

10. SUMMARY AND CONCLUSIONS

10.1. Project Description

The project is being established by Rio Tinto Exploration India Limited (RTEI), a subsidiary of Rio Tinto Plc, UK (RT). The parent company is among the largest mining companies in the world. RTEI has been exploring for diamonds in India since 2001 and in Madhya Pradesh since 2002.

Exploration in the Bunder Prospecting License has resulted in location of kimberlite pipes in the area that requires evaluation of diamond content. Occurrence of diamonds in an economically mineable pipe can be as little as 0.3 carats per tonne of rock or 6 parts per billion. Recoveries of such quantities require accurate and efficient processing of the host rock. The Bulk Sample Processing Plant proposed near Bakswaha is for this purpose and has a capacity to process 25000 tonnes of samples annually. The plant is critical to evaluation of the deposit that could eventually lead to a large mine.

The proposed plant site is located 2 km from Bakswaha among agricultural fields on the Bakswaha – Bajna Road. The site measures 2.66 ha and has been purchased after completing all administrative formalities from the land owners. The district administration has also given clearance for the proposed change of land use.

The plant, constituting 36 containers, costing Rs.11.25 crores has been imported and is currently in Mumbai port awaiting transport to site. Several modules of the plant operate within the containers that are up to stacked 3 units high. This arrangement facilitates easy commissioning and decommissioning besides reducing noise and dust pollution. The plant would be under CCTV coverage.

Kimberlite rock samples would be collected from pits and boreholes located in the PL area, transported to the plant site by trucks and stockpiled. The samples would then be crushed through different stages and processed in a dense media column that uses a mixture of water and ferrosilicon. Diamonds being heavy would sink and would be collected in concentrates that would be processed through X-ray sorters and picked. The lighter rejects fraction constituting less than 6mm and more than 1 mm coarse sand constituting 71% of the feed rock would be collected and returned to exploration pits or authorised land fills. The water from the process plant would carry less than 1mm fine rejects material (29%) that would be pumped into a tailings pond where clarified water after settling of fine fraction would flow into a second tailing pond. This water would be recirculated and used in the plant. The fine tailings from pond 1 would be removed from time to time and returned to pits/ land fills.

The plant would be powered by a 640 kva diesel generator set. When the plant is not operating, utilities like lighting etc would be supported by a smaller generator of 15 kva.

A few key parameters for the plant design are spelt out below:

- Geotechnical assessment for the site forms a basis for designs
- Site layout has a catchment area of 96990 sq.m
- Weather data indicates a 1 in 100 years event of a maximum 24 hr rain fall of 473mm
- A garland drain system with an area of 1220 sq.m would isolate the catchment from the core area of the plant. This is adequate to deal with the 1 in 100 year event mentioned above.
- Drain embankments would use materials excavated from site; this would facilitate appropriate rehabilitation during closure.
- On the western half of the land, 6845 sq.m would be surfaced with compacted murum. This area would used to store samples and rejects
- Additionally, an area of 570 sq.m would comprise a concrete platform for installation of the DMS plant
- The eastern half of the land would house two tailings ponds of 1686 m³ and 1597 m³ capacity respectively.
- The embankment for the ponds would meet the appropriate seismic and geotechnical characteristics of the area.
- The tailings pond embankment would be constructed using the materials excavated from the site so that it could be re-used during closure.
- The tailings pond area is covered by black clayey soil with very low permeability and would not allow infiltration.
- Out of the two tailings ponds, the pond 1 will receive all of the process fines and only the post settlement clear water will overflow into the pond 2.
- All rain water falling on the core plant area would reach pond 2 which will also be used as storage for rain water during the appropriate season.
- Fast growing bamboo species would be planted along the perimeter of the site.

The process requires 240 kl of water in a day. RTEI got hydro geological studies conducted to assess the potential of three tube wells available on the site. This formed the basis for a clearance by the CGWA for the water requirement.

The plant design provides for up to 90%recirculation of water and hence no process water would be released to the environment. However, during the heavy monsoon months, the rain water would overflow. The facility would ensure that the overflow water is not contaminated with plant rejects.

The plant would require up to 20 persons to operate, including 5 executives and 15 support staff. The support staff would be sourced from local communities.

10.2. Description of Environment

The proposed plant is located among agricultural field, away from forest as well as township. The area supports sub-optimal sustenance agriculture due to lack of irrigation facilities.

The water quality in the area meets desirable levels for use for industrial use.

The area has no industry nor is there much of traffic on the road. So air pollution levels are well below rural / residential area standards.

Noise levels are also low. However, when the plant operates, the machines may generate noise.

RTEI would provide ear protection devices to all workers working near such machines, where noise levels exceed 80 dB(A).

Since the plant is located in agricultural fields and 3 km away from edge of the forest, no adverse impact on flora and fauna is expected.

10.3. Anticipated environmental impacts and mitigation measures

Environmental risks due to the project arise from the following:

- Air pollution due to dust
- Air pollution due to DG set operation
- Impact on ground water regime
- Impact on water quality
- Impacts due to use of hazardous substances

Dust generation due to transport of samples to site would be minimized by covering the load on the trucks with tarpaulin. Generation of dust due to wind action on stockpiles would be minimized by covering the stock. Samples withdrawn from the stockpile for processing would be pre-wet with sprays to reduce dust during feed to the bins and primary crushing; rest of the process is all wet and hence no dust potential.

The DG sets would conform to the CPCB emission norms.

The ground water investigations indicate that the impact to the regime would be negligible.

As regards surface water quality, no process water would be released to the environment. Rain water falling in the catchment would be channeled through perimeter drains. Rain falling on the plant site would be collected in pond 2 for future use of plant. In case of heavy rain, rain water may overflow into the local drainage. This would not have any tailings material from the plant.

The process does not use any hazardous materials. Limited quantities of waste oils and greases generated due to operation of DG sets and maintenance of equipment would be disposed through authorized agencies.

Closure plan envisages return of the land to original agricultural status.

10.4. Environmental Monitoring Programme

The proposed plant is a small pilot scale operation and no major impacts are expected. For ensuring compliance of commitments, RTEI would monitor air and water quality and noise levels in the area. Any additional parameters as required would also be monitored.

10.5. Additional Studies

This EIA is supported by the following studies:

- Soil Investigation, Ground water and Air Quality study at Bunder DMS site, Bakswaha, Chhattarpur by Shriram Institute of Industrial Research, New Delhi.
- Construction designs for the plant and Report o Tailings Dam for Bunder DMS Project by SRK Consulting Engineers
- Operating and maintenance Manual for process plant by ADP Metco, South Africa, manufacturer of the kimberlite sampling plant.
- Final report – Baseline study of flora and fauna, Bunder Prospecting License area, Madhya Pradesh by Forest Research Institute, Dehradun
- Detailed Socio-economic baseline report of ERM India Private Ltd., Delhi
- Hydro-Geological report of RTEI BSPP – Bakswaha, Chhattarpur by Minenviron Systems Pvt. Ltd., Nagpur
- Optimum utilization of Groundwater in consideration of aquifer parameters in two villages of Bakswaha Block, Chhattarpur by AFPRO, Gwalior Field Unit, AFPRO.

10.6. Project Benefits

RTEI has conducted socio economic base line studies for the area. The area is underdeveloped. The 15 villages in 5 km radius buffer zone have population of 7,976, which is less than population of Bakswaha town. RTEI during the last 5 years of work in the area has followed a practice of constant interaction with the local communities and kept the communities fully informed through regular brief sheets, of the status of work. This would continue. RTEI has provided employment to 150 persons on rotation from time to time during the exploration work. Given that the region is economically backward, opening of a mine, which is the aim of RTEI's on-going work would bring huge benefits to the community, the region and the country. The Plant which is critical to evaluation of the project is therefore essential.

10.7. Environment Management Plan

RTEI is an ISO 14001 accredited company. It has a well entrenched organization structure in place, with a dedicated team working in the area to constantly monitor and manage all aspects of the project. The organization structure is so designed to escalate matters to the highest levels in its parent company should it warrant. Rio Tinto with its commitment to global sustainable development will meet and exceed its target to become the preferred neighbour of choice to region.

The project is unlikely to result in any serious environmental impacts but would bring in prosperity to the area, should the results from the processing plant return positive results leading to opening of a mine in the area.