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(Part- III : Mineral Reviews)

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MINOR MINERALS

30.17 OCHRE

(ADVANCE RELEASE)

GOVERNMENT OF INDIA
MINISTRY OF MINES
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30-17 Ochre

Ochre is a natural mineral pigment known to mankind from ages. In ancient times it had been used in colouring earthen-ware, household utensils and for decorative purposes. Though its use dates back to prehistoric times, ochre's use only became widespread in the late 19th century, when Jean-Etienne Astier of Roussilon introduced the industrial process for making ochre pigment.

It 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.

Depending upon the colour, the ochres are called red ochre, yellow ochre, green earth, sienna, umber and various other names. In addition to red ochre, the red oxide of iron, commonly called 'red oxide' is an important natural pigment which results from alteration of haematite & ferruginous laterite.

Red ochre is mostly used in Cement Industry. The Cement Grade mix raw material requires a minimum quantum of iron and alumina. The red ochre mixed with limestone makes a perfect mix of constituents in the raw material fed to the cement manufacturing units.

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.

RESERVES/RESOURCES

Deposits of red ochre are found chiefly in Bharatpur, Bhilwara, Bikaner, Chittorgarh & Udaipur districts in Rajasthan; Gwalior, Katni and Rewa districts in Madhya Pradesh; Anantapur, Kadapa, Visakhapatnam districts in Andhra Pradesh; Bhavnagar, Kachchh & Patan districts in Gujarat; Ballari & Bidar districts in Karnataka and Chandrapur district in Maharashtra.

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 reserves/resources of ochre as on 1.4.2015 as per the NMI data, based on UNFC system, have been estimated at 167.79 million tonnes. Out of these resources, about 36.93 million tonnes are under 'Reserves' category and 130.86 million tonnes are under 'Remaining Resources' category. Of the total, about 87% resources are of red ochre, 11% are of yellow ochre and the remaining 2% are of grades "Not-known". About 78% resources are concentrated in Rajasthan, followed by Madhya Pradesh 11%, Andhra Pradesh 7% and Gujarat about 2%. The remaining 2% resources are located in Karnataka, Maharashtra, Jharkhand and Uttar Pradesh (Table-1).

PRODUCTION

As per Govt of India Notification S.O. 423(E), dated 10th February 2015, 'ochre' has been declared as 'Minor Mineral', hence the producers report the production data directly to the respective States and not to IBM. However, efforts were made to collect this information through correspondence with the State Directorates of Mining and Geology of individual States or visiting their websites. But data of only a few States could be collected. All possible information/data that could be gathered has been presented in this Review.

State-wise production of ochre is given in Table-2. (Andhra Pradesh - yellow ochre, Gujarat - red ochre)

Table – 1 : Reserves/Resources of Ochre as on 1.4.2015
(By Grades/States)

(In tonnes)

Grade/State	Reserves				Remaining Resources								Total Resources (A+B)
	Proved STD111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)	
		STD121	STD122			STD221	STD222						
All India : Total	**21959552**	**4448341**	**10525912**	**36933805**	**44924890**	**13936202**	**31896176**	**2559245**	**3560819**	**32369262**	**1612607**	**130859201**	**167793006**
By Grades													
Red Ochre	16332257	4448341	9775941	30556539	43386327	12810591	28564110	1922633	1316886	25711807	1610486	115322840	145879380
Yellow Ochre	5626356	-	75802	5702158	1404292	912286	1796007	596612	2071612	5528926	2121	12311856	18014014
Not-known	939	-	674169	675108	134271	213324	1536059	40000	172321	1128529	-	3224505	3899613
By States													
Andhra Pradesh	5284990	-	64602	5349592	1404230	430231	1087353	347681	-	3596595	2121	6868210	12217802
Chhattisgarh	-	-	-	-	-	142	-	-	-	-	-	142	142
Gujarat	37862	-	75703	113565	-	32699	4303	-	-	3016066	-	3053068	3166633
Jharkhand	-	-	-	-	62	-	4	-	147	-	-	214	214
Karnataka	-	-	-	-	-	-	1766367	-	-	-	20000	1786367	1786367
Madhya Pradesh	1605342	194757	1895247	3695346	681904	1653225	5402710	356344	2577575	3732142	749250	15153150	18848495
Maharashtra	22260	-	16000	38260	-	-	156740	6010	6010	286000	-	454760	493020
Rajasthan	15009099	4253584	8474360	27737043	42838694	11819905	23478699	1824210	942087	21728459	841236	103473290	131210333
Uttar Pradesh	-	-	-	-	-	-	-	25000	35000	10000	-	70000	70000

Figures rounded off.

Table-2: State-wise Production of Ochre

(In tonnes)

State	Year		
	2016-17	2017-18	2018-19
Rajasthan	1706412	2219988	-
Andhra Pradesh	138683	145558	-
Gujarat	2900	304	16
Madhya Pradesh	-	-	-

Source: *As received from State DGMs and their websites.*
Note : " - " NA

CONSUMPTION

The details of consumption of commodity, i.e. mineral in the present case, is drawn from the database of Mining Tenement System (MTS) of IBM. Under rule 45(1) of MCDR 2017, the holder of mining lease or any person or company engaged in trading or storage, end-use or export of mineral mined in the country have to get registered with IBM. They submit monthly/annual returns under this rule to IBM. This data is fed/maintained in the database from which consumption details are extracted.

As per the information received from the various ochre consuming unit and estimate, the estimated consumption of ochre during 2016-17 to 2018-19 ranged from 1,397 thousand tonnes to 1,456 thousand tonnes. Out of the total estimated consumption in 2018-19, the Cement Industry accounted centpercent consumption of ochre. The industry-wise estimated consumption is furnished in Table - 3.

Table-3: Estimated Consumption* of Ochre (2016-17 to 2018-19) (By Industries)

(In tonnes)

Industry	Year		
	2016-17	2017-18(R)	2018-19(P)
All Industries	**1397300**	**1437900**	**1455900**
Cement	1396900	1437700	1455900
Paint	400	200	-

Figures rounded off.

**** Includes actual reported consumption and/or estimates made wherever required. Pausity of data, hence coverage may not be complete.***

EXPLORATION & DEVELOPMENT

The exploration & development details, if any, are covered in the Review on "Exploration & Development" in "General Reviews".

FUTURE OUTLOOK

Ochre is being used as natural pigment since ancient times and it is still being used for this purpose. India has huge resources of both yellow and red ochre. It is mostly produced in Andhra Pradesh, Rajasthan, Gujarat, Madhya Pradesh and Maharashtra. It is extensively used in Paint and Colour Industry and indian resources are large enough to last for many years in future.