

Annex B

Noise Management Plan

Part III Annex B

Noise Management Plan

Version 1.0

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Yara Dallol Potash Project, Danakil Depression, Ethiopia

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LIST OF ACRONYMS

Abbreviation	Full Definition
ANRS	Afar National Regional State
CHSSMP	Community Health, Safety and Security Management Plan
ES-MS	Environmental and Social Management System
ESIA	Environmental and Social Impact Assessment
dB	Decibels
IFC	International Financing Corporation
L _p	sound Pressure Level
L _w	Sound Power Level
NMP	Noise Management Plan
NSR	Noise Sensitive Receptor
PNL	Project Noise Levels
PS	Performance Standard
PSNC	Project Specific Noise Criteria
SLM	Sound Level Meter
WHO	World Health Organisation

Yara International is a leading global fertilizer company with sales of fertilizer to about 150 countries globally. As part of Yara International's overall upstream strategy, the company is exploring for suitable raw sources that can be developed and used as a source to Yara International's global fertilizer production and directly as finished product in its product portfolio. To complement these upstream processes, Yara International has recently started a subsidiary company, Yara Dallol BV, which is involved in the exploration and mining development of potash concessions in Ethiopia. These concessions are located in the Danakil Depression, Afar National Regional State (ANRS), Ethiopia. Yara International, through its subsidiary, proposes to develop a potash mine - the Yara Dallol Potash Project (hereafter referred to as the proposed Project) within these concession areas.

As part of the environmental approval process for the Project a suite of environmental and social management plans is needed to address the issues identified in the Environmental and Social Impact Assessment (ESIA). Several management plans have been developed to address impacts identified in the ESIA and are implemented as part of an environmental management system for the proposed Yara Dallol Potash Project.

The proposed Project will generate noise impacts. This Noise Management Plan (NMP) has been compiled to address the specific noise impacts that are anticipated to occur during the construction and operational phase of the proposed Project as identified in the ESIA and associated impact assessment. This plan sets out a formal system by which Yara Dallol BV can manage mitigation measures that will reduce and manage noise impacts during the construction and operational phase of the Project.

1.1 *POLICY STATEMENT AND OBJECTIVES*

1.1.1 *Policy Statement*

The development of this NMP has been guided by the Yara Dallol BV Health, Environment, Safety, Quality and Product Stewardship Policy, as set out in *Box 1.1*. This Policy is a high-level corporate statement of intent and establishes the principles to be followed in the management of environmental and health issues.

Box 1.1

Health, Environment, Safety, Quality and Product Stewardship Policy Statement

COMPANY COMMITMENT

Yara Dallol BV's aim is to establish sustainable growth and the creation of shareholder and societal value. Yara Dallol BV affirms to their stakeholders, including employees, customers and the public, their commitment to continuously improve and reach standards of excellence in Health Environment, Safety, Quality and Product Stewardship through their operations.

ENVIRONMENTAL POLICY

Yara Dallol BV will manage their business in a life cycle perspective. In its operations Yara Dallol BV will contribute to eco-efficiency by continuously improving energy consumption and reducing waste, emissions and discharges. Waste that is generated will be handled and disposed if safely and responsibly.

Yara Dallol BV will design their products and develop product applications to have the minimum adverse effect on the environment throughout their lifecycle.

1.1.2

Objectives

The objectives of this NMP are as follows:

1. Monitor noise emissions from the Project during the construction, operational and decommissioning/closure phases;
2. Determine compliance of Project Noise Levels (PNL) at noise sensitive receptors with the impact assessment criterion established during the ESIA;
3. Describe several mitigation/management measures to be implemented during the construction, operational and decommissioning/closure phases of the Project so as to minimise or eliminate noise impacts;
4. Establish an appropriate noise training programme for Yara Dallol BV Employees and contractors; and
5. Define the roles and responsibilities for implementing the measures to minimise or eliminate noise impacts.

1.2

PURPOSE AND SCOPE

The purpose of the NMP is to provide a clear set of actions and responsibilities for the control of noise impacts within the Project's area of influence.

The scope of this NMP covers construction, operational and decommissioning/closure phases of the Project. Mitigation measures are presented to ensure that noise impacts are managed to a level that is considered to be of Minor significance or to be Negligible.

This plan should be considered to be a “living” document that is amended in light of the learning experienced during its implementation.

1.3

LINKAGE TO OTHER ENVIRONMENTAL AND SOCIAL PLANS

This NMP should be read in the context of the Environmental and Social Management System (ES-MS) (discussed in *Chapter 13 of Part I of the ESIA*), which has been structured to provide a vehicle for the integrated management of the suite of management plans described in *Part III*, which have been designed to address a broad range of social and environmental risks.

It is recognised that the ES-MS and associated plans are living tools that will be constantly updated to accommodate changing circumstances.

The NMP links with the Community Health, Safety and Security Management Plan (CHSSMP). Noise has a direct link to social plans, specifically in regard to areas where people reside. The primary concern pertaining to noise emissions is annoyance to people (specifically during night periods) residing in the area. Thus it is imperative that any future social development takes into account the zones of noise emission impacts.

A summary of the legal requirements and standards relevant to the NMP are presented below.

2.1 NATIONAL LEGISLATION AND POLICY

The following Ethiopian regulation informed the development of this NMP:

2.1.1 *Constitution of the Federal Democratic Republic of Ethiopia*

Article 44 of the Constitution of Ethiopia (1995) states that all persons have the right to a clean and healthy environment; moreover, Article 51(3) of the Constitution of the Ethiopia (1995), states that the Federal Government shall, amongst others, establish and implement national standards (refer to *Section 2.2.1*) and basic policy criteria for public health.

Moreover, Article 92 of the Constitution states that the Federal Government shall endeavour to ensure that all Ethiopians live in a clean and healthy environment.

2.1.2 *Environmental Pollution Control Proclamation (300/2002)*

Complementary to the Environmental Policy of Ethiopia (1997) and the Environmental Impact Assessment Proclamation (299/2002) (which requires developmental activities to provide a number of guiding principles that require adherence to principles of sustainable development), the Pollution Control Proclamation requires ongoing activities to implement measures that would reduce their degree of pollution to a set limit or quality standard.

2.2 NATIONAL GUIDELINES AND STANDARDS

Within Ethiopia, the following document sets out the key considerations pertaining to noise:

2.2.1 *Environmental Standards for Industrial Pollution Control in Ethiopia*

The Ethiopian Federal Government has developed a list of environmental standards for the purposes of preventing significant industrial pollution. These standards present pollution limits for noise emissions.

These standards give guidance on noise impacts for three receptor categories (industrial, commercial and residential) and for daytime and night time (*Table 2.1*).

Table 2.1 Ethiopian Standards for Noise

Area Code	Category of area	Noise Limits in dB(A) LAeq,15min	
		Daytime (06:00 – 21:00)	Night time (21:00 – 06:00)
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential area	55	45

Furthermore, the Ethiopian standard for noise states that noise from the source activity (measured at the specified noise sensitive location) shall not give rise to sound pressure levels (LAeq, 15 minutes), which exceed the limit value by more than 2 dB(A).

2.3 IFC PERFORMANCE STANDARDS

The following IFC Performance Standards are applicable to this NMP:

2.3.1 Performance Standard 1 (Assessment and Management of Environmental and Social Risks and Impacts)

IFC Performance Standard (PS) 1 is primarily a prescriptive document (with reference to quantitative guidelines) and includes objectives, which are considered key to the proposed Yara Dallol Potash Project, such as:

- Identify adverse impacts;
- Avoid, minimise, mitigate or compensate adverse impacts;
- Appropriate engagement of community on issues that could potentially impact them; and
- Promote improved social and environmental performance through effective use of management systems.

2.3.2 Performance Standard 3 (Resource Efficiency and Pollution Prevention)

IFC PS 3 is primarily a prescriptive document and includes the following objective relevant to this NMP:

- Avoid or minimise adverse impacts to human health and the environment by avoiding or minimising pollution from project activities.

2.4 IFC ENVIRONMENTAL, HEALTH AND SAFETY GUIDELINES

In addition to the above IFC PS, the following IFC Environmental, Health and Safety Guidelines are applicable to this NMP:

2.4.1 IFC EHS Guidelines – Environmental Noise Management

IFC EHS Guideline 1.7 Noise (IFC Noise 1.7) is an internationally recognised guideline document containing information for the assessment and management of noise. It also presents noise level criterion values applicable to sites such as the proposed Project.

The *IFC EHS Guideline Noise 1.7* differentiates between two principal receptor categories, residential and industrial, as summarised in *Table 2.2*. They make reference to noise from facilities and stationary noise sources, and are commonly applied as design standards for industrial facilities, and whilst this may imply they relate to some threshold of noise effects in a general sense, the IFC has indicated that they are not directly applicable to transport or mobile noise sources. Measurements are to be taken at noise receptors located outside the project property boundary.

Table 2.2 IFC/World Bank Noise Level Guidelines

Receptor	Maximum Allowable Ambient Noise Levels, LAeq,1hr, dB(A) Free field	
	Daytime 07:00 – 22:00	Night-time 22:00 – 07:00
Residential, institutional, educational	55	45
Industrial, commercial	70	70

The *IFC Noise 1.7* guideline states that noise impacts should not exceed the levels presented in *Table 2.2* or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.

For the purpose of this NMP, the Project specific noise criteria will be drawn from a combination of the Ethiopian Standards and the *IFC EHS Guidelines 1.7 Noise* as follows:

- The daytime period will be defined as 6:00 to 21:00 and the night time period will be from 21:00 to 6:00, as the IFC performance standard gives precedence to local standards and guidelines.
- Disturbance criteria will be based on an LAeq,15min assessment period as the IFC performance standards give precedence to local standards and guidelines.

- Amenity criteria (expressed as $L_{Aeq,period}$) is determined by adding 3 dB to the existing baseline noise level or Assessment Background Level (ABL);
- Project Specific Noise Criteria (PSNC) have been determined by the most stringent of the IFC Disturbance and Amenity criterion; and the WHO Community Noise Guidelines (1999) values. This is presented in *Table 2.3* overleaf.

Table 2.3 *Project Specific Noise Impact Assessment Criteria*

Project Phase & Duration	Receptor Type	Period	Noise Impact Scale							
			Negligible		Minor		Moderate		Major	
			PNL <	PNL >	PNL <	PNL >	PNL <	PNL >		
Operation Long term / Constant	Residential Receptors with Very Low Background Noise Levels (<i>viz.</i> Asabuya Village)	Daytime	35	35	40	40	45	45		
		Night time	30	30	35	35	40	40		
	Other Residential and Tourist (<i>viz.</i> Mount Dallol) Receptors	Daytime	40	40	45	45	50	50		
		Night time	35	35	40	40	45	45		
	Lower Sensitivity Residential Receptors (<i>viz.</i> Military Camp)	Daytime	55	55	60	60	65	65		
		Night time	45	45	50	50	55	55		
Construction Medium-term / Often	Residential Receptors with Very Low Background Noise Levels (<i>viz.</i> Asabuya Village)	Daytime	40	40	45	45	50	50		
		Night time	35	35	40	40	45	45		
	Other Residential and Tourist (<i>viz.</i> Mount Dallol) Receptors	Daytime	45	45	50	50	55	55		
		Night time	40	40	45	45	50	50		
	Lower Sensitivity Residential Receptors (<i>viz.</i> Military Camp)	Daytime	60	60	65	65	70	70		
		Night time	50	50	55	55	60	60		

1. PNL = predicted LAeq,15min Project Noise Level
2. Daytime = 6am to 9pm and Night time = 9pm to 6am

Please Note - the Ethiopian Military Camp will be considered a noise sensitive receptor; however, it is considered appropriate that it would have a lower sensitivity to noise than a residential receptor. The lower sensitivity is applied as the Military Camp is not a typical residential receptor, given that it operates 24 hours per day, there is likely to be noise generated on the Military Camp site during the Night Time period and there would be lesser expectation for lower noise levels during this period.

With respect to this Plan, Yara Dallol BV has the responsibility to provide noise management and to structure and coordinate noise management procedures for the Yara Dallol Potash Project.

Furthermore, Yara Dallol BV has the responsibility for ensuring that specific noise management and monitoring responsibilities allocated to them are organised and implemented. Yara Dallol BV has the responsibility to ensure that their employees and contracted third parties are trained and aware of all required noise related procedures.

The roles and responsibilities within Yara Dallol BV for the implementation of the NMP are presented in *Table 3.1*.

Table 3.1 *Responsible Parties and Roles and Responsibilities*

Responsible Parties	Roles and Responsibilities
Dallol General Manager	Responsible for assuring that the <i>Environmental and Social Manager</i> has the resources, information and authority to implement the management measures described in this NMP.
Environmental and Social Manager	Responsible for enforcing the management/monitoring measures described in this NMP. Responsible for the provision of noise training to Yara Dallol BV staff and contractors
Community Liaison Officer	Responsible for stakeholder engagement
Project Manager	Together with the Environmental and Social Manager is responsible for staffing, planning and day-to-day execution of the management measures described under the construction phase of this NMP. As needed, this individual will develop and propose staff plans and contractual language to ensure that these measures are implemented by Yara Dallol BV staff and contractors throughout the construction phase of the Project.
Operations Manager	Together with the Environmental and Social Manager, is responsible for staffing, planning and day-to-day execution of the management measures described under the operational phase of this NMP. As needed, this individual will develop and propose staff plans and contractual language to ensure that these measures are implemented by Yara Dallol BV staff and contractors during Project operation.
Contractors (Construction and Operations)	Responsible for following the noise procedures and requirements indicated in construction and operational sections of this NMP.

4 IMPACT MANAGEMENT

4.1 SUMMARY OF IMPACT MANAGEMENT

As with any project of this scale and nature, there are certain impacts that cannot be entirely eliminated, i.e. residual impacts after implementing mitigation measures. With respect to impact mitigation, the Project subscribes to the philosophy of impact avoidance (by changes to project planning and/or design) and impact reduction (to reduce impacts that cannot be avoided to acceptable levels). What follows, is a description of the potential residual impacts and the mitigation measures proposed to reduce them to acceptable levels. These mitigation measures essentially comprise the “management plan” to address noise related impacts.

The following sections will:

- Identify potential impacts associated with each phase of the Project;
- Identify the objectives and targets related to the impacts;
- Describe the management measure(s) to minimise the impact; and
- Assign responsibilities for the management measures.

4.2 MANAGEMENT DURING CONSTRUCTION

4.2.1 *Potential Impacts*

During the construction phase of the Project, Project noise emission sources influencing the noise impacts at NSR's are attributable to construction activities located in the area of the proposed Processing Plant.

4.2.2 *Objectives and Targets*

The primary objective of this NMP for the construction phase is to minimise impacts on the closest and/or most affected NSR's situated in the vicinity of Project during construction activities associated with the processing plant. Furthermore, a key objective is to keep the local community and regulators informed of activities (where required) and to respond quickly and effectively to issues and complaints.

4.2.3 *Management Actions*

The following management actions may not eliminate an impact, but would be expected to reduce its severity and may assist to achieve the *IFC EHS Guidelines 1.7 Noise* disturbance and amenity criteria (which is a reduction of PNL's at the receptor by 10dBA).

ERM has reviewed the predicted PNL, the anticipated impacts and receptor distances from Project noise emissions to allow the following general Project (Construction) management rules to be developed. These general rules are provided so that the hierarchical approach may be focused on the most affected receptors in proximity to the construction activities and works sites.

The following measures will be applied to all construction works undertaken **within 1,000 m of any NSR's**:

- A one-page summary of applicable noise criteria that relate to relevant work practices and nearby receptors will be developed. This summary will be placed on a notice-board so that all site operators can quickly reference noise information.
- Site managers will periodically check the site and nearby residences (or other sensitive land uses) for noise related issues so that solutions can be efficiently and quickly applied.
- Where feasible and reasonable, the dropping of materials from height will be avoided.
- Where feasible and reasonable, metal-to-metal contact on equipment will be avoided;
- Where feasible and reasonable, mobile equipment clustering near residences and other sensitive land uses will be avoided;
- Ensure that periods of respite are provided in the case of unavoidable maximum noise level events. These respite periods will be negotiated with the relevant local stakeholders.
- All potentially impacted receptors will be informed of the nature of works to be carried out, the expected noise levels and duration, as well as contact details for a Yara Dallol BV representative that be contacted in the event of a complaint.

For all construction works undertaken **within 600m of any NSR's**, Yara Dallol BV will implement the following noise control mitigation measures:

- Plant /machinery will be positioned as to minimise noise transmission towards NSRs.
- The most effective mufflers, enclosures and low-noise tool bits and blades will be selected, where necessary.
- Less annoying alternatives to conventional audible reversing alarms will be considered ⁽¹⁾ (such as visual and/ or broadband noise emitting models i.e.

(1) If found not to compromise safety requirements

'squashed duck') that provide a safe system of work. Furthermore, where possible the Project work sites will be configured to maximise forward movements of mobile equipment.

- Where feasible and reasonable, alternatives to diesel and petrol engines and pneumatic units will be used (such as hydraulic or electric-controlled units).
- Where feasible and reasonable, small equipment e.g. hand tools will be placed in an acoustically treated enclosure.
- Where feasible and reasonable, the throttle settings on plant and machinery will be reduced and equipment and plant will be turned off when not being used.
- All onsite chutes and bins will be lined with damping material.
- Equipment will be regularly inspected and maintained to ensure it is in good working order. The condition of mufflers will also be periodically checked.
- For machines with fitted enclosures, doors and door seals will be checked on a regular basis.
- To shield noise emissions to nearby NSR's, berms / earth bunds / or stockpiles will be erected. Multiple berms / earth bunds / or stockpiles may be used in order to optimise the acoustic performance of this mitigation measure. When noise barriers are deemed a requirement the following general design requirements will be met:
 - Construction management will schedule construction of berms / earth bunds / or stockpiles so that they are installed on site as early as possible and prior to high noise level generating activities.
 - Detailed design of any berms / earth bunds / or stockpiles will be undertaken in order to determine the adopted construction material and overall layout.
 - Berms / earth bunds / or stockpiles will be approximately 2.4 m in height.

In addition to the abovementioned management actions, Yara Dallol BV will provide relevant personnel with training in noise control procedures and equipment operation.

While the measures contained within this section will not necessarily result in meeting the project-specific noise criteria at all times, they will serve to reduce impacts to receptors.

4.3 *MANAGEMENT DURING OPERATION*

4.3.1 *Potential Impacts*

During the operational phase of the Project, Project noise emission sources influencing the noise impacts at NSR's are attributable to operational activities at the Processing Plant and through the use of trucks transporting product to the Port of Tadjoura.

4.3.2 *Objectives and Targets*

The primary objective for the operational phase is to minimise impacts on the closest and/or most affected NSR's situated in the vicinity of Project during operation of the processing plant and along the route through to Tadjoura Port. Furthermore, the NMP includes the following broad objectives for during the operational phase:

- Manage operational activities (primarily at the processing plant and the use of trucks to transport product to the Port of Tadjoura) in a way that limits interference to NSR's;
- Review monitoring results against model predictions, Project-specific noise criteria and modify activities to ensure limits are not exceeded; and
- To keep the local community and regulators informed of activities where required and to respond quickly and effectively to issues and complaints.

4.3.3 *Management Actions*

Noise emissions and associated impacts arising through the operational phase of the Project include operation of the processing plant and the use of trucks for the transport of product through to the Port of Tadjoura. Although these noise emissions will be taking place during the operational phase of the Project, Yara Dallon BV will ensure that the following management actions are considered during detailed design of the Project (i.e. – **pre-construction**):

Processing Plant

- Establish permanent signage around the site e.g. at site offices, that is visible to all personnel, which identifies the need to limit noise e.g. 'Please respect our neighbours and keep noise to a minimum'.
- Where feasible and reasonable, equipment/machinery with lower sound power levels will take preference.
- Silencers will be installed on all fans if necessary.
- Suitable mufflers will be installed on engine exhausts and compressor components.

- Acoustic enclosures will be constructed for equipment radiating significant noise.
- Where necessary, noise emissions will be minimised and controlled through the installation of noise containments, with enclosures and curtains at or near the source equipment (e.g. crushers, grinders, and screens).
- Internal traffic routing in the processing plant will be optimised, particularly to minimise vehicle reversing needs (reducing noise from reversing alarm).

Transport of Potash to Tadjoura Port

- Noise emission levels for trucks in either sound pressure level (Lp) at a given distance or sound power level (Lw) will be sourced from the suppliers of the trucks.
- Additional or upgraded exhaust mufflers on the product haul trucks will be considered.
- Given that the truck will also be spending considerable amount of time unloaded, there is potential for noise to be generated from unladen suspension – such as spring rattle and bounce over uneven surfaces. As such, Yara Dallol BV will consider dampening springs and bushes or the use of airbag suspension to assist in the reducing noise from unladen trailers.
- Provide relevant personnel with training in noise control procedures and equipment operation.

In addition to the above mentioned management actions, Yara Dallol BV will implement the following management actions during the physical transportation of product through to the Port of Tadjoura (i.e. during the operational phase of the Project):

- Relevant personnel will be provided with training in noise control procedures and equipment operation and furthermore.
- The informal use of truck honking systems is prohibited (especially in residential areas) and will only be used to prevent vehicle / pedestrian /wildlife collision.
- A conservative vehicle maintenance schedule will be developed that seeks to reduce any increase in noise / vibration outputs due to ‘wear and tear’ as the vehicles age. This maintenance schedule will include targets and monitoring measures for vehicle replacement according to safety, noise, vibration, cost and performance criteria.

4.4 *MANAGEMENT FOR DECOMMISSIONING AND CLOSURE*

4.4.1 *Potential Impacts*

For during the decommissioning and closure phase of the Project, Project noise emission sources influencing the noise impacts at NSR's are mainly attributed to decommissioning of the processing plant.

4.4.2 *Objectives and Targets*

The primary objective for the **decommissioning and closure phase** is identical as for during the construction phase, mainly to minimise impacts on the closest and/or most affected NSR's situated in the vicinity of Project activities during decommissioning and closure.

4.5 *MANAGEMENT ACTIONS*

Management actions associated with the decommissioning and closure phase of the Project will be similar to those undertaken during the construction phase. As a result, the management actions that will be adopted during the decommissioning and closure phase of the Project will be those that are detailed for during the construction phase (refer to *Section 4.2.3 on Page 4-1*).

5.1 OVERVIEW

Noise monitoring will include operator noise measurements at the closest and most affected receptors identified for each Project stage and operating conditions. Monitoring will be undertaken by suitably trained environmental personnel at the following intervals:

- **Construction and Decommissioning & Closure Phase** - at least every 2 to 3 months whilst construction/decommissioning activities are occurring at the site of the processing plant.
- **Operational Phase** - at least twice within the first calendar year of operation (year 0) and at least once per calendar year thereafter (to year 10), site noise level contributions should be measured, assessed and reported in accordance with the noise monitoring methodologies described in this NMP.

Moreover, additional noise monitoring may be determined necessary with the upgrade of any major infrastructure components. The need for additional noise monitoring will be determined by Yara Dallol BV Environmental and Social Manager familiar with the Project.

For each noise monitoring event, a report will be prepared and communicated to relevant stakeholders, see below.

5.2 NOISE MONITORING

The following outlines the noise monitoring methodology:

- Noise measurements will be taken using a Type 1 or Type 2 'integrating-averaging' Sound Level Meter (SLM) meeting all appropriate IFC standards. Statistical analysers and data loggers may be used and should provide equivalent performance in respect to the frequency weighting, time weighting, and statistical accuracy and in tolerance based on the SLM specification.
- The SLM will be set to frequency weighting 'A' or a data analyser for sampling the running value of A-weighted sound pressure level. A 'fast' time weighting will be applied in all cases.
- Measurements will be undertaken at least 3.5m from any reflecting structure other than the ground, with the SLM microphone will be placed at 1.5 metres above the ground.
- Monitoring will be undertaken during the relevant period where noise impacts have the most potential to adversely affect the closest and/or

potentially most affected NSR's in the vicinity of the noise emissions (i.e. at Asabuya Village, Musley Village and at the Military Camp).

- All noise measurements will be of a 15 minutes duration and the $L_{Aeq,15min}$ site noise level contribution determined in the absence of any influential sound, that is audibly distinguishable and extraneous to the sound from the site.
- Instantaneous noise levels for all noted noise emission sources (extraneous or otherwise) and meteorological conditions (average and maximum wind speeds, temperature, precipitation and cloud cover etc.) will be recorded during all measurements.

A maximum wind speed limit of 5m/s at the microphone will be applied. Where the maximum wind speed exceeds 5m/s at the microphone, the duration of this meteorological event and any increase in noise levels will be noted.

5.3

COMMUNITY COMPLAINTS

Complaints arising from construction and site establishment works or from mining and processing operations will be treated sensitively and in a manner that recognises the potential for noise to cause environmental impacts.

Records of any complaints associated with noise will be kept and captured on a grievance register, identifying the nature of the complaint, the particular activity, plant and/or equipment that initiated the complaint, and documenting the action taken. All complaints will be investigated and feedback provided to the complainant.

6 REPORTING AND DOCUMENTATION

6.1 GOVERNMENT/AUTHORITY REPORTING

There are no Ethiopian regulatory requirements dealing specifically with the need to submit noise monitoring reports to the Ethiopian Government.

6.2 COMMUNITY REPORTING

Any community complaints around noise will form part of the community grievance feedback process (refer to *Annex C* in *Part II* of this ESIA).

6.3 INTERNAL REPORTING

Quarterly reports during the construction phase, biannual reports during year 0 of operation and annual reports thereafter will be generated and lodged with the Yara Dallol BV board of directors as part of Yara Dallol BV's Environmental and Social Monitoring.

The reports will summarise the data collected through the monitoring programme, identifying any occasions when the action levels were triggered and the remedial action that was taken. The reports will also include the findings of the *ad hoc* observation, and will include a record of the activities resulting in impacts and any remedial actions taken, and the likelihood of a repetition of impact. The reports will also summarise any complaints received from the local communities, setting out the complaint, whether it was substantiated and any actions taken to alleviate the impact.

Table 7.1 Construction and Decommissioning/Closure Phases

Impact	Objective	Mitigation/Management Measures	Monitoring Plan	Responsibility
Noise impacts on NSR's as a result of construction / decommissioning activities associated with the establishment and decommissioning of the processing plant	To minimise impacts on the closest and/or most affected receptors situated in the vicinity of activities associated with the establishment and decommissioning of the processing plant.	<p>All construction/decommissioning works undertaken within 1,000 m of any NSR's:</p> <ul style="list-style-type: none"> Develop a one-page summary of applicable noise criteria that relate to relevant work practices and nearby receptors will be developed. This to be placed on a notice-board. Site managers will periodically check for noise related issues so that solutions can be efficiently and quickly applied. Where feasible and reasonable, the dropping of materials from height will be avoided. Where feasible and reasonable, metal-to-metal contact on equipment will be avoided. Where feasible and reasonable, mobile equipment clustering near residences and other sensitive land uses will be avoided. Ensure that periods of respite are provided in the case of unavoidable maximum noise level events. All potentially impacted receptors will be informed of noisy work to be carried out. <p>All construction/decommissioning works undertaken within 600m of any NSR's:</p> <ul style="list-style-type: none"> Plant/machinery will be positioned as to minimise noise transmission towards NSRs. The most effective mufflers, enclosures and low-noise tool bits and blades will be selected. Less annoying alternatives to conventional audible reversing alarms will be considered (and if found not to compromise safety requirements). Where possible the Project work sites will be configured to maximise forward movements of mobile equipment. Where feasible and reasonable, alternatives to diesel and petrol engines and pneumatic units will be used. Where feasible and reasonable, small equipment will be placed in an acoustically treated enclosure. Where feasible and reasonable, the throttle settings on plant and machinery will be reduced and equipment and plant will be turned off when not being used. All onsite chutes and bins will be lined with damping material. Equipment/machinery will be regularly inspected and maintained to ensure it is in good working order. To shield noise emissions to nearby NSRs, berms / earth bunds / or stockpiles will be erected. Multiple berms / earth bunds / or stockpiles may be used in order to optimise the acoustic performance of this mitigation measure. 	Operator noise measurements at the closest and most affected receptors at least every 2 to 3 months.	<ul style="list-style-type: none"> Community Liaison Officer Environmental and Social Manager

Table 7.2 Operational Phase

Impact	Objective	Mitigation/Management Measures	Monitoring Plan	Responsibility
Noise impacts on NSR's as a result of operational activities associated with the processing plant	To minimise impacts on the closest and/or most affected receptors situated in the vicinity of activities associated with the operation of the processing plant by implementing appropriate management actions during the detailed design phase of the Project.	<ul style="list-style-type: none"> Establish permanent signage around the site that is visible to all personnel, which identifies the need to limit noise. Where feasible and reasonable, equipment/machinery with lower sound power levels will take preference. Silencers will be installed on all fans if necessary. Suitable mufflers will be installed on engine exhausts and compressor components. Acoustic enclosures will be constructed for equipment radiating significant noise. Where necessary, noise emissions will be minimised and controlled through the installation of noise containments, with enclosures and curtains at or near the source equipment. Internal traffic routing in the processing plant will be optimised, particularly to minimise vehicle reversing needs. 	Operator noise measurements at the closest and most affected receptors at least twice within the first calendar year of operation (year 0) and at least once per calendar year thereafter (to year 10).	Yara Dallol BV Project Team associated with detailed design and planning of the Project
Noise impacts on NSR's as a result of operational activities associated with the transport of product through to the Port of Tadjoura	<p>To minimise impacts on the closest and/or most affected receptors situated in the vicinity of activities associated with the transportation of product through to the Port of Tadjoura by implementing appropriate management actions during the detailed design phase of the Project.</p> <p>To minimise impacts on the closest and/or most affected receptors situated in the vicinity of activities associated with the physical transportation of product through to the Port of Tadjoura</p>	<ul style="list-style-type: none"> Noise emission levels for trucks will be sourced from the suppliers of the trucks. Additional or upgraded exhaust mufflers on the product haul trucks will be considered. Consider dampening springs and bushes or the use of airbag suspension to assist in the reducing noise from unladen trailers. 	N/A	<p>Yara Dallol BV Project Team associated with detailed design and planning of the Project</p> <ul style="list-style-type: none"> Operations Manager Environmental and Social Manager
		<ul style="list-style-type: none"> The informal use of truck honking systems is prohibited (especially in residential areas) and will only be used to prevent vehicle / pedestrian / wildlife collision. 		
		<ul style="list-style-type: none"> Development of a conservative vehicle maintenance schedule. 		