

## **2. LEGISLATIVE AND REGULATORY FRAMEWORK**

The primary objective (from an environmental perspective) is to meet the various environmental guidelines and legislations applicable to this Project.

The applicable national regulations include:

- FEPA Sectoral Guidelines for Drainage and Irrigation, Power Generation, Industry (Manufacturing), Agriculture/Agro-Allied, and Infrastructure Projects.
- National Effluent Limitations Regulations (S.1.8) 1991;
- National Pollution Abatement in Industries and Facilities Generating Wastes (S.1.9) 2004;
- National Management of Solid and Hazardous Wastes Regulations (S. 1.15) 1991;
- Guidelines and Standards for Environmental Pollution Control in Nigeria 1991;
- Petrochemicals Sectoral Guidelines for EIA 1995;
- Edo State Environmental Edict;
- Relevant Local Government Bye-laws;
- National Policy on the Environment, 1989;
- Environmental Impact Assessment Procedural Guidelines 1995;
- Environmental Impact Assessment (EIA) Act No. 86 of 1992; and
- National Guidelines and Standards for Water Quality 1999

The applicable international regulations include:

- IFC/World Bank policies and guide lines
- IFC Guidance Note on PS1
- OP/BP 4.01 Environmental Assessments
- IFC General EHS Guidelines 2007
- Equator Principles

### **2.1 NIGERIA ENVIRONMENTAL REGULATIONS**

The applicable national policies include:

## **National Policy on the Environment (1988)**

This policy aims to achieve sustainable development in Nigeria, and in particular to:

- secure a quality of environment adequate for good health and well being;
- conserve and use the environment and natural resources for the benefit of present and future generations;
- restore, maintain and enhance the ecosystems and ecological processes essential for the functioning of the biosphere to preserve biological diversity and the principle of optimum sustainable yield in the use of living natural resources and ecosystems;
- raise public awareness and promote understanding of the essential linkages between the environment, resources and development, and encourage individuals and communities participation in environmental improvement efforts.

## **National Agricultural Policy 1988**

This policy promotes:

- Self sufficiency in food and raw materials production;
- Increase export promotion and rural development; and,
- Promotion of sustainable and appropriate farming methods.

## **National Economic Empowerment and Development Strategy (NEEDS) 2003**

This strategy promotes macro-economic stability to improve the performance of the agricultural and other sectors of the economy. It also provides the framework for attaining the country's Millennium Development Goals (MDGs). The objectives of the strategy include:

- Foster effective linkages between the agricultural sector and other sectors of the economy;
- Modernize agricultural production and create a sector that is responsive to the needs and realities of the Nigerian economy;
- Create more agricultural and rural employment opportunities to increase the income of farmers and rural dwellers;
- Reverse the trend in the import of food through a progressive program for agricultural expansion; and
- Strive towards food security and food surplus that could be exported.

### **Applicable National Regulations**

A number of national legislation regulating industrial activities and their impacts on the environment are applicable to this project. Relevant legislations are listed below

- National Environmental Standards and Regulations Enforcement Agency Act 2007.
- Environmental Protection Agency Decree 1998.
- Interim Guidelines and Standards for Environmental Pollution Control in Nigeria 1988.
- Effluent Limitations Regulations 1991.
- Land Use Act 1978
- Pollution and Abatement in Industries in Facilities Producing Waste Regulations 1991
- Management of Solid and Hazardous Wastes Regulations 1991
- Harmful Wastes Decree No. 42 1988
- National Guideline and Standard for Environmental Pollution Control 1991
- Workmen Compensation Act 1987
- Factories Act 1962
- Environmental Impact Assessment Act 1992

## **Institutional Framework**

### **Federal**

#### *Federal Ministry of Environment, Housing and Urban Development (FMEH&UD)*

The Federal Ministry of Environment (FMENV) was created in 1999 to take over the function of the Federal Environmental Protection Agency (FEPA). The ministry has a mandate to co-ordinate environmental protection and conservation of natural resources for sustainable development. The FMEnv was merged with the Ministry of Housing in 2006 to create the FMEH&UD. The specific responsibilities of the ministry are to:

- monitor and enforce environmental protection measures;
- enforce international laws, conventions, protocols and treaties on the environment;
- prescribe standards and make regulations on air quality, water quality, pollution and effluent limitations, the atmosphere and ozone protection, control of toxic and hazardous substances; and
- promote cooperation with similar bodies in other countries and international agencies connected with environmental protection.

### **State**

#### *Edo State Ministry of Environment*

This Ministry (formerly Edo State Environmental Protection Agency) was set up by Edo State Environmental Edict of 1994. Its duties include protecting and developing the general environment of the State. Other duties as outlined in the Edict include:

- Monitor the Implementation of EIA guidelines and procedures on all developmental projects in the State;
- Monitor and regulate disposal of solid, gaseous, and liquid wastes from facilities;
- Monitor air, water, land and soil in the State to determine pollution levels; and

- Establish penalties for persons obstructing personnel of the ministry in the performance of their duties.

## **2.2 INTERNATIONAL STANDARDS**

The applicable international policies and regulations are as follows.

### **2.2.1 EQUATOR PRINCIPLES (JULY 2006)**

The objective of the Equator Principles (“EP”) is to provide a financial industry benchmark for determining, assessing and managing environmental and social risk in project financing. The conditions under which the Equator Principles Financial Institutions (“EPFIs”) will provide financing to projects are summarized in Principles 1-9 below.

Full details regarding the Equator Principles are available at <http://www.equator-principles.com>.

#### ***Principle 1: Review and categorization:***

As part of the EPFI's project social and environmental review and due diligence, the EPFI will categorize each project based on the magnitude of its potential impacts and risks, in accordance with the environmental and social screening criteria of the International Finance Corporation (IFC) (Exhibit I of the EP).

Based on the applicable criteria, this Project is considered a category A, given its scope and magnitude.

The EP defines a Category A project as *“Projects with potential significant adverse social or environmental impacts that are diverse, irreversible or unprecedented”*.

During the drafting of the EP, there was significant debate about the regime that would apply to projects which entails relocation of process plants. There was no definitive decision reached on “grand-fathering” the emission permits. Nevertheless it is important to point out that this Project does not entail the generation of “new” environmental impacts on a global basis – essentially the environmental impacts are being transferred from one location to another.

#### ***Principle 2: Social and Environmental Assessment:***

For a project classified as category A or B, the borrower is expected to carry out a Social and Environmental Assessment which addresses all relevant social and environmental risks of the project. A recommended list of issues expected to be addressed by the assessment is described in Exhibit II of the EP, which includes, inter alia:

- Assessment of baseline environmental and social conditions;
- Consideration of feasible environmentally and socially preferable alternatives;
- Requirements under host country laws and regulations, applicable international treaties and agreements;
- Protection of human rights and community health, safety and security;
- Protection of cultural property and heritage;

- Protection and conservation of biodiversity, including endangered species and sensitive ecosystems in modified, natural and critical habitats, and identification of legally protected areas;
- Sustainable management and use of renewable natural resources;
- Use and management of dangerous substances;
- Major hazards assessment and management;
- Labour issues and occupational health and safety;
- Fire prevention and life safety;
- Socio-economic impacts;
- Land acquisition and involuntary resettlement;
- Impacts on affected communities, and disadvantaged or vulnerable groups;
- Impacts on indigenous peoples, and their unique cultural systems and values;
- Cumulative impacts of existing projects, the proposed project, and anticipated future projects;
- Consultation and participation of affected parties in the design, review and implementation of the project;
- Efficient production, delivery and use of energy; and
- Pollution prevention and waste minimization, pollution controls (liquid effluents and air emissions), solid and chemical waste management.

The assessment is also expected to propose mitigation and management measures appropriate to the nature and scale of each specific project.

***Principle 3: Applicable social and Environmental Standards:***

For projects located in non OECD countries and those located in OECD countries not designated as High-Income (as defined by the World Bank Development Indicators Database), the assessment should also refer to the then applicable IFC Performance Standards (Exhibit III of the EP) and the then applicable Industry Specific Environmental Health and Safety Guidelines ("EHS guidelines") (Exhibit IV of the EP).

For all projects, the assessment process should address compliance with relevant requirements of host country laws, regulations, and permits pertaining to social and environmental matters.

***Principle 4: Action plan and management system:***

For all Category A and Category B projects located in non-OECD countries, and those located in OECD countries not designated as High-Income, the borrower is expected to prepare an Action Plan ("AP"), which addresses the relevant findings and draws on the conclusions of the assessment. The AP should describe and prioritize the actions needed to implement mitigation measures or corrective actions as well as monitoring measures necessary to manage the impacts and risks identified.

***Principle 5: Consultation and Disclosure:***

For category A and, as appropriate, category B projects located in non-OECD countries and those located in OECD countries not designated as High-Income, the government, borrower or third party expert should consult with project affected communities in a structured and

culturally appropriate manner.

The assessment documentation and AP or a non-technical summary thereof, should be made available to the public by the borrower for a reasonable minimum period in the local language and in a culturally appropriate manner. The borrower should take account of and document the process and results of the consultation, including any actions agreed.

***Principle 6: Grievance Mechanism:***

For category A and, as appropriate, category B projects located in non-OECD countries, and those located in OECD countries not designated as High-Income, to ensure that consultation, disclosure and community engagement continues through construction and operation of the project, the borrower will establish appropriate procedures in order to receive and address concerns or grievances about the project's social and environmental performance.

***Principle 7: Independent Review:***

For all Category A and, as appropriate for Category B projects, an independent social or environmental expert not directly associated with the borrower should review the assessment, AP and consultation process documentation, to assist EPFI's due diligence, and assess Equator Principles compliance.

***Principle 8: Covenants:***

The EP also recommends incorporation of covenants linked to compliance. The borrower will covenant to:

- Comply with all relevant host country social and environmental laws, regulations and permits;
- Comply with the AP (where applicable);
- Provide regular reports in a format agreed with EPFIs on compliance with the AP (where applicable), and on compliance with relevant local, state and host country social and environmental laws, regulations and permits; and
- Decommission the facilities in accordance with an agreed Decommissioning Plan (where applicable). The level of detail contained in any such decommissioning plan will depend on the impacts associated with the project.

“The Action Plan may range from a brief description of routine mitigation measures to a series of documents (e.g., resettlement action plan, indigenous peoples plan, emergency preparedness and response plan, decommissioning plan, etc). The level of detail and complexity of the Action Plan and the priority of the identified measures and actions will be commensurate with the project's potential impacts and risks” (Equator Principles, July, 2006) Where a borrower is not in compliance with its social and environmental covenants, EPFIs will work with the borrower to bring it back into compliance to the extent feasible, and if the borrower fails to re-establish compliance within an agreed grace period, EPFIs reserve the right to exercise remedies, as considered appropriate.

***Principle 9: Independent Monitoring and Reporting:***

To ensure ongoing monitoring and reporting to EPFIs over the life of the loan, EPFIs, for all

Category A projects, and as appropriate, for Category B projects, require appointment of an independent environmental and/or social expert or require the borrower to retain qualified external experts to verify its monitoring information.

***Principle 10: EPFI reporting:***

Each EPFI adopting the Equator Principles commits to report publicly, at least annually, on its EP implementation processes and experience, taking into account appropriate confidentiality considerations.

**2.2.2 IFC PERFORMANCE STANDARDS ON SOCIAL AND ENVIRONMENTAL SUSTAINABILITY (JULY 2006)**

As of 30 April 2006, the following list of IFC Performance Standards are applicable:

- Performance Standard 1: Social and Environmental Assessment and Management System
- Performance Standard 2: Labor and Working conditions
- Performance Standard 3: Pollution Prevention and Abatement
- Performance Standard 4: Community Health, Safety and Security
- Performance Standard 5: Land Acquisition and Involuntary Resettlement
- Performance Standard 6: Biodiversity Conservation and Sustainable Natural Resource management
- Performance Standard 7: Indigenous Peoples
- Performance Standard 8: Cultural Heritage

(The IFC Performance Standards, Guidance Notes (accompanying each performance standard), and Industry Sector EHS Guidelines can be found at <http://www.ifc.org>.)

**2.2.3 INDUSTRY-SPECIFIC ENVIRONMENTAL, HEALTH AND SAFETY (“EHS”) GUIDELINES**

Environmental Health and Safety Guidelines, referred to in Principle 3 of the EP, consist of two complementary sets of guidelines available at the IFC website: <http://www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelines>.

- Industry sector environmental guidelines contained in The IFC (World Bank Group) EHS Guidelines for Nitrogenous Fertilizer Production (April 30, 2007) and the IFC (World Bank Group) General EHS Guidelines for (April 30, 2007) (“IFC GUIDELINES”).

Current versions of these guidelines can be found at <http://www.ifc.org/EHSGuidelines/Update>.

**2.2.4 THE IFC ENVIRONMENTAL, HEALTH AND SAFETY GUIDELINES FOR NITROGENOUS FERTILIZER PRODUCTION**

The IFC (World Bank Group) EHS Guidelines for Nitrogenous Fertilizer Production (April 30, 2007) and the IFC (World Bank Group) General EHS Guidelines for (April 30, 2007) contain the EHS guidelines for nitrogenous fertilizer plants. Guidelines are provided for pollution prevention and control, treatment technologies, pollutant loads, and allowable emissions, which are summarized below.

## **Pollution Prevention and Control Guidelines**

### Ammonia Plants

- Natural gas is recommended for use as feedstock where possible, to minimize air emissions;
- the recommended practice is to use hot process gas from the secondary reformer to heat the primary reformer tubes (the exchanger-reformer concept), to enhance energy efficiency;
- Direct hydrogen cyanide (HCN) gas in a fuel oil gasification plant to a combustion unit to prevent its release.
- Consider using purge gases from the synthesis process to fire the reformer; and strip condensates in order to reduce ammonia and urea;
- It is recommended to choose carbon dioxide removal processes that do not release toxics to the environment. In case monoethanolamine (MEA) or other processes, such as hot potassium carbonate, are used for carbon dioxide removal, proper operation and maintenance procedures should be adopted in order to minimize releases to the environment.

### **Target Pollution Loads**

The IFC GUIDELINES suggest the following production-related targets (the numbers relate to the production processes before introducing pollution control measures):

- New ammonia plants should set target nitrogen oxide emissions of not more than 0.5 kg.t-1 of product (expressed as NO<sub>2</sub> at 3% O<sub>2</sub>).
- Liquid effluents should not include ammonia releases of more than 0.1 kg.t-1 of product.
- Reduce condensates from ammonia production.

### **Treatment Technologies**

A list of treatment technologies is suggested in the IFC GUIDELINES. Such technologies would present useful tools to achieve cleaner production and to maintain effluent/emissions quality at acceptable levels.

- In urea plants, fugitive emissions from prilling towers may be controlled using wet scrubbers or fabric filters. Dust emissions from bagging operations may also be controlled using fabric filters.
- New urea plants should control particulate matter in air emissions to levels below 0.5 kg.t-1 of product for both urea and ammonia.
- A nitrogenous fertilizer complex generally produces other effluents such as boiler blow-down, water treatment plant backwash, and cooling tower blow-down from ammonia plants. These effluents may require pH adjustment and settling, and should preferably be recycled or reused.
- Spent catalysts are sent for regeneration or disposed of in a secure landfill.
- Finally, modern plants using good industrial practices are able to achieve the pollutant loads described below.

### **Emissions Guidelines**

The IFC GUIDELINES state that, for each project, the emission levels (for design and operation) are to be established through the Environmental Assessment process, based on

the country legislation and the IFC GUIDELINES, as applied to local conditions. Air emissions, liquid effluents, and ambient noise guidelines presented below indicate levels that are normally acceptable to the World Bank Group. Deviations from the recommended emission levels should be explained. The emission levels stipulated should be achieved for at least 95% of the time that the plant is operating, calculated as a proportion of annual operating hours. Deviations from these levels in consideration of specific local project conditions should be justified in the environmental assessment.

### Air Emissions

Table 2.1 shows the allowable levels for air emissions from nitrogenous fertilizer plants.

**Table 2.1 Air Emissions Levels for Nitrogenous Fertilizer Manufacturing Plants (IFC GUIDELINES)**

Pollutant	Unit	Guideline Value
<b><u>Ammonia Plants<sup>1</sup></u></b>		
<i>NH<sub>3</sub></i>	<i>mg/Nm<sup>3</sup></i>	<i>50</i>
<i>NO<sub>x</sub></i>	<i>mg/ Nm<sup>3</sup></i>	<i>300</i>
<i>PM</i>	<i>mg/ Nm<sup>3</sup></i>	<i>50</i>
<b><u>Nitric Acid Plants</u></b>		
<i>NO<sub>x</sub></i>	<i>mg/ Nm<sup>3</sup></i>	<i>200</i>
<i>N<sub>2</sub>O</i>	<i>mg/ Nm<sup>3</sup></i>	<i>800</i>
<i>NH<sub>3</sub></i>	<i>mg/ Nm<sup>3</sup></i>	<i>10</i>
<i>PM</i>		<i>50</i>
<b><u>Urea Plants</u></b>		
<i>Urea (prilling/granulation)</i>	<i>mg/ Nm<sup>3</sup></i>	<i>50</i>
<i>NH<sub>3</sub> (prilling/granulation)</i>	<i>mg/ Nm<sup>3</sup></i>	<i>50</i>
<i>PM</i>	<i>mg/ Nm<sup>3</sup></i>	<i>50</i>
<b><u>AN/CAN Plants</u></b>		
<i>PM</i>	<i>mg/ Nm<sup>3</sup></i>	<i>50</i>
<i>NH<sub>3</sub></i>	<i>mg/ Nm<sup>3</sup></i>	<i>50</i>

### Liquid effluents

Table 2.2 shows the allowable levels for liquid effluents from nitrogenous fertilizer plants.

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<sup>1</sup> NO<sub>x</sub> in the flue-gas from the primary reformer. The other emissions are from process, prilling towers etc. NO<sub>x</sub> in all types of plants: temperature 273K (0oC), pressure 101.3 kPa (1 atmosphere), oxygen content 3% dry flue gas.

**Table 2.2 Effluents Levels for Nitrogenous Fertilizer Manufacturing Plants (IFC GUIDELINES)**

<b>Pollutant</b>	<b>Unit</b>	<b>Guideline Value</b>
<i>pH</i>	<i>S.U.</i>	<i>6-9</i>
<i>Temperature Increase</i>	<i>°C</i>	<i>&lt;3</i>
<b><u>Ammonia Plants</u></b>		
<i>NH<sub>3</sub></i>	<i>mg/l</i>	<i>5</i>
<i>Total Nitrogen</i>	<i>mg/l</i>	<i>15</i>
<i>TSS</i>	<i>mg/l</i>	<i>30</i>
<b><u>Nitric Acid Plants</u></b>		
<i>NH<sub>3</sub></i>	<i>mg/l</i>	<i>5</i>
<i>Total Nitrogen</i>	<i>mg/l</i>	<i>15</i>
<i>TSS</i>	<i>mg/l</i>	<i>30</i>
<b><u>Urea Plants</u></b>		
<i>Urea (prilling/granulation)</i>	<i>mg/l</i>	<i>1</i>
<i>NH<sub>3</sub> (prilling/granulation)</i>	<i>mg/l</i>	<i>5</i>
<b><u>AN/CAN Plants</u></b>		
<i>AN</i>	<i>mg/l</i>	<i>100</i>
<i>NH<sub>3</sub></i>	<i>mg/l</i>	<i>5</i>
<i>Total Nitrogen</i>	<i>mg/l</i>	<i>15</i>
<i>TSS</i>	<i>mg/l</i>	<i>30</i>

### **Hazardous Materials and Wastes**

In general, non-hazardous materials should be used instead of hazardous materials whenever possible. All hazardous wastes, process residues, solvents, oils and sludges must be properly disposed. Leachates containing hazardous pollutants must not exceed the allowable limits for liquid effluent discharge.

Recommended practices for hazardous materials management, including handling, storage and transport are presented in the IFC General EHS Guidelines. These include:

1. Appropriate storage for all hazardous (ignitable, reactive, flammable, radioactive, corrosive, and toxic) materials in clearly labeled containers or vessels.
2. Storage and handling of hazardous materials and wastes must be in accordance with the local regulations and international standards and appropriate to their hazard characteristics.
3. The design of storage and liquid impoundment areas for fuels, raw and in-process materials, solvents, wastes, and finished products should include secondary containment to prevent the contamination of soil, groundwater, and surface waters.
4. Fire prevention systems and secondary containment should be provided for storage facilities, where necessary or required by regulations.
5. Specific measures are also provided in the IFC GUIDELINES general environmental guidelines for certain chemicals such as asbestos and asbestos-containing-materials, polychlorinated biphenyls (PCBs), chromates, and ozone-depleting substances.

### **Solid wastes**

Recycling or reclamation of materials is favored whenever technically and economically feasible. If recycling or reclamation is not possible, wastes must be disposed of in an environmentally acceptable manner complying with local laws and regulations.

### **Noise**

The typical sources of noise emissions in nitrogenous fertilizer plants include the large rotating equipment such as compressors and turbines, pumps, electric motors, air coolers, rotating drums, spheroidizers, conveyors, belts, cranes, fired heaters and from emergency depressurization.

After the application of noise abatement measures, noise levels should not exceed the levels presented in Table 2.3 or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.

The IFC GUIDELINES recommend that noise monitoring may be carried out for the purposes of establishing the existing ambient noise levels in the area of the plant or existing facility, or for verifying operational noise levels during the operation phase.

Noise monitoring should be carried out using a type 1 or 2 sound level meter meeting all appropriate IEC standards.

**Table 2.3 Noise Levels IFC GENERAL EHS GUIDELINES**

Receptor	Noise Level Guidelines $L_{Aeq}$ (dBA) <sup>2</sup>	
	Day (07:00 – 22:00)	Night (22:00 – 07:00)
Residential, institutional, educational <sup>3</sup>	55	45
Industrial, commercial	70	70

### **Fires and Explosions**

Common causes of fires and explosions in nitrogenous fertilizer plants include:

- accidental release of synthetic gas in ammonia plants
- ammonia release in urea plants
- explosions of air/ammonia mixture and nitrite/nitrate salts in nitric acid plants
- initiation of fire and explosion by ammonium nitrate in AN plants
- fires of fertilizer products or dust contaminated with oil or other combustible materials in the presence of a heat source.

### **Monitoring and Reporting Requirements of the IFC GUIDELINES**

1. As stipulated in the IFC GUIDELINES for nitrogenous fertilizer plants, frequent sampling may be required during start-up and upset conditions. Once a record of

<sup>2</sup> Guideline values are for noise levels measured out of doors. Source: Guidelines for Community Noise, World Health Organization (WHO), 1999.

<sup>3</sup> For acceptable indoor noise levels for residential, institutional and educational setting refer to Guidelines for Community Noise, World Health Organization (WHO), 1999.

consistent performance has been established, frequency of sampling could be reduced.

2. Air emissions should be monitored annually.
3. Effluents should be monitored continuously for pH and monthly for other parameters.
4. Monitoring data should be analyzed and reviewed at regular intervals and compared with the operating standards so that any necessary corrective actions can be taken. Records of monitoring results should be kept in an acceptable format. The results should be reported to the responsible authorities and relevant parties, as required.

### Key Issues

Finally, the IFC GUIDELINES for nitrogenous fertilizer plants makes a number of recommendations to promote and enhance compliance with the emissions requirements:

1. Natural gas, should be chosen wherever possible, as feedstock for ammonia plants.
2. Preference should be given to high-pressure processes or absorption processes in combination with catalytic reduction units.
3. The use of low-dust-forming processes for solids formation is advised.
4. Condensates and other waste liquids should be recycled.
5. Maximize product recovery and minimizing air emissions by applying appropriate methods including the use of scrubbers and bag-houses.

### 2.2.5 KNO HISTORIC EMISSIONS vs. IFC GUIDELINES FOR NITROGENOUS FERTILIZER MANUFACTURING PLANTS

The KNO emissions data (referenced in Appendix 1 and 2) indicate consistency with the IFC GUIDELINES. The comparison of the historic KNO emissions with the IFC GUIDELINES is shown in Table 2.5 below. Note that the data for the urea plant is based on the new urea granulator to be installed as part of the EPC scope.

**Table 2.4 KNO Historic Emissions vs. IFC GUIDELINES For Nitrogenous Fertilizer Manufacturing Plants (Air Emissions)**

Pollutant	IFC GUIDELINE	KNO Emission (2007) <sup>4</sup>
<b><u>Ammonia Plant</u></b>		
<i>NH<sub>3</sub></i>	<i>50 mg/Nm<sup>3</sup></i>	<i>131.39 Tons</i>
<i>NO<sub>x</sub></i>	<i>300 mg/ Nm<sup>3</sup></i>	<i>235.72 Tons</i>

<sup>4</sup> Agrium KNO reports emissions in tons as required by the US EPA. Lack of historic flow rates data inhibits conversion of the historic KNO data to mg/Nm<sup>3</sup>. The new plant will report emissions in mg/Nm<sup>3</sup> to aid comparison with the IFC Guidelines.

<i>PM</i>	<i>50 mg/ Nm<sup>3</sup></i>	<i>12.74 Tons</i>
<b>Urea Plants</b>		
<i>Urea (prilling/granulation)</i>	<i>50 mg/ Nm<sup>3</sup></i>	<i>-</i>
<i>NH<sub>3</sub> (prilling/granulation)</i>	<i>50 mg/ Nm<sup>3</sup></i>	<i>205.43 Tons</i>
<i>PM (prilling/granulation)</i>	<i>50 mg/ Nm<sup>3</sup></i>	<i>7.47 Tons</i>

The KNO water treatment facilities which form part of the utility plant will not be relocated from Kenai.

New water supply and water treatment units will be installed as part of the EPC scope. This will comprise water supply/intake (from the Ossiomo river), raw water stations, recycling water stations, wastewater treatment stations and water drainage pipe network.

The wastewater will be treated prior to release of effluent to the Ossiomo river. The wastewater treatment station will be designed to treat effluent to meet the IFC GUIDELINES listed in Figure 2.2 prior to release into the Ossiomo river.