Initial Environmental Examination

Project Number: 51308-008
September 2023

India: Uttarakhand Climate Resilient Power System Development Project

Appendices Part 7

Prepared by Power Transmission Corporation of Uttarakhand Limited and Uttarakhand Power Corporation Limited for the Asian Development Bank.

C. Key Concerns during implementation

51. This section presents the key concerns during implementation of the project based on audit finding compared against the National and State regulations and ADB Environment Safeguard requirements.

Existing EHS management procedures and practice

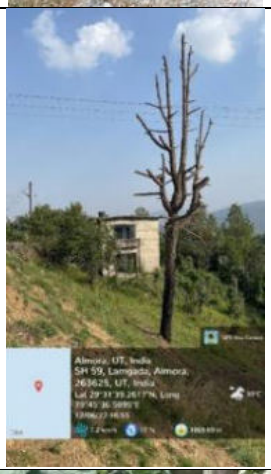
52. UPCL presently do not have a dedicated environmental and/or social safeguards team in the organisation for monitoring and managing environmental and health and safety risks. Discussion with officers of UPCL at headquarters and substations shows that there is no other clearly defined institutional setup to supervise and manage environmental and health and safety risks. Thus there is no existing structure that can be called upon to provide CAP and EMP implementation support, supervision and monitoring during construction or operation. Currently there is a Safety Manual and the Electrical Sub-Divisional (ESD) Superintendent Engineer (SE) with support from the Sub-Divisional Officer (SDO) is responsible for H&S aspects and other issues with support from assistant (AE) and/or junior engineers (JE) or staff of the substation. However, the SE, SDO, AE, JE, and the staff at substation level have not been exposed to environment, health and safety compliance matters. This set-up has led to lapses in compliance with national laws and regulations in relation to the existing substations as evidenced by the site visit and the environmental audit.

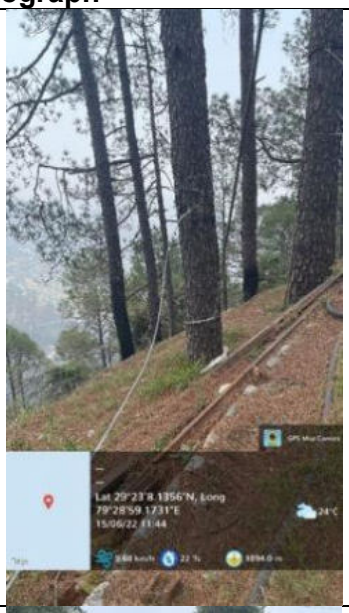
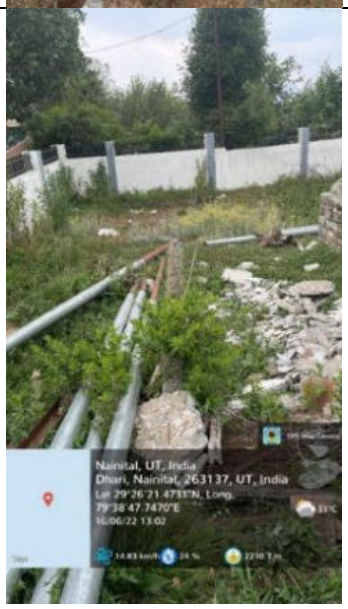
Key concerns – Biological Environment

i. Unintended disturbance to trees and vegetations in some substations that have trees other than in the switch yard (Pines SS – along internal paths, boundary)
ii. Site clearing and removal and replace of equipment firewood used as cooking fuel and or bon fire during extreme colds were reported.

Table 4.7 Representative photos showing impacts on substation flora

Concern	Sample photograph
Hatibarakala Substation – Electric meters and other wastes dumped and stored on the root/area of two neem trees/Indian lilac (*Azadirachta indica)*	

Concern	Sample photograph
Badhaipura Substation – Waste dumped and stored on the root/area of Papaya (*Carica papay*)	
Lamgarah substation: Lopped Mountain Cedar tree *(Toona ciliate)*	
Phoolchaur substation: material stored on root zone of Mango *(Mangifera indica)* **and Giant Milkweed** *(Calotropis procera)*	

Concern	Sample photograph
Pines substation: Cables around Chir Pine tree (*Pinus roxburghii*) and poles stored in root zone.	
Sarghakhet substation: ongoing renovation, and storage of materials.	

Source: ADB TA Consultant

iii. No threatened fauna species observed or reported by substations staff whose population would be impacted as all substations are existing and within modified habitat loss, although, if present, human-wildlife conflicts (Leopard, King Cobra, Himalayan Black Bear, Wild Boar, Asian Elephant, etc.) during works would need to be managed.

iv. Potential human-wildlife conflicts during works for substations, especially for migrant or workers from other regions/state who are not informed about the local sensitives and ecological or other issues, e.g., increased wildlife encounters, risk of road-related accident due to additional traffic, illegal hunting and poaching by workers venturing outside of the project footprint. The mountainous terrain also

hinders the movement of injured staffs to main hospitals located in major cities and towns due to treacherous road, limited communication, and transportation. As per a report in Goan Connection, dated 12.01.2021, Villagers in Pauri Garhwal, Chamoli, and Almora districts of Uttarakhand complaints of rising leopard attacks. Lack of basic healthcare in the region resulting in transporting victims many kilometers away in critical condition.

v. In September 2021, a 48-year-old man was killed by a bear in Pithoragarh district. The victim was a labour working on a road project on Munsiyari-Milam road stretch.

vi. Secondary information on Human-Wildlife Conflicts in the state is provided below. The substations proximity wise conflicts and hotspots are provided in Table 4.8. A human-wildlife conflict information is provided in Figure 4.8 and locations of substation in relation to wildlife conflict spots mapped in Figure 4.9.

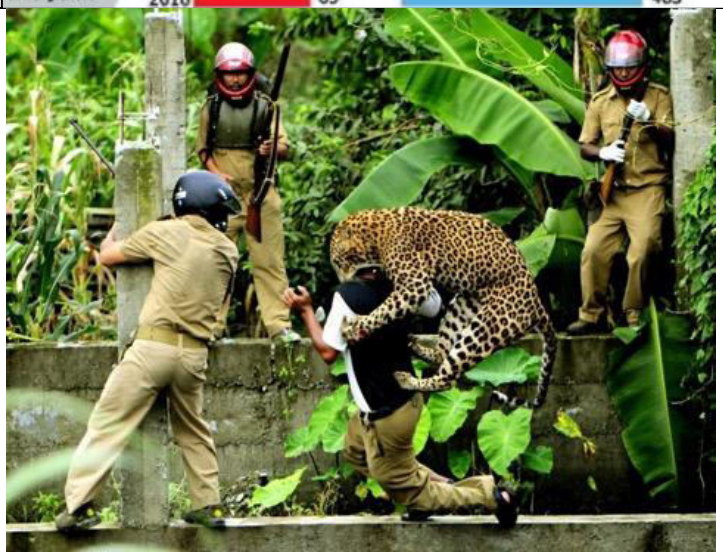
Table 4.8 Substation and wildlife sensitivities (upto 10km)

S. No.	Nearest Substation	Distances to		
		Asian Elephant Corridors and Latest conflict area	**Latest Common Leopard conflict area**	**Other animals (Himalayan Black Bear & wild boar)**
1	Ramnagar Danda		Narendra Nagar – 9km	
2	Lal Tappar	Four incidents within distance of 9 to 18km (upto Dec 2021). Elephant movement reported 0m (access road) of substation yearly. Elephant Corridor (wti.org): 1. Chila-Motichur – 15km 2. Kansrau-Barkote – 3.5km 3. Motichur-Barkote and Rishikesh (Tinpani) – 6.5km 4. Motichur-Gohri - 13km		
3	Tarikhet	Elephant Corridor: 8. Malani-Kota (Ringora Bijrani) – 30km 9. South Patidun-Chikliya (Mohan-Kumeria) – 25km	Tarikhet – 1km	
4	Lamgarah		Bajol – 2km	
5	Sairaghat			Wild Boar: Baisiya Chhana – 5.5km
6	Kamalwaganja	Elephant Corridor: 10. Fathehpur-Gadgadia (Nihal Bhakra) – 3.5km		
9	Garampani		Garampani - 100m	
10	Sarghakhet		Okhalkanda – 4.5km	

11	Pines		Pines- 3m	
12	Jhankat	Elephant Corridor: 11. Kilpura-Khatima-Surai – 11km		• Himalayan Black Bear: Jhankaiya – 10km • Himalayan Black Bear: Nanakmatta – 7km
13	Kashipur	Elephant Corridor: 5. Rawasn -Sonanadi via landsdowne – 40km 6. Rawasn -Sonanadi via Bijnor - 45km 7. Chilkiya-Kota (Sunderkhal) – 24km		

Source: ADB TA Consultant

Figure 4.8 Data on Human-Wildlife Conflict in Uttarakhand

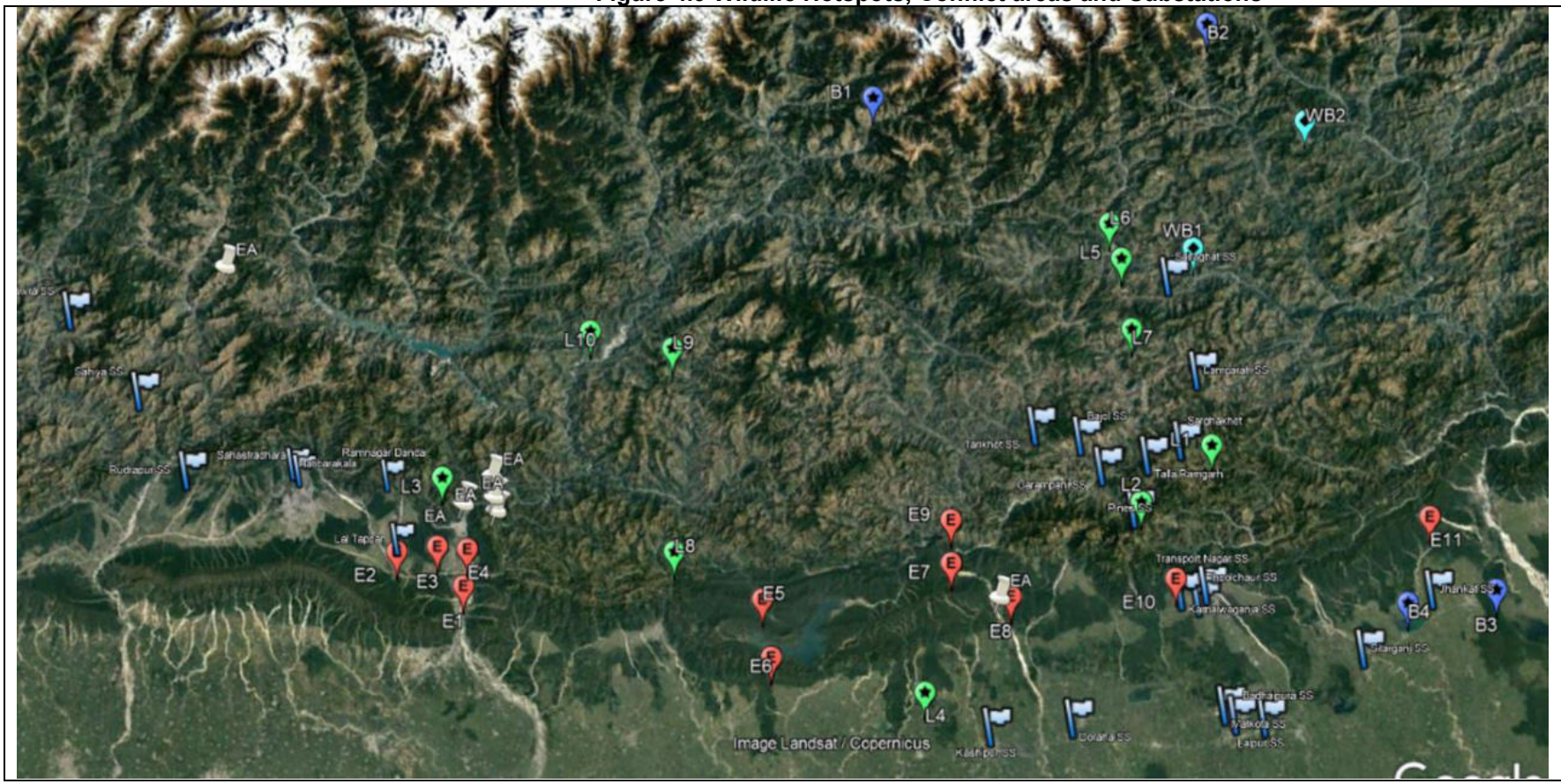


Leopard capturing in progress by Forest Officials

Elphant conflict on State Highway, Bharkote, Dehradun

Source: news18.com and times.com

Figure 4.9 Wildlife Hotspots, Conflict areas and Substations



	Substations
	Elephant Corridors (E)
	Leopard attack area (L)
	Elephant attack area (EA)
	Bear attack area (B)
	Wild Boar attack area (WB)

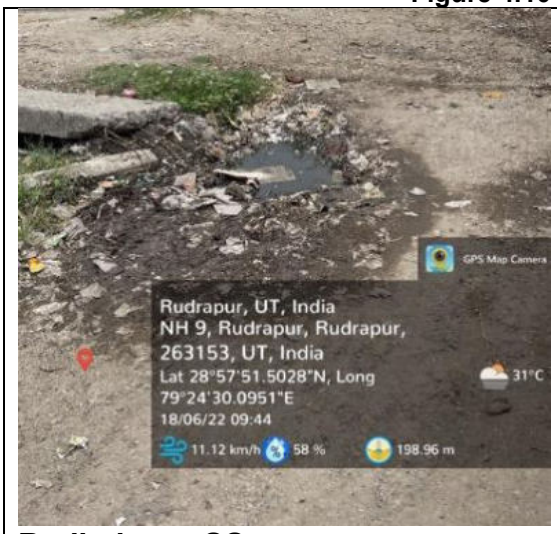
Source
Wildlife Trust of India
Mapped by ADB TA Consultant

Source: ADB TA Consultant

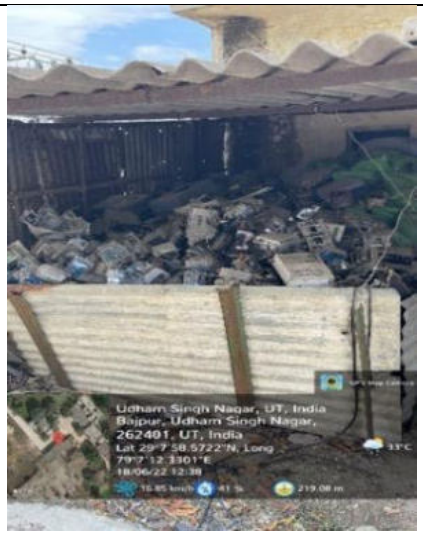
Key concerns- Physical Environment

i. In substations, moderate earthwork for renovation and modernization will take place with replacement of old/defunct equipment, site paving and repairs the control buildings. Some of these are located close to residential/sensitive receptors including Kamalwaganja, Badhaipura, Transport Nagar, Kashipur, Tarikhet, Phoolchaur, Doraha, Garampani, Jhankat and Talla Ramgarh with houses at 0m, and will be subjected to medium to high pollution impacts during construction works.
ii. Potential change in topography and terrain during installation of foundations for substation equipment, repair, and renovations. Primarily substations located in high altitude, steep terrain and cut and fill may be required to create a level construction platform, especially for substations like Pines and Lamgarah.
iii. Potential soil erosion due to clearance of vegetation and surface water runoff across bare ground especially during the monsoon season with risk of construction induced landslide, especially in substations located in steep terrain.
iv. Sediment laden surface water runoff from substations causing surface water pollution and affecting aquatic ecology, especially those located close to and within river valleys like- Garampani, Bajol, Sahiya and Rudrapur substation.
v. Inadequate topsoil management and soil contamination.
vi. Construction wastes may not be managed, stored, and disposed as per CAP/EMP.
vii. Inadequate storm water and sanitary systems both at substation site (Garampani, Rudrapur, Bajol and Sahiya) and in labour camps may pollutant nearest bodies.
viii. Open defecation or disposal of untreated sanitary effluent from workers sanitation (any septic tank) to surface or ground water causing water pollution.
ix. Disposal of solid wastes inappropriately on land or in nearby water bodies.

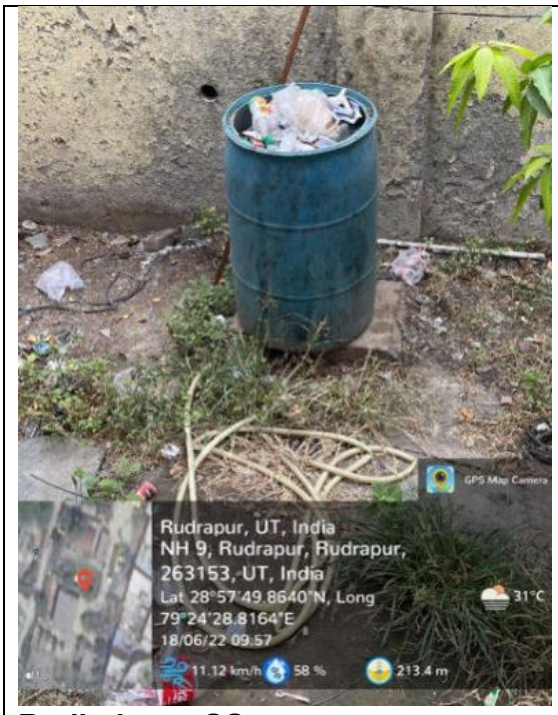
Figure 4.10 Wastes in Substations



Badhaipura SS



Doraha SS



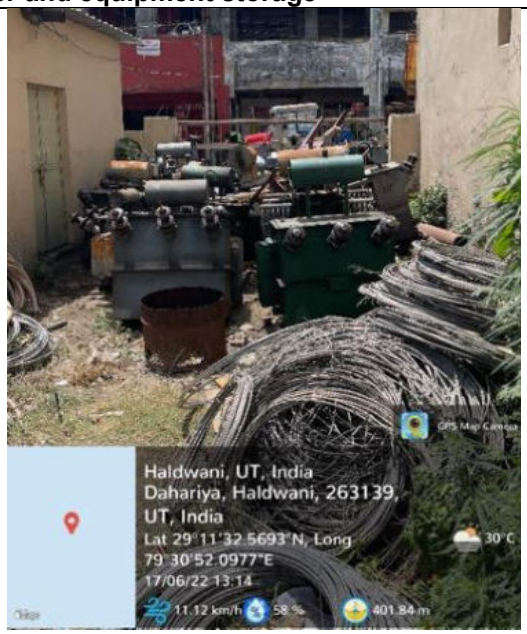
Badhaipura SS

Drainage system in Doraha SS

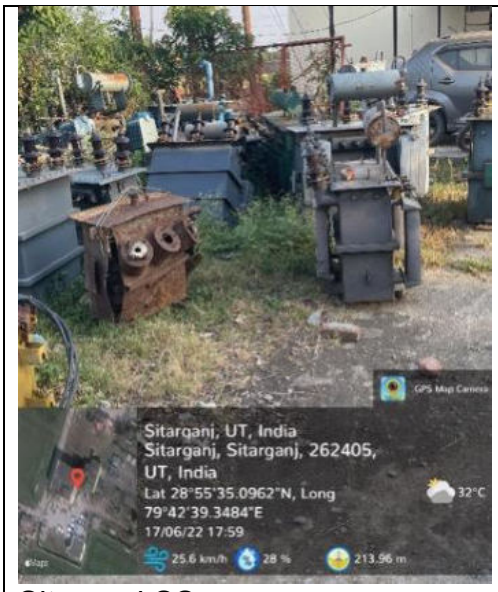
Source: ADB TA Consultant

Figure 4.11 Transformer and equipment storage

Matkota SS



Transport Nagar SS



Sitarganj SS

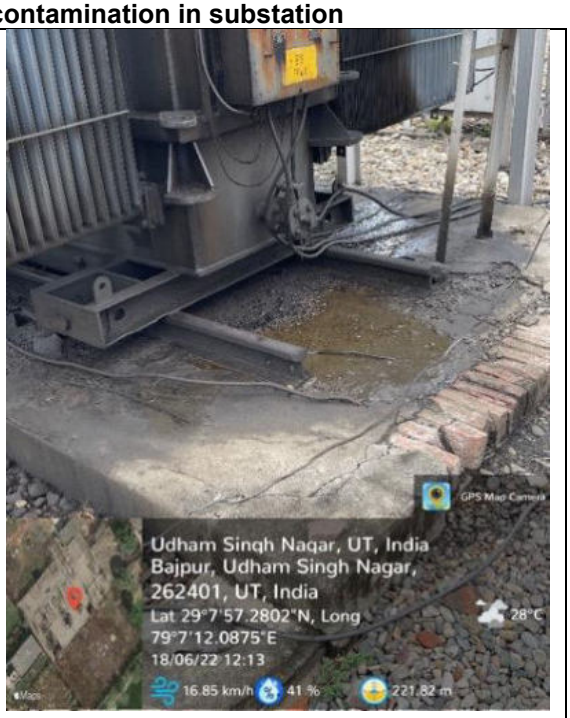
Lalpur SS

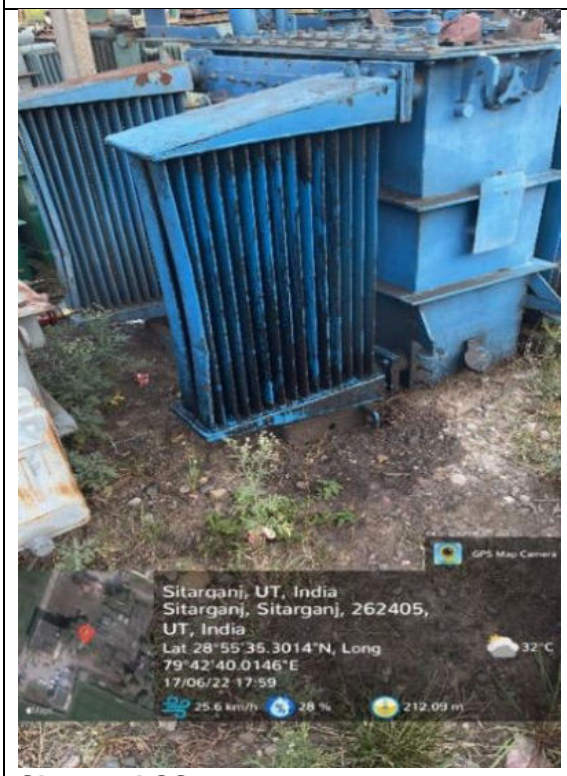
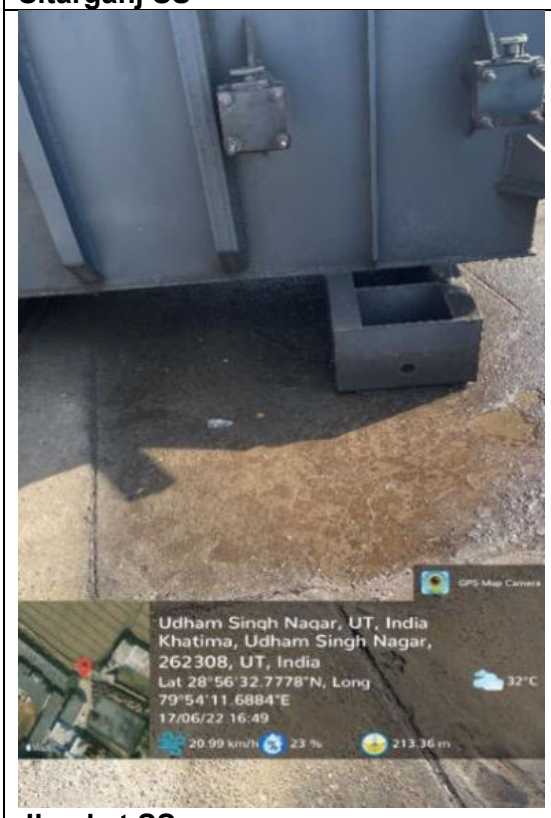
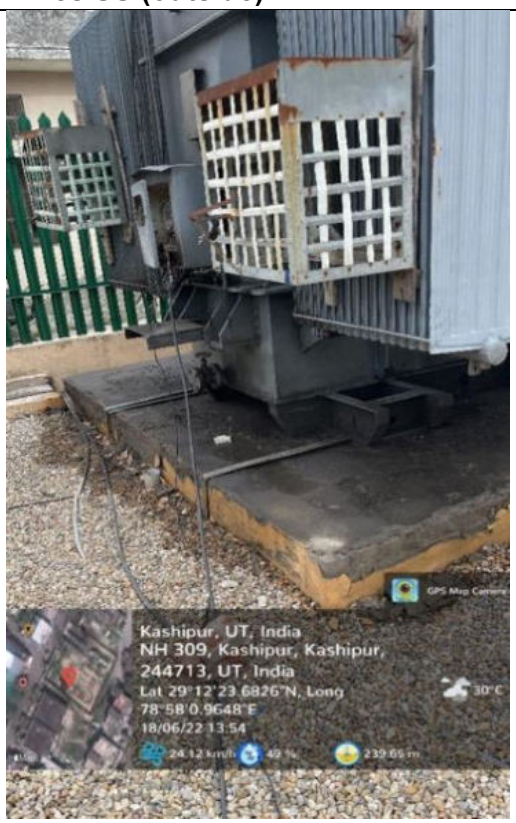
Source: ADB TA Consultant

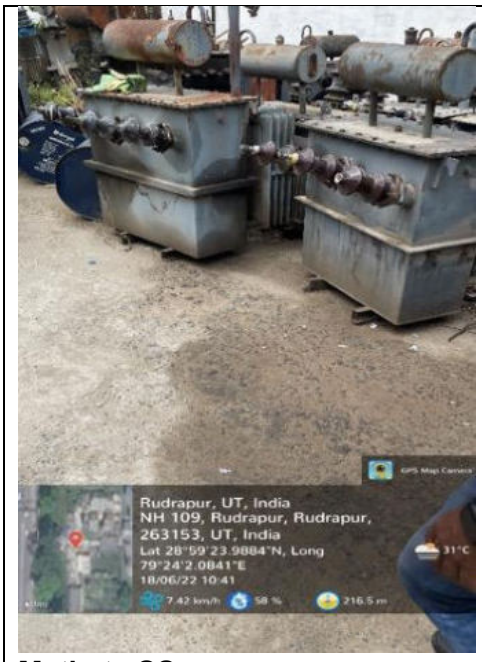
x. Storage of hazardous materials and disposal not as per requirements.
xi. Storage of fuel, oil, chemicals during construction, operation, and maintenance works inside and outside the substation area (as evidenced from Pines substation) and the potential for spills and leaks including transformer oils to result in soil contamination, including during transport of transformers for repair and maintenance.
xii. Disposal of hazardous wastes, including mineral oils from transformers inappropriately on land or in nearby water bodies.

Figure 4.12 Oil Leakage and contamination in substation

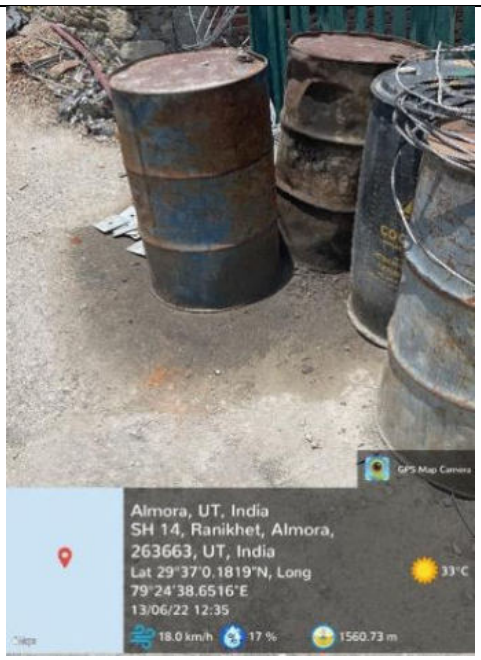
Badhaipura SS



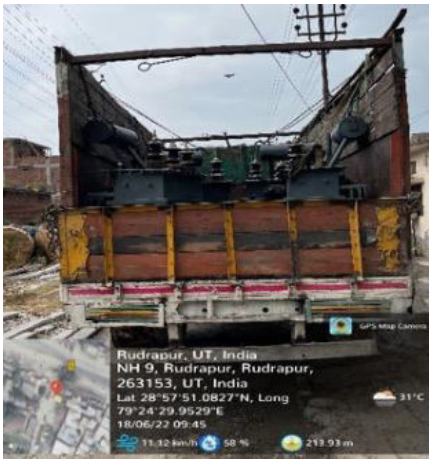
	Doraha SS
 **Sitarganj SS**	 **Pines SS (outside)**
 **Jhankat SS**	 **Kashipur SS**



Matkota SS



Tarikhet SS



Badhaipura SS: Transformers being transported in trucks for repair/disposal with no lining - potential for oil lekage along road during transport

Source: ADB TA Consultant

xiii. SF6 (a potent GHG) gas leakage from gas-insulated switch gear installed at substations during revocation works

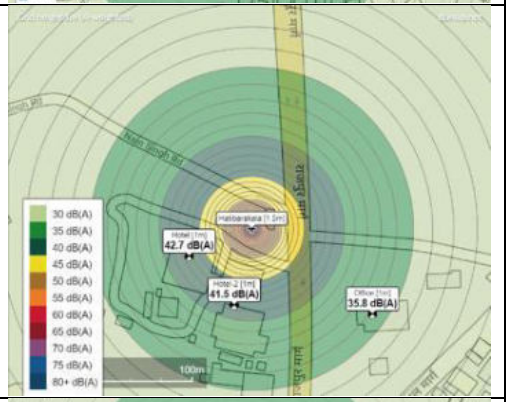
xiv. The use of construction equipment for renovation and earthworks, and construction vehicles may increase the dust, emissions and noise levels experienced by adjacent receptors, especially at Kamalwaganja, Badhaipura, Transport Nagar, Kashipur, Tarikhet, Phoolchaur, Doraha, Garampani, Jhankat and Talla Ramgarh.

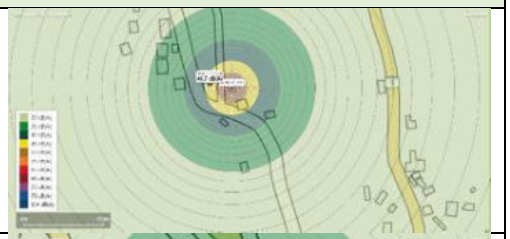
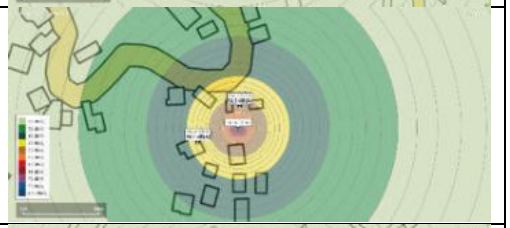
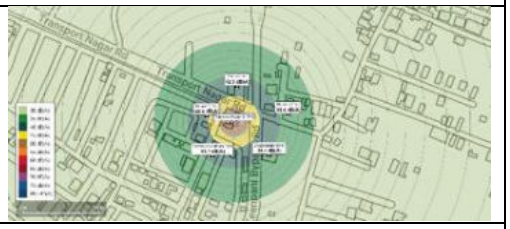
xv. Noise attenuates over distance but at these short distances the construction noise will be experienced at the adjacent receptors and will need to be managed. The equipment and machinery used for construction activity will produce cumulative noise

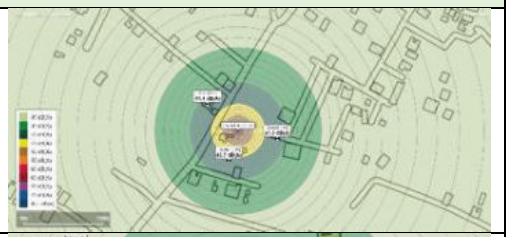
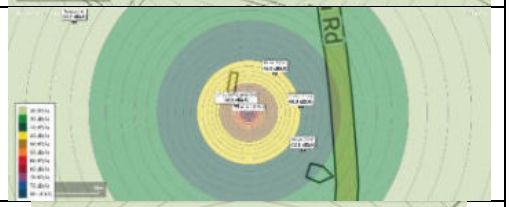
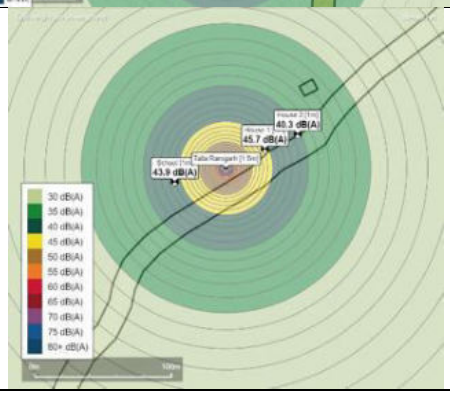
at the properties depending on the source type, sound power, number, weather condition, distance, and duration of working period.

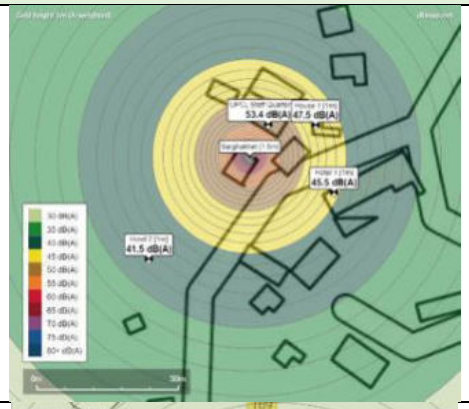
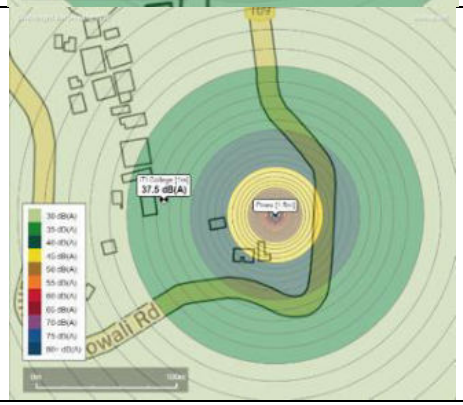
xvi. To assess the impacts, preliminary noise modelling was conducted for selected substations located close to sensitive receivers. The model presents a ‘worst-case scenario’. For modelling purpose, the cumulative source sound power (Lw) level (SPL) from activities during substation renovation works was taken as 90 dB(Z), although the impact will be greater if the contractor uses construction methods resulting in a greater sound power level than this. The assessment results are provided in the Table 4.9.

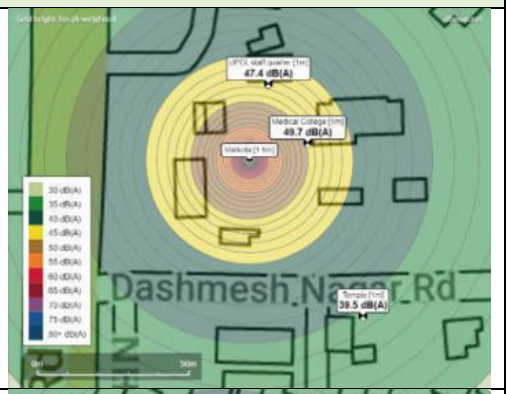
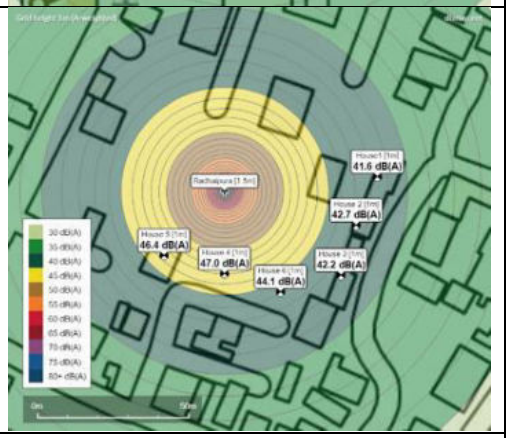
Table 4.9 Construction Noise Assessment (pre-mitigation) for substations

Substation	Nearest Sensitive Receptor	Distance (m)	Background noise level dB(A)	LAeq, T Calculated dB(A)	Assessment Limit, dB(A) – GoI (Day Time)	Cumulative baseline dB(A)	Emission Exceedance, dB(A)	Noise Map
Shashtradhara	Crematorium	2	53	90	50	**90**	**40**	
	Nearest House	3		47	55	54	-	
	UPCL staff quarter	0		47	55	54	-	
Hatibarakala	Hotel	0	54	43	55	54	-	
Ramnagar Danda	School	3	46	90	50	**90**	**40**	
	Temple	3		90	50	**90**	**40**	
	Panchayat Office	3		39	55	47	-	
Lal Tappar	Labour Houses/huts	3	53	44	55	54	-	

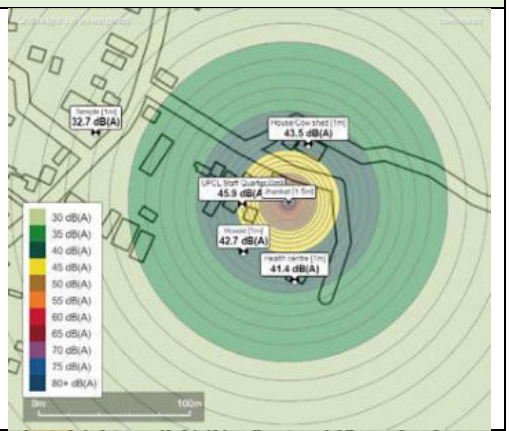
Substation	Nearest Sensitive Receptor	Distance (m)	Background noise level dB(A)	LAeq, T Calculated dB(A)	Assessment Limit, dB(A) – GoI (Day Time)	Cumulative baseline dB(A)	Emission Exceedance, dB(A)	Noise Map
Sahiya	House	2	46	47	55	**50**	-	
Tarikhet	House	0	50	53	55	**55**	-	
Lamgarah	Local Temple	0	56	90	50	**90**	**40**	
	Monk's hut (being constructed)	45		43	55	56	-	
Kamalwaganja	Nearest House	40	58	44	55	58	-	
	UPCL Staff quarters	0		48	55	58	-	
	Local Temple	3		90	50	**90**	**40**	
Transport Nagar	Nearest house	30	64	44	55	64	-	
	Market/Shop	40		39	65	64	-	
	Commercial area	30		41	65	64	-	
	School	0	59	90	50	**90**	**40**	

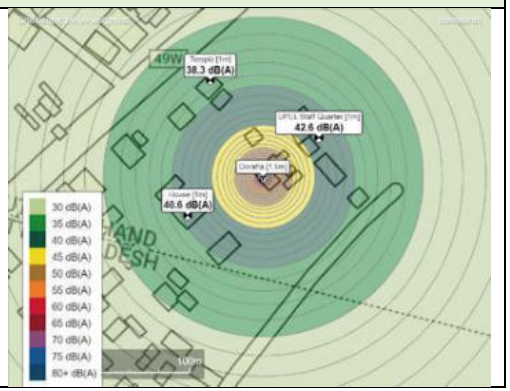
Substation	Nearest Sensitive Receptor	Distance (m)	Background noise level dB(A)	LAeq, T Calculated dB(A)	Assessment Limit, dB(A) – GoI (Day Time)	Cumulative baseline dB(A)	Emission Exceedance, dB(A)	Noise Map
Phoolchaur	House	20		44	55	59	-	
Garampani	House	2	57	46	55	57	-	
	UPCL staff quarter	0		57	55	60	**5**	
Talla Ramgarh	School	30	47	44	50	49	-	
	House	0		46	55	50	-	
	House	10	52	48	55	54	-	

Substation	Nearest Sensitive Receptor	Distance (m)	Background noise level dB(A)	LAeq, T Calculated dB(A)	Assessment Limit, dB(A) – GoI (Day Time)	Cumulative baseline dB(A)	Emission Exceedance, dB(A)	Noise Map
Sarghakhet	Hotel	3		46	55	53	-	
Pines	ITI College	20	48	90	50	**90**	**40**	
Matkota	Medical College	0	53	90	50	**90**	**40**	

Substation	Nearest Sensitive Receptor	Distance (m)	Background noise level dB(A)	LAeq, T Calculated dB(A)	Assessment Limit, dB(A) – GoI (Day Time)	Cumulative baseline dB(A)	Emission Exceedance, dB(A)	Noise Map
	UPCL Staff quarter	0		47	55	**57**	-	
Bhadaipura	Nearest house	0	55	47	55	56	-	
	Local Temple	2		90	50	**90**	**40**	

Substation	Nearest Sensitive Receptor	Distance (m)	Background noise level dB(A)	LAeq, T Calculated dB(A)	Assessment Limit, dB(A) – GoI (Day Time)	Cumulative baseline dB(A)	Emission Exceedance, dB(A)	Noise Map
Lalpur	House	45	49	44	55	50	-	
Sitarganj	UPCL Temple	0	47	90	50	**90**	**40**	
	Nearest house	50		44	55	49	-	
	UPCL Staff quarter	0		46	55	50	-	
Jhankat	House	10	45	43	55	47	-	
	UPCL Staff quarter	0		46	55	**49**	-	

Substation	Nearest Sensitive Receptor	Distance (m)	Background noise level dB(A)	LAeq, T Calculated dB(A)	Assessment Limit, dB(A) – GoI (Day Time)	Cumulative baseline dB(A)	Emission Exceedance, dB(A)	Noise Map
	Primary Health Centre	30		90	50	**90**	**40**	
Kashipur	Nearest House	0	56	44	55	49	-	
	UPCL Temple	0		90	50	**90**	**40**	
	UPCL Staff quarter	0		47	55	57	-	
	Hospital	5		90	50	**90**	**40**	
Doraha	UPCL Temple	0	49	90	50	**90**	**40**	
	UPCL Staff quarter	0		43	55	50	-	

Substation	Nearest Sensitive Receptor	Distance (m)	Background noise level dB(A)	LAeq, T Calculated dB(A)	Assessment Limit, dB(A) – GoI (Day Time)	Cumulative baseline dB(A)	Emission Exceedance, dB(A)	Noise Map
	House	5		41	55	50	-	

Assessment criteria GoI vs IFC EHS most stringent for residential, commercial, or silent zone.
Substations (Rudrapur, Sawra, Sairaghat and Bajol) without any residences/sensitive land uses with 50m were not included in the assessment.
Shashtradhara, Ramnagar Danda, Pines,Matkot, Sitarganj, Lamgarah, Doraha, Jhankat, Kashipur, Lalpur, Kamalwaganja SS: sensitive/silence zone is adjacent/within substation. The 100m buffer of Silence zone encompasses the Substation in these cases. The limits for sensitive land use is 50dB(A) at 100m buffer from the building. In this case, which is within the substation area, hance hence the predicted sound pressure level is taken as 90 dB(A)
Background noise levels inside substation measured using IOS Mobile app 'Decibel X' (version 9.5.0)
Red - exceeds from assessment limit (GoI, CPCP 2000 guidelines)
Blue – exceeds the IFC EHS 3dB(A) above background criteria (note the emission exceedance given in comparison to assessment limit not background)
In areas where exceedance is predicted noise barrier will be required.

Source: ADB TA Consultant

Key concerns – Socio-economic environment

xvii. The substation locations are accessible from existing rural and urban main roads and/or state highway. Paved roads at distance varying in the range of 0-40m. nearly all of them are adjacent to the main road. (except Garampani and Lamgarah substation). Some of the access roads are unpaved and/or in need of repair.

xviii. Traffic congestion due to movement of project vehicles specillay in high altitude substation like Bajol, Sairaghat, Tarikhet, Pines, Lamgarah, Sahiya, Sawra and Sarghakhet, which are located on twoway narrow to medium width main roads. Susbtations like Bajol, Pines and Sairaghat do not have vehicle entrace to substation, located higher than the access road and will use cranes. This will disrupt traffic in the access road as well as congestions.

xix. GRM information and contact details are not provided on site

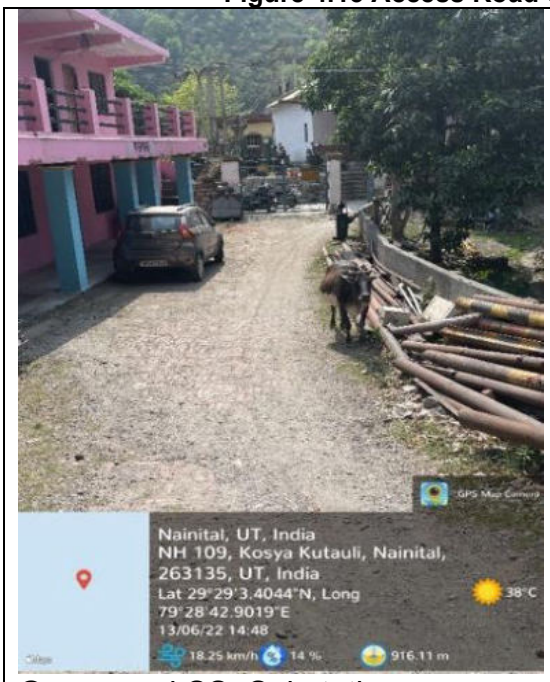
xx. Locals not informed of project activities before work commencement

xxi. Potential impact on the aesthetics in and around substation due to renovation

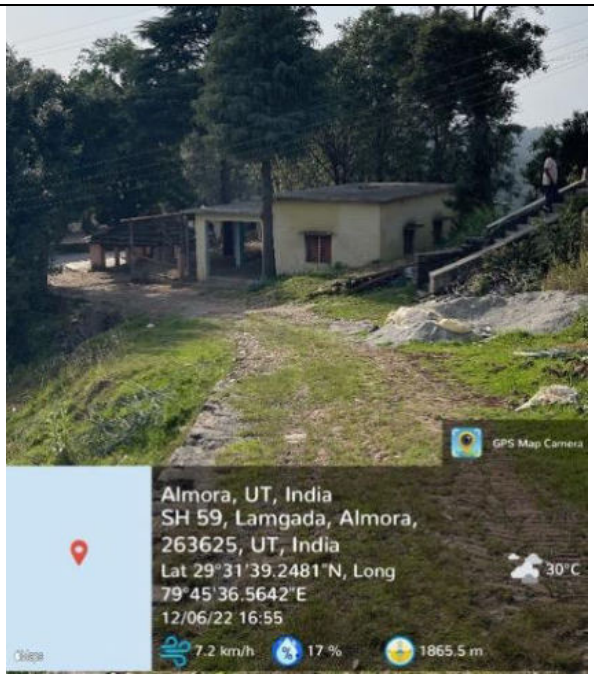
xxii. Stress on use of community resources and services e.g., water supplies, hospitals

xxiii. Damage to temples close to and within SSs

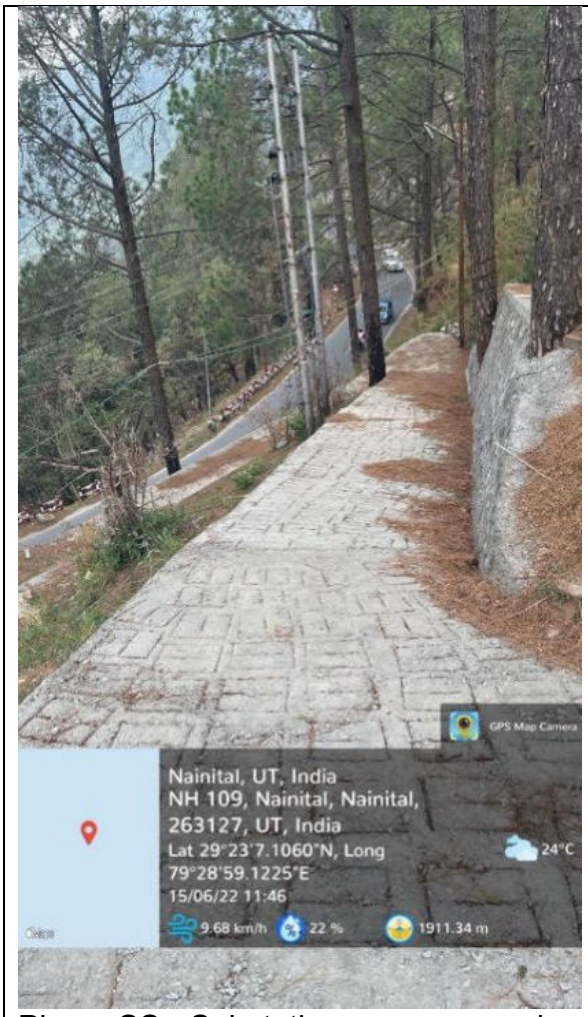
Figure 4.13 Access Road conditions in some of the Substations



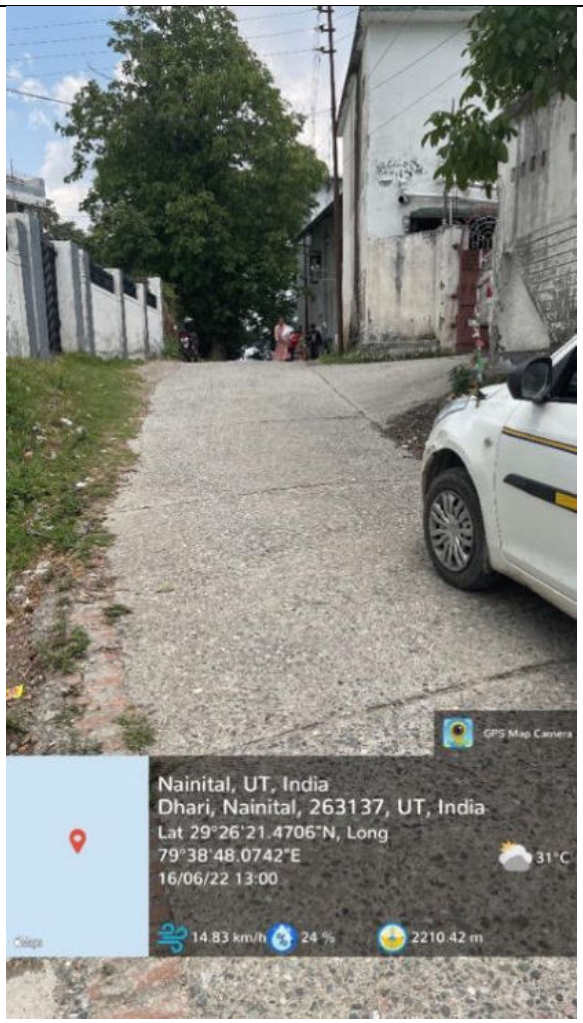
Garampani SS: Substation access road – unpaved, electrical equipment storage, narrow- private house (pink)



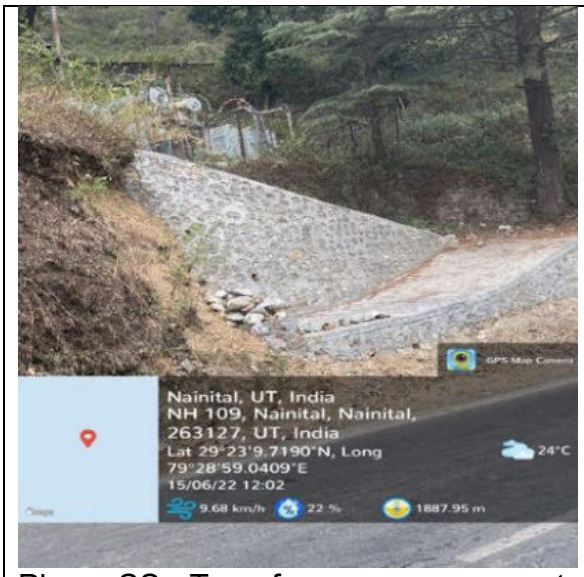
Lamgarah SS: Substation entry road from access road (unpaved, damaged, steep and temple at starting)



Pines SS: Substation access road – very steep, no vehicle access into SS



Sarghakhet SS: Access road – Narrow and uphill

 Pines SS: Transformer zone near to main road level – traffic disruption during crane operations to replace transformers.	 Representative photograph showing crane used in residential area to replace transformer. (Source: The Hans India)

Source: ADB TA Consultant

Stakeholder Consultation details

53. The purpose of the stakeholder consultation and public participation process is to ensure that interested or affected stakeholders as well as the public are informed about UPCL's plan for and to solicit their views and opinions about the project, including substation renovation. According to ADB's Safeguard Policy Statement (2009): "*The borrower/client will carry out meaningful consultation with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation.*

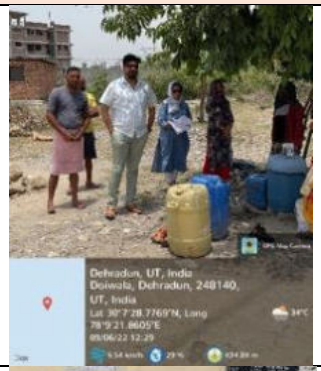
54. Consultations were held to inform the substation audit, as well as the IEE, with residents living adjacent (up to 50m) to the audited substation and likely to be most impacted during project implementation. Consultations were held at 17 substations in June 2022 during the audit. Out of the 25 substations, consultations were not held in 8 substations either due to no habitations nearby (Pines, Bajol, Sairaghat, Sawra) or non-availability of locals during the audit period (Hatibarakela, Jhankat, Doraha and Ramnagar Danda). Consultations were held during the substation audits whereby residents within 50m of the SS were in invited for consultation.

55. The consultations feedback on living close to a substation in relation to community H&S, social issues and or incidents observed within and/or outside, were recorded. Information sharing was done regarding the proposed project and anticipated work /activities with likely impacts were discussed. Various socio-economic information was recorded in the format for evaluation. Summary of stakeholder consultation outcome is provided in Table 4.10. The questionnaire used for consultation is and one sample filled up format is provided as **Annexure 3.**

Table 4.10 Substation Public Consultation Summary

Consultation Location/Date	No. of Private House in 50m	No. of houses consulted	Number of participants (male/female)	Issues Raised/ Concerns	Project Response/Inputs to project design	Consultation Photolog
Shastradhara Substation, Dehradun, 8.06.2022	03	02	2 males (service) /2 female one service & 1 housewife)	• Kids playing near substation road • Storm water heavy flow during monsoon • Whenever conflict with electric office, public throws stones at UPCL staff quarters. • Outside vehicle parking in substation area • Crematorium smoke, dust and smell is a nuisance • General public scale house boundary and pass thorough compound	• Consultation and disclosure before work starts • Build a fence between road and houses – gated • Build main gate and make it secured	
Sahiya Substation, Dehradun 21.6.2022	02	02	1 male (business), 3 females (housewife)	• Storm water during monsoon creates havoc near the house and the substation • Sparks and fire in the substation as windblown branches	• Consultation and disclosure before work starts • Higher and better-quality fencing around substation • Build a storm water drain	

Consultation Location/Date	No. of Private House in 50m	No. of houses consulted	Number of participants (male/female)	Issues Raised/ Concerns	Project Response/Inputs to project design	Consultation Photolog
				fall on the electrical equipment • Provide higher substations fencing and wall – to mitigate fire hazards • Wall to prevent cattle entre substation • Road is washed away during monsoon	• Repair the access road	
Rudrapur Substation, Dehradun 21.6.2022	01	01	1 male (Poultry farm owner)	• High E.coli in bore well water • Area inundated during monsoons and heavy rainfall • Remove distribution lines from roadside	• Water testing before work starts to confirm potability as this source is also used by substation staff • Repair the access road • Remove distribution lines from roadside	

Consultation Location/Date	No. of Private House in 50m	No. of houses consulted	Number of participants (male/female)	Issues Raised/ Concerns	Project Response/Inputs to project design	Consultation Photolog
Lal Tappar Substation, Dehradun 9.6.2022	05	04	1 male (worker)/ 3 female (worker /housewife)	• Recent fire in the substation during monsoon – was controlled by substation staff • Water scarcity in area • Provide employment	• Consultation and disclosure before work starts • Hire for labour works if feasible and approved by UPCL SDO/HO • Provide potable water to nearby houses	
Tarikhet Substation, Almora, 13.6.2022	01	01	1 female (housewife)	• Area has seen many Leopards attacks • Provide CCTV in area • Provide higher walls around substation to prevent Leopard entry	• Consultation and disclosure before work starts • Orientation of workers in relation to working in high altitude areas and human-wildlife conflict management • Remove the transformers that are adjacent to the house and move towards the control room or as suitable within the compound	

Consultation Location/Date	No. of Private House in 50m	No. of houses consulted	Number of participants (male/female)	Issues Raised/ Concerns	Project Response/Inputs to project design	Consultation Photolog
					• Higher fence/wall around substation	
Lamgarah Substation, Almora, 12.6.2022	01	01	1 male (business/ shop)	• Repair the front road • Manage Leopard attack if possible • Minimal damage to the temple when renovation of substation takes place (already conflicted)	• Consultation and disclosure before work starts • Since there is a history of conflict between locals vs UPCL regarding the road repair as it is adjacent to the temple – orientation of workers and approval from village head through consultation to be done • Orientation of workers in relation to working in high altitude areas and human-wildlife conflict management	Not available

Consultation Location/Date	No. of Private House in 50m	No. of houses consulted	Number of participants (male/female)	Issues Raised/ Concerns	Project Response/Inputs to project design	Consultation Photolog
Kamalwaganja Substation, Nainital, 17.6.2022	15	01	1 male (service)	• Development of slums and encroachments in the area • Water scarcity in dry seasons • Wastes disposed along roadsides	• Detailed consultation and disclosure before work starts	
Transport Nagar Substation, Almora, 17.6.2022	01	01	2 male (1 service, 1 roadside vendor)	• Vendor impacted by heavy traffic and congestion on the substation access road	• Traffic management • Consultation with local shops and business and disclosure before work starts	

Consultation Location/Date	No. of Private House in 50m	No. of houses consulted	Number of participants (male/female)	Issues Raised/ Concerns	Project Response/Inputs to project design	Consultation Photolog
Phoolchaur Substation, Almora, 17.6.2022	01	01	1 male (farmer/ business)	• School adjacent - no incidents took place • Low voltage in the area • Water scarcity	• Relocate switchyard to vacant available land with substation and away from the school • Project will mitigate the voltage issue	
Garampani Substation, Nainital, 13.6.2022	03	02	2 males (shop & retired businessman)	• Major flooding and risk of area washed away due to flooding of the adjacent river in the river valley • Leopard sighted nearby, takes way domestic animals	• Retention wall is required 250m upstream of the substation on the river to divert the heavy flow away from the substation • Consultation and disclosure before work starts • Orientation of workers in relation to working in high altitude areas and human-wildlife conflict management	

Consultation Location/Date	No. of Private House in 50m	No. of houses consulted	Number of participants (male/female)	Issues Raised/ Concerns	Project Response/Inputs to project design	Consultation Photolog
Talla Ramgarh Substation, Nainital, 16.6.2022	01	01	1 male (business/ wife local village council member)	• Removal of the poles and electrical system from the roadside	• Consultation and disclosure before work starts • Remove the poles to inside of the substation	
Sarghakhet Substation, Nainital, 13.6.2022	02	01	1 male (service)	• Heavy snowfall in the area • Wildlife electrocutions observed – must prevent • Water scarcity in the area • Transport/ communication is very few • Landslide during heavy rain/cyclones damaging crops	• Traffic management along narrow and steep road surrounded by hotels and tourists • Consultation with locals and hotel owners and disclosure before work starts	

Consultation Location/Date	No. of Private House in 50m	No. of houses consulted	Number of participants (male/female)	Issues Raised/ Concerns	Project Response/Inputs to project design	Consultation Photolog
Matkota Substation, US Nagar, 18.6.2022	0	01	1 male (service)	• Water scarcity	• UPCL to check for ways to improve water supply	
Badhaipura Substation, US Nagar, 18.6.2022	04	01	1 male (business)	• Municipal wastes dumped along roadside • Poor sanitation and public health	• UPCL to take up with Rudrapur Municipal Office	

Consultation Location/Date	No. of Private House in 50m	No. of houses consulted	Number of participants (male/female)	Issues Raised/ Concerns	Project Response/Inputs to project design	Consultation Photolog
Lalpur Substation, US Nagar, 17.6.2022	02	01	1 male (service/shop)	• Road is damaged • Water scarcity in the area	• Repair damaged road • UPCL to check for ways to improve water supply	
Jhankat Substation, US Nagar, 17.6.2022	03	01	1 male (service)	• Temple is adjacent and disturbed due to substation vehicles/repairs	• Provide additional fence around temple and limit works/noise during major festival/gathering	

Consultation Location/Date	No. of Private House in 50m	No. of houses consulted	Number of participants (male/female)	Issues Raised/ Concerns	Project Response/Inputs to project design	Consultation Photolog
Kashipur Substation, US Nagar, 18.6.2022	05	01	1 male (journalist)	• Not observed any accidents/incidents in the substation • There will be improvement in electrical supply after the renovation	• None	
Substations where consultation were not conducted	• Pines (no residents in 50m) • Bajol (no residents in 50m) • Sairaghat (no residents in 50m) • Sawra SS (no residents in 50m) • Hatibarakela (no residents in 50m) • Ramdanagr Danda (no residents in 50m) • Doraha (not available) • Sitarganj (not invited/available)					

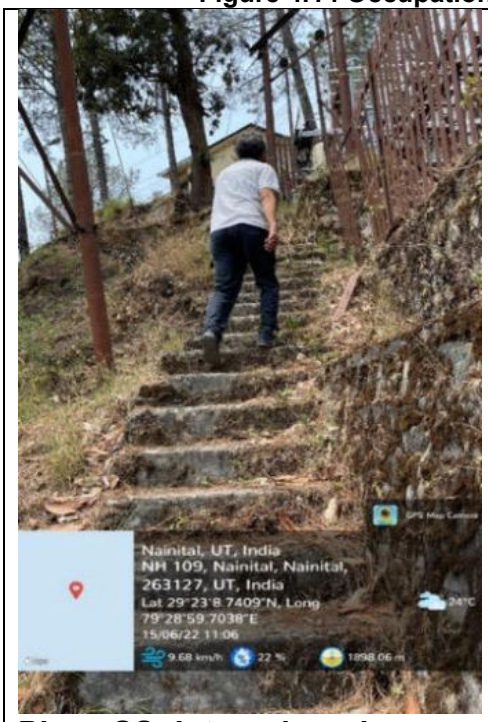
Male	19
Female	09 (47%)
Total Consulted	28
Approx. total private houses in 50m of all substations consulted	50
Total houses consulted	23 (46%)
Approximate total population (assuming 4 family members per household) in 50m of the consulted houses	200
Percentage consulted (28 out of possible 200)	14%

Source: ADB TA Consultant

Key concerns: Social - Occupational Health and Safety

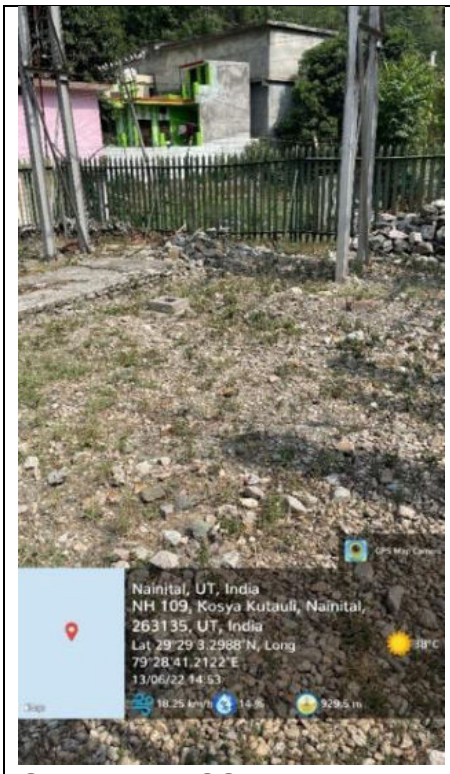
i. Health and safety impacts will be in terms of risk of accidents due to work being executed at considerable heights and steep, moving through narrow, landslide prone high-altitude roads, in the absence of training, PPE and other H&S measures
ii. Unsanitary and unhealthy working conditions including at overnight accommodation provided by contractor, leading to H&S incidents/accidents
iii. Conditions for accidents due to falls and trips, lightning, fires, due to inadequate safety arrangements, storage of tools/equipment's, vehicle movement, with no signage and barricades, electrical safety issues, lifting gears/cranes, first aid arrangements not as per standard
iv. Labour standards - temporary labour camps, sanitation systems, drinking water and other essential requirements inadequate onsite and camps lacking basic infrastructure and sanitation requirements, including very cold weather conditions in high altitude substations like Sawra, Sahiya, Sarghakhet (snow reported in December-January), Pines, Tarikhet, etc.
v. Emergency preparedness, training, and awareness on EHS and other statewide hazards (landslide, forest fire, flooding, earthquake) – trainings/drills may not be provided

Figure 4.14 Occupational health and safety concerns in substations

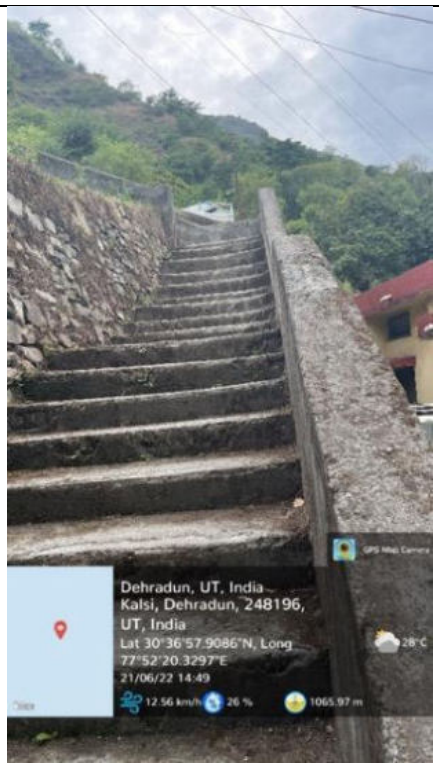


Pines SS: Internal roads

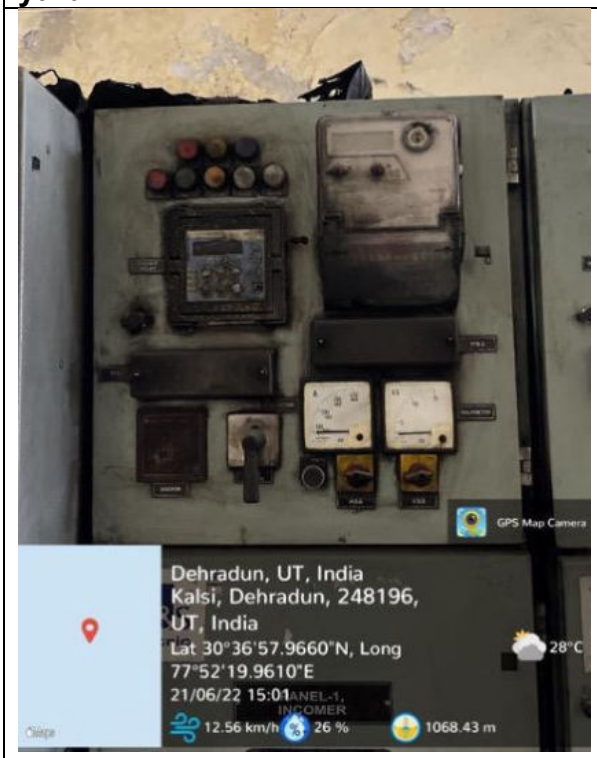
Entrance gate to Sairaghat SS. Plates are stored at entrance.



Garampani SS: Unpaved and uneven yard

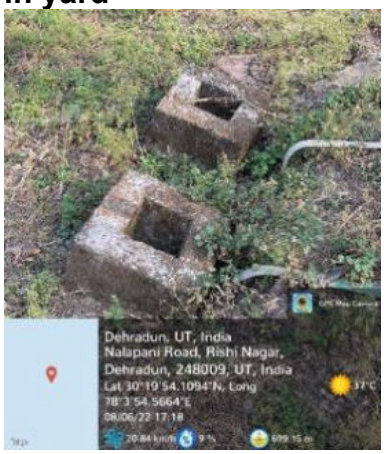


Sahiya SS: entrance to substation below road level

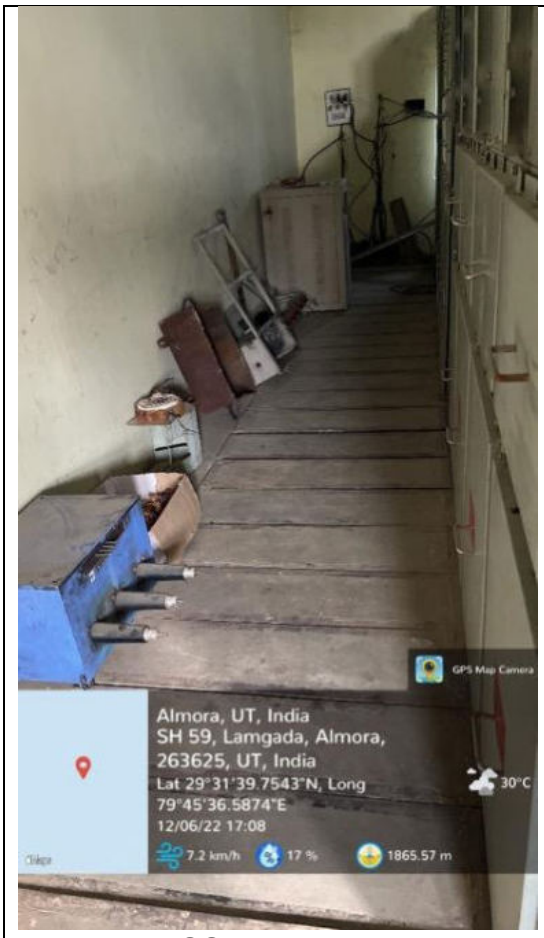


Sahiya SS: Brunt control room equipment after major fire in 2021

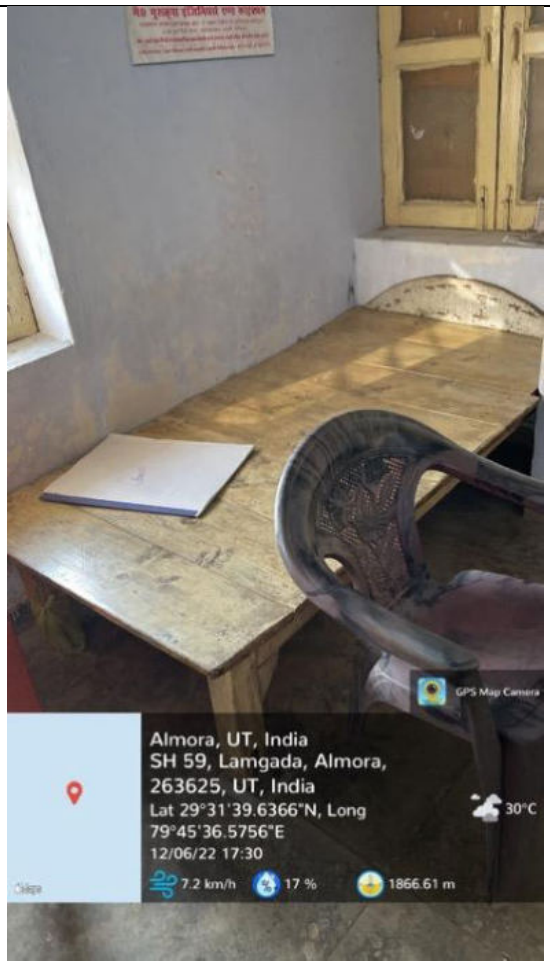
Transport Nagar SS: gaps and cracks in yard



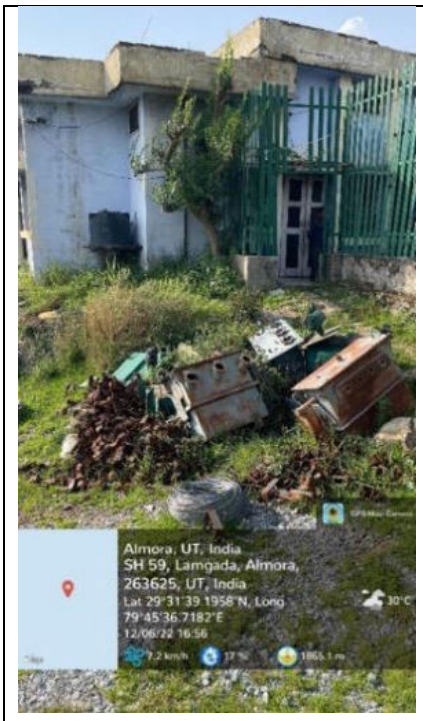
Sahastradhar SS: Open pits in yard



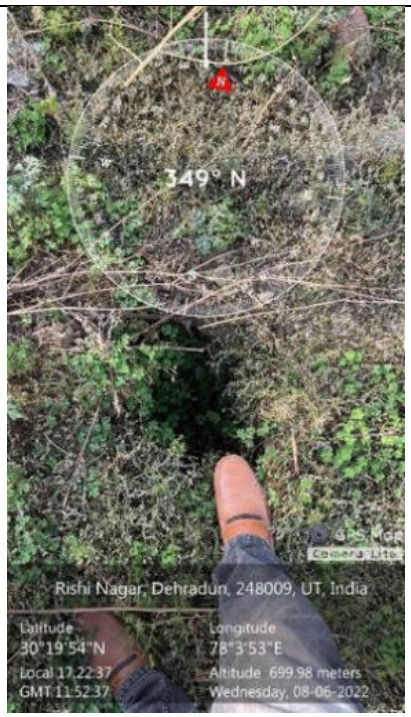
Lamgarah SS: Limited ventilation and natural light



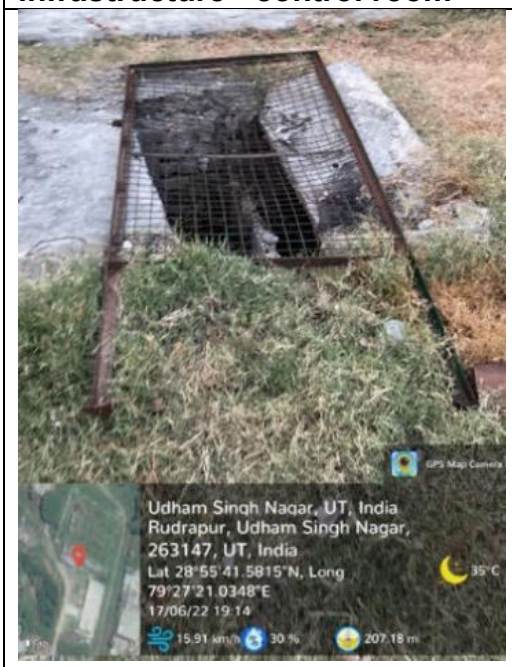
Lamgarah SS: Resting area inside control room



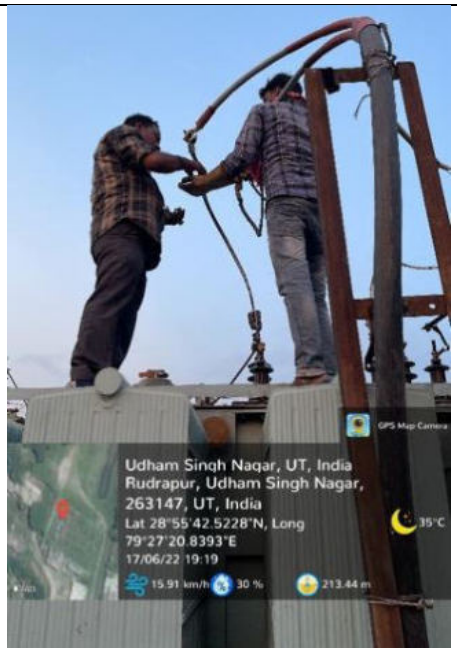
Lamgarah SS: Damaged infrastructure - control room



Sahstradhara SS: Hidden pits in yard



Lalpur SS: Pit covered with net



Lalpur SS: Workers on transformer without PPE

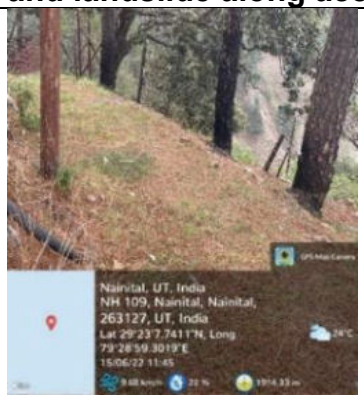
 Matkota SS: Workers without PPE	 Badhaipura SS: Locals used for yard cleaning without PPE

Figure 4.15 Representative photographs potential natural hazards and emergencies

Landslide damaged main road: Nainital to Almora

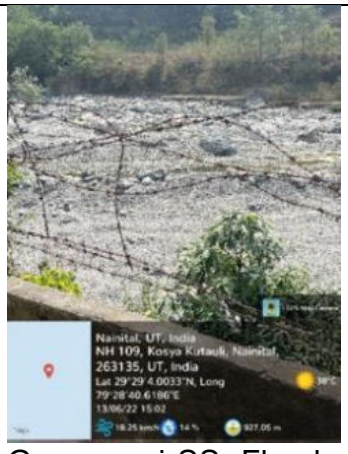
Sahiya and Sawra SS: Steep terrain and landslide along access road

Forest fire in Nainital region.



Brunt trees in Pines SS

Sairaghat SS: Landslide and trees uprooted by cyclone in the background



Garampani SS: Flood ravaged river 0m from substation

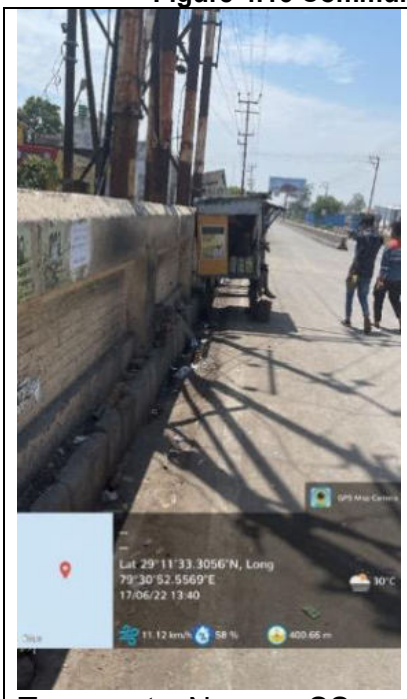
Source: ADB TA Consultant

Key concerns: Social - Community Health and Safety

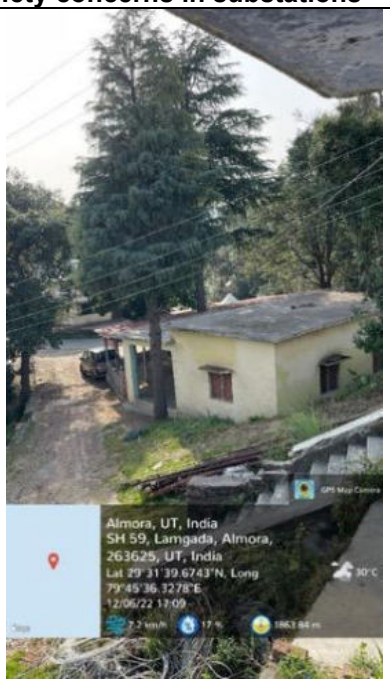
i. Inadequate signage and broken fence/barricades observed; locals have easy access to substation.

ii. Traffic disturbance from vehicles used for transporting construction materials through settlement areas including those in high attitude roads
iii. Risks to community due to renovation activities including construction traffic, storage of materials along roadside, inappropriate disposal of wastes along roadside, inadequate warning signs dust, noise, etc.
iv. Spread of communicable diseases including COVID-19, HIV/AIDS, and other STDs from presence of migrant workers
v. Community interactions and conflict with project workers as reported at Lamgarah SS

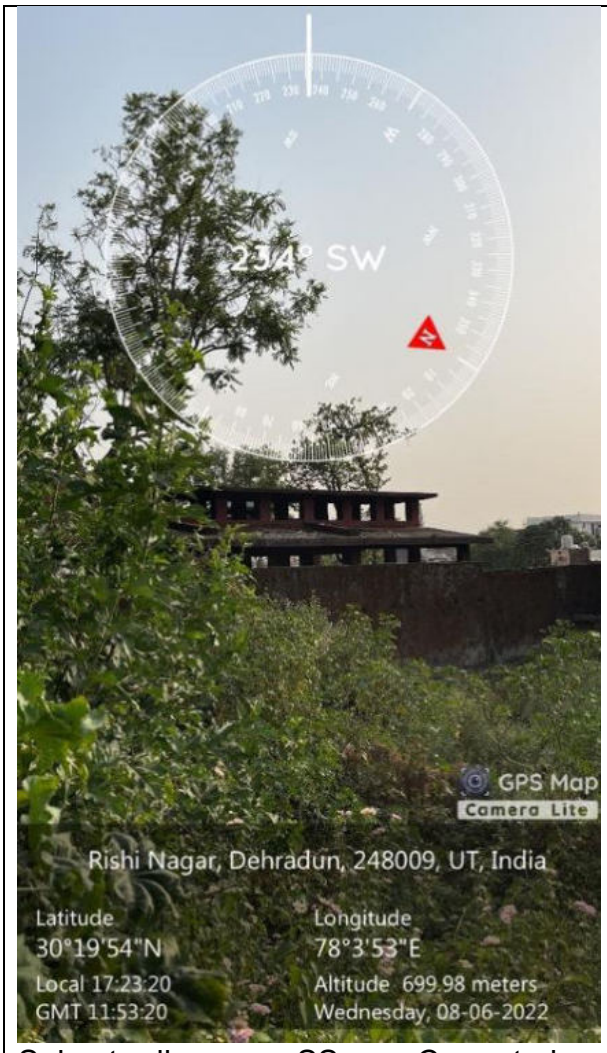
Figure 4.16 Community health and safety concerns in substations



Transport Nagar SS: vendor along substation boundary

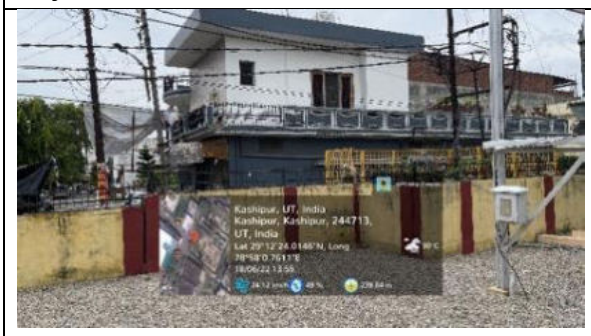


Lamgarah SS: Temple located at entrance of substation. Conflict with UPCL and locals was reported when there was plans for renovating the road to the substation.

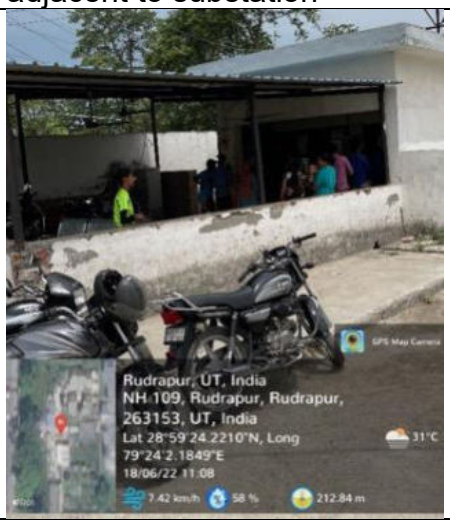


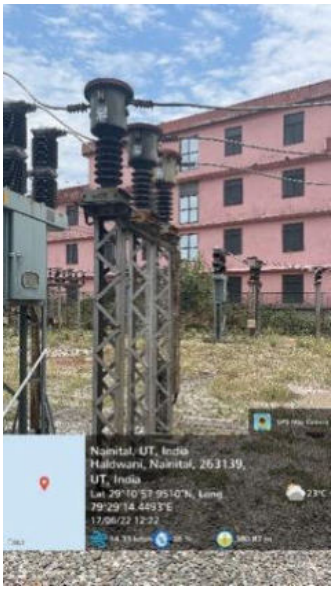
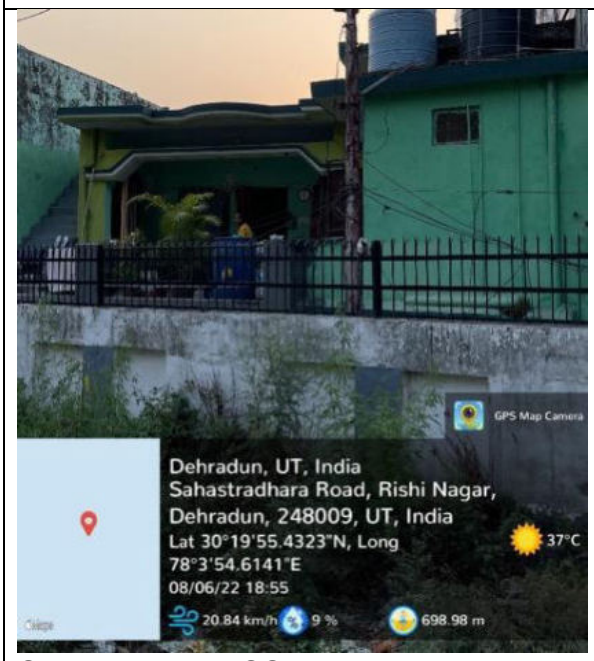
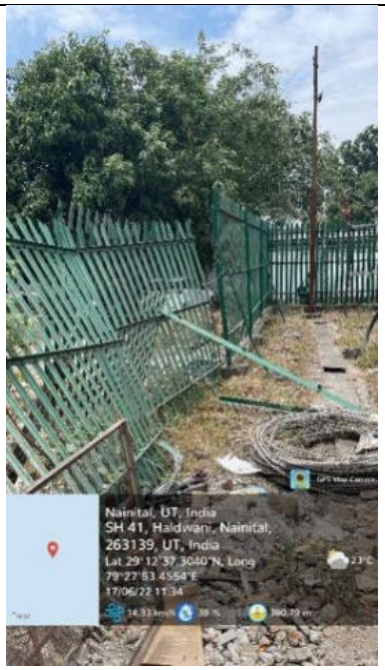
Sahastradhara SS: Crematorium adjacent to substation

Garampani SS: private residence adjacent to substation



Kashipur SS: private residence adjacent to substation



	Matkota SS: Electricity office for bill payment inside substation compound
 Matkota SS: New hospital and medical college adjacent to substation	 Phoolchaur SS: School adjacent to substation
 Sahastardhara SS: Low walls are easily scaled by locals	 Kamalwaganja SS: Damaged fencing

V. CORRECTIVE ACTION PLAN

The corrective action plan (CAP) for the substations is included in this report as **Annexure 4**. CAP actions should be addressed by UPCL before the commencement of activities planned under the UPCL substation component or instead specifically included in the contract for the works contractor to address as part of their scope of works. UPCL will complete a detailed report submitted to ADB confirming the completion of the included actions at each substation, for clearance before any project works commence. It will also be the responsibility of the contractor on accepting access to the substation to ensure that the CAP has been implemented, or to have agreed with UPCL how matters will be dealt with under the contract, as from the start of construction they will be responsible for EMP (IEE) implementation on site.

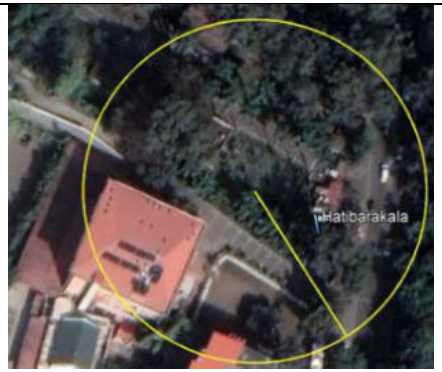
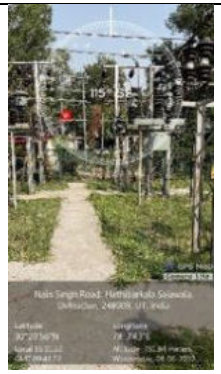
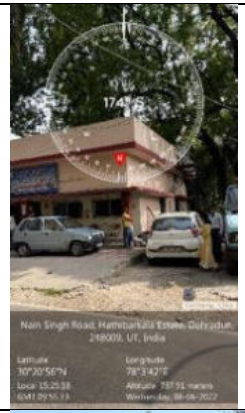
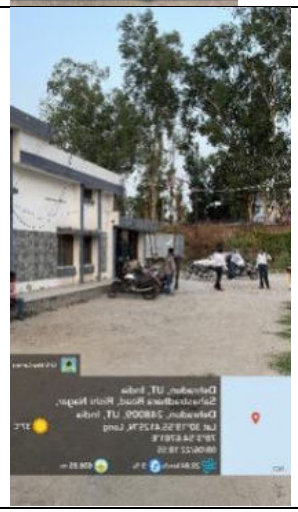
VI. CONCLUSION

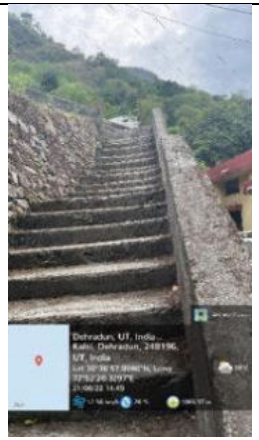
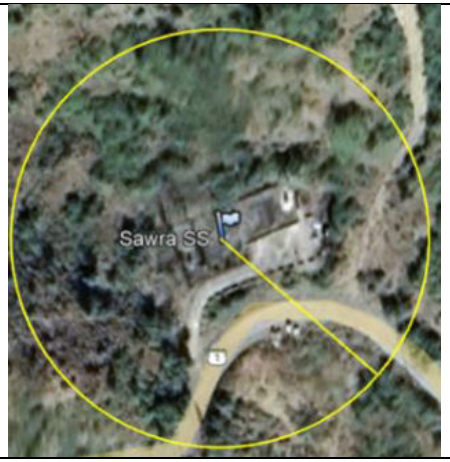
Overall waste management, including handling, storage, and disposal, is the principal EHS concern in all substations audited. Pieces of solid waste (removed parts of transformers, metal scraps etc.) had no specific and designated area for collection and storage, and there was no organized disposal mechanism. Usually, they are seen all over the compound and stored there until transported to another substation. Almost all transformers were leaking oil and without spill bund, etc. Furthermore, safety requirements and training and awareness of staff was found to be woefully inadequate. There are no written hazardous materials or solid and hazardous waste management systems and guidelines for substation personnel; there were no written Environment, Health and Safety procedures or trainings to prepare staff for emergencies. Inadequate Personal Protective Equipment (PPE) and first aid was recorded at all substations.

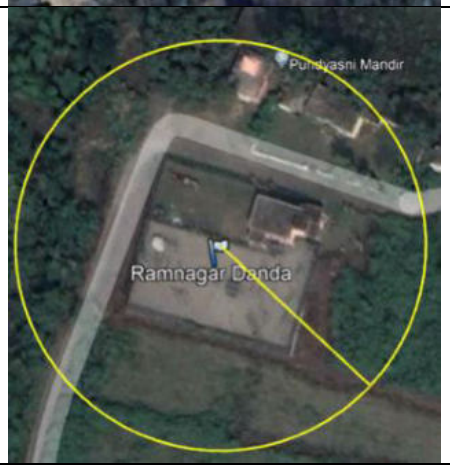
The EHS audit findings reflect that fact that neither the national nor the ADB's SPS 2009 requirements are complying in any of the substations.

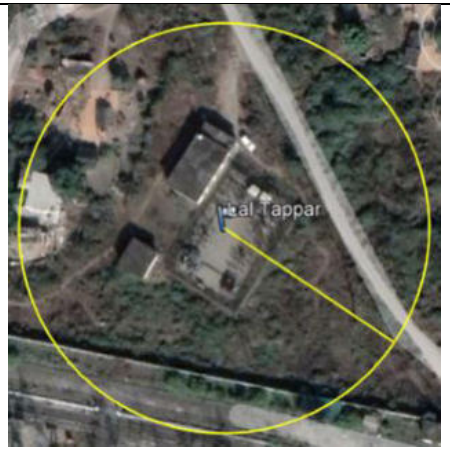
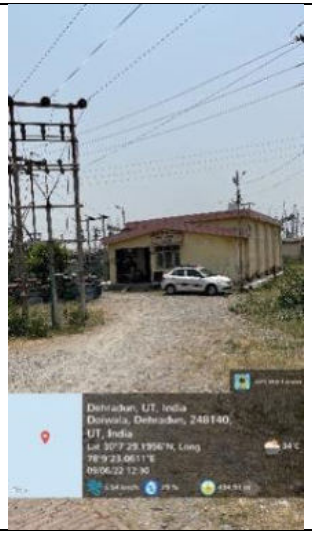
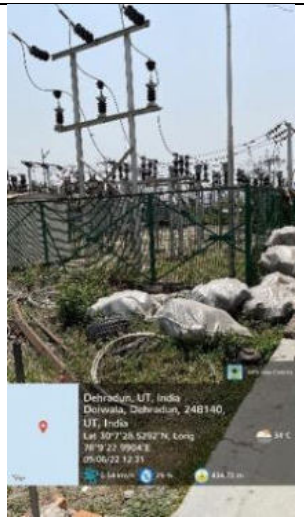
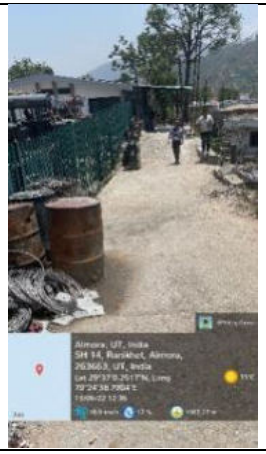
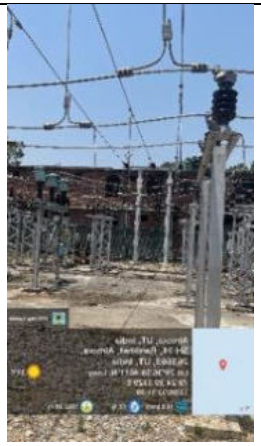
1.1. ANNEXURES

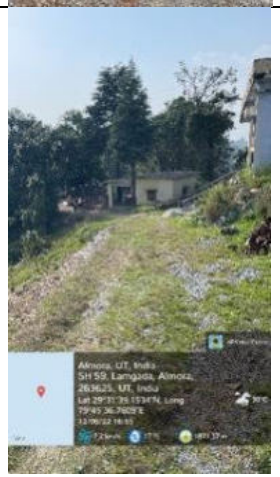
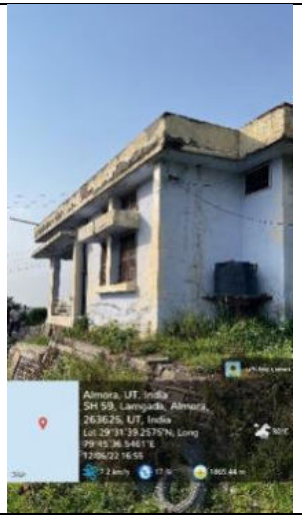
Annexure 1: SS Audit Photolog

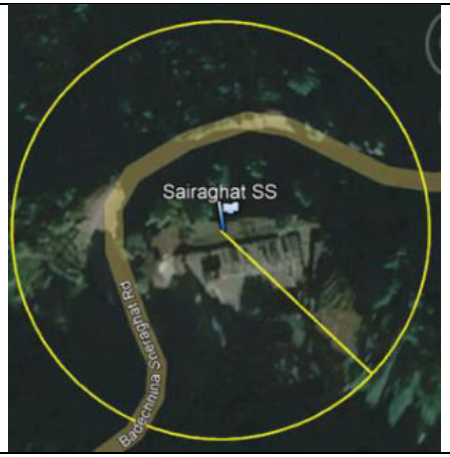
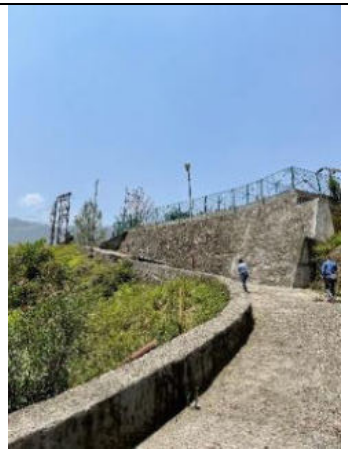
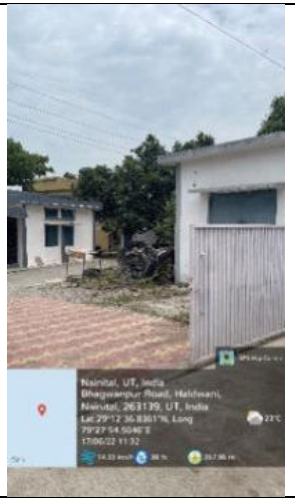
Sl. No.	Name	Location (Google Earth) -50m	Access	Building/Compound
		District: Dehradun		
1	Hatibarakala			
	Sahastradhara			

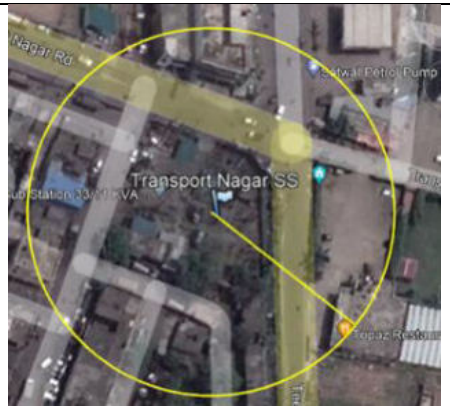
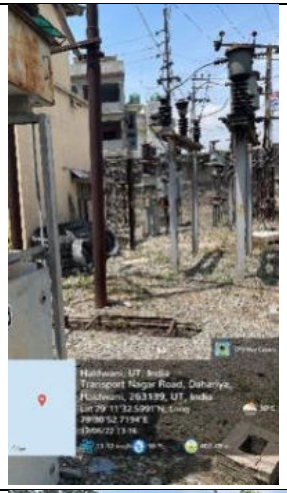
Sl. No.	Name	Location (Google Earth) -50m	Access	Building/Compound
		District: Dehradun		
	Sahiya			
	Sawra			

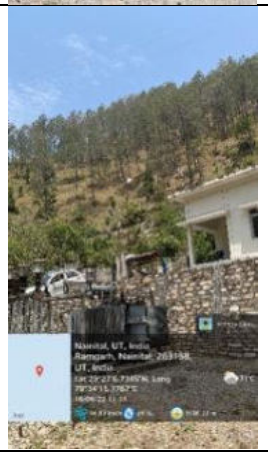
Sl. No.	Name	Location (Google Earth) -50m	Access	Building/Compound
		District: Dehradun		
	Rudrapur			
	Ramnagar Danda			

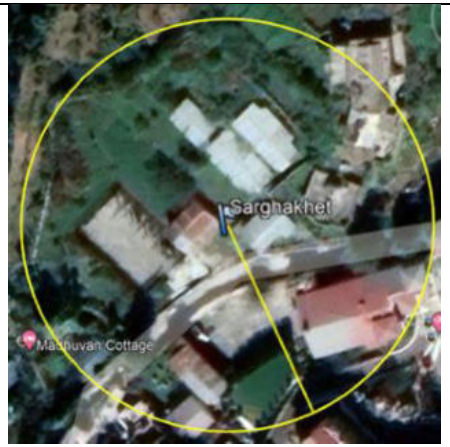
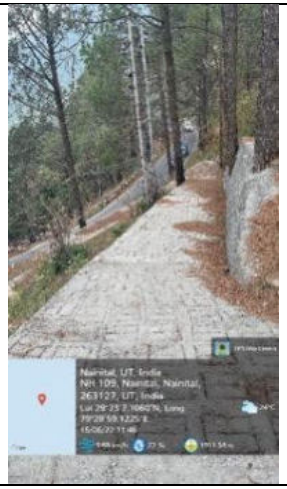
Sl. No.	Name	Location (Google Earth) -50m	Access	Building/Compound
		District: Dehradun		
	Lal Tappar			
		District: Almora		
	Tarikhet			

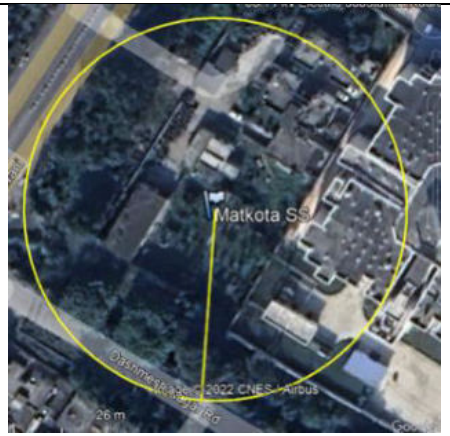
Sl. No.	Name	Location (Google Earth) -50m	Access	Building/Compound
		District: Dehradun		
	Bajol			
	Lamgarah			

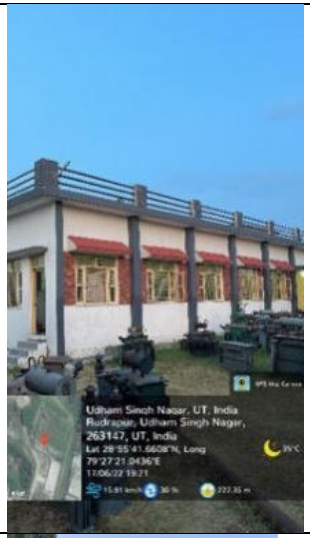
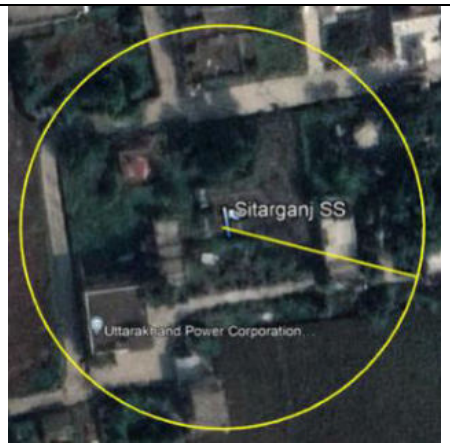
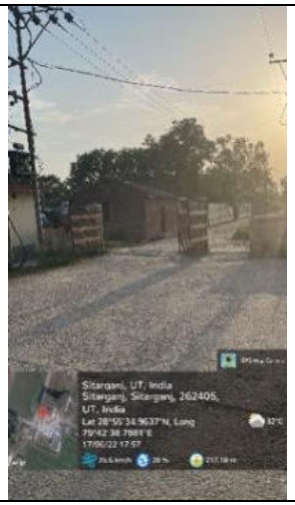
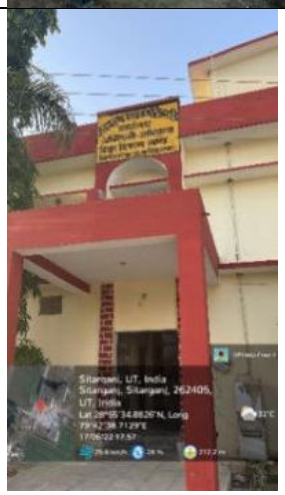
Sl. No.	Name	Location (Google Earth) -50m	Access	Building/Compound
		District: Dehradun		
	Sairaghat			
		District: Nainital		
	Kamalwaganja			

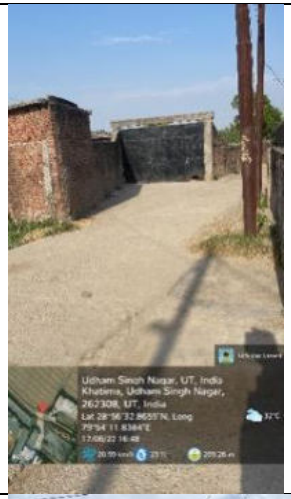
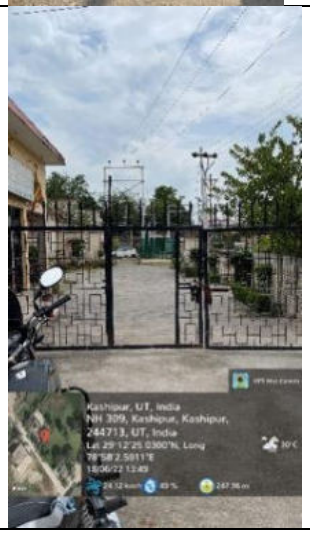
Sl. No.	Name	Location (Google Earth) -50m	Access	Building/Compound
		District: Dehradun		
	Transport Nagar			
	Phoolchaur			

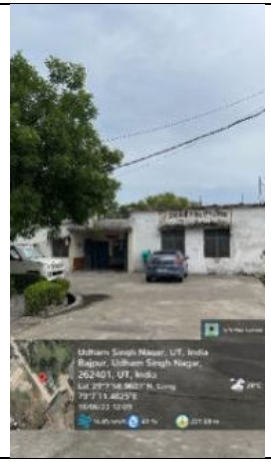
Sl. No.	Name	Location (Google Earth) -50m	Access	Building/Compound
		District: Dehradun		
	Garampani			
	Talla Ramgarh			

Sl. No.	Name	Location (Google Earth) -50m	Access	Building/Compound
		District: Dehradun		
	Sarghakhet			
	Pines			
		District: US Nagar		

Sl. No.	Name	Location (Google Earth) -50m	Access	Building/Compound
		District: Dehradun		
	Matkota			
	Bhadaipura			

Sl. No.	Name	Location (Google Earth) -50m	Access	Building/Compound
		District: Dehradun		
	Lalpur			
	Sitarganj			

Sl. No.	Name	Location (Google Earth) -50m	Access	Building/Compound
		District: Dehradun		
	Jhankat			
	Kashipur			

Sl. No.	Name	Location (Google Earth) -50m	Access	Building/Compound
		District: Dehradun		
	Doraha			

Source: ADB TA Consultant

Annexure 2: Template Audit Checklist

Substation Name:	
Year of establishment:	
Type of Substation (GIS/AIS):	
Voltage:	
No. incomers and voltage:	
No. outgoers and voltage:	
Grid Reference:	
Aerial map of substation:	
Photo of substation compound:	
Photo of any control building and details of wall/roof materials:	
No. transformers with make/model, MVA, manufacturer name and dates of manufacture/installation with photo of rating plate:	
Noise level at site entrance, indicative reading:	
Noise level adjacent to transformer, indicative reading:	
EMF level at site entrance, indicative reading:	
EMF level adjacent to transformer, indicative reading:	
Outside temperature, indicative reading:	
Area of substation, and layout map (area in use and available for expansion):	
Photo of vehicle entrance: Is it off a paved road?	
Topography – flat land, sloped, or steep terrain:	
Previous land use (if known):	
Describe the land uses within 500m (supported with photos): Confirm presence or absence of agricultural land-cultivated or uncultivated, protected or environmentally sensitive areas, community or protected forest, water	

bodies, religious or ancestral cultural resources (e.g. temples, shrines, sacred trees)?	
Nearest protected or key biodiversity area (distance in m)?	
Have endangered species been encountered in the vicinity (elephant, tiger, etc.)?	
No. buildings within 50m and no. inhabitants:	
Nearest individual residence (name and distance in m, mark on aerial map if possible):	
Nearest habitation (name and distance in m, mark on aerial map if possible):	
No. community facilities (schools, health centre etc.) within 50m with estimated no. of visitors (mark on aerial map if possible):	
Nearest surface water (distance in m, mark on aerial map if possible):	
No. groundwater wells/pumps/springs within 50m (mark on aerial map if possible):	
Total staff at substation (technical and non-technical): **No. men / no. women:**	

Audit Checks:	**F**	**P**	**N**	**N/A**	**Remarks** (attach photos to support findings)
A. Housekeeping / Waste Management					
Is an environment policy available on site?					Note if one exits at organization level:
Is a pollution prevention manual or procedure available on-site covering hazardous materials management, oil storage etc?					Note if one exits at organization level:
Is a waste management manual or procedure available on-site covering both solid and hazardous waste storage and disposal?					Note if one exits at organization level:
Is there vegetation (grass, trees, shrubs) on site?					Provide details of vegetation and how it is managed, note if trees will need to be cut if further development in compound:
Is the substation kept neat and tidy with no discarded wastes?					

Are there any trip hazards on the ground e.g. open channels, materials, equipment, trash laying around?					
Are there any other features that could post a danger e.g. broken or loose tiles?					
Is there any general waste storage and/or disposal on-site?					Provide details of types of waste stored and how disposed of?
Is solid waste segregated into recycling and waste for disposal?					
Is there a dedicated, labelled storage area for solid waste?					
Does the storage area have an impermeable floor?					
Is the storage area under cover?					
Do garbage bins have lids?					
Are garbage bins enclosed to contain leachates?					
Is any waste burning on site – open burning or incineration?					
Is any composting taking place on-site?					
Is end of life or unused equipment being stored on site?					
Is there a dedicated, labelled storage area for this equipment?					
Are supplies of fuel, oil, chemicals, SF6 tanks being stored on site?					
Are material data sheets for the fuels, oil or chemicals displayed?					
Are there empty drums, old transformers or used batteries on site?					
Are there any hazardous wastes (solid/liquid/gas) being stored and/or disposed of?					How are any hazardous wastes (solid/liquid/gas) being stored and disposed of?
Is there a dedicated, labelled storage area for fuels, oils, and chemicals, SF6 tanks, empty drums, old transformers, and/or hazardous wastes?					
Does the storage area have an impermeable floor?					
Is the storage area under cover?					
Is the storage area locked?					
Does the storage area have a spill containment bund of 110% capacity (see picture glossary at end of checklist for example)?					
Is the storage area drainage connected to sump to collect runoff?					
Are all storage barrels or tanks labelled with their contents and hazard warning signs?					
Are empty storage barrels or tanks sent to stores for onwards disposal?					Site or company level procedures for disposal:

Are redundant transformers sent to stores for onwards disposal?					Site or company level procedures for disposal:
Are used batteries sent to stores for onwards disposal?					Site or company level procedures for disposal:
Has there been any pest problem on site?					
Are any pest control measures undertaken on site?					Provide details of control measures and how often undertaken:
B. Transformers and Oil Leakage					
Is the power circuit breaker oil insulated?					
Are there any oil insulated transformers?					Provide copies transformer oil material data sheets:
Are there any oil filled capacitors?					
Do the transformers and capacitors have a label indicating contains PCB (polychlorinated biphenyl) or is PCB free?[1]					
Is any other evidence available on-site to confirm transformers and/or capacitors PCB free e.g. supplier certification, oil test results?					Provide copies of any documentary evidence:
Is it known when the transformer oil was last changed?					Confirm date:
Is a maintenance logbook kept on the premises?					Describe schedule of maintenance:
Are the transformers mounted on an impermeable platform extending beyond the footprint of the transformer?					
Does the transformer platform have a spill containment bund/sump of 110% capacity?					
Is there any evidence of oil leaking or having previously leaked from transformers or other equipment?					
Have any oil spills occurred at the substation in the past 5 years?					If yes, number and details of incidents:
Is there any spill equipment available on site (e.g. sand, cloths, or other absorbent material)?					
C. Escape of SF_6 (sulphur hexafluoride) and other greenhouse/hazardous gases					
Is there presence of SF_6 at the substation?					
Is this a GIS?					
Is the power circuit breaker gas insulated?					
Is there gas insulated switchgear?					
Are there any gas insulated transformers?					
Are SF6 leakage detectors installed?					
Are portable SF6 leakage detectors available at the substation?					

Are records of SF6 use kept?					Provide indication of annual usage:
Are records of SF6 leakage kept?					
Have any SF6 leakages occurred at the substation in the past 5 years?					Provide indication annual leakage rate:
Is there a SF_6 retrieval arrangement on-site?					
Is redundant equipment with SF6 sent to stores for onwards disposal?					Site or company level procedures for disposal of equipment containing SF6:
Are there presence of other hazardous gases within equipment or on the substation compound?					
D. Noise, EMF, Lighting and Ventilation					
Are there high levels of noise pollution at or around the site (e.g. traffic, etc.)					
Are there any warning signs noise levels may exceed >85dBA?					If yes, is ear protection available:
Is any transformer hum audible?					
Has noise monitoring been undertaken at the substations in last 5 years?					If yes, provide results if available:
Are there any sources of vibration?					
Are shielding equipment/materials installed to reduce EMF exposure?					
Has EMF monitoring been undertaken at the substations in last 5 years?					If yes, provide results if available:
Is adequate ventilation provided in control building?					
Are all vents free of blockages?					
Is heating and/or air conditioning available and adequate?					
Is adequate natural or artificial lighting provided in control building?					
Is adequate lighting provided in the substation compound at night?					
Are all lights in working order?					
Are there high level of air pollution at or around the site (e.g. dust, traffic, etc.)?					
Has air quality monitoring been undertaken at the substations in last 5 years?					If yes, provide results if available:
E. First Aid Equipment					
Is a first aid kit available on site?					Elaborate on contents:
Is the first aid kit well equipped?					

Is it clearly labelled where the first aid kit is stored?					
Is the first aid equipment within its expiry date?					
Do any staff on site have first aid training?					Confirm how many and the extent of training received:
Is one staff with first aid training present on the site at all times?					
Are there any posters showing first aid procedures especially for electrocution?					
F. Fire Safety Equipment					
Does the substation have any fire detectors and alarm?					Elaborate on equipment provided separately for yard and control room:
Are the alarm systems operational?					
Are any firewalls provided e.g. between transformers?					
Does the substation have automatic fire suppression systems connected to the alarm systems e.g. sprinklers?					Elaborate on system:
Is firefighting equipment present?					Elaborate on equipment provided separately for yard and control room, No. and type fire extinguishers No. of fire buckets filled with sand
Do fire extinguishers have an in-date service record?					
Is a record of fire alarm tests and fire drills available on site?					
Do any staff on site have fire training?					
Is one staff with fire training present on the site at all times?					
Are there any notices or posters describing procedures to be followed in the event of a fire?					
G. Community Health and Safety					
Is there a security fence and gates?					
Does the security fence have any gaps, permitting entry?					
Are the gates kept locked?					
Is 24/7 security guard present?					
Is the door to the control room kept locked?					
Are there written or graphic “danger of electrocution” signs posted on the fence/gates?					
Are there written or graphic “danger of electrocution” signs posted on electrical equipment?					
H. Handling Emergencies					

Is an emergency plan available (e.g. for fire, earthquake, flood, accidents, illness etc.)?					Provide copies of any documentary evidence:
Are any COVID-19 specific precautions being followed on-site?					
Are the staff trained on responding to emergency situations?					
Are emergency exits sign-posted and clear of blockages?					
Is the location and phone number of doctor and hospital posted in a clear location?					Distance to nearest doctor / clinic: Distance to nearest hospital able to treat electrocution accidents and other serious conditions:
Is there an emergency eye wash or shower?					
Is an accident logbook available on site?					Elaborate on incidents recorded:
Has the substation ever been subject to earthquakes?					Describe measures (if any) in place to improve disaster-resilience against earthquakes?
Has the substation ever been subject to flooding?					Describe measures (if any) in place to improve disaster-resilience against flooding?
Has the substation ever been subject to landslides / slope stability issues?					Describe measures (if any) in place to improve disaster-resilience against landslides / slope stability issues?
I. Health and Safety of Staff					
Is a health and safety policy available on site?					Note if one exits at organization level:
Is a health and safety risk assessment available on site?					Note if one exits at organization level:
Is a health and safety manual or procedure available on site?					Note if one exits at organization level:
Are there records of safety inspections, testing and calibration?					
Is there signage indicating to workers the hazards present?					
Is there adequate depth of gravel provided?					
Does the control building look structurally sound?					
Has an asbestos survey ever been undertaken at the substation?					
Is there any evidence of asbestos on site especially lagging and roofing materials?					
Did auditor receive an OHS site induction?					
Have staff on site received OHS training?					
Are training materials and equipment available on site?					
Is maintenance handled by staff on site?					
Is there a strict written procedure available for de-energizing before working on electrical equipment?					

Do external maintenance workers come in to undertake more advanced maintenance?					Clarify division of labour between on-site workers and other in-coming specialised NEA workers:
Are the staff working on operation and maintenance activities trained on working at heights?					
Are the staff working on operation and maintenance activities trained on working with electricity?					
Are medical checks of staff undertaken?					
Are staff informed of appropriate PPE for job e.g. via signage?					
Are staff on site wearing personal protective equipment (PPE)?					
Is there a store of PPE available on site[2]?					List the types of PPE that are available:
Do staff avail of personal exposure monitoring equipment to warn of exceeding exposure levels to electromagnetic fields?					
J. Drainage					
Is there any standing water visible on site?					
Is a drainage system provided?					Identify where it connects to:
K. Sanitation and Welfare Facilities					
Is a toilet available on site?					Are there facilities for male and female?
Is the toilet clean?					
Is the toilet inside staff building or outside it?					
Does the toilet connect to existing municipal sewerage system?					
Does the toilet connect to septic tank?					
Is there also a soakaway for the septic tank overflows?					
Is there any sign on leakage/pollution from septic tank?					
Are handwashing facilities available?					
Is hot and cold water available?					
Is soap provided?					
Does the toilet have lock or vacant indicator?					
Is potable water available on site?					Elaborate on the source:
Is there any evidence of potable water meeting Drinking Water Standards?					Provide copies of any documentary evidence:
Are staff stationed at substation during on-shift hours (including security guards) ?					If so, how many? How long are staffs' shifts?

					How long are security guards' shifts?
Is there an undercover rest area available?					
Is a food preparation and clean eating area available?					Is the area free from any contamination from work processes?
Is cooking fuel used on site?					Describe fuel(s) used:
Are staff staying at the substation overnight (out of hours) and how many (including security guards)?					
Is there a dedicated accommodation area for staff?					Describe worker accommodation and facilities provided e.g. is it clean, does it protect from wind, rain and sun; does it have a bed; heating; air conditioning etc.?
Is a TV/Radio/Internet connection available for staff?					
Is there a dedicated shelter for any security guards?					Describe shelter e.g. is it clean, does it protect from wind, rain and sun; does it have a bed; heating; air conditioning; do the guards have access to the sanitation and cooking facilities within the compound etc.?

Consultations on past/present concerns (also inform them of the intended works)	**Name/Address**	**Position/Occupation**	**Concerns/Issues**
Occupants of buildings within 50m:			
Management of community facilities (schools, health center etc.) within 50m:			

Undertaken by:

_____

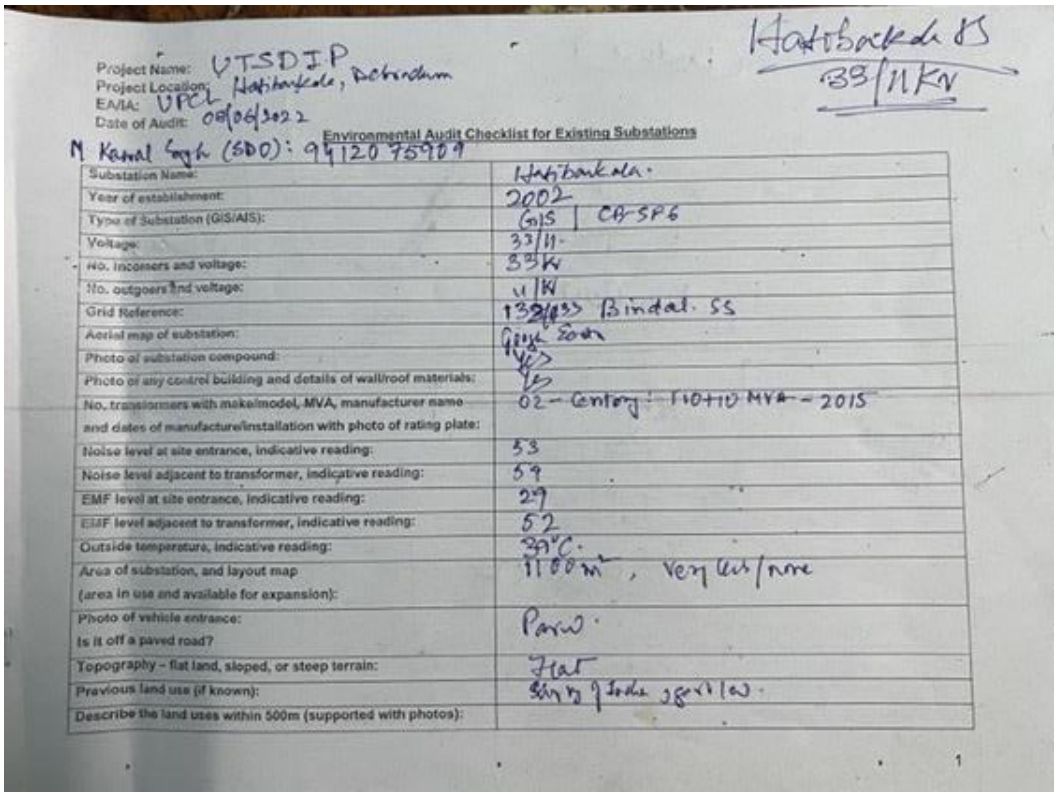
name/designation/signature

Date: _ _/_ _/_ _

[1] PCBs are persistent organic pollutants, meaning they a resistant to environmental degradation through time and may remain indefinitely present in the environment.
[2] E.g. hard hats, safety glasses steel-toed boots, rated dielectric footwear, insulated gloves, insulated tools, electrical insultation blankets, live-line tools/hot sticks, respiratory equipment etc.

Source: ADB TA Consultant

Completed Sample Audit Checklist:



Project Name: VTSDIP
Project Location: Hatibankola, Dehradun
EA/IA: UPCL
Date of Audit: 08/06/2022

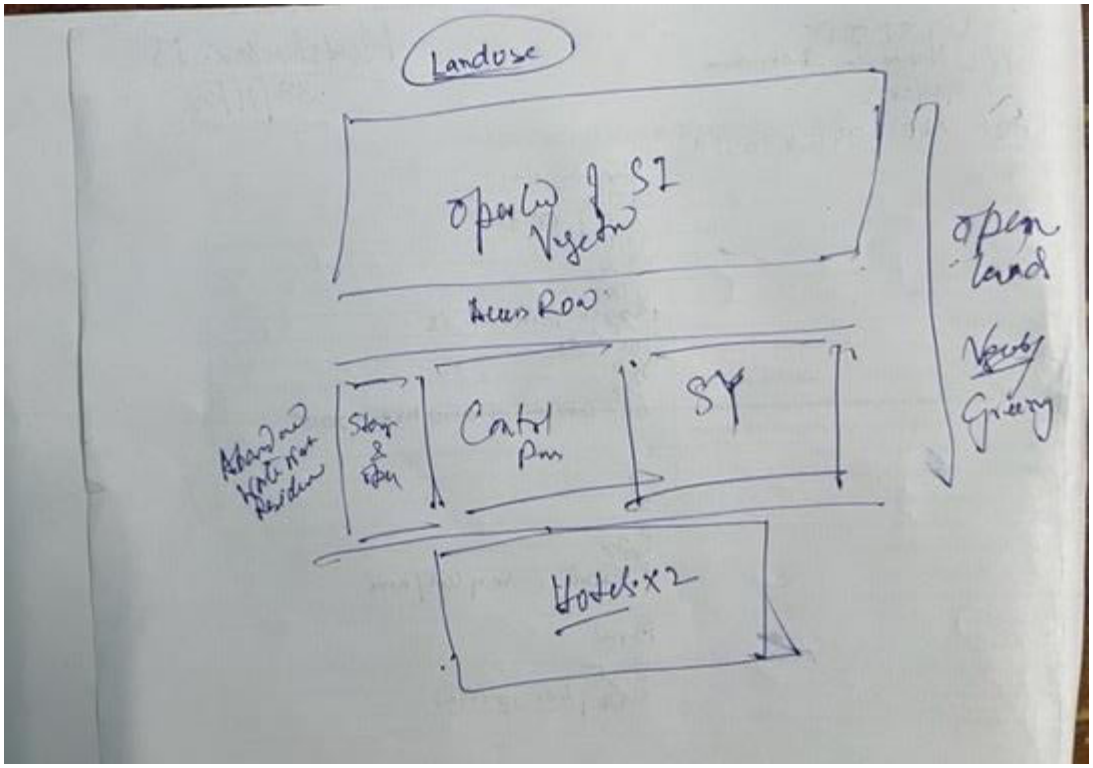
Hatibankola SS
33/11 KV

Environmental Audit Checklist for Existing Substations

M Kamal Singh (SDO): 9412075909

Substation Name:	Hatibankola.
Year of establishment:	2002
Type of Substation (GIS/AIS):	GIS | CB-SF6
Voltage:	33/11.
No. incomers and voltage:	33 KV
No. outgoers and voltage:	11 KV
Grid Reference:	132/33 Bindal. SS
Aerial map of substation:	Google Earth
Photo of substation compound:	Yes
Photo of any control building and details of wall/roof materials:	Yes
No. transformers with make/model, MVA, manufacturer name and dates of manufacture/installation with photo of rating plate:	02 - Century : 10+10 MVA - 2015
Noise level at site entrance, indicative reading:	53
Noise level adjacent to transformer, indicative reading:	59
EMF level at site entrance, indicative reading:	2.9
EMF level adjacent to transformer, indicative reading:	5.2
Outside temperature, indicative reading:	39°C.
Area of substation, and layout map (area in use and available for expansion):	1100 m², Very less/none
Photo of vehicle entrance: Is it off a paved road?	Paved.
Topography – flat land, sloped, or steep terrain:	Flat
Previous land use (if known):	Single Storied residential.
Describe the land uses within 500m (supported with photos):	

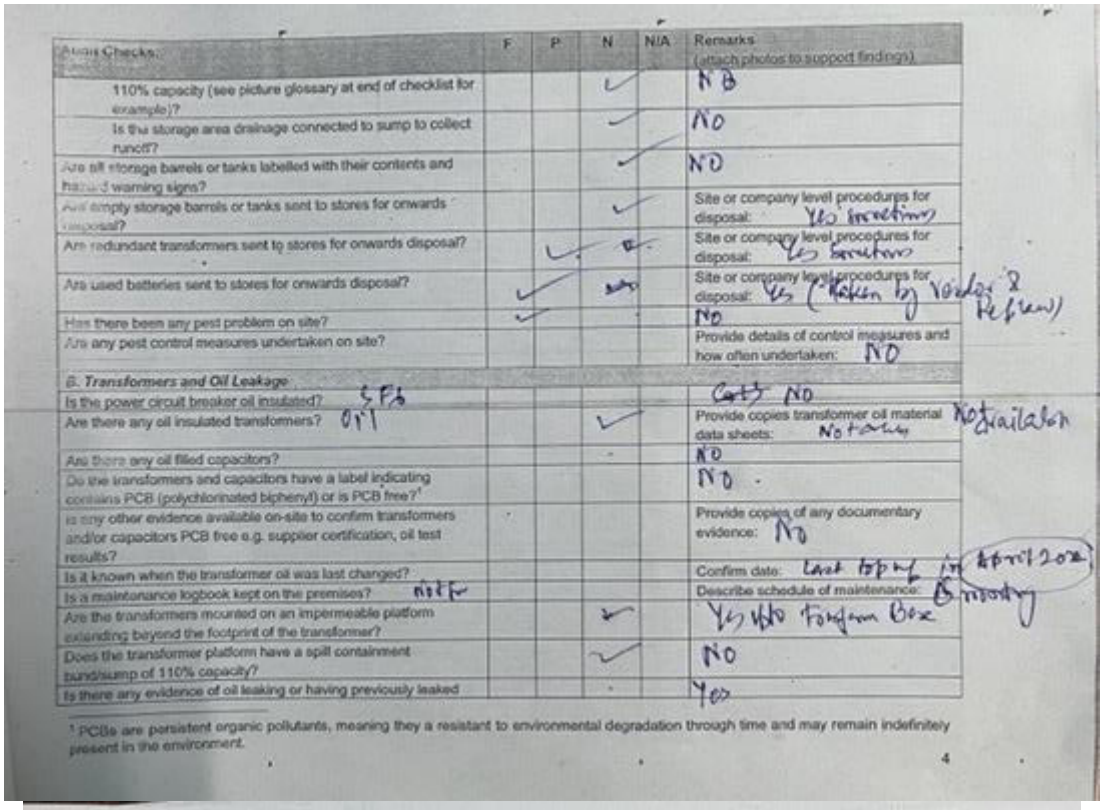
1



Confirm presence or absence of agricultural land-cultivated or uncultivated, protected or environmentally sensitive areas, community or protected forest, water bodies, religious or ancestral cultural resources (e.g. temples, shrines, sacred trees)?	~~Small bed temple~~ NIL
Nearest protected or key biodiversity area (distance in m)?	~~[illegible]~~ Rajaji National Park (10 Km) / FRI -2.5-3Km
Have endangered species been encountered in the vicinity (elephant, tiger, etc.)?	Monkeys, Nil [illegible] Pond,
No. buildings within 50m and no. inhabitants:	Hotel X2 (along with Shops)
Nearest individual residence (name and distance in m, mark on aerial map if possible):	Eg - CPHD [illegible] Road — 500m
Nearest habitation (name and distance in m, mark on aerial map if possible):	[illegible], [illegible] /Dehradun city.
No. community facilities (schools, health centre etc.) within 50m with estimated no. of visitors (mark on aerial map if possible):	Nil
Nearest surface water (distance in m, mark on aerial map if possible):	Nil
No. groundwater wells/pumps/springs within 50m (mark on aerial map if possible):	Nil [illegible] (OHT)
Total staff at substation (technical and non-technical): No. men / no. women:	Tech: 11 NT: 4 (15) Female: 02 Male: 13

Audit Checks:	F	P	N	N/A	Remarks (attach photos to support findings):
A. Housekeeping / Waste Management					
Is an environment policy available on site?			✓		Note if one exits at organization level.
Is a pollution prevention manual or procedure available on-site covering hazardous materials management, oil storage etc?			✓		Note if one exits at organization level.
Is a waste management manual or procedure available on-site covering both solid and hazardous waste storage and disposal?			✓		Note if one exits at organization level.
Is there vegetation (grass, trees, shrubs) on site?			grass, Herbs,		Provide details of vegetation and how it is managed, note if trees will need to be cut if further development in compound: 1 gulmohar tree, 2 Neem tree, Palm trees - outside gate.
Is the substation kept neat and tidy with no discarded wastes?		✓			Some waste - Paper, Bottles, polythene bags.
Are there any trip hazards on the ground e.g. open channels, materials, equipment, trash laying around?		✓			Cable trench
Are there any other features that could post a danger e.g. broken or loose tiles?		✓			Open trench in Control Room
Is there any general waste storage and/or disposal on-site?			✓		Provide details of types of waste stored and how disposed of? NO
Is solid waste segregated into recycling and waste for disposal?			✓		NO
Is there a dedicated, labelled storage area for solid waste?			✓		NO
Does the storage area have an impermeable floor?					NO
Is the storage area under cover?					
Do garbage bins have lids?					
Are garbage bins enclosed to contain leachates?					
Is any waste burning on site – open burning or incineration?			✓		Yes small burnt patch observed.
Is any composting taking place on-site?			✓		NO
Is end of life or unused equipment being stored on site?			✓		Yes - Some equipments.
Is there a dedicated, labelled storage area for this equipment?	✓				Yes - Small stores, - but accessible
Are supplies of fuel, oil, chemicals, SF6 tanks being stored on site?			✓		Yes - oil in drums. (Room [illegible])
Are material data sheets for the fuels, oil or chemicals displayed?			✓		NO
Are there empty drums, old transformers or used batteries on site?			✓		Yes
Are there any hazardous wastes (solid/liquid/gas) being stored and/or disposed of?			✓		How are any hazardous wastes (solid/liquid/gas) being stored and disposed of? - transformer oil.
Is there a dedicated, labelled storage area for fuels, oils, and chemicals, SF6 tanks, empty drums, old transformers, and/or hazardous wastes?	✓				Storage Room (Room within [illegible] in not [illegible] & can be [illegible] by [illegible])
Does the storage area have an impermeable floor?	✓				
Is the storage area under cover?	✓				
Is the storage area locked?	✓				
Does the storage area have a spill containment bund of			✓		NO

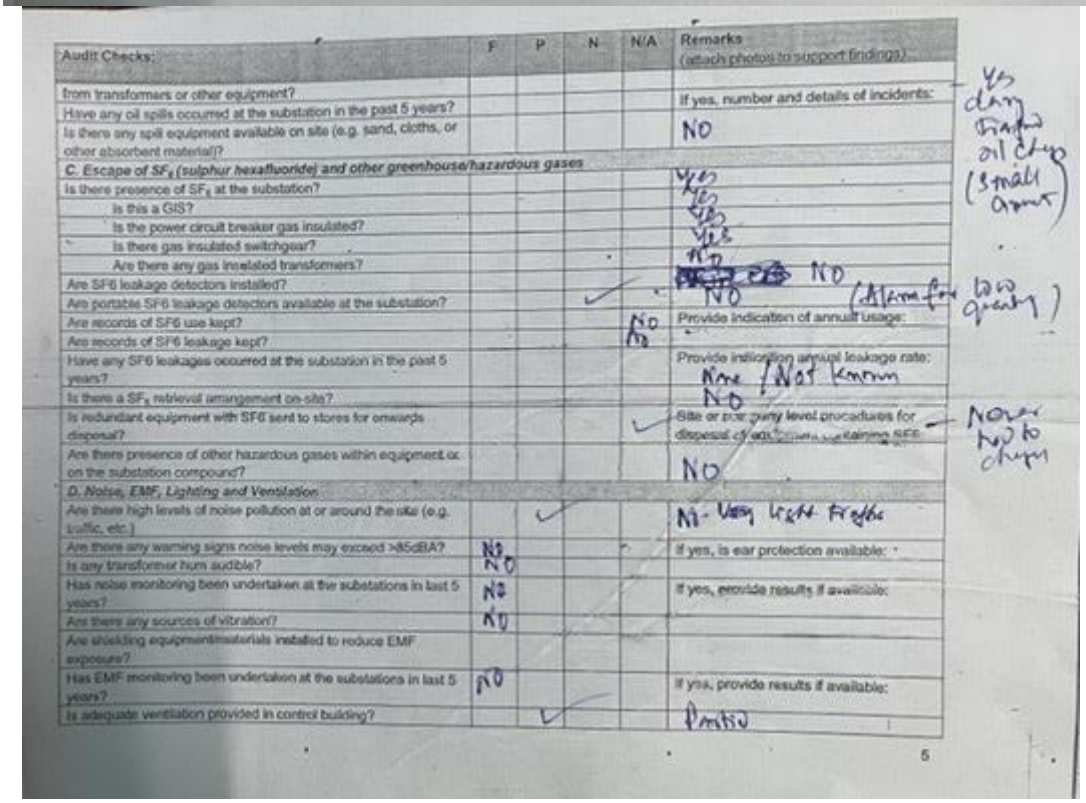
3



Audit Checks:	F	P	N	N/A	Remarks (attach photos to support findings)
110% capacity (see picture glossary at end of checklist for example)?			✓		NB
Is the storage area drainage connected to sump to collect runoff?			✓		NO
Are all storage barrels or tanks labelled with their contents and hazard warning signs?			✓		NO
Are empty storage barrels or tanks sent to stores for onwards disposal?			✓		Site or company level procedures for disposal: Yes sometimes
Are redundant transformers sent to stores for onwards disposal?		✓			Site or company level procedures for disposal: Yes sometimes
Are used batteries sent to stores for onwards disposal?	✓		✓		Site or company level procedures for disposal: Yes (Taken by Vendor & Refund)
Has there been any pest problem on site?	✓				NO
Are any pest control measures undertaken on site?					Provide details of control measures and how often undertaken: NO
B. Transformers and Oil Leakage					
Is the power circuit breaker oil insulated? SF6					Cell: NO
Are there any oil insulated transformers? OIT			✓		Provide copies transformer oil material data sheets: Not available
Are there any oil filled capacitors?					NO
Do the transformers and capacitors have a label indicating contains PCB (polychlorinated biphenyl) or is PCB free?[1]					NO
Is any other evidence available on-site to confirm transformers and/or capacitors PCB free e.g. supplier certification, oil test results?					Provide copies of any documentary evidence: NO
Is it known when the transformer oil was last changed?					Confirm date: Last topping in April 2021
Is a maintenance logbook kept on the premises? NIL					Describe schedule of maintenance: Bi monthly
Are the transformers mounted on an impermeable platform extending beyond the footprint of the transformer?			✓		Yes Not Tongham Box
Does the transformer platform have a spill containment bund/sump of 110% capacity?			✓		NO
Is there any evidence of oil leaking or having previously leaked					Yes

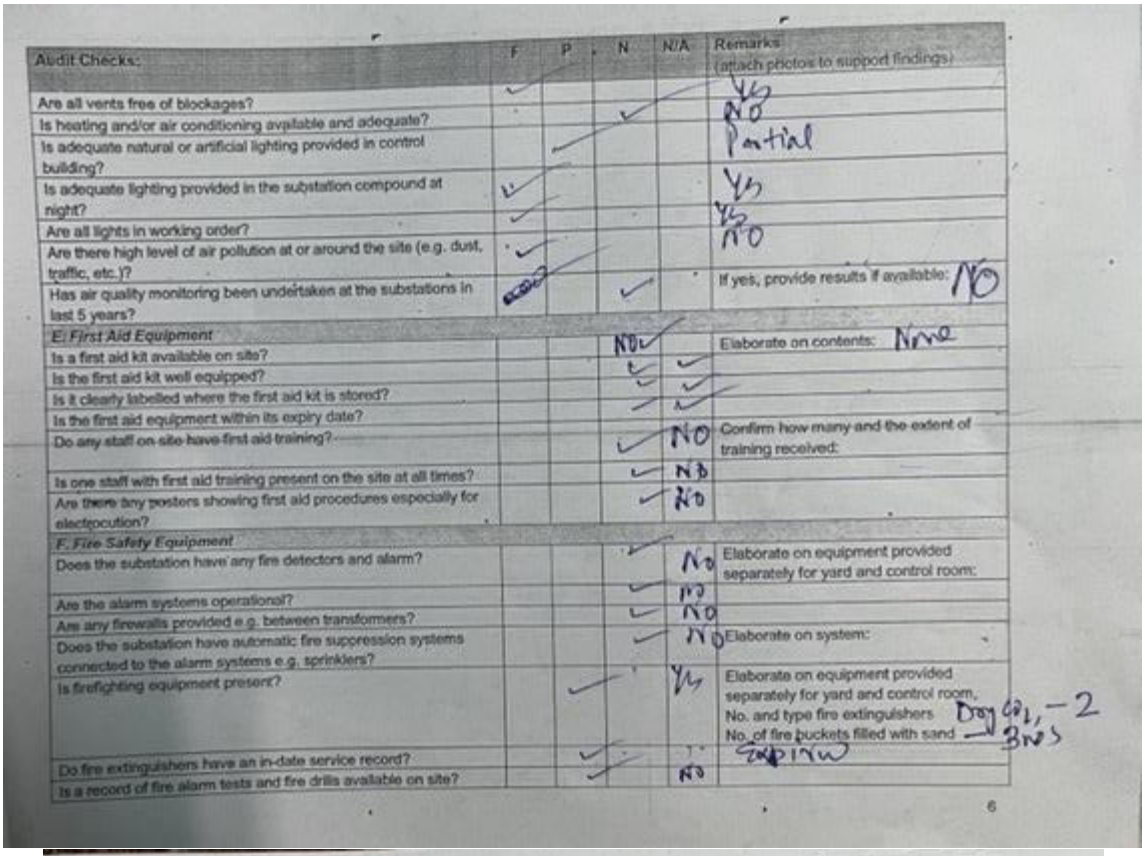
[1] PCBs are persistent organic pollutants, meaning they a resistant to environmental degradation through time and may remain indefinitely present in the environment.

4



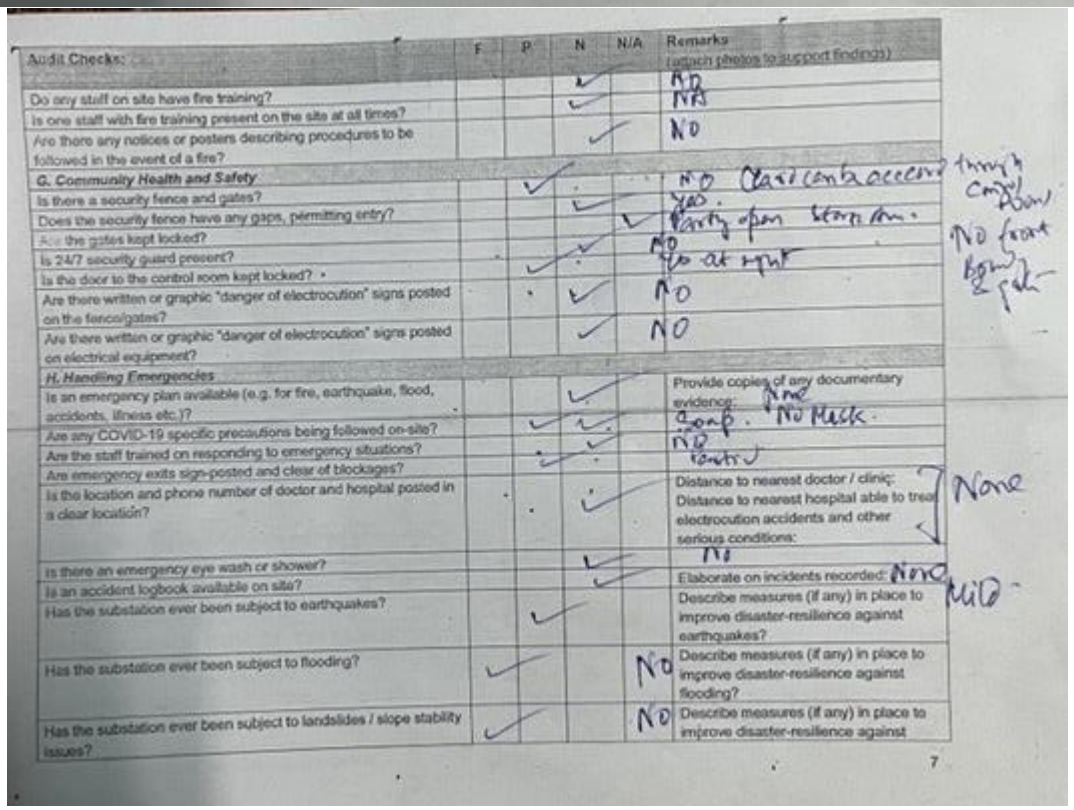
Audit Checks:	F	P	N	N/A	Remarks (attach photos to support findings)
from transformers or other equipment?					Yes
Have any oil spills occurred at the substation in the past 5 years?					If yes, number and details of incidents: clean Engine oil drop (small amt)
Is there any spill equipment available on site (e.g. sand, cloths, or other absorbent material)?					NO
C. Escape of SF_6 (sulphur hexafluoride) and other greenhouse/hazardous gases					
Is there presence of SF_6 at the substation?					Yes
Is this a GIS?					Yes
Is the power circuit breaker gas insulated?					Yes
Is there gas insulated switchgear?					Yes
Are there any gas insulated transformers?					NO
Are SF6 leakage detectors installed?					NO
Are portable SF6 leakage detectors available at the substation?			✓		NO (Alarm for low gravity)
Are records of SF6 use kept?				NO	Provide indication of annual usage:
Are records of SF6 leakage kept?				NO	
Have any SF6 leakages occurred at the substation in the past 5 years?					Provide indication annual leakage rate: None / Not known
Is there a SF_6 retrieval arrangement on-site?					NO
Is redundant equipment with SF6 sent to stores for onwards disposal?			✓		Site or company level procedures for disposal of equipment containing SF6: Never NO to charge
Are there presence of other hazardous gases within equipment or on the substation compound?					NO
D. Noise, EMF, Lighting and Ventilation					
Are there high levels of noise pollution at or around the site (e.g. traffic, etc.)		✓			Mi - Very light Traffic
Are there any warning signs noise levels may exceed >85dBA?	NO				If yes, is ear protection available:
Is any transformer hum audible?	NO				
Has noise monitoring been undertaken at the substations in last 5 years?	NO				If yes, provide results if available:
Are there any sources of vibration?	NO				
Are shielding equipment/materials installed to reduce EMF exposure?					
Has EMF monitoring been undertaken at the substations in last 5 years?	NO				If yes, provide results if available:
Is adequate ventilation provided in control building?		✓			Partial

5



Audit Checks:	F	P	N	N/A	Remarks (attach photos to support findings)
Are all vents free of blockages?	✓				Yes
Is heating and/or air conditioning available and adequate?			✓		NO
Is adequate natural or artificial lighting provided in control building?		✓			Partial
Is adequate lighting provided in the substation compound at night?	✓				Yes
Are all lights in working order?	✓				Yes
Are there high level of air pollution at or around the site (e.g. dust, traffic, etc.)?	✓				NO
Has air quality monitoring been undertaken at the substations in last 5 years?	✓		✓		If yes, provide results if available: NO
E. First Aid Equipment					
Is a first aid kit available on site?			NO ✓		Elaborate on contents: None
Is the first aid kit well equipped?			✓	✓	
Is it clearly labelled where the first aid kit is stored?			✓	✓	
Is the first aid equipment within its expiry date?			✓	✓	
Do any staff on site have first aid training?			✓	NO	Confirm how many and the extent of training received:
Is one staff with first aid training present on the site at all times?			✓	NO	
Are there any posters showing first aid procedures especially for electrocution?			✓	NO	
F. Fire Safety Equipment					
Does the substation have any fire detectors and alarm?			✓	NO	Elaborate on equipment provided separately for yard and control room:
Are the alarm systems operational?			✓	NO	
Are any firewalls provided e.g. between transformers?			✓	NO	
Does the substation have automatic fire suppression systems connected to the alarm systems e.g. sprinklers?			✓	NO	Elaborate on system:
Is firefighting equipment present?		✓		Yes	Elaborate on equipment provided separately for yard and control room. No. and type fire extinguishers Dry Co2, – 2 No. of fire buckets filled with sand 3 NOS
Do fire extinguishers have an in-date service record?		✓			Expired
Is a record of fire alarm tests and fire drills available on site?		✓		NO	

6



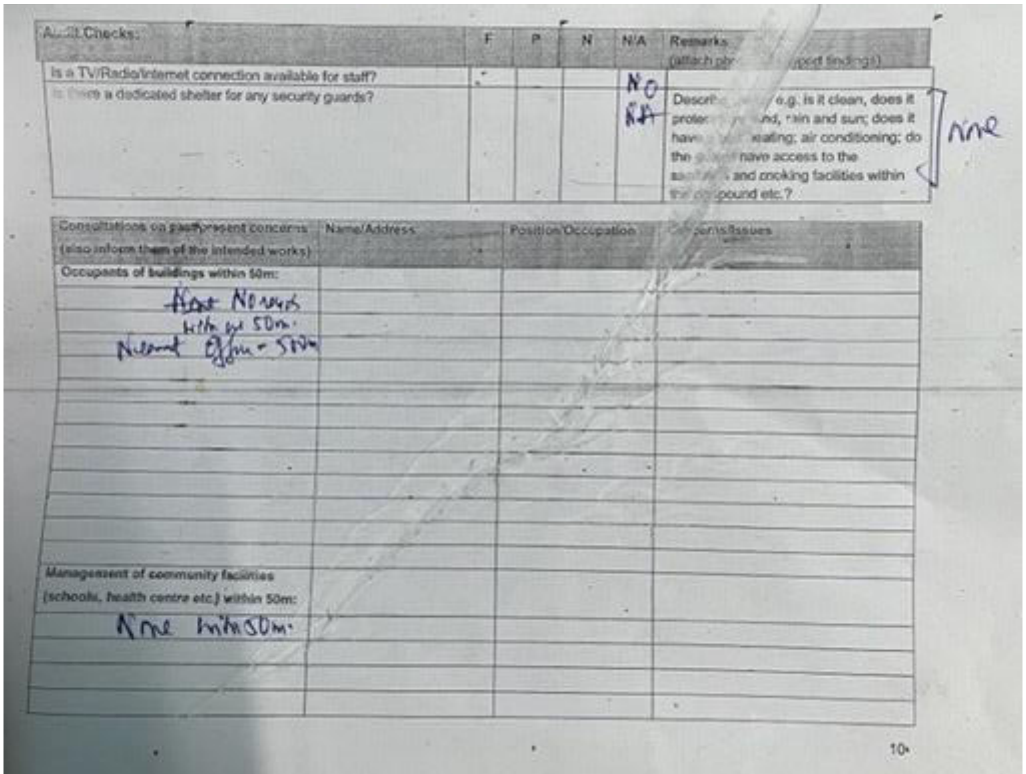
Audit Checks:	F	P	N	N/A	Remarks (attach photos to support findings)
Do any staff on site have fire training?			✓		NO
Is one staff with fire training present on the site at all times?			✓		NA
Are there any notices or posters describing procedures to be followed in the event of a fire?			✓		NO
G. Community Health and Safety		✓			NO Main entrance through control room
Is there a security fence and gates?			✓		Yes.
Does the security fence have any gaps, permitting entry?				✓	Partly open towards Rm.
Are the gates kept locked?			✓		NO
Is 24/7 security guard present?		✓			No at night
Is the door to the control room kept locked?		✓			NO from Rm & gate
Are there written or graphic "danger of electrocution" signs posted on the fence/gates?			✓		NO
Are there written or graphic "danger of electrocution" signs posted on electrical equipment?			✓		NO
H. Handling Emergencies					
Is an emergency plan available (e.g. for fire, earthquake, flood, accidents, illness etc.)?			✓		Provide copies of any documentary evidence: None
Are any COVID-19 specific precautions being followed on-site?		✓	✓		Soap. No Mask.
Are the staff trained on responding to emergency situations?		✓	✓		NO control
Are emergency exits sign-posted and clear of blockages?		✓			
Is the location and phone number of doctor and hospital posted in a clear location?			✓		Distance to nearest doctor / clinic: None Distance to nearest hospital able to treat electrocution accidents and other serious conditions:
Is there an emergency eye wash or shower?			✓		No
Is an accident logbook available on site?			✓		Elaborate on incidents recorded: None Mild
Has the substation ever been subject to earthquakes?		✓			Describe measures (if any) in place to improve disaster-resilience against earthquakes?
Has the substation ever been subject to flooding?	✓			NO	Describe measures (if any) in place to improve disaster-resilience against flooding?
Has the substation ever been subject to landslides / slope stability issues?	✓			NO	Describe measures (if any) in place to improve disaster-resilience against

7

Audit Checks:	F	P	N	N/A	Remarks (attach photos to support findings)
					landslides / slope stability issues?
I. Health and Safety of Staff					
Is a health and safety policy available on site?			✓		Note if one exits at organization level: NA
Is a health and safety risk assessment available on site?			✓		Note if one exits at organization level: NA
Is a health and safety manual or procedure available on site?			✓		Note if one exits at organization level: NA
Are there records of safety inspections, testing and calibration?			✓		
Is there signage indicating to workers the hazards present?			✓		
Is there adequate depth of gravel provided?		✓			yes
Does the control building look structurally sound?	✓				yes
Has an asbestos survey ever been undertaken at the substation?			✓		NO
Is there any evidence of asbestos on site especially lagging and roofing materials?	✓				NO
Did auditor receive an OHS site induction?			✓		
Have staff on site received OHS training?			✓		
Are training materials and equipment available on site?			✓		
Is maintenance handled by staff on site?		✓			Mostly by contractor
Is there a strict written procedure available for de-energizing before working on electrical equipment?			✓		NO
Do external maintenance workers come in to undertake more advanced maintenance?		✓		Yes	Clarify division of labour between on-site workers and other in-coming specialised NEA workers: details not provided
Are the staff working on operation and maintenance activities trained on working at heights?			✓		NO
Are the staff working on operation and maintenance activities trained on working with electricity?			✓		NO
Are medical checks of staff undertaken?			✓		NO
Are staff informed of appropriate PPE for job e.g. via signage?			✓		NO
Are staff on site wearing personal protective equipment (PPE)?			✓		NO
Is there a store of PPE available on site[2]?			✓		List the types of PPE that are available: [illegible] (inadequate) available when they go out to work in DL
Do staff avail of personal exposure monitoring equipment to warn					

[2] E.g. hard hats, safety glasses steel-toed boots, rated dielectric footwear, insulated gloves, insulated tools, electrical insulation blankets, live-line tools/hot sticks, respiratory equipment etc.

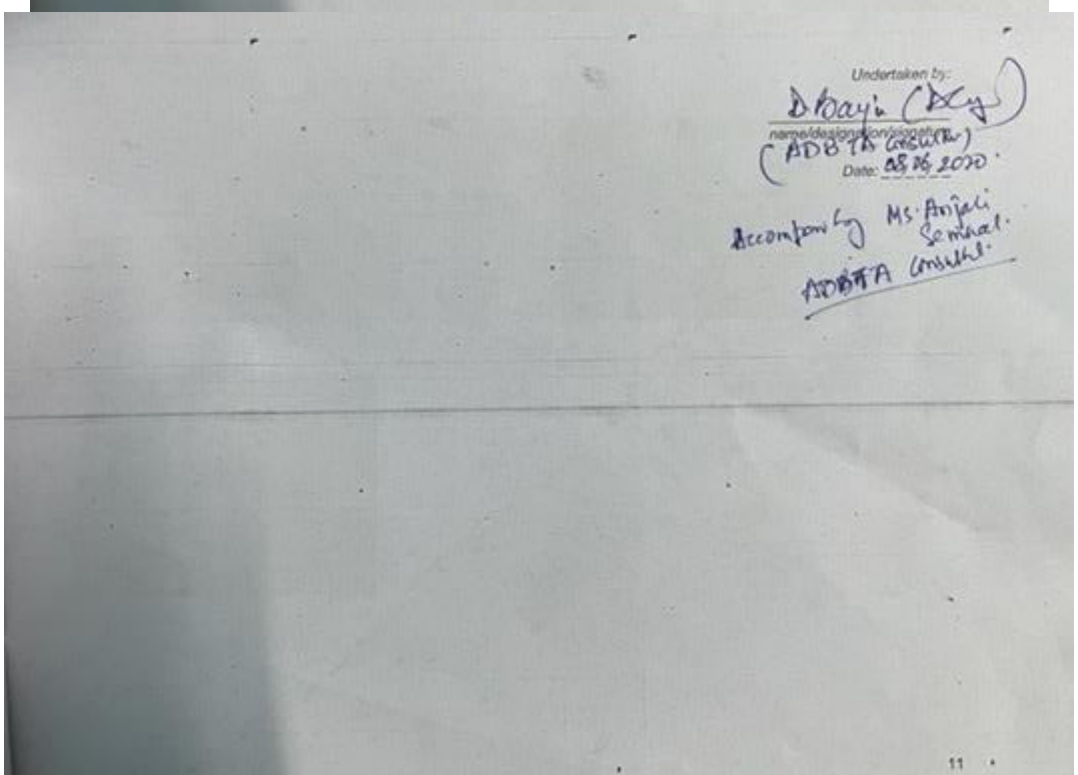
Audit Checks:	F	P	N	N/A	Remarks (attach photos to support findings)
of exceeding exposure levels to electromagnetic fields?					
J. Drainage					
Is there any standing water visible on site?	✓			No	
Is a drainage system provided?	✓				Identify where it connects to: [illegible]
K. Sanitation and Welfare Facilities					
Is a toilet available on site?	✓			Yes	Are there facilities for male and female? No [illegible]
Is the toilet clean?		✓		Yes	
Is the toilet inside staff building or outside it?	✓			Inside	
Does the toilet connect to existing municipal sewerage system?	✓			Yes	
Does the toilet connect to septic tank?	✓			Yes	
Is there also a soakaway for the septic tank overflows?	✓			NO	
Is there any sign on leakage/pollution from septic tank?	✓			NO	
Are handwashing facilities available?		✓		Yes	Basin in Bathroom
Is hot and cold water available?			✓	NO	
Is soap provided?			✓	NO	
Does the toilet have lock or vacant indicator?		✓			lock-Yes / Indicator-NO
Is potable water available on site?	✓			Yes	Elaborate on the source: Municipal supply
Is there any evidence of potable water meeting Drinking Water Standards?				No	Provide copies of any documentary evidence: NA
Are staff stationed at substation during on-shift hours (including security guards) ?				Yes	If so, how many? 02 How long are staffs' shifts? 08 hr How long are security guards' shifts? NA
Is there an undercover rest area available?				NO	
Is a food preparation and clean eating area available?				✓	Is the area free from any contamination from work processes? NA
Is cooking fuel used on site?					Describe fuel(s) used: NA
Are staff staying at the substation overnight (out of hours) and how many (including security guards)?				Yes	Yes (02)
Is there a dedicated accommodation area for staff?				NO	Describe worker accommodation and facilities provided e.g. is it clean, does it protect from wind, rain and sun; does it have a bed; heating; air conditioning etc.?



Audit Checks:	F	P	N	N/A	Remarks (attach photos to support findings)
Is a TV/Radio/Internet connection available for staff?				NO	
Is there a dedicated shelter for any security guards?				NA	Describe e.g. is it clean, does it protect from wind, rain and sun; does it have heating; air conditioning; do the guards have access to the sanitation and cooking facilities within the compound etc.? None

Consultations on past/present concerns (also inform them of the intended works)	Name/Address	Position/Occupation	Concerns/Issues
Occupants of buildings within 50m:			
~~Hont~~ No roads within 50m. Nearest 1km – 50m			
Management of community facilities (schools, health centre etc.) within 50m:			
None within 50m.			

10



Undertaken by:

D Bayin (signature)

name/designation/signature (ADB TA Consultant)

Date: 08.06.2020.

Accompany by Ms. Anjali Semmal. ADB TA Consultant.

11

Source: ADB TA Consultant

Annexure 3: Template Public Consultation

Uttarakhand Transmission Strengthening and Distribution Project
Consultation Form for Local Communities

PERSONAL DETAILS

1. Date:
2. Name of the Respondent:
3. Phone Number of Respondent:
1. Municipality / Rural Municipality of Respondent's Residence:
2. Residence close to for SS or TL/DL:
3. Age of Respondent:

Under 16 ☐ 16-55 ☐ Over 55 ☐

4. Gender of Respondent:

Female ☐ Male ☐ Others ☐

5. Main Livelihood (Occupation):
6. Secondary Livelihoods:
7. Ethnic Group:
8. Caste:
9. Religion:
10. Main Language:
11. Other Languages:
12. Number of family members living under the same roof (as a single household):
13. Do you or any of your family members fall into any of the following vulnerable groups?:

Potentially Vulnerable Group		**Remarks (numbers and relationship)**
Female Headed Household	☐	
Below Poverty Line	☐	
Indigenous Peoples	☐	
Children	☐	
Elderly	☐	
Illiterate	☐	
Persons with Disabilities	☐	

14. How is Your and Your Family Members Underlying Health?
    Very Poor ☐ Poor ☐ Good ☐ Very Good ☐
    Elaborate on Health Conditions/Diseases Currently Suffered or Suffered in the last year, if any:

15. Awareness of the Project Prior to this Consultation:
    Not At All Aware ☐ Slightly Aware ☐ Very Aware ☐

LAND USE, LIVELIHOODS, AND SENSITIVE COMMUNITY RECEPTORS

16. Where is your residence and/or land located in relation to the following project locations:

	Residence	**Land/ occupation zone/Cropland/shops/Office, etc**	**Remarks**

In the vicinity of the TL/DL ROW			
In the vicinity of the SS			
In vicinity of other proposed facilities			
None of the above (please specify)			

17. Are you Concerned about Land Use being Adversely Impacted By The Project?

Yes ☐ No ☐ Don't Know ☐

If yes, elaborate on Concerns and Suggest any Measures the Project Can Consider Mitigating Impacts, noting that compensation will be paid for land acquisition and resettlement:[17]

18. Accidental property damage during construction works of DL/TL /SS – houses, shops, school, other infrastructures

Yes ☐

No ☐

Don't Know ☐

If yes, elaborate on Concerns and Suggest any Measures the Project Can Consider to Mitigate Impacts:

19. Are you aware of any sensitive community receptors that may be directly or indirectly adversely impacted by the project, please identify their location on map provided whenever possible:

Receptor		**Remarks Potential Impact/Suggested Mitigation**
Agricultural land	☐	
Forest/Wildlife	☐	
School	☐	
Clinic, Health Center, or Hospital	☐	
Religious Building	☐	
Irrigation channel	☐	
Groundwater well	☐	
Road	☐	
Other	☐	

BIODIVERSITY

20. Are you aware of any legally protected areas or other sensitive ecological haibat that may be directly or indirectly adversely impacted by the project, please identify their location on map provided whenever possible:

Legally Protected Area or Sensitive Ecological Habitat/KBA/IBA/Wildlife Movement/Active area	**Location**	**Remarks Potential Impact/ Suggested Mitigation**

[17] Under Land Use Consider Damage to Crops, Structures, Trees etc. but also Landscape/Visual Impacts

21. Is any biodiversity supported by the local area of social, economic, or cultural importance to your local community (e.g. fisheries, forests)?

Yes ☐ No ☐ Don't Know ☐

If yes, please elaborate:

22. With reference to the photo guide provided, are you aware of any of these threated, endemic or migratory species being present in the project SS/DL area?

Yes ☐ No ☐ Don't Know ☐

If yes, please elaborate on species, season, and other factors including locations:

Species	Season Observed	When sites/heard about	Siting area	Any conflict/observations

23. Are you Concerned about Forest/Wildlife being Adversely Impacted By The Project?

Yes ☐ No ☐ Don't Know ☐

If yes, Identify Concern and Suggest Measures the Project Can Consider Mitigating Impacts:

Habitat or Species	Remarks Potential Impact/Suggested Mitigation

24. Does you livelihood depend on wild animals within the DL/TL/SS area, whether used for personal consumption or commercial purposes?

Yes, personal consumption ☐ Yes, commercial ☐

No ☐ Don't Know ☐

If yes, please elaborate:

25. Does you livelihood depend on harvest of wild (not cultivated) plants including trees/timber, whether for personal consumption (heating, cooking, food, medicinal, regligious) or commercial purposes, directly from the DL/TL/SS area?

Yes, personal consumption ☐ Yes, commercial ☐

No ☐ Don't Know ☐

If yes, please elaborate:

Plant Species or Type	Purpose/Use of Plant	Season Harvested	Location	Quantity Per Year*

Plant Species or Type	Purpose/Use of Plant	Season Harvested	Location	Quantity Per Year*

*If sold also indicate split of quantity kept for personal consumption and put up for sale and the market price in kg (or state alternative units)

26. With reference to the photo guide provided, are you aware of any of these threated wild animal or plant species being present in the DL/TL/SS or surroundings area?

Yes ☐ No ☐ Don't Know ☐

If yes, please elaborate on location:

27. Are you Concerned about Wild Animals and Plants being Adversely Impacted by The Project?

Yes ☐ No ☐ Don't Know ☐

If yes, Identify Habitats or Species of Concern and Suggest Measures the Project Can Consider Mitigating Impacts:

Habitat or Species	Remarks Potential Impact/Suggested Mitigation

PHYSICAL CULTURAL RESOURCES

28. Are you Concerned about Physical Cultural Resources being Adversely Impacted By The Project?

Yes ☐ No ☐ Don't Know ☐

29. Are you aware of any Physical Cultural Resources of either national or local importance (e.g. temples, shrines, religious forests, sacred groves or trees, cremation places etc.) that may be directly or indirectly adversely impacted by the Project, please identify their location on map provided whenever possible?

Name of Physical Cultural Resource	Location	Remarks Potential Impact/ Suggested Mitigation

HUMAN ENVIRONMENT

30. Are you aware of any of the following having occurred in the local area?

Earthquakes ☐ Landslides ☐ Storms ☐

Flooding ☐ Drought ☐ None ☐ Don't Know ☐

31. Are you aware that, if not well managed, there may be community safety risks associated with operation of the SS and DL/TL?

Yes ☐ No ☐ Don't Know ☐

Please elaborate on Concerns and, if no, suggest any Measures the Project Can Consider Increasing Awareness:

Only for persons living around SS or along/adjacent to DL?TL

32. Are you Concerned about the Overall Community Health and Safety Impacts of the Project?:

Yes ☐ No ☐ Don't Know ☐

If yes, elaborate on Concerns and Suggest any Measures the Project Can Consider Mitigating Impacts:

33. Do You Believe that UPCL/PTCUL has met National Regulations for the operation of SS and DL/TL lines? If Not, Feedbacks/suggestion?

34. How would you qualify:

The existing noise level in the area?

Very Quiet ☐ Quiet ☐ Noisy ☐ Very Noisy ☐

The existing air quality (dust levels) in the area?

Very Dirty ☐ Dirty ☐ Clean ☐ Very Clean ☐

The availability of water resources for drinking, washing etc.

Very Poor ☐ Poor ☐ Good ☐ Very Good ☐

The existing surface water quality in the area?

Very Polluted ☐ Polluted ☐ Clean ☐ Very Clean ☐

The existing ground water quality in the area?

Very Polluted ☐ Polluted ☐ Clean ☐ Very Clean ☐

Solid and hazardous waste management in the area is?

Very Poor ☐ Poor ☐ Good ☐ Very Good ☐

The existing road traffic in the area?

Very Busy ☐ Busy ☐ Quiet ☐ Very Quiet ☐

35. What are the main sources of existing pollution in the local area?

None ☐ Lack of Sanitation ☐ Agriculture ☐

Discarded Waste ☐ Traffic ☐ Other (please state) ☐

Don't Know ☐

36. Has the SS/project temporarily/or permanently during operation?

Increased existing noise levels in the area?

Yes: Intolerable ☐ Yes: Tolerable ☐ No ☐ Don't Know ☐

Decrease existing air quality (dust) in the area?

Yes: Intolerable ☐ Yes: Tolerable ☐ No ☐ Don't Know ☐

Increase pressure on availability water resources for drinking, washing etc.

Yes: Intolerable ☐ Yes: Tolerable ☐ No ☐ Don't Know ☐

Decrease existing surface water quality in the area?

Yes: Intolerable ☐ Yes: Tolerable ☐ No ☐ Don't Know ☐

Decrease existing ground water quality in the area?

Yes: Intolerable ☐ Yes: Tolerable ☐ No ☐ Don't Know ☐

Increase solid and hazardous waste in the area?

Yes: Intolerable ☐ Yes: Tolerable ☐ No ☐ Don't Know ☐

Increase existing road traffic in the area?

Yes: Intolerable ☐ Yes: Tolerable ☐ No ☐ Don't Know ☐

If yes to any of the above, elaborate on Potential Impacts and Detail Measures the Project Can Consider to Mitigate These Impacts:

37. Do you and your family have:

Socioeconomic Condition		Remarks
Access to electricity from national grid	☐	
Access to electricity from an off-grid system (solar panel, etc.)	☐	
Access to drinking water from home tap	☐	
Access to drinking water from public well	☐	
Access to drinking water from waterbody	☐	
Access to clean sanitation facilities (toilet)	☐	
Connection to sewerage system	☐	
Access to health care close to home	☐	
Access to public transportation system close to home (e.g. bus route)	☐	
Access to private transportation system (motorbike, car, etc.)	☐	

38. How Do You Believe Socioeconomic Conditions Will Be/is being Impacted By The Project?

Positively ☐ Negatively ☐ Don't know ☐

Elaborate on Potential Socioeconomic Impacts and Detail Measures the Project Can Consider to Mitigate Any Negative Impacts:

39. Do You Believe the Project would/is Impact Transport Connectivity in Your Area, including transport by foot or by vehicle?

Positively ☐ Negatively ☐ Don't know ☐

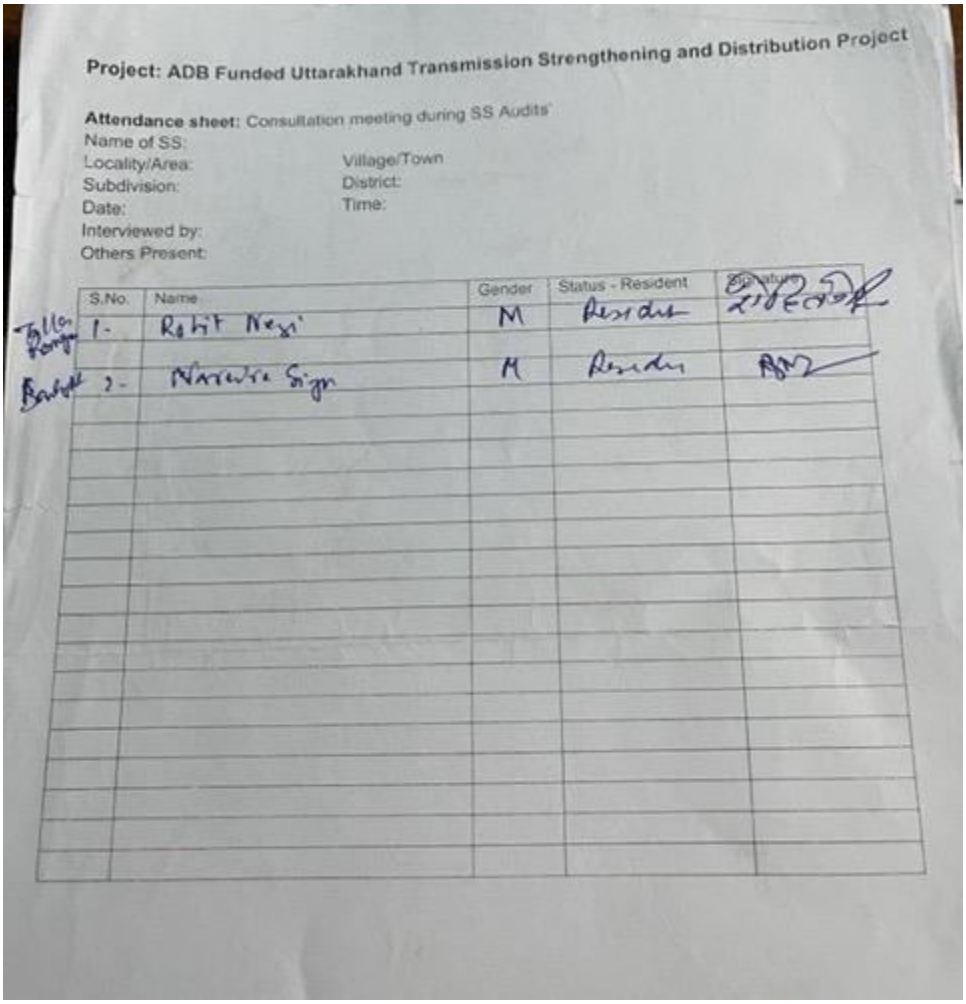
Elaborate on Potential Impacts on Transport Connectivity and Detail Measures the Project Can Consider to Mitigate Any Negative Impacts:

GENERAL

40. Further Suggestions to Project on Environment, Health and Safety Impacts to be Considered Further and Measures that Could be Incorporated to Mitigate Them.

Name and Signature of Interviewee:
Name and Signature of Interviewers:
Date:
Place:

Sample Attendance Sheet:



Project: ADB Funded Uttarakhand Transmission Strengthening and Distribution Project

Attendance sheet: Consultation meeting during SS Audits'

Name of SS:
Locality/Area: Village/Town
Subdivision: District:
Date: Time:
Interviewed by:
Others Present:

S.No.	Name	Gender	Status - Resident	Signature
1-	Rohit Negi	M	Resident	
2-	Narendra Singh	M	Resident	

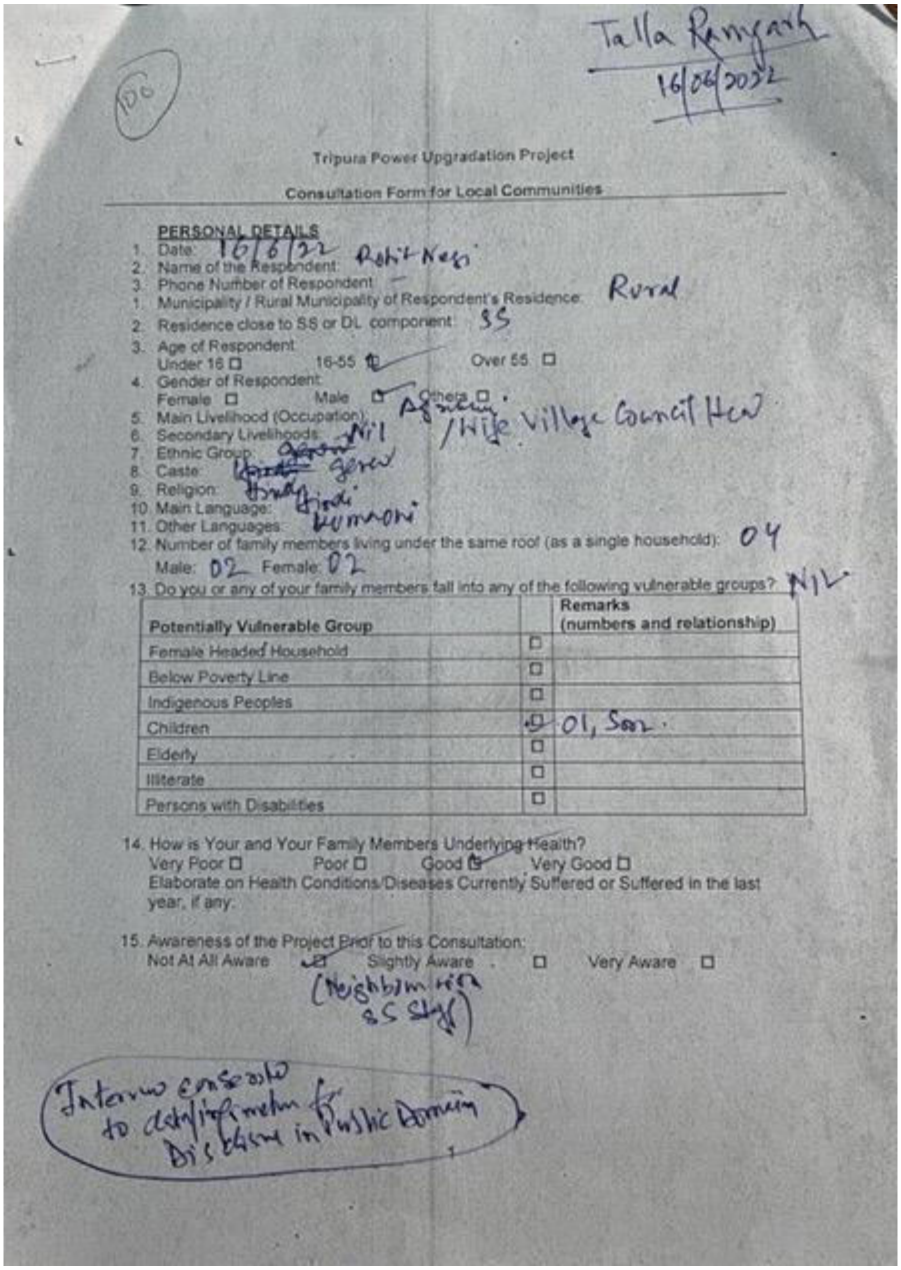
Project: ADB Funded Uttarakhand Transmission Strengthening and Distribution Project

Attendance sheet: Consultation meeting during SS Audits

Name of SS: Lal Tappa
Locality/Area: Lal Tappa
Subdivision:
Village/Town: Mazri Grant
District: Dehradun
Date: 09/06/22
Time:
Interviewed by: OD/BS
Others Present: SS staff.

S.No.	Name	Gender	Status - Resident	Signature
1.	Tony	M		
2.	Meena devi	F		
3.	Saroon Bhandari	F		
4.	Sumitra devi	F		

Completed Sample Consultation:



Talla Ramgarh
16/06/2022

Tripura Power Upgradation Project

Consultation Form for Local Communities

PERSONAL DETAILS

1. Date: 16/6/22
2. Name of the Respondent: Rohit Negi
3. Phone Number of Respondent: —
1. Municipality / Rural Municipality of Respondent's Residence: Rural
2. Residence close to SS or DL component: SS
3. Age of Respondent:
   Under 16 ☐ 16-55 ☑ Over 55 ☐
4. Gender of Respondent:
   Female ☐ Male ☑ Others ☐
5. Main Livelihood (Occupation): Agriculture / Wife Village Council Head
6. Secondary Livelihoods: Nil
7. Ethnic Group: General
8. Caste: General
9. Religion: Hindu
10. Main Language: Hindi
11. Other Languages: Kumaoni
12. Number of family members living under the same roof (as a single household): 04
    Male: 02 Female: 02
13. Do you or any of your family members fall into any of the following vulnerable groups? NIL

Potentially Vulnerable Group		Remarks (numbers and relationship)
Female Headed Household	☐	
Below Poverty Line	☐	
Indigenous Peoples	☐	
Children	☑	01, Son.
Elderly	☐	
Illiterate	☐	
Persons with Disabilities	☐	

14. How is Your and Your Family Members Underlying Health?
    Very Poor ☐ Poor ☐ Good ☑ Very Good ☐
    Elaborate on Health Conditions/Diseases Currently Suffered or Suffered in the last year, if any:
15. Awareness of the Project Prior to this Consultation:
    Not At All Aware ☑ Slightly Aware ☐ Very Aware ☐
    (Neighbour with SS Site)

Interview consents to data/information for Disclosure in Public Domain

LAND USE, LIVELIHOODS, AND SENSITIVE COMMUNITY RECEPTORS:

16. Where is your residence and/or land located in relation to the following project locations:

	Residence	Land/Cropland/Shop/Office, etc.	Remarks
In the vicinity of the distribution line ROW (within 50m)			
In the vicinity of the SS (within 50m)	SS		
None of the above (please specify)			

17. Are you Concerned about Land Use being Adversely Impacted By The Project?
Yes ☐ No ☐ Don't Know ☐
If yes, elaborate on Concerns and Suggest any Measures the Project Can Consider Mitigating Impacts, noting that compensation will be paid for land acquisition and resettlement.[1]

18. Accidental property damage during construction works of DL /SS – houses, shops, school, other infrastructures
Yes ☐
No ☐
Don't Know ☐
If yes, elaborate on Concerns and Suggest any Measures the Project Can Consider to Mitigate Impacts:

19. Are you aware of any sensitive community receptors that may be directly or indirectly adversely impacted by the project, please identify their location on map provided whenever possible: None

Receptor		Remarks Potential Impact/Suggested Mitigation
Agricultural land	☐	
Forest/Wildlife	☐	
School	☐	
Clinic, Health Center, or Hospital	☐	
Religious Building	☐	
Irrigation channel	☐	
Groundwater well	☐	
Road	☐	
Other	☐	

[1] Under Land Use Consider Damage to Crops, Structures, Trees etc. but also Landscape/Visual Impacts

BIODIVERSITY

20. Are you aware of any legally protected areas or other sensitive ecological haibat that may be directly or indirectly adversely impacted by the project, please identify their location on map provided whenever possible:

Legally Protected Area or Sensitive Ecological Habitat/KBA/IBA/Wildlife Movement/Active area	Location	Remarks Potential Impact/ Suggested Mitigation
Mountain/Forest	Around the Substation	—

21. Is any biodiversity[2] supported by the local area of social, economic, or cultural importance to your local community (e.g. fisheries, forests) used for personal consumption (heating, cooking, food, medicinal, religious) or commercial purposes?
Yes ☐ No ☑ Don't Know ☐
If yes, please elaborate:

22. With reference to the photo guide provided, are you aware of any of these threated, endemic or migratory species being present in the surronding area?

Yes ☑ No ☐ Don't Know ☐
If yes, please elaborate on species, season, and other factors including locations:

Species	Season Observed	When sites/heard about	Siting area	Any conflict/observations
Leopard (local name → Gordhon)	(forest fire) Not Specific	Sited Heard	River/Road	None
Black Bear	Summer	Heard	River	None

When forest fire than come down

23. Are you aware of any wildlife impacts associated with existing operation of the SS and DL e.g. elephant, bird or bat electrocution of collision?
Yes ☐ No ☑ Don't Know ☐
If yes, please elaborate:

24. Are you Concerned about Wild Animals and Plants being Adversely Impacted by The Project?
Yes ☐ No ☐ Don't Know ☑
If yes, Identify Habitats or Species of Concern and Suggest Measures the Project Can Consider Mitigating Impacts:

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[2] Wild animals or wild (not cultivated) plants including trees/timber within the surrounding area

> Monkey, Snake
> Bird – Owl, Longtailed Bird, Sparrow, Parrots

Habitat or Species	Remarks Potential Impact/Suggested Mitigation

PHYSICAL CULTURAL RESOURCES

25. Are you Concerned about Physical Cultural Resources being Adversely Impacted By The Project?
Yes ☐ No ☐ Don't Know ☐

26. Are you aware of any Physical Cultural Resources of either national or local importance (e.g. temples, shrines, religious forests, sacred groves or trees, cremation places etc.) that may be directly or indirectly adversely impacted by the Project, please identify their location on map provided whenever possible?

Name of Physical Cultural Resource	Location	Remarks Potential Impact/ Suggested Mitigation
Temple.	Tal Ranna North Area = 1km	—

HUMAN ENVIRONMENT

27. Are you aware of any of the following having occurred in the local area?
Earthquakes ☐ Landslides ☐ Storms ☐
Flooding ☐ Drought ☐ None ☐ Don't Know ☐

28. Do You Believe that TSECL has Met National Regulations for the operation of its exiting SS and DL lines? If No, please elaborate and provide suggestions for improvement? Don't Know

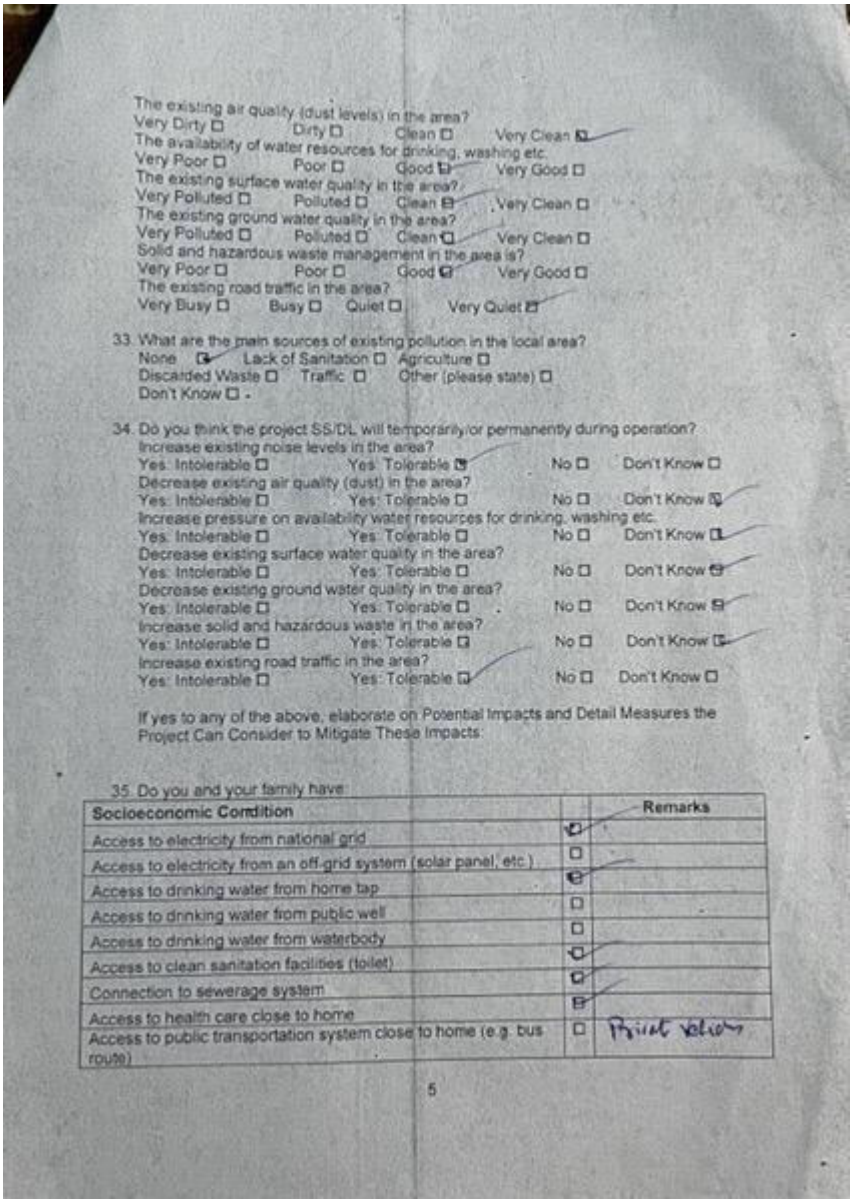
29. Are you aware of any incidents/human fatalities having occurred due to operation of TSECL's exiting SS and DL lines? If yes, please elaborate? None

30. Are you aware that, if not well managed, there may be community safety risks associated with operation of the SS and DL?
Yes ☐ No ☐ Don't Know ☐
Please elaborate on Concerns and, if no, suggest any Measures the Project Can Consider Increasing Awareness: — Remove Pole from Road Side

31. Are you Concerned about the Overall Community Health and Safety Impacts of the Project?
Yes ☐ No ☐ Don't Know ☐
If yes, elaborate on Concerns and Suggest any Measures the Project Can Consider Mitigating Impacts:

32. How would you qualify the existing noise level in the area?
Very Quiet ☐ Quiet ☐ Noisy ☐ Very Noisy ☐

4



The existing air quality (dust levels) in the area?
Very Dirty ☐ Dirty ☐ Clean ☐ Very Clean ☑
The availability of water resources for drinking, washing etc.
Very Poor ☐ Poor ☐ Good ☑ Very Good ☐
The existing surface water quality in the area?
Very Polluted ☐ Polluted ☐ Clean ☑ Very Clean ☐
The existing ground water quality in the area?
Very Polluted ☐ Polluted ☐ Clean ☐ Very Clean ☐
Solid and hazardous waste management in the area is?
Very Poor ☐ Poor ☐ Good ☑ Very Good ☐
The existing road traffic in the area?
Very Busy ☐ Busy ☐ Quiet ☐ Very Quiet ☑

33. What are the main sources of existing pollution in the local area?
None ☑ Lack of Sanitation ☐ Agriculture ☐
Discarded Waste ☐ Traffic ☐ Other (please state) ☐
Don't Know ☐ -

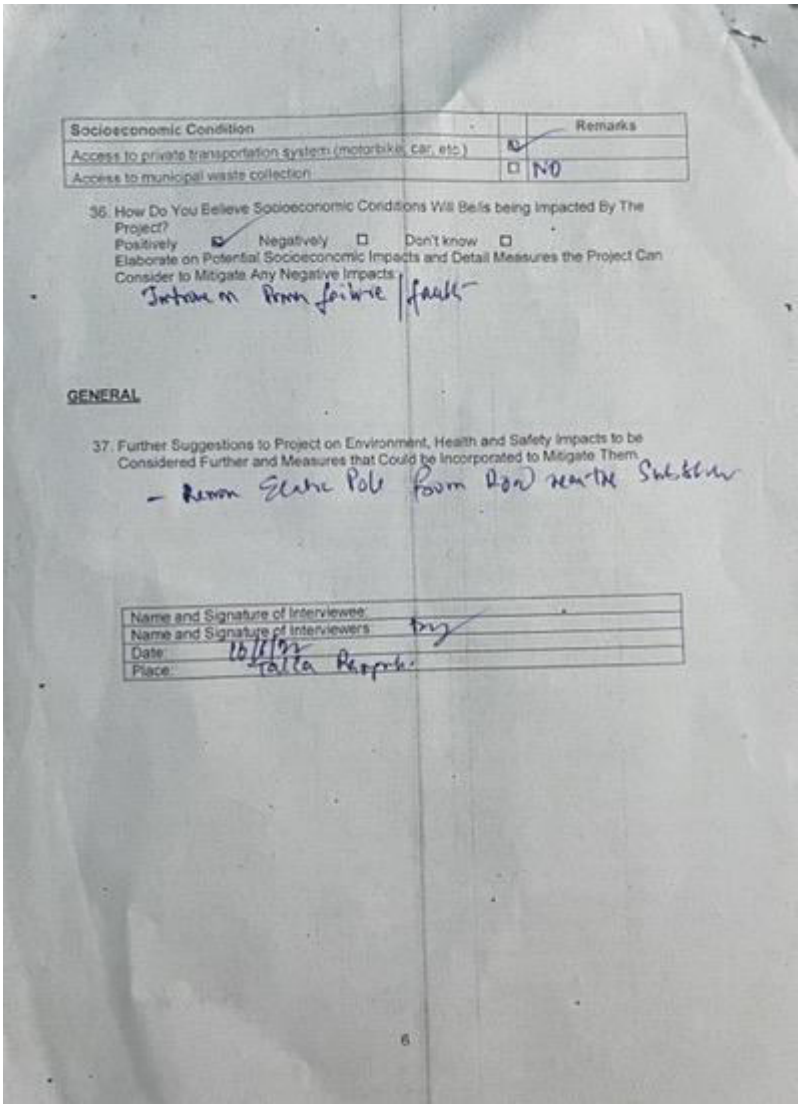
34. Do you think the project SS/DL will temporarily/or permanently during operation?
Increase existing noise levels in the area?
Yes: Intolerable ☐ Yes: Tolerable ☑ No ☐ Don't Know ☐
Decrease existing air quality (dust) in the area?
Yes: Intolerable ☐ Yes: Tolerable ☐ No ☐ Don't Know ☑
Increase pressure on availability water resources for drinking, washing etc.
Yes: Intolerable ☐ Yes: Tolerable ☐ No ☐ Don't Know ☑
Decrease existing surface water quality in the area?
Yes: Intolerable ☐ Yes: Tolerable ☐ No ☐ Don't Know ☑
Decrease existing ground water quality in the area?
Yes: Intolerable ☐ Yes: Tolerable ☐ No ☐ Don't Know ☑
Increase solid and hazardous waste in the area?
Yes: Intolerable ☐ Yes: Tolerable ☐ No ☐ Don't Know ☑
Increase existing road traffic in the area?
Yes: Intolerable ☐ Yes: Tolerable ☑ No ☐ Don't Know ☐

If yes to any of the above, elaborate on Potential Impacts and Detail Measures the Project Can Consider to Mitigate These Impacts:

35. Do you and your family have

Socioeconomic Condition		Remarks
Access to electricity from national grid	☑	
Access to electricity from an off-grid system (solar panel, etc.)	☐	
Access to drinking water from home tap	☑	
Access to drinking water from public well	☐	
Access to drinking water from waterbody	☐	
Access to clean sanitation facilities (toilet)	☑	
Connection to sewerage system	☐	
Access to health care close to home	☑	
Access to public transportation system close to home (e.g. bus route)	☐	Private vehicle

5



Socioeconomic Condition		Remarks
Access to private transportation system (motorbike, car, etc.)	☑	
Access to municipal waste collection	☐	NO

36. How Do You Believe Socioeconomic Conditions Will Be/Is being Impacted By The Project?
Positively ☑ Negatively ☐ Don't know ☐
Elaborate on Potential Socioeconomic Impacts and Detail Measures the Project Can Consider to Mitigate Any Negative Impacts.
Increase in Room for the fault

GENERAL

37. Further Suggestions to Project on Environment, Health and Safety Impacts to be Considered Further and Measures that Could be Incorporated to Mitigate Them
- Remove Electric Pole from Road near the Sidewalk

Name and Signature of Interviewee:	
Name and Signature of Interviewers:	[signature]
Date:	10/11/17
Place:	Talta Resort

6

Source: ADB TA Consultant

Annexure 4: Common Corrective Action Plan (Cap) For Existing Substations

Non-Compliance Issue	Corrective Action	By whom	By when	Budget (source)
SHORT TERM CORRECTIVE ACTIONS				
General	• Provide all SS managers with EHS awareness training so they can understand and implement the corrective action that is required at each SS • Provide specific training to all SS managers/workers on PCBs to raise awareness of the risks and the need for compliance with national regulations; the Regulation of Use, Handling and Disposal of Polychlorinated Biphenyls and the Hazardous and Other Wastes (Management and Transboundary Movement) Rules. • Provide specific training to SS managers/workers on SF6 management, and management of end of life/defunct/damaged units like gas-based circuit breakers to ensure they are appropriately disposed of by a certified industrial waste management company who will need to remove SF6 and treat the equipment prior to disposal in accordance with International Electrotechnical Commission (IEC) standard 61634 and ensure the SF6 is not released to atmosphere.	PMU E&S Officer with support of PISC	Upon loan effectiveness	UPCL with training expertise provided under PISC budget
	• Submit a status report for each SS confirming the implementation status of short-term corrective action plan to ADB for clearance prior to commencement of any works at the SS in question	PMU E&S Officer with support of PISC	Before access to SS given to contractor	UPCL
	• Records of all EHS permits applicable to the SS to be made available at the SS site	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer	Before access to SS given to contractor	UPCL

Non-Compliance Issue	Corrective Action	By whom	By when	Budget (source)
Housekeeping/waste management	• Prohibit any open burning of waste at the SS site • Dedicated labelled storage areas for materials and segregated waste; ideally storage will be in a locked area, under cover to provide shelter from the elements, having fully enclosed garbage bins for the disposal of municipal solid waste, and where liquids or leachable materials are stored having an impermeable floor bunded to 110% capacity of the volume that is stored • If impermeable floor bunded to 110% is not available in the short-term, liquid and leachable materials/waste to be kept on drip trays to provide secondary containment • Tidy up the SS ensuring all materials and wastes including cables, broken electrical systems, meters, glass and plastic, oils etc. are collected up, segregated, and stored in the designated and labelled storage areas • Remove (and prohibit any further) end-of-life equipment or waste stored outside the SS boundary relocating it to designated and labelled storage areas within the SS • Remove all end-of-life equipment that has built up on site to UPCL stores with storage, transport, and disposal as per the GoI regulations following the waste hierarchy • Remove all other waste that has built up on site by appropriately licensed waste management company with all storage, transport, and disposal as per GoI regulations [including but not limited to the (i) Hazardous and Other (Management and Transboundary Movement) and Amendment, Rules, 2019 (ii) Construction and Demolition Waste Management Rules, 2016, (iii) E-Waste Management Rules, 2016, and (iv) Plastic Waste Management Rules, 2016] whilst following the waste hierarchy	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer	Before access to SS given to contractor, or if including corrective action in contract this is to be completed by contractor before they commence works	UPCL

Non-Compliance Issue	Corrective Action	By whom	By when	Budget (source)
Transformers and oil leakage	• Filled drums (mineral oil) are all to be sealed and labelled with their contents with safety warnings • MSDS to be available at the SS site for all the materials used on site • Collect up and store empty and filled drums (mineral oil) in a locked, under cover, designated storage area, they should either be stored on an impermeable floor bunded to 110% capacity of volume stored, or if not available in the short-term kept on drip trays to provide secondary containment • Defunct transformers prior to being removed from site are to be placed in a designated storage area, they should either be stored on an impermeable floor bunded to 110% capacity of volume stored, or if not available in the short-term kept on drip trays to provide secondary containment • Inventory to be prepared of existing transformers on site, make, model, risk of PCBs and other details including transformer test report, details any maintenance works undertaken, dates oil changes, leakage incidents etc. • Clearly label all transformers as either containing PCBs, at risk of containing PCBs, or PCB-free provided documentary evidence exists[18] • Carry out inspections and preventive maintenance to minimize oil leakages; ensure values, nuts and bolts are fully functional and tightly secured, ensure rubber seals of radiators are intact • Existing transformers in a poor state of repair and which are currently leaking oil to be maintained/repaired so they are left in good condition • Health and safety risk assessment for exposure of staff to PCBs to be undertaken before maintenance/repair work is undertaken on any existing SS transformers • Clean up all existing oil spill, excavate any contaminated soil and send for disposal (as hazardous waste) using appropriately licensed waste management company with all storage, transport, and disposal as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 • Make available spill management materials (sorbent pads, loose sorbent material, sand, etc.) next to the storage area for immediately soaking up any leaks or spills that do accidentally occur	UPCL SS Manager with support PIU/Electrical Division under guidance of PMU E&S Officer	Before access to SS given to contractor, or if including corrective action in contract this is to be completed by EPC contractor before they commence works	UPCL

Non-Compliance Issue	Corrective Action	By whom	By when	Budget (source)
Escape of SF6	• Inventory to be prepared of all SF6 containing equipment on site, their make and model, volume of SF6 contained, details of repair works undertaken, dates of SF6 replenishment, leakage incidents etc. • Provide SF6 leakage detection equipment at all SS supporting SF6 containing equipment. • Carry out inspections and preventive maintenance to minimize SF6 leakages.	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer	Before access to SS given to contractor, or if including corrective action in contract this is to be completed by contractor before they commence works	UPCL
Noise, EMF, lighting, and ventilation	• Existing vents/windows to be unblocked • Defunct bulbs/lights to be replaced • Provide adequate natural and/or artificial lighting levels to meet the IFC EHS Guidelines on Occupational H&S (*Table 2.3.3. Minimum Limits for Workplace Illumination Intensity*) within control rooms, toilets, stairways, and other areas having regular staff movements	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer	Before access to SS given to contractor, or if including corrective action in contract this is to be completed by contractor before they commence works	UPCL

[18] In the absence of documentary evidence (e.g., contract specification or certification for supply of original transformer, maintenance records for oil replacement including material safety data sheet, or transformer oil test results etc.) for given transformers confirming they are PCB-free, all old transformers must be considered by the staff at risk of containing PCBs. Mineral oil-filled transformers were not designed to use PCBs, but many have been found to be contaminated with PCBs.

Non-Compliance Issue	Corrective Action	By whom	By when	Budget (source)
First aid equipment	• Make available fully stocked, in-date first aid kit in a prominent, signed position • Provide eye wash station and water supply to shower located near the storage areas for fuel/oil/chemicals	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer	Before access to SS given to contractor, or if including corrective action in contract this is to be completed by contractor before they commence works	UPCL
Fire safety equipment	• Provide sand buckets, full of sand, placed in a prominent, signed location near to fire-risk locations such as transformers and oil storage areas • Make available fire extinguishers (including for oil and electric fires) in a prominent, signed location near to fire-risk locations such as transformers and oil storage areas with service and expiration dates clearly labelled. • Expired/exhausted fire extinguishers to be refilled/replaced so all are in date.	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer	Before access to SS given to contractor, or if including corrective action in contract this is to be completed by contractor before they commence works	UPCL

Non-Compliance Issue	Corrective Action	By whom	By when	Budget (source)
Community H&S	• Entire SS boundary to be well secured, existing boundary fence or wall to be installed/repaired/replaced ensuring no gaps for entry of people or livestock/wild animals and that it is sufficiently high so that it cannot be climbed over • For SS that are housing divisional offices to be fenced off from the SS so that office workers and members of community paying bills do not have access to the SS. • Gates are to be installed/repaired/replaced and to be kept always closed except when there is vehicle/staff movement through the gate. Recommended to have a larger gate for the vehicles and a side gate for staff entry/exit. • Doors to control rooms to be kept shut during both day and night. • Security persons are to be deployed at all SS for 24x7 period with rotation/shifts. Number of security guards is to be determined by UPCL based on the size/area of the SS and adjacent land use. • Close-circuit (CC TV) camera to be installed at those substations located in leopard encounter areas with monitoring in the control room • Dedicated shelter to be provided at the site entrance for use by any security guards, shielding them from rain, wind, and extreme (hot and cold) temperatures. • Switch yard area/transformers are also to be fenced having a locked gate with visual and written warning signages including the ISO 7010 Hazard Type: Electrical Symbol warning of the risk of electrocution. • Safety signage with large and colorful display to be placed along SS boundary and at gate with visual and written warning signages including the ISO 7010 Hazard Type: Electrical Symbol warning of the risk of electrocution. • Safety sign to be placed to make local community aware that the SS site is out of bounds for livestock.	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer	Before access to SS given to contractor, or if including corrective action in contract this is to be completed by contractor before they commence works	UPCL

Non-Compliance Issue	Corrective Action	By whom	By when	Budget (source)
Handling emergencies	• Identify and install emergency exit signage on all emergency exits • Keep clear all the emergency exits, remove blockages due to storage of end-of-life equipment • Provide first aid posters including first aid for electrocution incident • Prominently post a list of doctors/emergency health/fire station contacts (names/locations/phone numbers) list in case of emergency • Provide posters on fire safety • Establish and maintain an incident logbook	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer	Before access to SS given to contractor, or if including corrective action in contract this is to be completed by contractor before they commence works	UPCL

Non-Compliance Issue	Corrective Action	By whom	By when	Budget (source)
H&S of staff	• Provide everyone who enters the SS with an OHS induction • Records of medical tests / health check-up of staff to be accessible by the SS Manager • All staff to be given required PPE and other requisite safety equipment. • Provide sufficient PPE spares available on site for visitors etc. • Ensure all staff and visitors always wear PPE including safety boots • Introduce disciplinary system for non-compliance with PPE requirements to enforce their use • All potential trip and fall hazards to be removed including repair of broken floor inside control rooms, cable drain tiles and covers, etc. • All the electrical equipment to have visual and written warning signage including the ISO 7010 Hazard Type: Electrical Symbol warning of the risk of electrocution. • Carry out inspections and preventive maintenance to ensure electrical standards are upheld • Employ third party to conduct pest control, if required. Pest control to be based on integrated pest management approaches and aim to reduce reliance on synthetic chemical pesticides especially those hazardous to human health and the environment, such as, the use of carbolic acid as deterrent to snakes. • Food waste to be stored in fully enclosed bins to avoid attracting wild life, rodents usually followed by snakes • Strict observation of COVID-19 requirements whilst pandemic is ongoing including wearing of masks, use of hand sanitizers, etc. • Health and safety risk assessment for exposure of staff to asbestos dust to be undertaken before maintenance/repair work is undertaken; potential presence of asbestos at the SS to be surveyed by using a competent third party[19]	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer	Before access to SS given to contractor, or if including corrective action in contract this is to be completed by contractor before they commence works	UPCL
Drainage	• In damp/wet areas the surfaces of the SS are to be cleaned so algae (slippiness) is not present and warning signs to be placed	UPCL SS Manager with support PIU/Electrical Sub-	Before access to SS given to contractor,	UPCL

[19] In the event asbestos is found, its presence should be documented, and warning signs installed to avoid it being disturbed. If at risk of being disturbed thereby exposing workers to asbestos dust an Asbestos Removal Plan is to be prepared detailing how asbestos will be safely removed from site, asbestos must not be disturbed by workers but removed by a competent specialist asbestos contractor in accordance with GoI requirements, the WB-IFC EHS general guidelines and other GIIP. Asbestos waste must be safely and soundly disposed of as a hazardous waste material in accordance with GoI regulations and WB-IFC EHS general guidelines.

Non-Compliance Issue	Corrective Action	By whom	By when	Budget (source)
		Division under guidance of PMU E&S Officer	or if including corrective action in contract this is to be completed by contractor before they commence works	
Old Equipment	• Bunded storage area for old equipment / replaced equipment will be established. Must be able to contain at least 1500 liters of oil and be large enough to store a 20 ton transformer	UPCL SS Manager with support PIUs/Electrical Sub-Division under guidance of PMU E&S Officer	Before access to SS given to contractor, or if including corrective action in contract this is to be completed by contractor before they commence works	UPCL
Sanitation and welfare facilities	• Provide potable drinking water supply meeting GoI drinking water standards (regular testing of drinking water is included in IEE EMoP scope) • For all existing toilets ensure adequate lightening, repairing of door, locks, and latches provided as well as hand washing facilities with soap and water • Cleaning of existing toilets on daily basis, use of disinfectant and floor cleaners • Ensure all sources of wastewater connected to septic tank • Ensure that septic tanks are well maintained • Install a soakaway for disposal of the septic tank wastewater, no untreated wastewater should be disposed of to surface water or ground • For the welfare of SS staff during their shifts provide a dedicated cooking area / clean eating area / rest area for staff on-site that meets GoI and ILO worker accommodation requirements	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer	Before access to SS given to contractor, or if including corrective action in contract this is to be completed by contractor before they commence works	UPCL

Non-Compliance Issue	Corrective Action	By whom	By when	Budget (source)
Other	• Provide a safe vehicular access for entry/exit from the substation to the road (public highway) having adequate sight lines for all drivers and warning signs of entranceway • UPCL access roads to substations to be repaired (Lamgarah, Rudrapur) before any works at the substation commences • Remove any stored distribution poles/lines from road side (Rudrapur, Talla Ramgarh) • Maintain vegetation at the SS that poses a health and safety hazard e.g., because gaps/channels/broken covers are hidden due to vegetation growth or snakes may be hidden within the grass etc.	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer	Before access to SS given to contractor, or if including corrective action in contract this is to be completed by contractor before they commence works	UPCL
LONG TERM CORRECTIVE ACTIONS				
General	• Develop and adopt corporate wide EHS policy and manuals/procedures (SOP) for SS operation • SOP developed to include guidelines for pollution prevention including management or handling procedures for oil spills, spillage, runoff from leaks off equipment, and waste management, including for hazardous waste management • SOP develop to include guidelines for H&S management including emergency preparedness • Ensure copy of EHS policy and SOP available at all SS • Provide SS managers/workers on training with respect implementation of the SOP • Submit a status report for each SS confirming the implementation status of long-term corrective action plan to ADB for clearance prior to commissioning of the SS in question by the contractor	PMU E&S Officer with support of PISC	Prior to commissioning by the EPC contractor	UPCL with guidance of ADB TA Consultant in preparing the SOP
Housekeeping/waste management	• In SS where a locked, under cover material and waste storage area with an impermeable floor bunded to 110% capacity of the volume stored are not available in the short-term for the storage of fuel/oil/chemicals and solid/hazardous waste construct such a storage area	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer (either as a separate undertaking	Prior to commissioning by the contractor	UPCL

Non-Compliance Issue	Corrective Action	By whom	By when	Budget (source)
		or to be included in the scope of EPC contract)		
Transformers and oil leakage	• In SS where existing transformers are at risk of containing PCBs ensure they are tested[20] (such testing is included in IEE EMoP scope) • For those transformers confirmed as containing PCBs ensure these are dechlorinated or removed from site with storage, transport, and disposal as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 • In SS where bund of 110% capacity extending beyond the transformer footprint is not available in the short-term retrofit such a bund to existing transformers	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer (either as a separate undertaking or to be included in the scope of work contract)	By 31/12/2025[21]	UPCL
Escape of SF6	• Install SF6 leakage warning alarm for existing equipment containing SF6	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer (either as a separate	Prior to commissioning by the contractor	UPCL

[20] The most suitable way to determine if PCB is present is for a suitably qualified institute to sample and analyze the oil in accordance with United Nations Environment Protection Agency (UNEP) Guidelines (PCB_ID_1st_print-2.PDF (unep.org)) following a health and safety risk assessment and plan referring to PCB Transformers and Capacitors: From Management to Reclassification and Disposal - First Issue (unep.org). It is not recommended to take an oil sample from hermetically sealed oil distribution transformers since the transformer itself is fully closed to the environmental condition, but a sample for PCB testing can be taken by experienced staff. Conservator type transformers can be readily tested. Once transformers have been found to contain PCBs they must be labelled as such, any PCB storage areas should also be marked to allow expeditious identification and response to a PCB accident. Similarly, transformers found to be PCB free should be marked as such for future reference of compliance with GoI regulations and the log of test results to support this kept by UPCL.

[21] Government of India Regulation of Use, Handling and Disposal of Polychlorinated Biphenyls permits the use of existing PCB containing equipment up until 31.12.2025 provided it is within its certified lifetime and properly maintained without possibility of leakage or release of PCBs into the environment with disposal of waste PCBs or contaminated equipment by 2028 in accordance with the Stockholm Convention.

Non-Compliance Issue	Corrective Action	By whom	By when	Budget (source)
		undertaking or to be included in the scope of work contract)		
Noise, EMF, lighting, and ventilation	• Control panel and other equipment within SS control buildings to be rearranged and placed in a manner to maximizing natural ventilation and light • Switch yard lightening system to be improved so all areas well-lit at night when required	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer (either as a separate undertaking or to be included in the scope of work contract)	Prior to commissioning by the contractor	UPCL
Fire safety equipment	• Ensure automatic fire alarm, fire suppression systems and firewalls installed	UPCL SS Manager with support PIU/Electrical Division under guidance of PMU E&S Officer (either as a separate undertaking or to be included in the scope of EPC contract)	Prior to commissioning by the EPC contractor	UPCL
Handling emergencies	• Ensure a SS specific emergency preparedness plan is developed including the communication system and protocols for response to a fire, earthquake, flood, medical emergency etc. and followed for SS operation with regular fire drills and alarm tests conducted (copy kept on site) • Ensure all SS workers receive basic first aid and firefighting training with annual refreshers • Ensure that at least one staff at SS is fully trained as a first aider and fire marshal	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer	Prior to commissioning by the contractor	UPCL

Non-Compliance Issue	Corrective Action	By whom	By when	Budget (source)
H&S of staff	• Ensure H&S risk assessment is completed for the SS operation and maintenance works undertaken and that appropriate H&S management actions identified including a system of issuing permits for work at height etc. (copy of risk assessment and the action plan to be kept on site) • Building structural status – ensure building repairs are undertaken to maintain the integrity of control buildings especially in the event of an earthquake	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer (either as a separate undertaking or to be included in the scope of EPC contract)	Prior to commissioning by the contractor	UPCL
Drainage	• Ensure SS has adequate drainage to avoid damp and wet conditions • Provide storm drainage at the SS with oil-water separator on all drains • Construct a storm water drainage at Sahiya ss the area between the ss compound and the nearest house is flooded during monsoon. • Retention wall is required 250m upstream of the Garampani substation on the river to divert the heavy water flow away from the substation (although design to not exacerbate flooding elsewhere)	UPCL SS Manager with support PIU/Electrical Sub-Division under guidance of PMU E&S Officer	Prior to commissioning by the contractor	UPCL

Source: ADB TA Consultant