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(Part- III : MINERAL REVIEWS)

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OCHRE

(FINAL RELEASE)

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES

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37 Ochre

Ochre is a natural mineral pigment that occurs in various shades and colours generally ranging from yellow to deep orange or brown. The pigmentary strength of ochre is mainly due to the presence of oxides of iron.The presence of hydrated iron oxide imparts yellow colour and anhydrous iron oxide red. A mixture of ferrous and ferric oxide imparts mainly brown besides other shades. Ochres are non-toxic and are used in manufacturing of paints that not only dries quickly but also covers surfaces thoroughly. Occurrences of ochre have been reported from several States in the country.

RESOURCES

Deposits of red ochre are found chiefly in West Godavari and Visakhapatnam districts in Andhra Pradesh; Banaskantha district in Gujarat; Bidar district in Karnataka; Satna & Gwalior districts in Madhya Pradesh; Nagpur district in Maharashtra; and Chittorgarh & Udaipur districts in Rajasthan. Deposits of yellow ochre are found in Guntur and Kurnool districts in Andhra Pradesh; Jabalpur, Mandla, Satna & Shahdol districts in Madhya Pradesh ; and Nagpur district in Maharashtra.

The total resources of ochre as on 1.4.2010 as per the UNFC system, are estimated at 144.26 million tonnes. Out of these resources, about 54.94 million tonnes are under Reserves category and 89.31 million tonnes are under Remaining Resources category. Of the total, about 87% resources are of Red ochre, 12% are of Yellow ochre and the remaining 1% are of grades "Not-known". About 81% resources are concentrated in Rajasthan, followed by Andhra Pradesh 8%, Madhya Pradesh 7% and Gujarat about 2%. The remaining 2% resources are located in Karnataka, Maharashtra , Jharkhand and Uttar Pradesh (Table - 1).

PRODUCTION, STOCKS & PRICES

As per GOI notification S.O.423(E) dated 10th February 2015, 'Ochre' has been declared as 'minor mineral' hence the production beyond January 2015 is not available with IBM.The production of ochre at 2.2 million tonnes in 2014-15 (up to January, 2015) increased by about 39% as against the production in the previous year.

There were 33 reporting mines in 2014-15 as against 44 in the previous year. Besides, the production of ochre was also reported as an associated mineral from 20 mines. Seven principal producers accounted for 71% of the total production during the year. The entire production of ochre was reported from private sector in both the years.

Rajasthan continued to be the leading State producing ochre, contributing 89% of the total production in 2014-15 followed by Andhra Pradesh 7%, Madhya Pradesh 3% and the remaining nominal production was contributed by Gujarat (Tables- 2 to 5).

Mine-head closing stock of ochre for the year 2014-15 (up to January,2015) was 1587 thousand tonnes as against 590 thousand tonnes in the previous year (Table- 6).

The average daily employment of labour in 2014-15 was 384 as against 484 in the previous year. Domestic prices of ochre are furnished in the General Review on 'Prices'.

EXPLORATION & DEVELOPMENT

During the year 2014-15, DGM, Rajasthan carried out exploration for red ochre near villages Achalpuria, Amlawad, Chaniatheri & Bamotar etc. in Pratapgarh district, Rajasthan. The exploration work included regional mineral survey, regional geological mapping and detailed geological mapping over an area of 100 sq. km, 10 sq. km and 1.5 sq. km respectively and four samples were collected.

Table – 1 : Reserves/Resources of Ochre as on 1.4.2010
(By Grades/States)

(In tonnes)

	Reserves				Remaining resources								
	Proved STD111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)	Total resources (A+B)
		STD121	STD122			STD221	STD222						
All India : Total	**39863403**	**683093**	**14395680**	**54942176**	**15897677**	**13232482**	**21008598**	**2477593**	**3232246**	**32701243**	**769250**	**89319089**	**144261265**
By Grades													
Red Ochre	37974003	192682	13661485	51828170	15694029	12293432	18915924	1840981	927381	23070808	769250	73511805	125339975
Yellow Ochre	1654547	457712	687865	2800124	17680	758567	1682025	596612	2218504	8501906	-	13775294	16575418
Not-known	234853	32699	46330	313882	185968	180483	410649	40000	86361	1128529	-	2031990	2345872
By States													
Andhra Pradesh	1692839	344121	631277	2668237	-	97810	1199762	347681	-	6569575	-	8214828	10883065
Gujarat	12243	32699	65047	109989	-	-	26520	6971	6210	2906608	-	2946309	3056298
Jharkhand	63695	-	4361	68056	-	-	-	-	147039	-	-	147039	215095
Karnataka	-	-	-	-	-	-	1766367	-	-	-	20000	1786367	1786367
Madhya Pradesh	486269	128178	41027	655474	253245	1549706	1094108	267721	2141616	3732142	749250	9787788	10443262
Maharashtra	22260	-	16000	38260	17680	38080	100980	6010	6010	286000	-	454760	493020
Rajasthan	37586097	178095	13637968	51402160	15626752	11546886	16820861	1824210	896371	19196918	-	65911998	117314158
Uttar Pradesh	-	-	-	-	-	-	-	25000	35000	10000	-	70000	70000

Figures rounded off.

MINING & PROCESSING

Ochre is worked by shallow open-pit mining. Red and yellow ochres occur separately in different bands, depending upon the hydration either in the same mine or in different mines. The run-of-mine contains gritty matter which is removed by levigation & also by hand sorting wherever possible.

Table – 2 : Principal Producers of Ochre, 2014-15

Name & address of producer	Location of mine	
	State	District
Mohd. Sher khan, S/o Gulbaz Khan, Khwaja Bagh, Post Sawa- 312 613, Dist: Chittorgarh, Rajasthan.	Rajasthan	Chittorgarh
*Smt. Parvati Inani, 32-A, Kumbha Nagar, Chittorgarh - 312 001 Rajasthan.	Rajasthan	Chittorgarh
Anil Kumar Sukhwal 733, Near Bus Stand, Sawa - 312 001, Distt. Chittorgarh, Rajasthan.	Rajasthan	Chittorgarh
*Mohd. Saeed Khan, S/o Md. Sher Khan , At & Post Sawa - 312 613, Distt. Chhittorgarh, Rajasthan	Rajasthan	Chittorgarh
*Sajid Ali Nai Abadi, Kannoj Road, Post: Sawa - 312 613, Distt. Chittorgarh, Rajasthan	Rajasthan	Chittorgarh
Mohammad Rashid Shekh, Nai Abadi, Kajorpura, Post Sawa, Distt. Chittorgarh - 312 613, Rajasthan	Rajasthan	Pratapgarh
Indermal Darji, Near Jain Temple, At & Post Sawa - 312 613, Distt. Chittorgarh, Rajasthan.	Rajasthan	Chittorgarh

** Producing ochre as an associated mineral.*

Table – 3 : Production of Ochre, 2012-13 to 2014-15
(By States)

(Qty in tonnes; value in ₹'000)

State	2012-13		2013-14		2014-15* (P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	**1833783**	**582998**	**1580675**	**495087**	**2203708**	**816164**
Andhra Pradesh	97581	21953	130901	23136	155723	23188
Gujarat	4690	797	5050	859	6300	1071
Madhya Pradesh	55445	13552	69246	13068	70422	17329
Rajasthan	1676067	546696	1375478	458024	1971263	774576

* Data upto January 2015.

Table – 4: Production of Ochre, 2013-14 and 2014-15 (By Sector/States/Districts)

(Qty in tonnes; value in ₹'000)

State/District	2013-14			2014-15* (P)		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
India	**44(16)**	**1580675**	**495087**	**33(20)**	**2203708**	**816164**
Private Sector	44(16)	1580675	495087	33(20)	2203708	816164
Andhra Pradesh	**17**	**130901**	**23136**	**11**	**155723**	**23188**
Anantapur	1	844	211	-	-	-
Cuddapah	10	114719	20387	8	146508	21463
Kurnool	6	15338	2538	3	9215	1725
Gujarat	**1**	**5050**	**859**	**1**	**6300**	**1071**
Patan	1	5050	859	1	6300	1071
Madhya Pradesh	**11(4)**	**69246**	**13068**	**9(5)**	**70422**	**17329**
Jabalpur	3(1)	8448	2086	3(1)	35313	5952
Katni	(1)	2425	606	(1)	10600	2650
Rewa	1(2)	29933	7464	1(3)	18509	7821
Satna	6	25990	2667	4	4700	776
Umaria	1	2450	245	1	1300	130
Rajasthan	**15(12)**	**1375478**	**458024**	**12(15)**	**1971263**	**774576**
Bhilwara	2(2)	50475	14645	1(3)	95755	19201
Bikaner	(3)	1662	157	(3)	7422	722
Bundi	(1)	2753	785	(1)	11845	2914
Chittorgarh	7(5)	1028810	403905	5(7)	1612946	686752
Pratapgarh	3	209806	28009	2	177900	54983
Sikar	-	-	-	1	8055	1490
Udaipur	3(1)	81972	10523	3(1)	57340	8514

** Data upto January,2015*

Figures in parentheses indicate number of associated mines of ochre with bauxite,ball clay, felspar, fireclay, iron ore, kaolin/chinaclay & laterite.

Table – 5 : Production of Ochre*, 2013-14 and 2014-15 (P) (By Frequency Groups)

(Qty in tonnes)

Production group	No. of mines		Production for the groups		Percentage in total production		Cumulative percentage	
	2013-14	2014-15*(P)	2013-14	2014-15*(P)	2013-14	2014-15*(P)	2013-14	2014-15*(P)
All Groups	**44(16)**	**33(20)**	**1580675**	**2203708**	**100.00**	**100.00**	**-**	**-**
Up to 5000	26(8)	12(4)	45443	20517	2.88	0.93	2.88	0.93
5001 to 10000	3	5(2)	20051	46599	1.27	2.12	4.15	3.05
10001 to 20000	6(1)	6(4)	117645	136895	7.44	6.21	11.59	9.26
20001 to 30000	1(2)	4(3)	74982	164572	4.74	7.47	16.33	16.73
Above 30001	8(5)	6(7)	1322554	1835125	83.67	83.27	100.00	100.00

** Data upto January,2015.*

Figures in parentheses indicate number of associated mines of ochre with ball clay, bauxite, felspar, fireclay, iron ore, kaolin/chinaclay & laterite

Table – 6 : Mine-head Closing Stocks of Ochre, 2013-14 & 2014-15*
(By States)

(In tonnes)

State	2013-14	2014-15
India	**590059**	**1587197**
Andhra Pradesh	26992	38991
Gujarat	1127	1350
Jharkhand	973	973
Karnataka	5119	5119
Madhya Pradesh	92824	120592
Rajasthan	463024	1420172

** Data upto January,2015*

CONSUMPTION

Consumption of ochre in 2014-15 in the organised sector was at 2,174 thousand tonnes of which Cement Industry alone consumed the entire production(99.53%). The ceramic and paint industries accounted for the remaining consumption. A sizeable quantity is believed to have been consumed by small-scale units as well as cottage industries. However, consumption data in this sector are not available (Table-7).

Ochre is used in colourwashes, distempers, oil paints, lacquers, primers tiles & ceramic, fertilizer and also for imparting colour to paper and cement. It dominates the market because it is cheaper, available in abundance and has good pigmentary quality.

At present, synthetic ferric oxide and other pigments are manufactured extensively and these possess better pigmentary properties than natural ochre. Synthetic products are fast replacing the natural ones, particularly because of quality.

Table – 7 : Consumption* of Ochre, 2012-13 to 2014-15
(By Industries)

(In tonnes)

Industry	2012-13	2013-14 (R)	2014-15 (P)
All Industries	**2065600**	**2294000**	**2174100**
Cement	2055500(18)	2283900 (17)	2164000 (18)
Ceramic	8900 (1)	8900 (1)	8900 (1)
Paint	1200(15)	1200 (15)	1200 (12)

Figures rounded off.

Figures in parentheses denote the number of units in organised sector .

** Paucity of data , hence consumption may not be complete.*

Note: *Data on consumption of ochre (including oxide) relate to units reporting from organised sector only. The data do not include consumption in small-scale units, cottage industries, colour washing, construction industry, etc.*

FOREIGN TRADE

Exports

Exports of ochre increased marginally to 4,034 tonnes in 2014-15 from 3,550 tonnes in the previous year. Out of total exports in 2014-15, exports of earth colours were 1,761 tonnes, red oxide 1,901 tonnes and yellow ochre at 372 tonnes. Exports were mainly to Philippines (28%),

Saudi Arabia (20%) and Tanzania (6%). Exports of earth clay in 2014-15 were 8,915 tonnes compared to 7,115 tonnes in the previous year. Exports were mainly to Saudi Arabia (63%), Bangladesh (11%) & Korea Rep.of (9%) (Tables- 8 to 13).

Imports

Imports of ochre decreased substantially to 176 tonnes in 2014-15 from 282 tonnes in the previous year. Out of total imports in 2014-15, imports of earth colours were 37 tonnes, red oxide 121 tonnes and yellow ochre 18 tonnes only. Imports of ochre were mainly from China(55%), Germany (23%) & USA (14%). Imports of earth clay were 4,617 tonnes in 2014-15 as against 586 tonnes in the previous year. The imports were mainly from Bangladesh(85%) (Tables- 14 to 19).

Table – 8 : Exports of Ochre : Total (By Countries)

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹ '000)	Qty (t)	Value (₹ '000)
All Countries	**3550**	**72785**	**4034**	**92570**
Saudi Arabia	669	12623	789	21203
Philippines	868	13137	1138	19351
Thailand	151	3621	212	5479
Ethiopia	25	323	217	4565
Tanzania	151	2431	241	3760
Bangladesh	6	1228	34	3368
Brazil	1	576	21	2940
Guinea	129	2254	107	2662
Nepal	87	4234	233	2601
UK	45	988	120	2385
Other countries	1418	31370	922	24256

Table – 9 : Exports of Ochre: Earth Colours (By Countries)

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹ '000)	Qty (t)	Value (₹ '000)
All Countries	**1618**	**26594**	**1761**	**24363**
Philippines	854	11433	1103	14562
Ethiopia	24	298	169	2684
Germany	168	3186	96	1817
Saudi Arabia	95	1326	100	1349
UAE	66	1050	9	878
Kuwait	24	691	25	755
South Africa	11	296	20	613
Tanzania	51	690	26	404
Kenya	35	723	9	370
Indonesia	68	759	26	271
Other countries	222	6142	178	660

Table – 10 : Exports of Ochre: Yellow Ochre (By Countries)

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹ '000)	Qty (t)	Value (₹ '000)
All Countries	**531**	**12099**	**372**	**11415**
Saudi Arabia	229	5114	154	3659
Bangladesh	2	778	14	1682
Philippines	6	300	3	1101
USA	70	1237	32	915
Spain	79	1771	38	772
Ethiopia	-	-	26	464
UAE	17	509	16	453
Denmark	-	-	20	390
Germany	-	-	2	378
Kenya	37	378	22	286
Other countries	91	2012	45	1315

Table – 11 : Exports of Persian Red (By Countries)

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹ '000)	Qty (t)	Value (₹ '000)
All Countries	**++**	**13**	**++**	**62**
Nepal	-	-	++	62
Other countries	++	13	-	-

Table –12 : Exports of Ochre: Red Oxide (By Countries)

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹ '000)	Qty (t)	Value (₹ '000)
All Countries	**1401**	**34079**	**1901**	**56730**
Saudi Arabia	345	6184	535	16195
Thailand	151	3621	212	5479
Philippines	8	1404	32	3689
Tanzania	90	1643	199	3090
Brazil	1	576	21	2940
Guinea	129	2254	107	2662
UK	24	421	120	2385
Nepal	39	3285	79	2272
Kazakhstan	-	-	10	1903
Bangladesh	2	404	20	1686
Other countries	612	14287	566	14429

Table – 13 : Exports of Earth Clay (By Countries)

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹ '000)	Qty (t)	Value (₹ '000)
All Countries	**7115**	**35053**	**8915**	**60466**
Saudi Arabia	4537	14430	5578	30221
Bangladesh	96	2250	1015	14425
Korea, Rep. of	1180	6677	775	4870
Qatar	-	-	409	2959
Egypt	375	1144	532	2283
Israel	80	1813	64	1644
Nepal	82	511	195	1249
Nigeria	165	1275	76	687
USA	2	30	90	501
Mozambique	152	2404	40	492
Other countries	446	4519	141	1135

Table – 14 : Imports of Ochre: Total (By Countries)

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹ '000)	Qty (t)	Value (₹ '000)
All Countries	**282**	**30443**	**176**	**25953**
China	131	13757	96	15440
Germany	9	3867	40	3259
USA	136	9467	25	2378
Thailand	++	158	9	1881
France	++	653	1	1063
Belgium	++	288	++	818
Brazil	1	389	1	441
Italy	5	1369	2	356
Singapore	++	100	2	175
Japan	-	-	++	79
Other countries	++	395	++	63

Table – 15 : Imports of Ochre: Earth Colours (By Countries)

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹ '000)	Qty (t)	Value (₹ '000)
All Countries	**32**	**2343**	**37**	**1823**
Germany	-	-	37	1739
USA	++	59	++	44
China	30	1914	++	29
Italy	2	369	++	11
Other countries	++	1	-	-

Table – 16 : Imports of Ochre: Yellow Ochre (By Countries)

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹ '000)	Qty (t)	Value (₹ '000)
All Countries	**18**	**5732**	**18**	**5211**
Thailand	++	158	9	1881
France	++	653	1	1063
Belgium	++	272	++	818
Germany	3	1682	++	761
China	13	1759	7	464
Italy	2	712	1	190
Finland	-	-	++	34
Other countries	++	496	-	-

Table – 17 : Imports of Persian Red (By Countries)

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹ '000)	Qty (t)	Value (₹ '000)
All Countries	**++**	**272**	**++**	**96**
USA	++	272	++	96
Other countries	-	-	-	-

Table – 18 : Imports of Red Oxide (By Countries)

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹ '000)	Qty (t)	Value (₹ '000)
All Countries	**232**	**22096**	**121**	**18823**
China	88	10084	89	14947
USA	136	9136	25	2238
Germany	6	2185	3	759
Brazil	1	389	1	441
Singapore	-	-	2	174
Italy	1	287	1	156
Japan	-	-	++	79
Spain	-	-	++	22
UAE	-	-	++	7
Other countries	-	15	-	-

Table – 19 : Imports of Earth Clay (By Countries)

Country	2013-14		2014-15 (P)	
	Qty (t)	Value (₹ '000)	Qty (t)	Value (₹ '000)
All Countries	**586**	**16862**	**4617**	**2979**
Bangladesh	316	433	3917	2251
Japan	10	498	700	728
Other countries	260	15931	++	++