

## Chapter III : Use of Technology

Department had introduced a web-based application named Department of Mines and Geology Online Management System (*DMGOMS*) with effect from 10 October 2017, for:

- online submission of application for mineral concession,
- deposit all government dues,
- maintaining demand registers,
- lease information,
- data of permits issued,
- illegal mining cases and
- empanelment of weigh bridges, *etc.*

The *DMGOMS* provides facility to generate various reports for effective monitoring of the leases and others matters. Timely updating of information in the *DMGOMS* is essential for effective monitoring of the leases as well as working of the officials. Coordinates of leases were also uploaded on this application. Online generation of *rawanna/transit pass* through *DMGOMS* was made compulsory from November 2017 for dispatch of minerals with the aim to check evasion of royalty, to enhance transparency in the system and to facilitate paper less environment friendly work. The Government of India also initiated (October 2016) Mining Surveillance System (MSS) to identify illegal mining activities.

Use of the satellite-based technology *i.e.* remote sensing data and GIS technology has an immense importance to check and prevent illegal mining. It is a transparent system which has a deterrence effect as continued monitoring can be made from satellite data. It is bias-free and independent as the system is built on technology-based evidence. It has quicker response and action as the mining areas can be monitored regularly and the sensitive areas could be monitored more frequently.

Audit scrutinised records of the selected offices and information available on *DMGOMS*. Audit findings are discussed in the succeeding paragraphs.

### **3.1 Non-utilisation of satellite images to detect and prevent illegal mining activities**

According to Paragraph 7.5.1 of Rajasthan Mineral Policy, 2015, the Department will encourage usage of high-resolution satellite data for detecting encroachments and illegal mining. As per the official website of the Department, the AME/MEs of division offices shall:

- keep proper watch and take suitable measures to check unauthorised mining and leakage of revenue and also inspect check posts as well as mineral stocks of processor, manufacturer, dealer and trader in his jurisdiction.
- keep a watch over all the mining and mineral activities in his area and shall keep higher officers well informed of the same.

Further, AME/MEs (Vigilance) were also assigned duties to:

- carry out intensive checking against unauthorised mining or unauthorised excavation;

- inspect the mining areas wherever there is any doubt about working outside the lease hold areas.
- conduct frequent checking of vehicles carrying mineral in their jurisdiction particularly, where there are possibilities of evasion of royalty.

AME/MEs are assisted by foremen and surveyors. They were assigned duties to keep watch on the mining activity in the area and whenever, any unauthorised work is detected they shall report the matter immediately to ME/AME concerned. They shall ensure that there is no leakage of revenue in their areas and shall inspect the check posts and mineral carrying vehicles. They shall also inspect mineral stocks of processor, manufacturer, dealer, trader within their jurisdiction as per provision of relevant Acts and Rules.

During review of records of selected five division offices, it was observed that the use of technology, viz. GIS technology was not being applied by the Department for keeping a watch over the mining activities in the State except in a few cases where the Government of India pointed out illegal mining sites with the help of satellite images. Audit used Google Earth Pro application<sup>1</sup> to detect illegal mining nearby the leases allotted by the Department. Audit identified 122 illegal mining points/areas (IMP) in selected area. All the nearby leases of these IMPs were of minor minerals *i.e.* masonry stone, soapstone, marble, felspar, quartz and silica sand. Review of records of these leases revealed that no inspection was carried out by three offices. Resultantly, the Department was unable to identify illegal mining activities either through remote sensing data/GIS technology or through physical inspections of leases. Details are given in the **Table 3.1**:

**Table 3.1**  
**Details of illegal mining points identified through Google Earth Pro**

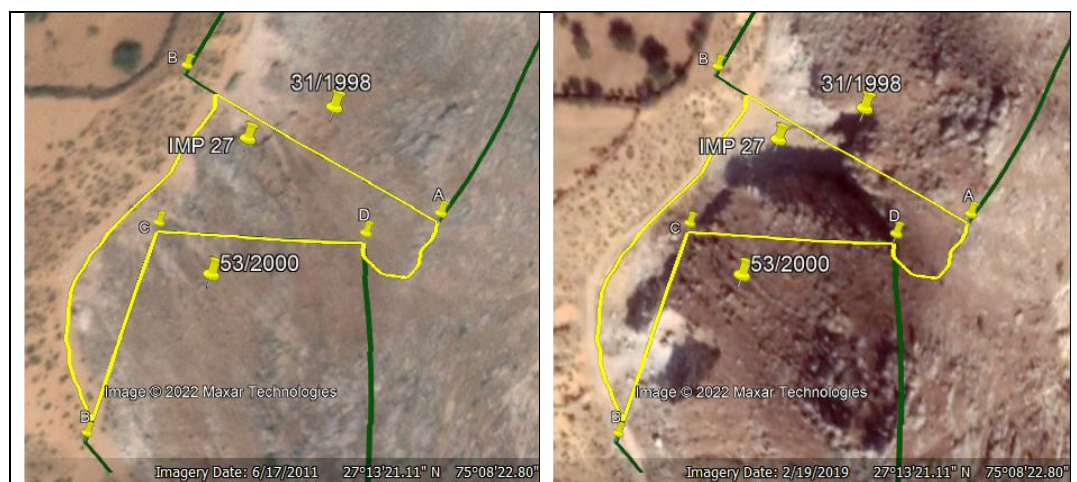
Sl. No.	Name of office and number of leases	Name of selected Tehsil	Total number of leases in the Tehsil	Number of leases selected (area of leases in hectare)	Number of IMPs identified	Areas of IMPs in hectare	Number of leases related to IMPs	Number of inspection by departmental officials in IMP related leases
1	2	3	4	5	6	7	8	9
1	ME Sikar (251)	Dantaramgarh	137	113 (123.44)	35	21.85	48	6
2	AME Kotputli (370)	Kotputli	249	100 (620.30)	29	32.76	44	1
3	AME Neem ka Thana (493)	Neem ka Thana	493	100 (146.41)	8	6.09	12	0
4	ME Alwar (451)	Rajgarh	147	100 (346.07)	15	7.68	21	0
5	ME Makrana (197)	Parbatsar	101	101 (112.43)	35	14.87	50	0
<b>Total</b>	<b>(1762)</b>		<b>1,127</b>	<b>514 (1,348.95)</b>	<b>122</b>	<b>83.25</b>	<b>175</b>	<b>7</b>

<sup>1</sup> *Google Earth Pro* is a computer program that renders a 3D representation of Earth, based primarily on satellite imagery. It is a free on-line application.

The above table depicts that illegal mining activities were being done nearby 34.04 per cent of selected leases i.e. 175 out of 514 selected leases. The identified area of illegal mining was 83.25 hectare. This indicates that illegal mining was being done nearby the allotted leases and remained largely undetected. Further, inspections were also not effective as illegal mining activities nearby the leases were not mentioned in any of the field inspections reports. This indicated inadequate and in-effective inspections by the officials.

Audit analysed the changes in the area over the years through remote sensing data. The images below are taken with a gap of few years and the visualisation of illegal mining was evident in the latest images. Some illustrative images are as follows:

- Green line depicts limits of Lease area.
- Yellow line depicts illegal mined area.



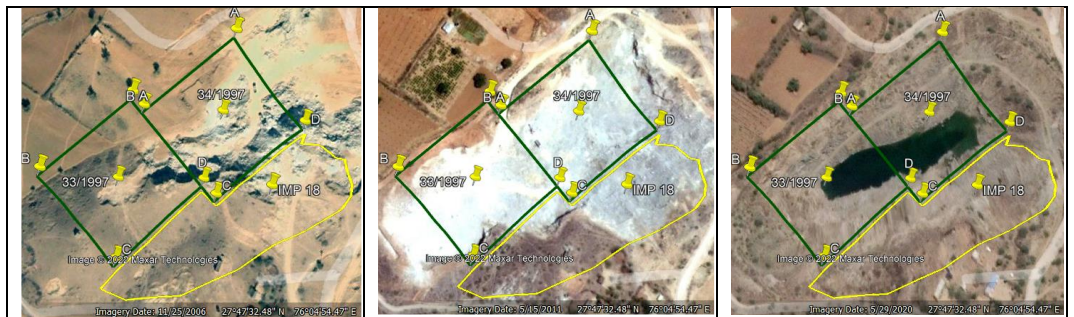
**Figure 1:** Comparison of Satellite Imagery taken on 17.06.2011 and 19.02.2019 showed the illegal mining in 0.44 hectare of land outside the lease area (lease number 53/2000 and 31/1998, ME Sikar).



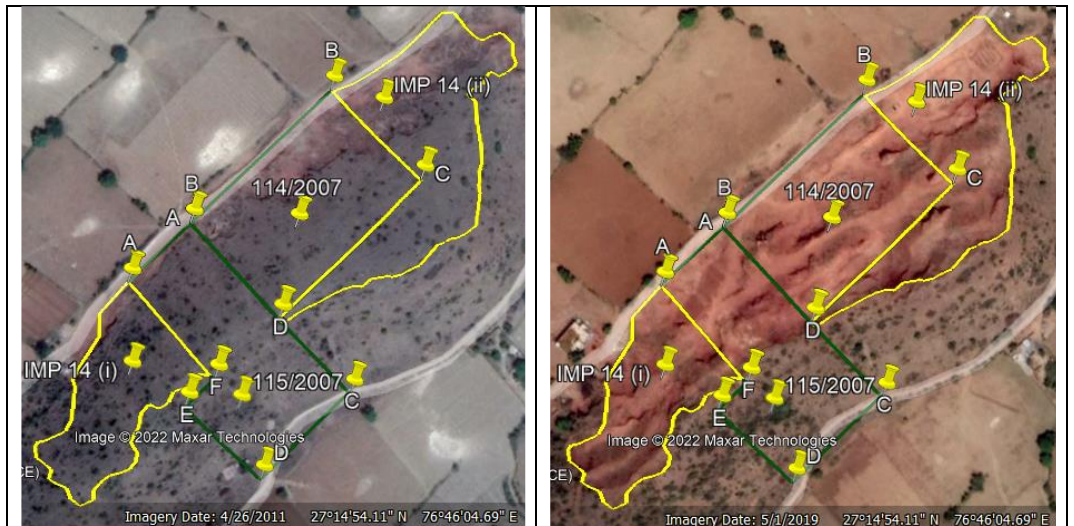
**Figure 2:** Analysis of Satellite Imagery taken on 11.04.2013, 26.11.2016 and 29.05.2020 revealed continuous illegal mining in 0.92 hectare adjoining the lease number 295/2005 (AME Neem ka Thana).



**Figure 3:** Analysis of Satellite Imagery taken on 10.10.2007, 07.01.2014 and 04.12.2018 revealed illegal mining in 0.43 hectare area adjoining lease number 380/2005 (ME Makrana).



**Figure 4:** Analysis of Satellite Imagery taken on 25.11.2006, 15.05.2011 and 29.05.2020 revealed continuous illegal mining in an area of 1.13 hectare adjoining lease number 33/1997 and 34/1997 (AME Kotputli).



**Figure 5:** Analysis of Satellite Imagery taken on 26.04.2011 and 01.05.2019 revealed illegal mining in an area of 1.63 hectare adjoining lease number 114/2007 and 115/2007 (ME Alwar).

The above images illustrate how satellite imagery can be used as a powerful tool to identify illegal mining. However, no attempts were found to be made by the Department in this regard, despite a clear provision in the policy for the

same. Cases of IMPs nearby the leases revealed an alarming situation and the Department needs to tackle it on a priority basis.

### Joint Physical Verification

To confirm the results of satellite images, audit carried out a Joint Physical Verification (JPV) at the sites, along with the officials of the Department. Audit selected five IMPs of each Division for JPV. Accordingly, JPV was carried out (between 22 March 2021 and 30 June 2021) at 25 IMPs in five division offices. Department used Global navigation satellite system (GNSS)<sup>2</sup> to verify the coordinates of the leases and IMPs. Depth/height of the pits of IMPs was measured with the help of Tape Measure (*Feeta*) as Division offices didn't have latest equipment to measure depth and height of the pit such as laser-based measuring technology and mapping tools. JPV confirmed illegal mining in all the IMPs checked. Results are given in the **Table 3.2**:

**Table 3.2**

#### Results of Joint Physical Verification

Sl. No.	Name of Division	Total number of IMPs identified through GIS technology	Total number of IMPs verified through JPV	Area of IMP according to Satellite images (In hectare)	Approximate depth of illegal mining pit <sup>3</sup>	Remarks
1.	Alwar	15	4	3.38	20 to 60 meter	-
			1	0.61	Not taken	Illegal mining was verified in JPV, however, GNSS equipment could not connect with the satellite, therefore, area and height were not ascertained.
2.	Kotputli	29	5	5.26	22 to 70 meter	-
3	Makrana	35	4	1.39	6 to 25 meter	-
			1	0.72		
4	Neem ka Thana	8	5	4.18	6 to 20 meter	-
5.	Sikar	35	4	1.19	5 to 25 meter	
			1	0.48	-	Illegal mining of ordinary earth was found in IMP area, therefore, co-ordinates and depth were not taken.
<b>Total</b>		<b>122</b>	<b>25</b>	<b>17.21</b>	<b>5 to 70 Meter</b>	

Following points were observed from the analysis of the **Table 3.2**:

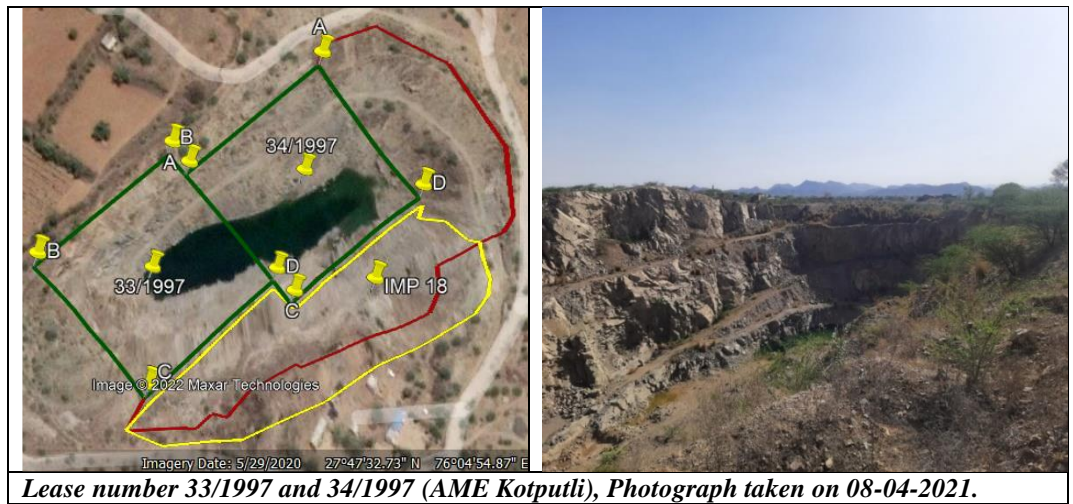
<sup>2</sup> **Global navigation satellite system (GNSS)** is a general term describing any satellite constellation that provides positioning, navigation, and timing services on a global or regional basis.

<sup>3</sup> Maximum depth of the pit was noted during JPV.

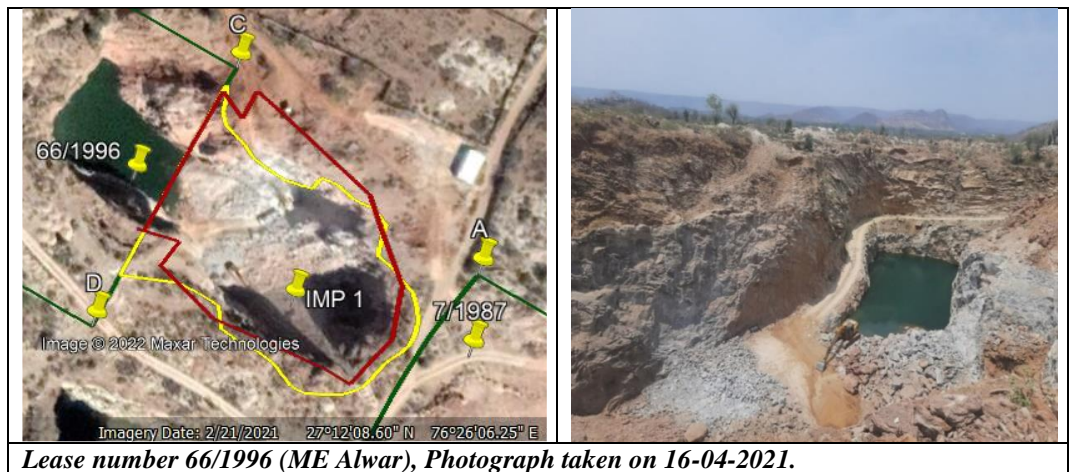
- Illegal mining pits were found at similar locations as identified through *Google Earth Pro* images at all the places except in one case where GNSS could not be connected with satellite;
- Depth of excavation of minerals in these illegal mining pits was ranged between 5 and 70 meters.

A few images of area identified through satellite images and area verified during JPV are given below for illustration of each selected division office. The lease area is shown by green line, area identified by satellite images is by yellow line and area identified during JPV is marked by red line. Photographs taken are also given hereunder to prove the illegal mining.

● Lease area ● Illegal mined area according to Google Earth Pro ● Physically verified Illegal mined area



*Figure 6*



*Figure 7*



**Lease number 53/2000 and 31/1998 (ME Sikar), Photograph taken on 24-03-2021.**

**Figure 8**



**Lease number 295/2005 (AME Neem ka Thana), Photograph taken on 06-04-2021.**

**Figure 9**



**Lease number 380/2005 (ME Makrana), Photograph taken on 24-06-2021.**

**Figure 10**

From the above, it is evident that satellite images could be used to identify the illegal mining activities.

### **Back filling of illegal mining**

During JPV, audit also noticed that at two IMPs (Sikar and Neem ka Thana), huge pits of illegal excavation were being back filled with the mix of sand, dust or overburden material.

### **Image of back filling of illegal mining pit**



*Figure 11*

Thus, JPV established that use of technology is helpful in identifying illegal mining activities.

The Government replied (February 2022) that drone survey was done in 59 leases of ME Gotan and ME Nagaur. Further, directions were also issued to offices for inviting tender as per availability of budget for conducting drone survey of minimum 5 per cent of leases selected through random sampling method. Department also issued directions to offices to identify the illegal mining site through *Google Earth Pro* application on the basis of satellite images. After the matter was reported (February 2022) to the Government, the departmental officials<sup>4</sup> inspected (June and July 2022) 14 IMPs out of 25 jointly verified IMPs. Department confirmed that 13.37 lakh MT mineral masonry stone, marble, quartz, felspar and silica sand in these 14 IMPs was illegally excavated. Notices had been issued to the nearby lease holders. For the remaining IMPs it was intimated that action was being taken.

According to the royalty rates prescribed in the RMMC Rules, 2017 the cost of this illegally excavated mineral (13.37 lakh MT) was ₹111 crore. Out of this ₹ 0.50 crore was recovered by AME Neem Ka Thana. Further progress is awaited (August 2022).

The fact confirmed the audit contention that the use of technology can prove to be a powerful tool to identify illegal mining areas and can assist the Department in effective control over mining activities. However, except in few limited leases the Department did not use the technology to identify illegal

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<sup>4</sup> ME/AME: Alwar (2 IMPs); Kotputli (1IMP); Makarana (5 IMP); Neem ka Thana (1 IMP) and Sikar (5 IMP).



mining. Delay in identification of illegal mining areas would lead to increase in illegal mining activities and loss of revenue to the State exchequer. Thus, there is a need to expedite use of technology.

### 3.2 Misuse of Rawannas

*Rawanna* is a legal document to authorise the movement of mineral. A lessee has to generate *e-rawanna* from the *DMGOMS* before each dispatch of mineral from the lease area.

According to rule 2(xliii) of RMMC Rules 2017, “*rawanna*” means the *rawanna* or *e-rawanna* duly issued by the Department or electronically generated from the departmental web portal and includes any other system notified by the Government for dispatch, consumption or processing of mineral or overburden from a specified area granted under any mineral concession or permit. Further, according to rule 54 of RMMC Rules, 2017, no person shall undertake any prospecting or mining operations in any area without holding any mineral concession, permit or any other permission granted or permitted under these rules, as the case may be and shall not dispatch mineral from the mines without valid *rawanna* or transit pass.

Dispatch of illegally mined minerals with the support of *e-rawannas* is not only a threat to revenue but also leads to illegal mining activities in the State. There were 22,242 leases of minor minerals in the State out of which audit analysed 514 leases of selected divisions<sup>5</sup> to observe this threat. It was observed that in 13 MLs no excavation was done by the lessees in the lease areas. However, 5.20 lakh metric ton (MT) of mineral involving cost of ₹ 16.64 crore was dispatched from these MLs using 22,854 *e-rawannas* till March 2020. It indicated that misuse of *e-rawannas* was being done on a large scale in the State and the department could not effectively prevent the illegal mining.

An illustrative satellite image is given hereunder:



Figure 12

The analysis of Satellite images revealed that there was no mining activity at ML number 121/2006 (ME Makrana) during the period July 2014 to June 2021. However, the lessee dispatched 57,568.43 MT mineral through 2,317 *e-rawanna* from this lease from 30 August 2018 to 25 November 2019.

<sup>5</sup> Audit selected five Divisions and 514 leases and noticed misuse of *e-rawannas* in four Divisions. No such case was noticed in any of the selected 100 leases of Division Alwar.

The fact indicates that *e-rawannas* were misused to transport minerals excavated from other than the allotted areas. The details of misuse of *e-rawannas* are given in the **Table 3.3**:

**Table 3.3**  
**Details of minerals dispatched by misuse of *rawannas***

S. No.	Name of Office	Selected Tehsil	No. of leases	Number of <i>e-rawannas</i>	Quantity of mineral dispatched (in MT)	Cost of mineral (₹ in crore)
1	ME Sikar	Dantaramgarh	2	172	5,035.26	0.18
2	AME Kotputli	Kotputli	3	2,331	52,680.63	1.84
3	AME Neem ka Thana	Neem ka Thana	5	17,459	3,26,188.76	11.45
4	ME Makrana	Parbatsar	2	2,381	58,663.41	1.64
5	ME Jaipur <sup>6</sup>	-	1	511	77,834.00	1.53
In ME Jaipur, the lessee dispatched 99,464 MT of masonry stone during April 2000 to March 2020, however, mineral excavated during this period was 21,630 MT as per site inspection report (25.06.2020) of Mines Foreman. Hence, the lessee dispatched 77,834 MT (99464-21630) of masonry stone by misusing <i>rawanna</i> .						
<b>Total</b>			<b>13</b>	<b>22,854</b>	<b>5,20,402.06</b>	<b>16.64</b>

The Government replied (February 2022) that a separate IT wing has been proposed for effective monitoring of such cases.

**The fact remains that Department did not utilise the technology to check the misuse of *rawannas*. Had the Department used the satellite imagery they would be aware of the extent of mining and could correlate that with issue of *e-rawannas*.**

### **3.3 Demarcation and Allocation of leases**

Rule 7 of RMMC Rules, 1986 envisaged that the ML shall be granted after the area is first delineated and plots suitably numbered. Further, rule 12 of RMMC Rules, 2017 prescribed that the Government shall identify and demarcate the area where a mineral concession is proposed to be granted using global positioning system (GPS) or differential global positioning system (DGPS)<sup>7</sup>, prior to issuance of ‘the notice inviting bid’ with respect to mineral concession auction.

Mines Foremen and Surveyor were responsible for preparing lease area plans and maps *etc.* according to the directions of AME/ME concerned. Maps were prepared with the help of Compass and *Feeta* prior to availability of DGPS/GNSS and thereafter, with the help of DGPS/GNSS.

Thus, planning, demarcation and allotment of leases was to be done with due diligence so that irregularities such as overlapping of leases and unnecessary gap areas between the leases could be avoided.

During scrutiny of satellite images of leases, Audit observed that the demarcation of leases was not done with due diligence, which resulted in

<sup>6</sup> A unit covered under Regular Audit.

<sup>7</sup> **Differential Global Positioning System (DGPS)** is an enhancement to Global Positioning System (GPS) that provides improved positional accuracy.

overlapping of leases and gap areas between the leases. Department did not use technology to overcome these issues as discussed in the ensuing paragraphs.

### 3.3.1 Overlapping of leases

Scrutiny of images of selected leases on *Google Earth Pro* revealed that lease areas of 43 leases overlapped with each other. This shows that these leases were not demarcated properly. Without clear demarcation of lease area, Department could not assess the mineral excavated by the individual lessee. Further, responsibility for non-compliance with the rules and instructions in the overlapped area could also not be fixed. Cases of overlapping of leases noticed in the test checked *Tehsils* are given in the **Table 3.4**:

**Table 3.4**  
Details of overlapping of leases

S.N.	Name of office and (Name of <i>Tehsil</i> selected)	Number of leases in selected <i>Tehsil</i>	Number of leases selected	Number of leases overlapped (percentage to number of leases selected)	Overlapped area (in hectare)
1	ME Sikar (Dantaramgarh)	137	113	7 (6)	0.25
2	AME Kotputli (Kotputli)	249	100	10 (10)	52.16
3	AME Neem ka Thana (Neem Ka Thana)	493	100	-	-
4	ME Alwar (Rajgarh)	147	100	15 (15)	2.36
5	ME Makrana (Parbatsar)	101	101	11 (11)	2.59
<b>Total</b>		<b>1127</b>	<b>514</b>	<b>43 (8)</b>	<b>57.36</b>

The above table depicts that about eight *per cent* of leases were not demarcated correctly to avoid overlapping. The overlapped area of these leases (as shown in table 3.4) was 57.36 hectare. These leases were sanctioned between the years 1977 and 2017 and since then the problem has continued. An illustrative image is given below to show overlapping of leases.

#### Image of leases under the jurisdiction of ME Sikar



**Figure 13**

The Government replied (February 2022) that previously demarcation of leases was done with the help of Compass and *Feeta* (Tape measure) and maps were prepared manually by plotting lease area on master map. Use of GPS/DGPS (GNSS) equipment was made compulsory for the purposes after RMMC Rules, 2017, came into force, therefore, these errors occurred as accuracy of manual plotting differs from computerized GIS plotting.

### **3.3.2 Gap areas between the leases**

Rule 7 of RMMC Rules, 2017 prescribes that the area surrounded by two or more mining leases or by forest boundary or any other reserved land shall be treated as gap area and such gap area shall be granted as a mining lease by way of e-auction. Further, where gap area is less than 0.5 hectare, such area shall be granted by way of e-auction among surrounding lessees and the same shall be added in the lease of successful bidder.

Scrutiny of satellite images of 514 selected leases revealed that departmental officials demarcated leases in such a way that there were 30 gap areas left between the leases. Audit noticed illegal mining in 14 gap areas as given in the **Table 3.5:**

**Table 3.5**  
**Details of gap areas**

S. No.	Name of Office	Number of gap areas	Number of gap areas where illegal mining noticed	Area of illegal mining in gap area (In hectare)
1	ME Sikar	8	8	3.45
2	AME Kotputli	7	0	0.00
3	AME Neem Ka Thana	5	1	0.10
4	ME Alwar	7	2	0.76
5	ME Makrana	3	3	0.77
<b>Total</b>		<b>30</b>	<b>14</b>	<b>5.08</b>

The Department did not make efforts to allocate/auction of these gap areas. Audit is of the view that if the Department had allotted these gap areas this would have fetched additional revenue of royalty and illegal mining activities would have also got stopped. Thus, Department was deprived of the additional revenue as dead rent and royalty. Further, illegal mining also could not be prevented in these areas. An illustrative image of gap area where illegal mining was noticed is as follows:

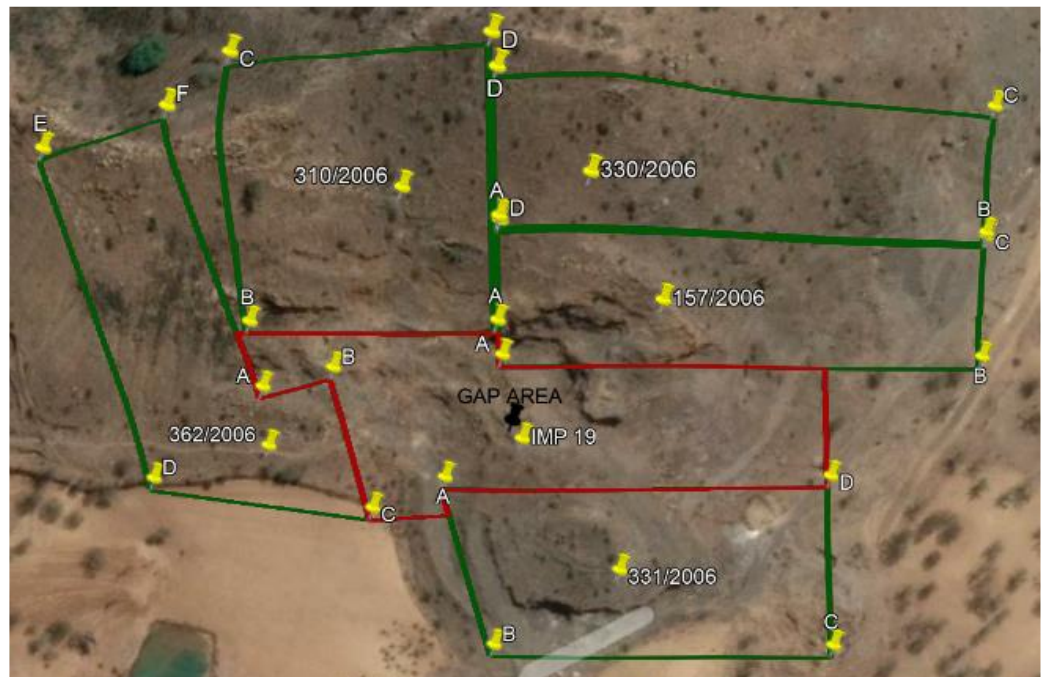


Figure 14

**Image of illegal mining in gap area under the jurisdiction of ME Sikar**

● Green line depicts Lease area. ● Red line depicts Gap area.

The Government replied (February 2022) that suitable gap areas would be auctioned and intimated to Audit.

**Thus, deliberate failure of the Department not only encouraged illegal mining but also deprived of the additional revenue as dead rent and royalty.**

### 3.4 Deficient online system

The Department introduced a new online system *DMGOMS* (10 October 2017) for the stakeholders. It includes key functions *e.g.* e-payment, lease information system, online demand register, *e-rawanna* and *e-transit pass etc.*

Audit noticed that the Department did not utilise the system to its full extent. Deficiencies are discussed in the succeeding paragraphs.

#### 3.4.1 Dispatch of mineral through *rawannas* over the quantity permitted in Consent to Operate/Environment Clearance

According to rule 28(2)(iv)(b) RMMC, Rules 2017 lessee shall keep production of all the minerals within the limits of mine plan or permitted under applicable laws. Provided that:

- if the lessee has excavated mineral to the extent of ten *per cent* over and above the quantity specified in the mine plan or permitted under applicable laws, only single time royalty shall be recovered;
- quantity more than ten *per cent* but upto twenty five *per cent*, two times of royalty on entire quantity over and above specified in the mine plan or permitted under applicable laws shall be recovered and

- any quantity more than twenty five *per cent*, entire quantity over and above specified in the mine plan or permitted under applicable laws shall be treated as unauthorized excavation and lessee shall be liable to pay cost of such excess mineral which shall be computed as ten times of the royalty payable at the prevalent rate, without affecting the powers of taking action by the other departments.

Further, rule 34 of RMMC Rules, 2017 provides for environmental safeguard. Accordingly, no mining lease or quarry licence shall be granted without obtaining prior consents, approvals, permits, no-objections and the like as may be required under applicable laws for commencement of mining operations.

During scrutiny of records of selected leases and information available on *DMGOMS*, it was observed that lessees had excavated excess minerals against the permitted quantity mentioned in Consent to Operate (CTO)/Environment Clearance (EC). Details are given in the **Table 3.6:**

**Table 3.6**

**Details of excess excavated mineral beyond permitted quantity**

S. No.	Name of Division	No. of leases	Quantity excavated in excess of CTO (in Metric Ton)	Quantity excavated in excess of EC (in Metric Ton)	Quantity excavated without CTO (in Metric Ton)	Quantity excavated without EC (in Metric Ton)	Amount Recoverable (₹ in crore)
1	AME Neem ka Thana	2	23,445	17,300	-	-	0.13
2	AME Kotputli	26	5,96,337	29,830	2,73,266	60,820	3.80
3	ME Alwar	2	5,619	-	-	-	0.07
4	ME Makrana	8	6,000	34,285	-	3,22,294	9.99
<b>Total</b>		<b>38</b>	<b>6,31,401</b>	<b>81,415</b>	<b>2,73,266</b>	<b>3,83,114</b>	<b>13.99</b>

Audit test checked 514 leases of selected five division offices out of which it was noticed that 38 lessees had excavated minerals in excess of the permitted quantity in CTO/EC or without obtaining CTO/EC. Due to violation of the provisions of RMMC Rules, 2017 an amount of ₹ 13.99 crore was leviable on the lessees. However, the Department did not notice the irregularity. The above table indicates that about seven *per cent* of the test checked lessees were violating the provisions, but the Department was not vigilant in checking these activities.

The Government replied (February 2022) that auto blocking of generation of *e-rawannas* in excess of the quantity permitted by CTO had been made effective since 27 October 2018 in *DMGOMS*. Similar module has also been developed for EC. It was added that, however, it would be made effective after decision at departmental level.

Reply is not tenable as due diligence was not followed by the departmental officials to prevent generation of *e-rawannas* in excess of the permitted quantity. Further, delay in module to auto block generation of *e-rawannas* in excess of the quantity permitted by EC also leads to leakage of revenue. Absence of due diligence and non-mapping of required checks in *DMGOMS* resulted in the dispatch of mineral over the quantity permitted in CTO/EC.

### 3.4.2 Incomplete/incorrect information of demand and recovery on *DMGOMS*

Information of pending demand of illegal mining activities was sought (between January and July 2021) from the selected five offices. Only three offices provided information. Scrutiny of demands of illegal mining activities related to mining leases revealed that the demand was not shown in the demand register maintained on *DMGOMS* in the case of 53 leases as detailed in **Table 3.7**:

**Table 3.7**  
Details of penalty amount not shown in *DMGOMS*

(₹ in crore)					
S. No.	Name of Office	Number of leases where demand of illegal mining activities not entered in <i>DMGOMS</i>	Demand raised	Demand recovered	Pending demand
1	AME Neem ka Thana	42	25.08	4.32	20.76
2	ME Alwar	4	15.89	0.79	15.10
3	AME Kotputli	7	30.23	2.99	27.24
<b>Total</b>		<b>53</b>	<b>71.20</b>	<b>8.10</b>	<b>63.10</b>

Audit noticed that the pending demand as shown in above table was not uploaded by the Department on *DMGOMS*. Thus, *DMGOMS* did not depict actual pendency of demand against the lessees in respect of illegal mining activities.

In the absence of information on pending demand by the remaining two offices, it could not be checked as to whether all pending demands of the lessees were shown in the *DMGOMS* by these Divisions.

The Government replied (February 2022) that action is being taken as per rules.

Reply is not tenable as the departmental officials did not raise the demand of penalty for illegal mining activities (as shown in the above table). Further, Department did not have a system to check that every demand is entered in the online system.

### 3.4.3 Co-ordinates of Short Term Permits not uploaded

According to rule 51 of RMMC Rules, 2017 Short Term Permit (STP) may be granted for excavation and use of mineral masonry stone, *murrum*, (ordinary earth *etc.*) to a contractor for executing works of Government, Semi-Government, Local Body, *Panchayati Raj* Institution or Organizations aided or funded by the Government. Accordingly, the Department issued 22,445 STPs<sup>8</sup> for excavation of mineral or to consume royalty paid minerals.

Scrutiny of information available on *DMGOMS* disclosed that Department had not uploaded the coordinates of STPs on *DMGOMS*. In the absence of these coordinates, illegal mining nearby the STPs could not be identified by Audit.

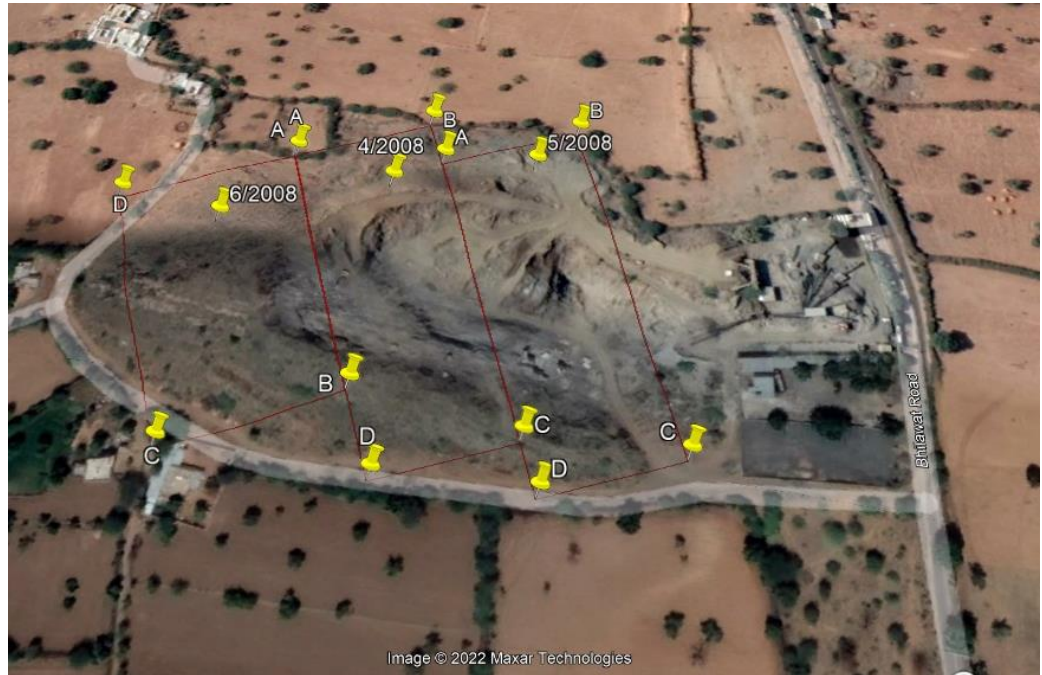
The Government replied (February 2022) that provision for uploading the coordinates of STPs was available in the *DMGOMS* and concerned offices can upload the same.

<sup>8</sup> Position of issued STPs as on 1<sup>st</sup> April 2020.

The fact remained that concerned offices had not uploaded the coordinates of the STPs and Department also did not ensure that coordinates of STPs were got uploaded.

#### **3.4.4 Absence of GIS Mapping**

GIS Mapping is the process of inputting data layers into GIS software to produce a map. These Maps present users with legible information that raw data cannot display on its own. It helps in better decision making and better geographic information record keeping *etc.* Gap areas and overlapping of leases can be identified by GIS mapping. *DMGOMS* has a provision for GIS Mapping of each lease. Illustrative image of GIS Mapping is given hereunder:



**Figure 15**

#### **Illustrative image of GIS mapping of leases**

Scrutiny of information available on *DMGOMS* disclosed that GIS Mapping had not been done for any of the leases of selected Division offices. In the absence of GIS Mapping, departmental officials were deprived of the necessary information to point out irregularities done by the lessees and others.

Further, it is noteworthy to mention here that the Government of India, Ministry of Mines had launched the Mining Surveillance System (MSS) in the country in October 2016 for major minerals to detect illegal mining. The Central Government had also asked the State Government to implement MSS for minor minerals by digitising all minor mineral leases by December 2016. However, Department had not digitised minor minerals leases (July 2021).

On being pointed out, AME Neem ka Thana replied (December 2020) that online software was not updated, therefore, mapping could not be done. ME Sikar and Alwar replied (December 2020) that there was no option in online software for GIS mapping. Thereafter, the Government replied (February 2022)



that *DMGOMS* had been integrated with the *Rajdharaa*<sup>9</sup> and sanctioned lease areas were super imposed on *Rajdharaa* GIS system.

Test check of GIS mapping of lease areas revealed that overlapping of lease areas and gap areas between the leases could not be identified through this module. Thus, the purpose of GIS mapping could not be achieved.

### 3.4.5 Generation of *e-rawannas*

DMG instructed (18 October 2017) that till the completion of the maximum time period mentioned in *e-rawanna* for reaching the destination for a vehicle, no other *e-rawanna* can be generated for that vehicle. Each dispatch of mineral by a vehicle includes loading of mineral, generation of *e-rawanna*, parking of vehicle on weigh bridge, confirmation of *e-rawanna* by weigh bridge, reaching the vehicle at the destination and unloading of mineral and return to the mining site.

Audit, however, noticed that *e-rawannas* were generated before the completion of maximum time period mentioned on previous *e-rawanna* for the same vehicle. This indicates that above instructions issued by DMG were not mapped in *DMGOMS*. Some illustrative cases noticed are given hereunder:

- (i) Second *e-rawanna* was generated within five minutes after generation of first *e-rawanna* for the same vehicle despite the fact that the distance of destination in the first *e-rawanna* was 15 kilometres;
- (ii) Second *e-rawanna* was generated within five minutes for the same vehicle despite the fact that the distance of destination in first *e-rawanna* was 10 kilometres;
- (iii) Seven *e-rawannas* were generated within 80 minutes for the same vehicle and four *e-rawannas* generated within 15 minutes for the same vehicle. Illustrative images are given hereunder to show the irregularity.

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<sup>9</sup> Integrated GIS Infrastructure of the State to enable good governance, sustainable development and citizen empowerment and to maintain standardized GIS assets of the State, developed by Department of Information, Technology & Communication.

Weigh bridge Registration Number: 201711080398

Figure 16: Two e-rawannas for vehicle number RJ32GC3664 were generated within five minutes as shown in figure 16 and 17.

Figure 17: Two e-rawannas for vehicle number RJ32GC3664 were generated within five minutes as shown in figure 16 and 17.

- Distance of same areas within Sikar district was varied between 60 to 201 kilometres in different e-rawannas. This indicated that actual distances were not shown in the e-rawannas. Possibility of use of e-rawannas for multiple trips cannot be ruled out.

Illustrative images are given hereunder:

### Weigh bridge Registration Number: 201711240616

Government of Rajasthan  
DEPARTMENT OF MINES & GEOLOGY, RAJASTHAN

**RJ23RB7570** eRawanna No. **ETHG1025650377**

RJ23RB7570 is having eRawanna No. ETHG1025650377 (Confirmed) which expires on 17-Mar-2020 02:48:13 PM.

Generated on	: 17-Mar-2020 09:48:13 AM	Consignee Name	: SSSSS
Confirmed on	: 17-Mar-2020 10:15:33 AM	Consignee Address	: sikar, ranoli gorla bajor sikar, Sikar, Rajasthan,
Lease No.	: ME/SKR/Minor/ML/31/2009	Approximate Distance	: 60 Km
Name of the Lessee	: Sajina Devi	Collection Through	: ERCC (Unpaid Rawanna)
Lease Location	: Ruppura / Dataram Grah / Sikar	Royalty	: ₹ 0/-
Mineral	: Masonary Stone	DMFT	: ₹ 0/-
Net Mineral Weight	: 2.23 (Metric Ton)	Royalty Schedule Rate	: 7. (a) Masonary Stone(Sandstone, Limestone, Granite, Rhyolite, Quartzite, Schist, Phyllites, Schist etc.) - (a) Used as Khanda, ballast, road metal, fatchere, gitty, parera, crusher dust, gravel, hajhra etc. - (i) Alwar, Bharatpur, Jaipur, Jhuhujhuni, Sikar, Dholpur, Karuli, Johdpur district. (35/-PMT)
Tare Weight	: 3.35(1.95 Tractor Wt + 1.4 Trolley Wt) (Metric Ton)	Bridge Name	: SHRI GANPATI DHARM KANTA(201711240616)/RUPPURA
Driver Details	: Subhashji (Mob: 8104340210)		

Front Image: Tue 12:44:01  
Side Image: Tue 12:45:35

Figure 18: Distance from Ruppura to Ranoli was shown 60 kilometres (figure 18) whereas distance for the same places was shown 201 kilometres (figure 19).

Government of Rajasthan  
DEPARTMENT OF MINES & GEOLOGY, RAJASTHAN

**RJ23GB7873** eRawanna No. **DRMT1025162357**

RJ23GB7873 is having eRawanna No. DRMT1025162357 (Confirmed) which expires on 02-Mar-2020 06:43:06 PM.

Generated on	: 02-Mar-2020 07:43:06 AM	Consignee Name	: SIKAR MANDI
Confirmed on	: 02-Mar-2020 08:01:46 AM	Consignee Address	: Sikar, Fathepur, ranoli, Palsana, Sikar, Rajasthan, 9166407375
Lease No.	: ME/SKR/Minor/ML/342/2008	Approximate Distance	: 201 Km
Name of the Lessee	: M/S Sunrise Stones	Collection Through	: ERCC (Unpaid Rawanna)
Lease Location	: Rooppura / Dataram Grah / Sikar	Royalty	: ₹ 0/-
Mineral	: Masonary Stone	DMFT	: ₹ 0/-
Net Mineral Weight	: 9.66 (Metric Ton)	Royalty Schedule Rate	: 7. (a) Masonary Stone(Sandstone, Limestone, Granite, Rhyolite, Quartzite, Schist, Phyllites, Schist etc.) - (a) Used as Khanda, ballast, road metal, fatchere, gitty, parera, crusher dust, gravel, hajhra etc. - (i) Alwar, Bharatpur, Jaipur, Jhuhujhuni, Sikar, Dholpur, Karuli, Johdpur district. (35/-PMT)
Tare Weight	: 7.7 (Metric Ton)	Bridge Name	: SHRI GANPATI DHARM KANTA(201711240616)/RUPPURA
Driver Details	: Raju (Mob: 9887214698)		

Front Image: Mon 10:31:10  
Side Image: Mon 10:31:25

Figure 19: Distance from Ruppura to Ranoli was shown 60 kilometres (figure 18) whereas distance for the same places was shown 201 kilometres (figure 19).

Deficient online system resulted in these irregularities. Audit is of the view that if the distance in *e-rawanna* was mentioned using GIS technology, this irregularity could have been avoided.

The Government replied (February 2022) that such cases were checked by the ME/AME concerned and instructions were issued time to time in this regard.

Reply is not tenable as test check of *e-rawannas* revealed serious irregularities, which remained undetected by the concerned offices.

### 3.5 Installation of GPS devices in the vehicles

According to rule 44 (18) of RMMC Rules, 2017 the Government will explore the possibility of prescribing GPS tracking system in the vehicles involved in transportation of minerals.

It was observed that the State Government did not make effort to install GPS tracking system in these vehicles (July 2021). In the absence of these devices, monitoring of vehicles could not be done to check misuse of *rawannas* i.e. transportation of minerals excavated from other than the lease areas or more than one trip being done with the support of one *rawanna*.

#### **Good Practices adopted by other States**

- **Installation of GPS devices in the vehicles (Goa State)**

With the aim to stop illegal mining of minor minerals, proper collection of Government revenue, public safety and proper accounting of minor mineral extracted, State Government of Goa decided (29 January 2018) to regulate minor mineral transportation in Goa State. Therefore, owners of vehicles used for transportation of minor minerals within the State of Goa were directed to register their vehicles on DMG (Goa) platform upon payment of onetime registration fee of ₹ 5000 to qualify for carrying out transportation activities of mineral from 1 April 2018 after installation of GPS devices.

- **Radio-frequency identification (RFID) system TAGS on the vehicles (Karnataka State)**

Karnataka State introduced Integrated Lease Management System (ILMS) which involves less of manual intervention and more usage of electronic mode resulting in saving of time and hassle-free movement of mineral. To avoid manual mistake and malfunction DMG (Karnataka) introduced RFID system to be incorporated in lease premises, Check Posts and Buyer Premises to systematize mineral movement tracking and acknowledgement. In Check Posts, it facilitates fast vigilance and eliminates manual intervention to achieve transparency. Further, RFID system is tampered proof and eliminates chances of malfunction.

The Government replied (February 2022) that proposals for compulsory installation of GPS and RFID tag had been received from the Department.

### **3.6 Summary of findings**

Department did not leverage technologies easily available in public domain to identify and curb illegal mining activities. Audit noticed irregularities *viz.* overlapping of leases and non-allotment/auction of gap areas lying between the leases, *etc.* Inadequate inspections of mines by the concerned officials resulted in non-identifications of these irregularities.

With the use of remote sensing data and GIS technology, Audit identified illegal mining activities in 122 cases (34 *per cent* of test-checked leases) nearby sanctioned mining leases in five selected *tehsils* under five selected divisions out of 49 divisions. The identified area of illegal mining was 83.25 hectare. Audit also noticed 13 mining leases where mineral was not excavated, however, 5.20 lakh MT of mineral was shown dispatched by misusing 22,854 *e-rawannas*. Departmental officials demarcated leases in such a way that there were gap areas between the leases. These gap areas encouraged illegal mining. Illegal mining was noticed in 14 gap areas out of 30

*i.e.* 46 per cent. Department introduced (10 October 2017) a web-based application 'DMGOMS' for effective monitoring of the mining activities. However, the Department failed to utilise the system effectively. Demands related to illegal mining activities (₹ 71.20 crore) were not shown on the demand register maintained at DMGOMS in 53 cases. Dispatch of minerals from mining leases in excess of limits prescribed in Environment Clearance Certificate/Consent to Operate were found and there was no check in the system to prevent the dispatch of mineral in excess of permissible quantity. The State Government did not initiate any such system or use of satellite images to identify illegal mining activities except carry out drone survey of 43 leases in Nagaur district.

### 3.7 Recommendations

*The Department may consider:*

1. *utilising Remote Sensing/GIS technology such as Google Earth Pro application to identify illegal mining activities along with other modern technology such as drone survey to expedite identification of illegal mining activities;*
2. *mapping all the existing leases using Remote Sensing data and GIS technology to do away the overlapping of leases;*
3. *to fix accountability on the officials for leaving gap areas unauctioned and setting a time frame for auction of gap areas on priority basis;*
4. *providing a check in the DMGOMS to auto block the generation of e-rawannas whenever the quantity crosses the permitted limit by EC also and to expedite the recovery of the amount for the illegally mined minerals;*
5. *providing a system in the DMGOMS to generate demand notice only after uploading the demand in online demand and collection register;*
6. *mapping and uploading coordinates of all the STPs wherein mining was permitted;*
7. *using GIS technology for measuring distance between place of dispatch and destination in e-rawanna; and*
8. *adopting good practices of GPS installation in vehicles and use of RFID technology as initiated by other states and proposed by the Department of Mines and Geology, Rajasthan.*

