

PHASE 2 EXPANSION OF THE IRON ORE EXPORT CHANNEL

SCOPING REPORT FOR THE UPGRADE OF THE SISHEN - SALDANHA RAILWAY LINE TO 93 MTPA IRON ORE CAPACITY.

EXECUTIVE SUMMARY

BACKGROUND – GENERAL

Transnet Limited is conducting a feasibility study for a proposed upgrading of the Sishen-Saldanha railway line to achieve capacity of around 93 Million Tonnes Per Annum (MTPA), to match Iron Ore Channel planning milestones.

The railway line from Sishen to Saldanha is an 861 km long, purpose-built single, heavy haul line, to carry export iron ore from mines in the Sishen area. The line has progressed from having 10 crossing loops at ± 90 km intervals to the current 19 loops, generally at ± 45 km apart. The line is electrified to 50 kV AC. Trains comprising 216 wagons with a payload of 85t or 100t are hauled by a combination of Class 9E electric and Class 34 diesel-electric locomotives on the head end.

Investment and infrastructure upgrading to achieve 41MTPA iron ore export using 342 wagon trains and lengthened crossing loops is currently in progress. However, it is technically possible to achieve 47MTPA or even 67MTPA using the same built track and basic infrastructure, through improved timetabling and reducing turnaround time. This increase in tonnage is not subject to Environmental Authorisation, provided no further infrastructure is constructed. Ore traffic on the line can be expected to be between 8 and 12 trains per day in 2008 and move to between 13 and 24 trains per day beyond 2013, depending on the operating model chosen.

The construction of railway lines is a listed activity in terms of the Environment Conservation Act 73 of 1989 as amended, under which legislation the project has been registered. Similarly, the erection of structures associated with communications networks, change in land use or any other use of virgin land could be applicable, while activities listed under the National Environmental Management Act 107 of 1998 (NEMA) are relevant. This Scoping Report has been prepared for the National Department of Environmental Affairs and Tourism (DEAT) as the lead authority.

MAIN CAPACITY INCREASE OPTIONS AND INFRASTRUCTURE

The possible increase beyond 67MPTA to 93MTPA iron ore export is being considered through a number of possible infrastructure, rolling stock and railway system upgrading activities described below. Certain options, for example doubling the line and the running of 420 wagon trains have been shown to be unlikely to be carried forward.

Extend all Crossing Loops to allow the crossing of 420 Wagons Trains

Extend existing loops by 400m to 500m, drainage structures (culverts but no bridges) and Electrical Overhead Traction Equipment (OHTE), widening of existing cuttings and embankments within the rail corridor and extend access structures such as agricultural underpasses.

Double the Line (or sections thereof)

Allow totally or largely bi-directional train traffic by connecting the Loops and installing “cross over” points. Construction of complete railway infrastructure as for Loop extensions but including all road and rail and river bridges as well as a single tunnel.

Provide Intermediate Crossing Loops

Build up to 20 additional intermediate Loops, approximately halfway between existing crossing Loops. Widen and extend existing cuttings and embankments, drainage structures and access culverts for a length of generally 4km to 5km long each.

New signalling, communications structures and traction power installations will be required.

Upgrade the 50kV Traction Power Supply

Construct a 50kV feeder line along the route and provide five additional traction feeder stations. Since this is required irrespective of the feasibility of traffic > 67MTPA, this activity is being addressed in a separate Basic Assessment under the NEMA Environmental Regulations.

Upgrade the Railway Support Systems

Increased train movement and operational needs may require the provision of additional maintenance facilities at Kathu (Sishen) and overnight facilities en route for crew changes.

THE EXISTING ENVIRONMENT

Major points on the line are Erts Yard near Sishen where ore is loaded at the mine's rapid loading facility, Halfweg or Loop 10, which is a crew change area and Salkor Yard at Saldanha, where trains are split into two sections for discharge through tipplers in the Port of Saldanha.

The ore line has a maximum grade of 1:100 against empty trains and 1:250 against full trains. The line rises to the Langeberg range at a distance of 42km from Sishen, before descending to the Gariiep River near Groblershoop. From this point between Loops 15 and 16 the line climbs gradually to a plateau 1006m amsl near Loop 8 (Sous) before sloping down to the coast at Strandfontein, reaching Salkor some 150km further.

All surface water interfaces have been accommodated in the design and planning of the line 30 years ago. Culverts or bridges cater for surface water bodies or rivers, streams, and drainage lines. No wetlands are encountered on the areas earmarked for possible intermediate Loops, except near the Grootbergrivier. The line passes through very sensitive wetland systems in the coastal zone, particularly Verlorenvlei, Wadrifoutpan and near Rocher Pan, as well as near significant pans in the interior around Brandvlei and Kenhardt. However, no construction likely to affect these locations is planned.

The vegetation within the rail reserve and particularly near existing Loops is generally highly disturbed and of little to no conservation value, with few exceptions where unspoiled conditions are encountered. The surrounding vegetation has also, in most of the project area, been disturbed through utilization for agricultural purposes. Animal life is transitory through and across the reserve and has adapted to the presence of an active railway line.

The entire route passes through a very sparsely settled part of the country, particularly between Loop 3 (Bamboesbaai) and Loop 18 (Tomkins). The most populous zone occurs where the line passes through Elands Bay and close to Lamberts Bay and Velddrif in the coastal zone, Vredendal where the line swings inland and some distance from Kenhard, Groblershoop and Olifantshoek in the Northern Cape.

CONSTRUCTION ACTIVITIES

No additional disturbed area would be involved for 420 train Loop extensions but additional land may be required at intermediate Loops to allow for a maintenance track and service road. In the event that cut and fill activities do not balance over the 4km to 5km new Loop lengths, borrow pits have to be used for this purpose.

Domestic solid waste associated with construction teams is estimated at 8m³ per week. Temporary accommodation on site is not planned, although this may occur. Solid waste or liquid effluent generated by accommodation facilities, if occurring, will be carefully managed in terms of standard Transnet specifications. Temporary emissions from construction and earthmoving equipment will be experienced during the construction period of ± 12 months per Loop.

It is expected that approximately 120 to 150 construction workers will be required per construction site, not necessarily at the same time. Water will be sourced where available from existing Municipal sources, local farm boreholes or surface sources authorised per water use permit, where available and applicable.

ENVIRONMENTAL ISSUES

Create Infrastructure for > 67MTPA - extending crossing Loops for 420 wagon trains

Extending all 20 Loops by a distance of 400m to 500m each will have a limited impact on the bio physical and social environment, in view of the highly transformed nature of the environment in question. The option is no longer being considered at this stage.

Create Infrastructure for > 67MTPA: doubling the line - general

Doubling of the entire line, including structures, will result in significant environmental disturbance out of proportion to the benefit gained and of a magnitude sufficient to render the proposal a fatal flaw or environmental “show stopper”.

Create Infrastructure for > 67MTPA: establish new intermediate Loops

The provision of 20 additional crossing Loops as an alternative means of increasing capacity of the ore line above 67MTPA will impact on the environment. The disturbance of approximately 80km - 100km of rail reserve, with certain sections possibly outside then reserve, is significant and will bring about a greater disturbance to an extensive section of the environment.

Terrestrial Disturbance during Extension of Existing Loops or Construction of Intermediate Loops – borrow pits and spoil heaps

The construction of new formation earthworks for traffic >67MTPA will entail borrow activities, or may generate excess material to be spoiled. Creation of borrow pits is a negative impact partly mitigated through proper management measures.

Effect on Drainage / Surface Hydrology from Extension of Culverts and Drains

Numerous culverts will have to be extended to accommodate additional track in areas prone to erosion and infrequent but potentially high flow storm events. The extension of the existing culverts is not expected to create any additional impact on surface hydrology.

Ecological Disturbance – construction of Loops next to existing line

Construction of adjoining tracks at new intermediate Loops could impact negatively on the local ecological systems. Ecological disturbance over and above the barrier effect of the existing line is rated as high significance, and additional track at intermediate Loops is of medium significance.

Ecological Disturbance – Coastal and Estuarine Environments – doubling or loop extensions: > 67MTPA capacity increase activities

The line traverses a complex and sensitive coastal environment which could be negatively impacted through the construction of intermediate Loops. The doubling option is deemed a fatal flaw in this zone and the possible establishment of intermediate Loops must be studied further.

Noise from Increased Train Movement / Longer Trains: > 41MTPA operational activities

An increase above the presently authorised 41MTPA could involve running longer (from 342 to 420 wagons) and / or more frequent trains with an associated increase in noise. Train noise is identified as a significant issue especially in the very quiet, inland rural areas and needs further study.

Increased Safety Hazard – road and pedestrian traffic

Increased train and road traffic will increase the accident risk at level crossings and on the maintenance road respectively, especially the “Orex Road” crossing at Loop 2. The issue is deemed of medium to high significance.

Increased safety hazards – derailments and operational incidents

An increased volume of ore traffic and the running of longer trains could increase the potential for derailments or train related operational incidents. This aspect is managed through the Safety Management System / Contingency Planning, as well as Risk Assessment for new generation trains.

Effect on the Landscape, Community and Sense of Place at Elands Bay

The ore line is perceived as a negative intrusion into the natural and social environment and a source of nuisance and disturbance to the community of Elands Bay. Main environmental concerns include train noise, vibration, aesthetic effect of railway structures and trains, nuisance from train operations and the effect of trains and freight on marine, estuarine (wetland) and avifaunal ecology from vibration and pollution.

The externalised issues at Elands bay, as well as the sensitivity of the natural and social environment to current or increased rail traffic is highly significant.

Construction of Microwave Towers and Communication Equipment at New Loops

Upgraded and additional microwave or communications equipment including masts and antennae would be required for train control and voice communication. At this stage the position of any new sites within the rail reserve is not known. External structures, which are not covered in this study, are deemed of high significance.

Upgrade of the Power Supply Infrastructure on the Line

Upgrading the power supply to the line is critical to current approved capacity as well as expansion phases and will result in additional Traction Feeder Stations (TFS) and a 50kV feeder line running the length of the line. This is being handled as a separate Basic Assessment Study.

Construction and Social Issues at Loop and Building Sites (> 67MTPA Activity)

The construction processes and staff associated with Loop construction could impact negatively on the external Physical and Social Environment. The issue is rated of high significance but also has a high management potential.

Orex Road Issue between Lamberts Bay and Elands Bay

The “Orex” road crossing near Elands Bay is the greatest level crossing risk in open line traffic conditions and increased train and road traffic will increase the inherent risk of collisions. Mitigation is possible through providing additional protection.

Liberation of Ore Dust from Trains Loaded Trains

Loaded ore trains in transit on the ore line have the potential to liberate ore dust to the environment, resulting in pollution or health hazards. A specialist study indicates that except for the immediate mining and loading areas no significant emissions above limits may be expected.

Avifauna Interaction – OHTE and New 50kV Electrical Feeder Line

The additional OHTE structures for the additional Loops increases the risk of electrocution of birds, as well as the risk in-flight of collision with wires. Specialist studies show this to be a low risk.

Archaeological Disturbance at New Loop Construction

Construction work at new intermediate Loops could result in off-site archaeological disturbance. Intermediate Loop areas and borrow pits would be subjected to specialist archaeological studies.

Loss of Access or Traffic Disturbance through Bridge Construction

Road over / under rail bridges may have to be extended / doubled, leading to disruption of road traffic through temporary closure or diversion of the road. Possible closure of a bridge is a negative external environmental impact and is of high significance.

Loss of Access through Changes in Level Crossings

Landowners could be affected by loss of access over existing level crossings as a result of new intermediate Loops. Loss of customary access is sensitive and significant on an individual basis.

PUBLIC PARTICIPATION

An appropriate Public Participation Programme (PPP) has been conducted and the project has been extensively advertised in local, as well as the national press. The public response to the project has been small and generally positive, with the exception of significant concerns at Elands Bay.

CONCLUSIONS AND RECOMMENDATIONS

The option of Doubling the Ore Line indicates fatal flaws or Environmental Impacts of such significance as to render the project unacceptable in its planned scope and extent.

The provision of 20 extra intermediate Loops ($\pm 100\text{km}$ total) is an environmentally cost effective means of increasing capacity beyond 67MTPA but requires further, detailed study.

The availability of water for new Loops may be a constraint and construction work has the potential for significant Physical and Social Environmental Impact if not properly managed.

The operation of more trains to achieve tonnages $>67\text{MTPA}$ will generate roughly the same noise propagation levels as the 41MTPA (342 wagon trains) operation and significantly less than the 420 wagon train option (the latter no longer under consideration).

The coastal section and the town of Elands Bay has surfaced as the most sensitive section of the line, from both a current operational perspective as well as in terms of increased activity:

- Elands Bay is one of the reasons for determination of a “fatal flaw” in the possible doubling of the ore line as a capacity increase option.
- The possible construction of additional Loops ($>67\text{MTPA}$ infrastructure additions) North (at 115km) and South (at 65km) of Elands Bay (82km) should have no physical effect on the town.
- The main issues relate to perceived externalised environmental impacts in the form of

disturbing noise, train movement affecting the sense of place and quality of life, vibration affecting the built and natural environment and pollution of marine and inland water bodies

- The perceived problems are founded on the routing of the line planned some 40 years ago and which, based on significant topographical and geographical constraints, cannot easily be re-routed or realigned so as to avoid this undoubtedly sensitive area.

The increase in train traffic and train noise has been shown to be significant in rural areas with very low residual or background noise levels. Potential for mitigation of environmental noise will be enhanced through greater use of electric traction and removal of diesel –electric locomotives.

The current risk and hazards to road vehicles using the service road will increase during the construction period.

The drainage structures provided along the length of the line are adequate but show the effects of off-site scour and erosion not attributable to the railway itself.

Temporary closure of the road over rail bridges, where occurring, will cause disruption to movement of traffic and livestock for individual periods of six to twelve months.

Studies have shown that the liberation of iron ore dust from trains along the ore line after leaving the immediate loading / mining vicinity is an insignificant / improbable external environmental impact.

The report recommends, among others that:

- A comprehensive and binding EMP for the project should be compiled and approved prior to commencement of physical work that may affect the environment.
- Previous operational non-compliances in the fields of waste management and plastic litter affecting adjoining farming should receive greater attention in future.
- Transnet and Transnet Freight Rail should address the operational issues related to current and possibly increased operations (41 to 67MTPA and beyond) that are of concern to the Elands Bay community, as raised by public scoping. This includes the possibility of amended maintenance practices with a view to reducing train noise, clearing alleged sources of pollution, proceeding with the reduction / elimination of (noisy) diesel – electric traction and instituting environmental management planning measures such as air and water quality monitoring.

ENVIRONMENTAL IMPACT ASSESSMENT ISSUES

The Scoping Study has identified certain key issues where the extent, environmental complexity and / or impacts are of a minor or internalised nature to the extent that no further study in the EIA phase of the study is considered necessary. These include:

- Extension of 19 crossing Loops for running 420 wagon trains (Unlikely to be pursued).
- Doubling the line, including or excluding major structures. Will not be taken forward as a serious option for the capacity increase to 93MTPA
- The construction of additional OHTE at Loops and a 50kV feeder line. This is being handled as a separate Basic Assessment authorisation.
- Airborne dispersion of iron ore dust.

- Ecological effects on tortoises. An updated study aids identification of species and concept management measures are provided for further investigation and implementation by TFR.
- Additional infrastructure – locomotive maintenance buildings / structures required at Kathu for daily maintenance of locomotives, within the present rail or mine operating environment, are not a listed activity as such

The Scoping Study has identified certain issues or project options that may require further detailed and / or specialist study, including:

- Construct and operate 20 additional passing Loops - studies in respect of plant ecology, archaeology, surface hydrology, social / land use and noise sensitive environments could be considered.
- Elands Bay – including effects on aquatic and estuarine ecology from noise and vibration, the effect of train movement on the landscape, sense of place and tourism potential of Elands Bay detailed noise assessment, water quality – possible pollution of aquatic environment from iron ore dust and environmental feasibility assessment of alternative route options,
- Voice and data communications systems at proposed new intermediate Loops or other sites within the reserve.
- Additional crew accommodation facilities, if required