

**KA DRAFT ENVIRONMENTAL IMPACT ASSESSMENT
REPORT NA KA BYNTA KA
KALAGAW COAL MINE PROJECT
BAN PYNMIH 0.15 MTPA (RATED/REAK RATED) CAPACITY
HA UMBAR VILLAGE, KALAGAW, RANIKOR C&RD BLOCK,
DISTRICT: SOUTH WEST KHASI HILLS, MEGHALAYA**

KA EXECUTIVE SUMMARY

U Project Proponent: Bah Teilang Pde

Ba la pynbit pynbiang da ka:



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Limited**

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Ka NABET Category 'A' Certified Organisation [Sector 1 (a) (i)]

Lyngba Certificate No. NABET/EIA/2326/IA 0124

Naitung 2024

KYRTENG JONG KA PROJEK: KALAGAW COAL MINE
KYRTENG JONG U PROJEK PROPONENT: TEILANG PDE

Executive Summary

1. KA JINGLAMPHRANG

Ka Mining bad Geology Department sorkar Meghalaya ha ka hukum jong ka vide no. **MG.40/2021/47** kaba **19 tarik Jymmang 2021** ka la ai ia ka Prospecting License (PL) ban tih dewiong na ka bynta u applicant Bah Teilang Pde halor ka jaka kaba 100 Ha. kaba don ha Umbar Village Kalagaw Ranikor C&RD Block District: South West Khasi Hills Meghalaya. Hadien kata ka sorkar pdeng ka la ai jingmynjur ia ka mining lease na ka bynta ka Kalagaw Coal Mine da ka Letter No. **PS1-13016/2/2022-PS1 (FTS: 354288)** kaba **25 tarik laiong 2023** kat kum ka Rule 42 (2) jong ka Mineral Concession Rules 1960 ban pynbit pynbiang ban tih dewiong halor ka jaka kaba 100 Ha. ha ka jingmyntoi jong u applicant. Kat kum ka shithi vide **No. T/WSW/2020-21/NFL/PCM/115/728** kaba **29 tarik Risaw 2020** ba la pynmih da ka Department of Forests and Environment Government of Meghalaya ka projek kaba la buh ka hap hapoh ka **“non-forest” land**. Ka Mining Plan bad Mine Closure Plan ka la pdiang da ka Ministry of Coal Government of India da ka In-principle Approval Letter kaba **24 tarik Kyllalyngkot 2024**. Ka State Expert Appraisal Committee (SEAC) Meghalaya ha ka jingialang jong ka kaba la long ha ka **12 tarik Lber 2024** ka la ai jingmynjur ia ki Terms of Reference (ToR) ban pynkhreh ia ka EIA/EMP report bad hadien kata ka la pynmih ia ka ToR da ka shithi nombar **ML/SEAC/SEIAA/PP/WKH/22/2024** kaba **19 tarik Jylliew 2024** ia u Bah Teilang Pde.

2. JINGBATAI BNIAH JONG KA PROJEK

Ka projek Kalagaw Coal Mine kaba la ai jingmut ka long ban tih ia ka 1.27 MT jong ki dewiong ha ka jingim jong ka projek kaba long 15 snem [10 (Jingim jong ka Mine) + 5 (Por ha dien ka jingpynwai bad jingpynim pat ia ka jaka)] da kaba pyllait ia ka 21.4287 MM3 jong ka OB ha ka average stripping ratio jong ka 16.8730 m³/T haduh ka jingjylliew

Ka Draft Environmental Impact Assessment/Environmental Management Plan na ka bynta ka jingpynmih 0.15 MTPA Dewiong da ka Open Cast (OC) Mining Method ha ka jingheh ka Mine Lease Area kaba long 100.00 Ha. ha ka shnong UMBER Kalagaw, Ranikor C&RD Block, South West Khasi Hills District, State: Meghalaya

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kaba 90 m. Kane ka projek ka la ai jingmut ban long ka jinglah ban tih 0.15 MTPA kaba dei ruh ka peak rated capacity ha ka por jong ka Life of Mine (LoM). Ka quality jong ka dewiong kan pher ha ka range G2-G17.

2.1. Jingbatai Bniah Jong Ka Jaka

Kane ka projek jong ka Ka Kalagaw Coal Mine ka hap ha Khasi Hills (Minor CF) Coal Field. Kane ka jaka la pyni thikna ha ka **Figure 1.1**.

Ka Draft Environmental Impact Assessment/Environmental Management Plan na ka bynta ka jingpynmih 0.15 MTPA Dewiong da ka Open Cast (OC) Mining Method ha ka jingheh ka Mine Lease Area kaba long 100.00 Ha. ha ka shngong UMBER Kalagaw, Ranikor C&RD Block, South West Khasi Hills District, State: Meghalaya

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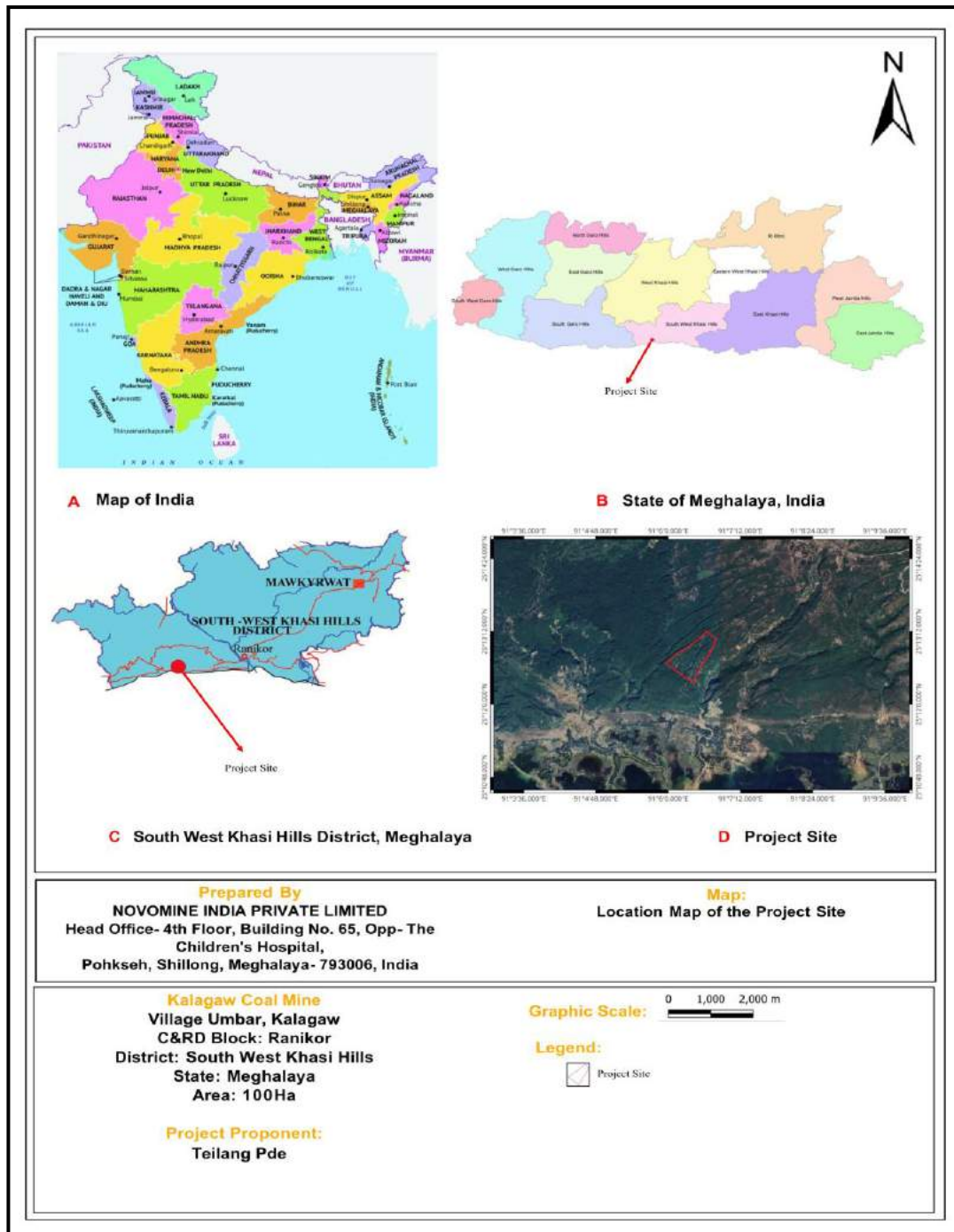


Fig 1.1: Ka map jong ka Kalagaw Coal Mine

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KYRTENG JONG U PROJEK PROPONENT: TEILANG PDE

Ki jingbatai kham bniah jong ka projek ki long kumne harum:

Kyrteng jong ka Projek	: Kalagaw Coal Mine
Shnong bajan tam	: Umbir
Block	: Ranikor
District	: South West Khasi Hills
State	: Meghalaya
Latitudes	: 25°12'18.50" N to 25°13'12.59" N
Longitudes	: 91°05'57.42" E to 91°06'47.46" E
U Toposheet No Survey of India.	: 78O/4 (Restricted)
Airport bajan	: Umroi Airport (176 km, NE Direction)
Railway Station bajan	: Guwahati Railway Station (244 km, NE Direction)
Highway bajan	: SH 4 (0.81 km towards the South)

Kane ka projek ka hap ha ka **"Category – B1"** katkum ka EIA Notification ba la bthah da ka MoEFCC, New Delhi, lyngba S.O. 1533, ha u 14 tarik, Nai Lur, 2006 & bad ki amendments kiba bud hadien, namarkata, ka Environmental clearance na ka bynta kane projek hap ban ioh na ka ophis jong ka State Environment Impact Assessment Authority (SEIAA), Meghalaya.

2.2. Ka Jingpyndonkam Ia Ka Khyndew/Jaka

Ka jaka baroh kawei jong ka projek ka dei 100.0 ha bad na kato 8.7 ha ka dei ka khlaw Ki jingdonkam, jingtreikam ha ki kyndon kiba pher bap her jong ka jingtih dewiong ki long kumne harum:

Ka Draft Environmental Impact Assessment/Environmental Management Plan na ka bynta ka jingpynmih 0.15 MTPA Dewiong da ka Open Cast (OC) Mining Method ha ka jingheh ka Mine Lease Area kaba long 100.00 Ha. ha ka shnong UMBER Kalagaw, Ranikor C&RD Block, South West Khasi Hills District, State: Meghalaya

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Table 1.1: Ha ka por jong ka projek

Sl. No	Jait Jaka	Area (Ha.)
1.	Jaka 'dew tep	45.32
2.	Jaka ba la tih thliew	8.38
3.	Jaka ba theh nuit ha bym buh dewiong	28.76
4.	Ka jaka Safety Zone	3.33
5.	Surok bad ki jaka treikam	0.23
6.	Jaka jingthung	0.38
7.	Jaka ba tam	13.6
8.	Total	100.00

Table 1.2: Hadien jong ka Projek (Hadien 15 snem)

Sl. No.	Jaka ba la dep pynbit pynbha biang (reclaim)	Jait Jaka	Area (Ha.)
1.		Ki dieng ba thung	74.14
2.		Ki Jaka um	8.32
3.		Jaka na ka bynta paidbah	0.23
4.		Total	82.69
5.	Jaka ba nym shah pynthut		17.31
6.	Total		100.00

2.3. Ka Rukom Tih

Ka jingtih dewiong kan long da kaba pyndonkam da ka shovel-dumper combination ha ka opencast mechanized method (da ka rukom jong ki open cast machine). Ki tiar kiba donkam eh ki dei ki ki jingpynbthei (explosives), ki machinery, ka diesel, ki tiar pynbtuit (lubricants), ka bor ding (electricity), ka um bad ki tiar ba pyndonkam ki briew kiba leh ia kana ka kam.

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Ka Opencast mining ka bud ia kine ki kyndon jong ka jingtreikam harum:

1. Ia ka dew thung yn sa weng noh bad yn buh ha ka jaka ba la buh kyrpang (top soil dump). Kane ka dei ba kin ioh ban pyndonkam biang hadien da la kut ka projek.
2. Ka jingtih bad ka jingbthei kan sa pynphiah ia ka Overburden bad kine ki maw ki ba rit yn sa weng lyngba ki borsha na machine (katkum jingdonkam) bad rah sha ki jaka (dumpers) ki ba la buh kyrpang. Yn sat hied bad buh ia baroh ki tiar ki ban sa pyndonkam ha kane.
3. Kine ki overburden lane ki maw bad dew ki bym donkam shuh yn sa rah bad thep ha ka kali ban buh noh sha ki external/internal dumps.
4. U dewiong hi u ju don ha ki jingjylliew bapher bapher jong ka khyndew (Seam IV, Seam V, Seam VI) bad ka jingrben jong kine ruh ka pher na iwei sha iwei (0.05 to 3.30 m jong ka jingrben). Namarkata ka rukom tih ba plie naduh na jrong shapoh (open cast method) kan lah ban pynmih ba bun tam u dewiong bad wat ki dew ki ba stang (0.50m) ruh yn lah ban sei da pyndonkam da kane ka rukom tih. Kine ki dewiong ba la dep sei pat de yn sat hep ha ki trok na ka jaka ba tih.
5. Ka dew thung ka ba la dep sei nyngkong bad ba la buh kyrpang yn sab uh biang ha kine ki jak aba la dep tih bad sei ia u dewiong. Ia kane yn leh hadien ka 15 snem (ha ka por ban khang ia ka projek), bad kane ka dew thung yn sa buh ha kine ki par dewiong ban ioh ban thung jingthung biang kum ki dieng ki siej.
6. Ha ki jaka ki ba la long thliew na ka daw jong ka jingtih (mine voids), yn sa weng noh ia ki shyiap bad ka um ba don um kin sa filter noh bai oh ban pyndonkam biang ia ka um ha kiwei kiwei ki kam.

Kine baroh ki kyndon kam (operations) yn sa leh katkum ka statutory provisions of Mines Act fand Coal Mine Regulations, kaba dei na ka bynta ka jingsumar bad jingpeit jong ki nongtreikam jong kane ka par dewiong. Yn bat bad ia id lyngba baroh ki kyndon ba la bthah da ka MoEFCC, ka Meghalaya State Pollution Control Board (MSPCB) bad ka Environmental Clearance.

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3. KA JINGBATAI BNIAH JONG KA JAKA

Ki jinglong jong ki line ba shatrai duh jong ka jaka na ka bynta shibun ki bynta ha ka mariang, kum. Ka lyer, jingsawa, ka um, khyndew bad ka ioh ka kot la dep ban pynrung ha u bnai Risaw 2023 shaduh u bnai Nohprah 2023 ha ka jingpule bniah ia ka jaka kaba kynthup 10 km sawdong jong ka parmaw. Kiwei kiwei ki jinglum jingtip jong ka mariang ha ki jingthung bad ki mrad, ki khyndew ba pyndonkam, khlaw bad kiwei kiwei ruh la dep ban pynrung lyngba ka jing survey ia ki jaka bad kumjuh la lum na ki state Govt. department bapher bapher. Ki jingioh jingtip hadien ki survey ki pyni shai ba ki ia id katkum ka jingdonkam bad jingbthah jong ka EIA Notification, 2006 lyngba S.O. 1533, ha ka 14 tarik, Nailur 2006, ki amendment ki ba bud hadien bad ka Terms of Reference (ToR) ba la ai da ka ophis jong ka SEIAA, Meghalaya.

Physiography (Jinglong ka jaka)

Kane ka jaka tih dewiong Kalagaw Coal Mine ka dei ka bynta jong ka Nonghyllam Plateau (ka bynta jong ka Meghalaya Plateau) bad ka dei ka jaka kaba kham flat ha ka bynta ba kham lyngkot, lait noh ha ka bynta shatei, kaba long kaba kham rngad. Ka bynta shatei jong ka block ka dei ka bynta kaba kham heh bad ka jingheh ka long kumba 380 m halor ka MSL (Mean Sea Level). Ka jingheh, ka nang hiar ha ka bynta shathie jong ka block, ha kaba ka jingheh ka long kumba 220 m halor ka MSL. Kane ka jaka ka pyni ia ka dendritic drainage pattern kaba don jingmut bad ka monotonous lithology jong ka Tura sandstone formation.

Drainage (Ka rukom ia id ki wah)

Ki wah kum ka Wah Chibak, Wah Kynshi, Wah Um Sur ki dei ki major surface water bodies hapoh ka jingjngai kaba 10 km, kiba ia id na ka bynta shatei sha ka bynta shathie. Ka rukom ia id ka drainage pattern ka long kat kum ka topography jong ka jaka bad lah ban iohi ia ka dendritic pattern.

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Meteorology (Ka jingshisha jong ka mariang)

Ka projek ka hap hapoh ka South West Khasi Hills, Meghalaya ha kaba ka jingshisha jong ka district ka long kham sub-tropical ha ki bynta shatei bad shathie, katba ha ka central upland zone, ka jingshisha ka long temperate bad ha ki jaka ba kham beit ha ki bynta shatei, shathie bad sepngi jong ka district, ka jingshisha ka long sub-tropical.

Ka district ka kynduh ia ka South-West monsoon bad ka jinghap slap ka don ha ka por sngi, hynrei ka pher bha ha ka jingkhim na ka bynta shisngi na kawei ka bynta sha kawei ka bynta hapoh ka district. Ka average slap ka long na 1200 mm haduh 3000 mm shisnem.

Ka jaka Automatic Weather Station (AWS) kaba jan eh ka don ha Nongstoin kaba don ha West Khasi Hills district jong ka Meghalaya, kaba jngai kumba 37 km na ka boundary jong ka projek bad ka jaka Automatic Rain Gauge Station (ARG) kaba jan eh ka don ha Mawkyrwat jong ka West Khasi Hills district jong ka Meghalaya, kaba jngai kumba 40 km na ka boundary jong ka projek.

Ha ka por ba ki la ioh ia ki baseline data, ka jingkhriat ka ba kham kylluid ka long 31.6°C, katba ka jingkhain kaba kham kyrpang ka long 12.70°C bad ka average temperature ka long 21.94°C. Ka average relative humidity ka long 75.27% bad ka jinghap slap baroh ka long 484.7 mm. Ka 1st predominant wind direction ka long na ka North direction bad 24.6% jong ka jingiarap jong ka lyer kaba peit sha ka jaka. Ka jingiarap lyer kaba kham jur ka long 11.31 m/s.

3.1. Ka jinglong jong ka Lyer

Ki parameter bapher jong ka jingrung khongpong ka lyer kum ka particulate matter kaba rit haduh 10µm ka jingheh (PM10), particulate matter kaba rit haduh 2.5µm (PM2.5), Sulphur Dioxide (SO₂) bad Nitrogen Oxides (NO_x) ki la ithuh kum ki parameter ba donkam kiba ia dei bad ki kam jong ka projek ban pyni ia ka baseline status jong ka ambient air quality hapoh ka study area kat kum ki Terms of Reference (ToR) ba la pynmih da ka SEIAA jong ka Meghalaya. Ban peit ia ka baseline ambient air quality, hynriew tylli ki jaka peit ia ka ambient air quality monitoring ki la ithuh ha ka core zone bad buffer zone

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(10 Km radius study area) jong ka projek.

Ka Jinglong Jong Ka Lyer Ha Core Zone: Ka ambient air quality data ba la peit ha ka core zone ka pyni ba ka PM10 concentration ka kylla na 41.7 $\mu\text{g}/\text{m}^3$ sha 25.4 $\mu\text{g}/\text{m}^3$ ha ka jaka projek kaba la ai jingmut bad ka average ka long 35.8 $\mu\text{g}/\text{m}^3$. Ka PM2.5 concentration ka kylla na 20.10 $\mu\text{g}/\text{m}^3$ sha 12.60 $\mu\text{g}/\text{m}^3$ ha ka jaka projek kaba la ai jingmut bad ka average ka long 17.10 $\mu\text{g}/\text{m}^3$. Ka SO₂ bad NO_x concentration ki kylla na 6.8 $\mu\text{g}/\text{m}^3$ sha 5.1 $\mu\text{g}/\text{m}^3$ bad 9.7 $\mu\text{g}/\text{m}^3$ sha 7.0 $\mu\text{g}/\text{m}^3$ bad. Baroh ki parameter ki lap ba ki long hapoh ki limit ba la buh da ka National Ambient Air Quality Standards bad ki Coal Mines Standards ba la buh da ka MoEF&CC.

Ka Jinglong Jong Ka Lyer Ha Buffer Zone: Ka concentration (98 percentile) jong ka PM10 ka kylla na 60.74 $\mu\text{g}/\text{m}^3$ (BA – 1: Rajaju) sha 46.50 $\mu\text{g}/\text{m}^3$ (BA – 4: Khonjoy). Ka PM2.5 concentration ka kylla na 36.10 $\mu\text{g}/\text{m}^3$ (BA – 1: Rajaju) sha 23.60 $\mu\text{g}/\text{m}^3$ (BA – 4: Khonjoy). Ka SO₂ bad NO_x concentration ki kylla na 10.50 $\mu\text{g}/\text{m}^3$ sha 7.94 $\mu\text{g}/\text{m}^3$ bad 19.31 $\mu\text{g}/\text{m}^3$ sha 11.45 $\mu\text{g}/\text{m}^3$. Baroh ki parameter ki lap ba ki long hapoh ki limit ba la buh da ka National Ambient Air Quality Standards bad ki Coal Mines Standards ba la buh da ka MoEF&CC.

3.2. Ka um

Ka jingshah ktah jong ka projek kaba la ai jingmut ha ka mariang um ka la khein ia ka jinglong ka um hapoh khyndew bad ka um ba tuid (surface water) hapoh kane ka jaka jong ka projek. Kaba long baroh 10 tylli ki sample um kata ka long 4 tylli ki sample na ka surface water, bad 6 tylli ki sample na ka um hapoh khyndew ki la bishar ia ki parameter bapher bapher jong ka physico-chemical bad bacteriological. Ki result jong ka water quality ki la ia nujor bad ki standard ba la buh.

Surface Water (um ba tuid): Ki pH value ki lap ba ki don ha ka jingkut hapdeng 6.08 haduh 6.43. Ki Nitrates, TDS, Chlorides concentrations ki don hapoh ka tolerance limits. Ki

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total coli forms ki don ha baroh ki surface water sample ba la lum hapoh ka jaka ha ka jingkut hapdeng 42 haduh 49 MPN. Ka jingdon jong ki coli forms ka pyni ba ka jingjaboh ka lah ban dei na ka runoff water kaba don bacteria ha ka khyndew ne ka sewage ne lah ban dei na ki mrad ne ka jingleitshabar ki brierw.

Kat kum ka CPCB water quality criteria, ki parameter ba la pule ki dei pH, DO, BOD, bad ki total coli forms. Lah ban iohi ba ki surface water sample SW1 bad SW2 ki hap hapoh ka CPCB water quality criteria Class – C bad ki surface water sample SW3 bad SW4 ki hap hapoh ka CPCB water quality criteria hapoh Class – E.

Na ki result jong ka jingbishar, lah ban iohi ba ka surface water ba la lum na baroh ki jaka ka donkam ia ka jinpyinkhuid ba biang ban pynlong ia ka ba biang ban pynioh um dih.

Ground Water (um hapoh khyndew): Ki pH value ki lap ba ki don ha ka jingkut hapdeng 6.6 haduh 7.7. Ka ground water quality ka pyni ba ki parameter ki iahap bad ki jingdonkam jong ka CPCB ground water quality criteria.

3.3. Ka Jingsawa

Lah leh ka survey jong ka noise level hapoh bad ha ki bynta jong ka jaka khaii ban pule ia ki noise levels. Lah khein ia ki jingkhein noise levels ha ka por 24 kynta da ka High Precision Sound Level Meter ha hynniew tylli ki jaka hapoh ka jaka pule jong ka projek. Lah lap ba ki noise levels ha ka por sngi bad miet ha ki buzzer zone bad shabar ki hap hapoh ki jingkhein ba la buh.

3.4. Ka Khyndew

Ka jingthoh ia ka pattern ka jingpyndonkam ia ka khyndew ha ka jaka pule (10 km) jong ka block ka la leh da ki satellite imagery bad ka jingpyndonkam khyndew hapoh ka jaka projek ka long: Jaka ba don dieng/jingthung- 19291.05 Ha (85.979%), Jaka madan/maw/Fallow land- 1833.37 Ha (8.171%), Jaka ba at khyndew (Built up area)- 601.71 Ha (2.682%), Jaka rep- 309.48 Ha (1.379%), Wah/Wahduid/Nala- 225.07 Ha (1.003%), Par dewiong- 173.59 Ha

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(0.774%) bad Pung/Reservoir- 2.78 Ha (0.012%).

3.5. Ka Quality Jong Ka Khyndew

Ki jingkhein physico-chemical jong ka khyndew, kiba don jingmut na bynta ka jingmih ki jingthung bad ka jinglong product ka rep, pH, EC, Organic Carbon, Nutrients bad kiwei ki met trace lah pule na hynriew tylli ki sample khyndew ha ka jaka pule.

Ka texture (jinglong) jong ka khyndew na baroh hynriew tylli ki jaka ka long sandy loam. Ki sample khyndew jong baroh ki shnong ha ka jaka pule ki long neutral sha slightly acidic ha ka jingkhein pH hapdeng 5.42 sha 5.96.

Ki macro nutrients Nitrogen (N), Phosphorus (P), Potassium (K) ki la pule ha ka jaka pule. Ka Nitrogen ka ranged na 65.20 sha 74.50 kg/ha-1 kaba pyni ba ka don ha ka less category. Ka Phosphorus ka range na 2.2 sha 2.5 kg/ha-1 bad hap ha 'very less category'. Ka Potassium ka range na 148.7 sha 185.0 kg/ha-1 kaba pyni ba ka don ha ka jingkhein ba duna ban ia kaba dei ban long.

3.6. Ki Jingim-Jingthung

Ka jingpule ia ka ecology ka long ban ithuh ia ki jingdon jingthung thang kumjuh ia ki mrad bapher bapher ba don jingma bad ban ioh ia ka jingpynwandur ha ka jaka ba la ai jingmut ban tih dewiong bad ki jaka ba don sawdong jong kane ka jaka.

Ym don khlaw hapoh ka prospecting block kaba yn wanphai ha ka kut jong ka projek. Ym don National parks, Sanctuaries, Biosphere Reserve, Tiger Reserve bad Elephant Reserves, Reserve Forest ne Protected Forest ha ka jaka pule jong ka projek. Namar kata, ka projek kam hap hapoh ka Eco-Sensitive zone. Ka projek ka don ha ka jaka kaba duna ki jingthung bad ka sub-tropical broad leaved moist deciduous forest bad scrub forest type (jait khlaw).

Na ka jingpule ecology, lah ban iohi ba ka core zone jong ka Kalagaw Coal Mine projek kam don ia kino kino ki species jingthung ne jingri ba endemic bad ba don jingma.

3.7. Ka Imlang Sahlang

Ka jaka projek ka don ki shnong 42 hapoh ka 10 km radius jong ka jaka ba pule. Ki bynta ba pyniadei bad ka ioh ka kot, ka demographic structure, economic bad livelihood pattern jong

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ki shnong 42 ki la peit katkum ka 2011 Census. Kine ki shnong ki don 1840 tylli ki iing kiba ioh jingpyntien jingim ia 10540 ngut ki briew.

Na baroh ki nongtrei (4486), ka jingkhein ki primary workers ka long 3202 (71.4%) bad ki long kynthup ki nongrep bad nongbylla rep. Ki jingdon ki building bapher bapher (infrastructural facilities) ha ka study area, ka jingbha jingmiat jong ka rukom im (quality of life), kiwei ki social factors ki la lap ba ki long na poor sha moderate (kaba mut ki long kiba duk bad kiba kat ban biang).

4. KA JINGPYNKHREH BAN PYNIADA NA KI JINGMA IA KA MARIANG

Kane ka section ka pynioh ia ki jingdon jingma jong ka projek, ki jingma ba lah lah ha ka jaka projek, ha ka por pre-operational bad operational bad ka environment management plan ba la pynkhreh ban tehlakam ia ki jingma bad jingjakhlia.

Ka jingiakren halor ka jingma jong ki bynta bapher ba iadei bad ka environment ban kyntait ia ki jingma. Haba kheif ia ka jingma ba thymmai na ka projek bad ki prokram ban pdiang ia ki jingleh ki ban khanglad ia ki jingma ia ka lyer, um, jingsawa, khyndew, ecology bad ki aspect kiwei ki jingdon jingma ki la kheif. Ki mitigation measures kiba don na bynta ka lyer, um, noise, khyndew, bad jingim ki la ai hapoh.

4.1. Ki Jingma Na Ka Lyer Bad Ki Jingpyniada

Ka jingpynmih ka lyer bymkhuid ka lah ban jia ha ki bynta bapher jong ka jingtrei mining kum ka excavation, drilling, blasting, loading bad ka jingrah jong ki tiar donkam. Ki Suspended Particulate Matter (PM₁₀ bad PM_{2.5}) ki dei ki pollutant (ba pynjaboh) ba kongsan kiba lah mih ha ka por jong ka mining operations.

Ka projek Kalagaw Coal Mine kan shim ia kine ki lad ban pynduna ia ki dust emissions na ki jingtrei bapher:

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- Ban lait na ka jingpumpum na ka drilling operations, yn pyndonkam da ka wet-drilling.
- Ka coal seam kaba lah ban tih yn pynsgem shuwa ban tih na bynta ban lait na ka jingpumpum.
- Ha ka por excavation, yn pyndonkam da ki tiar pynbthei (explosives) na ki nongdie ba la ioh jingmynjur na ka DGMS na bynta ka blasting bad yn pynduna ia ka overcharging jong ki blast holes ha ka OB. Baroh ki kyndon DGMS kiba iadei bad ka jingshngain ha ka por blasting yn bud ryntih.
- Ka jingpynsangeh ia ka jingbun jong ka jingpumpum kaba lah mih na ki dewiong ba la buh bad OB dumps da ka jingpyntreikam da ki jait jingthung fibrous species jong ki kynbat bad kiwei ki jingthung na katei ka thain ha ki jaka ba riat bad hajan jak aba theh ki niut.
- Yn shna ia ki wind screens da ka jingpyndonkam ia ki jar kiba jyrngam bad sainar kiba ker ban pynduna ia ka jingkhik jong ka dust.
- Yn pyntreikam ia ka jingthung jingthung ha ki bynta jong ka quarry bad OB dumps ha ki lai tylli ki shynrang, ban long kum ka barrier jong ka mariang ban khanglad ia ka pumpum.
- Yn pynbiang ia ki jingtei PPE ba pura kynthup ia ki dust filters/masks na bynta baroh ki nongtrei ha ki jaka ba mih dust.
- Ki Ki lynti surok ba iaid trok kin ki daw kiba kongsan ba pynmih ki pumpum ha ki opencast mines. Ban pynduna ia ka jingeh jong ka kine ki pumpum na ki lynti surok, yn shim ia kine ki sienjam:
 - Yn pyntrei ia ka black topping ia ki permanent roads ha ki jaka ba hapoh bad

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bad habar jong ka par dewiong ha kaba ki dewiong bad jingrah trucks/dumpers bad tippers kin iaid.

- Yn kynshait um man la ka por katkum ka jingdonkam ba man la ka sngi ha ki kine ki surok ha ka por ba donkam.
 - Ha ka por jingrah jong ka dewiong bad overburden, yn don ka minimum time interval kaba 5-6 minit hapdeng kawei ka dumper bad kawei na bynta ban pynneh ia ka dust particles ba khia.
 - Baroh ki jingrah trucks kin don ka tarpaulin sheets (ki plastic kiba tap nalor) haba pyniaid ia ki tiar donkam (coal bad/or overburden) bad yn pynpaw ba ym don truck ba palat briew, kumta ba kan ym don ka spillage jong ka tiar donkam ha ka por jong ka jingiaid.
 - Yn pynlong ia ka avenue plantation jong ki jait jingthung ba thymmai kiba don ka high APTI (Air Pollution Tolerance Index) ha ki bynta jong ki surok.
- Ka jingmih emission na ki HEMMs kaba don NO_x, CO, unburnt HCs, etc. yn pynioh ka jingpeitngor da kaba bud ryntih ia ki jingpeit bniah ia ki kali (vehicle maintenance) schedules kynthup ka periodical tuning jong ki engines man la ka por.

4.2. Ki Jingshahktah na ka jingjaboh um bad ka jingpyniaid ia ka

Ka daw ba kongsan jong ka jingjaboh um ka dei ka jingpynmih na ki par dewiong bad ka jingtuid ka dewbah kaba kit ia ki rben ba lait. Ka um kaba mih na ki par dewiong yn pynkhuid ha ki pung ban pynneh ia ki rben sha trai jong ka pung.

Ka um kaba donkam man la ka sngi ha kane ka par dewiong ka long kumba 150 KLD, ha kaba 60 KLD na kane yn pyndonkam ban pynjah ia ka pumpum(dust suppression), 10 KLD ban sait ia ki HEMM ha workshop, 70 KLD ban thung dieng, bad 10 KLD na kane ban pyndonkam ha iing bad jingdonkam shimet.

Ki jingpyniaid jingpynkhuid um ki long kumne harum:

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- Yn tei ia ki synsar jaboh (garland drains) kiba don ka jingheh bad ka jingjrong kaba biang ha ka bynta ba long poh bad ha ki jaka ba pynlang ia ka um, haduh ba kut ka jingdon ki (LoM), khnang ba kane ka um kaba tuid na ka jingkieng ka um, kan ym poi sha ki shnong jong ka Porkhadoh, Nongkulang, Mawmarin bad ki jaka ka mariang bad ki jaka rep.
- Yn tei ia ka jinglum um slap (rainwater harvesting) ha ka jingheh kaba biang ban pynlang ia ka um slap ha ki ainguh sngi, khnang ba kan pynneh ia ka um ha kane ka jaka khyndew jong ka par dewiong.
- Ban tehlakam ia ka jingtyrkhong bad jingpynjaboh ia ka um mariang, ki lad jingpyniaid kum ki tangki jngai, ki iing badki jingpynlong um, bad ki jingtei ki garland drains ki long kiba biang.
- Ka jingtei ia ki bniat badki jingteh hapoh ka long ban tehlakam ia ka jingtuid ka um halor ki hajar. Kane yn leh da kaba tei ia ki terrace bad ki jingpynlong um ha ki jaka ba shait tuid.
- Yn shna ia ki jingkyndong bad ka khyndew ba heh na bynta ban pynduna ia ka jingtuid um bad ka jingtyrkhong ia ka khyndew.
- Ka um kaba lum ha ka kynroh jong ka quarry yn pyndonkam da kaba mih bad pynlang sha ka Effluent Treatment Plant (ETP).
- Ka um kaba mih na ka jingsait ia ki HEMMs yn lum bad pyndait ha ka ETP. Ka um kaba la pynkhuid yn pyndonkam ban sait bad pynkhuid ia ki HEMMs, tehlakam ia ka lyer bad ban thung dieng - pynneh ia ka jinglum ka um (Zero Liquid Discharge - ZLD).
- Ka um jong ka septic tank yn pynkhuid da ka septic tank bad pynlang sha ki soak pits.

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- Ka um kaba don ha ka dewbah bad ka um kaba rit yn pynneh bad peit man la ka por.

Ha ka jingpynbeit halor kane, lah ban ong ba kam don jingma kaba khraw halor ka jingtyrkhong ka um hapoh khyndew ha kane ka jaka. Ha kaba kum kane ka jingjia jingma na ka jingkhyndew ha ka par dewiong, ka Kalagaw Coal Mine projek kan shim ia ki lad ba biang ban teh lakam ia kane ka jingeh.

4.3. Ki Jingshaktah Na Ka Jingsawa bad ka Jingtahlakam ia Ka

Ka daw ba kongsan jong ka jingsawa ha ki par dewiong ka dei ka jingpyndonkam ia ki kor kiba khelaiñ, ka jingtrei jong ki kor diesel kum ki DG sets, ki pump ban pyniap um, ki kor ban wut lyngkha, ki dumper (trok rah ñuit), ki road grader, ki excavator, bad kiwei de, kumjuh ruh ka jingpynbthei, ka jingiaid ki truck. Kito ki nongtrei kiba pyndonkam ia ki HEMM ha ki jaka ba don jingsawa kaba tam ia ka 90 dB(A) kin shah ia ka jingshngain kum ki earplugs bad earmuffs. Kaba kham kham ia ki khet kum ki dozers (kali khwai khyndew), shovels (borsha), dumpers (trok rah ñuit), feeder breakers, bad kiwei de kin shna ia ki jingpynshngain bad ki jaka ba lait na ka jingjaboh.

Ki lad jingpyniaid ban pynduna ia ka jingsawa kin long kumne harum:

- Ki lad ban pynduna ia ka jingbthei kin pyndonkam da ki millisecond delay detonators bad relay systems ban pynduna ia ka jingsawa bad ka jingkhie shakri jong ka bthei.
- Ki jingktah bym salia kiba lah ban jia na ka jingbthei ba ar kan lah ban pynneh da ka jingthmu kaba dei, ka jingthew bad ka jingpynbiang ka jingkit.
- Ka jingthmu kaba dei jong ka jingbthei kaba la khein naduh ki lad jong ka lyer kaba bha bad ka por ba ka par dewiong ka trei.
- Ka jingthung dieng ha ki lai jaka ha ka par dewiong bad sawdong ka jaka thied.
- Ka jingthung dieng ha ka lynti iaid kali jong ka par dewiong.
- Ki injin jong ki HEMM bad kiwei pat ki kor bad kali jong ka par dewiong kin pynneh

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bha ban pynduna ia ka jinggsawa. Ka jingpyntreikam ia ki silencers ha ki dumpers (trok rah ñuit) bad kiwei pat ki kali kin pyrshang ban tehlakam ia ka jinggsawa kaba mih.

- Ka por trei kin peit bniah bha da ka Site Manager/Engineer ban pynneh ia ka jingkhie shet jong ki nongtrei na ka jinggsawa kaba khraw. Yn buh shuh ia ka pla jong ka bai sah ban peit ia ka koit ka khiah jong ki nongtrei man la ka saw bnai kaba kynthup ruh ia ka audiometric tests.

Nangta, da kitei ki lad ban pynduna ia ka jinggsawa kumba la kdew haneng, ka jinggsawa kan ieng ha ka rukom kaba biang katkum ki kyndon ba la buh.

4.4. Ki Jingshah ktah na ka Jingkhieh Khyndew bad ka Jingtehlakam ia ka

Ka jingpynbthei ha ki jaka tih dewiong ka lah ban pynlong ia ka jingkhieh khyndew kaba lah ban pynjutor ia ki jingtei kiba marjan. Ka jingjubor na ki maw kiba la bthei ruh ka dei kawei pat ka jingeh kaba donkam ban da peit. Ki lad jingpynkhuid kin long ha kane ka projek ban tehlakam ia ka jingsawa bad ka jingkhieh jong ka bthei ha ki jaka kiba marjan bad kane ka projek.

- Yn pyndonkam ia ka lad jingbthei kaba iada kaba long ka Controlled muffled blasting technique ban pynduna ia ka jingkhieh jong ka bthei.
- Ka jingkhuid niat bniah jong ki niat kiba kham larkam.
- Ka jaka hapoh ka 500-meter radius jong ka jaka bthei yn pynbna kum ka jaka ba ma/jaka ba kham eh, da kaba pyniing ia ki lama iong ne ki jingshai ba biang. Ka jingpyniaid ne jinglong shapoh jong kane ka jaka kan long kaba khang pyrshah haba pynlong ia ka jingsawa bthei.
- Ban iada ia ki nongtrei par dewiong ba don bynta, yn shna ia ki jaka rieh ha ki jaka bthei ban ai ia ka jingiada ha ka por pynbthei.
- Yn ai jingmaham da ka sur ba kongsan khatsan minit shwa ban bthei, khnang ba ki brierw kin lah ban mih noh na ka jaka ba ma.

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4.5. Ki Jingshah Ktah Ha Ka Khyndew bad ka Jingtehlakam ia Ka

Ka rukom pyndonkam ia ka khyndew ha ka jaka ba shah khang ki lah ban kylla na ka daw jong ki bynta bapher jong ki jingtrei khaii dewiong. Yn leh ia ka jingkyllain ia ka khyndew ryngkat bad ki jingtrei khaii dewiong ba dang ia id khnang ban pynduna ia ki jingmih ki ban pynjolor ia ka mariang. Hadien ba kut ki jingtrei khaii dewiong, yn thung jingthung ha ka 74.14 Ha jong ka khyndew da u Projek Proponent, 8.32 Ha jong ka khyndew yn sa kylla sha ka pung um – kaba lah ban long ka jingmysaw ba pawkhat jong ka surface water bad ban pynioh biang ia ka ground water ha ka lawei na bynta ki shnong ba marjan (Sengupta, 2015), bad 0.23 Ha jong ka khyndew yn sa pynneh na bynta ka jingpyndonkam paidbah. 17.31 Ha jong ka khyndew yn sa ieh khlem pynjot.

Ki lad jingpynkhuid harum yn sa leh ha kane ka projek:

- Yn thung jingthung ha ka 74.14 Ha. jong ka jaka projek da ki jingthung khlaw tynrai, ki jingthuh kiba heh APTI, kiba long kiba lah ban pyndonkam bad khie bit.
- Ka dew thung ka nym khleh bad ka overburden bad kin sa bret abd buh beit la ka jong ha ki jaka ba la buh kyrpang halor ka jingthung greenbelt/jingthung.
- Ka jingpyndap biang ia ki jaka ba shah tih mine ha ka por ba dang ia id ki jingtrei khaii dewiong.

4.6. Ki Jingshahktah ha ka Ecology (Mariang Jingim) bad ka Biodiversity (Mrad bad Jingthung)

Watla don ka bynta jong ka jaka par dewiong kaba kynthup ia ka khlaw ba ym pat ktah, ki bynta jong ka jaka peit kin lah ban kdew ha ki bynta bapher kum ka khlaw tropical, subtropical-broad leaved bad ka khlaw pyn, temperate forest bad ki jaka niut (Soil & Water Conservation Department, 2011). Kumta, ki lad jingyada harum kin sa leh ban iada ia kino kino ki jingthung kum kitei:

- Ka jingthung jingthung ha ki lynti lynti ha ki jaka bym dei khlaw hapoh ka 5 km

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radius na ka jaka par dewiong da ki jingthung tynrai.

- Yn sa leh ia ka jingthung angiosperms (ki jingthung dieng bad soh) ban khring ia ki jait mrad bapher kum ki khniang, jakoid, bsein, sim, bad mrad ba heh.
- Jingpynspray um man ka por ha ki jaka ba pynmih pumpum kum ki jaka kit bad buh, ki lynti ia id kali bad ki lynti kit, ki jingthylli dew thung, ki jingpynlang dewiong, bad kiwei kiwei, ban lait na ka jingpynlang dust bad kiwei ki kynroh ha ki dieng ha ki jaka ba marjan.
- Ban pynneh ia ka jingiasoh jong ka level jong ka um ha kane ka jaka, ka um na ka karkhana dei ban pyndonkam hok na ka bynta shibun ki kam, kum ka dust suppression, ka jingthung, ka shna-um HEMMs, bad kiwei. Ka um ba lah tam shall dei ban pyndonkam biang na ka bynta ka jingiarap sngewbha na khyndew, hadien ba la pynsangeh lyngba ki jaka pynsangeh um.
- La pynkhreh shwa ia ka Greenbelt Development Plan kaba kyrpang ia kane ka jaka bad ka projek.

4.7. Ki Jingktah ha ka Ioh ka Kot ha ka Imlang Sahlng

Kane ka projek ka la antad ban wanrah tang ki jingktah ba bha ha ka jingim jong ki brier ha ki shnong ba marjan. Kan wanrah ka jingkieh haka ioh ka kot haka jaka projek kaba kynthup ruh ia ka jingkylla ha ka jingtei (infrastructure) bad ki jingai jingmyntoi jong ka shnong. Ki nongpyniaid ka projek kin pynleit jingmut ban shna jingkylla na ka bynta ka jingim ba bha jong ki nongtrei ha ka karkhana, ki longiing jong ki bad ki brier ka shnong ba marjan. Kumjuh ruh, ki jingtrei khaii dewiong kin wanrah ki lad trei kam ba khlem pat ai kam bad kin wanrah ruh ki lad sumar bad lad pynmih jingtip kiba shai.

5. KA PROGRAMME BAN PEIT IA KA MARIANG

La pynkhreh ia ka jingpeit ia ka mariang na ka bynta ka projek ban peit bniah ia ka jingtreikam hok jong ka Environment Management Plan bad ban shim ki lad jingsumar haba jia ka jingjakhlia haki jaka marjan. Ka Environment Management Committee kan long

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ha ka dorbar projek ban peit ia ka jingpyntrei kam jong ki lad ban sumar ia ka marban ha ka projek.

Ka jinglong ka lyer, ka jinglong ka um, ka jingjrong ka sur, ka jinglong ka khyndew ka um kin peit kham slem bad kin shim ki lad jingsumar haba donkam. Ka Environmental Monitoring Cell (EMC) kan long ka jaka pdeng na ka bynta baroh ki jingpeit mariang bad ka jingthoh jingtip. Kane ka jingtip kan kynthup bad phah man ka por sha ki bor synshar ka jylla Meghalaya. Ki reports kin long kiba shai bad phah man la ka hynriew bnai.

6. KIWEI PAT KI BYNTA JONG KA JINGKHMIIH KA PROJEK

6.1. Ka Jingpynweng/Jingpynkhih ia ki Nongshong Shnong

Ym don ki jaka shnong ha ka projek bad kumta ym donkam ka jingbishar pynkylla bad jingpyniaid noh jong ka Sorkar Meghalaya ne ka jingpyntrei kam jong ka.

6.2. Ka jingpynshisha ia ka jingma bad ka Plan Ban Sumar Jingma

Ki jingtrei khaii dewiong bad ki kam ba iadei kin don bun ki jingma ia ki nongtrei bad ia ka pyrthei baroh kawei. U nongtrei ha ka karkhana dewiong un donkam ban trei ha ki jinglong ba iaineh shngain bad koit khlieh.

La dei ban leh ia ka jingpeit jingma man la ka por. Ka jingpeit jingma kan kynthup ia ka jingpynshisha ia ki jingma ban ithuh, pynkhreh bad pynioh ia ki jingiarap kaba biang. Ka thong na ka bynta ka jingpeit jingma man la ka por ban ithuh ia ki jingma, pynshisha ia ka jingma bad ki jingteh bad peit ia ka jingpyntrei ia ki jingteh na ki jingpeit jingma ba la dei shwa.

Ka Kalagaw Coal Mine projek ka long ka jingsdang thymmai bad ka jingtrei khaii dewiong kan leh da ka shovel dumper combination ha ka opencast mechanized method (ka rukom tih najrong shapoh). La leh ka jingsumar kaba kyrpang haba pynmih nongtrei ha ka karkhana shuwa ban pynkham ia ki nongtrei sha ka karkhana, yn pynbit pynbiang ka jinghikai kam bad ki jingstad ia ki kyndon jong ka Regulation 106 jong ka CMR 2017. Ki mat ba khraw kiba dei ban sumar ka jingpyndait ki dei kine:

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- Jingneh ka stability jong ki Benches, Quarry High walls bad Spoil Dumps
- Ka jingpait ka slope ha Mine Pit bad ha OB Dump
- Jingpeit ba kham bha pyrshah na ka jinglang na ka um kaba sah
- Jingpeit ia ka jingsdang jong ki equipment kaba pyndep ha ki Horizons
- Jingsumar na ki Electric shocks
- Jingpynneh ka jingsumar na ka Jinging ding
- Ka jingpynduna ia u pum pum bad ka jingsumar ia ki Exhaust Fumes
- Jingpeit ka jingsumar haba tih bad pynbthei
- Jingpyniaid ia ki jingpynmih ki mar pynbthei
- Ki jingsunar na ki accident kali
- Jingsumar ia ka koit ka khiah

6.3. Jingpyllait Paidbah

Jingpyllait paidbah yn leh hadien ka jingphah ia ka Draft EIA Report sha ki bor ba dei.

7. KA JINGMYNTOI JONG KA PROJEK

Ka jingpynlong ia ka Kalagaw Coal Mine projek ka long kaba kongsan na ka bynta ka jingiarap ka jingpyntreikam ka dewiong na ka jaka bad ban pynbiang ia ki jingdonkam jong ki nongthied bad ha ki jingdonkam bapher bapher. Ka jingpynlong ia ka projek kan wanrah ki jingmyntoi ba kum kine:

- Ki lad trei kam ba khlem pat ai kam ia ki briew ka thain bad ka jingkiew ka jingpynmih jingtip, ka jingpyntrei kam, ka jingsumar jingmyntoi shnong bad ki lad sumar ka koit ka khiah.
- Ka projek kan iarap ka jingim ba bha, ka ioh ka kot, ka thain bad ruh ka jylla
- Ka projek kan iarap ka jingkylla ha ki lad infrastructure (jingtei) ha bad ha marjan ka projek.

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8. KA ENVIRONMENT MANAGEMENT PLAN (EMP)

Ka EMP ka long ka plan kaba kongsan ban pyntreikam ia ka projek ban long kaba neh bad kababha ia ka mariang. Ka EMP kaba treikam ka dei ban pynlong ia ka projek kaba pyni ia ka jinglong hok ba kin sumar ka kiei kiei kiba ktah ne pynjulor. Kine ki thong ki dei ban pynkhreh ha ka design jong ka EMP ban pynbeit ia ki jingktah kiba sniew kiba kin long kiba la leh na ka khaii:

- Ka jingpynbit pynbiang ia ka khyndew bad ka par dewiong jaka khaii kiba la dep khaii bad active points jong ka mine lease area haduh kaba lah kut, haka jingiatrei lang bad ka ioh ka kot jong ka khaii, ka rukom tuid ki wah, ka jingskhem jong ka khyndew, ka jinglong dieng bad kumta ter ter;
- Jingbuh duna ia ka jingktah ia ka um bad ka jinglong ka thain bad jingpynneh ia ka na ka bynta ki nongshongshnong;
- Ki jingtrei ban pynbha ka jinglong ka lyer, ka jinglong ka um bad ka khyndew haka por khaii bad hadien ka khaii; bad
- Ka jingpynneh ia ka jinglong kaba iarap ban pynbha ka jinglong ka jingim, ka ioh ka kot jong kane ka thain.

9. KA JINGLUT JINGSEP JONG KA PROJEK

Ka Kalagaw Coal Mine ha ka jingheh 100.0 ha kan long kaba la shongthuh ia u nong applikant Bah Teilang Pde. Ka jingbun ka pisa ka projek ka long hapdeng ₹2500 Lakhs. U nongpyniaid ka projek un buh ia ₹150 Lakhs ban pynbeit ia ki jingktah ia ka mariang ba wan na kane ka projek khaii kum ka Corporate Environment Responsibility (CER) Programme.

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10. JINGPYNKUT

Ka jingkiew bad jingmih kamai ka India ka shong hapdeng ha ka dewiong, kaba long ka jingpynmih ka bor ba kongsan. Ka khaii dewiong ha Meghalaya ka long kum ka jingmih kamai kaba rit bad ki nongshong shnong, kiba dei ruh ki trai jong ki minerals hapoh ka khyndew jong ki. Ka dewiong ba la pynmih kan iarap ia ki jingdonkam ka power sector, ki karkhana shna cement, ki fertilizers, ki karkhana tyrpeng, bad kumta ter ter kin myntoi na ka dewiong ba la pynmih na ka karkhana. Ka jingpyntreikam ia kane ka projek ka long na ka bynta ka jingpynmih ia ka dewiong reserves na Kalagaw Coal Mineda ka jingshah shovel-dumper combination ha ka opencast mechanized method. Ka long na ka bynta ka jingpyntreikam ia 1.3911 MT jong ki reserves dewiong ha ka jingim baroh kawei jong ka karkhana. Ha 12 snem. Na ka jingpeit bniah ia ki jingktah ka marban bad ki lad jingsumar kiba la pynkhreh ha ka EMP, ka la antad ba ym don jingktah kaba khraw ha ka ecosystem kan jia na ka jingpyntrei ia kane ka opencast mine. Hynrei, ka projek kan wanrah shibun ki jingmyntoi kum ka jingpynbit ia ki lad trei kam khlem pat ai kam bad jingkiew ka jingim ka thain, da ka jingkylla ha ki lad infrastructure bad ka jingim ba bha jong ki briew ka thain.