

SUSTAINABLE MINING AND GEOINFORMATION

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Week – 10

Lecture 48: Sustainable Development in Mining Legislation- II

Welcome, students, to lecture 48 of our NPTEL course on Sustainable Mining and Geoinformation. Today, we shall continue our discussion on sustainable mining in mining legislation. Yesterday, we started this discussion on the same topic, and we discussed the National Mineral Policy 2019. Today, we shall continue the discussion on the provisions in the mining legislation on the topic of sustainable development. In today's class, we shall discuss the MMDR Act 1957, the Mineral Conservation and Development Rules (MCDR) 2017, and the provisions of the contribution to the District Mineral Fund 2015. So, these are the different statutory provisions where we will be discussing sustainable development in the mining industry. First, we shall discuss the Mines and Minerals Development and Regulation Act 1957. This MMDR Act, the original act which was enacted in 1957, and the last amendment came in 2016, was published in 2017. Different provisions under this act outline how to develop our mineral resources in the country. Under this MMDR Act, the regulation, that is, the Mineral Conservation and Development Rules (MCDR), comes from this act. We shall also discuss the MCDR, which was amended in 2017. We shall start with the Mines and Minerals Development and Regulation Act 1957. There are several provisions in this Act, and we will only discuss those provisions that are relevant to sustainable development. Section 9B under the MMDR Act deals with the District Mineral Foundation.

CONCEPTS COVERED

- Provisions of MMDR Act, 1957
- Provisions of MCDR, 2017.
- Provisions of CMDF, 2015.




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MMDR ACT, 1957

- MINES AND MINERALS (DEVELOPMENT AND REGULATION) ACT, 1957.

9B. District Mineral Foundation:

- (1) In any district affected by mining operations, State Govt. shall, establish a trust, as a non-profit body, to be called the District Mineral Foundation.
- (2) The object of the DMF shall be to work for the interest and benefit of persons, and areas affected by mining related operations.
- (3) Composition and functions of DMF shall be prescribed by State Govt.




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We have talked about this in previous classes, in the National Mineral Policy, which we discussed in the last class. As per Section 9B, in any district affected by mining and allied industries, the state government shall establish a trust, which is a non-profit body. The name of the trust will be the District Mineral Foundation or DMF. The objective of the District Mineral Foundation shall be to work for the interest and benefit of the persons affected by mining. Those persons affected by the mining industry mainly refer to the project-affected persons and the local community. The community that lives in the mining area or the peripheral area includes persons affected by the mining industry, as well as areas affected by the mining industry. The mining industry means mining operations. The beneficiation operation or any other operation, as well as mineral processing operations, will all be counted as mining operations. The composition and functions of the District Mineral Foundation shall be determined by the concerned state government. Here, when we say the District Mineral Foundation, which district? The district in which the mining operation is going on. The district in which the mining is located. That is the district that will have the District Mineral Foundation (DMF).

The state government shall be guided by the provisions contained in Article 244, read with the 5th and 6th Schedules of the Constitution, relating to the administration of the scheduled areas and tribal areas, and provisions of the Panchayat Extension to the Scheduled Areas Act 1996. We have discussed this provision in our last class, where there are tribals living in those forest areas where we want to do mining or allied activity. There are specific provisions to be complied with respect to the rights of the tribal community. We have a regulation called the Scheduled Areas and Tribal Areas and Provisions of Panchayat Extension to the Scheduled Areas Act 1996. We call it PESA, 1996. The scheduled area, the government has notified as per the 5th and 6th Schedules of the Constitution. Most of the northeastern states, like Arunachal Pradesh, Manipur, and some of the states that are tribal-dominated, have their scheduled areas. Some parts of Jharkhand and Odisha are also scheduled areas where tribal people are living. Where tribal people are more than 40 percent, the government has notified them as scheduled areas. They are also in the forest area. If you have mining in the scheduled area, we also have to comply with the Scheduled Tribes and Other Traditional Forest Dwellers Recognition of Forest Rights Act 2006. So, these two provisions: in scheduled areas, the rights of the tribal people, and in the forest, the Forest Rights Act of the ST people, those have to be complied with. These are mandatory. Now, the prospecting license and mining leaseholder shall, apart from paying the royalty to the state government, pay the District Mineral Foundation an amount equivalent to a fixed percentage of the royalty.

MMDR ACT, 1957

(4) State Govt. shall be guided by the provisions contained in article 244 read with **Fifth and Sixth Schedules** of Constitution relating to administration of the **Scheduled Areas and Tribal Areas** and the Provisions of the **Panchayats (Extension to the Scheduled Areas) Act, 1996** and the **Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (2 of 2007)**.

(5) The PL/ ML holder shall, apart from royalty, **pay to DMF** of district of the mines, an amount which is equivalent to a **fixed % of royalty** paid in terms of 2nd Schedule, not exceeding one-third of the royalty, as prescribed by GOI.

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The state government and the mining company are paying royalties to the state government. The mines are located, let us say, for example, in the state of Odisha, in the Iron Ore Mines. Depending on the leasehold area and production, the company pays royalties to the state government. And as per the second schedule, what is the royalty rate? That is decided by the Government of India. What is the royalty rate? Per ton of

coal produced, per ton of iron ore produced. So, the annual production and the per-rupee per-ton production of the mineral. So, you can calculate the royalty. Once you have calculated the royalty, a fixed percentage of the royalty will be paid by the mining company to the District Mineral Foundation. It could be, let's say, 10 percent or something like that. And what percentage is again decided by the contribution to the District Mineral Foundation Rules 2015? We will discuss later that in 2015, a specific rule came into effect with respect to what the contribution to the District Mineral Foundation should be. Section 9C of the MMDR Act 1957: National Mineral Exploration Trust. The Government of India shall establish a National Mineral Exploration Trust (NMET), a trust that is a non-profit body. The objective of the NMET shall be to use the funds accrued to the trust for regional and detailed exploration. Now, this fund towards NMET will also be paid by the mining company, and this fund will be going to the Government of India. The NMET fund is apart from the royalty.

MMDR ACT, 1957

9C. National Mineral Exploration Trust:

- 1) GOI shall establish National Mineral Exploration Trust (NMET), a non-profit body.
- 2) The object of NMET shall be to use the funds accrued to the Trust for the purposes of regional and detailed exploration.
- 3) Composition and functions of NMET shall be prescribed by GOI.
- 4) PL/ML holder shall pay to NMET a sum of 2 % of the royalty.

17A. Reservation of areas for purposes of conservation:

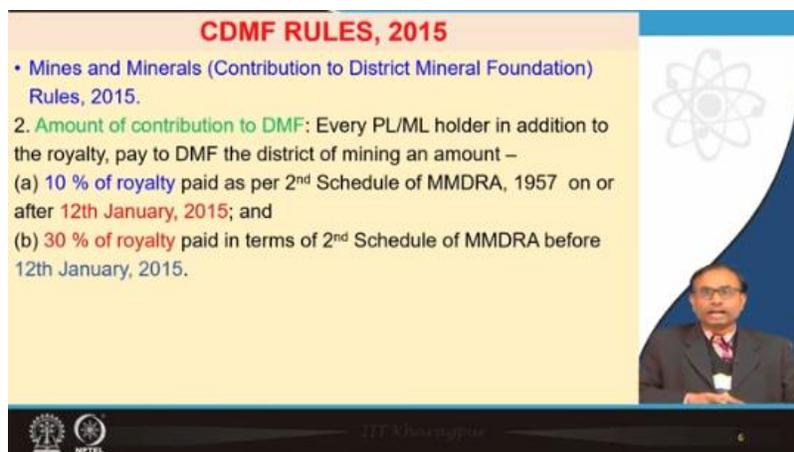
- 1) GOI with a view to conserving any mineral, may reserve any area not already held under any PL/ML by notification in the Official Gazette.

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The mining companies are paying royalties. Apart from the royalty, they will pay a percentage of the royalty, which will go to the District Mineral Foundation. Some additional amount, which is some percentage of the royalty, will go to the National Mineral Exploration Trust. The prospecting license holder or mining leaseholder shall pay to NMET a sum of 2 percent of the royalty. This is a fixed percentage of 2 percent of the royalty amount that will go to the Government of India to the NMET trust. This fund will be used for regional exploration and detailed exploration. This is actually with respect to how the mining industry will contribute to mineral resource conservation when looking for new resources. Because resources are very important for the economic growth of the country, this mining company should also contribute to that. Section 17A is the reservation of some areas for the purposes of conservation. Government of India, with a view to conserving any mineral. If they decide so, they may reserve an area designated

as a geographical area where that mineral resource is located or present. So, the government may identify that area and reserve that area for itself, and it will not grant any prospecting license or mining lease of that area to any company, any private or otherwise; it will conserve it for only the government company or the government body. So, the government is empowered to identify which minerals need to be conserved and which property needs to be conserved. There has to be a body that will determine that.

Now, we come to the Mines and Minerals (Contribution to the District Mineral Foundation) Rules, 2015. Section 2 states that any prospecting license holder or mining lease holder who is paying the royalty to the state government has to pay an amount equivalent to a certain percentage of the royalty towards the District Mineral Foundation fund. This District Mineral Foundation fund will be in the same district where mining and allied activities are occurring. So, 10% of the royalty is paid as per the second schedule of the MMDRA 1957 on or after 12th January 2015, and 30% of the royalty is paid in terms of the second schedule of the MMDRA before January 2015. So, after 12 January 2015, the contribution of a mining company to the District Mineral Foundation is 10% of the royalty. If they are paying 100 rupees as royalty to the state government, they have to pay 10 rupees to the District Mineral Foundation. Remember that this fund towards the District Mineral Foundation will be used in that district, in the peripheral area of the mining area, for the benefit of that area, for the benefit of the affected community, for the benefit of the project-affected persons. In that area, the district itself will use that fund for betterment activities for economic, social, and cultural improvement. Now, we come to the Mineral Conservation and Development Rules 2017 or MCDR 2017. Now, as per the MCDR 2017 in Chapter 3, we have already discussed the provisions of the mine closure plan in Rules 22, 23, 24, and 25.



CDMF RULES, 2015

- Mines and Minerals (Contribution to District Mineral Foundation) Rules, 2015.

2. Amount of contribution to DMF: Every PL/ML holder in addition to the royalty, pay to DMF the district of mining an amount –

- (a) 10 % of royalty paid as per 2nd Schedule of MMDRA, 1957 on or after 12th January, 2015; and
- (b) 30 % of royalty paid in terms of 2nd Schedule of MMDRA before 12th January, 2015.

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These sections talk about the submission of progressive and final mine closure plans and the modification of the mine closure plans. We have discussed these provisions when I talked about the mine closure plan. Rule 27 talks about financial assurance to be given by the mining company for the implementation of the progressive and final mine closure plan. How will the mining company open an escrow account in any public sector bank in the name of CCO, Coal Controller Organization, or the name of the Indian Bureau of Mines? How will they be depositing the financial assurance every year? There are some formulas we discussed during the mine closure plan discussion. Rules 22 to 27 are about the mine closure plan and the financial assurance. We have already discussed these in the MCDR. Now, Chapter 5 Rule 35 is about sustainable mining. So, the mining leaseholder shall take all possible precautions to undertake sustainable mining while conducting prospecting, mining, beneficiation, or metallurgical activity in the area. The mining leaseholder shall monitor mining and allied activities as per the notified template of star rating prescribed by IBM, and as per this sub-rule two, the company has to submit a self-assessment report online before the first of July of every year for the previous financial year. So, the company or the mine has to submit a self-assessment report. The format of the report is prescribed by the Indian Bureau of Mines. You can go to the IBM website and download the format that is provided for the self-assessment report that will be used for the star rating evaluation by IBM. Now, the report has to be submitted along with the satellite images, plans, and maps.

CHAPTER III: MINE CLOSURE PLAN

Sec 22-25: Submission of progressive and final mine closure plans, modification of mine closure plans.

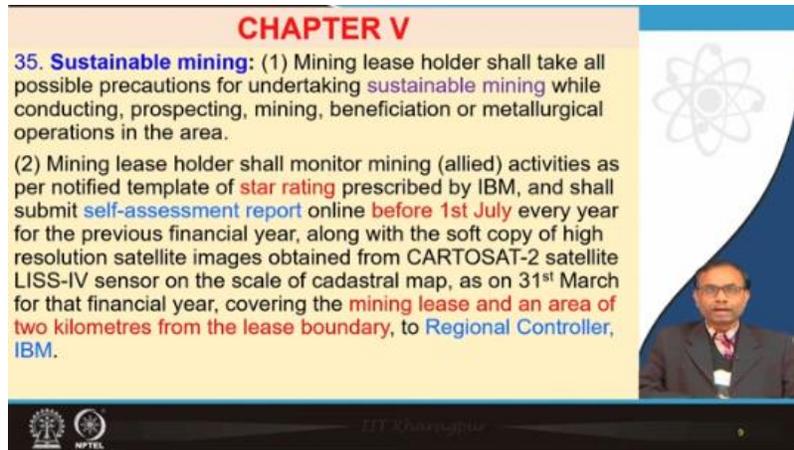
Sec 27: Financial assurance for implementation of progressive and final mine closure plan.

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CHAPTER V

35. Sustainable mining: (1) Mining lease holder shall take all possible precautions for undertaking sustainable mining while conducting, prospecting, mining, beneficiation or metallurgical operations in the area.

(2) Mining lease holder shall monitor mining (allied) activities as per notified template of star rating prescribed by IBM, and shall submit self-assessment report online before 1st July every year for the previous financial year, along with the soft copy of high resolution satellite images obtained from CARTOSAT-2 satellite LISS-IV sensor on the scale of cadastral map, as on 31st March for that financial year, covering the mining lease and an area of two kilometres from the lease boundary, to Regional Controller, IBM.

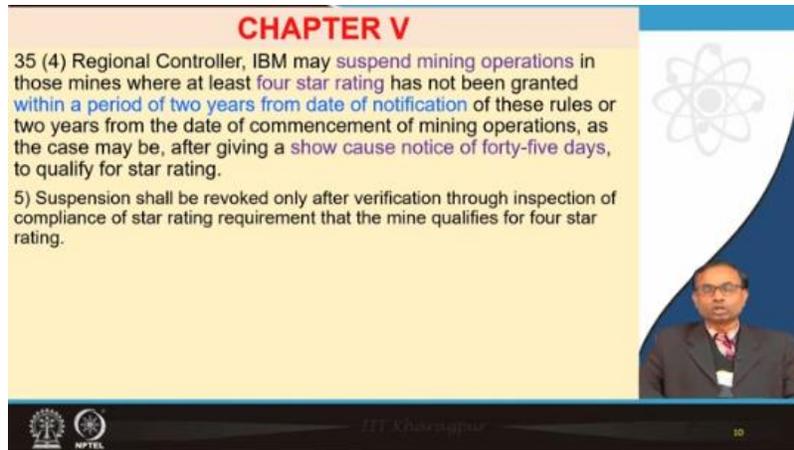


Along with the report, the company has to produce a self-assessment report. And the images, particularly the remote sensing, from the remote sensing data, the remote sensing image cadastral maps, have to be submitted covering the mining leach area and an area of 2 kilometers from the leach boundary. With these maps, we will give a pictorial evaluation of the environmental status of the mining areas. And this self-assessment has to be submitted online, and this report containing the satellite images and other maps has to be submitted to the regional controller of the IBM office. Now, the regional controller of the Indian Bureau of Mines is the designated authority for this star rating system. They will evaluate the self-assessment report along with the images and the maps, and they will provide a rating. If the mining company secures a rating of less than 4 stars within a period of 2 years from the notification or within a period of 2 years from when the mine has started... If the mine fails to get a 4-star rating, then the regional controller of mines, IBM, can give a show cause notice to the mining company that the mine is not able to obtain a four-star rating. On that basis, the regional control can give a show cause notice and then suspend the operation. It can suspend the mining operation. Now, the suspension shall be revoked only after verification through inspection of compliance with the star rating requirement that the mine qualifies for the 4-star rating.

CHAPTER V

35 (4) Regional Controller, IBM may suspend mining operations in those mines where at least four star rating has not been granted within a period of two years from date of notification of these rules or two years from the date of commencement of mining operations, as the case may be, after giving a show cause notice of forty-five days, to qualify for star rating.

5) Suspension shall be revoked only after verification through inspection of compliance of star rating requirement that the mine qualifies for four star rating.



When the mine takes corrective measures to improve the environmental and other sustainability parameters, when it takes remedial or corrective measures, then the officers from the regional control or IBM office come for verification. If they are satisfied, they will again make an evaluation and give a 4-star rating, and only then can the suspension be revoked. Section 36 is the removal and utilization of topsoil. Every prospecting license or mining leaseholder shall remove the topsoil separately. This topsoil shall be utilized for the restoration and rehabilitation of the land, which is no longer required for prospecting or mining purposes, or the soil will be used for stabilizing the landscape of the external domes. Whenever topsoil cannot be used for concurrent reclamation, it shall be stored separately, conserved, and preserved in some way for future use. Rule 37, storage of overburden, waste rocks, etc. Prospecting license and mining leaseholders shall take all steps so that the overburden material, waste rock, mill tailing reject, washery reject, fines of the mill tailing, slimes produced during the mining operation, and the beneficiation operation shall be stored in separate dumps. The dumps shall be properly secured to prevent escape of the material, erosion of the material in harmful quantities which may cause degradation of the water body, degradation of the land, degradation of the soil, or degradation of the environment, and prevent the causation of floods.

REMOVAL AND UTILISATION OF TOP SOIL

36. **Removal and utilisation of top soil:** 1) Every Prospecting license-cum-mining lease (PL/ML) holder shall remove top soil separately.

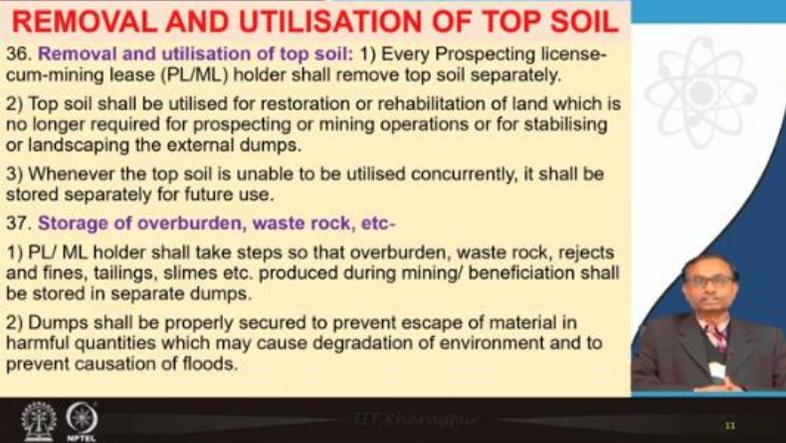
2) Top soil shall be utilised for restoration or rehabilitation of land which is no longer required for prospecting or mining operations or for stabilising or landscaping the external dumps.

3) Whenever the top soil is unable to be utilised concurrently, it shall be stored separately for future use.

37. **Storage of overburden, waste rock, etc-**

1) PL/ ML holder shall take steps so that overburden, waste rock, rejects and fines, tailings, slimes etc. produced during mining/ beneficiation shall be stored in separate dumps.

2) Dumps shall be properly secured to prevent escape of material in harmful quantities which may cause degradation of environment and to prevent causation of floods.



It has been seen that in many cases, the tailing dam may fail, and then it will flood and damage the surrounding land. So, for that, you have to properly secure those dams, overburden dumps, tailings dumps, slime dumps, and things like that. 36.3: Site for dumps, tailings, and slimes shall be selected on impervious ground to ensure that minimum leaching takes place during precipitation. When you have these dumps and then there is rainfall, water will seep through and infiltrate the waste material, the dump material, and they may contain toxic chemicals and heavy metals. So, there should not be leaching, which will go up to the aquifer and pollute the groundwater. So, you have to select an impervious layer so that there will be minimal leaching. Materials such as waste rocks and overburden shall be backfilled into the mine excavation with the aim of restoring the land to its original land use. Wherever backfilling of waste rock in the excavated area is not feasible, the waste dump shall be suitably terraced, and suitable slopes should be maintained and stabilized through vegetation methods, afforestation methods, reclamation, and revegetation. Through reclamation and revegetation, this waste dump should be reclaimed and stabilized. Fines, rejects, and tailings from mines of the beneficiation plant shall be deposited or disposed of in a specially prepared tailing disposal area, which we know as a tailing pond or tailing dam.

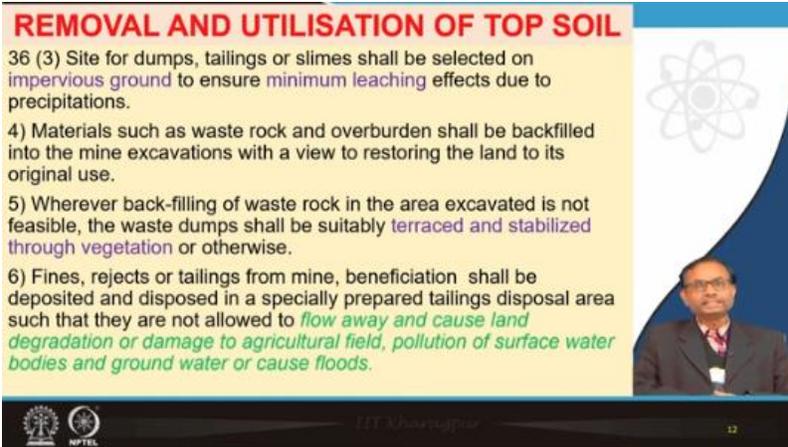
REMOVAL AND UTILISATION OF TOP SOIL

36 (3) Site for dumps, tailings or slimes shall be selected on **impervious ground** to ensure **minimum leaching** effects due to precipitations.

4) Materials such as waste rock and overburden shall be backfilled into the mine excavations with a view to restoring the land to its original use.

5) Wherever back-filling of waste rock in the area excavated is not feasible, the waste dumps shall be suitably **terraced and stabilized through vegetation** or otherwise.

6) Fines, rejects or tailings from mine, beneficiation shall be deposited and disposed in a specially prepared tailings disposal area such that they are not allowed to **flow away and cause land degradation or damage to agricultural field, pollution of surface water bodies and ground water or cause floods.**



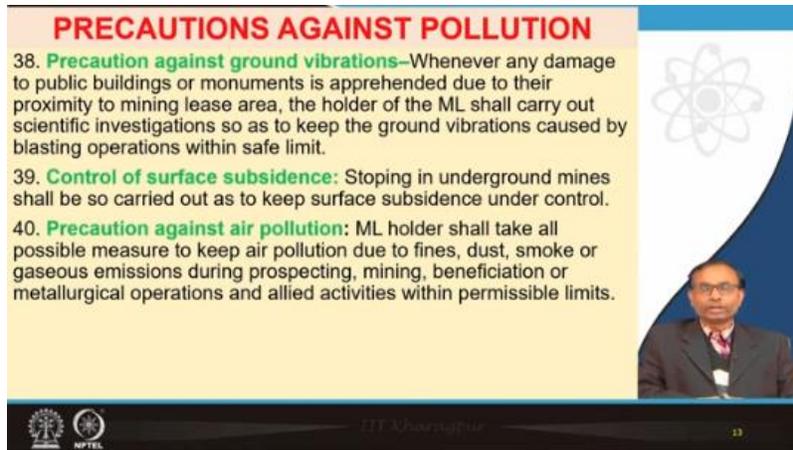
The tailing pond or tailing dam shall be prepared so that the tailings do not flow away and cause degradation of the land or damage to agricultural fields, pollution to surface water bodies, and pollution to groundwater bodies. So, these are the precautions to be taken with respect to the tailing pond. Now, in the mining, we do the blasting. So, there is ground vibration. So, section 38 says that precautions should be taken against ground vibration. Whenever any damage to a public building or monument is apprehended due to the proximity to the mining area, the mining leaseholder shall carry out a scientific investigation to keep the ground vibration within the safe limit. So, for that, they have to get technical help from the research organizations so that they can do their blast design properly. So, the ground vibration should be kept within the allowable limit. The DGMS has prescribed the ground vibration limit. So, the mining company should comply with that. Rule 39 is about the control of surface subsidence. In the underground method of mining, when we are doing stoping or coal mining, we are doing the extraction of the coal and depilering, and there will be subsidence. Now, the underground mines should be backfilled with sand or other noncombustible material, such as fly ash, etc., so that the surface subsidence is kept under control and within the limit. Precautions against air pollution: Rule 40, the mining lease holder shall take all possible measures to keep air pollution due to fines, dust, smoke, or gaseous emissions during the mining operation, during the mineral beneficiation operation, and during the metallurgical operation within the permissible limit.

PRECAUTIONS AGAINST POLLUTION

38. **Precaution against ground vibrations**—Whenever any damage to public buildings or monuments is apprehended due to their proximity to mining lease area, the holder of the ML shall carry out scientific investigations so as to keep the ground vibrations caused by blasting operations within safe limit.

39. **Control of surface subsidence**: Stopping in underground mines shall be so carried out as to keep surface subsidence under control.

40. **Precaution against air pollution**: ML holder shall take all possible measure to keep air pollution due to fines, dust, smoke or gaseous emissions during prospecting, mining, beneficiation or metallurgical operations and allied activities within permissible limits.

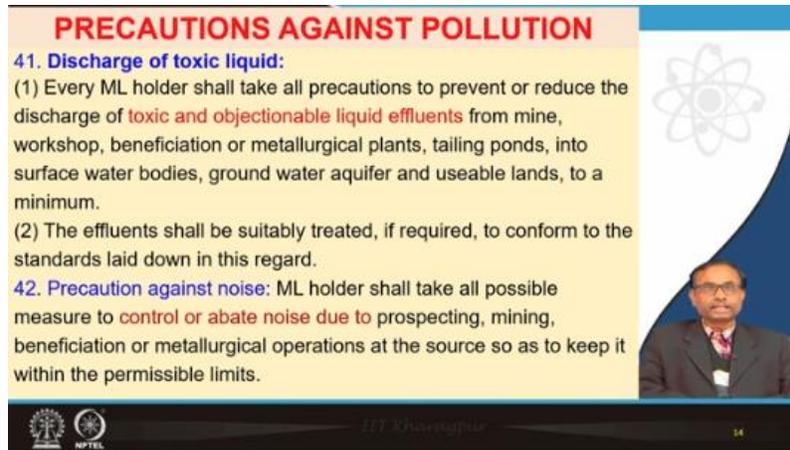


Mining legislation for the workplace area, we have the Central Pollution Control Board, which brings out standards for air pollution, so there is a limit for the industrial area. Those standards will be applicable in the working area, particularly in the open-cast mines. The mine air quality with respect to different criteria has to be within those standards as prescribed by the CPCB. Rule 41 is about the discharge of toxic liquid effluent. The mining lease holder shall take precautions to prevent or reduce the discharge of toxic and objectionable liquid effluents from the mine, from the workshop, the beneficiation plant, or the metallurgical plant. from the tailing pond into surface water bodies, ground water bodies, or aquifers, or to the usable land. All precautions should be taken so that the effluent to ground water and surface water on the land should be kept to a minimum. The effluent, if required, shall be suitably treated to conform to the standards laid down in this regard. The Ministry of Environment and Forests has notified waste effluent discharge standards. The mining industry has to comply with those standards that are relevant to the industry. Noise is another pollution. Rule 42: Mining leaseholders shall take all possible measures to control or abate noise pollution, which takes place during prospecting, mining, and in the beneficiation plant or in the metallurgical operation at the source, so as to keep the noise within the permissible limit. There are workplace noise labels which is prescribed by the DGMS, the Directorate General of Mine Safety. So, these DGMS guidelines for the noise are applicable to the mining operation. Rule 43, permissible limits and standards: The standards and permissible limits with respect to air pollutants, water pollutants, and effluent noise will be notified by the concerned authorities from time to time.

PRECAUTIONS AGAINST POLLUTION

41. Discharge of toxic liquid:
(1) Every ML holder shall take all precautions to prevent or reduce the discharge of **toxic and objectionable liquid effluents** from mine, workshop, beneficiation or metallurgical plants, tailing ponds, into surface water bodies, ground water aquifer and useable lands, to a minimum.
(2) The effluents shall be suitably treated, if required, to conform to the standards laid down in this regard.

42. Precaution against noise: ML holder shall take all possible measure to **control or abate noise due to** prospecting, mining, beneficiation or metallurgical operations at the source so as to keep it within the permissible limits.



The concerned authorities for air could be CPCB; for water, it could be CPCB; for noise, it could be DGMS; and for ground vibration, it is DGMS, etc. For groundwater, the Central Groundwater Board is the concerned authority. So, the concerned authorities will bring the standards from time to time, and the mining companies will comply with those standards with respect to different types of pollution. Rule 44 is about the restoration of flora. The mining leaseholder shall carry out prospecting or mining operations in accordance with the applicable laws in a scientifically sound manner to cause the least damage to the flora in the mining area or nearby areas. We have come to the end of today's lecture. I want to summarize what we discussed today. We have discussed the provisions relevant to the sustainable development of the mining industry. In particular, we have discussed the provisions mentioned in the Mines and Minerals (Development and Regulation) Act, 1957. We have discussed the provisions in the Mineral Conservation and Development Rules, 2017. We have discussed the contribution to the District Mineral Foundation Rules, 2015, and the provisions relevant to the sustainable development of mineral resources and the mining industry. Regarding references to the topics discussed in today's class, these notes were taken from standard acts and rules, such as the MMDR Act, 1957; the MCDR, 2017; and the Mining and Minerals Contribution to District Mineral Foundation Rules, 2015. All these can be found in the public domain on the ministry's website. If you go to the Ministry of Mines, you will find all these regulations on the website.

PRECAUTIONS AGAINST POLLUTION

43. **Permissible limits and standards:** The standards and permissible limits of all pollutants, toxins and noise referred to in rules 40, 41 and 42 shall be such as may be notified by the concerned authorities from time to time.

44. **Restoration of flora:** ML holder shall carry out prospecting/ mining operations, in accordance with applicable laws in such manner so as to cause **least damage to the flora** of the prospective/mining area and the nearby areas.



SUMMARY

We have discussed relevant provisions of:

- MMDR Act 1957,
- MCDR 2017
- CDMF Rules, 2015

with respect to Sustainable Development of Mineral Resources and Mining Industry.



REFERENCES

- **MINES AND MINERALS (DEVELOPMENT AND REGULATION) ACT, 1957.**
- **Mineral Conservation and Development Rules 2017**
- **Mines and Minerals (Contribution to District Mineral Foundation) Rules, 2015.**



They are also available on the Indian Bureau of Mines website. So, you can download these regulations and go through them in detail to learn about the different legislations applicable to mines and which legislations concern sustainable development. With this, I conclude today's lecture, and I thank you for your patience. Thank you.