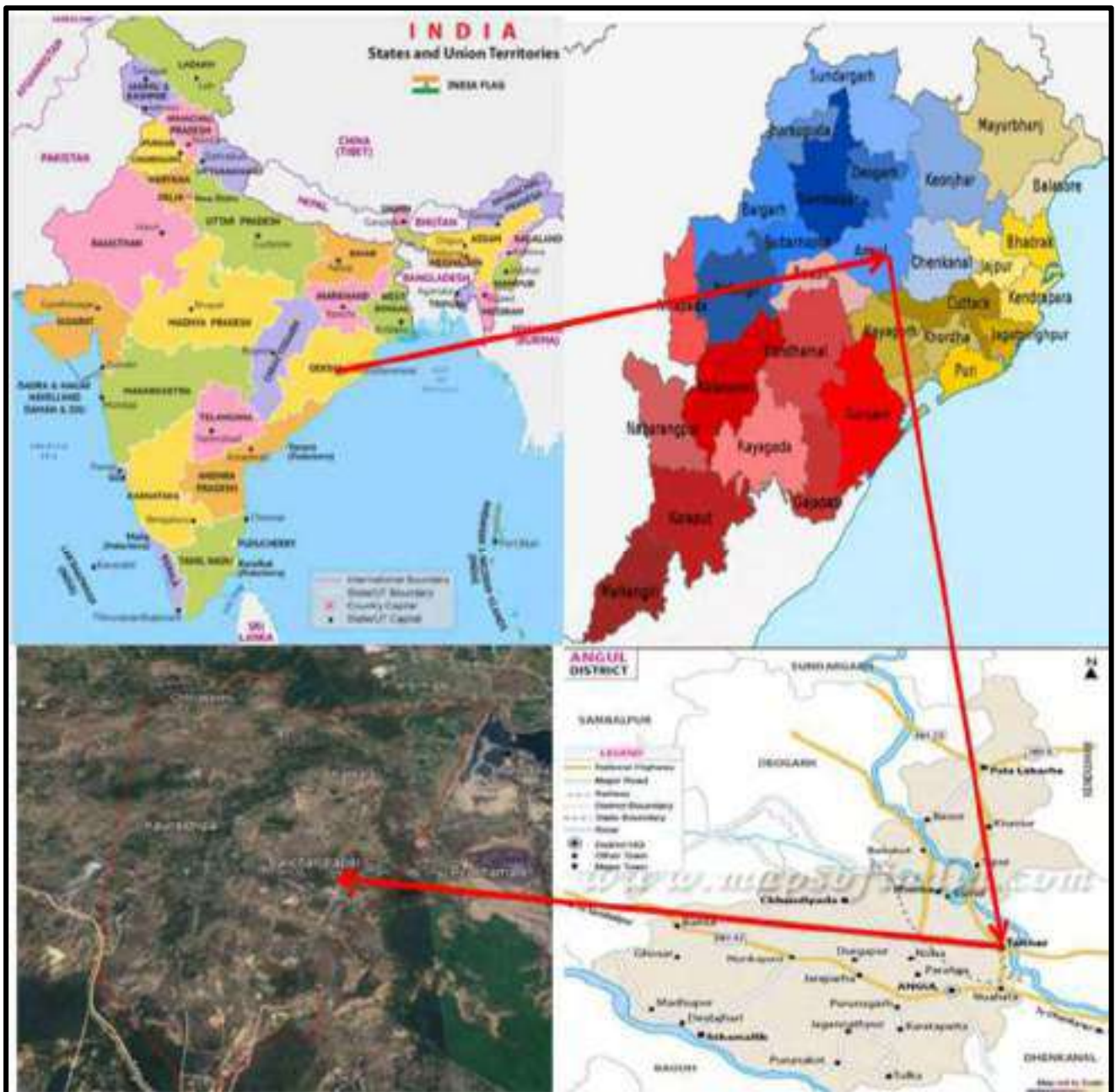


Fig-1. Location Map of Subhadra OCP, MCL

3. TOPOGRAPHY

The surface topography is gently undulating and the ground is generally being used for cultivation purposes by the villagers. Around south western part, the surface topography is mildly undulating and slopes towards north. The ground level rises towards south-eastern corner of the block with highest elevation above Mean Sea Level of about 167.50 meter.

4. LAND USE PATTERN

The proposed land use pattern of 1111.85 Ha. of mining lease area as per approved Mining Plan and Mine Closure Plan is given below: Table 1

Angul Forest Division										
Sl. No	Type of Land Use	Forest Land in Ha				Total Forest Land in Ha (3+4+5+6)	Non-Forest Land in Ha		Total non-forest land in Ha (8+9)	Total Land in Ha (7+10)
		RF	PR F	Rev. forest	DLC		Govt. land	Private land		
1	2	3	4	5	6	7	8	9	10	11
1	Mining Excavation Area	0.71	0.00	33.82	55.00	89.53	225.73	566.02	791.75	881.28
2	Safety Zone 7.5Mtr along Mining lease boundary	0.04	0.00	0.77	0.66	1.47	5.56	4.76	10.32	11.79
3	Infrastructure	0.00	0.00	13.00	21.24	34.24	47.83	61.43	109.26	143.50
4	Others (Top soil dump, Coal stock Yard, External dump, Nalla diversion)	0.00	0.00	0.00	0.00	0.00	10.54	64.74	75.28	75.28
5	Rationalisation area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.75	0.00	47.59	76.90	125.24	289.66	696.95	986.61	1111.85

5. DETAILS OF FOREST LAND WITHIN THE ML AREA

Forest land to be worked for mining and allied purpose-123.77 Ha

Area set aside for Safety Zone

1.47 Ha

125.24 Ha

6. SOIL TYPE

The areas are filled up with colluvial soil with sand, silt deposits and clay of older alluvium, older and younger floodplain deposits. In most of the area the soil is moderately coarse in nature whereas it is loamy in the cultivated land. The area has three nalas namely Singada Jhor, Ghurudia nala and Masani jhor. The soil has been deposited in the valley area mostly from these nalas. There were two periods of glacial advance and retreat during the deposition of Talcher sediments.

7. CLIMATE

The lease area lies in sub-tropical region where climate is characterized by an oppressively hot summer and cool winter. Summer is typically from April to July when monthly temperature ranges from a maximum of 45.50 degree centigrade during day time to a minimum of 15 Degree Centigrade at night time. Winter is from November to February when the maximum temperature during daytime goes to 37 Degree Centigrade and minimum temperature at night- becomes as low as 6.70 Degree Centigrade. The average annual rainfall as recorded at IMD observatory at Angul is 1277 mm.

8. DRAINAGE

Brahmani River, flowing approximately north to south along the eastern boundary of the Talcher coalfield, provides the main drainage of the region. This river is fed by seasonal nalas, viz. Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor and a few small nalas. From the eastern boundary of the block, the Brahmani river lies eastward at a distance of about 20 km.

Singada Jhor flows eastward and forms major part of the northern boundary of the block. Downstream Singada Jhor merges into Brahmani River at the north eastern part of the coalfield. Sinhajori nala, Ghurudia nala and Masani jhor flowing from south to north within the block feed Singada jhor for most part of the year and control the drainage pattern of the block. Small ponds and dug wells are common in this block and are utilized for irrigation and drinking purpose.

9. EXISTING VEGETATION

The forest growth available in the area resembles Northern Tropical Dry Deciduous Forest. Sal (*Shorearobusta*) is the most dominant tree with Mahula (*Madhuca indica*), Chara (*Buchanania lanzan*), Jamu (*Pisidium guajava*), Teak (*Tectona grandis*), Tala (*Borassus flabellifer*), Neem (*Azadirachta indica*) as common associates.

The vegetation of the applied area is composed of Sal (*Shorearobusta*), Mahula (*Madhuca indica*), Chara (*Buchanania lanzan*), Jamu (*Pisidium guajava*), Teak (*Tectona grandis*), Tala

(*Borassus flabellifer*), Neem (*Azadirachta indica*), Arjuna (*Terminalia arjuna*), Gambhari (*Gmelina arborea*), Harida (*Terminalia chebula*), Kaju (*Anacardium occidentale*), Mango (*Mangifera indica*), Kadamba (*Anthocephalus chinensis*), Nala (*Arundo donax* Linn) etc. **Sal (*Shorearobusta*)** is the pre-dominant species.

10. OBJECTIVES OF THE SCHEME

Planning for plantation & grass seed sowing will be done with the following objectives:

- a. To meet the stipulation No.11 (b) of Stage-I Forest clearance accorded vide Letter 8-06/2023-FC, dated 05.12.2023 of MoEF & CC, Government of India, New Delhi, i.e., “**planting of adequate drought hardy plant species & sowing of seeds, in appropriate area within mining lease to arrest soil erosion in accordance with the approved scheme.**”
- b. To compensate the loss to vegetation due to operation of the mine.
- c. To prevent spread of fugitive dust generated due to mining and allied activities.
- d. To attenuate noise generated by the mine.
- e. To reduce soil erosion.
- f. To stabilize the slope of external over-burden dumps.
- g. To increase the green cover and to improve aesthetics.
- h. To attract the birds, which are addressed as litmus of nature.
- i. To provide recreational value to colony inhabitants.
- j. Attract Animals to re-colonize the area where the Mine is abandoned.

11. PLANTATION

In order to fulfil the above objective, it is proposed to go for plantation in an area measuring 84.21 Ha. within the Mining Lease area. Saplings would be planted at the rate of 1000 trees /ha in Block plantation mode. Post planting care would be taken to replace casualties, remove dead, dying, diseased and top broken trees etc. In this connection it is proposed to take up plantation at six (6) different locations as per the map given as Annexure-I. The location-wise area details are given below.

Proposed Plantation Area

Sl. No	Location	Area (in Ha.)
1	Singada Jhor (50 mt. strip across North Side)	6.82
2	Singada Jhor (50 mt. strip across South Side)	26.82
3	Diverted Ghrudia Nala (50 mt. across East Side)	19.36
4	Diverted Masania Nala (50 mt. across West Side)	11.43
5	Safety Zone	11.79
6	Within Infrastructure area	8.00
Total Area		84.21

The list of species proposed for plantation is as follows:

SI. No.	Local Name	Botanical Name	Family
1	Gamhar	<i>Gmelina arborea</i>	Verbenaceae
2	Harida	<i>Terminalia chebula</i>	Combretaceae
3	Mahula	<i>Madhuca indica</i>	Sapotaceae
4	Jamun	<i>Syzygium cumini</i>	Myrtaceae
5	Babul	<i>Acacia nilotica</i>	Leguminosae
6	Neem	<i>Azadirachta indica</i>	Meliaceae
7	Kurum	<i>Adina cordifolia</i>	Rubiaceae
8	Siris	<i>Albizia lebbek</i>	Leguminosae
9	Sissoo	<i>Dalbergia latifolia</i>	Fabaceae
10	Bahada	<i>Treminalia bellerica</i>	Combretaceae
11	Karanja	<i>Pongamia pinnata</i>	Papilionaceae
12	Asan	<i>Terminalia tomentosa</i>	Combretaceae
13	Amla	<i>Emblica officinalis</i>	Combretaceae
14	Mundi	<i>Mitragyna parviflora</i>	Rubiaceae
15	Kusum	<i>Schleichera oleosa</i>	Sapindaceae
16	Sunari	<i>Cassia fistula</i>	Fabaceae
17	Kasi	<i>Bridelia retusa</i>	Phyllanthaceae

The choice of species is based on the following parameters: (i) Drought hardy and (ii) it should prevent soil erosion. Selection of the plant species is based on the inventory of the local forest species. like **Neem (*Azadirachta indica*)**, **Karanja (*Pongamia pinnata*)**, **Asan (*Terminalia aalata*)**, **Kusum (*Schleichera oleosa*)**, **Amla (*Emblica officinalis*)**, **Mundi (*Mitragyna parviflora*)**, **Kasi (*Bridelia retusa*)**, **Sunari (*Cassia fistula*)** etc.

It is proposed to go for block plantation @ 1000 plants per Hectare. Planting shall be done during July in pre-dug pits of size 45 cm X 45 cm X 45 cm. A basal dose of N.P.K fertilizer shall be applied at the time of planting, besides mixing with insecticides to prevent termites & insects. Fruit bearing trees and bamboo rhizomes shall not be planted in close proximity. A minimum distance of 2.5 mt X 2.5 mt shall be maintained on every fourth plants in planting either of the species. Care should be taken to complete the planting during July while rains are still on during first or second week of July.

a. Pre-Planting and Planting Operation

Different operations that will be taken up for plantation are as follows:

i) Raising of nursery

Seedlings required for plantation shall be raised in a temporary nursery nearer to the planting site and water sources. Nursery work will be started one and half year before the year of plantation so that one and half year-old seedlings will be available for plantation. 20% extra seedlings shall be raised besides the actual requirement to compensate the casualties. Seedlings will be raised in polythene bags of 10" x 6" size following standard nursery practice.

ii) Alignment and pitting

Alignment and pitting will be taken up in the month of March-April, Pits of size 45cm X 45cm X 45cm will be dug maintaining a spacing of 2.5mtr X 2.5mtr.

iii) Actual Planting

The seedling would be planted in the dugout pits of size 45cm x 45cm x 45cm with a spacing of 2.5mtr x 2.5mtr. Plantation will be taken up after first regular shower of monsoon and will be completed by the end of July. Species will be planted as per suitability of the soil condition. NPK fertilizer @50gms per plant will be applied as basal dosage 5 gm of anti-termite insecticide will also be applied to each pit while planting. Casualties, if any noticed, shall be replaced with the extra seedlings raised for the purpose. During second year also, casualty replacement will be done for which seedlings shall be raised.

iv) Weeding, Soil working & Manuring

For establishment and better growth of the planted seedlings, timely weeding, soil working and manuring are necessary. It is proposed to carry out two weedings, soil working and manuring during the first year and second year of plantation and one weeding and soil working during third year. During first year and second year, first weeding and manuring shall be carried out during August-September and the second one during October-November along with soil working after rains. First weeding shall be around the plants and the second one will be done in strip. In the third year the weeding will be done around the plants, which will be carried out during August.

After each weeding, intensive soil working will be done around each plant at a radius of 0.5mtr, followed by manuring of @50grms NPK per plant in ring form.

v) Application of insecticides

The plantation site, after planting with good and healthy seedlings, may cause influx of insects, which usually eat and damage the tender leaves and shoots of the plants. To get rid of such insect attack, application of insecticides will be taken up in required doses

at desired intervals. Spraying of insecticides shall be done preferably in a sunny day in the forenoon as per requirement.

b. Post Plantation Care

Post Plantation care shall be adopted to ensure maximum survival of the plants. Funds would be provided for maintenance of the plants for ten years (i.e. nine years) after the year of plantation. In the present Scheme, provision of fund would be made immediately after planting the seedlings. Watering would be done at regular interval during the dry spell. In the dry season, watering would be regularly done especially during February to June. Watering in one year planted saplings would be more frequent (10 days in a month). Manuring would be done by using organic manure (cow dung, agricultural waste, kitchen waste, etc.). Diseased and dead plants would be uprooted, destroyed and replaced by fresh saplings. Growth and survival of saplings would be regularly monitored and remedial actions would be undertaken as required.

12. GRASS SEED SOWING:

In order to minimize soil erosion in the mining lease area of Subhadra OCP it is proposed to go for sowing of grass seeds in a phased manner over an area of 538.17 Ha. in the back-filled area as per the Table given below.

Phase Wise Grass Seeding in Back Filled Area		
Production Year	Back Filled Area (in Ha.)	Cumulative Area (in Ha)
9th Year	77.83	77.83
14th Year	80.9	158.73
19th Year	49.13	207.86
23rd Year	60.06	267.92
Final Reclamation (End of Mine life)	270.25	538.17

Some soil binding grasses species like *Vetiveria zizanioides*, *Bothriochloa odorata*, *Themeda triandra*, *Andropogon monticola*, *Apluda mutica* will be introduced. The Grass seeding shall be done after spreading of Top soil in the back-filled area with adequate mixing of good earth & farm grade manure.

The location map for proposed area where drought hardy species shall be planted & the grass seeds shall be shown is furnished as **Annexure-I**.

The proposed plantation activity shall be taken up as per approved Cost Norm for Block Plantation @ 1000 Saplings /Ha & corresponding approved matrix of State Forest Dept. It is to mention that the financial forecast for plantation of 84.21 Ha has been taken up in the Scheme namely Mitigative measure to minimize soil erosion in compliance to Condition no 11(a) of Stage -I Forest Clearance granted by MoEF & CC, Govt of India.

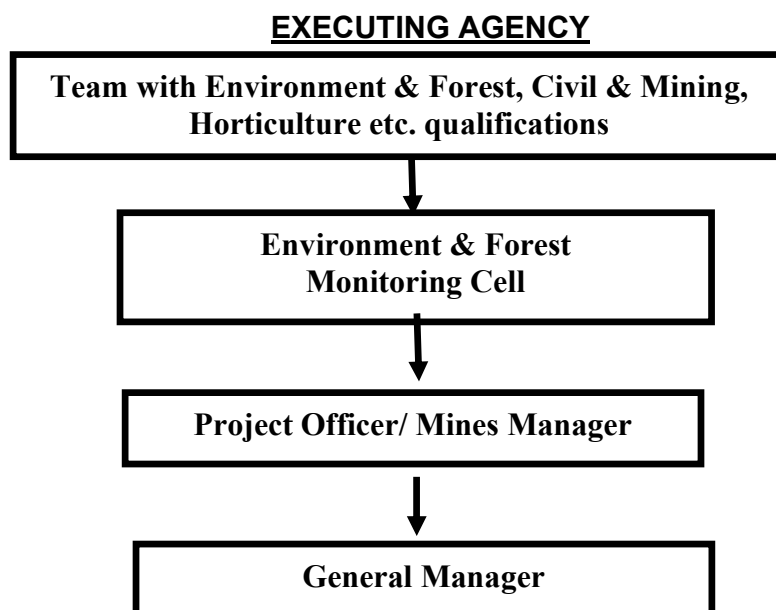
Besides the Cost Norm for Grass seeding is provided as **Annexure-II**

13. MOTIVATION OF PEOPLE

The villagers / VSS Committee members of the adjoining villages are to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the adjoining villages and resolution will be passed to support plantation activities. For motivation of the villagers/ VSS Committee members, they will be provided incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure for this purpose.

14. EXECUTING AGENCY

The work will be executed by the User Agency i.e., M/s Mahanadi Coalfields Limited through dedicated departments manned by technically qualified persons with outsourced man and machinery as and when required. To facilitate this, the user agency shall establish its own executing and supervision cells along with required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department.



15. INSPECTION, MONITORING AND EVALUATION

Proper inspection, monitoring and evaluation will be done in-house by designated authorities of MCL under supervision of Forest Department.

16. REQUIREMENT OF FUNDS

The total cost for implementation of the proposed interventions will be Rs. 2,00,52,214.00 (Rupees Two Crores Fifty-Two Thousand Two Hundred Fourteen) only excluding the cost of Plantation for droughty hardy species which has been considered in the Scheme namely Mitigative measure to minimize soil erosion in compliance to Condition no 11(a) of Stage -I Forest Clearance granted by MoEF & CC, Govt of India. The expenditure will be made during the course of mine life and post reclamation as per approved Mining Plan and Mine Closure Plan.

This budget will be subject to increase in amount considering the increase in cost of materials and labour charges. However, escalation factor @ 20% has been considered over and above the tentative estimate.

The tentative expenditure based on approved base norm and corresponding matrixes approved by State Forest Department.

FINANCIAL FORECAST

(Wage Rate @ Rs. 311.00 according to Base Cost Norm and Rate/ Ha. for the year 2024-25 as per approved Matrix)

Sl. No.	Description of the work	Fund Required (in Rs.)
1	Block Plantation (@1000 nos of seedlings/ha.) over 84.21 ha. @ Rs.2,71,7,16/- per ha. (Rate / Ha. as per approved matrix for 2024-2025)	The Cost for the Plantation is already included in the Scheme-11 (a)
2	Watering (Solar Bore well) fitted with Drip System @2.34,221.00 per ha. (Rate / Ha. as per approved matrix for the year 2024-25) × 84.21 ha.	
3	SMC @41,248.00 per ha. (Rate / Ha. as per approved matrix for the year 2024-25) × 84.21 ha	
4	Grass seeding over 538.17 Ha @ Rs.27,000/- per Ha	1,45,30,590.00
	Sub Total-1	
5	15% of the total cost for motivation of VSS / People involved	21,79,588.00
	Sub Total-2	1,67,10,178.00
6	Price escalation @ 20%	33,42,036.00
	Grand Total (1 + 2)	2,00,52,214.00

(Rupees Two Crores Fifty-Two Thousand Two Hundred Fourteen only)

Note: The above-mentioned expenditure has already been included in the budget of approved Mining Plan and Mine Closure Plan.

M/s Mahanadi Coalfields Ltd. do hereby undertake to execute the item of works mentioned in this scheme and incur the approved amount in a phased manner as per approved Mining Plan and Mine Closure Plan/ Environment Management Plan (EMP).


महा प्रबंधक
एमसीएल, सुभद्रा क्षेत्र
M/s Mahanadi Coalfields Limited
MCL, Subhadra Area



Project Head
Subhadra Coal Mining Ltd., Angul


Staff Officer (Survey)
MCL, Subhadra Area

Countersigned

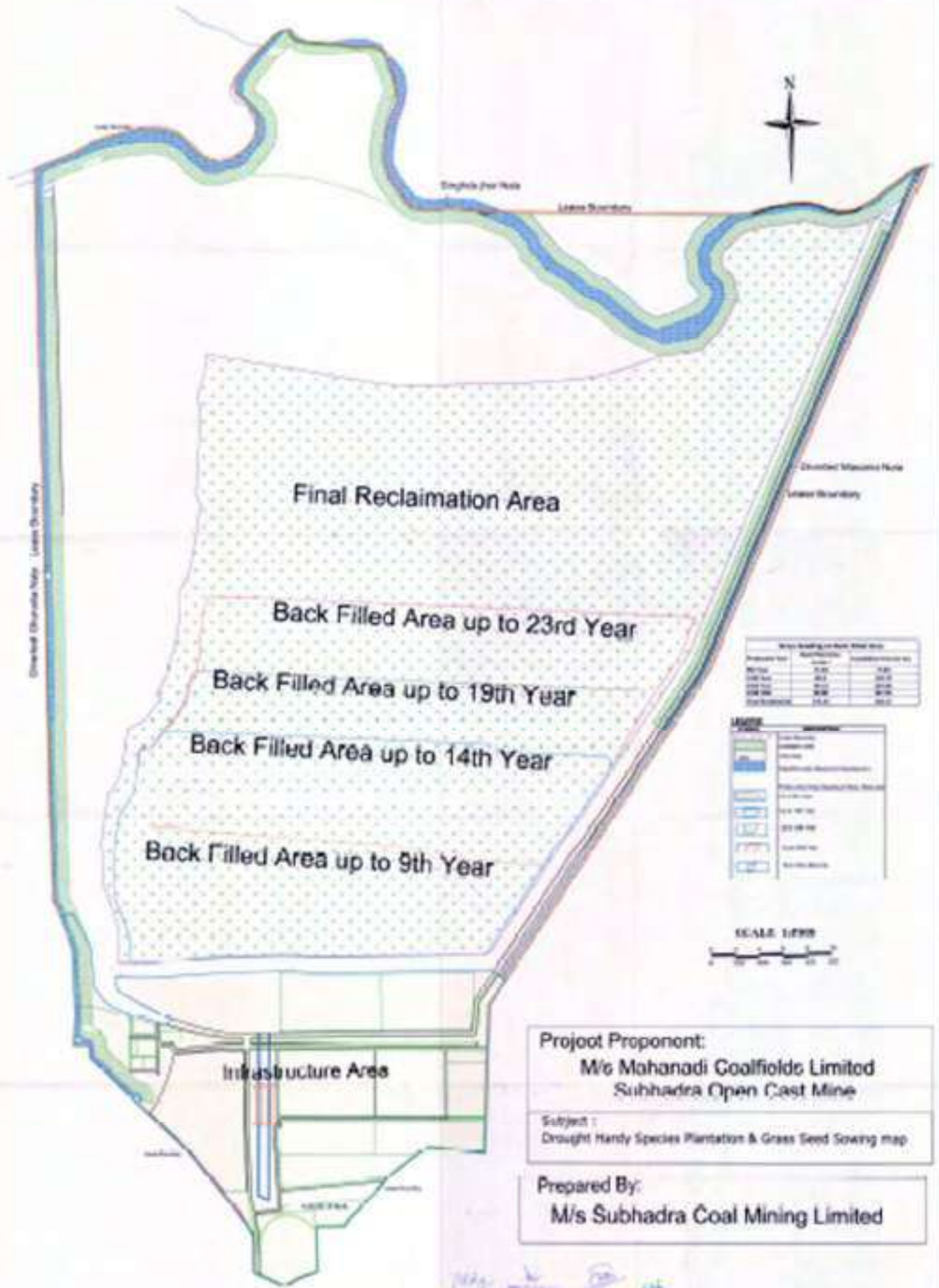

Divisional Forest Officer
Angul Division
Angul, Division

APPROVED FOR Rs. 2,00,52,214/-


Regional Chief Conservator
of Forests, Angul Circle.

Drought Hardy Species Plantation & Grass Seed Sowing Map

ANNEXURE -I



Project Proponent:
M/s Mahanadi Coalfields Limited
Subhadra Open Cast Mine

Subject :
 Drought Hardy Species Plantation & Grass Seed Sowing map

Prepared By:
M/s Subhadra Coal Mining Limited

COST OF GRASS SEED SOWING PER HACTARE

Wage Rate Rs.450/-

Sl. No.	Purpose	No of Labour/ Quantity of materials	Rate (Rs.)	Amount (Rs.)
1	Spreading of good earth and FYM including carriage	20 Nos	450.00	9000.00
2	Adding FYM and good earth	2 TL FYM	1,000/ TL FYM	4000.00
		2 TL good earth	1,000/TL Good earth	
3	Cost of grass seed 50 kg/Ha.		100/kg	5000.00
4	Broadcast sowing	20 nos.	450.00	9000.00
Total				27000.00



MCL

SUBHADRA OPEN CAST COAL PROJECT

***Scheme
for***

**CONSTRUCTION OF CHECK DAMS, RETENTION/TOE
WALLS TO ARREST SLIDING DOWN OF THE
EXCAVATED MATERIAL ALONG THE CONTOUR**

in compliance

with

Condition No.11(c) of

Stage-I approval granted vide

Letter No.8-06/2023-FC, Dated.05.12.2023

of Govt. of India, Ministry of Environment, Forests

& Climate Change, New Delhi.

for

Diversion of 125.24 Ha. (including 1.47 Ha. of Safety Zone)

of Forest Land within 1111.85 Ha. of ML area of Subhadra OCP

for Non forestry use U/s-2 (ii) of FC Act-1980

**in villages Kankarei, Pirakhaman, Chhotabereni, Balichandrapur,
Raijharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuabola, Kumunda
and Jaipur RF of Chhendipada and Talcher Tahasil,**

Angul District, Odisha.

M/s. Mahanadi Coalfields Limited

SCHEME FOR CONSTRUCTION OF CHECK DAMS, RETENTION/TOE WALLS TO ARREST SLIDING DOWN OF THE EXCAVATED MATERIAL ALONG THE CONTOUR IN SUBHADRA OCP OF M/S MAHANADI COALFIELDS LTD. IN ANGUL FOREST DIVISION OF ANGUL DISTRICT OF ODISHA.

1. INTRODUCTION

Subhadra Open Cast Coal Mine is a Greenfield opencast mining project spread over a lease area of 1111.85 Ha. in Kankarej, Pirakhaman, Chhotabereni, Balichandrapur, Raijharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuabol, Kumunda villages and Jaipur RF, Chhendipada & Talcher Tahasil, Dist-Angul, Odisha.

Ministry of Coal, Government of India has allotted this coal block in favour of M/s. Mahanadi Coalfields Limited vide allotment order no. NA-103/1/2021-NA dated 18-11-2021.

As per approved Mining Plan and Mine Closure Plan, the mine life is 36 years. Out of total 1111.85 Ha. of Mining Lease area, total forest land involved in 125.24 Ha. (Revenue forest and DLC of 124.49 Ha. + Reserve forest of 0.75 Ha.)

Mahanadi Coalfields Limited has named Utkal-A and West of Gopalprasad (west) coal block as Subhadra Open Cast Project vide their letter no. 539-H dated 26.09.2019.

M/s. Mahanadi Coalfields Limited submitted the Forest Diversion proposal to obtain Forest Clearance from MoEF & CC, Government of India for 125.24 Ha. of forest land U/s 2(ii) of the Forest (Conservation) Act 1980. The Stage-I Forest Clearance approval over 125.24 ha of Forest Land Under Section- 2 (ii) (including 1.47 ha. of Safety Zone) of the Forest (Conservation) Act, 1980 has been granted by MoEF & CC, Government of India vide their Letter No. 8-06/2023-FC, dated 05.12.2023, where in it has been stipulated as per **Condition No. 11(c) for construction of Check Dams, retention/toe walls to arrest sliding down of the excavated material along the contour in accordance with the approved scheme.**

2. LOCATION

The mining lease area is covered in the Survey of India Topo sheet No. F45T1 and F45S13 and situated between the latitude 20° 55' 56.225" N to 20° 58' 47.344" N, and longitude 84° 58' 42.383" E and 85° 0' 50.476" E. The above ML area covering villages are Kankarei, Pirakhaman, Chhotabereni, Balichandrapur, Raijharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuabola Kumunda and Jaipur RF in Chhendipada & Talcher Tahasil, Angul Forest Division Angul District Odisha.

LOCATION MAP

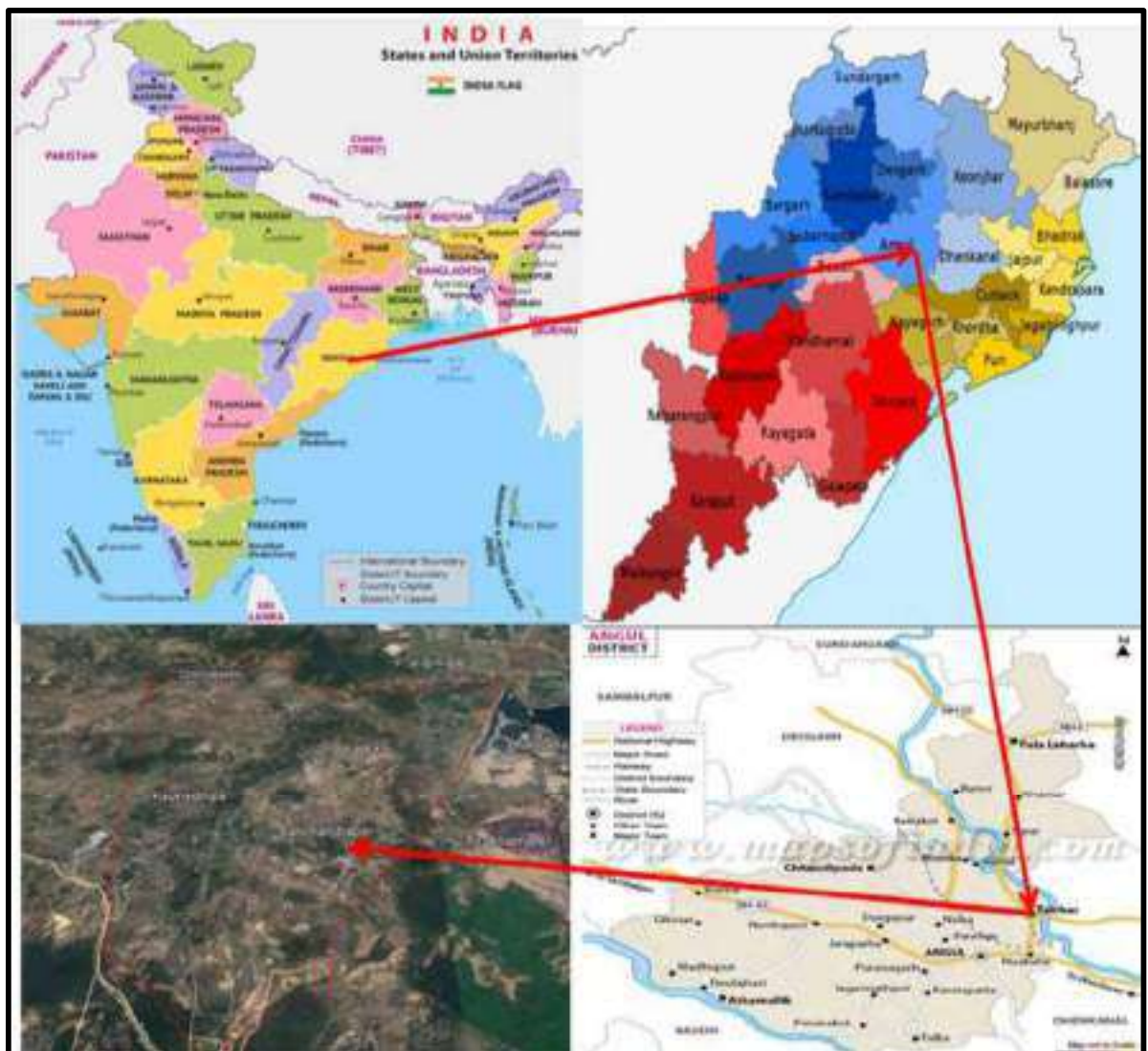


Fig-1. Location Map of Subhadra OCP, MCL

3. TOPOGRAPHY

The surface topography is gently undulating and the ground is generally being used for cultivation purposes by the villagers. Around south western part, the surface topography is mildly undulating and slopes towards north. The ground level rises towards south-eastern corner of the block with highest elevation above Mean Sea Level of about 167.50 meter.

4. LAND USE PATTERN

The proposed land use pattern of 1111.85 Ha. of mining lease area as per approved Mining Plan and Mine Closure Plan is given below:

Table 1: Purpose wise break up forest and non-forest land

Sl. No.	Type of Land Use	Forest Land in Ha				Total Forest Land in Ha (3+4+5+6)	Non-Forest Land in Ha		Total non-forest land in Ha (8+9)	Total Land in Ha (7+10)
		RF	PRF	Rev. forest	DLC		Govt. land	Private land		
1	2	3	4	5	6	7	8	9	10	11
1	Mining Excavation Area	0.71	0.00	33.82	55.00	89.53	225.73	566.02	791.75	881.28
2	Safety Zone 7.5Mtr along Mining lease boundary	0.04	0.00	0.77	0.66	1.47	5.56	4.76	10.32	11.79
3	Infrastructure	0.00	0.00	13.00	21.24	34.24	47.83	61.43	109.26	143.50
4	Others (Top soil dump, Coal stock Yard, External dump, Nalla diversion)	0.00	0.00	0.00	0.00	0.00	10.54	64.74	75.28	75.28
5	Rationalisation area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.75	0.00	47.59	76.90	125.24	289.66	696.95	986.61	1111.85

5. DETAILS OF FOREST LAND WITHIN THE ML AREA

Forest land to be worked for mining and allied purpose-123.77 Ha

Area set aside for Safety Zone

1.47 Ha

125.24 Ha

6. SOIL TYPE

The areas are filled up with colluvial soil with sand, silt deposits and clay of older alluvium, older and younger floodplain deposits. In most of the area the soil is moderately coarse in nature whereas it is loamy in the cultivated land. The area has three nalas namely Singada Jhor, Ghurudia nala and Masani jhor. The soil has been deposited in the valley area mostly from these nalas. There were two periods of glacial advance and retreat during the deposition of Talcher sediments.

7. CLIMATE

The lease area lies in sub-tropical region where climate is characterized by an oppressively hot summer and cool winter. Summer is typically from April to July when monthly temperature ranges from a maximum of 45.50 degree centigrade during day time to a minimum of 15 Degree Centigrade at night time. Winter is from November to February when the maximum temperature during daytime goes to 37 Degree Centigrade and minimum temperature at night- becomes as low as 6.70 Degree Centigrade. The average annual rainfall as recorded at IMD observatory at Angul is 1277 mm.

8. DRAINAGE

Brahmani River, flowing approximately north to south along the eastern boundary of the Talcher coalfield, provides the main drainage of the region. This river is fed by seasonal nalas, viz. Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor and a few small nalas. From the eastern boundary of the block, the Brahmani river lies eastward at a distance of about 20 km.

Singada Jhor flows eastward and forms major part of the northern boundary of the block. Downstream Singada Jhor merges into Brahmani River at the north eastern part of the coalfield. Singada Jhor, Ghurudia nala and Masani jhor flowing from south to north within the block feed Singada Jhor for most part of the year and control the drainage pattern of the block. Small ponds and dug wells are common in this block and are utilized for irrigation and drinking purpose.

9. OBJECTIVE OF THE SCHEME

The main objective of the present scheme is to fulfil the Condition No. 11(c) of the Stage-I approval granted vide Letter No- 8-06/2023-FC dt. 05.12.2023 of MoEF & CC, Government of India to undertake “**Construction of Check dams, Retention /Toe walls to arrest sliding**

down of the excavated material along the contour in accordance with the approved scheme”.

The different steps proposed to be adopted are as under:

- a) To prevent erosion of sediment due to surface runoff.
- b) To prevent of obstruction of natural water sources.
- c) To complete construction activities efficiently before surface soil is exposed.
- d) To prevent overflow of eroded soil from the mining areas to the natural streams and habitations.

10. PROPOSED METHODOLOGY

To achieve the above objectives, it has been proposed to take up both biological and structural works to prevent erosion of surface soil and water conservation. The vegetative method is to be adopted mostly around the OB dumping sites and along the proposed diversion of Ghurudia Nala & Masania Nala. The structural works are suggested around OB dumping sites in the lower reaches.

a) Structural Measures

Vegetative means of erosion control are the most feasible and economic measures. However, as the pressure on land is increasing, it is necessary to bring even highly eroded land for utilization. In this type of land, vegetative measures only are not adequate to keep down the erosion. Some structural measures are required to be undertaken along with vegetative measures. Structural measures, therefore, serve as supplementary to vegetative measures. The approved Mining Plan and Mine Closure Plan has prescribed some structural measures to be undertaken to minimise soil erosion which are enlisted below:

i) Construction of Retaining wall

It is proposed to construct Retaining wall around the temporary external OB dump area with a length 9252 meter as per the approved mining plan.

ii) Construction of Garland drain

From the outer side of the retaining wall a shallow trench (1.0 m wide x 1.50 m deep) will be dug around the temporary external OB Dump area for storage of run-off accumulated for draining surface water before it is flown to the natural water course. The proposed Garland drain will be having a for length of 6750 meter.

iii) Terracing of OB Dump Slope

It is proposed to construct berm & terraces over a length of 25010 m. on the proposed Dumps considering the volume of OB materials & the area earmarked for dumping. The slope of individual terrace should be within the permissible range considering the angle of repose of the soil and space available, thereby maintaining the angle of repose at less than 28°. The terracing will be done through the internal resources by deploying the operating mining equipment. All these operations will be carried out after sufficient deposition of OB. When OB dump will partially mature, the work will be executed.

iv) Construction of Settling Tanks

It is proposed to construct 2 nos. of settling tanks at North-East (Settling tank no-1) & North-West corner (Settling tank no-2) for sedimentation of run-off water that will come out of garland drain.

v) De-siltation of Settling Tank

The de-silting works of the settling tank will be taken up at regular intervals to prevent sedimentation and choking of streams. This de-silting of settling tank will provide space and base to hold the sediment laden runoff thereby allowing settling and clear water to flow down. This de-silting work will be preferably undertaken once in a year before & after monsoon. The implementation of the plans will be site specific in nature depending upon the severity of the sedimentation and choking of stream.

The location of different structural measures proposed above from sl no i) to sl no iv) are shown in a map which is attached as Annexure-I. Further the structural measures that are proposed to be undertaken in order to minimise soil erosion and choking of streams are dealt in detail including the financial forecasts for the corresponding structural measures and do form part of other schemes e.g.

b) Slope of the proposed Dump

During the conceptual period, 613.18 Mcum of waste will be generated. Out of this, 103.72 Mcum of waste will be temporarily kept in an external dump on the north side within the block boundary. A temporary dump area with a perimeter of 9252 meters has been earmarked for this purpose. After 12 production years, the waste will be re-handled and backfilled into the quarry void along with in-situ waste. The overall slope of the dump during the planned period will be maintained at a 28°.

c) Management

Re-treating fashion will be adopted to dump the total waste material generated during planned period. Three (3) terraces will be formed during planned period of 5 years in the entire proposed dump. Each terrace will have inward slope with catch drain at inward side of the terrace. The catch drain of the individual terrace will be connected to the garland drain outside the periphery of the dump. These catch drain will preferably have half concrete open pipe followed by settling tank to avoid wash offs. Each terrace will have a provision of berms at the outer end to reduce gully formation due to rain water wash offs.

To control erosion in the proposed waste dumps, regular compaction, development of terraces and vegetation are proposed to be done. Also, the retaining wall and garland drain for the proposed waste dump will be constructed to arrest wash-offs from the dump. It is proposed to construct both the retaining wall and garland drain at the end of 1st year plan period. No proposal has been given for the rehabilitation of the dump during planned period of five (5) years.

11. INSPECTION, MONITORING AND EVALUATION

Proper inspection, monitoring and evaluation will be done in-house by designated authorities of MCL under supervision of Forest Department.

12. MOTIVATION OF PEOPLE

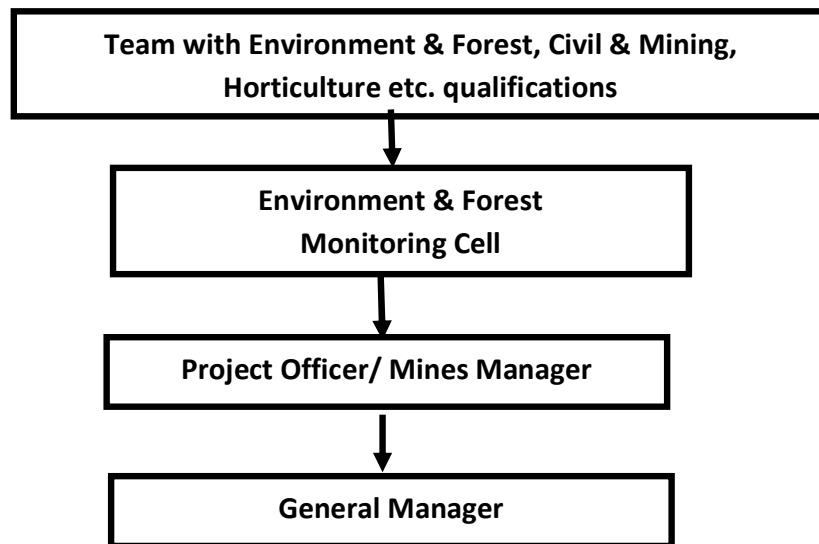
The villagers / VSS Committee members of the adjoining villages are to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the adjoining villages and resolution will be passed to support plantation activities. For motivation of the villagers/ VSS Committee members, they will be provided incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure for this purpose.

13. EXECUTING AGENCY

The work will be executed by the User Agency i.e., M/s Mahanadi Coalfields Limited through dedicated departments manned by technically qualified persons with outsourced man and

machinery as and when required. To facilitate this, the user agency shall establish its own executing and supervision cells along with required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department.

EXECUTING AGENCY



14. REQUIREMENT OF FUNDS

The financial forecast for construction of Retention wall, Garland drain & Setting Tank to arrest sliding down of the excavated material will be Rs. 9,11,63,208.00 (Rupees Nine Crores Eleven Lakhs Sixty-Three Thousand Two Hundred Eight) only.

FINANCIAL FORECAST

(Wage Rate @ Rs. 311.00 according to Base Cost Norm and Rate/ Ha. for the year 2024-25 as per approved Matrix)

Sl No.	Description of the Work	Fund Required (In Rs.)
1.	Retaining Wall 9252 m.	5,36,43,096.00
2.	Garland Drains 6750 m.	45,90,000.00
3.	Construction of Settling Tank No-1	42,01,354.00
4.	Construction of Settling Tank No-2	26,25,846.00
5.	De-siltation work for Garland drains intermittently and settling pond on L.S.	5,00,000.00
5.	Repairs to retaining wall on L.S.	5,00,000.00
SUB TOTAL (1)		6,60,60,296.00
7.	15% of the total cost for motivation of VSS / People involved	99,09,044.00
SUB TOTAL (2)		7,59,69,340.00
8.	Price escalation @ 20%	1,51,93,868.00
GRAND TOTAL (1+2)		9,11,63,208.00


(Rupees Nine Crores Eleven Lakhs Sixty-three Thousand Two Hundred Eight only)

Note: The above-mentioned expenditure has already been included in the approved Mining Plan and Mine Closure Plan.

M/s Mahanadi Coalfields Ltd. do hereby undertake to execute the item of works mentioned in this scheme in a phased manner at the project cost.


M/s Mahanadi Coalfields Ltd.
सुभद्रा क्षेत्र
General Manager
MCL, Subhadra Area

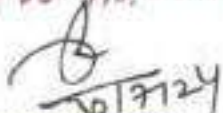

Project Head
Subhadra Coal Mining Ltd., Angul


Staff Officer (Survey)
MCL, Subhadra Area

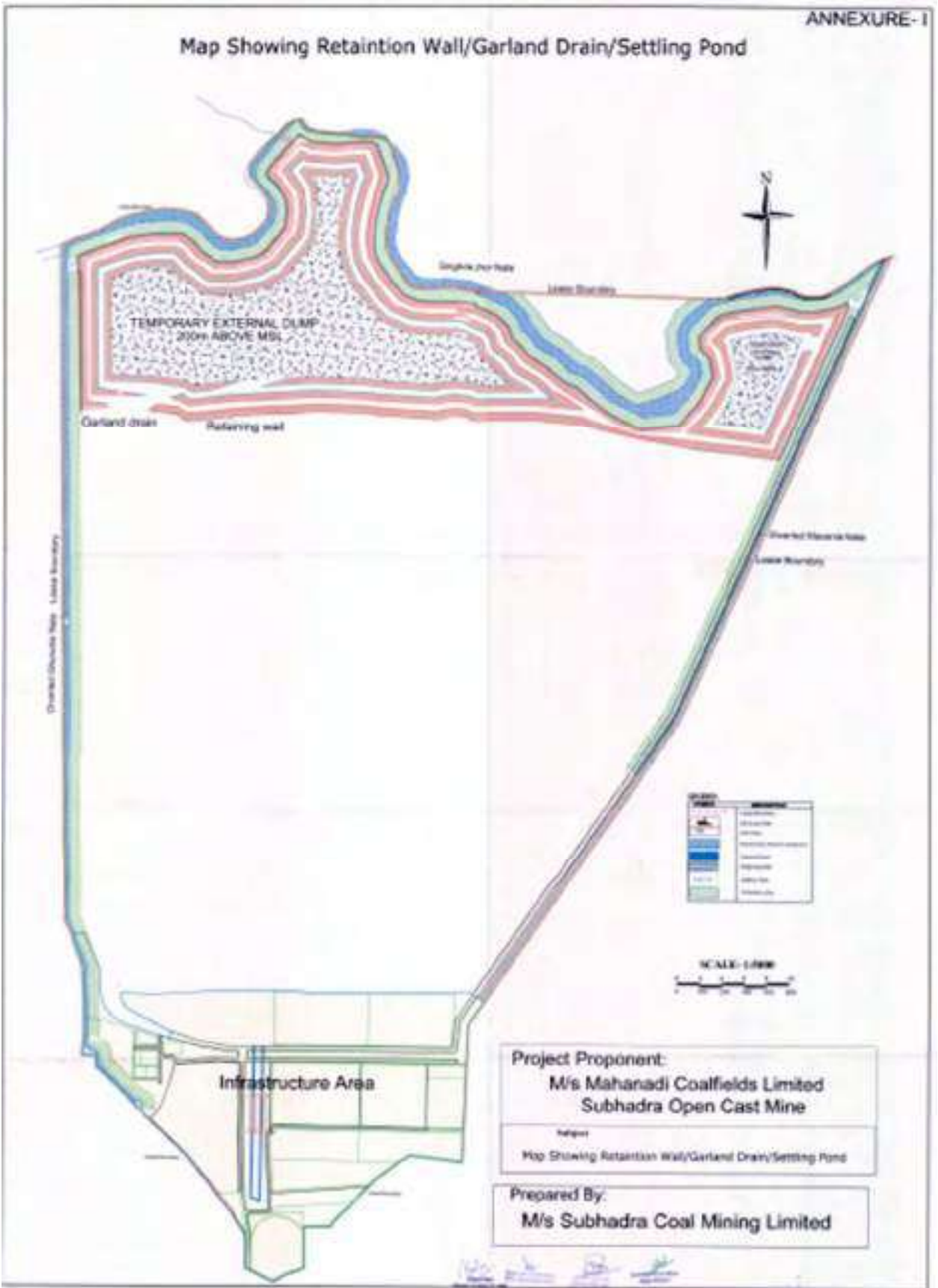
Countersigned

Divisional Forest Officer
Angul Division
Angul, Division

Approved for DS- 9.11.63/208/-


20/7/24
Regional Chief Conservator
of Forests, Angul Circ's.

Map Showing Retainment Wall/Garland Drain/Settling Pond



Project Proponent:
M/s Mahanadi Coalfields Limited
Subhadra Open Cast Mine

Prepared By:
M/s Subhadra Coal Mining Limited

ESTIMATE FOR CONSTRUCTION OF RETAINING WALL

Wage RatRs.450/Day

Sl.No	Job Description	No	Length (in mtr.)	Width (in mtr.)	Height (in mtr.)	Unit	Quantity	Rate	Amount
1	Earth work is hard soil or gravelly soil within 50 mtr initial lead & 1.50 mtr initial lift including rough dressing & breaking clods to maximum 5.00cm to 7.00 cm & laying layers not exceeding 0.30mtr in depth and as per the direction of the engineer -in-charge.	1	3000	0.7	0.7	CUM	1470	167.81	246680.7
2	Filling in foundation and plinth with sand watered and rammed	1	3000	0.7	0.075	CUM	157.5	323.11	50889.825
3	Cement concrete M-10 grade (PCC 1:4:8 for foundation) with crushed broken granite coarse aggregate of size 40 mm downgraded mixed in concrete mixture including cost conveyance and royalty of all materials, machineries and labour and laying in head works and canal structures with required lifts and de-lifts as per direction of Engineer-in-charge.	1	3000	0.6	0.075	CUM	135	3746.5	505777.5
4	BRICK WORK for foundation having crushing strength not less than 75 kg/cm ² with dimensional tolerance \pm 8 percent in cement mortar (1:6) in foundation and plinth per cum.	1	3000	0.5	0.3	CUM	450	3592.4	1616580
		1	3000	0.375	0.3	CUM	337.5	3592.4	1212435
5	BRICK WORK for S/S, having crushing strength not less than 75 kg/cm ² with dimensional tolerance \pm 8 percent in cement mortar (1:6) in foundation and plinth per cum	1	3000	0.25	2.5	CUM	1875	3592.4	6735750
6	Concrete for plinth M-20 grade with crushed broken granite coarse aggregate of size 20mm downgraded mixed plant including cost of all materials, machineries and labour and transportation of mixed concrete	1	3000	0.25	0.1	CUM	75	4496.7	337252.5
7	Concrete for coping M-20 grade with crushed broken granite coarse aggregate of size 20mm downgraded mixed plant including cost of all materials, machineries and labour and transportation of mixed concrete	1	3000	0.35	0.025	CUM	26.25	4496.7	118038.375
								Total:	1,08,23,404.00
<u>1,08,23,404 X 450</u> 280									1,73,94,756.00

(Rupees One Crore Seventy-Three Lakhs Ninety-Four Thousand Seven Hundred Fifty-Six only)

The cost for construction of Retaining Wall for 3000m is 1,08,23,404/- at Wages@ Rs.280.00

The cost for construction of Retaining Wall for 3000m is 1,73,94,756/- at Wages@450.00

The cost for construction of Retaining Wall for 1m is $17394756 \div 3000 = 5798.25$ say 5798/-**The cost of Retaining Wall for 9252 m is $5798 \times 9252 = 53643096$ /-**

Detail Estimate of Retaining wall

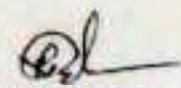
Annexure -II
Wage rate Rs.311/Day

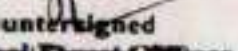
ESTIMATE FOR CONSTRUCTION OF RETAINING WALL									
Sl. No.	JOB DESCRIPTION	NO	LENGTH	WIDTH	HEIGHT	UNITS	QUANTITY	RATE Rs.	AMOUNT
1	Earth work is hard soil or gravelly soil within 50m initial lead and 1.5m initial lift including rough dressing and breaking clods to maximum 5cm to 7cm and laying in layers not exceeding 0.3m in depth and as per the direction of the Engineer-in-charge.	1	3000	0.7	0.7	CUM	1470	167.81	246680.7
2	Filling in foundation and plinth with sand watered and rammed.	1	3000	0.7	0.075	CUM	157.5	323.11	50889.825
3	Cement concrete M-10 grade (PCC 1:4:8 for foundation) with crushed broken granite coarse aggregate of size 40mm downgraded mixed in concrete mixture including cost conveyance and royalty of all materials, machineries and labour and laying in head works and canal structures with required lifts and de-lifts as per direction of Engineer-in-charge.	1	3000	0.6	0.075	CUM	135	3746.5	505777.5
4	BRICK WORK for foundation having crushing strength not less than 75 Kg/cm ² with dimensional tolerance ±8 percent in cement mortar (1:6) in foundation and plinth per cum	1	3000	0.5	0.3	CUM	450	3592.4	1616580
		1	3000	0.375	0.3	CUM	337.5	3592.4	1212435


5	BRICK WORK for S/S, having crushing strength not less than 75 Kg/cm ² with dimensional tolerance ± 8 percent in cement mortar (1:6) in foundation and plinth per cum.	1	3000	0.25	2.5	CUM	1875	3592.4	6735750
6	Concrete for plinth M-20 grade with crushed broken granite coarse aggregate of size 20mm downgraded mixed in batching and mixed plant including cost of all materials, machineries and labour and transportation of mixed concrete.	1	3000	0.25	0.1	CUM	75	4496.7	337252.5
7	Concrete for coping M-20 grade with crushed broken granite coarse aggregate of size 20mm downgraded mixed in batching and mixed plant including cost of all materials, machineries and labour and transportation of mixed concrete.	1	3000	0.35	0.025	CUM	26.25	4496.7	118038.375
								Total:	10823403.90
								Say	10823404.00
								$\frac{10823404.00 \times 311.00}{280}$	12021709.40 Or 1,20,21,709

(Rupees One Crore Twenty Lakhs Twenty One Thousand Seven Hundred & Nine only)


Authorized Signatory
S. K. PATEL
 Executive Director (P&T)-I
 Project & Technical Department
 National Aluminium Company Ltd
 Bhubaneswar-751061


 Asst. Conservator of Forest
 Angul Division


 Countersigned
 Divisional Forest Officer
 Angul Division


 Forest Range Officer
 Chhendipada Range

DETAILS ESTIMATE OF CONSTRUCTION OF GARLAND DRAIN

Wage rate Rs.450.00/day

Sl No	Description of items	No	Length (in mtr.)	Width (in mtr.)	Height (in mtr.)	Qty	Unit	Rate	Amount
1	Cleaning of Jungles & bushes	1	3000	7		21000	Sqm	1.7	35,700.00
2	Earth work in hard soil in embankment roads within 50 mtr initial lead & 1.5 mtr initial lift including rough dressing & breaking clods to Maximum 5.00 cm to 7.00 cm & laying layers not exceeding 0.30 mtr depth as per specification.	1	3000	3	0.75	6750	Cum	167.81	11,32,717.50
3	Ramming and rolling earth work with light H.R.R. in embankments in layers not exceeding 0.30 m in depth as directed by the Engineer-in-charge.	1	3000	3	0.75	6750	Cum	14.22	95,985.00
4	Rough Stone Dry Packing with local boulder only labour charges(Local boulder will be supplied by the Company through contractual manner)	2	3	2	0.3	3.6	Cum	1271.1	4575.96
								Total	12,68,978.00
									1268978.00X450 280
									2039429.00

The cost for construction of Garland Drain for 3000m is 1268978/- at wages@ Rs.280.00

The cost for construction of Garland Drain for 3000m is 2039429/- at Wages@ Rs.450.00

The cost for construction of Garland Drain for 1m is $2039429 \div 3000 = 679.80$ say 680/-

The cost for construction of Garland Drain for 6750 m is $680 \times 6750 = 4590000$ /-

DETAIL ESTIMATE OF CONSTRUCTION OF GARLAND DRAIN

Annexure -III

Wage Rate- Rs.311.00/-

Sl No	Description of Items	No	Length	Width	Height	Qty	Unit	Rate	Amount
1	Cleaning of Jungles & bushes	1	3000	7	-	21000	Sqm	1.7	35,700.00
2	Earth work in hard soil in embankment roads with in 50 mtr initial lead & 1.5mtr initial lift including rough dressing & breaking clods to Maximum 5.00 cm to 7.00 cm & laying layers not exceeding 0.30 mtr depth as per specification.	1	3000	3	0.75	6750	Cum	167.81	11,32,717.50
3	Ramming and rolling earth work with light H.R.R. in embankments in layers not exceeding 0.30m in depth as directed by the Engineer-in-charge	1	3000	3	0.75	6750	Cum	14.22	95,985.00
4	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be Supplied by the Company through contractual manner)	2	3	2	0.3	3.6	Cum	1271.1	4575.96
Total:									12,68,978.46
									Or,
									12,68,978.00
									14,09,471.99
									Or,
									14,09,472.00
<u>1268978.00 x 311.00</u>									
280									

Range Officer
Dipada Range

Authorized Signatory

S. K. PATEL

Executive Director (P&T)
Project & Technical Department
National Aluminium Company Ltd
Bhubaneswar-751001

asst Conservator of Forest
Angul Division

Countersigned
Divisional Forest Officer
Divisional Forest Officer
Angul Division

Annexure-IV

ESTIMATE FOR CONSTRUCTION OF SETTLING TANK No-1

Wage rate Rs.450.00/day

Sl No	Description of items	No	Length	Width	Height	Qty	Unit	Rate	Amount	
1	Earth work in hard soil in embankment roads within 50 mtr initial lead & 1.50 mtr initial lift including rough dressing & breaking clods to Maximum 5.00 cm to 7.00 cm & laying layers not exceeding 0.30 mtr depth as per specification.	1	120	40	1.50	7200	Cum	167.8	12,08,160.00	
2	Specification approved by department along with proper compaction with H.R.R. Excavation	1	120	40	1.50	7200	Cum	14.2	1,02,240.00	
3	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be supplied by our Company)	1	120	40	0.20	960	Cum	1271.1	12,20,256.00	
4	Transportation charges for 5.00 km lead by truck load from quarry to work site with all cost of, labour, T & P etc. all complete in all respect as per specification and direction of			As same as item No-3			960	Cum	87.0	83520.00
	Rate per one No Settling tank @ wages rate Rs. 280									26,14,176.00
	<u>261476X450</u> 280									42,01,354.00

Cost for construction of Settling tank No-1 = Rs. 42,01,354/-

ESTIMATE FOR CONSTRUCTION OF SETTLING TANK No-2

Wage rate Rs.450.00/day

Sl No	Description of items	No	Length	Width	Height	Qty	Unit	Rate	Amount	
1	Earth work in hard soil in embankment roads within 50 mtr initial lead & 1.50 mtr initial lift including rough dressing & breaking clods to Maximum 5.00 cm to 7.00 cm & laying layers not exceeding 0.30 mtr depth as per specification.	1	60	50	1.50	4500	Cum	167.8	7,55,100.00	
2	Specification approved by department along with proper compaction with H.R.R. Excavation	1	60	50	1.50	4500	Cum	14.2	63,900.00	
3	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be supplied by our Company)	1	60	50	0.20	600	Cum	1271.1	7,62,660.00	
4	Transportation charges for 5.00 km lead by truck load from quarry to work site with all cost of, labour, T & P etc. all complete in all respect as per specification and direction of			As same as item No-3			600	Cum	87.0	52,200.00
	Rate per one No Settling tank @ wages rate Rs. 280									16,33,860
	<u>1633860X450</u> 280									26,25,846.00

Cost for construction of Settling tank No-2 = Rs. 2625846.00/-

ESTIMATE FOR CONSTRUCTION OF SETTLING TANK

Annexure -IV

Wage rate Rs.311.00/Day

Sl. No.	Description of items	No	Length	Width	Height	Qty	Unit	Rate	Amount
1	Earth work in hard soil in embankment roads with in 50 mtr initial lead & 1.50 mtr initial lift including rough dressing & breaking clods to Maximum 5.00 cm to 7.00 cm & laying layers not exceeding 0.30 mtr depth as per specification.	1	4.00	3.00	1.50	18.0	Cum	167.8	3020.6
2	Specification approved by department along with proper compaction with H.R.R Excavation	1	4.00	3.00	1.50	18.0	Cum	14.2	256.0
3	Rough Stone Dry Packing with local boulder only labour charges (Local boulder will be Supplied by our Company)	1	4.00	6.00	0.20	4.80	Cum	1271.1	6101.3
4	Transportation charges for 5.00 km lead by truck load from quarry to work site with all cost of, labour, T. & p. etc. all complete in all respect as per specification and direction of	As same as item No-3				4.80	Cum	87.0	417.4
Rate per one No Settling tank									9795.30
Cost of 01 no. Settling tank									9795.30
$\frac{9795.30 \times 311}{280}$									10,879.77 Or, 10,880.00

Authorized Signatory

S. K. PATEL

Executive Director (P&T)
Project & Technical Department
National Aluminium Company Ltd
Bhubaneswar-751001Forest Range Officer
Chhendipada RangeAsst. Conservator of Forest
Angul DivisionCountersigned
Divisional Forest Officer
Angul Division
Angul, Division



SUBHADRA OPEN CAST COAL PROJECT

Scheme

for

STABILIZE THE OVERBURDEN DUMPS BY APPROPRIATE GRADING/BENCHING, SO AS TO ENSURE THAT ANGLES OF REPOSE AT ANY GIVEN PLACE IS LESS THAN 28⁰

in compliance

with

Condition No.11(d) of

Stage-I approval granted vide

Letter No.8-06/2023-FC, Dated.05.12.2023

of Govt. of India, Ministry of Environment, Forests

& Climate Change, New Delhi.

for

Diversion of 125.24 Ha. (including 1.47 Ha. of Safety Zone)

of Forest Land within 1111.85 Ha. of ML area of Subhadra OCP

for Non forestry use U/s-2 (ii) of FC Act-1980

in villages Kankarei, Pirakhaman, Chhotabereni, Balichandrapur, Raijharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuabola, Kumunda and Jaipur RF of Chhendipada and Talcher Tahasil,

Angul District, Odisha.

M/s. Mahanadi Coalfields Limited

SCHEME FOR STABILIZE THE OVERBURDEN DUMPS BY APPROPRIATE GRADING/BENCHING, IN ACCORDANCE WITH THE APPROVED SCHEME, SO AS TO ENSURE THAT ANGLES OF REPOSE AT ANY GIVEN PLACE IS LESS THAN 28⁰

1. INTRODUCTION

Subhadra Open Cast Coal Mine is a Greenfield opencast mining project spread over a lease area of 1111.85 Ha. in Kankarei, Pirakhaman, Chhotabereni, Balichandrapur, Raijharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuaboli, Kumunda villages and Jaipur RF, Chhendipada & Talcher Tahasil, Dist-Angul, Odisha.

Ministry of Coal, Government of India has allotted this coal block in favour of M/s. Mahanadi Coalfields Limited vide allotment order no. NA-103/1/2021-NA dated 18-11-2021. Mahanadi Coalfields Limited has named Utkal-A and West of Gopalprasad (west) coal block as Subhadra Open Cast Project vide their letter no. 539-H dated 26.09.2019.

As per approved Mining Plan and Mine Closure Plan, the mine life is 36 years. Out of total 1111.85 Ha. of Mining Lease area, total forest land involved is 125.24 Ha. (Revenue forest and DLC of 124.49 Ha. + Reserve forest of 0.75 Ha.)

M/s. Mahanadi Coalfields Limited submitted the Forest Diversion proposal to obtain Forest Clearance from MoEF & CC, Government of India for 125.24 Ha. of forest land U/s 2(ii) of the Forest (Conservation) Act 1980.

The Stage-I Forest Clearance approval over 125.24 ha of Forest Land Under Section- 2 (ii) (including 1.47 ha. of Safety Zone) of the Forest (Conservation) Act, 1980 has been granted by MoEF & CC, Government of India vide their Letter No. 8-06/2023-FC, dated 05.12.2023, where in it has been stipulated as per **Condition No. 11(d) for stabilize the overburden dumps by appropriate grading/benching, in accordance with the approved scheme, so as to ensure that angles of repose at any given place is less than 28⁰**

2. LOCATION

The mining lease area is covered in the Survey of India Topo sheet No. F45T1 and F45S13 and situated between the latitude $20^{\circ} 55' 56.225''$ N to $20^{\circ} 58' 47.344''$ N, and longitude $84^{\circ} 58' 42.383''$ E and $85^{\circ} 0' 50.476''$ E. The above ML area covering villages are Kankarei, Pirakhaman, Chhotabereni, Balichandrapur, Rajjharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuabola Kumunda and Jaipur RF in Chhendipada & Talcher Tahasil, Angul Forest Division Angul District Odisha.

LOCATION MAP

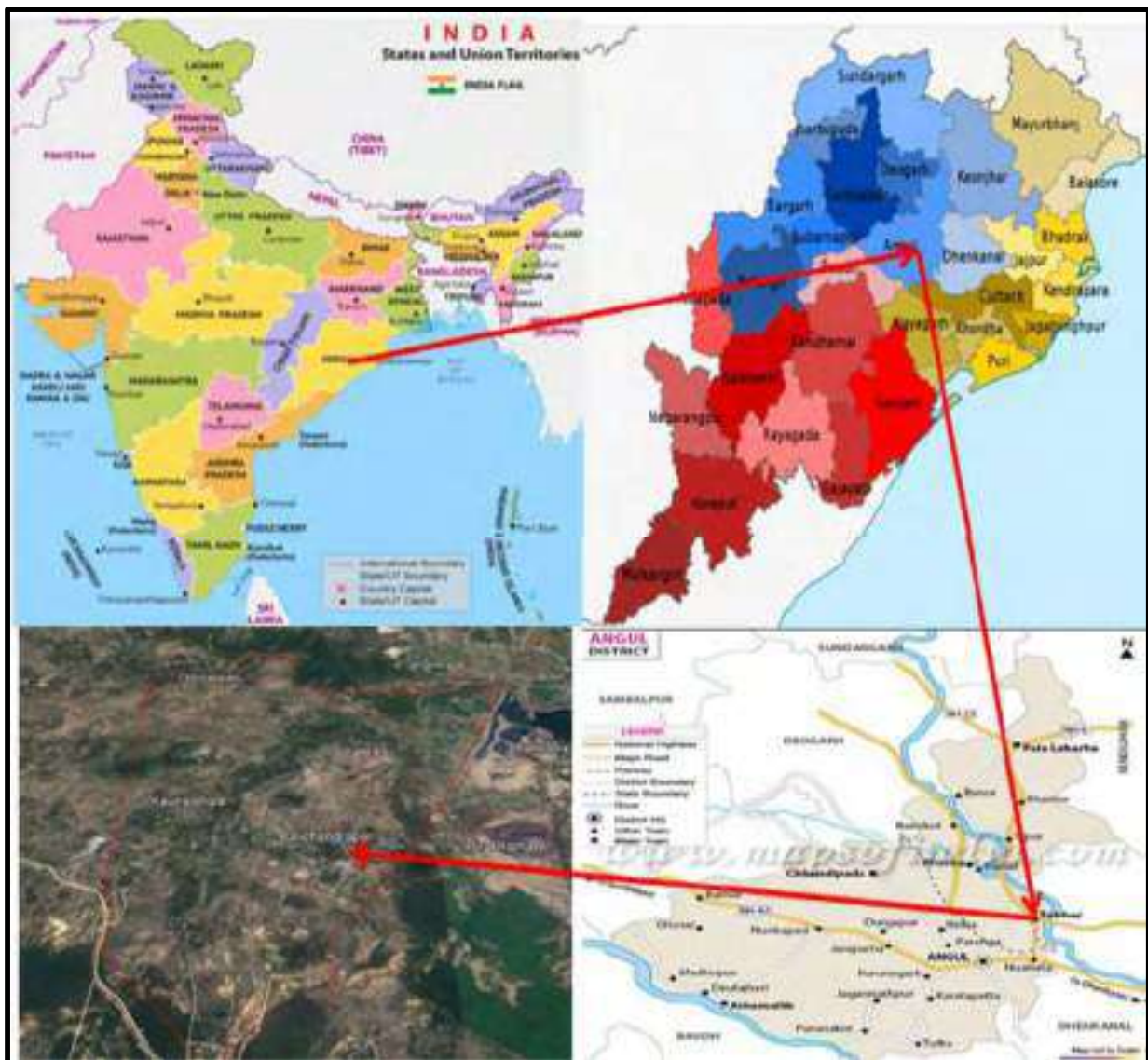


Fig-1. Location Map of Subhadra OCP, MCL

3. TOPOGRAPHY

The surface topography is gently undulating and the ground is generally being used for cultivation purposes by the villagers. Around south western part, the surface topography is mildly undulating and slopes towards north. The ground level rises towards south-eastern corner of the block with highest elevation above Mean Sea Level of about 167.50 meter

4. LAND USE PATTERN

The proposed land use pattern of 1111.85 Ha. of mining lease area as per approved Mining Plan and Mine Closure Plan is given below:

Table 1: Purpose wise break up forest and non-forest land

Sl. No.	Type of Land Use	Forest Land in Ha				Total Forest Land in Ha (3+4+5+6)	Non-Forest Land in Ha		Total non-forest land in Ha (8+9)	Total Land in Ha (7+10)
		RF	PRF	Rev. forest	DLC		Govt. land	Private land		
1	2	3	4	5	6	7	8	9	10	11
1	Mining Excavation Area	0.71	0.00	33.82	55.00	89.53	225.73	566.02	791.75	881.28
2	Safety Zone 7.5Mtr along Mining lease boundary	0.04	0.00	0.77	0.66	1.47	5.56	4.76	10.32	11.79
3	Infrastructure	0.00	0.00	13.00	21.24	34.24	47.83	61.43	109.26	143.50
4	Others (Top soil dump, Coal stock Yard, External dump, Nalla diversion)	0.00	0.00	0.00	0.00	0.00	10.54	64.74	75.28	75.28
5	Rationalisation area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.75	0.00	47.59	76.90	125.24	289.66	696.95	986.61	1111.85

5. DETAILS OF FOREST LAND WITHIN THE ML AREA

Forest land to be worked for mining and allied purpose-123.77 Ha

Area set aside for Safety Zone 1.47 Ha

125.24 Ha

6. SOIL TYPE

The areas are filled up with colluvial soil with sand, silt deposits and clay of older alluvium, older and younger floodplain deposits. In most of the area the soil is moderately coarse in nature whereas it is loamy in the cultivated land. The area has three nalas namely Singada Jhor, Ghurudia nala and Masani jhor. The soil has been deposited in the valley area mostly from these nalas. There were two periods of glacial advance and retreat during the deposition of Talcher sediments.

7. CLIMATE

The lease area lies in sub-tropical region where climate is characterized by an oppressively hot summer and cool winter. Summer is typically from April to July when monthly temperature ranges from a maximum of 45.50 degree centigrade during day time to a minimum of 15 Degree Centigrade at night time. Winter is from November to February when the maximum temperature during daytime goes to 37 Degree Centigrade and minimum temperature at night- becomes as low as 6.70 Degree Centigrade. The average annual rainfall as recorded at IMD observatory at Angul is 1277 mm.

8. DRAINAGE

Brahmani River, flowing approximately north to south along the eastern boundary of the Talcher coalfield, provides the main drainage of the region. This river is fed by seasonal nalas, viz. Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor and a few small nalas. From the eastern boundary of the block, the Brahmani river lies eastward at a distance of about 20 km.

Singada Jhor flows eastward and forms major part of the northern boundary of the block. Downstream Singada Jhor merges into Brahmani River at the north eastern part of the coalfield. Singada Jhor, Ghurudia nala and Masani jhor flowing from south to north within the block feed Singada jhor for most part of the year and control the drainage pattern of the block. Small ponds and dug wells are common in this block and are utilized for irrigation and drinking purpose.

9. EXISTING VEGETATION

The forest growth available in the area resembles Northern Tropical Dry Deciduous Forest. Sal (*Shorea robusta*) is the most dominant tree with Mahula (*Madhuca indica*), Chara (*Buchanania lanzan*), Jamu (*Pisidium guajava*), Teak (*Tectona grandis*), Tala (*Borassus flabellifer*), Neem (*Azadirachta indica*) as common associates.

The vegetation of the applied area is composed of Sal (*Shorea robusta*), Mahula (*Madhuca indica*), Chara (*Buchanania lanzan*), Jamu (*Pisidium guajava*), Teak (*Tectona grandis*), Tala (*Borassus flabellifer*), Neem (*Azadirachta indica*), Arjuna (*Terminalia arjuna*), Gambhari (*Gmelina arborea*),

Harida (*Terminalia chebula*), Kaju (*Anacardium occidentale*), Mango (*Mangifera indica*), Kadamba (*Anthocephalus chinensis*), Nala (*Arundo donax* Linn) etc. **Sal (*Shorearobusta*)** is the pre-dominant species.

10. PHASE WISE MINING ACTIVITY AND MANAGEMENT OF OVERBURDEN DUMP

Taking into consideration the topography of the deposit, estimated reserve and grade, disposition of coal body, nature of intercalated waste, incidence of coal, and production requirement, the deposits will be mined by fully mechanised method with the deployment of Surface miner, hydraulic shovel, dumpers, dozers etc. on three shift bases.

a. OB Generation

The Total OB generated would be 613.18 Mcum. during conceptual period. Out of this, 103.72 Mcum of OB will be temporarily kept in an external dump on the north side within the block boundary. Simultaneously the OB to be generated during proposed and conceptual period would be reused for backfilling in the mined out void area starting from the 3rd production year onwards up to the end of 36th year/ end of mine life. The total OB generated will be re-handled completely and backfilled in the mine out area. The entire 103.72 Mcum of OB generated from 1st year till 13th Year mining production shall be re-handled from 13th year till onward 26th year of mining period.

b. The salient features of OB Dump Management practices

Retaining wall and garland drain would be provided around the proposed dumps with settling tanks. Precautionary measures to be adopted during waste disposal are as follows:

- i. The ultimate dump slope to be maintained around 28°.
- ii. Terrace shall have inward slope with a provision of catch drain.
- iii. The dump edge will be covered with bund. Garland drains will be constructed adjacent to proposed dumps following the contour & different terrace will be connected to the catch drain. The drainage pattern should be such that the runoff will be channelized to the catch drain before releasing to the garland drain outside the periphery of dump. Catch drain is to be made up of half concrete with number of cemented stairs to check the heavy flow off of water as well as to reduce gully formation due to constant run off.

11. THE OBJECTIVES OF THE PROPOSE PLAN

The objectives of the proposed plan are as follows:

- i. To fulfil the stipulation, i.e. Condition No. 11(d) imposed in the Stage-I approval granted vide Letter No. 8-06/2023 FC dated 05/12/2023 of MoEF & CC, Government of India to prepare

plan for **Stabilize the overburden dumps by appropriate grading/benching so as to ensure that angles of repose at any given place is less than 28°.**

- ii. To adopt proper Management and scheduling of overburden materials so as to minimize external dumping.
- iii. To provide methodologies and implement the proposed works in time bound manner to prevent slope failures there by providing stable OB dump slopes.
- iv. To stabilize the over burden dumps by plantation.
- v. To prevent overflow of eroded soil from the fines, OB dump areas which lead to siltation in the streams.

12. PROPOSED METHODOLOGY

Due to the geological feature of the mining lease area, the dumps would be higher than the adjoining ground level. Top soils from the slopes of the dump are likely to flow during heavy rains and disturb the topography of its adjoining land, till the dump surface is completely stabilized by biological means. In order to curb this situation, retaining walls of minimum one & half meter height have been planned all along the peripheral contour of the dumps to arrest the possibility material running down on the slopes. Waste dumping has been planned in such a manner that backfilling can be done with a view to reclaim the degraded land.

The methods to be adopted for stabilization of OB dumps are as follows:

a. Vegetative methods (Biological Measures)

As the waste material is kept temporarily and utilised for back filling of the mine void area, no need of plantation over the temporary dump area.

b. Bio-engineering Measures

- Terraces as a soil conservation measures.

c. Structural measures

- Terracing of slopes, plugging of gullies by construction of catch drain
- Construction of Garland drains, Settling Tank.

To give an ideal shape to the dump, appropriate slope has to be maintained for which terraces to be made in dumps to maintain the slope. The angle of repose of the terrace would be around 28°. Backfilled areas would be biologically reclaimed. Terraces would be developed having maximum height of 10m in dumps keeping in view the gradual progress of dump and area available for minimum utilisation of virgin land. The details of dumps and terraces to be made have been summarized as follows:

i. Terracing of OB Dump Slope

It is proposed to construct berm & terraces over a length of 25010 m. on the proposed dumps considering the volume of OB materials & the area earmarked for dumping. The slope of individual terrace should be within the permissible range considering the angle of repose of the soil and space available, thereby maintaining the angle of repose at less than 28°. The terracing will be done through the internal resources by deploying the operating mining equipment. All these operations will be carried out after sufficient deposition of OB has been made. Map showing OB terracing and provision of other structural measures is attached as **Annexure-I**. Further to be in clarity the cross section of proposed Temporary External OB dump, (a not to scale) map is provided as **Annexure -II**.

13. INSPECTION, MONITORING AND EVALUATION:

Proper inspection, monitoring and evaluation will be done in-house by designated authorities of MCL under supervision of Forest Department.

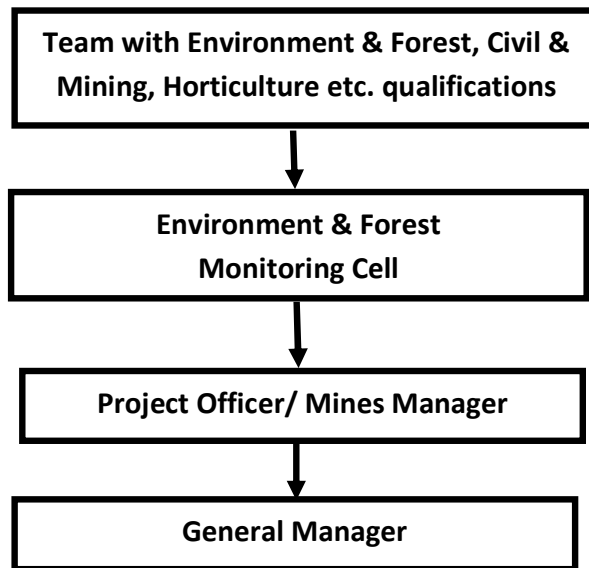
14. MOTIVATION OF PEOPLE:

The villagers / VSS Committee members of the adjoining villages are to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the adjoining villages and resolution will be passed to support plantation activities. For motivation of the villagers/ VSS Committee members, they will be provided incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure for this purpose.

15. EXECUTING AGENCY:

The work will be executed by the User Agency i.e. M/s Mahanadi Coalfields Limited through dedicated departments manned by technically qualified persons with outsourced man and machinery as and when required. To facilitate this, the user agency shall establish its own executing and supervision cells along with required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department.

EXECUTING AGENCY



16. TERRACING OF THE DUMP SLOPE

For terracing of OB Dump in a planned manner, internal resources shall be deployed utilising HEMM vehicles etc. However, an estimated cost calculation is provided below to calculate the amount of cost to be incurred for the said job.

Engagement of HEMM on the O/B dump slope for terracing

Location	-Over Burden Dump
Work efficiency per hour	- 3.38 running meter on the dump
Width & height of the terrace	- 30 m. & 30 m.
Rate for engagement of HEMM/hr	- Rs. 2000.00
Rate for engagement of HEMM/hr/m	- Rs.2000.00 / 3.38 m = Rs. 591.71 or say Rs.592/-
Total Cost	= Rs. 592.00 X 25,010 m = Rs. 1,48,05,920.00 or say Rs.1,50,00,000

Therefore, cost of terracing to be done at OB Dump for a length of 25,010 Running Metre is Rs. 1,50,00,000.00 **(Rupees One Crore Fifty Lakhs Only)**

17. REQUIREMENT OF FUNDS

The financial forecast for terracing of OB Dump will be Rs. 1,50,00,000.00 (Rupees One Crore Fifty Lakhs Only)

Note: The above-mentioned expenditure has already been included in the budget of approved Mining Plan and Mine Closure Plan.

M/s Mahanadi Coalfields Ltd. do hereby undertake to execute the item of works mentioned in this scheme in a phased manner at the project cost.


M/s Mahanadi Coalfields Ltd
General Manager
MCL, Subhadra Area

Countersigned

Divisional Forest Officer
Angul Division


Project Head
Subhadra Coal Mining Ltd., Angul


Staff Officer (Survey)
MCL, Subhadra Area

Approved for Rs. 1,50,00,000/-


20/9/24
Regional Chief Conservator
of Forests, Angul Circle.

MAP SHOWING OB DUMP TERRACING FOR STABILIZATION



Project Proponent:
M/s Mahanadi Coalfields Limited
Subhadra Open Cast Mine

Prepared By:
M/s Subhadra Coal Mining Limited

CROSS SECTION OF OB DUMP

NOT TO SCALE

CROSS SECTION B-B'
OF OB DUMP



LEGEND:

SYMBOL	DESCRIPTION
	Garland drain
	Retaining wall

LONGITUDINAL SECTION A-A'
OF OB DUMP



Divisional Forest Officer
Angul Division

Project Head
Sambalpur Iron Works Ltd. Angul

Staff Officer (Survey)
WCL, Sambalpur Area

Station, West of
General Manager
WCL, Sambalpur Area



Office of the General Manager
(Subhadra Area)
At/Po :Angul, Near Biju Maidan
Dist: Angul – 759122 (Odisha)
Website :www.mcl.gov.in
Email Id: gmsubhadraarea@gmail.com



Annexure-27

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 12 (a) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that the "User agency shall ensure demarcation of Safety Zone (7.5-meter strip all along the inner boundary of the mining lease area), and its fencing, protection and regeneration by erecting adequate number of 6 feet high RCC boundary pillars inscribed with DGPS co-ordinates with barbed wire fencing and deploying adequate numbers of watchers under the supervision of the State Forest Department"

General Manager
Subhadra Area, MCL



Office of the General Manager
(Subhadra Area)
At/Po :Angul, Near Biju Maidan
Dist: Angul – 759122 (Odisha)
Website :www.mcl.gov.in
Email Id: gmsubhadraarea@gmail.com



Annexure-28

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 12 (b) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that the "Boundary of the safety zone of the mining lease, adjacent to habitation / roads, should be properly fenced by the user agency".

General Manager
Subhadra Area, MCL



Office of the General Manager
(Subhadra Area)
At/Po : Angul, Near Biju Maidan
Dist: Angul – 759122 (Odisha)
Website : www.mcl.gov.in
Email Id: gmsubhadraarea@gmail.com



Annexure-29



UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 12 (c) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that the "Safety zone shall be maintained as green belt around mining lease and to ensure dense canopy in the area, regeneration shall be taken up in this area by the user agency at project cost under the supervision of State Forest Department"

General Manager
Subhadra Area, MCL

 ITUW TSA NEW DELHI 2024	<p>Office of the General Manager (Subhadra Area) At/Po :Angul, Near Biju Maidan Dist: Angul – 759122 (Odisha) Website :www.mcl.gov.in Email Id: gmsubhadraarea@gmail.com</p>	 MCL
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Annexure-30

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 12 (d) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "The user Agency shall ensure that safety zone is maintained as per the prescribed norms".



**General Manager
Subhadra Area, MCL**





SUBHADRA OPEN CAST COAL PROJECT

Scheme

For

TOP SOIL MANAGEMENT PLAN

in compliance

with

Condition No.13 of

Stage-I approval granted vide

Letter No.8-06/2023-FC, Dated.05.12.2023

of Govt. of India, Ministry of Environment, Forests

& Climate Change, New Delhi.

for

Diversion of 125.24 Ha. (including 1.47 Ha. of Safety Zone)

of Forest Land within 1111.85 Ha. of ML area of Subhadra OCP

for Non forestry use U/s-2 (ii) of FC Act-1980

**in villages Kankarei, Pirakhaman, Chhotabereni, Balichandrapur,
Raijharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuabola, Kumunda
and Jaipur RF of Chhendipada and Talcher Tahasil,**

Angul District, Odisha.

M/s. Mahanadi Coalfields Limited

SCHEME FOR NO DAMAGE SHALL BE CAUSED TO THE TOP SOIL AND THE USER AGENCY WILL FOLLOW THE TOP SOIL MANAGEMENT PLAN.

1. INTRODUCTION

Subhadra Open Cast Coal Mine is a Greenfield opencast mining project spread over a lease area of 1111.85 Ha. in Kankarei, Pirakhaman, Chhotabereni, Balichandrapur, Rajjharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuabol, Kumunda villages and Jaipur RF, Chhendipada & Talcher Tahasil, Dist-Angul, Odisha

Ministry of Coal, Government of India has allotted this coal block in favour of M/s. Mahanadi Coalfields Limited vide allotment order no. NA-103/1/2021-NA dated 18-11-2021.

Mahanadi Coalfields Limited has named Utkal-A and West of Gopalprasad (west) coal block as Subhadra Open Cast Project vide their letter no. 539-H dated 26.09.2019.

As per approved Mining Plan and Mine Closure Plan, the mine life is 36 years. Out of total 1111.85 Ha. of Mining Lease area, total forest land involved in 125.24 Ha. (Revenue forest and DLC of 124.49 Ha. + Reserve forest of 0.75 Ha.)

M/s. Mahanadi Coalfields Limited submitted the Forest Diversion proposal to obtain Forest Clearance from MoEF & CC, Government of India for 125.24 Ha. of forest land U/s 2(ii) of the Forest (Conservation) Act 1980.

The Stage-I Forest Clearance approval over 125.24 ha of Forest Land Under Section- 2 (ii) (including 1.47 ha. of Safety Zone) of the Forest (Conservation) Act, 1980 has been granted by MoEF & CC, Government of India vide their Letter No. 8-06/2023-FC, dated 05.12.2023, where in it has been stipulated as per **Condition No. 13 for No damage shall be caused to the top-soil and the user agency will follow the top soil management plan.**

2. LOCATION

The mining lease area is covered in the Survey of India Topo sheet No. F45T1 and F45S13 and situated between the latitude $20^{\circ} 55' 56.225''$ N to $20^{\circ} 58' 47.344''$ N, and longitude $84^{\circ} 58' 42.383''$ E and $85^{\circ} 0' 50.476''$ E. The above ML area covering villages are Kankarei, Pirakhaman, Chhotabereni, Balichandrapur, Raijharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuabola Kumunda and Jaipur RF in Chhendipada & Talcher Tahasil, Angul Forest Division Angul District Odisha.

LOCATION MAP

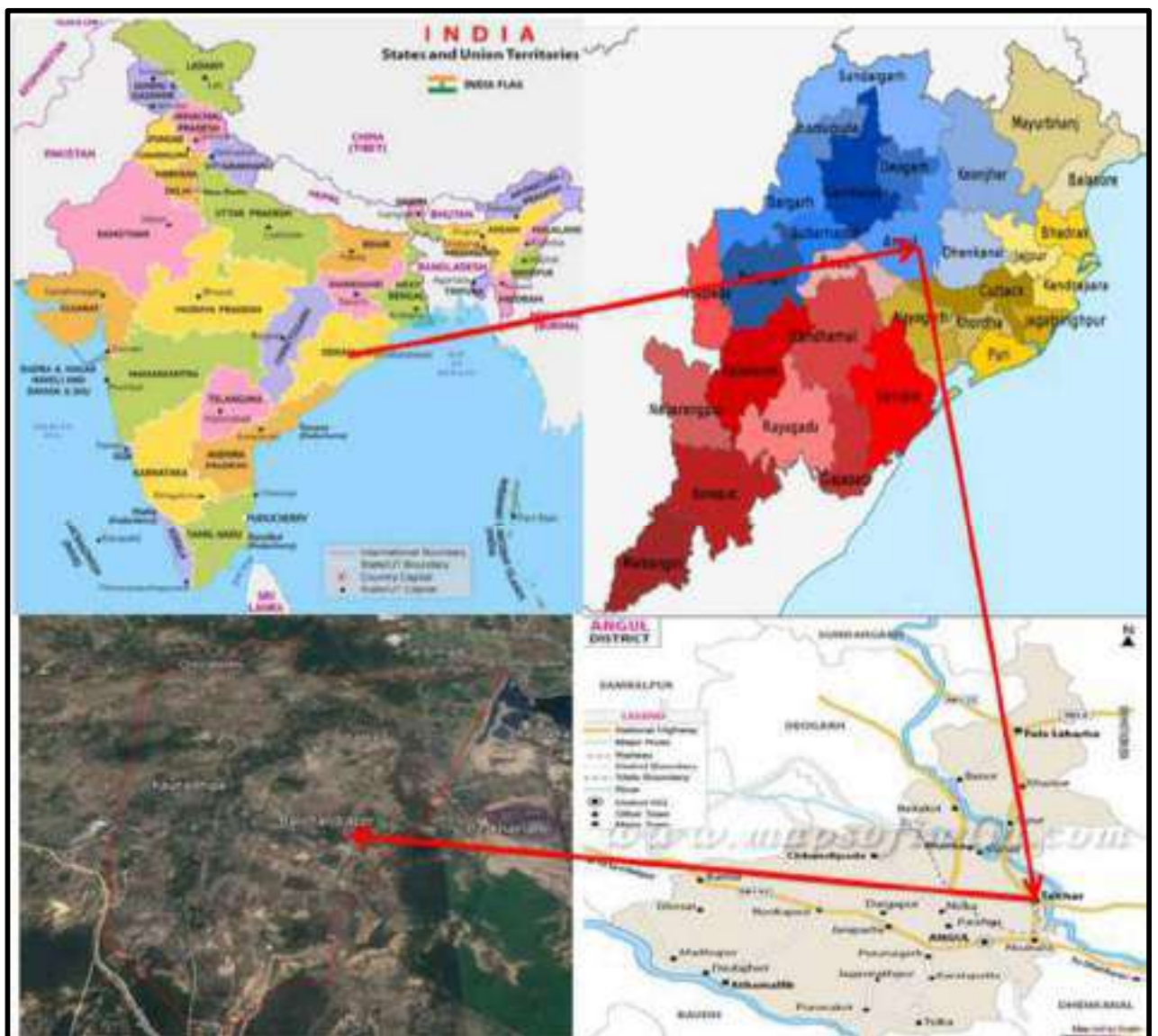


Fig-1. Location Map of Subhadra OCP, MCL

3. TOPOGRAPHY

The surface topography is gently undulating and the ground is generally being used for cultivation purposes by the villagers. Around south western part, the surface topography is mildly undulating and slopes towards north. The ground level rises towards south-eastern corner of the block with highest elevation above Mean Sea Level of about 167.50 meter.

4. LAND USE PATTERN

The proposed land use pattern of 1111.85 Ha. of mining lease area as per approved Mining Plan and Mine Closure Plan is given below:

Table 1: Land use details.

Type	Land Use (Proposed)	Land Use (End of Life)	Land Use (Post Closer)						Total
			Agriculture land	Plantation	Water Body	Public /Company Use	Forest Land (Returned)	Unplanted	
Excavation Area	881.28	881.28		182.52					
Backfilled Area	715.24	715.24	495.27				37.45		715.24
Excavated Void Without Plantation	130.68	130.68						130.68	130.68
Water Harvesting	35.36	35.36			35.36				35.36
Top Soil Dumping	8.97	8.97	8.97						8.97
Coal Stock Yard	9.76	9.76	9.76						9.76
External Dump	24.17	24.17	24.17						24.17
Safety Zone	11.79	11.79		11.79					11.79
Haul road Between Quarries	Nil	Nil							0
Road diversion	Nil	Nil							0
Nala Diversion & Settling Pond	8.42	8.42				8.42			8.42
Roads, building & Infrastructure	Road-15.72	Road-15.72				15.72			
	Township-27.21	Township-27.21		1.26		25.86			
	Infrastructure-75.32	Infrastructure-75.32					75.32		
	Sub-total	118.32	118.32						118.16
Rationalization Area	25.34	25.34		25.34					25.34
Garland Drains	Negligible	Negligible							0
Embankment	11.49	11.49				11.49			11.49
Green Belt	6.89	6.89					6.89		6.89
Water Reservoir near pit	Nil	Nil							0
UG Entry	none	none							0
Undisturbed	Nil	Nil							0
Explosive Magazine	5.58	5.58					5.58		5.58
Pit head power plant	Nil	Nil							0
Agriculture land	Nil	Nil							0
Total	1111.85	1111.85	538.17	220.91	35.36	61.49	125.24	130.68	1111.85

5. DETAILS OF FOREST LAND WITHIN THE ML AREA

Forest land to be worked for mining and allied purpose-123.77 Ha

Area set aside for Safety Zone 1.47 Ha

125.24 Ha

6. SOIL TYPE

The areas are filled up with colluvial soil with sand, silt deposits and clay of older alluvium, older and younger floodplain deposits. In most of the area the soil is moderately coarse in nature whereas it is loamy in the cultivated land. The area has three nalas namely Singada Jhor, Ghurudia nala and Masani jhor. The soil has been deposited in the valley area mostly from these nalas. There were two periods of glacial advance and retreat during the deposition of Talcher sediments.

7. CLIMATE

The lease area lies in sub-tropical region where climate is characterized by an oppressively hot summer and cool winter. Summer is typically from April to July when monthly temperature ranges from a maximum of 45.50 degree centigrade during day time to a minimum of 15 Degree Centigrade at night time. Winter is from November to February when the maximum temperature during daytime goes to 37 Degree Centigrade and minimum temperature at night-becomes as low as 6.70 Degree Centigrade. The average annual rainfall as recorded at IMD observatory at Angul is 1277 mm.

8. DRAINAGE

Brahmani River, flowing approximately north to south along the eastern boundary of the Talcher coalfield, provides the main drainage of the region. This river is fed by seasonal nalas, viz. Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor and a few small nalas. From the eastern boundary of the block, the Brahmani river lies eastward at a distance of about 20 km.

Singada Jhor flows eastward and forms major part of the northern boundary of the block. Downstream Singada Jhor merges into Brahmani River at the north eastern part of the coalfield. Singada Jhor, Ghurudia nala and Masani jhor flowing from south to north within the block feed Singada jhor for most part of the year and control the drainage pattern of the block. Small ponds and dug wells are common in this block and are utilized for irrigation and drinking purpose.

9. PLAN FOR TOP SOIL MANAGEMENT

The top soil of Mining Lease area is present in three layers i.e. on an average of 0.35 m thickness. The excavated top soil over mining area shall be stored separately before commencement of mining activities in that proposed area and stacked separately at the earmarked area with a height of four metre. Top soil will be preserved by planting sewing grass seeds on slopes of top soil dump. Top soil dumps will have a maximum height of 04 metres and slope of 28°. Top soil will be preserved as per top soil management method detailed below.

10. OBJECTIVES

The objectives of Top soil management to be executed are as follows:

- i) To meet the stipulation No.13 of Stage-I Forest clearance accorded vide letter No.8-06/2023-FC dt.05.12.2023 of MoEF & CC, Government of India, New Delhi i.e., **“No damage shall be caused to the top soil and the User Agency will follow the Top soil management Plan”**.
- ii) To identify top soil resources and to follow correct procedure for optimum recovery.
- iii) To manage and conserve the top soil reserves by implementing biological measures.
- iv) To provide sufficient stable top soil for reclamation work of dumps, back filled areas and degraded lands.

11. MANAGEMENT OF TOP SOIL TO BE GENERATED FROM MINING

This Topsoil Management Plan has provision for soil stripping and stockpiling procedures to minimize top soil degradation and maximize availability of suitable soil for future reclamation.

The top soil in Mining area is scanty which is present in extremely thin layers. Whatever top soil is available will be excavated during the development of unbroken patches within the mining lease. Precautionary measures will be taken so that this valuable resource is not wasted. This excavated top-soil will be utilized for concurrent reclamation works in the mine as per this plan. The top soil will be stored temporarily until it is being used for reclamation. The total top soil generated from the total excavation area of 881.28 ha. is approx. 3.14 Mcum.

Prior to stripping, the area will be cleared by removing the weed growth. The proposed procedure for soil handling is given below which includes soil handling measures in order to optimize retention of soil characteristics (in terms of nutrients and micro-organisms) conducive to growth of plant.

12. METHODOLOGY

In accordance with the above objectives of providing sufficient stable soil for reclamation and to optimize soil recovery, the following strategies have to be followed:

- i) Top soil stockpile is identified outside quarry area but within mining lease area.
- ii) Stripping off the topsoil by dozer or by small shovel dumper combination rather than scrapers to minimize structural degradation;
- iii) Improvement of drainage and promotion of re-vegetation.
- iv) Stabilization of Top soil surface by biological measures i.e. by sowing seeds of grass with other leguminoceae (Fabaceae) species.
- v) To utilize stripped top soil as soon as possible for reclamation in a phased manner in accordance with the reclamation plan as prescribed in the approved Mine Plan & Mine Closure Plan.

13. TOP SOIL MANAGEMENT AND CONSERVATION PLAN

The top soil is removed in a phased manner throughout the mine life period of 36 years and is temporarily stored in an earmarked area of 8.97 ha. which is located in the south-east corner within the mine lease area. Simultaneously, the accumulated top soil will be re-handled and spreading over the mine out backfilled area started from 3rd production year onwards. The maximum accumulation in the running stock of top soil in the temporary storage area is approx. 0.45 M cum. The maximum height of the storage dump is 3-4 mtr. The location map of top soil dump and its cross-section is furnished as Annexure-I & II respectively.

At any point of time, the total slope area of the top soil dump shall not be more than 0.486 ha. hence provision shall be made for sowing with grass seeds over an area of 0.5 Ha. to mitigate soil erosion of top soil.

Leguminoceae (Fabaceae) like Green garm (Vigna radiate), Black gram (Vigna mungo), Horse gram (Macrotyloma uniflorum) and broadcasting of seeds of local shrubs / grasses will be sown

in the slope of the top soil storage area. The cost norm of Grass seeding has been provided in **Annexure-III**.

Table-2. Year wise Top Soil generation and Utilisation.

Year/Stage	Top Soil Generated (Cumulative, in Mcum)	Top Soil Utilised in the Backfilled area (Cumulative, in Mcum.)
Y-1, Construction -1	0	0
Y-3, Production-1	0.84	0
Y-5, Production-3	1.04	1.11
Y-10, Production-8	1.61	1.16
Y-15, Production-13	2.90	2.45
Y-20, Production-18	3.07	2.62
Y-25, Production-23	3.08	2.63
Y-30, Production-28	3.11	2.66
Y-36, Production-34	3.14	2.69
Y-39, Post Closure	3.14	3.14

A dry toe wall of loose boulders with cement sand patching over the surface of the wall having a length of 1200 mtr. and height 1 meter will be constructed around top soil stock pile to prevent sliding of the staked material. The cost norm of Toe wall has been provided in **Annexure-IV**.

The topsoil stripping will be completed by using bulldozers and tippers of smaller. In areas where the topsoil is relatively thin, the same will be removed in such a way so as to prevent mixing of topsoil and sub-soil.

As mentioned above, the top soil shall be collected in a phased manner as per working of mine based on approved Mining Plan and shall be spread over the backfilled areas progressively according to approved Mine closure plan. These operations shall be done utilising internal resources like deployment of HEMM vehicles etc. for which the cost likely to be incurred is included in approved Mine Plan and Mine Closure Plan.

14. INSPECTION, MONITORING AND EVALUATION:

Proper inspection, monitoring and evaluation will be done in-house by designated authorities of MCL under supervision of Forest Department.

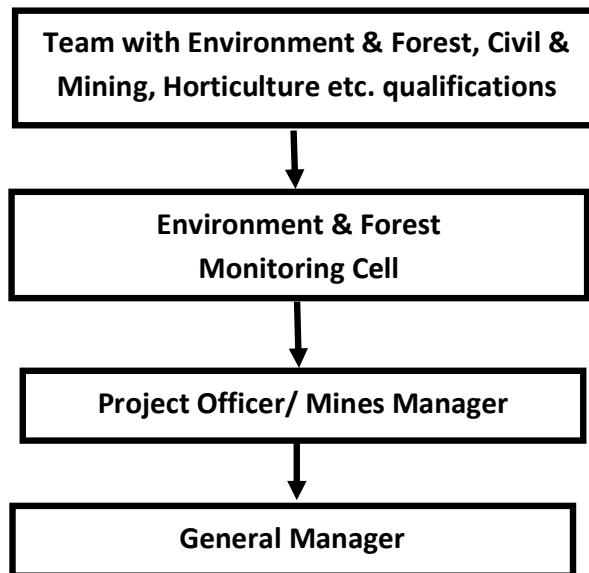
15. MOTIVATION OF PEOPLE:

The villagers / VSS Committee members of the adjoining villages are to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the adjoining villages and resolution will be passed to support plantation activities. For motivation of the villagers/ VSS Committee members, they will be provided incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure for this purpose.

16. EXECUTING AGENCY

The work will be executed by the User Agency i.e. M/s Mahanadi Coalfields Limited through dedicated departments manned by technically qualified persons with outsourced man and machinery as and when required. To facilitate this, the user agency shall establish its own executing and supervision cells along with required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department.

EXECUTING AGENCY



17. REQUIREMENT OF FUNDS

The total cost of implementation of measures for Top Soil Management will be Rs.61,65,602.00 (Rupees Sixty-One Lakhs Sixty-Five Thousand Six Hundred Two) only.

This budget will be subject to increase in amount considering the increase in material cost and labour charges.

FINANCIAL FORECAST

Wage Rate Rs.450/-

Sl. No.	Description of the work	Funds Required (in Rs)
1	Cost for sowing of grass seeds on the slope of top soil storage area 0.5 ha @ Rs.27,000/- per ha. per annum for 3rd, 6th, 13th, 18th, 23rd, 28th, 34th production year and after mine closure (0.5 ha X Rs. 27,000/- X 8 times = Rs. 1,08,000/-)	1,08,000.00
2	Cost for erection of 1200 m dry toe wall around top soil stock pile	43,59,828.00
	SUB TOTAL (1)	44,67,828.00
3	15% of the total cost for motivation of VSS / People involved	6,70,174.00
	SUB TOTAL (2)	51,38,002.00
	Price escalation @ 20%	10,27,600.00
	Grand Total	61,65,602.00

(Rupees Sixty One Lakhs Sixty Five Thousand Six Hundred Two only)

Note: The above-mentioned expenditure has already been included in the budget of Environment Management Plan (EMP) as well as approved Mining Plan and Mine Closure Plan.

M/s Mahanadi Coalfields Ltd, do hereby undertake to execute the item of works mentioned in this scheme in a phased manner at the project cost.

M/s Mahanadi Coalfields Ltd


प्रबंधक
सुभाद्रा क्षेत्र
General Manager
MCL, Subhadra Area



Project Head
Subhadra Coal Mining Ltd., Angul

Countersigned


Divisional Forest Officer
Divisional Forest Officer
Angul Division
Angul, Division


Staff Officer(Survey)
MCL, Subhadra Area

APPROVED Rs. 61,65,602/-


30/7/24
Regional Chief Conservator
of Forests, Angul Circle.

TOP SIL MANAGEMENT PLAN



Project Proponent:
 M/s Mahanadi Coalfields Limited
 Subhadra Open Cast Mine

Subject:
 TOP SIL MANAGEMENT PLAN

Prepared By:
 M/s Subhadra Coal Mining Limited

(Handwritten signatures and stamps)

CROSS SECTION OF TOP SOIL

NOT TO SCALE

CROSS SECTION C-C' OF TOP SOIL



State Commissioner
MCL, Suburban Area

Special Com. Secy (C.A. Dept)

for their
written, from the
General Manager
MCL, Suburban Area

Divisional Forest Officer
Forest Division

COST OF GRASS SEED SOWING PER Ha.

Wage Rate Rs. 450/-

Sl. No.	Purpose	No of Labour/ Quantity of materials	Rate (Rs.)	Amount (Rs.)
1	Spreading of good earth and FYM including carriage	20 Nos	450.00	9000.00
2	Adding FYM and good earth	2 TL FYM	1,000/ TLFYM	4000.00
		2 TL good earth	1,000/TL Good earth	
3	Cost of grass seed 50 kg/Ha.		100/kg	5000.00
4	Broadcast sowing	20 nos.	450.00	9000.00
Total				27000.00

Annexure-IV

**DETAIL ESTIMATE OF TOE WALL OF LOOSE LOCAL BOULDER WITH CEMENT-SAND PATCHING
OVER THE SURFACE OF BOULDER WALL**

Wage Rate Rs.450/Day

Sl. No	Description of items	No	Length	Width	Height	Qty	Unit	Rate	Amount
1	Earth work is hard soil or gravelly soil within 50 mtr initial lead & 1.50 mtr initial lift including rough dressing & breaking clods to maximum 5.00cm to 7.00 cm & laying layers not exceeding 0.30mtr in depth and as per the direction of the engineer -in-charge.	1	1000	0.7	0.7	CUM	490	167.81	82226.9
2	Filling in foundation and plinth with sand watered and rammed	1	1000	0.7	0.075	CUM	52.5	323.11	16963.275
3	Cement concrete M-10 grade (PCC 1:4:8 for foundation) with crushed broken granite coarse aggregate of size 40 mm downgraded mixed in concrete mixture including cost conveyance and royalty of all materials, machineries and labour and laying in head works and canal structures with required lifts and de-lifts as per direction of Engineer-in-charge.	1	1000	0.6	0.075	CUM	45	3746.5	168592.5
4	BRICK WORK for foundation having crushing strength not less than 75 kg/cm ² with dimensional tolerance ± 8 percent in cement mortar (1:6) in foundation and plinth per cum.	1	1000	0.5	0.3	CUM	150	3592.4	538860
		1	1000	0.375	0.3	CUM	112.5	3592.4	404145
5	BRICK WORK for S/S, having crushing strength not less than	1	1000	0.25	1	CUM	250	3592.4	898100

	75 kg/cm ² with dimensional tolerance ± 8 percent in cement mortar (1:6) in foundation and plinth per cum								
6	Concrete for plinth M-20 grade with crushed broken granite coarse aggregate of size 20mm downgraded mixed plant including cost of all materials, machineries and labour and transportation of mixed concrete	1	1000	0.25	0.1	CUM	25	4496.7	112417.5
7	Concrete for coping M-20 grade with crushed broken granite coarse aggregate of size 20mm downgraded mixed plant including cost of all materials, machineries and labour and transportation of mixed concrete	1	1000	0.35	0.025	CUM	8.75	4496.7	39346.125
								Total :	22,60,651.3
									36,33,189.59 Or 36,33,190.00
									<u>2260651.3</u> X 450 280

Cost for construction of toe wall for 1000 mtr is Rs. 3633190 @ of Wages rate Rs.450.00
 Cost for construction of toe wall for 1 mtr. is Rs. 3633190 ÷ 1000 =Rs. 3633.19 @ Wages rate Rs.450.00
 Cost for construction of toe wall for 1200 mtr @ wages rate Rs.450 =**3633.19×1200=4359828.00**



SUBHADRA OPEN CAST COAL PROJECT

***Scheme
for***

DE-SILTING OF VILLAGE TANKS AND OTHER WATER BODIES LOCATED WITHIN 05 KM FROM THE MINE LEASE BOUNDARY SO AS TO MITIGATE THE IMPACT OF SILTATION OF SUCH TANKS/ WATER BODIES

in compliance

with

Condition No.14 of

Stage-I approval granted vide

Letter No.8-06/2023-FC, Dated.05.12.2023

of Govt. of India, Ministry of Environment, Forests

& Climate Change, New Delhi.

for

Diversion of 125.24 Ha. (including 1.47 Ha. of Safety Zone)

of Forest Land within 1111.85 Ha. of ML area of Subhadra OCP

for Non forestry use U/s-2 (ii) of FC Act-1980

***in villages Kankarei, Pirakhaman, Chhotabereni, Balichandrapur,
Raijharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuabola,
Kumunda and Jaipur RF of Chhendipada and Talcher Tahasil,
Angul District, Odisha.***

M/s. Mahanadi Coalfields Limited

SCHEME FOR DE-SILTING OF VILLAGE TANKS AND OTHER WATER BODIES LOCATED WITHIN 05 KM FROM THE MINE LEASE BOUNDARY SO AS TO MITIGATE THE IMPACT OF SILTATION OF SUCH TANKS/ WATER BODIES

1. INTRODUCTION

Subhadra Open Cast Coal Mine is a Greenfield opencast mining project spread over a lease area of 1111.85 Ha. in Kankarej, Pirakhaman, Chhotabereni, Balichandrapur, Rajjharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuaboli, Kumunda villages and Jaipur RF, Chhendipada & Talcher Tahasil, Dist-Angul, Odisha.

Ministry of Coal, Government of India has allotted this coal block in favour of M/s. Mahanadi Coalfields Limited vide allotment order no. NA-103/1/2021-NA dated 18-11-2021.

As per approved Mining Plan and Mine Closure Plan, the mine life is 36 years. Out of total 1111.85 Ha. of Mining Lease area, total forest land involved in 125.24 Ha. (Revenue forest and DLC of 124.49 Ha. + Reserve forest of 0.75 Ha.)

Mahanadi Coalfields Limited has named Utkal-A and West of Gopalprasad (west) coal block as Subhadra Open Cast Project vide their letter no. 539-H dated 26.09.2019.

The Stage-I Forest Clearance approval over 125.24 ha of Forest Land Under Section- 2 (ii) (including 1.47 ha. of Safety Zone) of the Forest (Conservation) Act, 1980 has been granted by MoEF & CC, Government of India vide their Letter No. 8-06/2023-FC, dated 05.12.2023, where in it has been stipulated as per **Condition No. 14 for undertaking de-silting of village tanks and other water bodies located within 05 km from the mine lease boundary so as to mitigate the impact of siltation of such tanks/ water bodies.**

2. LOCATION

The mining lease area is covered in the Survey of India Topo sheet No. F45T1 and F45S13 and situated between the latitude $20^{\circ} 55' 56.225''$ N to $20^{\circ} 58' 47.344''$ N, and longitude $84^{\circ} 58' 42.383''$ E and $85^{\circ} 0' 50.476''$ E. The above ML area covering villages are Kankarei, Pirakhaman, Chhotabereni, Balichandrapur, Rajjharan, Kaunsidhipa, Golagadia, Bhalugadia, Baghuabola Kumunda and Jaipur RF in Chhendipada & Talcher Tahasil, Angul Forest Division Angul District Odisha.

LOCATION MAP

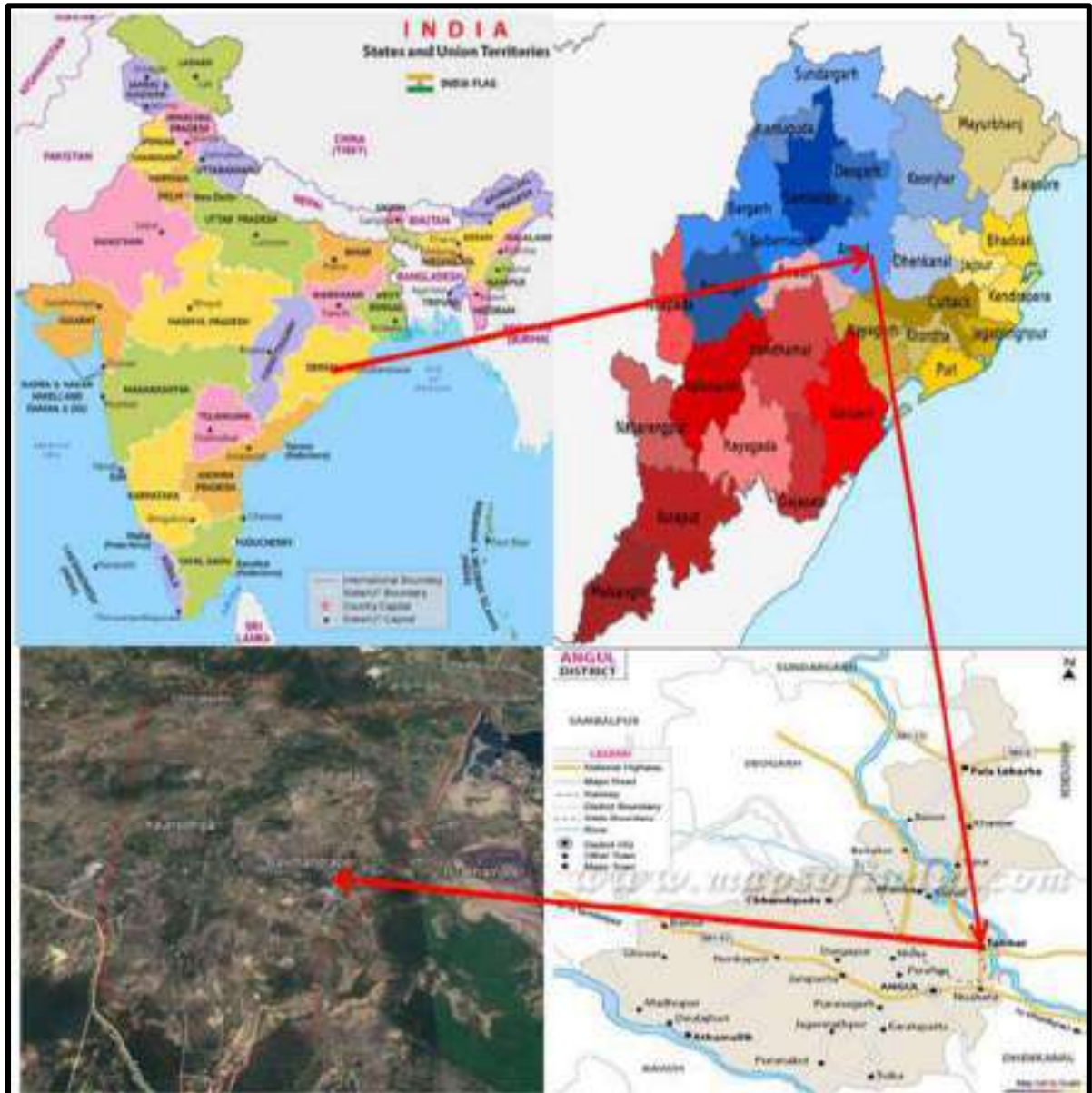


Fig-1. Location Map of Subhadra OCP, MCL

3. TOPOGRAPHY

The surface topography is gently undulating and the ground is generally being used for cultivation purposes by the villagers. Around south western part, the surface topography is mildly undulating and slopes towards north. The ground level rises towards south-eastern corner of the block with highest elevation above Mean Sea Level of about 167.50 meter.

4. LAND USE PATTERN

The proposed land use pattern of 1111.85 Ha. of mining lease area as per approved Mining Plan and Mine Closure Plan is given below:

Table 1: Purpose wise break up forest and non-forest land

Sl. No.	Type of Land Use	Forest Land in Ha				Total Forest Land in Ha (3+4+5+6)	Non-Forest Land in Ha		Total non-forest land in Ha (8+9)	Total Land in Ha (7+10)
		RF	PRF	Rev. forest	DLC		Govt. land	Private land		
1	2	3	4	5	6	7	8	9	10	11
1	Mining Excavation Area	0.71	0.00	33.82	55.00	89.53	225.73	566.02	791.75	881.28
2	Safety Zone 7.5Mtr along Mining lease boundary	0.04	0.00	0.77	0.66	1.47	5.56	4.76	10.32	11.79
3	Infrastructure	0.00	0.00	13.00	21.24	34.24	47.83	61.43	109.26	143.50
4	Others (Top soil dump, Coal stock Yard, External dump, Nalla diversion)	0.00	0.00	0.00	0.00	0.00	10.54	64.74	75.28	75.28
5	Rationalisation area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.75	0.00	47.59	76.90	125.24	289.66	696.95	986.61	1111.85

5. DETAILS OF FOREST LAND WITHIN THE ML AREA

Forest land to be worked for mining and allied purpose-123.77 Ha

Area set aside for Safety Zone

1.47 Ha

125.24 Ha

6. SOIL TYPE

The areas are filled up with colluvial soil with sand, silt deposits and clay of older alluvium, older and younger floodplain deposits. In most of the area the soil is moderately coarse in nature whereas it is loamy in the cultivated land. The area has three nalas namely Singada Jhor, Ghurudia nala and Masania nala. The soil has been deposited in the valley area mostly from these nalas. There were two periods of glacial advance and retreat during the deposition of Talcher sediments.

7. CLIMATE

The lease area lies in sub-tropical region where climate is characterized by an oppressively hot summer and cool winter. Summer is typically from April to July when monthly temperature ranges from a maximum of 45.50 degree centigrade during day time to a minimum of 15 Degree Centigrade at night time. Winter is from November to February when the maximum temperature during daytime goes to 37 Degree Centigrade and minimum temperature at night- becomes as low as 6.70 Degree Centigrade. The average annual rainfall as recorded at IMD observatory at Angul is 1277 mm.

8. DRAINAGE

Brahmani River, flowing approximately north to south along the eastern boundary of the Talcher coalfield, provides the main drainage of the region. This river is fed by seasonal nalas, viz. Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor and a few small nalas. From the eastern boundary of the block, the Brahmani River lies eastward at a distance of about 20 km.

Singada Jhor flows eastward and forms major part of the northern boundary of the block. Downstream Singada Jhor merges into Brahmani River at the north eastern part of the coalfield. Sinhajori nala, Ghurudia nala and Masani jhor flowing from south to north within the block feed Singada jhor for most part of the year and control the drainage pattern of the block. Small ponds and dug wells are common in this block and are utilized for irrigation and drinking purpose.

9. EXISTING VEGETATION

The forest growth available in the area resembles Northern Tropical Dry Deciduous Forest. Sal (*Shorearobusta*) is the most dominant tree with Mahula (*Madhuca indica*), Chara (*Buchanania lanzan*), Jamu (*Pisidium guajava*), Teak (*Tectona grandis*), Tala (*Borassus flabellifer*), Neem (*Azadirachta indica*) as common associates.

The vegetation of the applied area is composed of Sal (*Shorearobusta*), Mahula (*Madhuca indica*), Chara (*Buchanania lanzan*), Jamu (*Pisidium guajava*), Teak (*Tectona grandis*), Tala (*Borassus flabellifer*), Neem (*Azadirachta indica*), Arjuna (*Terminalia arjuna*), Gambhari (*Gamelina arborea*), Harida (*Terminalia chebula*), Kaju (*Anacardium occidentale*), Mango (*Mangifera indica*), Kadamba (*Anthocephalus chinensis*), Nala (*Arundo donax* Linn) etc. **Sal (*Shorea robusta*)** is the pre-dominant species.

10. RAINFALL

There is a wide variation of rainfall in the catchment area and around 10 kms radius of buffer zone of this mine. The average annual rainfall of this mine area is affected by steep hills, forest cover etc. The average annual rainfall of last 10 years comes to 1317.494 mm. in Angul block and 1167.89 mm. in Chhendipada block.

Table 1: Monthly Rainfall Data of Angul Block (in mm)
Average Rainfall = 1317.494 mm

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
2014	0.00	25.2	44.84	23.2	143.4	76.4	450.2	258.6	301.3	125	0.00	0.00	1448.14
2015	29.8	4	0.00	30.5	31	187	374.6	336.3	164	29.8	0.00	27.4	1214.4
2016	0.00	17	65.2	12.2	96	137.8	224.2	438.4	155.4	81.8	7.6	0.00	1235.6
2017	2.4	0.00	20.6	3.8	23.6	184.4	184.2	205.6	154.8	57.4	30.6	0.00	867.4
2018	0.00	0.00	0.8	92.8	133.8	261.4	297	301.2	272.6	114.8	0.6	64.6	1539.6
2019	0.00	30.2	19	44.6	94.8	140.4	234.6	219	268	191.4	0.00	4	1246
2020	13.8	72.6	79	98.8	93.8	227.6	147.2	474.5	108.4	270.8	0.00	0.00	1586.5
2021	0.00	0.00	20.8	19	145	271.8	230.6	111	415.4	24.6	52.4	70	1360.6
2022	51.2	3.9	0.00	0.00	86.6	160.6	333.8	446.8	85.2	49.6	0.00	0.00	1217.7
2023	0.00	0.00	46.6	42.2	41.6	361.4	311	269	312	68	1	6	1459
Average	9.72	15.29	29.684	36.71	88.96	200.88	278.74	306.04	223.71	101.32	9.22	17.2	1317.494

Source: <https://rainfall.nic.in/>

Table 2: Monthly Rainfall Data of Chhendipada Block (in mm)
Average Rainfall = 1167.89 mm

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
2014	0.00	33.4	14.2	2	59.2	122.8	446.9	210.8	272.2	106.6	0.00	0.00	1268.1
2015	11	13.4	11.4	52.8	33.4	179.3	279.8	201.2	131.4	0.00	0.00	44	957.7
2016	0.00	30.6	19.5	0.00	76.8	243.8	156.5	346	112.4	55.9	0.00	0.00	1041.5
2017	0.00	0.00	12.9	0.00	39.1	177.9	184.1	215.2	191	122.2	13.4	0.00	955.8
2018	0.00	0.00	0.00	110.1	145.3	131.4	289.6	169.5	200	139	0.00	55.2	1240.1
2019	1.2	15.4	34.6	41	80.4	208.4	95.6	199.2	238.2	140.4	0.00	2.6	1057
2020	9.3	69.4	70.6	153	104.4	127.6	241.2	421.6	118	196	0.00	0.00	1510.7
2021	0.00	0.00	0.00	0.00	146.2	104.8	177	185	380.2	70.8	64.8	34.5	1163.3
2022	32.8	3.4	0.00	0.00	90.2	197.6	266.9	428.9	82.5	104.6	0.00	0.00	1206.9
2023	0.00	0.00	38.8	49.4	39.4	329.2	296	218	170	105	23	9	1277.8
Average	5.43	16.56	20.2	40.83	81.44	182.28	243.36	259.54	189.59	104.05	10.12	14.53	1167.89

Source: <https://rainfall.nic.in/>

11. FACTORS RESPONSIBLE FOR SILTATION

Siltation is an inherent problem with ponds, lakes and almost all types of water reservoirs world over. Siltation occurs due to deposition or settling of soil eroded from the land mass, decaying fallen leaves, grass and other vegetative materials and decomposed organic materials settled on pond bottoms. Soil erosion may be attributed as the primary factor responsible for pond siltation in this area. Higher gradient and excess rainfall are the most common reasons of soil erosion. Erosion of Soil occurs from the waste dumps, excavated areas and naturally denuded ground surface. However, looking into the current problem of siltation of the village ponds, the major factors are the surface runoff containing silt particles entering into the pond. As the age of the ponds increases, new layers of silt accumulate on the older ones and the silt layers become thicker. Finally, the depth of the pond decreases and it loses its water storage capacity. At this time, it needs to be de-silted to recover. The best practice against siltation is to

de-silt the bottom of the pond at regular intervals as well as taking adequate preventive measures.

12. DETAIL OF PONDS/ WATER BODIES WITHIN 5 KMS BUFFER AREA

For the purpose as mentioned in Condition No. (14) of the Stage-I approval letter, a list of 61 village tanks/ water bodies situated within the buffer area of 5 Kms from the lease boundary is prepared based on Topographical Map. The Topographical Map showing 5 kms buffer area of Subhadra OCP is furnished as **Annexure-I**, wherein, location of 61 ponds and water bodies have been identified. The list of 61 ponds and water bodies with corresponding coordinates is provided as **Annexure-II**.

13. POSSIBILITY OF SILTATION OF THE VILLAGE PONDS / WATER BODIES DUE TO MINING ACTIVITIES

The sub surface water shed where the mining lease falls is drained mainly by Singhada Jhor Nala which is flowing west to east along northern boundary of the lease area. Ghurudia nala flows across the lease area and meets Singhada Jhor near north east. The area has a natural slope from South to North with well drained topography.

As far as village ponds within 05 kms buffer zone of the lease are concerned, it is observed that 43 tanks / water bodies are located in other mines and mining projects. Further 08 nos. are located at the either far away from the working pits and are existing at the up side of the surface gradient. The remaining 10 nos. of tanks and water bodies are situated at the north side of the Singhada Jhor and far away from the working pits,

MCL do undertake to carry out desilting activities in those all these 61 nos. of tanks/water bodies identified on the basis of Topographical Map as stipulated under Condition No.14 of the Stage I Forest Clearance. Besides MCL do further undertake to carry out desilting in any other tanks/water bodies identified in course of time in future too.

14. METHODOLOGY

It is proposed to carry out the total de-siltation of the tanks/water bodies every five years during summer when the ponds shall dry up exposing the silts. The dried silt shall be removed manually or mechanically based on the ground condition. In case of mechanical removal of silt, small excavators such as back-hoe / small hydraulic shovels or pay loader, depending upon the quantity of silt accumulation shall be used.

The work shall comprise: -

- a) Total de-siltation in the five-year period.
- b) Implementing preventive measures during the following four years to minimize re-siltation of the ponds.

It is proposed that the ponds having accumulation of over 1000 m³ shall be de-silted by mechanical means and the rest shall be handled manually. It is proposed to deploy one 0.9 m³ back hoe with one 10 tonne tipper for de-silting of the pond in a period of two-three days. The machines shall be deployed in a planned manner to complete the work in a shortest time frame. Necessary advice of BDO, Angul and Chhendipada & Panchayat Sarpanch will be taken into account.

In case of smaller ponds, where the accumulation of silt is very small, the de-siltation operation shall be done manually by engaging sufficient manpower.

The ponds shall be allowed to dry up completely during the early summer i.e. during March and April followed by de-siltation in the above-described manner.

a) 1st Year Plan & Management:

The first-year work shall also comprise the following preventive measures to minimize siltation.

- Providing embankment to the ponds where ever necessary.
- Strengthening the existing pond embankment to check external flow of surface run-off in to the pond.
- Regular removal of aquatic weeds and polythene bags / bottle thrown by villagers.

b) Subsequent 2 Years Plan and Management: In the subsequent 2 years, the rate of siltation shall be negligible, which can be dealt by manual methods using the local labourers. This will also otherwise help in employment generation.

c) Preventive Measures & Maintenance: It is essential to take up preventive measures in order to minimize re-siltation of the ponds.

d) Dewatering of village pond: This will be carried out by engaging dewatering pump, if necessary.

e) De-silting: After pumping out the water from the pond, silts are to be removed either manually by deploying labour or excavator & dumper combination.

f) Earthwork Excavation: Wherever required, soil has to be removed for deepening the pond to increase water holding capacity of the pond.

15. INSPECTION AND MONITORING

Proper inspection, monitoring and evaluation will be done in-house by designated authorities of MCL under supervision of Forest Department.

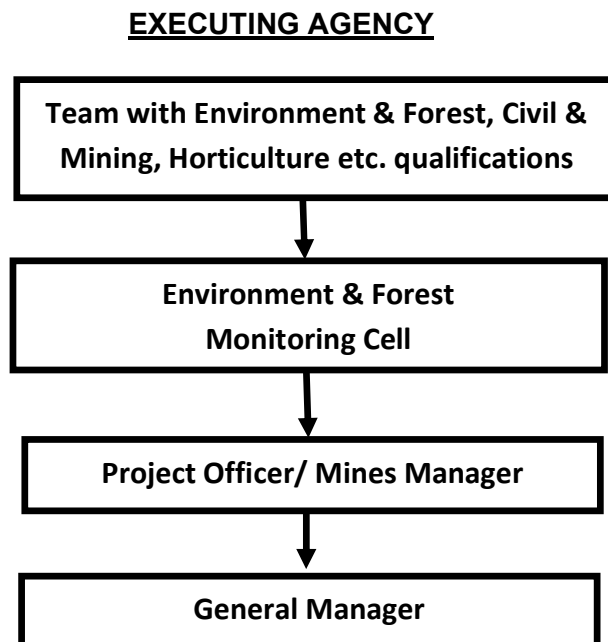
16. MOTIVATION OF PEOPLE

The villagers / VSS Committee members of the adjoining villages are to be involved in protection and management of plantation. Before execution of the work, a meeting will be conducted in the adjoining villages and resolution will be passed to support plantation activities. For motivation of the villagers/ VSS Committee members, they will be provided

incentives in shape of different community articles, buildings, and different community amenities of fixed and movable type through entry point activities (EPA). Health camps shall also be organized in the villages. Thus, 15% of the plantation cost has been earmarked for expenditure for this purpose.

17. EXECUTING AGENCY

The work will be executed by the User Agency i.e. M/s Mahanadi Coalfields Limited through dedicated departments manned by technically qualified persons with outsourced man and machinery as and when required. To facilitate this, the user agency shall establish its own executing and supervision cells along with required infrastructural facilities. In order to maintain the quality of work, in-house supervision through competent personnel shall be provided. The entire work shall be carried out in co-ordination with the Forest Department



REQUIREMENT OF FUNDS

As and when required appropriate expenditure shall be incurred in accordance to prevailing Govt. approved rates in consultation with concerned village committees under the supervision of State Forest Dept. MCL is providing herewith an Undertaking to carry out desilting of these village tanks and other water bodies located within 05 (Five) KM from the mining lease boundary so as to mitigate the impact of siltation of such tanks/water bodies.

UNDERTAKING

M/s Mahanadi Coalfields Ltd. do hereby undertake to execute desilting of village tanks and other water bodies located within 05 (Five) KMs from the mine lease boundary of Subhadra OCP as per Govt. approved rates in consultation with and under the supervision of State Forest Dept.


16.07.24
M/s Mahanadi Coalfields Ltd.
महानदी कोयला
एमसीएल, सुभद्रा क्षेत्र
General Manager
MCL, Subhadra.

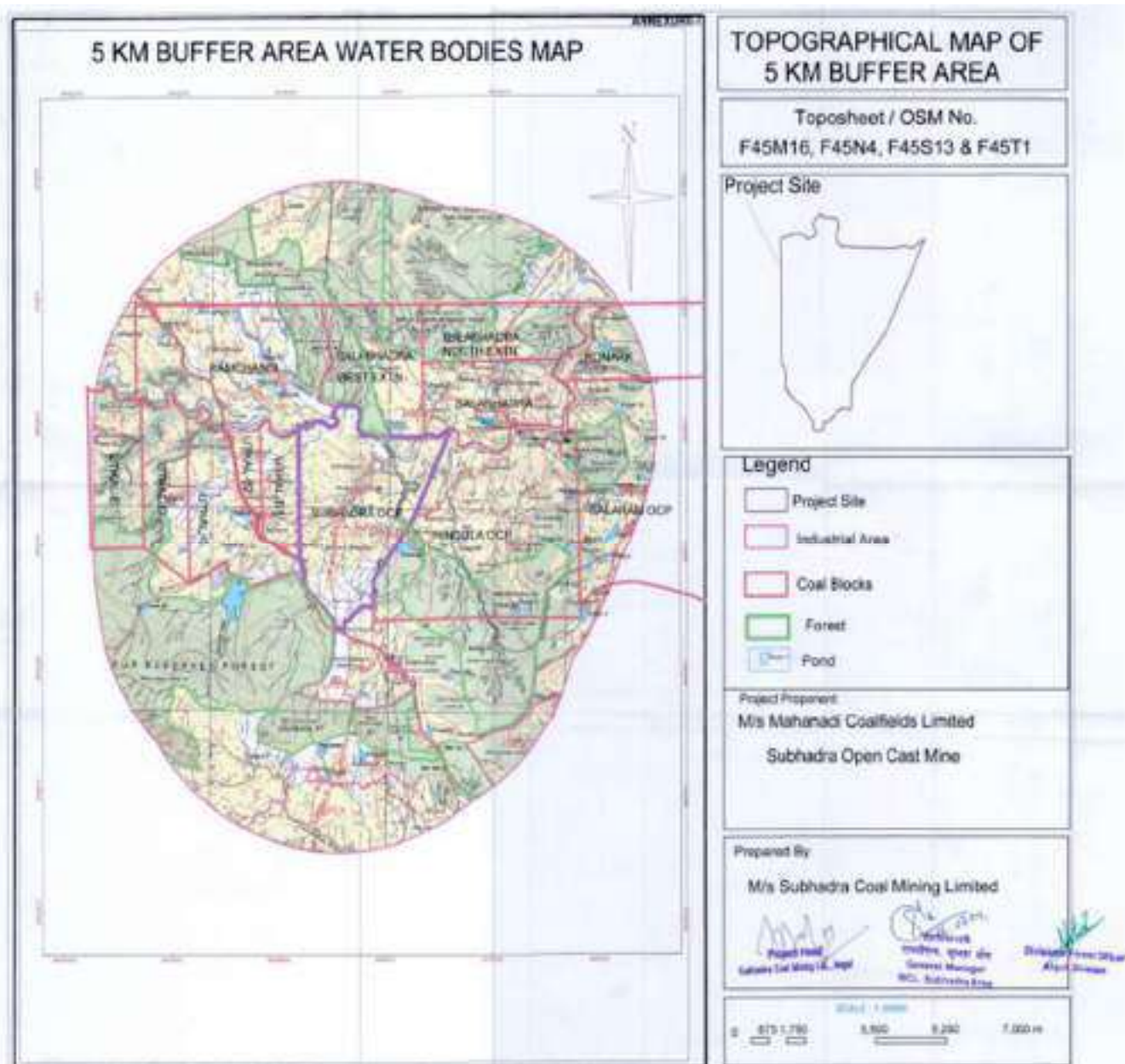

Project Head
Subhadra Coal Mining Ltd., Angul

Countersigned

Divisional Forest Officer
Divisional Forest Officer
Angul Division



APPROVED.

30/7/24
Regional Chief Conservator
of Forests, Angul Circle.



Coordinates of Water Bodies			
Pond No	Co-Ordinate		Village Name
1	20°56'10.87"	85°02'43.28"	Ambapal
2	20°58'06.71"	85°03'30.29"	Kalamchuin
3	20°57'56.93"	85°02'33.23"	Kalamchuin
4	20°56'32.12"	85°02'54.30"	Ambapal
5	20°56'52.84"	85°03'06.28"	Ambapal
6	20°56'50.04"	85°02'49.94"	Ambapal
7	20°57'12.47"	85°03'07.43"	Kalamchuin
8	20°57'04.39"	85°02'48.20"	Kalamchuin
9	20°57'58.73"	85°03'19.86"	Ambapal
10	20°57'32.11"	85°02'45.73"	Kalamchuin
11	20°57'42.35"	85°03'04.52"	Kalamchuin
12	20°57'44.28"	85°03'04.52"	Kalamchuin
13	20°58'06.71"	85°03'30.47"	Kalamchuin
14	20°58'21.28"	85°03'36.17"	Kalamchuin
15	20°58'47.03"	85°03'12.91"	Banabaspur
16	20°58'46.19"	85°02'53.00"	Banabaspur
17	20°59'00.44"	85°03'17.91"	Banabaspur
18	20°59'05.66"	85°03'27.56"	Banabaspur
19	20°59'13.01"	85°02'50.66"	Banabaspur
20	20°59'19.85"	85°02'37.59"	Banabaspur
21	20°59'30.78"	85°02'59.62"	Banabaspur
22	20°58'32.68"	85°01'21.40"	Kumunda
23	20°59'01.82"	85°01'16.77"	Kumunda
24	20°58'58.52"	85°01'28.95"	Kumunda
25	20°59'12.48"	85°01'33.88"	Kumunda
26	20°58'57.13"	85°00'32.40"	Kumunda
27	20°59'13.24"	84°59'50.41"	Kumunda
28	20°58'54.46"	84°58'27.96"	Chakradharpur
29	20°59'05.76"	84°58'21.52"	Chakradharpur
30	20°59'21.00"	84°58'12.93"	Chakradharpur
31	20°59'49.85"	84°57'39.16"	Chakradharpur
32	20°59'39.14"	84°56'51.16"	Similisahi
33	20°59'26.47"	84°56'56.71"	Similisahi
34	20°59'35.59"	84°56'11.21"	Similisahi
35	20°58'02.62"	84°56'00.69"	Gopiballavpur
36	20°58'16.50"	84°55'51.89"	Gopiballavpur
37	20°57'30.58"	84°56'52.98"	Dubamolia
38	20°56'56.71"	84°57'45.03"	Raijharana
39	20°57'18.30"	84°57'57.57"	Raijharana
40	20°56'12.04"	84°56'33.57"	Durgapur
41	20°54'22.20"	84°58'02.86"	Kaliakata
42	20°54'19.86"	84°58'56.21"	

43	20°54'30.13"	84°59'02.39"	
44	20°54'24.56"	84°59'42.45"	Ramadihi
45	20°54'45.80"	85°00'36.70"	Puribahal
46	20°55'24.88"	85°00'51.52"	Nisha
47	20°55'08.88"	85°02'04.81"	Ambapal
48	20°57'00.57"	85°00'12.38"	Ambapal
49	20°56'58.16"	85°01'05.70"	Pirakhamana
50	20°56'14.67"	85°01'49.43"	Pirakhamana
51	20°56'18.52"	85°01'58.82"	Malibandha
52	20°56'23.07"	85°02'33.42"	Malibandha
53	20°56'30.67"	85°02'24.87"	Malibandha
54	20°57'02.69"	85°02'33.08"	Nuhamuhin
55	20°57'07.08"	85°02'06.71"	Nuhamuhin
56	20°57'23.68"	85°02'04.10"	Gopal Prasad
57	20°57'42.10"	85°02'28.89"	Gopal Prasad
58	20°57'41.47"	85°02'35.95"	Gopal Prasad
59	20°58'04.29"	85°02'31.98"	Gopal Prasad
60	20°58'23.96"	85°02'16.88"	Gopal Prasad
61	20°58'28.54"	85°02'36.32"	Gopal Prasad

 ITUW TSA NEW DELHI 2024	<p>Office of the General Manager (Subhadra Area) At/Po :Angul, Near Biju Maidan Dist: Angul – 759122 (Odisha) Website :www.mcl.gov.in Email Id: gmsubhadraarea@gmail.com</p>	 MCL
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Annexure-33

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 15 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "The cost of felling of trees shall be deposited by the User Agency with the State Forest Department".



General Manager
Subhadra Area, MCL





Office of the General Manager
(Subhadra Area)
At/Po : Angul, Near Biju Maidan
Dist: Angul – 759122 (Odisha)
Website : www.mcl.gov.in
Email Id: gmsubhadraarea@gmail.com



Annexure-34

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 18 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "Trees should be felled in phased manner as per the requirement in the approved Mining Plan with prior permission of concerned Divisional Forest Officer".

General Manager
Subhadra Area, MCL



Office of the General Manager
(Subhadra Area)
At/Po :Angul, Near Biju Maidan
Dist: Angul – 759122 (Odisha)
Website :www.mcl.gov.in
Email Id: gmsubhadraarea@gmail.com



Annexure-35

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 17 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FG Dt. 05-12-2023)

I do hereby undertake that "The User Agency shall explore the possibility of translocation of maximum number of trees identified to be felled and shall ensure that any tree felling shall be done only when it is unavoidable and that too under strict supervision of the State Forest Department".

General Manager
Subhadra Area, MCL



**OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS (WILDLIFE)
& CHIEF WILDLIFE WARDEN, ODISHA**

Government of Odisha, Forest, Environment & Climate Change Department
PRAKRUTI BHAWAN, PLOT NO. 1459, SAHEED NAGAR, BHUBANESWAR- 751007
Phone: 0674-2602250, Website: www.wildlife.odisha.gov.in, Email: odishawildlife@gmail.com

No. 11775 / CWLW-FDWC-FD-0011-2023
Dated, Bhubaneswar the 09 October, 2024

To

The General Manager
Subhadra Area, At / PO- Angul
District – Angul, PIN- 759122

Sub: Diversion of 125.24 ha. of forest land for Subhadra OCP Coal Mining Project by M/s Mahanadi Coal Fields Ltd. under Angul Forst Division- Approval of SSWLCP.

Sir,

I am directed to convey the approval of PCCF (WL) & CWLW, Odisha for the Site Specific Wildlife Conservation Plan at a financial outlay of ₹3236.376 Lakh (Rupees Thirty-two Crore Thirty-six Lakh Thirty-seven Thousand Six Hundred) only as per the details of activities mentioned in Chapter-6 of the Plan prepared in compliance to Condition No. 08 of the Stage-I approval granted by MoEF&CC, New Delhi. A sum of ₹3236.376 Lakh (Rupees Thirty-two Crore Thirty-six Lakh Thirty-seven Thousand Six Hundred) only may be deposited in the State CAMPA fund through portal (<https://parvesh.nic.in>) for the purpose of implementation of various activities within the project impact area in Angul Forest Division.

2. Activities in the project area as per Chapter-6 of the Plan will be executed by the project proponent under the guidance of the concerned DFO. Further, the User Agency shall deposit 5% of the plan cost over and above in the A/c. of the society "The Wildlife Odisha" maintained in this office towards unforeseen interventions.

3. The Plan period is five years and will be revisited by the concerned DFO at least one year before expiry of its implementation. The User Agency will bear the cost of such Plan on its approval. Further, the User Agency will bear additional cost, if any, towards enhancement of wage rate and escalation of price of materials at the time of implementation of this Plan.

P.T.O.

In case of any deviation, it will be dealt as per law for violations of Van (Sanrakshan Evam Samvardhan) Adhivyam, 1980, Environment (Protection) Act 1986 and Wildlife (Protection) Act 1972.

Encl.: Copy of the approved SSWLCP

Yours faithfully,


09/10/2024
Chief Conservator of Forests (WL-III)

Memo. No. 11776 / Dt. 09/10/2024
Copy forwarded for information and necessary action to the: -

1. OSD-cum-Special Secretary to Government of Odisha, FE&CC Department, Bhubaneswar with reference to that Department Memo No. 25837/ FE&CC dated 14.12.2023 addressed to this office.
2. PCCF (FD & NO, FC Act), O/o the PCCF & HoFF, Odisha, Bhubaneswar with reference to Memo No. 7459 dated 25.09.2024 of the DFO, Angul Forest Division.
3. Regional Chief Conservator of Forests, Angul Circle along with copy of the approved SSWLCP with reference to his office Memo No.3746 dated 26.09.2024.
4. Divisional Forest Officer, Angul Forest Division along with copy of the approved SSWLCP with reference to Memo No. 3747 dated 26.09.2024 of the RCCF, Angul Circle.
5. Deputy Conservator of Forests (Administration), O/o. the PCCF(WL) & CWLW, Odisha. He is requested to raise demand to the User Agency for deposition of ₹161.8188 Lakh as contribution to the account of the society "The Wildlife Odisha".


09/10/2024
Chief Conservator of Forests (WL-III)

SUBHADRA OPEN CAST COAL MINE

(WEST OF GOPAL PRASAD WEST & UTKAL-A BLOCK)

Capacity: 25.0 MTPA

Area: 1111.85 Ha

In Talcher Coalfields (Mahanadi Coalfields Limited)

Angul Forest Division,

Angul district, Odisha

SITE-SPECIFIC WILDLIFE MANAGEMENT PLAN



**Prepared by
Divisional Forest Officer,
Angul Forest Division**

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

- I Subhadra OCP Coal Block is located in Talcher Coalfield (Main Basin), Angul district of Odisha. It is situated between the latitudes of 20° 55'56.225" N and 20°58'47.344" N, and the longitudes of 84° 58'42.383" E and 85° 0'50.476" E. This coal block is encompassed within the Survey of India Topo Sheet No. F45S13 & F45T1, which is based on a scale of 1:50,000.
- II The project encompasses a total area of 1111.85 hectares, with 125.24 hectares designated as forest land. The block's boundary is determined based on the provided following details:
- North:** Southern bank of Singhara Jhor and common boundary with Balabhadra & Balabhadra West Extn blocks.
- South:** Arbitrary lines and unblocked area.
- East:** Power line as well as common boundary with Gopal prasad East and Eastern part of Gopalprasad West block
- West:** Common boundary with Utkal-B1 and Utkal-C blocks and Angul-Chhendipada State Highway No-63.
- III The important villages in and around the proposed coal block are Kankarei, Kaunsidhipa, Balichandrapur, Baghuabola, Pirakhaman, Chhotabereni, Golagadia, Kumundaand Raijharan villages located within the core zone of the study area and are adjacent to the project Site, while village Malibrahmani, Sanatribida & Kosala are located in the buffer zone of the Subhadra OCP.
- IV The core zone of Subhadra OCP contains following Reserve Forest, Protected Forest, and Revenue Forest: -

Sr.No.	RF/PF	Area (Ha)
1.	Jaipur RF	0.75
2.	Kankarei Revenue Forest	46.98
3.	Pirakhaman Revenue Forest	4.09
4.	Balichandrapur Revenue Forest	2.21
5.	Raijharan Revenue Forest	13.99
6.	Kaunsidhipa Revenue Forest	20.30
7.	Golagadiya Revenue Forest	9.17
8.	Chhotabereni Revenue Forest	7.38
9.	Kumunda Revenue Forest	12.43
10.	Bhalugadia Revenue Forest	7.29



11.	Baghuabola Revenue Forest	0.65
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Angul, the district headquarters, is situated on National Highway No.55, which connects Cuttack to Sambalpur. It is the closest town, approximately 22 km away, accessible via the Rengali-Chhendipada-Angul metalled road that runs along the southwestern boundary of the block. Additionally, the block is well-connected to Talcher town (around 36 km) and Talcher Railway station, which serves as the terminal station on the Talcher-Cuttack section of the East Coast Railways. The villages within this block are interconnected through mud roads and Morrum roads, facilitating accessibility within and between them. The block is located approximately 20 km away from the south-western boundary, where the nearest railhead, Angul, is situated. This railhead is connected to the Sambalpur-Bhubaneswar railway line of the East Coast Railways. Moving towards the east direction, about 240 km away, you will find the nearest port, Paradip, situated at the Bay of Bengal. If you are looking for the nearest airport, it is the Biju Pattanaik Airport, which is approximately 150 km away from the block in the south-east direction. This airport is located in the state capital, Bhubaneswar.

- V The Singada Jhor river flows in an easterly direction and constitutes a significant portion of the northern boundary of the block. As it continues downstream, the Singada Jhor merges with the Brahmani River in the northeastern part of the coalfield. Within the block, the Sinhajori nala, Ghurudia nala, and Masani jhor flow from south to north, providing a constant water supply to the Singada Jhor and influencing the drainage pattern of the area. Additionally, there are numerous small ponds and dug wells in this block, which are commonly used for irrigation and drinking purposes.
- VI The terrain of the area is characterized by gentle undulations, and the local residents primarily utilize the land for agricultural activities. In the southwestern region, the topography is slightly undulating and slopes in a northerly direction. Towards the southeastern corner of the block, the ground level gradually increases, reaching its highest point at approximately 160 meters above Mean Sea Level near borehole no. DMTU-106.
- VII The core zone of this coal block comprises 9 villages, namely Kankarei, Kaunsidhipa, Balichandrapur, Baghuabola, Pirakhaman, Chhotabereni, Golagadia, Kumunda, and Raijharan. Additionally, the study area includes Malibrahmani, Sanatribida, and Kosala villages. Below is a summary of the demographic pattern observed in the study area:



Demographic profile of the study area

SR. NO.	PARAMETER	STUDYAREA
1.	No. of Villages	81
2.	Households	15975
3.	Household Ratio	4.1
4.	Total Population	66878
5.	Male Population (%)	34526(51.62%)
6.	Female Population (%)	32352(48.37%)
7.	Population (0-6 Years %)	8555(12.79%)
8.	Sex-Ratio	937
9.	Child Sex Ratio	895
10.	Scheduled Caste %	14683 (21.95%)
11.	Scheduled Tribes %	5639 (8.43%)
12.	Literates %	43362 (64.83%)
13.	Male Literates	25003 (57.66%)
14.	Female Literates	18359 (42.33%)
15.	Main Workers%	19211(28.72%)
	• Cultivators (%)	6432 (33.48%)
	• Agricultural Labourers (%)	3148 (16.38%)
	• Household Labourers (%)	1120 (5.82%)
	• Other Workers (%)	8511 (44.30%)
16.	Marginal Workers%	6569 (9.82%)
17.	Non-Workers %	41098 (61.45%)

Source: *PCA Census 2011, Orissa State

- VIII The State's forest cover spans across an area of 52,155.95 km², accounting for 33.50% of its total geographic area. Among this, very dense forest covers 7,212.80 km², moderately dense forest covers 20,994.90 km², and open forest covers 23,948.25 km². Additionally, there is a scrub land area of 4923.70 km².
- IX The current Working Plan of Angul forest division is effective from 2021-22 to 2030-31. As per the revised Forest Types (Champion and Seth 1968), the study area has been categorized as Orissa Semi Evergreen Forest (2B/C3), Moist Peninsular Low-Level Sal Forest (3C/C2e (ii)), Dry Peninsular Sal Forest (5B/C1c), and Dry Bamboo Brakes (5/E9). Within this Working Circle, Sal occurs either in its pure form or in combination with other tree species such as *Shorea robusta*, Saja (*Terminalia tomentosa*), Dhaora (*Anogesissus latifolia*), Bija (*Pterocarpus marsupium*), Sena (*Lagerstroemia parviflora*), Salia (*Boswellia serrata*), Tinsa (*Ougeinia oojeinensis*), Sagaun (*Tectona grandis*), Kari (*Saccopetalum tomentosum*), etc.



X The **flora** existing in the core and buffer zone are Sal (*Shorea robusta*), Teak (*Tectona grandis*), Haldu (*Adina cordifolia*), Dhaora (*Anogeissus latifolia*), Kardhai (*Anogeissus pendula*), Saliha (*Boswellia serrata*), Char (*Buchnanan lanzan*), Dhobin (*Dalbergia paniculata*), Tendu (*Dyospyros melanoxylon*), Amla (*Emblica officinalis*), Lendia (*Lagerstoremia parviflora*), Gunja (*Lannea coromandelica*), Mahua (*Madhuca indica*), Bija (*Pterocarpus marsupium*), Kusum (*Schleichera oleosa*), Bhelwa (*Semecarpus anacardium*), Jamun (*Syzygium cumini*), Harra (*Terminalia chebula*), Bahara (*Terminalia belerica*), Saja (*Terminalia tomentosa*) etc. **Grasses** noticed are *Aristida (Aristida funiculata)*, *Chloris (Chloris barbata)*, *Digitaria (Digitaria radicata)*, *Dimeria (Dactyloctenium aegyptium)*, *Setaria (Setaria glauca)*, *Cenchrus (Cenchrus biflorus)*, *Cyperus* etc. **Weeds** noticed are *Ageratum conyzoides*, *Alys icarous* and *Euphorbia sps.*

XI The observed fauna includes –

Mammals- Bison (*Bos gaurus*), Jackal (*Canis aureus*), Sambhar (*Cervus unicolor*), Short Nosed Fruit Bat (*Cynopterus sphinx*), Indian Elephant (*Elephas maximus*), Wild Cat (*Felis chaus*), Mongoose (*Herpestes edwardsii*), Striped Hyena (*Hyaena hyaena*), Indian Porcupine (*Hystrix indica*), Rhesus Macaque (*Macaca mulatta*), Common Otter (*Lutra lutra*), Indian Pangolin (*Manis crassicaudata*), Sloth Bear (*Melursus ursinus*), Kalarapartia Bagh (*Panthera pardus fusca*), etc.

Birds- Brown fish Owl (*Bubo zeylonensis*), Blue Rock Pigeon (*Columba livia*), Asian Koel (*Eudynamis scolopacea*), Rufous Wood Pecker (*Micropternus brachyurus*), Pied Kingfisher (*Ceryle rudis*), Painted Partridge (*Gallus erdixlunulata*), Bengal Vulture (*Galloperdix lunulata*), Indian Great horned Owl (*Bubo bengalensis*), Common Parakeet (*Psittacula eupatria*), Grey Jungle Fowl (*Gallus sonneratti*), Jungle Myna (*Acridothera tristis*), Indian Cuckoo (*Cuculus micropterus*), Indian Roller (*Coracias behghalensis*), Spotted Dove (*Streptopelia chinensis*), Bush Quail (*Perdicula asiatica*), Chestnut bellied Sand Grouse (*Pterocies exustus*), Peacock (*Pavo cristatus*), Cattle Egret (*Bubulus ibis*), Green Imperial Pigeon (*Ducula aenea*).

Reptiles- Indian Rock Python (*Python morulus*), Garden Lizard (*Calotes versicolor*), Rat Snake (*Ptyas mucosa*), Indian Cobra (*Naja naja*), King Cobra (*Ophiophagus hannah*),



SSWLMP for Subhadra OCP in Talcher Coalfields, Odisha of M/s Mahanadi Coalfields Limited
Russel's Viper (*Vipera russelii*), Bengal Monitor Lizard (*Varanus bengalensis*),
Checked Keelback (*Xenochrophis piscator*).

Fishes- Katla (*Catla catla*), Mrigal (*Cirrhinus mrigala*), Rohu (*Labeo rohita*), Singi
(*Heterophneustes*

Fossil), Balia (*Waalngonia attu*), Seula (*Ophiocaphalus striatus*), etc.

- XII The potential negative impacts caused by this project include air pollution, noise pollution, occasional accidental death of wildlife, generation of litter, loss and degradation of habitats, forest fires, and fragmentation of wildlife habitats. To address these concerns, various mitigation measures have been implemented in the core area of the project, such as habitat improvement and protection, fire protection, awareness campaigns, and immunization of cattle along with awareness and capacity building for villagers. In the buffer area, mitigation measures include wildlife habitat improvement, fire protection measures, an anti-depredation squad, compassionate grants, and the creation of water holes.
- XIII A monitoring committee will be established under the leadership of the Conservator of Forest Angul Circle, with the Divisional Forest Officer (DFO) of Angul Division serving as the Member Secretary. The committee will also include the Range Officers, Foresters, and Forest Guards of concerned forest area. Additionally, the village head of neighboring villages will attend the biannual meeting to thoroughly discuss the progress and impact of the plan's recommendations. Any changes or adjustments to the approved recommendations by the Principal Chief Conservator of Forests (Wildlife) will be implemented.
- XIV The user agency, MCL, will submit an undertaking along with this Site-Specific Wildlife Management Plan, committing to provide the necessary funds and physical support to ensure the proper implementation of the points wise measures i.e. point no.1 to 6 mentioned in the Animal Passage Plan in and around the Subhadra OCP mining lease area in the future.



CHAPTER-1

INTRODUCTION

CHAPTER-1-INTRODUCTION AND METHODOLOGY

1.1 Introduction:

The mineral wealth of a nation is an important feature in its economic progress, and mining in India has a vital role in the development. Odisha has a glorious heritage in the field of natural resources, mines and minerals. The state is geologically so endowed that it has become a veritable repository of minerals.

Electricity is the key factor for development of a nation. All sectors viz. industrial, agriculture and social require electric power for their growth and availability of electricity in the nation. Coal-based power plants are probably the most economically viable and time tested solution towards the solution of this problem. These thermal power plants obviously need constant supply of coal. Infact, about 67% of the power plants in India are coal based.

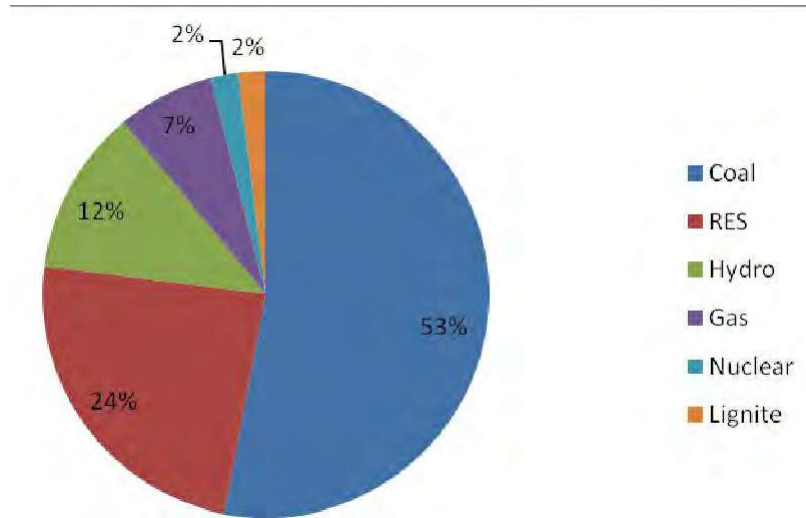
Coal Mining

Coal provides over 25 percent global primary energy need and 40 percent of the world's electricity consumption. It drives much of the global economic development. It is the main fuel for electricity generation in most of the countries in world. It is an essential element in over 65 percent of the world's steel production (World Coal Institute, 2006). It is the most abundant fuel resource in India. It is the prime source of energy and perhaps the largest contributor to the industrial growth of the country. Over the years, coal has become a major source of revenue in central India. Most of the rural consumers depend on coal for their energy needs. For consumers, coal offers excellent value, as it is cheaper per energy unit in comparison with other fuels.

The current per capita commercial primary energy consumption in India is about 350 kg/year-1. Considering the limited reserve potentiality of petroleum and natural gas, eco-conservation restriction on hydro electrical project and geo- political perception of nuclear power, coal will continue to occupy center- stage of India's energy scenario. No doubt coal plays a fundamental role in global development, but it must meet a number of social and environmental challenges to demonstrate its role in sustainable development.



Coal plays a crucial role in the production of electricity in India. As per the CEA data with regard to installed capacity in India (as of Oct'20), coal based installed capacity is about 53%, followed by Renewable Energy Sources (RES) at 24%, while hydro power (12%), gas (7%), nuclear (2%) and lignite (2%) round up the rest. The graph representing the fuel wise contribution to the country's installed power generation capacity is shown in the figure 1.1 below.



Source: <https://powermin.nic.in/en/content/power-sector-glance-all-india>

Figure 1.1: Fuel-wise contribution in India installed power generation capacity

Mining is one of the major contributors towards the growth and sustenance of human civilization. In this context, coal mining has played a special role since ancient times; as coal is a major source of energy for the development of a society. However, coal mining has its own downside i.e., coal mines lead to degradation of land and especially for an opencast mine, where large tracts of land are used. During production of coal from mines and subsequent transportation of coal, significant pollution is generated. The pollution includes land degradation, air pollution, and water pollution, noise pollution, beside shaving impact on socio-economic status of the area and flora & fauna.

Coal deposits in Odisha

Coal deposits are mainly confined to eastern and south-central parts of the country. The states of Jharkhand, Odisha, Chhattisgarh, West Bengal, Andhra Pradesh, Maharashtra and Madhya Pradesh account for more than 99% of the total coal reserves in the country.

Odisha is one of the mineral rich states especially coal point of view. The state has about a quarter of the total coal reserves of the country. Though mining of minerals and extraction of metals were in practice in ancient Odisha. Modern mining as per available records started in 1909, when coal was first excavated in the Rampur area of IB valley. Over the years the mining activity has been accelerated to meet the demand of the public & private sector. Coal has been known as the alternative source of energy. In the year 1992 Mahanadi Coalfield Limited, a subsidiary of Coal India formed for Odisha. And after that all the mines those are coming under the Coal India subsidiaries in Odisha came under MCL. The IB Valley and Talcher coalfield are two main coal fields of Orissa where coal reserves and consequently coal mining activities are concentrated.

Talcher coalfield is having coal reserves of 40.87 billion (64.64%) tonnes and Ib Valley coalfield has 22.36 (33.36%) billion tonnes of coal reserves. Talcher coalfield is lying between latitudes 20^o 53' N and 20^o 12' N and longitude 84^o 24' E and 85^o 33' E. It is situated in Angul district of Orissa. It was first started at Gopalprasad in the year 1837. Since the sixties, there has been a steady increase in coal production from Talcher coalfield. Coal production was 0.91 Mt in 1972-73, the year of nationalization; the production became 13.80 Mt in the year 1991-92 just before the formation of MCL and 42.06 Mt in 2003- 04. The coal reserve of Mahanadi Coalfields Limited is spread over two Coalfields viz., Talcher and IB Valley with Ten (10) operating Areas consisting of Seven (7) underground and Sixteen (16) Open Cast Projects.

Rising demand for energy and coal as the primary energy source make it a significant resource in the country. Opening of Subhadra OCP coal, mine will have the following benefits:

- Increase supply of coal for India's power programme.
- Reduces power shortages hindering growth, foreign investment and productivity.



- Generate additional employment, both direct and indirect which will lead to economic growth of the industrial sector as well as country.
- This coal mining project will generate revenue Rs.47,700 crores in form of Govt Royalty, DMF, NEMT, GST & Social employment opportunity in & around .
- Quality of life of local populace in villages shall improve due to company's community development programmes.

1.2 Location of Lease Area:

The Talcher coalfield is the largest repository of power grade coal in India. It occupies a basin in the south-eastern part of the Mahanadi Valley belt of Gondwana Basin and covers an area of about 1800 sq. kms and is located mainly in Angul district of Odisha. It is located between longitudes 20 degree 53 minute to 21 degrees 12-minute North and longitudes 84 degree to 85 degrees 23-minute East. The strike length of the coalfield in east-west direction is about 80kms and the width in north south direction is about 26Km.

The block lies between latitude 20° 55'56.225" N and 20° 58'47.344" N and longitude 84° 58'42.383" E and 85° 0'50.476" E and is covered under Survey of India topo sheet No. F45Z13 & F45T1 on RF 1: 50,000. The boundary of the block is defined as per the following details:

North: Southern bank of Singhara Jhor and common boundary with Balabhadra & Balabhadra West Extn blocks.

South: Arbitrary lines and unblocked area

East: Power line as well as common boundary with Gopalprasad East and Eastern part of Gopal prasad West block

West: Common boundary with Utkal-B1 and Utkal-C blocks and Angul-Chhendipada State Highway No-63.

Utkal-A and West of Gopalprasad West block covers an area of 11.45 sq. km. The block is nearly triangular in shape having about 5.2 km length in north-south direction and about maximum 3.6 km width in east-west direction.



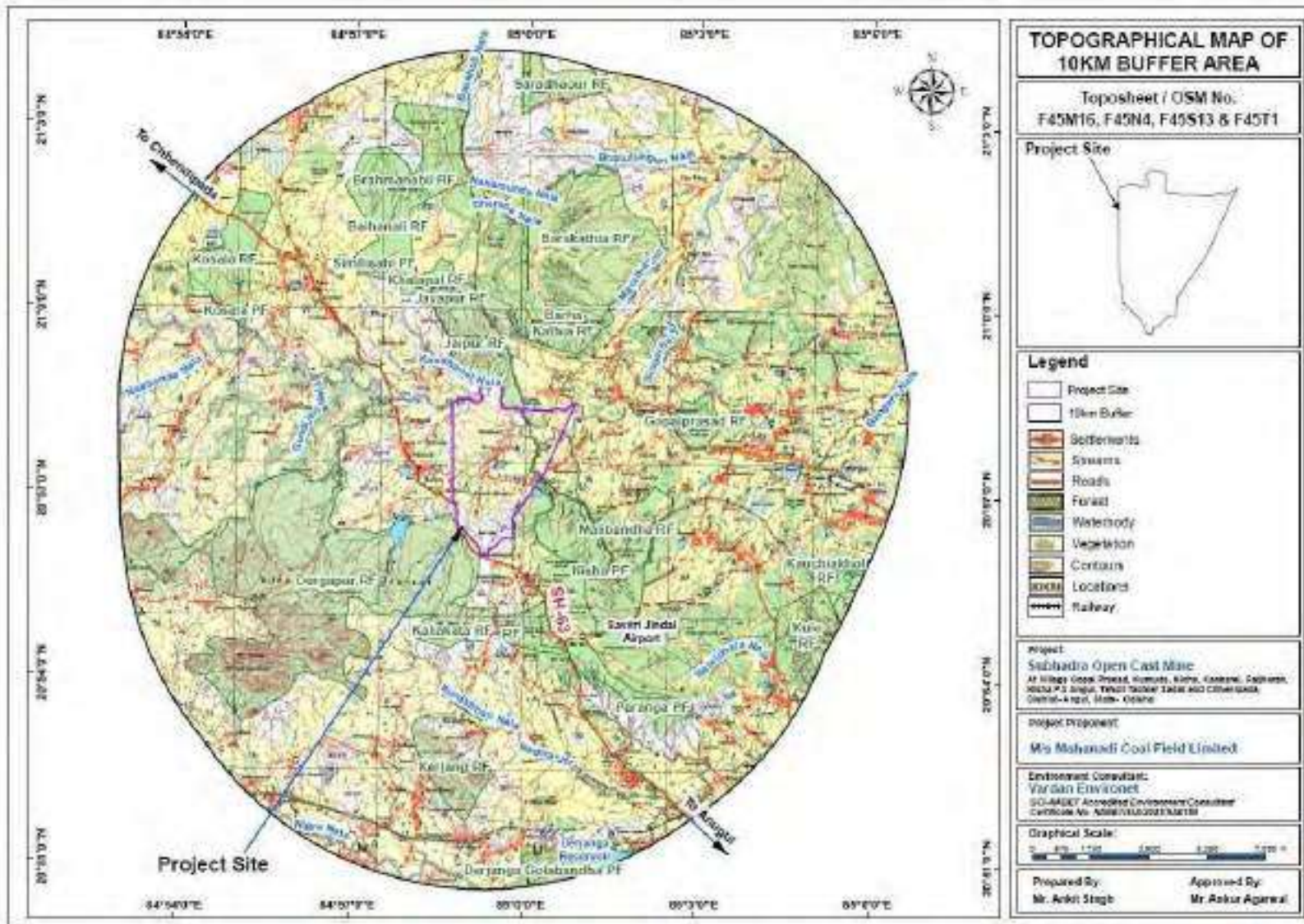


Figure-1.2:10 km Study area around Subhadra OCP



CHAPTER-2

PROJECT AND IMPACT AREA

CHAPTER-2-PROJECT AND IMPACT AREA

2.1 PROJECT AREA

The proposed project covers an area of 1111.85 Ha. The block is nearly triangular in shape having about 5.2 km length in north-south direction and about maximum 3.6 km width in east-west direction.

The block lies between latitude 20°55'56.225" N and 20°58'47.344" N and longitude 84°58'42.383" E and 85°0'50.476" E and is covered under Survey of India toposheet No. F45S13 & F45T1 on RF 1: 50,000. The boundary of the block is defined as per the following table:

Table-2.1: Boundaries of the Block

North	Southern bank of Singhada Jhor including proposed diversion.
South	Arbitrary lines and unblocked area
East	Power line as well as common boundary with 'Gopal Prasad East and Eastern part of Gopalprasad West block'
West	Common boundary with Utkal-B1 and Utkal-C block.

Table-2.2: Location Details

Coalfield	Talcher Coalfield
Area	Subhadra Area
Tehsil	Talcher and Chhendipada
District	Angul
Latitudes & Longitudes	A-20°56'31.89"N 84°58'48.26"E B-20°56'51.92"N 84°58'44.54"E C-20°58'27.97"N 84°58'42.33"E D-20°58'32.54"N 84°59'0.97"E E-20°58'28.73"N 84°59'5.77"E F-20°58'39.68"N 84°59'11.16"E G-20°58'48.30"N 84°59'19.19"E H-20°58'37.15"N 84°59'34.55"E I-20°58'23.31"N 84°59'37.48"E



	J-20°58'28.96"N 85°0'50.90"E K-20°56'36.65"N 84°59'47.38"E L-20°56'16.66"N 84°59'46.69"E M-20°56'6.82"N 84°59'22.44"E N-20°55'58.93"N 84°59'18.24"E
Toposheet No.	F45S13 &F45T1 on RF1:50,000

2.2 Forest Jurisdiction:

The administrative jurisdiction of proposed Subhadra OCP comes under Angul Forest Division.

Out of the lease hold area of 1111.85 ha only 125.24 ha is forestland.

Table-2.3: Lease Hold Area

Type of Land	Area (ha)
Forest Land	125.24
Non-Forest Land	986.61
Total	1111.85

2.3 Land Use Pattern:

The project area comprises of total 1111.85 ha, out of which, 125.24 ha Land is forest land, 696.50 ha is tenancy land and 290.11 ha area is Non-Forest Govt. land. The existing land utilization in the project area is given in **Table 2.4**.

Table-2.4: Land Use Pattern of Subhadra OCP

	Land Type	Area(Ha)
Tenancy	Agricultural	661.70
	Township	0.00
	Grazing	0.00
	Barren	0.00
	Water Bodies	6.28
	Road	0.25
	Community/Other use	28.27
Non-Forest Govt.	Agricultural	138.80
	Township	0.00
	Grazing	58.67
	Barren/Other use	92.64



Forest	Reserve Forest	0.75
	Protected Forest	0.00
	Revenue Forest	124.49
Total Area		1111.85

Table-2.5: Mining Land Use Details

Type	Land Use Proposed	Land Use(End of Life)	Land Use (PostClosure)						Total
			Agriculture Land	Plantation	Water Body	Public/Company Use	Forest Land (Returned)	Unplanted	
Excavation Area	881.28	881.28							
Backfilled Area	715.24	715.24	495.27	182.52			37.45		715.24
Excavation void without plantation	130.68	130.68						130.68	130.68
Water harvesting	35.36	35.36			35.36				35.36
Top Soil Dump	8.97	8.97	8.97						8.97
Coal Stock Yard	9.76	9.76	9.76						9.76
External dump	24.17	24.17	24.17						24.17
Safety Zone	11.79	11.79		11.79					11.79
Haul road between quarries	0.00	0.00							0.00
Nala Diversion & Settling pond	8.42	8.42				8.42			8.42
Road, building & Infrastructure	Road: 15.72	Road: 15.72				15.72			118.16
	Township: 27.12	Township: 27.12		1.26		25.86			
	Infra: 75.32	Infra: 75.32					75.32		
	118.16	118.16							
Rationalization area	25.34	25.34		25.34					25.34
Embankment	11.49	11.49				11.49			11.49
Greenbelt	6.89	6.89					6.89		6.89
Explosive magazine	5.58	5.58					5.58		5.58
Total	1111.85	1111.85	538.17	220.91	35.36	61.49	125.24	130.68	1111.85



2.4 Demographic Pattern:

Demographic structure of the study area was estimated for the selected parameters as households, population, sex ratio, scheduled caste, scheduled tribes, literacy from primary census abstract, CD 2011 of Odisha State. Total number of households in the study area is about 15975 with total population is about 66878 with male population is 34526 (51.62%) and female population is 32352 (48.37%). Summary of demographic profile of the study area is given in **Table 2.6**. Demographic and Occupational Structure of the study is given in **Table 2.7 and 2.8** respectively.

Table-2.6: Demographic profile of the study area

SR.NO	PARAMETER	STUDYAREA
1.	No. of Villages	81
2.	Households	15975
3.	Household Ratio	4.1
4.	Total Population	66878
5.	Male Population (%)	34526(51.62%)
6.	Female Population (%)	32352(48.37%)
7.	Population (0-6Years%)	8555(12.79%)
8.	Sex Ratio	937
9.	Child Sex Ratio	895
10.	Scheduled Caste %	14683(21.95%)
11.	Scheduled Tribes %	5639(8.43%)
12.	Literates %	43362(64.83%)
13.	Male Literates	25003(57.66%)
14.	Female Literates	18359(42.33%)
15.	Main Workers%	19211(28.72%)
	• Cultivators (%)	6432(33.48%)
	• Agricultural Labourers (%)	3148(16.38%)
	• Household Labourers (%)	1120(5.82%)
	• Other Workers (%)	8511(44.30%)
16.	Marginal Workers %	6569(9.82%)
17.	Non-Workers %	41098(61.45%)

Table-2.7: Details of village-wise demographic pattern

Sr.No.	Villages	Households	Total Population	Male Population	Female Population	Population(0-6Years)	Schedule dCaste	Schedule d Tribes	Literates
Odisha State									
Angul District									
Chhendipada Tahasil									
1	Kaunsidhipa	37	167	89	78	21	0	0	98
2	Chhotabereni	89	339	176	163	44	229	9	235
3	Kankarei	525	1799	913	886	223	154	115	1214
4	Balichandrapur	63	278	140	138	27	34	10	187
5	Pirakhaman	114	390	204	186	52	0	92	217
6	Raijharan	804	3151	1591	1560	553	1247	359	1836
7	Ambapal	354	1691	877	814	203	505	0	1083
8	Ambapaljungle	0	0	0	0	0	0	0	0
9	Natada	641	2899	1536	1363	344	397	299	1992
Total		2627	10714	5526	5188	1467	2566	884	6862
Talcher Tahasil									
1	Kumunda	466	1838	966	872	197	260	6	1354
2	Bhalugadia	199	797	416	381	98	203	0	563
3	Baghuabol	0	0	0	0	0	0	0	0
Total		665	2635	1382	1253	295	463	6	1917
Grand Total		3292	13349	6908	6441	1762	3029	890	8779



Table-2.8: Occupational Structure of the Study Area (RURAL)

Sr.No.	Villages	Total Main Workers	Main Workers				Marginal Workers	Non-Workers
			Cultivators	Agricultural Laborers	Household Laborers	Other Workers		
Odisha State								
Angul District								
Chhendipada Tahasil								
1	Kaunsidhipa	46	27	3	1	15	3	118
2	Chhotabereni	85	9	61	0	15	17	237
3	Kankarei	490	295	108	4	83	8	1301
4	Balichandrapur	52	30	18	0	4	104	122
5	Pirakhaman	101	65	25	0	11	0	289
6	Raijharan	1201	459	443	122	177	338	1612
7	Ambapal	528	76	33	4	415	17	1146
8	Ambapaljungle	0	0	0	0	0	0	0
9	Natada	847	255	44	6	542	128	1924
Total		3350	1216	735	137	1262	615	6749
Talcher Tahasil								
1	Kumunda	809	174	359	4	272	12	1017
2	Bhalugadia	198	101	5	3	89	116	483
3	Baghuabol	0	0	0	0	0	0	0
Total		1007	275	364	7	361	128	1500
Grand Total		4357	1491	1099	144	1623	743	8249



2.5 Cropping Pattern:

Two seasonal crops mainly Kharif (summer crop) and Rabi (winter crop) are well developed in this region. The crops grown are Paddy, Jawar, Maize and Kodo. Mustard and Til are also grown along with the pulses like Arhar, Mung etc. The main Kharif crop is also paddy which is cultivated with a short rotation and this type of crop is grown only where irrigation facilities are available during winter. In addition, Alsi, Mustard, etc. are also grown during Rabi. A very significant matter is use of fertilizers and pesticides in this region are very much limited as most of the agricultural practitioners are traditional and support use of green manure.

2.6 Extent of Biotic Pressure on the study area:

At present agriculture is not imposing any biotic pressure on the natural ecosystem particularly of this region. The population growth is a common phenomenon all over which is not restricted to only the study area. The population growth has its impact on the natural ecosystem, common to everywhere. The energy consumption by the villagers for cooking food items entirely depends on adjoining forest areas i.e. Collection of fuelwood.

2.7 Non-timber Forest Produces (NTFPs) Collection:

Tropical forests, known as the most biodiverse regions on Earth, are home to a plethora of medicinal and economically valuable plants. Unfortunately, the excessive exploitation of these forests has led to a rapid decline, making it a significant global concern in terms of both the environment and the economy (Hareetal.1997). Sacred groves, also referred to as "Debasthali" or "Saktipitha," are small patches of pristine vegetation that have been preserved by local communities as part of their socio-cultural and religious practices. These groves not only support diverse ecosystems but also contribute to the sustainable livelihoods of indigenous communities and serve as a reservoir of genetic diversity.

The majority of families residing in the impact area are from the SC and ST communities, who are actively engaged in the collection of NTFPs. They have been utilizing the forest area for open grazing and other customary practices. Additionally, the villagers gather leaves from fodder species by cutting branches. Another common practice among the villagers is to obtain NTFPs such as Amla, Bahada, Harida, Bela, Kendu, Kusum, etc. with minimal labor but higher yield by either lopping the branches or even felling the entire tree for a few fruits. It is imperative to put an end to these practices. Therefore, it is



recommended that the forest fringe villagers and members of the VSS undergo training on non-destructive methods of collecting NTFPs. They should also be educated on the latest techniques for sustainable NTFPs collection.

The Angul division's forests are home to a wide range of species that produce various non-timber forest products (NTFPs) such as fruits, seeds, tubers, barks, leaves, roots, and gums. These NTFPs can meet the needs of many people without depleting the resource. Rural households, in particular, rely on NTFPs for essential food and nutrition, medicine, fodder, fuel, thatch, construction materials, mulch, and non-farm incomes. These products play a crucial role in helping communities cope with periods of food scarcity during the agricultural cycle and in mitigating other seasonal fluctuations. The people living in and around the forests depend on NTFPs as a vital component of their livelihood security. They gather these products for personal consumption and also sell them to supplement their earnings. For the rural population, especially those living on the outskirts of the forest, collecting and marketing NTFPs can provide employment during lean periods of the agricultural cycle and serve as a safety net against risks and household emergencies.

In recent years, there has been a significant increase in the demand for various types of Non-Timber Forest Products (NTFPs) as raw materials in industries such as herbal cosmetics, dyes, and ayurvedic drugs. This surge in demand has resulted in a booming global trade of these herbal materials, estimated to be worth over 60 billion dollars annually. However, this high demand for a limited number of NTFP varieties has led to destructive exploitation, particularly of already scarce and endangered species. Collectors often employ methods that are extremely damaging, posing a serious threat to species that have underground propagative parts like rhizomes, bulbs, and tubers. As a result, these species face the risk of extinction. Even once abundant species like Amla (*Embolica officinalis*) and Char (*Buchnanian lanzan*) are now under threat due to over-exploitation. Middle-aged trees, which are crucial for the growth of these species, are being indiscriminately cut down to harvest unripe fruits before they naturally fall. This practice not only hampers the regeneration of the species but also affects the genetic composition and quality of the resource, especially if only inferior fruits and seeds are left for regeneration. Furthermore, the greed of local communities, middlemen, and end users further complicates the situation. If this unsustainable and excessive exploitation continues, it will ultimately endanger the very existence of these resources. Overexploitation is



exacerbated by factors such as excessive grazing, illegal tree felling, frequent forest fires, and the invasion of weeds, which often result in the loss of natural regeneration of these species in the forest.

The forest plays a crucial role in meeting the diverse needs of people. The rural community relies on the forest for bamboo, poles, fuel wood, and timber, which are essential for agricultural implements, house construction, bullock carts, and fencing. Additionally, the forest provides various non-timber forest products (NTFP) such as seeds, leaves, flowers, roots, and bark. These NTFP items are obtained from the forest and are important sources of food, particularly for tribal and rural poor communities. It is reported that 60% of non-timber forest produce is consumed as food or dietary supplements by forest dwellers. Furthermore, approximately 75% of forest-dependent individuals supplement their food intake throughout the year with tubers, flowers, leaves, and fruits. In rural areas, the main species used for timber include Sal, Bandhan, Teak, Kurum, Asan, and for poles, Arjun, Kendu, Sidha, Karada, Dhaura, and others.

2.8 Topography & Drainage:

The surface of the area has a gentle undulating topography, with the highest point located in the southwest at an elevation of 167.50m above mean sea level (AMSL), and the lowest point in the northeast at an elevation of 107.50m AMSL. The average gradient of the surface is 1:120. The drainage of the coal field is directed towards the Brahmani River, which is located 20km east of the block. Within the block, the drainage flows into the Singhada Jhor perennial stream at the northern boundary, which eventually feeds into the Brahmani River. Additionally, there is a seasonal stream called Ghurudia that traverses across the block. The mean annual precipitation in the area is 1277mm, with 70% of it occurring during the rainy season.

HFL has been estimated based on actual measurements taken at two locations: one situated 2.1km upstream and the other 2.2km downstream. The Brahmani River, which runs approximately 20km from the mine boundary in the north along the eastern boundary of the Talcher coalfield, serves as the primary drainage system for the area. This river is replenished by seasonal nalas, namely Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor, and a few smaller nalas. Singada Jhor flows towards the east and forms a significant portion of the northern boundary of the block. It eventually merges with the Brahmani



River downstream, in the northeastern part of the coalfield. Within this block, there are several small ponds and dug wells that are commonly used for irrigation and drinking purposes.

2.9 Natural Drainage Lines:

The region is drained by the Brahmani River, which runs approximately 20 km away from the northern to southern boundary along the eastern boundary of the Talcher coalfield. This river is primarily supplied by seasonal nalas, namely Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor, and a few smaller nalas. Moving eastward from the block's eastern boundary, the Brahmani river is situated at a distance of around 20 km. Singada Jhor dominates the drainage pattern of the block for most of the year. Additionally, small ponds and dug wells are commonly found in this area and serve purposes such as irrigation and drinking water supply.

2.10 Climate:

The region experiences a warm sub-tropical climate with an average annual precipitation of 1277mm. The majority of rainfall, about 70%, occurs during the rainy season. The mean temperature ranges from 6.70C to 45.50C. At the Angul Meteorological (IMD) station, the annual average wind speed recorded in 2019 was 2.5kmph. However, the monthly mean wind speed varies throughout the year, ranging from 1.8kmph in October to 3.4kmph in June. For different seasons, the prevailing wind directions in this area are as follows: SW for monsoon, NW & NE for post-monsoon, NW, NE & SE for winter, and NW, SE, NE & SW for pre-monsoon cyclone seasons. The average relative humidity in the region fluctuates between 25% in March or April and 82% in August.

2.11 Description of Flora and Fauna:

The distribution pattern of natural species of flora and fauna in an ecosystem reflects changes in the composition of biotic communities. This sensitivity of animal and plant species to changes in their environment can be utilized for monitoring the Impact Assessment studies of any project. The biological communities serve as indicators of the environmental condition and the availability of resources for their distribution and survival. These communities consist of both plant (flora) and animal (fauna) species, which interact not only with each other but also with the physical and chemical components of the



SSWLMP for Subhadra OCP in Talcher Coalfields, Odisha of M/s Mahanadi Coalfields Limited
environment. The changes in the biotic community are studied by examining the distribution, abundance, and diversity of species.



2.11.1 Methodology for Biodiversity Assessment:

I. Floral Diversity:

The present study on the floral assessment for the project activity is based on field survey of the area. Inventory methodology was adapted to the baseline data of floral diversity in a corridor of 10km radius from the project site of the proposed project using the relevant toposheets of scale 1:50000.

A forest inventory is “**an attempt to describe the quantity and quality of forest trees and many of the characteristics of the land area upon which the trees are grown.**” The objective of this floral inventory of the study area, is to provide a complete checklist of flora along with the entire stretch of the proposed project for formulating effective management and conservation measures. The tree species, shrubs, herbs and climbers observed in the study area (Core zone, Buffer Zone and Protected Areas NP/WLS/PF/RF) are represented in the **Table 2.9**.

II. Faunal Diversity:

A linear transect of 1.0 km each was chosen for sampling at each site. Each transect was trekked for 1.5 hr for the sampling of faunal diversity through following methods for different categories. For the sampling of butterflies, the standard ‘Pollard Walk’ method was employed and all the species recorded daily. Voucher specimens of the species that could not be identified in the field were collected using a butterfly net besides photographing them.

For bird’s sampling, ‘Point Sampling’ along the fixed transect (Foot trails) was carried out. All the species of birds were observed through a binocular and identified with the help of field guide book and photographs.

For the sampling of mammals, direct count on open width (20m) transect was used. In addition, information on recent sightings/records of mammals by the villagers/locals was also collected. For carnivores, indirect sampling was carried out and the mammals were identified by foot marks, faeces and other marks/sign created by them. In case of reptiles mainly lizards were sampled by direct count on open width transects.

The study of fauna takes substantial amount of time to understand the specific faunal characteristic of area. The assessment of fauna has been done by extensive field survey of



the area. During survey, the presence of wildlife was also inhabitants depending on animal sightings and the frequency of their visits in the project area which was later confirmed from forest department, wildlife departments, etc.

III. Aquatic Diversity:

a) Zooplankton:

For zooplankton analysis, 20L of subsurface water was strained through 53 μ Nytex plankton net and the concentrate was transferred to labeled plankton bottle after rinsing the net with distilled water. The planktons were immediately preserved in 4% neutral formaldehyde solution for subsequent examination and quantification.

Zooplanktons samples were observed in a sedimentation chamber under an inverted plankton microscope. Planktons were identified with the help of standard keys and references.

b) Phytoplankton:

Similarly, for phytoplankton analysis, water sample were taken directly from the sites in 100 ml sampling bottles and preserved with Lugol's solution immediately. Then the samples were centrifuged in the laboratory followed by removal of desired amount of supernatant from the centrifuge tube to make the required concentration.

c) Fishes:

Fisheries data has been collected through consultation with local fishermen and throwing nets.

2.11.2 Forest Types of Study Area:

Odisha state is situated in the eastern part of the country and has a geographic area of 1,55,707 km², which constitutes 4.74% area of the country. Odisha is bound on the east by the 450 km coastline of the Bay of Bengal and is surrounded by Andhra Pradesh on the South-West, Chhattisgarh on the west and Jharkhand in the north, West Bengal in the north-east and Bay of Bengal in the east. Physiographically, the State can be divided into four regions, North Plateau, Eastern Ghats, Central Tableland and Coastal Plains. The State is drained by three major rivers, Mahanadi, Brahmani and Baitarni. The State is rich in mineral resources including coal, iron, bauxite, chromite and nickel.

The State's forest cover spans across an area of 52,155.95 km², accounting for 33.50% of its total geographic area. Among this, very dense forest covers 7,212.80 km², moderately dense forest



SSWLMP for Subhadra OCP in Talcher Coalfields, Odisha of M/s Mahanadi Coalfields Limited covers 20,994.90 km², and open forest covers 23,948.25 km². Additionally, there is a scrub land area of 4923.70 km². (ISFR-2021)

Tropical dry deciduous forests cover the maximum forest cover in the state followed by tropical moist deciduous forests. According to revised Forest Types (Champion & Seth,1968) the forest type of the lease area along with the 10 km Radius buffer area, confirms to following forest types: -

- i. Dry Peninsular Sal Forest (5B/C1c)
 - ii. Northern Dry Mixed Deciduous Forest (5B/C2)
 - iii. Dry Bamboo Brakes (5/E9)
-
- i. **Dry Peninsular Sal Forest (5B/C1c):** The characteristic species of this forest type are *Shorea robusta*, *Anogeissus latifolia*, *Woodfordia fruticosa*, *Buchanania lanzan*, *Madhuca indica*, *Diospyros tomentosa* etc. The soil is dry and shallow with less undergrowth and climbers compared to moist area. *Pterocarpus marsupium* is less in this forest type.
 - ii. **Northern Dry Mixed Deciduous Forest (5B/C2):** The characteristic species of this type are *Anogeissus latifolia*, *Cleistanthus collinus*, *Nyctanthes arbortristis*, *Lannea coromandelina*. *Mallotus philippensis* etc. Rainfall ranges from 900 to 1150 mm. Dry soil condition is generally observed and undergrowth is scanty.
 - iii. **Dry Bamboo Brakes (5/E9):** Bamboo grows in dense patches with some thorny species.



2.11.2 Biodiversity within the Core Zone:

2.11.2.1 Flora:

M/s Mahanadi Coalfields Limited has been allocated the core zone, known as Subhadra OCP area, in Talcher Coalfield, Odisha by the Ministry of Coal, Government of India. This lease is situated in the Talcher Coalfields (Main Basin), specifically in Tehsil: Talcher, Angul district of Odisha. For more information on the floral diversity of the Subhadra OCP (core zone), please refer to **Table-2.9**.

Table-2.9: Floral Diversity within Core Zone

Sr.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
TREES					
1	<i>Acacia auriculoformis</i>	Babul	Fabaceae	Tree	LC
2	<i>Acacia leucophloea</i>	Gohira	Fabaceae	Tree	NA
3	<i>Acacia nilotica</i>	Bandhana	Fabaceae	Tree	NA
4	<i>Aegle marmelos</i>	Bela	Rutaceae	Tree	NT
5	<i>Alangium lamarckii</i>	Ankula	Cornaceae	Tree	NA
6	<i>Albizia lebbeck</i>	Kala Sirisa	Fabaceae	Tree	LC
7	<i>Albizia procera</i>	Dhala Sirisa	Fabaceae	Tree	LC
8	<i>Artocarpus heterophyllus</i>	Panasa	Moraceae	Tree	NA
9	<i>Artocarpus lakoocha</i>	Jeotha	Moraceae	Tree	NA
10	<i>Azadirachta indica</i>	Neem	Rutaceae	Tree	LC
11	<i>Bauhinia purpurea</i>	kanchan	Caesalpiniaceae	Tree	NA
12	<i>Bauhinia racemosa</i>	Ambta	Caesalpiniaceae	Tree	NA
13	<i>Bombax ceiba</i>	Simili	Malvaceae	Tree	LC
14	<i>Boswellia serrata</i>	Salai	Burseraceae	Tree	NA
15	<i>Buchanania lanzan</i>	Chara	Anacardiaceae	Tree	NA
16	<i>Butea monosperma</i>	Palasa	Fabaceae	Tree	NA
17	<i>Careya arborea</i>	kumbhi	Lecythidaceae	Tree	NA
18	<i>Cassia fistula</i>	Sunari	Caesalpiniaceae	Tree	LC
19	<i>Dalbergia latifolia</i>	Shisoo	Fabaceae	Tree	VU
20	<i>Dillenia indica</i>	Oau	Dilleniaceae	Tree	LC
21	<i>Dilleni apentagyna</i>	Rai	Dilleniaceae	Tree	NA
22	<i>Diospyros embryopteris</i>	Mankadakendu	Ebenaceae	Tree	NA
23	<i>Diospyros montana</i>	Hinjala	Ebenaceae	Tree	NA
24	<i>Ficus benghalensis</i>	Bara	Moraceae	Tree	NA
25	<i>Ficus glaberrima</i>	Kharsan	Maoraceae	Tree	NA



Sr.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
26	<i>Ficus religiosa</i>	Aswatha	Moraceae	Tree	NA
27	<i>Flacourtia indica</i>	Bhaincha	Salicaceae	Tree	LC
28	<i>Gardenia gummifera</i>	Kaapar	Rubiaceae	Tree	LC
29	<i>Gardenia latifolia</i>	Damkurudu	Rubiaceae	Tree	NA
30	<i>Grewia tiliifolia</i>	Dhaman	Tiliaceae	Tree	NA
31	<i>Holoptelea integrifolia</i>	Dhaurang	Ulmaceae	Tree	NA
32	<i>Kydia calycina</i>	Kapasia	Malvaceae	Tree	NA
33	<i>Lagerstroemia parviflora</i>	Sidha	Lythraceae	Tree	NA
34	<i>Madhuca indica</i>	Mahula	Sapotaceae	Tree	NA
35	<i>Mallotus philippensis</i>	Gundi	Euphorbiaceae	Tree	NA
36	<i>Mangifera indica</i>	Amba	Anacardiaceae	Tree	NA
37	<i>Polyalthia longifolia</i>	Debadaru	Annonaceae	Small	NA
38	<i>Pongamia glabra</i>	Karanja	Fabaceae	Tree	NA
39	<i>Pterocarpus marsupium</i>	Bijasal	Fabaceae	Tree	NT
40	<i>Schleichera oleosa</i>	Kusuma	Sapindaceae	Tree	LC
41	<i>Semecarpus anacardium</i>	Bhalia	Anacardiaceae	Tree	LC
42	<i>Shorea robusta</i>	Sal	Dipterocarpaceae	Tree	LC
43	<i>Sterculia urens</i>	Girdhini / Genduli	Sterculiaceae	Tree	NA
44	<i>Sterculia villosa</i>	Kodala	Sterculiaceae	Tree	NA
45	<i>Strychnos nux-vomica</i>	Kochila	Loganiaceae	Tree	NA
46	<i>Syzygium cumini</i>	Jamun	Myrtaceae	Tree	NC
47	<i>Tamarindus indica</i>	Tentuli	Caesalpiniaceae	Tree	LC
48	<i>Tectona grandis</i>	Sagaun	Verbenaceae	Tree	EN
49	<i>Terminalia arjuna</i>	Arjuna	Combretaceae	Tree	LC
50	<i>Terminalia bellirica</i>	Bahada	Combretaceae	Tree	LC
51	<i>Terminalia chebula</i>	Harida	Combretaceae	Tree	LC
SHRUBS					
1	<i>Adhatoda vasica</i>	Basanga	Acanthaceae	Shrub	LC
2	<i>Antidesma diandrum</i>	Mamari	Phyllanthaceae	Shrub	NA
3	<i>Atalantia monophylla</i>	Narguni	Rutaceae	Shrub	NA
4	<i>Calamus guruba</i>	Beta	Arecaceae	Shrub	NA
5	<i>Calotropis gigantea</i>	Arakha	Asclepiadaceae	Shrub	NA
6	<i>Carissa spinarum</i>	AnkaKoli	Apocynaceae	Shrub	LC
7	<i>Eupatorium odoratum</i>	Pokasungha	Asteraceae	Shrub	G5
8	<i>Euphorbia royleana</i>	Siju	Euphorbiaceae	Shrub	NA
9	<i>Flemingia chappar</i>	Ranidantakathi	Fabaceae	Shrub	NA
10	<i>Helicteres isora</i>	Mura	Sterculiaceae	Shrub	NA
11	<i>Lantana camara</i>	Nagairy	Verbenaceae	Shrub	G5



Sr.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
12	Mimosa pudica	Lajakoli	Fabaceae	Shrub	LC
13	Nyctanthes arbortristis	Gangasiuli	Oleaceae	Shrub	LC
14	Phyllanthus reticulatus	Panjoli	Euphorbiaceae	Shrub	NA
15	Ricinus communis	Rendi	Euphorbiaceae	Shrub	NA
16	Woodfordia fruticosa	Dhatki	Lythraceae	Shrub	LC
17	Ziziphus oenoplia	Kantaikoli	Rhamnaceae	Shrub	NA
HERBS					
1	Aerva lanata	Gorakhganja	Amaranthaceae	Herb	NA
2	Andrographis paniculata	BhuinNima	Acanthaceae	Herb	NA
3	Argemone mexicana	Swarnchhiri	Papaveraceae	Herb	NA
4	Boerhavia diffusa.	Raktpunarwa	Nyctaginaceae	Herb	NA
5	Bulbostylis barbata		Cyperaceae	Sedges	NA
6	Cassia tora	Chakundi	Caesalpiniaceae	Herb	NA
7	Catharanthus roseus	Sadabahar	Apocynaceae	Herb	NA
8	Commelina benghalensis	Kanchara	Commelinaceae	Herb	NA
9	Crotalaria prostrate	KartikJhumka	Fabaceae	Herb	NA
10	Cyperus rotundus	Motha	Cyperaceae	Sedges	LC
11	Daturas tramonium	Dudura	Solanaceae	herb	NA
12	Desmodium cephalotes	Ranidanturi	Fabaceae	Herb	NA
13	Euphorbia hirta	Doodhi	Euphorbiaceae	Herb	NA
14	Evolvulus alsinoides	Sakhpushpi	Convolvulaceae	Herb	NA
15	Fimbristylis dipsacea	NA	Cyperaceae	Sedges	NA
16	Fimbristylis falcata	HathiPaw	Cyperaceae	Sedges	NA
17	Fumaria indica	Pitpapa	Papaveraceae	Herb	NA
18	Heliotropium indicum	Hastimundi	Boraginaceae	Herb	LC
19	Ipomoea aeriocarpa	Besharam	Convolvulaceae	Herb	NA
20	Justiciaquinque angularis	Justicia	Acanthaceae	Herb	NA
21	Leucas aspera	Bhondaki	Lamiaceae	Herb	NA
22	Melilotus indica	Van Maithi	Fabaceae	herb	NA
23	Ocimum basilicum	BanTulsi	Lamiaceae	Herb	NA
24	Oxalis corniculata	Teenpati	Oxalidaceae	Herb	NA
25	Phyllanthus niruri	BhuinAnala	Euphorbiaceae	Herb	NA
26	Polygonum barbatum	Polygonum	Polygonaceae	Herb	NA
27	Polygonum glabrum	Polygonum		Herb	NA
28	Rauvolfia serpentina	Sarpantha	Apocynaceae	Herb	CITES Appendix II
29	Rungia pectinata	Rungia	Acanthaceae	Herb	NA
30	Sida cordifolia	Kharenti	Malvaceae	Herb	NA
31	Sida rhombifolia	Atibala	Malvaceae	Herb	NA



Sr.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
32	<i>Solanum nigrum</i>	makoya	Solanaceae	Herb	NA
33	<i>Solanum virginianum</i>	Katai	Solanaceae	Herb	NA
34	<i>Tridax procumbens</i>	KhalMuriya	Asteraceae	Herb	NA
35	<i>Triumfetta rhomboidea</i>	Chipki	Tiliaceae	Herb	NA
36	<i>Xanthium strumarium</i>	Gokharu	Asteraceae	Herb	NA
37	<i>Gloriosa superba</i>	Agnisikha	Colchicaceae	Herb	NA
GRASSES & BAMBOO					
1	<i>Aristida adscensionis.</i>	Aristida	Poaceae	Grasses	NA
2	<i>Dendrocalamus strictus</i>	Salia`Baunsa	Poaceae	Grasses	NA
3	<i>Bothriochloa apertusa</i>	Bothricloa	Poaceae	Grasses	NA
4	<i>Cenchrus ciliaris</i>	Cenchurus	Poaceae	Grasses	LC

(Source: Primary Survey Data)

2.11.2.2 Fauna:

The presence of various animal species in a specific area can provide valuable insights into the environmental conditions and the overall welfare of the population residing there. Studying the fauna helps us understand the state of natural systems and provides indications of how the ecosystem is functioning. It allows us to monitor pollution levels, assess biological richness and heritage quality, and quantify habitat changes that may impact threatened species. Arthropods, Molluscs, Pisces, Birds, and Mammals are particularly sensitive to changes in the ecosystem, making them excellent indicators of ecosystem health. For specific information on the faunal diversity of Subhadra OCP (Core Zone), please refer to **Table-2.10**.

Table-2.10: Faunal Diversity within Core Zone

Sr. No.	Common Name	Scientific Name	Schedule as per WPA, 1972	Conservation Status as per IUCN	Schedule as per WPA, 2022
Mammals					
1	Spotted Deer	<i>Axis axis</i>	III	LC#	II
2	Jackal	<i>Canis aureus</i>	II	LC#	I
3	Short Nosed Fruit Bat	<i>Cynopterus sphinx</i>	V	LC#	III
4	Five striped Palm Squirrel	<i>Funambulus pennantii</i>	IV	LC#	
5	Mongoose	<i>Herpestres edwardsii</i>	IV	LC#	I
6	Indian Porcupine	<i>Hystrix indica</i>	IV	LC#	I
7	Rhesus Macaque	<i>Macaca mulatta</i>	II	LC#	NL



(Monkey)					
8	Indian Field Mouse	<i>Mus booduga</i>	V	LC#	NL
9	Common house Rat	<i>Rattus</i>	V	LC#	IV
10	India Langoor	<i>Semnopithecus sp</i>	II	LC#	II
11	Common Fox	<i>Vulpes bengalensis</i>	II	LC#	I
12	Indian Civet	<i>Viverricula indica</i>	II	LC#	I
13	Wild Boar	<i>Sus scorfa</i>	III	LC#	II
Birds					
1	Jungle Myna	<i>Acridotheres fuscus</i>	IV	LC#	II
2	Common Myna	<i>Acridotheres tristis</i>	IV	LC#	II
3	Common Kingfisher	<i>Alcedo atthis</i>	IV	LC#	II
4	Brown-cheeked Fulvetta	<i>Alcippe poioicephala</i>	IV	LC#	II
5	House Swift	<i>Apus affinis</i>	IV	LC#	II
6	Indian Pond Heron	<i>Ardeola grayii</i>	IV	LC#	II
7	Eagle Owl	<i>Bubo sp.</i>	IV	LC#	II
8	Cattle Egret	<i>Bubulcus ibis</i>	IV	LC#	II
9	Crow Pheasant	<i>Centropus sinensis</i>	IV	LC#	II
10	Golden-fronted Leaf-bird	<i>Chloropsis aurifrons</i>	IV	LC#	II
11	Blue-winged Leafbird	<i>Chloropsis cochinchinensis</i>	IV	LC#	II
12	Blue Rock Pigeon	<i>Columba livia</i>	IV	LC#	II
13	White Rumped Shama	<i>Copsychus malabaricus</i>	IV	LC#	II
14	Magpie Robin	<i>Copsychus saularis</i>	IV	LC#	II
15	Indian Roller	<i>Coracias benghalensis</i>	IV	LC#	II
16	Jungle Crow	<i>Corvus macrorhynchos</i>	IV	LC#	II
17	Common Crow	<i>Corvus splendens</i>	V	LC#	III
18	Common Quail	<i>Coturnix coturnix</i>	IV	LC#	II
19	Drongo	<i>Dicrurus adsimilis</i>	IV	LC#	II



20	Lesser Golden Backed Woodpecker	<i>Dinopium benghalense</i>	IV	LC#	II
21	BlackWinged Kite	<i>Elanus caeruleus</i>	IV	LC#	II
22	Ashy-crowned Finch-lark	<i>Eremopterix grisea</i>	IV	LC#	II
23	Red Munia	<i>Estrilda mandava</i>	IV	LC#	II
24	Koel	<i>Eudynamis scolopacea</i>	IV	LC#	II
25	Lesser Kestrel	<i>Falco naumanni</i>	IV	LC#	II
26	Common Kestrel	<i>Falco tinnunculus</i>	IV	LC#	II
27	Black Partridge	<i>Francolinus</i>	IV	LC#	II
28	Painted Partridge	<i>Francolinus pictus</i>	IV	LC#	II
29	Red Spurfowl	<i>Galloperdix spadicea</i>	IV	LC#	II
30	Red Jungle Fowl	<i>Gallus</i>	IV	LC#	II
31	Jungle Owlet	<i>Glaucidium radiatum</i>	IV	LC#	II
32	White Breasted Kingfisher	<i>Halcyon smyrnensis</i>	IV	LC#	II
33	Heart spotted Woodpecker	<i>Hemicircus canente</i>	IV	LC#	II
34	Wire-tailed Swallow	<i>Hirundo smithii</i>	-	LC#	II
35	Rufous Backed Shrike	<i>Lanius schach</i>	-	LC#	II
36	Black-headed Munia	<i>Lonchura malacca</i>	IV	LC#	II
37	Coppersmith Barbet	<i>Megalaima haemacephala</i>	IV	LC#	II
38	Crested Bunting	<i>Melophus lathami</i>	IV	LC#	II
39	Small Green Bee-eater	<i>Merops orientalis</i>	IV	LC#	II
40	Blue tailed Bee-eater	<i>Merops philippinus</i>	IV	LC#	II
41	Blue cheeked Bee-eater	<i>Merops superciliosus</i>	IV	LC#	II
42	Black Kite	<i>Milvus migrans</i>	IV	LC#	II
43	Blacknaped Flycatcher	<i>Monarcha azurea</i>	IV	LC#	II
44	Blue headed Rock Thrush	<i>Monticola cinclorhynchus</i>	IV	LC#	



45	Pied Wagtail	<i>Motacilla alba</i>	IV	LC#	II
46	Grey Wagtail	<i>Motacilla cinerea</i>	IV	LC#	II
47	Yellow Wagtail	<i>Motacilla flava</i>	IV	LC#	II
48	Large Pied Wagtail	<i>Motacilla maderaspatensis</i>	IV	LC#	II
49	Tickell's Blue Flycatcher	<i>Muscicapa tickelliae</i>	IV	LC#	II
50	Purple Sunbird	<i>Nectarinia asiatica</i>	IV	LC#	II
51	Crested Hawk Eagle	<i>Nisaetus cirrhatus</i>	I	LC#	I
52	Golden Oriole	<i>Oriolus</i>	IV	LC#	II
53	Black Headed Oriole	<i>Oriolus xanthornus</i>	IV	LC#	II
54	Tailor Bird	<i>Orthotomus sutorius</i>	IV	LC#	II
55	Grey Tit	<i>Parus major</i>	IV	LC#	II
56	Yellow-cheeked Tit	<i>Parus xanthogenys</i>	IV	LC#	II
57	House Sparrow	<i>Passer domesticus</i>	IV	LC#	II
58	Pea-fowl	<i>Pavo cristatus</i>	I	LC#	I
59	Jungle Bush Quail	<i>Perdica asiatica</i>	IV	LC#	II
60	Small Minivet	<i>Pericrocotus cinnamomeus</i>	IV	LC#	II
61	Ashy Wren-warbler	<i>Prinia socialis</i>	IV	LC#	II
62	Blossom headed Parakeet	<i>Psittacula cyanocephala</i>	IV	LC#	
63	Rose Ringed Parakeet	<i>Psittacula krameri</i>	IV	LC#	II
64	Red Vent Bulbul	<i>Pycnonotus cafer</i>	IV	LC#	II
65	Red Whiskered Bulbul	<i>Pycnonotus jocosus</i>	IV	LC#	II
66	Pied Bush-chat	<i>Saxicola caprata</i>	IV	LC#	II
67	Collared Bush-chat	<i>Saxicola torquata</i>	IV	LC#	II
68	Indian Robin	<i>Saxicola idesfulicata</i>	IV	LC#	II
69	Velvet-fronted Nuthatch	<i>Sitta frontalis</i>	-	LC#	II



70	Crested Serpent Eagle	<i>Spilornis cheela</i>	-	LC#	II
71	Indian Ring Dove	<i>Streptopelia chinensis</i>	IV	LC#	
72	Jungle Babbler	<i>Turdoides striatus</i>	IV	LC#	II
73	Hoopoe	<i>Upupa epops</i>	IV	LC#	II
74	Red Wattled Lapwing	<i>Vannellus indicus</i>	IV	LC#	II
Reptiles					
1	Green Vine Snake	<i>Ahaetulla nasuta</i>	IV	LC#	II
2	Garden Lizard	<i>Calotes versicolor</i>	-	-	II
3	Russel's Viper	<i>Daboia russelii</i>	IV	LC#	I
4	Geckos	<i>Hemidactylus flavirdis</i>	IV	-	
5	Indian Cobra	<i>Naja naja</i>	IV	LC#	I
6	Yellow Rat Snake	<i>Ptyas mucosa</i>	II	-	I
7	Indian Python	<i>Python morulus</i>	I	Vu#	I
8	Bengal Monitor Lizard	<i>Varanus bengalensis</i>	I	LC#	I
9	Sand Boa	<i>Erycinae</i>	IV	NT	IV
10	Banded Krait	<i>Bungarus fasciatus</i>	IV	LC	IV
Butterflies					
1	Common Emigrant	<i>Catopsilia pomona</i>	NA	NA	NA
2	Stripped Tiger	<i>Danaus genutia</i>	NA	NA	NA
3	Common crow	<i>Euploea core</i>	NA	NA	NA
4	Common Grass Yellow	<i>Euremahe cabe</i>	NA	NA	NA
5	White orange tip	<i>Ixias marianne</i>	NA	NA	NA
#LC–Least Concern; NT–Near Threatened; Vu–Vulnerable; EN–Endangered; CR–Critically Endangered					

2.11.3 Biodiversity within the Buffer Zone:

2.11.3.1 Flora:

The vegetation is fairly dense and occurs on crystalline rocks and yellow loam soils. Soil and topography vary together. It can be helpful to differentiate three sub types of topography; hilltops and plateaus, lower hill slopes and valley bottom. There is light



shrubland weed growth under the forest canopy. The vegetation mainly consists of tall trees of *Shorea robusta*, *Tectona grandis*, *Terminalia tomentosa*, *Madhuca indica*. The vegetation can be described as moist peninsular low level Sal forest.

The floristic richness of an area can be determined by the number of plant species it contains. However, it is important to note that these species are not evenly distributed. In the buffer zone of the project, a total of 67 tree species, 19 shrub species, 37 herb species, 12 grass/bamboo species, and 5 climber species were recorded.

There were a total of 33 families documented in the tree flora. The Fabaceae family emerged as the dominant family with 10 individuals, while the Caesalpiniaceae and Moraceae families each had 05 species in the tree flora. In the shrub flora, there were 15 families and 19 species, with the Acanthaceae and Fabaceae families leading with 2 species each. The herbaceous flora consisted of 36 species from 19 families, with the Cyperaceae family being the most prominent with 04 species.

Along with primary survey, the list of plants species reported in the Working Plans of **Angul Forest Division** has been studied out of which the main associates of Sal as observed in the field are furnished below in **Table No. 2.11**.

Table-2.11: Floral Diversity within buffer zone of study area

Sr No.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
Trees					
1	<i>Acacia auriculoformis</i>	Babul	Fabaceae	Tree	LC
2	<i>Acacia leucophloea</i>	Gohira	Fabaceae	Tree	NA
3	<i>Acacia nilotica</i>	Bandhana	Fabaceae	Tree	NA
4	<i>Acacia catechu</i>	Khair	Fabaceae	Tree	LC
5	<i>Adina cordifolia</i>	Holondo	Rubiaceae	Tree	NA
6	<i>Aegle marmelos</i>	Bela	Rutaceae	Tree	NT
7	<i>Alangium lamarckii</i>	Ankula	Cornaceae	Tree	NA
8	<i>Albizia lebbeck</i>	Kala Sirisa	Fabaceae	Tree	LC
9	<i>Albizia procera</i>	Dhala Sirisa	Fabaceae	Tree	LC
10	<i>Alstonia scholaris</i>	Chhatian	Apocynaceae	Tree	LC
11	<i>Artocarpus heterophyllus</i>	Panasa	Moraceae	Tree	
12	<i>Artocarpus lakoocha</i>	Jeotha	Moraceae	Tree	NA
13	<i>Azadirachta indica</i>	Neem	Rutaceae	Tree	LC
14	<i>Bauhinia purpurea</i>	kanchan	Caesalpiniaceae	Tree	NA



Sr No.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
15	<i>Bauhinia racemosa</i>	Ambta	Caesalpiniaceae	Tree	NA
16	<i>Bombax ceiba</i>	Simili	Malvaceae	Tree	LC
17	<i>Boswellia serrata</i>	Salai	Burseraceae	Tree	NA
18	<i>Buchanania lanzan</i>	Chara	Anacardiaceae	Tree	NA
19	<i>Bursera serrata</i>	Dongsoradi	Burseraceae	Tree	NA
20	<i>Butea monosperma</i>	Palasa	Fabaceae	Tree	NA
21	<i>Careya arborea</i>	kumbhi	Lecythidaceae	Tree	NA
22	<i>Cassia fistula</i>	Sunari	Caesalpiniaceae	Tree	LC
23	<i>Cassia siamea</i>	Chakundi	Caesalpiniaceae	Tree	NA
24	<i>Cleistanthus collinus</i>	Karada	Phyllanthaceae	Tree	VU
25	<i>Cochlospermum gossypium</i>	Ganiari	Buxaceae	Tree	NA
26	<i>Croton oblongifolius</i>	Gotha	Euphorbiaceae	Tree	NA
27	<i>Dalbergia latifolia</i>	Shisoo	Fabaceae	Tree	VU
28	<i>Dillenia indica</i>	Oau	Dilleniaceae	Tree	LC
29	<i>Dillenia pentagyna</i>	Rai	Dilleniaceae	Tree	NA
30	<i>Diospyros embryopteris</i>	Mankadakendu	Ebenaceae	Tree	NA
31	<i>Diospyros melanoxylon</i>	Kendu	Ebenaceae	Tree	NA
32	<i>Diospyros montana</i>	Hinjala	Ebenaceae	Tree	NA
33	<i>Ficus benghalensis</i>	Bara	Moraceae	Tree	NA
34	<i>Ficus glaberrima</i>	Kharsan	Maoraceae	Tree	NA
35	<i>Ficus religiosa</i>	Aswatha	Moraceae	Tree	NA
36	<i>Flacourtia indica</i>	Bhaincha	Salicaceae	Tree	LC
37	<i>Gardenia gummifera</i>	Kaapar	Rubiaceae	Tree	LC
38	<i>Gardenia latifolia</i>	Damkurudu	Rubiaceae	Tree	NA
39	<i>Grewia tiliifolia</i>	Dhaman	Tiliaceae	Tree	NA
40	<i>Gmelina arborea</i>	Gambhari	Lamiaceae	Tree	LC
41	<i>Holoptelea integrifolia</i>	Dhaurang	Ulmaceae	Tree	NA
42	<i>Kydia calycina</i>	Kapasias	Malvaceae	Tree	NA
43	<i>Lagerstroemia parviflora</i>	Sidha	Lythraceae	Tree	NA
44	<i>Lannea grandis</i>	Indramai	Anacardeaceae	Tree	NA
45	<i>Madhuca indica</i>	Mahula	Sapotaceae	Tree	NA
46	<i>Mallotus philippensis</i>	Gundi	Euphorbiaceae	Tree	NA
47	<i>Mangifera indica</i>	Amba	Anacardiaceae	Tree	NA
48	<i>Mitragyna parvifolia</i>	Mundi	Rubiaceae	Tree	NA
49	<i>Polyalthia longifolia</i>	Debadaru	Annonaceae	Small Tree	NA
50	<i>Pongamia glabra</i>	Karanja	Fabaceae	Tree	NA
51	<i>Pterocarpus marsupium</i>	Bijasal	Fabaceae	Tree	NT
52	<i>Pterocarpus santalinus</i>	Ratka Chandan	Fabaceae		EN
53	<i>Santalum album</i>	Chandan	Santalaceae	Tree	VU



Sr No.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
54	<i>Sapindus laurifolia</i>	Ritha	Sapindaceae	Tree	NA
55	<i>Schleichera oleosa</i>	Kusuma	Sapindaceae	Tree	LC
56	<i>Semecarpus anacardium</i>	Bhalia	Anacardiaceae	Tree	LC
57	<i>Shorea robusta</i>	Sal	Dipterocarpaceae	Tree	LC
58	<i>Sterculia urens</i>	Girdhini	Sterculiaceae	Tree	NA
59	<i>Sterculia villosa</i>	Kodala	Sterculiaceae	Tree	NA
60	<i>Strychnos nux-vomica</i>	Kochila	Loganiaceae	Tree	NA
61	<i>Syzygium cumini</i>	Jamun	Myrtaceae	Tree	LC
62	<i>Tamarindus indica</i>	Tentuli	Caesalpiaceae	Tree	LC
63	<i>Tectona grandis</i>	Sagaun	Verbenaceae	Tree	EN
64	<i>Terminalia arjuna</i>	Arjuna	Combretaceae	Tree	NA
65	<i>Terminalia bellirica</i>	Bahada	Combretaceae	Tree	LC
66	<i>Terminalia chebula</i>	Harida	Combretaceae	Tree	NA
67	<i>Zizyphus jujube</i>	Barkoli	Rhamnaceae	Tree	NA
SHRUBS					
1	<i>Adhatoda vasica</i>	Basanga	Acanthaceae	Shrub	LC
2	<i>Antidesma diandrum</i>	Mamari	Phyllanthaceae	Shrub	NA
3	<i>Atalantia monophylla</i>	Narguni	Rutaceae	Shrub	NA
4	<i>Calamus guruba</i>	Beta	Arecaceae	Shrub	NA
5	<i>Calotropis gigantea</i>	Arakha	Asclepiadaceae	Shrub	NA
6	<i>Carissa spinarum</i>	AnkaKoli	Apocynaceae	Shrub	LC
7	<i>Cycas circinalis</i>	Arguna	Cycadaceae	Shrub	EN
8	<i>Eupatorium odoratum</i>	Pokasungha	Asteraceae	Shrub	G5
9	<i>Euphorbia royleana</i>	Siju	Euphorbiaceae	Shrub	NA
10	<i>Flemingia chappar</i>	Ranidantakathi	Fabaceae	Shrub	NA
11	<i>Helicteres isora</i>	Mura	Sterculiaceae	Shrub	NA
12	<i>Ixoraparviflora</i>	TelaKuruan	Rubiaceae	Shrub	NA
13	<i>Lantana camara</i>	Nagairy	Verbenaceae	Shrub	G5
14	<i>Mimosa pudica</i>	Lajakoli	Fabaceae	Shrub	LC
15	<i>Nyctanthes arbortristis</i>	Gangasiuli	Oleaceae	Shrub	LC
16	<i>Phyllanthus reticulatus</i>	Panjoli	Euphorbiaceae	Shrub	NA
17	<i>Ricinus communis</i>	Rendi	Euphorbiaceae	Shrub	NA
18	<i>Woodfordia fruticosa</i>	Dhatki	Lythraceae	Shrub	LC
19	<i>Ziziphus oenoplia</i>	Kantaikoli	Rhamnaceae	Shrub	NA
HERBS					
1	<i>Aerva lanata</i>	Gorakhganja	Amaranthaceae	Herb	NA
2	<i>Andrographis paniculata</i>	Bhuin Nima	Acanthaceae	Herb	NA
3	<i>Argemone mexicana</i>	Swarnchhiri	Papaveraceae	Herb	NA
4	<i>Boerhavia diffusa.</i>	Raktpunarwa	Nyctaginaceae	Herb	NA



Sr No.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
5	<i>Bulbostylis barbata</i>		Cyperaceae	Sedges	NA
6	<i>Cassia tora</i>	Chakundi	Caesalpiaceae	Herb	NA
7	<i>Catharanthus roseus</i>	Sadabahar	Apocynaceae	Herb	NA
8	<i>Commelina benghalensis</i>	Kanchara	Commelinaceae	Herb	NA
9	<i>Crotalaria prostrate</i>	Kartik Jhumka	Fabaceae	Herb	NA
10	<i>Cyperus rotundus</i>	Motha	Cyperaceae	Sedges	LC
11	<i>Datura stramonium</i>	Dudura	Solanaceae	herb	NA
12	<i>Desmodium cephalotes</i>	Ranidanturi	Fabaceae	Herb	NA
13	<i>Euphorbia hirta</i>	Doodhi	Euphorbiaceae	Herb	NA
14	<i>Evolvulus alsinoides</i>	Sakhpushpi	Convolvulaceae	Herb	NA
15	<i>Fimbristylis dipsacea</i>	NA	Cyperaceae	Sedges	NA
16	<i>Fimbristylis falcata</i>	HathiPaw	Cyperaceae	Sedges	NA
17	<i>Fumaria indica</i>	Pitpapra	Papaveraceae	Herb	NA
18	<i>Heliotropium indicum</i>	Hastimundi	Boraginaceae	Herb	LC
19	<i>Ipomoea aeriocarpa</i>	Besharam	Convolvulaceae	Herb	NA
20	<i>Justicia quinqueangularis</i>	Justicia	Acanthaceae	Herb	NA
21	<i>Leucas aspera</i>	Bhondaki	Lamiaceae	Herb	NA
22	<i>Melilotus indica</i>	VanMaithi	Fabaceae	herb	NA
23	<i>Ocimum basilicum</i>	BanTulsi	Lamiaceae	Herb	NA
24	<i>Oxalis corniculata</i>	Teenpati	Oxalidaceae	Herb	NA
25	<i>Phyllanthus niruri</i>	BhuinAnala	Euphorbiaceae	Herb	NA
26	<i>Polygonum barbatum</i>	Polygonum	Polygonaceae	Herb	NA
27	<i>Polygonum glabrum</i>	Polygonum	Polygonaceae	Herb	NA
28	<i>Rauvolfia serpentina</i>	Sarpandha	Apocynaceae	Herb	CITES Appendix II
29	<i>Rungia pectinata</i>	Rungia	Acanthaceae	Herb	NA
30	<i>Sida cordifolia</i>	Kharenti	Malvaceae	Herb	NA
31	<i>Sida rhombifolia</i>	Atibala	Malvaceae	Herb	NA
32	<i>Solanum nigrum</i>	Makoya	Solanaceae	Herb	NA
33	<i>Solanum virginianum</i>	Katai	Solanaceae	Herb	NA
34	<i>Tridax procumbens</i>	KhalMuriya	Asteraceae	Herb	NA
35	<i>Triumfetta rhomboidea</i>	Chipki	Tiliaceae	Herb	NA
36	<i>Xanthium strumarium</i>	Gokharu	Asteraceae	Herb	NA
GRASSES&BAMBOO					
1	<i>Aristida adscensionis.</i>	Aristida	Poaceae	Grasses	NA
2	<i>Dendrocalamus strictus</i>	Salia Baunsa	Poaceae	Grasses	NA
3	<i>Bothriochloa pertusa</i>	Bothriochloa	Poaceae	Grasses	NA
4	<i>Cenchrus ciliaris</i>	Cenchurus	Poaceae	Grasses	LC
5	<i>Chrysopogon serrulatus</i>	Chrysopogan	Poaceae	Grasses	NA
6	<i>Cynodon dactylon</i>	Doob	Poaceae	Grasses	NA



Sr No.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
7	<i>Dichanthium annulatum</i>	Dichanthium	Poaceae	Grasses	NA
8	<i>Digitari astricta</i>	Digitaria	Poaceae	Grasses	NA
9	<i>Eragrostis amabilis</i>	Erogrrostis	Poaceae	Grasses	NA
10	<i>Heteropogon contortus</i>	hetropogan	Poaceae	Grasses	NA
11	<i>Imperata arundinacea</i>	Chhana	Poaceae	Grasses	NA
12	<i>Symbopogon martini</i>	Dhanwantary	Poaceae	Grasses	NA
CLIMBERS					
1	<i>Abrus precatorius</i>	Kaincha	Fabaceae	Climber	NA
2	<i>Asparagus racemosus</i>	Shatawari	Liliaceae	Climber	NA
3	<i>Butea superba</i>	Buduli	Fabaceae	Climber	NA
4	<i>Gymnema sylvestris</i>	Gudamari	Asclepiadaceae	Climber	NA
5	<i>Tinospora cordifolia</i>	Guluchi	Menispermaceae	Climber	NA

2.11.3.2 Fauna:

The analysis of fauna requires a significant amount of time in order to comprehend the distinct characteristics of the fauna in a particular area. The evaluation of fauna was conducted through an extensive field survey of the region. During the survey, the existence of wildlife was confirmed through direct field observations, as well as through oral information provided by local residents. Additionally, data obtained from the relevant forest department has been compiled and presented below. (Table-2.12).

Table-2.12: Faunal Diversity from Study Area (BufferZone)

Sr.No	Common Name	Scientific Name	Schedule of WPA, 1972	Conservation Status as per IUCN	Schedule of WPA, 2022
Mammals					
1	Spotted Deer	<i>Axis axis</i>	III	LC#	II
2	Bison	<i>Bos gaurus</i>	I	VU	I
3	Jackal	<i>Canis aureus</i>	II	LC#	I
4	Sambhar	<i>Cervus unicolor</i>	III	VU	I
5	Short Nosed Fruit Bat	<i>Cynopterus sphinx</i>	V	LC#	IV
6	Indian Elephant	<i>Elephas maximus</i>	I	EN#	I
7	Wild Cat	<i>Felis chaus</i>	II	LC#	I
8	Five Striped Palm Squirrel	<i>Funambulus pennanti</i>	IV	LC#	IV
9	Mongoose	<i>Herpestres edwardsii</i>	IV	LC#	I



Sr.No	Common Name	Scientific Name	Schedule of WPA, 1972	Conservation Status as per IUCN	Schedule of WPA, 2022
11	Striped Hyena	<i>Hyaena hyaena</i>	III	NT#	I
12	Indian Porcupine	<i>Hystrix indica</i>	IV	LC#	I
14	Rhesus Macaque	<i>Macaca mulatta</i>	II	LC#	IV
15	Common Otter	<i>Lutra lutra</i>	II	VU	I
16	Indian Pangolin	<i>Manis crassicaudata</i>	I	EN#	I
17	Barking Deer	<i>Muntiacus muntjak</i>	III	LC#	II
18	Indian Field Mouse	<i>Mus booduga</i>	V	LC#	IV
19	Sloth Bear	<i>Melursus ursinus</i>	I	VU	I
20	Kalarapartia Bagh	<i>Panthera pardus fusca</i>	I	VU	I
21	Wild Boar	<i>Sus scrofa</i>	III	LC	II
22	Northern Plain Grey/ Hanuman Langur	<i>Semnopithecus entellus</i>	II	LC	II
Birds					
1	Shikra	<i>Accipter badius</i>	IV	LC#	I
2	Jungle Mynah	<i>Acridotheres fuscus</i>	IV	LC#	II
3	Common Mynah	<i>Acridotheres tristis</i>	IV	LC#	II
4	Common Iora	<i>Aegithina tiphia</i>	IV	LC#	II
5	Common Kingfisher	<i>Alcedo atthis</i>	IV	LC#	II
6	Brown-cheeked fulvetta	<i>Alcippe poioicephala</i>	IV	LC#	II
7	White Breasted Hen	<i>Amaauronis phoenicurus</i>	IV	LC#	II
8	Common Teal	<i>Anas crecca</i>	IV	LC#	II
9	Open Billed Stork	<i>Anas tomusoscitans</i>	IV	LC#	II
10	Pied Hornbill	<i>Anthracoceros coronatus</i>	I	NT#	II
11	House Swift	<i>Apus affinis</i>	IV	LC#	II
12	Tawny Eagle	<i>Aquila rapax</i>	I	VU#	II
13	Grey Heron	<i>Ardea cineara</i>	IV	LC#	II
14	Pond Heron	<i>Ardeola grayii</i>	IV	LC#	II
15	Ashy Swallow Shrike	<i>Artamus fuscus</i>	-	LC#	II
16	Spotted Owlet	<i>Athene brama</i>	IV	LC	II
17	Eagle Owl	<i>Bubo bubo</i>	IV	LC#	II
18	Cattle Egret	<i>Bubulcus ibis</i>	IV	LC#	II
19	Common Indian Nightjar	<i>Caprimulgus asiaticus</i>	IV	LC#	II



Sr.No	Common Name	Scientific Name	Schedule of WPA, 1972	Conservation Status as per IUCN	Schedule of WPA, 2022
20	Crow Pheasant	<i>Centropus sinensis</i>	IV	LC#	II
21	Pied Kingfisher	<i>Ceryle rudis</i>	IV	LC	II
22	Harada chadhei	<i>Crecapus phoenicopterus</i>	IV	LC	II
23	Whiskered Tern	<i>Chlidonias hybrida</i>	-	LC#	II
24	Golden-fronted Leaf-bird	<i>Chloropsis aurifrons</i>	IV	LC#	II
25	Blue-winged Leafbird	<i>Chloropsis chochinensis</i>	IV	LC#	II
26	White Necked Stork	<i>Ciconia episcopus</i>	IV	VU#	II
27	Pied Crested Cuckoo	<i>Clamator jacobinus</i>	IV	LC#	II
28	Blue Rock Pigeon	<i>Columba livia</i>	IV	LC#	NL
29	White Rumped Shama	<i>Copsychus malabaricus</i>	IV	LC#	II
30	Magpie Robin	<i>Copsychus saularis</i>	IV	LC#	II
31	Indian Roller	<i>Coracias benghalensis</i>	IV	LC#	II
32	Large Cuckoo- shrike	<i>Coracina novaehollandiae</i>	-	LC#	II
33	Jungle Crow	<i>Corvus macrorhynchos</i>	IV	LC#	II
34	Common Crow	<i>Corvus splendens</i>	V	LC#	II
35	Common Quail	<i>Coturnix coturnix</i>	IV	LC#	II
36	Brain-fever bird	<i>Cuculus varius</i>	IV	LC#	II
37	Indian Tree Pie	<i>Dendrocitta vagabunda</i>	IV	LC#	II
38	Lesser Whistling Teal	<i>Dendrocygna javanica</i>	IV	LC#	II
39	Tickell's Flower Pecker	<i>Dicaeum erythrorhynchos</i>	IV	LC#	II
40	Fire-breasted Flower Pecker	<i>Dicaeum ignipectus</i>	IV	LC#	II
41	Black Drongo	<i>Dicrurus macrocercus</i>	IV	LC#	II
42	White-bellied Drongo	<i>Dicrurus caeruleus</i>	IV	LC#	II
43	Greater Racket- tailed Drongo	<i>Dicrurus paradiseus</i>	IV	LC#	II
44	Lesser Golden Backed	<i>Dinopium</i>	IV	LC#	II



Sr.No	Common Name	Scientific Name	Schedule of WPA, 1972	Conservation Status as per IUCN	Schedule of WPA, 2022
	Woodpecker	<i>benghalense</i>			
45	Little Egret	<i>Egretta garzetta</i>	IV	LC#	II
46	BlackWinged Kite	<i>Elanus caeruleus</i>	IV	LC#	II
47	Ashy-crowned Finch-lark	<i>Eremopterix grisea</i>	IV	LC#	II
48	Red Munia	<i>Estrilda amandava</i>	IV	LC#	II
49	Asian Koel	<i>Eudynamys scolopaceus</i>	IV	LC#	II
50	Lesser Kestrel	<i>Falco naumanni</i>	IV	LC#	II
51	Common Kestrel	<i>Falco tinnunculus</i>	IV	LC#	II
52	Black Partridge	<i>Franco linusfrancolinus</i>	IV	LC#	II
53	Painted Partridge	<i>Francolinus pictus</i>	IV	LC#	II
54	Grey Partridge	<i>Francolinus pondicerianus</i>	IV	LC#	II
55	Fantail Snipe	<i>Gallinago gallinago</i>	IV	LC#	II
56	Moorhen	<i>Gallinula chloropus</i>	IV	LC#	II
57	Red Spurfowl	<i>Galloperdix spadicea</i>	IV	LC#	II
58	Red Jungle Fowl	<i>Gallus gallus</i>	IV	LC#	II
59	Myna	<i>Gracula religiosa</i>	IV	LC	II
60	Jungle Owlet	<i>Glaucidium radiatum</i>	IV	LC#	II
61	White Breasted Kingfisher	<i>Halcyon smyrnensis</i>	IV	LC#	II
62	Brahmani Kite	<i>Haliastur indus</i>	IV	LC	II
63	Heart spotted Woodpecker	<i>Hemicircus canente</i>	IV	LC#	II
64	Black-winged Stilt	<i>Himantopus himantopus</i>	IV	LC#	II
65	Indian Cliff Swallow	<i>Hirundo fluvicola</i>	-	LC#	II
66	Wire-tailed Swallow	<i>Hirundo smithii</i>	-	LC#	II
67	Pheasant Tailed Jacana	<i>Hydrophasianus chirurgus</i>	IV	LC#	II
68	Rufous Backed Shrike	<i>Lanius schach</i>	-	LC#	II
69	Black-headed Munia	<i>Lonchura malacca</i>	IV	LC#	II
70	Coppersmith Barbet	<i>Megalaima haemacephala</i>	IV	LC#	II
71	Crested Bunting	<i>Melophus lathami</i>	IV	LC#	II



Sr.No	Common Name	Scientific Name	Schedule of WPA, 1972	Conservation Status as per IUCN	Schedule of WPA, 2022
72	Small Green Bee-eater	<i>Merops orientalis</i>	IV	LC#	II
73	Blue tailed Bee-eater	<i>Merops philippinus</i>	IV	LC#	II
74	Blue cheeked Bee-eater	<i>Merops superciliosus</i>	IV	LC#	II
75	Bronze Winged Jacana	<i>Metopidius indicus</i>	IV	LC#	II
76	Black Kite/Pariah Kite	<i>Milvus migrans</i>	IV	LC#	II
77	Gobara chadhei	<i>Molpates cafer</i>		LC#	II
78	Black naped Flycatcher	<i>Monarcha azurea</i>	IV	LC#	II
79	Blue headed Rock Thrush	<i>Monticola cinclorhynchus</i>	IV	LC#	II
80	Pied Wagtail	<i>Motacilla alba</i>	IV	LC#	II
81	Grey Wagtail	<i>Motacilla cinerea</i>	IV	LC#	II
82	Yellow Wagtail	<i>Motacilla flava</i>	IV	LC#	II
83	Large Pied Wagtail	<i>Motacilla maderaspatensis</i>	IV	LC#	II
84	Tickell's Blue Flycatcher	<i>Muscicapa tickelliae</i>	IV	LC#	II
85	Purple Sunbird	<i>Nectarinia asiatica</i>	IV	LC#	II
86	Golden Oriole	<i>Oriolus oriolus</i>	IV	LC#	II
87	Black Headed Oriole	<i>Oriolus xanthornus</i>	IV	LC#	II
88	Tailor Bird	<i>Orthotomus sutorius</i>	IV	LC#	II
89	Grey Tit	<i>Parus major</i>	IV	LC#	II
90	Yellow-cheeked Tit	<i>Parus xanthogenys</i>	IV	LC#	II
91	House Sparrow	<i>Passer domesticus</i>	IV	LC#	II
92	Pea fowl	<i>Pavo cristatus</i>	I	LC#	I
93	Jungle Bush Quail	<i>Perdica asiatica</i>	IV	LC#	II
94	Small Minivet	<i>Pericrocotus cinnamomeus</i>	IV	LC#	II
95	Scarlet Minivet	<i>Pericrocotus flammeus</i>	IV	LC#	II
96	Small Indian Cormorant	<i>Phalacrocorax niger</i>	IV	LC#	II
97	Black Redstart	<i>Phoenicurus ochruros</i>	IV	LC#	II
98	Yellow-fronted Pied Woodpecker	<i>Picoides mahrattensis</i>	IV	LC#	II
99	Indian Pitta	<i>Pitta brachyura</i>	IV	LC#	II
100	Weaver Bird	<i>Ploceus</i>	IV	LC#	II



Sr.No	Common Name	Scientific Name	Schedule of WPA, 1972	Conservation Status as per IUCN	Schedule of WPA, 2022
		<i>philippinus</i>			
101	Eastern Golden Plover	<i>Pluvialis dominica</i>	IV	LC#	II
102	Slaty-headed Scimitar Babbler	<i>Pomatorhinus horsfieldi</i>	IV	LC#	II
103	Purple Moorhen	<i>Porphyrio porphyrio</i>	IV	LC#	II
104	Ashy Wren Warbler	<i>Prinia socialis</i>	IV	LC#	II
105	Blossom headed Parakeet	<i>Psittacula cyanocephala</i>	IV	LC#	II
106	Large Indian Parakeet	<i>Psittacula eupatria</i>	IV	NT#	II
107	Rose Ringed Parakeet	<i>Psittacula krameri</i>	IV	LC#	II
108	Red Vented Bulbul	<i>Pycnonotus cafer</i>	IV	LC#	II
109	Red Whiskered Bulbul	<i>Pycnonotus jocosus</i>	IV	LC#	II
110	White-throated Fantail Flycatcher	<i>Rhipidura albicollis</i>	IV	LC#	II
111	White-browed Fantail Flycatcher	<i>Rhipidura aureola</i>	IV	LC#	II
112	Painted Snipe	<i>Rostratula benghalensis</i>	IV	LC#	II
113	Pied Bush-chat	<i>Saxicola caprata</i>	IV	LC#	II
114	Collared Bush-chat	<i>Saxicola torquata</i>	IV	LC#	II
115	Indian Robin	<i>Saxicoloides fulicata</i>	IV	LC#	II
116	Chestnut-bellied Nuthatch	<i>Sitta castanea</i>	IV	LC#	II
117	Velvet-fronted Nuthatch	<i>Sitta frontalis</i>	IV	LC#	II
118	Crested Serpent Eagle	<i>Spilornis cheela</i>	IV	LC#	II
119	Spotted Dove	<i>Streptopelia chinensis</i>	IV	LC#	II
120	Indian Ring Dove	<i>Streptopelia decaocto</i>	IV	LC#	II
121	Spotted Dove	<i>Spilopelia chinensis</i>	IV	LC	II
122	Red Turtle Dove	<i>Streptopelia tranquebarica</i>	IV	LC#	II
123	Pied Mynah	<i>Sturnus contra</i>	IV	LC#	II
124	Grey-Headed Myna/Chestnut-tailed starling	<i>Sturnus malabaricus</i>	IV	LC#	II
125	Black-headed Myna/brahminy Myna	<i>Sturnus pagodarum</i>	IV	LC#	II



Sr.No	Common Name	Scientific Name	Schedule of WPA, 1972	Conservation Status as per IUCN	Schedule of WPA, 2022
126	Rosy Pastor	<i>Sturnus roseus</i>	IV	LC#	II
127	Indian Paradise Flycatcher	<i>Terpsiphone paradisi</i>	IV	LC#	II
128	Black Headed Ibis	<i>Threskiornis melanocephalus</i>	IV	NT#	II
129	Indian Grey Hornbill	<i>Tokus birostris</i>	IV	LC#	II
130	Yellow-footed Green Pigeon	<i>Treron phoenicoptera</i>	IV	LC#	II
131	Common Redshank	<i>Tringa totanus</i>	IV	LC#	II
132	Jungle Babbler	<i>Turdoides striatus</i>	IV	LC#	II
133	Hoopoe	<i>Upupa epops</i>	IV	LC#	II
134	Red Wattled Lapwing	<i>Vannellus indicus</i>	IV	LC#	II
135	Black Dongo	<i>Dicrurus macrocercus</i>	IV	LC	II
136	Indian Cuckoo	<i>Eudynamis scolopaclus</i>	IV	LC	II
Reptiles					
1	Garden Lizard	<i>Calotes versicolor</i>	-	LC	NL
2	Russel's Viper	<i>Daboia russelii</i>	IV	LC#	I
3	Green Vine Snake	<i>Ahaetulla nasuta</i>	IV	LC	II
4	Common Skink	<i>Mabuya carinata</i>	-	LC#	NL
5	Indian Cobra	<i>Naja naja</i>	IV	LC#	I
6	Yellow Rat Snake	<i>Ptyas mucosa</i>	II	-	I
7	Indian Python	<i>Python morulus</i>	I	Vu#	I
8	Monocellata Cobra	<i>Naja naja kuothia</i>	II	LC	I
9	King Cobra	<i>Ophiophagus hannah</i>	II	VU	I
10	Bengal Monitor Lizard	<i>Varanus bengalensis</i>	I	LC#	I
11	Russel's Viper	<i>Vipera russelii</i>	II	NA	I
12	Checkered Keelback	<i>Xenochrophis piscator</i>	IV	LC	I
Fishes					
1	Mahurali	<i>Amblypharyngodon mola</i>	NA	LC	NA
2	Bhakura	<i>Catla catla</i>	NA	LC	NA
3	Mirkali	<i>Cirrhina mrigla</i>	NA	LC	NA
4	Magura	<i>Clarias batrachus</i>	NA	LC	NA
5	Dand Khirri	<i>Esomus dandrica</i>	NA	LC	NA
6	Singi	<i>Heterophneustes</i>	NA	LC	NA



Sr.No	Common Name	Scientific Name	Schedule of WPA, 1972	Conservation Status as per IUCN	Schedule of WPA, 2022
		<i>fossil</i>			
7	Rohi	<i>Labeo rohita</i>	NA	LC	NA
8	Todi	<i>Mastacembelus armatus</i>	NA	LC	NA
9	Kantia	<i>Myotus cavasius</i>	NA	LC	NA
10	Chitala	<i>Notopterus chitala</i>	NA	LC	NA
11	Phalli	<i>Notopterus notopterus</i>	NA	LC	NA
12	Jalanga	<i>Pangasius pangasius</i>	NA	LC	NA
13	Chenga	<i>Ophiocaphalus gachua</i>	NA	LC	NA
14	Seula	<i>Ophiocaphalus striatus</i>	NA	LC	NA
15	Balia	<i>Waalngonia attu</i>	NA	VU	NA
Tortoise					
1	Land Tortoise	<i>Testudo eleonguta</i>	IV	CR	I
2	Water Tortoise	<i>Lissemys punctata</i>	IV	VU	I
Butterflies					
1	Common Emigrant	<i>Catopsilia pomona</i>	NA	NA	NA
2	Common map	<i>Cyrestis thyodamas</i>	NA	NA	NA
3	Stripped Tiger	<i>Danaus genutia</i>	NA	NA	NA
4	Plain Tiger	<i>Danaus chrysippus</i>	NA	NA	NA
5	Common crow	<i>Euploea core</i>	NA	NA	NA
6	Common Grass Yellow	<i>Eurema hecabe</i>	NA	NA	NA
7	Western blue sapphire	<i>Heliophorus sp.</i>	NA	NA	NA
8	Danaid Egg Fly	<i>Hypolimnas misippus</i>	NA	NA	II
9	White orange tip	<i>Ixias marianne</i>	NA	NA	NA
10	Blue Pancy	<i>Junonia orithya</i>	NA	NA	NA
11	Common evening Brown	<i>Melanitis leda</i>	NA	NA	NA
12	Common Bush Brown	<i>Mycalesis perseus</i>	NA	NA	NA
13	Lime butterfly	<i>Papilio demoleus</i>	NA	NA	NA
# LC –Least Concern; NT –Near Threatened; VU–Vulnerable; EN–Endangered; CR–Critically Endangered					

(Source: Primary Survey Data) Note: -NA=Not assessed yet,)



2.11.4 Aquatic Ecology:

The biological species are the best indicators of environmental quality. This includes different species, such as, phytoplankton, zooplankton, benthos, fishes etc. Studies on biological aspects of certain ecosystems are an important part of any environmental impact Assessment in view of the need for conservation of environmental quality and safety of aquatic life.

From the baseline survey on existing aquatic environmental conditions in and around the proposed Project the following data were generated:

- Biological characteristics of river water
- Inventorization of phytoplankton and Zooplankton
- Present status of riverine fish fauna: Identification of fish species
- Migratory pattern, feeding and breeding grounds of the fish fauna
- Assessment of local catches during the field trips to assess the fish fauna

2.11.4.1 Assessment of Aquatic diversity:

The samples for qualitative and quantitative analysis of planktons were collected from the sub surface layer at knee depth. Water samples were filtered through plankton net of 20µmesh size (APHA, 1971). The filtered samples were concentrated by using the centrifuge. By using Lackey's drops method and light microscope (Lackey, 1938), the qualitative analysis was carried out for phytoplankton and zooplankton (**Table 2.13**). The standard flora and other literature were followed for the qualitative evaluation of Plankton.

Table-2.13: Phytoplankton and Zooplanktons Recorded in the Study Area

Sl. No.	Phytoplankton Species	Zooplankton Species
1.	<i>Naviculasp. (Diatom)</i>	<i>Daphnia sp.</i>
2.	<i>Cyclotellasp. (Diatom)</i>	<i>Moina sp.</i>
3.	<i>Synedrasp. (Diatom)</i>	<i>Paramecium sp.</i>
4.	<i>Pinnulariasp. (Diatom)</i>	<i>Euglena sp.</i>
5.	<i>Oscillatoria sp.</i>	<i>Ranatra sp.</i>
6.	<i>Nostoc sp.</i>	<i>Larvae of culex sp.</i>
7.	<i>Anabaena sp.(Diatom)</i>	<i>Larvae of Dytiscus sp.</i>
8.	<i>Spirogyra sp.</i>	<i>Cyclops sp.</i>
9.	<i>Pediastrum. sp.</i>	<i>Diaptomus sp.</i>
10.	<i>Microspora sp.</i>	

2.11.4.2 Aquatic Floral Diversity:

Wetlands are very useful to us. By producing resources, enabling recreational activities



And controlling flood and pollution, they contribute to the national and local economies and environmental consequences. Wetlands provide important and incredible services to society, these services can neither be sold nor do they have the market value and tried to give wetlands an economic value.

Table-2.14: Wetland/Marshland Diversity of Study area

Family	Botanical Name	Local Name
Salviniaceae	<i>Azolla pinnata</i>	Mosquito Fern
Commelinaceae	<i>Commelina benghalensis</i>	Kana
Cyperaceae	<i>Cyperus alternifolius</i>	UmbrellaS edge
Poaceae	<i>Echino chloacolona</i>	Shama
Pontederiaceae	<i>Eichho rniacrassipes</i>	Jal Kumbhi
Lemnaceae	<i>Lemna minor</i>	DuckWeed
Onagraceae	<i>Ludwigia adscendens</i>	Water Primrose
Marsileaceae	<i>Marsilea quadrifolia</i>	Four Leaf Clover
Oxalidaceae	<i>Oxalis corniculata</i>	Amrul
Ranunculaceae	<i>Ranunculus sceleratus</i>	Aglaon
Typhaceae	<i>Typha angustifolia</i>	Patera

2.11.5 Details of Endemic, Threatened and Scheduled Species:

As per list of **The Indian Wildlife (Protection) Act, 1972**, Fauna coming under the **Schedule-I** are treated as endangered species. The **schedule - I** fauna as per reconnaissance survey are listed in **Table-1.12**. Although these are very common species and found in every locality, even in villages, certain steps should be taken to conserve the critical wildlife:

- I. Programs for the conservation of wildlife will be formulated and implemented outside the protected areas by educating the local communities with help of local public agencies, and other stakeholders including the environment division officers of our company, in order to reduce the scope of man-animal conflict.
- II. It will be ensured that human activities on the fringe of the protected areas do not degrade the habitat.

Over all, the status of wildlife in a region is an accurate index of the state of ecological resources, and thus, of the natural resources base of human well-being. This indicates the Interdependent nature of ecological entities (the web of life), in which wildlife is a



vitallink and a base of eco-tourism. Thus, the importance of conserving and protecting wildlife will be spread among the local people.

Table 2.15 list of Scheduled species (IWPA-1972) from study area

Sr.No.	Scientific name	Common Name	Schedule
Mammals			
1	<i>Elephas maximus indicus</i>	Elephant	Schedule-I
2	<i>Manis crassicaudata</i>	Pangolin	Schedule-I
3	<i>Melursus ursinus</i>	Sloth Bear	Schedule-I
4	<i>Panthera pardus</i>	Bagh	Schedule-I
Reptiles			
5	<i>Varanus bengalensis</i>	Bengal Monitor Lizard	Schedule-I
6	<i>Python molurus</i>	Python	Schedule-I
Birds			
7	<i>Pavo cristatus</i>	Indian Peafowl	Schedule-I
8	<i>Aquila rapax</i>	Tawny Eagle	Schedule-I
9	<i>Anthracoceros coronatus</i>	Pied Hornbill	Schedule-I
10	<i>Nisaetus cirrhatus</i>	Hawk-eagle	Schedule-I

So far, according to our study and from the available literature, there is no endemic plant and species present in this area. A brief note on facts on these animals is as follows



2.11.6 Status of Schedule-I Fauna present in the study area:

1. Elephant (*Elephas maximus indicus*):

Elephants have not been sighted within the mining lease area or the impact area. However, there have been documented instances of elephant movement occurring far beyond the lease area in the Angul district of Odisha State. According to the Ministry of Environment, Forest & Climate Change, there are a total of 2,865 elephants in Odisha, Jharkhand, and Chhattisgarh. Out of these, Odisha accounts for nearly 70% with 1,930 elephants, followed by Jharkhand with 688 elephants and Chhattisgarh with 247 elephants as of 2012. While Jharkhand is renowned for being a habitat and transit route for elephants, its boundary is significantly distant from the lease area. The movement of elephants has also been observed in the eastern part of the Renukoot Dam. However, this dam acts as a substantial barrier preventing elephants from approaching anywhere near the current Subhadra OCP mine lease area. The movement of elephants and other large wildlife in the Talcher Forest Division is depicted in Figure-1.3, which showcases a map titled "Diverted wildlife corridor due to coal mines" obtained from the forest department of Talcher Forest Division.

Habitat: Elephants are versatile animals, although they primarily inhabit scrub forests. While they can be spotted in jungles, they tend to stay near the outskirts where they have access to open, grassy spaces. They have a preference for areas that offer a combination of grass, low woody plants, and forest cover. Elephants typically do not stay in one foraging area for an extended period, usually moving on after a few days. The movement of elephants is primarily influenced by the availability of food, water, and shade, which are the three fundamental resources for them (Sukumar et al, 2003). Their home-range can vary from 30 to 600 square kilometers.



Food: Elephants eat a wide variety of species of vegetation. They are herbivore, folivore and lignivore. More than 100-130 different species of plants may be eaten They prefer grasses, but they also consume bark, roots, leaves, wood, stems and leaves of trees, vines, shrubs, tubers, bamboo and barn, an average day's intake is 150-200kg of wet vegetation. The proportions of the different plant types in their diet vary depending upon the habitat and season. Annual diet has been found to be dominated by grass. Maximum straying distance covered by the raiding elephant has been recorded upto 5.5 km.

Time activity budget of elephants: Generally, they are active almost throughout the day during rainy and winter months, but during summer months they are active only in the morning and evening hours. They become active well before dawn and start their morning activities in the vicinity of the area where they spent night. Evening hour is the time for drinking and bathing especially during summers. In summer season percentage of movement is more due to lack of fodder species and shrinkage of natural water sources.

Food Plants: Following is a list of plants reported as food by different workers. However, only the names of plants, local to the area, have been taken and the local names have been changed. Part of the plant eaten may be different for the different species.

Threats: The Asian elephant faces numerous challenges in the present day, primarily stemming from habitat loss, degradation, agricultural and farming activities, grazing, mining, human interference, trade, pollution, ivory hunting, insurgency, corridor loss, anthropogenic pressures on their habitat, conflicts between humans and elephants, forest fires, and illegal captures of live animals. Additionally, poisoning and disease pose further threats to these majestic creatures.



SSWLMP for Subhadra OCP in Talcher Coalfields, Odisha of M/s Mahanadi Coalfields Limited

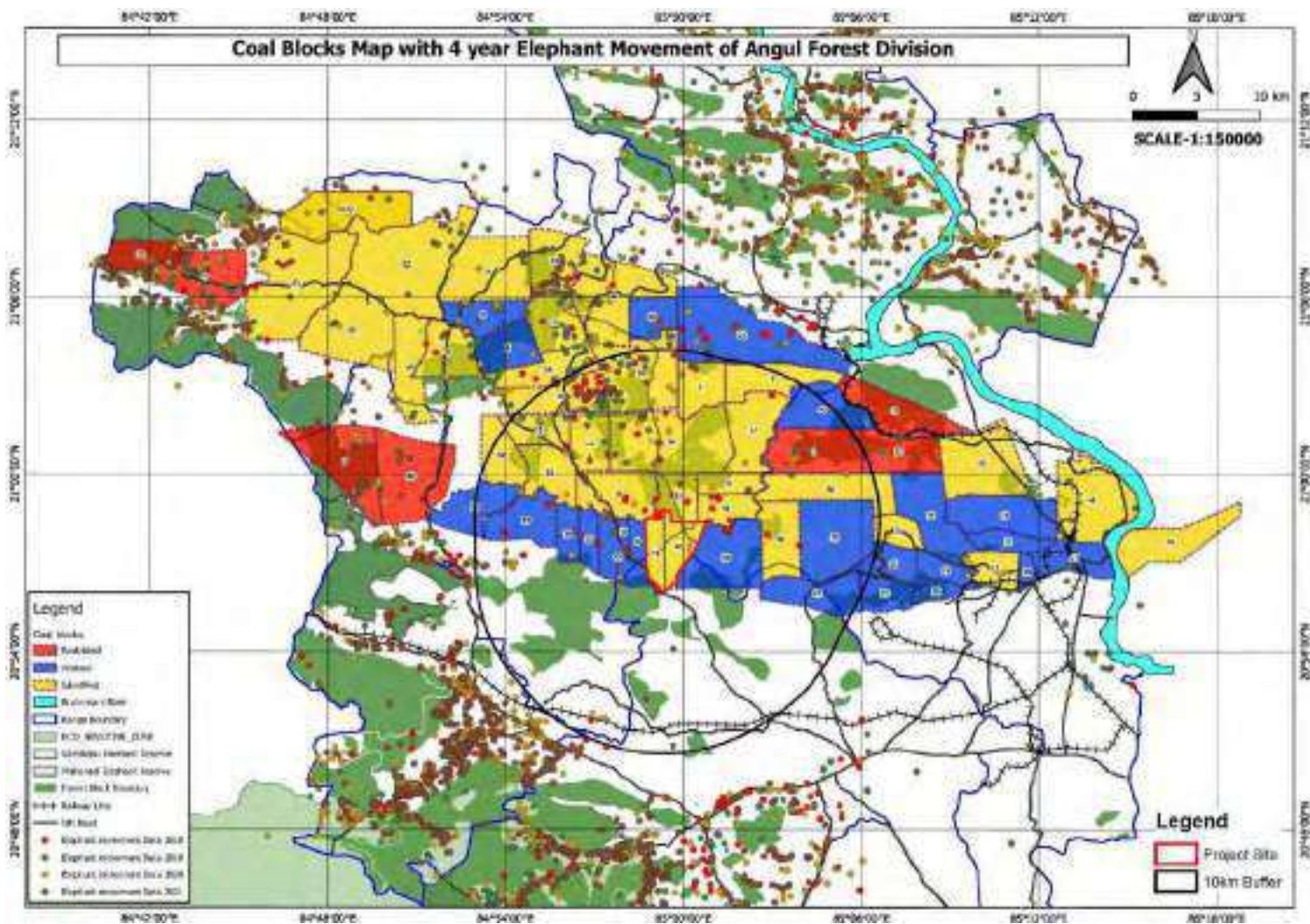


Figure-2.1: Elephant Movement in Angul Forest Division



Table-2.16: List of Food Plants for Elephant

Sr.No.	Botanical Name	Local Name
1	Acacia catechu	Khair
2	Acacia nilotica	Babool
3	Aegle marmelos	Bel
4	Albizzia lebbek	Kalasisiris
5	Bambusa arundinacea	Bans
6	Albizzia procera	Safedsiris
7	Bauhinia variegata	Kachnar
8	Bauhinia vahlii	Mahul
9	Bauhinia malabarica	Khatua
10	Bombax ceiba	Semal
11	Brachiaria sp.	Ghas
12	Bridelia retusa	Kasai
13	Careya arborea	Kumhi
14	Cordia myxa	Lassora
15	Cymbopogon flexuosus	Ghas
16	Cynodon dactylon	DoobGrass
17	Dalbergia sissoo	Shisham
18	Dendrocalamus strictus	Bans/ Bamboo
19	Desmostachya bipinnata	Urai/Khus
20	Eleusine sp.	Ghas
21	Emblica officinalis	Amla
22	Eucalyptus sp.	Nilgiri
23	Eulaliopsis binata	BagaiGhas
24	Feronia elephantum	Kaith
25	Ficus bengalensis	Bargad/Bar
26	Ficus glomerata	Dumar/Gular
27	Ficus religiosa	Pipal
28	Ficus rumphii	Duranga-hesa
29	Ficus infectoria	Pakar
30	Flacourtia indica	Kandai
31	Garuga pinnata	Kekad
32	Grewia elastica	Dhaman
33	Helicteres isora	Ainhi
34	Holarrhena antidysenterica	Korea
35	Ipomoea sp.	Karmata
36	Imperata arundinacea	Ulu
37	Kydia calycina	Baranga/Pula
38	Lagerstroemia parviflora	Senha/Sidha



Sr.No.	Botanical Name	Local Name
39	<i>Limonia acidissima</i>	Kaith
40	<i>Mallotus philippinensis</i>	Sinduri/Rohini
41	<i>Mimosa pudica</i>	Lajwanti
42	<i>Mitragyna parvifolia</i>	Mudhi
43	<i>Musa paradisiaca</i>	Banana
44	<i>Neyraudia arundinacea</i>	Bichhloo
45	<i>Oryza sativa</i>	Dhan
46	<i>Ougeinia oojeinensis</i>	Tinsa
47	<i>Phoenix humilis</i>	ButaChhind
48	<i>Pithecellobium dulce</i>	JangalJalebi
49	<i>Randia dumetorium</i>	Mainphal
50	<i>Saccharum munja</i>	Kandi-khar
51	<i>Saccharum officinarum</i>	Ganna
52	<i>Saccharum spontaneum</i>	Kans
53	<i>Sansevieria sp.</i>	Sisal
54	<i>Schleichera oleosa</i>	Kosam/Kusum
55	<i>Shorea robusta</i>	Sarai/Sal
56	<i>Syzygium cumini</i>	Jamun
57	<i>Tamarindus indica</i>	AmlI/ Imli
58	<i>Terminalia tomentosa</i>	Saja
59	<i>Tectona grandis</i>	Sagaun/Teak
60	<i>Tinospora cordifolia</i>	Giloe/Gurch
61	<i>Thysanolaena agrostis</i>	Hathighas/Pirlu
62	<i>Zizyphus mauritiana</i>	Bhander
63	<i>Zizyphus xylopyra</i>	Ghont

Elephant Corridor: There are no designated elephant corridors within a 10 km radius of the project site. Nevertheless, according to the Forest Division's report, elephants do migrate between important forest blocks within their habitat. The movement track for these elephants is formed by revenue forestlands, Demarcated Protected Forests (DPF), and village forest areas that connect these isolated forest blocks. Unfortunately, the central Indian elephant habitats have become highly fragmented and degraded due to encroachment, shifting cultivation, and mining activities.

Disturbance of elephant movement due to project activities: The mining zone does not have an elephant corridor and the forest department and primary study has not reported or recorded any elephant presence. A pathway for the movement of elephants, known as the Kanheijharan-Anantpur corridor, exists adjacent to the buffer area of project, providing a



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secure route for their passage. This corridor serves as a significant pathway for elephants in the region.

2. Indian Pangolin (*Manis crassicaudata*):

Manis Crassicaudata are insectivorous mammals understood to occur in various types of tropical forests as well as open land, grasslands and degraded habitats, including in close proximity to villages. It is a medium-sized mammal, with a streamline elongated body and tail covered with large overlapping scales rather than fur. Indian Pangolin is widely distributed in India, except the arid region, high Himalayas and the North-East. It can be found at elevation upto 2500m. The species also occurs in Bangladesh, Pakistan, Nepal and SriLanka.

Habitat: *Manis crassicaudata* occupy a variety of habitats. They have been found in tropical rainforests, subtropical thorn forests, plains and the lower slopes of mountains. The Indian pangolin is solitary, mostly nocturnal, and terrestrial.

Ecology and Behavior: These pangolins dig their own burrows in the ground, at depths of 1.5-6 m; these are frequently under large rocks and the entrance is often hidden with soil. When in danger, they roll up into balls, with their large tails pressed tightly against face and belly to help protect them. Longevity of this animal in captivity can exceed 19 years.

These pangolins are not often observed in the wild due to their solitary, secretive, and nocturnal nature. A loud emission of a hissing sound has been reported when they are frightened or angry.

Food: The Indian pangolin is almost entirely insectivorous and more specifically myrmecophage (ant/termite specialist). Its diet includes beetles, cockroaches, termites, and possibly worms, but mainly ants and termites. It feeds on the eggs, larvae, and adults of its prey, but eggs are the preferred choice. The Indian pangolin is nocturnal and uses its well-developed sense of smell to locate ant nests or termite mounds and other food sources. Pangolins tear apart and dig into mounds by using the three center claws on their forefeet, throwing loose soil backwards with their hind feet. When feeding, the rostral part of the pangolin's tongue is quickly inserted and withdrawn to capture prey. This movement is also used for drinking.

Conservation Status: The species is therefore listed as endangered in the IUCN Red List of Threatened Species; under the Schedule I of the Wildlife (Protection) Act 1972 of India



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and included in Appendix II of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

3. Bengal Monitor Lizard (*Varanus bengalensis*):

Habit: They are often found in agricultural areas. Bengal monitors shelter in burrows that they dig or crevices in rocks and abandoned termite mounds. It is mostly diurnal in habit.

Habitat: It is found in a wide range of habitats, viz. forest, river banks, by the side of nullah, and agricultural land. It occupies burrows, dense vegetation, hollows of trees, rock cracks and crevices.

Behavior: Mainly ground dweller, but is a very good climber as well. Bengal Monitors are usually solitary and usually found on the ground although the young are often seen on trees. They shelter and spend nights in burrows or crevices in rocks, make use also of abandoned termite mounds. In the night their body temperature drops below ambient. In the morning they raise their body temperatures by basking before commencing activity and for this reason they are rarely active early in the morning and most active in the afternoons when temperatures are highest.

Food: Their normal prey consists of beetles, grubs, orthopterans, scorpions, crabs, snails, ants and other invertebrates. Vertebrate prey is comparatively rare and includes frogs, fish, other lizards, snakes, birds and their eggs and rodents. They sometimes capture roosting bats.

Threat: Monitor lizards are hunted for skin and their body fat. Its eggs are considered a delicacy and the entire animal is also eaten. Unani, the Greco-Arabian system of medicine, recommends the use of various body parts of monitors to cure numerous ailments. The population of the Common Indian Monitor, *Varanus bengalensis* has alarmingly dwindled throughout the Indian sub-continent mainly due to excessive exploitation of the adults for their commercially valuable skins, as food and in traditional medicines. Habitat loss due to large-scale deforestation, urbanization, dams and hydroelectric projects and other biotic factors are also responsible for the population decline of the species.

Conservation Status: Status: Not Listed (IUCN 2000); Endangered (ESA). Schedule Indian Wildlife (Conservation) Act, 1972.

4. Indian Python (*Python molurus*):

Habitat: It is a non-poisonous, lethargic and slow-moving snake, exhibiting little if any timidity and rarely rousing itself seriously to escape, even when attacked. Diurnal and/or



nocturnal habit depends upon the degree of disturbance from human in their environment.

The snake hibernates in cold season, in any convenient retreat. There are very few records of attack on human beings are also there in the area.

Food: Feeds on mammals, birds and reptiles, but prefers mammals. Stomach content has own frogs, toads, monitor lizard, wild duck, peafowl, poultry, rat, hare, porcupine, langur, jackal, mousedeer, and hogdeer, chital, sambar fawn, barking deer, chinkara and leopard. Thus has a very wide range of food items.

Threats: It is killed for flesh and skin. However, in the presently applied lease area it is not eaten. Killing for skin is also not reported in the area. However, it is killed only because it is a snake.

Conservation: The snake, although occurs in the area but is rare. Reports of its conflicts with human being are extremely rare. Public awareness is the most important method for its conservation.

Conservation Status: This species is classified as Lower Risk/Near Threatened (LR/NT) on the IUCN Red List of Threatened Species (v2.3, 1994). This means that it has been evaluated, but does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. However, it is considered Near Threatened (NT), meaning that it does not qualify for Conservation Dependent, but is close to qualifying for Vulnerable. Year assessed: 1996.

2.11.7 Conservation plan for Schedule-I Bird Species:

Birds, occupying higher trophic levels in the ecosystems, respond quickly to the changes in the habitats and therefore serve as one of the best indicators for evaluating the ecological status and functioning of ecosystems of the area. Therefore, we created baseline data on birds by systematically collected data on occurrence in the core and buffer areas separately. For creating baseline data on birds, we carried out bird surveys in different habitats as differential habitat preferences are seen in birds. Based on our extensive field visits, literature survey, and consultation local people, we found 8 bird species of high conservation significance as they belong to Schedule-I of Indian Wildlife Protection Act 1972.

Occurrences of birds in the study area are mainly due to the overall ecological condition which provides them suitable habitats where they obtain their food and safety for their



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breeding or wintering in the region. Therefore, any changes or degradation of air, soil and water quality would lead to degradation of vegetation and habitats of birds. Increased noise levels and disturbance levels would result in their displacement from the core area and its immediate surroundings. Direct disturbance by presence of people, vehicle, their noise, vibrations, lights, etc. Can potentially displace most of the birds' species from core area.

Therefore, it is recommended that project proponent shall take utmost care in controlling dust, fugitive emissions and put in place all pollution control measures during construction phase which would not result in degradation of air, soil, water qualities that affect the surrounding forest areas and vegetation. It is also recommended that workers shall be strictly instructed so that they don't engage in poaching of birds. It is further recommended that project proponent shall monitor the ecological status of the study area including species of birds and their habitats as part of their periodic comprehensive biodiversity monitoring programme.

2.11.8 Movement of Mega Wildlife:

Elephant is the flagship species of this area and the only mega herbivore (wildlife) with long ranging movement behavior, present in the Angul Forest Division. Elephants have not been reported from the mining lease area. However, there are reports of the movement of elephants, surrounding the lease area. Elephants follow streams and move in valleys and unless hard pressed try to avoid hilly terrain to conserve energy. This behavior exposes them close to human habitation.

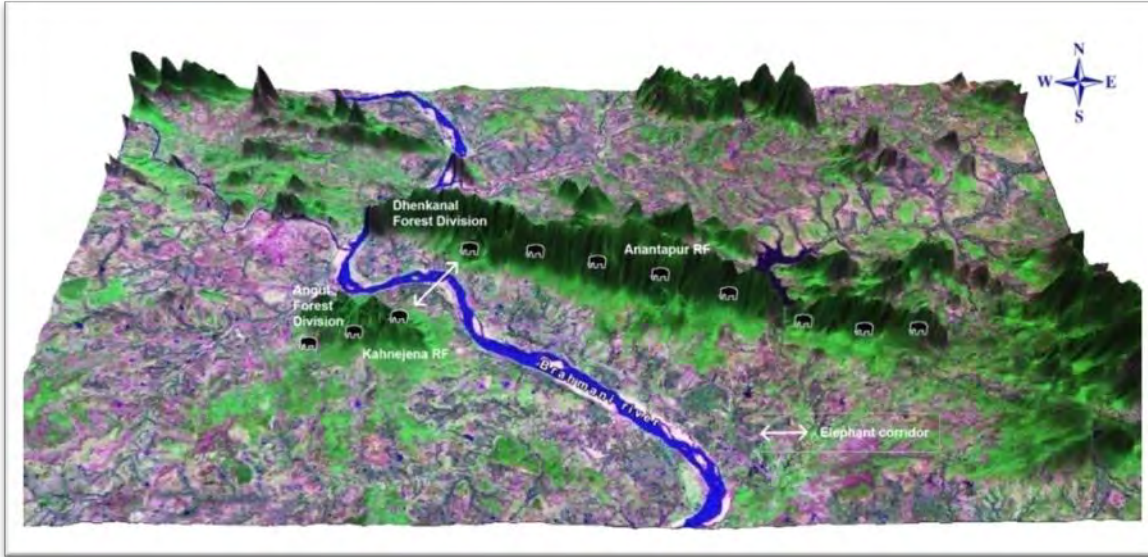
Due to qualitative and quantitative decline of wildlife habitat including loss of prey base in the Division and loss of connectivity and fragmentation of the habitat, there are increase in man-animal conflicts. Studies shows that the changing land use in the peripheries of the PA's due to demographic changes are affecting wildlife habitats. These pressures influence the movement pattern, habitat utilization and behavior leading to regular increase in the race for survival between man and animals. There is no protected area within the 10 km radius of the project. During the paddy harvesting season elephants are found to be roaming around the nearby villages.

Elephants generally migrate from the forests of Satkosia wildlife Division to Nuakheta, Bolong, Krushnachakra, Burti, Antulia-Tabada blocks of Raigada, Angul & Jarapada Ranges & from Keonjhar, Deogarh Divisions to Bulajhar, Phuuljhari, Nialu-Lodhahhari-Sapkata blocks of Talcher, Kaniha Ranges.



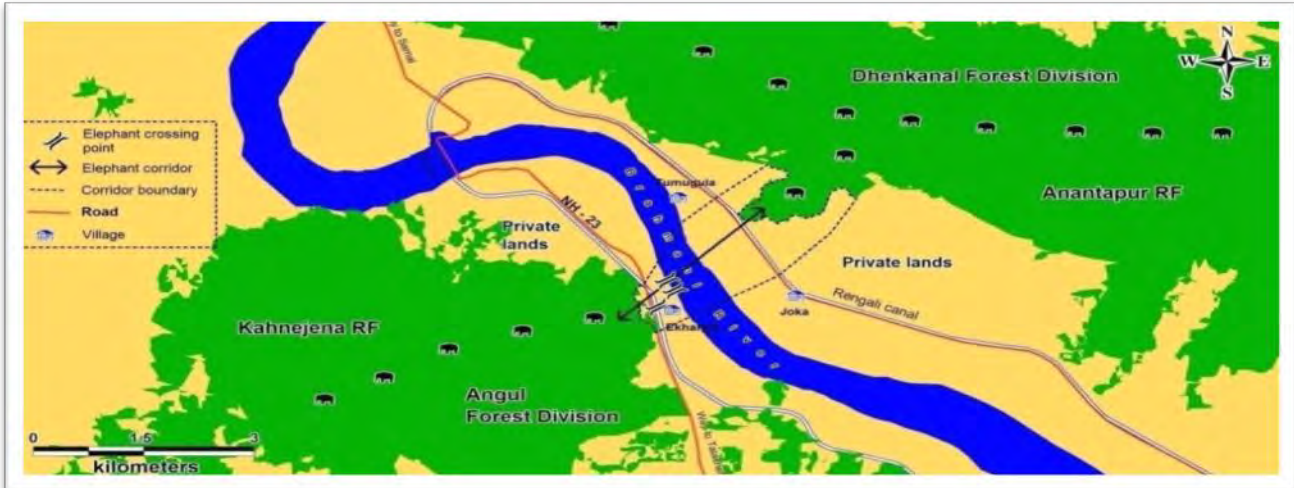
2.11.9 Kahnejena - Anantapur INTER - DISTRICT

This corridor connects Kanhejena Reserve Forest of Angul Forest Division with Anantapur Reserve Forest of Dhenkanal Forest Division. Elephants from Satkosia WLS, Handapa Reserve Forest move through adjoining forest patches of Simuliapadar RF, Durgapur RF, Nisha PF, Kuio PF, Kauchiakhhol RF, Rakas RF and Kanhejena RF to Anantapur RF. National Highway-23, construction of Rengali Irrigation canal, establishment of brick kilns on the Brahmani River bank and presence of industries (Fly Ash Brick Plant, Sponge Iron and Tar Refinery) in Ekagharia village are the hurdles in the corridor affecting elephant use severely.



Corridor dependent villages

Ekagharia, Bikisar, Bilinda, Jaka, Tumugula, Dangarbeda, Patuapali and Sarasikipal



At present Animal / Elephant movement along the corridor has been reduced due to Construction of Rengali Right and left Canals, Development of Roads / National Highways, and avoidance of animals due to Coal mining and related traffic pressure day and night.



2.11.10 Satkosia Tiger Corridor:

Forest Blocks which are part of the Kanheijena-Anantpur Elephant Corridor are also part of the Similipal - Satkosia Tiger Corridor as identified by the NTCA. As this corridor is very important and for maintaining animal movement between Similipal and Satkosia, it is also important for the survival of viable population in the Satkosia Tiger Reserve. At present no RBT is reported in Satkosia Tiger Reserve.

Remarks in the Site Inspection Report (SIR):

The wild animals observed in the core area are Wild Boar, Barking Deer Indian Hare, Languor, Jackal, Peafowl, Blue Jay, Egrets, Kingfisher, Drongo. On rare and endangered animal: No rare and endangered animal observed. (Site Inspection Report of DFO, Angul is at **Annexure-VI**)

2.11.11 Elephant movement Pattern in ZOI / Add. ZOI:

The elephants / leopards from Satkosia Sanctuary / Tiger Reserve frequently enters into Handapa RF- Adjoining forests of Simuliapadar RF- Durgapur RF in the Western side – Nisha PF- Kuio PF- Kauchiakhhol RF- Rakas RF – Kanheijena RF – To Anantapur RF in Dhenkanal District via elephant corridor crossing the River Brahmani. On the way they are crossing Rengali Right Canal and Left Canal, NH- 23 Canal.

2.11.12 Human- Wildlife Conflict (Depredation Data)

a) Crop damage: (Angul Division)

Year	No of cases	Area affected in Ac	Compassionate Grant in Rs	
			Sanctioned	Paid
2020-21	9186	1745.41	1,91,57,238/-	1,91,57,238/-
2021-22	6211	1397.71	1,52,26,528/-	1,52,66,390/-
2022-23	8098	1923.64	2,09,49,339/-	2,09,48,519/-
2023-24	11461	2542.502	3,77,29,000/-	3,77,29,371/-
2024-25 (up to July 2024)	1175	233.659	1,11,64,285/-	2,09,52,192/-

Crop damage data (Angul Division)

b) House Damage:

Year	No of cases		Compassionate Grant Sanctioned & paid in Rs
	Part Damage	Full damage	
2020-21	15	72	7,50,000/-
2021-22	3	7	76,000/-
2022-23	26	44	4,94,820
2023-24	72	9	7,12,000/-
2024-25 (upto July 2024)	19	0	2,80,000/-

House damage (Angul Division)



C) Human Kill & Injury:

Year	No of cases			Compassionate Grant Sanctioned & paid in Rs
	Human Kill	Human Injury (Temp)	Human Injury (Permanent)	
2020-21	21	6	24	89,10,000/-
2021-22	10	2	13	52,90,000/-
2022-23	18	20	05	74,90,000/-
2023-24	20	13	7	1,47,15,000/-
2024-25 (upto July 2024)	5	0	0	24,60,000/-

Human kill & injury**D) Elephant Kill:**

Year	Elephant Death (case no and Date)	Reason of Death
2020-21	3	Natural death
2021-22	7	Natural death (3nos), Electrocution (4no)
2022-23	3	Natural death (2nos), Electrocution (1no)
2023-24	2	Natural death (1no), Train hit(1no)
2024-25(up to July 2024)	4	Electrocution (2nos)& others (reason not known)

Elephant Kill**2.11.13 Public View on Man Animal Conflict:**

Human- Wild Animal Conflict (HWC) is in a rising trend in this locality. Due to industrialization / Mining etc the Mega animal movement has been affected. The animal lovers are very much concerned about hostile attitude of public, depletion of wild animals in the region and remote possibility of striking a balance between Habitats- Developmental activities- Mining activities.

2.11.14 Other Projects within ZOI & their Impact Zone:

There are many Coal blocks in Talcher Coal field area. The habitat is completely destroyed by coal mining. The rail corridors developed / being developed completely blocked the animal movement.

2.11.15 Man-Animal Conflict:

Man animal conflict refers to negative interaction between wild animals and human beings such as crop raiding, human death and injury caused by wildlife and in retaliation (or otherwise) human beings killing the animals. Wildlife Management efforts raise conflict Issues not only through crop raiding, cattle lifting, property and life damage but also, generally when conservation comes into conflict with development. Both wildlife and people are in conflict and the goal is to enable coexistence and sharing of resources on sustainable scale. This is best achieved by addressing both sides of the equation.

The bear population is quite high in this area and the surrounding forests. A peculiar phenomenon is prevalent in this area. The sloth bear usually remains inside the forest during the winter months but comes out of its cover in search of Mahua flowers which is a delicacy for it. Normally in the winter mornings the environment remains full of fog and the bear has long fur on its eyebrows, which obstruct its vision.

Of late, another phenomenon has also troubled the local populace. Elephant herds have been reported to have occasionally crossed the area while moving from the Odisha Forests to the Elephant habitats down south. The local populaces have had their houses brought down and suffered a lot on account of these elephant movements.

2.11.16 Poaching/ Killing of animals:

While forest fires are usually unintentional and are in advertently due to carelessness, poaching is intentional and a crime of a very serious nature. Poaching is usually organized crime and there are tiers of different level of criminals involved in the racket. At the lowest level are usually the local people. There are certain tribes that are known to have been poachers for generations. They are usually the least benefited in terms of money that a serious poaching can accrue but without them usually poaching is not possible. The reason is simple, it's they who know the jungles well and its they who can walk long distances inside the forest and its they who use ingenious and usually difficult to trace methods like electrocution (by using a connection from overhead H.T. electrical transmission lines), poisoning (sometimes even large poisoning of water sources which shrink during the pinch period and a large number of animals can come to drink water from one water hole and get poisoned) and traps. The traps are sometimes very ingenious and entirely home made using small iron pieces and iron springs. These are usually so smartly hidden that they can be completely overlooked even by the people. The forest staff may have a real tough time in weeding out such traps.



Apart from the local people there is a whole chain that goes upright to the International level. This well-oiled system makes wildlife crimes very lucrative and International data Suggest that wildlife related crimes are only third after arms drugs related crimes in terms of money exchanged (WPSI-Wildlife Protection Society of Indian publication).

Nevertheless, poaching can be thwarted and the poachers brought to book but there is no short cut. It requires 24 hr monitoring of forest areas, particularly those that have relatively high biodiversity and where the number of animals is high.

2.11.17 Working Plan Prescriptions:

The present Working Plan of Angul Forest Division, valid from 2021-22 to 2030-31 consists of nine Working Circles as detailed below: -

- Improvement Working Circle
- Protection Working Circle
- Conservation and Maintenance of Soil and Water Resources
- Rehabilitation Working Circle
- Plantation Working Circle
- Bamboo (Overlapping) Working Circle
- Wildlife (Overlapping) Working Circle

The demand of the day is to manage the forest by active participation of local people (Joint Forest Management) on sharing basis. In the end for any felling takes place the stakeholders will have a 50% share. Only in Protection Management Working Circle this procedure has not been adopted as no felling is permitted. Therefore, thrust has been more on eco-development through strategies aimed at uplifting the local economy and also at increasing the general awareness of the local community about the importance of biodiversity and wildlife. When we plan for conservation of Wildlife in a forest area (and its neighboring Impact Area) that has to be diverted for a non-forest activity like coalmining, the task becomes rather peculiar because the question of usufruct sharing in case of Participatory Forest Management can only be addressed by the forest department and can certainly not go beyond the provisions of the Working Plans in force. What can be done though is a whole-hearted effort towards eco-development through uplifting of the local economy and also through enhancing the awareness level of the local community



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about the need of biodiversity and Wildlife Management. The Conservation Plan would then focus towards awareness building of local people and also uplifting of local economy through capacity building and monetary support. While previously the whole emphasis used to be on exploitation of forests produce for economic gain, now a day the emphasis is more on protection, improvement and rehabilitation of the forests by treating the forests more as an ecosystem rather than as a timber factory. For our case we would discuss the Bio-diversity and Wildlife Management Management Circle in some detail in the paragraphs below.

2.11.18 Bio-diversity Conservation Management Circle:

The main objectives of this Biodiversity Conservation Management Circle as listed in ~~the~~two Working Plans are outlined briefly below:

- Maintenance, Conservation and enhancement of Biodiversity
- Conservation and Maintenance of Soil and Water Resources

To meet these objectives, the following treatments are proposed in general:

- Wildlife Habitat Improvement by Enrichment Plantation which will include species suitable for wildlife in general and Elephant in particular.
- Priority would be given to engineering structures (Soil Moisture Conservation measures) for preventing soil erosion.
- Special Fire protection measures including fire lines and use of fire blowers.
- Provisions for saltlicks and water holes.
- Creation of Grasslands and meadows especially for herbivores.
- Studies on elephant habitat utilization by engaging Research Scholars.
- Bio-diversity assessment and monitoring by engaging Scientist and Research assistant.
- To create a Bio-diversity Park for nature lovers and student having Biology as a subject in their reading to identify the species, their phenology and area of distribution.



2.11.19 Wildlife Management:

Objectives and approaches of Wildlife Management:

- To improve the habitat of wildlife by reducing biotic interference caused in the form of illicit felling, poaching, grazing, and shifting cultivation, encroachment, overexploitation of timber and bamboos and forest fire, etc.
- Food, water, cover and space are the most important components of wildlife habitats.
- To conserve and preserve the diversity and integrity of flora and fauna within natural ecosystem.
- To carry out extensive as well as intensive research concerning to the improvement and development of wild habitat and wildlife.
- To educate the local inhabitants about the importance of wild fauna in the forest ecosystem.
- To conserve the existing prime wildlife habitats like the are as which are frequently visited by wild animals and birds for shelter, food, water, cover, etc. By providing adequate protection and by taking various developmental measures.
- To conserve and enhance the food availability in the natural areas as
 - Food is an essential prerequisite for wildlife habitat. Food availability in a habitat changes with the season. Herbivores depend on plant materials for their sustenance and normally selective feeders as their food preference are related to palatability.
 - Herbivores prefer the leaves, barks, twigs, flowers, fruits and seeds of their selective species. Wild elephants feed on barks and leaves of especially of Moraceae family. Deer, monkey, langur, hares feed on wild fruits. Among the plant materials, grass constitutes a major portion of the herbivores' foods.
 - Wildlife is basically divided into two broad groups i.e., Carnivores and herbivores. Carnivores prey on herbivores. The population growth of herbivores will increase the population of carnivores. Therefore, protection to forest is primefacily required. Besides, anti- depredation squad has to be deployed at vulnerable places in order to depredate elephant intervening to



human habitats and herbivores soling near the villages to quench their thirst during summer.

- To conserve the promote wildlife habitats-
-Dead trees (snags) and stag headed trees are to be preserved for avi-fauna (wood picker) and reptiles like snakes and lizards to live and breed. Similarly, rookeries are to be preserved for mongoos to live and breed. Earthen mounts inside the forests are to be retained for bear and ratel that mainly depend on white ants.

2.11.20 Methodology:

The foresters, ranging from the forest guard to the Divisional Forest Officer (DFO) of Angul Division, will implement this conservation plan using their usual methods. The main goals of this plan are to provide guidelines for the management of the forest and wildlife in the Zone of Influence (ZoI) of the coal block area. These guidelines, known as the approved Working Plan, are mandatory for the foresters to follow. They apply to both the Core area, which includes the mining project, and the Buffer area, which extends 10 km from the periphery of the mining lease boundary.

2.11.21 Data Referred:

The following Data has been referred;

- Project Details including impact of mining.
- Locality factors including Climate, Geology, Hydrology and Ecology.
- Demography
- Forest and Wildlife related Chapters of Working Plan.
- Bio-diversity scenario.
- Survey of India Toposheets, Maps indicating mining area, surface map, forest maps of Angul district.
- Information about Plants species of medicinal and economic importance.
- Information about rare and endangered plants and animals.
- Information about Wildlife census and Poaching.
- Information about Compensation paid to victims due to Wildlife-Human interface.
- Present forest management practices and Working Plan prescriptions.
- Present Wildlife management in the area as depicted in the Working Plan (Wildlife overlapping Working Circle).



CHAPTER-3

IMPACTS OF THE PROJECT

CHAPTER-3- IMPACTS OF THE PROJRCT

Project Impacts on Environment

Mining operations often have significant environmental consequences that can extend beyond the immediate mining areas. It has become increasingly important and necessary to assess the environmental and health impacts of mining operations. The emission of particulate matter, Sulphur Dioxide (SO₂), and nitrogen oxides (NOX) from mining activities contribute to air pollution, posing health risks to the population exposed to it. In order to gather essential information, environmental baseline data has been collected from October 2022 to December 2022 for both the project site and a 10 km Zone of Influence (ZoI).

The project's Impact Area, which spans a radius of 10 km, has undergone an assessment of its environmental base line. In order to identify environmentally sensitive areas within the study area, a preliminary reconnaissance survey was conducted. The collection of environmental base line data involved primary surveys, literature surveys, and discussions with relevant departments and agencies.

3.1 Possible Impacts:

The Environmental Impact Assessment study has provided a comprehensive description of the potential effects on the Human population, Flora & Fauna. The Environment Management Plan has established general principles and protective measures to mitigate these effects. However, there are specific impacts on flora and fauna that require detailed attention within this plan. The project area and project impact area are expected to experience the following impacts.

3.2 Impact on Soil:

Top Soil:

The ore and waste rock surfaces are covered by topsoil, which will be removed for ore excavation. The thickness of the topsoil varies depending on the location, ranging from none on exposed outcrops and steep slopes to depressions. During the initial development of the mine and subsequently, the topsoil and alluvium will be separately removed and stored in a dump for future use before planting. A significant portion of the forest land will be affected by the mining pit, with a safety zone set aside. As a result, soil erosion may occur, leading to the formation of gullies and ravines, which can further damage the forest and wildlife habitat. The possibility of landslides cannot be ignored.



3.3 Over burden:

The estimated mineable coal reserve within the specified mine boundaries is 768.83 million tonnes (Mt), accompanied by an in-situ overburden of 613.18 million cubic meters (Mcum). The overburden consists of various components such as top overburden, parting between seams, ungraded coal, bands thicker than 1 meter, and coal seams less than 1 meter. The process involves re-handling 103.72 Mcum of in-situ equivalent overburden. The total handling of overburden, including the re-handled portion, amounts to 716.90 Mcum. The overall stripping ratio for in-situ overburden is 0.80 cubic meters per tonne (cum/t), and when considering re-handling, it becomes 0.93 cum/t.

3.4 Impact on Vegetation:

As the mining excavation progresses, the vegetation in the area, including trees, shrubs, herbs/climbers, grasses, and medicinal plants, will gradually vanish. Additionally, the influx of labor force may result in a sudden increase in the demand for small timber and firewood, which will further intensify the biotic pressure on the surrounding forests. Consequently, this will lead to the destruction of more forests within the impacted area, resulting in a decline in both the quantity and quality of flora.

3.5 Reduction in wildlife habitats due to diversion of forest area:

During the lifespan of the mine, a total of 125.24 hectares of forest land will be devastated as a result of mining activities. The forests within the mining zone will be completely destroyed, depriving wild animals of their natural habitat. Consequently, the reduction in wildlife habitat will be significant. Additionally, the biotic pressure that was previously absorbed by the forests in this area will now be transferred to the adjacent forest areas within the impact zone. Consequently, the forests in the impact area will face even more depletion.

3.6 Impact on flora and fauna in general:

The vegetation in the designated project area will suffer extensive destruction, with the exception of the safety zone. Furthermore, even the areas allocated for plantation will not be immediately accessible to wild animals. The desiccation resulting from the excavation of large mine pits may also lead to the destruction of vegetation surrounding these pits.

In this particular region, the requirement for fuel wood is relatively low in both the project area and the impact zone due to the presence of coal. However, other needs like cattle grazing, gathering non-timber forest products (NTFP), collecting small timber, and obtaining building



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materials have to be fulfilled from the forest areas within the impact zone. This additional pressure will contribute to the further deterioration of the surrounding Reserve Forests, especially within the impact zone.

The risks to wild animals can be categorized as follows:

1. Direct Threat
2. Indirect Threat

- The direct endangerment of wildlife occurs through the killing and hunting of wild animals for various purposes, including the collection of wild meat/ bush meat. Additionally, the movement of a significant number of vehicles, machinery, and equipment can lead to accidental killings. Forest fires also present a direct threat, as they result in the trapping and killing of numerous small and medium-sized animals. In some cases, even large animals become trapped in these fires.

- The shrinkage and degradation of habitat, as well as the scarcity of food and water, contribute to the indirect threat. The majority of conflicts between humans and animals occur as a result of this indirect threat. Angul district is home to numerous coal blocks that are currently in operation. Therefore, it is crucial for us to redirect our attention towards areas located outside the Coalzone.

3.7 Impact on Water Regime:

3.7.1 Impact on Water quantity/ Loss of Moisture:

Due to mining activities, there will be a notable increase in evaporation from the exposed soil, resulting in a decline in its moisture retention capacity. This will lead to the drying out of the soil, which can further harm the nearby vegetation. Moreover, the underground water in the surrounding area will also be depleted. The process of removing water and releasing large quantities into the natural drainage system may contribute to a reduction in both underground water and groundwater, thereby worsening the problem of water scarcity. As a result of the excavation process, a substantial amount of water will accumulate in the mine pits. This will inevitably attract wild animals, potentially causing them to become trapped in the pits, which could have fatal consequences for them.

3.7.2 Water accumulation:

3.7.3 Water pollution:



The Singhada Jhor, a perennial nala, flows from west to east along the northern boundary of the project area, serving as the main natural drainage line for the project. The water, along with slurry, will be extracted from the mine pit and discharged into the natural drainage system. There are several ponds and wells located throughout the property. A small reservoir to the south is depicted on the topographical map, which is primarily used for irrigation purposes. However, it is important to note that the water source within the mining area may be muddy due to the presence of a significant amount of dust and soil particles. Additionally, there is a possibility of oily substances being released from various machinery and vehicles, which could further contaminate the water in the mine area. Moreover, the local water source is also at risk of contamination due to the frequent use and cleaning of heavy vehicles and machinery. The utilization of slurry pumps for dewatering and the subsequent release of water, along with slurry, into the natural drainage system will result in the contamination of the natural streams, posing health hazards for both the human population and animals.

3.8 Impact on Air:

3.8.1 Air pollution:

In a semi mechanized opencast mine, various mining operations such as extraction, loading and unloading, movement of dumpers on haul roads, and external dumping and sizing of ore are anticipated to produce fugitive dusts that become airborne. The current concentration of SO₂ and NO_x in the proposed core zone area is consistently below 10 µg/m³ in all recorded measurements. However, there is an expectation of relatively higher levels of SPM and RPM due to the presence of fine particles that easily become airborne after blasting and on haul roads. The high specific gravity of the ore mitigates the generation of dust to a certain extent. Nevertheless, the excavation waste will contribute to an increase in airborne dust levels to some degree.

The mining process will generate large amount of dust. The activities which produce dust are:

- Drilling, blasting, excavation and transportation of overburden;
- Drilling, blasting, excavation and transportation of coal;
- Construction and demolition activities like construction of workshop, Coal Handling Plants, land cleaning, handling of debries and materials, etc.
- Loading, unloading of coal and movement of vehicles and equipments;
- Wind erosion;
- Movement of vehicles on haul roads at the time of transportation of coal and over burden.



- Grinding and crushing of coal.

The grinding process and internal transportation of coal powders, whether through conveyer belts or other means, as well as the unloading and reloading procedures, will result in the dispersion of a significant quantity of dust along with the coal powder. The combination of this dust and coal powder has the potential to contribute to air pollution, which in turn can lead to respiratory issues in wildlife. Moreover, the substantial amount of dust and coal powder settling on grasses and other fodder plants renders them unsuitable for consumption. Consequently, when animals consume these contaminated fodders, it can result in digestive problems.

3.9 Noise Pollution:

The operation of heavy machinery and blasting activities in the mining area result in the emission of a significant amount of noise, which can potentially disrupt the natural habitat of wild animals. The movement of numerous heavy vehicles in and around the lease area further exacerbates this disturbance, causing panic within the Zone of Influence. As a result, wild animals will actively avoid areas frequented by heavy vehicles, rendering these regions inaccessible to them.

3.10 Quantum of Pollutants:

Given that the project is centered around a Coal mine, the predominant pollutants consist of dust combined with coal powder. Without implementing appropriate measures, a substantial amount of dust is likely to be produced during the operation. The mining activities, movement of a significant workforce and vehicles within the mining area, and the establishment of a residential colony will result in the generation of a considerable quantity of waste within the mining vicinity. Alongside the overburden generated during the process, there will also be a substantial production of pollutants, including bio-degradable waste that, if not handled properly, can act as pollutants, as well as hazardous waste such as used oil, used batteries, and filter materials containing oil. It is expected that the mining process will generate the following types of hazardous waste.

1. Used Batteries,
2. Used Oil and Greese,
3. Oily sludge,
4. Filter and filter materials.
5. Laminated Packing material sand polythene packets,
6. Spare parts, nails, etc.



The consumption of food contaminated with poisonous used batteries can be fatal. Additionally, the use of used oil and oil emulsion can harm plants and contaminate water sources. These hazardous substances pose a threat to the environment, including water and soil pollution, and can lead to various health issues for both human and animal populations, including wild animals.

3.11 Degradation Anticipated:

Physiographic change of the habitat: Large pits will be excavated for the mining activity. However, certain sections or some of the pits can be filled with overburden and topsoil, which will be stored separately according to the mine closure plan. Nevertheless, these materials will not be sufficient to backfill all the pits. As a result, the original physiography of the area will be altered, thereby disrupting the existing wildlife habitat. The Zone of Influence contains numerous Forests blocks and several Forest kissam Land. The mining operation will inevitably cause some disturbance in the surrounding area, especially within the Reserved Forests located in the Impact Zone.

3.12 Destruction of Wildlife Habitat:

As a result of mining operations within the leased area, the biotic pressure previously exerted on the lease area will be transferred to the surrounding regions. The local community's collection of fuel wood, small timber, and other non-timber forest products (NTFP) will also be redirected to the surrounding area, leading to increased pressure on the adjacent forested land. Additionally, the grazing activities of local cattle will be shifted to these forests, further intensifying the biotic pressure. Consequently, these forested areas will experience additional strain, potentially disrupting the wildlife habitat within them.

3.13 Probable increase in the vehicular traffic:

The mining process is completely automated. Numerous machinery and vehicles will be utilized for the project's operation.

Table-3.1: Configuration of Equipments and Vehicles

Sl no	Particulars	Capacity	No. of equipment
HEMM			
Overburden:			
1.	Hydraulic shovel	10-11cu.m.	5
2.	Hydraulic shovel	6-7cum	6
3.	Rear Dumper	100T	40



Sl no	Particulars	Capacity	No. of equipment
4.	Rear Dumper	60T	76
5.	Drill	250mm	9
6.	Drill	160mm	14
HEMM			
7.	Dozer	410HP	2
8.	Crawler Dozer with Ripper	850HP	10
9.	Crawler Dozer	410HP	6
Coal (OCP)			
1.	Surface Miner	50tclass	7
2.	Front End Loader	5-7m3	7
3.	Wheel Dozer	450HP	4
4.	Rear Dumper	60T	39
Common			
1.	Rough Terrain Crane	75T	3
2.	Tyre Mounted Telescopic	25T	5
3.	Pick-n-Carry Crane	10T	4
4.	Fork Lift Truck	5T	4
5.	Water Sprinkler	28Kl	15
6.	Diesel Hyd. Backhoe	1.5cum	2
7.	Truck Mounted Mobile Crane/Atomizer	-	4
8.	Tyre Handler for upto 100T	--	2
9.	Vibratory Compactor	10T	4
10.	Motor Grader	280HP	4
11.	Maintenance Van	150HP	2
12.	Fire Tender	14KL	2
13.	Fuel Bowser	20 KL	4



CHAPTER-4

MITIGATION MEASURES

CHAPTER-4-MITIGATION MEASURES

The mining purpose necessitates the diversion of 125.24 hectares of forest area within the project site. Numerous other mining projects are currently in operation or have been approved in the vicinity, which means that the impact of this project could extend beyond the boundaries of the other mining areas. Consequently, there is a high probability of an increased congregation of wild animals within the surrounding forest areas. As a result, these animals will become more vulnerable to various threats. Hence, the primary objective of the Management Plan is to mitigate and minimize these potential risks.

The Divisional Forest Officer will implement various interventions within the project impact area, which extends beyond the project boundary by approximately 10 kilometers. These interventions will encompass enhancing the habitat, implementing measures to mitigate conflicts between humans and animals, and facilitating the movement of large wildlife across man-made linear infrastructures that obstruct their natural movement.

The Plan prescribes certain control measures for conservation of Flora & Fauna. These are:

- Enhancement of vegetal cover through biological reclamation, arboriculture/afforestation, greenbelt/ avenue plantation.
- Creation of water holes.
- Zero discharge or release of treated water.
- Mass afforestation within the zone of Impact.

The aforementioned measures are merely recommendations, as there is no specific plan in place. This consideration is taken into account when formulating the present Wildlife Management Plan. Taking into consideration the potential risks to wildlife outlined in the previous chapter, the Management Plan is designed to tackle nearly all of these threats. Both the mining area and the Impact Zone will undergo habitat enhancement to ensure a greater availability of food and water for the wild animals. The proposed measures for mitigation are outlined below:

4.1 Habitat Improvement

The enhancement of the wildlife habitat within the Impact Zone is being suggested through the implementation of the following initiatives:

4.2 Safe passage to Existing Wild-life



It is crucial to preserve the current population of wild animals in the lease area and relocate them to safer habitats. This goal can be accomplished by initiating mining operations in areas that are distant from the forested regions, thus enabling these animals to migrate to the adjacent forest areas, specifically near Durgapur RF. The Zone of Influence encompasses numerous Reserved Forests, providing ample opportunities for the wild animals in the lease area to find their way to nearby forested areas.

4.3 Restoration of habitats

Restoration of habitat will be carried out gradually within the project area, alongside the mining activity. By the time the mine is closed, a significant portion of the project area will have been transformed into a suitable habitat. As part of the conceptual phase, the 182.52 hectares of backfilled area will be utilized for the green belt development program, while 11.79 hectares of the safety zone area will be dedicated to plantation from the base year. Following the standard plantation norm of 2500 seedlings per hectare, a total of 485,775 seedlings are proposed to be planted during the conceptual period. The safety zone area is located around the mine pits and will serve as a green belt, preventing the spread of dust and coal powder. Additionally, it will act as a buffer zone between the mine and the wildlife habitat. These plantations are already included in the mining plan, so no additional funds are required for this purpose.

4.4 Soil and water conservation

Due to the extensive excavation of mining operations, a significant loss of moisture is expected, along with extensive soil erosion. The majority of the allocated area will be used for mining, excluding the safety zone where the rainfall will be directed to settling tanks through gentle gradient channels to minimize soil erosion. This arrangement is included in both the Mining Plan and the Environment Management Plan, eliminating the need for separate provisions. To mitigate high soil erosion rates, the planting of trees and grass will stabilize the overburden dumps, as outlined in the Mining Plan. Therefore, no additional provisions are necessary in this plan.

4.5 Control of Dust

The extraction procedure entails the emission of substantial amounts of particulate matter, resulting in air contamination that profoundly affects both individuals and laborers engaged in mining operations. Moreover, this particulate matter presents difficulties for the local fauna. As a result, the management of dust becomes an essential component of the mining process. Although



it is unfeasible to entirely eradicate dust generation, endeavors are undertaken to reduce the quantity of dust generated during mining activities. Diverse measures are implemented to accomplish efficient dust control.

- The drills are provided with well-designed dust extraction/suppression system. Wherever necessary, wet drilling will be taken up.
- Blasting operation designed to produce minimum dust;
- Use of optimum amount of explosive so as to produce minimum dust.
- Use of sprinklers and dust suppression units at the time of loading, transportation and handling of coal and over burden. Mobile water sprinklers and mobile Tankers will be deployed in the project area wherever necessary particularly in the coal storage yard.
- Dust extraction/suppression system installed in coal handling plant through mist formation system and sprinklers at all transfer points as well as surrounding areas.
- Black topping of haul roads and regular maintenance is done.
- Regular maintenance of HEMMs and P&M.
- Deployment of Surface Miners where, dust generation is controlled by water sprinkling and the process of drilling, blasting and crushing are eliminated.
- Green belt provided around the quarry, workshop complex and a venue plantation taken up along haul roads and other roads.
- Provision of adequate fire-fighting arrangements.
- Dust control measures have been proposed as compliance to Environmental Impact Assessment and therefore special provision is not made for this.

4.6 Control of water pollution

Water pollution plays a crucial role in coal mining as it is the most significant factor. Each day, a substantial amount of water is produced along with slurry, which needs to be extracted from the mining pits. Moreover, the cleaning of vehicles and machinery, as well as the disposal of waste, contribute to the generation of large quantities of contaminated water. To mitigate water pollution, it is essential to treat the water before releasing it into the natural drainage system. The discharged water will be collected in sump pits and directed towards a sedimentation pond and an effluent treatment plant. The treated water will then be utilized for dust suppression on haul roads, washing dumpers and dozers, and other similar purposes. To effectively control water pollution, the following measures will be implemented:



- Waste water generated in the workshop and vehicle servicing/ machinery servicing units is channeled through oil & grease tap and settling tanks.
- Provision of septic tanks, soak pits and Sewage Treatment plant installed for domestic effluents.
- Mined is charge water is treated and re-used.
- Garland drains provided around OB dumps and the water channeled through settling tanks.
- Regular monitoring is done and corrective steps taken when required.
- Oil and Grease recovered manually will be stored in drums and auctioned.

The Environment Management Plan includes the implementation of various measures to address surface runoff. Sedimentation ponds will be utilized to allow the settling of suspended materials, while garland drains will help channel the runoff. Any excess water will be redirected to the natural drainage system. As these measures are already outlined in the plan, no additional provisions are necessary.

4.7 Noise control

The subsequent actions will be implemented to ensure that the noise is maintained at the lowest feasible level:

- The effective design of plant and machinery involves incorporating built-in mechanisms such as silencers, mufflers, and enclosures for noise-producing components, as well as utilizing shock-absorbing pads at the foundation of vibrating equipments.
- Silencers provided where necessary.
- Routine maintenance of equipments,
- Enclosures for crusher house, etc.
- Rational deployment of noise generating plant and machinery.
- Greenbelts are created around the quarry infrastructure sites, service building area and avenue plantation along the haul roads to absorb Noise.
- HEMMs are installed /kept with sound proof cabins.
- Chute linings in Coal Handling Plant.
- Provision of isolation for vibrating equipments (both fixed and mobile).
- Major portion of coal production is achieved by deployment of eco-friendly surface miners, which eliminates the process of drilling, blasting and crushing, and reduces noise & dust generation.



- Wherever blasting is required the same is restricted to a particular time during the day (preferably shift change time) so as to cause minimum panic to wild animals. Night blasting if avoided.
- Regular monitoring of noise levels at various points.

4.8 Lighting

The mining activity's central region is adequately lit, preventing animals from entering the hazardous mining area. The use of vehicle headlights, which disturb the animals, is limited, and only dippers are permitted within the mining site. These practices have been incorporated into the mining process, eliminating the need for additional funding.

4.9 Overburden Management

The top soil and other mine waste constitute the overburden. These materials are stored separately for backfilling of mine pits as per mine closure plan. The OB dumps are surrounded by retaining walls followed by Garland drains. Washing away of the top soil is controlled by providing retaining wall around the dump and adopting dump stabilization methods. The backfilled area will be technically and biologically reclaimed. The steps taken in this regard are as follows:

- Overburden is dumped at designated location.
- Loose soil and Overburden are promptly lifted to the designated location.
- Proper Terracing is done keeping in view the angle of Repose.
- Dump stabilization is done by planting grasses and other suitable species.
- The dumps are surrounded by retaining walls to control washing away of soil.
- Garland drains are provided around the retaining walls leading to settling tanks, to settle the washed away soil/silt etc.
- Check dams provided along the natural drainage system to control soil erosion.

4.10 Garbage Management

Since Garbage not only creates problems for the wild life but also creates problems for mining activity. Particularly non-degradable materials like polythene bags etc. pose a lot of problem for machineries as well as Wild animals. Hence proper garbage management is also an important activity in mining process. Some of the steps to be taken within the mining area have



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been indicated under water pollution. The additional steps which are to be taken for Garbage management are as follows.

- 1) Entry of non-biodegradable materials which are likely to produce garbage such as polythene bags, aluminum foils, tin foils, etc. are restricted in to the Mining area.
- 2) Un-avoidable generation of hazardous materials such as used batteries, used oils, parts of machineries and equipments are promptly collected and kept at secluded places for disposal.
 - i. There will be generation of large number of used batteries. These batteries will be kept in store and put to Auction sale every year.
 - ii. Similarly, large quantities of used oil will be generated. This oil will be stored in drums and auctioned annually.
 - iii. There will also be generation of huge quantities of Oily sludge from oil & grease trap as well as substantial quantities of filter materials. These materials will be disposed in pits lined with impervious layers.
- 3) The Garbage generated in the Mining area is regularly collected and segregated in-to Bio-degradable and non-degradable materials.
- 4) The non-degradable materials if any are sent for recycling.
- 5) The Bio-degradable substances are put in the Compost pits for conversion in-to manure. The Manure obtained from these pits will be utilized for plantation purpose.
- 6) Garbage management is an important activity as per provisions of Environmental Management Plan. Hence no separate provision is made for this.

4.11 Fall of animals in the mining pits

In order to prevent accidental fall of animals in the mine pits the following steps shall be taken.

- The Executives and the Supervising staff will be educated and motivated to collect information regarding presence of wild animals in the mining area. In case any such animal is noticed it will be driven away to the nearest forest.
- There will be large scale activities within the mining area and it will be sufficiently illuminated with bright light so that the wild animals will avoid the area.
- It is also proposed to install Solar Electric fencing over 10 km to prevent animals from entering the project area.



- In-spite of the precautions taken, in case of accidental fall of any wild animal in the mining pit, the workers will be educated to inform the local Forest authorities and act as per their advice.

4.12 Free distribution of Seedlings

To enhance the vegetal cover in the vicinity of the project site, a specific quantity of seedlings/ saplings will be provided to the residents residing in the neighboring villages. The distribution will consist of an equal number of teak seedlings/ saplings and grafted seedlings/ saplings of fruit-bearing plants.

4.13 Provision of Vehicle

One vehicle will be provided to the Forest Department for protection and monitoring of forest area and wildlife.

4.14 Provision of Equipments

Certain equipments such as Computers, Camera traps, Night vision equipments, GPS/DGPS, etc. as per the requirement of the Forest Department will be supplied.

4.15 Exposure visit of Staff and VSS members

The Forest Department personnel, along with the VSS members, will embark on educational trips both within and outside the state to enhance their understanding of forest and wildlife conservation. These excursions will primarily concentrate on the conservation of the Elephant.

4.16 Awareness activities on conservation of wildlife by project proponent

The nearby villages will be extensively educated about the importance of wildlife conservation and their ecological roles. They will be instructed to appreciate the value of wildlife, maintain a safe distance from them, and effectively handle any conflicts that may arise. The villagers will receive training on the general behavior, preferred habitat, and food choices of wildlife. It is expected that the villagers will undergo a behavioral change based on the aforementioned points. The awareness campaign will ensure that all villagers understand the significance of wildlife and refrain from engaging in any criminal activities against animals and forests. This awareness will be disseminated through popular lectures, film screenings, and the recognition and rewarding of eco-friendly villagers. The responsible agency will take proactive measures to create awareness in the villages surrounding the mining area. The following activities will be implemented as part



of the awareness generation initiative: distribution of informative leaflets, organizing essay writing, debate, and drawing competitions in schools and colleges, staging street plays and Nukad Natak, celebrating important days related to wildlife conservation, conducting training sessions, boosting awareness through social media platforms, and creating informational pamphlets.

4.17 Immunization/ vaccination of Livestock through organizing camps by project proponent

A significant number of domestic cattle reside in the region and exert immense grazing pressure on the natural vegetation. They frequently visit the forested areas where various herbivores, which serve as the primary food source for large carnivores, also inhabit. These cattle are often susceptible to FMD (Foot and Mouth disease). When they graze in the forested areas, there is a higher likelihood of disease transmission from cattle to wild herbivores. To address this issue, the cattle will receive regular immunization against F.M.D (Foot and Mouth Disease) to prevent the spread of diseases carried by cattle in the forest and their impact on the wild animals. The project proponent will endeavor to minimize the risk of disease transmission from domestic cattle to wild animals by organizing vaccination and immunization camps for domestic cattle.

4.18 Improvement of feed and drinking water facilities in Durgapur RF, Malibandha RF and Jaipur RF

-Conservation of elephants' preferred food plants, such as grasses, palms, liana vines, fast-growing trees, and water sources, elephants will be restricted to their forest home up to some extent.

-Early warning bulk SMS Alerts along with pulsating warning lights on towers that warn of Elephant presence in mine lease boundary areas will be developed.

-A Community-based-conflict-management (CBCM) measure, as a means of empowering the community to share the responsibility of human-animal conflict mitigation with the Forest Department will be ensured through JFMC/ EDC/ Gram Sabha considering their vital stake and eliciting more rapid response. Community and farmer groups will be engaged to ensure that besides preventive measures, traditional crop-guarding methods are encouraged, with the involvement of the local community/ farmers. A compendium on good practices on crop guarding techniques will be developed for use by the local community with the help of the forest department.



4.19 Nourishment/ strengthening of source habitats (Satkosia Tiger Reserve and Mahanadi Elephant Reserve) for keystone species; Elephant & Tiger

According to the elephant census report of 2012 and 2017, the Angul Forest Division recorded sightings of 56 and 45 elephants respectively. As per elephant census report 2024 recorded sightings 119 nos of elephant. This year, there has been a remarkable increase in the elephant population, estimated to be between 140-300 individuals. The Satkosia Tiger Reserve and Mahanadi Elephant Reserve serve as crucial habitats for both elephants and tigers in this region.

4.20 Species-specific Wildlife Management Plan for Elephant

The study area primarily focuses on the conservation of the Elephant, making it the species of utmost concern. Consequently, a distinct conservation strategy has been devised specifically for elephants, placing emphasis on rescue, release, and anti-depredation efforts.

Table 4.1: Specific Conservation Plan for Elephant

Kingdom:	Animalia
Phylum:	Chordata
Class:	Mammalia
Order:	Proboscidea
Family:	Elephantidae
Genus:	<i>Elephas</i>
Species:	<i>Elephas maximus</i>



Name	Habitat	Ecology and Behaviour	Threats	Conservation Strategies
Asian Elephant (<i>Elephas maximus indicus</i>)	Asian elephants inhabit grasslands, tropical evergreen forests, semi-evergreen forests, moist deciduous forests, dry deciduous forests and dry thorn forests, in addition to cultivated and secondary forests and scrublands.	Asian elephants are crepuscular, mega herbivores having a diet up to 150 kg per day. They are known to feed on more than 100 different plant species including most commonly of the order Malvales, as well as the legume, palm, sedge and true grass families. They drink at least once a day and need plenty water for bathing that's why they never move far from a permanent source of fresh water. Cows and calves move about together as groups, while bulls disperse from their mothers upon reaching adolescence. They produce three basic sounds: growls, squeaks and snorts. Growls are used for short distance communication; squeaks come in two forms; chirpings and trumpets. Chirping consists of multiple short squeaks and signal conflict and nervousness whereas trumpets are lengthened squeaks with increased loudness and produced during extreme arousal. Snorts signal changes in activity and increase in loudness during mild or strong arousal.	Loss, degradation and fragmentation of its habitat are the major threats associated with this animal, which leads to increasing conflicts between humans and elephants. Poaching for ivory and a variety of other products including meat and leather are the other prominent threats.	The individuals residing in the neighboring regions and the staff members of the mining corporation would be incentivized to safeguard the elephant. Despite the fact that the elephant has not been observed or reported within the mining site in recent times, its existence and mobility have been verified in previous years. Hence, the subsequent approaches will be implemented to preserve this majestic creature: -The priority will be given to the habitat improvement program, which involves planting various plant species mentioned in the green belt development program. Local species preferred by the elephant, as discussed in the previous chapter of this document, will be emphasized. In order to enhance the natural areas, grasses and saplings of tree species will be distributed to the villagers for planting. -Conservation of bathing sites and Increase knowledge base on elephants and their habitat conservation and reduce human-animal conflict through awareness campaigns in nearby villages. -One-time grant for monitoring elephant numbers, population trends, and threats to elephants and their habitats within the study area. -Habitat improvement activities (enriching soil,

				<p>water, vegetal cover, etc.) will be ensured to enhance the food density in the study area.</p> <ul style="list-style-type: none">-There will be a provision of elephant depredation squad, gajraj vahan and other suitable vehicles and equipments for safety and rescue of the animal.-Creation of various physical barriers like Elephant Proof Trench (EPT), removable barriers, spike walls, solar fencing, tentacle fencing, and biological fencing wherever required.-A provision of acoustic deterrence's and farm based deterrence like flash light, spot light, flickering light, etc.-Constitution of Hathi-Mitra dal in affected villages and trained them for the purpose of conservation of the species.
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4.21 MINE CLOSURE PLAN

The mine closure plan is one of the most important requirements in the environmental management of mining projects. The closure operation is a continuous series of activities right from the commencement to decommissioning of the project. Therefore, the progressive mine closure plan is specifically included in the mining plan. The primary aim is to ensure that the following broad objectives along with the abandonment of the mine can be successfully achieved:

- Creation of a productive and sustainable after-use for the site, acceptable to mine owners, regulatory agencies, and most importantly to the community.
- Protection of public health and safety of the surrounding habitation.
- Minimization of environmental damage.
- Conservation of valuable attributes and aesthetics.
- Counter balancing the adverse socioeconomic impacts.

Some of the activities which will be undertaken as per the Approved Mining Plan are as follows.

- 1) Land Degradation and Restoration.
- 2) Existing Water Bodies – Diversions.
- 3) Post Closure Water Quality Management
- 4) Post Closure Air Quality Management
- 5) Waste Management
- 6) Top Soil Management
- 7) Management of Coal Rejects.
- 8) Restoration of Land used for Infrastructure
- 9) Disposal of Mining Machinery.
- 10) Safety & Security.
- 11) Abandonment Cost & Financial Assurances.
 - a) Cost of Activities to be taken up for closure of the mine – Rs 693.54 Crores.
 - b) Amount to be deposited in Escrow account – Rs 277.82 Crores



4.22 Post Mining Land Use

During post mining stage, the excavated mining area will be partly backfilled from the existing waste dumps prevailing over the lease at the time to restore the natural profile. The back fill will be properly graded & terraced and will be biologically reclaimed by the coir matting and plantation. The post mining land use thereafter is given below:

Table 4.1: Proposed and Post Closure Land use of Project

	Land use (Proposed)	Lind Use (End of life)	Land Use (Post Closure)						Total
			Agricu ltural	Plantat ion	Water Body	Public /Com pany Use	Forest Land (Return ed)	Unplan ted	
Excavation Area	881.28	881.28	0	0	0	0	0	0	
Backfilled Area	715.24	715.24	495.27	182.52	0	0	37.45	0	715.24
Excavated Void Without Plantation	130.68	130.68	0	0	0	0	0	130.68	130.68
Water harvesting	35.36	35.36	0	0	35.36	0	0	0	35.36
Top Soil Dump	8.97	8.97	8.97	0	0	0	0	0	8.97
Coal Stock Yard	9.76	9.76	9.76	0	0	0	0	0	9.76
External Dump	24.17	24.17	24.17	0	0	0	0	0	24.17
Safety Zone	11.79	11.79	0	11.79	0	0	0	0	11.79
Haul Road between quarries	Nil	Nil	0	0	0	0	0	0	Nil
Road diversion	NIL	NIL	0	0	0	0	0	0	NIL
Nala Divulsion & Selling Pond	8.42	8.42	0	0	0	8.42	0	0	8.42
Roads, buildings	Road: 15.72	Road: 15.72	0	0	0	15.72	0	0	118.16
Infrastruct ure, Sub-	Township : 27.12	Townshi p: 27.12	0	1.26	0	25.86	0	0	

	Land use (Proposed)	Lind Use (End of life)	Land Use (Post Closure)						Total
			Agricltural	Plantation	Water Body	Public /Company Use	Forest Land (Returned)	Unplanted	
total	Infra: 75.32	Infra: 75.32	0	0	0	0	75.32	0	
	118.16	118.16	0	0	0	0	0	0	
Rationalization	25.34	25.34	0	25.34	0	0	0	0	25.34
Garland drains	Negligible	Negligible	0	0	0	0	0	0	0
Embankment	11.49	11.49	0	0	0	11.49	0	0	11.49
Green Belt	6.89	6.89	0	0	0	0	6.89	0	6.89
Explosive mag.	5.58	5.58	0	0	0	0	5.58	0	5.58
Total	1111.85	1111.85	538.17	220.91	35.36	61.49	125.24	130.68	1111.85

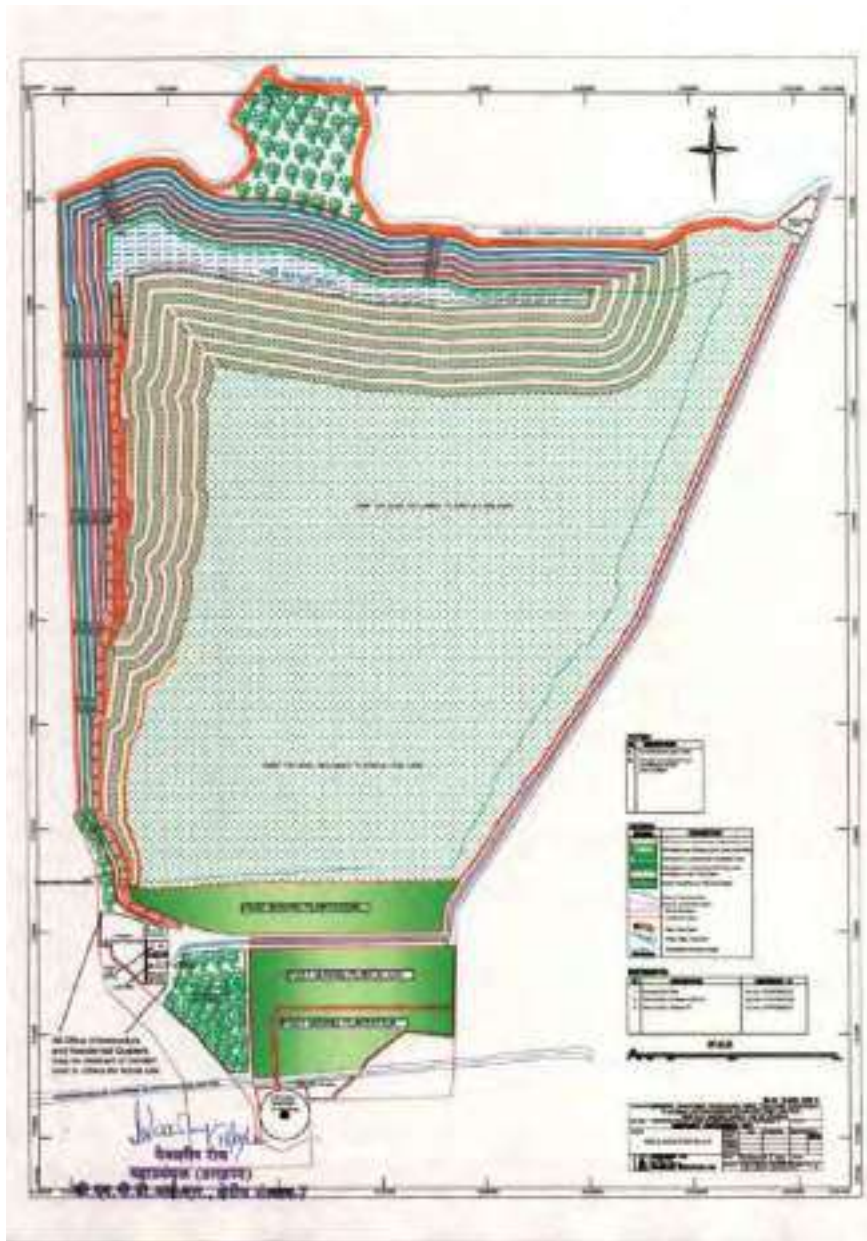


Fig. 4.1. Layout of Post Mining Land Use Plan

4.23 Disturbance in the connectivity between different RFs:

The immediate vicinity of the lease mine area is home to three notable forests: Durgapur RF in the South-West, Malibandha RF in the South-East, and Jaipur RF in the North. It might be possible that the mine lease area, being a large land parcel, serves as a connecting pathway for elephants between these Reserved forests. In the event of such a circumstance, the diversion of this land parcel for mining endeavors could potentially pose obstacles to the

movement of elephants between these forests. This particular situation could lead to the elephants having to undertake extensive journeys, thereby presenting new challenges in terms of human-elephant conflicts.

Moreover, various animals that have wide home range and reported/ recorded near forests sharing boundaries of project can be affected by mining activities by restricting their movement from one forest area to another.

Table 4.2: List of animal species found in the forest sharing boundaries of the project

Sl. No.	Common Name	Scientific Name	Schedule as per IWPA, 1972	Conservation Status as per IUCN	Schedule as per IWPA, 2022
1	Spotted Deer	<i>Axis axis</i>	III	LC	II
2	Barking Deer	<i>Muntiacus muntjak</i>	III	LC	II
3	Common Fox	<i>Vulpes bengalensis</i>	II	LC	I
4	Five striped Palm squirrel	<i>Funambulus pennanti</i>	IV	LC	II
5	Hedgehog	<i>Paraechinus micropus</i>	IV	LC	II
6	India Langoor	<i>Semnopithecus sp</i>	II	LC	II
7	Indian Civet	<i>Viverricula indica</i>	II	LC	I
8	Indian Elephant*	<i>Elephas maximus</i>	I	EN	I
9	Indian Field Mouse	<i>Mus booduga</i>	V	LC	-
10	Indian Porcupine	<i>Hystrix indica</i>	IV	LC	I
11	Jackal	<i>Canis aureus</i>	II	LC	I
12	Mongoose	<i>Herpestres edwardsii</i>	IV	LC	I
13	Musk Shrew	<i>Suncus murinus</i>	-	LC	-
14	Rhesus Macaque	<i>Macaca mulatta</i>	II	LC	II
15	Sambhar	<i>Cervus unicolor</i>	III	VU	I
16	Short Nosed Fruit Bat	<i>Cynopterus sphinx</i>	V	LC	II
17	Wild Boar	<i>Sus scrofa</i>	III	LC	II
18	Wild Cat	<i>Felis chaus</i>	II	LC	I

*Last recorded at boundary sharing with Jaipur RF in the year of 2018/ LC- Least Concern, EN- Endangered, VU- Vulnerable

Table 4.3 The measures for mitigation to be done by Angul Forest Division

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
A	Habitat Improvement					
1	Weed eradication (30 Mandays) and Sowing of seeds (10 Mandays) in the zone of Impact for the rejuvenation and restoration of the Elephant Habitat. 40 Mandays (40x450/-= 18000/-)per ha.	0.180	500	ha	90	Durgapur RF, Barakathia RF, Hirapur RF, Kerjang RF, Nisha PF and Rakas RF, etc. In the zone of impact and the elephant movement area of the Angul Forest Division. 100 ha per year
2	Creation of Water Body	10.00	2	Nos.	20	In the zone of impact and the elephant movement area of the Angul Forest Division.
3	Miyawaki plantations in small blank patches of the degraded forests coming within the elephant habitat for the quick restoration & rejuvenation. (Miyawaki Plantation 5 ha during 1st year Rs.192.375lakhs and 5 ha during 2nd year including maintenance Rs.245.833 lakhs, 2nd and 3rd Maint. Rs.86.051 lakhs, 3rd and 4th yr Maint. Rs.52.0565lakhs, 4th yr maint. Rs.19.4645lakhs)	59.578	10	ha	595.78	Miyawaki Plantation 5 ha during 1st year and 5 ha during 2nd year. (Cost norm is enclosed as <i>Annexure-IV</i>)

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
4	SMC structures in and around the Snigdhajor Nallah. In the Zone of Impact. Rs 50000/- per ha	0.50	500	ha	250	Differnet Nalas of Durgapur RF, Barakathia RF, Hirapur RF, Kerjang RF, Nisha PF and Rakas RF, etc. In the zone of impact and the elephant movement area of the Angul Forest Division. 100 ha per year.
5	Wildlife Awareness / Motivational camps	0.40	50	Nos.	20	10 camps per year
6	Incentive Rewards for Zero Forest Fire VSS / Villages. It will be used for the various Income Generating Activities Rs. 1lakhs in LS per year	1.00	5	Years	5	Reward will be given as per the fire points analysis of the OFMS portal.
7	Anti Depredation Squad (of 10 person):	28.60	5	Nos.	143	With hired vehicle and other contingency. One squad per year.
8	POL for Fire Blowers, vehicles, Motor bikes and boats for patrolling round the clock in the Zone of impact	20.00	5	Years	100	20 Lakhs per year
9	Fire Line Creation & maintenance:	0.045	500	Km	22.5	Durgapur RF, Barakathia RF, Hirapur RF, Kerjang RF, Nisha PF and Rakas RF as per Working Plan prescription. Based on the prevalent wage rate. 100 Km per year
					1246.28	

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
B	Protection & Surveillance					
10	Wildlife Protection Squad (10 Persons with hired vehicle etc)	28.60	5	Nos.	143	With hired vehicle and other contingency. One squad per year.
11	Anti Depredation Equipment's, Uniform, Contingency and unforeseen expenditures	15.00	5	Years	75	15 Lakhs per year in LS
12	PTZ and AI based early warning system	3.00	15	Nos.	45	
13	Speed monitoring system, Early warning system, Bulk SMS system, etc	0.75	50	Nos.	37.5	
14	Anti-Poaching /Protection barracks	25.00	1	Nos.	25	At Samal Barrage or in the zone of impact; With all logistic support, Solar light and safety measures etc.
15	Strengthening of the existing infrastructure like Anti Poaching Camp, Protection Barrack, Watch Towers including Ration of the staff staying there	15.00	5	Years	75	15 Lakhs per year in LS
16	Various acoustic and farm based deterrence like flash light, spot light, flickering light and other acoustic devices, ANIDERS, etc.	10.00	5	Years	50	10 Lakhs per year in LS
17	Radio collaring of the elephants and related expenditure	7.00	10	Nos.	70	
18	Drone Camera (with Infrared Facilities):	12.00	4	Nos.	48	
19	Special Drone camera with AI based detection system	25.00	1	Nos.	25	
					593.5	

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
C	Research & Development					
20	Wages of the Two Data Managers for the Data Analysis and Monitoring and Supervision.	0.52	60	Months	31.2	
					31.2	
D	Peoples Participation:					
21	Incentivise to Informers, Rewards & Awards	1.00	5	Years	5	For collecting intelligence on crime against Wildlife and allied matters. Rs 1 Lakh per year.
22	Solar street lights in villages.	0.30	50	Nos.	15	
23	High mast lights in different villages	2.00	50	Nos.	100	
24	Deployment of 50 nos. of Gajamitra round the year @ 13,500/- per month and Rs 3750/- per person for uniform, equipment's and various Logistics.	1.68	250	Nos.	420	
25	Training cum Review of Gaj Mitra- including fooding, charges, honorarium for resource persons, logistics and misc. expenditure (8 nos. to be conducted every year at Range level, Rs 15000 per training) (6 Ranges*8 Nos. per year*5years)	0.15	240	Nos.	36	

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
26	Creation of Tentacle Solar fencing in the sensitive areas where physical barriers are not possible	50.00	5	LS	250	
					826	
	Total				2696.98	
	Add 20% for cost escalation				539.396	
	Total				3236.376	

CHAPTER-5

ANIMAL PASSAGE PLAN

CHAPTER-V

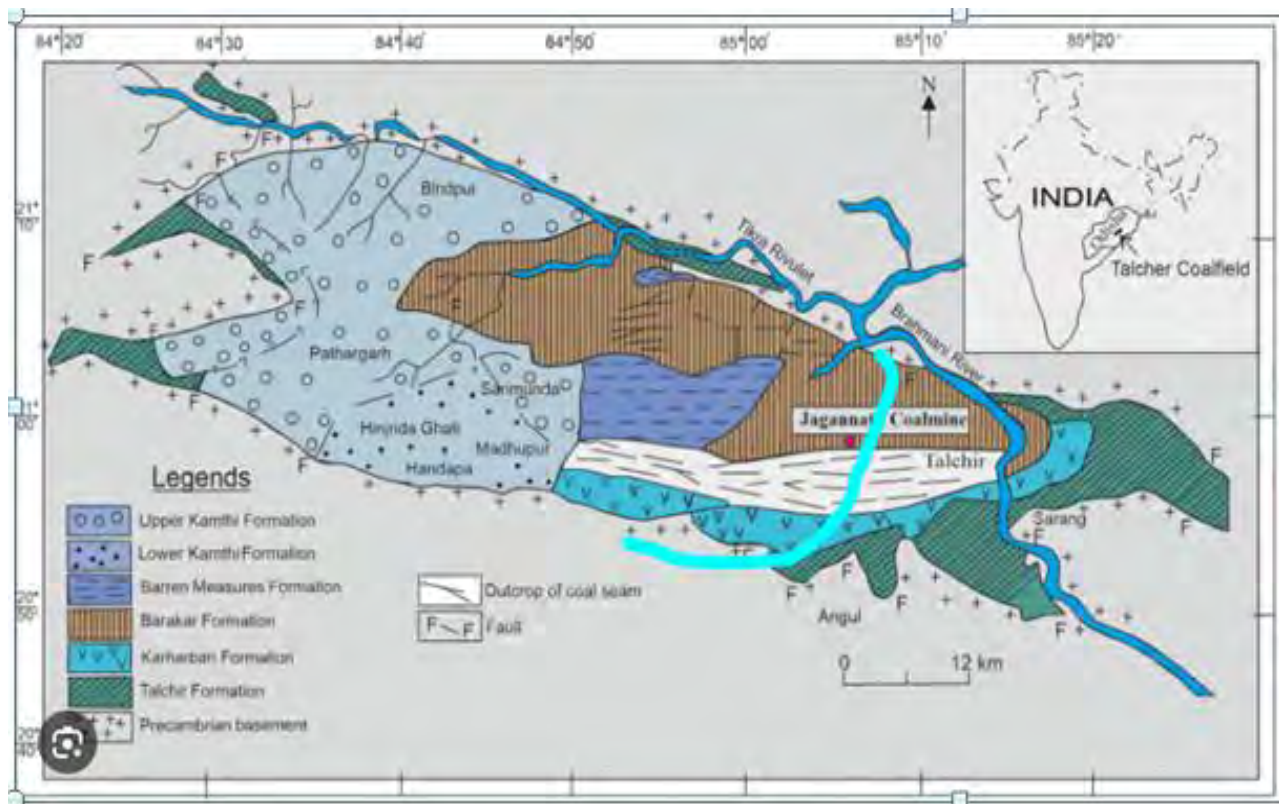
Animal Passage Plan

5.1 Introduction:

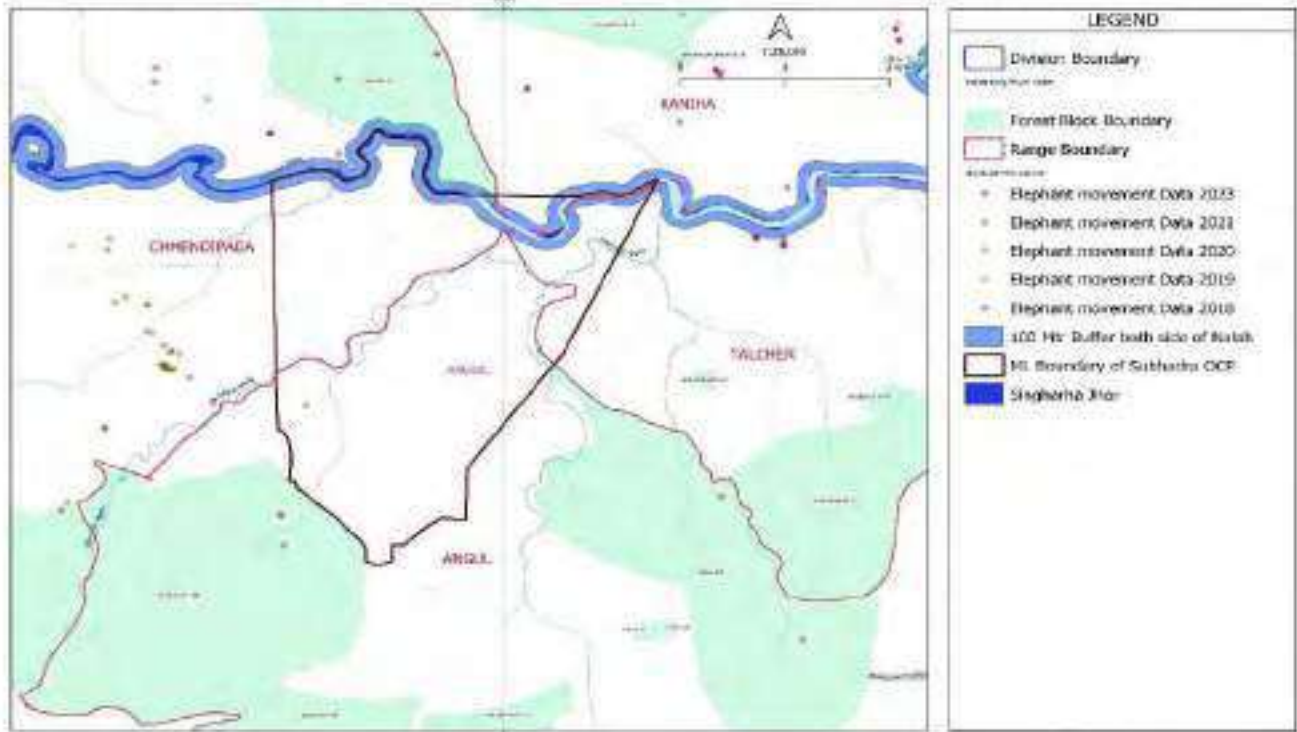
Coal was discovered in the Talcher Coalfields at Gopalprasad in 1837. Handidhua Colliery was opened by M/s Villiers in 1921. NCDC opened several mines – at South Balanda in 1960, Nandira in 1962 and Jagannath in 1972. Production rose from 0.91 million tons in 1972-73 to 33.10 million tons in 2001-02. Talcher Coalfield is subdivided into five production/ administrative areas: Talcher, Jagannath, Kalinga, Lingaraj and Hingula.

According to Geological Survey of India, the Talcher Coalfield has reserves of 38.65 billion tons, the highest in India.

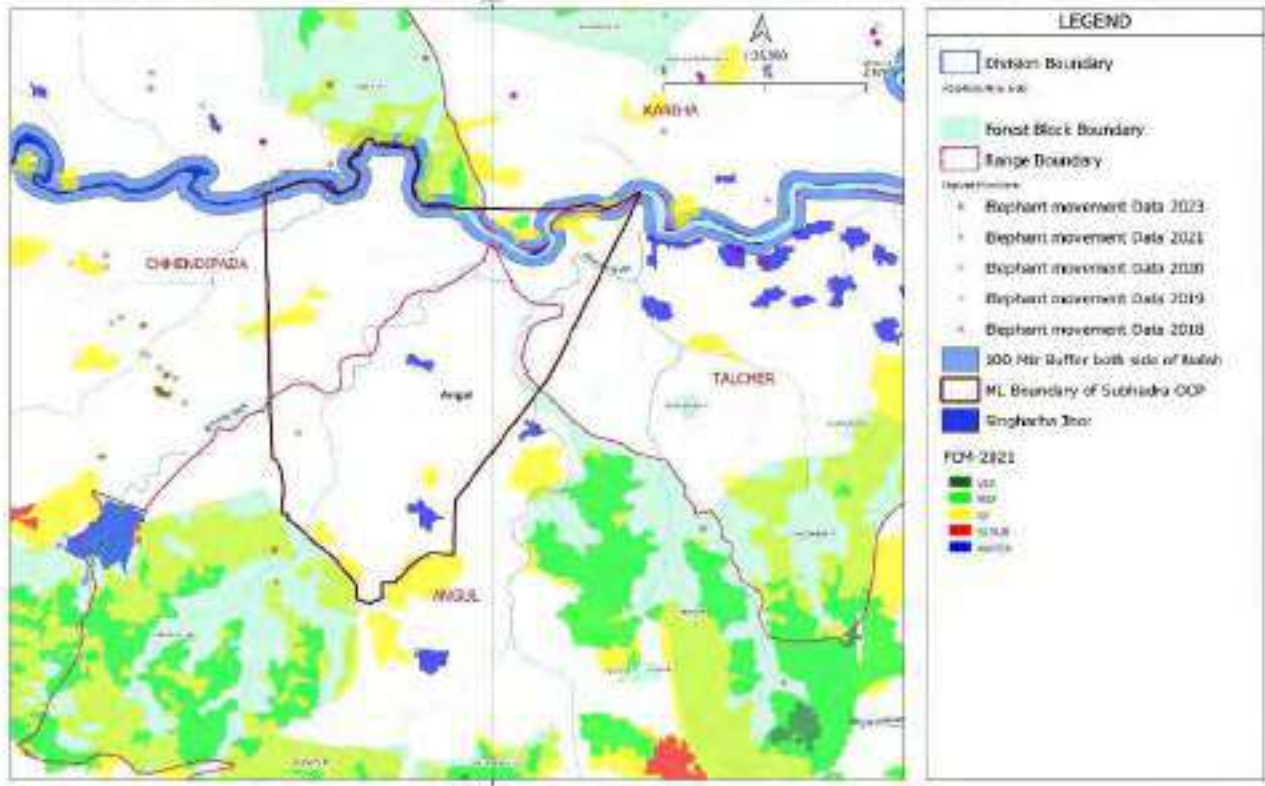
Talcher Coalfield covers an area of 500 km² (190 sq mi). Talcher coal is classified as sub-bituminous to high volatile bituminous rank based on the vitrinite reflectance (0.40–0.59%), volatile matter (43.0–55.1%), and carbon content (71.2–79.3%). The ash yield varies from 12.4 to 39.3%. As of 2011, nearly one hundred thousand tons of coal is dispatched daily to power stations in Odisha, Tamil Nadu, Andhra Pradesh, West Bengal and other parts of India.



MAP SHOWING 100 MTR BUFFER BOTH SIDE OF SIGHADA JHOR FOR ANIMAL PASSGE PLAN OF SUBHADRA OCP



MAP SHOWING 100 MTR BUFFER BOTH SIDE OF SIGHADA JHOR FOR ANIMAL PASSGE PLAN OF SUBHADRA OCP



The length of Coal deposit / Coal seam in Talcher Coal field is about 30 km with a varied width of 15-20 km. Combination of all mining blocks in connective mode are forming a linear structure over a length of 30 km. This needs to be addressed and a strip of land with vegetation needs to be left as such to maintain connectivity from S-W to N-E as animal passage / elephant corridor. The deposit lies from South East to North West direction along the river Brahmani as depicted above. Many coal mines are in operation and many others are in pipeline for obtaining Forest and Environment Clearance. Coal is being transported to many power plants in Odisha and outside the state by train. There is also provision for Road side sale for local consumption. About 25% of the produce are being transported outside the Talcher area by Truck / Lorry / Multi-axial trucks of 40-60 Tons Capacity.

5.2 Elephant Movement:

There is wildanimal movement pattern connecting Satkosia Wildlife Sanctuary-cum-Tiger Reserve/ Similipal-Satkosia Corridor with Deogarh Division (Kundheigola RF) /Redhakhhol Division (Reamal RF)/Athamallik Division(Handapa RF) to Similipathar RF, Durgapur RF and then to Nisha PF, Rabipur RF through Kanheijena RF then joins to Kanheijena- Anantapur Elephant corridor. Then animals move towards Hadagarh sanctuary via Moulabhanja – Anantapur, corridor. Any disruption or disturbance to the natural movement paths of elephants, tigers, and other animals can lead to human-wildlife conflict along the entire route.

At present movement of Elephant as mentioned below is observed.

“The elephants / leopards from Satkosia Sanctuary / Tiger Reserve/ Deogarh Division (Kundheigola RF) /Redhakhhol Division (Reamal RF)/ Athamallik Division (Handapa RF) frequently enters into Adjoining forests of Kanloi RF, Devinagar RF, Similipathar RF- Dangapal PRF, Durgapur RF in the Western side – Nisha RF- Jaipur RF-Badakathia RF-Rabipur RF- Sibarampur RF- Kanheijena RF – To Anantapur RF in Dhenkanal District via elephant corridor crossing the River Brahmani. On the way they are crossing Rengali Right Canal and Left Canal, NH- 23 Canal near Kankilli /Ekagharia Village”.

The Subhadra OCP lease area is seeing occasional movement of the elephants. Nala originating from Durgapur RF / Chendipada Area are flowing towards North- East and joins to River Brahmani / Samal barrage up stream. Durgapur and Jaipur RF’s Bamboo forests situated adjacent to the Subhadra OCP lease area, attracts wildlife like Wild boar, barking Deer, Lizards, Mongoose etc.

5.3 Description of the Subhadra OCP lease area and Elephant movement

The proposed project covers an area of 1111.85 hectares. The block is nearly triangular, with a length of approximately 5.2 km in the north-south direction and a maximum width of about 3.6 km in the east-west direction. The boundary of the block is defined as follows:

- Northern Boundary: The northern side of the project area touches the southern bank of Singhada Jhor, including the proposed diversion.
- Southern Boundary: The southern boundary of the project adjacent to SH 63, which connects Angul to Chhendipada.

- Eastern Boundary: The eastern boundary shares a common boundary with Gopal Prasad East and Hingula Mines.
- Western Boundary: The western boundary shares a common boundary with Utkal B1 and Utkal C.

Major Reserve Forests within the 10 km Boundary:

The following Reserve Forests fall within a 10 km radius of the project area boundary:

- Durgapur RF
- Kaliakata RF
- Kerjang RF
- Kuio RF
- Jaltap RF
- Badakathia RF
- Bramhanbil RF
- Jaipur RF
- Kosala RF
- Khalapal RF
- Maliabandha RF
- Malibramhani RF
- Nisha RF
- Rabipur RF
- Paranga RF
- Similisahi RF
- Saradhapur RF

Presence and Movement of Wildlife:

Based on field data, it was found that various mammals, birds, and reptiles are present within the 10 km boundary of the project area.

Major Mammals:

- Indian Elephant: Field data and evidence suggest that elephant movement is common around the project boundary and occasional inside the lease area of the Subhadra OCP. Due to the presence of multiple Reserve Forests surrounding the project area, elephants move from one Reserve Forest to another at different times of the year. Major movements occur during the crop season and Fruiting season of mango and cashew.
- Leopard: Evidence of leopard movement was found through camera traps and pug mark signs. Leopards generally move in Durgapur RF.
- Other Mammals: Sloth bear, barking deer, wild pig, Indian hare, Indian pangolin, palm squirrel, jackal, Indian porcupine, Rhesus macaque, Hanuman langur, Common Fox, Wild Cat, Indian Field Mouse, Indian Porcupine and palm civet are common within the 10 km boundary of the project area.

List of Birds:

- Forest owlet
- Jungle fowl
- Myna
- Kingfisher,
- Parakeet,
- Sikra,
- Indian Koel & many more.

List of reptiles:

- King Cobra
- Indian Python
- Monocellata Cobra
- Spectacled Cobra
- Garden Lizard
- Rock Agama
- Monitor Lizard & etc.

Based on VHF data and the elephant movement register, the movement pattern of elephants within the 10 km boundary of the project area is provided for the years 2022-2024, in both tabular form and on a map.

**Date wise Elephant movement within 10 KM buffer zone area
of Subhadra OCP of the Angul Forest Division**

Date	No of Elephant	From	To	GPS Reading						Via
				D	M	S	D	M	S	
04.07.2022	1	Similipathar RF	Durgapur RF (Compt. No-1)	20	56	48.1	84	53	0.9	
05.07.2022	1	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-1)	20	56	48.2	84	53	1	
06.07.2022	1	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-1)	20	56	48.8	84	52	27	
07.07.2022	1	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-1)	20	56	13.8	84	52	42.2	
08.07.2022	1	Durgapur RF (Compt. No-1)	durgapur RF (Compt. No-2)	20	56	43.1	84	54	38.1	
09.07.2022	1	durgapur RF (Compt. No-2)	Durgapur RF (Compt. No-1)	20	56	35.6	84	53	3.7	
10.07.2022	1	Durgapur RF (Compt. No-1)	Similipathar RF	20	56	17	84	52	43.2	
11.07.2022	3	Kankurpal RF	Jaltap RF	21	2	15.1	84	58	55.4	
12.07.2022	3	Jaltap RF	Jaipur RF	21	0	14.1	84	58	22.3	
13.07.2022	3	Jaipur RF	Kumunda Beat	20	58	57.9	84	58	52.1	

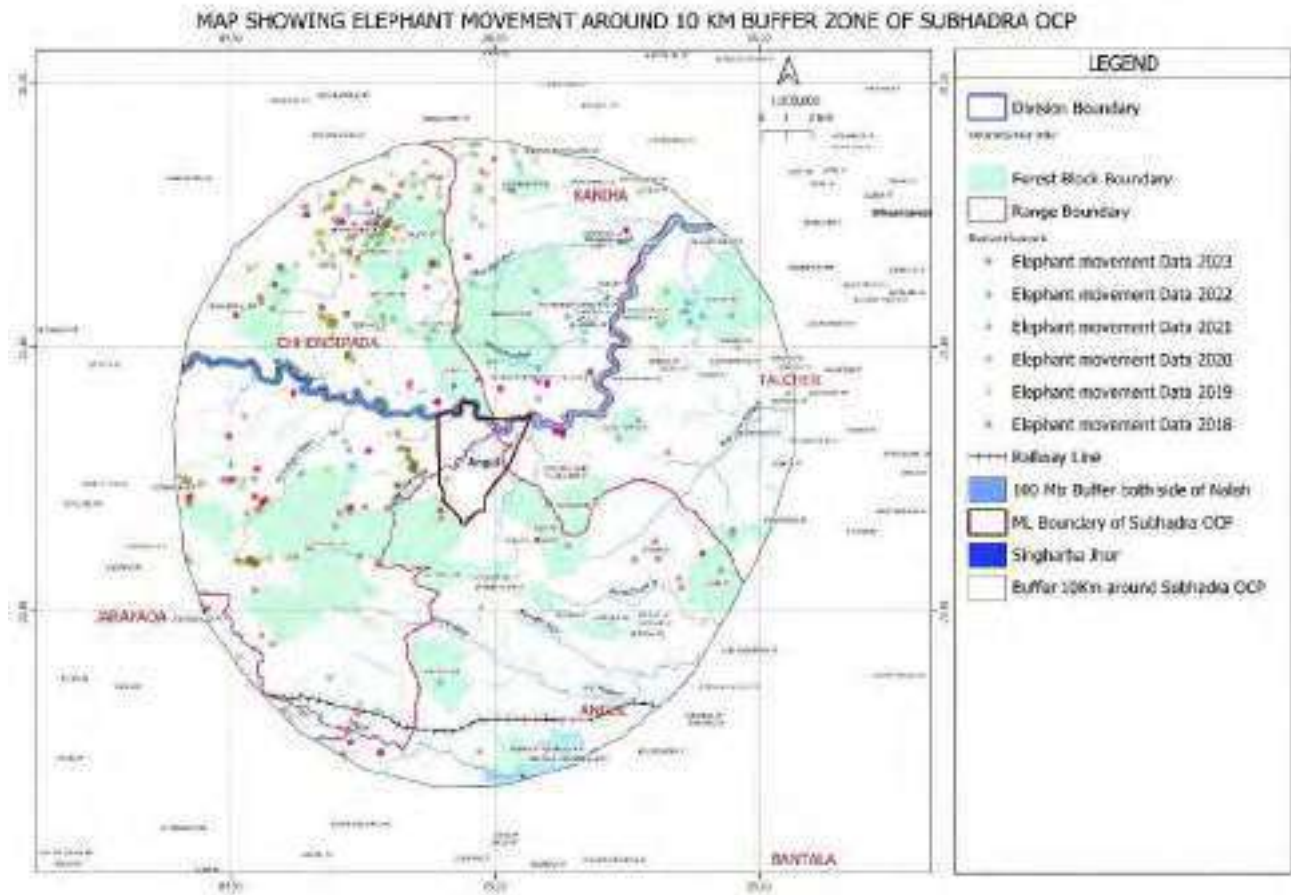
16.07.2022	2	Similipathar RF	Durgapur RF (Compt. No-1)	20	56	32	84	53	2	
18.07.2022	2	Durgapur RF (Compt. No-1)	Similisahi RF	21	1	22.1	84	57	17	
19.07.2022	2	Similisahi RF	Kankurpal RF	21	6	26.3	84	55	23.8	
31.08.2022	3	Chhendipada RF	Jaltap RF	21	1	45.7	84	57	57.7	
01.09.2022	3	Jaltap RF	Similisahi RF	21	1	0.4	84	57	14.5	
01.09.2022	1	Kankurpal RF	Jaltap RF	21	1	42.8	84	57	58.3	
02.09.2022	1	Jaltap RF	Jaltap RF	21	1	37.7	84	57	58.5	
10.10.2022	1	Katatada Beat	Jaipur RF	21	0	13.3	84	58	29.6	Jamanuda, Durgapur RF (Compt. No-8)Raijharan
19.12.2022	1	Kankurpal RF	Jaltap RF	21	1	56.6	84	58	34.2	
20.12.2022	1	Jaltap RF	Durgapur RF (Compt. No-3)	20	57	18.8	84	56	44.9	Raijharan
27.12.2022	21	Similipathar RF	Durgapur RF (Compt. No-1)	20	57	0	84	54	4.7	
20.01.2023	2	Santarabandha RF	Kosala RF	21	1	52.2	84	55	6.1	Balinali village
29.01.2023	2	Basantapur Beat	Chakundapal DPF	21	1	3.2	84	54	42.1	Kukurpeta
30.01.2023	2	Chakundapal DPF	Kosala RF	21	1	10.8	84	55	15.8	
30.01.2023	1	Similipathar RF	Durgapur RF (Compt. No-2)	20	56	58.4	84	53	56.3	
31.01.2023	2	Kosala RF	Chakundapal DPF	21	0	39.9	84	53	39.6	
01.02.2023	1	Durgapur RF (Compt. No-2)	Durgapur RF (Compt. No-2)	20	55	55.6	84	54	40.6	
10.02.2023	2	Similipathar RF	Durgapur RF (Compt. No-3)	20	56	13.6	84	56	28.1	Korada, Jhintipal
11.02.2023	2	Durgapur RF (Compt. No-3)	Durgapur RF (Compt. No-1)	20	56	28.8	84	52	45.1	Korada, Jhintipal
12.02.2023	2	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-1)	20	57	0.6	84	53	50.1	
13.01.2023	2	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-1)	20	55	57.3	84	54	16.1	
18.02.2023	2	Similipathar RF	Durgapur RF (Compt. No-1)	20	56	38.7	84	53	5.1	
19.02.2023	2	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-2)	20	56	31.5	84	54	45	
20.02.2023	2	Durgapur RF (Compt. No-2)	Durgapur RF (Compt. No-8)	20	55	57.2	84	56	22.5	Durgapur, Banardiha, Kerejang

21.02.2023	2	Durgapur RF (Compt. No-8)	Durgapur RF (Compt. No-5)	20	55	15.5	84	56	55.7	Banardiha, Kerejang, Odakapa
22.02.2023	2	Durgapur RF (Compt. No-5)	Durgapur RF (Compt. No-1)	20	56	34.1	84	53	1.9	Korada, Durgapur
27.02.2023	2	Similipathar RF	Durgapur RF (Compt. No-2)	20	56	29.3	84	54	42.5	Putagadia, Korada
28.02.2023	2	Durgapur RF (Compt. No-2)	Durgapur RF (Compt. No-8)	20	56	22.8	84	56	42.7	Kerejang, Banardiha
06.03.2023	2	Similipathar RF	Durgapur RF (Compt. No-1)	20	56	13	84	52	41.8	Putagadia
08.03.2023	1	Similipathar RF	Durgapur RF (Compt. No-1)	20	56	14.3	84	52	42	Putagadia , Korada
09.03.2023	1	Durgapur RF (Compt. No-1)	Putagadia RF	20	56	56.6	84	51	44.6	
11.03.2023	2	Similipathar RF	Durgapur RF (Compt. No-3)	20	57	9.6	84	55	37.1	Nandichhor e, Jhintipal, Korada
12.03.2023	2	Durgapur RF (Compt. No-3)	Durgapur RF (Compt. No-1)	20	56	14.2	84	52	42.1	
13.03.2023	2	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-1)	20	56	11.3	84	52	42.7	
13.03.2023	1	Similipathar RF	Durgapur RF (Compt. No-8)	20	56	20.4	84	56	37.7	Putagadia, Korada, Jhintipal
14.03.2023	1	Durgapur RF (Compt. No-8)	Durgapur RF (Compt. No-8)	20	55	4.4	84	57	21.3	
14.03.2023	2	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-1)	20	56	12.3	84	52	42.1	
15..03.2023	2	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-3)	20	55	26.3	84	55	46.6	
16.03.2023	2	Durgapur RF (Compt. No-3)	Durgapur RF (Compt. No-2)	20	56	19.4	84	54	34.4	
17.03.2023	2	Durgapur RF (Compt. No-2)	Durgapur RF (Compt. No-2)	20	56	9.4	84	54	42.9	
18.03.2023	2	Durgapur RF (Compt. No-2)	Durgapur RF (Compt. No-2)	20	56	31.6	84	54	45	
01.04.2023	2	Similipathar RF	Durgapur RF (Compt. No-1)	20	56	36	84	53	2.8	
02.04.2023	2	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-2)	20	56	29.2	84	54	42.6	
03.04.2023	2	Durgapur RF (Compt. No-2)	Durgapur RF (Compt. No-8)	20	56	23.4	84	57	2.9	Bhalugadia
04.04.2023	2	Durgapur RF (Compt. No-8)	Durgapur RF (Compt. No-5)	20	55	27.7	84	55	49.7	Banardiha
10.04.2023	2	Nisha Beat	Durgapur RF	20	56	14.5	84	56	42.5	

			(Compt. No-8)							
21.04.2023	1	Basantapur Beat	Kosala RF	21	1	26.5	84	54	59.9	Kukurpeta
22.04.2023	1	Kosala RF	Bramhanbil RF	21	2	0.1	84	56	51.4	Bhagalakata
23.04.2023	1	Bramhanbil RF	Chakundapal DPF	21	0	57.3	84	54	27	Bramhanbil
08.05.2023	1	Similipathar RF	Durgapur RF (Compt. No-1)	20	56	35.8	84	53	2.7	
10.05.2023	1	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-2)	20	56	31.6	84	54	45.5	went to Nisha Beat
12.05.2023	1	Nisha Beat	Durgapur RF (Compt. No-8)	20	56	22.1	84	56	43.3	
12.06.2023	1	Basantapur Beat	Kosala RF	21	0	54.2	84	54	57.6	Kukurpeta
16.06.2023	1	Similipathar RF	Durgapur RF (Compt. No-2)	20	56	37.1	84	54	32.7	went to Similipathar RF
03.07.2023	1	Karatapata Beat	Jaipur RF	21	0	24.9	84	57	22.4	Badakerejan g, Rajjharan, Golagadia
18.07.2023	4	Kankurpal RF	Chakundapal DPF	21	0	44.7	84	54	7.9	Karadabahal , Balinali
19.07.2023	4	Chakundapal DPF	Chhendipada RF	21	3	5.2	84	53	3.9	
25.07.2023	3	Kankurpal RF	Jaltap RF	21	1	55.1	84	58	34.3	Bramhanbil
31.07.2023	2	Similipathar RF	Durgapur RF (Compt. No-5)	20	55	14.9	84	55	26.9	Durgapur, Korada
01.08.2023	2	Durgapur RF (Compt. No-5)	Durgapur RF (Compt. No-8)	20	56	20.4	84	57	32.4	
02.08.2023	2	Durgapur RF (Compt. No-8)	Durgapur RF (Compt. No-8)	20	56	22.9	84	56	42.6	went to Nisha Beat
04.08.2023	2	Nisha Beat	Durgapur RF (Compt. No-6)	20	54	28.9	84	54	31.4	went to Hinsar Beat
23.02.2024	1	Kadalimuda Beat	Jaipur RF	20	58	46.5	84	59	15	Durgapur, Rajjharan , Sandhapal, Kudapal
11.03.2024	1	Similipathar RF	Durgapur RF (Compt. No-2)	20	56	29.4	84	54	42.6	
27.04.2024	1	Kasidiha Mango Orchard	Balinali Mango Orchard	21	2	43.3	84	54	59.6	
28.04.2024	1	Balinali Mango Orchard	Bhagalakata VF	21	1	59.9	84	55	21.9	
29.04.2024	1	Bhagalakata VF	Kosala RF	21	1	27.7	84	55	27.4	
30.04.2024	1	Kosala RF	Badapal Mango	20	59	40.7	84	54	40.2	

			Orchard								
01.05.2024	1	Badapal Mango Orchard	Korada Mango Orchard	20	57	27.5	84	54	23.9	Nandichhor e, Kaithadhipa	
02.05.2024	1	Korada Mango Orchard	Durgapur RF (Compt. No-8)	20	55	29.6	84	57	28.7	went to Nisha Beat	
05.05.2024	1	Nisha Beat	Jaipur RF	20	58	38.6	84	59	45.7		
06.05.2024	1	Jaipur RF	Jaipur RF	20	58	47.1	84	59	16.1		
08.05.2024	1	Nisha Beat	Durgapur RF (Compt. No-8)	20	56	46.8	84	57	47.8		
16.05.2024	1	Kumuda Beat	Takua Mango Orchard	21	3	17.8	84	58	48.3	Went to Dereng Beat	

Based on the tabular data it was found that, Elephant movement is very close to the Project area.



5.4 Development of Elephant Corridor:

As the eastern and western boundaries of the project area are adjacent to other mining areas, some of which are operational and others will soon be operational, this will completely block animal movements from the southern side to the northern side and vice versa. Given that elephants are mega-herbivores with long-range movement patterns, restricting their movement paths presents a significant challenge. However, certain

interventions can be implemented within the Reserve Forests to ensure that animals remain within the forested areas while meeting all their requirements.

More and more disturbances will be there along their movement path through Jagannath Colliery. The animals may find it difficult in communicating through these collieries. To maintain their Habitat connectivity, it is proposed to leave aside a strip of land on both sides of the Singhada Jhor Nala (100m width from the bank of the nala) which will be a non-disturbance zone. Vegetation by utilizing various fodder species will be created on both sides of nala. This nala will not be disturbed throughout the life of the mines.

It has been provided to create small water holes / ponds by using sand bags.



This will ensure water availability during summer also. Apart from it, various SMC measures like Check Dams, LBCD, Percolation pits, etc will be executed along the Nala to ensure water availability round the year.

The user agency i.e. MCL will take steps to

- i. Maintain no mining Zone along this Singhada Jhor Nala (100m on both sides) total width of the proposed passage 250m (2x100m + 50 m) including the width of the Singhada Jhor Nala.
- ii. Maintain vegetation cover all along the Nala,
- iii. Steps are to be taken to keep this nala free from any garbage especially plastic bottles / Polythene.
- iv. Motivational drive among the villagers living near to this Nalla. Implement community awareness programs to educate local populations about the importance of wildlife conservation and ways to reduce human-animal conflicts.
- v. Extensive SMC measures to be taken along the Nala to ensure water availability round the year.
- vi. MCL will ensure that no pollutants and discharge from the mining activity will enter the Nala.

Therefore, the user agency, MCL, will submit an undertaking along with this Site-Specific Wildlife Management Plan to implement the measures mentioned above for the Animal Passage Plan within the mining lease area of Subhadra OCP, under the supervision of the Forest Department in the future.

CHAPTER-6

FINANCIAL FORECAST

FINANCIAL FORECAST

The conservation scheme with a major focus on elephant conservation. Below are the appropriations for the Wildlife Conservation Plan. (Table 6.1, 6.2 and 6.3)

Table 6.1 Abstract of Interventions of Angul Division

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
A	Habitat Improvement					
1	Weed eradication (30 Mandays) and Sowing of seeds (10 Mandays) in the zone of Impact for the rejuvenation and restoration of the Elephant Habitat. 40 Mandays (40x450/-= 18000/-)per ha.	0.180	500	ha	90	Durgapur RF, Barakathia RF, Hirapur RF, Kerjang RF, Nisha PF and Rakas RF, etc. In the zone of impact and the elephant movement area of the Angul Forest Division. 100 ha per year
2	Creation of Water Body	10.00	2	Nos.	20	In the zone of impact and the elephant movement area of the Angul Forest Division.
3	Miyawaki plantations in small blank patches of the degraded forests coming within the elephant habitat for the quick restoration & rejuvenation. (Miyawaki Plantation 5 ha during 1st year Rs.192.375lakhs and 5 ha during 2nd year including maintenance Rs.245.833 lakhs, 2nd and 3rd Maint. Rs.86.051 lakhs, 3rd and 4th yr Maint. Rs.52.0565lakhs, 4th yr maint. Rs.19.4645lakhs)	59.578	10	ha	595.78	Miyawaki Plantation 5 ha during 1st year and 5 ha during 2nd year. (Cost norm is enclosed as <i>Annexure-IV</i>)

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
4	SMC structures in and around the Snigdhajor Nallah. In the Zone of Impact. Rs 50000/- per ha	0.50	500	ha	250	Differnet Nalas of Durgapur RF, Barakathia RF, Hirapur RF, Kerjang RF, Nisha PF and Rakas RF, etc. In the zone of impact and the elephant movement area of the Angul Forest Division. 100 ha per year.
5	Wildlife Awareness / Motivational camps	0.40	50	Nos.	20	10 camps per year
6	Incentive Rewards for Zero Forest Fire VSS / Villages. It will be used for the various Income Generating Activities Rs. 1lakhs in LS per year	1.00	5	Years	5	Reward will be given as per the fire points analysis of the OFMS portal.
7	Anti Depredation Squad (of 10 person):	28.60	5	Nos.	143	With hired vehicle and other contingency. One squad per year.
8	POL for Fire Blowers, vehicles, Motor bikes and boats for patrolling round the clock in the Zone of impact	20.00	5	Years	100	20 Lakhs per year
9	Fire Line Creation & maintenance:	0.045	500	Km	22.5	Durgapur RF, Barakathia RF, Hirapur RF, Kerjang RF, Nisha PF and Rakas RF as per Working Plan prescription. Based on the prevalent wage rate. 100 Km per year
					1246.28	

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
B	Protection & Surveillance					
10	Wildlife Protection Squad (10 Persons with hired vehicle etc)	28.60	5	Nos.	143	With hired vehicle and other contingency. One squad per year.
11	Anti Depredation Equipment's, Uniform, Contingency and unforeseen expenditures	15.00	5	Years	75	15 Lakhs per year in LS
12	PTZ and AI based early warning system	3.00	15	Nos.	45	
13	Speed monitoring system, Early warning system, Bulk SMS system, etc	0.75	50	Nos.	37.5	
14	Anti-Poaching /Protection barracks	25.00	1	Nos.	25	At Samal Barrage or in the zone of impact; With all logistic support, Solar light and safety measures etc.
15	Strengthening of the existing infrastructure like Anti Poaching Camp, Protection Barrack, Watch Towers including Ration of the staff staying there	15.00	5	Years	75	15 Lakhs per year in LS
16	Various acoustic and farm based deterrence like flash light, spot light, flickering light and other acoustic devices, ANIDERS, etc.	10.00	5	Years	50	10 Lakhs per year in LS
17	Radio collaring of the elephants and related expenditure	7.00	10	Nos.	70	
18	Drone Camera (with Infrared Facilities):	12.00	4	Nos.	48	
19	Special Drone camera with AI based detection system	25.00	1	Nos.	25	
					593.5	

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
C	Research & Development					
20	Wages of the Two Data Managers for the Data Analysis and Monitoring and Supervision.	0.52	60	Months	31.2	
					31.2	
D	Peoples Participation:					
21	Incentivise to Informers, Rewards & Awards	1.00	5	Years	5	For collecting intelligence on crime against Wildlife and allied matters. Rs 1 Lakh per year.
22	Solar street lights in villages.	0.30	50	Nos.	15	
23	High mast lights in different villages	2.00	50	Nos.	100	
24	Deployment of 50 nos. of Gajamitra round the year @ 13,500/- per month and Rs 3750/- per person for uniform, equipment's and various Logistics.	1.68	250	Nos.	420	
25	Training cum Review of Gaj Mitra- including fooding, charges, honorarium for resource persons, logistics and misc. expenditure (8 nos. to be conducted every year at Range level, Rs 15000 per training) (6 Ranges*8 Nos. per year*5years)	0.15	240	Nos.	36	

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
26	Creation of Tentacle Solar fencing in the sensitive areas where physical barriers are not possible	50.00	5	LS	250	
					826	
	Total				2696.98	
	Add 20% for cost escalation				539.396	
	Total				3236.376	

(Rupees Thirty Two crores Thirty Six lakhs Thirty Seven thousand Six hundred only)


Project Head
 Subhadra Coal Mining Ltd., Angul


Staff Officer (Envt. & Forest)
 MCL Subhadra Area


 महा प्रबंधक
 एमसीएल, सुभद्रा क्षेत्र
General Manager
 MCL, Subhadra Area


Divisional Forest Officer
 Angul, Division

Recommended.

Approved


 26/9/24
Regional Chief Conservator
 of Forests, Angul Circle.


Principal Chief Conservator of Forests
 (Wildlife) & Chief Wildlife Warden
 Odisha, Bhubaneswar

Table 6.2 Physical & Financial Flow Chart of Angul Division

SL. No	Interventions	Target				Year					
		Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	1st Year	2nd year	3rd Year	4th Year	5th Year	Total
A	Habitat Improvement										
1	Weed eradication (30 Mandays) and Sowing of seeds (10 Mandays) in the zone of Impact for the rejuvenation and restoration of the Elephant Habitat. 40 Mandays (40x450/- = 18000/-)per ha.	0.180	500	ha	90	18	18	18	18	18	90
2	Creation of Water Body	10.00	2	Nos.	20	10	10				20
3	Miyawaki plantations in small blank patches of the degraded forests coming within the elephant habitat for the quick restoration & rejuvenation. (Miyawaki Plantation 5 ha during 1st year Rs.192.375lakhs and 5 ha during 2nd year including maintenance Rs.245.833 lakhs, 2nd and 3rd Maint. Rs.86.051 lakhs, 3rd and 4th yr Maint. Rs.52.0565lakhs, 4th yr maint. Rs.19.4645lakhs)	59.578	10	ha	595.78	192.375	245.833	86.051	52.0565	19.4645	595.78

SL. No	Interventions	Target				Year					
		Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	1st Year	2nd year	3rd Year	4th Year	5th Year	Total
4	SMC structures in and around the Snigdhajor Nallah. In the Zone of Impact. Rs 50000/- per ha	0.50	500	ha	250	50	50	50	50	50	250
5	Wildlife Awareness / Motivational camps	0.40	50	Nos.	20	4	4	4	4	4	20
6	Incentive Rewards for Zero Forest Fire VSS / Villages. It will be used for the various Income Generating Activities Rs. 1lakhs in LS per year	1.00	5	Years	5	1	1	1	1	1	5
7	Anti Depredation Squad (of 10 person):	28.60	5	Nos.	143	28.6	28.6	28.6	28.6	28.6	143
8	POL for Fire Blowers, vehicles, Motor bikes and boats for patrolling round the clock in the Zone of impact	20.00	5	Years	100	20	20	20	20	20	100
9	Fire Line Creation & maintenance:	0.045	500	Km	22.5	4.5	4.5	4.5	4.5	4.5	22.5
	Sub-Total				1246.28	328.475	381.933	212.151	178.1565	145.5645	1246.28

SL. No	Interventions	Target				Year					
		Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	1st Year	2nd year	3rd Year	4th Year	5th Year	Total
B	Protection & Surveillance										
10	Wildlife Protection Squad (10 Persons with hired vehicle etc)	28.60	5	Nos.	143	28.6	28.6	28.6	28.6	28.6	143
11	Anti Depredation Equipment's, Uniform, Contingency and unforeseen expenditures	15.00	5	Years	75	15	15	15	15	15	75
12	PTZ and AI based early warning system	3.00	15	Nos.	45	24	21				45
13	Speed monitoring system, Early warning system, Bulk SMS system, etc	0.75	50	Nos.	37.5	18.75	18.75				37.5
14	Anti-Poaching /Protection barracks	25.00	1	Nos.	25	25					25
15	Strengthening of the existing infrastructure like Anti Poaching Camp, Protection Barrack, Watch Towers including Ration of the staff staying there	15.00	5	Years	75	15	15	15	15	15	75
16	Various acoustic and farm based deterrence like flash light, spot light, flickering light	10.00	5	Years	50	10	10	10	10	10	50

SL. No	Interventions	Target				Year					
		Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	1st Year	2nd year	3rd Year	4th Year	5th Year	Total
	and other acoustic devices, ANIDERS, etc.										
17	Radio collaring of the elephants and related expenditure	7.00	10	Nos.	70	14	14	14	14	14	70
18	Drone Camera (with Infrared Facilities):	12.00	4	Nos.	48	48					48
19	Special Drone camera with AI based detection system	25.00	1	Nos.	25	25					25
	Sub-Total				593.50	223.35	122.35	82.60	82.60	82.60	593.50

SL. No	Interventions	Target				Year					
		Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	1st Year	2nd year	3rd Year	4th Year	5th Year	Total
C	Research & Development										
20	Wages of the Two Data Managers for the Data Analysis and Monitoring and Supervision.	0.52	60	Months	31.2	6.24	6.24	6.24	6.24	6.24	31.2
	Sub-Total				31.2	6.24	6.24	6.24	6.24	6.24	31.20
D	Peoples Participation:										
21	Incentivise to Informers, Rewards & Awards	1.00	5	Years	5	1	1	1	1	1	5
22	Solar street lights in villages.	0.30	50	Nos.	15	7.5	7.5				15
23	High mast lights in different villages	2.00	50	Nos.	100	50	50				100
24	Deployment of 50 nos. of Gajamitra round the year @ 13,500/- per month and Rs 3750/- per person for uniform, equipment's and various Logistics.	1.68	250	Nos.	420	84	84	84	84	84	420
25	Training cum Review of Gaj Mitra- including fooding, charges, honorarium for resource persons, logistics and misc. expenditure (8 nos. to be conducted every year at Range level, Rs 15000 per training) (6 Ranges*8 Nos. per year*5years)	0.15	240	Nos.	36	7.2	7.2	7.2	7.2	7.2	36

SL. No	Interventions	Target				Year					
		Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	1st Year	2nd year	3rd Year	4th Year	5th Year	Total
26	Creation of Tentacle Solar fencing in the sensitive areas where physical barriers are not possible	50.00	5	LS	250	50	50	50	50	50	250
	Sub-Total				826	199.7	199.7	142.2	142.2	142.2	826
	Total				2696.98	757.7650	710.2230	443.1910	409.1965	376.6045	2696.980
	Add 20% for cost escalation				539.396	151.5530	142.0446	88.6382	81.8393	75.3209	539.396
	Total				3236.376	909.3180	852.2676	531.8292	491.0358	451.9254	3236.376


Project Head
 Subhadra Coal Mining Ltd., Angul


Staff Officer(Envt.& Forest)
 MCL Subhada Area


 महा प्रबंधक
 एमसीएल, सुभद्रा क्षेत्र
General Manager
 MCL, Subhadra Area


Divisional Forest Officer
 Angul, Division

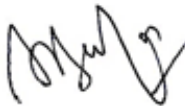
Table 6.3 Budget under Conservation Plan

Note: All the conservation activities shall be carried out with the participation of the State Forest Department and other expert Institutions of the region. Planting material will be procured from local or nearby nurseries of Forest department and subsequently from high tech nursery proposed in this plan. Iron-guards will also be installed to protect the early growth of saplings/seedlings to protect them from grazing/browsing.

Table 6.3 Budget under activities to be implemented by the project proponent under this conservation plan

SI No.	Management interventions
1	<p>Awareness activities on conservation of wildlife by project proponent (Trainings, lectures, film screenings, informative leaflets, organizing essay writing, debate, and drawing competitions in schools and colleges, staging street plays and Nukad Natak, celebrating important days related to wildlife conservation, conducting training sessions, boosting awareness through social media platforms, creating informational pamphlets and others that are appropriate)</p> <p><i>Intent- Encourage the public to be more conscious of wildlife conservation efforts and importance of wildlife</i></p>
2	<p>Immunization/ vaccination of Livestock through organizing camps by project proponent</p> <p><i>Intent- Regular vaccination against Foot and Mouth Disease (F.M.D) in order to mitigate the transmission of diseases carried by cattle within the forest and minimize their detrimental effects on the wildlife.</i></p>
3	<p>5% of the project cost i.e Rs.161.8188/- Lakhs will be deposited by the UA in account of the Wildlife Society of Odisha (The total Project Cost Rs.3236.376/- * 5% = Rs. 161.8188/- Lakhs)</p>

4	The user agency, MCL, will submit an undertaking along with this Site-Specific Wildlife Management Plan, committing to provide the necessary funds and physical support to ensure the proper implementation of the points wise measures i.e. point no.1 to 6 mentioned in the Animal Passage Plan in and around the Subhadra OCP mining lease area in the future.
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Project Head
Subhadra Coal Mining Ltd., Angul



Staff Officer (Envl. & Forest)
MCL, Subhadra Area



Divisional Forest Officer
Angul Division
Angul, Division

महा प्रबंधक
एम.सी.एल., सुभद्रा क्षेत्र
General Manager
MCL, Subhadra Area

Approved



Principal Chief Conservator of Forests
(Wildlife) & Chief Wildlife Warden
Odisha, Bhubaneswar

ANNEXURES

File No. J-11015/72/2021- IA-II(M)
Government of India
Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)

Indira Paryavaran Bhawan,
Jorbagh Road, N Delhi - 3
Email: lk.bokolia@nic.in Tel: 01124695363

Dated: 22nd November, 2021

To,
The Chief General Manager (CP&P)
M/s Mahanadi Coalfields Limited
PO - Jagruti Vihar, Burla,
Sambalpur-768 020 (Odisha)

E-mail: cgmenvt2014@urmail.com

Sub: Subhadra Open Cast Mine with production capacity of 25 MTPA in mine lease area of 1111.85 ha of M/s Mahanadi Coal field Limited located at Village Gopal Prasad, Kumuda, Nisha, Kankareil, Rajjharan, Nisha P.S Angul, Tehsil Tachler Sadar and Chhendipada, District Angul (Odisha) - For Terms of Reference- reg

Sir,

This has reference to your Online Proposal No. IA/OR/CMIN/232524/2021 dated 13th October, 2021, on the above-mentioned subject.

2. The Ministry of Environment, Forest and Climate Change has considered the proposal for grant of Terms of Reference to Subhadra Open Cast Mine with production capacity of 25 MTPA in mine lease area of 1111.85 ha of M/s Mahanadi Coal field Limited located at Village Gopal Prasad, Kumuda, Nisha, Kankareil, Rajjharan, Nisha P.S Angul, Tehsil Tachler Sadar and Chhendipada, District Angul (Odisha).
3. The proposal was considered by the sectoral Expert Appraisal Committee (EAC) in the Ministry in its 21st EAC meeting held on 27th October, 2021 through Video Conferencing. The details of the project, as per the documents submitted by the project proponent, and also as informed during the meeting, are reported to be as under: -
 - (i) The project area is covered under Survey of India Topo sheet No: F45Z13 & F45T1 on RF 1:50,000 and is bounded by the geographical coordinates ranging from latitude 20°55'56.225" to 20°58'47.344" N and longitudes 84° 58'42.383" to 85° 0'50.476" E.
 - (ii) Coal linkage of the project: Basket Linkage to consumer all over India.
 - (iii) No Joint venture cartel has been formed.
 - (iv) Project does not fall in the Critically Polluted Area (CPA) where the MoEF&CC vide its OM dated 13th January 2010 has imposed moratorium on grant of environment clearance.

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- (v) Employment generation: 2108 manpower will be deployed which will provide direct employment and other near about 5,000 people will also be attracted to an economically resurgent area providing service/education etc.
- (vi) The project is reported to be beneficial in terms of
- Improvement in physical Infrastructure and infrastructure like roads, school building, provision of drinking water, community hall, plantation etc.
 - Increase in employment Potential.
 - Contribution of Direct tax, sales tax, Royalty etc to the National Exchequer.
 - Overall economic growth of the country.
- (vii) Total mining lease area as per block allotment is 1111.85 Ha. Mining plan (including Progressive Mine closure plan) has been approved by the MCL Board vide letter no. MCL/SBP/CS/BD-235/Exct/2021/111767 dt- 07.06.2021.
- (viii) The land usage pattern of the project is as follows:
Pre-mining land use details (Area in Ha)

S. No.	Land Use	Within ML Area	Outside ML Area	Total
1	Agricultural Land	800.50	--	800.50
2	Forest Land	125.24	--	125.24
3	Wasteland	92.64	--	92.64
4	Grazing Land	58.67	--	58.67
5	Surface Water Bodies	6.28	--	6.28
6	Settlement	0.00	--	0.00
7	Others(specify)	28.27	--	28.27
8	Old Excavation Area(East Quarry)	NA	--	NA
9	Old Excavation Area(West Quarry)	NA	--	NA
10	Old OB Dumps	NA	--	NA
11	Roads and Mine Infrastructure	0.25	--	0.25
12	R&R colony	NA	--	NA
13	Staff Colony	NA	--	NA
14	Green belt	NA	--	NA
15	Balance Area	0.00	--	0.00
	Total Project Area	1111.85		1111.85

Post Mining

Sl No	Land Use	Land use (Ha)				Total
		Plantation/ Agriculture	Water Body	Public Use	Undisturbed	
1	External OB Dump	24.17	--	--	--	24.17
2	Top Soil dump	8.97	--	--	--	8.97

3	Excavation	715.24	--	--	130.68	845.92
4	Roads	--	--	15.72	--	15.72
5	Built-up Area	117.26	--	37.35	--	154.61
6	Green Belt	6.89	--	--	--	6.89
7	Undisturbed Area	--	--	--	--	0.00
8	Safety Zone Rationalization Area	11.79	--	--	--	11.79
9	Diversion/Below River/Nala/Canal	--	--	8.42	--	8.42
10	Water Body	--	35.36	--	--	35.36
11	Staff Colony	--	--	--	--	0.00
	Total Area	884.32	35.36	61.49	130.68	1111.85

- (ix) Total geological reserve reported in the mine lease area is 1108.39 Mt with 791.04 Mt as mineable reserves. Out of total mineable reserve of 791.04 Mt, 768.83 Mt are available for extraction. Percent of extraction is 97.19%.
- (x) 9 seams with thickness ranging from 0.13 to 35.26 are workable. Grade of Coal is G-13, Stripping ratio is 0.93 while average gradient is 3.480
- (xi) Method of mining operations envisaged by Opencast Mining Method Coal winning by Surface Miner, pay loader & tipper and OB removed by Shovel-Dumper combination.
- (xii) Life of mine is 36 years (as on 1.04.2022)
- (xiii) The project has one temporary external OB dumps in an area of 24.17 ha with 30 m height and 103.72 Mm³ of OB which will be re-handled and simultaneously backfilled into the de-coaled area (internal OB dumping). An area of 715.24 ha is proposed for internal OB dump. Total 716.90 Mm³ of OB material is envisaged for backfilling in internal OB dump.
- (xiv) Total quarry area is 881.28 ha out of which backfilling will be done in 715.24 ha while final mine void will be created in an area of 35.36 ha with a depth of 30m. Backfilled quarry area of 715.24 Ha shall be reclaimed with plantation/grass/agriculture.
- (xv) Transportation of coal has been proposed by tippers /pay loader in mine pit head, from surface to siding by close conveyor and at sidings by RLS with railway.
- (xvi) Reclamation Plan in an area of 884.32ha, comprising of 24.17 ha of temporary external dump, 715.24 ha of internal dump, 6.89 Ha of Green Belt. In addition to this, an area of 138.02ha, included in the roads/infrastructure and built-up area, top soil dump has also been proposed for green belt development.
- (xvii) 125.24 ha of forest land has been reported to be involved in the project.
- (xviii) No National Parks, Wildlife Sanctuaries and Eco-Sensitive Zones have been reported with 10km boundary of the project.
- (xix) The range of ground water is varying between 3.42 mbgl to 10.12 mbgl during the pre-monsoon in core zone and between 2.25mbgl to 10.90mbgl in buffer zone. During the post monsoon period it is varying between 1.17mbgl to 5.00mbgl in core zone and between 2.15mbgl to 7.80mbgl in buffer zone. Total water requirement for the project is 5.525MLD

- (xx) The seasonal nallah, Ghurudia Nallah is flowing within the mine boundary and Singhada Jhor in extreme north boundary of the mine. It is planned for diversion of Guhuridia Nallah in the eastern boundary of the mine and Singhada Jhor will be straighten in north boundary.
- (xxi) No court cases, violation cases are pending against the project of the PP.
- (xxii) The project does not involve violation of the EIA Notification, 2006 and amendment issued there under.
- (xxiii) The project involves 1425 project affected families. R&R of the PAPs will be done as per Orissa Rehabilitation and Resettlement Policy 2006.
- (xxiv) Total cost of the project is Rs. 3955.65 Cr. Cost of production is Rs.678.00 per tonne. CSR cost is Rs.2.00 per tonne or 2% of the average net profit of the Company of the three immediately preceding financial years whichever is higher. R&R cost is Rs.405.46 crores. Environment Management Cost is Rs 76.12crores.

4. The Expert Appraisal Committee in its 21st EAC meeting held on 27th October, 2021, through Video Conferencing has recommended the proposal for grant of Terms of References (ToR). Based on the recommendations of the EAC, the Ministry of Environment, Forest and Climate Change hereby grants approval to the Terms of References for Subhadra Open Cast Mine with production capacity of 25 MTPA in mine lease area of 1111.85 ha of M/s Mahanadi Coal field Limited located at Village Gopal Prasad, Kumuda, Nisha, Kankarei, Rajjharan, Nisha P.S Angul, Tehsil Tachler Sadar and Chhendipada, District Angul (Odisha), for preparation of EIA/EMP reports with public consultations, under the provisions of the Environment Impact Assessment Notification, 2006 and subsequent amendments/circulars thereto, subject to the compliance of the following terms and conditions as specified/notified in the standard ToR applicable for opencast coal mines, along with the additional conditions as under:-

Specific Conditions

- (i) Public Consultation, including public hearing, shall be conducted through concerned SPCB as per the provisions/procedure contained in the EIA Notification, 2006 for information of the stakeholders about the present coal mining operations inviting comments and their redressal. All the issues raised and PP reply should be incorporated in EIA.
- (ii) Stage-I Forest Clearance for diversion for non-forestry activity shall be submitted at the time of submission of EIA.
- (iii) PP should submit the real time aerial footage and video of the Mining lease area made through drone with a special focus on the area adjacent to the rivers.
- (iv) PP shall not divert the Singhada Jhor stream and will not disturbed the forest area or green patch located towards North eastern boundary for next 20 years of the mine life. Adequate protection measures shall be proposed in EIA Report. Accordingly, a distance of about 60 mts along Singhada stream shall be left to avoid any pollution, thus the Mine plan shall be revisited/relooked.

- (v) A detailed hydrological survey of the Ghurdia nallah/Stream, regarding its catchment area, flow volume and length of the stretch to be diverted to be provided with proper diversion plan in EIA/EMP report.
- (vi) A water reservoir and forest area is located towards South West directions so the extra measure adopted for combating the pollution should be mentioned in EIA/ EMP report.
- (vii) PP shall clarify the area of the project with allotment of block from MoC and Mine Plan. Further, PP shall reduce the area of project implementation by excluding the green patch towards the North eastern boundary.
- (viii) PP shall submit alternate land for grazing purpose with water bodies of same area within 5 km of project area.
- (ix) PP shall prepare the Mining Plan in such a manner that condition prescribed by EAC shall intact from environment point of view. EIA-EMP shall accordingly be prepared on the suggested stipulation with point-wise compliance & in accordance with recommendations of Mining Plan
- (x) In addition to existing data already collected (if any), the Cumulative Impact Assessment Study, ecosystem services study and biodiversity study of the area shall be carried over by project proponent. PP shall collect one season baseline data of all environmental parameters and shall compare with the data of earlier data collected for cumulative assessment of area. Air pollution impact predication shall be conducted by considering the maximum values.
- (xi) PP shall explore the possibilities of utilization of OB material for different purposes (in construction of roads, manufacture of artificial sand, aggregates, use for farmers etc.) and accordingly Plan shall be included in EIA/EMP Report.
- (xii) PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs.
- (xiii) Inpit conveyor belt with silo loading should be proposed and installed for transportation of coal till railway siding. No transportation of coal by trucks/dumpers shall be proposed in EIA/EMP.
- (xiv) No trucks or vehicles used for transportation of Coal to be passed by village roads or roads located near to the villages.
- (xv) PP has to adopt the adequate route or dedicated route causing least hindrance to existing traffic and its budgetary provision should also be provided in EIA report.
- (xvi) PP to engage the adequate capacity of dumper size/trucks in order to reduce the fleet size.
- (xvii) PP shall submit detailed project report for implementation of railway siding for evacuation of coal with its target date of completion. Target date should be such that railway siding should be operational within 2 years of commissioning of mine operations. Forest Clearance shall be submitted if railway siding land comes under forest land.

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- (xviii) Wind rose pattern in the area should be reviewed and accordingly location of AAQMS shall be planned by the collection of air quality data. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area.
- (xix) Project proponent to prepare Environmental Cost Benefit Analysis for the project in EIA/EMP Report.
- (xx) PP shall provide the details of mining technology/methodology proposed to be adopted for coal mining operations and its associated environmental benefits of using from Climate Change perspective by i.e. the likely emissions of greenhouse gases from the mining operations to be estimated with the modelling for future prediction related to the climate of that study area.
- (xxi) Detailed Social Impact Assessment shall be prepared in villages for Rehabilitation and Re-settlement. R &R Activity shall be proposed with timeline and allotted fund with the approval of District Commissioner/collector.
- (xxii) Permission for ground water withdrawal shall be obtained from Central Ground Water Authority (CGWA) only for mining activity.
- (xxiii) Heavy metals including other parameters in surface water quality shall be analyzed and provided in EIA Report. Further, detailed mineralogical and chemical composition of the mineral and percentage of free silica from a NABL/MoEF&CC accredited laboratory
- (xxiv) PP shall be submitting R &R in respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programs prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government.
- (xxv) PP should clearly bring out that what is the specific diesel consumption ~ (Liters/Tonne of total excavation & mineral) and steps to be taken for reduction of the same. Year-wise target for reduction in the specific diesel consumption needs to be submitted.
- (xxvi) PP shall provide provision of integrated mine plan and mine reclamation cum land form / land scape plan for both underground and open cast coal mining projects. The plan must show the predicted post mining reclaimed and reformed surface by regarding and reshaping to reduce its height as close to the original surface level and proper sloping benching and terracing of external dump should be clearly brought out in the post mine closure plan. This would also include water management strategies such as surface water catchment and drainage paths etc. of post mining land surface. The final mine void shall be reduced and brought as near as ground so that land can be restored and reclaimed
- (xxvii) PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of coal.
- (xxviii) PP shall submit letter from PCCF that mine does not fall under corridors of any National Park and Wildlife Sanctuary and does not involve any violation of forest area and wild sanctuary with certified map showing distance of nearest sanctuary
- (xxix) Details of toe wall and garland drain to be constructed along the OB dump.

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- (xxx) Reclamation to be done using geo-texturing technique of the dumps close to habitation and a cause of visual intrusion.
- (xxxii) Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted.
- (xxxiii) PP should bring out the awareness campaign to be carried out on various Environmental issues, practical training facility to be provided to the environmental engineer/diploma holders, mining engineer/diploma holders, geologists, and other trades related to mining operations. Target for the same needs to be submitted.
- (xxxiv) Details of Fog mist sprayer (static water sprinklers) at coal stock yard and along the permanent haul road.
- (xxxv) Details of black topping of permanent haul roads.
- (xxxvi) The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.
- (xxxvii) The socio-economic study to be conducted with actual survey report and a comparative assessment to be provided from the census data of 2011-part B to be provided in EIA/ EMP report also economic status of the study area and what economically project will contribute should be clearly mention. The study should also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data of 2011 part A to be provided and to link it with the initialization and quantification of need based survey for CSR activities to be followed.
- (xxxviii) A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report

4.1. This grant of Terms of References(ToR) for the said project is further subject to the general conditions as under

- (i) All documents should be properly indexed, page numbered.
- (ii) Period/date of data collection should be clearly indicated.
- (iii) Authenticated English translation of all material provided in Regional languages.
- (iv) After the preparation of the draft EIA-EMP Report as per the aforesaid TOR, the proponent shall get the Public Hearing conducted as prescribed in the EIA Notification 2006 and take necessary action for obtaining environmental clearance under the provisions of the EIA Notification 2006.
- (v) The letter/application for EC should quote the Ministry's file No. and also attach a copy of the letter prescribing the ToR.
- (vi) The copy of the letter received from the Ministry on the ToR prescribed for the project should be attached as an annexure to the final EIA-EMP Report.
- (vii) General Instructions for the preparation and presentation before the EAC of ToR/EC projects

of Coal Sector should be incorporated/ followed.

(viii) The aforesaid ToR has a validity of **Four** years only.

(ix) Grant of ToR does not necessarily mean grant of EC.

(x) Grant of ToR to the present project does not necessarily mean grant of TOR/EC to the captive/linked project.

(xi) Grant of ToR to the present project does not necessarily mean grant of approvals under the Forest (Conservation) Act, 1980 or the Wildlife (Protection) Act, 1972.

(xii) Grant of EC is also subject to circulars issued under the EIA Notification 2006, which are available on the Ministry's website: www.envfor.nic.in

5. Standard ToR: The EIA/EMP report should contain the information in accordance with provisions & stipulations as given in the standard ToR for Opencast coal mine projects (please visit the following link to download the Standard ToR:

<http://environmentclearance.nic.in/writereaddata/standardtorreference.pdf>

6. You are required to submit the final EIA/EMP prepared as per TORs to the Ministry within 4 years as per this Ministry's Notification vide S.O 751 (E) dated 17th February, 2020 for considering the proposal for environmental clearance.

7. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India/National Accreditation Board of Education and Training (QCI/NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization(s)/laboratories including their status of approvals etc. vide Notification of the MoEF dated 19th July, 2013.


(Lalit Bokolia)
Director

Copy to:

1. The Additional Principal Chief Conservator of Forests, Regional office (EZ), Ministry of Environment & Forests, A-31, Chandrasekharpur, Bhubaneswar- 751023 (Odisha).
2. The Secretary, Department of Environment & Forests, Government of Orissa, Secretariat, Bhubaneswar (Odisha).
3. The Chairman, Orissa State Pollution Control Board, Parivesh Bhawan, A/118, Nilkanthanagar, Unit VIII, Bhubaneswar - 751012 (Odisha).
4. District Collector, Angul, Government of Odisha.
5. Monitoring File /Record File 7. PARIVESH Portal


(Lalit Bokolia)
Director

A. Generic TOR for an opencast / UG coalmine project

- (i) An EIA-EMP Report should be prepared for a peak capacity of MTPA over an area of ha addressing the impacts of the underground coalmine project including the aspects of mineral transportation and issues of impacts on hydrogeology, plan for conservation of flora/fauna and afforestation/plantation programme based on the generic structure specified in Appendix III of the EIA Notification 2006. Baseline data collection can be for any season except monsoon.
- (ii) The EIA-EMP report should also cover the impacts and management plan for the project specific activities on the environment of the region, and the environmental quality – air, water, land, biotic community, etc. through collection of baseline data and information, generation of baseline data on impacts for MTPA of coal production based on approval of project/Mining Plan.
- (iii) A Study area map of the core zone and 10km area of the buffer zone (15 km of the buffer zone in case of ecologically sensitive areas) delineating the major topographical features such as the land use, drainage, locations of habitats, major construction including railways, roads, pipelines, major industries/mines and other polluting sources, which shall also indicate the migratory corridors of fauna, if any and the areas where endangered fauna and plants of medicinal and economic importance are found in the area.
- (iv) Map showing the core zone along with 3-5 km of the buffer zone) delineating the agricultural land (irrigated and unirrigated, uncultivable land (as defined in the revenue records), forest areas (as per records) and grazing land and wasteland and water bodies.
- (v) Contour map at 3m interval along with Site plan of the mine (lease/project area with about 3-5 km of the buffer zone) showing the various surface structures such as buildings, infrastructure, CHP, ETP, Stockyard, township/colony (within/adjacent to the ML), green belt and undisturbed area and if any existing roads, drains/natural water bodies are to be left undisturbed along with details of natural drainage adjoining the lease/project and modification of thereof in terms of construction of embankments/bunds, proposed diversion/rechannelling of the water courses, etc., highways, passing through the lease/project area.
- (vi) Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area. Impacts of project, if any on the landuse, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations. Extent of area under surface rights and under mining rights.

S.N.	ML/Project Land use	Area under Surface Rights (ha)	Area Under Mining Rights (ha)	Area under Both (ha)
1.	Agricultural land			
2.	Forest Land			
3.	Grazing Land			
4.	Settlements			

5.	Others (specify)						
Area Under Surface Rights							
S.N.	Details	Area (ha)	Forest Land	Agr. land	Wasteland	Settlements	Others
1.	Buildings						
2.	Infrastructure						
3.	Roads						
4.	Others (specify)						
	TOTAL						

- (vii) Study on the existing flora and fauna in the study area carried out by an institution of relevant discipline and the list of flora and fauna duly authenticated separately for the core and buffer zone and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna. The flora and fauna details should be furnished separately for the core zone and buffer zone. The report and the list should be authenticated by the concerned institution carrying out the study and the names of the species scientific and common names) along with the classification under the Wild Life Protection Act, 1972 should be furnished.
- (viii) Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working plan/scheme until end of mine life should be reflected on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps should also be included.
- (ix) Impact of mining on hydrology, modification of natural drainage, diversion and channelling of the existing rivers/water courses flowing through the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.
- (x) Collection of one-season (non-monsoon) primary baseline data on environmental quality – air (PM₁₀, PM_{2.5}, SO_x, NO_x and heavy metals such as Hg, Pb, Cr, AS, etc), noise, water (surface and groundwater), soil along with one-season met data.
- (xi) Map of the study area (core and buffer zone) clearly delineating the location of various monitoring stations (air/water/soil and noise – each shown separately) superimposed with location of habitats, wind roses, other industries/mines, polluting sources. The number and location of the stations should be selected on the basis of the proposed impacts in the downwind/downstream/groundwater regime. One station should be in the upwind/upstream/non-impact non-polluting area as a control station. Wind roses to determine air pollutant dispersion and impacts thereof shall be determined. Monitoring should be as per CPCB guidelines and standards for air, water, noise notified under Environment Protection Rules. Parameters for water testing for both ground and surface water should be as per ISI standards and CPCB classification of surface water wherever applicable.
- (xii) Impact of mining and water abstraction and mine water discharge in mine on the hydrogeology and groundwater regime within the core zone and 10km buffer zone including long-term modelling studies on the impact of mining on the groundwater regime. Details of

rainwater harvesting and measures for recharge of groundwater should be reflected wherever the areas are declared dark/grey from groundwater development.

- (xiii) Study on subsidence, measures for mitigation/prevention of subsidence, modelling subsidence prediction and its use during mine operation, safety issues.
- (xiv) Detailed water balance should be provided. The breakup of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the competent authority in the State Govt. and impacts vis-à-vis the competing users should be provided.
- (xv) Impact of choice of mining method, technology, selected use of machinery - and impact on air quality, mineral transportation, coal handling & storage/stockyard, etc, Impact of blasting, noise and vibrations.
- (xvi) Impacts of mineral transportation – within and outside the lease/project. The entire sequence of mineral production, transportation, handling, transfer and storage of mineral and waste, and their impacts on air quality should be shown in a flow chart with the specific points where fugitive emissions can arise and the specific pollution control/mitigative measures proposed to be put in place. Examine the adequacy of roads existing in the area and if new roads are proposed, the impact of their construction and use particularly if forestland is used.
- (xvii) Details of various facilities to be provided in terms of parking, rest areas, canteen, and effluents/pollution load from these activities. Examine whether existing roads are adequate to take care of the additional load of mineral and their impacts.
- (xviii) Examine the number and efficiency of mobile/static water sprinkling system along the main mineral transportation road within the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality.
- (xix) Impacts of CHP, if any on air and water quality. A flow chart of water use and whether the unit can be made a zero-discharge unit.
- (xx) Conceptual Final Mine Closure Plan along with the fund requirement for the detailed activities proposed there under. Impacts of change in land use for mining operations and whether the land can be restored for agricultural use post mining.

Table 1 Stage-wise Cumulative Plantation

S.N	YEAR*	Green Belt		External Dump		Backfilled Area		Others (Undisturbed Area / etc)		TOTAL	
		Area (ha)	No. of trees	Area (ha)	No. of Trees	Area (ha)	No. of Trees	Area (ha)	No. of Trees	Area (ha)	No. of Trees
1.	1 st year										
2.	3 rd year										
3.	5 th year										
4.	10 th yr										
5.	15 th yr										
6.	20 th yr										
7.	25 th yr										
8.	30 th yr										
9.	34 th year (end of										

	mine life)									
10	34-37 th Year (Post-mining)									

*As a representative example

- (xxi) Occupational health issues. Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be furnished.
- (xxii) Details of cost of EMP (capital and recurring) in the project cost and for final mine closure plan. The specific costs (capital and recurring) of each pollution control/mitigative measures proposed in the project until end of mine life and a statement that this is included in the project cost.
- (xxiii) Integrating in the Env. Management Plan with measures for minimising use of natural resources – water, land, energy, raw materials/mineral, etc.
- (xxiv) R&R: Detailed project specific R&R Plan with data on the existing socio-economic status (including tribals, SC/ST) of the population in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with the schedule of the implementation of the R&R Plan.
- (xxv) CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project.
- (xxvi) **Public Hearing should cover the details as specified in the EIA Notification 2006**, and include notices issued in the newspaper, proceedings/minutes of public hearing, the points raised by the general public and commitments by the proponent made should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.
- (xxvii) Status of any litigations/ court cases filed/pending in any Court/Tribunal on the project should be furnished.
- (xxxvi) Submission of sample test analysis of: Characteristics of coal - this includes grade of coal and other characteristics – ash, S and heavy metals including levels of Hg, As, Pb, Cr etc.
- (xxxviii) Copy of clearances/approvals – such as Forestry clearances, Mining Plan Approval, NOC from Flood and Irrigation Dept. (if req.), etc.

(A) Forestry Clearance

Total ML / Project Area (ha)	Total Forest Land (ha)	Date of FC	Extent of forest land	Balance area for which FC is yet to be obtained	Status of appl. for diversion of forestland
		If more than one, provide details of each FC			

M

(B) Mining Plan / Project Approval: Date of Approval of Mining Plan/Project Approval: Copy of Letter of Approval of Mining Plan/Project Approval

(xxxviii) Corporate Environment Responsibility:

- a) The Company must have a well laid down Environment Policy approved by the Board of Directors.
- b) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.
- c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.
- d) To have proper checks and balances, the company should have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.

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adjacent Utkal-C and Utkal-B1 blocks, it is expected that this nala will be diverted at further upstream by owners of adjacent blocks.

Other small streams entering into the property from east are proposed to be diverted by Hingula Expansion OCP.

There are ponds and wells all around the property. One small reservoir towards south is shown in topographical map used for irrigation. With resettlement of villages, these will not be required anymore.

Water coming from outside property will be diverted without using to original destination, Singhada Jhor River. Settling pond is proposed just before release of water into the river.

8.3 Post Closure Water Quality Management

The development of the open pits, stockpiles, waste rock dumps, CHP and infrastructure often interrupt some of the natural drainage paths. Interference with drainage patterns may result in deprivation of water to drainage systems downstream of the mining developments or localised shadowing effects on some vegetation which may be reliant on intermittent flows. Furthermore, chemical reactions in waste rock have the potential to be detrimental to plant growth and to result in contamination of both surface and groundwater. In addition, mining and processing operations, transport, store and use a range of hazardous materials including fuels, process reagents, lubricants, detergents, explosives, solvents and paints. If these materials are not properly managed, they may have the potential to cause atmospheric, soil or water contamination and could potentially pose ongoing risks to human health and the environment.

In proposed project, Singada Jhor and other seasonal stream are flowing through mine boundary. It is therefore necessary to take proper diversion of stream during the operation so the downstream users may not be affected.

At the time of mine closure all the activity must have been stopped and hence chances of contamination are very less but it is again necessary to monitor the ground water quality and river water quality so that any change in quality can be detected.

8.3.1 Drainage arrangement for external OB dump

- **Catch Drain**

An open drain of appropriate size is provided on all terraces at the foot of next bench to receive the storm water from upper benches. This is then discharge to the lower benches through masonry chute, thus minimizing gully formation in the slope of external dump.

- **Foot Drain**

A foot drain of proper size is provided around the external OB dump (portion exposed to outside only). This drain collects run-off from dump and direct it to settling tank/sedimentation pond before discharge to nearby natural watercourses.

8.3.2 Drainage arrangement for internal OB dump

- During working stage, the run-off is collected from internal dump by foot drain for diverting to mine sump for pumping.
- In the post-mining period, the drainage pattern of the reclaimed area will be such that the run-off will be diverted to final void of the quarry as a measure for water harvesting.

8.3.3 Post Closure Air Quality Management

Legislative Framework

Air quality is managed through a framework established under Environmental Protection Act 1986. There are two notification under which air quality standards are governed in coal mining area:

- Notification No. GSR 742(E), Dt: 25th September 2000 also known as coal mine standards
- Notification No. GSR 826(E), Dt: 16th November 2009 also known as National Ambient Air Quality Standard.

Since at the time of closure of mine, no mining activity is taking place, so, coal mine standard is not applicable and only NAAQS-2009 is applicable. In relation to the coal mine projects the key contaminant of concern is particulate matter. Relevant air quality objective in relation to particulate matter at sensitive receptor is $PM_{10} < 100 \mu\text{g}/\text{m}^3$, $PM_{2.5} < 60 \mu\text{g}/\text{m}^3$ respectively. Loose soil through wind erosion may only be the source of particulate matter at the time of closure. To deal with wind erosion problem, technical reclamation and biological reclamation of overburden (OB) is the best way. In biological reclamation of external OB dumps and internal OB dumps they are stabilized by covering and planting of native plants and grasses. The area must be regularly monitored at least monthly once to check the status of air quality in initial period of closure.

8.4 Waste Management (Figures in Mcum) (Tentative)

Year/Stage (Life of the mine plus post closure period)	OB Removal (Cumulative)			External Dump (Cumulative)		Internal Backfilling (Cumulative)		Embankment (Cumulative)	
	Top soil	OB	Total	Top soil	OB	Top soil	OB	Top soil	OB
Up to Base Year*	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Y-1, Core-1	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Y-3, Prod-1	0.84	0.81	13.65	0.84	0.57	Nil	0.04	Nil	Nil
Y-5, Prod-2	1.58	49.78	51.32	1.52	33.92	Nil	15.88	0.04	0.15
Y-10, Prod-8	1.61	302.16	203.77	1.35	87.48	2.22	114.71	0.04	0.15
Y-15, Prod-13	2.58	716.02	370.92	2.43	88.13	1.43	237.83	0.04	0.15
Y-20, Prod-18	3.07	401.54	404.01	2.38	39.83	1.66	368.25	0.04	0.15
Y-25, Prod-23	3.08	479.81	482.89	0.26	0.00	2.79	479.98	0.04	0.15
Y-30, Prod-28	3.11	544.85	548.05	0.25	0.00	2.88	545.21	0.04	0.15
Y-35, Prod-34	3.14	610.54	613.18	0.25	0.00	2.65	608.88	0.04	0.15
Post closure									
Y-38, PC-3	3.14	610.54	613.18	0.00	0.00	3.10	609.88	0.04	0.15

8.5 Top Soil Management (Including Action plan for Top Soil Management) (Tentative):
(All Figures are cumulative and in MM³)

Year/Stage (Life of the mine plus post closure period)	Top soil removal plan	Top Soil Used				
		Spreading over embankment	Spreading over backfill area	Spreading over external OB dump area	Used in Green Belt area	Total utilized
Up to Base Year*	Nil	Nil	Nil	Nil	Nil	Nil
Y-1, Core-1	0.08	0.00	0.08	0.00	0	0.08
Y-3, Prod-1	0.84	0.00	0.08	0.08	0.00	0.98
Y-5, Prod-2	1.04	0.04	0.00	0.55	0.00	1.11
Y-10, Prod-8	1.61	0.04	0.22	0.58	0.00	1.15
Y-15, Prod-13	2.58	0.04	1.46	0.06	0.00	2.48
Y-20, Prod-18	3.07	0.04	1.83	0.04	0.00	2.63
Y-25, Prod-23	3.08	0.04	1.64	0.56	0.00	2.93
Y-30, Prod-28	3.11	0.04	1.87	0.06	0.00	2.65
Y-35, Prod-34	3.14	0.04	1.70	0.08	0.00	2.69
Post closure						
Y-38, PC-3	3.14	0.04	2.15	0.66	0.00	3.14

No permanent external dump is proposed and temporary surface dump will be re-handled from Yr-13. Running stock of top soil at stock yard is 0.45 Mcum.

8.6 Management of Coal Rejects

There may be rejects from coal seams while extracting with surface miner. Quantity has not been estimated but percentage of such reject generated in adjacent Hingula mine is 8-9%. Such reject will be dumped in specified area within internal dump. Height of such reject stack will not be more than 10m. Such reject area will be quickly covered with other non-combustible OB material. Such stacks will not be continued more than 50m in the direction of backfilling advance. After filling with non-combustible OB for 100m, a new stack may be formed. Objectives of such operation are –

1. Prevent spontaneous combustion by not allowing such rejects to come in contact of air for long time
2. Prevent dump slope failure by not causing slippage planes to form

Devasish Roy
4/5/23
देवाशिस रॉय
महा इन्जिनियर (उत्खनन)
विभागाध्यक्ष (जे.एच.ए.)
सी.एम.पी.सी. आर्ट, डी. सं-7
भुवनेश्वर (ओडिशा)

8.7 Restoration of Land used for Infrastructure

Sl	Type of infrastructure	Status post final closure
1	Rail corridor of MCRL	This will be owned and maintained by separate companies and will continue to serve coal blocks at south-west area of the Talcher coal field. The siding lines will be dismantled.
2	Coal handling Plant	To be dismantled totally
3	Workshops & Stores	To be dismantled totally
4	Surface Roads	To be handed over to State Government in good condition who is supposed to maintain also.
5	Offices & ancillary buildings	As life of buildings are considered 60 years, these will be in useable condition. These may be handed over to any organization interested with acceptance of renovation and maintenance at their own expense
6	Electric poles, cables, sub-stations	These will be used by other nearby projects of MCL if suitable. Rest will be disposed of as per extant rules of the company.
7	Township	As life of buildings are considered 60 years, these will be in useable condition. These may be handed over to any organization interested with acceptance of renovation and maintenance at their own expense

8.8 Disposal of Mining Machinery

Disposal will be as per rules laid down by the holding company Coal India Limited, whose one subsidiary is MCL, who is owner of the mine.

8.9 Safety & Security

Measures to be implemented to prevent access to surface opening for underground working, excavation, etc.

8.10 Abandonment Cost and Financial Assurance

8.10.1 Abandonment Cost: Cost of Activities to be taken up for closure of the mine

	Head	Unit	Quantity	Rate Rs/unit	Amount "Rs Cr"
Progressive Closure	Drinking Water Quality Management for life of 36 years	No/Yr	36	8295	1.20
	Surface Water Quality Management	No/Yr	8	9551	0.33
	Effluent Water Quality Management	No/Yr	48	2387	0.47
	Water Quality Management Total				1.89
	Air Quality Management	No/Yr	96	37592	12.99
	Waste Management	Rs/cum	Regular activity, so not considered		
	Barbed Wire fencing around dump	Rs/m	Not proposed		
	Barbed wire fencing around the pit	Rs/m	13000	700	0.91
	Filling of void – Re-handling of crown dump	Rs/cum	23.99 Mcum	77	184.72
	Top soil management	Rs/cum	3.14 Mcum	5.00	3.14
	Technical & Biological reclamation of mined out of land and OR dump	Rs/ha	470.69	50000	23.53
	Plantation over virgin area including green belt	Rs/ha	109.97	34000	3.74
	Manpower cost and supervision	Persons/Yr	11	40000	15.84
	Tie wall around the dump	Rs/m	9252	3300	3.05
Garland drain	Rs/m	17484	4000	6.99	

	Head	Unit	Quantity	Rate Rs/unit	Amount "Rs Cr"
	Garland drain around the dump	R/s/m	5252	4000	3.70
	Any other activity - River & Nala Diversion	R/s/m	6172	38577	23.81
Dismantling of infra-structure & decommissioning/rehabilitation of mining machinery	Dismantling of workshop	R/s/qm	504401	630	32.26
	Rehabilitation of the dismantled facilities	To be sold as scrap			
	Dismantling of pumps and pipes / other facilities	R/s/qm	3500	630	0.22
	Dismantling of stowing bunker, provisioning of pumps for bore well pumping arrangement		Not Required		
	Dismantling of UG equipment		Not Required		
	Rearranging water pipeline to dump top, park/agricultural land	LS	LS	LS	0.25
Safety & security	Barbed wire fencing around dump	R/s/m	Not proposed		
	Barbed wire fencing around the pit		0.91 crs as given above		
	Barbed wire fencing with masonry pillars	R/s/m	Not proposed		
	Concrete wall with masonry pillars around the pit	R/s/m	3857	3700	1.43
	Securing air shaft and bore well pump		Not Required		
	Securing of incline		Not Required		
	Concrete wall fencing around the water body		Not Required		
	Boundary wall around the water body		Not Required		
	Stabilization (viz berthing, pitching etc) of side walls of the water body		Not Required		
	Toe wall around the dump		3.08 crs as given above		
	Garland drain		0.40 crs as given above		
	Garland drain around the dump		4.08 crs as given above		
	Drainage channel from main OB dumps	R/s/m	500	4000	0.20
Technical & biological reclamation of mined out land and OB dump	Filling of void	No proposal to bring OB from outside			
	Top soil management	Rs.38.00 crs as given above			
	OB re-handling for backfilling	Rs.474.71 crs as given above			
	Terracing, blanketing with soil and vegetation of external dump	LS			2.75
	Peripheral road, gates, view point, cemented steps on bank	LS			5.00
	Expenditure on development of agricultural land	LS			5.00
	Landscaping and plantation	R/s/ha	300	50000	15.00
Post closure management and supervision	Power cost	R/s/MW/Yr	300	29009	2.34
	Post mining Surface water quality management	No/Yr	8	9551	0.02
	Post mining Effluent water quality management	No/Yr	48	2367	0.03
	Total of water quality management				0.05
	Post mining air quality management	No/Yr	96	37592	1.08
	Subsidence monitoring for 5 years		Not Required		
	Waste management (levelling, grading, plantation)	R/s/ha	300	1500000	45.00
	Filling of void – Re-handling of crown dump	R/s/cum	37.68 Mcum	77	289.98
Others	Manpower cost and supervision	R/s/Pers/Yr	25	400000	3.00
	Entrepreneurship development (vocational/skill development training) for sustainable income of affected people	R/s/Pers	148	100000	4.75
	Golden handshake/retranchment benefits to 100 employees of OC	MDO mode of mine operation, Company staff will be re-deployed in other facilities of MCL			
			Not Required		

देवाशिस सिंह

महा इन्जीनियर (उत्खनन)
विभागप्रमुख (प्रा. एवं. अ.)
सी.एम.पी.डी. हाई, शे. नं-7
अजमेर (राजस्थान)

	Head	Unit	Quantity	Rate Rs/unit	Amount "Rs Cr"
	Online financial grant to societies/institutions/organizations which is dependent on the project	Rs/est/Org	14	500000	0.70
	Provide jobs in other mines of the company	Own staff to be retained and re-deployed			
	Continuation of other services like running of schools etc.	Rs/Sch/Yr	1	500000	0.50
TOTAL					693.54

8.10.2 Financial Assurance: Amount to be deposited in Escrow account

(As a security against the mine activities to be carried out for the closure of the mine)

WPI as on	Apr-19	121.1
WPI as on base date extrapolated	Apr-22	126.3
Escalated rate of Closure cost		1.0429
	UG	OC
Base Rate of Closure Cost "Rs. Crs./Ha"		0.0900
Closure Cost "Rs. Crs./Ha"		0.0939
Project Area "Ha"		1111.85
Amount to be deposited into Escrow Account "Rs. Crs."		104.3594
Amount already deposited in Escrow Account "Rs. Crs."		0.00
Net Amount to be deposited in Escrow Account "Rs. Crs."		104.3594
Rate of compounding of Annual Closure Cost		5.00%
Balance Life of the project "in Yrs"		39
Annual Closure Cost "Rs. Cr."		2.8989
"In Crs"		277.82

Year	OC	Year	UG	Total
Rupees in Lakhs				
1	289.8871			289.8871
2	304.3815			304.3815
3	319.6006			319.6006
4	335.5806			335.5806
5	352.3596			352.3596
6	369.9778			369.9778
7	388.4785			388.4785
8	407.9003			407.9003
9	428.2953			428.2953
10	449.7101			449.7101
11	472.1958			472.1958
12	495.8054			495.8054
13	520.5957			520.5957
14	546.6255			546.6255
15	573.9668			573.9668
16	602.6546			602.6546
17	632.7873			632.7873
18	664.4267			664.4267
19	697.6480			697.6480
20	732.5304			732.5304
20	732.5304			732.5304
22	807.6147			807.6147
23	847.9854			847.9854
24	890.3952			890.3952
25	934.9150			934.9150
26	981.6608			981.6608
27	1030.7430			1030.7430
28	1082.2810			1082.2810
29	1136.3951			1136.3951
30	1193.2149			1193.2149
31	1252.8788			1252.8788
32	1315.5194			1315.5194
33	1381.2954			1381.2954
34	1450.3602			1450.3602
35	1522.8782			1522.8782
36	1599.0221			1599.0221
Total	27781.7189			27781.7189

देवाशिस रॉय

महा प्रबंधक (उत्खनन)
विभागाध्यक्ष (चौ. एवं अ.)
सी.एम.पी.डी. अर्द्ध, सं. सं-7
बनारस (सीकर)

Annexure-IV

Proposed Cost Norm for Dense Plantation through Miyawaki Technique for 1 Ha. @ Wage Rate Rs. 450/- per MD

						Wage Rate	450.00
Sl. No	Head of Account	Period of Execution	Unit	Quantity / Labour in MD	Labour Cost in Rs.	Material Cost in Rs.	Total Cost in Rs. per Ha.
1	2	3		4	5	6	7
	0th Year & 1st Year						
1	Cost of seedlings for 1 Ha = 10000 Sq. Mtr for planting a spacing of 1 mtr. X 1 mtr. with Inspection Path iside (8800 nos., 1 & 1/2 year seedlings including 10% for CR Planting)						
	Total = 8800 Nos.@ Rs. 67.6155/- per seedlings		Nos.	8800	493020.00	101996.40	595016.40
2	Survey, Demarcation & Preparation of Map		MD	2	900.00	-	900.00
3	Marking of Planting Points (1 mtr. X 1 mtr.)		MD	10	4500.00	-	4500.00
4	Soil Testing and Chemical Analysis		LS	-	-	5000.00	5000.00
5	Site Preparation		MD	12	5400.00	-	5400.00
6	Charges for digging up continuous trench upto a depth of 2' by help of JCB @ Rs. 147.73/- per Cum. over 3000 Cum. (100 mtr. X 100 mtr. X 0.6 Cum.) (Rs. 147.73 X 6000 Cum.)		Cum.	6000	-	886380.00	886380.00
7	Mixing up existing Soil with Sand, CDM, Organic Insecticides and preparation of raised bed						
i.	Cost of CDM = 430 Cum.		Cum.	430.00	-	285714.00	285714.00
ii	Cost of Sand = 430 Cum.		Cum.	430.00	-	166100.00	166100.00
iii	Cost of Bio Insecticide (LS) @ Rs. 40 per Kg.		Kg.	800.00	-	32000.00	32000.00
iv	Labour Charge for mixing @ 20 MD per Ha.		MD	20	9000.00	-	9000.00
8	Carriage & Planting @ 15 MD per 1000 Nos. including application of bio fertilizer, Bazal Dose		MD	120	54000.00	-	54000.00
9	Mesh Fencing over 400 Rmt. @ Rs. 940 per Rmt.		Rmt.	400	-	376000.00	376000.00
10	Cost of Rice Husk including Transporting Cost @ Rs. 16000 per 560 Sqft. excluding Inspection Path 1000 Sqft.		Sq.Ft	8000	-	228570.00	228570.00
11	Spreading of Rice Husk inside Planting Area (1 Labour for 500 Sq.Mtr.)		MD	20	9000.00	-	9000.00
12	Soil Working & Application of Bio Fertilizer		MD	35	15750.00	-	15750.00
13	Cost of Bio Fertilizer (Vermi Compost) @ 100 gm. per plant @ Rs. 20/- per Kg.		Kg.	800	-	16000.00	16000.00
14	Fire Protection Measures		MD	15	6750.00	-	6750.00
15	Watering November to March @ Rs. 89.40/- per plant over 8000 plants @ 10 days per month		Nos.	8000	-	715200.00	715200.00
16	Watch and Ward for 9 months (July to March) 540 Days		MD	540	2,43,000.00	-	243000.00
17	Contingency for Sign Board		LS	-	-	10000.00	10000.00
	TOTAL				841320.00	2822960.40	3664280.40
18	Add 5% for Monitoring & Supervision				-	183214.02	183214.02
	Grand Total 0th Year & 1st Year				841320.00	3006174.42	3847494.42
	2nd Year Maintenance						
1	Casualty Replacement (10 %)						
i	Cost of 10% = 800 nos. of Seedlings @ Rs. 67.6155/- per seedlings		Nos.	800	44820.00	9272.40	54092.40
ii	Pitting & Replacement		MD	10	4500.00	-	4500.00
2	Soil Working = 17.5 MD & Manuring = 17.5 MD		MD	35	15750.00	-	15750.00
3	Cost of Bio Fertilizer (Vermi Compost) @ 100 gm. over 8000 plants @ Rs. 20/- per Kg.		Kg.	800	-	16000.00	16000.00
4	Maintenance of Fencing = 400 Rmt. @ 50/- per Rmt.		Rmt.	400	-	20000.00	20000.00
5	Watering 5 days per month from November to March & April to June @ Rs. 71.52/- per plant		Nos.	8000	-	572160.00	572160.00
6	Fire Protection Measures		MD	15	6750.00	-	6750.00
7	watch and Ward for whole year		MD	720	3,24,000.00	-	324000.00
8	Contingency (Sign Board Repair & Photography)		LS	-	-	5000.00	5000.00
	TOTAL				395820.00	622432.40	1018252.40
9	Add 5% for Monitoring & Supervision					50912.62	50912.62

Sl. No	Head of Account	Period of Execution	Unit	Quantity / Labour in MD	Labour Cost in Rs.	Material Cost in Rs.	Total Cost in Rs. per Ha.
	Grand Total 2nd Year Maintenance				395820.00	673345.02	1069165.02
	3rd Year Maintenance						
1	Soil Working		MD	35	15750.00	-	15750.00
2	Maintenance of Fencing = 400 Rmt. @ 100/- per Rmt.		Rmt.	400	-	40000.00	40000.00
3	Spreading of Rice Husk on Top Layer		Sqft.	8000	-	234296.00	234296.00
4	Fire Protection Measures		MD	15	6750.00	-	6750.00
5	watch and Ward for whole year		MD	720	3,24,000.00		324000.00
	TOTAL				346500.00	274296.00	620796.00
6	Add 5% for Monitoring & Supervision					31039.80	31039.80
	Grand Total 3rd Year Maintenance				346500.00	305335.80	651835.80
	4th Year Maintenance						
1	Maintenance of Fencing = 400 Rmt. @ 100/- per Rmt.		Rmt.	400	-	40000.00	40000.00
2	Fire Protection Measures		MD	15	6750.00	-	6750.00
3	watch and Ward for whole year		MD	720	3,24,000.00		324000.00
	TOTAL				330750.00	40000.00	370750.00
4	Add 5% for Monitoring & Supervision					18537.50	18537.50
	Grand Total 4th Year Maintenance				330750.00	58537.50	389287.50
	Grand Total Project Cost				1914390.00	4043392.74	5957782.74

Abstract		
Year of Maintenance		Amount
1st Financial year	Rs.	3847494.42
2nd Financial year	Rs.	1069165.02
3rd Financial year	Rs.	651835.80
4th Financial year	Rs.	389287.50
Total		5957782.74

Say OR Rs. 59,57,800/- per ha

By fax/E-mail 53

CCF (CAMPA)

GOVERNMENT OF ODISHA
FOREST & ENVIRONMENT DEPARTMENT

PAL CHIEF CONSERVATOR OF FORESTS
ODISHA, BHUBANESWAR
25 MAY 2020
Recd. No. 17195

No. FE-DIV-MISC-0007-2018-3872 /F&E, Date 19.02.2020

10F(Con) 87/2018

From

Sri Debidutta Biswal, IFS

Special Secretary to Government

To

The Chief Executive Officer, CAMPA

O/o the Principal Chief Conservator of Forests, Odisha,

Bhubaneswar,

Sub: Proceedings of the 17th Meeting of State Level Steering Committee of Compensatory Afforestation Fund Management and Planning Authority (State Authority), Odisha held on 11.02.2020 at 12.45PM in the 2nd Floor, Conference Hall of Lokseva Bhawan under the Chairmanship of Chief Secretary, Odisha.

Sir,

I am directed to invite a reference to the subject cited above and to enclose herewith approved copy of proceedings of the 17th Meeting of State Level Steering Committee of Compensatory Afforestation Fund Management and Planning Authority (State Authority), Odisha held on 11.02.2020 at 12.45PM in the 2nd Floor, Conference Hall of Lokseva Bhawan under the Chairmanship of Chief Secretary, Odisha with a request to circulate the same to all concerned.

Yours faithfully


M
19/02/2020

Special Secretary to Government

P. T. O.


Memo No. 3873 /F&E, Date 19.02.2020

Copy with copy of the enclosures as above forwarded to the Principal Chief Conservator of Forests, Odisha, Bhubaneswar for information & necessary action.

 19/02/2020
Special Secretary to Government

Memo No. 3874 /F&E, Date 19.02.2020

Copy with copy of the enclosures as above forwarded to the PS to Additional Chief Secretary, Forest & Environment Department for kind information of Additional Chief Secretary.

 19/02/2020
Special Secretary to Government

Proceedings of the 17th Meeting of State Level Steering Committee of Compensatory Afforestation Fund Management and Planning Authority (State Authority), Odisha held on 11.02.2020 at 12.45 PM in the 2nd Floor Conference Hall of Lokaseva Bhawan under the chairmanship of the Chief Secretary, Odisha.

The meeting was presided over by the Chief Secretary, Odisha & Chairperson, State Level Steering Committee of the Compensatory Afforestation Fund Management and Planning Authority (State Authority), Odisha. The members of Steering Committee who attended the meeting are at **Annexure-I**.

The meeting started with the welcome address by the Principal CCF & HoFF, Odisha. While highlighting the actions taken on the proceedings of the last meeting, the Principal CCF & HoFF informed the house that all observations have been duly complied. Addl Chief Secretary highlighted the developments taken in CAMPA especially formation of State Authority, fund position in CAMPA, broad frame work of the APO 20-21.

With the permission of the chair, the Chief Executive Officer, State Authority, Comp. Affn. Fund, Odisha made a brief Presentation on the agenda items.

Proposals of APO 2020-21

A. Fund position :

The Chief Executive Officer informed the committee on the fund position available with State Authority. Pursuant to Provisions of Rule 39 of CAF Rules, 2018, the APO 2020-21 has been formulated by the State Authority. The present fund position is given below:

Amount Received from National Authority after reconciliation upto 07.02.2019	Rs.5933.89 Cr
Amount deposited by User Agencies from 08.02.2019 to 31.10.2019	<u>Rs.271.82 Cr</u>
Total:	Rs.6205.71 Cr
Amount Budgeted for APO 19-20 (-)	<u>Rs.600 Cr</u>
Balance:	Rs.5605.71 Cr
Interest Accrued from treasury bill investment as estimated by 05.03.2020	<u>Rs.143.63 Cr</u>

Total Fund Available:

Rs.5748.34 Cr

(b) Details of Area under Compensatory Afforestation:

Total area diverted upto Sep 2019	55534.3998 ha
Stipulation of Comp Affn upto Sept 2019	72606.5706 ha
Achievement upto Sep 2019	64135.268 ha
Balance Area to be covered	8471.3026 ha
Proposed area for Comp. Affn in APO 2020-21	4355.35 ha
Area to be covered in APO 2021-22	4000 ha

(c) Details of Outlay of APO 20-21:

1. CA, PCA:

The Chief Executive Officer informed the committee that under this APO, a budget provision of Rs.75.01 Crore is required to take up 237.64 ha Block Plantation (AR), 2548.08 ha ANR with gap, 458.68 ha ANR without gap, 974.724 ha Bald Hill, 5050 Nos. saplings plantations, ancillary works in 146.83 ha and 2nd, 3rd, 4th, 5th & 6th year maintenance of previous years plantations and preliminary operations for 21-22 plantations.

2. Regional WL Management & Site Specific WL Conservation Plan:

Funds have been provisioned for implementation of Regional Wildlife Management Plan and implementation of Site Specific Wildlife Conservation Plan (9 new site specific plans and 74 ongoing plans) to the tune of Rs.5.00 Crore and Rs.31.42 Crore respectively.

3 Under 80% of NPV:

A. PLANTATION ACTIVITIES:

Plantations over an area of 44050 ha will be taken up in APO 2020-21 with financial outlay of Rs.149.21 cr. Details are as follows:

Block Plantation -	1500 Ha.
Bald Hill Plantation-	1000 Ha.
Fodder and fruit bearing species plantation-	550 Ha.

Bamboo plantation @400 / Ha. - 1000 Ha.

ANR with Gap - 40,000 Ha.

Total: 44050 Ha.

1557

B Apart from plantations, Bamboo SSO over 75,000 ha and SMC over 6,650 ha activities will be taken up with financial outlay of Rs.17.88 crore & Rs.20.62 crore respectively in this APO. Maintenance of old plantations will also be taken up with an outlay of Rs.62.56 crore.

C Wildlife Management :

(i) Wildlife Management activities like relocation of villages from protected areas, animal rescue center, wood-saving cooking appliances, management of biological diversity and resources, distribution of fuel saving devices etc. in the wildlife areas will be carried out exclusively. A provision of Rs.20.25 Crore has been made in this APO

(ii) creation and maintenance of meadow, rejuvenation of wildlife corridors, creation of water body, maintenance of old plantations, etc. has been provisioned at a outlay of Rs.18.61 Crore.

(iii) SMC works like LBCD, staggered trench, graded bund, WHS etc. under Wildlife has been kept at Rs.6.42 Crore

(iv) Protection of Wildlife habitats through deployment of anti-depredation squad, equipments, mobility, erection trench and fence, etc. at Rs.49.32 Crore.

(v) For protection from fire in **Wildlife Divisions**, the outlay for Rs.6.47 Crore has been made for fire squads, equipments, fire line etc.

Thus for wildlife habitats a provision of Rs.101.07 Cr has been made under 80% NPV.

D Ama Jungle Yogana: This is a VSS based plantation and protection activity being proposed in 23 divisions covering 580 Vana Samrakshna Samithies with an outlay of 72 Cr.

E FOREST PROTECTION:

(i) **Forest Protection** is one of the key interventions under CAMPA. The main activities proposed in this category are deployment of Forest Protection Squads in 32 vulnerable sites in 24 Divisions. Provision of Coordination cells to ensure the protection at State Headquarters to receive and transmit the information from Divisions and different parts of the State and transmission of the same to

appropriate quarters for taking immediate necessary action by the field functionaries have been made with a total of Rs.9.29 Crore

(ii) **Fire Protection:** For management of forest fire in the state, 216 squads are proposed to be deployed in 37 Forest Divisions. It includes creation and management of fire lines, awareness programs for the people living in the immediate vicinity of the forest to protect the forest from fire, etc. An amount of 21.84 Cr. is proposed under fire protection.

(iii) **Involvement of VSS in Forest Protection:** This is a new activity proposed in the Plan to incentivize the VSS who are doing exceptional work for forest protection. Under this an amount of 10 Cr is proposed. A total outlay of 41.14Cr has been made for protection.

4. ACTIVITIES UNDER 20% OF NPV FUND

A. **INFRASTRUCTURE DEVELOPMENT:**

The requirement of Infrastructure development of the Deptt. is highly essential for growing of nurseries, accommodation of frontline staff and their movement in management of forest and wildlife. Hence, the provisions made in the present APO include maintenance of Mega/Permanent nurseries, construction of Range Offices, Range Officer's residence, Forester & Forest Guard quarters, Seizure yard, construction of Boundary wall, Forest Road, Culvert, Cause Way and tube-well for drinking water facility. A budget of **Rs. 56.01 Cr.** has been earmarked under the component infrastructure development.

Under **Wildlife**, for strengthening communication facilities, construction of infrastructure for protection of wildlife, an amount of **Rs.16.18 crore** has been made in this APO.

Thus, a total provision of **Rs. 72.19 Crore** under Infrastructure Development has been made in this APO.

B. **RESEARCH:**

The main activities proposed under Research are production of QPM, maintenance of plus trees (old), ex-situ conservation of *Mesua ferrea*, maintenance of *Santalum album* plantation with different host species, maintenance of hi-tech nursery and other nursery, creation of sample plots in RET seedling plantation, logistic support for research activities, for this an outlay of **Rs.2.20 Cr** is proposed in APO 2020-21.

Under **Wildlife**, conservation, sustainable use and documentation of biodiversity, preservation of habitat etc., an amount of **Rs.1.5 crore** has been made in this APO.

Thus, a total provision of **Rs. 3.70 Crore** under Research has been made in this

C. DEVELOPMENT OF TRAINING CAPACITY OF TRAINING COLLEGE/SCHOOLS:

As regards training of frontline staff in Odisha Forest Rangers College, Angul, Forester's Training Schools at Bhubaneswar, Champua and G. Udayagiri, a provision of **Rs.4.00 Cr.** has been proposed for development campus, procurement of training equipment and for the training programmes.

D. CAPACITY BUILDING:

To develop capacity building of the frontline staff, training programmes in different divisions are being conducted by resource persons to update the skill of Scientific Management of Forest & Wildlife for which a provision of **Rs.1.00 crore** has been kept in this APO.

Under **Wildlife**, awareness, training and capacity building, an amount of **Rs.0.75 crore** has been made in this APO.

Thus, a total provision of **Rs. 1.75 Crore** under Capacity Building has been made in this APO.

E. FOREST IT & GEOMATICS AND WORKING PLAN EXERCISE:

CAMPA funds are being utilized for digitization of delivery process of governance. A website for forest organization has already been developed to facilitate smooth up-gradation of Forest IT. Digitization of forest boundary is going on in different Divisions. The financial outlay for the above purpose under APO 2020-21 has been kept at **Rs.20.00 crore.**

F. MONITORING & EVALUATION:

At present the Forest Range Officers are over burdened with multifarious works like implementing different schemes, uploading data in e-Green watch, CAMPA tracker & accounting, monitoring of the said schemes etc. For the above works one support staff who is well conversant with data management and analysis is essential for each Range Office.

As per CAMPA guidelines, all the activities of previous operations carried out under CAMPA are being monitored and evaluated by an independent 3rd party organization to assess the quality of works already undertaken as well as effective utilization of funds.

As per Campa rules, there will be a robust internal monitoring for the activities that will be taken up in 2020-21. For this, a provision of **Rs.5.00 crore** has been kept in APO 2020-21.

Under **Wildlife**, provision for monitoring and evaluation, an amount of **Rs.0.50 crore** has been made in this APO.

Thus, a total provision of **Rs. 5.50 Crore** under Monitoring and Evaluation has been made in this APO.

UTILIZATION OF INTEREST MONEY:

The Chief Executive Officer apprised the committee about the utilization of interest money. As per Rule 6 (a) & (b) of CAF Rule 2018, the interest accrued on monies in State Fund shall be used i.e. not less than 60% towards conservation and development of forest and wildlife, plantation & protection related activities & not more than 40% for development and management of state authority office, procurement of office equipment and other contingencies of State Authority. Accordingly, the following activities have been included in the present APO.

UNDER 60% ACTIVITY.

Special Project:

a. Miyawaki Plantation:

This is a Japanese technique of raising plantation in a highly degraded forest land. The plantation of Indigenous Forest Species is taken up in close spacing of 1mt X 1mt. The plantation is designed in such a manner that the different canopy cover is maintained so as to produce maximum biomass and species diversity. An area of 3.5 Ha. has been identified in 4 divisions , namely Malkangiri, Koraput, Kalahandi North and Sambalpur Divisions for **Rs.1.30 crore**.

b. Sowing of Bamboo Seed:

To augment fodder availability for wildlife and restocking the forests, it has been proposed to sow 1030 Ha. with Bamboo seeds with an outlay of **Rs. 0.25 Cr.**

c. Orchidarium:

Similpal Forest is the home of a number of rare Orchids. Due to effect of climatic change and other anthropogenic factors the species are depleting fast. In order to conserve this, 3 sites have been identified in Similpal and is proposed to take up the same with budget outlay of **Rs.0.30 Cr.** The Executive Committee allowed to take up 1 site at Patabill in Similpal with intensive interventions at Rs.0.30 crore.

d. Protection and Conservation of Pure Strand & RET species

Some species like Bandhan, Piasal, Rakta Chandan, Chandan, Siali, etc. were in abundance. Due to many climatic and anthropogenic reason the number of such plants have been depleted drastically and now available in degraded state in pockets. In order to improve their status, 12 sites in the state have been identified over an area of 884 Ha. which include 85 ha under ANR gap and 799 ha ANR without gap with vegetative fencing around the targeted areas for their protection and management. Provision for the same has been kept at **Rs.2.37 Cr.**

e. **Raising of Root Trainer Seedling:**

Production of Quality Planting Materials (QPM) adopting scientific and technical method not only meet the demand of Forest Plantation but also reduce the inputs, time. The technique is eco-friendly and use of traditional poly-pots are avoided. Proposal of raising 16.50 lakh seedlings in 11 no. of identified High-Tech Nurseries have been included in this APO at Dhenkanal, Athgarh, Khurda (2), Puri WL, Sambalpur, Athmalik, Kalahandi North, Rajnagar WL (2) and Nayagarh divisions, with a financial layout of **Rs. 2.20 Cr.**

f. **Raising of 18 months old Seedlings:**

The success of plantation mainly depends upon the quality of planting materials. If the seedlings are tall, sturdy and seasoned, the rate of success will be maximum. Keeping in view, it has been proposed to raise 2.0 Cr. seedlings in different permanent Nurseries of the State which shall be used in plantation during 2021-22. An amount of **Rs.36.64 Cr** has been kept for the purpose.

g. **Distribution of Seedlings:**

The distribution of seedlings to the farmers, Institutions, Urban bodies, Panchayat, in past years have significantly helped in increasing tree cover outside forest. To continue the tree plantation initiative by general public raising and distribution of 1.0 Cr. seedlings have been included in APO 2020-21 with an outlay of **Rs.13.10 Cr.**

Para Forest Squad:

To improve the protection scenario of the Forest it has been proposed to engage 195 no. of para protection squads comprising 10 local youth per squad for 12 months with an outlay of **Rs.28.31 crore.**

Strengthening of mobility in all Forest Ranges for protection:

To strengthen the mobility of forest rangers and frontline staffs it has been proposed to engage hired vehicle in 219 ranges having no Govt. vehicles and to make provision for driver and POL in 70 ranges where there is Govt. vehicle. For this purpose, an amount of **Rs.13.13 crore** has been kept in this APO.

Offsetting wage rate enhancement

To offset the escalated expenditure in compensatory afforestation and related activities due to enhancement of wage rate as per provision under rule 6(a) (i), an amount of **Rs.3.00 crore** is kept for the purpose.

UNDER 40% ACTIVITY :

Interest money amounting Rs.20.00 Cr out of accrued interest has been proposed for the following activities:

- i. An amount of **Rs.15.00 Cr.** has been proposed for completion of State Capacity Building Centre (Forest Academy) started under CAMPA APO 2019-20.
- ii. Further, an amount of **Rs.5.00 Crore** has been proposed to meet the Contingency expenditure of State Authority during the next financial year.

The State Level Steering Committee, after due deliberations, approved the Annual Plan of Operation 2020-21. Details of activities vis-à-vis financial outlay under the APO is furnished hereunder.

Sl. No.	Component of Work	Financial Outlay (Rs. in Cr.)		
		Forest	Wildlife	Total
1	CA, Addl.CA, PCA, SZ, 1.5 SZ etc	75.01	0	75.01
2	Integrated Wildlife Management Plan	0		36.42
	(i) Regional Wildlife Management Plan	0	5.00	
	(ii) Site Specific Wildlife Conservation Plan	0	31.42	
Net Present Value (NPV)				
	80% Activities			

5	Bamboo SSO	17.88	0	17.88
6	Soil & Moisture Conservation	20.62	6.42	27.04
7	Forest Protection	41.14	55.79	96.93
8	Wildlife Management	0	20.25	20.25
9	Ama Jangala Yojana	72.00	0	72.00
	Total 80%	363.41	101.07	464.48
	20% Activities			
10	Infrastructure Development	56.01	16.18	72.19
11	Research and Development	2.20	1.50	3.70
12	Devt. of Training capacity of Training College/Schools	4.00	0	4.00
13	Capacity Building	1.00	0.75	1.75
14	Forest IT & Geomatics	20.00	0	20.00
15	Monitoring & Evaluation	5.00	0.50	5.50
	Total 20%	88.21	18.93	107.14
	TOTAL NPV -	451.62	120.00	571.62

Proposal for Utilisation of Interest money

(As per Rule 6 (b) of CAF, Rule 2018)

I	Under 60% Activities	Financial outlay (Rs. in Crore)
1	<ol style="list-style-type: none">1. Miyawaki Pln. – 3.5 Ha.,2. Sowing of bamboo seeds over 1030 ha3. Orchidarium – 1 site,4. Protection of pure strand & RET species – 85 ha ANR with gap, 799 ha ANR without gap with fencing5. Root-trainer seedling – 16.5 lakh,6. Raising of 2 cr no. 18month old seedling for plantation 2020-21,7. Distribution of 6month old seedling- 1cr no.	56.16
2	Para Protection Squad engaging local youth 195 squads.(10 person in each squad)	28.31
3	Strengthening of Range Office for protection through provision of transportation	13.13
4	Offsetting the escalated expenditure due to wage rate enhancement	3.00

	TOTAL 60% Activities -	100.60
II	Under 40% Activities	
1	Construction of State Capacity Building Centre	15.00
2	Expenses for State Authority	5.00
	Total 40% Activities -	20.00
	TOTAL INTEREST	120.60
	Grand Total APO	803.65

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Abstract of outlay of APO 2020-21

Sl.No	Component	Financial Outlay (Rs. in cr.)
1	CA, PCA etc.	75.01
2	i. Regional Wildlife Management Plan	5.00
	ii. Site Specific WL Management Plan	31.42
3	NPV (80% + 20%)	571.62
4	Utilisation of Interest Money (60% + 40%)	120.60
	GRAND TOTAL:	803.65

1. Changes in APO 2019-20

There has been no change in financial outlay of APO 2019-20. However, the Chairman of the Executive Committee of State CAMPA has allowed the following for inclusion in the APO.

- i. Avenue Plantation (Jai Shakti Abhiyan) in Cuttack Forest Division over 76 RKM with financial outlay of Rs.93.57 lakhs, as a measure to recharge ground water to combat the drought situation in Kendrapara district.
- ii. Odisha was affected by a severe cyclonic storm "Fani" during the month of May, 2019 in which the Konark – Balukhand Wildlife Sanctuary of Puri Wildlife Division was severely devastated. In order to restore the greenery and the wildlife habitat, ANR plantation over 400 ha with financial outlay of Rs. 96.76 lakhs.
- iii. In order to get quality planting material (QPM) for 2020-21 plantation, 1,46,42,000 seedlings (48,50,000 seedlings of 18 months old + 97,92,000 seedlings of 6 months old) has been raised under Preliminary Operation.

To carry out the above activities, funds to the tune of Rs.30.00 Crore has been met out of provision made in the approved APO under Plantation activities and Interest fund (Pre-planting Operation for 2020-21 plantation Rs.20.00 Crore + Revision of wage rate Rs.10.00 Crore).

The committee approved the aforementioned activities post-facto.

Chief Secretary-cum-Chairman directed the officials to intensify field level management of the afforestation project under CAMPA. He also stressed on effective implementation of WL Management Plan and growth of bio-diversity. He further directed to enhance the mangrove forest covered in Bhitarkanika area of Kendrapara district. It was further decided to include correction of sagged electric line and other related interventions in the site specific WL Management Plan to minimize man-animal conflict. The Department was also advised to take up bald hill plantation in Koraput, Rayagada, Bolangir and Kalahandi districts.


Chief Secretary

17th STEERING COMMITTEE MEETING OF STATE CAMPA, ODISHA
 Held on 11.02.2020 at 12.45 P.M. under the Chairmanship
 of Chief Secretary, Odisha

Participants

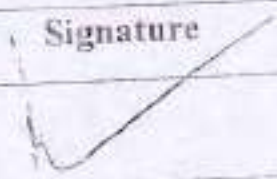
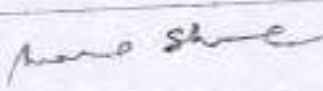
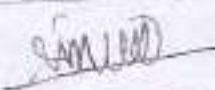
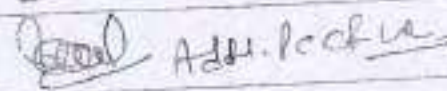
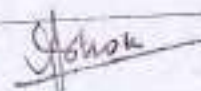


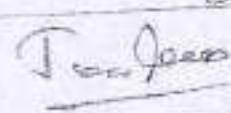

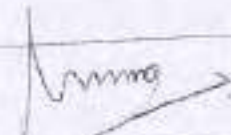
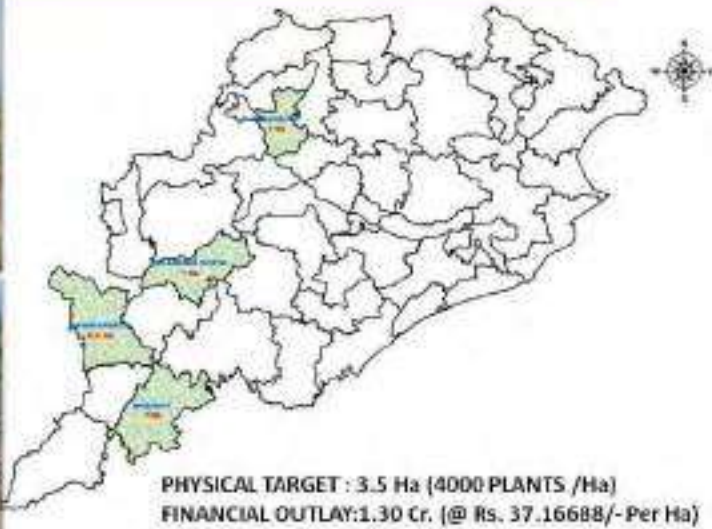
Sl.No.	Members Present	Signature
01	Development Commissioner cum Addl. Chief Secretary	
02	Addl. Chief Secretary to Govt. of Odisha Forest & Environment Department.	
03	Principal Chief Conservator of Forests, & HoFF Odisha.	
04	Principal CCF (Wildlife) & CWLW, Odisha	 Addl. Secy.
05	Principal Secretary to Government, Rural Development Department	
06	Principal Secretary to Government, Agriculture & Farmers Empowerment Department	
07	Principal Secretary to Government, Revenue & Disaster Management Department	
08	Principal Secretary to Govt., Panchayati Raj & Drinking Water Department	Members: Ranjan Kishore Addl. Secy. PR & DW Dept
09	Principal Secretary to Govt., Science & Technology Department	
10	Principal Secretary to Government, Finance Department	
11	The Commissioner-cum- Secretary to Govt. ST & SC Development Department	
12	PCCF cum Project Director OFSDP, Bhubaneswar (special invitee)	
13	Additional Principal Chief Conservator of Forests (Central), Eastern Regional Office, MOEF, Govt. of India	 D I A F (C).
14	Principal Chief Conservator of Forests (Forest Division) & Nodal Officer, O/o the Principal CCF, Odisha	
15	Member Secretary, State Forest Development Agency, O/O PCCF, Odisha	
16	Director & Special Secretary, SC & ST Research & Training Institute, Bhubaneswar	
17	Chief Executive Officer, of the State Authority, as Member Secretary	

Table 2.1.2 DIVISION WISE & LOCATION WISE DETAILS OF MIYAWAKI PLANTATION

Sl No	Name of the Division	Location	Area in Ha.	Fin Target (Lakhs)	Geo Co-ordinates	
1	Sambalpur	Potapali VF	1	37.17	N-21-26-55.56	E-83-55-31.07
2	Kalahandi (N)	Kutrukhai	1	37.17	N19 05 48.3	E83 08 27.8
3	Koraput	Sapara - B	1	37.17	N18.81842	E82.68044
4	Malkangiri	Balimela NAC	0.5	18.58	N 18.22727	E 82.08529
		Grand Total-	3.5	130.08		

DETAILS OF MIYAWAKI PLANTATION PROPOSAL IN APO 2020-21





MCL

Office of the General
Manager (Subhadra Area) NEAR
BIJU MAIDAN Po/Dist: Angul - 759122
(Odisha) Website: www.mcl.gov.in mail
id: gm-subhadraarea@mcl.com
gm-subhadra.mcl@coalindia.in



Ref. No. MCLGM(SA)/2024/793

Date: 24.09.2024

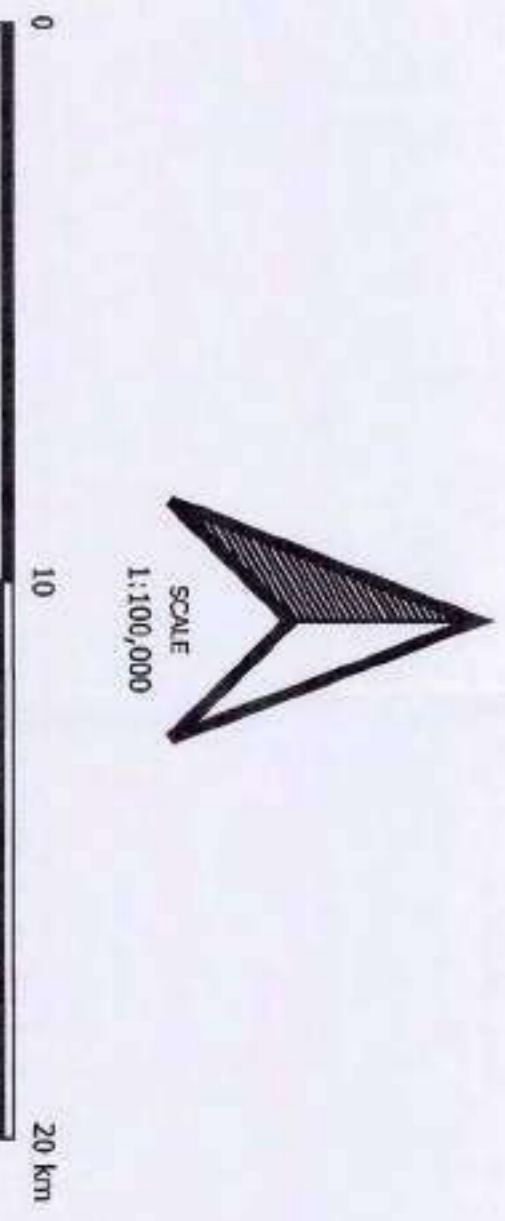
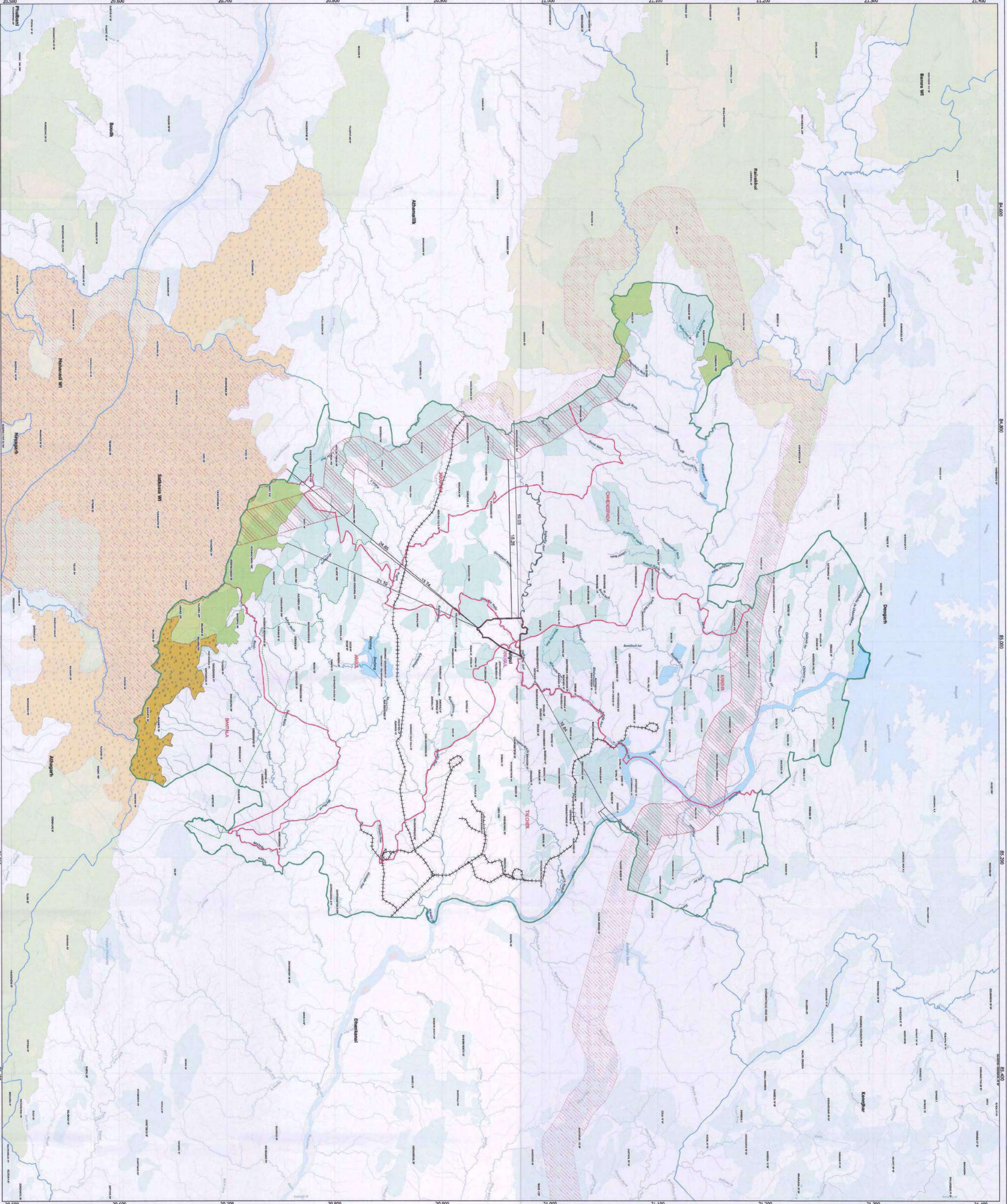
Undertaking Regarding Animal Passage Plan

Subhadra OCP do hereby undertake implementation of the measures mentioned below for the Animal Passage Plan in and around the Subhadra OCP mining lease area in the future.

1. Maintain no mining Zone along this Singhada Jhor Nallah (100m on both sides) total width of the proposed passage 250m (2x100m + 50 m) including the width of the Singhada Jhor Nallah within leasehold area of Subhadra Project
2. Maintain vegetation cover all along the Nallah.
3. Steps are to be taken to keep this nallah free from any garbage especially plastic bottles / Polythene.
4. Motivational drive among the villagers living near to this Nallah. Implement community awareness programs to educate local populations about the importance of wildlife conservation and ways to reduce human-animal conflicts.
5. Extensive SMC measures to be taken along the Nallah to ensure water availability round the year.
6. MCL will ensure that no pollutants and discharge from the mining activity will enter the Nallah.


24.09.24.
नेहा प्रबोधि
General Manager (Subhadra Area)
Subhadra Mining Area
Authorized Signatory

Map showing the distance between the protected area and corridors from the Subhadra OCP Coal Block in the Angul Forest Division.



LEGEND

- Kanherla-Anantapur Corridor
- Division Boundary
- Tiger Corridor
- Sankarajiri Reserve
- Sankarajiri R. Reserve
- Mahanadi R. Reserve
- Mahanadi R. Reserve
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Name of Protected Area	Distance in Km
Proposed ECO SENSITIVE ZONE	13.74
Proposed Mahanadi Reserve	16.84
Proposed Sankarajiri Reserve	21.19
Proposed Mahanadi Reserve	24.85
Proposed Sankarajiri Reserve	15.25

Staff Officer (Env & Forest)
 MCL, Subhadra Area
 Project Head
 Subhadra Coal Mining Ltd, Angul

Range Officer (Env & Forest)
 MCL, Subhadra Area
 Divisional Officer
 Angul Division



OFFICE OF THE DIVISIONAL FOREST OFFICER; ANGUL DIVISION: ANGUL

Letter No. 7648 /Dated. 05-10-2024

To

The General Manager, Subhadra Area,
At./PO/Dist.- Angul, Odisha, Pin- 759122.

Sub: - Proposal for Seeking prior approval of Central Government under section 2 (ii) of the forest (Conservation) Act, 1980 in favour of M/s Mahanadi Coal filed Ltd. for non-forestry use of 125.24 ha forest land for Subhadra OCP Coal mining under Angul Forest Division and District Angul of Odisha State-reg. projects of Subhadra Area.

: - Approved of Site-Specific Wildlife Conservation Plan.

Ref: - Letter No. 11775 dt. 01.10.2024 of PCCF, WL, Odisha, BBSR.

Sir,

With reference to the above-cited subject, it is to inform you that the Site-Specific Wildlife Conservation Plan for the above project, with a financial outlay of Rs. 3236.376 Lakh (Rupees Thirty Two Crore Thirty Six Lakh Thirty Seven Thousand Six Hundred) only as per the details of activities mentioned in Chapter-6 of the Plan implemented by the Forest Department, has been approved by the Principal Chief Conservator of Forests, Wildlife & Chief Wildlife Warden, Odisha, Bhubaneswar vide his letter No. 11775 dt. 01.10.2024 (copy enclosed for your reference). Further, in point No. 02, it has been mentioned that activities in the project area as per Chapter-6 of the approved plan, will be executed by the project proponent under the guidance of the concerned DFO. Further, the User Agency shall deposit 5% of the plan cost over and above in the Account of the society "The Wildlife Odisha" maintained in O/o the P.C.C.F. WL and CWW Odisha, Bhubaneswar towards unforeseen interventions.

Hence, you are requested to deposit an amount of Rs. 3236.376 Lakh (Rupees Thirty-Two Crore Thirty-Six Lakh Thirty-Seven Thousand Six Hundred only) towards the cost of the approved Site-Specific Wildlife Conservation Plan into the State CAMPA fund through the e-portal (<https://parivesh.nic.in>) immediately. Additionally, you are requested to deposit 5% of the plan cost, over and above, into the account of "The Wildlife Odisha" and intimate to the undersigned for further action.

The plan period is five years and will be reviewed by the undersigned at least one year before the expiry of its implementation. The User Agency will bear the cost of such a plan upon its approval. Additionally, the User Agency will bear any extra costs arising from an increase in wage rates and the escalation of material prices during the implementation of this plan. In case of any deviation, it will be dealt with according to the law, under the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980, the Environment (Protection) Act, 1986, and the Wildlife (Protection) Act, 1972.

This is for information and necessary action.

Encl: - **Approved SSWCP.**

Yours faith fully


Divisional Forest Officer
Angul Division

Memo No. 7649 / Dated. 05.10.2024

Copy forwarded to the Regional Chief Conservator of Forests, Angul for favour of kind information & necessary action with reference to memo No. 11776 dt. 01.10.2024 of Principal Chief Conservator of Forests, Wildlife & Chief Wildlife Warden, Odisha, Bhubaneswar.


Divisional Forest Officer
Angul Division

Memo No. 7650 / Dated. 05.10.2024

Copy forwarded to the Principal Chief Conservator of Forest, Forest Diversion & Nodal Officer, F.C. Act. O/o the Principal CCF, Odisha Bhubaneswar for favour of kind information and necessary action with reference to memo No. 11776 dt.01.10.2024 of Principal Chief Conservator of Forests, Wildlife & Chief Wildlife Warden, Odisha, Bhubaneswar.


Divisional Forest Officer
Angul Division

Memo No. 7691 / Dated. 05.10.2024

Copy forwarded to the Principal Chief Conservator of Forests, Wildlife & Chief Wildlife Warden, Odisha, Bhubaneswar for favour of kind information and necessary action with reference to your memo No. 11776 dt. 01.10.2024.


Divisional Forest Officer
Angul Division



Office of the General Manager
(Subhadra Area)
A/Po: Angul, Near Biju Maidan
Dist. Angul - 759122 (Odisha)
Website: www.mcl.gov.in
Email Id: gm-subhadra.mcl@coalindia.in
gm-subhadraarea@gmail.com
Phone No- 06764-296537



MCL

Ref. No MCL/GM(SA)/2024/859

Date. 09.10.2024

To,

Divisional Forest Officer
Angul, Forest Division

Sub : Intimation regarding depositing of Rs 32,36,37,600/- for the cost of approved Site Specific Wildlife Conservation Plan in respect of 'Proposal for seeking prior approval of the Central Government under Section 2 (ii) of the forest (Conservation) Act, 1980 in favour of M/s Mahanadi Coalfield Ltd. for non forestry use of 125.24 ha of forest land for Subhadra Open Cast Coal Mining Project of Subhadra Area under Angul Forest Division and District Angul of Odisha State'

Ref.No- (i) Proposal No.FP/OR/ MIN/150133/ 2021.

(ii) Letter no-7648/ dated-05.10.2024 Demand for payment towards the cost of Site Specific Wildlife Conservation Plan through e-portal.

Dear Sir,

The cost of Site Specific Wildlife Conservation Plan of Rs 32,36,37,600/- (Rupees thirty two crore thirty six lakh thirty-seven thousand six hundred only) has been deposited on 09.10.2024 in CAMPA account no-1508258150133732 of Union Bank of India vide UTR no- SBINR52024100954137921 as per demand raised by you vide letter no- 7648/ dated-05.10.2024 for compliance of condition no-8 & condition no- 18 stipulated in Stage-IV In-Principle approval of forest diversion proposal of Subhadra OCP.

The copy of the UTR including NEFT/RTGS CHALLAN for CAMPA fund is enclosed herewith for kind information and necessary action.

Regards

Encl: As above

Yours faithfully

Krupa S Singh
09/10/2024
General Manager
Subhadra Area

For kind information to:

1. CMD, MCL
2. DT (Op), MCL
3. D (F), MCL
4. DT (P&P), MCL
5. GM (E&F), MCL
6. GM (P&P), MCL
7. GM (CMC), MCL
8. GM (L&R), MCL

Copy to:

1. Project Officer, Subhadra Project /SO(Min/P&P), Subhadra Area
2. SO(L&R), SO (Survey/E&F), Subhadra Area

AGENCY CDPY


 यूनियन बैंक Union Bank of India


NEFT / RTGS CHALLAN for CAMPA Funds

Date : 09-10-2024

Agency Name.	Meharshi Coalfields Limited
Application No.	BB180133732
NoEFTSG File No.	B-062023-FC
Location.	ORISSA
Address.	ANAND VIHAR, BURLASambalpur
Amount(In Rs)	323637600/-

Amount In Words (Thirty-Two Crore Thirty-Six Lakh Thirty-Seven Thousand Six Hundred Rupees Only)

NEFT/RTGS to be made as per following details;

Beneficiary Name:	ORISSA CAMPA
IFSC Code:	UBIN0896335
Pay to Account No.	180828@180133732 Valid only for this challan amount.
Bank Name & Address:	Union Bank Of India FCB Centre, 21/1, III Floor, Jalita Towers, Mission Road, Bengaluru-560027

- This Challan is strictly to be used for making payment to CAMPA by NEFT/RTGS only

Note: After making the required payment through chs even after 7 working days, then kindly mail a copy of it to Email: csbhr@unionbankofindia.bank, spurset@ubin0896335@unionbankofindia.bank



UTR - SAINRS20241009.

SAINR 52024100954187921

Transaction Details

Unique Transaction Reference Number	541NR52024110984137911	
Value Date	09/10/2024	
Related Reference Number		
Amount	32,36,37,600.000	INR
Commission	0.000	
Message Type	P08	

Beneficiary details

Beneficiary Account	1508258150133732	
Beneficiary Name	OPRISA CAMPA	
Beneficiary IFSC Code	UBIN0096335	
Beneficiary Address1	FCS BANGALORE	
Beneficiary Address2	UNION BANK OF INDIA	
Beneficiary Address3		
Dealer Code		

Details of Payment

Remitting Customer Details

Account Number	11051160922	
Remitter's IFSC Code	SBIN0012068	
Remitter's Name	MCL HINGULA AREA NEW	
Remitter's Address1	HINGULA AREA MAHENDRAPUR	
Remitter's Address2		
Remitter's Address3		

Sender to Receiver's Information

RECEIPTS

Error Details

Error Code	
Error Reason	

Additional Details

Instruction	
Priority	H:HIGH
Purpose Code	CASH:Cash Management Transfer
Credit Status	CREDIT CONFIRMED
Credit Time	04:10:18
Credit Date	09/10/2024





STATE WILDLIFE HEADQUARTERS

OFFICE OF THE PRINCIPAL CCF (WILDLIFE) & CHIEF WILDLIFE WARDEN, ODISHA
PRAKRUTI BHAWAN, PLOT No.1459, SAHEED NAGAR, BHUBANESWAR- 751007.
Website: www.wildlife.odisha.gov.in, Email: odishawildlife@gmail.com

No. 11968 /WLS-21/ 2024

Dated, Bhubaneswar, the 07 October, 2024

To,

The General Manager,
Subhadra Area, At/PO- Angul,
District-Angul, PIN-759122

Sub- Deposit of 5% of the approved Site Specific Wildlife Conservation Plan (SSWLCP) cost in the A/c of the Society- "The Wildlife Odisha"-regarding.

Ref- This office letter No. 11775/CWLW-FDWC-FD-0011-2023/ Dated 01.10.2024

Sir,

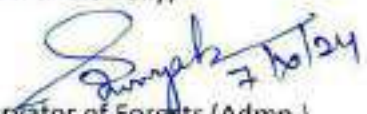
In inviting reference to the subject and correspondence as cited above, I am directed to request you to deposit 5% of the plan cost over and above the approved amount of the Site Specific Wildlife Conservation Plan i.e. Rs. 3236.376 Lakh (Rupees Thirty-two Crore Thirty-six Lakh Thirty-seven Thousand Six Hundred) amounting to Rs. 161.8188 Lakh (Rupees One Crore Sixty-one Lakh Eighty-one Thousand Eight Hundred Eighty) only in the A/c of the Society- "The Wildlife Odisha" and intimate the undersigned by 14.10.2024 positively. The detail of the savings bank account is mentioned below-

Customer Name: The Wildlife Odisha

Bank Account No.50100516644769


IFSC Code: HDFC0001252

Yours Faithfully,


Deputy Conservator of Forests (Admn.)

Memo No. 11969 /Date 07/10/2024

Copy forwarded to Divisional Forest Officer, Angul Forest Divisions for information and necessary action with reference to this Office Memo No.11776 Dated 01.10.2024. He is requested to follow it up with the User Agency concerned for early deposit of funds as per the demand raised above.


Deputy Conservator of Forests (Admn.)

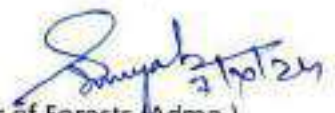
Memo No. 11970 /Date 07/10/2024

Copy forwarded to Regional Conservator of Forests, Angul Circle for information and necessary action with reference to this Office Memo No.11776 Dated 01.10.2024.


Deputy Conservator of Forests (Admn.)

Memo No. 11971 /Date 07/10/2024

Copy forwarded to Chief Conservator of Forests (WL-III) of this office for information and necessary action with reference to this Office Memo No.11776 Dated 01.10.2024.


Deputy Conservator of Forests (Admn.)



Office of the General Manager
(Subhadra Area)
At/Po Angul, Near Biju Maidan
Dist. Angul - 759122 (Odisha)
Website www.mcl.gov.in
Email Id: gm-subhadra.mcl@coalindia.in
gmsubhadraarea@gmail.com
Phone No- 06764-296537



MCL

Ref. No. MCL/GM(SA)/2024/ 960

Date: 09.10.2024

To,

Deputy Conservator of Forest (Admn.),
Office of the PCCF (WL)/CWLW, Odisha
Prakruti Bhawan, Plot No. 1459,
Saheed Nagar, Bhubaneswar-751007

Sub: Intimation for depositing 5% of the cost of approved Site Specific Wildlife Conservation Plan (SSWLCP) in the A/c of the Society- "The Wildlife Odisha" In respect of "Proposal for seeking prior approval of the Central Government under Section 2 (ii) of the forest (Conservation) Act, 1980 in favour of M/s Mahanadi Coalfield Ltd. for non forestry use of 126.24 ha of forest land for Subhadra Open Cast Coal Mining Project of Subhadra Area under Angul Forest Division and District Angul of Odisha State"

Ref.No- (i) Letter No. 11775/CWLW-FDWC-FD-J011-2023/ dated 01.10.2024 issued by CCF (WL-III)
(ii) Letter No. 11968/WLS-21/2024 Dated 07.10.2024

Dear Sir,

In reference to the letter at serial no (ii) above, the amount of Rs 1,61,81,880.00 (Rupees One Crore Sixty-one Lakh Eighty-one Thousand Eight Hundred Eighty) only has been deposited in the account of Society- "The Wildlife Odisha" (Account No: 50100518844769) v/c RTGS no IDFBRS2024100900520602 dated 09.10.2024 by M/s Subhadra Coal Mining Limited (SCML) as a pure agency of Mahanadi Coalfield Limited (MCL) as per Contract Agreement executed between Mahanadi Coalfield Limited (MCL) and M/s Subhadra Coal Mining Limited (SCML) dated 17.06.2022. The copy of statement of account is enclosed herewith for your kind information & necessary action please.

It is requested to kindly acknowledge the receipt of the above payment, so that the same may be submitted as a compliance of Stage-I FC Conditions.

Regards

Encl: As above

Yours faithfully

Kaipa S Singh
09/10/2024

General Manager
Subhadra Area

Forwarded for kind information to:

(1) PCCF(WL)/CWLW, Bhubaneswar
(2) PCCF(Nodal), Forest Diversion, FC Act,
Bhubaneswar
(3) RCCF, Angul
(4) DFO, Angul

(1) CMD, MCL
(2) D (P), MCL
(3) DT (OP), MCL
(4) D (F), MCL
(5) DT (P&P), MCL
(6) GM (E&F), MCL
(7) GM (CMC), MCL
(8) GM (L&R), MCL
(9) GM (P&P), MCL

Copy to:

- (1) PD, Subhadra Project/ SO (Min/P&P), Subhadra Area
- (2) SO(L&R), SO (Survey/E&F), Subhadra Area
- (3) Project Head, M/s SCML

STATEMENT OF ACCOUNT

CUSTOMER ID : 6642999078
ACCOUNT NO : 10403123851
ACCOUNT NAME : SUSHADRA COAL MINING LIMITED
STATEMENT PERIOD : 09-10-2024 to 09-10-2024



Transaction Date	Payment date	Narrative	Customer Reference No	Charge No	Debit	Credit	Running Balance
09-10-2024 13:41:30	09-10-2024	RTGS/IDFBAS202410080052 090027HE WILDLIFE OD/8144 ADFC0001252			10,161,860.00	0.00	1,732,623.15

IMPORTANT MESSAGE

- Unless the consultant notifies the bank immediately of any discrepancy found by him in this statement, it will be taken that he has found the account correct.
- 'Value date' is the effective date of Credit/Debit to the account.
- Bank does not send requests for Internet Banking Login ID, Password, Credit/Debit card numbers, Bank account numbers, or other sensitive financial information by e-mail. If you do receive a message of this type that appears to be from Bank or related to Bank, product or service, please do not respond. Send a copy of the message and any related details to services@idfcfirstbank.com.
- This is a system generated output and requires no signature.

----- End of the statement -----

FORM-II

(For projects other than linear projects)

Government of Odisha

Office of the District Collector, Angul

No. 874Dated 19/4/2024.**TO WHOMSOEVER IT MAY CONCERN**

In compliance of the Ministry of Environment and Forests (MoEF), Government of India's letter No. 11-9/98-FC (pt.) dated 3rd August 2009 wherein the MoEF issued guidelines on submission of evidences for having initiated and completed the process of settlement of rights under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 ('FRA', for short) on the Forest Land proposed to be diverted for non-forest purposes, it is certified that 125.24 hectares of forest land proposed to be diverted in favour of Subhadra Open Cast Coal Project of M/s Mahanadi Coalfields Limited for Coal Mining Purpose in Angul district falls within jurisdiction of villages namely Kankarel, Jalpur RF, Pirakhaman & Chhotabereni under Kankarel Gram Panchayat, Kaunsidhipa, Golagadia & Rajjharan under Rajjharan Gram Panchayat and Balichandrapur under Nisha Gram Panchayat coming under Chhendipada Block/ Tehsil in Angul Sub-division as well as villages namely Bhalugadia, Baghuabola in Gopalprasad Gram Panchayat and Kumunda in Kumunda Gram Panchayat coming under Talcher Block/ Tehsil in Talcher Sub-division.

It is further certified that:

- The complete process for identification and settlement of rights under the FRA has been carried out for the entire 125.24 hectares of forest land proposed for diversion. A copy of records of all consultation and meeting of the Forest Right Committee (s), Gram Sabha (s) Sub Division Level Committee (SDLCL) and the District Level Committee are enclosed as Annexure-A to Annexure-I.
- the proposal for such diversion (with full details of the project and its implications, in vernacular/ local language) have been placed before each concerned Gram Sabha of forest-dwellers, who are eligible under the FRA;
- the each of concerned Grama Sabha (s), has certified that all formalities/processes under the FRA have been carried out, and that they have given their consent to the proposed diversion and the compensation and ameliorative measures, if any, having understood the purpose and details of proposed diversion. A copy of certificate issued by the Gram Sabhas of 10 villages is enclosed as Annexure- B to Annexure-C.
- the discussion and decisions on such proposal had taken place only when there was a quorum of minimum 50% of the members of Gram Sabha present;
- the diversion of forest land for facilities managed by the Government as required under Section 3 (2) of the FRA have been completed and the Gram Sabhas have given their consent to it;
- the rights of Primitive Tribal Groups and Pre-Agricultural Communities, where applicable have been specifically safeguarded as per section 3 (1) (e) of the FRA.

End.: As above.


Abdul M. Akhtar, IAS
Collector & District Magistrate, Angul
COLLECTOR, ANGUL



Office of the General Manager
(Subhadra Area)
At/Po :Angul, Near Biju Maidan
Dist: Angul – 759122 (Odisha)
Website :www.mcl.gov.in
Email Id: gmsubhadraarea@gmail.com



Annexure-40

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 20 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "The User Agency shall undertake mining in a phased manner after taking due care for reclamation of the mined over area. The concurrent reclamation plan as per the approved mining plan shall be executed by the User Agency from the very first year, and an annual report on implementation thereof shall be submitted to the Nodal Officer, Forest (Conservation) Act, 1980, in the concerned State Government and the concerned Regional Office of the Ministry".

General Manager
Subhadra Area, MCL



Office of the General Manager
(Subhadra Area)
At/Po :Angul, Near Biju Maidan
Dist: Angul – 759122 (Odisha)
Website www.mcl.gov.in
Email Id: gmsubhadraarea@gmail.com



Annexure-41

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No.21 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "The User Agency shall comply with the Hon'ble Supreme Court order on re-grassing, and re-grass the mining area and any other areas which may have been disturbed due to mining to restore them to a condition which is fit for growth of fodder, flora, fauna, etc. in a timely manner".

General Manager
Subhadra Area, MCL



Office of the General Manager
(Subhadra Area)
At/Po :Angul, Near Biju Maidan
Dist: Angul – 759122 (Odisha)
Website :www.mcl.gov.in
Email Id: gmsubhadraarea@gmail.com



Annexure-42

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No.22 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "Period of diversion of the said forest land under this approval shall be for a period co-terminus with the period of the mining lease proposed to be granted under the Mines and Minerals (Development and Regulation) Act, 1957, as amended time to time and the Rules framed there-under".

General Manager
Subhadra Area, MCL



File No.: IA-J-11015/72/2021-IA-II(M)

Annexure-43

Government of India
Ministry of Environment, Forest and Climate Change
IA Division



Dated 06/03/2024



To,

Shital Kumar Sahoo
Mahanadi Coalfields Limited
ANAND VIHAR, BURLA , BURLA SAMBALPUR, SAMBALPUR, ODISHA, , 768020
mcl4cil@gmail.com

Subject: Subhadra Open Cast Mine with production capacity of 25 MTPA in mine lease area of 1111.85 ha of M/s Mahanadi Coalfield Limited located at Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil Talcher Sadar and Chhendipada, District Angul (Odisha) – Environmental Clearance – reg.

Sir/Madam,

This is in reference to your application submitted to MoEF&CC vide proposal number IA/OR/CMIN/445297/2023 dated 12/10/2023 for grant of prior Environmental Clearance (EC) to the project under the provision of the EIA Notification 2006-and as amended thereof.

2. The particulars of the proposal are as below :

(i) EC Identification No.	EC23A0101OR5745830N
(ii) File No.	IA-J-11015/72/2021-IA-II(M)
(iii) Clearance Type	Fresh EC
(iv) Category	A
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals
(vi) Sector	Coal Mining
(vii) Name of Project	Subhadra Open Cast Project
(ix) Location of Project (District, State)	ANUGUL, ODISHA
(x) Issuing Authority	MoEF&CC
(xii) Applicability of General Conditions	No

3. The proposal is for Environmental Clearance for Subhadra Open Cast Mine with production capacity of 25 MTPA in mine lease area of 1111.85 ha of M/s Mahanadi Coalfield Limited located at Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil Talcher Sadar and Chhendipada, District Angul (Odisha).

4. Terms of Reference (ToR) was granted vide letter no. J-11015/70/2021-IA. II(M) dated 22.11.2021 and Amendment in

ToR vide letter dated **28.02.2022**. Public Hearing was conducted on 25.08.2023 under the Chairmanship of Shree Pratap Pritimaya, O.A.S. (S) ADM, Angul. Proposal for EC with EIA/EMP report was submitted on PARIVESH portal.

5. Project Proponent alongwith QCI NABET consultant (Vardan Environet) made the detailed presentation in the 3rd & 6th EAC meeting held during 16-17 November, 2023 & 17th Jan 2024, respectively and interalia provided the following information to the EAC:

(i) The Subhadra Open Cast Coal Mine of MCL is located in Kankarei, Pirakhaman, Balichandrapur, Rajjharan, Kaunsidhipa, Golagadia, Chhotabereni, Kumunda, Bhalugadia, Baghuaboli villages and Jaipur RF Tehsil Talcher and Chhendipada, District Angul (Odisha).

(ii) The project area is covered under Survey of India Topo sheet No. F45S13 & F45T1 (RF 1:50000) and is bounded by the geographical coordinates ranging from 20°55'56.225" N and 20°58'47.344" N and longitudes 84°58'42.383" E and 85°0'50.476" E. The DGPS coordinates of the ML area are given in Table 2.1 of EIA Report.

(iii) Project does not fall in the Critically Polluted Area (CPA), where the MoEF&CC's vide its OM dated 13th January, 2010 has imposed moratorium on grant of Environment Clearance.

(iv) There are no National Parks, eco-sensitive Zones, within 10 km radius.

(v) The Utkal A (Subhadra) Coal Mine has been allotted by Ministry of Coal vide order no NA-103/1/2021-NA dated 18.11.2021.

(vi) 125.24ha (Reserve Forest Land: 0.75 ha, Govt. Revenue Forest area: 124.49 ha) of forest land have been reported to be involved in the project. Applications for Forest Clearance was submitted vide Proposal No. FP/OR/MIN/150133/2021 dt. 25.01.2022. Stage I FC has been recommended in the FAC meeting held on 20.10.2023. Stage I FC has been granted vide letter no -8-06/2023-FC dated 05.12.2023.

(vii) There is no national park or wildlife sanctuary within the study area. However, due to presence of Schedule-I Fauna application submitted to DFO, Angul for approval of site specific wild life management plan.

(viii) Mining plan (including Progressive Mine closure plan) has been approved by the MCL Board vide letter no. MCL/SBP/CS/BD-257/Exct/2023/13262 dt- 13.05.2023.

(ix) Method of mining will be Open Cast Mechanized Mining. With due consideration to geo-mining characteristics of the deposit, the mine is proposed to be worked by shovel-dumper combination for OB excavation and Surface Miner for coal winning and loading by Front End Loader.

(x) LAND USE DETAILS OF MINE: Pre Mining land use details

S. No	Type of Land	Within ML Area (Area in Ha.)	Outside ML Area (Area in Ha)	Total (Area in Ha)
1	Agricultural	800.50	Nil	800.50
2	Forest	125.24	Nil	125.24
3	Wasteland	NA	NA	NA
4	Grazing land	58.67	Nil	58.67
5	Water bodies	6.28	Nil	6.28
6	Settlements	NA	NA	NA
7	Others (Specify)			
8	Old Excavation Area (East Quarry)	NA	NA	NA
9	Old Excavation Area (West Quarry)	NA	NA	NA

10	Old OB Dumps	NA	NA	NA
11	Roads	0.25	Nil	0.25
12	R & R Colony	NA	NA	NA
13	Staff Colony	NA	NA	NA
14	Green Belt	NA	NA	NA
15	Balance Area	NA	NA	NA
16	Barren land**	92.64	Nil	92.64
17	Township**	Nil	Nil	Nil
18	Community/others use area**	28.27	Nil	28.27
19	Total Project Area	1111.85	Nil	1111.85

** (As per the above table the total land use area is 1111.85 Ha. The other land use types are Barren land of 92.64, Community/others use area of 28.27 Ha.)

Post Mining

S. No.	Land Use	Land Use (End of Life)	Land Use (ha)				Total
			Plantation	Water Body	Public use	Undisturbed	
1	External OB Dump	24.17	0	0	0	0	24.17
2	Top Soil Dump	8.97	0	0	0	0	8.97
3	Excavation	881.28	0	0	0	0	
4	Roads, buildings Infrastructure	Roads: 15.72	0	0	15.72	0	118.16
		Township: 27.12	1.26	0	25.86	0	
		Infra: 75.32	0	0	0	0	
5	Green Belt	6.89	0	0	0	0	6.89
6	Undisturbed Area	0	0	0	0	0	0
7	Safety Zone	11.79	11.79	0	0	0	11.79
8	Rationalization Area	25.34	25.34	0	0	0	25.34
9	Diversion / Below River / Nala /Canal	8.42	0	0	8.42	0	8.42
10	Water Harvesting	35.36	0	35.36	0	0	35.36
11	Staff Colony		0	0	0	0	
12	Backfilled Area**	715.24	182.52	0	0	0	715.24
13	Excavated Void Without Plantation**	130.68	0	0	0	0	130.68
14	Coal Stock Yard**	9.76	0	0	0	0	9.76
15	Embankment**	11.49	0	0	11.49	0	11.49
16	Explosive Magazine**	5.58	0	0	0	0	5.58
Total Area		1111.85	220.91	35.36	61.49	0	1111.85

** (As per the above table the total land use area is 1111.85 Ha. The other land use types are Backfilled Area of 715.24Ha., Excavated Void without Plantation of 130.68 Ha., Coal Stock Yard of 9.76 Ha., Embankment of 11.49 Ha., and Explosive Magazine of 5.58 Ha.)

(xi) Total Geological Reserve reported in the mine lease area is 1142.67MT with 790.95MT Mineable Reserves by opencast mining. Out of total mineable reserve of 790.95MT, 768.83 MT are available for extraction. Percent of extraction is 67%.

(xii) Thickness of seams to be worked on: Opencast mining method is proposed for extraction of coal seam XI to IID. The effective thickness of the seams XI to IID is varying from 0.06m to 75.90m.

Grade of coal: Wt. Avg. G-13 (GCV – 3690 Kcal/Kg)

(xiii) Stripping Ratio: Only In-situ: 0.80 With Re-handling: 0.93

(xiv) Average gradient: - 3.480(1 in 16.44)

(xv) Maximum thickness of seams: Seam XI to IID varies from 0.06m to 75.90 m

(xvi) The project has 1 external OB dumps (temporary) in an area of 24.17 ha with 88m height and 103.72 Mm³ of OB. 1 internal OB dump in an area of 715.24ha with 613.18 Mm³ (Insitu) 103.72 Mm³ (Re handling) of material is envisaged in the project.

(xvii) Total quarry area is 881.28 ha out of which backfilling will be done in 715.24 ha up to 30m while final mine void will be created in an area of 130.68 ha with a depth of 160 m RL and 35.36 ha water body. Backfilled quarry area 182.52 ha shall be reclaimed with plantation, 495.27 ha agriculture land and 37.45 ha will be returned as forest land.

(xviii) Transportation of coal:

In pit: Initially through Dumper and in Pit Conveyor after few years.

Surface to siding: From surface hopper (20 No.) by belt conveyor (18 Nos.)

Siding to loading: Through two Rapid Loading System (RLS) (02 Nos)
Capacity 5000tonne each

Quantity being transported by Road/Rail/Conveyor: As per approved mining plan

Transportation will be carried out as per Approved Mining Plan.

(xix) Reclamation has been planned in an area of 965.45ha, comprising of 538.17 ha Agricultural use, 220.91 ha Plantation, 35.36 ha Water Body & 125.24 ha Forest Land return Area, Nala diversion, Township & Embankment. & 130.68 ha of final void area will be left unplanted.

(xx) Life of mine is 36 Years (including 2 Year of construction)

(xxi) Coal linkage - The mine has been allotted to MCL by the Ministry of Coal vide order no NA-103/1/2021-NA dated 18.11.2021. There shall be no restriction to carry on mining operations for own consumption, sale or for any other purpose.

(xxii) The Primary baseline data for specific micro-meteorology data, ambient air quality, waste quality, noise level, soil and flora & fauna has been collected during Post Monsoon season i.e. October to December, 2022.

(xxiii) Public hearing for the project of 25 MTPA capacity in an area of 1111.85ha was conducted on 25.08.2023 at Ground near Pirakhaman Primary school under Kankarei gram Panchayat of Chhendipada Tehsil of Angul District under the Chairmanship of Shree Pratap Pritimaya, O.A.S. (S) ADM, Angul. Major issues raised in the Public Hearing & appropriate action to address the issues raised in the Public Hearing have already been taken/ proposed to be taken are given in the action plan prepared and mentioned in Chapter -7 in Final EIA/EMP report.

(xixv) No court cases, violation cases are pending against the project of the PP.

(xxv) The project does not involve violation of the EIA Notification, 2006 and amendment issued thereunder since it is a Greenfield project.

(xxvi) Out of the total area of 1111.85 hectares of land to be acquired for the project 696.95 hectares are private land and the remaining areas are Government and Forest lands. While the acquisition of private land has a direct bearing on the personal social and economic status of the land owners. About 1853 families have been identified for displacement due to Subhadra OCP. The R & R benefits will be provided as per norms under R & R policy-2006 of Government of Odisha.

(xxvii) **Benefit of the Project:** Employment Generation-Proposed coal mine shall provide an opportunity of direct employment to 2108 persons and total indirect employment of approx. 5000 persons. The project is reported to be beneficial in terms of energy security for the development of country. Total cost of the project is Rs. 3955.65 Crore. Cost of production is Rs 678 per tonne., Fund for the CSR will be allocated based on 2% of the average net profit of the Company for the three immediately preceding financial years or Rs. 2.0 per tonne of coal production of previous year

whichever is higher. Different peripheral development and community development works will be taken up. R&R cost Rs 405.46Crore. Environment Management Cost was: Capital Rs 2295 Lakh; & Recurring Rs. 201Lakh.

6. Proposal was earlier considered by the EAC in its 3rd meeting held during 16.11.2023-17.11.2023. EAC after detailed deliberation deferred the project and sought additional information. Project Proponent submitted the information as sought by the EAC on the PARIVESH portal, accordingly proposal was considered by the EAC in its 6th meeting held during 17-18 January 2024. During the meeting the Committee deliberated on various issues related to project including issues raised during PH, EMP, Grazing land, plantation, transportation of mineral, water requirement, diversion of nallha. Mining lease area etc. EAC after detailed deliberation **recommended** the Environmental Clearance for Subhadra Open Cast Mine with production capacity of 25 MTPA in mine lease area of 1111.85 ha of M/s Mahanadi Coalfield Limited located at Village Gopal Prasad, Kumuda, Nisha, Kankarei, Rajjharan, Nisha P.S Angul, Tehsil Tachler Sadar and Chhendipada, District Angul (Odisha) with the specific conditions and standard EC conditions (Annexure 1) under the provisions of EIA Notification, 2006 and its amendments. Detailed deliberation, observation and recommendation of the EAC are available on the PARIVESH website.

7. Based on the representation received the proposal was again considered in 7th EAC meeting held during 12-14 February, 2024 wherein the Committee recommended that , *the Ministry may take further necessary action as per recommendation already given by the EAC.*

8. The MoEF&CC has examined the proposal in accordance with the provisions contained in the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and based on the recommendations of the EAC hereby **accords Environmental Clearance to M/s Mahanadi Coalfield Limited for Subhadra Open Cast Mine with production capacity of 25 MTPA in mine lease area of 1111.85 ha located at Village Gopal Prasad, Kumuda, Nisha, Kankarei, Rajjharan, Nisha P.S Angul, Tehsil Talcher Sadar and Chhendipada, District Angul (Odisha)** with the specific conditions and standard EC conditions (Refer: Annexure-I) under the provisions of EIA Notification, 2006 and its amendments.

9. The proponent shall obtain all necessary clearances/approvals that may be required before the start of the project. The Ministry or any other competent authority may stipulate any further condition for environmental protection. The Ministry or any other competent authority may stipulate any further condition for environmental protection.

10. The Environmental Clearance to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.

11. The PP is under obligation to implement commitments made in the Environment Management Plan, which forms part of this EC.

12. Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

13. The coal company/project proponent shall be liable to pay the compensation against the illegal mining, if any, and as raised by the respective State Governments at any point of time, in terms of the orders dated 2nd August, 2017 of Hon'ble Supreme Court in WP (Civil) No.114/2014 in the matter of 'Common Cause Vs Union of India & others.

14. The concerned State Government shall ensure no mining operations to commence till the entire compensation for illegal mining, if any, is paid by the project proponent through their respective Department of Mining & Geology, in strict compliance of the judgment of Hon'ble Supreme Court. This environmental clearance shall not be operational till such time the project proponent complies with the above said judgment of Hon'ble Supreme Court, as applicable, and other statutory requirements.

15. General Instructions:

(i) The project proponent shall prominently advertise it at least in two local newspapers of the District or State, of which

one shall be in the vernacular language within seven days indicating that the project has been accorded environment clearance and the details of MoEF&CC website where it is displayed.

(ii) The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn must display the same for 30 days from the date of receipt.

(iii) The project proponent shall have a well laid down environmental policy duly approved by the Board of Directors (in case of Company) or competent authority, duly prescribing standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest / wildlife norms / conditions.

(iv) Action plan for implementing EMP and environmental conditions along with responsibility matrix of the project proponent (during construction phase) and authorized entity mandated with compliance of conditions (during operational phase) shall be prepared. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Six monthly progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six-Monthly Compliance Report.

(v) Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.

(vi) The Regional Office of this MoEF&CC shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.

16. This issue with an approval of the Competent Authority.

Copy To

1. The Secretary, Ministry of Coal, Shastri Bhawan, New Delhi.
2. The Additional Principal Chief Conservator of Forests, Regional office (EZ), Ministry of Environment & Forests, A-31, Chandershekharpur, Bhubaneswar- 751023 (Odisha).
3. The Secretary, Department of Environment & Forests, Government of Orissa, Secretariat, Bhubaneswar (Odisha).
4. The Member Secretary, Central Pollution Control Board, CBD-cum-Office Complex, East Arjun Nagar, Delhi - 32
5. The Chairman, Orissa State Pollution Control Board, Parivesh Bhawan, A/118, Nilkanthanagar, Unit VIII, Bhubaneshwar - 751012 (Odisha).
6. District Collector, Angul, Government of Odisha
7. PARIVESH portal

Annexure 1

Specific EC Conditions for (Mining Of Minerals)

1. Specific Conditions:

S. No	EC Conditions
1.1	<i>Any activity of the forest land shall only be carried out after obtaining necessary forest clearance.</i>
1.2	<i>PP to obtain the CTO for 25 MTPA (peak) capacity after grant of EC.</i>
1.3	<i>PP shall deploy electric vehicles to the extent of 50% of transportation fleet for evacuation of coal through road up to Balaram Siding (Approx. 11 KM) till commencement of rail evacuation system with CHP of Subhadra OCP which is likely to commence from the fourth year of mining operations. PP shall monitor the EV usage through installation of adequate number of CCTV cameras. Till such time transportation from a dedicated road and village road shall not be used for the same.</i>
1.4	<i>PP shall adopt 6 ponds outside the lease area in different village and carry out the various activities for their protection and maintenance as proposed in the plan submitted for the same to Ministry The budget earmarked for water conservation plan for these ponds is Rs. 1.00 crores shall be kept in a spate account and audited annually. PP while submitting the compliance report to Regional Office and on Parivesh Portal as the case may be also submit evidence of implementation of the plan including geo tagged photographs.</i>
1.5	<i>PP shall develop greenbelt on approximately 38% of the lease area, i.e. on 426.15 ha of land as proposed in the plantation plan submitted to the Ministry and maintain a survival rate of at least 70% (after 10 years of the plantation) by carrying out gap plantation in case of mortality. The budget earmarked for the plantation shall be kept in a separate account. PP should annually submit the audited statement of expenditure along with proof of activities viz. photographs (before & after with geolocation date & time), details of expert agency engaged, details of species planted, number of species planted, survival rate, density of plantation etc. to the Regional Office of MoEF&CC and on PARIVESH Portal as the case may be for the activities carried out during previous year. Third party monitoring of the plantation shall be done preferably by an institution of MoEFCC (eg ICFRE).</i>
1.6	<i>PP shall maintain atleast 10 mtrs width tree plantation of broad leaved species and wind break/greenshield of about 10 mts height along the boundary of coal storage yard.</i>
1.7	<i>PP shall implement the activities-wise proposed to address the issues raised during Public Hearing. The budget earmarked for the same is Rs 1235 lakhs and the same shall be kept in a separate account and audited annually. The details of activities undertaken, amount spent along with documentary proof shall be a part of report to be submitted to IRO, MoEF&CC. The maintenance of all activities shall be covered through recurring cost of Public Hearing, and continued as a part of CSR budget.</i>
1.8	<i>PP shall ensure that all type of plastic waste generated from the mines shall be stored separately in isolated area and disposed of strictly adhering to the Plastic Waste Management Rules 2016. In pursuant to Ministry's OM dated 18/07/2022 PP shall also create awareness among the people working in the project area as well as in its surrounding area on the ban on Single Use Plastic(SUP) in order to ensure compliance of Ministry's Notification published by the Ministry on 12/08/2021. A report along with photograph on the measures taken shall also be included in the six monthly compliance report being submitted by PP.</i>
1.9	<i>All the mitigation measures committed / envisaged in the EIA/EMP report and subsequent submission (ANNEXURE 2) shall be implemented which also includes i) Fog cannon</i>

S. No	EC Conditions
	<p><i>installation: to mitigate dust emissions, ii) Increased greenbelt development budget: aligned with the expanded plan and iii) 02 Continuous Ambient Air Quality Monitoring Stations (CAAQMS): for real-time air quality monitoring. The budget as per revised EMP is Rs 2995 Lakh (Capital) and Rs 201 Lakh (Recurring) shall be kept in a separate account. PP should annually submit the audited statement along with proof of activities carried to the Regional Office of MoEF&CC and PARIVESH Portal as the case may be for the activities carried out during previous year.</i></p>
1.10	<p><i>PP to install 2 continuous ambient air quality monitoring stations at suitable locations preferably on village side with consultation of SPCB. The real time data so generated shall be uploaded on company website and linked with website of CPCB &SPCB. In addition, data should also be displayed digitally at entry and exit gate of mine lease area for public display.</i></p>
1.11	<p><i>PP shall implement Effluent Treatment Plant for wastewater generated from workshop and Sewage Treatment Plant for its colony. No untreated water shall be discharged from mine boundaries to ponds/nallah/river.</i></p>
1.12	<p><i>PP to install solar lights along the road used for transportation of minerals also take up installation of solar lights in rural areas with its maintenance within the study area of 10 km radius buffer zone within one year.</i></p>
1.13	<p><i>Proponent shall appoint an Occupational Health Specialist for Regular and Periodical medical examination of the workers engaged in the Project and maintain records accordingly; also, Occupational health check-ups for workers having some ailments like BP, diabetes, habitual smoking, etc. shall be undertaken once in six months and necessary remedial/preventive measures taken accordingly. The Recommendations of National Institute for ensuring good occupational environment for mine workers shall be implemented. The prevention measure for burns, malaria and provision of anti-snake venom including all other paramedical safeguards may be ensured before initiating the mining activities.</i></p>
1.14	<p><i>PP shall conduct feasibility studies for assessment of voids for backfilling of ash and mixing of ash with overburden, taking up backfilling ash and OB mixing activities during operations as well as post closure of mines in line with the Fly Ash Utilization Notification, 2021.</i></p>
1.15	<p><i>Hon'ble Supreme Court in an Writ Petition(s) Civil No. 114/2014, Common Cause vs Union of India &Ors vide its judgement dated 8th January, 2020 has directed the Union of India to impose a condition in the mining lease and a similar condition in the environmental clearance and the mining plan to the effect that the mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. Compliance of this condition after the mining activity is over at the cost of the mining lease holders/Project Proponent". The implementation report of the above said condition along with geo tagged photographs shall be sent to the Regional Office of the MoEF&CC.</i></p>
1.16	<p><i>PP shall strengthen the existing Environment Management division of the unit under intimation to the IRO</i></p>

1. Statutory Compliance

S. No	EC Conditions
1.1	The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project.
1.2	The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.
1.3	The project proponent shall prepare a Site-Specific Conservation Plan & Wildlife Management Plan and approved by the Chief Wildlife Warden. The recommendations of the approved Site-Specific Conservation Plan / Wildlife Management Plan shall be implemented in consultation with the State Forest Department. The implementation report shall be furnished along with the six-monthly compliance report (in case of the presence of schedule-I species in the study area).
1.4	The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the concerned State pollution Control Board/ Committee prior to start/commencement of mining operations/production
1.5	The project proponent shall obtain the necessary permission from the Central Ground Water Authority
1.6	Solid/hazardous waste generated in the mines needs to be addressed in accordance to the Solid Waste Management Rules, 2016/Hazardous & Other Waste Management Rules, 2016.
1.7	Permission of power supply to be taken from the concerned authority for meeting power demand of the project site.
1.8	The maximum production or peak production at any given time shall not exceed the limit as prescribed in the EC.
1.9	Validity of Environment Clearance is as per life of the mine mentioned in EC letter or 30 years as per EIA Notification, 2006 and its amendments therein
1.10	All the conditions stipulated in previous Environment Clearance conditions should be strictly complied within certain timeline

2. Air Quality Monitoring And Mitigation Measure

S. No	EC Conditions
2.1	Continuous ambient air quality monitoring stations as prescribed in the statute be established in the core zone as well as in the buffer zone for monitoring of pollutants, namely PM10, PM2.5, SO2 and NOx. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Online ambient air quality monitoring stations may also be installed in addition to the regular monitoring stations as per the requirement and/or in consultation with the SPCB. The new CAAQMS should be installed with expansion.

S. No	EC Conditions
2.2	The Ambient Air Quality monitoring in the core zone shall be carried out to ensure the Coal Industry Standards notified vide GSR 742 (E) dated 25th September, 2000 and as amended from time to time by the Central Pollution Control Board. Data on ambient air quality and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly reported to the Ministry/Regional Office and to the CPCB/SPCB.
2.3	Transportation of coal, to the extent, if permitted by road, shall be carried out by covered trucks/conveyors. Effective control measures such as regular water/mist sprinkling/rain gun/ Fog cannon etc shall be carried out in critical areas prone to air pollution (with higher values of PM10/PM2.5) such as haul road, loading/unloading and transfer points. Fugitive dust emissions from all sources shall be controlled regularly. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central/State Pollution Control Board.
2.4	The transportation of coal shall be carried out as per the provisions and route envisaged in the approved Mining Plan or environment monitoring plan. Transportation of the coal through the existing road passing through any village shall be avoided. In case, it is proposed to construct a 'bypass' road, it should be so constructed so that the impact of sound, dust and accidents could be appropriately mitigated.
2.5	PP to install solar lights along the road used for transportation of coal to avoid the accidents at night and also seek its maintenance.
2.6	Vehicular emissions shall be kept under control and regularly monitored. All the vehicles engaged in mining and allied activities shall operate only after obtaining 'PUC' certificate from the authorized pollution testing centres.
2.7	Coal stock pile/crusher/feeder and breaker material transfer points shall invariably be provided with dust suppression system. Belt-conveyors shall be fully covered to avoid air borne dust. Side cladding all along the conveyor gantry should be made to avoid air borne dust. Drills shall be wet operated or fitted with dust extractors.
2.8	Coal handling plant shall be operated with effective control measures w.r.t. various environmental parameters. Environmental friendly sustainable technology should be implemented for mitigating such parameters.
2.9	Adequate measures on EMP should be analyzed on annual basis to assess the trend of air pollution data from continuous monitoring station and quarterly report shall be generated and submitted with 6 monthly compliance reports to RO, MoEF&CC.
2.10	Effective safeguard measures for prevention of dust generation and subsequent suppression like regular water sprinkling shall be carried out in areas prone to air pollution. The Fugitive dust emission from all sources shall be regularly controlled by installation of required equipment's. It should be ensured that air pollution level confirm to the standards prescribed by the MOEFCC/CPCB
2.11	Adequate number of Fog canon (mist sprayer) shall be installed to reduce the impact of air pollution at dust generating sources with time bound action plan.
2.12	PP should Install Wind breaker/shield arrangement along the railway siding for reducing the dust propagation in upwind direction.

S. No	EC Conditions
2.13	Post environmental closure third party monitoring by reputed instituted in air quality, water, land & soil etc shall be carried out and analysed with EMP measures at regular interval. A suitable recommendation in this regard, shall be furnished to IRO, MoEF&CC for compliance. The data used for analysis shall be obtained from continuous AQMS, site specific water regime. Also third party shall analyses the implementation of river diversion, meeting to the requirement of project report.
2.14	Comparison of average monthly temperature of pre and post mine operation after obtaining EC shall be elaborated for post three years and a record to be maintain at regular interval.

3. Water Quality Monitoring And Mitigation Measures

S. No	EC Conditions
3.1	The effluent discharge (mine waste water, workshop effluent) shall be monitored in terms of the parameters notified under the Water Act, 1974 Coal Industry Standards vide GSR 742 (E) dated 25th September, 2000 and as amended from time to time by the Central Pollution Control Board.
3.2	The monitoring data shall be uploaded on the company's website and displayed at the project site at a suitable location. The circular No.J-20012/1/2006-1A.11 (M) dated 27th May, 2009 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this regard for its compliance.
3.3	Regular monitoring of ground water level and quality shall be carried out in and around the mine lease area by establishing a network of existing wells and constructing new piezometers during the mining operations. The monitoring of ground water levels shall be carried out four times a year i.e. pre-monsoon, monsoon, post-monsoon and winter. The ground water quality shall be monitored once a year, and the data thus collected shall be sent regularly to MOEFCC/RO.
3.4	Monitoring of water quality upstream and downstream of river including ponds, lakes, tanks shall be carried out once in six months and record of monitoring data shall be maintained and submitted to the Ministry of Environment, Forest and Climate Change/Regional Office.
3.5	Ground water, excluding mine water, shall not be used for mining operations. Rainwater harvesting shall be implemented for conservation and augmentation of ground water resources.
3.6	Catch and/or garland drains and siltation ponds in adequate numbers and appropriate size shall be constructed around the mine working, coal heaps & OB dumps to prevent run off of water and flow of sediments directly into the river and water bodies. Further, dump material shall be properly consolidated/ compacted and accumulation of water over dumps shall be avoided by providing adequate channels for flow of silt into the drains. The drains/ ponds so constructed shall be regularly de-silted particularly before onset of monsoon and maintained properly. Sump capacity should provide adequate retention period to allow proper settling of silt material. The water so collected in the sump shall be utilised for dust suppression and green belt development and other industrial use. Dimension of the retaining wall constructed, if any, at the toe of the OB dumps within the mine to check run-off and siltation should be based on the rainfall data. The plantation of native species to be made between toe of the dump and adjacent field/habitation/water bodies.
3.7	Adequate groundwater recharge measures shall be taken up for augmentation of ground water. The project authorities shall meet water requirement of nearby village(s) after due treatment conforming

S. No	EC Conditions
	to the specific requirement (standards).
3.8	Industrial waste water generated from CHP, workshop and other waste water, shall be properly collected and treated so as to conform to the standards prescribed under the standards prescribed under Water Act 1974 and Environment (Protection) Act, 1986 and the Rules made there under, and as amended from time to time. Adequate ETP /STP needs to be provided.
3.9	The water pumped out from the mine, after siltation, shall be utilized for industrial purpose viz. watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after monsoon and maintained properly.
3.10	The surface drainage plan including surface water conservation plan for the area of influence affected by the said mining operations, considering the presence of river/rivulet/pond/lake etc, shall be prepared and implemented by the project proponent. The surface drainage plan and/or any diversion of natural water courses shall be as per the approved Mining Plan/EIA/EMP report and with due approval of the concerned State/GoI Authority. The construction of embankment to prevent any danger against inrush of surface water into the mine should be as per the approved Mining Plan and as per the permission of DGMS or any other authority as prescribed by the law.
3.11	The project proponent shall take all precautionary measures to ensure riverine/riparian ecosystem in and around the coal mine up to a distance of 5 km. A rivarine/riparian ecosystem conservation and management plan should be prepared and implemented in consultation with the irrigation / water resource department in the state government.
3.12	Quality of polluted water generated from the operations which include COD and acid mine drainage and metal contamination shall be monitored along with TDS, DO, TSS. The monitored data shall be uploaded on the website of the company as well as displayed at the site in public domain.
3.13	Domestic water shall be providing to the residents/villages which are coming under the zone of influence of the project due to ground water extraction and mining operation by installing adequate number of RO plants with proper supply line and Taps within 2 years
3.14	No obsolete technologies for sewage treatment shall be implemented. Construction of Sewage Treatment Plant with latest technology should be completed within 2 years and treated water shall be reused for plantation. CTE and CTO of STP shall be obtained as per the norms.

4. Noise And Vibration Monitoring And Prevention

S. No	EC Conditions
4.1	Adequate measures shall be taken for control of noise levels as per Noise Pollution Rules, 2016 in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with personal protective equipments (PPE) like ear plugs/muffs in conformity with the prescribed norms and guidelines in this regard. Adequate awareness programme for users to be conducted. Progress in usage of such accessories to be monitored.
4.2	Controlled blasting techniques shall be practiced in order to mitigate ground vibrations, fly rocks, noise and air blast etc., as per the guidelines prescribed by the DGMS.

S. No	EC Conditions
4.3	The noise level survey shall be carried out as per the prescribed guidelines to assess noise exposure of the workmen at vulnerable points in the mine premises, and report in this regard shall be submitted to the Ministry/RO on six-monthly basis.

5. Mining Plan

S. No	EC Conditions
5.1	5- Star Rating is mandatory to obtaine certification as per guidelines of Mininstry of Coal
5.2	Mining shall be carried out under strict adherence to provisions of the Mines Act 1952 and subordinate legislations made there-under as applicable.
5.3	Mining shall be carried out as per the approved mining plan (including Mine Closure Plan) abiding by mining laws related to coal mining and the relevant circulars issued by Directorate General Mines Safety (DGMS).
5.4	No mining shall be carried out in forest land without obtaining Forestry Clearance as per Forest (Conservation) Act, 1980.
5.5	Efforts should be made to reduce energy and fuel consumption by conservation, efficiency improvements and use of renewable energy.
5.6	PP shall adopt mining method by preferably using surface miners for the project and silo loading through in-pit conveyor should be adopted
5.7	Tranportation of coal till Railway Siding shall be developed to avoid transportation through Road

6. Land Recalmtion

S. No	EC Conditions
6.1	Digital Survey of entire lease hold area/core zone using Satellite Remote Sensing survey shall be carried out at least once in three years for monitoring land use pattern and report in 1:50,000 scale or as notified by Ministry of Environment, Forest and Climate Change(MOEFCC) from time to time shall be submitted to MOEFCC/Regional Office (RO).
6.2	The final mine void depth should preferably be as per the approved Mine Closure Plan, and in case it exceeds 40 m, adequate engineering interventions shall be provided for sustenance of aquatic life therein. The remaining area shall be backfilled and covered with thick and alive top soil. Post-mining land be rendered usable for agricultural/forestry purposes and shall be diverted. Further action will be treated as specified in the guidelines for Preparation of Mine Closure Plan issued by the Ministry of Coal dated 27th August, 2009 and subsequent amendments.
6.3	The entire excavated area, backfilling, external OB dumping (including top soil) and afforestation plan shall be in conformity with the “during mining”/”post mining” land-use pattern, which is an integral part of the approved Mining Plan and the EIA/EMP submitted to this Ministry. Progressive compliance status vis-a-vis the post mining land use pattern shall be submitted to the MOEFCC/RO.

S. No	EC Conditions
6.4	Fly ash shall be used for external dump of overburden, backfilling or stowing of mine as per provisions contained in clause (i) and (ii) of subparagraph (8) of fly ash notification issued vide SO 2804 (E) dated 3rd November, 2009 as amended from time to time. Efforts shall be made to utilize gypsum generated from Flue Gas Desulfurization (FGD), if any, along with fly ash for external dump of overburden, backfilling of mines. Compliance report shall be submitted to Regional Office of MoEF&CC, CPCB and SPCB.
6.5	Further, it may be ensured that as per the time schedule specified in mine closure plan it should remain live till the point of utilization. The topsoil shall temporarily be stored at earmarked site(s) only and shall not be kept unutilized. The top soil shall be used for land reclamation and plantation purposes. Active OB dumps shall be stabilised with native grass species to prevent erosion and surface run off. The other overburden dumps shall be vegetated with native flora species. The excavated area shall be backfilled and afforested in line with the approved Mine Closure Plan. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment, Forest and Climate Change/ Regional Office.
6.6	The project proponent shall make necessary alternative arrangements, if grazing land is involved in core zone, in consultation with the State government to provide alternate areas for livestock grazing, if any. In this context, the project proponent shall implement the directions of Hon'ble Supreme Court with regard to acquiring grazing land.
6.7	Top soil should be stored separately at marked area and necessary vegetation shall be maintained to avoid any entrainment of dust
6.8	Progressive backfilling of mine and progressive reclamation of OB dump shall be done
6.9	Active OB Dump should not be kept barren/open and should be covered by temporary grass to avoid air born of particles
6.10	PP shall explore the possibilities of utilization of OB material for different purposes (in construction of roads/ manufacture of artificial sand, aggregates/ use for farmers etc.)
6.11	All approach roads to mine and all other roads which are in regular use should be black topped. The maintenance of road shall be done by PP in collaboration with state government
6.12	Hon'ble Supreme Court in an Writ Petition(s) Civil No. 114/2014, Common Cause vs Union of India & Ors vide its judgement dated 8th January, 2020 has directed the Union of India to impose a condition in the mining lease and a similar condition in the environmental clearance and the mining plan to the effect that the mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. Compliance of this condition after the mining activity is over at the cost of the mining lease holders/Project Proponent". The implementation report of the above said condition shall be sent to the Regional Office of the MoEF&CC

7. Green Belt

S. No	EC Conditions
7.1	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered/endemic flora/fauna, if any, spotted/reported in the study area. The Action plan in this regard, if any, shall be prepared and implemented in consultation with the State Forest and Wildlife Department.
7.2	Greenbelt consisting of 3-tier plantation of width not less than 7.5 m shall be developed all along the mine lease area as soon as possible. The green belt comprising a mix of native species (endemic species should be given priority) shall be developed all along the major approach/ coal transportation roads. And Plantation should also be carried out in nearby area with consent of forest department and gram panchayat within 10 km radius with its proper maintainance

8. Public Hearing And Human Health Issues

S. No	EC Conditions
8.1	Adequate illumination shall be ensured in all mine locations (as per DGMS standards) and monitored weekly. The report on the same shall be submitted to this ministry & it's RO on six-monthly basis.
8.2	The project proponent shall undertake occupational health survey for initial and periodical medical examination of the personnel engaged in the project and maintain records accordingly as per the provisions of the Mines Rules, 1955 and DGMS circulars. Besides regular periodic health check-up, 20% of the personnel identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, as amended time to time.
8.3	Personnel (including outsourced employees) working in core zone shall wear protective respiratory devices and shall also be provided with adequate training and information on safety and health aspects.
8.4	Implementation of the time bound action plan on the issues raised during the public hearing shall be ensured. The project proponent shall undertake all the tasks/measures as per the time bound action plan submitted with budgetary provisions during the public hearing. Land oustees shall be compensated as per the norms laid down in the R&R policy of the company/State Government/Central Government, as applicable.
8.5	The project proponent shall follow the mitigation measures provided in this Ministry's OM No.Z-11013/5712014-IA.II (M) dated 29th October, 2014, titled 'Impact of mining activities on habitations-issues related to the mining projects wherein habitations and villages are the part of mine lease areas or habitations and villages are surrounded by the mine lease area'.
8.6	PP to conduct need based assessment survey of the area to for in order to decide the activities to be carried under the CSR and to provide detail of the activity carried out with adequate budgetary provision and time bound action plan.
8.7	PP should conduct epidemiology study to (analysis of the distribution, patterns and determinants of health and disease conditions in defined populations).
8.8	Permanent Health care facilities of Hospital should be established within 5 km of project boundary

S. No	EC Conditions
	for the local people.
8.9	PP must ensure an emergency action plan during pandemic in order to provide assistance to the nearby villages located within the 10 km radius buffer zone (If required)
8.10	PP is asked to also identify the rural areas for installation of solar light with its maintenance within the study area of 10 km radius buffer zone within one year
8.11	PP to take measure for installation of Renewable Energy sources in nearby area falling within 10 km radius
8.12	The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right for darkness and minimal noise levels at night. PPs must ensure that the biological clock of the villages is not disturbed; by orienting the floodlights/ masks away from the villagers and keeping the noise levels well within the prescribed limits for day light/night hours
8.13	Adequate facility of drinking water, plantation and other social amenities should be provided to established R&R villages.
8.14	Persons of nearby villages shall be given training on livelihood and skill development to make them employable with its proper records.
8.15	Compensation of the land acquired for the project shall be settled as per the R&R Policy within fixed timeline

9. Corporate Environment Responsibility

S. No	EC Conditions
9.1	The company shall have a well laid down environmental policy duly approved by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental/forest/wildlife norms/conditions. The company shall have defined system of reporting infringements/deviation/violation of the environmental/forest/wildlife norms/conditions and/or shareholders/stake holders.
9.2	A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.
9.3	Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six Monthly Compliance Report.
9.4	Self environmental audit shall be conducted annually. Every three years third party environmental

S. No	EC Conditions
	audit shall be carried out.
9.5	PP should establish in house (at project site) environment laboratory for measurement of environment parameter with respect to air quality and water (surface and ground. A dedicated team to oversee environment management shall be setup which should comprise of Environment Engineers, Laboratory chemist and staff for monitoring of air, water quality parameters on routine basis. Any non- compliance or infringement should be reported to the concerned authority

10. Miscellaneous

S. No	EC Conditions
10.1	The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.
10.2	The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.
10.3	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.
10.4	The project proponent shall monitor the criteria pollutants level namely; PM10, SO2, NOx (ambient levels) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company.
10.5	The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change at environment clearance portal.
10.6	The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.
10.7	The project authorities shall inform to the Regional Office of the MOEFCC regarding commencement of mining operations.
10.8	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.
10.9	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during their presentation to the Expert Appraisal Committee.
10.10	No further expansion or modifications in the plant shall be carried out without prior approval of the

S. No	EC Conditions
	Ministry of Environment, Forests and Climate Change.
10.11	Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.
10.12	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.
10.13	The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.
10.14	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.
10.15	The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter.

Additional EC Conditions

N/A



Annexure 2

Budgetary Provision for Public Hearing issues and EMP

Public Hearing Budget

Proposed Activities under Public Hearing Commitment Scheme		Place of Implementation	Phasing of Allocated proposed PH commitment Budget (Rs. Lakh)					
			Year-1	Year- 2	Year- 3	Year- 4	Year- 5	Total
Air & Water Pollution control measures	Different measures to control Air pollution/Water Pollution like utilization of water sprinklers, fixed sprinklers, fog canon etc.	Kosala village (NW), Sandhapal (NW)						
		Natada (E), Ambapal (E)	80	80	80	80	80	400
Infrastructure development	Construction of Road, School, Solar Street lights supply, Cremation ground etc.	Villages - Kusumpal, Mallibandh, Ambapal,	50	50	50	50	50	250
Plantation	Plantation - Avenue & Community etc.	Kankarei, Pirakhamana, Rajjharan, Balichandrapur	5	5	5	10	10	35
Healthcare	Health Care and vaccination,	Health centres - Angul DHH,	50	50	50	50	50	250

Proposed Activities under Public Hearing Commitment Scheme		Place of Implementation	Phasing of Allocated proposed PH commitment Budget (Rs. Lakh)					
			Year-1	Year- 2	Year- 3	Year- 4	Year- 5	Total
	awareness camp, mobile medical camp, Immunization, medicine etc.	Kosala CHC, Chhendipada CHC, Mandapada PHC Villages - Nisha, Kosala, Raijharan, Balichandrapur, Sandhapal						
Water & Sanitation	Drinking Water Supply and Construction of wells, ponds, hand pumps and tube wells	Village - Kumunda, Ambapal, Natada,	30	30	30	30	30	150
Education & Livelihood Generation	Skill Development Training, Support to schools and other educational institutions	Kankarei High School, Kosala High School, Raijharan High School	30	30	30	30	30	150
Total			245	245	245	250	250	1235

(B) EMP budgetary provision (Capital and Recurring)

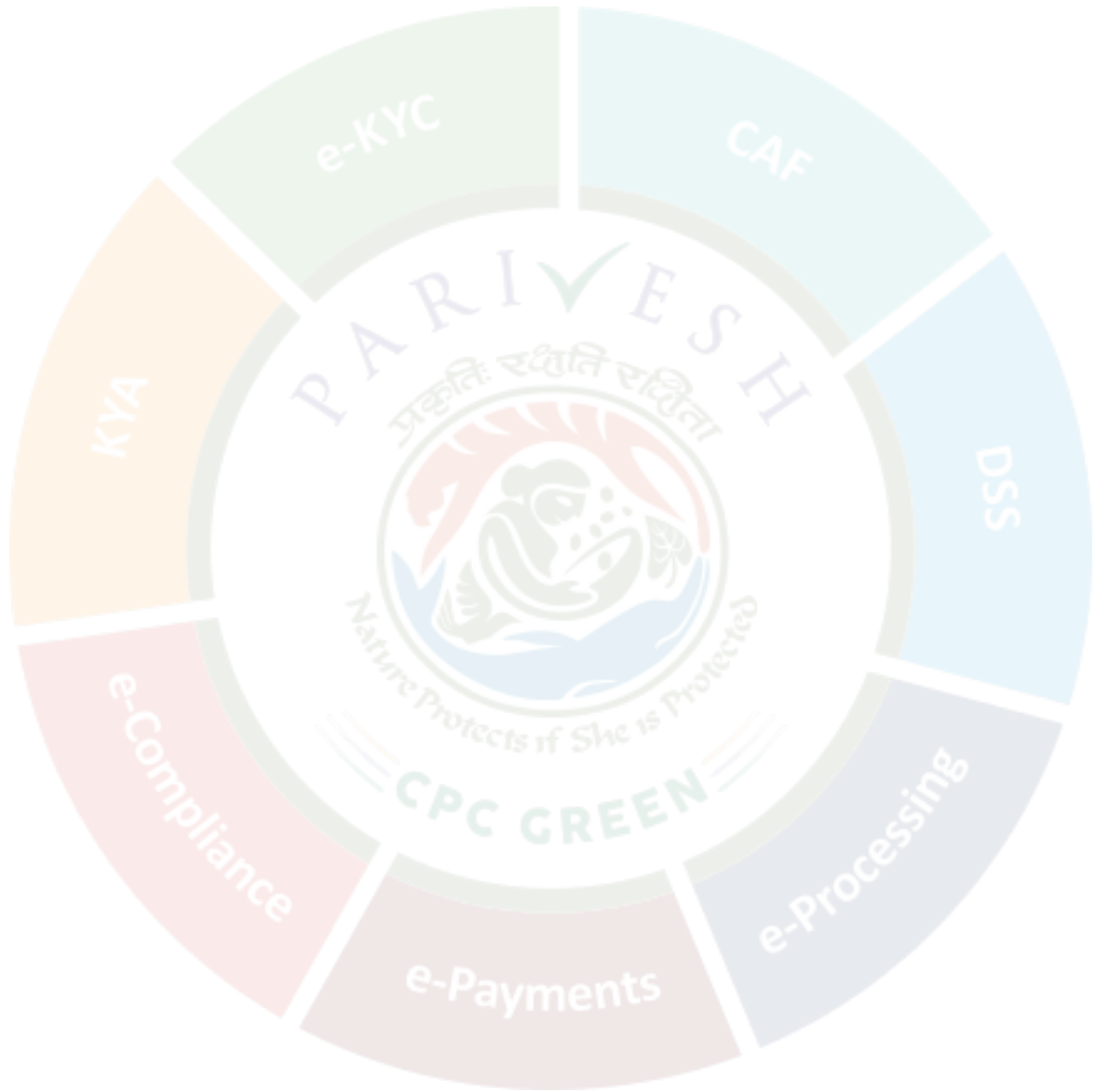
	Activity / Item	Units			
			Unit Cost	Capital Cost	Recurring Cost
1.	Air Pollution Control				
a	Truck Mounted Tankers with Mist Spray Sprinkling Arrangement for Haul Roads/Mine/Safety zone etc.	2	35	70	10
b	Mobile Water Mist Spray Sprinkler / truck mounted fog cannon for coal transportation route	1	50	50	6
c	Fixed type Mist spray at Coal stock pile/crusher/Transfer Points etc.	2	15	30	5
d	Wind Barrier Wall & Vertical Greenery System at proposed Railway Siding	LS	LS	30	4
e	Fixed fog cannons at coal stockyard	4	10	40	4
f	CAAQMS	2	15	30	3
Sub Total				250	32
2.	Water Pollution Control				
a	Garland Drain	LS	LS	60	10
b	Effluent Treatment Plant (ETP)	1	LS	90	9
c	Sewage Treatment Plant (STP)	1	LS	40	6
d	Mine Water Sedimentation Pond & Pumps	1	20	20	5
Sub Total				210	30
3.	Noise Control				
a	Noise Pollution Control Measures	LS	LS	100	20
Sub Total				100	20

4.	Conservation of Natural Resources				
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a	Solar lighting arrangement	50	0.7	35	2
b	Pond Conservation of 06 ponds outside the lease area	LS	LS	100	5
c	Soil Preservation (Biological Reclamation)	LS	LS	25	2
Sub Total				160	9
5.	Reclamation & Nursery Development				
a	Green Belt Development & Avenue Plantation etc.	LS	LS	500	55
Sub Total				500	55
6.	Fire Fighting Equipment				
a	Fire tender	1	100	100	10
b	Advance Fire fighting equipment, Fire extinguisher, smoke detectors (for office and workshop), fire Automatic Fire Detection and alarm system etc.	10	30	300	30
Sub Total				400	40
7.	Occupational Health				
a	Personnel Protection Equipment (Ear muffs/plugs, Goggles, Gloves, Helmets, Dust Mask, Safety Boots)	1500	LS	50	10
Sub Total				50	10
8.	Miscellaneous				
a	Awareness Programme (Display Boards (Digital) etc.	-	LS	30	2
b	CCTV camera for monitoring loading and transport, mine blast, fire, dust generation monitoring,	LS	LS	10	1

c	Equipment for Plantation O & M like water tanker, tractor with trolley, other equipment	LS	LS	50	2
Sub Total				90	5
9.	Public Hearing Budget			1235	0
Total Cost (Rs. Lakhs)				2995	201







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Annexure-44

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No.24 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "No labour camp shall be established on the forest land and the User Agency shall provide fuels preferably alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas".

General Manager
Subhadra Area, MCL



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Annexure-45

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No.25 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "The boundary of the diverted forest land, mining lease and safety zone, as applicable, shall be demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, distance from pillar to pillar and GPS coordinates".

General Manager
Subhadra Area, MCL



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Annexure-46

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No.26 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "The layout plan of the mining plan / proposal shall not be changed without the prior approval of the Central Government and the forest land shall not be used for any purpose other than that specified in the proposal".


General Manager
Subhadra Area, MCL





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Annexure-47

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No.27 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "The forest land proposed to be diverted shall under no circumstances be transferred to any other agency, department or person without prior approval of the Central Government".

General Manager
Subhadra Area, MCL



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Annexure-48

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No.28 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "No damage to the flora and fauna of the adjoining area shall be caused".

General Manager
Subhadra Area, MCL



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Annexure-49

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No.29 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "The User Agency shall submit the annual self -compliance report in respect of the above stated conditions to the State Government, concerned Regional Office and to this Ministry by the end of March every year regularly".

General Manager
Subhadra Area, MCL



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Annexure-50

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No.30 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "Any other condition that the concerned Regional Office of this Ministry may stipulate with the approval of competent authority in the interest of conservation, protection and development of forests & wildlife".

General Manager
Subhadra Area, MCL



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Annexure- 51

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No.31 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "The user agency will be comply all the provisions of the all Acts, Rules, Regulations, Guidelines, Hon'ble Court Order (s) and NGT Order (s) pertaining to this project, if any, for the time being in force, as applicable to the project".

General Manager
Subhadra Area, MCL



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Annexure- 52

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No.32 of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "Violation of any of these conditions will amount to violation of Forest (Conservation) Act, 1980 and action would be taken as prescribed in para 1.21 of Chapter 1 of the Handbook of comprehensive guidelines of Forest (Conservation) Act, 1980 as issued by this Ministry's letter No. 5-2/2017-FC dated 28.03.2019."

General Manager
Subhadra Area, MCL