

4.1 DIAMOND

Introduction

Diamond mining in India can be traced back to the 5th Century (B.C). Mining and trading activity of diamonds took place to a large extent in 16th and 17th Century (A.D) in Andhra Pradesh. Golconda was the major trading centre. Before the 19th Century (AD), diamonds were recovered from older conglomerates and quaternary gravel. The diamond producing centres were gravel of river Krishna in Andhra Pradesh, Panna diamond belt in Madhya Pradesh, gravel of river Mahanadi in Odisha and Wairagarh Conglomerates of Maharashtra. The Majhgawan pipe in Madhya Pradesh and Wajrakarur pipe in Andhra Pradesh were also mined for diamond but the Kimberlite nature of these deposits were recognised much later in 1930. At present Majhgawan mine of M/s. National Mineral Development Corporation in Panna diamond belt of Madhya Pradesh is the only mine working on commercial scale in the country. GSI has carried out exploration work in search of deposits of diamond in many parts of India including the potential areas in Andhra Pradesh (Wajrakarur), Chhattisgarh, Jharkhand, Karnataka and Telangana.

A number of diamond occurrences have been located in Anantapur, Kurnool, Krishna, Mehboobnagar and Guntur districts of Andhra Pradesh; Panna and Chhattarpur district of Madhya Pradesh; Raipur district of Chhattisgarh; Chittorgarh, Jhalawar and Kota districts of Rajasthan and Mirzapur district of Uttar Pradesh. Potential occurrences are being explored in the basin of river Mahanadi in Sambalpur district of Odisha. Diamonds as precious stones are mostly used for ornamental purpose. Industrial diamonds are used for drill bits. India was once the single largest exporter of cut and polished diamonds in the world, though its domestic production of raw diamond is very insignificant.

Basis of Grade Classification

In the inventory as on 1.4.2015, the resources of diamond have been classified into the following grades :

- i) Gem
- ii) Industrial
- iii) Unclassified

Basis of Categorisation of Resources

As per United Nations Framework Classification (UNFC), resources are broadly classified into 'reserves' and 'remaining resources'.

According to the norms of this system reserves of diamond have been placed under proved (111) and probable (122) categories.

The remaining resources have been placed under measured (331), indicated (332) and inferred (333) categories.

Salient Features of the Inventory

The total resources of diamond in the country as on 1.4.2015 are estimated at 31,836,091 carats with 756,765 carats gem grade, 840,823 carats industrial grade and 30,238,503 carats unclassified grade. Of these, 959,659 carats (3.01%) fall under reserve category and balance 30,876,432 carats (96.98%) are remaining resources. The entire quantity under reserve category is of 'unclassified grade' and has been estimated in Madhya Pradesh only. Out of the total resources, 30,876,432 carats (96.99%) are in freehold and the balance 959,659 carats (3.01%) are in leasehold (public) areas.

All India scenario of diamond reserves, remaining resources and total resources as on 1.4.2015 vis-a-vis 1.4.2010 have been given in Tables - 1 and 2. The tables give an idea about the significant changes in terms of increase or decrease of resources as per lease status, grade and states. In Table-3, district-wise reserves/ resources as on 1.4.2015 have been given.

The estimated resources of diamond are concentrated only in three states. Of these, Madhya Pradesh is credited with 28,709,136 carats (90.17%) having unclassified grade only, followed by Andhra Pradesh with 1,822,955 carats (5.73%), having 235,165 carats gem grade, 58,423 carats industrial grade and 1,529,367 carats unclassified grade and Chhattisgarh with 1,304,000 carats (4.10%) having 521,600 carats gem grade and 782,400 carats industrial grade.

A small decrease of 85,659 carats diamond resources has been recorded in comparison to the earlier inventory as on 1.4.2010. The entire decrease is of unclassified grade diamonds which is due to revised data supplied by M/s NMDC Ltd. for their Diamond Mining Project main lease (113.532 ha) in Chhattarpur district, Madhya Pradesh.

Diamonds are also recovered from conglomerate and gravel beds at shallow depths by small operators in Panna district on the basis of Annual Permits granted by Diamond Officer, Government of Madhya Pradesh.

Out of the 1,822,955 carats of diamond resources in Andhra Pradesh about 1,667,960 carats (91.5%) have alone been estimated in Anantapur district. The balance resources are in Krishna and Kurnool districts. The entire resource of Chhattisgarh is held by Raipur district and that of Madhya Pradesh by Panna and Chhattarpur districts.

Table - 1 : Reserves/Resources of Diamond as on 1.4.2015 vis-à-vis 1.4.2010
(By Lease Status/Grade)

Lease status/Grade	Reserves			Remaining resources			Total resources		
	1.4.2015		Net change	1.4.2015		Net change	1.4.2015		Net change
	1.4.2015	1.4.2010		1.4.2015	1.4.2010		1.4.2015	1.4.2010	
All India : Total	959659	1045318	(-)85659	30876432	30876432	No Change	31836091	31921750	(-) 85659
Gem	-	-	-	756765	756765	No Change	756765	756765	No Change
Industrial	-	-	-	840823	840823	No Change	840823	840823	No Change
Unclassified	959659	1045318	(-)85659	29278844	29278844	No Change	30238503	30324162	(-) 85659
Freehold	-	-	-	30876432	30876432	No Change	30876432	30876432	No Change
Gem	-	-	-	756765	756765	No Change	756765	756765	No Change
Industrial	-	-	-	840823	840823	No Change	840823	840823	No Change
Unclassified	-	-	-	29278844	29278844	No Change	29278844	29278844	No Change
Leasehold (Public)	959659	1045318	(-)85659	-	-	-	959659	1045318	(-)85659
Unclassified	959659	1045318	(-)85659	-	-	-	959659	1045318	(-)85659

figures rounded off.

Out of the total resources of diamond in the country about 29,047,514 carats (91%) resources have been estimated under inferred (333) category. These resources are based on a very limited and preliminary exploration. If these areas are examined for further detailed exploration, the confidence level of resource

position of diamond in the country may improve. GSI is doing extensive work in this direction.

A total 21 deposits have been covered in the inventory as on 1.4.2015, for which resources have been estimated (19 freehold and 02 leasehold public).

**Table – 2 : Total Resources of Diamond as on 1.4.2015 vis-à-vis 1.4.2010
(By States)**

(In carats)			
State	Total Resources		Net Change
	As on 1.4.2015	As on 1.4.2010	
All India : Total	31836091	31921750	(-) 85659
Gem	756765	756765	No Change
Industrial	840823	840823	No Change
Unclassified	30238503	30324162	(-) 85659
Andhra Pradesh	1822955	1822955	No Change
Gem	235165	235165	No Change
Industrial	58423	58423	No Change
Unclassified	1529367	1529367	No Change
Chhattisgarh	1304000	1304000	No Change
Gem	521600	521600	No Change
Industrial	782400	782400	No Change
Madhya Pradesh	28709136	28794795	(-) 85659
Unclassified	28709136	28794795	(-) 85659

figures rounded off.

Table - 3 : District wise Reserves/Resources of Diamond as on 1.4.2015

State/District	(In carats)		
	Reserves	Remaining Resources	Total Resources
All India : Total	959659	30876432	31836091
Andhra Pradesh	-	1822955	1822955
Anantapur	-	1667960	1667960
Krishna	-	99395	99395
Kurnool	-	55600	55600
Chhattisgarh	-	1304000	1304000
Raipur	-	1304000	1304000
Madhya Pradesh	959659	27749477	28709136
Chhatarpur	-	27400000	27400000
Panna	959659	349477	1309136

figures rounded off.

4.2 EMERALD

Introduction

Emerald is a green coloured, highly precious gemstone and a variety of the mineral beryl ($\text{Be}_3\text{Al}_2(\text{SiO}_3)_6$) colored green by trace amounts of chromium and sometimes vanadium. It is one of the most reputed gemstone in vedic astrology. In hindi, emerald stone is revered as "Panna".

It is cyclosilicate and toughness (resistance to breakage) is classified generally poor. Emerald is rare and command immense value on account of their colour, clarity and weight. Emeralds, like all colored gemstones, are graded using four basic parameters—the four Cs of connoisseurship: color, clarity, cut and carat weight.

In gemology, color is divided into three components: hue, saturation, and tone. Trace amount of iron will tint emerald a bluish green or a yellowish green color depending upon its oxidation state. Yellow and blue are the normal secondary hues found in emeralds. Some believe that the name "emerald" should be used when chromium is the cause of the green color, and that stone coloured by vanadium should be called "green beryl".

Occurrences of emerald are also reported from Rajasthan, Odisha and Chhattisgarh. However, resources have not been estimated so far. In Rajasthan, emeralds have been found to occur at a number of places in districts Rajsamand and Ajmer. In Ajmer Rajsamand belt of Rajasthan, emerald occurrences are confined to the upper fringes of pegmatites. In Odisha, occurrences of emerald are reported from Bira-Mohorajpur belt in district Bolangir. In Chhattisgarh, occurrences of emerald are reported from Deobhog area in Raipur district. Sporadic and irregular crystals of emerald, aquamarine and amethyst are also reported in a few localities in coimbatore district, Tamil Nadu. (GSI, miscellaneous Publication No.30).

Basis of Grade Classification

The following grade classification has been adopted in the mineral inventory as on 1.4.2015.

Unclassified : Estimation for which supporting data is not available to classify under any grade.

Basis of Categorisation of Resources

As per United Nations Framework Classification (UNFC), resources are broadly classified into 'reserves' and 'remaining resources'.

According to norms of this system reserves / resources of Emerald has been placed under reconnaissance category.

Salient Features of the Inventory

All India scenario of Emerald reserves, remaining resources and total resources as on 1.4.2015 have been appended in Table - 1 and 2. In Table 3, district-wise reserves/resources as on 1.4.2015 have been given.

A total of 2 deposits have been reported in the present inventory. The total resources of Emerald in the country as on 1.4.2015 are estimated at 55869 kg. The present inventory on Emerald is prepared for the first time.

Of the total resources entire 55869 kgs are placed in freehold category.

Jharkhand is the only state where estimation of Emerald with 55869 kgs has been done.

**Table - 1 : Reserves/Resources of Emerald as on 1.4.2015 vis-à-vis 1.4.2010
(By Lease Status/Grade)**

	Reserves				Remaining resources				Total resources				(In kg)
	1.4.2015		1.4.2010		1.4.2015		1.4.2010		1.4.2015		1.4.2010		
		Net change		Net change		Net change		Net change		Net change		Net change	
All India : Total	-	-	-	-	55869	-	-	-	(+) 55869	55869	-	-	(+) 55869
Unclassified	-	-	-	-	55869	-	-	-	(+) 55869	55869	-	-	(+)55869
Free Hold	-	-	-	-	55869	-	-	-	(+) 55869	55869	-	-	(+) 55869
Unclassified	-	-	-	-	55869	-	-	-	(+) 55869	55869	-	-	(+)55869

55
figures rounded off.

Table – 2 : Total Resources of Emerald as on 1.4.2015 vis-à-vis 1.4.2010
(In Kg)
(By States)

State	Total Resources		Net Change
	As on 1.4.2015	As on 1.4.2010	
All India	55869	-	(+)55869
Jharkhand	55869	-	(+)55869

Figures rounded off

Table -3 : District wise Reserves/Resources of Emerald as on 1.4.2015

State/District	Reserves	Remaining resources	(In kg)
			Total resources
All India : Total	-	55869	55869
Jharkhand	-	55869	55869
Singhbhum (West)	-	55869	55869

figures rounded off.

4.3 GARNET

Introduction

Garnet is a collective name for a group of isomorphous minerals having a composition of $3R^{++}O$, $R_2^{+++}O_3$, $3SiO_2$ where R represents bivalent metals like magnesium, calcium, manganese, iron and trivalent metals like aluminium, iron, manganese and chromium. Many garnets are admixture of the various varieties. The hardness varies from 6.5 to 7.5 on Moh's scale and specific gravity from 3.4 to 4.3. Colour is a physical property which can broadly distinguish varieties of garnets as follows:

- | | |
|-----------------|---|
| 1. Pyrope | Mg-Al garnet, deep red in colour |
| 2. Almandite | Fe-Al garnet, deep red to brownish red in colour |
| 3. Andradite | Ca-Fe garnet, brownish red, yellow green or black in colour |
| 4. Grossularite | Ca-Fe garnet. Pale green, yellow or red in colour. |
| 5. Spessartite | Mn-Al garnet, deep hyacinth or brownish red in colour |
| 6. Uvarovite | Ca-Cr garnet, emerald green in colour. |

Out of these, almandite and andradite are the most common varieties. Clear flawless and richly coloured garnet are used as semi-precious stones. The most important industrial use of fresh, hard garnet is as abrasive in the form of coated paper, cloth, discs and loose grains for surfacing and polishing of soft building stones. On crushing, it breaks into angular fragments which have high capillary attraction resulting in firm adhesion to cloth, paper or wheels coated with glue.

Basis of Grade Classification

The following grade classification has been adopted in the inventory based on the reported information of the exploration/exploitation agencies.

1. Gem
2. Semi-Precious

3. Abrasive
4. Others
5. Unclassified
6. Not Known

Basis of Categorisation of Resources

As per United Nations Framework Classification (UNFC), resources are broadly classified into 'reserves' and 'remaining resources'.

According to the norms of this system, 'reserves' of garnet have been placed under proved (111) and probable (121) & (122) categories. The 'remaining resources' have been placed under feasibility (211), pre-feasibility (221) & (222), measured (331), indicated (332), inferred (333) and reconnaissance (334) categories.

Salient Features of the Inventory

The total resources of garnet in the country as on 1.4.2015 are estimated at 56,161 thousand tonnes, of these 12,784 thousand tonnes (23%) fall under 'reserve' category and 43,377 thousand tonnes (77%) are under 'remaining resource' category.

All India scenario of garnet reserves, remaining resources and total resources as on 1.4.2015 vis-a-vis 1.4.2010 have been given in Tables - 1 and 2. The tables give an idea about the significant changes in terms of increase or decrease of resources as per lease status, grade and states. In Table-3 district-wise reserves/ resources as on 1.4.2015 have been given.

Out of the total resources, 36,199 thousand tonnes (64%) have been placed under freehold, 10,531 thousand tonnes (19%) in leasehold private and 9,431 thousand tonnes (17%) in leasehold public sectors.

Resources of garnet have been classified into Gem, abrasive, semi-precious, others, unclassified and not-known grade based on the reported end use data by the exploration/exploitation agencies. The largest share in the total resources is held by unclassified variety with 34,394 thousand tonnes (61%) followed by abrasive variety 20,904 thousand tonnes (37%). The remaining two percent is accounted by Semi-precious, others, Gem and Not-known grades.

Table - 1 : Reserves/Resources of Garnet as on 1.4.2015 vis-à-vis 1.4.2010
(By Lease Status/Grade)

Lease status/Grade	Reserves			Remaining resources			Total resources		
	1.4.2015		Net change	1.4.2015		Net change	1.4.2015		Net change
	1.4.2015	1.4.2010		1.4.2015	1.4.2010		1.4.2015	1.4.2010	
All India : Total	12783856	19324793	(-)6540937	43377166	37638032	(+)5739134	56161022	56962825	(-) 801803
Gem	39396	-	(+)39396	81450	-	(+) 81450	120846	-	(+) 120846
Abrasive	12667217	18850066	(-)6182849	8236565	2710935	(+)5525630	20903782	21561001	(-)657219
Semi-Precious	1158	991	(+)167	4645	4361	(+)284	5803	5352	(+)451
Others	-	5534	(-)5534	260982	230657	(+)30325	260982	236191	(+)24791
Unclassified	76085	468202	(-)392117	34318396	34211676	(+)106720	34394481	34679878	(-)285397
Not Known	-	-	-	475128	480403	(-)5275	475128	480403	(-)5275
Freehold	-	-	-	36198968	36178799	(+)20169	36198968	36178799	(+)20169
Abrasive	-	-	-	1457477	1448311	(+)9166	1457477	1448311	(+)9166
Semi-Precious	-	-	-	2973	2922	(+)51	2973	2922	(+)51
Others	-	-	-	169400	169400	No change	169400	169400	No change
Unclassified	-	-	-	34175282	34175282	No change	34175282	34175282	No change
Not Known	-	-	-	393836	382884	(+)10952	393836	382884	(+)10952
Leasehold (Private)	3633770	15663051	(-)12029281	6897538	1224112	(+)5673425	10531307	16887163	(-)6355856
Gem	39396	-	(+)39396	81450	-	(+) 81450	120846	-	(+) 120846
Abrasive	3576469	15618664	(-)12042195	6636024	1119560	(+)5516464	10212493	16738224	(-)6525731
Semi-Precious	1158	991	(+)167	1667	1434	(+)233	2825	2425	(+)400
Others	-	5534	(-)5534	91582	61257	(+)30325	91582	66791	(+)24791
Unclassified	16747	37862	(-)21115	86622	36394	(+)50228	103369	74256	(+)29113
Not Known	-	-	-	193	5468	(-)5275	193	5468	(-)5275
Leasehold (Public)	9150086	3661742	(+)5488344	280660	235120	(+)45540	9430746	3896862	(+)5533884
Abrasive	9090748	3231402	(+)5859346	143064	143064	No change	9233812	3374466	(+)5859346
Semi-Precious	-	-	-	5	5	No change	5	5	No change
Unclassified	59338	430340	(-)371002	56492	-	(+)56492	115830	430340	(-)314510
Not Known	-	-	-	81099	92051	(-)10952	81099	92051	(-)10952

figures rounded off.

Gem variety garnet resources for the first time reorted from Tamil Nadu and Rajasthan . Almost entire resource (99.57%) fall in Tamil Nadu.

The state of Tamil Nadu is endowed with the largest share of 26,918 thousand tonnes (48%) of total resources in the country followed by Andhra Pradesh 17,267 thousand tonnes (31%) , Odisha 9,393 thousand tonnes (17%) and Telangana 1960 thousand tonnes (3%) and the remaining 1% resources are accounted together by other states namely Chhattisgarh, Jharkhand, Kerala and Rajasthan.

In the inventory as on 1.4.2015, a net decrease of about 802 thousand tonnes resources, have been recorded as compared to earlier inventory as on 1.4.2010. However, total 12 new deposits with resources of 206 thousand tonnes have been reported in the inventory as on 1.4.2015.

In Odisha, a substantial quantity of about 5,859 thousand tonnes resources have been increased

mainly due to reassessment of the resources in existing lease hold deposits in Ganjam and Nawapara districts. In Rajasthan resources have been increased by 87 thousand tonnes. However, resources in Andhra Pradesh has been decreased by 1,798 thousand tonnes. There is addition of two new leasehold (private) deposit in Nellore & Visakhapatnam district. In Tamil Nadu also a decrease of resources by 6,910 thousand tonnes have been recorded.

A sizeable quantity, about 27,993 thousand tonnes (50%) of total resources of garnet have been estimated under inferred and reconnaissance categories. These resources are based on a limited and preliminary exploration. A detailed exploration in these areas may improve the confidence level of the resources.

A total 152 deposits have been covered in the inventory as on 1.4.2015. Out of this, 53 deposits are in freehold areas and 99 deposits are in leasehold areas (91 deposits in leasehold private sector and 8 deposits in leasehold public sector).

**Table – 2 : Total Resources of Garnet as on 1.4.2015 vis-à-vis 1.4.2010
(By States)**

(In tonne)

State	Total Resources		Net Change
	As on 1.4.2015	As on 1.4.2010	
All India : Total	56161022	56962824	(-) 801802
Andhra Pradesh	17267129	19064747	(-) 1797618
Chhattisgarh	28800	28800	No change
Jharkhand	110071	110071	No change
Kerala	198861	198861	No change
Odisha	9392956	3533610	(+) 5859346
Rajasthan	285000	198416	(+) 86584
Tamil Nadu	26918009	33828319	(-) 6910310
Telangana	1960196	-	(+) 1960196

figures rounded off.

Table - 3 : District wise Reserves/Resources Garnet as on 1.4.2015

(In tonne)

State/District	Reserves	Remaining Resources	Total Resources
All India : Total	12783856	43377166	56161022
Andhra Pradesh	1757148	15509981	17267129
Godavari East	-	12811200	12811200
Nellore	11360	22789	34149
Srikakulam	1745788	2666767	4412555
Visakhapatnam	-	9225	9225
Chhattisgarh	-	28800	28800
Bastar	-	28800	28800
Jharkhand	-	110071	110071
Hazaribagh	-	110071	110071
Kerala	45797	153064	198861
Kollam	45797	143064	188861
Thiruvananthapuram	-	10000	10000
Odisha	9044951	348005	9392956
Ganjam	9044951	-	9044951
Nawapara	-	5	5
Sambalpur	-	348000	348000
Rajasthan	75048	209952	285000
Ajmer	21305	82691	103996
Bhilwara	40763	88271	129034
Jhunjhunu	-	2570	2570
Sikar	-	3972	3972
Tonk	12980	32447	45427
Tamil Nadu	1845815	25072194	26918009
Kanyakumari	100999	8987544	9088543
Ramnathapuram	-	1625	1625
Thanjavur	-	4900	4900
Tiruchirapalli	39000	70184	109184
Tirunelveli	1705816	15861571	17567387
Tiruvarur	-	146370	146370
Telangana	15097	1945099	1960196
Khammam	15097	1945099	1960196

figures rounded off.

4.4 GOLD

Introduction

Gold a soft, shiny, yellow element that is the most easily shaped metal. It occurs in veins and alluvial deposits. It is durable, resistant to corrosion, and a good conductor of heat and electricity. Gold is generally believed to be a symbol of security and prosperity. Gold is a relatively scarce metal in the world and a scarce commodity in India. India is a minor producer of gold but has huge demand for the metal mainly in jewellery and ornament sector. The domestic demand is mainly met through imports. Properties of gold which make it useful for industrial consumption are malleability, ductility, colour, resistance to corrosion, high electrical conductivity, lustre and therapeutic effects of some of its salts.

Basis of Grade Classification

Gold ore is not used directly in the industry, it is first converted into metal and then marketed for end-use. Therefore the resources of gold as on 1.4.2015 have been classified based on their type of occurrences as primary and placer (ore and metal).

Basis of Categorisation of Resources

As per United Nations Framework Classification (UNFC), the resources have broadly been classified into 'reserves' and 'remaining resources'. According to the norms of this system, reserves of gold ore have been placed under proved (111) and probable (121) & (122) categories. The remaining resources have been placed under feasibility (211), pre-feasibility(221) & (222), measured (331), indicated (332), inferred (333) and reconnaissance (334) categories.

Salient Features of the Inventory

The total resources of primary gold ore in the country as on 1.4.2015 are estimated at 501.83 million tonnes with 654.74 tonnes of gold metal. Of these, 17.22 million tonnes (3.43%) fall under reserve category containing 70.09 tonnes of primary gold metal and balance 484.61 million

tonnes (96.56%) are remaining resources containing 584.65 tonnes of primary gold metal. The total resources of placer gold ore (which occur only in Kerala state) as on 1.4.2015 are estimated at 26.12 million tonnes with 5.86 tonnes gold metal. The entire placer gold resources have been placed under remaining resources.

All India scenario of gold ore and metal reserves, remaining resources and total resources as on 1.4.2015 vis-a-vis 1.4.2010 have been given in Tables - 1 and 2. The tables give an idea about the significant changes in terms of increase or decrease of resources as per lease status, grade and state. In Table -3 district wise reserves/resources as on 1.4.2015 have been given.

Of the total resources, 419.88 million tonnes primary gold ore (83.67%) containing 407.15 tonnes metal and 26.12 million tonnes of placer gold ore (100%) containing 5.86 tonnes metal are in freehold. About 77.18 million tonnes of primary gold ore (15.38%) containing 234.87 tonnes metal are in leasehold public and 4.76 million tonnes of primary gold ore (0.95%) containing 12.72 tonnes metal are in leasehold private.

Of the total primary gold ore resources (502 million tonnes), Karnataka endowed with 104 million tonnes (21%) ore resources containing 310.62 tonnes metal followed by Rajasthan 125 million tonnes of ore (25%) containing 233.11 tonnes metal, Bihar 223 million tonnes (44%) of ore containing meager 37.6 tonnes of metal. The remaining 50 million tonnes ore (about 10%) containing 73.41 tonnes metal resources are confined in eight states namely Andhra Pradesh, Chhattisgarh, Jharkhand, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu and West Bengal. Besides, about 26.12 million tonnes placer gold ore resources containing 5.86 tonnes metal have been estimated in the state of Kerala.

The total resources of Primary Gold ore as on 1.04.2015 are estimated 502 million tonnes with about 654.74 tonnes of Gold metal. An overall increase of gold ore is about 8.14 million tonnes

Table- 1 : Reserves/Resources of Gold as on 1.4.2015 vis-à-vis 1.4.2010
(By Lease Status/Grade)

Lease status/Grade	Reserves			Remaining resources			Total resources			(In tonne)
	1.4.2010		Net change	1.4.2010		Net change	1.4.2010		Net change	
	1.4.2015			1.4.2015			1.4.2015			
All India : Total										
Ore (Primary)	17228174	24124537	(-)6896363	484611458	469570375	(+)15041083	501839632	493694912	(+)8144720	
Metal (Primary)	70.09	110.54	(-)40.45	584.65	549.30	(+)35.35	654.74	659.84	(-)5.1	
Ore (Placer)	-	-	-	26121000	26121000	No Change	26121000	26121000	No Change	
Metal (Placer)	-	-	-	5.86	5.86	No Change	5.86	5.86	No Change	
Freehold										
Ore (Primary)	-	-	-	419889035	407989423	(+)11899612	419889035	407989423	(+)11899612	
Metal (Primary)	-	-	-	407.15	389.41	(+)17.74	407.15	389.41	(+)17.74	
Ore (Placer)	-	-	-	26121000	26121000	No Change	26121000	26121000	No Change	
Metal (Placer)	-	-	-	5.86	5.86	No Change	5.86	5.86	No Change	
Leasehold (Public)										
Ore (Primary)	13316100	24086478	(-)10770378	63873107	61475517	(+)239759	77189207	85561995	(-)8372788	
Metal (Primary)	61.53	110.41	(-)48.88	173.34	159.59	(+)13.75	234.87	270.00	(-)35.13	
Leasehold (Private)										
Ore (Primary)	3912074	38059	(+)3874015	849316	105435	(+)743881	4761390	143494	(+)4617896	
Metal (Primary)	8.56	0.13	(+)8.43	4.16	0.30	(+)3.86	12.72	0.43	(+)12.29	

figures rounded off.

and decreased in primary metal is about 5.1 tonnes as compared to previous inventory as on 1.4.2010. The increase is attributed to reconciliation of resources in existing deposits and inclusion of 10 new deposits including 1 L/H (P) and other 9 are F/H deposits. Andhra Pradesh (1 deposit Pvt.), Jharkhand (1 deposit F/H), Karnataka (3 deposit F/H) and Rajasthan (5 deposits F/H).

In Karnataka, a decrease of 4.96 million tonnes ore containing 26.38 tonnes metal recorded in inventory as on 1.4.2015 as compared to earlier inventory as on 1.4.2010. It is mainly due to re-assessment of resources in the existing deposits. Three new deposits in freehold (01 in Haveri & 2 in Tumakuru district) were also reported in the state.

In Andhra Pradesh, an increase of gold ore about 0.49 million tonnes containing 3.82 tonnes metal has been recorded due to upward revision in resources of one deposit (L/H, Pvt.) in Kurnool districts.

In Rajasthan, total 5 new F/H deposits have been included in Alwar (3) & Banaswara (2) districts. As a result, gold ore resources in Rajasthan have increased by 10.62 million tonnes

containing 15.63 tonnes metal as compared to inventory as on 1.4.2010.

In Jharkhand, an increase of 1.9 million tonnes ore containing 1.83 tonnes metal has been recorded due to inclusion of 1 new (L/H, Pvt.) deposit in Ranchi district as compared to inventory as on 1.4.2010.

There is no change in gold ore and metal content in the states of Bihar, Chhattisgarh, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu. and West Bengal.

Of the total resources of gold ore, about 379 million tonnes (75.50%) of primary ore and 24 million tonnes of placer ore have been placed under inferred and reconnaissance categories. These resources are based on a limited and preliminary exploration. If these areas are examined for further detailed exploration, the confidence level of resource position of gold ore in the country may improve.

A total of 95 deposits have been covered in the inventory as on 1.4.2015, of which 81 deposits are in freehold, 14 deposits are in leasehold (12 public and 2 private)

**Table – 2 : Total Resources of Gold as on 1.4.2015 vis-à-vis 1.4.2010
(By States)**

(In tonne)			
State	Total Resources		Net Change
	As on 1.4.2015	As on 1.4.2010	
All India : Total			
Ore (Primary)	501839632	493694912	(+)8144720
Metal (Primary)	654.74	659.84	(-)5.1
Ore (Placer)	26121000	26121000	No Change
Metal (Placer)	5.86	5.86	No Change
Andhra Pradesh			
Ore (Primary)	12773404	12275347	(+)498057
Metal (Primary)	39.54	35.72	(+)3.82
Bihar			
Ore (Primary)	222884860	222884860	No Change
Metal (Primary)	37.6	37.6	No Change
Chhattisgarh			
Ore (Primary)	4841033	4841033	No Change
Metal (Primary)	5.51	5.51	No Change
Jharkhand			
Ore (Primary)	10126638	8151348	(+)1975290
Metal (Primary)	14.56	12.73	(+)1.83
Karnataka			
Ore (Primary)	103846184	108802811	(-)4956627
Metal (Primary)	310.62	337	(-)26.38
Kerala			
Ore (Primary)	558460	558460	No Change
Metal (Primary)	0.2	0.2	No Change
Ore (Placer)	26121000	26121000	No Change
Metal (Placer)	5.86	5.86	No Change
Madhya Pradesh			
Ore (Primary)	7788000	7788000	No Change
Metal (Primary)	8.4	8.4	No Change
Maharashtra			
Ore (Primary)	1517000	1517000	No Change
Metal (Primary)	3.55	3.55	No Change
Rajasthan			
Ore (Primary)	124603720	113975720	(+)10628000
Metal (Primary)	233.11	217.48	(+)15.63
Tamil Nadu			
Ore (Primary)	67000	67000	No Change
Metal (Primary)	1	1	No Change
West Bengal			
Ore (Primary)	12833333	12833333	No Change
Metal (Primary)	0.65	0.65	No Change

figures rounded off.

Table - 3 : District wise Reserves/Resources Gold as on 1.4.2015

(In tonne)			
State/District	Reserves	Remaining Resources	Total Resources
All India : Total			
Ore (Primary)	17228174	484611458	501839632
Metal (Primary)	70.09	584.65	654.74
Ore (Placer)	-	26121000	26121000
Metal (Placer)	-	5.86	5.86
Andhra Pradesh			
Ore (Primary)	3902725	8870679	12773404
Metal (Primary)	8.49	31.05	39.54
Anantapur			
Ore (Primary)	-	795815	795815
Metal (Primary)	-	3.03	3.03
Chittoor			
Ore (Primary)	-	3011532	3011532
Metal (Primary)	-	13.58	13.58
Kurnool			
Ore (Primary)	3902725	5063332	8966057
Metal (Primary)	8.49	14.44	22.93
Bihar			
Ore (Primary)	-	222884860	222884860
Metal (Primary)	-	37.6	37.6
Jamui			
Ore (Primary)	-	222884860	222884860
Metal (Primary)	-	37.6	37.6
Chhattisgarh			
Ore (Primary)	-	4841033	4841033
Metal (Primary)	-	5.51	5.51
Kanker			
Ore (Primary)	-	2403608	2403608
Metal (Primary)	-	1.61	1.61
Raipur			
Ore (Primary)	-	2437425	2437425
Metal (Primary)	-	3.9	3.9
Jharkhand			
Ore (Primary)	9349	10117289	10126638
Metal (Primary)	0.07	14.49	14.56
Ranchi			
Ore (Primary)	-	9524000	9524000
Metal (Primary)	-	12.6	12.6
Singhbhum(East)			
Ore (Primary)	9349	105435	114784
Metal (Primary)	0.07	0.22	0.29
Singhbhum(West)			
Ore (Primary)	-	487854	487854
Metal (Primary)	-	1.67	1.67
Karnataka			
Ore (Primary)	13316100	90530084	103846184
Metal (Primary)	61.53	249.09	310.62

National Mineral Inventory - An Overview

Table-3 (Contd.)

State/District	Reserves	Remaining Resources	Total Resources
Chitradurga			
Ore (Primary)	-	1230000	1230000
Metal (Primary)	-	4.63	4.63
Dharwar			
Ore (Primary)	-	9789500	9789500
Metal (Primary)	-	32.98	32.98
Gulbarga			
Ore (Primary)	-	164197	164197
Metal (Primary)	-	0.64	0.64
Hassan			
Ore (Primary)	-	4040000	4040000
Metal (Primary)	-	5.77	5.77
Haveri			
Ore (Primary)	-	8095000	8095000
Metal (Primary)	-	25.55	25.55
Kolar			
Ore (Primary)	-	35602563	35602563
Metal (Primary)	-	36.13	36.13
Raichur			
Ore (Primary)	13316100	25376000	38692100
Metal (Primary)	61.53	128.32	189.85
Tumkur			
Ore (Primary)	-	6232824	6232824
Metal (Primary)	-	15.07	15.07
Kerala			
Ore (Primary)	-	558460	558460
Metal (Primary)	-	0.2	0.2
Ore (Placer)	-	26121000	26121000
Metal (Placer)	-	5.86	5.86
Malappuram			
Ore (Primary)	-	558460	558460
Metal (Primary)	-	0.2	0.2
Ore (Placer)	-	24815000	24815000
Metal (Placer)	-	4.53	4.53
Palakkad			
Ore (Placer)	-	1306000	1306000
Metal (Placer)	-	1.33	1.33
Madhya Pradesh			
Ore (Primary)	-	7788000	7788000
Metal (Primary)	-	8.4	8.4
Jabalpur			
Ore (Primary)	-	200000	200000
Metal (Primary)	-	0.4	0.4
Katni			
Ore (Primary)	-	466000	466000
Metal (Primary)	-	0.59	0.59
Sidhi			
Ore (Primary)	-	7122000	7122000
Metal (Primary)	-	7.41	7.41

(Contd.)

National Mineral Inventory - An Overview

Table-3 (Concl.d.)

State/District	Reserves	Remaining Resources	Total Resources
Maharashtra			
Ore (Primary)	-	1517000	1517000
Metal (Primary)	-	3.55	3.55
Bhandara			
Ore (Primary)	-	57000	57000
Metal (Primary)	-	0.11	0.11
Nagpur			
Ore (Primary)	-	1460000	1460000
Metal (Primary)	-	3.44	3.44
Rajasthan			
Ore (Primary)	-	124603720	124603720
Metal (Primary)	-	233.11	233.11
Alwar			
Ore (Primary)	-	2560000	2560000
Metal (Primary)	-	1.75	1.75
Banswara			
Ore (Primary)	-	108763000	108763000
Metal (Primary)	-	220.63	220.63
Bhilwara			
Ore (Primary)	-	1270000	1270000
Metal (Primary)	-	0.72	0.72
Dausa			
Ore (Primary)	-	4600000	4600000
Metal (Primary)	-	6.67	6.67
Dungarpur			
Ore (Primary)	-	4500000	4500000
Metal (Primary)	-	1.13	1.13
Sirohi			
Ore (Primary)	-	2430720	2430720
Metal (Primary)	-	1.13	1.13
Udaipur			
Ore (Primary)	-	480000	480000
Metal (Primary)	-	1.08	1.08
Tamil Nadu			
Ore (Primary)	-	67000	67000
Metal (Primary)	-	1	1
Dharmapuri			
Ore (Primary)	-	67000	67000
Metal (Primary)	-	1	1
West Bengal			
Ore (Primary)	-	12833333	12833333
Metal (Primary)	-	0.65	0.65
Purulia			
Ore (Primary)	-	12833333	12833333
Metal (Primary)	-	0.65	0.65

figures rounded off.

4.5 RUBY

Introduction

Ruby is a transparent, lustrous, red gem variety of corundum. It frequently shows variation in colour from deep to pigeon's blood red, in parallel or irregular bands. The colour is supposed to be due to traces of chromium. The minute, hexagonal or irregular, often elongated or angular cavities and irregularly occurring inclusions are distinguishing characters of natural ruby. It also has low dispersion and hence exhibit no 'fire'. There is an abnormal amount of fire, when parallel. Fibrous inclusions occur along the lines of crystallisation. Ruby, when cut in en-cabochon fashion (dome shaped, the base coinciding with the basal plane of the crystal) shows a white, six-rayed star on the surface when examined in light. The phenomenon is called as 'asterism'. Such star ruby is a valuable gem stone. Ruby occurs as disseminated crystals formed by:

1. Magmatic segregation of basic igneous rocks.
2. Desilication of pegmatite dykes intruded into basic igneous rocks.
3. Metamorphism of highly aluminous rocks.

It also occurs as alluvial placers. Though the resources of ruby have only been estimated in Odisha, its occurrences are also reported from Tumkur and Chikmagalur districts, Karnataka, and Tiruchirapalli district, Tamil Nadu.

Basis of Grade Classification

Ruby is the prime gem variety of corundum. This is the most fascinating gem stone after diamond. Resources of ruby in the inventory as

on 1.4.2015 have been placed under unclassified grade.

Basis of Categorisation of Resources

As per United Nations Framework Classification (UNFC), resources are broadly classified into 'reserves' and 'remaining resources'.

According to the norms of this system, remaining resources have been placed under feasibility (221), pre-feasibility (222) and inferred (333) categories.

Salient Features of the Inventory

Total resources as on 1.4.2015 of ruby in the country are estimated at 5,349 kg. The entire resources of ruby are placed under 'remaining resources' category, which are estimated in the state of Odisha only.

All India scenario of ruby reserves, remaining resources and total resources as on 1.4.2015 vis-a-vis 1.4.2010 have been given in Tables - 1 and 2. These tables give an idea about changes in terms of increase or decrease of resources as per lease status, grade and state. In Table-3, district-wise reserves/resources as on 1.4.2015 have been given.

Total 5 deposits of ruby have been covered in the NMI as on 1.4.2015, of which 2 deposits are in freehold areas and 3 deposits in non-working leasehold (public) areas. Hence, reserves of 236 kilograms as per NMI as on 1.4.2010 has been shifted to 'remaining resources' category.

Table - 1 : Reserves/Resources of Ruby as on 1.4.2015 vis-à-vis 1.4.2010
(By Lease Status/Grade)

Lease status/Grade	(In kilogram)								
	Reserves			Remaining resources			Total resources		
	1.4.2015	1.4.2010	Net change	1.4.2015	1.4.2010	Net change	1.4.2015	1.4.2010	Net change
All India : Total	-	236	(-)236	5349	5113	(+)236	5349	5349	No Change
Unclassified	-	236	(-)236	5349	5113	(+)236	5349	5349	No Change
Freehold									
Unclassified	-	-	No Change	4537	4537	No Change	4537	4537	No Change
Leasehold (Public)									
Unclassified	-	236	(-)236	812	576	(+)236	812	812	No Change

figures rounded off.

**Table – 2 : Total Resources of Ruby as on 1.4.2015 vis-à-vis 1.4.2010
(By States)**

(In kilogram)

State	Total Resources		Net Change
	As on 1.4.2015	As on 1.4.2010	
All India : Total	5349	5349	No Change
Odisha	5349	5349	No Change

figures rounded off.

Table - 3 : District wise Reserves/Resources of Ruby as on 1.4.2015

(In kilogram)

State/District	Reserves	Remaining Resources	Total Resources
All India : Total	-	5349	5349
Odisha	-	5349	5349
Kalahandi	-	5349	5349

figures rounded off.

4.6 SAPPHIRE

Introduction

Sapphire in true sense is a blue, transparent, gem variety of corundum but in trade parlance all gem varieties other than red are called as sapphire. Natural sapphire has low dispersion and hence no fire. Some of them are characterised by the presence of fine parallel fibres as inclusions exhibiting the phenomenon of 'Silk'. With an abnormal amount of silk developed along the lines of crystallisation and when the crystal is cut in en-cabochon fashion, it shows 'asterism' i.e. a white, six-rayed star seen on the surface when examined in light. The blue colour of sapphire is considered to be due to the presence of titanium.

Sapphire occurs as disseminated crystals formed by the following :

1. Magmatic segregation in basic/ultrabasic igneous rocks.
2. Desilication of pegmatite dykes intruded into basic igneous rocks.
3. Metamorphism of highly aluminous rocks.

It also occurs in alluvial placers. Though the resources of sapphire are confined only in Jammu & Kashmir, its occurrences are also reported from Andhra Pradesh, Karnataka, Kerala and Tamil Nadu.

Basis of Grade Classification

Sapphire is a prime gem variety of corundum. It is the most fascinating gem stone after diamond. The blue variety is called 'Sapphire'. In the inventory as on 1.4.2015, the resources have been

placed under 'unclassified grade'.

Basis of Categorisation of Resources

As per United Nations Framework Classification (UNFC), resources are broadly classified into 'reserves' and 'remaining resources'.

According to the norms of this system, the entire estimation of sapphire has been placed under inferred (333) category of remaining resources.

Salient Features of the Inventory

The total quantity of sapphire estimated in the country as on 1.4.2015 at 450 kilogram, is placed under remaining resources category. The entire resource is in a single lease hold (public) deposit and has been estimated in Doda district of Jammu and Kashmir. Since the information of exploitation of this deposit is not available, the resource position remains unchanged as compared to 1.4.2010.

All India scenario of sapphire reserves, remaining resources and total resources as on 1.4.2015 vis-a-vis 1.4.2010 have been given in Tables -1 and 2. The tables give an idea about the changes in terms of increase or decrease of resources as per lease status, grade and state. In Table-3, district wise reserves/resources have been given.

Only one deposit of Sapphire in leasehold public is covered in the updation of NMI as on 1.4.2015.

**Table – 2 : Total Resources of Sapphire as on 1.4.2015 vis-à-vis 1.4.2010
(By States)**

State			(In kilogram)
	Total resources		Net Change
	As on 1.4.2015	As on 1.4.2010	
All India : Total	450	450	No change
Jammu & Kashmir	450	450	No change

figures rounded off.

Table -3 : District wise Reserves/Resources of Sapphire as on 1.4.2015

State/District				(In kilogram)
	Reserves	Remaining resources	Total resources	
All India : Total	-	450	450	
Jammu & Kashmir	-	450	450	
Doda	-	450	450	

figures rounded off.

Table - 1 : Reserves/Resources of Sapphire as on 1.4.2015 vis-à-vis 1.4.2010
(By Lease Status/Grade)

Lease status/Grade	Reserves				Remaining resources				Total resources			
	1.4.2015		1.4.2010		1.4.2015		1.4.2010		1.4.2015		1.4.2010	
				Net change				Net change				Net change
All India : Total	-	-	-	No change	450	450	450	No change	450	450	450	No change
Unclassified	-	-	-	No change	450	450	450	No change	450	450	450	No change
Leasehold (Public)	-	-	-	No change	450	450	450	No change	450	450	450	No change
Unclassified	-	-	-	No change	450	450	450	No change	450	450	450	No change

figures rounded off.

4.7 SILVER

Introduction

Silver is a noble and scarce metal. It is white in colour, malleable and resistance to atmospheric oxidation. Hence it is in use since last thousands of years. Apart from its monetary and decorative uses, its highest known electrical conductivity amongst all metals has found application in modern age, viz for printed electric circuits, coating for electronic conductors and in alloys of gold and copper for electric contacts. Its chloride and iodide are light sensitive and hence used in photographic material. These two modern uses are also responsible for contributing its supply as scrap.

It occurs generally with lead, zinc, copper and gold ores and its extraction is as a by-product from electrolysis or chemical methods.

Silver is recovered as a co-product as well as a by-product in the country. Economically viable native silver deposits are not reported. Silver was recovered in the past as a co-product in gold refining, at KGF complex and Hutti Gold Mines in Karnataka, as a by-product in smelting and refining of lead, zinc and copper concentrates at Debari smelter in Rajasthan, at Tundoo and Moubandar smelters (Ghatsila) in Jharkhand and at Visakhapatnam in Andhra Pradesh. The present production of silver comes from Chanderiya Lead-Zinc smelters of HZL and from gold refinery of HGML. In addition, Hindalco Industries Ltd., recovers silver as a by-product during smelting from imported copper concentrates at Dahej, Gujarat.

Basis of Grade Classification

As silver is associated with copper, lead, zinc and gold mineralisation and recovered as a by-product, hence a specific basis could not be adopted for grade classification. Therefore, the resource classification has been adopted in the inventory in terms of ore and metal.

Basis of Categorisation of Resources

As per United Nations Framework Classification (UNFC), resources are broadly classified into 'reserves' and 'remaining resources'.

According to norms of this system reserves of silver ore and corresponding metal have been placed under proved (111) and probable (121) & (122) categories.

The remaining resources have been placed under pre-feasibility (221) and (222), measured (331), indicated (332) and inferred (333) categories.

Salient Features of the Inventory

The total resources of silver ore in the country as on 1.4.2015 are estimated at 511.95 million tonnes with 29981.82 tonnes of silver metal. Out of the total resources, 150.44 million tonnes ore (29.39%) fall under reserve category containing 7171.94 tonnes silver metal and the balance 361.51 million tonnes of silver ore (70.61%) are remaining resources containing 22809.88 tonnes of silver metal.

All India scenario of silver ore and metal reserves, remaining resources and total resources as on 1.4.2015 vis-a-vis 1.4.2010 have been appended in Tables - 1 and 2. The tables give an idea about the significant changes in terms of increase of resources as per lease status, grade and state. In Table - 3 district wise reserves/resources as on 1.4.2015 have been given.

Of the total resources, 59.35 million tonnes ore (11.59%) containing 1119.19 tonnes metal are in freehold, 108.87 million tonnes ore (21.27%) containing 322.48 tonnes metal are in leasehold public and 343.73 million tonnes ore (67.14%) containing 28540.15 tonnes metal are in leasehold private.

Rajasthan is credited with the largest share of the resources at 447.22 million tonnes ore (87.36%) containing 29359.49 tonnes silver metal followed by Jharkhand 23.84 million tonnes ore (4.66%) containing 5.22 tonnes metal, Andhra Pradesh 16.95 million tonnes ore (3.31%) containing 128.13 tonnes metal, Karnataka 12.73 million tonnes ore (2.49%) containing 6.35 tonnes metal, Uttarakhand 3.39 million tonnes ore (0.66%) containing 138.59 tonnes metal, Madhya Pradesh 3.22 million tonnes of ore (0.63%) containing 159.86 tonnes metal and the rest 4.60 million tonnes ore (0.89%) containing 184.18 tonnes metal are shared by other states namely Maharashtra, Meghalaya, Odisha, Sikkim and Tamil Nadu.

An increase of 44.97 million tonnes resources with 2353.57 tonnes metal has been recorded in the inventory as on 1.4.2015 in comparison to the earlier inventory as on 1.4.2010. This increase was due to 5 new deposits and upward revision of resources in existing leasehold private deposits.

Table - 1 : Reserves/Resources of Silver as on 1.4.2015 vis-à-vis 1.4.2010
(By Lease Status/Grade)

Lease status/Grade	Reserves			Remaining resources			Total resources			(In tonne)
	1.4.2015		Net change	1.4.2015		Net change	1.4.2015		Net change	
All India : Total										
Ore	150443903	187558668	(-) 37114765	361510732	279426291	(+) 82084441	511954635	466984959	(+) 44969676	
Metal	7171.94	8039.57	(-) 867.63	22809.88	19588.68	(+) 3221.20	29981.82	27628.25	(+) 2353.57	
Freehold										
Ore	-	-	-	59347079	56817079	(+) 2530000	59347079	56817079	(+) 2530000	
Metal	-	-	-	1119.19	1098.97	20.22	1119.19	1098.97	20.22	
Leasehold (Public)										
Ore	57401091	85468668	(-) 28067577	51471653	26664212	(+) 24807441	108872744	112132880	(-)32260136	
Metal	214.11	345.87	(-) 131.76	108.37	15.93	(+) 92.44	322.48	361.80	(-) 39.32	
Leasehold (Private)										
Ore	93042812	102090000	(-) 9047188	250692000	195945000	(+) 54747000	343734812	298035000	(+) 45699812	
Metal	6957.83	7693.70	(-) 735.87	21582.32	18473.78	(+) 3108.54	28540.15	26167.48	(+) 2372.67	

figures rounded off.

About 91.84% of the total increase in resources, amounting to 41.30 million tonnes ore with 2353.29 tonnes metal, have been accounted alone by Rajasthan. The remaining 8.16% increase has been accounted by Karnataka.

In Rajasthan, a net increase of 41.30 million tonnes of ore resources containing 2353.29 tonnes of metal has been recorded due to addition of 3 new deposits and upward revision in resources of the existing lease hold deposits in the state.

In Karnataka, an increase of 3.67 million tonnes of the resources containing 0.28 tonnes of metal has been recorded. This increase in resources was due to addition of 2 new deposits in the state.

Overall, 5 new deposits with 5.36 million tonnes of ore resources containing 20.68 tonnes of metal has been reported in the inventory as on 1.4.2015

Of the total resources of silver ore, about 218.72 million tonnes (42.72%) resources with 17233.03 tonnes of metal have been estimated under inferred category. These resources are based on very limited and preliminary exploration. If these areas are examined for further detailed exploration, the confidence level of resource position of silver ore in the country may improve.

A total of 35 deposits have been recorded in the inventory as on 1.4.2015, of which 20 deposits are in freehold and 15 in leasehold, comprising 10 deposits in leasehold (Public) and 5 deposits in leasehold (Private).

**Table – 2 : Total Resources of Silver as on 1.4.2015 vis-à-vis 1.4.2010
(By States)**

State	Total Resources		Net Change
	As on 1.4.2015	As on 1.4.2010	
All India : Total			
Ore	511954635	466984959	(+)44969676
Metal	29981.82	27628.25	(+)2353.57
Andhra Pradesh			
Ore	16950000	16950000	No change
Metal	128.13	128.13	No change
Jharkhand			
Ore	23840000	23840000	No change
Metal	5.22	5.22	No change
Karnataka			
Ore	12733612	9064677	(+)3668935
Metal	6.35	6.07	0.28
Madhya Pradesh			
Ore	3216000	3216000	No change
Metal	159.86	159.86	No change
Maharashtra			
Ore	235000	235000	No change
Metal	0.23	0.23	No change
Meghalaya			
Ore	880000	880000	No change
Metal	19.8	19.8	No change
Odisha			
Ore	1749500	1749500	No change
Metal	64.91	64.91	No change
Rajasthan			
Ore	447220900	405920159	(+)41300741
Metal	29359.49	27006.20	(+)2353.29
Sikkim			
Ore	949623	949623	No change
Metal	56.69	56.69	No change
Tamil Nadu			
Ore	790000	790000	No change
Metal	42.55	42.55	No change
Uttarakhand			
Ore	3390000	3390000	No change
Metal	138.59	138.59	No change

figures rounded off.

Table - 3 : District wise Reserves/Resources Silver as on 1.4.2015

(In tonne)

State/District	Reserves	Remaining Resources	Total Resources
All India : Total			
Ore	150443903	361510732	511954635
Metal	7171.39	22809.88	29881.82
Andhra Pradesh			
Ore	-	16950000	16950000
Metal	-	128.13	128.13
Guntur			
Ore	-	16950000	16950000
Metal	-	128.13	128.13
Jharkhand			
Ore	-	23840000	23840000
Metal	-	5.22	5.22
Singhbhum (East)			
Ore	-	23840000	23840000
Metal	-	5.22	5.22
Karnataka			
Ore	12350000	383612	12733612
Metal	2.95	3.40	6.35
Chitradurga			
Ore	-	383612	383612
Metal	-	3.40	3.40
Raichur			
Ore	12350000	-	12350000
Metal	2.95	-	2.95
Madhya Pradesh			
Ore	-	3216000	3216000
Metal	-	159.86	159.86
Betul			
Ore	-	2630000	2630000
Metal	-	125.52	125.52
Katni			
Ore	-	586000	586000
Metal	-	34.34	34.34
Maharashtra			
Ore	-	235000	235000
Metal	-	0.23	0.23
Bhandara			
Ore	-	235000	235000
Metal	-	0.23	0.23
Meghalaya			
Ore	-	880000	880000
Metal	-	19.80	19.80
Khasi Hills (East)			
Ore	-	880000	880000
Metal	-	19.80	19.80

(Contd.)

National Mineral Inventory - An Overview

Table-3 (Concl'd.)

State/District	Reserves	Remaining Resources	Total Resources
Odisha			
Ore	-	1749500	1749500
Metal	-	64.91	64.91
Sundergarh			
Ore	-	1749500	1749500
Metal	-	64.91	64.91
Rajasthan			
Ore	138093903	309126997	447220900
Metal	7168.99	22190.50	29359.49
Ajmer			
Ore	7300000	4664000	11964000
Metal	219.00	63.17	282.17
Alwar			
Ore	-	2530000	2530000
Metal	-	20.22	20.22
Bhilwara			
Ore	49500000	53522579	103022579
Metal	2930.60	3312.25	6242.85
Jhunjhunu			
Ore	45051091	26748418	71799509
Metal	211.16	84.46	295.62
Rajsamand			
Ore	22528812	143000000	165528812
Metal	3355.68	15088.06	18443.74
Sikar			
Ore	-	5000000	5000000
Metal	-	125.00	125.00
Udaipur			
Ore	13714000	73662000	87376000
Metal	452.55	3497.34	3949.89
Sikkim			
Ore	-	949623	949623
Metal	-	56.69	56.69
Sikkim East			
Ore	-	949623	949623
Metal	-	56.69	56.69
Tamil Nadu			
Ore	-	790000	790000
Metal	-	42.55	42.55
Villupuram			
Ore	-	790000	790000
Metal	-	42.55	42.55
Uttarakhand			
Ore	-	3390000	3390000
Metal	-	138.59	138.59
Dehradun			
Ore	-	1790000	1790000
Metal	-	4.59	4.59
Pithoragarh			
Ore	-	1600000	1600000
Metal	-	134.00	134.00

figures rounded off.