Initial Environmental Examination

Project Number: 51308-008
September 2023

India: Uttarakhand Climate Resilient Power System Development Project

Appendices Part 2

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

Appendix D – Rapid Environmental Assessment Checklist

Rapid Environmental Assessment (REA) Checklist

Country/Project Title: **IND: Uttarakhand Climate Resilient Power System Development Project**

Sector Division: **South Asia Department Energy Sector**

Screening Questions	Yes	No	Remarks
A. PROJECT SITING IS THE PROJECT AREA ADJACENT TO OR WITHIN ANY OF THE FOLLOWING ENVIRONMENTALLY SENSITIVE AREAS?			
▪ CULTURAL HERITAGE SITE		✓	Project components do not impact on any internationally, nationally or state designated cultural heritage sites. None of the proposed substations or alignments of power lines and/or cables are within or near any ASI or state protected monuments. However, local physical cultural resources are present.

Screening Questions	Yes	No	Remarks
▪ PROTECTED AREA	✓		PTCUL components: none of the proposed 8 substations or HV Power lines are located within or close to any nationally or internationally designated protected areas with the exception of Khatima-II SS and LILO lines are within 250m of a tiger corridor. However, these are located in a semi-urban location outside of the reserve and no direct impacts to this area are anticipated. Mitigation measures will be applied to ensure workers to not encroach in this area. Second stringing of an existing 132 kilovolts (kV) overhead line passing through government forest land has already received written approval of Department of Forests on the condition no new trees will be cut. Forest clearance for the original line was previously obtained by PTCUL. UPCL Components: the proposed substation at Kaniya lies in the nominal 10 kilometers (km) ecologically sensitive zone (ESZ) of Corbett National Park which is applicable since the actual ESZ boundaries not yet notified. It is on government land located adjacent to a road and amidst the settlement of Sawaldya village near Ramnagar. It will be fed from a PTCUL substation at Chilkiya Ramnagar. Given the ESZ location the associated power line has been planned through underground cable which will be constructed within the right of way of existing road. Hence no impact on the protected area is envisaged. Other than this, none of the new substations and associated lines/cables are proposed in a protected area. No existing substations are located in the protected areas although some are in the vicinity of forest land. Both PTCUL and UPCL substations and underground cables in the built up urban area of Dehradun are within the Doon Valley Ecologically Sensitive Area but this is designated to control pollution from industrial activities rather than for its biodiversity value and construction works are allowed.
▪ WETLAND		✓	No protected or classified wetland is located within or near the proposed substations and the alignment of the proposed power lines.
▪ MANGROVE		✓	No such area is located in the project Vicinity.
▪ ESTUARINE		✓	No such area is located in the project Vicinity.
▪ BUFFER ZONE OF PROTECTED AREA	✓		See comments relating to protected areas above.
▪ SPECIAL AREA FOR PROTECTING BIODIVERSITY	✓		See comments relating to protected areas above.

Screening Questions	Yes	No	Remarks
B. POTENTIAL ENVIRONMENTAL IMPACTS WILL THE PROJECT CAUSE…			
▪ encroachment on historical/cultural areas, disfiguration of landscape and increased waste generation?	✓		None of the proposed substations and power lines and/or cables are located in proximity to any ASI or state protected monuments. However, some local physical cultural resources are present and will need to be protected from damage during construction. The possibility of chance finds is low since the works are proposed in areas with less historical significance but given the extensive excavation works for the underground cabling it is possible that they could occur. A chance find procedure will be developed. There will be land disturbance due to construction of the substations and the high voltage power lines. High voltage power lines are generally passing through agricultural areas and are already a feature in the wider landscape of the project areas. There will be an increase in waste during construction that will be mitigated by the implementation of the EMP requiring good housekeeping and a Construction Waste Management Plan to be developed by the Contractor reflecting national requirements and international good practice.
▪ encroachment on precious ecosystem (e.g. sensitive or protected areas)?	✓		See comments relating to protected areas above. The sites and routes selected for all substations and lines avoided protected areas. However, there is the possibility of threatened birds being present in the Project area. The IEE and its EMP will propose measures, such as bird diverters to reduce potential impacts to species.
▪ alteration of surface water hydrology of waterways crossed by roads and resulting in increased sediment in streams affected by increased soil erosion at the construction site?		✓	Not anticipated. Substations will not affect waterways and high voltage power line towers will not be located in water courses and so are unlikely to have any impacts on hydrological features. During construction of new substations, tower construction and laying of underground cables sediment laden runoff can be minimized by good housekeeping practices, avoiding civil works during rainy seasons etc.
▪ damage to sensitive coastal/marine habitats by construction of submarine cables?		✓	Not Applicable

Screening Questions	Yes	No	Remarks
▪ deterioration of surface water quality due to silt runoff, sanitary wastes from worker-based camps and chemicals used in construction?	✓		Loose soil resulting from excavation works (during construction of new substations, laying of high voltage power lines and underground cables) along with surface water runoff could result in increased sedimentation of water courses, but this will be mitigated by good housekeeping as prescribed in the EMP with works avoided during the rainy season and conditions for the storage and management of soil stockpiles etc. Since local labour is easily available labour camps may not be required. Local hiring will be given priority. For the power lines/cables, in general, only small groups of workers are required (10–15 people) at work sites which move along the work corridor thus portable self-contained toilet facilities will need to be provided for laborers engaged in transient works. Most workers may stay in community facilities or rented accommodation. But if setting of labour camps is required within the substation sites, or close to power line alignments, contractors will be required to provide sanitary and waste management facilities for minimizing the sanitary waste for the workers; the waste management will be prescribed in an EMP to ensure it disposed in an environmentally safe and sound manner. Open defecation, use of pit latrines and discharge of untreated sewage to waterways will be prohibited. Construction related oils, fuels or chemicals used will need to be stored in an environmentally safe and sound manner and be disposed as per the guidelines of the Hazardous Wastes (Management, Handling and Trans-Boundary Movement) Rules, 2008.
▪ increased local air pollution due to rock crushing, cutting and filling?	✓		During the construction of new substations, localized air pollution may occur for a small duration due to increased dust during excavation especially for substations and underground cables being laid in open trenches in Dehradun, but impacts will be temporary and localized. Similarly increased dust may occur while making excavations for tower foundations. Mitigation measures will be detailed in an EMP to minimize the impact, such as dampening down work zones and stockpiles. Construction material will be obtained from statutorily approved sources.

Screening Questions	Yes	No	Remarks
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	✓		Risks exist during substation construction and operation and in the construction and maintenance of power lines. General OHS impacts relating to working with live electricity and electrical equipment and construction vehicles exist. Also, during underground cabling and maintenance works due to nonplacement of cable markers and not marking over existing electrical cable routes. Mitigation measures to be included in an EMP will ensure that workers are adequately qualified for the job and provided with regular OHS training and safety equipment. International good practice guidelines, such as the IFC environmental health and safety (EHS) Guidelines will also form part of the EMP requirements.
▪ chemical pollution resulting from chemical clearing of vegetation for construction site?		✓	Chemical clearing of vegetation is not envisaged in the proposed works, and will not be permitted.
▪ noise and vibration due to blasting and other civil works?		✓	Increased noise levels and possibly vibrations are expected during construction and operation. Mostly the works outside of Dehradun avoid residential areas, however many residential receptors are present in Dehradun and they will be impacted by project noise. Usage of construction machinery can generate around 90dBA at source meaning that in some instances noise levels close to the work zones may be elevated above relevant standards, but generally for short periods. Specific measures will need to be outlined in the EMP to manage construction noise, such as time constraints, providing stationary equipment like DG set with acoustic enclosures etc. Blasting may be required in rocky areas, although there are few such areas and they will likely be located a distance from sensitive human receptors.

Screening Questions	Yes	No	Remarks
▪ dislocation or involuntary resettlement of people?	✓		Potential involuntary resettlement impact for construction of one substation being addressed through a Resettlement Plan. For high voltage power lines agriculture land belonging to private owners shall be utilized for tower bases; no residential structures will be affected due to alignment of line, but agricultural crops may be damaged etc. For underground cables temporary dislocation and/or impact on roadside businesses is anticipated during laying of underground cables alongside roads due to restriction of access to shops during the period of laying of cables. Further detailed assessment of involuntary resettlement related impacts will be included in a Resettlement Plan.
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?	✓		No indigenous people are present in the Project area. Due to the introduction of new electrical infrastructure children may be at increased risk from electrocution if not sensitized. Some disproportionate impacts as a result of construction may occur on the poor, women and children, plus the elderly or those suffering respiratory diseases due to increased dust etc.
▪ social conflicts relating to inconveniences in living conditions where construction interferes with pre-existing roads?	✓		Construction works are not expected to cause significant social conflicts. Some inconvenience may be caused due to increased road traffic/ congestion and road blockages especially for works in Dehradun and the underground cabling associated with Kaniya substation which will run in the ROWs. However, these should be short lived and localized. Traffic management Plan will need to be developed and implemented to manage interference with pre-existing roads and facilitate safe access and passage for residents during works.
▪ hazardous driving conditions where construction interferes with pre-existing roads?	✓		Road congestion may increase temporarily during construction, yet this should be of short duration and localized. To minimize the impact a traffic management plan will need to be prepared and implemented by the contractors to manage any potentially hazardous driving condition. Prior information about road closures and/or diversions, appropriate signage, flagmen, and other traffic management controls will need to be implemented. Safe diversions will need to be put in place to ensure the safety of pedestrians and drivers with barriers to demarcate open trenches or excavations.

Screening Questions	Yes	No	Remarks
▪ Creation of temporary breeding habitats for vectors of disease such as mosquitoes and rodents?	✓		Potential for ponding although works will be of limited duration. The ground water or rainwater collected in any excavated pits should be pumped out immediately and all excavations would need to be filled back to original level as soon as possible. Proper sanitation and wastewater management will be required to avoid creation of temporary breeding habitats for vectors of disease such as mosquitoes and rodents.
▪ dislocation and compulsory resettlement of people living in right-of-way of the power transmission lines?		✓	Further detailed assessment of IR related impacts will be included in a Resettlement Plan. Dislocation and compulsory resettlement of people in the right-of-way is unlikely to be needed. Land to be used for power line towers or poles is mostly agricultural/barren land. However, compensation will be paid for temporary damages to the crops per Resettlement Plan. PTCUL and UPCL underground cabling will be laid in the existing utility corridor of roads. Limited temporary dislocation/ impact on roadside businesses is anticipated during laying of underground cables alongside roads due to restriction of access to shops during the period of laying of cables.
▪ **environmental disturbances associated with the maintenance of lines (e.g. routine control of vegetative height under the lines)?**	✓		In general there are few trees that exist within the HV alignments and substations. Some tree cutting and routine clearance of vegetation maybe required during operational phase, but no significant impacts from this activity are anticipated. All lines in Dehradun will be underground and will not result in environmental disturbance during maintenance.
▪ facilitation of access to protected areas in case corridors traverse protected areas?		✓	Not applicable.
▪ disturbances (e.g. noise and chemical pollutants) if herbicides are used to control vegetative height?		✓	Usage of herbicides will be prohibited.

Screening Questions	Yes	No	Remarks
▪ large population influx during project construction and operation that cause increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	Large population influx is not anticipated. Local labor is readily available. Preference will be given to this local labor. Works will be of small scale and short duration. If setting of labor camp is required at the substation sites, contractors will provide labor camp for around 30-35 laborers on substation site with separate water supply and sanitation facilities, which will need to be established to not cause any burden on social infrastructure and services (such as water supply and sanitation systems) of nearby residents. Drinking water will be obtained from only the approved sources or an approved new borewell source. For h power lines or cables, only small crew of 10-15 people at a time moving out in one week to another location.
▪ Social conflicts if workers from other regions or countries are hired?		✓	No such issues envisaged. Local labor is readily available. Preference will be given to local labor to avoid social conflicts and to minimize provision of temporary construction camps.
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?	✓		If needed the labor camps will be constructed away from local settlements with proper sanitation and solid waste disposal facilities to avoid possible transmission of communicable diseases from workers to the local population. For high voltage power lines, the labor camps will be migratory in nature and workers may stay in either community facilities or rented accommodation instead of setting up a dedicated labor camp. Disposal of solid waste from labor camps will be of small volumes but there will be sanitary wastewater. Contractors will be required to provide adequate sanitation facilities during construction and training on sanitation and solid waste disposal. Awareness will be created amongst the workers about hygiene and health protection. All wastes from sites and camps will be segregated and treated accordingly; inert waste (soil) will be used for backfilling as much as possible to avoid waste generation. Remaining wastes will be collected and disposed of by licensed waste management contractors. The EMP will need to provide clear guidelines relating to the management of all waste types.
▪ risks to community safety associated with maintenance of lines and related facilities?	✓		Health and safety practices will need to be followed during maintenance of power lines to minimize risks.

Screening Questions	Yes	No	Remarks
▪ community health hazards due to electromagnetic fields, land subsidence, lowered groundwater table, and salinization?	✓		Substation sites of Araghar and Khatima are in close proximity to residential areas. Other substation sites are located away from any residential area. For 33 kV no electromagnetic field related impacts are envisaged. For higher voltages electromagnetic field is unlikely to extend beyond the boundary of the substation at levels considered to represent a risk to the public. All high voltage power lines are of voltages where no significant impacts to humans are anticipated. Further, the safety clearance distances as per Indian Electricity Act shall be maintained by PTCUL and UPCL. Information, education, and communication efforts will need to build awareness of living safely in proximity to powerline facilities. No impacts to groundwater tables or salinization are anticipated.
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?	✓		Transformer oil, lubricants, fuel and other chemicals used during construction and operation would be stored and disposed (surplus or wastes) in accordance with statutory provisions. Some small volumes of oil (1-2 liters for maintenance) may be kept at the substation work sites and possibly 20l petrol cans. The EMP will need to include specific provisions for the management of these at work sites and for the management of explosives used for any blasting that may be needed. However, it is far more likely pneumatic hammers will be used for rock breaking where any are encountered.
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., high voltage wires, and transmission towers and lines) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	✓		Substation sites of Araghar and Khatima are in close proximity to residential areas. Other substation sites are located away from any residential area. The line alignments will meet the safety clearances from habitation and no household structure is anticipated to come under the RoW of the high voltage power lines. Anti-climbing devices will be installed on each tower to prevent injury to anyone climbing the structure. Underground cables will be below ground and should not be accessible to the local community.

Appendix E – Site Photos

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<tr><th colspan="2">PTCUL SS</th></tr>
<tr><td colspan="2">Selaqui</td></tr>
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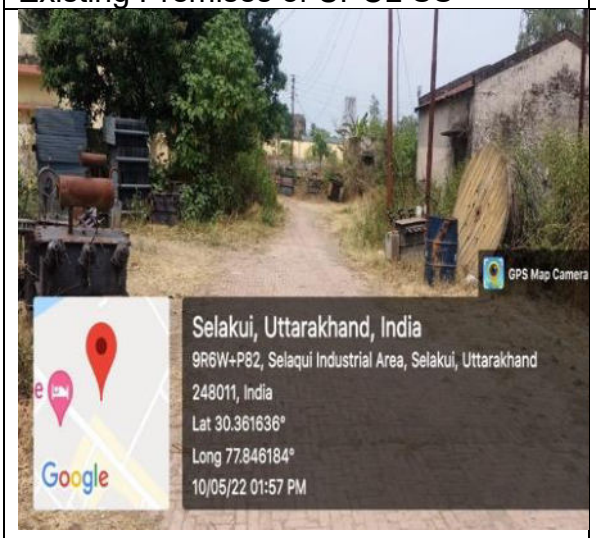
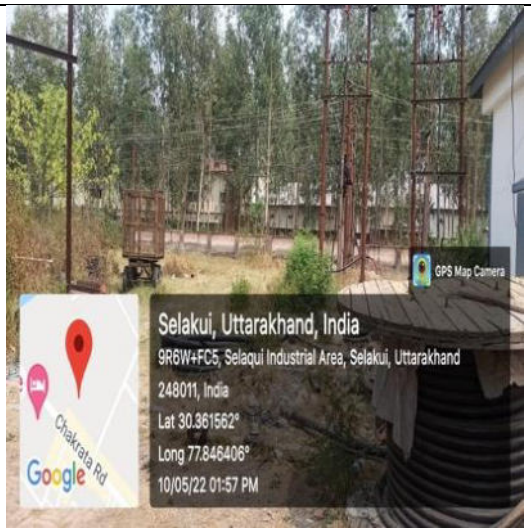
<tr><td>Existing Premises of UPCL SS</td><td></td></tr>
<tr><td> 
</td><td> 
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<tr><td></td><td>Industrial Area, Industry next to the SS premises</td></tr>
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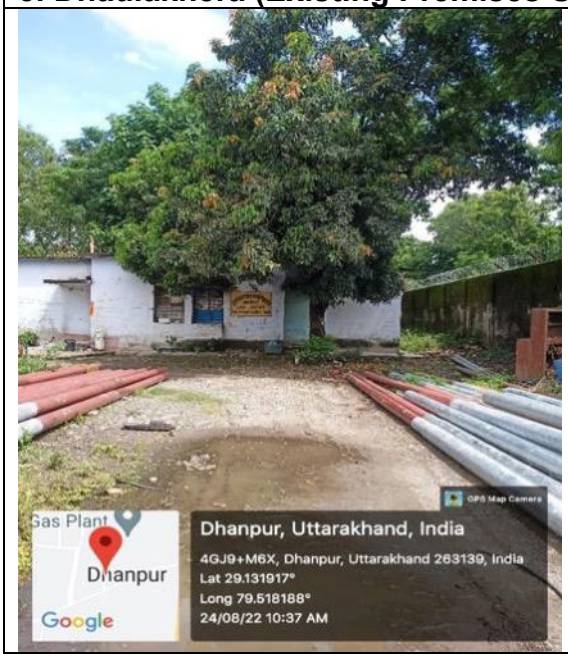
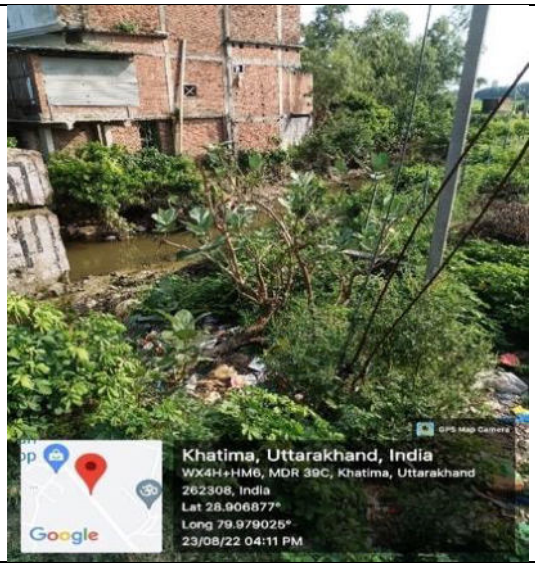
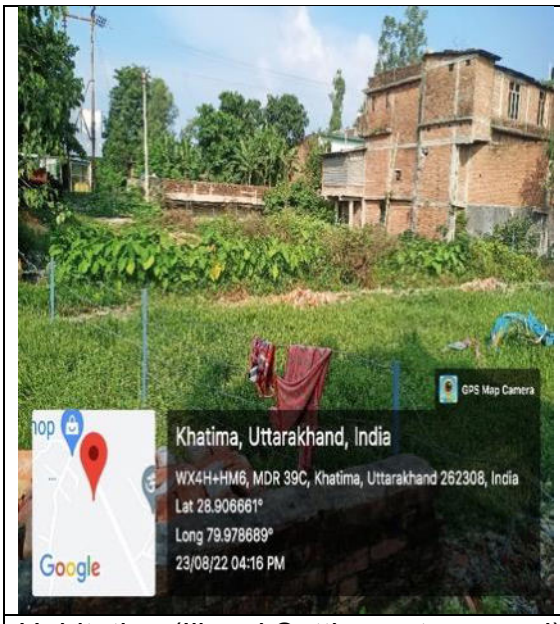
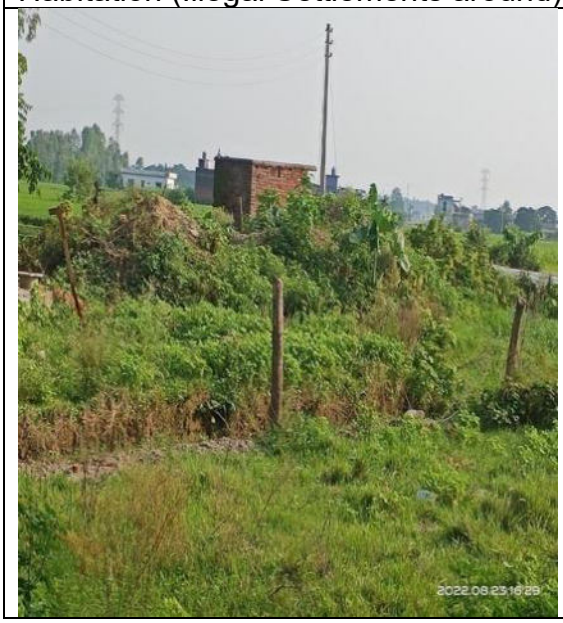
Overview of the Site	
Araghar (Existing Premises UPCL)	
	
Site within Existing Campus of UPCL SS	UPCL Material Stored at Site

	
Material scattered at Site	Joint Site Visit and Discussion with UPCL and PTCUL officials
3. Dhaulakhera (Existing Premises UPCL)	
	

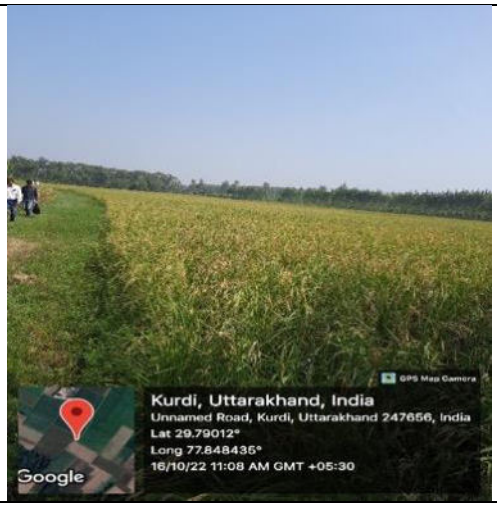
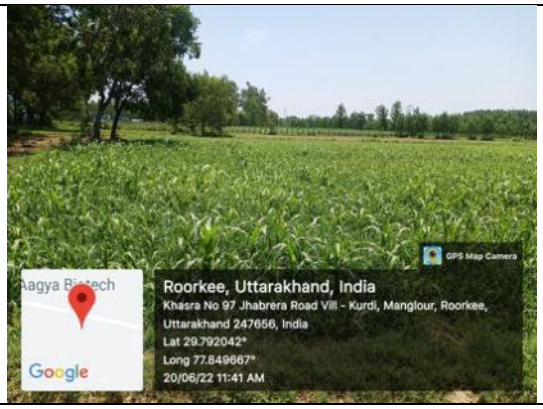
	
Approach Road and Stone Crusher Next to Site	Boundary of SS
4.Khatima	
	
Proposed SS	Nala (Drain) Next to Site



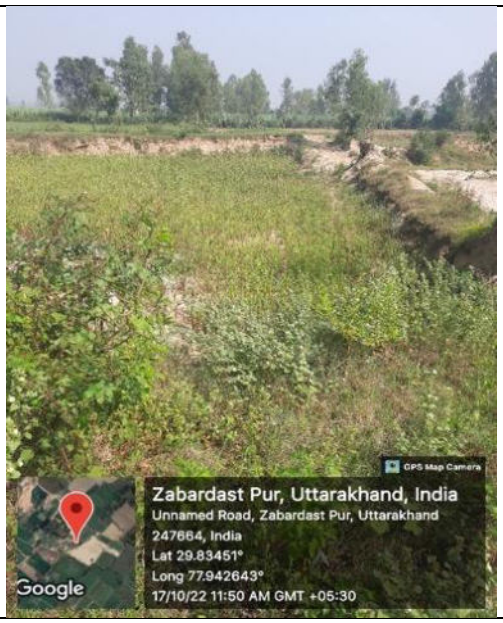
Habitation (Illegal Settlements around)

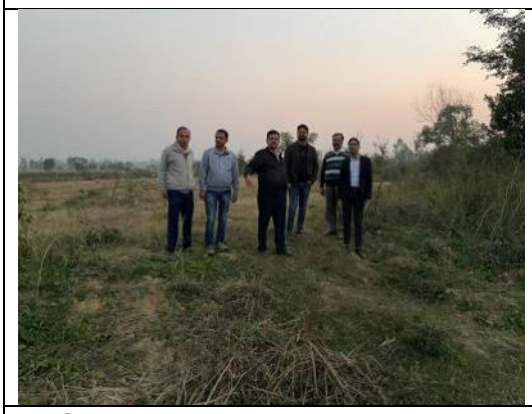


5. Lohaghat	
	
Entrance Gate	
	
	
Approach Road (Degree College Road)	Excavation Works for Tower at the SS Site

	
Pithoragarh-Lohaghat Line Existing Double Circuit Tower near the SS	Approach Road
6. Manglore	
	
	

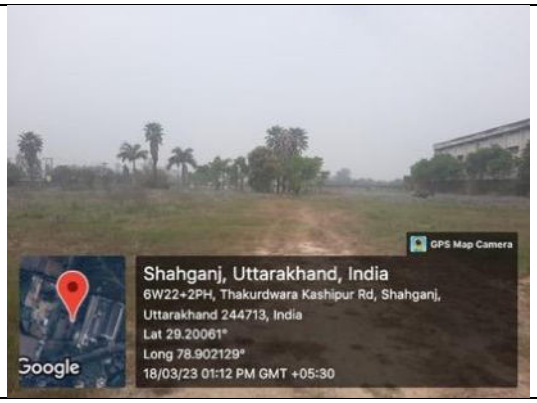
7. Landhora





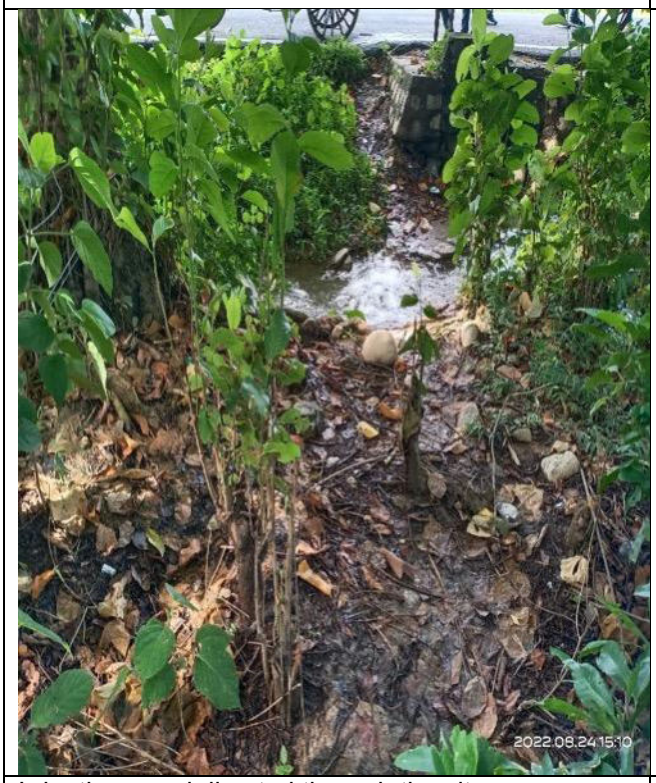
8. Sarwarkhera

Gated Plot (Board in the name of Diamond Factory) and Security Guard Cabin	Plot generally vacant with few ornamental trees

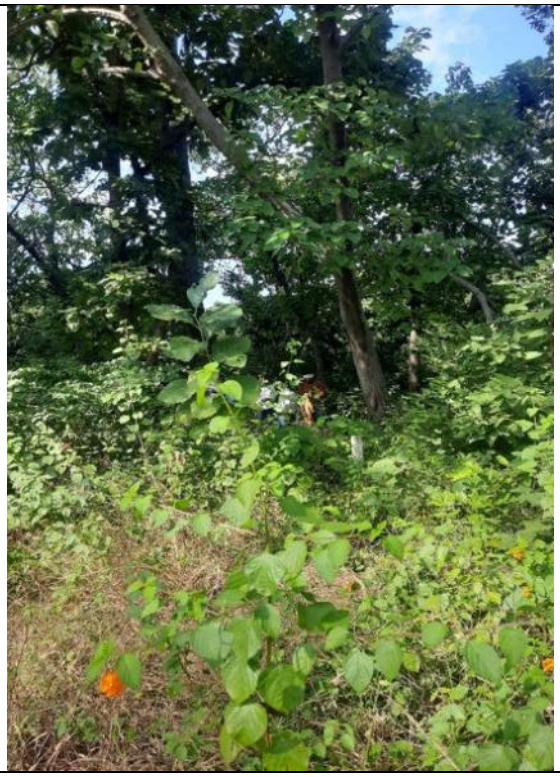
	
Pashupati industy on left side	Shrubs and Grass
	
Some Waste piled at one corner	
	
Few Ornamental trees at site	

New SubStations UPCL

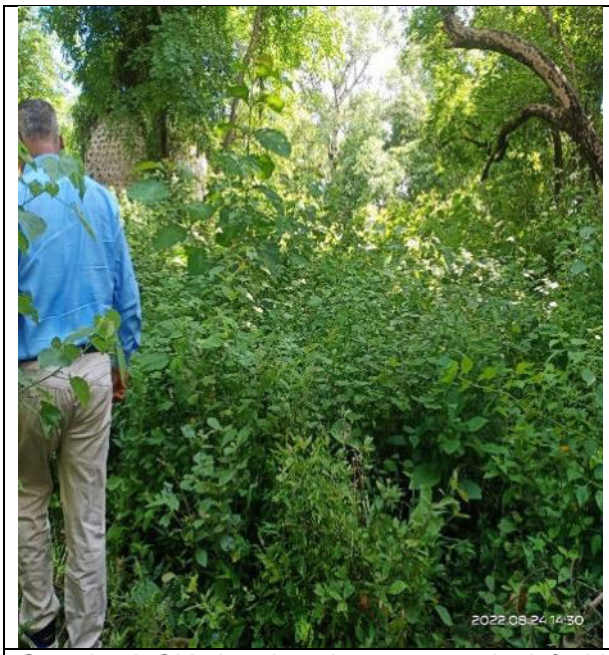
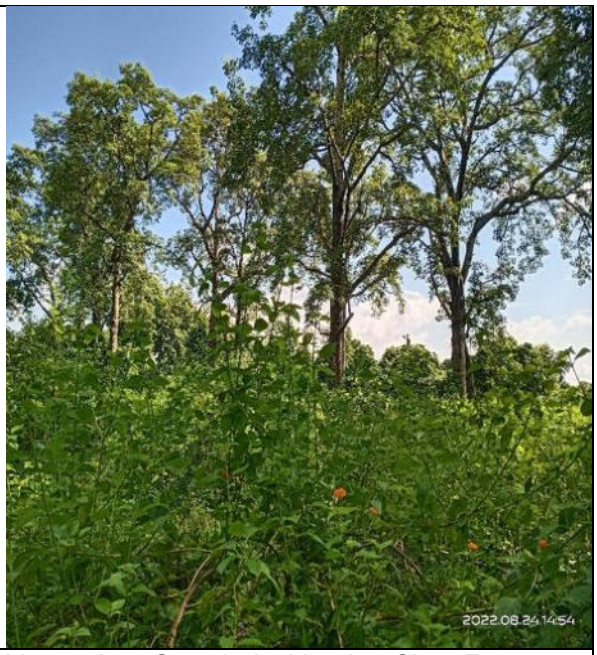
1. Kaniya, Ramnagar

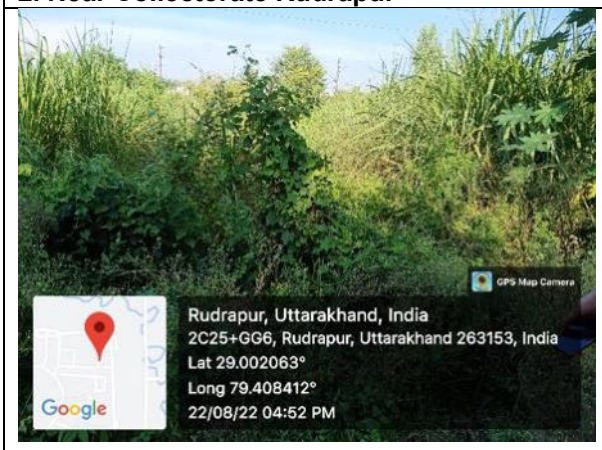
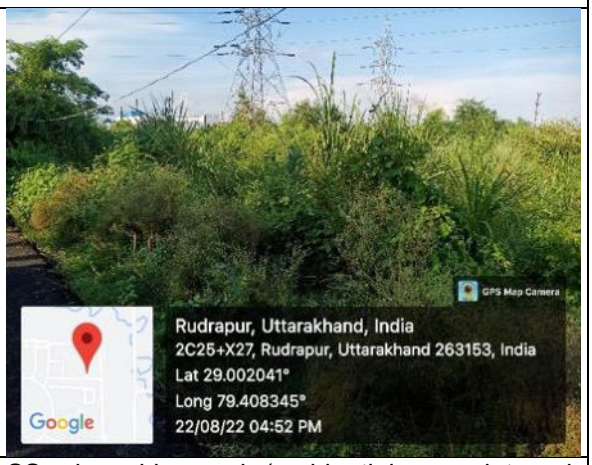
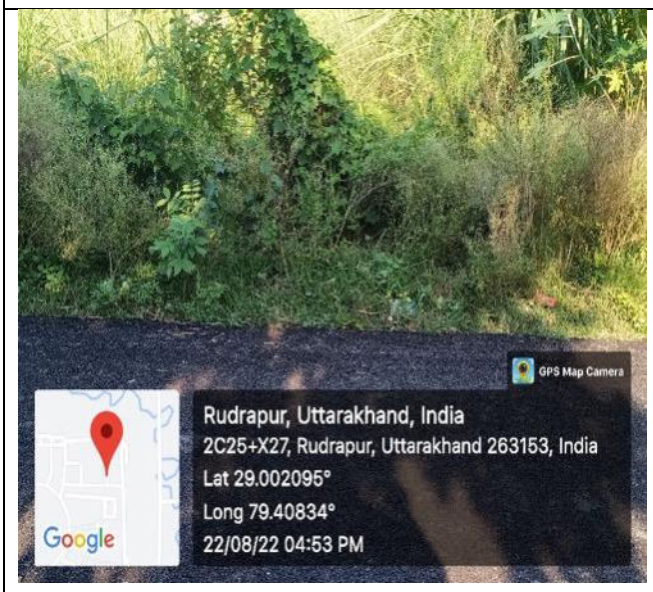


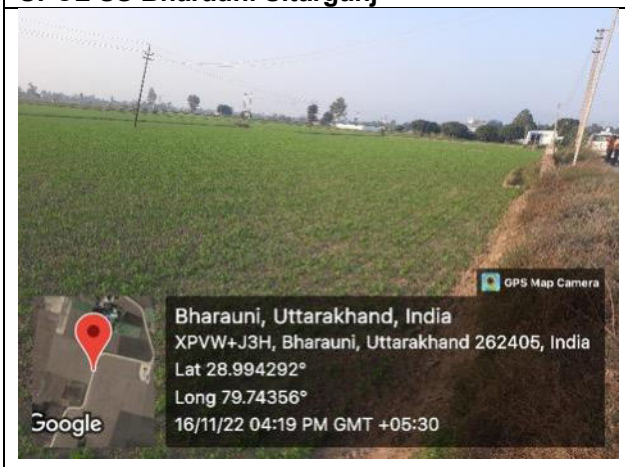
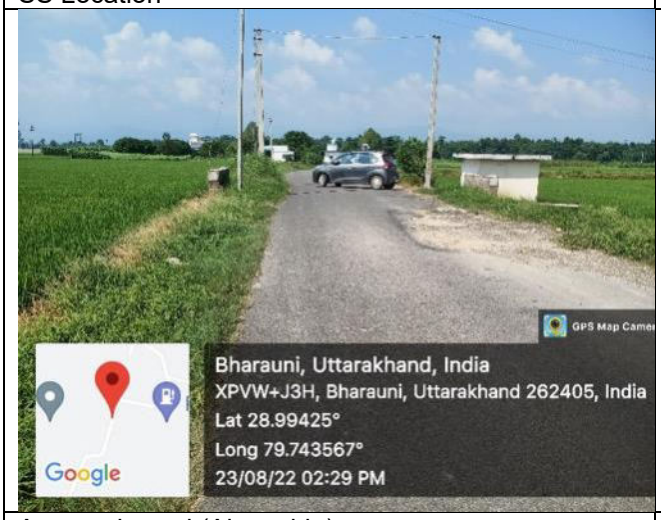
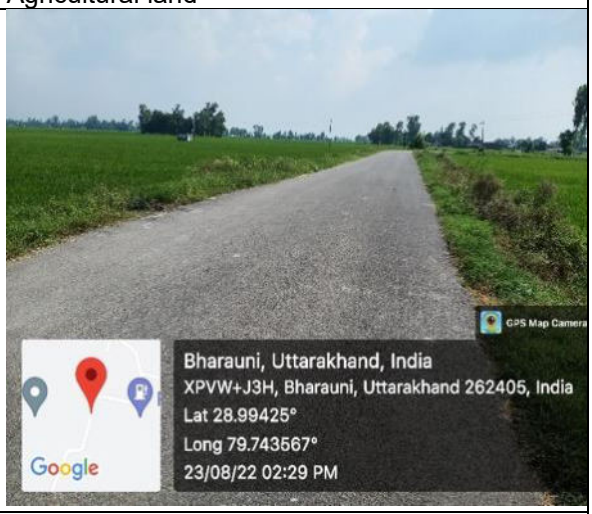
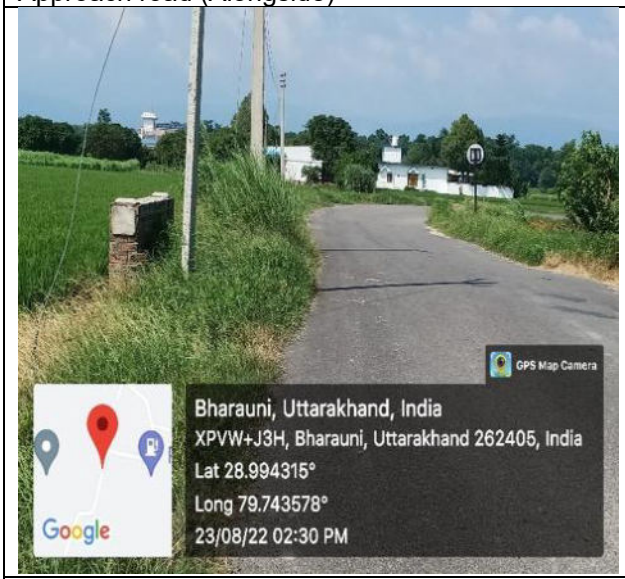
Irrigation canal diverted through the site



Trees inside the Site

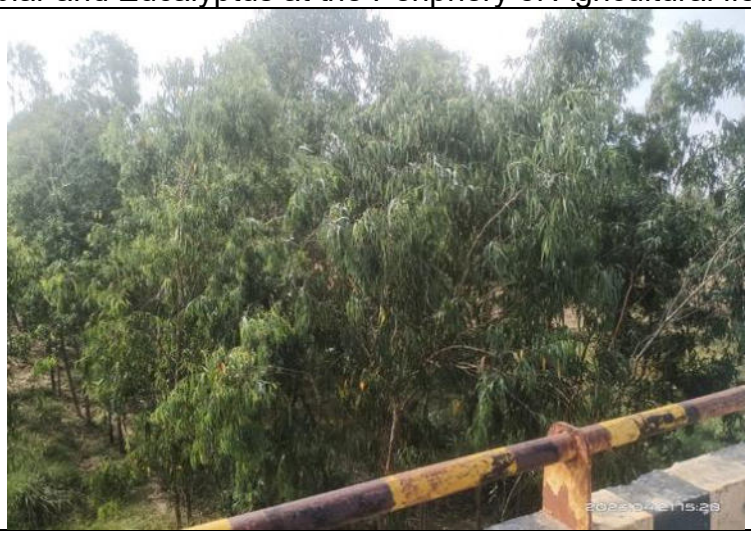
	
Govt. land, Old abandoned structure to the left side	Vegetation Growth inside the Site. Few tree felling required
	
SS located along Dhela Road	Agricultural land and few houses opposite to the site

2. Near Collectorate Rudrapur	
	
SS Site vegetation growth	SS alongside road (residential area internal road)
	
Road to the Site	Vegetation (Grass and shrubs) at Site
	
Mandi Parishad Govt. Officers Residence within 50 m. (Gated Colony, Separate access and boundary wall)	Mandi Parishad Govt. Officers Residence within 50 m. as seen from the Site.

UPCL SS Bharauni Sitarganj	
	
SS Location	Agricultural land
	
Approach road (Alongside)	
	
Scattered residences near the site	Tubewell within 50 m

Various PTCUL LILO Alignments

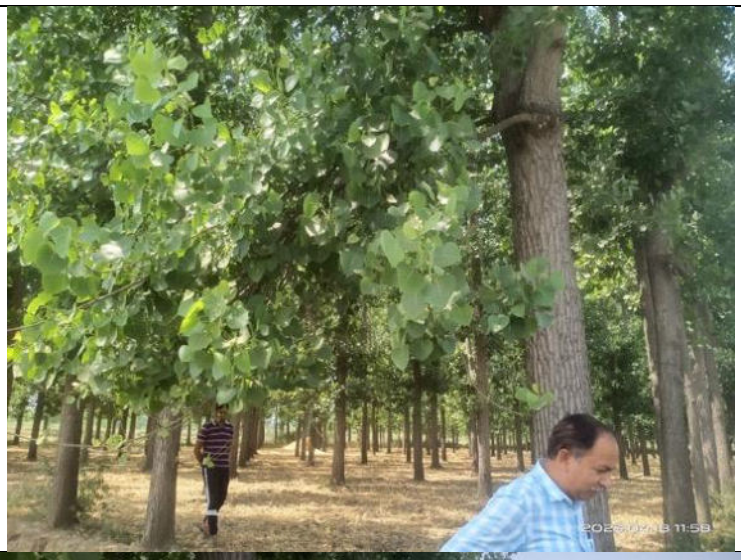
132 kV Mahuakheraganj-Jaspur

Poplar and Eucalyptus at the Periphery of Agricultural fields

Eucalyptus Trees


2023.04.21 15:27


2023.04.21 15:22

220 kV Roorkee - Nara



Talking to the landowner/ farmer at the plot adjacent to Manglaur SS

3-4 years Mature Poplar trees

1 year poplar planted

220 KV Manglaur - Nara

Trees at the periphery of fields


2023.04.18 14:01

ENVIRONMENT MONITORING REPORT

"Environmental Monitoring of Existing UPCL & Baseline Data generation of proposed ADB funded project UTSDIP. Monitoring has been conducted as per CPCB Guideline to about 36 different location of Uttrakhand.

Period of Performance: May 2023 to June 2023

Submitted to:

Ms. Anjali Semwal

Prepared By:

ECON LABORATORY AND CONSULTANCY
(ISO 9001, ISO 14001,ISO:45001 Certified,MOEF Recognised under EPA Act 1986 & NABL Accredited Laboratory)
Vill. Khabarwala, P.O.: Jaintanwala, Near GariCantt.,
Dehradun, Uttarakhand- 248003
Contact No.8534957815,8126534344
www.econlaboratory.com,email:uk@econlaboratory.com,econlab.consultancy@yahoo.in