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Appendix A

Observation Dug well groundwater level data of the study area for the year 2021

For the year 2021

S.No	WELL NO.	LATTITUDE	LONGITUDE	Elevation (m)	MAY'21 (PR)	AUG'21 (M)	NOV'21 (P0)	WLF (m)
					(m. bgl)	(m. bgl)	(m. bgl)	
1	DW-1	24.170556	82.605833	299.79	2.00	1.10	1.80	0.20
2	DW-2	24.104167	82.583889	302.25	4.50	2.45	4.15	0.35
3	DW-3	24.107500	82.587222	305.00	3.10	1.15	2.80	0.30
4	DW-4	24.115000	82.594167	311.81	4.50	2.20	2.90	1.60
5	DW-5	24.115833	82.578056	312.33	8.20	6.30	6.05	2.15
6	DW-6	24.110833	82.579444	305.88	7.70	3.65	8.10	-0.40
7	DW-7	24.115278	82.528889	296.91	6.85	5.25	4.15	2.70
8	DW-8	24.079444	82.580000	305.00	9.90	8.75	7.35	2.55
9	DW-9	24.069628	82.532619	285.00	1.10	0.95	1.05	0.05
10	DW-10	24.056240	82.538368	310.00	2.60	1.40	2.50	0.10
11	DW-11	24.086111	82.558333	308.00	5.85	0.75	1.20	4.65
12	DW-12	24.130702	82.773094	297.00	4.15	2.25	4.00	0.15
13	DW-13	24.134797	82.779066	272.66	8.95	6.20	4.50	4.45
14	DW-14	24.131763	82.776918	272.97	7.60	6.45	7.95	-0.35
15	DW-15	24.168333	82.767500	278.97	5.05	2.95	4.65	0.40
16	DW-16	24.138296	82.690010	278.37	7.70	7.15	6.30	1.40
17	DW-17	24.144167	82.771111	271.13	1.90	0.65	1.80	0.10
18	DW-18	24.200199	82.777232	277.27	5.85	3.70	5.05	0.80
19	DW-19	24.181189	82.682206	283.00	10.40	8.70	8.05	2.35
20	DW-20	24.198889	82.688611	365.16	5.90	3.65	5.20	0.70
21	DW-21	24.166494	82.690930	375.32	12.50	10.55	9.15	3.35
22	DW-22	24.213611	82.641667	369.98	3.00	0.30	2.90	0.10
23	DW-23	24.207778	82.615556	383.37	3.00	0.60	2.40	0.60
24	DW-24	24.212250	82.582866	357.75	4.00	1.75	2.85	1.15
25	DW-25	24.203176	82.580556	381.86	13.85	11.55	10.25	3.60
26	DW-26	24.205000	82.594722	390.83	1.15	0.35	1.05	0.10
27	DW-27	24.209829	82.568325	402.75	4.15	1.65	2.25	1.90
28	DW-28	24.208065	82.559214	406.00	7.70	5.60	5.80	1.90
29	DW-29	24.206832	82.559214	386.47	7.10	5.80	6.95	0.15
30	DW-30	24.224875	82.543569	385.15	10.40	8.20	11.50	-1.10
31	DW-31	24.215556	82.553889	384.21	5.90	3.40	4.65	1.25
32	DW-32	24.209844	82.625820	385.55	3.90	0.85	4.95	-1.05
33	DW-33	24.211571	82.593457	380.00	5.20	2.15	3.30	1.90
34	DW-34	24.199910	82.571673	380.03	6.55	6.10	6.40	0.15
35	DW-35	24.182359	82.561280	388.58	6.50	4.80	4.30	2.20
36	DW-36	24.179861	82.555875	388.71	3.80	1.15	1.70	2.10
37	DW-37	24.113048	82.529237	382.29	7.50	4.90	7.00	0.50
38	DW-38	24.063611	82.585556	379.52	9.35	8.55	7.05	2.30
39	DW-39	24°03'57.7"	82°32'51.4"	305.00	5.65	2.35	5.25	0.40
40	DW-40	24.073611	82.532500	275.00	3.85	2.05	2.05	1.80
41	DW-41	24.094916	82.652346	300.00	7.30	5.05	3.10	4.20
42	DW-42	24.104444	82.657500	307.00	3.85	1.95	2.85	1.00
43	DW-43	24.112778	82.666111	293.35	2.60	1.00	2.55	0.05
44	DW-44	24.183889	82.647500	292.02	15.45	14.60	18.50	-3.05
45	DW-45	24.181944	82.645833	294.33	10.25	9.40	7.40	2.85
46	DW-46	24.191500	82.650442	398.43	9.65	8.35	11.50	-1.85
47	DW-47	24.184167	82.669167	379.59	12.40	10.70	6.95	5.45
48	DW-48	24.191086	82.651013	393.00	11.00	8.35	11.65	-0.65
49	DW-49	24.190808	82.656529	386.50	11.45	9.85	11.75	-0.30
50	DW-50	24.190278	82.649444	384.26	2.80	1.75	1.70	1.10
51	DW-51	24.121111	82.646389	390.09	3.45	0.90	3.05	0.40
52	DW-52	24.198714	82.698044	384.00	18.35	14.70	18.90	-0.55
53	DW-53	24.228537	82.697019	301.00	6.75	3.84	4.15	2.60
54	DW-54	24.197941	82.679996	377.95	3.40	1.10	3.20	0.20

55	DW-55	24.224727	82.710323	350.19	4.20	1.85	2.95	1.25
56	DW-56	24.246168	82.704924	368.60	21.75	16.85	18.17	3.58
57	DW-57	24.245469	82.682494	367.22	11.35	6.60	7.65	3.70
58	DW-58	24.224165	82.670490	360.22	16.65	7.75	9.10	7.55
59	DW-59	24.214189	82.687839	360.49	4.55	1.05	1.50	3.05
60	DW-60	24.218225	82.702957	341.89	5.80	1.50	3.55	2.25
61	DW-61	24.210656	82.671684	366.94	1.90	0.50	0.95	0.95
62	DW-62	24.206857	82.666352	357.66	11.40	8.00	9.45	1.95
63	DW-63	24.204093	82.681843	381.96	6.20	4.25	4.50	1.70
64	DW-64	24.212753	82.662630	378.79	8.00	7.20	7.40	0.60
65	DW-65	24.211034	82.689323	364.63	5.60	0.95	1.90	3.70
66	DW-66	24.203844	82.748398	365.03	5.20	2.10	6.34	-1.14
67	DW-67	24.224495	82.729161	356.74	6.95	2.25	4.15	2.80
68	DW-68	24.205278	82.756389	292.32	3.15	1.15	0.95	2.20
69	DW-69	24.208611	82.767222	365.53	12.30	7.70	9.80	2.50
70	DW-70	24.180833	82.770833	279.76	11.15	8.55	7.75	3.40
71	DW-71	24.187222	82.771667	295.11	13.35	10.95	12.15	1.20
72	DW-72	24.172500	82.766667	283.00	7.30	4.05	6.55	0.75
73	DW-73	24.181111	82.769444	281.52	10.65	9.60	9.75	0.90
74	DW-74	24.202500	82.766667	272.95	8.70	5.90	6.40	2.30
75	DW-75	24.210556	82.783056	276.32	5.90	4.10	3.40	2.50
76	DW-76	24.111944	82.766111	298.00	8.70	5.90	6.40	2.30
77	DW-77	24.117186	82.762770	296.00	5.90	4.10	3.40	2.50
78	DW-78	24.111944	82.641111	272.50	3.90	2.45	2.00	1.90
79	DW-79	24.118062	82.752670	273.06	0.85	0.35	0.65	0.20
80	DW-80	24.111881	82.721618	295.28	4.30	2.65	4.00	0.30
81	DW-81	24.115859	82.706341	273.30	3.55	2.25	2.70	0.85
82	DW-82	24.111426	82.727395	284.55	2.25	0.75	0.90	1.35
83	DW-83	24.159201	82.589589	290.97	16.75	14.30	11.10	5.65
84	DW-84	24.158550	82.579874	276.87	11.90	8.10	7.65	4.25
85	DW-85	24.166617	82.586948	487.94	22.97	21.87	23.50	-0.53
86	DW-86	24.075648	82.609248	488.45	3.10	2.15	2.90	0.20
87	DW-87	24.080280	82.639514	484.34	5.80	2.15	3.35	2.45
88	DW-88	24.080439	82.645320	286.54	12.80	5.90	8.00	4.80
89	DW-89	24.096166	82.628291	285.53	2.20	1.10	2.10	0.10
90	DW-90	24.092494	82.625164	287.75	13.35	10.15	10.75	2.60
91	DW-91	24.095870	82.620466	297.07	0.95	0.65	1.00	-0.05
92	DW-92	24.184444	82.646389	297.94	9.55	9.45	9.15	0.40
93	DW-93	24.083056	82.601944	300.37	5.90	3.35	6.20	-0.30
94	DW-94	24.089722	82.589444	393.60	8.35	6.90	4.85	3.50
95	DW-95	24.102778	82.587500	285.16	4.05	2.30	3.75	0.30
96	DW-96	24.099722	82.633333	293.06	4.65	1.90	3.00	1.65
97	DW-97	24.105002	82.633539	302.08	0.95	0.25	0.85	0.10
98	DW-98	24.173151	82.635131	307.59	15.00	12.40	16.50	-1.50
99	DW-99	24.178333	82.635000	305.20	15.75	11.55	16.80	-1.05
100	DW-100	24.086111	82.558333	417.07	3.80	2.40	3.60	0.20
			Minimum	271.13	0.85	0.25	0.65	-3.05
			Maximum	488.45	22.97	21.87	23.50	7.55
			Average	334.55	7.27	4.91	5.88	1.39

Appendix B

Table B.1: Layers parameters of interpreted sounding data

VES NO.	LOCATION	Lattitude	Longitude	$\rho 1(\Omega\text{-m})$	$\rho 2(\Omega\text{-m})$	$\rho 3(\Omega\text{-m})$	$\rho 4(\Omega\text{-m})$	$\rho 5(\Omega\text{-m})$	$\rho 6(\Omega\text{-m})$	h1(m)	h2(m)	h3(m)	h4(m)	h5(m)	Ht(m)
VES-1	Near Kakri colony	24.1795861	82.77505278	9.7	229	74	225	19.4		3	4.9	8.8	27.7		44.4
VES-2	Near Beena colony	24.1490361	82.77475	92.8	25	76.3	86	15.2		1.4	5.1	32.9	13.8		53.2
VES-3	Near north of Koharauliya	24.1349972	82.78608056	13.1	24.6	144				11.3	64.8				76.1
VES-4	Koharauliya-1	24.1263806	82.77743611	32.8	9.1	15.8	102			0.6	7.4	32.6			40.6
VES-5	Koharauliya-2	24.1311111	82.771944	11.1	15.2	81				4.5	37.8				42.3
VES-6	Koharauliya-3	24.1241333	82.77308889	7.9	51.5	22.7	31.8			6	2.4	32.6			41
VES-7	East of GVP Sagar-1	24.1236194	82.76541667	9.9	5.7	14.4	44.3	133		1.5	6.3	19.7	56.4		84
VES-8	East of GVP Sagar-2	24.1189361	82.75751667	10.7	22.9	31.6	98.9			11.2	24.7	47.5			83.4
VES-9	Moher Block	24.1650306	82.59765556	319	175	534	655			1.5	2.5	31.7			35.8
VES-10	Mudwani dam	24.136389	82.644444	643	32.5	11.7	33.2			5.3	22.9	24.9			53
VES-11	Near khadiya colony	24.1238944	82.68692778	55.4	2.8	69.6	2.1	23.4		1.3	1.9	3.6	45.4		52.2
VES-12	Near Dudhichu	24.1022278	82.64703333	36.7	4.8	12.8	24.9			2.6	11.1	38.5			52.19
VES-13	Near Bareja Lake	24.1202778	82.61861111	57.5	15.5	62.6				1.3	5				6.3
VES-14	Nigahi Internal OB VP	24.166667	82.633056	788	77.5	275	5.9			1	1.2	19.9			22.1
VES-15	West Turra	24.15205	82.62088889	759.1	375.2	93.4	189.3			1.5	6.7	20.6			28.8
VES-16	Amlohri Colony	24.1032444	82.60139167	87.7	7.7	14.2	75.3			0.8	18.2	35.8			54.8
VES-17	Near Jayant Colony	24.1214028	82.65731667	45.3	19.1	70.5	11.9	13.1		1.6	3.4	13	44.5		62.5
VES-18	Banauli-1	24.0912028	82.63328333	40.1	7.6	17.3	3.1			1.2	2.3	26.5			29.9
VES-19	Banauli-2	24.0975	82.6325	5.25	9.31	16.5	7.7			1.41	2.68	26.3			30.4
VES-20	Banauli-3	24.0829444	82.6346611	3.83	10.1	18.9	6.37			1.35	6.99	20.3			28.6
VES-21	Banauli-4	24.100278	82.6325	4.18	6.3	17.81	12.65			1.5	6.25	32.25			40
VES-22	SC Nigahi Colony	24.109722	82.630556	10.6	20.1	10.9	59.2			5.08	6.7	33.3			45.1
VES-23	Nigahi Colony Stadium	24.1103111	82.62250556	13.1	16.5	18.6	43.6			3.6	39.6	14.7			57.9

VES-24	Near Nigahi road	24.1121639	82.63079167	9.02	12.8	14.7	51.5			3.02	18.2	35.8			57
VES-25	Amlohri Basti	24.0980056	82.57703056	42.2	9.3	21.5	58.6			0.8	18.9	38.3			58
VES-26	Near Ghurital	24.0748917	82.63584444	4.22	10.5	15.5	4.49			1.45	7.46	42			50.9
VES-27	Near Pachkhora road	24.0833722	82.62208333	33.7	3.2	16.3	27.6			2.5	16.5	39.5			58.5
VES-28	Waidhan	24.0765583	82.61325833	33.2	9.5	17.1	26.1			2.3	16.1	35.9			54.3
VES-29	Near Mangalam Waidhan	24.0710556	82.60616667	35.6	3.7	13.8	24			2.5	17.6	30.1			50.2
VES-30	Singrauli village	24.205	82.627	237	14	35.4	496	818		0.6	1	10.1	50.5		62.1
VES-31	Khatas	24.22	82.633	99.1	248	3925	82.8			5.9	6.8	59.5			72.3
VES-32	Mahdahiya	24.21481	82.558898	77.4	16.5	11.6	24.6	56.1		0.4	8.5	8.3	79.5		96.8
VES-33	Padri	24.196	82.532	16.3	8.9	19.4	55.3			0.9	3.6	17.9			22.4
VES-34	Rampurua	24.205	82.527	43.9	14.5	11.1	39.7	62		1	4.7	6.7	47.6		60
VES-35	Inurra	24.229	82.578	69.4	24.3	194	928			0.8	2.4	42.9			46.1
VES-36	Naudiya	24.201	82.581	19	112	384	5.8	36.4		0.9	8.5	7	24.2		40.6
VES-37	Phulzar	24.217	82.575	11.7	122	43.2	228	58.4		0.9	2.9	6.1	54.7		64.6
VES-38	Gorbi Basti	24.210152	82.612403	70.4	49	12.4	5989			1.3	6.8	14.1			22.1
VES-39	Khirwa	24.245	82.638	953	192	23	217	722	1268	0.2	11.1	5.8	2	8.4	27.5
VES-40	Gorbi block -b colony	24.203548	82.590084	20.1	114	291	12.7	26.1		1	8.3	8	30.4		47.6
VES-41	Rajkhand	24.199	82.559	10	23.2	6.5	55.5			1.6	2.7	10.5			14.8
VES-42	Naudia	24.206924	82.570892	53.1	9.2	61.8	3.9	37.7		0.9	2.1	4.3	13.9		21.2
VES-43	solang	24.193	82.561	11	14.3	29.7	11.3	1225		0.9	12.6	27.1	43.6		84.21
VES-44	Kasar	24.238	82.551	151	19.4	212	10499			0.5	11.5	78.5			90.5
VES-45	Barhati	24.256	82.558	187.4	110.5	32.3	484.2	7819		0.3	5.3	8.7	105.1		119.4
VES-46	Lotan	24.242	82.577	273	76.1	198	769			0.8	2.5	35.1			38.4
VES-47	Barwani	24.264	82.595	293	59.1	1530	678			1	20.6	55.2			76.8
VES-48	Piparkhad	24.261	82.611	73.7	27.1	38.3	4340	100.9		0.5	2.6	18.9	33.7		55.8
VES-49	Karaila	24.244	82.598	182	42.7	185	916			1.9	8.4	52.6			63
VES-50	Bhaudar	24.258	82.538	104	26.2	704	2688			5	9.1	70.9			85
VES-51	Pipra	24.265	82.561	108	22.3	449	1713			5.5	6.2	60.5			72.3

VES-52	Gangi	24.245	82.542	66.2	11.6	42.2	645			0.7	4.9	16.4			22
VES-53	Tikuritola	24.233	82.614	167	97.5	17.1	276	1357		1	1.6	7.4	52.9		62.9
VES-54	Thurua	24.198	82.546	17.7	10.5	22	36.7	59.9		0.9	3.4	15	44.7		64
VES-55	Ramgarh	24.211	82.542	92.3	21.8	16.9	30.5	45.9		0.4	8.6	8.5	76.4		93.9
			Minimum	3.83	2.8	6.5	2.1	13.1	1268	0.2	1	3.6	2	8.4	6.3
			Maximum	953	375.2	3925	10499	7819	1268	11.3	64.8	78.5	105.1	8.4	119.4
			Average	120.38909	49.067455	187.22564	637.22135	664.65789	1268	2.162	10.04145	26.78942	44.57895	8.4	53.08727

LIST OF PUBLICATION

- **Singh, D. K.**, & Kishore, N. (2022). Geoelectrical Sounding to Identify Sub-surface and Groundwater State at Village Banauli, Singrauli District, Madhya Pradesh, India. *Nature Environment and Pollution Technology:An International Quarterly Scientific Journal*. Vol. 21(4): pp. 1639-1647.
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- **Singh, D.K.**, & Kishore, N. (2020). Numerical Approach to Solve Approximation of Zoeppritz Equation Using Least Square Method and Genetic Algorithm. **ICOMS 2020** Organised by NCL, Singrauli M.P India.
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