

***WELCOME TO
PRESENTATION ON NMDC R&D
PROJECTS***

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NMDC has been striving for value addition to Iron ore largely through the following routes.

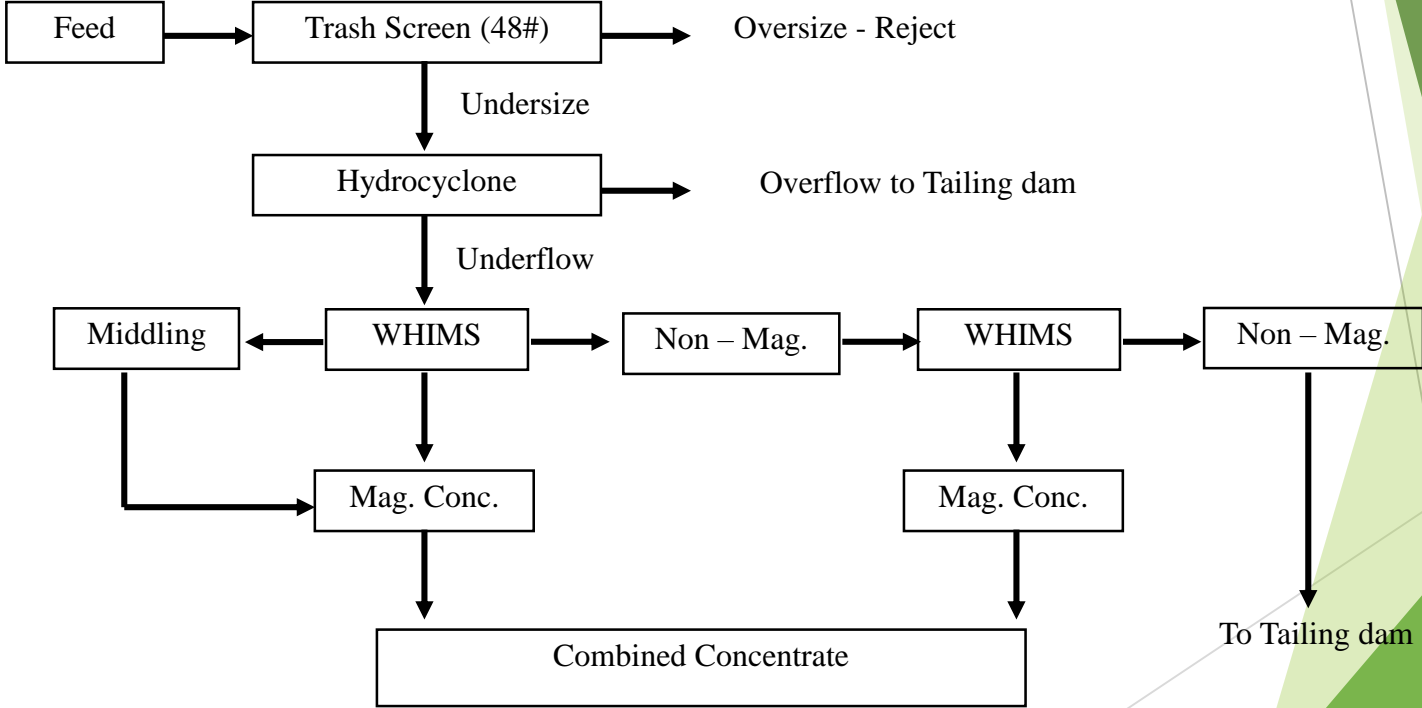
1. Beneficiation of Slimes/Lean/Low grade Iron ores including BHQ/BHJ
2. Agglomeration
3. Value addition through New/Emerging Technologies
4. Value addition through forward integration



1. Value Addition through Beneficiation:

Beneficiation of slimes:

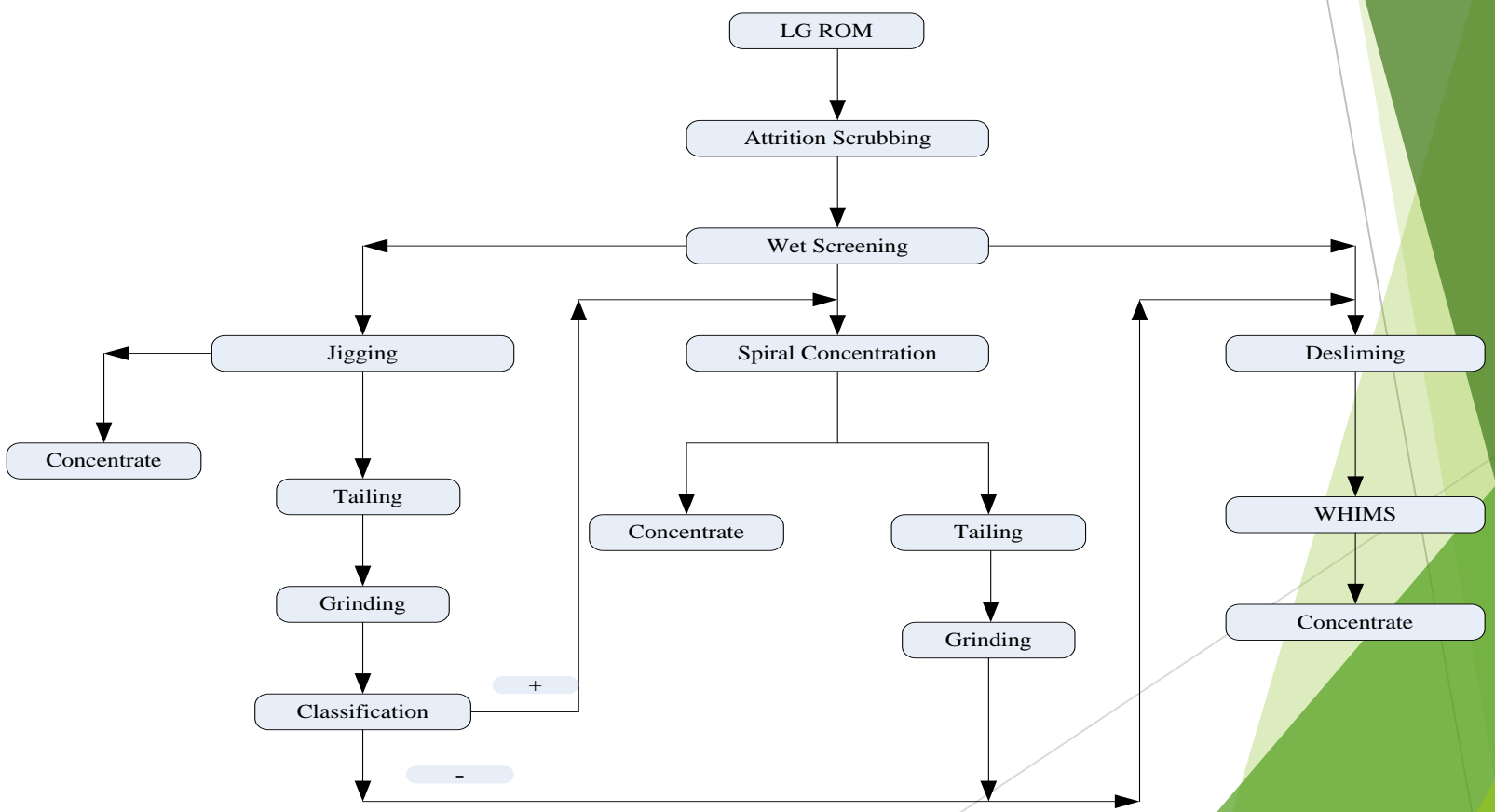
Flow Sheet Adopted For Utilization Of Slimes:





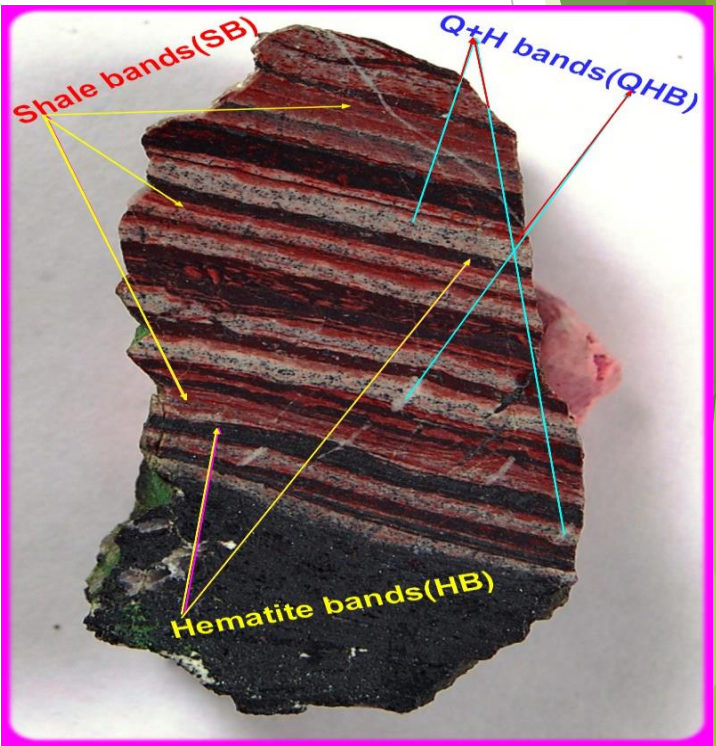
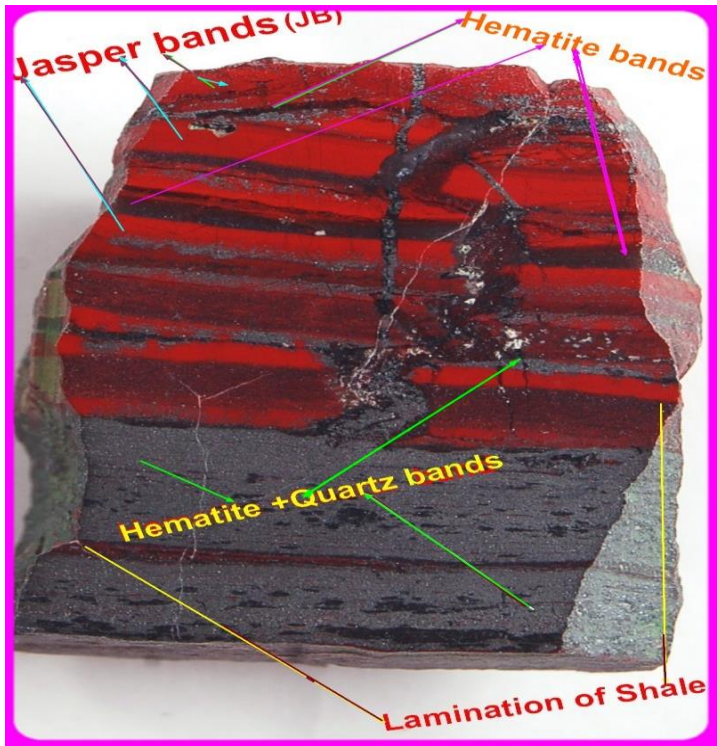
1.2 Beneficiation of Low grade:

A Typical Flow Sheet for Processing Of Low Grade Iron Ore of Donimalai





1.3 Beneficiation of BHQ/BHJ:





Chemical Analysis of As Received Sample

| Constituent | Assay percent |
|--------------------------------|---------------|
| Fe | 41.20 |
| FeO | 1.54 |
| SiO ₂ | 39.10 |
| Al ₂ O ₃ | 0.96 |
| LOI | 0.94 |
| P | 0.057 |
| S | 0.018 |

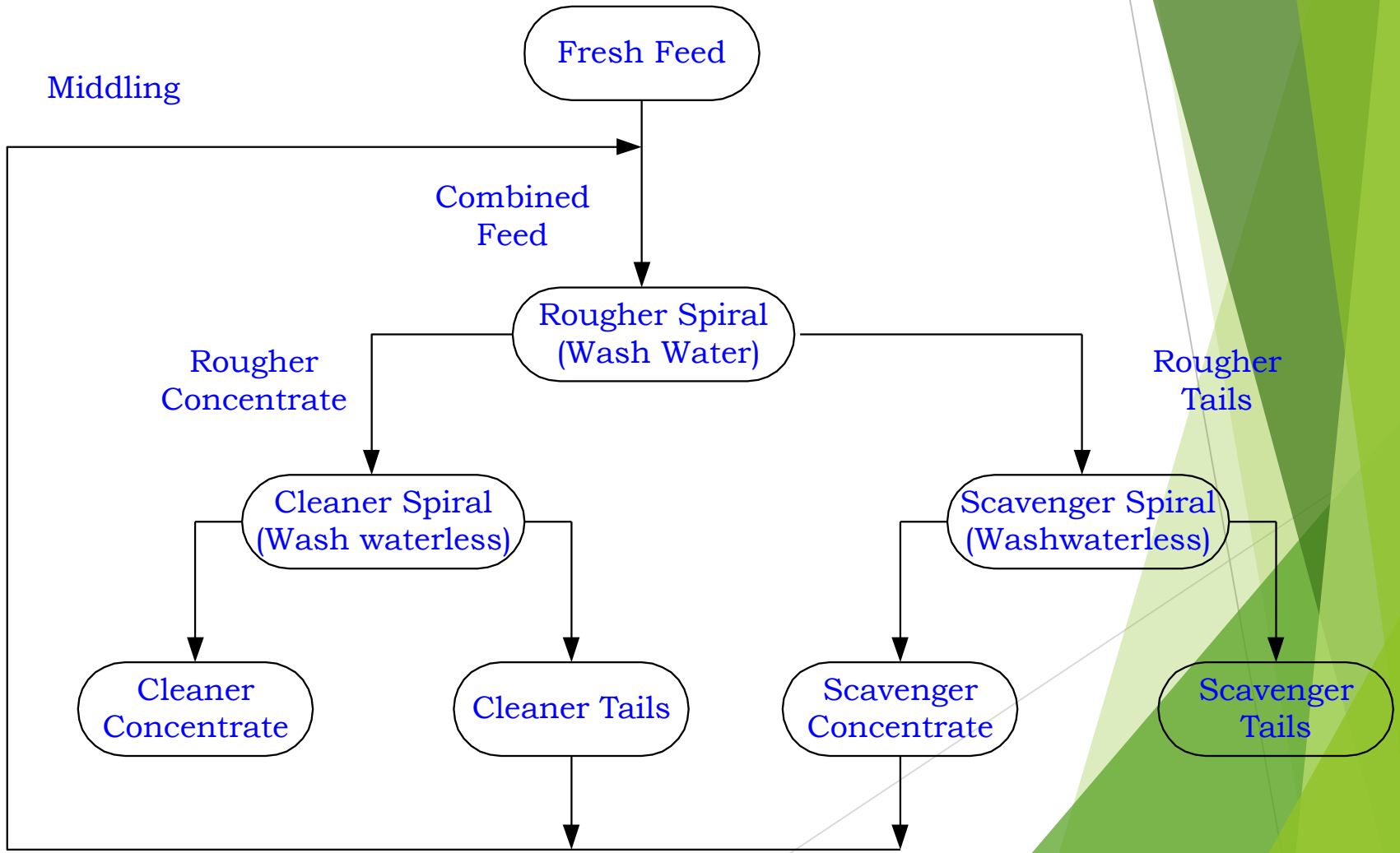
Chemical Analysis of Product Concentrate

| Constituent | Assay percent |
|--------------------------------|---------------|
| Fe | 65 - 67 |
| SiO ₂ | 3.7 - 5.5 |
| Al ₂ O ₃ | 0.4 - 0.6 |
| Yield | 25 - 28% |





Flow sheet Adopted For Processing Of BHJ/BHQ After Grinding the ROM For Optimum Liberation:





2. Value Addition through Agglomeration:

A] 1.2 MTPA Pellet plant At [Donimalai](#)

B] 2.0 MTPA Pellet plant At [Bacheli](#)

Objective: Utilization of accumulated slime in tailing dam near mine site . Present tailing dam at bld-5 will be filled completely in 4-5 years if present scale of operation is maintained. No additional lands are available for construction of new tailing dam as Bialdiala mines falls in reserved forest area. To continue mining it is very important to utilize accumulated slimes economically and make space for dumping of fresh generated slime.



3. Value addition through New/Emerging Technologies

Value added products from Iron ore (Blue Dust) of NMDC:

A] *Ferric Oxide*

B] *Dry Beneficiation of Blue dust*

C] *High Purity Carbon Free Sponge Iron Powder*

D] *Pigment Grade Ferric Oxide*

E] *Ferrite Powder*

F] *Nano crystalline Iron powder from Blue dust*



4. Value addition through Forward Integration:

A] 3.0 MTPA Integrated steel plant At Nagarnar:

Current R&D Projects-R&D Centre-NMDC Ltd

1

Palletisation studies with Blue dust

- Research is carried out to utilize blue dust in palletization.
- The pelletization studies with natural blue dust was taken up to establish blue dust as feed to the existing pellet plant at Donimalai

2

Beneficiation of high ash coal

- To reduce Ash content in Indian Coal by utilizing the wet & dry beneficiation method at R&D Centre.

3

Recovery of Iron & other value added product from red mud

- To develop a process to recover Iron and titanium die oxide (TiO_2) from Red Mud. Leaching studies carried out at different parameters and enhance the TiO_2 from 4% to 13%.

Contd..

4

Development of Self reducing iron ore pellets using Microwave heating.

- The project for development of self-reducing pellet was taken up to minimize the coke in BF and solid waste through use of iron ore and coal composite pellets. The composite pellets produced will be self-reduced during the pellet making and will have all the desired properties of the feed to the sponge iron. Attempt will also be made to get highest possible reduction during pellet making.

5

Development of dry beneficiation technology for processing of hydrated iron ore (Collaborative work with CSIRO-Australia)

- Due to the rising concerns regarding water security and sustainability in the iron ore mining industry, there is demand for alternative dry beneficiation process. In this project, separating ultrafine low grade iron ore materials was studied. Results of this project demonstrated that it is possible to achieve a separation about 9.21% lean grade ultra fines content with a cut size of D50 20Micron through a single stage circulating air classification application.
- Batch scale study of dry beneficiation by using rotating wheel air classifier and Microwave assisted magnetizing roasting studies using laboratory high temperature microwave furnace completed at CSIRO Australia.
- Further pilot scale studies will be carried out at NMDC R&D Centre.

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Utilization of SMS Slag

- To develop process for recovery of value added product from SMS Slag and its application in brick making.

Thank You



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N M D C

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