TRANSNET

SCOPING AND ENVIRONMENTAL IMPACT ASSESSMENT

Scoping and Environmental Impact Assessment for the proposed Manganese Export Facility and Associated Infrastructure in the Coega Industrial Development Zone, Port of Ngqura and Tankatara area

DRAFT EIA REPORT

CHAPTER 16:

CONCLUSIONS AND RECOMMENDATIONS

Contents

TABLES AND FIGURES

CHAPTER 16: CONCLUSIONS AND RECOMMENDATIONS

This chapter contains the main conclusions and recommendations from the EIA process, as well as a comparative assessment of positive and negative impacts associated with the proposed alternatives and the EAP's opinion on the environmental suitability of the project and whether the project should receive environmental authorisation.

The conclusions on the most significant impacts identified, together with the management actions required to avoid or mitigate the negative impacts (or to enhance the positive benefits) are presented in the following sections.

16.1 IMPACT OF THE PROPOSED MANGANESE ORE EXPORT FACILITY

16.1.1 Air quality

The main emissions to air from operations at the proposed Manganese Ore Export Facility result from wind-entrained dust, materials handling and fuel combustion from diesel locomotives at the compilation yard. Estimates for the proposed Manganese Ore Export Facility compare the emissions from the different activities with installed dust control equipment as proposed by the proponent (standard mitigation) and with additional dust management using water and chemical surfactants (full mitigation). The added controls show a marked reduction in the estimated emission for dust. In both cases the stockyard is the main source of dust emissions, with the stockpiles the largest source followed by stacking and reclaiming activities.

16.1.1.1 Increased dust and other atmospheric pollutants (construction phase)

Dust generated during the construction activities (e.g. vehicle dust entrainment, demolition, excavation, ground levelling, etc.) and exhaust emissions from construction vehicles and equipment (typically particulates, including PM_{10} and $PM_{2.5}$, as well as CO, NO_x, SO_2 and VOCs, including benzene) may have a nuisance impact beyond the immediate construction area under windy conditions. The construction activities are typically short lived and the pollutants are released close to ground level with little or no buoyancy which limits their dispersion and the potential impacts to the site. The potential **negative** air quality impact on human health from construction is therefore expected to be of **very low** significance.

16.1.1.2 Compliance with air quality standards in terms of dust deposition and PM_{10} and ambient $PM_{2.5}$ concentrations (operation phase)

Design consideration in all aspects of the proposed Manganese Ore Export Facility and the proposed dust suppression approach (water and chemical surfactants) ensure that the current and proposed future national ambient standards are not predicted to be exceeded anywhere in the modelling domain (a 40x40 km area around the proposed facility). No adverse effects from exposure to modelled 24-hour or annual particulate matter (PM) concentrations (PM_{10} and $PM_{2.5}$) are expected at any of the 18 sensitive receptor areas. However, the black dust from the manganese ore may result in nuisance and possibly health impacts at neighbouring facilities such as the nearby Coega salt

pans. The significance of the potential dust deposition impacts (**negative** impact) and exposure to PM_{10} and $PM_{2.5}$ on human health is expected to be **low**.

Under upset conditions (i.e. dust suppression with water and chemical surfactants not taking place), exceedances of the 24-hour ambient standard (PM_{10} and $PM_{2.5}$) are predicted at the stockyard and the immediate surrounding environment. However, there is no anticipated adverse health effect as a result of these potential exceedances. There is also a **medium** health risk associated with the 24 h cumulative PM_{10} concentrations at Cerebos Coega evaporation area (northern boundary).

16.1.1.3 Exposure to manganese ore dust in the neighbouring environment (operation phase)

The main potential health risk associated with the proposed facility relates to the exposure of the neighbouring environment (18 sensitive receptors have been identified inside and outside the IDZ, e.g. Coega Saltworks, Motherwell Residential Area, Addo Elephant Park, etc.) to manganese ore dust. Under full mitigation, the risk estimates calculated for manganese suggest a low risk anywhere in the modelling domain, except at one area within the industrial zone, where it will be moderate (northern boundary of the Cerebos Coega evaporation area). The significance of the potential impacts of exposure to manganese on human health is expected to be **medium** (at Cerebos Coega Evaporation area, north) to **low** (at other identified sensitive areas).

Under upset conditions, there is a **moderate** to **high** health risk for neurological effects at two receptor points within the industrial area, i.e. Cerebos Coega evaporation area (centre and north) and a **low** health risk at Cerebos PVD (Pure Vacuum Dried) Salt Plant. For the rest of the 18 sensitive receptor areas, risks estimates indicated that it would be unlikely for any individual chronically exposed at these sites to develop neurological effects due to manganese exposure.

16.1.1.4 Compliance with ambient standards in terms of NO_x and Benzene, Toluene, Ethylbenzene and Xylene (BTEX) concentrations (operation phase)

The modelled 1-hour NO_x concentrations resulting from locomotive emissions exceed the national ambient standard for NO_2 over a relatively large area of the IDZ and the Tankatara Farm, but do not exceed the SA occupational standard. Calculations for acute, chronic and cumulative risks from exposure to NO_2 showed that it would be unlikely for any individual to develop adverse health effects as a result of exposure to the concentrations considered.

Predicted ambient concentrations for BTEX from diesel combustion by locomotives are not predicted to exceed ambient standards and guidelines anywhere in the study area. The acute risks for predicted concentrations of TEX are negligible. The incremental cancer risk associated with exposure to benzene is below the acceptable risk of 1 in a million at all 18 sensitive receptor sites.

The significance of the potential impacts of exposure to NO_x and BTEX on human health is expected to be **low to very low**.

16.1.2 Terrestrial Ecology

The range of Sundays Valley Thicket, Grassridge Bontveld, Motherwell Karroid Thicket, Sundays Doringveld and saltmarsh (manmade) vegetation communities cover the proposed Manganese Ore Export Facility. These areas, although largely intact or semi-intact, have in some areas been transformed and degraded predominantly through agricultural cultivation and some alien plant infestation, with the Sundays Valley Thicket along the slopes adjacent to the Coega River relatively pristine. The main impacts on terrestrial ecology associated with the proposed development are summarised below.

16.1.2.1 Direct Loss of Vegetation and Species of Special Concern (SCC)

The construction of the Manganese Ore Export Facility (Compilation Yard, Rail Link, Manganese ore Stockyard and Conveyor) will require the clearing of land which will be almost irreversibly altered from the natural state. This will also lead to the destruction of Species of Special Concern (SSC) habitats, predominantly within the Grassridge Bontveld, but to a lesser extent in the Sundays Valley Thicket and Motherwell Karroid Thicket.

With effective mitigation, the residual impact of the project associated with the loss of Grassridge Bonteveld, Sundays Doringveld and Saltmarsh habitats is predicted to be of **low to very low** significance, while the residual impact associated with the loss of Sundays Valley Thicket and Motherwell Karroid Thicket habitats is predicted to be of **medium** significance. The residual **negative** impact of the project associated with the destruction of SSC is predicted to be of **low** significance.

16.1.2.2 Fragmentation of Ecological Corridors and disruption of Ecological processes as a result of artificial barriers

The IDZ Open Space Management Plan (OSMP) incorporates an ecological corridor along the banks of the Coega River (on the eastern side south of the N2 and on both sides north of the N2) that allows for some permanent connectivity between the coastal and inland areas. The clearing of vegetation will result in both the fragmentation of ecological corridors and artificial disruptions to ecological processes during the construction and the operational phases. In particular, the proposed rail link line (i.e. rail link and line doubling) will traverse the designated IDZ open space network as well as designated Nelson Mandela Bay Municipality Draft Bioregional Plan (2011), resulting in barriers to long-term ecological processes and increased fragmentation. The rail link will also result in additional barriers to faunal movement thus disrupting the movement corridors. Residual **negative** effects that are likely to persist are predicted to be of **medium to low** significance.

16.1.2.3 Faunal mortality as a result of habitat destruction, road mortality, fences and poaching

Construction activities (e.g. bush clearing and earthmoving activities) will permanently destroy existing habitats and will have a direct impact on less mobile reptiles and invertebrates. In addition, frequent trucks or vehicle activity will result in an increase in mortality of reptiles. Faunal mortalities or severe disabilities could also result from workers setting snares to trap animals for food during construction and operational phases.

The residual **negative** impacts associated with faunal mortality are predicted to be of **low** (**medium** for Amphibians when raining and **very low** when not raining) significance.

16.1.2.4 Long-term effects of Manganese ore dust on adjacent vegetation

Deposition of manganese ore dust on vegetation adjacent to the Manganese Ore Export Facility, emanating most notably from the Stockyard, will occur during the Operational Phase.
Another particular concern is the potential effect of the proposed facility on the butterfly reserves to the southwest and northwest of the stockyard, where two rare butterfly species occur, *Aloeides clarki* and *Lepidochrysops bacchus*. No information on the direct effect of manganese ore dust on the butterflies was available. Given that the larval stage of both butterfly species feed only on particular plant species, the butterflies may be indirectly affected by impacts on these plants. Butterfly host plants within the Butterfly reserve(s) and designated Open Space network should therefore to be used as indicator species in monitoring programmes established as part of the EMP.

The residual **negative** impact associated with long-term effects of manganese ore dust on adjacent vegetation is predicted to be of **low to very low** significance.

16.1.3 Integrated water management and waste management

The main impacts assessed relate to water use, wastewater discharge, potential stormwater contamination and discharge, and waste management during the construction and operation of the proposed facility.

16.1.3.1 Water use

A relatively small volume of water of approximately 300 m^3 per day is required during construction and operation (assuming the use of surfactants for dust suppression, which reduces water usage by ~60%).The availability of sufficient spare water capacity at the Nooitgedacht Water Treatment works and at planned water treatment facilities (upgrade of existing facilities or return effluent from the proposed Coega Wastewater Treatment Works) to meet the Manganese Ore Export Facility water requirements has been confirmed by CDC and the NMBM. The potential **negative** residual impact of the proposed facility on water supplies is therefore assessed to be of **low** significance. Nevertheless, water conservation measures should be implemented throughout the facility to further minimise the amount of water required. Treated service wastewater (from truck washing, dust suppression) and stormwater will be reused on the site for service water purposes, thereby further reducing the actual water requirements for the proposed project.

Alternative water sources are being investigated and include treated wastewater from the Fishwater Flats Wastewater Treatment Works (once upgraded) and process wastewater from other facilities within the Coega IDZ (e.g. distilled water from the Cerebos operations) should this become available. A condition of water use in the Coega IDZ is that potable water cannot be used for industrial purposes (i.e. as process water). However, as the aforementioned effluent re-use facilities have not yet been constructed, an agreement has been reached whereby NMBM can supply potable water to the Coega IDZ for industrial purposes for an interim period of two (2) years (exact date of commencement is unconfirmed) (Groenewald, 2012).

16.1.3.2 Wastewater discharge

A key issue related to wastewater discharges (sewerage, service/construction wastewater and contaminated stormwater) from the site is the risk of pollutants reaching the environment in the event of inappropriate disposal. The amount of service wastewater anticipated to be generated on-site (e.g. truck washing, floors cleaning, etc.) during operations is estimated to be minimal and will be treated via an oil/water separator prior to be sent, together with potentially contaminated stormwater, to the stormwater control dam for re-use. The availability of sufficient spare capacity at the Fishwater Flats Wastewater Treatment Works to treat the quantities of effluent from the project has been confirmed (total requirement from the project is approximately 0.04% of the additional capacity).

The potential **negative** residual impact associated with wastewater discharges at the proposed facility is therefore assessed to be of **low** significance.

16.1.3.3 Stormwater management

Atmospheric deposition of manganese ore emissions from the facility and possible spillages (accidental or otherwise) of manganese ore, oils, chemicals, litter etc. could result in contaminated stormwater and pollution of the environment. Given the proposed stormwater management system whereby all contaminated stormwater is kept separate from “clean” stormwater and the limited particulate emissions anticipated reaching the stormwater, the residual **negative** impact of contaminated stormwater on the environment is predicted to be of **low** significance.

16.1.3.4 Materials handling and waste management

Materials handling could potentially lead to spillages of manganese ore or hazardous materials (chemicals, oils, etc.) within the facility. If spillages are cleaned up promptly according to stringent housekeeping procedures then the **negative** residual impact arising from materials handling is rated as being of **low** significance during the construction and operation phase**.**

The main impact related to waste management is the handling, storage and disposal of hazardous wastes (e.g. empty chemical containers, oily rags, used oils, lubricants, etc.) and manganese ore mud accumulated at the bottom of the stormwater control dams. It is estimated that the quantity of hazardous waste that will be stored on site in a temporary storage area may be more than 35 m^3 per month prior to be disposed of at an appropriate hazardous waste landfill site (e.g. Aloes landfill facility which has applied for an extension of the landfill site with a design-life of 100 years).

Given the absence of in-depth information regarding the manganese ore mud, this product will at this stage be assessed as if it is hazardous (precautionary principle). During commissioning of the facility, the mud will undergo a hazard classification rating to verify if it is hazardous or not. If acceptable, the mud could be returned to the stockyards and used as a sacrificial layer at the stockyard. The composition of the Manganese ore mud (quality) will also determine if it has any potentially beneficial use which would lead to a positive impact. If confirmed hazardous, it will need to be disposed of at an appropriate hazardous waste landfill site (e.g. Aloes landfill facility).

The residual impacts associated with hazardous waste management are therefore predicted to be of **medium** to **low** significance.

During operations, the volume of general waste from the proposed facility is anticipated to be relatively small (i.e. approximately 20 kg of waste per day). The waste minimization plan proposed by the proponent (recycling or re-use of wastes) would reduce the amounts of wastes that are sent to landfill sites and would lead to a **positive** impact of **low** significance.

16.1.4 Aquatic ecology

The main impacts of the project on aquatic ecology are the potential loss of wetland(s) and fragmentation of aquatic habitat (construction phase); and the loss of aquatic ecosystem services such as surface flow attenuation and surface flow filtration (construction and operation phases).

The compilation yard Alternative 1 (preferred layout) would impact on one wetland which is already degraded and contains several modifications; while the Alternative 2 layout for the proposed compilation yard would result in the loss of two relatively intact wetlands.

The railway lines for the compilation yard and the doubling of the railway line to the stockyard, and adjacent service road, lead to habitat fragmentation where they cross water courses. These crossings will either be via new culverts, lattice bridges or the road bridge over the Coega River. Secondly, the crossing of watercourses could also lead to loss of ecosystem services, such as affected surface flow attenuation and surface flow filtration.

The residual **negative** impacts of the proposed development (considering the Alternative 1 layout for the compilation yard) are predicted be of **low** significance, with the exception of the loss of wetlands which is of **medium** significance. The residual **negative** impacts in terms of loss of wetland habitats, loss of ecosystem services and habitat fragmentation associated with the construction of Alternative 2 compilation yard would remain of **high** significance.

16.1.5 Groundwater

The shallow groundwater of the area is saline and not used for socio-economic purposes. It, however, provides baseflow to the Coega River and this function must not be negatively impacted (both in terms of groundwater levels, gradients and quality). There is a deeper good quality aquifer beneath the site (approximately 25 m to 1 200 m deep), which is protected by a thick impermeable clay layer.

The potential impacts of the proposed development on groundwater relate to dust fall out, infiltration of stockpile leachate, contaminated stormwater outflows and accidental oil spillages/fuel leakages. None of these potential pollution sources are considered a direct geohydrological threat as the upper geological layers contain very little groundwater and the shallow groundwater is saline. In addition, the upper clay rich formations may also prevent any contamination from reaching the important bedrock aquifer.

Overall, the residual **negative** impacts associated with the proposed activities on groundwater are predicted to be of **low to very low** significance.

16.1.6 Marine ecology

The likelihood that manganese ore can be introduced into the marine environment as a consequence of dust being washed or blown off the quay during shiploading is considered small as a result of the dust abatement measures planned for the proposed facility. Therefore, the potential residual impacts on the marine environment that are directly attributable to the Manganese Ore Export Facility are predicted to be **negative** and of **low** significance.

Increased shipping at the Port of Ngqura and more widely in Algoa Bay as a result of the proposed facility, may lead to impacts of the marine environment. These risks associated with developing the Port of Ngqura were subject to an earlier Environmental Impact Assessment (CES, 2001) that was approved by the National Department of Environmental Affairs and Tourism. Nonetheless, the specific impacts on marine ecology associated with the proposed Manganese Ore Export Facility are summarised below.

16.1.6.1 Spread of alien species

The increased number of ships traversing Algoa Bay and entering the Port of Ngqura as a result of the new facility increases the risk of invasive species transfer through release of ballast water. Since no on-shore ballast treatment facilities are planned for Ngqura, ships will need to exchange their ballast water before entering the port. For this to be effective, such exchange must be actively enforced and monitored. Although the likelihood of ballast water to be exchanged in the port is very low, the potential associated impact could be significant. Therefore, the residual **negative** impact associated with the release of alien species from ballast water in the port is predicted to be of **medium to low** significance.

16.1.6.2 Large fuel spill in Algoa Bay

The commissioning of the Manganese Ore Export Facility will increase the number of ships entering the Port of Ngqura by 5 to 6 ships per week (one ship per day) and will result in an increased risk of collision and release of fuels and oils as a consequence. In the event of a large spill in Algoa Bay, the islands off the coast as well as the estuaries and aquaculture sites will all be at risk. A large spill could therefore have a profound negative impact on the ecology of Algoa Bay at large and in turn have negative downstream socio-economic impacts. The significance of this residual impact is predicted to be **high**, due to the extent of a potential spill and magnitude of the die-off of organisms and possible effects on seabird communities in the event of such a spill. This significance does not, however, indicate a "no-go" for the proposed facility. Rather, it is a caution for Transnet National

Ports Authority (TNPA) to continue enforcing existing shipping management practices and international best practice (i.e. Marpol agreement) to prevent and/ or limit the occurrence of such a spill.

16.1.7 Avifauna

The two main impacts on avifauna associated with the proposed development are disturbance due to habitat loss and fragmentation, and collisions with overhead cables).

16.1.7.1 Habitat fragmentation and loss

All components of the proposed development require the clearing of land which will be almost irreversibly altered from the natural state, including loss and fragmentation of vulnerable species such as Grassridge Bonteveld and Sundays Valley Thicket habitat. The Bontveld habitat is very important for threatened and priority bird species such as Denham's Bustard, Secretarybird and Blue Crane as well as a number of raptors. The impact of the proposed development of Sundays Valley Thicket is less critical since the species inhabiting it are fairly widespread in distribution. The residual **negative** impact of the project on avifauna as a result of habitat reduction and fragmentation is predicted to be of **medium** significance.

16.1.7.2 Collisions with new powerlines

New powerlines/overhead cables pose a real threat to the movement of large bird species through the project area. Besides the Denham's Bustard, Secretary bird and Blue Crane, other large birds that could be affected adversely include eagles, herons, storks and flamingos. With the exception of the Martial and other eagles these large birds are not agile fliers and are likely to strike powerlines/rail overhead cables especially at night or in the windy conditions which occur frequently in the Coega area. The potential residual **negative** impact on the avifauna, particularly the large endangered species, associated with the installation of new powerlines/overhead cables will be of **medium** significance. It must however be noted that CDC/NMBM will be responsible to install the main powerlines to the site for the proposed projects and as such will also be responsible to implement the recommended associated management actions.

16.1.8 Noise

During the construction phase, the closest residents are not predicted to be impacted by noise generated from the project. Construction activities at the compilation yard are predicted to impact a worker's cottage located approximately 170 m west of the main railway line. However, this impact is anticipated to be of very short duration (i.e. construction of the first northern section of the compilation yard). The overall residual noise impact from the proposed development is predicted to be of **low** significance.

During the operational phase, noise levels of the manganese ore handling terminal (when no trains are operational at high speed) are well below the SANS 10103 recommended levels. For the rail operations, the noise from the main railway line and the shunting operations will be intermittent and occur approximately sixteen times per day for 200 wagon arrivals. The predicted noise levels associated with the rail operation will exceed SANS 10103 recommended levels at the main dwellings and workers cottage on Tankatara Farm and at the Coega Hotel during the day and at night, however, it will remain lower than the current ambient noise levels which already exceed SANS 10103 limits. The residual noise impacts associated with operational activities are therefore predicted to be of **low** significance.

16.1.9 Visual

16.1.9.1 Visual impact on the landscape

The sensitivity of the landscape character of the Coega IDZ to changes brought about by introducing the Manganese Ore Export Facility is low as it will not change the industrial nature of the landscape. The extension of the compilation yard beyond the current IDZ boundary will only occur over a short distance (about 3 km) yet still within close proximity to the existing main railway line. The significance of the residual impact of introducing the proposed development into an industrial landscape is therefore predicted to be **low**.

16.1.9.2 Visual intrusion on sensitive viewers

Sensitive viewers include users of the N2 road, residents in the surrounding area and visitors to the GAENP. A Manganese Ore Export Facility is a large industrial development and the ore stockpiles are prominent since few viewers find them aesthetically pleasing. They attract attention due to their size and their strong contrast in colour and texture with most settings. The topographic screening by the deeply incised Coega River at this location is very effective and, from a visual perspective, it is unlikely that there is a better site in the IDZ for locating the stockpiles. The conveyor system is a long, linear structure which will potentially be highly visible, particularly for sections requiring cut-and-fill. As far as possible, rehabilitation of cut areas will be necessary. The compilation yard will be constructed in a relatively undisturbed area of the landscape (in terms of industrial developments) but there are very few highly sensitive visual receptors that will be affected by the development.

The residual visual intrusion of the proposed facility on the existing views of sensitive visual receptors is predicted to be of **low** significance.

16.1.9.3 Visual intrusion of night lighting on sensitive viewers

The Manganese Ore Export Facility will add new lights to the region, potentially adding to light pollution such as glare and sky glow. The existing nightscape of the stockyard area is very bright with considerable sky glow and glare, while it is relatively dark with few lights in the immediate vicinity of the proposed compilation yard. The compilation yard will therefore introduce a new node of potential light pollution in the region and appropriate night lighting of the development will minimise the impact on visual receptors in the Greater Addo Elephant National Park. The residual impact of night lighting is therefore predicted to be of **low** significance.

16.1.10 Heritage Resources

16.1.10.1 Archaeological resources

Apart from occasional Middle Stone Age stone artefacts, no other important sites/materials were observed within the study area. In addition, these stone tools are not associated with any other archaeological remains and therefore of low cultural significance. The proposed areas for development therefore appear to be of **low** archaeological sensitivity, but archaeological sites/materials may be exposed when the vegetation and top soil are removed (for example human remains), in particular in areas within 5 km from the coast.

16.1.10.2 Palaeontological resources

Many infrastructure components of the proposed Manganese Ore Export Facility overlie sedimentary rocks that are of low palaeontological sensitivity and / or do not involve sizeable bedrock excavations at the construction phase. In all cases, irrespective of its permanent nature, the palaeontological impact significance of the construction phase of the proposed development is rated

as **low to very low**, given its local extent (confined to the immediate development footprint) and the generally sparse occurrence of fossils in most – but not all - of the sedimentary rocks concerned.

16.1.10.3 Historical and cultural resources

The proposed development will impact three graveyards located in Zones 9 and 13. A detailed study is being undertaken by Transnet to identify the precise extent to which these graveyards may be affected and specify the required grave exhumation process that must be followed. This will be done according to the legal requirements.

16.2 RECOMMENDED MANAGEMENT ACTIONS AND MONITORING REQUIREMENTS

The most important recommended management actions to mitigate negative impacts or enhance benefits, as well as requirements for monitoring, are summarised in Table 16.1.

16.2.1 Recommendations for management actions

Operational and construction best practice measures ("good housekeeping") and legislated requirements identified by the specialist studies have been listed in the respective impact assessment chapters and will not be repeated in Table 17-1. The management actions and requirements for operational best practice have been incorporated into the Environmental Management Plan (EMP) for the proposed Manganese Ore Export Facility (refer to Part B of the EIA Report).

The Manganese Ore Export Facility design includes accepted best international practices at all stages of the ore handling process, in particular in terms of dust management and integrated water management. However, the prevention and minimization of environmental impacts (e.g. control of dust, stormwater management etc.) are not only dependent on the design and technologies, but are also dependent on optimum operations and management at the facility. Therefore, environmental awareness and job specific training for all construction staff, drivers, contractors and employees is necessary. Standard Operating Procedures (SOPs) need to be developed and implemented.

Responsibility for implementing these actions may lie with the facility operator or with TNPA and are listed in the Environmental Management Plan (Part B of this EIA report). It is of critical importance that responsibilities for managing the impacts associated with construction and operations are clarified and accepted by all parties prior to the start of construction. Recommendations, where appropriate, must be incorporated into contract documentation for sub-contractors and compliance should be enforced.

16.2.2 Recommendations for monitoring

The EMP provides the framework for monitoring the effectiveness of the management actions. For this purpose, appropriate, measurable, defined and valid indicators should be identified, developed and agreed upon with the proponent. The implementation of the EMP should include regular auditing and reporting, and lead to the refinement of targets and indicators. Monitoring results should be made publically available. The monitoring programme should promote continuous improvement and identify any negative trends which need to be managed effectively.

Table 16.1 Key recommended management and monitoring actions

Management actions proposed by the proponent	Additional recommended management actions	Monitoring actions
AIR QUALITY		
DESIGN PHASE • Fully enclose the tippler • Install open gable walls on the entry and exit sides. • Install dust abatement equipment (i.e. high pressure water fog system at hopper feeder chutes, water sprayers at stackers and reclaimers, surge bins and at all transfer points) • Equip stackers and reclaimers with a dynamic chute • Install a berm (i.e. wind barriers) to the west of the stockpile • Cover overland conveyor • Install wind board on stockyard conveyor and shiploader conveyor • Enclose transfer points and surge bins. **CONSTRUCTION** • Implement dust management actions included within Transnet General Construction EMP and SES[1] . **OPERATION** • Ensure stockpiles are always sufficiently wet to avoid dust generation (use of water and chemical surfactant resulting in a capping of approximately 21 days • Ensure maximum stacker drop height of 1.5 m • Operate and maintain moisture addition during stacking and reclaiming and at hopper feeder chutes	**DESIGN PHASE** • Equip ship-loader with loading spouts • Install automated water cannons at stockpiles **CONSTRUCTION** • Loads on vehicles carrying dusty construction materials should be covered on public roads (whether empty or not). While travelling on-site, the trucks must use practical mitigation for dust management • Limit access to construction site to construction vehicles only • Impose vehicle speed restrictions on the construction site • Maintain high moisture content on exposed surface and roads by spraying with water • Conduct a maintenance programme for construction vehicles **OPERATION** • Implement traffic control measures on the stockyard and limit access • Design and implement spill management programme to effectively clean spilt ore immediately • Implement programme to vacuum spilt ore on paved surfaces and to avoid ore and dust accumulation • Implement wetting programme for unpaved roads and open areas • Vegetate open unused areas with suitable ground cover • In the case of water restrictions being imposed, the recommended management action is to supress dust on the stockpiles using chemical suppressant. • In a severe drought (no available water), cease operations at the facility when the wind speed exceeds a predetermined threshold at which dust is visibly entrained (Proponent to determine threshold during commissioning).	1. Conduct ambient air quality and meteorological monitoring to verify modelling predictions. Pursue the existing ambient air quality monitoring programme for the IDZ, currently limited to SO_2, NO_2 and PM_{10}. Monitor Manganese content in dust fall out on a monthly basis. 2. Test, monitor and service the dust abatement equipment to ensure high levels of operational efficiency. 3. Conduct facility-wide spillage audits, in particular to minimize spillage of manganese ore leading to wind-blown dust generation. 4. Monitor wind speeds.

[1] Standard Environmental Specifications

Management actions proposed by the proponent	Additional recommended management actions	Monitoring actions
TERRESTRIAL ECOLOGY		
DESIGN PHASE • Fencing of the facility: o Fencing of the railway line and compilation yard (rail link and loop): "stock-proof" fence with a height of approximately 1.35 to 1.5 m, and with spacing or gaps at the bottom of the fence to allow animals to pass underneath, but that will keep out cattle and sheep. o External fencing of the facility: Where required, install security palisade fencing around all facilities • Design of railway line and access roads to allow for the migration of fauna: o Install lattice bridge crossing structures and culverts as proposed by Transnet (Chapter 2, section 2.3.4 of the EIA report) **CONSTRUCTION** • Ensure compliance with Transnet Environmental Specifications and Construction EMP and take cognisance of the Coega IDZ Alien Vegetation Management plan or the Port of Ngqura Alien Invasive Vegetation Management Plan if within the port of Ngqura • Implement a rehabilitation plan (to be developed in line with CDC IDZ Re-vegetation guidelines), including topsoil management, re-establishment of a movement corridor for displaced fauna etc. **OPERATION** • Implement a traffic management plan.	**DESIGN PHASE** • External fencing of the facility: o No palisade fencing in areas directly adjacent to or within animal movement corridors, i.e. the IDZ Open Space corridor o Install a standard game fencing where the Compilation Yard borders the Sundays River Conservancy (Tankatara Farm). • Prevent using electric fencing as far as is practically feasible. • The final layout plan for the railway link/line (Review alignment for railway link, loop and doubling of railway line, fencing design, and design and locations of culverts and bridges) should be presented to the Coega ELC and submitted to DEA for sign-off before the start of construction. • Design the fencing to steer fauna towards rail underpasses or culverts • Should a road be constructed between two wetlands (unless the road is not directly on the ground surface), use signage and/or temporarily close the road in the event of a major frog migration • Where lattice bridges are constructed for the rail line, the impact of the service road is to be avoided by having the road cross on the lattice bridge (if possible); or the impact is to be minimised by having the road located in the servitude of the bridge, in already disturbed areas (if possible) and with minimal infilling so as to avoid impacts on surface run-off. • The final layout plan must take cognisance of the trade-offs and Biodiversity Offsets requirements presented in the regional planning/biodiversity offset guidelines. **CONSTRUCTION** • Minimise and delineate construction boundaries (to limit area to be cleared), and keep disturbances within construction boundaries - Demarcate areas of disturbance • Prepare a Flora and Fauna Relocation Plan and implement an extensive Search and Rescue (for flora and fauna) to relocate animals/protected flora before construction commences • Develop and implement a Fire Management Plan and a long-term Alien Plant Management Plan	5. Monitor vegetation removal and clearing during construction. 6. Monitor relocation of flora and fauna during construction. 7. Monitor the presence of alien invasive species on site in line with the Invasive Vegetation Management Plan. 8. Conduct long-term monitoring of the effect of Mn ore dust on vegetation, especially butterfly host plants within the Butterfly reserve(s) and designated Open Space network for excessive accumulation and severe toxicity effects on fauna and flora. 9. Monitor the implementation of the rehabilitation/ re-vegetation plan.

Management actions proposed by the proponent	Additional recommended management actions	Monitoring actions
	OPERATION • Implement the Fire Management Plan and the long-term Alien Plant Management Plan	
AQUATIC ECOLOGY		
DESIGN PHASE • Construct and use of the two proposed Sustainable Urban Drainage Systems (SUD), i.e. stormwater attenuation ponds, for the compilation yard • Implement the concept bridge for the road bridge over Coega River as proposed by the proponent (Figure 2.10 in Chapter 2) • Implement the 15 culverts and the 2 lattice bridges as identified by the proponent (Refer to Table 2.1 in Chapter 2) • Install all erosion control / energy dissipation structures as described in the proposed design provided by the proponent, e.g. reno mattress and suitable wing walls (refer to Chapter 2, section 2.3.4)	**DESIGN PHASE** • Avoid all remaining wetland areas and their delineated buffer areas of 50m, as shown in Chapter 9, Figure 9.2. Include the buffer areas as no-go areas. • Where possible, avoid the delineated riverine/water course areas, as shown in Chapter 9, Figure 9.3 • Ensure that, following the construction of the road bridge, the longitudinal profile of the Coega River is close to natural with little or no impoundment resulting on the upstream side of the proposed crossing. **CONSTRUCTION** • Limit hard engineered surfaces that increase surface water run-off. **OPERATION** • Any areas that become destabilised should either be re-vegetated or erosion control mechanism such as gabions should be installed.	10. Monitor erosion while areas of vegetation are being cleared as well as all potential erosion sources such as bridge or culvert areas 11. Water quality monitoring plan: Transnet should co-ordinate their efforts with the CDC/IDZ water quality monitoring plan in order to monitor the operational phase of the project. The current monitoring plan is adequate to capture any potential issues based on the assessment of the current localities in relation to this project
INTEGRATED WATER MANAGEMENT		
DESIGN PHASE • Design of an effective stormwater management system o keep clean stormwater separate from potentially contaminated stormwater, o 2 attenuation ponds (SUDs) to allow controlled release of stormwater at the compilation yard, o stormwater control dams to recycle contaminated stormwater via silt traps at the stockyard and quay o v-drain at the middle of each stockpile that collects the dust suppression water overflows and any stormwater run-off o apron slab around the tippler will slope towards the side drains available on either side of the existing railway line.	**DESIGN PHASE** • Line stormwater control dams at the stockyard and the quay with an impermeable clay layer or geosynthetic material **CONSTRUCTION** • Where possible, adopt water conservation techniques and best practice. • Develop a Stormwater Management Plan, including erosion management (e.g. use of chopped brushwood, minimise removal of vegetation properly grading any susceptible slopes, paving or reinforcing exposed surfaces, reinforcement of soil slopes, dissipation and slow seepage of runoff into the soil) • Implement stormwater management measures to ensure soil is not washed into the Coega River • Wastewater from the facility to be disposed of at a suitable disposal point off site.	12. During construction, monitor turbidity of the stormwater runoff after a rainfall event to ensure that acceptable levels are maintained (adhere to CDC stormwater quality) 13. Meter water use and ensure it remains within specified requirements during construction and operation 14. Minimise water use by closely monitoring weather for rainfall during operation 15. Monitor erosion during the operation phases 16. Conduct facility-wide spillage audits,

Management actions proposed by the proponent	Additional recommended management actions	Monitoring actions
o access road to the quay will have a concrete lined side drain that flows into a pipe leading to the quayside stormwater control dam • Construct a concrete floor on the gallery under the overland conveyor to contain any potential spillage, which will then be collected manually and taken back to the stockyards • Construct oil/water separators to treat workshop and washbay wastewaters **CONSTRUCTION** • Implement management actions included within Transnet General Construction EMP and SES (these include requirements for stormwater management, dewatering, spillages, and structural and non-structural erosion control measures) • Construct a secondary containment around all fuel and chemical/hazardous substances storage areas and refuelling areas. **OPERATION** • Recycle service wastewater and contaminated runoffs via the control dam • Implement adequate sewage management practices (e.g. regularly inspect systems and septic tanks, conduct maintenance, etc.) • Bund materials and chemicals handling areas to contain possible spillages • Vehicles transporting fuel and other hazardous materials must comply with SABS standards	**OPERATION** • Review the available service water supply sources after 2 years operation and identify the best option (e.g. potable water, return effluent, effluent from other industries within the IDZ etc.) • Adopt water conservation techniques and best practice. • Develop and Implement a Stormwater Management Plan, including erosion management. • Develop and implement a Railway/Stockyard and Quay Operation Management Plan that includes procedures and protocols for day-to-day activities • Ensure safe storage of chemicals, for example, through secondary containment, sloping floors and use of Material Safety Data Sheet. • Provide all fuel dispensing stations with an impervious area and a secondarily contained area • No batching plants, vehicle refuelling or vehicle maintenance should occur within 32m of a water course or 50m from wetlands • Spill kits to be available at strategic locations through-out the facility • Develop a Waste Management Plan and initiate a waste minimisation system • Classification of the Manganese ore mud after commissioning of the facility to identify appropriate disposal methodology • Investigate potential beneficial uses for the manganese ore mud (e.g. sacrificial layer at stockpile, brick manufacturing process etc.)	in particular to minimize spillage of materials, chemicals or wastes leading to pollution of stormwater. 17. Conduct preventative maintenance of equipment and vehicles to prevent oil or fuel leaks.

Management actions proposed by the proponent	Additional recommended management actions	Monitoring actions
GROUNDWATER		
DESIGN PHASE • Ensure that the stockpiles are placed on an impermeable barrier as proposed by the proponent (e.g. PVC layer) – refer to Chapter 2 Section 2.4.11.	**DESIGN PHASE** • Determine a groundwater quality baseline in the study area. Install monitoring boreholes in the vicinity of the stockpiles and compilation yard to collect baseline data in that area (refer to Chapter 8, Table 8.9). **CONSTRUCTION** • Ensure that existing monitoring boreholes remain intact if at all possible. If a monitoring borehole is damaged or has to be removed it needs to be replaced as close as possible to the borehole damaged/destroyed.	18. Monitor groundwater quality: collect a baseline data in that area for approximately 1 year prior to construction
MARINE ECOLOGY		
OPERATION • TNPA to require presentation of the ballast water log by each ship's master before any loading takes place to prove compliance with exchanging ballast at sea. • Use bubble barriers around the ships and, where possible, deploy skimmers during cargo loading • Ensure all vessels are MARPOL compliant • Ensure a rigorous vessel traffic control plan is implemented.	**OPERATION** • Reduce the amount of time any ore is resident on the quay by removing spills as soon as possible. • Recommend that the Port of Ngqura Oil Spill Contingency Plan includes specifications for the management of oiled seabirds etc. • Vessels to travel at lowest, navigationally safe, speeds to give whales time to move away. Report whale sightings to port authorities so that ships can be warned to avoid collisions (i.e. on-going Marine Mammal Monitoring Plan).	19. TNPA to pursue on-going biological monitoring of the harbour and adjacent ecosystems to detect any invasive species 20. Audit continuous monitoring of shipping safety in the Ngqura Harbour and in Algoa Bay at large to ensure that potential collisions are detected and actions taken to avoid them especially in the approach channels. 21. Audit oil spill contingency plan for its effectiveness 22. TNPA to routinely service oil spill response equipment to ensure high levels of operational efficiency.

Management actions proposed by the proponent	Additional recommended management actions	Monitoring actions
AVIFAUNA		
• None proposed.	**DESIGN PHASE** • Restrict night-time lighting to the minimum necessary for safe construction and operations • Install bird flight diverters that are visible both by day and by night, on powerlines/rail overhead cables at all locations where known bird flight paths intersect powerline routes (refer to Chapter 7, Figures 7.1 and 7.2). Ornithologist to walk along the proposed powerline/rail overhead cables routes (prior to construction) to identify whether any sections of the powerline/rail cables require bird flight diverters to be installed. [2] **CONSTRUCTION** • Establish an avifaunal baseline monitoring programme: Transects through the vegetation/areas which will potentially receive the greatest quantity of manganese ore dust deposition should be monitored for their use by birds (mainly northeast and southwest of the stockyard) **OPERATION** • Keep up-to-date with developments in improving the effectiveness of bird flight diverters, throughout the life of the project. • Consider installing webcam monitors at key locations to monitor to improve the monitoring of potential mortalities of large birds colliding with the powerlines/overhead cables. [2]	23. Monitor vegetation for their use by birds during the breeding season pre- and post-construction 24. Monitor numbers and breeding success of the large grassland bird species to provide an indication of the degree to which project activities affect or disturb these birds 25. Monitor collision mortalities along the construction haulage routes, and after completion of construction 26. Monitor powerline routes and overhead cables for railway link for dead birds. Review the situation after a year. [3] 27. Continue monitoring of the avifauna and of the breeding colonies on the saltpans
NOISE		
• None proposed.	**DESIGN PHASE** • If possible, consider the relocation of the workers cottage located on Tankatara farm close to the railway line (refer to Noise Sensitive Area 3 in Chapter 3). Alternative management actions could include the construction of a noise screen or double glaze windows. Investigate the use of brake wagons to minimise the coupling and decoupling noise	28. Conduct noise monitoring during the construction phase to determine if the noise emissions are within prescribed limits (every six months, for at least 2 years) 29. Conduct ambient noise monitoring during the operational phase to

[2] Note that CDC/NMBM would be responsible for the implementation of the above two recommendations for the new powerlines to the proposed site and that Transnet cannot guarantee that it will be implemented.
[3] Note that CDC/NMBM will be responsible to monitor collisions along the main powerline supplying the proposed site

Management actions proposed by the proponent	Additional recommended management actions	Monitoring actions
	CONSTRUCTION • Limit activities exceeding the prescribed night time noise levels (SANS 10103) to daylight hours. No piling at night at the compilation yard.	determine if the noise emissions are within prescribed limits. Monitoring should be conducted around the site and at the closest residential areas to determine the actual environmental noise impact (every six months, for at least 2 years)
VISUAL		
• None proposed.	**DESIGN PHASE** • Adherence to CDC Visual Guidelines for Development[4] with regard to painting of structure, i.e. avoid using glossy or reflective surfaces; and select muted shades such as olive, ochre or rust. • A landscape architect to be consulted on planting and rehabilitation of the cut-and fill areas and other steep slopes. The lighting design should minimise nightscape impacts such as sky glow, light spill and glare (i.e. bright lights located below the southern and northern river banks, light screening features which minimise uplighting and glare, miminise light spill beyond the project boundary, timer switches or motion detectors for areas that are not occupied continuously). **CONSTRUCTION** • Minimise night lighting of construction sites within requirements of safety and efficiency • Laydown areas and construction camps to be located in low visibility areas, where possible • Minimise vegetation clearance since the site contains relatively high thicket which should be used to conceal/screen construction activities and equipment as much as possible • Implement a rehabilitation plan for sites where scarring can occur (e.g. conveyor route, access and haulage roads and railway tracks).	30. Monitor effectiveness of lighting plan 31. Monitor adherence to Coega IDZ Visual guidelines for Developments

[4] CKA. 2002. Coega Industrial Development Zone Visual Guidelines for Development. Guidelines. Pretoria: Cave Klapwijk and Associates.

Management actions proposed by the proponent	Additional recommended management actions	Monitoring actions
HERITAGE RESOURCES - ARCHAEOLOGY		
• Incorporate Transnet's Heritage management plan into the Project Environmental Specifications developed for the construction phase	**CONSTRUCTION** Zones 8 and 9 and Tankatara farm: • Inform construction managers/foremen, before construction, on the possible types of heritage sites which may be encountered. • Train a site monitor to report to the foreman when archaeological sites are found • Ensure an archaeologist is present during the vegetation clearing in areas that have been identified as having potential for archaeological sites/materials • Report any concentrations of archaeological material uncovered during construction (e.g. human remains, and/or accumulations of fossil bone, concentrations of marine shell and stone tools) to the archaeologist at the Albany Museum (tel. 046 622 2312) or to the Eastern Cape Provincial Heritage Resources Authority (tel. 043 642 2811) immediately. All work must stop to allow an archaeologist to conduct a systematic and professional investigation. Relevant permits must be granted to a professional archaeologist by the SAHRA to remove such material. Zone 11: • Initiate a Phase 2 AIA before construction. Record any archaeological material before destruction and submit a report to SAHRA for review. Zone 13: • Ensure an archaeologist is present on site during the clearing of the vegetation • Use least intrusive methods for clearing of the vegetation (e.g. small machineries), where possible. • Conduct a Phase 2 archaeological investigation and submit a report to SAHRA for review (with further recommendations) if sensitive sites/features are exposed.	32. Monitoring for archaeological sites/materials during the vegetation clearing
HERITAGE RESOURCES - PALAEONTOLOGY		
Incorporate Transnet's Heritage management plan into the Project Environmental Specifications developed for the construction phase	**CONSTRUCTION** • A qualified palaeontologist must be appointed in the case of substantial new excavations (e.g. more than 200 m^3) into the potentially fossil-rich Kirkwood Formation, Sundays River Formation and Salnova Formation • A palaeontologist must be present in the event of: o Deeper (>3m) excavations within the compilation yard footprint o Any new cuttings into the Sundays River Formation in the Brak River and Coega River Valleys along the doubled-up railway line o New excavations into Kirkwood and Sundays River Formation rocks along the conveyor line route in Zone 8 of the IDZ	33. Monitoring at least on a daily basis of all excavations for newly exposed fossil material is undertaken (where sizeable bedrock excavations not required)

Management actions proposed by the proponent	Additional recommended management actions	Monitoring actions
	• Environmental Officer to familiarize himself with the recent palaeontological report for the Coega IDZ (Dr J Almond, 2010) and the possibility of significant buried fossil heritage • If any substantial fossil remains are found, these should be safeguarded, preferably *in situ*, and the Eastern Cape Provincial Heritage Resources Authority (ECPHRA) must be contacted. A qualified palaeontologist to record and sample the occurrence of these fossil remains, and also to advise on any further mitigation actions.	
HERITAGE RESOURCES – HISTORICAL AND CULTURAL SITES		
Incorporate Transnet's Heritage management plan into the Project Environmental Specifications developed for the construction phase	**DESIGN PHASE** • Identify the number and exact location of graves to be relocated • Develop a graves relocation plan.	

16.3 CUMULATIVE EFFECTS

In terms of cumulative effects, surrounding developments have been taken into account and the following significant cumulative impacts of concern have been identified during this EIA process. Several industrial developments that are either operational or have received environmental authorisation in and around the Coega IDZ have been taken into account when considering potential cumulative impacts. These developments include, amongst others:

Table 16.2 Current and proposed developments within the Coega IDZ

IDZ Zones	Current and proposed developments
Zone 3	• Accoustex – supply of components to the automotive industry; • Coega Dairy – ultra-high temperature dairy processing plant; • Cape Concentrates – tomato paste manufacturing plant; and • Dynamic Commodities – sorbet (ice-cream) manufacturing plant
Zone 2	• UTI – courier services • Aldo Scribante racetrack – vehicle racetrack
Zone 5	• PhytoAmandla - Biofuel processing plant • OSHO Cement Grinding Facility • Aluminium Pechiney Smelter – Authorisation granted in 2002
Zone 6	• Afro-Asia Steel – steel recycling plant (under construction)
Zone 8	• Oiltanking Grindrod Calulo (OTGC) - bulk liquid storage and handling facility
Zone 9 **Zones 4, 5, 9 & 10**	• Electrawind - Wind mast and wind test turbine • Electrawind – Wind farm 24 turbines. Authorisation granted in 2011
Zone 12	• EAB Astrum Energy – Proposed 13 MW photovoltaic solar facility Authorisation granted in 2012 • Universal Wind – Proposed 80 MW wind farm (20 turbines). Authorisation granted in 2012
Zone 14 and PPC land	• Innowind – Proposed wind farm (75 wind turbines). Authorisation granted in 2011
Neptune substation	• Palmtree Power – proposed 300kW wind turbine. Authorisation granted in 2008

Taking into account the above development and the findings from the specialist study in this EIA, the main cumulative impacts identified are as follows:

- **Terrestrial habitat fragmentation and disruption of Ecological processes as a result of artificial barriers:** The proposed facility (in particular the compilation yard) will result in fragmentation and disruption of the Coega River Ecological Corridor, and the cumulative effect, in conjunction with existing and potential future impacts to this corridor is of concern. However, through the implementation of the proposed mitigation measures (e.g. rehabilitation of slopes and use of open lattice bridges), the impact can be reduced to allow for some ecological connectivity to be retained.

- **Increase in environmental degradation and loss of ecosystem function:** The proposed facility will result in environmental degradation, and the cumulative effect, in conjunction with existing and potential future impacts to IDZ is of concern. However, bearing in mind that it is within a designated Industrial Development Zone, the contribution of the facility footprint to the overall degradation of the IDZ environment is insubstantial. Importantly, the

necessary measures to minimise the impact of the proposed facility to the environment, especially where there is an overlap or conflict with the designated Open Space Network, must be implemented.

- **Aquatic habitat fragmentation:** This impact needs to be assessed in terms of the other projects within the vicinity, especially due to the linear nature of railway lines, and therefore on a regional scale. The permanent loss of any aquatic system would be seen as habitat fragmentation. Due to the scale of the proposed and approved projects within the IDZ footprint in relation to the observed water bodies, the potential for habitat fragment along the water courses would be significant.

- **Increased risk of avifauna collisions with infrastructures such as powerlines and wind turbines:** The main concern with respect to cumulative impacts is the potential development of a number of wind farms in and adjacent to, the Coega IDZ. If built, these wind farms will add considerably to the threat to birds posed by the manganese ore handling and export facility project's supply powerlines and overhead rail electricity network. Much of the area comprising Grass Ridge Bontveld will become hazardous for Denham's Bustard, Secretarybird, and Blue Crane besides other large birds, (herons, storks and flamingos), which may pass through the area. Until the bidding rounds for renewable energy projects and their financial closure is complete it will not be known how many, if any, of these wind farms will be built. It must however be noted that the NMBM/CDC will provide supply to the site (i.e. they will be responsible for the construction of new powerlines) and the proposed facility will operate using underground lines from the site boundaries to the supply points.

- **Palaeontological features:** Cumulative impacts on the highly fossiliferous, but volumetrically limited, estuarine deposits of the Salnova Formation as a result of the Ngqura Port and associated development projects within Zones 8 and 9 of the Coega IDZ, such as the proposed Manganese Ore Export Facility, are potentially significant.

16.4 PERMITS AND LICENCES

16.4.1 Environmental Authorisation

Before clearing of the proposed site is initiated, the appropriate environmental authorisation must be obtained in terms of the National Environmental Management Act (NEMA) and associated EIA Regulations. Should the project proceed, the site development programme will need to be agreed to with the CDC.

16.4.2 Air Quality

The storage and handling of more than 100 000 tons of ore at a facility other than a mine is a Listed Activity in terms of NEM: Air Quality Act (Act No. 39 of 2004 (Government Notice 248 of 31 March 2010) - Category 5 (Mineral processing, storage and Handling and sub-category 5.1 (Storage and handling of ore or coal). As such, the facility requires an Atmospheric Emission License (AEL) in order to operate. Such an application has been lodged with the NMBM (Appendix B).

16.4.3 Terrestrial Ecology

In terms of the **National Forests Act**, 1998 (Act No 84 of 1998) and Government Notice 1339 of 6 August 1976 (promulgated under the Forest Act, 1984 (Act No 122 of 1984) for protected tree

species), the removal, relocation or pruning of any protected plants will require a license from the Department of Agriculture, Forestry and Fisheries (DAFF).

Protected indigenous plants in general are controlled under the relevant provincial Ordinances or Acts dealing with nature conservation. In the Eastern Cape the relevant statute is the 1974 **Provincial Nature Conservation Ordinance** no 19 (PNCO) and **Threatened or Protected Species** (T.o.P.S) in terms of the National Environmental Management: Biodiversity Act (No. 10 of 2004), (NEMBA). In terms of the Ordinance and Act, permits must be obtained from the Department of Economic Development, Environmental Affairs Environment and Tourism (DEDEAT) to remove or destroy any listed plants and animals.

Initial investigations indicate that a total of 41 indigenous species of special concern may occur on site

16.4.4 Heritage

In terms of Sections 35(4) of the National Heritage Resources Act 25 of 1999, should any archaeological or palaeontological materials/sites be found during construction of the proposed facility, a permit must be obtained from the South African Heritage Resources Agency (SAHRA) to remove such remains. Such removal should be undertaken by a professional archaeologist/palaeontologist.

In terms of Sections 36(3) (a) of the National Heritage Resources Act 25 of 1999, a permit will be required for the relocation of the graves within the three identified graveyards (along the railway line, and on the proposed stockyard site).

16.4.5 Waste Management

A Waste Licence Application is required in terms of the National Environmental Management: Waste Act (Act No. 59 of 2008), GN R 718 published on 3 July 2009, Category A listed activities. Listed Activities A2, A11 and A18 are triggered as a result of the temporary storage of hazardous wastes exceeding 35 m^3 and the potential treatment of wastewater/contaminated stormwater prior to be collected in the stormwater dam for re-use. A waste license application has been lodged for the above mentioned activities with the National Department of Environmental Affairs and was acknowledged on 17 May 2012 (Reference number: 12/9/11/L920/1). An updated waste licence application has been submitted to DEA together with the draft EIA report (Appendix B).

16.4.6 Water Use

A Water Use License will be required in terms of Section 21 of the Water Act (Act 36 of 1998) as a result of the proximity to or the crossing of watercourses in the area: Several components of the project are located within 500m of wetland areas, new road bridge over the Coega River and the new railway lattice bridges at the compilation yard, 6 of these new culverts cross delineated water courses or are within the 32m buffer of the watercourse. The WULA application will be submitted to the Department of Water Affairs after submission of the draft EIA report to account for feedback from DWA.

DWA would also require the project proponent to register the proposed stormwater control dams at the stockyard and at the quay respectively, as their storage capacity exceeds 10 000 m^3 as well as the abstraction of construction water from the Coega River. As it is proposed to construct a road bridge across the Coega River to access the stockyard, a permit for this activity will be required.

16.5 NO GO ALTERNATIVE

The following main implications of the no-go alternative are discussed below:

- Constraints being placed on growth of the manganese mining sector in South Africa
- Loss of socio-economic development opportunities in the mining and transport/shipping sectors from growth in manganese ore export
- Continued environmental impacts from manganese export via the current terminal in the Port of Port Elizabeth and associated constraints for urban planning.

The no-go option would result in reduced potential for existing (and new) South African manganese ore mines to grow the country's share of the international manganese market, as a result of constrained ore export facilities. The no-go alternative will also lead to socio-economic opportunities being lost in the transport/shipping sector in the Port Elizabeth/Coega area; as well as reduced socio-economic opportunities associated with constraints to upstream mining potential in the Kalahari Basin (e.g. Northern Cape). The no-go alternative would therefore result in the loss of an opportunity of having a facility capable of handling a throughput capacity of 16 Mtpa, compared to the current maximum of 5.5 Mtpa via Port Elizabeth harbour, which could negatively influence the longevity and growth of manganese ore mines in the Kalahari Basin.

The no-go option could also require the existing Manganese Terminal in Port Elizabeth to be upgraded from 5.5 Mtpa to 16 Mtpa in order to meet the increase in Manganese ore export demands, therefore impeding on other potential developments at the Port of Port Elizabeth upon decommissioning of that Terminal. The current infrastructure would need to be upgraded, additional stockpile areas would be required and new equipment would be introduced. This would also include additional capacity in terms of a railway shunting yard, conveyers as well as quay areas for ship loading. It should also be noted that a terminal upgrade at Port Elizabeth harbour would need an environmental authorisation which would result in delays to the ability of Transnet to meet the projected export demand for manganese ore. Such a delay could result in the SA manganese mining industry losing out on long-term contracts to supply high grade manganese ore to the international market.

16.6 CONSIDERATION OF ALTERNATIVES

Apart from the no-go alternative, other types of alternatives were considered in the pre-feasibility planning for this project and as part of this EIA process. The analysis of the various alternatives is presented in Chapters 2 and 4 of this EIA Report, with a summary provided below:

16.6.1 Land use alternatives

Land use alternatives were not identified for the proposed project, as it falls within the Coega IDZ, in an area that has been designated for industry (special land use) since the conception of the IDZ and Port of Ngqura in the mid-1990s.

16.6.2 Location and routing alternatives

During pre-feasibilities studies in 2008, several possible locations for the **stockyard** were considered and assessed in terms of planning, engineering, commercial, environmental and sociological criteria. The environmental screening study (CSIR, 2008) concluded that the proposed location of the stockyard (north of the N2) is the most favourable in terms of environmental and social impacts. Consequently, no alternative locations for the stockyard were included in the EIA.

For the overland **conveyor routing**, two alternative routings have been investigated for the overland conveyor system as part of this EIA.

- The **preferred** overland conveyor route was developed with the future port expansion in mind and will not sterilise any future port expansions or quayside activities in this are due to it being placed 400m behind the future proposed quay wall.
- The **alternative** route makes use of the culvert that was originally constructed for the planned conveyor route from Berths C100 and C101 to the proposed aluminium smelter.

Other alternatives for the overland conveyor route have been considered as part of the site selection process but were excluded for various reasons. Please refer to Section 2.2 in Chapter 2 for further details.

Three alternatives for the design and location of the **rail compilation yard** were originally investigated by Transnet SOC Ltd and comprised the following conceptual options: (i) linear layout rail line; (ii) loop line on the Tankatara farm area; and (iii) loop line in the IDZ. Option (i) and (ii) were excluded by Transnet and only option (iii) was being taken as a reasonable and feasible alternative. Following input from the CSIR team and its ecological specialist, two compilation layout alternatives for the proposed compilation yard within the IDZ were identified and have been assessed as part of this EIA. These are referred to as Alternative 1 (preferred layout) and Alternative 2.

16.6.3 Technology alternatives as part of the development

No major technology alternatives are applicable for the proposed project. This is due to the fact that the technology proposed for the construction and operation of the Manganese Ore Export Facility will be guided by industry standards and global best practice in the manganese ore storage and handling industry. This therefore limits the amount of variability in terms of the technology. The applicable technology alternatives for this project relate to the infrastructure being installed and constructed, such as the type of roofing system for the conveyor system, the type of ship loaders, the type of stackers and reclaimers, spill contingency, and stormwater management.

As part of the management actions in the EIA, various technical and engineering alternatives were investigated to avoid or minimise the negative impacts of the project. For example, in the air quality study, the use of water and surfactants as well as the construction of a berm are proposed for dust mitigation. And in the aquatic and botanical studies, the use of lattice bridge structures for sections of the railway link line are recommended as an alternative to solid berms for the railway foundation.

16.7 OVERALL EVALUATION OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

The environmental impact assessment has investigated and assessed the significance of the predicted positive and negative impacts associated with the proposed Manganese Ore Export Facility. No negative impacts have been identified within the ambient of this EIA that, in the opinion of the Environmental Assessment Practitioner, should be considered “fatal flaws” from an environmental perspective, and thereby necessitate substantial re-design or termination of the project. The fact that this is an industrial development taking place in an IDZ should be taken into account when considering the main residual impacts of the project. The **main negative residual impacts** are:

High significance (with mitigation applied effectively)

- Loss of two relatively pristine wetlands in the IDZ associated with the construction of the alternative layout of the compilation yard, if Alternative 2 is chosen.
- Impact of a large fuel spill in Algoa Bay on marine ecosystems, especially seabirds, should such an event occur (high intensity although the probability for it to occur is low). This impact relates to increased risks associated with a developing harbour.

Medium significance (with mitigation applied effectively)

- Loss of one partly degraded wetland in the IDZ as a result of the construction of the preferred compilation yard layout, if Alternative 1 is chosen.
- Health effects on humans due to exposure to manganese ore dust in the neighbouring environment (e.g. northern boundary of the Cerebos Coega Evaporation dam)
- Direct loss of vegetation and Species of Special Concern (SCC), in particular Sundays Valley Thicket and Motherwell Karroid Thicket habitats, as a result of the project footprint
- Fragmentation of ecological corridors and disruption of ecological processes as a result of artificial barriers, in particular due to the construction of the compilation yard and doubling of the railway line
- Handling and disposal of the manganese ore mud collected at the bottom of the dams
- Fragmentation of and reduction in aquatic ecology habitat (e.g. seasonal pans) due to the construction of the facility.
- Collisions of birds with additional powerlines and overhead cables for the upgraded railway line and compilation yard
- Introduction of alien marine species into Algoa Bay as a result of ballast water being released by ships in or near the Port of Ngqura.

The **main positive impacts** associated with the proposed Manganese Ore Export Facility are summarised below:

- The construction phase will take approximately 44 months, from approximately 2015 to 2018.
- During construction it is estimated that a total of approximately 1 500 people (at peak times) would be required to complete the project over a 36 month period. This includes skilled, semi-skilled and unskilled labour. The workforce would be sourced locally where possible. However, it is likely that some of the semi-skilled workforce would come from outside the immediate vicinity of the Nelson Mandela Bay Metro. Sourcing of labour will be done according the CDC Zone Labour Agreement, which includes requirements for promoting use of local labour and broad-based black economic empowerment.
- During the operational phase of the facility (40 to 60 years), it is estimated that approximately 550 people will be permanently employed over a 24 hour period.
- Opportunity to increase the maximum export capacity of manganese from the current level of 5.5 Mtpa (via PE harbour) to a max of 16 Mtpa at the Port of Ngqura. Given that South Africa has more than 80 % of known world resources of ore with manganese content greater than 34 %, this expanded facility enables the country to generate additional revenues from manganese export arising from the predicted strong growth in global demand in the coming years.
- The decrease in air emissions currently generated at the existing export facilities in PE and the opportunity to re-develop these facilities at PE harbour to a more suitable activity within the urban planning context.

Overall, there is no significant difference in the significance levels between the impacts assessed for the preferred and alternative conveyor routes and compilation yard layouts, with the exception of the impact associated with the loss of wetlands. This impact is assessed to be of high significance for the alternative compilation yard layout and of medium significance for the preferred compilation yard layout. The Environmental Assessment Practitioner (EAP) therefore recommends the following alternatives are adopted:

1) Preferred Compilation yard layout (Alternative 1), given that this alternative only impacts one partly degraded wetland
2) Preferred conveyor route given that there is no difference in the significance rating of residual impacts for the two conveyor route alternatives (both are medium to low significance) and that this alternative is consistent with the medium to long term planning for the port development (Port Master Plan).

The project design incorporates best international practices detailed in the various specialist studies. Taking into consideration the findings of the EIA process for the proposed Manganese Ore Export Facility, it is the opinion of the EAP that the project benefits outweigh the costs and that the project will make a positive contribution to steering South Africa on a pathway towards sustainable infrastructure development. Provided that the specified mitigation measures are applied effectively, it is proposed that the project receive environmental authorization in terms of the EIA Regulations promulgated under the National Environmental Management Act (NEMA).

In order to ensure the effective implementation of the mitigation and management actions, a framework **Environmental Management Plan (EMP)** has been prepared for the construction and operation of the proposed project (Part B of the EIA Report). The EMP must be developed in more detail during the detailed design phase. For example, more detail must be provided at that stage on roles and responsibilities, monitoring activities, communication and reporting protocols, resources required, and review and audit requirements.