Kuzbass Pischekombinat Livestock and Meat Processing Project

Supplementary Information

Prepared for:

Kuzbass Pischekombinat
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Annex A: Environmental and Social Management and Monitoring Plan

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Abbreviations

BAT	Best Available Techniques
BOD	Biological Oxygen Demand
BREF	Best Available Techniques reference documents
COD	Chemical Oxygen Demand
EBRD	European Bank of Reconstruction and Development
EHS	Environmental Health and Safety
ESMMP	Environmental and Social Monitoring and Management Plan
EU	European Union
IFC	International Finance Corporation
ILO	International Labour Organisation
KPK	Kuzbass Pischekombinat
KPS	Construction Contractor
MPC	Maximum Permissible Concentration
OVOS	Russian Environmental Impact Assessment
PPE	Personal Protective Equipment
PRS	Pushkinskoe Rural Settlement
RF	Russian Federation
SPZ	Sanitary Protection Zone
UNECE	United Nations Economic Commission for Europe
WB	World Bank
WPZ	Water Protection Zone

1 Introduction

This document provides information on environmental and social impacts for the Kuzbass Pischekombinat (KPK or the Company) Livestock and Meat Processing Project (the 'Project') located in Novokuznetsk and the surrounding areas. It has been prepared as part of a package of documents that have been released into the public domain to supplement existing OVOS[1] assessment materials already prepared for the Project.

KPK's investment plan includes the expansion of existing meat processing facilities, a new pig farm, the upgrade of recently purchased dairy and beef cattle farms, the development of an animal feed (fodder) plant, a new slaughterhouse and an upgrade of an existing slaughterhouse.

A number of environmental and social assessments have been carried out for the facilities listed above including OVOS documentation, in accordance with Russian Federation (RF) law, for the first phase of the pig farm, the fodder plant and the new slaughterhouse. Additional information is provided in the form of this document entitled 'supplementary documentation' for the dairy farm and the new slaughterhouse, an accompanying Non Technical Summary and an Environmental and Social management and Monitoring Plan (ESMMP) that provides an overview of the entire expansion project. Collectively these materials have been prepared in accordance with RF requirements (where an OVOS is available) and industry best practice as outlined in:

- World Bank/IFC guidelines for environmental and social management; and
- European Union reference documentation for Best Available Techniques (BAT).

International lending institutions are considering the provision of finance to KPK in support of KPK's overall expansion plan. Potential lenders to the Project include the European Bank for Reconstruction and Development (EBRD) which is considering direct funding for some elements of the overall project. This Supplementary Information (SI) document is a requirement of the bank as specified under its Environmental Policy, 2003. Of note, the EBRD is only considering direct funding for some elements of the overall project. This document therefore supplements existing information for the:

1. upgrade and expansion of the dairy farm; and
2. development of a new slaughterhouse.

As stated above, an OVOS environmental assessment study has already been prepared for the new slaughter house. Therefore whilst this Supplementary Information document provides some additional assessment it also makes reference to the existing OVOS materials as appropriate. The dairy farm does not have an OVOS and therefore additional

[1] The OVOS is an Environmental Impact Assessment required under Russian Law for projects with the potential to result in adverse environmental effects.

environmental and social impact assessment is captured in this Supplementary Information document. This does not negate the need to comply with RF requirements and produce an OVOS for the dairy farm if deemed necessary by Russian permitting authorities.

This report forms one element of the overall Project disclosure package and should be read in conjunction with the OVOS materials, the non technical summary and the Environmental and Social Management and Monitoring Plan.

2 Applicable Standards and Requirements

2.1 National legislation

The project must as a minimum comply with RF environmental law. A review of the legislative framework in provided in the OVOS documentation [Section 1.2, Ref 1]

2.2 Other standards and requirements

The existing OVOS documentation has been reviewed (where available) and assessed against EBRD's environmental assessment requirements for Category A Projects as outlined in their 2003 Environmental Policy. Of particular note, EBRD requires:

- Preparation of an EIA
- Compliance with its Public Information Policy
- Adherence to the spirit of the UNECE Convention on Access to Information, public participation in Decision-Making and access to justice (Aarhus Convention)
- Adherence to the spirit of the UNECE Convention on Environmental Impact Assessment in a Transboundary Context (ESPOO Convention)
- That the project meets good international environmental practice, such that:
    - it meets national environmental law;
    - EU standards (where applicable); and
    - World Bank Group Guidelines (where EU standards do not suffice).

The project should also meet IFC safeguard Policy on:

- Indigenous Peoples (Operational Directive OD4.20, 1991);
- Involuntary resettlement (Operational Directive OD4.30 1990); and
- Cultural property (World Bank Operational Policy Note No. 11.03. Management of Cultural Property in Bank-Financed Projects)

and

ILO core labour standards on:

- Forced labour (C105);
- Child Labour (C182); and
- Discrimination (C111).

The key EU standards/reference documents include:

- EU Environmental Impact Assessment Directive (85/337/EEC) as amended (97/11/EC);
- Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques for Intensive Rearing of Poultry and Pigs. July 2003 (BREF code ILF);
- Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Slaughterhouses and Animal By-Products Industries (BREF code SA);
- EC Directive 91/676/EEG concerning the protection of waters against pollution caused by nitrates from Agricultural sources; and
- Guidance for the Red Meat Processing (Cattle, Sheep and Pigs) Sector. Sector Guidance note IPPC SO.01. UK Environment Agency, July 2003;

It should also meet World Bank Group Environmental Health and Safety (EHS) Guidelines including:

- EHS Guidelines for Meat Processing, April 2007; and
- EHS Guideline for Mammalian Livestock Production.

3 Project Description (all facilities)

3.1 Overview

The Kuzbassky Pischekombinat Company (KPK) produces meat products for sale within Siberia, operating a number of existing farms and meat processing facilities. KPK's main meat processing facilities are located in the town of Novokuznetsk, from where it distributes meat products throughout Siberia. The farms and other facilities are located in rural areas to the north of Novokuznetsk.

KPK is currently in the process of expanding its facilities through a series of farm acquisitions, expansions and the construction of new facilities (the 'Project'). Through its proposed investment plan the Company hopes to control all elements of the meat production process, including the production of its own animal feed, cattle and pig farming, slaughter, meat processing and distribution of the finished product to market. This approach will allow KPK to manage the quality of meat product throughout the product chain from the initial stages through to the point of sale to the public and ultimately result in an improved availability and quality of product.

KPK's current operational facilities include:

- an existing meat processing facility including an external warehousing facility in Novokuznetsk where they produce a variety of pork, beef and to a limited extent chicken based meat products, including smoked sausages;
- a newly constructed and part operational pig breeding farm located approximately 40 km North of Novokuznetsk near the village of Shkolnoe;
- a recently acquired beef cattle farm located 150 km east of Novokuznetsk near the village of Parhaevka;
- a recently acquired dairy farm located 165 km northwest of Novokuznetsk near the village of Pushkino; and
- a recently acquired small scale animal slaughter facility located close to the dairy farm and the village of Krasninskoe.

The Company also intends to invest in new build facilities and the upgrade of existing facilities as follows:

- a number of upgrades and improvements to the existing meat processing facilities by the end of 2008;

- further expansion (phase 2) of the newly constructed pig breeding farm (phase 1), and associated pig fattening farm, doubling the size and capacity of the farm by the end of 2009;
- upgrade of the recently acquired dairy farm replacing the old facilities with new build facilities (barns and milking parlour) and restocking the herd by the end of 2009;
- upgrade of the recently acquired beef cattle farm replacing the old facilities with new build facilities (over wintering barns) and restocking the herd by the end of 2009;
- upgrade of the existing slaughterhouse in mid 2009;
- construction of a 'new build' slaughterhouse, close to the pig farm, in mid 2009;
- construction of a 'new build' animal feed production plant from November 2008 through to the middle of 2009; and
- a distribution and sales network, including its own shops, between November 2008 and the middle of 2009.

The location of these facilities is shown in figure 1 below.

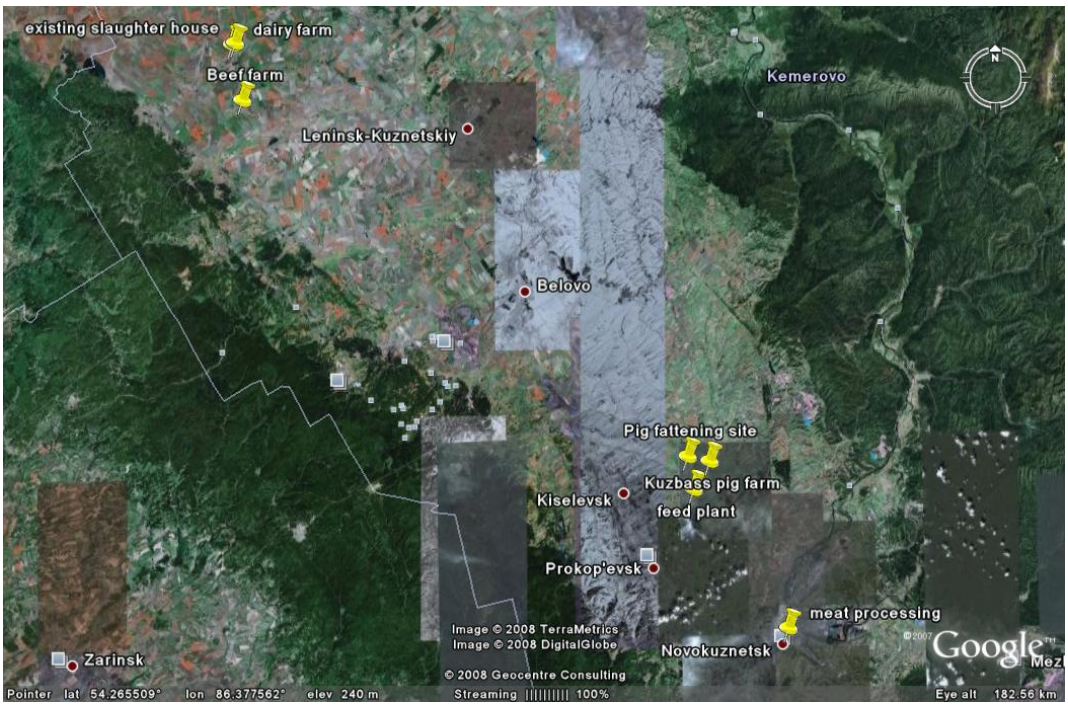


Figure 1. Location of KPK facilities

At the existing meat processing site, slaughter facility, dairy farm and beef cattle farm the company will either reuse existing buildings or in the case of the farms, existing facilities will

be demolished and the same land used for the new facilities (cow sheds). For the 'new build' facilities (new slaughter house, expansion of the pig farm and feed production plant) construction will take place on 'greenfield' land that is designated for agricultural use. The facilities are widely dispersed with distances of between several kilometres and tens of kilometres separating the sites.

The Company intends to use modern technologies and equipment imported from Western Europe. The buildings have a relatively simply design and can be erected over short durations using KPK's own construction workforce (construction will be carried out by KPS, a contractor to KPK).

The entire expansion project is described here as background. However, this document is concerned only with the provision of supplementary information for those elements of the Project funded directly by EBRD that do not already have OVOS materials, or where necessary, additional information is required to supplement the OVOS. Therefore the remainder of this document is primarily concerned with the :

1. upgrade and expansion of the dairy farm; and

2. the development of a new slaughterhouse.

Further information concerning environmental and social impacts from the other facilities are provided in OVOS materials [Ref. 1, Section 3.3 and Section 5] and an accompanying Non Technical Summary for the entire Project. [Ref. 4]

4 Environmental and social setting

4.1 Environmental setting

The Kemerovo is predominantly rural and sites will be located on either 'greenfield' locations or existing farm sites. The continental setting results in a wide annual temperature range with temperatures hot summers and prolonged cold winters. The average annual air temperature is -1.80C with its minimum -44°C (December/January), and maximum +37°C (June/July).

The annual precipitation rate is about 398 mm. Prevailing wind direction during all seasons is western and south-western. Monthly average wind velocity is 3.8 m/s. Depth of soil freezing comprises 2.0 m.

The area is dominated by the coal mining industry which has resulted in poor air quality and contaminated soils in some locations.

Information about the environmental setting is provided in the OVOS materials [Section 3.3].

4.2 Social setting

KPK's main meat processing facilities are located in the town of Novokuznetsk, from where it distributes meat products throughout Siberia. The farms and other facilities are located to the north and east of Novokuznetsk in agricultural land.

The **Prokopyevsk district** was founded in 1965 and is situated in the southern part of Kemerovo region, bordering with Novokuzneck and Belovo districts and Altaisky krai. It is 40-50 km north-east of Novokuznetsk. There are many coal mines in Prokopyevsk close to residential houses, which together with heavy traffic results in high levels of air pollution (dust, soot, CO, NO_2) and soil/groundwater contamination. The district accounts for 3.6% of Kemerovo regional area, comprising 50% of agricultural lands, 40% of forests, 2% of developed lands and 8% of other uses.

Coal mining comprises 99 % of the district's economy with more than 10 operational coal mines and 1/5 of the Kuzbass region's coal being mined here. Villages and cities within the district are connected via roads with public transport being bus. The paved roads density is 167 km per 100 km^2. There is a railway station at Trudoarmeiskaya.

The population has been steadily decreasing over recent years from 33,400 in 2004 to 32,800 in 2006. Unemployment was 4.8% in 2004 and 5.5% in October 2005. The increasing level of unemployment could be explained by a decrease in the number of employees needed by the coal industry. Other relatively minor commercial activities in the district include beef and dairy cattle farming and forestry.

The number of 'vulnerable people', in the district according to Russian definitions is approximately 9,590 people (as of February, 2008). These are likely to be pensioners, households below the official poverty line and indigenous minority population and specifically include

- Workers of labour front (357);
- Veterans of work (pensioners) (1 677);
- Rehabilitates (196);
- Kemerovo region pension recipients (1,425);
- Recipients of monthly fees for a child (1,872);
- Participants of World War II (1);
- Invalids of World War II (65);
- Residents of the blockade of Leningrad (4);
- Family members of people who died in World War II (213);
- Invalids (2,497)
- Child-invalids (121);
- Chernobyl accident invalids (1);
- Liquidators of Chernobyl accident in 1986-1987 (yy- 7);
- Liquidators of Chernobyl accident in 1988-1989 (yy- 3);
- Participants of the Chechnya war (156); and
- Other (995).

The Prokopyevsk district has 32 schools, two orphan homes, two retirement and invalids communities (hostels), two music schools, one sport school, one Central hospital, three policlinics, three local hospitals, five ambulances, 48 cultural houses, nineteen cinemas, nineteen auto clubs and 36 libraries.

The **Promishlennaya district** includes eight rural settlements including the Pushkinskoe rural settlement (PRS), and five villages- Pushkino, Parhaevka, Krasninskoe, Ivano-Rodionovsky, Kamenka. The district is located in the western part of Kemerovo region in the central part of Kuzneck depression. The neighbouring districts are Leninsk Kuznetsky region (to the south), Toguchinsky district of Novosibirsk region (to the west), Topkinsky (to the north), Krapivinsky (to the east). The administrative centre is the urbanised settlement of Promishlennaya (72 km from Kemerovo).

The Promishlennaya district covers an area of 3,100 km^2 equating to 3.2% of Kemerovo regional area and comprising 79 % of agricultural lands (including 50% of pasture lands), 17% forests, 1.4% surface water, 9.4% other land uses. It is served by an electrified railway linking from Novosibirsk to Kemerovo and has 338 km of paved roads.

The population of the Promishlennaya district is approximately 49,800, including 32,100 people involved in agriculture (as of January 1, 2008).

The Pushkinskoe rural settlement (PRS) covers an area of 330 km^2 which is comprised of 19,100 hectares of crops (including 12,700 hectares of grain crops and 6,100 hectares of feed crops). It has a population of 3,036 people including Pushkino (212) people, Krasninskoe (1,327) and Parhaevka (266), and a population density of nine people per km^2. Agriculture represents the main commercial activity, dominated by grain, meat and dairy production. The area is served by two schools, one nursery, one hospital, two libraries and four houses of culture. There is also a bus service to other villages in the district

Social baseline characterisation has not identified any indigenous minority people, cases of involuntary resettlement or cultural property that might be directly affected by the Project.

Information about the environmental setting is provided in the OVOS materials [Section 5].

5 Project Description (slaughterhouse and dairy farm)

5.1 New Slaughterhouse - facility description

The proposed slaughter house will be constructed by mid 2009 approximately 5km to the west of the main pig breeding farm complex. This is based upon a separation zone in accordance with good international practice and a Sanitary Protection Zone of 1km from the village of Shkol'nyy. It will only slaughter pigs from KPK's own pig farm facilities to minimise the risks of cross contamination between farms and has a design capacity to meet the needs of KPK's fully operational phase 1 and 2 pig farm (See NTS, Ref. 4). The slaughterhouse will be designed and equipped using western European technologies and constructed by KPK's own construction division. It will have the capacity to slaughter 120 pigs/hour or 9,660 tonne/year (meat on bone) and require approximately 30 employees once operational. Hot water for heating, cleaning and use in the treatment of the carcasses will be provided by the site's boiler house. The site will source electricity from Kuzbasenergo municipal supply. Water will be drawn from the same wells that serve the pig farm.

KPK has also considered the commissioning of an energy-from-waste recovery plant, to utilise inedible animal by-products in the production of bio fuel although there are no plans at this time to proceed with the facility.

5.1.1 Main specifications of the slaughterhouse

Table 1 below provides details of the main specification of the slaughterhouse

Slaughtering Capacity - pigs/hour - meat on bone, t/y - boneless meat, t/y	 120 9,660 8,018
Annual capacity, pigs/year	260 000
Electric power supply sources	Grids of OAO Kuzbassenergo
Estimate headcount of employees	30
Estimate power demand (maximum)	heat – 10.8 MW (all sites); electricity – 3000 kW
Estimate annual demand in water resources to meet the production needs (full capacity),	300,000 m^3/y
Transportation needs	Most of the goods will be transported by trucks (52,045 t/y).

Table 1: Slaughterhouse specifications

5.1.2 Description of slaughterhouse operations

The slaughterhouse has been designed with separate areas for immobilization, bleeding, skinning, gutting and inspection.

The pigs will arrive in vehicles specially designed for the transport of live pigs, will be unloaded and then housed in a lairage area (the area used to temporarily house pigs before they are slaughtered). The following slaughter and cutting process line will then be used:

- Stunning (immobilisation);
- Sticking (cutting of throat and bleeding);
- Cleaning/scalding and dehairing;
- Gutting; and
- Carcass preparation (carcass halving).

Each of these processes is discussed further in turn.

Stunning (Immobilization)

There are a number of acceptable methods to stun pigs including captive bolt, electronarcosis, exposure to carbon dioxide and concussion. The proposed slaughterhouse will utilise electronarcosis in which electrodes are placed to span the brain enabling a current to pass through it. The electric shock is designed to stun rather than kill the pigs. The process is carried out in a manner that minimizes the stress to pigs.

Sticking (cutting of throat)

Immediately after stunning a chain will be wrapped around a hind leg and the pig lifted. An automated overhead rail will move the pigs to the bleeding line where the throat is cut and the blood is allowed to drain into a collected tank.

The bleeding operation ensures that all the blood leaves the animal. The cutting knife edge will be sterilized through immersion in a hot water sterilizer operating at a temperature of at least 82° C. The bleeding duration is at least 6 minutes. Blood will be collected in a blood bath and pumped through the closed line to the collecting tank located in a room separated from the slaughtering area. The blood can be further processed for use in human or animal food production.

Cleaning, scalding and dehairing

Following the bleeding operation and prior to scalding, pigs will pass through the washing facility to remove the bulk of any mud/manure. They will then be drawn via an overhead rail through a scalding tank where it will be fully submerged in water at a temperature of 60°C for 5-6 minutes to loosen the pig hair. The pigs are then unchained and placed in a dehairing machine where hair is removed by rotating rubber flails. The operation will last for 3 minutes. The hair is a usable by product that will be collected in drums and taken by a dedicated conveyor to the hair treatment area.

Drying: Singeing and Cleaning

Pigs will be re-hung on another overhead rail (this time on hooks placed through the hind legs), and will be dried with rubber flails which also help to further remove hairs. After the drying, the carcass will be sent to the singeing furnace and exposed to flames at a temperature of 900 to 1000°C. This operation lasts for only a few seconds during which surface impurities and bacteria are removed and any remaining hair is singed. The furnace is fired with natural gas, and furnished with exhaust fans and hood to extract air emissions. After singeing, the carcass passes through a final cleaning/cooling machine, where it will be sprayed with cold water and again cleaned with rotating flails. The singed hair residues will also be removed at this stage.

Gutting

Gutting will take place with the animal still hanging from the overhead rail. The abdominal membrane will be cut to remove stomach, bowels, liver, lungs, heart, and tongue. The gutting operation will be finished within 30 minutes after the bleeding operation. Abdominal cuts will be made with sterilized cutters and saws.

The inners will be sent to the inspection together with the carcass to be clearly identified as part of the same pig. The inners (including food waste) will be collected, inspected and sent to the bowels area to have the content of the bowels removed and the bowels cleaned. Any inedible waste will be accumulated in closed containers and stored in the condemned material rooms to be then transported by specialized operators to rendering plants. The bowel contents will be collected and moved using compressed air (minimizing water use) to a waste collection area.

Halving the Carcass

The operator will halve the pig along the spine forming two halves connected by way the head. After the inspection, the carcasses will be washed in a shower and weighed. Following the veterinary inspection carcasses will be sent to the refrigeration chambers for storage prior to being shipped. The Project will include cooling and refrigerating chambers, and chambers for the storage of frozen products.

All the carcass by-products (blood, skins and product unfit for human consumption) will be sent to specific premises that are separated from the slaughtering area. No meat products will by used in other products, for example pet foods or for the production of tallow.

The remaining edible waste, red inners and heads are processed in a specific room that is separated from the slaughtering area and gut room and then stored in refrigerated chambers at a temperature of $0/+2^0$ C prior to shipment.

5.2 Dairy farm - facility description

KPK recently acquired a dairy farm located 165 km northwest of Novokuznetsk near the village of Pushkino. Currently the cows are housed during the winter months from

November to April and graze on leased pasture land during the summer months returning twice daily to the farm for milking.

The Company intends to upgrade the dairy farm by replacing the old facilities with new build facilities (barns and milking parlour) and restocking the herd in 2009. Two barns will be constructed each with a capacity for 600 cows using technologies from Western Europe. The barns will be based on a modern loose housing system design with various separated departments for milked cows, heifers, calves, dry cows, etc. Cows can move freely throughout the stable departments which are equipped with cubicles for resting, feed lots for the provision of concentrate and a centrally situated feeding fence. There will also be an indoor milking parlour. The barns have slatted floors and are equipped with automatic cleaning scrapers with manure basins underneath to collect manure (and urine). Following construction of the new barns, cattle will be housed indoor throughout the year and the pasture released. The existing buildings will be dismantled or possibly reconstructed and the waste materials will be disposed of to licensed waste contractors.

Construction of the two new barns will take approximately 6 months.

6 Potential impacts

This section discusses the potential impacts associated with the new slaughterhouse and dairy farm in turn. Where significant impacts are identified, mitigation measures necessary to reduce impacts to acceptable levels are outlined. Of note, OVOS documentation has been prepared for the proposed slaughterhouse [Ref 3], and this section therefore only summarises the key environmental issues and mitigation measures associated with the slaughterhouse.

6.1 New slaughterhouse

During the construction, environmental and social impacts will be typical of any medium-scale construction project in a rural area, for example nuisance issues such as noise and dust. These impacts can be readily managed through a number of measures and actions and in many cases will be effectively controlled by the use of best available techniques for slaughterhouse facilities. During the operational phase impacts will be typical of those specific to the meat processing industry, including the production of solid waste and by-products, waste water management, emissions to air, odours, energy and water resource consumption. Animal welfare, including transport of the pigs and temporary housing of pigs prior to slaughter are also important issues for any slaughterhouse.

The table below provides an overall summary of the potential impacts from the slaughterhouse before the implementation of the mitigation measures/controls. Each of these is then discussed in more detail to determine the likely significance of impacts and if necessary identify mitigations to reduce impacts to acceptable levels.

Table 2. Potential impacts from construction and operation of the new slaughterhouse

	Air quality	Odour	Dust	Surface waters	Groundwater	Soil contamination	Water use	Noise	Energy Efficiency	Transport infrastructure	Road safety	Wastes	Community Health	Socio-economic	Occupational Health	Animal Welfare
Construction																
Transportation			●					●		●	●			●p		
Earthworks	○		●					●				●		●p		
Construction works	○						○							●p		
Abnormal events	○				●	●						●	●		●	
Operations																
Live animal transport			●					●		●	●	●		●p		●
Lairage		●			●	●	●	●	●			●		●p		●
Slaughter/processing	●	●					●		●			●		●p	●	●
Effluent treatment					●	●							●			
Boiler house (emissions)	●											●				
Transport (of meat)			●							●	●			●p		
Abnormal events	●				●	●						●	●			

Key
- ● Potential significant adverse impact
- ○ Potential minor adverse impact
- ●p Potential positive impact

Slaughterhouse, impacts and mitigation measures (construction)

Construction works will take approximately 6 months to complete. They will involve site preparation earthworks, provision of drainage, temporary workshop areas, construction of the slaughterhouse and ancillary facilities. These activities will result in air emissions (mainly from construction vehicles), noise and dust, solid wastes, generation of wastewater and possibly result in accident spillage of chemicals and fuels.

A number of measures and working practices are required to mange these issues in order to minimise the impacts on the environment and local communities. Specific measures are outlined in the Environmental and Social Management and Monitoring Plan in Annex A of this document. These include:

- Health, safety and environmental awareness training (ESMMP, row GE2);
- Solid waste management (ESMMP, rows GE3 and GE4);

- Handling of hazardous materials (ESMMP, row GE5);
- Protection of air quality, including dust suppression techniques (ESMMP, rows GE6 and CE1);
- Community Safety/traffic management (ESMMP, row GH10);
- Security to prevent access and injury to the public or animals (ESMMP, row CE4)
- Minimisation of noise and vibration (ESMMP, row CE2);
- Wastewater treatment/collection (ESMMP, row CE3);
- Protection of terrestrial habitat (ESMMP, row CE5);
- Prevention of Soil Erosion during earthworks (ESMMP, row CE6);
- Site reinstatement including removal of all temporary structures and reinstatement or temporary workshop areas etc to its former condition (ESMMP, row CE7); and
- Emergency response action to deal with minor chemical/fuel spillages (ESMMP row GE5).

There are also requirements in the ESMMP to enhance some of the social benefits associated with this project, most notably the generation of local employment (ESMMP, row GS1).

Further detail on some of the potential impacts and mitigation measures is provided below.

Increased traffic

During construction, traffic levels will increase due to the delivery of construction materials and personnel, potentially resulting in some deterioration in the quality of roads surfaces, increased risk to pedestrians, and increases in dust and noise. However, the slaughterhouse will be constructed on land already owned by KPK at least 1 km from the nearest residences. The site will be accessed by a newly constructed track that will connect the construction site with an existing municipal road. The site will be accessed without the need for construction vehicles to pass through nearby villages and therefore increased construction traffic is unlikely to impact on nearby villages.

A number of measures can be put in place to reduce these risks/impacts, including speed restrictions on KPK vehicles close to residential areas and on vulnerable roads if necessary (ESMMP, row GH10).

Community disputes/conflict

On large construction projects there can be a significant influx of construction workers, often from outside of the region or even from overseas. With the influx of workers there can be additional pressure placed on infrastructure e.g. medical health facilities, roads, accommodation and in some cases an increase in infectious diseases affecting local community members. There can also be conflicts and disputes between local community members and construction workers. However, such impacts are unlikely for this construction project because:

- The scale and duration of construction will not result in large numbers of construction workers;
- KPK will use its own construction workforce which is local to the region;
- The worksite/camp will have a set of rules to ensure minimal impact to the environment and to nearby community members of nearby residential areas. This will include a Camp Management Plan which will not only outline basic requirements health and safety and environmental awareness, but also basic requirements for good behaviour and courtesy to local community members. (Code of conduct - ESMMP, CS1)

Impacts and mitigations measures (operation)

Transportation of live animals

The pigs will be transported from KPK's finishing (fattening farms) using a fleet of vehicles designed for the transport of live animals. When transporting live animals strict animal welfare standards apply. In Russia animals must be transported in accordance with Federal Law #52 dated April 24, 1995 (last amended) "On animals which specifies vehicles requirements, space per animal, veterinary provisions, access to food and water, loading and unloading requirements, ventilation and temperature, rest periods during long journeys etc. The same requirements are also laid out in EU Guidance for Best Available Techniques, prepared in accordance with Animal Welfare: EU Welfare in transport regulation (EC) No 1/2005. The regulation requires that all persons who take animals on a journey, whatever the length, should always apply the following good transport practice:

- The journey is properly planned and time is kept to a minimum and the animals are checked and their needs met during the journey;
- The animals are fit to travel;
- The vehicle and loading and unloading facilities are designed, constructed and maintained to avoid injury and suffering;
- Those handling animals are trained or competent in the task and do not use violence or any methods likely to cause unnecessary fear, injury or suffering; and
- Water, feed and rest are given to the animals as needed, and sufficient floor space and height is allowed.

It further specifies animals that cannot be transported, including:

- Unfit animals;
- Very young animals except if the journey is less than 100 km, e.g. calves of less than 10 days of age, pigs of less than three weeks and lambs of less than one week; and

- Pregnant female animals (if they have reached the latest stage of gestation (within 10% of the estimated time of the gestation before birth) and for a period of one week after giving birth.

For journeys up to 65km transporters are not required to have vehicle authorisation or training and certificates of competence. However, they must comply with the technical rules on fitness to travel, means of transport and transport practices (Annex 1 of Council Regulation 1/2005), requiring:

- Vehicles/containers and their fittings shall be designed, constructed, maintained and operated so as to:

  (a) avoid injury and suffering and to ensure the safety of the animals;

  (b) protect the animals from inclement weather, extreme temperatures and adverse changes in climatic conditions;

  (c) be cleaned and disinfected;

  (d) prevent the animals escaping or falling out and be able to withstand the stresses of movements;

  (e) ensure that air quality and quantity appropriate to the species transported can be maintained;

  (f) provide access to the animals to allow them to be inspected and cared for;

  (g) present a flooring surface that is anti-slip;

  (h) present a flooring surface that minimises the leakage of urine or faeces; and

  (i) provide a means of lighting sufficient for inspection and care of the animals during transport.

- Sufficient space shall be provided inside the animals' compartment and at each of its levels to ensure that there is adequate ventilation above the animals when they are in a naturally standing position, without on any account hindering their natural movement.
- Partitions shall be strong enough to withstand the weight of animals. Fittings shall be designed for quick and easy operation.
- Piglets of less than 10 kg, lambs of less than 20 kg, calves of less than six months and foals of less than four months of age shall be provided with appropriate bedding material or equivalent material which guarantees their comfort appropriate to the species, the number of animals being transported, the journey time, and the weather. This material has to ensure adequate absorption of urine and faeces.

During transportation, journey times must not exceed 8 hours without a feed/watering/rest period or 24 hours provided they have continuous access to water. Pigs must at least be able to lie down and stand up in their natural position. In order to comply with these minimum requirements, the loading density for pigs of around 100 kg should not exceed 235 kg/m^2.

KPK's pigs will come from the nearby finishing farms located approximately 5 km from the slaughterhouse, thereby significantly reducing transport induced stress. As a consequence of the short distances involved, some of the requirements outlined above do not apply. Nevertheless, KPK will adhere to standards set forth for the transport of live animals to the extent they apply to KPKs operations.

Lairage

Pigs arriving for slaughter will be kept in temporary holding pens (lairage pens) for up to a maximum of 20 hours. This facility will be newly constructed in line with good industry practice.

The EU adopted detailed welfare at slaughter rules in 1993. They are set down in Directive 93/119/EC on the protection of animals at the time of slaughter or killing. This Directive requires that animals shall be spared any avoidable excitement, pain or suffering during movement, lairaging, restraint, stunning, slaughter or killing. It also requires that the construction, facilities and equipment of slaughterhouses, and their operation, shall be such as to spare animals any avoidable excitement, pain or suffering. To this extent lairage facilities must protect animals from adverse weather, provide moderate amounts of food (if kept more than 12 hours) and water, have bedding if kept overnight and space to lie down, must be separated from other animals if they might cause harm to one another. The slaughterhouse must also have a separate area for sick or injured pigs.

The new slaughterhouse will be designed to EU standards by western European companies, ensuring adequate space, ventilation, anti-slip flooring, passage ways designed to avoid injury etc. During the summer months the region can be warn reaching temperature of around 30^{o}C. Pigs are particularly vulnerable to heat stress and the lairage pens will therefore be fitted with a sprinkler system capable of administering a fine mist to keep the pigs cool (and calm). Further details are provided in chapter 2.3 of the slaughterhouse OVOS [Ref. 3].

Pigs kept in lairage pens are either not fed or provided moderate quantities of food if kept in lairage pens for more than 12 hours. This reduces the volume of food in the stomach (which has to be recovered following slaughter) and also helps minimise the volume of manure generated. Nevertheless, some manure will be produced which will be collected and transported to main lagoons at the nearby pig breeding farm (see Non technical Summary [Ref 3]).

Slaughter/processing

The slaughter process is described in Section 5, resulting in the generation of wastes, wastewater, air emissions and high levels of resource consumption.

Waste products from the slaughtering process can often be utilised as a by-product. Wastes include manure from the lairage pens, contents of the pig stomachs, inedible by-products such as hair and bones, fat recovered via fat separators and non recoverable materials that

require disposal. KPK plans to maximise the use of these by-products in the following manner:

- Manure will be transported to the main manure lagoons for later application to agricultural land as fertiliser
- Blood will be collected and used in animal foods
- Stomachs will be cleaned and sold for human consumption;
- Bones will be sold via retail outlets
- Inedible fats, for example, recovered via fat separators at the water treatment plant will be sent to a rendering facility;
- Intestines will be cleaned and used for sausage casings;
- Mucosa from the small intestine will be sent to the waste water treatment plant for treatment and then discharge; and
- Injured and in some cases sick pigs will be separated from other animals, slaughtered and sent to a rendering plant (under advice from State Veterinary Services).

As a result there is very little waste that can not be used as a valuable by-product. Waste streams are discussed in more detail in Chapter 4.3 of the OVOS [Ref 3.]

General wastes, including plastics, light bulbs, office wastes etc will be collected by a licensed waste contractor. Further information on general wastes is provided in Section 4.3 of the OVOS [Ref. 3].

Wastewater treatment

Process water from a slaughterhouse will typically have a high organic content due to blood, mucosa which results in a high Biological Oxygen Demand (BOD). It may also have a high nitrogen content, pathogens and phosphorus from the blood and contain detergents from cleaning operations. Volumes of effluent also tend to be high because of the need to clean pigs, daily replacement of water in the scalding tank and wash down of equipment and flooring on a daily basis.

The slaughterhouse will use modern technology and design, in line with good international practice to reduce effluent volumes and reduce the BOD of the wastewater actually reaching the water treatment plant. Measures will include efficient draining of blood from the pigs (extended duration of draining), the use of screens over floor drains to trap solids, trigger operated hoses to prevent unnecessary use of water when cleaning floors (e.g. from hoses left running unnecessarily) and movement of some by-product such as bowel content by compressed air. Cleaning agents will be carefully selected with preferential selection of those agents that are relatively less environmentally damaging.

The site will have effluent treatment facilities. At the time of writing the design of the plant has not been finalised although it is expected to consist of mechanical clarification using a 1mm screen followed by chemical flocculation, flocculent removal and dewatering and

disposal of resultant solid waste, and biological treatment in order to meet its discharge consents [see Section 4.2, Ref 3].

The treated wastewater will be discharged to the municipal sewerage system with zero discharge to surface waters. Separate systems will be in place for surface run-off water and sanitary wastewater.

Emissions to air

Air emissions from the actual slaughtering process are relatively small. For the proposed slaughterhouse the two main emissions result from the singeing process and from the coal fired boiler house.

Emissions to air have been assessed in the OVOS [Ref 3, Section 4.1.1]. The OVOS estimates the emission of nitrogen dioxide, ammonia, sulphur dioxide, carbon dioxide and total particulates amongst others. All the pollutants were predicted to be less than the Maximum Permissible Concentration (MPC) at the edge of the Sanitary Protection Zone[2] (SPZ), a distance of 1 km from the proposed site.

One of the main issues arising from slaughterhouse is odour. Odours can be released from the lairage facilities (manure), the singeing process and the waste water treatment plant (if malfunctioning/poorly operated). Under RF law there are no requirements to assess odours and; therefore, air emission assessments carried out as part of the OVOS do not directly consider odours and no dedicated odour abatement equipment will be used at the site. Anecdotal evidence from other large scale pig slaughter facilities show that odour can be controlled in a well managed facility. However, odour abatement is required under international good practice and the lack of any odour assessment represents a significant uncertainty over the issue and for this reason odour monitoring should be undertaken at the edge of the SPZ, with consideration given to the installation of odour abatement equipment in the future if necessary.

Particulates can be generated from lairage facilities due to moving animals and the singeing process. At the proposed slaughterhouse lairage facilities will be in closed buildings and dust from lairage is not considered a significant issue. This will also help to minimise noise and odours. Particulates from singeing are largely as result of fuel combustion. The use of clean burning natural gas, as recommended for good international practice, will be used at the KPK slaughterhouse and will therefore minimise particulate emissions.

Transport

The operational phase of the new slaughterhouse will result in increased traffic with several trucks arriving at the site each day. However, the impacts will be minimal because the small distances between the finishing farm and the slaughterhouse and ample capacity of the existing road system for such vehicles. Nevertheless, vehicles will be well maintained (to

[2] SPZ is a buffer zone around a facility where certain activities are prohibited to protect public health. Prohibited activities include: residential areas and individual dwelling houses; landscape and recreational zones; leisure areas; health resorts; gardening and cottage areas; summer resort communities and individual “dachas”/country houses and other activities with specified high/restrictive environmental quality parameters; sport facilities; children’s playgrounds; educational and childcare centres; and medical institutions for public use.

prevent unnecessary exhaust emissions) and drivers will be appropriately trained and authorised to transport live animals.

Abnormal events (including spread of disease)

One of the biggest risks to an intensive livestock farmer is an outbreak of infectious disease which can ultimately result in part of all of the farm animal stock being destroyed. Consequently strict measures are put in place to avoid cross contamination between farms and facilities, including controls over the movement of livestock and people, disinfection procedures for people entering the facilities and for trucks leaving the site (tyre wash and disinfection). The KPK slaughterhouse will receive added protection because the pigs will be sourced exclusively from KPKs own breeding and finishing farms where similar strict controls are in place. However, emergency plans are required in the event of an outbreak of disease; such plans are discussed further in Section 8.

Other abnormal events might include loss of power and the outbreak of fire. The facility will have its own back up power supply using diesel generators to protect against a loss of power [Ref 3. Chapter 2.4] and will be equipped with an automatic fire detection system and fire hose system.

Other issues

The facility will have a high energy and water usage. Water will be sourced from the same artesian well used for other parts of the pig farm complex. Hydrogeological studies have confirmed groundwater recharge rates and the suitability of this water source [Chapter 2.5 of the OVOS [Ref 3.]) Measures to reduce water usage are described above under Waste water treatment although further consideration should be given to the recycling of uncontaminated process water, for example, in truck washing.

Energy will be supplied from municipal electrical system (Kuzbasenergo) as discussed further in Chapter 2.4 of the OVOS [Ref 3.]. Measures to reduce energy consumption should be built into the design of the facility and include use of properly insulated materials, automated singeing flame that switches off between carcasses, insulated sterilisers (for knife sterilisation and efficient refrigeration systems. These measures are included within the facility design, although further consideration could be given to the utilisation of organic wastes for production of bio fuels in the future.

The OVOS concluded that, based estimation of social economic trends in the area of Prokopievsk region under review, the pig complex construction (including the slaughterhouse) will positively affect the living conditions of the local population by decreasing unemployment, causing a growth of overall income of the population, improving living standards and by providing additional opportunities for prospective development of rural settlements, implementation of social programs. The intended activity will also facilitate a breakthrough of the regional economy and growth of the area's investment attractiveness.

Monitoring

The OVOS does not specify the need for any monitoring at the slaughterhouse. However given the comments regarding odour above, air quality monitoring at the edge of the SPZ would be appropriate. Such monitoring is also required to confirm actual levels of air pollutants against the predicted air pollutant concentrations and should be further refined within detailed design documentation.

Further information is available in the slaughterhouse OVOS [Ref 3].

6.2 Dairy farm

The table below provide an overall summary of the potential impacts from the dairy farm before the implementation of the mitigation measures/controls outlined in this section. . Each of these is then discussed in more detail to determine the likely significance of impacts and if necessary identify mitigation measures to reduce impacts to acceptable levels. In many respects, the environmental and social setting and the nature of construction activities is similar to that of the slaughterhouse described above. As a result the impacts and proposed mitigation measures are largely the same.

Table 3. Potential impacts from expansion/construction and operation of the dairy farm

	Air quality	Odour	Dust	Surface waters	Groundwaters	Soil contamination	Water use	Noise	Energy Efficiency	Transport infrastructure	Road safety	Wastes	Community Health	Socio-economic	Occupational Health	Animal Welfare
Construction																
Demolition	○		●			●		●				●	●	●p	●	
Transportation			●					●		●	●			●p	●	
Earthworks	○		●					●				●		●p		
Construction works	○		●				○									
Camp management	○						○									
Abnormal events	○				●	●						●	●		●	
Operations																
Housing/feeding/milking								●	●			●		●p		●
Silage		●		●	●	●							●		●	
Manure management	●	●		●	●	●										
Death (natural causes)												●				
Transportation			●							●	●					
Abnormal conditions (e.g. fire, disease)	●				●	●						●	●		●	

Key

- Potential significant adverse impact

○ Potential minor adverse impact
●p Potential positive impact

6.2.1 Dairy Farm, Impacts and mitigation measures (construction)

The construction works will take approximately 6 months to complete and will involve site preparation earthworks, provision of drainage, temporary workshop areas, construction of the new dairy barns and ancillary facilities. These activities will result in air emissions (mainly from construction vehicles), noise and dust, solid wastes, generation of wastewater and possibly result in accident spillage of chemicals and fuels.

A number of measures and working practices are required to manage these issues in order to minimise the impacts on the environment and local communities. Specific measures are outlined in the Environmental and Social Management and Monitoring Plan in Annex A of this document. These are similar to the measures specified for the slaughterhouse, including:

- Health, safety and environmental awareness training (ESMMP, row GE2);
- Solid waste management, with particular attention to the hazardous waste materials (e.g. asbestos) from demolition of the existing barns (ESMMP, rows GE3 and GE4);
- Handling of hazardous materials, (ESMMP, rows GE5);
- Protection of air quality, including dust suppression techniques (ESMMP, row GE6 and CE1);
- Community Safety/traffic management (ESMMP, row GH10);
- Security to prevent access and injury to the public or animals (ESMMP, row CE4)
- Minimisation of noise and vibration (ESMMP, row CE2);
- Wastewater treatment/collection (ESMMP, row CE3);
- Protection of terrestrial habitat (ESMMP, row CE5);
- Prevention of Soil Erosion during earthworks (ESMMP, row CE6);
- Site reinstatement including removal of all temporary structures and reinstatement or temporary workshop areas etc to its former condition (ESMMP, CE7); and
- Emergency response action to deal with minor chemical/fuel spillages (ESMMP GE4).

There are also requirements in the ESMMP to enhance some of the social benefits associated with this project, most notably the generation of local employment (ESMMP, GS1).

Further detail on some of the potential impacts and mitigation measures is provided below.

Traffic

During construction, traffic levels will increase due to the delivery of construction materials and personnel, potentially resulting in some deterioration of roads surfaces, increased pedestrian risk, dust and noise. The dairy farm is located approximately 1 km from the nearest residences although traffic will use local roads which pass through or close to residential areas. The heavy vehicles will bring increased noise and dust and will possibly affect the structure and integrity of the road surfaces, particularly where they are not paved.

A number of measures will be put in place to reduce these risks/impacts, including speed restrictions for project vehicles close to residential areas and on vulnerable roads if necessary (ESMMP, GH10).

Demolition/Construction works

During demolition of the existing barns, the asbestos roofing will be removed and disposed by licensed specialist contractors (in line with RF requirements) and non hazardous materials disposed to a licensed landfill site.

Community disputes/conflict

On large construction projects there can be a significant influx of construction workers, often from outside of the region or even fro overseas. With the influx of workers there can be additional pressure placed on infrastructure e.g. medical health facilities, roads, accommodation) and in some cases an increase in infectious diseases affecting local community members. There can also be conflicts and disputes between local community members and construction workers. However, such impacts are unlikely for this construction project because:

- The scale and duration of construction will not result in large numbers of construction workers;
- KPK will use its own construction workforce which is local to the region; and
- The worksite/camp will have a set of rules to ensure minimal impact to the environment and to nearby community members of nearby residential areas. This will include a Camp Management Plan which will not only outline basic requirements health and safety, environmental awareness, but also basic requirements for good behaviour and courtesy to local community members. (Code of conduct - ESMMP, CS1)

6.2.2 Dairy Farm, Impacts and mitigations measures (operation)

Table 3 shows that the key environmental issues associated with dairy farming include: waste management; wastewater; air emissions; and animal disease. These are discussed further below

Water supply

Clean (drinking) water is currently supplied solely by the municipality from wells shared with other users. KPK has plans to source water from a new groundwater well (also to be owned by the municipality) which will be installed before the end of 2008. This new well is located approximately 600m northwest of the site and will also be used to supply the slaughterhouse which is situated approximately 750km south of the dairy farm. The demand for water will increase in line with the increased number of cattle. Studies have been undertaken that confirm the well can supply the farm's needs without adverse impact on other users in the area.

Waste water

Waste water at the farm will result from cleaning activities (e.g. milking equipment in the milking parlour, wash down areas) but quantities will be relatively minor. Nevertheless the liquid waste stream can have high levels of Biological Oxygen Demand (BOD)[3], nutrients and suspended solids. The new build farm will be designed with separated stormwater drainage and a process wastewater system. Process water will be treated in a wastewater treatment plant, to be designed as part of the project's design documentation, in order to meet RF discharge limits (and WB/IFC discharge guideline values where applicable) before its anticipated release under license to the nearby municipal sewer system. See ESMMP, Row OE8)

Housing/feeding/milking

The new buildings will be designed to western European standards with animal welfare built into the design (see below). The cattle will be housed in insulated buildings with controlled temperature and ventilation systems and ample space per cow (in line with SniP 2.10.03-84 "On buildings and constructions of livestock, poultry farms and fur farms").

Cattle will be housed within the barns throughout the year.

Waste management

The dairy farm will produce a number of waste streams during normal operations including general wastes in the form of packaging, waste feed, used ventilation filters, plastics, oily rags, light bulbs. Animal wastes including manure and dead animals.

General wastes are expected to be minimal and will be collected by licensed waste contractor for disposal to licensed disposal site.

The farm is likely to loose some cows either through natural death or from injury/disease. The cattle barns will be designed with segregated areas for sick and dead animals where animals will be kept whilst awaiting veterinary inspection.

If animals do not recover, they will be slaughtered and disposed of in an appropriate manner depending upon the cause of death and in accordance with advice from the veterinary

[3] Biological Oxygen Demand (BOD) is a measure of water quality. A high BOD would indicate that water is polluted.

service. For example, if the death is a result of natural causes (as determined by the veterinary) the carcass will be sent to a rendering plant. However if the animal died to ill health it will be disposed under license to a dedicated burial pit located 3 km from the dairy farm. Procedures for disposal will be determined by the State Veterinary Service and will vary depending upon the nature of the dead cow. Of note, burial of dead animals is forbidden in some countries, but is permitted within the RF. This issue is discussed further in Section 8.

Further information concerning mitigation measures is provided in the ESMMP, rows GE3 and GE4.

Manure

Significant volumes of manure will be produced by the dairy cattle consisting largely of un-metabolised nutrients. It contains nitrogen and phosphorus, disease causing bacteria and will also result in the emission of ammonia. It therefore requires careful management in order to protect groundwater/surface water resources and human health.

In the existing tie-stall barns, manure (and urine) is removed mechanically from the stables and stored on open ground which can lead to the uncontrolled release of nitrogen and phosphorus nutrients and impacts on soil and groundwater quality. Manure storage at the farm is currently not in accordance with the EU Directive 91/676/EEG promoting reduction of nitrogen release, including dedicated storage of manure with protection against rainfall. However, the new barns will be equipped with slatted flooring and dry manure scrapers which reduce ammonia emissions through regular collection of manure in collection basins underneath the flooring. The under floor manure basins will be periodically emptied and the manure pumped to a covered storage lagoon before sale to neighbouring farmers for use as fertiliser. During the upgrade of the farm, new manure storage facilities will be built in accordance with RF requirements outlined in NTP 17-99 rules, Section 11), requiring facilities that have a hard flooring to prevent leachate filtration to soils and groundwater. Manure storage areas will also be located well away from any surface waters/or floodplains. Further measures to reduce leachate and therefore risk of groundwater contamination include protection against rainfall and, use of dry manure scraping (rather than flushing with water)

Manure can also contain trace amounts if hazardous substances, either from food supplements purposefully added to cattle feed, for example, such as growth promoters and antibiotics, or from undesirable contaminant in the feed, include pesticides, heavy metals and dioxins. To minimise the risk of trace contaminants, KPK will produce its own cattle feed and implement its own quality control procedures. Feed quality will be tested and there is no intention to add supplements to the feed.

There is ample demand for the manure due to the large areas of agricultural land in the area. Manure management is discussed in more detail on Section 9, Cumulative Impacts.

Further requirements to manage manure are specified in the ESMMP, row OE10.

Socio-economic benefits

The existing dairy farm employs 10 staff working in shifts, whereas the new dairy farm will employ approximately 20 full time employees once operational. Thus some employment may result from the new dairy farm although overall **social impacts** (positive and negative) are anticipated to be negligible.

Milk quality

Milk is tested by Promishlennovskaya veterinary laboratory. Milk from cows with mastitis is collected separately and is given to calves (or calves drink directly from the cow). Staff recognize sick cows via visual observations for the cows (there are 2 veterinaries, livestock experts onsite, herdsman onsite). Each cow has a unique number.

The milk collection system is washed each shift (twice per day).

Silage

Leachate from silage is nutrient rich with high levels of nitrate. This can cause eutrophication in surface waters and/or can be harmful to human health if ingested in large quantities potentially leading to an illness know as 'blue baby syndrome', an illness that occurs when large amounts of nitrates in water are ingested by an infant and converted to nitrite by the digestive system. The nitrite then reacts with oxyhemoglobin (the oxygen-carrying blood protein) to form metheglobin, which cannot carry oxygen. In cases where large amounts of metheglobin forms in the blood, body tissues may be deprived of oxygen, causing the infant to develop a blue coloration of their mucous membranes and possibly digestive and respiratory problems. The majority of cases have occurred when nitrate levels have been over 100 mg/litre. Efforts are therefore required to prevent silage leachate from entering surface of groundwater.

KPK currently has no plans to produce and store silage. However, if this position changes and silage is required, silage will be managed in accordance RF requirements (Technical Design norms for silage and hay storage areas, NTP-APK 1.10.11.001-00, dated December 2000) and with international best practice (Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources.

As a minimum this will include storage of silage in accordance with good practice and in manner that prevents contamination of groundwater supplies, including but not limited to:

- Storage of silage as bales or impermeable containers;
- Shelter from rain and snow fall;
- Leachate control;
- Adequate separation from communities;
- Adequate separation from water bodies; and

- Safe working practices for handling silage.

Written procedures for storage practices will be prepared should silage be used by KPK in future. The procedure will take account of RF requirements and international good practice for the storage and handling of silage. (ESMMP OE12)

Air emissions

Air emissions from the farm will include ammonia (from manure), methane, odours and dust. Ammonia emissions from manure can be reduced using good manure management practices described above. In addition to these measures, the barns and storage areas should be located away from residential areas in compliance with the RF Sanitary Protection Zone requirements. The design of the barns and provision of storage tanks beneath the barns will also help reduce odour.

Dairy farms also result in the release of methane, both directly from cows as a digestive by product and during microbial action within manure. Good manure management practice to reduce odours will therefore also help to minimise methane releases e.g. undisturbed storage of manure to maintain an emission reducing crust. Methane emissions, normalised against milk production, are also reduced if milk yield increase, as will be case for the dairy farm when it is restocked with high yield dairy cows.

Traffic

Vehicle movements will increase during the construction phase due to the movement of raw materials, machinery and the workforce potentially resulting in some nuisance to the residents of Krasninskoe. Such nuisance will be short term.

Milk will continue to be collected by road tanker with the number of collection vehicles increasing from approximately 5 vehicles per week to approximately 10 vehicles per week. However, this number of vehicle movements remains small and will have no discernable impact on residents.

The impact of vehicle movements is anticipated to be minor. Nevertheless, KPK will periodically review and assess the affects of the Project's vehicle movements and if necessary, KPK consider options to manage traffic and improve road safety. (ESMMP, row GH10)

Abnormal conditions (e.g. fire, disease)

Abnormal conditions refer to any circumstance outside of normal operating conditions. This might include equipment/ power failure, fire or outbreak of infectious disease. These issues are discussed in See Section 9, Emergency Response.

Animal welfare

The conditions in which farm animals are kept, transported and slaughtered is not only an issue of public/consumer concern, but also affects the health of animals, likelihood of disease and ultimately the quality of meat. As a result there are a number of animal welfare standards which are applicable to the farming facilities and slaughterhouses operated by the Company under RF law, EU Conventions and Directives on animal welfare protection and under international good animal welfare practice.

The UK Animal Welfare Council developed a model with “five freedoms” to assess animal welfare. These comprise freedom:

- from hunger and thirst;
- from discomfort;
- from pain, injury or disease;
- to express normal behaviour; and,
- from fear and distress.

The table below summarises current animal welfare practices at KPK’s existing dairy farm in relation to animal welfare conditions based on the EU Directive (98/58/EC).

Table 4. Animal welfare practice at the dairy farm

Requirement	Dairy farm	Planned improvements
Adequate lighting available for inspection	Poor lighting observed	Improved lighting will be provided in the new dairy and beef barns
Accommodation and animals securing material should not be harmful to animals and be capable of being thoroughly cleaned	Poor technical building integrity, including heavy erosion of concrete ceiling and flooring. Rusty feeding fence and metal frames (e.g. feeding fence).	New build buildings based on western European design will be constructed in case of dairy and beef farm
Comfortable indoor climate including sufficient lighting and dark intervals.	No cows were kept indoors; however barns had several windows without coverage, holes in the walls, broken asbestos roofing sheets, poorly sealed doors, etc.	New build buildings based on western European design will be constructed in case of dairy and beef farm
Provide sufficient protection of animals kept outdoors.	Herd is guarded by staff on horses. There is no coverage against adverse weather conditions provided.	Dairy cattle will be kept indoors following construction of the new barns. Situation for beef cattle will remain unchanged
Regular inspection of automatic and mechanical equipment used for animals	Automatic and mechanical equipment used for animals is minimal. Mechanical gutter cleaner was observed to be very dirty and rusty.	Machinery in the new build beef and dairy facilities will be inspected regularly by on-site staff

Transport of live cattle

Cattle will be transported moved during herd restocking, and when animals are taken for slaughter. Such movements will be carried out in compliance with RF requirements for the transportation of live animals (Federal Law #52 dated April 24, 1995 (last amended) "On animals") and in line with applicable EU guidelines and in particular the welfare of animals during transport Council regulation (EC) 1/2005. This is same Directive that applies to pigs (discussed above) and the same requirements in terms of fitness to travel, space requirements, ventilation, rest periods etc. apply. Requirements that are specific to cattle are outline below:

- Horned cattle should be transported separately to hornless cattle
- Space per cow varies depending on size of animals (e.g. 0/95 – 1.3 m^2/animal for medium sized cattle of approximately 325kg)

6.3 Monitoring

KPK will monitoring the Project's environmental and social performance throughout construction and operations in accordance with all monitoring requirements placed upon the project under RF law (ESMMP, GM2, OM2, OM4), including air and wastewater emissions. The monitoring activities are outlined more fully in the ESMMP and include:

- Dust and noise levels (ESMMP, CM1)
- Odour monitoring at the edge of the SPZ and nearby residential areas (ESMMP, OE5)
- Groundwater monitoring in the vicinity of manure storage areas, and silage storage areas if used (ESMMP, OM1)
- Groundwater monitoring around burial pits (ESMMP, OM1)
- Energy and water use (ESMMP OM6 and OM7)
- Occupational incidents via an incident tracking log (GH11)

Public concerns will also be monitored through a grievance log.

These actions will be captured and managed via the implementation of KPK Social and Environmental Management and Occupational Health Management Systems (ESMMP).

7 Analysis of alternatives

An analysis of alternatives is an essential component of an EIA as it provides a justification for a project, considering the need for the project, alternative technologies/project locations and consideration of the 'no project' option. For this project, improved and increased production of meat products will result in an overall increase in the protein content of diets in the region, bringing it more in line with other parts of Russia and western Europe.

The overall project is diverse and located in a number of different areas. However, for all expansions/upgrades, the project is utilising western European technologies and good industry practice for intensive livestock production/meat processing. This approach will result in improved environmental performance and more sustainable production.

Slaughterhouse

The slaughterhouse is an integral component of the overall project expansion, and in particular, is an essential element of the pig farm complex. For the pig farm complex a series of locations were considered, taking account of land requirements and environmental sensitivities. KPK's initial site close to Novokuznetsk was rejected due to public objection on the grounds of environmental loading (proximity to river, availability of land to receive the manure). The selected site was one of two located further from Novokuznetsk with several advantages including sufficient distance from residential areas to meet the requirements for a 1km Sanitary Protection Zone (SPZ). Furthermore the site does not infringe any Water Protection Zones (WPZ), has sufficient available land, and is close to arable and pasture land where there is sufficient demand for manure. The site selected was also the preferred site for the majority of stakeholders expressing a view.

Once a site had been selected for the pig farm, the slaughter house was located as close as possible taking account of the necessary separation zones, thereby minimising the distance between finishing farms and the slaughterhouse and reducing the mileage and distances that live animals must be transported. Of note the new slaughterhouse is essential to meet the output of the fully operation (two phase) pig farm.

The selection of the dairy farm was heavily influenced by the availability of existing farms. The acquisition of an existing farm has numerous advantages in maintaining the same land use, maintaining and in some case increasing employment opportunities as well as improving previous sub optimal practices.

8 Emergency planning

A key emergency situation specific to farming activities relates to the outbreak and control of disease. In the event that there is a serious outbreak of disease it may be necessary to cull animals. In such a case the Veterinary Service assumes responsibility, including responsibility for notifying members of the public. A contract with Veterinary Service states that in case of disease outbreak the Veterinary Service will act in compliance with Federal Law #4979-1 “On veterinary” dated May 14, 1993 (last amended July, 2007), article 18. According to this law, the Company is responsible for isolating ill animals and immediately calling the veterinary. Procedures for quarantine/culling and then disposal of animals are applied by the Veterinary Service. Depending on the nature of an illness, for example, whether or not it is infectious, the Veterinary Service will decide upon the most appropriate disposal route in accordance with the sanitary veterinary rules for biological wastes collection, disposal and utilization” #13-7-2-469 dated December 4, 1995 (last amended in2007), article 1.3). If infectious, the entire farm will be isolated whilst the Veterinary Service determines appropriate procedures. For non infectious illnesses the diseased animals are separated from other animals and either treated or culled and sent to a rendering plant to produce tallow.

KPK currently has the use of two burial sites for disposal of dead animals; one located 3-5km from the dairy farm and a second 2-3 km from the pig farm area. The burial site by the pig farm has not been used whereas the site located close to the dairy farm and operated by OOO “Borokovo” (also the operator of the dairy and beef farms) has been used in the past. These sites require careful management, including a secured boundary, measures to prevent scavenging animals, hydrological survey and routine groundwater monitoring (see ESMMP). Vehicles used in the transportation of diseased animals must also be disinfected after each journey under advice from the veterinary authority.

All facilities are equipped with fire extinguishers and fire hoses have been installed at the meat processing, warehouse, existing slaughterhouse at Krasninskoe and pig farm, and are connected to municipal water supply system. Additional fire-fighting capability is provided by off site fire tenders a distance of 1 to 3 km from the beef and dairy farms. The slaughterhouse and the warehousing facility will be equipped with an automatic fire detection system.

Written procedures detailing actions, responsible parties and contingency plans in the event of emergency should be in place, as outlined in the ESMMP.

9 Cumulative impacts

An assessment of cumulative impacts requires that *'Risks and impacts will be analyzed in the context of the project's area of influence. This area of influence encompasses, as appropriate…….areas potentially impacted by cumulative impacts from further planned development of the project, any existing project or condition, and other project-related developments that are realistically defined at the time the Social and Environmental Assessment is undertaken; and areas potentially affected by impacts from unplanned but predictable developments caused by the project that may occur later or at a different location*.[4]

With reference to the above there are currently no further planned KPK activities in the area that might result in cumulative impacts nor are there any known or foreseeable projects that are related or might be stimulated by this project other than those already addressed in this document. However, the environmental studies undertaken to date under RF requirements for environmental assessment have not considered the cumulative impact of all KPK activities. Particular issues worthy of consideration include:

- Increased traffic movements;
- Management of manure (and in particular the availability of agricultural land to accommodate manure);
- The risks of cross contamination between sites and facilities to prevent the spread of infectious disease between animals (including disposal of diseased animals);
- Pressure on infrastructure (roads, rail, waste reception facilities, healthcare providers);
- Socio-economic impacts including employment and inflationary pressures;
- Water use; and
- Air emissions including odours (particularly from the phase 2 pig farm in combination with the nearby fodder plant, finishing farms and slaughterhouse which are all within a 5 km radius).

The significance of each of these is discussed below. Where the site specific measures already described are not sufficient to mitigate the cumulative impacts, additional mitigation measures are also described in this section.

Increased traffic

A small increase in traffic will occur at each of the farm locations, although these will be insignificant when taken in isolation. However the overall increased productivity will result in

[4] IFC Performance Standard 1, Social and Environmental Assessment and Management Systems

a more significant increase in the number of vehicles visiting the meat processing facilities in Novokuznetsk. The road network in this area is relatively efficient although some congestion might occur at the warehouse and main meat processing facilities. The increased traffic might warrant improved traffic control and improved signage/provision of pedestrianised areas in the loading/unloading areas. The Company has submitted its plans outlining specifications and changes to current road use to the traffic authorities. The plans have been approved by the authorities.

Manure management

The quantities of manure generated at the dairy farm and slaughterhouse cannot be considered in isolation because they are only two elements of a bigger project which collectively will produce significantly larger quantities of manure.

Storage and handling of manure represent the most important emission sources at the farms from an environmental point of view (Section 3.3 of the IPPC BREF on Intensive Rearing of Poultry and Pigs, dated: July 2003). Manure has relatively high concentrations of nitrogen (N) and phosphorous (P) nutrients excreted by the animals. The concentrations depend on:

- the animals' diet (e.g. concentration N and P in animals' feed);
- the type of animal (pigs, cows, milked cows, boars, sows, etc.);
- the production level (growth factor, number of pregnancies, milk yield, etc.); and
- genetics (e.g. the feed conversion factor).

In addition, ammonia emissions (NH_3) from manure arise from the mixing the solid and wet (urine) fractions.

Manure management and consequently emissions of ammonia and odour problems will be reduced following the various facility upgrades. However the overall production of manure will increase because of the increased numbers of animals housed at the various facilities. A key issue is the availability of agricultural land to take this manure. Manure will be spread on land in accordance with NTP 17-99 Technological design standards and sanitary rules for manure use for pastures irrigation and fertilizing #19-7-2/148 dated October 18, 1993 which specify the indicative parameters for the spreading of manure as described in Section 2.3.

Table 5 compares RF and EU requirements for manure application to agricultural land.

Table 5. Comparison of RF and EU requirements for application of manure to land

Issue	RF requirements	EU requirement[5]
Application rate	200kg/ha total nitrogen (without irrigation)	250kg/ha of total nitrogen within a 12 month period.
Timing	crop vegetation (pre growth) period; acceptable- winter time- temperature ≥ -10^{0}C, snow cover ≤20 cm.	Preferably when there is crop need for N in late winter/early spring. Manure should not be applied to frozen ground.
Proximity to surface waters	Prohibited within Water Protection Zones	Exclusion zones apply. At least 10m from watercourses (on flat ground) and 50m from boreholes/reservoirs used for human consumption.

International good management practice for manure management includes consideration of the total volumes of generated manure in relation to available land for manure disposal.

Based on the UK Guidance for Operators on Manure Management Planning for IPPC Installations, the following average areas of land are required for manure spreading (staying within 250kg N per ha) for each of the farms.

Table 6. Land availability requirements for manure produced at KPK facilities.

	Land required per animal *	Approximate number of animals	Months housed**	Approximate area of land required (ha)
Pig farm	0.078 ha per sow	2500 pigs	n/a	195 ha
Dairy Farm	0.039 ha per dairy cow	1200 cows	12	562 ha
Beef farm	0.019 ha per beef cow	1200 cows	6	137ha
Total				894 ha

* land requirements based on upper estimates.

** Months housed influences the total collected volume manure and consequently the land requirement (note that pigs are kept indoors all year round which is already anticipated in the conversion factor).

[5] Guidance for Operators on Manure Management Planning for IPPC installations

In addition to its own land KPK has agreement with the agricultural farms in the village of Krasnoe (to use up to 20,00ha), the Prokopiesk (to use up to 8,000ha) administrations to spread the manure to land as fertiliser. In addition it can also use the manure on its own land. Table 6 shows that KPK will need approximately 894 ha of land for their manure. This requirement falls well within the available land discussed above and demonstrates that there is ample land to receive the manure.

Good (international) farming practices require a Manure Management Plan with respect to use of both natural manure and/or fertilizer. A Manure Management Plan includes, but is not limited to:

- Records of current and expected volumes of manure and dirty water (e.g. from cleaning stables) generated and collected at the site (total volumes will depend on the number and types of animals, animals' diets, housing system, pasture, etc.);
- Manure applications strategies (availability of sufficient land, no application during winter when the soil will be frozen, consideration of the need of fertilizer in addition to natural manure, etc.).
- Application rates and timing to reduce diffuse pollution risk and maximise the efficiency of crop nutrient use (nutrient balances, optimal timing of nutrient supply to grass and/or grain, consideration of animal pasture management, etc.);
- Application methods (broadcast, band spreading, shallow injection, etc.) and precision to avoid unnecessary losses (emission to ditches or other sensitive land uses, manure run-off from hard soil cover layers, etc.).

KPK will comply with both RF and EU requirements for its own land and will also encourage other farmers purchasing KPK manure to apply the same standards. KPK will also develop a Manure Management Plan, for those operations under its direct control, to ensure all requirements are met and water resources are protected (see ESMMP). A system for recording manure collection and application, to help protect against over application, should also be described in the plan.

Cross contamination

The risks of cross contamination between sites and facilities to prevent the spread of infectious disease between animals is strictly controlled using appropriate separation zones (in accordance with EU guidelines), disinfection procedures for humans and vehicles and restrictions on the movements of animals and humans between farms. The use of a dedicated slaughterhouse that will only accept KPK pigs further reduces the risks of cross contamination. However, in the event of a disease outbreak procedures are in place, under the advice of the veterinary services, to quarantine animals/farms, control inter-farm vehicle movements and cull animals if necessary. Large numbers of diseased or potentially diseased animals can be buried at a licensed sites owned by KPK which has been designed for this purpose (See also Section 6).

Pressure on existing infrastructure

Large projects or projects with several concurrent elements occurring over a region can sometimes result in excessive pressure on existing infrastructure e.g. roads, rail, waste reception facilities, healthcare providers. Such pressures are often associated with the influx of large construction workforces, often from outside of the region of even outside of Russia. KPK will use preferred construction company which employs local workers to minimise the likelihood of community worker conflict. Some temporary accommodation will be necessary but the overall number of workers will remain small and dispersed without any significant cumulative impact. Some extra pressure will be placed on roads although the measures outlined for each individual site will be sufficient to address such problems. Extra use will be made of the rail network (especially for the transport of grain to the fodder plant). The rail network has spare capacity and therefore use of rail links should be encouraged.

Socio-economic

Socio-economic impacts including employment and inflationary pressures are also a risk for large projects. However such pressures are also associated with the influx of non local workers over prolonged periods that might often have extra disposable income, thereby increasing the demand for resources e.g. accommodation and food. The number origin and duration that construction workers present at the sites do not represent a significant socio-economic/community health risk.

The project will create/maintain long term employment opportunities at each facility. Estimates for each facility are fodder plant (30); pig farm complex (100), new slaughter house (30), beef farm (an extra 10), dairy farm (an extra 10). Collectively the project brings significant employment opportunities, particularly to the rural areas, and will therefore contribute significantly to the local economy.

Water usage

Studies have confirmed the availability of water for all KPK facilities, including facilities that share aquifers with other users.

Air emissions

The cumulative impact to air quality taking account of the collective emissions of the phase 2 pig farm, nearby fodder plant, finishing farms and slaughterhouse (all within a 5 km radius) has been considered. An environmental assessment has been undertaken for phase 1 of the pig farm. The results of predictive modelling have demonstrated that emissions levels are less than half the maximum permissible emissions (MPEs). The commissioning of a phase 2 will not result in a doubling of emissions (because the same manure lagoon will be used and surface areas will remain the same) and therefore cumulative impacts are not expected to breach emission limits. The OVOS takes account of background levels, in addition to the contribution from other KPK pig farm facilities, to predict that no harmful impact on air quality is likely from the slaughterhouse activities.

In summary, cumulative impacts for this project are relatively minor and will be managed through implementation of the site specific mitigation measures outlined in the ESMMP.

10 Labour Requirements

The Project will bring employment the area in the form of temporary construction work and more permanent positions once the new facilities are operational. In order to ensure that the benefits of additional employment opportunities are fully realised, the rights and conditions of those directly employed by the Project must be protected.

10.1 National and international requirements

The Company must first ensure that for all its operations it is compliant with RF labour laws. It must also seek to work only with reputable contractors that are also capable of meeting the labour requirements set forth in RF Law.

The Company must also meet the requirements of potential lending banks, as described in the Multilateral Development Bank Harmonised Edition of the 'Conditions for Contract for Construction – General Conditions, Section 6. International Federation of Consulting Engineers, March 2006.[6]

The EBRD also has a number of Policy requirements aimed directly at employment conditions and workers' rights. In addition to the fundamental requirement for compliance with national legislation, of particular note, the EBRD has established an 'EBRD standard labour requirement for construction contractors', specifying requirements in relation to:

- Prohibition of Forced Labour;
- Prohibition of Child Labour;
- Non-discrimination and equal treatment;
- Freedom of association and collective bargaining;
- Record-keeping;
- Wages;
- Hours of Work;
- Health and Safety;
- Social Security;
- Grievance mechanisms;
- Code of Conduct ;
- Reporting (of occupational incidents);
- Engagement of Staff and Labour; and
- Facilities for Staff and Labour.

[6] http://www1.fidic.org/downloads/cons_mdb_gc_mar06_protected.pdf

These requirements are aligned with the International Labour Organisation's core conventions concerning the abolition of child labour, the elimination of discrimination at the workplace and the elimination of forced and compulsory labour.

The Company will comply with RF law with particular attention to ensuring that the RF laws transposing the ILO fundamental conventions concerning the abolition of child labour, the elimination of discrimination at the workplace and the elimination of forced and compulsory labour are effectively complied with. The Company will act as a responsible employer to its own staff and those of contractors. It will also ensure, through contractual agreements, the same standards apply across the Project. The company will also establish monitoring and management systems including periodic EHS meetings with the contractors and supervision of contractors by the Company nominated specialist.

These requirements are captured in the ESMMP, rows GH2, GH3 and GH4.

10.2 Occupational Health and Safety

The Company will manage contractors to ensure a safe and healthy working environment, promoting best occupational health and safety practice, including the provision of adequate Personal Protective Equipment (PPE) and enforcement of its use.

The Company shall adopt safe working practice, in accordance with RF requirements, for working:

- in confined spaces;
- at heights;
- with moving machinery;
- dusty environments;
- electrical equipment; and
- as a vehicle driver.

In addition:

- Workers shall only perform tasks that they are trained and competent to undertake; and
- Signage and barriers shall be used to alert workers of any hazards.

These requirements extend to contractor camps/housing.

All facilities will have an emergency first aid kit on site and trained first aiders. The main meat processing facility shall have a doctor on site at all times that the facility is operational.

These requirements are captured in the ESMMP, rows GH1, GH5, GH6, GH9, GH11.

11 Summary

The Project is largely concerned with the expansion and upgrade of existing sites and activities. The Project has the potential to generate a number of adverse social and environmental impacts although these will be either short-term and/or relatively minor if managed properly.

The key negative impacts are presented in the table below along with a summary of mitigation measures and actions required to address the impacts.

Table 7. Summary of impacts and mitigation measures

Potential impact	Actions/Mitigation measures
Demolition and construction activities;	Good construction practice and camp management including: - Waste management for non hazardous/hazardous wastes; - Traffic management; - Good house keeping and Health and safety practices - A code of conduct for construction workers; and - Site reinstatement following completion of works.
Animal welfare	Construction of new/renovated facilities using modern design and Best Available Techniques. Use of suitable vehicles for the transport of live animals
Groundwater and soil contamination	Upgrade of facilities for storage and handling of manure at the dairy farm as planned. Additional studies to confirm the suitability of selected burial pits, one located close to the dairy farm.
Emergency response measures	Maintenance of existing emergency response plans and the development of an emergency plan that is integrated with the procedures of the veterinary service to address an outbreak of disease at the KPK farms.
Air emissions, including odours	Good management of facilities including: - Good management of organic wastes; - Clean facilities; - Efficient waste water treatment facilities; and - Good manure management.
Water use and waste water	- Confirmation of groundwater recharge rates using

treatment	hydrological studies. - Groundwater monitoring (depth and quality) - Appropriate waste water treatment to in order to meet necessary discharge criteria.
Social Impacts	Maintain communications, including provision of a grievance procedure, throughout construction and operations.

As indicated in Table 7, all these impacts can be managed through the use of appropriately designed new facilities and the development of an environmental health and safety management system that includes, amongst other items, detailed emergency response and manure management plans. Further detail of appropriate actions and mitigation measures to ensure responsible management of environmental and social concerns are outlined in an Environmental and Social Monitoring and Management Plan (ESMMP).

The environmental assessment work identified a number of potential impacts that require careful management through the preparation of new programmes or specific actions. These are captured in the ESMMP (Annex A) that the Company has committed to implement in full.

The Project should also bring a number of benefits to the region through additional employment opportunities, increased access to good quality meat products and generally promoting economic development in the area.

References

Ref 1. OVOS On choosing the site for Construction of pig farm complex with the capacity of 9660 t meat on the bone/year, designed by Eneco company, 2006).

Ref 2. State environmental review positive conclusion #Э1-399/344 On the OVOS On choosing the site for Construction of pig farm complex with the capacity of 9660 t meat on the bone/year.

Ref 3. OVOS On slaughterhouse of ZAO “KPK” pig farm in Prokopievsk region, designed by OOO “Sibirsky Consulting”, 2008.

Ref 4. Non Technical Summary for the Environmental and Social Impact Assessment - Kuzbass Pischekombinat Livestock and Meat Processing Project . ENVIRON Report no 61-C13873, October 2008.

Ref 5. OVOS On Fodder Plant of ZAO “KPK” pig farm in Prokopievsk region, designed by OOO “Sibirsky Consulting”, 2008.

Ref 6. Public consultation materials for OVOS On choosing the site for Construction of pig farm complex with the capacity of 9660 t meat on the bone/year.

Ref 7 Environmental Actions List and Environmental Impact Assessment Results as a part of design documentation, issued by OOO “Sibirsky Consulting”, 2008.

Annex A: Environmental and Social Monitoring and Management Plan for the new slaughterhouse and dairy farm

Environmental and Social Monitoring and Management Plan (ESMMP)

This document captures mitigation measures, actions and future work requirements (the requirements) to be undertaken by KPK as part of their planned expansion programme and ongoing operations. The requirements have been identified through the preparation of the environmental and social impacts assessment documents, including OVOS documentation prepared in accordance with RF law, and this supplementary information document and the Non Technical Summary.

The requirements described in this document make reference to both RF law and international good practice. It is a prerequisite that the Project is constructed and operated in compliance with RF law. Additionally the other measures outlined in this document, intended to compliment the requirements specified under Russian law, should also be implemented except where such implementation conflicts with RF Law.

The requirements are divided into environmental, social, health and safety and monitoring requirements and are either generic (applicable to all facilities and phases of the project) or applicable to specific facilities of phases of the Project.

ESMMP for ALL PHASES (Pre construction, Construction and Operations)

Ref	Issue/ potential impact	Mitigation measure/action	Responsible party	Timeframe	Facility	
					New slaughterhouse	Dairy farm
General requirements (all phases of the project)- Environmental						
GE1	Environmental permitting	All proposed activities must comply with RF permitting requirements, including the preparation of OVOS and environmental design documentation where deemed necessary.	KPK General Director	All stages		
GE2	Training	All workers (including construction workers) will be given Environmental Health and Safety training and informed of their obligations described in this ESMMP.	KPK and KPS management	All phases	√	√
GE3	Waste (non hazardous)	All wastes should be collected and removed from permanent facilities and construction sites. Food wastes will be contained in a manner that will not attract scavenging animals e.g. bins will have lids.	KPK and KPS management	All phases	√	√
GE4	Waste (hazardous)	Hazardous waste shall be stored so as to prevent or control accidental releases to air, soil, and water resources in area location. As appropriate - wastes will be stored in a manner that prevents the commingling or contact between incompatible wastes, and allows for inspection between containers to monitor leaks or spills. - wastes will be stored in closed containers away from direct sunlight, wind and rain. - Secondary containment shall be used if liquid wastes are stored in volumes greater than 220 litres. The available volume of secondary containment should be at least 110 percent of the largest storage container, or 25 percent of the total storage capacity (whichever is greater), in that specific location. - adequate ventilation will be provided where volatile wastes are stored. - spill containment and clean-up equipment will be in place on site (see hazardous materials) - waste management practices shall be monitored through regular internal audit . Waste contractors handling, treating, and disposing of hazardous waste will be appropriately licensed by the relevant regulatory agencies and follow good international industry practice for the waste being handled. Hazardous wastes will not be commingled.	KPS Construction management & KPK Corporate HSE Manager	All phases	√	√
GE5	Hazardous materials (fuel	Adequate secondary containment for fuel storage tanks and for the temporary storage of other fluids such as lubricating oils and hydraulic fluids will be provided.	KPS Construction management	All phases	√	√

Ref	Issue/ potential impact	Mitigation measure/action	Responsible party	Timeframe	Facility	
					New slaughterhouse	Dairy farm
	storage)	Any refuelling/transfer of hazardous liquids will be undertaken above impervious surfaces. Portable spill containment and cleanup equipment on site. Workers will be trained in the use of the equipment. Provision of suitable personal protection equipment. Hazardous materials should be securely stored and have appropriate signage. They should also be accompanied with accessible hazard data sheets.	& KPK Corporate HSE Manager			
GE6	Air quality (including dust)	Minimizing dust from open area sources, including storage piles, by using control measures such as installing enclosures and covers, and increasing the moisture content. Dust suppression techniques should be implemented, such as applying water or non-toxic chemicals to minimize dust from vehicle movements (particularly during construction) Managing emissions from mobile sources as follows: - Emissions do not result in pollutant concentrations that reach or exceed relevant ambient quality guidelines and standards by applying national legislated standards, or in their absence, the current WHO Air Quality Guidelines - Emissions from on-road and off-road vehicles should comply with national or regional programs. In the absence of these regardless of the size or type of vehicle, operators should implement the manufacturer recommended engine maintenance programs Avoiding open burning of solid wastes.	KPK management and KPS Construction management/ site foreman	All phases	√	√
General requirements (all phases of the project)- - Social						
GS1	Social benefits	Use of local workforce to maximize direct and secondary local employment opportunities.	KPK and KPS management	All phases	√	√
GS2	Social impacts/ community engagement	Establish a communication channels, including a Public Consultation and Disclosure Plan, in order to engage with potentially affected people. Establish a formal Grievance Procedure and inform stakeholders.	KPK and KPS management	All phases		
General requirements (all phases) - Health and safety						

Ref	Issue/ potential impact	Mitigation measure/action	Responsible party	Timeframe	Facility	
					New slaughterhouse	Dairy farm
GH1	Occupational Health and Safety Management System	Implement good management practices through the development of an occupational health and safety management system in line with OHSAS 18000.	KPK management	All phases		
GH2	Contractor management	The Company will inform contractors of their EHS responsibilities, including requirements within this ESMMP. Applicable Environmental Health and Safety requirements shall be specified within contractual agreements.	KPK and KPS management	All phases		
GH3	Labour Issues	The Company will act as a responsible employer to staff and contractors, operating in accordance in accordance with RF laws. It will also follow the conditions outlined in the Multilateral Development Bank Harmonised Edition of the 'Conditions for Contract for Construction – General Conditions, Section 6. International Federation of Consulting Engineers, March 2006, unless such compliance would contravene RF law. The Company will also ensure that its contractors apply the same standards. The Company will establish monitoring and management system including periodic EHS meetings with the contractors and supervision of contractors by the Company nominated specialist and will act to resolve any breaches.	KPK and KPS management	All phases		
GH4	Labour Issues	The Company (and contractors) will ensure compliance with RF labour laws, with particular attention to ensuring that the RF laws transposing the ILO fundamental conventions concerning the abolition of child labour, the elimination of discrimination at the workplace and the elimination of forced and compulsory labour are effectively complied with	KPK and KPS management	All phases	√	√
GH5	Workers Health and Safety	The Company will manage contractors to ensure a safe and healthy working environment, promoting best occupational health and safety practice. Provision of adequate Personnel Protective Equipment and enforcement of its use. Adoption of safe working practice, in accordance with RF requirements, for working: - in confined spaces - at heights	KPK and KPS management	All phases	√	√

Ref	Issue/ potential impact	Mitigation measure/action	Responsible party	Timeframe	Facility	
					New slaughterhouse	Dairy farm
		- with moving machinery - dusty environments - electrical equipment - as a vehicle driver Workers shall only perform tasks that they are trained and competent to undertake. Signage and barriers shall be used to alert workers of any hazards. These requirements extent to contractor camps/housing.				
GH6	Medical facilities/first aid	All facilities will have an emergency first aid kit on site and trained first aiders. The main meat processing facility shall have a doctor on site at all times that the facility is operational.	KPK and KPS management	All phases	√	√
GH7	Site security	Facilities will have adequate security/barriers to prevent accident of injury to member s of the public/wild animals. For example, lagoons for the storage of manure will be fenced to prevent children and/or animals falling into the lagoon.	KPK and KPS management	All phases	√	√
GH8	Signage	Appropriate health and safety (and hygiene) signage shall be in place at all facilities	KPK and KPS management	All phases	√	√
GH9	Housekeeping	Sites shall be properly managed with a good standard of house keeping to reduce the risks of accidental injury.	EHS Manager/site foreman	All phases	√	√
GH10	Community safety including road safety	The Company will periodically review and assess the affects of the Project's vehicle movements and if necessary consider options to manage traffic and improve road safety. Measures will be put in place to prevent the accumulation of mud on public roads (e.g. from construction sites). This might include the provision of a wheel wash for construction traffic exiting a muddy site. Erect security/barriers and warning signs to prevent public access to hazardous construction areas.	EHS Manager/site foreman	All phases	√	√

Ref	Issue/ potential impact	Mitigation measure/action	Responsible party	Timeframe	Facility	
					New slaughterhouse	Dairy farm
GH11	Incident tracking	A system will be used to monitor Health and safety incidents, including near misses. Incidents should be logged and investigated with any corrective actions communicated throughout the Company.	KPK Senior Management	All phases		
General requirements (all phases) - Monitoring						
GM1	EHS audit	Establish an Environment, Health and safety audit programme to monitor the EHS performance of construction sites, and confirm compliance with the mitigation measures outlined for construction activities. A multidisciplinary audit team (of KPK Environmental, Health and Safety specialists) should visit each of the construction sites periodically, an in particular shortly following commencement of works.	KPK Senior Management	All phases		
GM2	Legal compliance	Undertake all monitoring required under RF law as specified in the OVOS and associated environmental documentation.	KPK management	All phases		

KPK ESMMP for CONSTRUCTION

Ref	Issue/ potential impact	Mitigation measure/action	Responsible party	Timeframe	Facility	
					New slaughterhouse	Dairy farm
CONSTRUCTION specific - Environmental						
CE1	Traffic impacts	The movement and speed of heavy vehicles will be controlled (limited) to prevent damage to unpaved roads and soil. See also noise and vibration	KPK and KPS management	Construction	√	√
CE2	Noise and vibration	Use the following measures as appropriate: - Locate noise generating sources away from residential or other noise-sensitive receptors. - Comply with noise emission levels for the RF. - Plan activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance. - Avoid or minimise project transportation through community areas.	KPS Construction management/ site foreman	Construction	√	√
CE3	Wastewater discharges	Adequate portable or permanent sanitation facilities serving all workers should be provided at all construction sites.	KPS Construction management/ site foreman	Construction	√	√
CE4	Site security	All construction sites should be secured to prevent access by the public. Hazardous, capable of harming the public or animals, should not be left outside of the site's boundary	KPS Construction management/ site foreman	Construction	√	√
CE5	Terrestrial habitat protection	Sensitive terrestrial habitat will be avoided. Re-vegetation of disturbed areas with native plant species.	KPK Environmental Manger	Construction	√	√
CE6	Soil erosion (during earthworks)	Soil erosion will be reduced or prevented by: - Scheduling to avoid heavy rainfall periods (to the extent practical) - Mulching to stabilise exposed areas	KPK Environmental Manger/site	Construction	√	√

Ref	Issue/ potential impact	Mitigation measure/action	Responsible party	Timeframe	Facility	
					New slaughterhouse	Dairy farm
		- Re-vegetating areas promptly Off-site sediment transport will be reduced through use of settlement ponds, silt fences if necessary and modifying or suspending activities during extreme rainfall and high winds to the extent practical.	foreman			
CE7	Site Reinstatement	Where possible and appropriate, top soil will be segregated and replaced on other back fill material to promote regeneration of vegetation. All materials and temporary structures will be removed from the site upon completion of construction works.	KPK Environmental Manger/site foreman	Post Construction	√	√
CE8	Pipeline installation	Pipeline routes (for water supply) shall be selected to minimize adverse impacts by preferential selection of a route that: - uses previously disturbed areas, - avoids sensitive areas (including steep slopes, watercourses, sites of archaeological or cultural value, protected areas), - minimizes pipeline length.	KPK Environmental Manger/site foreman	Construction		
Construction - Social						
CS1	Code of conduct	KPS will prepare a code of conduct for project workers. The code will outline basic requirements and minimum expectations of workers both on-site and in surrounding communities to reduce the chance of any worker/community conflicts.	KPS senior management	Construction	√	√
Construction - Monitoring						
CM1	Dust and noise levels	Dust levels should be monitored through visual observation, including effectiveness of any dust suppression techniques. Noise levels should be monitored using hand held portable noise meters where particularly noisy activities are taking place or in the event that local residents raise concerns.	KPS site foreman	Construction	√	√

KPK ESMMP for OPERATIONS

Ref	Issue/ potential impact	Mitigation measure/action	Responsible party	Timeframe	Facility	
					New slaughterhouse	Dairy farm
OPERATIONS - Environmental						
OE1	General environmental and social management	Implement good management practices through the development of a social and environmental management system (SEMS), including: - grievance procedures - audit programme - stakeholder engagement plan - monitoring plan - training programme The Company should operate a SEMS in line with the international standards ISO14000 and SA 8000.	KPK General Director	In place for operations (end 2009)		
OE2	Site location	New sites will be selected with consideration given to environmental and social sensitivities and with public consultation. New and renovated sites will not infringe on any Sanitary Protection Zones or Water Protection Zones , or other protected zones.	KPK General Director	Pre-construction		
OE3	Air emissions (general)	Air emission will not exceed RF Maximum Permissible Concentrations (MPCs). Emissions will be controlled to acceptable levels through the use of good design and abatement equipment where necessary. In particular this applies to: - Boiler houses - Manure storage/transportation - Other combustion processes (pig singeing) Predictive studies are required to confirm adequacy of plant design ahead of construction (if a new build).	KPK Environment Manager	Pre-construction/operations	√	√
OE4	Air emissions (dust)	Dust abatement techniques should be used to maintain dust below acceptable levels specified under RF environmental legislation. Dust abatement technologies shall be used where necessary, for example, the fodder plant.	KPK Senior management	Operations		

Ref	Issue/ potential impact	Mitigation measure/action	Responsible party	Timeframe	Facility	
					New slaughterhouse	Dairy farm
OE5	Air emissions (odours)	Odours should be minimised. In particular odours should not be offence to residents living close to KPK facilities. Measures to reduce odours from manure are outlined under 'manure management'. Odour abatement equipment should also be used elsewhere where offensive odours a noticeable beyond site boundaries.	KPK Environment Manager	Operations	√	√
OE6	Water abstraction	Ensure all water is sourced from sustainable uncontaminated sources. Abstraction of water for the Project must not deprive other users of their normal water consumption or affect water quality.	KPK Environment Manager	Operations	√	√
OE7	Water usage	Monitor water use and explore opportunities to minimise water use through water conservation measures e.g. trigger operated hoses for facility/truck washing. Consider opportunities to recycle process water, for example, reusing uncontaminated process water to clean truck tyres (if appropriate).	KPK Environment Manager	During design phase and Operations	√	√
OE8	Wastewater generation	Take actions to minimise the amount of contaminants reaching the wastewater system, in particular milk at the dairy farm and blood at the slaughterhouses (both have a high BOD). Actions should include: • Optimising blood yield (e.g. allowing adequate bleeding time after sticking pigs); • At the end of each day when blood tanks are emptied use squeegies to remove as much residual blood as possible before washdown; Use catch pits / filters in drains to minimise the amount of solids reaching the effluent system.	KPK Senior Management/ KPK Energy Manager	Operations	√	√
OE9	Wastewater treatment	Use appropriately designed water treatment plant to meet the more stringent of applicable RF discharge criteria or the IFC waste effluent standards.	KPK Senior Manager	During design phase and Operations	√	√
OE10	Manure management	Design facilities to minimise odour and other air emissions and leachate from manure in line with good international practice. Measures will include:	KPK	Operations	√	√

Ref	Issue/ potential impact	Mitigation measure/action	Responsible party	Timeframe	Facility	
					New slaughterhouse	Dairy farm
	(storage)	- Storage of manure beneath pigs/cattle barns - Impermeable manure storage areas (e.g. lagoons) - Shelter from rain and snow - Leakage detection system in place	Senior Manager			
OE11	Manure management (application)	Application of manure in accordance with RF requirements. In line with international good practice a manure management plan will be prepared. The plan will outline: - Anticipated quantity of manure - Application strategies including availability of land to receive the manure - Application rates, locations and timing - Application methods and land use sensitivities that must be avoided.	KPK Senior Manager	Operations		
OE12	Silage management	Silage, if used by the Company, must be stored in accordance with good practice and in manner that prevents contamination of groundwater supplies, including but not limited to: - Storage of silage as bales or impermeable containers - Shelter from rain and snow fall - Leachate control Written procedures for the storage will be prepared should silage be used by KPK in the future. The procedure will take account of RF requirements and international good practice for the storage and handling of silage.	KPK Senior Manager	Operations		
OE13	Energy efficiency	Consideration should be given to energy efficiency review to identify energy saving options. Energy efficiencies should be considered at the design stage for new builds and as part of an energy audit for existing buildings. The audit findings should be integrated within the action programme of a Company wide Environmental Management System.	KPK Environment Management	During design phase and Operations	√	√
OE14	Animal welfare	Good animal welfare practices will be used in accordance with RF requirements and EU guidance for Best Available Techniques. Practices will cover amongst others: - Accommodation (including ventilation, and available space, access to other pigs, bedding)	Site managers	Operations	√	√

Ref	Issue/ potential impact	Mitigation measure/action	Responsible party	Timeframe	Facility	
					New slaughterhouse	Dairy farm
		- Dietary needs - Behavioural needs - Veterinary care - Live animal transportation - Provisions at the slaughterhouses				
OE15	Emergency response (outbreak of disease)	The will maintain emergency response procedures and contingency plans for the following eventualities, including as a minimum: - Fire - Loss of power - Failed Water Treatment Plant - Loss of refrigerant (for site using refrigerants) - Failed of heating and ventilation systems (including pig and cattle farms) - Outbreak of infectious disease (see row below)	KPK senior management	Pre – operations and operations	√	√
OE16	Outbreak of disease	A plan is required to address the Companies response in the event of infectious and non infectious diseases. This plan must address, amongst others: - Roles and responsibilities; - Communication channels and contact details; - Identification of disease; - Isolation and disinfection techniques; - Notification of relevant authorities/other parties; - Procedures for segregation/quarantine of ill or dead animals; - Culling of diseased animals; - Transport of diseased animals or carcasses; - Disposal options and appropriate locations.	KPK senior management	Pre – operations and operations	√	√

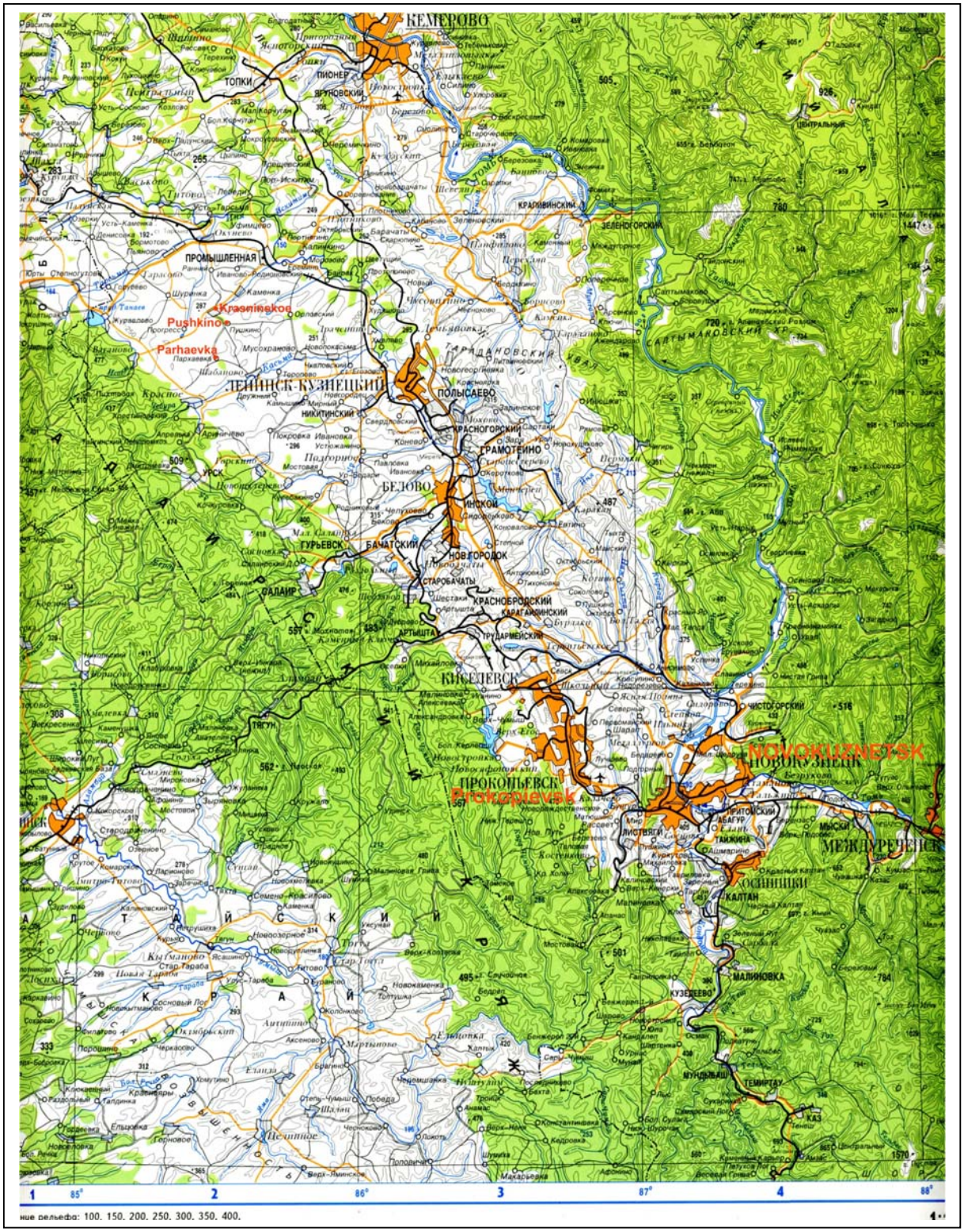
Ref	Issue/ potential impact	Mitigation measure/action	Responsible party	Timeframe	Facility	
					New slaughterhouse	Dairy farm
		In such incidents the State Veterinary Services (SVS) will often assume a command of the incident. The KPK plan should be integrated with SVS procedures.				
0E17	Burial pits	Pits are available for the burial of large numbers of animals carcasses should there be an outbreak of infectious disease. The suitability of these burial pits must be assessed to ensure disease can be contained, groundwater supplies will not be contaminated and public health is assured.	KPK Senior management	Pre - operations		√
0E18	Road journeys	Preferential use should be made of rail transport were possible e.g. raw material for the fodder plant. Elsewhere road vehicles will be essential including during product distribution. All vehicles should be properly maintained and driven by well trained drivers.	KPK Environment Management	Operations	√	√
0E19	Traffic management	Implement any measures to avoid congestion/improve safety at busy locations such as the warehouse and main meat processing facilities in accordance with recommendations by the relevant traffic authorities.	KPK Environment Management	Construction and Operations	√	
Health and safety - Operations						
OH1	Risk of explosion	The risk of explosive environments (from high levels of organic dust) will be determined during design of facilities. At the fodder plant measures will be in place remove any explosive risk.	KPK Management	Operations		
OH2	Hygiene standards	The highest levels of hygiene shall be maintained at all facilities. Strict disinfection and sterilisation procedures will apply.	KPK HSE Manager	Operations	√	√
Monitoring - operations						
OM1	Groundwater	Groundwater monitoring boreholes will be used for monitoring purposes at locations where there is a risk of soil and/or groundwater contamination. For example, in the vicinity of manure lagoons, burial pits and silage storage area (if applicable).	KPK management	Pre-operations and Operations	√	√
OM2	Air quality (including particulates)	To be monitoring in accordance with RF requirements	KPK Environment Manager	Pre-operations and Operations	√	√
OM3	Odours	Routine odour monitoring should be carried out at pre determined sampling locations, including site boundary and residential areas. The frequency and location of obnoxious odours should be recorded during any odour incidents.	KPK Environment Manager	Pre-operations and Operations	√	√

Ref	Issue/ potential impact	Mitigation measure/action	Responsible party	Timeframe	Facility	
					New slaughterhouse	Dairy farm
OM4	Effluent quality	To be monitoring in accordance with RF requirements	KPK Environment Manager	Pre-operations and Operations	√	√
OM 5	Water use	Install water meters and monitor them regularly to measure efficiency. Key Performance Indicators (KPIs) should be developed (e.g. water use per head) and performance benchmarked against best practice.	KPK Energy Manager	Operations	√	√
OM 6	Energy use	Install electricity meters and monitor them regularly to measure efficiency. KPIs should be developed (e.g. electricity use per head) and performance benchmarked against best practice.	KPK Energy Manager	Operations	√	√
OM 7	Blood yield	Blood yield should be measured at the slaughterhouses. This indicates the efficiency of recovering a useful by-product. High blood yield also demonstrates that the BOD load being discharged via effluent is being minimised.	KPK Senior Management	Operations	√	

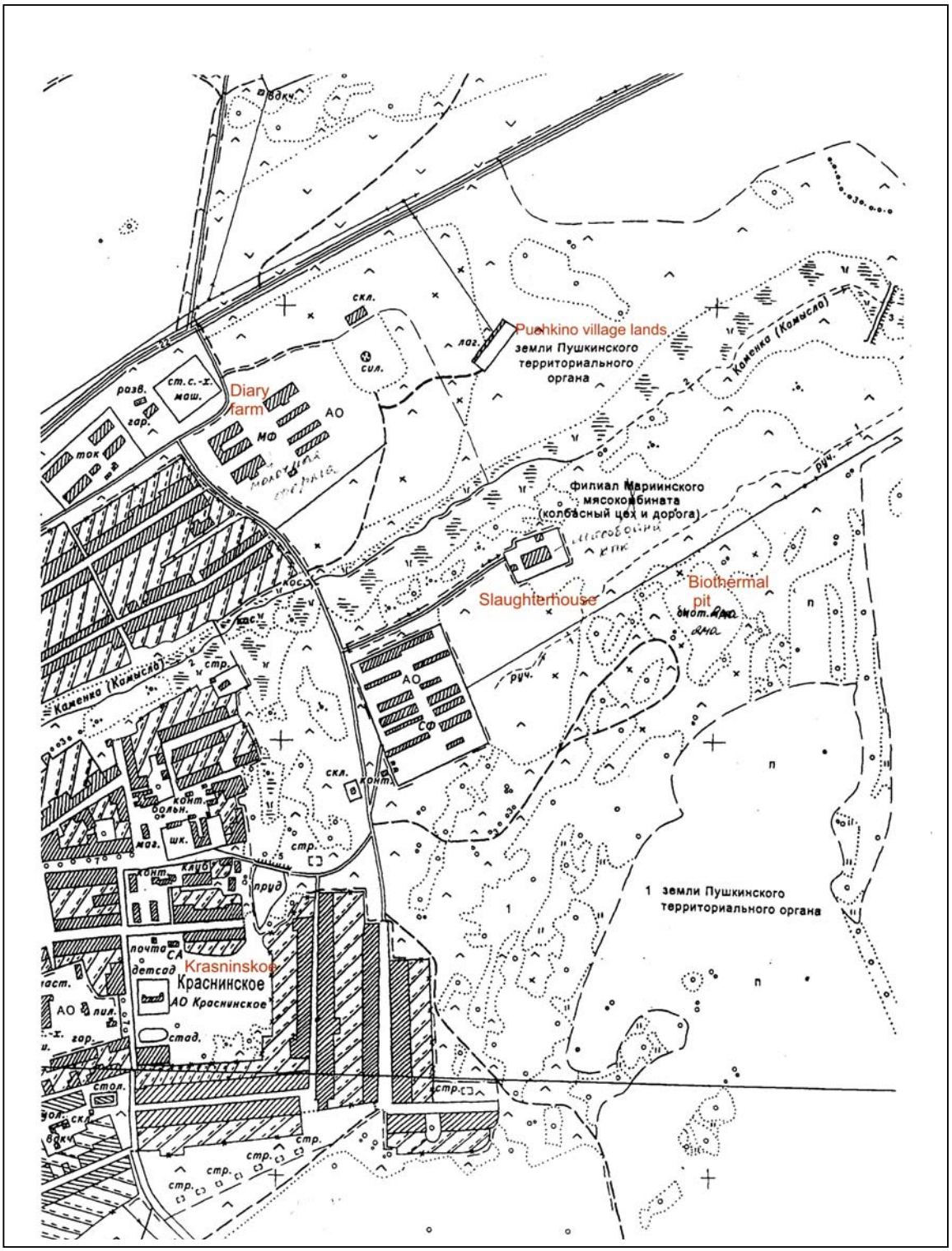
Annex B: Maps and Photos

Annex B1 – Location of all facilities
Annex B2 – Map showing locations of the dairy farm
Annex B3 – Proposed Slaughterhouse and other nearby pig complex facilities

Annex B1. Location of all facilities - dairy farm and existing slaughterhouse (Krasninskoe), beef farm (Parhaevka) and Pig farm complex (Prokopievsk) relative to Novokuznetsk (meat processing facilities)



Annex B2. Map showing locations of the dairy farm (and existing slaughterhouse)



Annex B3. Proposed Slaughterhouse and other nearby pig complex facilities