

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
रॉ मटेरियल्स डिवीजन
RAW MATERIAL DIVISION
बरसुआ लोह खादान
BARSUA IRON MINES
P.O. TENSA - 770042
Phone - 06625-236026 Fax - 236031



Ref. No. BIM /E&L/2020-21/72

Date: 11.07.2020

To
The Member Secretary,
State Pollution Control Board, Odisha,
A/118, Nilakantha Nagar, Unit-VIII,
Bhubaneswar – 751012

Sub: Environmental Statement for 2019-20 in respect of Barsua-Taldih-Kalta Iron Mines.

Sir,

Please find enclosed herewith the Environmental Statement in Form – V for the year ending on 31st March 2020 in respect of Barsua-Taldih-Kalta Iron Mines of M/s SAIL for your kind perusal.

Thanking You,

Yours faithfully,
For SAIL/Barsua Iron Mines

P K Rath

Chief General Manager, BIM & KIM

Encl: As Above

Copy to:

1. The Additional Director(s),
MOEF, Govt. of India,
Eastern Regional Office,
A/9, Chandrasekharapur,
Bhubaneswar, Odisha – 751023
2. The Regional Officer,
State Pollution Control Board,
Sector – 5, Rourkela - 769002

ENVIRONMENTAL STATEMENT

YEAR: 2019-2020



Steel Authority of India Limited
Raw Materials Division
Barsua-Taldih-Kalta Iron Mines
Sundargarh (Dist.)
Odisha – 770042

(2) Raw Material Consumption

Name of raw materials	Name of products	Raw material consumption per unit of product output	
		During the previous financial year (2018-19)	During the Current financial (2019-20)
(1) Diesel (Ltrs)	Iron Ore	1686539	3385242
(2) Lubricant			
a) Lubricant oil (Ltrs)		63833	53306
b) Grease(Kg)		11102	11434
(3) Explosive			
a) Slurry Explosive(Kg)		242944.5	437161
b) Detonators (Nos)		1717	1943
c) Detonating Fuse(Mtrs)		83165	100800
(4) Power Consumed (Kwh)		12526998	15894714
(5) Tyres (Nos)		23	545

The ROM production during 2018-19 is 3.935 million tonnes and during 2019-20 is 4.748 million tonnes.

PART - C**Pollution discharged to environment / unit of output**

[Parameter as specified in the consent issued]

Pollutants	Quality of pollutants Discharged (mass/day)	Concentrations of pollutants in discharges (mass/volume)	Percentage of variation from prescribed standards with reason.
a) Water	The Environmental monitoring report is attached in Annexure - I		
b) Air			

PART -D**Hazardous Wastes**

[As specified under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016]

Hazardous Wastes	Total Quantity(kg)	
	During the previous Financial Year (2018-9)	During the current Financial Year (2019-20)
a) From Process		
• Used Oil Filters	649 Nos.	409 Nos.
• Waste containing oil	788 kg	818.5 kg
• Used Oil	7980 Liters	13020 Liters
• Empty Barrels/Containers	170 Nos.	276 Nos.
• Used Batteries	67 Nos.	79 Nos.

FORM – V

Environmental Statement for the financial year ending 31st March 2020

PART – A

- (i) **Name and address of the owner/occupier of the industry operation or process.** : Barsua-Taldih-Kalta Iron Mines
P.O- Tensa,
Dist. : Sundargarh
Pin- 770042, Odisha
- Agent** : Shri P. K. Rath,
Chief General Manager (Mines)
- Nominated Owner** : Shri Vivek Gupta
Director (RM&L), SAIL
- (ii) **Industry category Primary - (STC code)** : Open Cast Iron Mine
Secondary - (SIC Code)
- (iii) **Production capacity** : 8.05 MTPA
- (iv) **Year of establishment** : 1960
- (v) **Date of the last environmental statement submitted** : 20.09.2019

PART – B

Water and Raw Material Consumption

(1) Water consumption	m³/day
Process	495.51
Cooling	472.15 (dust suppression)
Domestic	4362.16

Name of Products	Process water consumption per unit of product output	
	<i>During the previous financial year (2018-19) in m³/MT</i>	<i>During the Current financial (2019-20) in m³/MT</i>
(1) Washed Iron Ore	0.48	0.41

b) From Pollution Control facility - Waste oil from oil & grease separation pit - Sludge from oil & grease separation pit	Nil (Included in process above)
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PART – E Solid Wastes

Wastes	Total Quantity(Tonnes)	
	During the previous Financial Year (2018-19)	During the current Financial Year (2019-20)
(a) From Process		
(1) Overburden / rejects	436840 Ton	1046525 Ton
(2) Tailings	89911 Ton	48980 Ton
(b) From Pollution Control facilities	NIL	NIL
(c) (1) Quantity recycled or re-utilized within the unit	-	-
(2) Sold	-	-
(3) Disposed	526751 Ton	1095505 Ton

PART –F

Please Specify the characterisation (in terms of compositions and quantum) of Hazardous as well as Solid Wastes and indicate disposal practice adopted for both these category of wastes.

Hazardous Waste Handling and Disposal:

1	Used Oil Filters	Storage in an impervious pit under covered shed followed by final disposal in Authorised Hazardous Waste incinerator / SLF / CHWTSDF, Jajpur.
2.	Waste containing oil	Storage in an impervious pit / containers under covered shed followed by final disposal in Authorised Hazardous Waste incinerator / SLF / CHWTSDF, Jajpur.
3.	Used Oil	Storage in impervious pits / containers under covered shed followed by sale to authorized recycler through auction.
4.	Used Batteries	Stored in an earmarked place on impervious floor under covered shed followed by sale to authorized recycler through auction.
5.	Empty Barrels/Containers	Storage in an impervious pit under covered shed followed by disposal through authorized vendors.

Solid Waste Handling and Disposal:

These contain high proportions of overburden/mineral rejects in the form of gravel/ boulder and tailings. In the overburden, the Fe content is less than 45% however in mineral rejects the same is between 45-57%. The bulk chemical composition tailing is around 57.67% Fe, 6.29% Al₂O₃, 3.52% SiO₂ and 6.93% LOI.

Disposal practice adopted for solid wastes:

- i) Tailing generated out of washing and jigging operations are allowed to settle in tailing pond.
- ii) The Overburden, Mineral reject are being stacked at earmarked sites as per the approved mining plan within the existing broken areas.

PART – G

Impact of pollution abatement measures taken on conservation of natural resources and on the cost of production.

1. Various mineral conservation techniques are adopted by mine including use of low-grade ore by beneficiation, blending of mineral rejects with high grade ore as per steel plant quality requirements.
2. For conservation of natural resources, high efficiency HEMM are used with schedule maintenance which keeps the vehicular emission under control and also reduce the fuel consumption.
3. A System for Zero Discharge has been provided at Barsua Iron Mine for recovery and recycling of decanted water from the tailing pond which resulted in reduction of pollution load in the nearby water bodies and reduce the fresh water consumption.
4. Dry fog system has been installed at crushing plant and transfer points which improves the working environment in the plant.
5. Check dam, retaining wall, toe wall, garland drain and settling pit has been constructed for control of surface run-off from the mines which also result in augmentation of ground water.

PART – H

Additional measures/ investment proposal for environmental protection, abatement of pollution, prevention of pollution.

The following additional investment proposals for environmental protection, abatement of pollution, prevention of pollution are under consideration for the mine:

1. Construction of concrete road at the entry and exit point of mines.
2. Installation of additional one numbers of CAAQMS near transport road.
3. Construction of Check dam, garland drain, toe walls/ retention wall and settling pit.
4. De-silting of existing check dams.
5. Plantation of 20000 saplings around the mines.
6. Surface runoff and slope stability study for the mines.
7. Construction of rain water harvesting system for recharge of ground water.
8. Stabilization of waste dump with coir matting.
9. Installation of IP Cameras in the major dust prone areas.

PART – I

Any other particulars for improving the quality of environment.

1. Creating awareness amongst employees and villagers regarding protection of environment and forest by conducting various awareness programmes.
2. Celebration of Environment day, Environment week, Environment month, water conservation month, etc to create awareness among employees and villagers.
3. Display of Boards at various locations carrying environmental slogans and environmental parameters.
4. Celebration for Mass awareness by slogans, working models & Cultural Program by employees & school children in Mines Environment & Mineral Conservation week under the aegis of IBM.

Date : 11.07.2020



**Chief General Manager
Barsua & Kalta Iron Mines**



BARSUA-TALDIH-KALTA IRON MINES
DETAIL ANALYSIS OF AIR QUALITY MONITORING

Location	APRIL 2019				MAY 2019				JUNE 2019				JULY 2019				AUGUST 2019				SEPT 2019			
	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x
A) Ambient Air Quality in Residential, rural & other areas																								
Norm as per NAAQS	100	60	80	80	100	60	80	80	100	60	80	80	100	60	80	80	100	60	80	80	100	60	80	80
A 1	57.50	30.90	5.00	13.30	49.70	29.30	4.80	13.50	58.80	31.00	4.60	13.50	51.70	27.10	4.50	11.90	48.90	26.60	4.50	12.50	40.94	22.93	4.76	11.77
A 2	52.70	28.00	4.40	12.40	49.30	27.10	4.20	11.00	52.60	28.30	4.20	10.40	51.40	27.10	4.20	11.50	47.40	26.70	4.10	11.00	41.66	23.33	4.33	11.34
A 3	60.10	37.00	4.40	12.50	56.40	31.60	4.30	11.80	58.90	33.00	4.20	11.20	55.60	28.40	4.10	11.70	52.30	27.90	4.20	11.20	38.27	15.22	4.46	10.14
A 4	62.00	37.60	4.90	14.50	57.90	32.70	4.70	13.20	61.40	36.60	4.90	13.70	59.10	29.80	4.60	12.50	53.80	28.70	4.40	12.50	40.83	22.86	4.31	11.91

* unit in µg/m³

Note : Ambient Air Quality Monitoring was conducted as per MoEF Notification No. GSR 826(E), dtd. 16.11.2009.

B) Results of Fugitive Emission / Work Zone Quality

Location	APRIL 2019			MAY 2019			JUNE 2019			JULY 2019			AUGUST 2019			SEPT 2019		
	Min.	Max.	1200	Min.	Max.	1200	Min.	Max.	1200	Min.	Max.	1200	Min.	Max.	1200	Min.	Max.	1200
Norm as per IBM																		
Actual (PM)																		
F 1	256	353	273	316	295	334	256	359	256	311	226	348						
F 2	453	513	529	552	748	771	425	611	506	532	410	584						
F 3	284	332	318	352	295	326	3.5	354	309	341	288	351						
F 4	302	344	342	367	325	365	301	352	302	351	309	348						
F 5	308	359	354	382	335	378	305	351	312	359	300	344						
F 6	608	721	689	731	699	805	623	789	667	721	412	506						
F 7	732	810	667	704	721	811	719	819	345	701	419	536						
F 8	708	746	725	752	746	802	687	759	706	732	420	511						
F 9	775	856	807	840	842	903	801	875	779	823	418	531						
F 10	796	875	828	861	879	951	768	922	806	843	612	846						
F 11	821	884	876	925	856	911	795	902	843	915	746	846						
F 12	901	956	892	928	938	997	826	926	867	911	726	844						

* unit in µg/m³Note : Fugitive emission standards as per MoEF Notification No. GSR 809(E), dtd. 4.10.2010 on iron ore mining and processing. Particulate matter (PM)-1200 µg/m³ at a distance of 253.2m. In the pre dominant downward direction from the source of generation

NB :

BDL - Below Detectable Limit (6µg/m³)

Locations :

- A 1 : Guest House, Tarsa township
- A 2 : Barua valley, Township
- A 3 : Taniara Village
- A 4 : Mine Site Office (KM)
- F1 : Drilling Site (BIM)
- F2 : Excavation & loading (BIM)
- F3 : Haul Road(BIM)
- F4 : Dump Area(BIM)
- F5 : Stock pile& Loading(B/V, BIM)
- F6 : Haul Road (TIM)
- F7 : Screening Area (TIM)
- F8 : Excavation Area(TIM)

BARSUA-TALDIH-KALTA IRON MINES
DETAIL ANALYSIS OF AIR QUALITY MONITORING

Location	OCTOBER 2019				NOVEMBER 2019				DECEMBER 2019				JANUARY 2020				FEBRUARY 2020				MARCH 2020			
	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x

A) Ambient Air Quality in Residential, rural & other areas.

Norm as per NAAQS	100	60	80	80	100	60	80	80	100	60	80	80	100	60	80	80	100	60	80	80	100	60	80	80
A 1	64.80	38.88	9.78	12.84	62.09	37.25	10.75	13.14	62.88	37.73	10.03	12.81	66.43	39.86	7.94	12.35	70.65	42.39	9.69	12.13	63.68	38.21	11.49	12.91
A 2	53.18	31.91	9.14	12.35	51.55	30.93	8.53	12.24	53.79	32.27	8.80	10.73	55.7	33.42	9.01	12.69	62	37.2	11.54	14.98	53.46	32.08	9.26	12.49
A 3	61.43	36.86	7.18	11.98	63.25	37.95	6.55	12.01	63.05	37.83	7.18	12.15	62.1	37.2	6.1	11.8	71.5	42.9	7.4	13	67.3	40.4	7.5	11.6
A 4	48.2	26.9	4.3	11.8	49.4	26.8	4.3	11.8	51.4	28.0	4.5	11.9	52.23	31.54	6.18	11.64	55.8	33.48	4.94	11.73	51.95	31.7	6.31	11.91

* unit in µg/m³

Note : Ambient Air Quality Monitoring was conducted as per MoEF Notification No. GSR 826(E), dtd.16.11.2009.

B) Results of Fugitive Emission / Work Zone Quality.

Location	OCTOBER 2019				NOVEMBER 2019				DECEMBER 2019				JANUARY 2020				FEBRUARY 2020				MARCH 2020			
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Norm as per IBM	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
Actual(PM)	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
F 1	39.2	586.6	561.2	598.2	571.2	602.8	541.2	648.2	552.2	588.8	550.2	811.2												
F 2	449.6	512.6	481.2	502.2	480.6	508.2	454.2	542.2	502.8	578.5	490.6	512.2												
F 3	530.6	610.2	544.8	596.2	538.8	577.2	532.2	592.2	542.2	618.2	506.6	614.6												
F 4	318.8	402.2	336.6	424.2	329.6	432.2	336.2	492.2	385.4	398.2	342.2	424												
F 5	392.6	502.2	402.8	444.2	409.6	466.2	388.2	434.2	406.2	488.2	411.2	471.2												
F 6	782.0	834.0	831.0	848.0	852.0	878.0	736.0	774.0	748.0	848.0	818.0	841.0												
F 7	802.0	842.0	841.0	858.0	866.0	904.0	743.0	788.0	806.0	926.0	772.0	816.0												
F 8	808.0	842.0	846.0	878.0	872.0	910.0	768.0	794.0	818.0	906.0	802.0	834.0												
F 9	417	513	410	569	423	569	424	558	446	516	411	584												
F 10	663	774	613	750	658	751	632	744	662	752	626	714												
F 11	668	836	706	845	712	845	711	837	718	806	732	816												
F 12	711	825	574	863	685	863	712	825	742	816	708	806												

* unit in µg/m³

Note : Fugitive emission standards as per MoEF Notification No. GSR 809(E), dtd.4.10.2010 on iron ore mining and processing. Particulate matter (PM)₁₀-1200 µg/m³ at a distance of 25±2m. In the pre dominant downward direction from the source of generation.

NB

BDL - Below Detectable Limit (6µg/m³)

Locations :

- A 1 Guest House, Tansa township
- A 2 Barua valley, Township
- A 3 Tapania Village
- A 4 Mine Site Office (KM)
- F1 : Drilling Site (BIM)
- F2 Excavation & loading (BIM)
- F3 Haul Road(BIM)
- F4 Dump Area(BIM)
- F5 Stock pile& Loading(B.V. BIM)
- F6 Haul Road (TIM)
- F7 Screening Area (TIM)
- F8 Excavation Area(TIM)

BARSUA-TALDIH-KALTA IRON MINE
WATER QUALITY OF GROUND WATER

Sl.No.	Parameters v	APRIL 2019			MAY 2019			JUNE 2019			JULY 2019			AUGUST 2019			SEPTEMBER 2019		
		GW1	GW 2	GW3	GW1	GW2	GW3	GW1	GW2	GW3	GW1	GW2	GW3	GW1	GW2	GW3	GW1	GW2	GW3
1	Colour	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2	Odour	U/O	U/O	U/O	U/O	U/O	U/O	U/O	U/O	U/O	AL	AL	AL	AL	AL	AL	AL	U/O	AL
3	Taste	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL
4	Turbidity	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
5	pH Value	7.2	7.22	7.3	7.13	7.16	7.21	7.13	7.21	7.26	7.24	7.21	7.28	7.16	7.11	7.21	7.34	7.31	7.34
6	Total Hardness (as CaCO ₃)	96	83	87	91	87	81	135	127	125	81	95	89	87	93	80	88	88	94
7	Iron (as Fe)	0.22	0.24	0.26	0.32	0.28	0.25	0.34	0.3	0.36	0.24	0.22	0.26	0.29	0.34	0.24	0.26	0.21	0.24
8	Chloride (as Cl ⁻)	52	46	47	42	40	44	35	32	36	48	50	45	41	40	45	52	46	51
9	Residual, free Chlorine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10	Dissolved Solids	185	162	162	172	169	163	216	195	186	167	183	163	165	173	162	162	170	174
11	Calcium (as Ca)	25	21	22	21	20	23	38.6	35.9	30.7	22	24	23	21	22	24	18.6	32	28.4
12	Magnesium (as Mg)	8.3	8.1	7.9	9.6	9.4	8.7	9.1	10.2	11.3	7.8	8.4	7.7	10.1	9.2	8.5	10.8	10.6	9.6
13	Copper (as Cu)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
14	Manganese (as Mn)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
15	Sulphate (as SO ₄)	12.6	9.71	9.76	8.76	6.69	6.48	5.22	6.18	5.46	9.82	12.3	9.82	6.71	8.69	6.42	9.26	12.1	9.21
16	Nitrate (as NO ₃)	1.46	1.32	1.35	1.53	1.47	1.35	1.46	1.51	1.48	1.33	1.5	1.32	1.5	1.52	1.28	1.44	1.64	1.28
17	Fluoride (as F)	0.14	0.18	0.12	0.11	0.13	0.14	0.16	0.18	0.15	0.19	0.15	0.11	0.12	0.1	0.15	0.26	0.21	0.18
18	Phenolic Compounds (as C ₆ H ₅ OH)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
19	Mercury (as Hg)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
20	Cadmium (as Cd)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
21	Selenium (as Se)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Arsenic (as As)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
23	Cyanide (as CN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Lead (as Pb)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
25	Zinc (as Zn)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
26	Chromium (as Cr+6)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
27	Antonie Detergents (as MBAS)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
28	Mineral Oil	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
29	Alkalinity	98	95	92	112	101	97	120	112	102	93	95	90	104	115	98	86	82	96
30	Aluminium (as Al)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
31	Boron (as B)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
32	Poly Aromatic Hydrocarbon as PAH	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
33	Pesticide	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent

ND :

GW 1 : Hand pump (Banka Bazar)

GW 2 : Hand pump at Zero point : (BIM)

GW 3 : Hand Pump at Kalta Village (KIM)

ND : Not Detected

UO : Un-Objectable

AL : Agreeable

CL : Colorless



**BARSUA-TALDIH-KALTA IRON MINE
WATER QUALITY OF GROUND WATER**

Sl.No.	Parameters v	OCTOBER 2019			NOVEMBER 2019			DECEMBER 2019			JANUARY 2020			FEBRUARY 2020			MARCH 2020		
		GW1	GW2	GW3	GW1	GW2	GW3	GW1	GW2	GW3	GW1	GW2	GW3	GW1	GW2	GW3	GW1	GW2	GW3
1	Colour	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2	Odour	AL	UO	AL	AL	UO	AL	AL	UO	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL
3	Taste	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL	AL
4	Turbidity	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
5	pH Value	7.34	7.31	7.12	7.34	7.31	7.56	7.34	7.31	7.11	7.38	7.36	7.28	7.38	7.34	7.24	7.32	7.34	7.62
6	Total Hardness (as CaCO ₃)	88.0	88.0	92.0	88.0	88.0	96.0	88.0	88.0	96.0	82	90	92	90	86	108	86	94	102
7	Iron (as Fe)	0.26	0.21	0.29	0.26	0.21	0.31	0.26	0.21	0.31	0.22	0.22	0.31	0.28	0.18	0.36	0.22	0.26	0.32
8	Chloride (as Cl ⁻)	52.0	46.0	55.0	52.0	46.0	52.0	52.0	46.0	55.0	50	48	56	56	42	62	50	52	64
9	Residual, free Chlorine	NID	NID	NID	NID	NID	NID	NID	NID	NID	NID	NID	NID	NID	NID	NID	NID	NID	NID
10	Dissolved Solids	162.0	170.0	182.0	162.0	170.0	187.0	162.0	170.0	182.0	160	166	182	168	162	190	158	174	196
11	Calcium (as Ca ²⁺)	18.6	32.0	29.3	18.6	32.0	29.3	18.6	32.0	29.1	18.2	30	28	19.2	30	31.8	18.2	34	30.2
12	Magnesium (as Mg)	10.8	10.6	9.7	10.8	10.6	9.7	10.8	10.6	10.2	11.4	11.2	10.2	11.6	11.2	9.82	11.2	12	9.8
13	Copper (as Cu)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
14	Manganese (as Mn)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
15	Sulphate (as SO ₄)	9.26	12.10	9.26	9.26	12.1	9.32	9.26	12.1	10.30	9.4	11.6	9.4	9.4	11.8	9.34	9	12.6	9.44
16	Nitrate (as NO ₃)	1.44	1.64	1.23	1.44	1.64	1.29	1.44	1.64	1.32	1.48	1.62	1.3	1.6	1.56	1.28	1.42	1.68	1.36
17	Fluoride (as F)	0.26	0.21	0.19	0.26	0.21	0.22	0.26	0.21	0.26	0.28	0.24	0.22	0.28	0.24	0.24	0.22	0.24	0.26
18	Phenolic Compounds (as C ₆ H ₅ OH)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
19	Mercury (as Hg)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
20	Cadmium (as Cd)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
21	Selenium (as Se)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Arsenic (as As)	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
23	Cyanide (as CN)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Lead (as Pb)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
25	Zinc (as Zn)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
26	Chromium (as Cr ⁺⁶)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
27	Anionic Detergents (as MBAS)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
28	Mineral Oil	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
29	Alkalinity	86.0	82.0	94.0	86.0	82.0	99.0	86.0	82.0	98.0	84	80	108	82	78	96	84	80	104
30	Aluminium (as Al)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
31	Boron (as B)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
32	Poly Aromatic Hydrocarbon as PAH	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
33	Pesticide	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent

NB :

GW 1 : Hand pump (Banka Bazar)

GW 2 : Hand pump at Zero point : (BIM)

GW 3 : Hand Pump at Kalta Village (KIM)

ND : Not Detected

UO : Un-Objectable

AL : Agreeable



BARSUA-TALDIH-KALTA IRON MINE
WATER QUALITY OF STREAM SAMPLES/SURFACE WATER

Sl.No.	Parameters	APRIL 2019							MAY 2019							JUNE 2019						
		SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7
1	Colour (max)	12	9	6	11	11	9	7	11	9	11	10	12	9	12	6	10	7	4	11	9	8
2	pH Value	7.05	6.91	6.4	6.36	6.6	6.91	7.11	7.06	6.53	6.83	6.91	6.86	7.11	6.98	7.08	6.91	6.95	7.08	7.04	7.22	6.75
3	TSS	23	26	16	15	16	21	36	17	21	18	20	22	20	24	Nil	10	Nil	Nil	13	12	20
4	DO	5.3	5.4	6.1	6	6.3	6.1	5.3	5.2	5.6	6.5	6.5	6.5	6.3	5.4	5.1	5.6	6	6.2	6.4	6.6	5.5
5	Turbidity	2	2.2	2	2.4	5.1	3.7	4	1.4	1.8	Nil	Nil	5.3	Nil	4.2	Nil	Nil	Nil	Nil	Nil	Nil	Nil
6	Chloride (as Cl)	21	22	20	23	20	23	26	22	20	21	20	21	22	20.1	20	22	23	20	24	25	21
7	TDS	83	91	82	90	84	86	92	94	95	90	91	85	90	91	110	113	106	96	101	111	108
8	BOD (3 days)	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
9	COD	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
10	Arsenic as As	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
11	Lead as Pb(max)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
12	Cadmium as Cd (max)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
13	Hexa Chromium as Cr ⁶⁺	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
14	Copper as Cu (max)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
15	Zinc as Zn(max)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
16	Selenium as Se (max)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
17	Cyanide as CN (max)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
18	Fluoride as F (max)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
19	Sulphates (SO ₄) (max)	2.3	2.1	2.3	2.1	2.4	2.4	2.8	2.5	2.4	2.1	2.1	2.5	2.6	2.5	2.4	2.8	2.5	2.1	3.2	3	3.3
20	Phenolic Compounds as C ₆ H ₅ OH (max)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
21	Iron as Fe (max)	0.81	0.84	0.81	0.8	0.82	0.86	0.85	0.82	0.81	0.74	0.71	0.7	0.81	0.8	0.91	0.9	0.85	0.81	0.85	0.93	0.81
22	Nitrate as NO ₃ (max)	0.74	0.82	0.74	0.63	0.8	0.77	0.92	0.83	0.95	0.83	0.64	0.86	0.84	1.02	0.9	1.03	1.01	0.86	1.04	1.02	1.13
23	Anionic Detergents (max)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
24	Total Coli form	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8

NB :

SW 1: Kuradih Nala US : BIM

SW 2: Kuradih Nala DS : BIM

SW 3: Samaj Nallah US : Near Phuljhar

SW 4: Samaj Nallah DS : Near Phuljhar

SW 5: Najkura Nala D/S : KIM

SW 6: Water stream from Hill : KIM (U/S of Najkura Nala)

SW 7: Kuradih Nala US : Near Bhutuda

CL: Colourless

ND: Not Detected

BARSUA-TALDIH-KALTA IRON MINE
WATER QUALITY OF STREAM SAMPLES/SURFACE WATER

Sl.No	Parameters	JULY 2019							AUGUST 2019							SEPTEMBER 2019						
		SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7
1	Colour (Pt-Co Scale)	<5	<5	<5	<5	<5	<5	<5	<5.0	10	10	<5.0	5	10	<5.0	<5	<5	<5	<5	<5	<5	<5
2	pH Value	7.09	6.94	6.51	6.52	6.71	6.93	6.78	7.01	6.61	6.87	6.98	6.74	7.06	7.02	7.12	6.94	6.56	6.62	6.78	6.96	6.78
3	TSS	20	25	17	14	17	20	16	16	22	17	21	28	22	24	24	25	16	21	12	18	16
4	DO	5.5	5.3	6.3	6.1	6.7	6	7.4	5.3	5.5	6.3	6.1	6.7	6.2	6.2	5.8	5.6	6.1	6.6	6.2	5.6	6.4
5	Turbidity	2.1	2.3	2.1	2.3	4.8	3.9	3.2	2.6	2.3	Nil	Nil	5.4	Nil	Nil	1.8	2.6	2	2.4	4.2	3.6	2.8
6	Chloride (as Cl)	23	21	23	25	22	24	28	23	21	20	24	22	20	26	28	26	30	26	28	28	32
7	TDS	82	93	87	91	85	88	96	95	93	91	95	87	92	92	94	102	91	98	90	96	11.6
8	BOD (3 days)	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	
9	COD	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<3.0	<4.0	<4.0	<4.0	<3.0	<4.0	<4.0	<4.0	
10	Arsenic as As	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	
11	Lead as Pb(max)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
12	Cadmium as Cd (max)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
13	Hexa Chromium as Cr ⁶⁺	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
14	Copper as Cu (max)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
15	Zinc as Zn(max)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	
16	Selenium as Se (max)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
17	Cyanide as CN (max)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ND	<0.01	<0.01	<0.01	
18	Fluoride as F ⁻ (max)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
19	Sulphates (SO ₄) (max)	5.6	6.1	5.8	5.2	2.2	2.3	5.6	2.4	2.6	2	2.2	3.4	3.8	2.4	6.4	6.6	5.2	6.4	2.2	2.3	6.1
20	Phenolic Compounds as C ₆ H ₅ OH (max)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.001	<0.05	<0.05	<0.05	
21	Iron as Fe (max)	0.82	0.81	0.86	0.83	0.8	0.85	0.82	0.8	0.82	0.76	0.74	0.72	0.83	0.71	0.84	0.78	0.81	0.86	0.8	0.85	0.81
22	Nitrate as NO ₃ (max)	0.71	0.8	0.75	0.66	0.82	0.75	0.68	0.8	0.93	0.82	0.66	0.85	0.85	0.62	0.76	0.84	0.68	0.75	0.82	0.75	0.78
23	Anionic Detergents (max)	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.05	<0.05	
24	Total Coli form	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	

NB :

SW 1: Kuradih Nala US : BIM

SW 2: Kuradih Nala DS : BIM

SW 3: Samaj Nallah US : Near Phuljar

SW 4: Samaj Nallah DS : Near Phuljar

SW 5: Najkura Nala : KIM

SW 6 : Water stream from Hill : KIM

SW 7: Kuradih Nala US : Near Bhutoda

CL: Colourless

ND: Not Detected



BARSUA-TALDIH-KALTA IRON MINE
WATER QUALITY OF STREAM SAMPLES/SURFACE WATER

Sl.No.	Parameters	OCTOBER 2019						NOVEMBER 2019						DECEMBER 2019					
		SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6
1	Colour (max)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2	pH Value	7.24	7.12	7.02	7.11	6.69	6.95	7.24	7.16	6.94	7.12	6.63	6.95	7.26	7.18	7.08	7.12	6.87	6.97
3	TSS	24.0	32.0	26.0	34.0	13.0	17.0	26.0	34.0	28.0	36.0	16.0	19.0	32	40	32	38	13.0	16.0
4	DO	6.1	6.6	6.2	6.8	6.4	5.5	6.6	6.2	6.4	6.2	6.2	5.5	6.6	6.8	6.2	7.1	6.7	5.7
5	Turbidity	1.2	2.6	1.8	2.8	4.1	3.7	1.8	2.2	2.1	3.2	4.7	3.3	1.8	2.2	1.9	2.6	4.9	4.2
6	Chloride (as Cl)	22.0	30.0	26.0	38.0	27.0	29.0	26.0	34.0	28.0	32.0	25.0	27.2	24	32	28	40	25.0	29.0
7	TDS	90.0	112.0	96.0	124.0	95.0	93.0	96.0	118.0	102.2	128.0	92.0	98.0	96	118	90	132	96.0	93.0
8	BOD (3 days)	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
9	COD	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
10	Arsenic as As	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
11	Lead as Pb(max)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
12	Cadmium as Cd (max)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
13	Hexa Chromium as Cr ⁶⁺	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
14	Copper as Cu (max)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
15	Zinc as Zn(max)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
16	Selenium as Se (max)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
17	Cyanide as CN (max)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
18	Fluoride as F (max)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
19	Sulphates (SO ₄) (max)	6.2	7.2	6.4	7.8	2.4	2.1	5.8	6.8	6.2	7.1	2.6	2.7	6.4	7.1	6.8	7.2	2.5	2.8
20	Phenolic Compounds as C ₆ H ₅ OH (max)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Iron as Fe (max)	0.42	0.48	0.41	0.44	0.81	0.86	0.38	0.42	0.36	0.40	0.82	0.81	0.38	0.41	0.42	0.41	0.81	0.87
22	Nitrate as NO ₃ (max)	0.78	0.91	0.81	0.96	0.86	0.77	0.71	0.89	0.74	0.90	0.84	0.79	0.71	0.84	0.80	0.88	0.85	0.77
23	Anionic Detergents (max)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
24	Total Coli form	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8

NB :

SW 1: Kuradih Nala US : BIM

SW 2: Kuradih Nala DS : BIM

SW 3: Samaj Nallah US : Near Phuljhar

SW 4: Samaj Nallah DS : Near Phuljhar

SW 5: Najkura Nala D/S : KIM

SW 6 : Water stream from Hill : KIM (U/S of Najkura Nala)

CL: Colourless

ND: Not Detected



BARSUA-TALDIH-KALTA IRON MINE
WATER QUALITY OF STREAM SAMPLES/SURFACE WATER

Sl.No.	Parameters	JANUARY 2020						FEBRUARY 2020						MARCH 2020					
		SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6
1	Colour (Pt-Co Scale)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2	pH Value	7.22	7.12	7.04	7.11	6.84	6.94	7.26	7.18	7.12	7.14	6.72	6.92	7.26	7.18	7.08	7.14	6.72	6.91
3	TSS	30.00	34.00	32.00	30.00	14.00	21.60	22.00	30.00	28.00	32.00	13.80	18.20	28.00	32.00	30.00	34.00	18.20	21.20
4	DO	6.60	6.20	6.60	6.40	6.60	6.20	6.60	6.40	6.40	6.20	6.20	6.60	6.20	6.10	6.60	6.40	6.40	6.60
5	Turbidity	1.10	1.80	1.60	2.40	4.40	4.10	1.80	2.40	2.10	2.20	4.20	4.10	2.10	2.40	2.20	2.60	4.60	4.10
6	Chloride (as Cl)	22.00	28.00	24.00	34.00	30.20	32.80	20.00	28.00	24.00	32.00	32.00	36.00	28.00	36.00	32.00	34.00	28.80	32.60
7	TDS	88.00	116.00	92.00	118.00	94.00	98.00	86.00	110.00	92.00	118.00	110.00	118.00	102.00	114.00	106.20	120.00	98.20	110.00
8	BOD (3 days)	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
9	COD	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
10	Arsenic as As	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
11	Lead as Pb(max)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
12	Cadmium as Cd (max)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
13	Hexa Chromium as Cr ⁶⁺	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
14	Copper as Cu (max)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
15	Zinc as Zn(max)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
16	Selenium as Se (max)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
17	Cyanide as CN (max)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
18	Fluoride as F (max)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
19	Sulphates (SO ₄) (max)	6.60	6.80	6.20	7.20	2.40	2.60	6.60	6.80	6.20	7.40	2.30	2.60	6.20	6.40	6.60	6.80	2.80	3.10
20	Phenolic Compounds as C ₆ H ₅ OH (max)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Iron as Fe (max)	0.44	0.44	0.44	0.46	0.68	0.71	0.44	0.42	0.44	0.42	0.81	0.86	0.42	0.44	0.4	0.41	0.78	0.82
22	Nitrate as NO ₃ (max)	0.82	0.88	0.84	0.92	0.78	0.71	0.72	0.84	0.8	0.89	0.91	0.8	0.74	0.82	0.72	0.88	0.82	0.78
23	Anionic Detergents (max)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
24	Total Coli form	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8

NB:

SW 1: Kuradih Nala US : BIM

SW 2: Kuradih Nala DS : BIM

SW 3: Samaj Nallah US : Near Phuljhar

SW 4: Samaj Nallah DS : Near Phuljhar

SW 5: Najkura Nala : KIM

SW 6: Water stream from Hill : KIM

SW 7: Kuradih Nala US : Near Bhutuda

CL: Colourless

ND: Not Detected