Greenko Energies Private Limited
CIN: U40109TG2000FTC034990

GEPL/MoEFCC/EDS/SPSP/231117 **Dated 17.11.2023**

To

Deputy Conservator of Forests
Baran Territorial Forest Division
Rajasthan

Sub: Diversion of 407.8227 Ha forest land for the development of Shahpur (1800 MW) Pumped Storage Project by M/s Greenko Energies Private Limited (GEPL) in Baran Territorial Forest Division, Baran District of Rajasthan State (Online Proposal No. FP/RJ/HYD/121439/2021)-reg

Ref: MoEF & CC EDS letter dated 17.10.2023.

Dear Sir,

With reference to above mentioned subject matter, reply to the observations of MOEF & CC EDS letter dated 17.10.2023 is herewith submitted for your kind consideration and further necessary action.

Thanking you,
Yours faithfully,

For **Greenko Energies Pvt. Ltd.**

Authorized Signatory

Encl: As above

Reply to EDS (Addl Details) Sought by MoEF & CC vide letter dated 17-10-2023

S.No	Condition	Reply
i	The CAT Plan for the total catchment area of both the reservoir of 6.48 Sq.Km and Wildlife Conservation Plan for Schedule-I species have been prepared towards instant proposal by R S Envirolink Technologies Pvt. Ltd. But it is not clear whether these plans have been approved by the competent authority as per prescribed guidelines or not. Therefore, this needs to be clarified and copy of approval of the competent authority needs to be submitted.	• MoEF&CC/EAC (IA division), while granting ToR vide letter dated 13.04.2020 (Copy enclosed at **Annexure-1)** has *inter-alia* observed that instant project being the Pump storage project and standalone in nature and upper reservoir is located away from the existing natural water systems and have no/negligible catchment area. Therefore CAT Plan, RIM treatment, L-section of river and Environmental flow study will not be required. • However, for an area of about 6.48 Sq.Km, CAT plan was prepared as a precautionary reclamation measure in consultation with DFO, Baran to control of soil erosion, if any. This plan was duly approved by the State Govt.
ii	Satellite imagery of the proposed diversion shows that the plantation work was carried out in the past at the Segment-7 (3.82 ha.) and there is presence of Agriculture land in the forest area proposed for diversion. The same needs clarification.	• To be replied by DCF, Baran/State Govt
iii	Satellite imagery of proposed CA area over Non-forest land of Ekalpar and Kolu Tala villages in patch No 12 & 16 under Jaisalmer District shows the presence of settlements. Also, Satellite imagery of the RDF patches for CA under Baran district are showing the encroachment for Agriculture land having few built-up areas as well. The State Govt. shall ensure that the area proposed for CA is free from all encumbrances.	• To be replied by DCF, Baran/State Govt
iv	The State Govt. has not provided the complete KML file of non-forest land involved in the project. The same needs to be furnished	• Since Non-Forest land KML can't be uploaded in Parivesh 1.0 separately. As desired, the complete KML file of Forest/non-forest land involved in the project is enclosed herewith for ready reference in CD.
v	In the component wise break-up, an area of 57.225 ha forest land has been proposed for the WCS & Powerhouse which is a huge area and	• Land Break up of 57.22 Ha area in WCS & Power House is give below:

<table>
<tr><th>S.No</th><th>Condition</th><th>Reply</th></tr>
<tr><td></td><td>no breakup of the same has been given. Therefore, the details of each component involved in the said area with justification may be provided.</td><td>
<table>
<tr><th>Component</th><th>Area (Ha)</th></tr>
<tr><td>WCS /Penstock</td><td>24.41</td></tr>
<tr><td>Powerhouse</td><td>7.865</td></tr>
<tr><td>Pot Head Yard</td><td>6.19</td></tr>
<tr><td>TRT</td><td>2.64</td></tr>
<tr><td>Lower Intake</td><td>14.97</td></tr>
<tr><td>Proposed Road form Lower Reservoir to Power House</td><td>1.1500</td></tr>
<tr><td>Total</td><td>57.225</td></tr>
</table>
Several fragmented patched with small extents are getting honeycombed within the project and the compactness of the left-over forest area in the project area is getting compromised. To avoid this, small fragments left between penstocks have been included in the diversion case.
</td></tr>
<tr><td>vi</td><td>The suitability certificates for CA area proposed over the NFL and DFL located under the Jaisalmer District are given. However, the proposed CA area appears to be in sand dunes, which may not be suitable for raising plantation and its survival. Therefore, the State Govt. shall re-examine the suitability of the NFL provided for CA and ensure that the area proposed is suitable for raising plantation.</td><td>Site suitability certificate for Non-Forest Land (NFL) has been accorded by DFO, IGNP-II, Jaisalmer based on site inspection report and incorporated in the diversion proposal. Further, DFO, IGNP-II, Jaisalmer vide letter dated 10-11-2023 (copy enclosed at Annexure-2) has reiterated that proposed CA area is not in sand dunes and presently cultivation is being practiced in that area and confirmed that the identified NFL is suitable for CA plantations.</td></tr>
<tr><td>vii</td><td>State shall clarify as to how the requirement of electricity will be met by the user agency to run project and its components. The detail of forest area required for the purpose (if any) shall be submitted.</td><td>For construction power requirement, the same will be met by the user agency from existing grid power available at the site.</td></tr>
<tr><td>viii</td><td>The detailed plan for evacuation and transmission of power so generated from this project shall be submitted</td><td>Evacuation and transmission of power from Shahpur Pumped Storage Project is yet to be finalized.
The Company is discussion in PGCIL for allotment of suitable evacuation point.
Various alternate alignments for the transmission line will be studied in detail and optimal alignment will be chosen in such a way that proposed line shall pass</td></tr>
</table>

S.No	Condition	Reply
		through non-forest land or that the barest minimum forest land is involved for the transmission line.
ix	The status of muck disposal plan shall be submitted.	• A detailed plan indicating the manner in which the muck generation, their transportation from different components of the project and its disposal at the designated sites along with reclamation/management measures had been duly incorporated in EIA /EMP Report. • EIA/EMP reports were submitted to MoEF & CC (IA Division) for grant of Environmental Clearance and at present the EC proposal is under active consideration by MoEF & CC. • Mitigation Measures once approved in the EC letter shall be implemented during construction phase in to-to. • Copy of Muck Management Plan has been already uploaded in Part-I which is available at serial number 33 of Additional Information and the same is enclosed again herewith for ready perusal at **Annexure-3.**
x	The State Govt. has reported that the proposed forest land for diversion is located within the notified conservation reserve "Shahbad upreti". Moreover, King vulture is also reported in the area as per the site inspection report of CCF/DCF. Therefore, the comments of the CWLW in this regard needs submission.	• King Vulture is not reported from the project area & further on discussions with Chief Wildlife Warden, it was confirmed that King vulture is not present in State of Rajasthan. • However, considering the general flora & fauna of the project area, detailed wildlife management plan including management measures for fauna species as per the conditions of TOR issued by MoEF & CC (IA - Division) has been prepared and submitted to Chief Wildlife Warden, Govt of Rajasthan and it is under final approval.
xi	In Part-1 of the application, many of the documents uploaded against the Copy of ownership proof of CA land and the Copy of MoU/agreement executed between the Present owner and the User Agency are either not	• Due to large file size which cannot be uploaded online, copies of MoU/agreement executed between the Present owner and the User Agency and the certified copy of Jamabandi (revenue record) & the copy of revenue documents and an abstract indicating the

S.No	Condition	Reply
	legible or the same are not commensurate with the requirement. The State Govt shall therefore ensure to submit the legible copies of the ownership proof of CA land and the MoU/agreement executed between the Present owner and the User Agency. The copy of revenue documents and an abstract indicating the owner wise detail of non-forest land shall also be submitted.	owner wise detail of non-forest land are provided in Hard Copy.
xii	Satellite imagery shows that, a road is passing through the forest land wherein a component i.e., Upper Reservoir has been proposed. The status of the same shall be submitted. Further, the connectivity of the local people may be hampered in case said road is submerged. In this regard, the comments of the State Govt. are required to be submitted	• Kutcha road visible in Satellite imagery from Kaloni village to nearby agriculture lands passes through forest is a temporary path/road being used by villagers. This is not a permanent road. After, the private land acquisition is done for the project, this road will no longer be required.

Greenko Energies Pvt. Ltd.

N. Gopi Krushna

Date: 17.11.2023
Place: Hyderabad

N. Gopi Krushna
Authorised Signatory

No. J-12011/02/2020-IA-I
Government of India
Ministry of Environment, Forest & Climate Change
(IA.I Division)

Indira Paryavaran Bhawan
3rd Floor, Vayu Wing
Jor Bagh Road
New Delhi-110 003

Dated: 13th April, 2020

To

M/s Greenko Energies Private Limited
Plot No. 1071, Road No. 44
Jubilee Hills, Hyderabad-500033
Telangana

Sub: Shahpur Pumped Storage Project (**2520 MW**) in District Baran, Rajasthan by M/s Greenko Energies Private Limited- reg. Terms of Reference (ToR).

Sir,

This has reference to online proposal No. IA/RJ/RIV/142374/2020 and letter no SHAHPUR/SPSP/MoEF&CC /ToR/ 20200210 Dated 10.02.2020 submitted to the Ministry for ToR to the project cited in the subject.

2. The above referred proposal was considered by the Expert Appraisal Committee (EAC) for River Valley & Hydroelectric projects in its 31st meeting held on 05.03.2020. The comments and observations of EAC on the project may be seen in the Minutes of the meeting which are available on the web-site of this Ministry.

3. Above proposal is for to develop Pumped Storage Project (PSP) in Shahpur (Village), Shahabad (Tehsil) of Baran (District) in the State of Rajasthan. Total capacity of the proposed PSP is 2520 MW (17640 MWH, based on 7-hour operation per day). Project involves creation of new upper reservoir and lower reservoirs consisting of rock fill embankment with central clay core. The geographical coordinates of the proposed upper reservoir are at Latitude 25°11'25.21"North and Longitude is 77°10'55.78" East and that of lower reservoir are at 25°11'40.00" North and 77°11'50.00" East.

4. The upper reservoir is proposed to be located on flat / gradually sloping land which is suitable for creating the desired gross storage capacity of 1.70 TMC. Out of 1.70 TMC, the live storage capacity is 1.63 TMC and the dead storage capacity is 0.075 TMC by keeping FRL & MDDL at EL 512.00m & EL 489.00m, respectively. For creating this storage, it is proposed to construct rockfill embankment for the average height of around 28 m (with maximum height of 30m) for the length of 6985m. Similarly, the lower reservoir is proposed to be located in the

flat / gradually sloping portion which is suitable for creating the desired gross storage capacity of 1.71 TMC in which the live storage capacity is 1.64 TMC and dead storage capacity is 0.07 TMC by keeping FRL and MDDL at EL 354.00m & EL 323.00m, respectively. For creating this storage, it is proposed to construct rockfill embankment for the average height of 34m (with maximum height of 42m) for the length of 3842 m.

5. Water conductor system consist of 52.20m high Power Intake Structure; 8 nos. each of 909 m long and 7.5m dia. surface circular steel lined Penstock / Pressure Shaft (i.e. consisting of 711 m long surface penstock, 121 m long vertical pressure shaft and 77 m long Horizontal pressure shaft) to feed 8 units of 315 MW; A surface Powerhouse having an installation of eight nos. reversible Francis turbine each of 315 MW capacity (6 units of fixed speed and 2 units of variable speed turbines) operating under a rated head of 157.00m in generating mode and 168.00m in pumping mode. 8 nos. 8.5 m diameter,190m long Tailrace Tunnel. 125 m wide and FSD of 5.5m is the Tail race channel of 953 m long joining with the proposed lower reservoir. As such, the proposed project will generate 2520 MW by utilizing design discharge of 1817.98 Cumec with rated head of 157.00 m. Upper and lower reservoir (both are to be constructed newly) and one-time water will be pumped from existing nearby Shahabad Kuno river to the proposed Shahpur Standalone PSP lower reservoir which is about 150 m away from the toe of the embankment of lower reservoir

6. Total land required for construction of various components, including infrastructure facilities and muck disposal area is estimated to be around 777.44 ha, involving 543.52 ha of forest land and 233.92 ha of non-forest land. An estimated cost of the project is Rs. 11736.73 Crores. As per the Form 1 there is no Protected Area notified under the Wild Life (P) Act, 1972; Critically Polluted areas as identified by the CPCB constituted under the Water (P) Act 1974; Eco Sensitive Areas as notified within 10 km of the project boundary.

7. The above proposal was appraised by the EAC in the 31st meeting held on 05.03.2020. EAC in the 31st meeting held on 05.03.2020 deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that in the instant project upper is located away from all existing natural water systems and have no/negligible catchment area therefore CAT Plan, RIM treatment, L-section of river and Environmental flow study for the upper and lower reservoir will not be required under EMP.

8. Based on recommendations of the EAC, the Ministry of Environment, Forest & Climate Change hereby **accords a fresh Terms of Reference (TOR)** as per the Standard ToR (Hydro projects) for the proposed activity as per the provisions of the Environmental Impact Assessment Notification, 2006 and as amended time to time along with the following additional ToR for preparation of EIA/EMP report:

Standard ToR

The EIA/EMP report should contain the information in accordance with provisions & stipulations as given in the **Standard ToR for hydro projects (***Please visit the following link to download the Standard ToR:*

http://environmentclearance.nic.in/writereaddata/standardtorreference.pdf.

Additional ToR

i. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

ii. The project involves diversion of about **543.52 ha** of forestland. Forest clearance shall be obtained as per the prevailing norms of Forest (Conservation) Act, 1980.

iii. Application to obtain prior approval of Central Government under the Forest (Conservation) Act, 1980 for diversion of forest land required should be submitted as soon as the actual extent of forest land required for the project is known, and in any case, within six months of issuance of this letter.

iv. Funds allocation for Corporate Environment Responsibility (CER) shall be made as per O.M. No. 22-65/2017-IA.III dated 01.05.2018 for various activities therein.

v. The details of funds allocation and activities for CER shall be incorporated in EIA/EMP report.

vi. The EIA report should clearly mention activity wise EMP and CER cost details and should earmarked clear break-up of the capital and recurring cost along with the timeline for incurring the capital cost.

vii. Consolidated EIA/EMP report is to be submitted as per the generic structure (Appendix III & IIIA) given in the EIA Notification, 2006.

viii. Conservation plan for the Scheduled I species, if any, in the project study area shall be prepared and submitted to the Competent Authority for approval.

ix. Pre-DPR Chapters viz., Hydrology and Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.

x. Dam break analysis, Disaster Management Plan and Fisheries Management Plan be prepared and submitted in the EIA/EMP report.

xi. Environmental matrix during construction and operational phase needs to be submitted.

xii. Both capital and recurring expenditure under EMP shall be submitted.

xiii. Impact of developmental activity/project on the wildlife habitat, if any, within 10 km of the project boundary shall be studied.

xiv. The consultant engaged for preparation of EIA/EMP report has to be registered with Quality Council of India (QCI/ NABET) under the scheme of Accreditation & Registration of MoEF& CC. This is a pre-requisite.

xv. Consultant shall include a "Certificate" in EIA/EMP report regarding portion of EIA/EMP prepared by them and data provided by other organization(s)/ laboratories including status of approval of such laboratories. Declaration by the Consultant that information submitted in the EIA/EMP is factually correct and shall be submitted along with EIA/EMP reports.

xvi. An undertaking as part of the EIA report from Project proponent, owning the contents (information and data) of the EIA report with the declaration about the contents of the EIA report pertaining to a project have not been copied from other EIA reports.

xvii. The draft EIA/EMP report prepared as per the Generic Structure (Appendix III of EIA Notification, 2006) incorporating information as per the Standard ToR, should be submitted to the State Pollution Control Board concerned for conducting Public Consultation, district wise, as per the provisions stipulated in EIA Notification, 2006. Public Hearing, which is a part of Public Consultation, shall be held district wise at the site or in its close proximity as prescribed in Appendix (IV) of EIA Notification, 2006. The draft EIA/EMP report is to be submitted to SPCB sufficient before the expiry of the ToR validity so that necessary amendments in EIA/EMP can be undertaken based on public hearing and the same is to be submitted to MoEF&CC before expiry of validity.

xviii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/EMP report in the relevant chapter. Final EIA/EMP report should be submitted to the Ministry for Environmental Clearance only after incorporating these issues, before the expiry of validity of ToR.

xix. As per Ministry's Notification 17.02.2020, the ToR will remain valid for a period of 5 years from the date of issue of this letter for submission of EIA/EMP report along with public consultation. The ToR will stand lapsed after completion of 5 years in case final EIA/EMP is not submitted.

xx. Baseline data and public consultation shall not be older than 3 years, at the time of submission of the proposal, for grant of Environmental Clearance.

xxi. In case of any change in the scope of the project such as capacity enhancement, change in submergence, etc., fresh scoping clearance has to be obtained.

xxii. The PP should submit a copy of TEC of the DPR along with EIA/EMP report.

xxiii. Details of the name and number of posts to be engaged by the project proponent for implementation and monitoring of environmental parameters be specified in the EIA report.

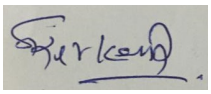
xxiv. The EIA/ EMP report must contain an Index showing details of compliance of all ToR conditions. The Index will comprise of page No. etc., vide which compliance of a specific ToR is available. It may be noted that without this index, EIA/ EMP report will not be accepted.

xxv. The PP should complete all the tasks as per the provisions of EIA Notification, 2006 and as amended time to time) and submit the application for final clearance within the stipulated time.

xxvi. Appropriate Biodiversity Conservation and Management plan for the Native, Rare & Endangered floral and faunal species getting affected due to the project shall be prepared.

This has approval of the Competent Authority.

Yours faithfully,

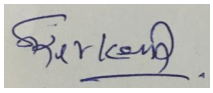


(Dr. S. Kerketta)
Director

Telefax: 011-24695314

Copy to:

1. The Secretary, Ministry of Water Resources, RD & GR, Sharm Shakti Bhawan, Rafi Marg, New Delhi-3.
1. The Secretary, Ministry of Power, Sharm Shakti Bhawan, Rafi Marg, New Delhi-110001.
2. The Pr. Secretary to Government Energy Department, Govt. of Rajasthan, Room No. 8340, SSO Building, Government Secretariat, Jaipur, Rajasthan
3. The Principal Chief Conservator of Forests, (HOFF), Rajasthan, Aranya Bhawan, Jhalana Institutional Area, Jaipur-302004, Rajasthan.
4. The Member Secretary, Rajasthan State Pollution Control Board, 4, Jhalana Institutioal Area, Jhalana Doongri, Jaipur, Rajastan-302004
5. The Chief Engineer, Project Appraisal Directorate, Central Water Commission, Sewa Bhawan R.K. Puram, New Delhi-110066.
6. The Deputy Director General of Forests (C), Regional Office (CZ), Ministry of Environment, Forest & Climate Change, Kendriya Bhawan, 5thFloor, Sector "H", Aliganj, Lucknow — 226020
7. Sr. PPS to JS(GM)
8. NIC Cell of MoEF&CC with a request to upload on MoEF&CC Website.
9. Guard File.



(**Director**)

ANNEXURE-2

कार्यालय संभागीय मुख्य वन संरक्षक, जोधपुर

क्रमांक एफ ( )एफसीए/2023/एनएफएल ग्रीनको/7166 दिनांक : 10-11-23

निमित्त :

अति प्रधान मुख्य वन संरक्षक (एफसीए)
एवं नोडल अधिकारी, एफसीए, राजस्थान, जयपुर

विषय :– Diversion of 407.8227 Ha of Forest Land for the Construction of Shahpur Pumped Storage Project by M/s Greenko Energies Pvt Ltd, Shahbad Tehsil in Baran Dist Rajasthan (Proposal No FP/RJ/HYD/121439/2021)

संदर्भ :– श्रीमान का पत्रांक 8104–05 दिनांक 9–11–2023 एवं उप वन संरक्षक, इगानप स्टेज–II जैसलमेर का पत्रांक 6386 दिनांक 10–11–2023

महोदय,

उपरोक्त विषयान्तर्गत निवेदन है कि विषयांकित प्रकरण में भारत सरकार द्वारा पत्रांक 8–25–2023–एफसी दिनांक 17–10–2023 के द्वारा प्रकरण में अतिरिक्त सूचनायें/औचित्य की टिप्पणी चाही गई है। जिसमें बिन्दु संख्या (vi) के संबंध में टिप्पणी इस कार्यालय से चाही गई है। जिस पर टिप्पणी निम्नानुसार है :–

क्र स	आक्षेप	टिप्पणी/अनुपालना
1	The suitability certificates for CA area proposed over the NFL and DFL located under the jaisalmer district are given. However, the proposed CA area appears to be in sand dunes, which may not be suitable for raising plantation and its survival. Therefore, the State Govt. Shall re-examination the suitability of the NFL provided for CA and ensure that the area proposed is suitable for raising plantation.	उप वन संरक्षक इगानप स्टेज–।। जैसलमेर द्वारा प्रस्तुत अनुपालना रिपोर्ट अनुसार उक्त प्रकरण में प्रत्यावर्तन के एवज में प्राप्त होने वाली भूमि का मौका निरीक्षण दिनांक 24.02.2023 को उप वन संरक्षक, इगानप स्टेज–।। जैसलमेर द्वारा किया गया था। प्रस्तावित भूमि में मौके पर Sand dunes नहीं हैं एवं प्रस्तावित भूमि समतल भूमि है जो कि नहर से सिंचित हैं एवं वर्तमान में इस भूमि पर फसल बोई हुई है। यह भूमि वृक्षारोपण के लिए उपयुक्त हैं जिसमें सिंचाई के लिए पानी भी नहर/खाला से उपलब्ध हो सकेगा एवं पौध की जीवितता भी बहुत अच्छी रहने की संभावना है। इस संबंध में आवश्यक CA Land का Suitability Certificate भी पूर्व में प्रेषित कर दिया गया है।

आलौच्य प्रत्यावर्तन प्रकरण में उप वन संरक्षक, इगानप. स्टेज–।। जैसलमेर द्वारा प्रस्तुत अनुपालना से यह कार्यालय सहमत है एवं अनुपालना रिपोर्ट श्रीमान को संलग्न प्रस्तुत है।

संलग्न – उक्तानुसार।

भवदीय

(एस आर वी मूर्थी)
संभागीय मुख्य वन संरक्षक,
जोधपुर

क्रमांक एफ ( )एफसीए/2023/एनएफएल ग्रीनको/ दिनांक :

प्रतिलिपि निम्न को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित :–

1. संभागीय मुख्य वन संरक्षक, कोटा
2. उप वन संरक्षक बारां/इगानप. स्टेज–।। जैसलमेर
3. ग्रीनको एनर्जी प्राइवेट लिमिटेड,

Signature valid

RajKaj Ref No 5952582

Digitally signed by S R Venkateswara Murthy
Designation : Chief Conservator Of Forest
Date: 2023.11.10 16:37:49 IST
Reason: Approved

संभागीय मुख्य वन संरक्षक,
जोधपुर

कार्यालय उप वन संरक्षक इन्दिरा गांधी नहर परियोजना स्टेज–II जैसलमेर

क्रमांकः एफ ( )तकनीकी/उवसंइगानप/2023/ 6386 दिनांक : 10.11.23

निमित्त :

संभागीय मुख्य वन संरक्षक
वन भवन, न्यू पाली रोड़
जोधपुर।

विषय :– Proposal for diversion of 407.8227 ha. For Shahpur (1800MW) Pumped Storage Project by M/s Greenko Energies Private Limited, in Hanumanth khera, Mungawali villages, G.P.-Mundiyar, Tehsil-Shahbad, Baran Disitrict, Rajasthan. (Proposal No. FP/RJ/HYD/121439/2021)

प्रसंग :– अतिरिक्त प्रधान मुख्य वन संरक्षक प्रोटेक्शन एवं नोडल अधिकारी(एफ.सी.ए.) राजस्थान, जयपुर का पत्र क्रमांक 8104–05 दिनांक 09.11.2023।

महोदय,

उपर्युक्त विषयान्तर्गत निवेदन है कि उक्त प्रकरण में प्रत्यावर्तन के एवज में प्राप्त होने वाली भूमि का मौका निरीक्षण दिनांक 24.02.2023 को अधोहस्ताक्षरकर्त्ता द्वारा किया गया था। इस संबंध में आवश्यक CA Land का Suilability Certificate भी प्रेषित कर दिया गया था। प्रासंगिक पत्र के द्वारा बिन्दु संख्या VI के संबंध में रिपोर्ट चाही गई है जो निम्नानुसार है :–

उक्त भूमि मौके पर Sand dunes नहीं हैं प्रस्तावित भूमि समतल भूमि है जो कि नहर से सिंचित हैं एवं वर्तमान में इस भूमि पर फसल बोई हुई है। यह भूमि वृक्षारोपण के लिए उपयुक्त हैं जिसमें सिंचाई के लिए पानी भी नहर/खाला से उपलब्ध हो सकेगा एवं पौध की जीवितता भी बहुत अच्छी रहने की संभावना है।

रिपोर्ट सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित है।

भवदीय

(पंकज कुमार गुप्ता)
उप वन संरक्षक
इ.गां.न.प. स्टेज–II
जैसलमेर

Signature Valid
RajKaj Ref 5050980
Digitally signed by Pankaj Kumar
Designation: Deputy Conservator Of Forest
Date: 2023.11.[illegible]1:17:52 IST
Reason: Approved

ENVIRONMENTAL IMPACT ASSESSMENT (EIA)
SHAHPUR PUMPED STORAGE PROJECT (1800 MW)

(Sector 1(c); Cat "A")

Draft Report

AUGUST -2022

Prepared for:

M/s GREENKO ENERGIES PRIVATE LIMITED, HYDERABAD

Prepared by:

R S Envirolink Technologies Pvt. Ltd.

403, BESTECH CHAMBER,
B-BLOCK, SUSHANT LOK-I, GURGAON
Ph: +91-124-4295383: www.rstechnologies.co.in

MUCK MANAGEMENT PLAN

Full title of the Project	:	Construction of Shahpur (1800 MW) Pumped Storage Project by M/s Greenko Energies Private Limited, in Hanumanthkhera, Mungawali villages, G.P-Subhdhara; Baint Village, G.P-Bichi; Sahjanpur Villages, G.P-Kasba Nonera; Kaloni, Shahpur Villages, G.P- Mundiyar; Tehsil-Shahbad; Baran District, Rajasthan.
Proposal No	:	**FP/RJ/HYD/121439/2021**
Date of Proposal	:	03-02-2021
Diversion Area	:	407.8227 Ha

10.1 MUCK MANAGEMENT PLAN

The muck generated from various project activities during the construction of the PSP may adversely affect the environment if not properly managed. The generated muck volume, if not properly disposed, can destroy the landscape and increase the atmospheric particulate matter. The Proposed Shahpur (1800 MW) Pumped Storage Project (PSP) is located at Baran District, Rajasthan is likely to generate large volume of muck of which some quantity will be utilizable and the remaining muck volume needs to be rehabilitated at appropriate dumping sites in a technically and ecologically sound manner.

Map showing location of Muck dumping site is given at **Figure 10.1.**

Figure 10.1: Location of Muck Disposal Site

10.1.1 Quantity of Material to be Excavated

The construction activities of the project would generate muck from excavation of various project structures. The total quantity of muck likely to be generated from excavation including construction of roads is about 15.61 Mcum. The component-wise quantity of muck to be generated is given at **Table 10.6** and Quantity of Muck to be disposed at **Table 10.7**. However, after the utilization of muck for different project components and considering the swell factor of 40% for excavated material, the total quantity of muck to be disposed is worked out as **7.54 Mcum**. The entire excavated material is proposed to be dumped at one location identified specifically for this purpose as shown above.

Table 10.1: Muck to be generated from various components of the project

S. No.	Project Component	Total Quantity of Muck to be generated (Million m^3)
1	Upper Reservoir	1.04
2	Upper Intake	0.19
3	Upper Reservoir Dam	0.61
4	Penstock & Pressure Shaft	0.77
5	Powerhouse	1.35
6	TRT	0.17
7	Lower Reservoir Dam	0.40
8	Lower Intake & Tailrace Channel	0.93
9	Lower Reservoir	8.50
10	Adit	0.015
11	Roads	1.64
	Total	**15.615**

Table 10.2: Quantity of muck to be disposed

S. No.	Description	Quantity in Million m^3
1	Total quantum of muck generated from the project components	15.615
2	Considering the swelling factor of 40% for the muck generated (1)	6.246
3	Total Dumpable Muck	21.861
4	Total consumption (in aggregates fine & Course, Road Development, Protection works and Embankment of upper & lower reservoirs etc	14.32
5	Net Quantity of muck to be disposed (3-4)	7.54
6	Muck disposal in MD site with 30 ha area	5.61
7	Muck disposal in Dead Storage part of Lower & Upper Reservoir	1.93

10.1.2 Muck Disposal Site

For the disposal 7.54 Mcum of muck an area of 30 Ha having capacity of 5.61 Mcum has been identified and the balance muck 1.93 Mcum shall be accommodated in the dead storage of the Upper and Lower Reservoirs. The disposal site was identified taking into consideration availability of suitable area, minimum distance from generation sites. Chainage wise area available and capacity of muck dumping site is given at **Table 10.2**

10.1.2.1 Criteria for Selection of Dumping Site

The following points were considered and followed as guidelines for finalization of the areas to be used as dumping sites:

i) The dumping sites have been selected as close as possible to the project area to avoid long distance transport of muck.
ii) The site is free from any landslides or creep and care has been taken that the sites do not have a possibility of toe erosion and slope instability.
iv) There is no active channel or stream flowing through the dumping sites.
v) The site is away from human settlement areas.

The identification of muck disposal areas was done in line with the topographic and site-specific conditions as specified above.

Table 10.3 Details of muck disposal site

S. No.	Chainage (m)	Area (Sqm)	Capacity (m^3)	Total Muck to be Dumped (Million m^3)
1	0 m	11177.06	0.00	0
2	150m	7754.9	2082515.60	-
3	300m	7940.9	1177185.00	-
4	450m	6629.46	1092777.00	-
5	600m	3670.89	1261792.88	
	TOTAL	37173.21	5614270.48	7.54

10.1.2.2 Methodology of Dumping

The muck that needs disposal would be piled at Ø (angle of repose) maximum of 30° at the proposed dumping site. The description regarding the stabilization of the stacked material along the proposed roads has been discussed in the following paragraphs.

The options like dumping muck in stages and allowing it to consolidate/settle through the monsoon, compacting the dumped muck with Bulldozer movement, zoning of the dump judiciously to ensure the stability of 30° slope under all superimposed conditions will be explored and utilised. The plan and cross-sections of the proposed muck dumping site is given at **Figures 10.2 and Figure 10.3**.

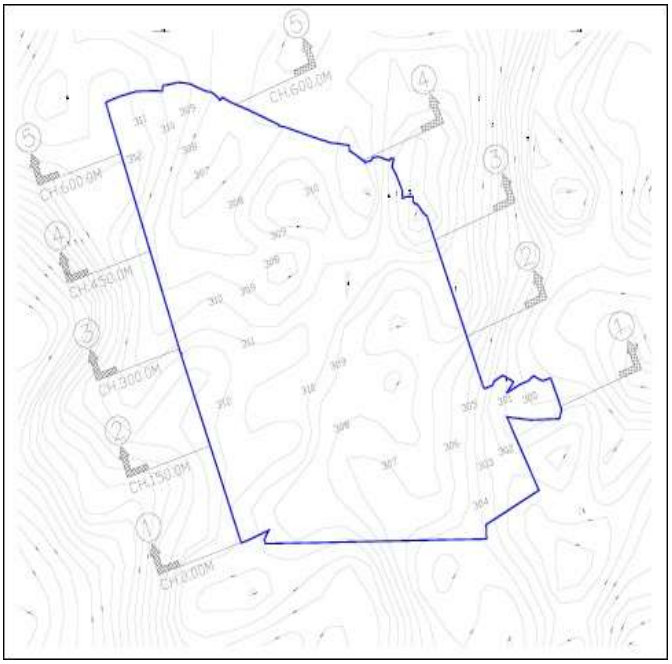


Figure 10.2 : Plan of Muck Dumping Site

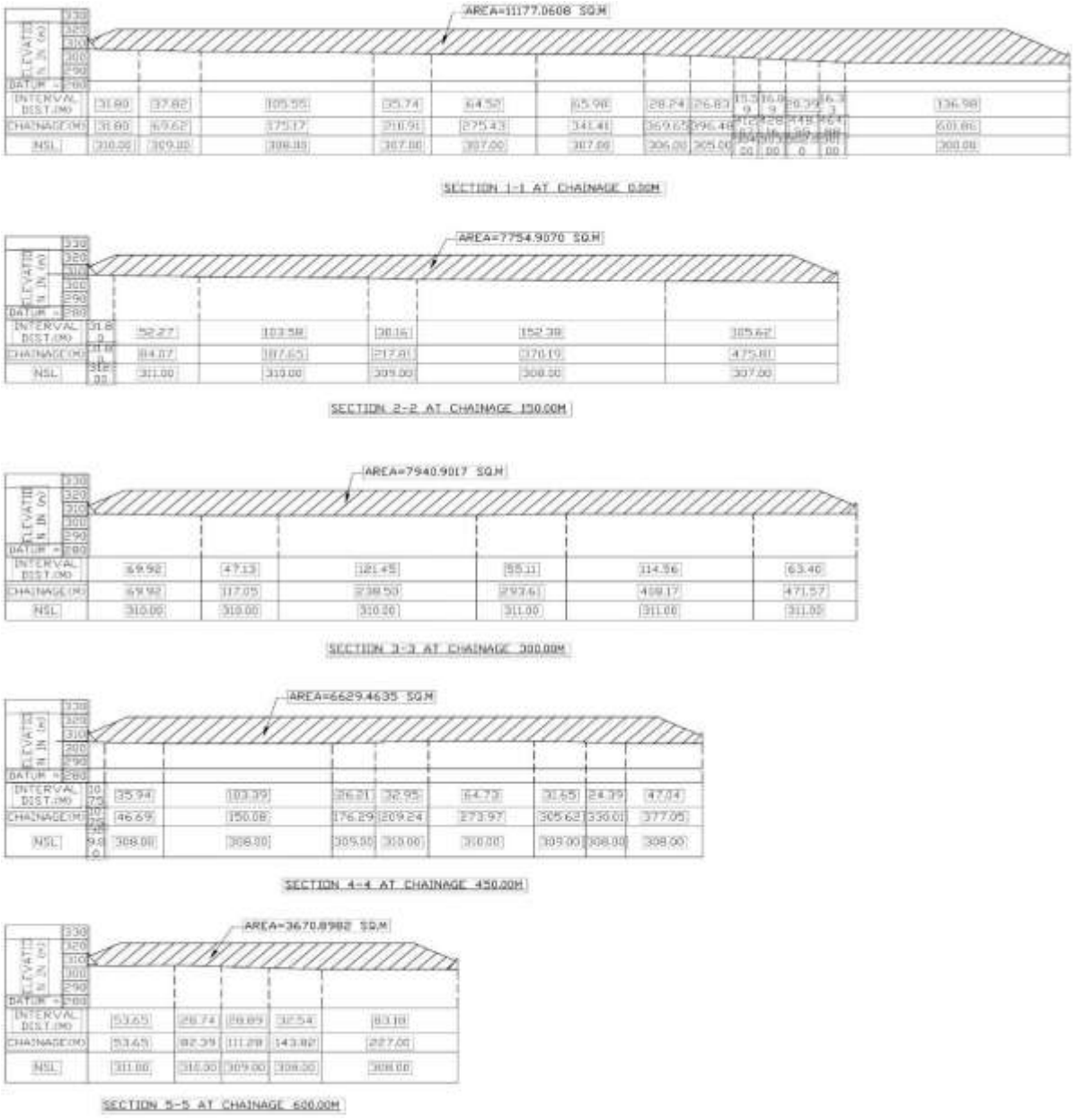


Figure 10.3 : Cross Section of Muck Dumping Site

The main objectives of process of muck dumping and restoration of these muck disposal sites are:

- to protect and control soil erosion;
- to create greenery in the muck disposal area;
- to improve and develop the sites into recreational site;
- to ensure maximum utilization of muck for the construction purpose;
- to develop the muck disposal site/ dumping yard to blend with the surrounding landscape; and

In Shahpur Pumped storage Project, a scientific approach and methodology was followed for identification of the dumping site. All possible alternate sites were inspected and examined before rejecting or selecting any site. The dumping site is characterized by:

i) no forest cover,
ii) the populated /settlement areas are away from the dumping site and therefore will have least impact on human settlements, and
iii) the identified muck site is close to the area of generation to avoid hazards related to transport of muck for long distances and minimizing traffic problems.

The generated muck will be carried in dumper trucks tightly covered in line with international best practices. All precautionary measures will be followed during the dumping of muck. All dumpers will be well maintained to avoid any chances of loose soil from being falling during the transportation. All unpaved routes will be periodically wetted with the help of sprinklers prior to the movement of dump trucks. Dumping would be avoided during the high-speed wind, so that suspended particulate matter (PM_{10}) levels could be maintained. After the dumping the surface of dumps will be sprayed with water with the help of sprinklers and then compacted.

As mentioned above, for disposal of 7.54 Mcum of muck, an area of 30 Ha having capacity of 5.61 Mcum has been identified and the balance muck 1.93 Mcum shall be accommodated in the dead storage of the Upper and Lower Reservoirs. The spare capacity has been earmarked for temporary storage of usable muck, traffic movement of dumpers and lifters. The spoil from various construction sites would be disposed of at designated site in a controlled and orderly manner. All measures would be adopted to ensure that the dumping of muck does not cause injury or inconvenience to the people or the property around the area. The general topography of the disposal area has a very mild slope. The spillage of muck will be prevented by making concrete retaining walls to retain the piled muck. The top surface would be leveled and graded after the capacity of any dumping site is exhausted. The top surface will be covered with soil and grass seeding will be ensured to promote vegetation cover.

Suitable retaining walls shall be constructed prior to dumping of muck, and terraces would be developed to support the muck on vertical slope and for optimum space utilization. Loose muck would be compacted layer-wise. The compacted muck will be ultimately covered with fertile soil, and suitable plants will be planted adopting suitable bio-technological measures (**see Figures 10.4**).

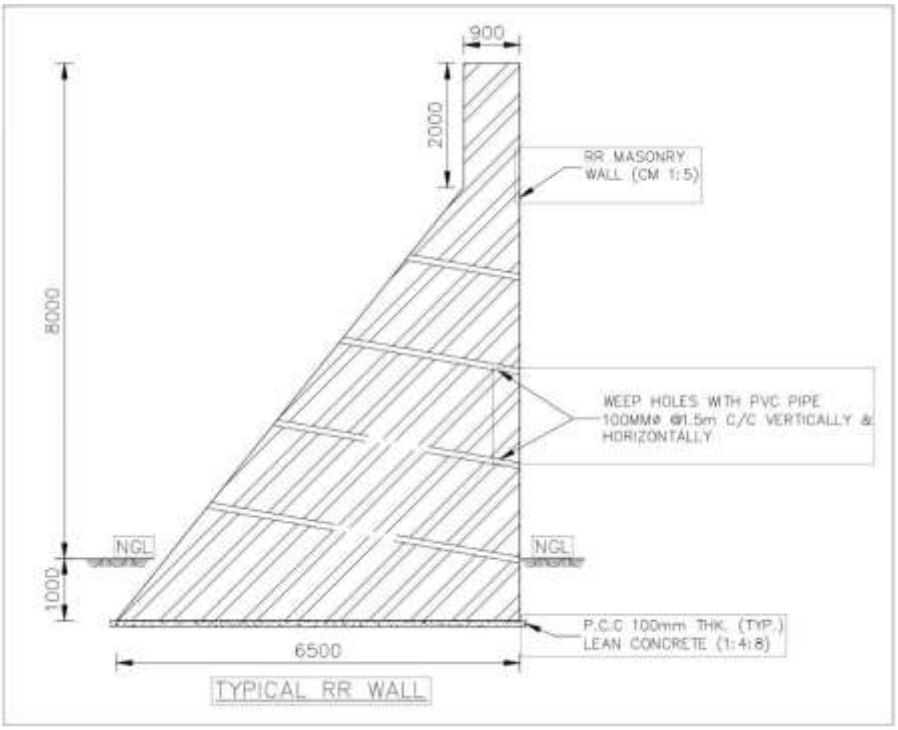


Figure 10.4 : Cross-section of Retaining Wall

10.1.3 Rehabilitation of Muck Disposal Site

The Rehabilitation plan of muck dumping site includes engineering and biological measures. The project authorities would ensure that the dumping yards blend with the natural landscape to develop the site with patches of greenery in and around it. The site can also be developed later as recreational park or any other purpose with sufficient greenery by planting ornamental plants. The muck dumping site would be developed as Eco-Park which would not only help in rehabilitation of disposed muck site but also help in propagating biodiversity conservations measures.

The following engineering and biological measures have been proposed for the development of spoiled areas.

10.1.3.1 Engineering Measures

For stacking of dumped material, RR masonry retaining wall is proposed to be built before dumping of any material on the site. The minimum length of dumping site is 2576 m and height of retaining wall is proposed to be 8 m. The retaining wall shall have PCC base of 100m thick and a width of about 6.5 m. The masonry wall is proposed with weeping pipes with PVC pipes of 100 mm for drainage. The leveling & Sloping would be done after dumping the material; after every cycle and simultaneously improving the drainage of the disposal site.

All the approach road to various project structures will be constructed with minimal environmental damage. The methodology consists in developing the formation width is half cutting and half filling, so that the materials obtained from cutting are utilized in filling. The excavation on hill side will be done to get a stable slope for the materials encountered. At places breast wall, gabion walls shall be done in natural slope to retain filled material, particularly where there is problem of retaining the slope.

i) Retaining Wall

Total area for the dumping of muck is 30 ha which can accommodate 5.61 Mcum. The height of the retaining wall will be approximately 8 m. A typical sketch of the retaining wall is given at **Figure 10.4**.

ii) Compaction

Compaction is an engineering measure, which would reduce bulk density of the muck thereby optimizing the use of muck disposal area and would make it suitable for the plantation and other biological measures. Top surface would be levelled and graded to make the alternative use. The muck will be spread in layers of 500-700mm thick layers. Top surface would be levelled and graded to make the alternative use. On top a layer of soil would be spread to make the land suitable for plantation. The total cost for the process of compaction is **Rs. 250.00 lakh**.

iii) Fencing

Fencing is a bio-engineering measure. After rehabilitation of muck the dumping area need protection for some time from disturbing by human and domestic animals. For this reason, fencing around the muck deposited is required. Barbed wire strands with two diagonal strands, clamped to wooden/ concrete posts placed at 3 m distance are proposed around the dumping piles. Project authorities will establish temporary wind barriers around 3 sides of dumps in close of settlement area.

Estimated cost of engineering measures is given at **Table 10.4.**

Table 10.4: Estimated Cost of Engineering Measures

S. No.	Particular	Volume	Rate in Rs./cum	Cost in Rs. Lakh
1	Earthwork for foundation (Cum)	3536	250	8.84
2	PCC 100 mm Thick M10 Grade Concrete (Cum)	1800	4500	81.00
3	R.R. Masonry	15000	3500	525.70
4	Weep Holes with PVC Pipe 100 mmØ @1.5m C/C Vertically & Horizontally (Rmt)	22000	150	33.00
5	Compacting and land leveling, etc.	LS	LS	250.00
	Total			**898.54**

10.1.3.2 Biological Measures

Top surface area of the dumping is about 30 ha. This area will be treated for the purpose of plantation. Vegetation cover controls the hydrological and mechanical effects on soils and slopes. Therefore, biological measures to stabilize the loose slope are essential. To implement the biological measures in dumping area the following activities would be taken into account. The biological measures include the following:

i) Soil treatment

Muck dumped at various sites is not considered to be nutrient rich as it is excavated from tunnels and other structures. In order to make it suitable for the plantation it will be provided bio treatment.

ii) Plantation

The selected species will be planted after their nurseries have been developed. The dumping areas are very small therefore; separate nursery would not be required. Saplings for planation should be procured from forest department nursery. Nearly 1-2 years old saplings would be used for the plantation. Grasses and herbaceous species would be used in the inter space of tree and shrub species. They will help in providing the continuous chain of support in retaining debris, reinforcing soil and increasing the infiltration capacity of the area.

After the process of compaction dumping site will be available for the plantation. In consultation with the horticultural department as well as forest department.

The afforestation with indigenous plant species of high ecological and economic value which can adapt to local habitat will be undertaken with 400-600 plants per hectare depending upon the canopy cover required. Major tree species which would be planted are listed in table below.

S. No.	Family	Scientific Name	Habitat
1	Anacardiaceae	*Mangifera indica*	Tree
2	Anonaceae	*Polyalthia longifolia*	Tree
3	Bignoniaceae	*Jacaranda mimosifolia*	Tree
4	Combretaceae	*Terminalia tomentosa*	Tree
5	Combretaceae	*Terminalia bellirice*	Tree
6	Fabaceae	*Albizia lebbeck*	Tree
7	Fabaceae	*Cassia fistula*	Tree
8	Fabaceae	*Dalbergia sissoo*	Tree
9	Fabaceae	*Dalbergia penniculata*	Tree
10	Fabaceae	*Acacia nilotica*	Tree
11	Fabaceae	*Acacia catechu*	Tree
12	Lamiaceae	*Tectona grandis*	Tree
13	Magnoliaceae	*Magnolia champaca*	Tree
14	Meliaceae	*Azadirachta indica*	Tree
15	Meliaceae	*Toona ciliata*	Tree
16	Myrtaceae	*Syzygium cumini*	Tree
17	Rubiaceae	*Anthocephalus Cadamba*	Tree
18	Rutaceae	*Aegle marmelos*	Tree
19	Sapotaceae	*Madhuca indica*	Tree
20	Acanthaceae	*Justicia adhatoda*	Shrub
21	Apocynaceae	*Nerium indicum*	Shrub
22	Euphorbiaceae	*Jatropha curcas*	Shrub
23	Poaceae	*Dendrocalamus strictus*	Shrub
24	Sapindaceae	*Dodonaea viscosa*	Shrub
25	Verbenaceae	*Vitex negundo*	Shrub

The estimated cost of these measures would be **Rs. 169.50 lakh**. This cost includes the cost of turfing of slopes, preparation of ground, spreading of manure, etc., providing 5 cm of soil cover and transportation and carriage. It also includes the cost of fencing, irrigation, watch and ward, etc. (**see Table 10.5**).

Table 10.5: Total financial outlay for the biological measures at dumping sites

S. No.	Particulars	Quantity	Rate (in Rs.)	Amount (Rs. in lakh)
1	Site preparation (Levelling and spreading of fertile soil)	30 ha	10,000	5.00
2	Pitting (size: 0.45 m x 0.45 m x 0.45 m)		Lumpsum	15.00
3	Manure and soil filling in pits including transportation		Lumpsum	12.00
4	Cost of plant material		Lumpsum	10.00
5	Transportation of Plant material from nursery	-	Lumpsum	5.00
6	Cost of RCC fence post and B/Wire	30 ha	25000.0	12.50
7	Planting of entire Plants raised in P/bag	30 ha	20,000	10.00
8	Maintenance for 5 years			50.00
9	Misc. (watering, transport, etc.)	-	Lumpsum	50.00
	Total			**169.50**

10.1.4 Financial Requirement

The estimated cost of the relocation and rehabilitation of excavated material is given in **Table 10.6**. The total cost of these measures will be **Rs. 1068.04 lakh.**

Table 10.6: Financial requirements for implementation of Muck Disposal Plan

S. No.	Item	Amount (Rs.in lakh)
1.	Engineering measures	898.54
2.	Biological measures	169.50
	Total	**1068.04**

Date: 20.06.2023 Name: Gopi Krushna N

Gopi Krushna N
Deputy General Manager (DGM)
Authorised Signatory
Greenko Energies Private Limited

Place: Hyderabad Authorized Signatory