

I/28217/2023



सत्यमेव जयते

भारत अग्रणी G20  
संयुक्त कुटुम्बकम्  
ONE EARTH • ONE FAMILY • ONE FUTURE

**भारत सरकार**  
**Government of India**  
**विद्युत मंत्रालय**  
**Ministry of Power**  
**केन्द्रीय विद्युत प्राधिकरण**  
**Central Electricity Authority**  
**विद्युत संचार विकास प्रभाग**  
**Power Communication Development Division**

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CEA Case No.: RAJ-700		
<b>PTCC approval for 400 kV 2 x D/C (Twin HTLS) Bikaner-II to Khetri Transmission Line associated with transmission scheme for evacuation of power from Solar Energy Zones in Rajasthan (8.1 GW) under Phase-II Part-F through TBCB [Length-271 km]-Regd.</b>		
S. No	Reference No.	Dated
(i)	POWERGRID: POWERGRID/PBTSL/PTCC/14	02.03.2022
(ii)	POWERGRID: N-1/Bikaner/BBTL/PTCC/2	03.01.2022
(iii)	POWERGRID e-mail	23.03.2023, 11.04.2023, 12.04.2023, 19.04.2023
(iv)	CEA-PS-17-11(11)/26/2023-PCD Division I/27606/2023	03.05.2023
(v)	POWERGRID: NRTS-I/PESM/2023	18.05.2023
(vi)	BSNL: DET/PTCC/ND/DV-10161/Raj-1398/2022-2023	20.01.2023
(vii)	BSNL: DET/PTCC/ND/DV-10099/Raj-1381/2022-2023	15.05.2023
(viii)	North Western Railway: SG/158/NWR/PTCC/884	17.03.2022
(ix)	North Western Railway: SG/158/NWR/PTCC/887	18.04.2022
(x)	Defense: B/46937/Sigs7(b)/2802/	05.05.2022
(xi)	Defense: B/46937/Sigs7(b)/2738/	14.03.2022

The PTCC proposals submitted vide reference (i), (ii) and (iii) has been examined. As POWERGRID has submitted the PTCC proposal in two parts, Induced Voltage calculation for one part of subject cited Transmission Line was issued vide reference (iv). However, vide reference (v) PGCIL has informed that, the earlier submitted data for soil resistivity was incorrect and requested for review of calculated Induced Voltage. Thereafter, so as to ascertain the revised data submitted by POWERGRID, a joint visit by officials of CEA, BSNL, North Western Railway and POWERGRID to verify soil resistivity was done and its report is enclosed at Annexure-IV.

The LF induction on Block and Telecom circuits of BSNL with respect to details furnished vide above reference (vi) has been computed. The voltage likely to be induced on paralleling Block and Telecom circuits of BSNL under Single Line to Ground fault condition are enclosed at Annexure-I.

The LF induction on Block and Telecom circuits of North Western Railway with respect to details furnished vide above reference (viii) & (ix) have been computed. The voltage likely to be induced on paralleling Block and Telecom circuits of North Western

I/28217/2023

Railway under Single Line to Ground fault condition are enclosed at Annexure-II and Annexure-III.

The screening factors as applicable have been considered. DG Signals, MoD vide reference (x) & (xi) have issued No Objection Certificate (NOC). DET, PTCC NZ, BSNL for a part of transmission line have issued No Objection Certificate (NOC) vide reference (vii).

EPR zone for proposed S/S is mentioned below:

Name of the proposed Substation	Half diagonal distance , D/2 (mts)	Fault Current I (KA)	Resistance of Earth Mat, R (ohms)	d (mts) at 430 V	d (mts) at 650 V	d (mts) at 7kV	d (mts) at 10kV
400/220 kV Bikaner-II S/S	150	18	0.1	478	265	N.A	N.A

As per the Telecom Details submitted by BSNL vide above reference (vi) & (vii) no telephone exchange of BSNL is falling within the EPR zone of proposed Substation.

Taking above into consideration, necessary action regarding issuance of PTCC approval for the subject cited transmission line might be taken under intimation to this office.

Encl.: As above

**Chief Engineer**

**To,**

1.	Divisional Engineer (PTCC), Northern Zone	BSNL, O/o GM (North), QA & Inspection Circle D-Tax Building, Eastern Court, Janpath New Delhi-110001	
2.	GM (S&T)	North Western Railway, Headquarter Office, Room No. 136, First Floor, Near Jawahar Circle, Jaipur - 302017	
4.	Executive Director (NR-I), POWERGRID	POWERGRID RHQ, NR-I, Faridabad	Copy for information.

I/28217/2023

ANNEXURE-I

CEA Case No.: RAJ-700					
Name of the Power line: 400 kV 2 x D/C (Twin HTLS) Bikaner-II to Khetri Transmission Line associated with transmission scheme for evacuation of power from Solar Energy Zones in Rajasthan (8.1 GW) under Phase-II Part-F through TBCB			Map Scale : 1 cm= 500 m		
			Total Length : 271 km		
			S.R. Value : 2,500 Ohm-cm		
S.No	Telecom. Details	Length of Parallelism in Km.	Mutual Coupling in Ohms.	Effective Fault current in Amps.	I.V in Volts.

BSNL: DET/PTCC/ND/DV-10161/Raj-1398/2022-2023 Dated 20.01.2023

Affected Blocks & Telecom Circuits Details

1.	TE Ratangarh to Sangam Circle 200 pair 2.8 km			IV less than 430 V	
2.	TE Ratangarh to ITI + AEN 200 Pair . 3.2 KM			IV less than 430 V	
3.	TE Ratangarh to Ramchander Park 200 Pair. 1.8 KM			IV less than 430 V	
4.	TE Ratangarh to Hospital Pillar 200 + 100 Pair, 0 9 KM			IV less than 430 V	
5.	TE Ratangarh to Churu Road 200 Pair, 1,5 KM			IV less than 430 V	
6.	TE Ratangarh to Salasar Road 400 Pair, 0.5 KM			IV less than 430 V	
7.	TE Ratangarh to Sardarshar Road 50 Pair, 2.5 KM			IV less than 430 V	
8.	Ramchanda Park to Hudera Village 50 Pair, 5 KM			IV less than 430 V	
9.	TE Ratangarh to Garh 300 Pair, 1 5 KM			IV less than 430 V	
10.	TE Ratangarh to Treasury 200 Pair, 1,6 KM			IV less than 430 V	

I/28217/2023

11.	TE Ratangarh to Minara Pillar 200 Pair, 2.5 KM	IV less than 430 V
12.	TE Ratangarh to Lal Pulia 400 Pair 1.3 KM	IV less than 430 V
13.	TE Ratangarh to Railway Stn 50 Pair 0 7 KM	IV less than 430 V
14.	TE Ratangarh to Fourth Pulia 800 Pair 0.5 KM	IV less than 430 V
15.	TE Ratangarh to Ghoom Chakar 200 Pair 1.5 KM	IV less than 430 V
16.	TE Ratangarh to Bhargav Chowk 100 Par 1.8 KM	IV less than 430 V
17.	TE Ratangarh to Holi Dora 100 Pair 11.5 km	IV less than 430 V
18.	TE Ratangarh to Hari Das Kl Dav 100 Pair 2 KM	IV less than 430 V
19.	TE Gorisar to PNB Gorisar 5 pair 0.3 km	IV less than 430 V
20.	TE Gorisar to Main Road 50 pair 0.5 km	IV less than 430 V
21.	Daudsar to BOB Bank 5 5 pair 0.2 km	Out of parallelism
22.	Gogasar to SBI bank 10 pair 0.2 KM	Out of parallelism
23.	Abosar to Chajjusar 50 pair 1.5 KM	IV less than 430 V
24.	Chajjusar to Gopal Puliya 20 pair 1 KM	IV less than 430 V
25.	Lachadsar to Panchayat Bhavan 50 pair 0.6 KM	IV less than 430 V
26.	Lachadsar to Gramin Bank 50 pair 0.8 KM	IV less than 430 V
27.	TE Rajaldesar to Dhani Bus 100 pair 0.9 KM	IV less than 430 V
28.	TE Rajaldesar to Old Bus Stand 400 pair x 2 1.2 KM	Out of parallelism
29.	TE Rajaldesar to Vishwkarma 100 pair 0.7 KM	Out of parallelism
30.	TE Rajaldesar to Police Thana 50 pair 0.6 KM	IV less than 430 V

31.	TE Rajaldesar to Bus Stand NH-II 50 pair 0.2 KM	IV less than 430 V			
32.	Gorisar to Khudera Bara 6 Fiber Armoured OF cable 12 KM	5.1	0.008	18832	150
33.	Kayamsar to Tedi 50 pair 4 KM	IV less than 430 V			
34.	Kayamsar to Godiya Bada 50 pair 5 KM	IV less than 430 V			
35.	Kayamsar to Takhalsar 50 pair 5 KM	IV less than 430 V			
36.	Kayamsar to Lawenda 50 pair 6 KM	2.505	0.0271	22593	612
37.	Kayamsar to Hatamsar 100 pair 4 KM	IV less than 430 V			
38.	Kayamsar to Rasoolpur 200 pair 3 KM	IV less than 430 V			
39.	Kayamsar to Narsara 50 pair 2 KM	2.645	0.0033	22252	73
40.	Kayamsar to Swami Ki Dhani 20 pair 2 KM	IV less than 430 V			
41.	Kayamsar to Godiya Chota 50 pair 4 KM	IV less than 430 V			
42.	Kayamsar to Takhalsar 50 pair 6 KM	IV less than 430 V			
43.	Tihawali to Sadensar 50 pair, 100 pair 3 KM	IV less than 430 V			
44.	Tihawali to Tihay 50 pair, 100 pair 4 KM	2	0.0031	23207	72
45.	Tihay to Bakarwasi 50 pair 2.5 KM	2.67	0.0088	23132	204
46.	Tihawali to Timoli 50 pair 8 KM	IV less than 430 V			
47.	Tihawali to Nayagli 20 pair, 2 KM	1.34	0.004	23481	94
48.	Tihawali to Sadensar, 100 Pair 3 KM	IV less than 430 V			
49.	Sadensar to Balod Choti wali 50 pair 5 KM	IV less than 430 V			
50.	Sadensar to Dabari 50 pair 5 KM	IV less than 430 V			
51.	Mandawa to Wahidpura 50 pair 5.5 KM	3.8	0.0228	22730	518
52.	Nua to Lumas Ka Bus 20 pair 6.5 KM	3.9	0.027	23484	634
53.	Nua to Hetamsar 50 pair, 20 pair, 10 pair 5.5 KM	2.159	0.026	23484	611
54.	Nua to Siryasar 100 pair 7 KM	2.816	0.0228	23672	540

I/28217/2023

55.	Bhimisar to Bharu 20 pair 6 KM	IV less than 430 V			
56.	Bakara to Darwala 50 pair 5 KM	3.71	0.0118	26800	316
57.	Bidasar to Bidasar 50 pair ( 4KM)	IV less than 430 V			
58.	Binjusr to Agaririlalan 100 + 50 pair 4.5 KM	Out of parallelism			
59.	Binjusr to Patusari 50 pair 3.5 KM	IV less than 430 V			
60.	Jasatpur Exchange to Charawas village 50 pair 8 KM	7.4	0.015	29936	449
61.	Jasatpur Exchange to Meena Ki Dhani 10 pair 8 KM	Out of parallelism			
62.	Jasatpur Exchange to Kharkhara 20 pair 6 KM	Out of parallelism			
63.	Kolihan Excjange to Nanuwali Baoti 20 pair 3 KM	Out of parallelism			
64.	Barau Exch to Nangli Sale'i Singh 50 pair 6 KM	IV less than 430 V			
65.	Barau Exch to Banleoti village 20 pair 4 KM	IV less than 430 V			
66.	Kolihan Exchange to Khetri city 2 x 400 pair, 1 x 200 pair, 1 x 100 pair 1 x 50 pair 4 KM each	Out of parallelism			
67.	Kolihan Exchange to Khetri city 2 x 50 pair, 1 x 20 pair, 03 KM)	Out of parallelism			
68.	Kolihan Exchange to chiteri village 50 pair 5 KM	Out of parallelism			
69.	Chiteni village to Tihara Village 10 pair 5 KM	Out of parallelism			
70.	Khetri to Kolihan City cable 50 par 4 KM	Out of parallelism			
71.	Mandwa to Nua Armoured OF cable 6 Fibre 16 KM	10.5	0.013	24474	318
72.	Wahidpura to Sigra Armoured OF cable 6 Fibre 6 KM	Out of parallelism			

I/28217/2023

ANNEXURE-II

CEA Case No.: RAJ-700					
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		Total Length : 271 km			
		S.R. Value : 2,500 Ohm-cm			
S.No.	Telecom. Details	Length of Parallelism in Km.	Mutual Coupling in Ohms.	Effective Fault current in Amps.	I.V in Volts.
<b>North Western Railway: SG/158/NWR/PTCC/884 Dated 17.03.2022</b>					
<b><u>Affected Blocks &amp; Telecom Circuits Details</u></b>					
	Nawalgarh to Dundlod Mukundgarh	Out of IV consideration zone			
2.	Dundlod Mukundgarh to Nua	2.1	0.006	25414	152
3.	Nua to Jhunjhunu	10.5	0.0054	25774	139
4.	Jhunjhunu to Ratansahar	3.6	0.0005	27180	14
5.	Ratansahar to Nari Khetri	Out of IV consideration zone			
6.	Nari Khetri to Chirawa	Out of IV consideration zone			
7.	Chirawa to Surajgarh	Out of IV consideration zone			
8.	Fatehpur Shekhawati to Kayamsar	4.05	0.0039	22164	87
9.	Kayamsar to Ramgarh Shekhawati	1.2	0.0049	22040	108
10.	Ramgarh Shekhawati to Bissau	Out of IV consideration zone			
11.	Bissau to Churu	Out of IV consideration zone			
12.	Ratangarh West cabin to Rajaldesar	5.25	0.0005	17373	9
13.	Rajaldesar to Churu	27	0.0081	18516	150
14.	Ratangarh West cabin to Sardarsahar	7.9	0.0033	17053	56
15.	Ratangarh West Cabin to Ratangarh Jn.	2	0.0002	17967	5
16.	Ratangarh Jn. To Parihar	Out of IV consideration zone			

17.	Batangarh Jn. To Molisar	13.9	0.0072	18286	132
18.	Molisar to Juharpura	5.9	0.0015	19798	30
19.	Juharpura to Churu	Out of IV consideration zone			



I/28217/2023

ANNEXURE-III

CEA Case No.: RAJ-700			Map Scale : 1 cm= 500 m		
Name of the Power line: 400 kV 2 x D/C (Twin HTLS) Bikaner-II to Khetri Transmission Line associated with transmission scheme for evacuation of power from Solar Energy Zones in Rajasthan (8.1 GW) under Phase-II Part-F through TBCB			Total Length : 271 km		
			S.R. Value : 2,500 Ohm-cm		
S.No.	Telecom. Details	Length of Parallelism in Km.	Mutual Coupling in Ohms.	Effective Fault current in Amps.	I.V in Volts.

North Western Railway: SG/158/NWR/PTCC/887 Dated 18.04.2022					
<b><u>Affected Blocks &amp; Telecom Circuits Details</u></b>					
1.	Lalgarh Jn to Kanasar		Out of IV consideration zone		
2.	Kanasar to Jamsar	6	0.0065	12290	80
3.	Jamsar to Jagdeowala	2	0.0007	11800	8
4.	Jagdeowala to Dhirera		Out of IV consideration zone		
5.	Dhirera to Dulmera		Out of IV consideration zone		
6.	Dulmera to Lunkaransar		Out of IV consideration zone		
7.	Lalgarh Jn to Nal		Out of IV consideration zone		
8.	Nal to Gajner		Out of IV consideration zone		
9.	Sudsar to Benisar		Out of IV consideration zone		
10.	Benisar to Sri Dungargarh		Out of IV consideration zone		
11.	Sri Dungargarh to Bigga		Out of IV consideration zone		
12.	Bigga to Parsenu		Out of IV consideration zone		
13.	Parsenu to Rajaldesar		Out of IV consideration zone		

Date:26.05.2023

JOINT VERIFICATION REPORT

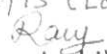
1. Vide letter dated 23.05.2023, CEA (Power Communication Development Division), has issued directions to carry out joint verification of the Soil resistivity data of 400 kV 2 \* D/C (Twin HTLS) Bikaner-II SEZ PP-Khetri transmission line(Part-II).
2. Accordingly, following members has visited the field for verification of Soil Resistivity date on 26.05.2023:-
  - i. Sh. Arjun Agrawal, Assistant Director, CEA, New Delhi
  - ii. Sh. I.S.S. Mishra, DET(PTCC), BSNL, New Delhi
  - iii. Sh. Ramratan Joshi, S.S.E(S&T), Sikar, Jaipur Division, NWR
  - iv. Sh. Mahesh Meena, S.S.E(S&T), Ratangarh, Bikaner Division, NWR
  - v. Sh. Jitender Meena, DGM, POWERGRID
3. The soil resistivity was measured by 04 electrode method using a Digital Earth Resistance Meter, Make-WACO; Sr.No.-395326 (Copy of calibration certificate is enclosed) at 06 nos. location and details of are mentioned below:-

Sl. No.	Loc. No.	Soil Resistance (Ohm) 'R'	Soil Resistivity (Ohm-M) $\rho=2 \pi RL$ (Where L=50 M)	Remarks
1	146A/0	0.06	18.84	
2	129/0	0.05	15.84	
3	102/0	0.07	21.98	Railway Crossing
4	AP58	0.04	12.56	Railway Crossing
5	AP-53	0.09	28.26	
6	60/3	0.06	18.84	

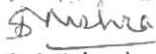
## Enclosures:

- a) Calibration Certificate
- b) Photograph of the Megger reading.

  
(Arjun Agrawal)  
Assistant Director, CEA

Value checked at  
km 290/15 (Loc. No. 102/0)  
  
(Ramratan Joshi)  
S.S.E(S&T), Sikar,  
Jaipur Division

  
(Jitender Meena)  
DGM, POWERGRID

The Calibration Certificate of Metering  
is from METL, Jaipur ~~\_\_\_\_\_~~  
  
(I.S.S. Mishra)  
DET(PTCC), BSNL

  
(Mahesh Meena)  
S.S.E(S&T), Ratangarh,  
Bikaner Division

Note: Calibration certificate of Megger

W00049/2023/PCD



# M. E. TESTING LABORATORY

CHEMICAL · NDT · MECHANICAL TESTING & CALIBRATION · GOVT APPROVED LABORATORY

Lab. 1 55-B, Arpit Nagar, Gandhi Path Road, Vaishali Nagar, Jaipur (Raj.) India

Lab. 2 Plot No. C 11, Sanskar Vihar C, Kanakpura Mali Godown, Meenawala, Jaipur

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E-mail metlpr@yahoo.com, metlpr@gmail.com, me\_testinglaboratory@gmail.com • Web : www.metlajipur.com

## CALIBRATION CERTIFICATE

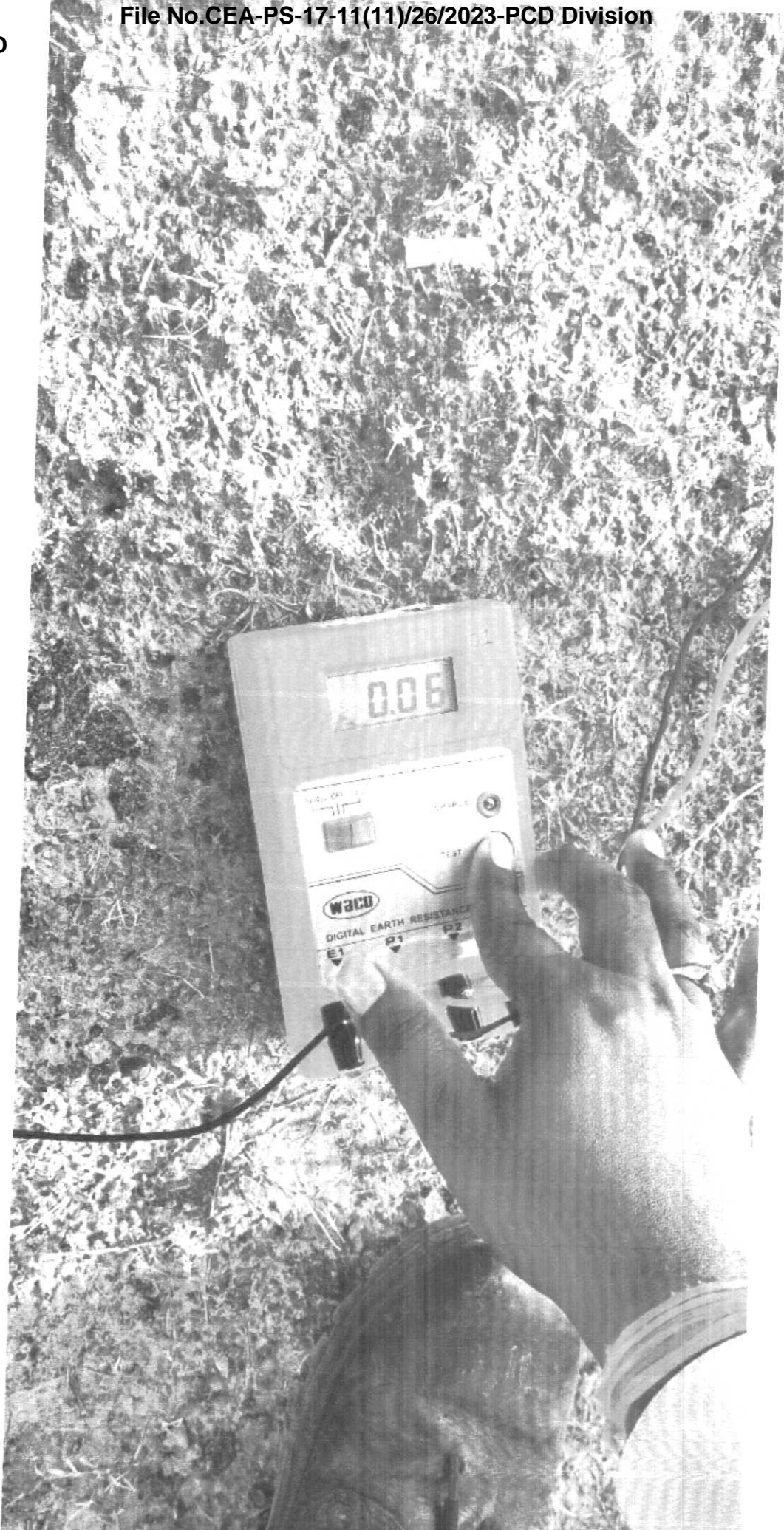
Calibration For :-		Calibration Date :- 12.08.2022		
M/s. Kaipataru Power Transmission Ltd. Near Indian oil petrol pump, Ajeetgarh - Neemkathana Road, Rampura, Thoi village, Shri madhopur, Tehsil, Sikar District, Rajasthan - 332718		Certificate No. :- METL/22-23/CAL/0247		
Detail of Calibration Item :-		Sug. Due Date :- 11.08.2023		
Item Name :- Digital Earth Resistance Meter		Issue on :- 12.08.2022		
Sr. No. :- 395326		Range :- 0 -10-1000 $\Omega$ L.C :- 0.01 $\Omega$ , 1 $\Omega$		
Date of Receipt :- 12.08.2022		Calibration Done At :- Permanent Lab		
Environmental Condition :-		Condition of M/c on Receipt :- ok		
Temp. (in $^{\circ}$ C) :- 25 $\pm$ 2 $^{\circ}$ C		Relative Humidity (%) :- 50 $\pm$ 5		
Detail of Standard Equipment Used for Calibration:-				
Equipment Name		Traceability		
Resistance Box		ERTL Delhi		
		Certificate No.		
		ERTL(N)/90(4)-2022-23		
S. No.	Parameter/Range	Measured on Reading Standard	Measured Reading of DUC	Measurement of Permissible Variation
1	0 -10 $\Omega$	1.00	1.01	+ 0.05 $\Omega$
2		5.00	5.02	+ 0.05 $\Omega$
3		10.00	10.03	+ 0.05 $\Omega$
1	0 -1000 $\Omega$	100	99	+ 10 $\Omega$
2		500	505	+ 10 $\Omega$
3		1000	996	+ 10 $\Omega$
The Measurement of Uncertainty (at C.L.95%, k=2) is $\pm$ 0.05 $\Omega$				
*****End of Result *****				
Page 1 of 1				



Testing Services | NDT | Sales of Lab Equipment  
Structural Design & Surveying



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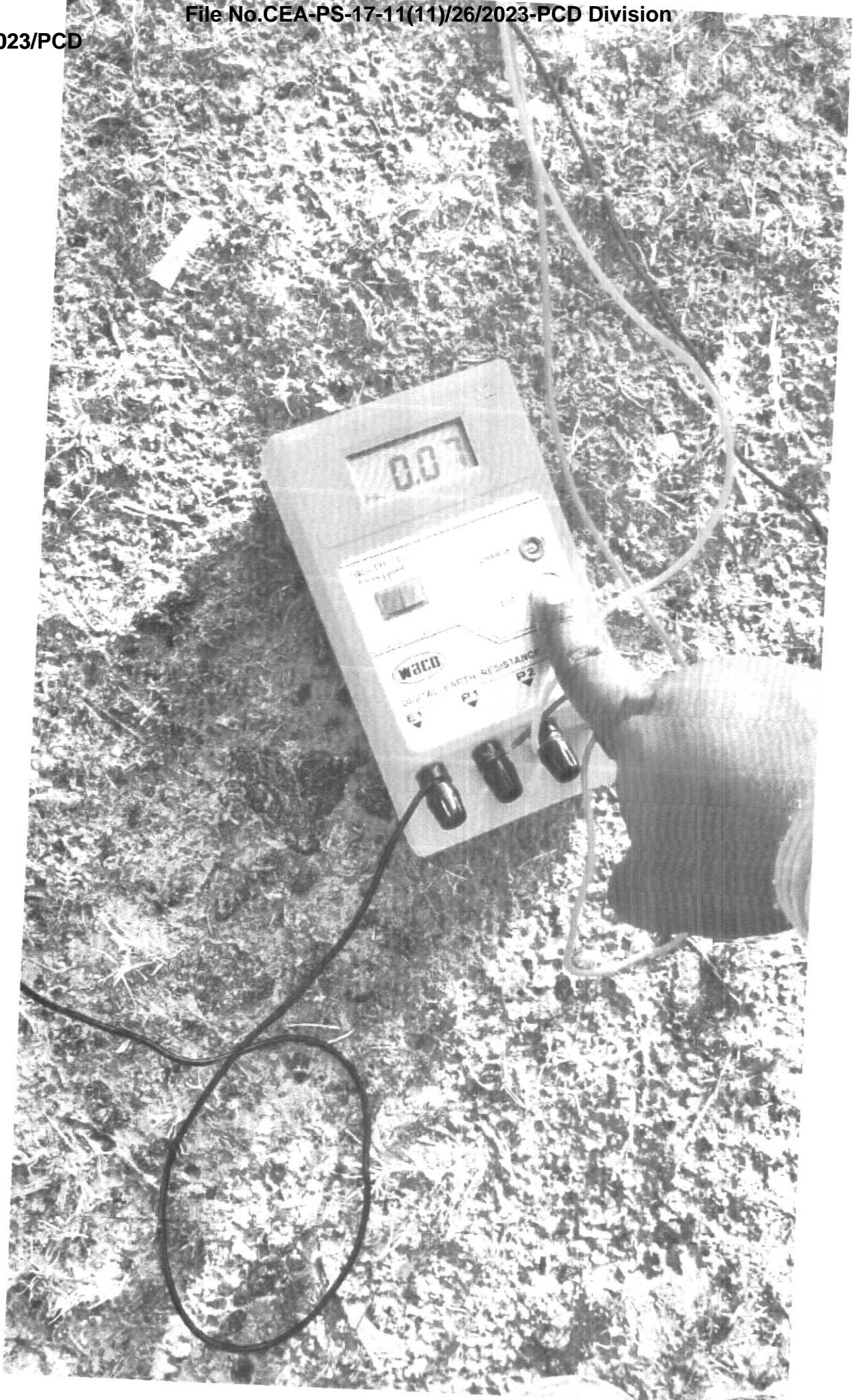
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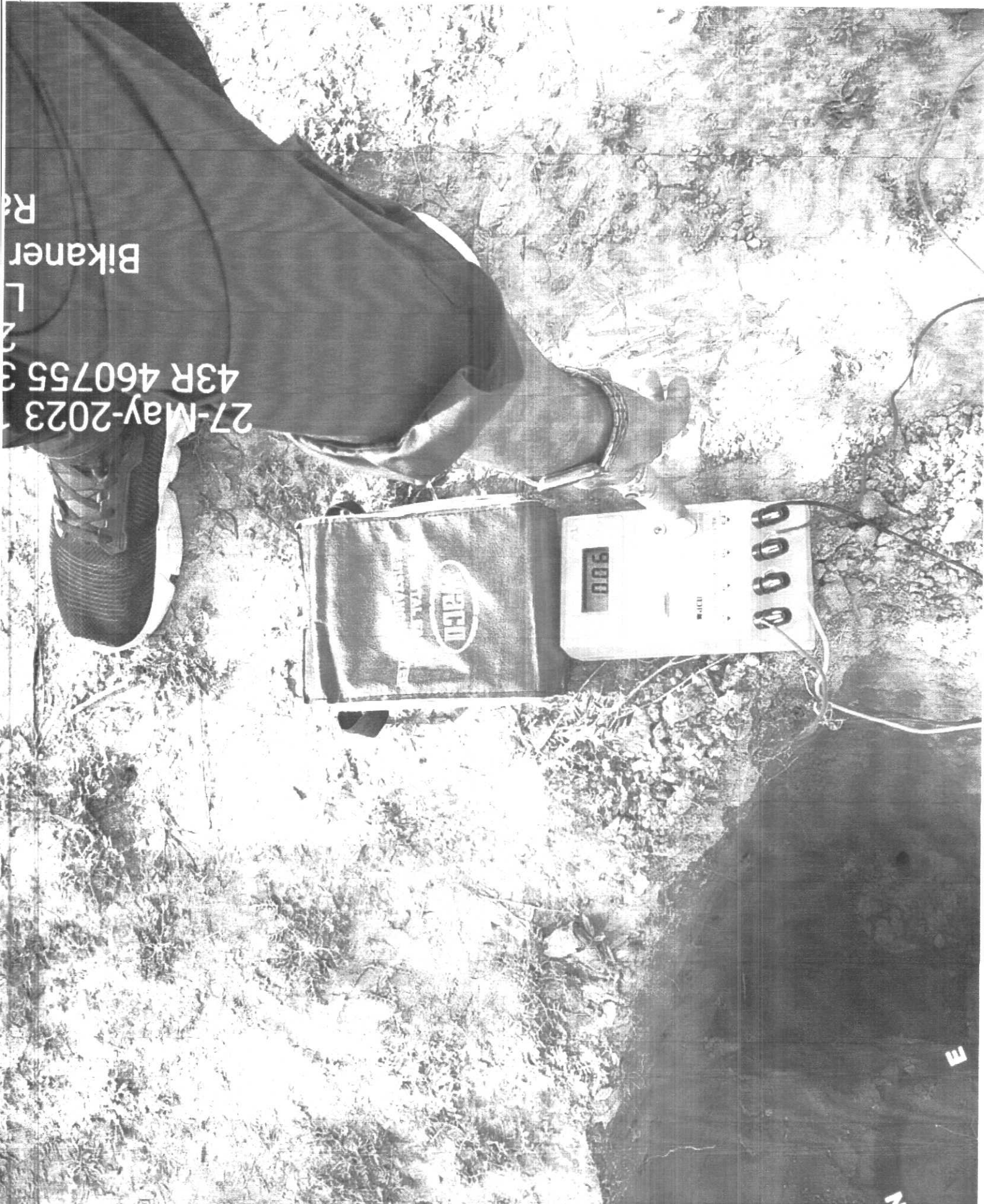


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