

GOVERNMENT OF MIZORAM
OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS
ENVIRONMENT, FORESTS & CLIMATE CHANGE DEPARTMENT
TUIKHUAHTLANG : MIZORAM

No. B.2203/19/2022-FC/PCCF/202-203

Dated Aizawl the 19th Jan, 2023

To,

Principal Secretary to the Govt. of Mizoram
Environment, Forests & Climate Change Department
Mizoram

Sub : **Proposal for diversion of 34.9969 ha of forest land for Panisagar- Aizawl Natural Gas Pipeline Project – reg.**

Ref : IRO, MoEFCC's letter F.No.3-MZ C 051/2022-SHI/2536-37 dated 01.12.2022

Sir,

With reference to the subject cited above, I am directed to submit herewith the following additional information against the queries raised by the Integrated Regional Office, MoEFCC, Shillong vide their letter No. quoted under reference above:

Sl. No	Observation made by IRO, Shillong	Action taken report by State Government
1.	Details of Gas/ Oil drilling location that is coming from and going to and status of their Forest Clearance approval, if any	Copy as Annexure-I.
2.	The number of trees to be affected with scientific names in each District.	Copy as Annexure-II (a, b & c).
3.	3-alternate routes examined and analysis may be provided.	Copy as Annexure-I & V (Map)
4.	The size and number of pipelines to be laid	Copy as Annexure-I.
5.	GPS points of all the start points and ends points of the pipeline through forest land.	Copy as Annexure-I.
6.	Whether any muck dumping is required as the width of the proposed pipeline is 10 mt	Copy as Annexure-I & IV
7.	The compensatory afforestation (CA) as per DSS analysis is at 3 locations, the CA at location 1 is over 9.51 ha which include 8.45 ha MDF and 1.06 ha Open Forest. Hence, the proposed CA at location 1 is to be inspected by officer not below the rank of Conservator of Forest with density specifically mentioned along with photographs and GPS Co-ordinates.	Copy as Annexure-III. DFO (Aizawl) has identified new CA Area. His certificate for suitability is attached.

This is for information and onward submission to IRO, Shillong.

Encl: As above.

Yours faithfully,

(RS SINHA)

Addl. Principal Chief Conservator of Forests (FC)

Memo No. B.2203/19/2022-FC/PCCF/202-203

Dated Aizawl the 19th Jan, 2023

Copy to:

1. Deputy Inspector General of Forests (C), Govt. of India, Ministry of Environment, Forests & Climate Change, North Eastern Regional Office, Law-U-Sib Lumbatngen Near MTC Workshop, Shillong - 793021, Email : ro.nez.shil@gmail.com
2. Conservator of Forest, (CC/NC) for information.
3. Divisional Forest Officer, Aizawl/ Mamit/ Kawrthah Forest Division for information.
4. Chief Project Manager, Indradhanush Gas Grid Limited, 5th Floor, Central Mall, Christian Basti, G.S Road, Guwahati, Email: sujit.das@iggl.co.in, Ph No: 9969220088 for information.



(MZ SINGSON)

Deputy Conservator of Forests (FC)

इंद्रधनुष गैस ग्रिड लिमिटेड

(आई ओ सी एल ओ एन जी सी एल गैस ओ आईएल तथा एन आर एल का एक संयुक्त उद्यम)

Indradhanush Gas Grid Limited

(A JV of IOCL, ONGCL, GAIL, OIL & NGL)



सन्दर्भसं /Ref.No.IGGL/MIZ/PZPL/FOREST/2022/01

दिनांक/ Date: 06.12.2022

To,
The Deputy Conservator of Forests (FC),
Environment, Forests & Climate Change Dept., Govt. of Mizoram,
Aizawl, Mizoram

Sub: Proposal for diversion of 34.9963 Ha forest land for laying of underground Natural Gas Pipeline along with Optical Fibre Cable (OFC) for Panisagar-Aizawl Pipeline Project in Mamit and Aizawl Districts of Mizoram.

Ref.: 1. Forest diversion Proposal No. FP/MZ/Others/154974/2022.
2. Government of India letter No. 3 MZ C 051/2022-SHI/2536-37 dated 01.12.2022.
3. Your letter No. B/22013/19/2022-FC/PCCF/ dated 06.12.2022.

Sir,

With reference to the subject and the letters cited above, we are submitting the information requested from the office of Integrated Regional Office, MoEF&CC, Shillong as below:

- Reply to Point No. 1:** Panisagar-Aizawl Natural Gas Pipeline section of IGGL is a part of North East Gas Grid (NEGG) and shall be connected to National Gas Grid to transport mostly imported Natural Gas from National Gas Grid to various locations in North Eastern region, through ongoing Baurani - Guwahati Pipeline Project of GAIL. Panisagar-Aizawl Natural Gas Pipeline section shall not be connecting directly to any Gas / Oil Drilling location.
- Reply to Point No. 3:** The Panisagar-Aizawl section of NEGG is connecting Panisagar in Tripura to Aizawl in Mizoram. In Mizoram, it enters through Kanmun village in Kawrthah Division of Mamit District. We have studied 3 (three) alternate routes for the proposed pipeline project along with the maps, which have already been submitted along with the online application. The present alignment involves minimum forest land and the detailed justification has been attached as **Annexure-I**.
- Reply to Point No. 4:** There is one no. of 12 inch dia Pipeline that shall be laid along with 40 mm dia OFC conduit.
- Reply to Point No. 5:** GPS co-ordinates of the starting point of the Pipeline: Latitude 24° 13' 59" N, Longitude 92° 17' 56" E. GPS co-ordinates of the terminal point of the Pipeline: Latitude 23° 45' 14" N, Longitude 92° 40' 32" E.
- Reply to Point No. 6:** With respect to the Pipeline width of 10m considered, no muck dumping is required beyond the proposed pipeline alignment. This is because the excavated soil shall be backfilled in the trench after lowering of the pipeline and the site shall be restored back to normal with the same excavated soil.

In view of the above clarifications, we are requesting your good self to kindly arrange to process the proposal at the earliest.

Yours faithfully,

Pankaj Patowary
6/12/2022
पंकज पाटोवारी
Pankaj Patowary
मुख्य परियोजना प्रबंधक
Chief Project Manager
Indradhanush Gas Grid Ltd
Guwahati-781005

पंजीकृत कार्यालय:
७ वीं मंजिल, एन.आर.एल. केंद्र,
१२२ए, जीएस रोड,
क्रिश्चियन बस्ती,
गुवाहाटी, असम ७८१००५

Regd. Office:
7th Floor, NRL Centre,
122A, G.S. Road,
Christian Basti,
Guwahati, Assam 781005

वेबसाइट/Website: <https://iggl.co.in>
ईमेल/Email: info@iggl.co.in
फोन नंबर/Phone No.: +91 95311-01226

सीआईएन/CIN
U40300AS2018GOI018660
वेबसाइट/Website: <https://iggl.co.in>

Alternate Route Option Study for laying 12" dia (Carbon Steel Pipe) IGGL pipeline along with 6" dia CS OFC Conduit for "Panisagar-Aizawl Natural Gas Pipeline Project" in the state of Mizoram

Following social, technical, construction and maintenance, statutory permissions feasibility and economical & environment impacts considered while concluding the Final Route for the total length of 112 km. in Mamit & Aizawl districts of Mizoram for "Panisagar-Aizawl Natural Gas Pipeline Project":

- For laying IGGL pipeline, minimize impact on environmental and social component such as flora, fauna, landscape, livelihoods of people living in the area, cultural heritage, protected areas, reinstatement potential and requirements, land use and places of habitation.
- Minimize adverse topographical components areas prone to landslides, flood prone areas and seismic activity.
- Address constructability and long-term integrity – including access, logistics of construction and crossing of road, canal and river crossings.
- Address safety of construction works and long-term safe operations.
- The objective of laying Natural Gas Pipeline from Panisagar to Aizawl for extension of Guwahati-Silchar-Panisagar Pipeline to Aizawl (Mizoram) with this intention the best option is to lay the Natural Gas Pipeline across various NH/SH/Canal/roads with minimum optimize use of forest area.
- For laying pipeline only Right of Use is required and no land acquisition is required. For laying pipeline, 1.2 mtr. width of trench is required and ground will be restored to its original position after laying.

As far as possible, during the route selection process, the least sensitive route from an environmental and social impact point of view is being identified within the engineering constraints presented by the terrain, hazards and the requirement to maintain the long-term integrity of the pipeline.

Route Selection Criteria:

Considering the general guidelines, specific criteria / guidelines to be adopted for the selection of the pipeline is as follows:

- Route length shall be as short as possible between Dispatch and Receipt Stations.
- Route shall avoid encroachment of Reserved Forest (RF) / Protected Forest (PF). If not possible, such encroachment shall be minimized.
- Up to maximum extent possible route shall try to avoid national Parks, Sanctuary and similar prohibited eco-sensitive areas. If not possible, such encroachment is minimized.

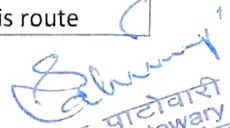

Pankaj Patowary
मुख्य परियोजना प्रबंधक
Chief Project Manager
Indradhanush Gas Grid Ltd.
Guwahati-781005

- Route through built-up / developed areas and industrial areas shall be kept to a minimum. Wherever a utility corridor is identified, the route shall be located within the identified corridor.
- Route through rocky terrain and through surface rocks shall be optimized.
- Route through hill/ghat shall be kept to a minimum.
- Route shall avoid high-risk locations for natural hazards such as land-slides.
- Route shall not pass through any areas earmarked for defense purposes.
- Route shall either avoid or minimize the encroachment into plantation areas.
- In case of presence of any monuments of archaeological importance, a minimum distance of 500 m shall be maintained.
- Route shall avoid mining / quarry areas.
- Route in normal terrain shall be such that the Pipeline installation by conventional method is possible without requiring any specialized techniques, except at crossing locations.

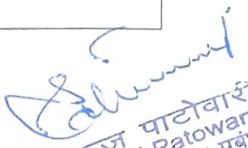
It is certified that all other possibilities/alternative route for IGGL project have been explored and the area of the project is barest minimum. There is no other alternative of non-forest land nearby available for this purpose. However following attempts made to find out three Alternatives.

Justification for Choosing the Alternative 1

Sl No	Alternative 1	Alternative 2	Alternative 3
1	Approx.Length:112 km	Approx.Length: 140 km	Approx.Length: 120 km
2	Route goes mostly along the Road and passes through Cross Country pipeline through the valleys avoiding hills and habitations as much as possible.	The route goes though hills and tough terrain and has the most forest area in between.	The route goes though hills and tough terrain and has dense mixed jungle in between.
3	The route passing through less populated area nearby	The route passing through more populated area	The route passing through more populated area
4	The RoU mainly goes along the roads and passes through agriculture land.	The RoU passes through agriculture land and road but on taking this route	The RoU passes through agriculture land and road but on taking this route


 पंकज पाटोवारी
 Pankaj Patowary
 मुख्य परियोजना प्रबंधक
 Chief Project Manager
 Indradhanu Gas Grid Ltd.
 Guwahati-781005

		more forest area would be covered and tree felling would be required.	more forest area would be covered and tree felling would be required.
5	Minimum presence of Reserved Forest Area.	More presence of Forest area. The pipeline will affect more area of reserve forest/wildlife sanctuary and will pass through the core region of forest.	More presence of Forest area. The pipeline will affect more area of reserve forest/wildlife sanctuary and will pass through the core region of forest.
6	Slight undulated terrain Terrain but feasible for Pipeline laying and construction activities.	No flat terrain for pipeline laying at many locations and less construction feasibility	No flat terrain for pipeline laying at many locations and less construction feasibility.
7	Time-line for completion of project: 18 months	Time-line for completion of project: 24 months	Time-line for completion of project: 30 months
8	The Route is technically, financially, time-limit, environmentally more feasible. Construction is easier on this route and the future operation and maintenance is easier. Therefore; IGGL has approved this route.	The Route is technically, financially, time-limit, environmentally not feasible. Construction is not easy on this route along the inhabitant area and escalate time-line and cost. The future operation and maintenance, Safety aspects is difficult. Therefore; IGGL has not approved this route.	The Route is technically, financially, time-limit, environmentally not feasible. Construction is more difficult and escalate time-line and over-run cost. The future operation and maintenance is difficult. Therefore; IGGL has not approved this route.
9	Approx. trees to be felled: 1897 nos	Approx. trees to be felled: 5000 nos	Approx. trees to be felled: 4000 nos
10	IGGL plans to lay the pipeline underground by Open Cut method between the two rows of trees. In case trees may be felled or cut, IGGL agrees to pay the compensation; as per the prevailing Norms, to Forest Department if the damages done to the trees during the execution of job.	IGGL plans to lay the pipeline underground by Open Cut method between the two rows of trees. In case trees may be felled or cut, IGGL agree to pay the compensation; as per the prevailing Norms, to Forest Department if the damages done to the trees during the execution of job.	IGGL plans to lay the pipeline underground by Open Cut method between the two rows of trees. In case trees may be felled or cut, IGGL agree to pay the compensation; as per the prevailing Norms, to Forest Department if the damages done to the trees during the execution of job.


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 Chief Project Manager
 Indradhanuh Gas Grid Ltd.
 Guwahati-781005

MAP SHOWING ALTERNATE ROUTES FOR PANISAGAR TO AIZAWL PIPELINE PROJECT IN MIZORAM STATE



**Tree enumeration for diversion of 34.9963 Ha of forest land for construction of
Natural Gas Pipeline from Panisagar to Aizawl
under Aizawl Forest Division**

Sl.no	Scientific Name	Local Name	(0-30) cm	(31-60) cm	(61-90) cm	(91-120) cm	(121-150) cm	>150 cm
1	<i>Oroxylum indicum</i>	Archangkawm	2					
2	<i>Garuga pinnata</i>	Bungbutuairam						1
3	<i>Ficus religiosa</i>	Hmawng						1
4	<i>Syzigium cumini</i>	Hmuipui	5					
5	<i>Macaranga indica</i>	Hnahkhar	15					
6	<i>Albizia procera</i>	Kangtek	5					
7	<i>Bischofia javanica</i>	Khuangthli			1			
8	<i>Adina cordifolia</i>	Lungkhup			1			
9	<i>Litsea monopelata</i>	Nauthak	18	7	2			
10	<i>Michelia oblonga</i>	Ngiau			1			
11	<i>Bombax insigne</i>	Pang			1			
12	<i>Artocarpus chaplasha</i>	Tatkawng		3	2			
13	<i>Tectona grandis</i>	Teak	25	5	18	2		1
14	<i>Magnifera indica</i>	Theihai			1			
15	<i>Ficus semicordata</i>	Theipui		1				
16	<i>Tatrameles nudiflora</i>	Thingdawi						1
17	<i>Derris robusta</i>	Thingkha		2	1			
18	<i>Vitex peduncularis</i>	Thingkhualu						1
19	<i>Parkia timoriana</i>	Zawngtah		1	1			
20	<i>Duabanga grandiflora</i>	Zuang		1	2			
		Sub total	70	20	31	2		5

Total	=	128
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 Divisional Forest Officer
 Aizawl Forest Division
 Aizawl, Mizoram

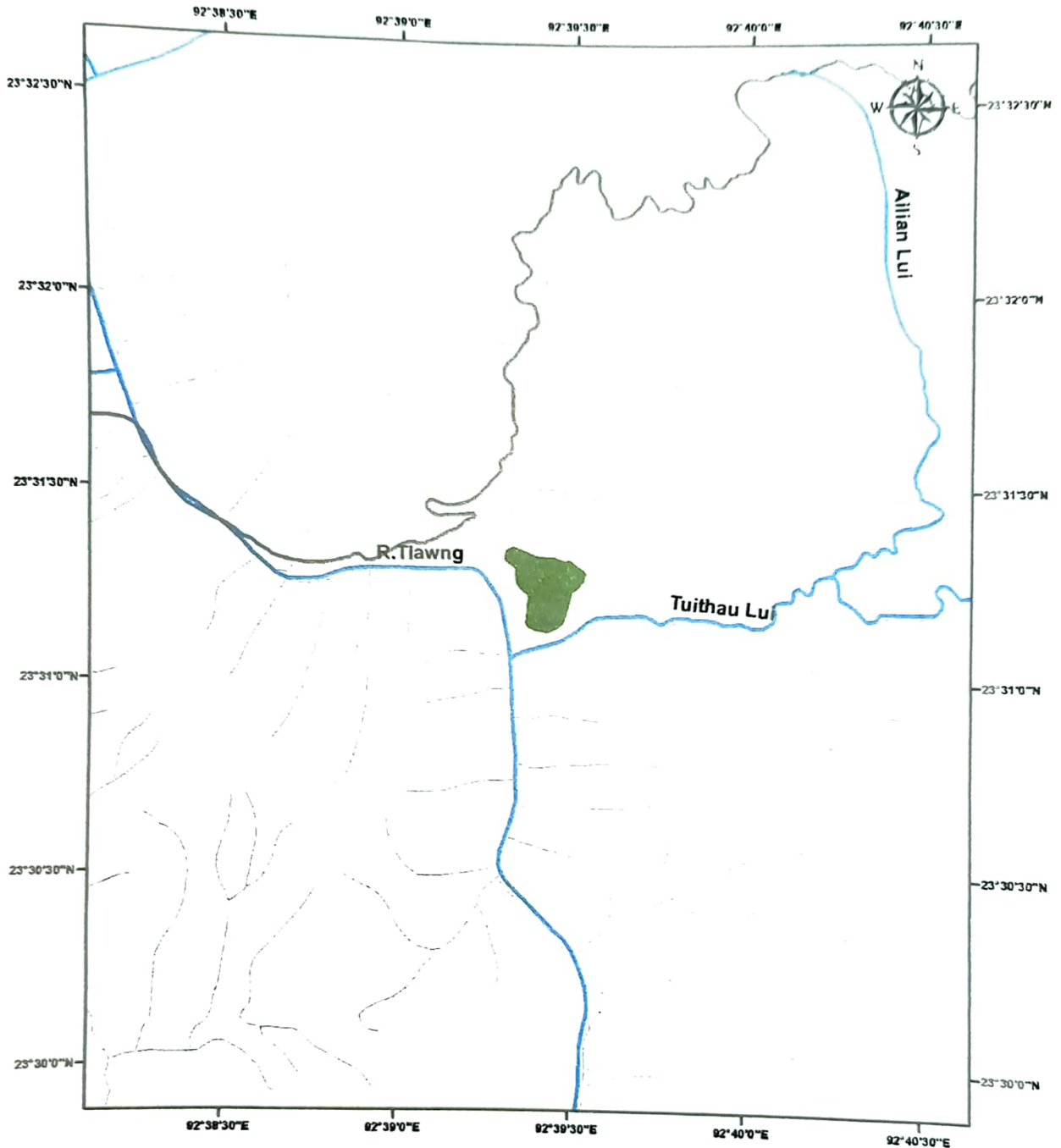
**TREES TO BE AFFECTED BY PANISAGAR- AIZAWL GAS PIPELINE PROJECT
UNDER MAMIT FOREST DIVISION**

Sl. No.	Scientific name	Local name	Girth Class (in cm.)						Total No. of Trees
			0-30	31-60	61-90	91-120	121-150	>151-180	
1	2	3	4	5	6	7	8	9	10
1	<i>Albizzia odoratissima</i>	Thingri	6	3	5	1			15
2	<i>Albizzia chinensis</i>	Vang	26	11	12	6	1		56
3	<i>Albizzia procera</i>	Kangtek	17	14	11	10	3		55
4	<i>Anogeissus acuminata</i>	Zairum	25	19	11	6	1		62
5	<i>Aporus aoctandra</i>	Chhawntual	3	3	1				7
6	<i>Artocarpus chaplasha</i>	Tatkawng		4	7	2			13
7	<i>Artocarpus fraxinifolius</i>	Nganbawm	5	2	1	1			9
8	<i>Balakata baccata</i>	Thingvawkpui	6	3	1	2			12
9	<i>Biscofia Javanica</i>	Khuangthli	9	10	4	2			25
10	<i>Bombax insignis</i>	Pang	9	5	3				17
11	<i>Bursera serrata</i>	Bil		4	2	1	1		8
12	<i>Callicarpa arborea</i>	Hnahkiah	17	10	4				31
13	<i>Castanopsis tribuloides</i>	Thingsia	4	1	2	4	2		13
14	<i>Cordia fragrantissima</i>	Muk	1	3	1				5
15	<i>Derris robusta</i>	Thingkha	18	16	12	8			54
16	<i>Duabanga grandiflora</i>	Zuang	9	16	16	10	1		52
17	<i>Embllica officinalis</i>	Sunhlu	10	5					15
18	<i>Erythrina variegata</i>	Fartuah	13	8	4	2	1		28
19	<i>Ficus semicordata</i>	Theipui	3	4	7	2			16
20	<i>Ficus hirta</i>	Sazu-theipui		3	2				5
21	<i>Ficus prostrata</i>	Theitit	2	5	4				11
22	<i>Gmelina arborea</i>	Thlanvawng	7	25	19	6	3	1	61

**Number of trees to be affected by Panisagar - Aizawl Natural Gas Pipeline Project
under Kawrthah Forest Division, Mamit District**

S/N	Species		Girth						Total no. of trees (species)
	Scientific Name	Local name	(0 - 30 cm)	(31 - 60 cm)	(61 - 90 cm)	(91 - 120 cm)	(121 - 150 cm)	(> 150 cm)	
1	Gmelina arborea	Thlanvawng	0	2	16	9	5	14	46
2	Michelia champaca	Ngiau						11	11
3	Tectona grandis	Teak	7	17	57	86	9	6	182
4	Azadirachta indica	Neem					1		1
5	Syzygium cumini	Lenhmui	2		1		1	2	6
6	Albizia-procera	Kangtek	1	7	9	9	5	5	36
7	Schima wallichii	Khiang			1				1
8	Dudbanga indica	Zuang	1		1			3	5
9	Erythina stricta	Fartuah	1	1	1	1			4
10	Ficus racemosa	Theichek		1	1	1			3
11	Mesua ferrea	Herhse	8						8
12	Artocarpus heterophyllus	Lamkhuang	2	1					3
13	Tectona grandis	Tlawr		1	3	10	1		15
14	Callicarpa arborea	Hnahkiah	2	15	39	5	1		62
15	Sterculia villosa	Khopui	3	10	6	2	1	2	24
16	Derris robusta	Thingkha	3	10	14	5	3	1	36
17	Garuga pinnata	Bungbutuairam	2		4	3	1	2	12
18	Neolamarckia cadamba	Banphar		1	3				4
19	Toona ciliata	Teipui		1	3		1		5
20	Alchornea tiliifolia	Zawngtenawhlung		1					1
21	Grewia serrulata	Vahriatabelkang		1	1				2
22	Stereospermum chelonoides	Zihngghal			1		2	3	6
23	Protium serratum	Bilthei	9	16	8	3	2	1	39
24	Albizia chinensis	Vang		1	2			1	4
25	Flueggea virosa	Saisiak			1				1
26	Artocarpus lacucha	Tat	8	8	3	3			22
27	Artocarpus chaplasha	Tatkawng	3	7	4		1		15
28	Cordia fragrantissima	Muk	1		5		1		7
29	Anogeissus acuminata	Zairum	3	7	2	3		2	17
30	Mallotus tetracoccus	Hnahkhar	6	8	18	3			35
31	Ficus semicordata	Theipui	15	30	38	8		1	92
32	Neonauclea purpurea	Lungkhup	1	3	3				7
33	Litsea monopetala	Nauthak		2	9	3			14
34	Fernandoa adenophylla	Zihhaw	1	1	1				3
35	Alstonia scholaris	Thuamriat			1	1			2
36	Drimycarpus racemosus	Vawmbal		1					1
37	Hibiscus macrophyllus	Vaiza	2	3	1	2			8
38	Bridelia tomentosa	Sabehliang	1		2				3
39	Vitex peduncularis	Thingkhawilu	1		4		1		6
40	Sterculia scaphigera	Phaithing	1	5	5	1			12
41	Ficus prostrata	Theitit		1					1
42	Quercus lanata	Thalte				1			1
43	Bombax insigne	Pang	3	1	1	2	1	2	10
44	Spondias pinnata	Tawitaw	2		2				4

PROPOSED AREA FOR RAISING COMPENSATORY AFFORESTATION FOR PANISAGAR - AIZAWL NATURAL GAS LINE PROJECT



[Signature]
Divisional Forest Officer
Aizawl Forest Division
Aizawl : Mizoram

00.125 0.25 0.5 0.75 1
Kilometers

Area : 9.5 Ha
Location : Uibo Ram, Steek, Tlawng RRF

Legend

- Proposed Area
- Rivers
- Drainage
- Roads

Prepared by :
GIS Cell, EF&CC Dept. Mizoram

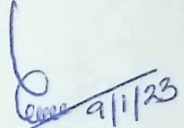
191

No. B.12020/4/2022-DFO(A)
GOVERNMENT OF MIZORAM
OFFICE OF THE DIVISIONAL FOREST OFFICER
AIZAWL FOREST DIVISION
AIZAWL : MIZORAM

Dated Aizawl, the 9th Jan/2023

LAND SUITABILITY CERTIFICATE

This is to certify that an area of 9.50 hectares of land situated at Uiboram, Sateek at 23°31'13.68"N and 23°25.47"E within Tlawng Riverine Reserve Forest under Aibawk Forest Range of Aizawl Forest Division, Mizoram selected for raising Compensatory Afforestation in lieu of 4.7305 hectares of forest land required to be diverted of forest land for Panisagar – Aizawl Natural Gas Pipeline Project is suitable for raising CA Plantation.


(LALTLANHLUA ZATHANG)
Divisional Forest Officer
Aizawl Forest Division
Aizawl, Mizoram

इंद्रधनुष गैस ग्रिड लिमिटेड

(आई ओ सी एल, ओ एन जी सी एल, गेल, ओआईएल तथा एन आर एल का एक संयुक्त उद्यम)

Indradhanush Gas Grid Limited

(A JV of IOCL, ONGCL, GAIL, OIL & NRL)



सन्दर्भसं /Ref.No.IGGL/MIZ/PZPL/FOREST/2022/06

दिनांक/ Date: 17th / 1 / 2023

To,
The Deputy Conservator of Forests (FC),
Environment, Forests & Climate Change Dept., Govt. of Mizoram,
Aizawl, Mizoram

Sub: Proposal for diversion of 34.9963 Ha forest land for laying of underground Natural Gas Pipeline along with Optical Fibre Cable (OFC) for Panisagar-Aizawl Pipeline Project in Mamit and Aizawl Districts of Mizoram.

Ref.: 1. Forest diversion Proposal No. FP/MZ/Others/154974/2022.
2. Government of India letter No. 3 MZ C 051/2022-SHI/2536-37 dated 01.12.2022.
3. IGGL letter IGGL/MIZ/PZPL/FOREST/2022/01 dated 06.12.2022.
4. Your letter No. B22013/19/2022-FC/PCCF dated 16.01.2023.

Sir,

With reference to the subject and the letters cited above, we are submitting the information requested from your good office as below:

- **IRO Original query:** Point No. 6: Whether any muck dumping is required as the width of the proposed pipeline is 10 mt.
- **Our original reply to IRO query:** With respect to the Pipeline width of 10m considered, no muck dumping is required beyond the proposed pipeline alignment. This is because the excavated soil shall be backfilled in the trench after lowering of the pipeline and the site shall be restored back to normal with the same excavated soil.
- **Further Explanation:** 10 (ten) metre width is required for the movement of construction vehicles, stringing and welding of Pipes in forest area during pipeline construction works. However, only 1 (one) metre width and 1.5 m depth of earth/soil is required to be excavated/cut and stacked alongside temporarily for laying the pipeline underground, within the 10 m diversion width. The excavated/soil shall be backfilled again after laying or put the subject pipeline along with OFC/OFC duct inside the trench, after completion of welding and inspection procedure as per Engineering standards. As a result, there will be no muck generation, as the site shall be restored back. It may be mentioned that the same execution methodology is being followed for all Pipeline projects throughout the country including North East wherever the permission has been obtained by IGGL from the concerned forest department.

In view of the above clarification, we are requesting your good-self once again to kindly expedite the process for IPA/ Stage-I approval, at the earliest..

Yours faithfully,

(Signature)

Cc: The Additional Principal Chief Conservator of Forests & Nodal Officer (FC),

पंजीकृत कार्यालय:

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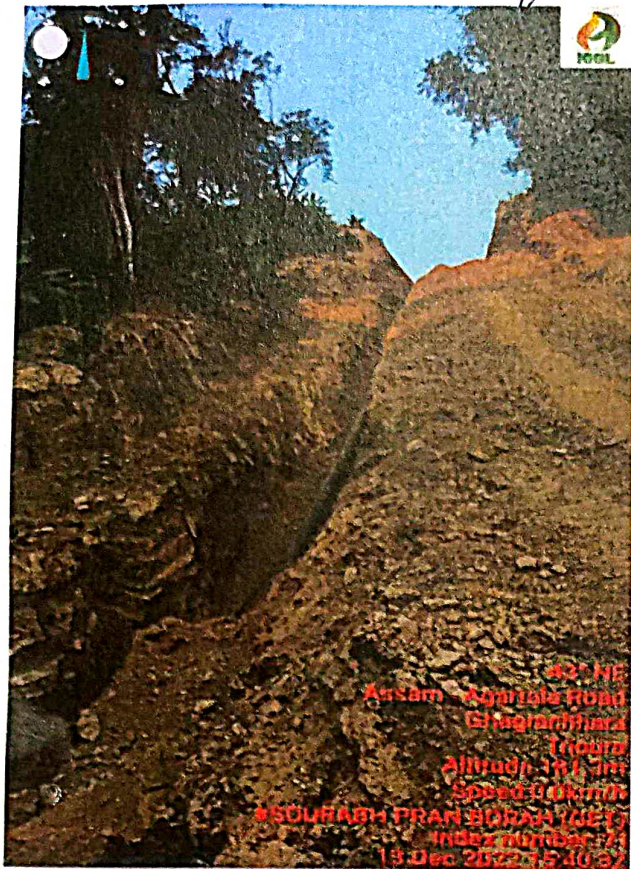
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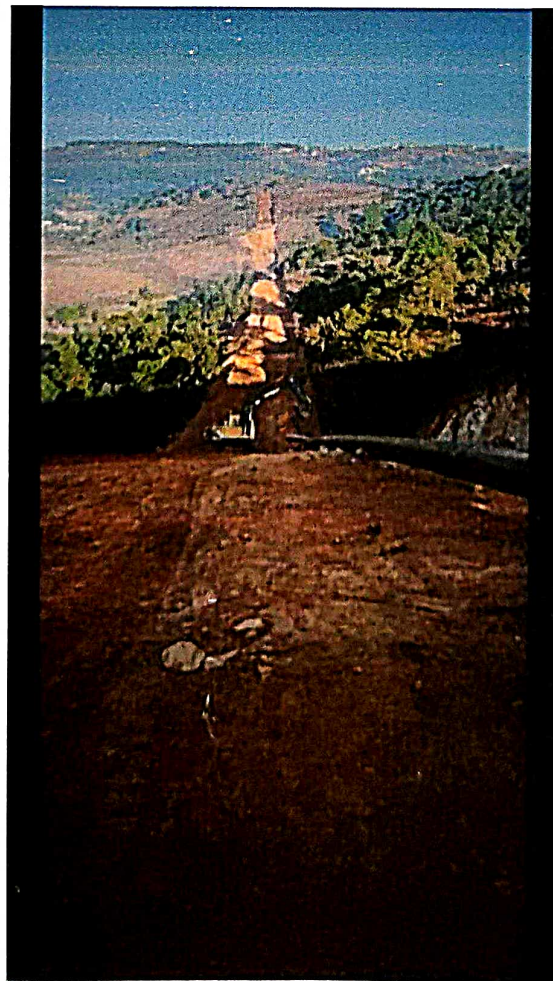
For Reference of IRO Quirica Point No. 6.



During Backfilling



During Lowering of pipes



10 m ROU clearing in forest land

TOP SOIL GRADING

Once the Bonds are signed and payments are done, soil grading is done. Here the top soil surface is excavated for easy movement of machineries and laying of pipes along the RoU over the affected land.



Figure: Both the images showing grading of top soil along the RoU

PIPE UNLOADING AND STRINGING

- Soil grading is followed by unloading of pipes on a suitable land on the Right of Use (RoU)



Figure: *Unloading and stacking of pipes*



Figure: *Stringing of pipes along RoU*

FITTING AND WELDING

Once the pipes are laid or stringing is done, pipes are fitted using external pressure clamp and internal pressure clamps.

Fitted pipes are then welded, and are examined for quality assurance using Radiography Testing



Figure: Welding of pipe joins after getting fitted

JOINT COATING/ INSULATION



After the welded joints are passed, they are cleaned and coated with an insulating sleeve to prevent direct exposure to land and conducting particles.

Figure: Joint coating for insulation in the exposed pipe joints

TRENCHING/ EXCAVATION

1. Once the coating of joints are completed, trenches are excavated wherein pipe strings are to be lowered.
2. After excavation, trenches are barricaded properly so as to avoid falling of any animals or humans into the dug trenches.



Figure: Trench excavated along the pipe string on RoU

LOWERING OF PIPES AND BACKFILLING

Pipe strings are lowered into the trenches where the top layer of the pipes are maintained 1.2 meters below the ground level.

Once the pipes are lowered, excavated soil is backfilled into the trench and levelled. Full restoration is done back into its original state.



Figure: Both figures showing lowering of the pipes into its trench