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Governmental licenses Project works - Serial AB N512624 dated 05.02.2010

Customer: Limited Liability Company
"Regionproduct-Ukraine"
Director
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Vol – 7

Environmental Impact Assessment

EIA

CONSTRUCTION OF THE DUCK FARM ON THE TERRITORY OF THE EVMYNKA VILLAGE COUNCIL OF THE KOZELETSKYI DISTRICT IN THE CHERNIGIV REGION.

Kyiv 2013

Project Structure

№ Volume	Denomination	Name	Notice
1.	GEN	General Explanatory Note	
3.	EIA	Environmental impact Assessment	
3.	SEISA	Statement of environmental impact by supposed activity	
4.	CED	Cost estimating documentation	
5.	PCO	Project of construction organization	
2.		**Working drawings**	
	GP	General plan	
	ACS	Architectural - construction solutions	
	TS	Technological solutions	
	ENWSS	External networks of water supply and sewerage	
	WSS	Water supply and sewerage.	
	EGS	External gas supply.	
	HV	Heating and ventilation	
	ES	Electrical supply	
	PEE	Power electrical equipment. Lighting	

SECTION ASSESSMENT OF ENVIRONMENTAL IMPACT
CONTENTS

Information on the EIA generation:

General Designer: LLC "INTERPROEKT GMBH", Kyiv, 3 Syretska st.

The Environmental Impact Assessment Report was developed by O. Sapura, National Academy of Sciences of Ukraine.

The materials on the impact of the design activity are presented in the local media, the discussion of the design decision involves local environmental NGOs, as well as sanitary and epidemiological service authorities.

1. Non-technical summary

Conclusions on the impact of the project on the environment, population health and social and economic growth resulting from the agrarian complex development were drawn during the assessment of the environmental impact of the hatchery, biogas complex, fattening hall, slaughter and carcass processing, fodder plant and elevator working project on the territory of the Evmynka village council and Osterska city council of the Kozeletskyi district in the Chernigiv region.

As a result of the assessment of environmental impact it was determined that the implementation of the design decisions associated with the construction and operation of the farm will be accompanied by a slight impact on all components of the environment, including:

- Air, due to the emission of the solid suspended parts of the undifferentiated composition, combustion products of natural gas and hazardous substances released during the ventilation of separate production facilities of the farm;
- Soil-vegetation layer, due the damages induced during the construction works;
- Aquatic environment, through the industrial use of water;
- Social environment, through the increase of the employment among the local population resulting in the positive impact on the social environment.

It should be noted that the negative impact on the environment is maintained at MPC level and thus is safe for health.

Discussing the economic and social prospects of the production it should be mentioned that poultry in general and duck breeding in particular is one of the most productive sectors of agriculture with the main objective to breed, raise, keep and feed the birds using mechanization, automation and preventive veterinary to produce the poultry products. Poultry is the most efficient livestock industry, which in the short period of time and with the low labor and fodder costs produces a high quality products (adult bird, offspring of the bird, incubation and nutritive eggs, slaughter products, feather etc.), manure which is used not only in the food but also in perfumery, microbiological industry and medicine. That is why it is necessary to develop and refine this extremely field of agriculture.

ASSESSMENT OF ENVIRONMENTAL IMPACT (AEI)
1. General data
1.1. Basis for elaboration of EIA

The basis for elaboration of section "Assessment of environmental impact" in composition of working project of fattening of the duck-broiler, biogas unit, hatchery, slaughter line and carcass processing, fodder plant and elevator on the territory of Evmynka village council and Osterska city council of Kozeletskyi district of Chernigiv region *are the tasks* for projection, elaboration EIA and declaration of intent.

Main purpose of section of EIA is an ecological reasoning of the expediency of construction of the object which is projected, its activity, determination of ways and means of saving of environmental state and compliance of ecological safety requirements.

Section EIA includes measures of protection of geological and air environment, soils, animal and plant kingdom, on utilization of production wastes.

List of sources of potential impact of planned activity on environment

Soils	Plot of land – area of 118,87ha in general.
Underground water	Impact is absent, waste waters will be discharged on local treatment plants
Surface water	Discharge of wastes to open water reservoirs is absent
Atmospheric air	Emissions of contaminants to atmospheric air during operation of technological equipment
Water resources	Source of water supply – water intake wells
Wastes	Disposal system

"Statement of ecological impacts" is published in local means of communication. Public expertise of project was not conducted.

Working project in full volume will be agreed with concerned establishments of village, district and region.

1.2. NORMATIVE DOCUMENTS

Assessment of environmental impact is conducted using following documents:

- The Law of Ukraine "About protection of natural environment";
- The Law of Ukraine "About ecological expertise";
- DBN.A.2.2-1-2003 "Composition and content of materials of environmental impact assessment (EIA) during projecting and construction of enterprise, buildings and structures. Main regulations of projecting;
- SNIP 2.01.01-82 "Construction climatology and geophysics";
- GND-86 "Design procedure of concentration in atmospheric air of harmful substances containing in emissions of enterprises"(L.Gidrometeoizdat, 1987.);
- GND 1-84 "Instruction regarding examination procedure, agreement and expertise of air protective measures and permission issuing for emission of contaminants to atmosphere on project decisions" (M.Goskomgidromet, 1984);
- Decision of Cabinet of Ministers of Ukraine № 554 dated 27.07.95 "About list of types of activity and objects, which constitute increased economic danger";
- "Collection of methods for determination of contaminants concentration in industrial emissions" (L.Gidrometeoizdat,, 1987);
- DD 52.04.52-85 "Emission regulation at adverse meteorological conditions";
- "State sanitary rules of atmospheric air protection GSN-201-57;
- Sanitary classification of enterprises, productions and buildings and sizes of sanitary-protective zones for them (order of Ministry of health protection of Ukraine№ 173 dated 19.06.96);
- GOST 17.2.1.03-84 "Nature protection. Atmosphere. Terms and definitions" GOST 17.2.1-04-77 "Labor protection. Atmosphere. Sources and meteorological factors of pollution by industrial emissions";
- GOST 17.2.4.02-81 "Protection of nature. Atmosphere. General requirements to the methods of determinations of contaminants";
- GOST 17.2.1.02-76 "Labor protection. Atmosphere. Classification of emissions on composition;
- State sanitary rules of projecting and development of settlements dated 19.06.96.
- Collection of indexes of emission (profit discharges) of contaminants to atmospheric air by different productions, volume 1.
- GSanPIN 2.2.7.029-99 «Hygienic requirements concerning treatment with industrial wastes and determination their category of danger for health of population».
- GSN 2.2.6.037-99 (Decision of Ministry of health Protection of Ukraine № 37 dated 01.12.1999) "Sanitary rules of production"

2. PHYSICAL-GEOGRAPHICAL AND CLIMATIC CHARACTERISTICS

Site of the enterprise is located on the territory of Evmynka village council and Osterska city council of Kozeletskyi district of Chernigiv region. Evmynka village in Ukraine, Kozeletskyi district of Chernigiv region. Population makes 956 persons. Local government administration — Evmynka village council.

This district is located in the South-West part of Chernigiv region, neighboring with Bobrovytskyy, Nosivskyy and Chernigiv districts of Chernigiv region. The distance between the district center and the Chernigiv city amounts to 70 km by the car. The area of buildings location is in the warm-temperate climate (mild with moderate moisture) with cool summers and moderately cold winters.

According to physiographic zoning, territory belongs to Dniprovsko-Desnanskyj physiographic district of region of Chernigiv Woodlands of mixed forests zone.

In orographic relation Chernigiv Woodlands represents northwest part of Prydniprovskyj lowlands. Area of territory is law-lying, somewhere plain-wavy. It is located in boundaries of Dniprovsko-Donetskyj hollow, filled by thickness of sedimentary sea, lagoonal, continental deposits of paleozoic and cainazoic. In geomorphological relation region presents by itself law-lying morainal-gritty plain disjoint on several plots by present-day valleys of rivers Dnipro, Desna. Flood plains of these rivers is segment-mantled, parallel-mantled and flattened out alluvial plains. Relief mainly low-lying, genetically accumulative. In relief of territory are distinguished numerous oxbow lakes and bogs, boggy plots, small hollows.

Main water arteries are rivers Dnipro and Desna with small arms. On north of territory there are small arms of Dnipro. West part of the park is adjoined to Kyyivs'ke Vodoskhovyshche.

Typical peculiarity of region is presence of boggy plots in flood plains, numerous distributaries, straits, oxbows, lakes, saucer-shaped hollows. «Saucers» — are locked lowerings of oval form which filled in spring by flash flood waters. Separate «saucers» represent by itself small lakes. Lakes in flood plains are met mainly in old riverbeds, oxbows and arms. Small Holy lake are located on west from village Koropje, and Clean Circle and Bobkiv Circle — on north east from hole Staro-Morovska Guta.

Average annual air temperature is + 6^0C. The coldest month in a year is February with the temperature reaching -33^0C. The warmest month is July, temperature can reach up to + 39^0C.

Soils are sandy, sod-podzol and loam. Average point is 41.

Forest surface is 70,9 thousand ha, main species are acerate and foliar trees.

Hydrography of the area is represented by the Desna and Oster rivers, their confluents and numerous lakes. The average width of the Desna river is 100 m, sometimes reaching 150 m. The water in the river is hydro-carbonated and calcium, low-salt and it is suitable for disposal in the food and also in the industrial needs. Water in the Oster river is iodinated. Water surface in the area amounts 21,3 thousand ha.

There are sand and clay among the mineral resources.

3. GENERAL CHARACTERISTICS OF PROJECTING OBJECT

3.1. Characteristics of planned activity.

The project foresees construction of a farm for growing and processing of a duck-broiler, which consists of slaughterhouse, forty production halls of fattening, fodder plant for fodder production, four hatcheries and biogas unit.

Farm includes 4 sites where 10 halls for ducklings-broilers fattening are located on each of them. There are 21600 heads of ducks in each hall, on the site there are 216000 heads of ducks.

Entry to the territory of farm is conducted through checkpoint with an outhouse for transport disinfection.

Territory is fenced along the perimeter.

Technological decisions

Composition I assignment of main production buildings.

Each building is divided into technological groups for ducklings-broilers fattening and are equipped with the longitudinal birdfeeders and automatic drinking bowls.

Fattening includes dry balanced fodder, which is stored in silos near the buildings. Dispensation of dry concentrated fodder is conducted by the automatic system of fodder dispensation.

Approximate norms of fodder need and stock (according to DNTD-AIC-04.05)

Fodder need for 1 head, kg: 6,5 per one cycle

Norms of mixed fodder stock during warehouse storage should make:

For 1 hall – 140 tonnes per one cycle, 910 tonnes per year.

For 1 site – 1400 tonnes per one cycle, 9100 tonnes per year.

In total for farm it will make 5600 tonnes per one cycle, 36400 tonnes per year.

№	Group of animals	Quantity, heads
For 1building	Young ducks in age of 0-6 weeks	21 600
For 1 site (10 buildings)	Young ducks in age of 0-6 weeks	216 000
For 4 sites	Young ducks in age of 0-6 weeks	864 000

3.2. Data concerning raw materials, land, water, energy resources which are used.

Characteristic of land resources.

Plot of land - area 118,87 ha - is provided on lease terms by the Kozeletskyi District State Administration for 49 years for farming.

Characteristic of water resources.

Source of water supply is projected well

№	Group of animals	Quantity, heads	Need in water	
			l/day	m3/day
For 1 hall	Young ducks in age of 0-6 weeks	21 600	6 250	6,25
For 1 site (10 buildings)	Young ducks in age of 0-6 weeks	216 000	62 500	62,5
For 4 sites	Young ducks in age of 0-6 weeks	864 000	250 000	250

№	Slaughterhouse	Quantity, hours	Need in water	
			l/hour	m^3/day
1	For technological needs	4	60 000	240
2	Washing of feather (water after treatment is used again)	4	50 000	200

№	Hatchery	Quantity, hours	Need in water	
			l/hour	m^3/day
1	For technological needs	8	1 000	8

№	Fodder plant	Quantity, hours	Need in water	
			l/hour	m^3/day
1	For technological needs	24	2500	60

Composition of pollutants of production and household waste water is expected to be as follows:

Name of waste water pollutants	Value of waste water pollutants indicators in mg/dm, for factories
pH	6,8-7,0
Suspended materials	6235
COD	6687
$BOD_{,full}$	4682
Bod_5	2639
Ammonia nitrogen	77
Phosphates	175
Fats	1341
bod_{full} /cod	0,70
bod_{full} /nitrogen	100/1,3
BOD_{full} /phosphor	100/1,8

All waste water is carried to projected treatment plants.

At the phase of biological treatment the BOD and COD indicators are improved, thus water can be carried to environment (e.g. to absorption field or waters).

Conclusion: planned production will not affect waters.

Planned production does not affect soil (hard surface, carrying of waste water to treatment plants).

Planned production does not have an impact on social environment.

Characteristic of gas supply.

Natural gas will be used for technological needs (steam production) and heating. Supply of gas will be conducted from gas pipeline of high pressure, located in t. Kozelets by leading gas pipeline to own gas distributive substation on which pressure of gas will be reduced to medium one. Then gas will be fed to each site by gas pipeline of medium pressure. On each site also will be installed gas distributive substation on which pressure of gas will be reduced to operating pressure and passed to consumers by inside-site gas networks. Gas consumption on each site is indicated in table:

П/П		**Slaughter house**	**Fodder plant and dryer on elevator**	**Hatchery**	**Site of fattening**	**Total**
1	**Maximum m³/hour**	488	550	40	1 848	**3 459**
2	**Average m³/hour**	366	223	40	467	**912**
4	**m³/day**	2 928	5 352	960	11 208	**16 032**
5	**m³/year**	761 280	1 392 000	350 400	4 090 920	**5 445 960**

Characteristic of power supply.

Power supply of farm will be carried out from own substation 35/10 kV, to which will be connected two lines 35 kV. After substation power 10 kV by internal networks will be supplied to each site. On sites there will be installed reducing transformers 10/0,4 kV and necessary automation for supply of power to consumers. Biogas complex will generate 1 000 kwt/hour of electric power with annual volume of manure from 5,4 million of ducks (1 200 kwt/hour generation,

200 kw/hour is used for operation of equipment of biogas complex), which will be used for own needs. On increase of duck production to 10,8 million per year generation will increase to 2000 kWt/hour. Electricity consumption is provided in table below:

П/П		Slaughter house	Fodder plant and elevator	Hatchery	Sites of fattening	Biogas complex	Total
1	**Maximum kWt/hour**	2 895	1 700	350	2 000	-1 000	**5 945**
3	**Rated kWt/hour**	2 000	1 020	350	1 000	-1 000	**3 370**
4	**kWt/day**	14 400	24 480	8 400	24 000	-24 000	**47 280**
5	**kWt/year**	5 256 000	6 364 800	3 066 000	8 760 000	-8 400 000	**15 046 800**

Technological Process Description

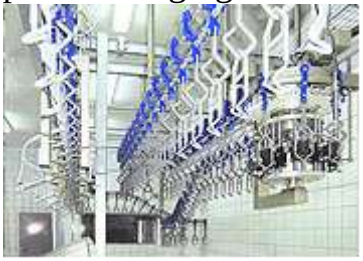
Slaughterhouse technological process description

Slaughterhouse and its equipment is provided by the German company EMF LEBENSMITTELTECHNIK -ANLAGENBAU GMBH.

Calculation basic capacity 5000 heads/hour
Total capacity 40000 heads/day
Technological process of the production includes:

- Initial processing (slaughter and feather removal);
- Semi-evisceration, deep processing and full processing of the carcasses;
- Forming and cooling of the carcasses;
- Sorting, marking, weighting, packing of the carcasses;
- Cooling and chilling of the carcasses;
- Storage and sale of the products.

Products are delivered in the boxes to the hanging area with the help of rolled transporter. Hanging is done manually.



Knocking of ducks is carried out in the water container for the knocking with help of the electric shock. Voltage and frequency is controlled in the control cabinet. Slaughter plant is located next to the knocking area. Ducks are brought on the conveyor to the rotating knife head first. Carotid artery is cut there and a bird may be dehematised.

After dehematisation duck is brought through the scald. It is filled with hot water enabling easy grazing in the nearby grazing device.

Wax with feather wastes from the carcasses is removed, cleaned and brought to usage.

Device for the head and trachea removal removes the head.

Process of viscera if started afterwards: firstly the cloak is removed to get the access to the abdominal cavity.

After the cloak removal abdominal cavity is opened with the device for the abdominal cutting, resulting in the set of inners as an output from the duck. Set of inners (bowels, ventriculus, heart etc.) is removed from the carcass by the viscera device. After the veterinary examination of the set of inners it is taken off from the carcass and useful inners (venticulus, heart, liver) are selected.

Removal of the crop (front camera in the venticulus) is done by the device for crop removal. Neck is removed by the neck removal device. Next step is lights removal. This is done with the help of the final control device. In the end of the conveyor the carcass is washed from inside and outside. Inside cleaning is done with the device for inside and outside cleaning.

With the help of the legs cutting device the carcasses are moved from the viscera line to the preliminary cooling.

Preliminary cooling is held with cooler in the water container or with air cooling. After the cooling temperature of the carcass is approx. 4^{o}C.

Ducks delivered from the cooling area are automatically sorted by different weight categories. In the end it can be cut or packed bodily. Cutting is done on the automated cutting line.

Whole duck as an frozen product is packed. It is dine with the help of the packing cone or semi-automated packing device. Fresh product is laid on the foamed material backing and covered with the coating. The same is done with the carcass parts.

Depending on the market situation and demand whole carcass is either frozen (shock chilling) and preserved further on or delivered to the storage room with the 0 ° C as a fresh product.

The production process is non-interruptible.

Slaughter wastes, such as bones, heads, and bowels are washed from the plant with the water. Outside the building of in the separate room wastes are separated from the water with the help of separator. Water is brought back to the slaughter plant for the repetitive usage. Wastes are recycled in the wastes recycling plant. Wastes are delivered to the silos for the raw material by the separator. From the silos and auger conveyors wastes are brought to the sterilizer which are the driers simultaneously. In the sterilizers raw material is warmed up to 133 ° C temperature with the excessive pressure 2 bars and held there for at least 20 minutes (EU normatives).

All the bacteria and microorganisms die in this process. Wasted water is brought through the system of cleaning equipment and becomes usable again after the processing.

Biological filters are foreseen to ensure the cleaning of the slaughterhouse air. Biofilter consists in its most efficient form of 1m filtering layer for cleaning of the air. In the filtering layer made of long-fibred fossil moss, heath and slip, the bacterial and fungus culture grows, it which eats organic, gasiform elements of the wasted air, which are the reason of the odor.

Fodder Plant Technological Process

The supplier of the equipment and production technology is BDW Feedmillsystems, Germany.

Capacity of the fodder plant under construction is 20 tonnes/ hour.
Daily capacity = 20 tonnes/hour*22= 440 tonnes/day.
Monthly capacity = 440 tonnes/hour*28= 12320 tonnes/month.
Annual capacity = 12320 tonnes/month*11=135520 tonnes/per year.

Production technology of the plant allows producing the fodder for all kinds of animals and poultry.

The product range produced at the plant includes crumbled all-mash, combined fodder, pelleted all-mash and semolina – ready-to-use product received from all-mash crushing to the needed size.

Technological process at the fodder plant includes the following stages:
1. Acceptance and allocation of the raw material supplied by the transportation;
2. Dozing and mixing of the all-mash components;
3. Injection of the fluid components (oil);
4. Crushing of the dozed and mixed components of the all-mash;
5. Obtaining of the pelleted all-mash with the diameter 3.2-6 mm and ready-to-use semolina of 1.5-2.5 mm diameter;
6. Packaging of the ready-to-use products in the sacks weighting 5-30 kg;
7. Folding of the ready-to-use products in the containers before the dispatch.

As a grain storage at the fodder plant an elevator of 30 000 tonne capacity is constructed. Technology of the elevator allows to accept motor transport and to unload them. Technological scheme of the elevator foresees the cleaning of the grain from the metal foreign matter. For the acceptance of the humid grain there is containers and drier. After drying the grain is brought to the storage containers. Grain can be transferred from the containers to the manufacturing building of fodder plant or for the motor transport dispatch.

There is a manufacturing-technical laboratory at the plant, which allows assessment of the raw material input, control of the production technological process and dispatch control.

All of the technological process at the elevator and fodder plant are carried out by the automatic control from the central control room.

Technological process of duck commercial flock breeding description

Equipment for the hatchery is supplied by the Big Dutchman Company.

Commercial cross of the Peking duck guarantees highly efficient meat production in the different natural and climatic zones of Ukraine without outdoor run, with

friction-tight laying, low fodder expense per one item, high level of livestock preservation.

Ducks are viable, efficient, quickly growing, have good ratio of feed conversion

Number of production sites	4	Pcs
Number of hatchery on the single site	10	Pcs
Area of the single hatchery	2 160	m^2
Total area of the buildings for the duck breeding	86 460	m^2
Livestock in the single hatchery at the laying	21 600	Heads
Livestock on the single site	108 000	Heads
Livestock in the single hatchery at the slaughter	20 520	Heads
Friction-tight of the laying in the beginning of the cycle	10,0	head/m^2
Friction-tight of the laying in the end of the cycle	9,5	head/m^2

and indicator of carcass output.

Production indicators of the duck breeding complex under construction.

Annual livestock	5 616 000	Heads
Amount of livestock at the slaughter per year	5 335 200	Heads
Annual meat production	10 790 000	kg

Total number of duck places	864 000	Heads
Number of cycles per year	6,5	
Flock preservation at the breeding	95	%
Live weight	3,2	kg
Fodder conversion	2,04	
Carcass output	63,2	%

Lifecycle of the ducks could be divided into three main stages:

Nursery period - 0 - 18 days;
Breeding -18 days and until the slaughter;
Slaughter - 42 - 56 days depending on the specific demand conditions.

One-day ducklings are brought to the hatchery in special boxes and folded in the cotes of the same size with capacity 500-1000 ducks each.

Seven first days ducklings are held at the 7m long and 4m width oval nursery site fenced with the 0.5-0.7m toll plastic sheets. On such area it is possible to preserve up to 1000 ducklings. Two nurseries are fenced with the one fence and are located on the equal distance from each other. This allows to keep ducklings close to the sources of warmth and protects them from the draught. Total flock shall be divided into the flocks about 500 heads each (two nurseries per section at the beginning period). Starting from the second day the fence is gradually widened by adding the sections. Nursery fence is removed on the 7th day.

From the 1st day until the 7th, while ducklings are in the nursery area, the process watering is held through the automated drinking pan with regard of 1 drinking pan per 100 ducklings (9.5 mm of the duckling). First three days of the watering is held through the drinking fountain with regard of 1 drinking fountain per 100 ducklings.

In the nursery period a tubular feed crip is used for the duck fattening, with regard to 1 crip per 100 ducks (9.5 mm/per duck).

Starting from the 7th day ducklings can freely move around in the hall. Drinking panpers are gradually moved to the one side of the area. Cylindrical feed crips are gradually substituted with the automated ones (feed front: 16 mm/duck).

Different types of fodder is used depending on the period of breeding:

Starting 1 = from 0 to 9 days
Starting 2 = from 10 to 16 days
Breeding = from 17 to 42 days
Finishing = from 43 days until the slaughter

The whole breeding period is carried out on the grating floor.

The advantages of the grating floor breeding are:
• higher tightness of the laying
• ducks do not have any contact with the litter
• dry floor
• cost for the nest material is excluded.

When a duck reaches the 3.2 kg of the live weight it is put in the special boxes and brought to the slaughterhouse. Ducks are fed 6 hours prior to slaughter.

Wastes from the production complex of the duck breeding are brought for recycling at the biogas unit. As a result of the anaerobic fermentation a litter is totally aseptisized and the odor is removed. Output from the biogas unit are biogas (60% methane) and fertilizer.

Biogas Complex (for the processing of the manure from at least 10,8 million ducks per year)

The concept foresees that the packaged unit with the possibility for enlargement able to operate in the different regimes. Basis for the construction of the unit is equipment and technology of the German company UTS Biogastechnik GmbH,

implemented on the hundreds of operating objects within the EU and out of its borders.

Project implementation provides the construction of biogas unit for the duck manure recycling with the extraction of biogas which can be as a fuel for the cogeneration plant producing the electric and heat power. Biogas is a result of the multi-level fermentation caused by the anaerobic activity of the microorganisms (microorganisms that do not vitally require oxygen). Normally, high-molecular organic essence (substrate) dissolves in a multiphase manner into low-molecular material with the methane formation. Fermentation takes place in the humid ambience necessary in the sufficient amount for the organisms in the initial substrate.

Fresh duck manure is aggregated in the impounding reservoir of the initial raw material wherefrom it is then delivered for fermentation to the bioreactors, each 5 234 m^3. Bioreactors are equipped with nozzle flexible gas holders, where the gas with the methane concentration of 56% is aggregated. After that biogas is dewatered, cleaned from the sulphur, then pressed in the compression pump and delivered to the two cogeneration plants with the 1.2 MWt el./ 1.27 kWt hour. capacity each.Heat energy produced during the cogeneration process is used (40-60% depending on the season of a year) to maintain the necessary for fermentation temperature in fermenters to heat the domestic compartments of the biogas complex.

On the initial stage, together with the biogas unit start it is advisable to add a corn silo, which will be delivered with the special facility of the solid substrate loading. There is no more necessity of the silo when an ordinary microbiological ambience in the bioreactor is formed.

Fermented substrate from the two bioreactors is centrifuged, being divided into liquid (approx. 2.5% DM) and solid (approx. 25% DM) fractions. Liquid substrate is aggregated in the lagoon for the further utilization of it as a liquid organic fertilizer.

- Initial essence (substrate) at the 10,8 million ducks per year level of fattening:

Duck manure: 200 000 tonnes/year when 10.5 % of the dry matter (10.5 % DM)

Corn silo: 500 ... 1 000 tonnes/year when 30 % DM

On the basis of abovementioned initial essence the following production parameters are calculated:

Biogas production capacity: approx. 7 000 000 nm^3/year (methane 56 %).

Given amount of gas is assumed to be used in the cogeneration plant (2 psc): el. capacity: approx. 2400 kWt (with the generator 10 kV on the biogas engine shaft) Heat capacity: approx. 2540 kWt

Output substrate after the centrifugation is considered as follows:

Approx. 182 500 tonnes/year when 2.5-4 % DM of a liquid fraction, approx. 44 000 tonnes/year when 23-25 % DM of a solid fraction.

Table shows the chemical composition of the liquid fraction.

Bio-fertilizer (fermented mass)	Chemical composition kg/tonnes			
	N	P_2O5	K_2O	MgO
Bird manure	7,1-8,2	6,8-7,9	5,0-5,6	1,5-2,2

Chemical composition of the solid fraction

Bio-fertilizer (fermented mass)	Chemical composition kg/tonnes			
	N	P_2O5	K_2O	MgO
Bird manure	17-18	10-10,9	8,0-8,8	3,5-4,2

Application rates of nitrogen kg per 1 ha:

Corn	150-180
Crops	30-90
Vegetable crops	60-120

Land requirement for entering the liquid and solid fractions of bio-fertilizers derived from the anaerobic fermentation.

For corn:
From 7 896 ha to 9 475 ha for liquid fraction
From 4 278 ha to 5 133 ha for solid fraction

Procedure of calculation:
*182500 * 7,6 /180 kg = 7705 kg for liquid fraction*
*44 000 * 17,5 /180 kg = 4278 kg for solid fraction*

For crops:
From 15 791 ha to 47 373 ha for liquid fraction
From 8 555 ha to 25 667 ha for solid fraction

For vegetable crops:
From 11 843 ha to 23 687 ha for liquid fraction
From 6 417 ha to 12 833 ha for solid fraction

Biogas production will be carried out in the closed tanks and hazardous substances will not be brought to the air environment. Biogas production will not have any negative impact on the water. Waste water is delivered to the sewer network.

Noise load will be 60 dB, while the ambient will not exceed 40 dB. Production waste will be regularly removed and delivered to the further processing.

The Description of Hatchery Technological Process

The hatchery equipment is provided by the Pas Reform Company

The hatchery under construction production capacity amounts to 15.4 million eggs per year.

Per week: eggs – 297000 pcs, hatched ducklings - 237 600 heads.

Per month: eggs – 1 188 000 pcs, hatched ducklings – 950 400 heads.

Per year: eggs – 15 444 000 pcs, hatched ducklings - 12 355 200 heads.

The main purpose of hatchery is production of viable offspring of a high quality. Its capacity fully satisfies own need of one-day ducklings. To fulfill this need there are 28 setters of 42335 eggs capacity each and 18 hatchers.

Following technological processes are carried out in the hatchery:

1. **Incubation preparation**
   - Quality control and acceptance
   - Eggs washing
   - Hatching tray stowage
   - Sanitation
2. **Incubation**
   - Laying
   - Candling
3. **Transfer of eggs to hatching**
4. **Hatching**
5. **Duckling selection**
6. **Duckling quality assessment**
7. **Duckling transportation**

Incubation preparation

Up-to-date technologies are applied on throughout the whole production process.

On arrival to the hatchery eggs are stored in the acceptance room, rigged in the way to maintain the optimal parameters of microclimate of eggs preservation. The re-usable and easily washable and suitable for sanitation trays and trolleys are used in the process.

Eggs' washing is an obligatory condition to reach the high level of hatchability.

A special washing machine for the eggs washing with the capacity of 10 thousand eggs/hour is foreseen.

To speed up the process of eggs displacement into hatching trays and to avoid losses a machine for eggs displacement with the vacuum hoists are foreseen.

The eggs are gradually warmed up before being transferred to hatchery. Eggs are transferred from the eggs depository to the room rigged with good ventilation and the temperature 20-24°C 12 hours prior to their displacement into the hatchery.

Loaded hatchery trolleys are transferred to the fumigation chamber.

Microorganisms located on the surface of eggshell could play decisive role on the hatchability of one-day offspring. That is why the sanitation right before stowage is very important.

Incubation

The egg is ready for the incubation after the sanitation.

One-stage incubation is used. The whole amount of eggs is stowed at a time resulting in the simultaneous hatching. The advantage of the one-stage incubation is that the climate conditions could be adjusted to the needs of the growing embryos. Another advantage of the one-stage incubation is the possibility to clean the hatcher after the each cycle, which mitigates the risk of infection communication.

Module design of the hatchery allows to create separately controlled microclimate in each section of the hatchery. Thus, it guarantees the homogeneous temperature. Each module section has its own temperature controller, warming, cooling, humidification and ventilation system.

Energy Saving Module (ESM™) minimizes the energy consumption significantly cutting the exploitation expenses.

Eggs candling will be carried out on the 10th day of the incubation. In this way unfertilized and dead-embryo eggs are detected and removed.

Transfer of the egg to hatching

Eggs are brought to the hatcher on the 25-26th day of the incubation.

Hatching

After the eggs are brought to the hatcher the hatching program is started and it lasts for the 3 days.

Duckling selection

The incubation period of the ducks is 27 days and 12 hours. Time of the selection influences the viability of the ducklings.

At the day of duckling selection all the equipment is cleaned and sanitized after the end of selection and duck transfer.

Duckling quality assessment

The assessment and selection of the 1-day offspring is carried out not later than 6 hours after the hatcher selection. The temperature in the room of the selection is 24-30 °C, lightening 10-12 Wt/m^2 of the floor square. The assessment is carried out on the smooth selection table. Offspring is evaluated by its appearance, general state and development.

Duckling transportation

Ducklings are set out to the farms immediately after being put in the transportation boxes. In case the is a necessity to delay them, ducklings rest in the room with the temperature 20-25 °C, good ventilation and without the draughts.

The boxes with ducklings are folded not exceeding 10 items and in a way that air could easily circulate.

The temperature in the transport for the ducklings is 20-24 °C.

Waste recycling

Hatcher wastes are macerated and converted into semifluid essence. The essence is transferred to the hermetic container with the help of a pump and brought to the recycling point, which is located on the territory of the slaughterhouse.

Strict hygienic, sanitary and safe labor norms are foreseen throughout the whole technological process. Namely, the sanitization, desinsectization and deratization are carried out. Employees follow the rules of production hygiene and sanitary.

Characteristic of energy resources.

Natural gas will be used as a fuel for the heating of the boilers' need.

3.3. Description of the engineer networks and communications.

System of water supply.

System of water supply of the designed complex includes:

- artesian water wells;
- mechanical and bacteria water treatment block (2 sets.);
- two water towers of 160m^3 volume;
- increasing pressure pump houses;
- systems of external household and firefighting water-supply.

Sewerage system

The project foresees the construction of a household sewerage complex – disposal of household wastes from sanitary-technical devices of the temporary residence complex to external system of household sewerage, hereafter referred as SPS and local treatment plant of household disposals.

Heating system

Heat supply to the heating systems is provided by the gas boilers, which are installed in the boiler rooms (separate buildings) in the temporary residence complex, building of security service, administration-household block.

Ventilation system.

Air exchange in the building is conducted through the ventilation system. Ventilation of buildings is automatic, forced, balanced system of ventilation. Air enters and discharged through vent shafts, located in the ceiling and on the walls. Fans are mounted in vent shafts.

Mechanism is operated from control panel by operator.

Air temperature:

- Estimated 14 ° C.

Relative air humidity:

- Maximum 75%;
- Minimum 65%.

Air speed m/s:

- In cold and transitional periods of year - 0,3;
- In warm period of year – 0,6.

3.4. Design data about estimated volumes of all types

The points of pedal bins in the premises are foreseen for the collection of solid household wastes, on the territory – containers. Accumulated solid household wastes will be transported by own trucks to village dump.

For collection of wastes from carcass processing (bones, entrails, etc.) the construction of a concreted area is foreseen. Special container with waterproof bottom and cover will be installed there. Container is intended for a short-term storage with duration of 1 day. Accumulated leavings will be daily transported to an existing site of utilization (with further processing into the meat-and-bone meal), which is located on the north-western part of an existing farm.

Container and transport is washed and disinfected in the special area of a point.

Manure (liquid manure) will fall into a quarantine tank through the system of sewer pipes, where after the heating it will enter the biogas reactors, where the formation of biogas takes place. Neutralized liquid manure will be purified and poured out on the field. After drying, the solid fraction is suitable for use as an organic fertilizer.

Wastes of vital activity of ducks are calculated taking into account temporary stay during an hour at coming out by 1 day of wastes of vital activity for one head – 0,423 kg of excrement.

Name of wastes	**Quantity, tonnes/year**	**Category of danger**	**Place of storage on enterprise**	**Method of utilization**
household wastes 7720.3.1.01	28.875 tonnes/year	IV	Containers on special intended area	Transported to village dump,
Luminescent lamps 7710.3.1.26	50 units/year	I	Special separate building	Passed to specialized enterprise «Himvolokno»
Manure 6000.2.8.20	91 250 tonnes/year	III	Regular scavenge with further removal	Removed to existing manure storage for further biogas production

Calculation of quantity of household wastes is made according to

$M=n \times q$

where: M – mass of wastes, tonnes/year;

q – specific value of waste formation, tonnes/(year•man.);

n – quantity of employers, man.

M= 385*0,075= 28. 875 tonnes/year (number of MSW in general among the enterprise)

M= 95*0,075= 7.125 tonnes/year (number of MSW in general among the hatchery)

M= 30*0,075= 2.25 tonnes/year (number of MSW in general among the hatchery)

M= 200*0,075= 15 tonnes/year (number of MSW in general among the slaughter)

M= 40*0,075= 3 tonnes/year (number of MSW in general among the fodder plant and elevator)

M= 20*0,075= 1,5 tonnes/year (number of MSW in general among the biogas)

Calculation of quantity of used luminescent lamps

N= n / q * t

n – quantity of lamps, which are used on enterprise, nos,

q – lifetime of lamps, hours q =8000 hours, т- quantity of hours of work of one lamp in year hour/year,

N - quantity of lamps, which is necessary to change, nos/year, N = 800/ 8000*480 =50 nos.

4. CHARACTERISTIC OF THE ENVIRONMENT AND IMPACT ASSESSMENT ON IT

Outgoing data

The object of this EIA is territory provided for the futher implementation of the design solutions with a size of 118.87 hectares and surrounding area, which are roads and houses.

Climate of Chernigiv region (the area where the project will be implemented decision):

Chernigiv is located on the North part of Ukraine on the right shore of the Desna river.

In general, climate of the town is temperate continental with mild winters and warm (sometimes hot) summer.

The average annual temperature is 6,7°C. The lowest is in January (minus 7,1°C), the highest - in July (18,7°C).

Monthly Temperature, (°C)

Temperature	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Year
Average	-7,1	-5,6	-0,6	7,8	14,5	17,6	18,7	17,7	12,8	6,8	1,2	-3,3	6,7
Day maximum	-3	-2	3	12	19	22	23	22	17	11	3	-1	11
Night minimum	-8	-7	-2	3	8	12	13	12	8	3	-1	-5	3

Lowest average monthly air temperature in January (minus 16,1°C) recorded in 1987, the highest (0,7°C) - in 2007.

Lowest average monthly temperature in July (16,4°C) was observed in 1935 and 1979, the highest (24,0°C) - in 1936

The absolute minimum air temperature (minus 35,9°C) was recorded in January 9, 1987, the absolute maximum (38,2°C) - July 30, 1936.

For the late 100-120 years air temperature in Chernigiv, as well as a whole on Earth tends to increase. During this period, the average annual temperature has increased by at least 1,5°C. The warmest in the history of observations was 2007. Mostly, in general is a temperature rises in the first half of the year.

In average per year it falls 599 mm of rainfall in Chernigiv, the lowest - in March and October, most of all - in July.

The average annual rainfall (mm)

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Рік
42	36	35	42	45	79	80	67	43	35	48	47	599

Minimum annual rainfall (337 mm) was observed in 1975, the maximum (794 mm) - in 1970.

The maximum daily rainfall (78 mm) was recorded in June 12, 1990

In an average per year there are 153 days with precipitation, minimum of (10) in October, most (18) - in December.

Every year in Chernigiv there is a snow cover, with the highest level in February.

Relative air humidity averages 79%, the lowest in May (69%), the highest - in December (89%).

Relative air humidity (%)

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Рік
85	84	82	73	69	71	74	75	78	83	88	89	79

The least cloudiness is observed in August, the biggest - in December.

Total cloudiness (points)

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Рік
7,3	7,2	6,7	6,2	5,3	5,4	5,2	4,9	5,3	6,2	7,9	8,2	6,3

- 0 point - bright.
- Less than 5 points lower level or clouds of middle level that are translucented or any number of top-level clouds – low cloudiness.
- From 1-3 to 6-9 points or 3-8 points of low-level clouds or dense clouds of middle level – cheangable cloudy.
- From 8-10 to 0-3 points of low-level clouds – overcast with clearing up.
- 7-10 points of lower level clouds - cloudy.
- 10 points of lower level clouds - overcast.
- The greatest frequency in winds are from the west, the smallest - from the northeast.

The frequency of different wind directions, (%)

N	NE	E	SE	S	SW	W	NW	Calm
12,7	9,2	11,5	10,0	14,9	13,1	16,7	11,9	19,1

The highest wind speed - in February, the lowest - in the summer. In January it averages 4.3 m/s in July - 3.2 m/s.

Monthly wind speed, (m/s)

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Year
4,3	4,4	4,1	4,1	3,4	3,2	3,2	3,1	3,4	3,9	4,4	4,6	3,8

During a year the average number of days with a storm is 14, with a hail – 3 and with a snow – 64.

4.1 Geological environment.

Project fattening of duck-broiler, biogas complex, hatchery, slaughter line and processing of carcasses, fodder plant and elevator on the territory of the Evmynka village Council and Osterska city Council of the Kozeletskyi district of chernigov region won't have a negative impact on the geological situation in the industrial area in the consequence of efforts to landscaping, waterproofing networks, buildings and floors.

References in accordance with area of location of object of designed activity were taken.

The area where design solutions will be implemented is shown below:

The radiation background of area meets current standards.

Air microflora.

Three groups of microorganisms were found in the atmpspheric air of v. Evmynka:

• coccus which creates pigment makes up to 70-80% of air microflora;

4.1.1. Climate and microclimate

Climatological characteristics and factors that determine the conditions of dispersal hazardous substances into ambient air are given in the table.

Indicators	Quantity
1. Factor stratification of the atmosphere, A	180
2. Factor of the terrain	1
3. Maximum average temperature of the ambient air in the hottest month of the year, T, °C	27,2
4. The average outdoor air temperature of the coldest month, T, °C	-7,2
5. Average annual wind rose, % N NE E SE S SW W NW	 17 12 9 11 17 9 11 14
6.Wind speed, repeatability of exceeding makes 5%, m/s	4-5

4.1.2. The impact assessment of climate conditions for the negative dispersion of pollutants in the atmosphere.

Among the conditions, determining the accumulation or dispersion of pollutants, information on the surface and the upraised inversion is particularly important. The increase of the air temperature with an increase of height instead of a decrease is called temperature inversion. Temperature inversion occurs in the surface layer of the atmosphere, especially from the ground, as well as in the free atmosphere, especially at the its lower two-kilometer layer. Temperature inversions create layers that delay dispersion.

The highest frequency of the upraised inversions is observed in the daytime and early morning hours (in every second case), the frequency is lower in the evening and night hours, though at this time it is still quite significant - 35% - 40% of all radiosonde issues. More often this type of inversion occurs in the cold season.

The condition of the atmosphere air object is characterized by the background concentrations.

4.1.3. Features of the climatic conditions that are favorable for the growth of the intensity of the impact of the proposed activity on the environment

Pollution of the surface layer is largely dependent on the meteorological conditions. In some periods when the weather conditions are contributed to the accumulation of pollutants in the surface layer of the atmosphere, the concentration of impurities could dramatically increase. The goal is to prevent the emergence of high level of pollution that in these times. To solve this problem one needs to predict in advance such conditions and to reduce pollutant emissions in the timely manner.

The necessity of developing measures to resolve the CL emission during AMC is determined by the management of hydrometeorology and environmental Control. But according to KD52.0452-85 "The control of emission under adverse weather conditions," part.1 "Measures of reducing emissions of pollutants into the atmosphere during the NMU are developed by those enterprise that are located in populated areas where by Goskomhidrometa is made a forecast of NMU." This item does not belong to the abovementioned kind of items.

4.2 Aqua environment

According to the effective norms the amount of water per capita is 0,18 m^3/day, thus the amount of water for the domestic use on the enterprise will be:

Name of production	Number of employees	Amount of necessary water per day, m^3	Amount of necessary water per month, m^3	Amount of necessary water per year, m^3
Fattening	95	17,1	427,5	5130
Hatchery	30	5,4	135	1620
Slaughterhouse	200	36	900	10800
Fodder plant and elevator	40	7,2	180	2160
Biogas unit	20	3,6	90	1080

Production needs identified by the technological task, the cost of water for domestic needs of employees - according to SNIP 2.04.01-85.

Employees use the household facilities and showers.

System of the cold water is in accordance with the requirements in SNIP 2.04.02-85, "Inner water supply and sewage deposited", technological and Architecture - Contractual sections of the project.

Water that is used in domestic and industrial needs related to the equipment washing, packaging, cleaning of industrial premises must be complied according to requirements of GOST 2874-82 "Drinking water."

Network internal plumbing pipes are adopted from polypropylene.

Wastewater is generated during washing equipment, packaging, flooring and panel production facilities, and needs of incubator employees.

Composition of pollution of the mix of industrial and domestic wastewater is expected as follows:

БПК повн. - 300 mg/l;

Temperature – 250C;

PH – 6,5 – 9;

Suspended solids – 210 mg/l.

Waste water of the enterprise (manufacturing, economic life, washing floors and storm water) is collected and diverted to their own treatment plants.

Installation of sewage treatment has two main components:

1. Degree of mechanical and chemical cleaning. On this step, free fat reduced by more than 90%. Indicators for wastewater of biological and chemical oxygen (BOD and COD) are reduced by 70-80%.

2. Degree of biological treatment (aerobic process). Micro-organisms convert organic matter to carbon dioxide and biomass. Nitrogen-containing compounds are oxidized to nitrate (nitrification) followed by controlled process converts nitrate to elemental nitrogen (denitrification).

On the stage of biological treatment the values of BOD and COD are improved again, thus when circumstances are normal water may be discharged into the nature (e.grams., field filtration or water bodies).

Conclusion: planned production won't have any negative impact on the water bodies.

Planned production has no effect on the soil (paved and drainage of storm water to treatment plants).

Planned production has no effect on the social environment.

Industrial and domestic wastewater discharged to the biological treatment structure. After the effluent conventionally treated water is filtered in the soil flow through 6 filtration wells with the total capacity of 200 m^3.

Territory characteristics	**Square, м^2**	**Run-off coefficient**		**Amount of rain water m^3/per year Wr=10 hr ψr F**	**Amount of melt water m^3/per year Wm=10 hm ψm F**	**Total amount of rain and melt water m^3/per year**
		Rain water, ψr	Melt water ψm			
Existing territory						
Territory under construction	260 000	0,8	0,7			
Solid surface	120 000	0,7	0,6			
Plants and lawns	100 000	0,15	0,5			
Total:	**480 000**	**29,58**	**32,65**	**133786,05**	**16688**	**150474**

There is no network of rain water sewerage near the industrial area. The project provides that rainwater and meltwater are diverged through the farm's own network of stormwater storage to storage tanks with the further use, partly by irrigation landscaping land, partly for filtration in the soil flow.

Conclusion

Project construction is expected:

- connection to the existing plumbing in the projected wells

- laying of internal and external networks of water supply and sewage systems in compliance with regulations that will prevent leakage of water from the network;
- carrying out landscaping;
- sewage to the biological treatment plant and then into the filtration wells;
- drainage of rain and melt water to storage;

Based on the quantity and quality of waste water the construction of the company will have no negative impact on the aquatic environment.

4.3 Air environment

Area of the object of the design activity taken under reference.

Conventional current rectangle coordinates	Name substances	Concentration							
		Wind direction							
		N	NE	E	SE	S	SW	W	NW
10000*10000	nitrogen dioxide	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02
	carbon monoxide	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4
	material in the form of suspended solids	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05
	methane	5	5	5	5	5	5	5	5
	ammonia	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02

Hygienic standards of acceptable content of chemical and biological substances in the atmospheric air of populated areas (the contaminants) are: maximum permissible concentration (MPC), indicative of safe levels (OBRD), the coefficients of the combined performance (COP) is compatible substances present and installed on the basis of their maximum allowable pollution indicators (GDZ).

Background concentrations of other pollutants that considered in the calculations are given in the table.

Substance	Background concentration, Sf, mg/m3	MPC settlements mg/m3	Sf in shares of MPC
nitrogen dioxide	0,02	0,2	0,1
carbon monoxide	0,4	5,0	0,08
material in the form of suspended solids	0,05	0,3	0,16
methane	5	50	0,1
ammonia	0,02	0,2	0,1

The pollution which comes into the atmosphere from the projected boiler and during disinfection of the aeration of eggs chamber was taken for the calculation.

These sources of emissions at industrial area are:

source number 1 - emissions from boiler chimney
source number 2 - emissions from exhaust ventilation BT1 incubator
source number 3 - emissions from feed production
source number 4 - slaughter
source number 5 - pollutant emissions by moving vehicles on the premises

Determination of thermal power boiler plant

The appendix contains formulas of calculation heat output for different types of boilers.

For boilers heat output Q depends on the steam capacity D0, steam parameters and other characteristics of the boiler.

The formula for calculating the heat capacity of the boiler Q, MW, based on its evaporation looks like:

$$Q = D_0 \frac{1}{w},$$

where D0 – steam boiler tonnes / hour;

w – steam capacity related to thermal boiler capacity, tonnes / (hour-MW).

The value of the ratio steam capacity of the boiler D0 for it's heat output Q are given in the table below.

Boiler steam capacity values related to its heat capacity.

Equipment	Value
Boiler with pressurized fresh pair p0 (13,8 MPa (at D0 ≤ 500 tonnes / hour) with intermediate superheating	1,35
Boiler steam pressure in the range: 9.8 MPa ≤ p0 ≤ 13,8 MPa (at D0 <500 tonnes / hour) without intermediate overheating	1,45
Boiler steam pressure in the range: 1.4 MPa <p0 <9,8 MPa (at D0 = 6,5 ... 75 tonnes / hour for superheated steam) without intermediate overheating	1,35
Boiler steam pressure p0 ≤ 1,4 MPa (at D0 ≤ 20 tonnes / hour for saturated steam) without intermediate overheating	1,50

Q=5 / 1/ 1,5 = 3,33 mWt.

Estimated fuel consumption per hour

$$Bh = \frac{Q_{уст.}}{Q_{рн} \times n} = \frac{3{,}33 \times 103 \times 860}{8395 \times 0{,}9} = 1382 \text{ nm3/hour.}$$

Estimated fuel consumption per second:

$$Bsec = \frac{1382 \times 103}{3600} = 383 \text{l/second} = 277 \text{grams/second}$$

4.3.1 Calculation of emissions of contaminants

Variables for calculations of pollutant emissions are produced by "Emissions of pollutants. Methods of determination. Ministry of Fuel and Energy of Ukraine »MPC 34.02.305-2001. Kyiv, 2002.

• Mass calorific value Qr i :

Qr I = 8395 kcal / hour = 37,13kcal/nm3 = 50,1 MJ / kg

• NOx converted to nitrogen dioxide:

emission Factor - kNOx = 100

f – degree of reduction during low load,

пI, пII , в, - effectiveness of primary and secondary measures for reducing emissions;

пII – the use of flue gas recirculation and low toxicity burner

пII = 0,1, пII = 0,2

kNO2= 100 x 1 x 1 x (1-0,3) = 70 grams / GJ

Пsec = 70 x 277 x 50,1 x 10-6 = 0,97grams /second

Пyear = 70 x 2110 x 50,1 x 10-6 = 7,4 tonnes/year

• Carbon monoxide

specific emissions kCO =17 grams / GJ

Пsec = 17 x 50,1 x 277 x 10-6 = 0,24grams /second

Пyear = 17 x 50,1 x 2110 x 10-6= 1,8t/year

- Emissions of greenhouse gases

Methane:

Specific emissions adopted kCH4 = 1 grams / GJ

Пsec = 1 x 50,1 x 277 x 10-6 = 0,01grams/second.

Пyear = 1 x 50,1 x 2110 x 10-6 = 0,1t/year

• dinitrogen oxide in N2O

specific emissions kN2O = 0,1 grams / GJ

Пsec = 0,1 x 50,1 x 277 x 10-6 = 0,001grams /second.

Пyear = 0,1 x 50,1 x 2110 x 10-6 = 0,01tonnes/year

• Carbon Dioxide

$$\text{specific emissions } kCO2 = \frac{44}{12} \times \frac{73{,}67}{100} \times \frac{106}{50{,}1} \times 0{,}99 = 56363 \text{ grams/GJ}$$

Пsec = 56363 x 50,1 x 277 x 10-6 = 782 grams /sec.

Пyear = 56363 x 50,1 x 2110 x 10-6 = 5960 tonnes/year

Heavy metals - mercury

Specific emissions kHg = 0,0001 grams / GJ

Пsec = 0,0001 x 50,1 x 27,5 x 10-6 = 1,0x10-6 grams/second.

Пyear = 0,0001 x 50,1 x 115 x 10-6 = 1,0x10-5 t/year

Determining of the feasibility of calculating ground-level concentrations of pollutants in the operation of elevators.

According ARD-86 (p.5.21) calculation of ground-level concentrations at the plant carried out for harmful substances released when the following condition: the calculation of ground-level concentrations of the components is performed if the

emissions from all sources referred to the MPC over the parameter F, according to requirements of paragraph 5.21 ARD-86.

M / remote> F, F = 0.01 x H when H> 10m, F = 0.1, when H <10m, where:

M - the total value of output from all sources of enterprise in the most adverse conditions of installed output, including air source and fugitive emissions, grams / second.,

MPC - maximum single maximum allowable concentration, mg/m3;

N - the average height of the emission source, 10m

code substance	Substance	Emissions		MPC mg/m3	M/MPC	expediency relation F = 0.1
		grams/second	tonne/year			
301	Nitrogen dioxide	0,97	7,4	0,2	4,85	It is advisable
337	Carbon monoxide	0,24	1,8	5,0	0,048	inappropriate
410	methane	0,01	0,1	50	0,0002	inappropriate
13000	dinitrogen oxide	0,001	0,01	-	-	-
12000	carbon Dioxide	782	5960	-	-	-

In order to determine the relevance of the received pollutant emissions from stationary sources the analysis of the obtained reduction with established standards for emissions is held. Comparison of the obtained emission of pollutants into the air when operating boiler (chimney) with the standards for emissions in accordance with the Decree of the Ministry of Environment number 309 of 27.06.06. tabulated.

Content of pollutants in flue gases taken on passport data.

Name of source	Parameters source		Consumption of gas-dust flow m3 / s	code of substance	Name of pollutants	Power output grams / s	The concentration of CL, mg/m3
	Height, m	Diameter, m					
Smoke tube steam boiler				301	Nitrogen dioxide	0,97	
				337	Carbon monoxide	0,24	

Number of substances	Name pollutants	Emissions by project data		Standard MPE	
		The value of the mass flow of gases that are degressed, grams / hour	Mass concentration of gas and dust flow mg/m3	Mass concentration of gas and dust flow mg/m3	Provided that the value of mass flow in gases that are emitted, grams / hour
Smoke tube of the steam boiler					
301	Nitrogen dioxide	3492 (which is less than 5000 grams / hour)	not normalized	500	5000 grams / hour or more
337	Carbon monoxide	864 (which is less than 5000 grams / hour)	not normalized	250	5000 grams / hour or more

No exceeding of the maximum allowable ratio of emission of solid particles suspended was observed.

Source 2 (Hatchery)

The land plot of 6,7 ha allotted for the fodder plant construction is located at distance of 1800 m from Beremytskoe village of Chernigiv region In the aeration chamber for egg disinfection is held using formaldehyde vapor liquid, which turns into a gaseous substance formaldehyde concentration is 0.5 ppm or less, equivalent to 0.6 mg/m3 (see TX)

Ventilation system BT1, ø300, L = 2500 m3

Number of output is - 0.00043 grams / second, 0.000129 tonne /year

Source 3 (fodder production)

The land plot of 7.2 ha allotted for the fodder plant construction is located at distance of 1300 m from Beremytskoe village of Chernigiv region.

The composition of fodder plant includes: elevator with granaries, grain, and animal feed production. Technology foresees the advanced filtration systems of air from dust with a high level of clearance.

When working elevator capacity 29 000 tonnes/year is allocated 0,2% by weight of harvested grain, namely 58 tonnes/dust. This emissions based treatment 90% of its 5,8 tonnes/year.

When using dryers capacity 29 000 tonnes/year is allocated 1,2% of the grain mass, namely 348 tonnes/year of dust. This emissions based treatment 98% of its 6,96 tonnes/year.

In the production of animal feed 120 000 tonnes/year allocated 14,7 kg/tonnes of finished product, ie 1 764 tonnes/year of dust. This emissions based treatment 99% of its 1,8 tonnes/year.

The total mass of dust emissions will be 14,56 tonnes/year.

Emissions from steam boiler:

Nitrogen dioxide - 1.84 tonnes / year.

Carbon monoxide - 5.03 tonnes / year.

Methane - 0.02 tonnes / year.

Carbon dioxide (greenhouse gas) - 308 tonnes / year.

Dinitrogen oxide (a greenhouse gas) - 0,002 tonnes / year.

Impact on air allowed.

Planned production does not cause adverse effects on soils, water, social environment.

Regulatory BA from the Company under GSP number 173 100 m (sustained).

Slaughterhouse

Land area provided for the construction of duck slaughterhouse is located on the agricultural land in the Village Evmynka, Kozeletskyi district in the Chernigiv region.

Regulatory BA from poultry slaughterhouse by DSP number 173 300 m from utilization plants for processing animal waste - 1000 m (sustained).

The processes of production, accompanied by the release of hazardous substances, includes poultry pre-slaughter maitenance and processing of the products that can not be sold as food in animal meal and animal fat.

Recycling contributes significantly to the improvement of the ecological environment:

1. Slaughter waste do not occur any more in the unprocessed form to the nature and do not pollute, therefore, ground water and soil.
2. Through recycling and reuse of the slaughter waste as an animal meal and animal fat and re-use as an animal feed is closed ecological loop.
3. Waste water (condensation of vapors arising during cooking) are fed to the device wastewater treatment. There's wastewater is treated and discharged can be no doubt in free nature
4. Ambient air in the installation shall be replaced by absorption (ventilation) air change rate of 5-10 times per hour (depending on how busy the room).

The air is humidified and fed to the biofilter. Utilization of air at the correct operation of almost tangible.

Production runs 19 hours a day, 250 days a year.

<u>Bold ante on keeping ducks:</u>
amonia - 0,002 tonnes / year;
hydrogen sulfide - 0,0004 tonnes / year;
phenol - 0.00004 tonnes / year;
propionic aldehyde - 0.0002 tonnes / year;
caproic acid - 0.0002 tonnes / year;
metylmerkaptan - 0.00004 tonnes / year;
dimetylsulfid - 0.0004 tonnes / year;
dimethylamine - 0,001 volumes / year;
solids (dust) - 0,017 tonnes / year.

<u>Bold on the installation of recycling:</u>
etylmerkaptan - 0.0005 tonnes / year;
ammonia - 0,291 tonnes / year;
hydrogen sulfide - 0,001 tonnes / year;
propionic aldehyde - 0,005 tonnes / year;
dymetylamyn - 0,041 tonnes / year;
caproic acid - 0.000002 tonnes / year;
pentanol - 0.0005 tonnes / year;
valeric acid - 0,005 tonnes / year;
dimetylsulfid - 0.0005 tonnes / year;
acetone - 0,041 tonnes / year;
phenol - 0,001 tonnes / year;
metylmerkaptan - 0.00005 tonnes / year;
solids (dust) - 1.14 tonnes / year.

All exhaust air is given to the biofilter with the degree of purification of 99%. Total emissions from the production after treatment will be:

etylmerkaptan - 0.000005 tonnes / year;

ammonia - 0,003 tonnes / year;
hydrogen sulfide - 0.000014 tonnes / year;
propionic aldehyde - 0.000052 tonnes / year;
dymetylamyn - 0.00042 tonnes / year
pentanol - 0.000005 tonnes / year;
valeric acid - 0.00005 tonnes / year;
dimetylsulfid - 0.00001 tonnes / year;
acetone - 0.0004 tonnes / year;
phenol - 0.00001 tonnes / year;
metylmerkaptan - 0.000001 tonnes / year;
solids (dust) - 0,012 tonnes / year.
Slaughethouse will not have any negative impact on the aquatic environment. Wastewater in the amount of 440 m3/day will be brought to the cleaning plants. After the cleaning water will be returned to the production of feathers in the amount of 200 m3/day.
Noise load in the building will be 75 dB and outside will not exceed 40 dB. Production waste will be disposed and processed for the additional use in the production of the pet dru fodder.

As seen from the results of previous calculations, emissions from insignificant.
Emissions from steam boiler:
Nitrogen dioxide - 2.56 tonnes / year.
Carbon monoxide - 1.71 tonnes / year.
Methane - 0,075 tonnes / year.
Carbon dioxide (greenhouse gas) - 1146 tonnes / year.
Dinitrogen oxide (a greenhouse gas) - 0,007 tonnes / year.
Impact on air boiler allowable by installing low-toxic burners in boilers with a low content of harmful substances in the flue gases

Emissions from the buildings in which ducks are growing (40 cases).

The calculation of the amount of emissions from the agrarian objects is carried using emission factors (specific emissions) by the method of "Specific indicators of pollutant emissions into the atmosphere from major industries and agriculture", Kyiv, Ukraine Ministry of Ecology, 2001year) and indicators "Compendium of emission factors OR the atmosphere by various industries "(Donetsk-2004r.).

Calculation of the amount of emissions (tonnes) of pollutants is made by the formula:

$E = E_i \times A \times 10^{-3}$ (т); where:

E_i - specific emissions of pollutants (kg);

A - productivity (number of animals).

The emissions of pollutants into the air from the agricultural objects occur as a result of enteric fermentation of animals and harvesting, storage and use of manure.

In order to reduce ammonia emissions to the atmosphere during the operation of the facility, agriculture sanitizing facilities are expected to use disinfectants with deodorizing properties (Hembar, Dezefekt, Neohlor, Bioklin, hazard class IV drugs, low toxicity, with appropriate permits the use of a livestock). The use of EM products in the solution for spraying surfaces and floors reduces ammonia emissions into the air up to 80%, reduces the formation of odors and their receipt into the air, creating comfortable conditions for work for employees and conditions for living for the population in the nearby areas.

Mean annual values of specific discharge pollutants directly from animals kept on stockyard (h10-6 / s d1 quintal of live weight, except microorganisms)

Name pollutant	Sources of discharge of pollutants into the atmosphere	
	Animals that are in areas	
	Ducks	
	Emissions grams / second per hundredweight	Emissions tonnes / second of all ducks that you grow the enterprise
1	2	3
Micro-organisms (cells / m)	75	11,34
ammonia	16	1,0368
hydrogen sulfide	4,4	0,28512
phenol	0,4	0,02592
propionic aldehyde	2,2	0,14256
caproic acid	2,5	0,162
Metylmerkaptan	0,4	0,02592
dimetylsulfid	3,8	0,24624
dymetylamyn	8,8	0,57024
Dust Down	180	11,664

<u>Quantification of emissions from slaughterhouse.</u>

Calculation is carried out for ducks, broilers, the average weight of 0.03 kg.

Power slaughter line 5000hol/hour (150ts/hour), 1.4 goals / second (0.05 kg / second), 40000hol/zminu (1200ts/zm) 10 000 thousand units / year (300000ts/year).

$E_{sec.microorg.}$ = 175 x 150ts x 10^{-3} = 26,25thous.kl.second (E_{year} = 175 x 300000 x10^{-3} = 52,5тис.кл/рік)

$E_{sec.amonia}$ = 16 x 150ts x 10^{-6} = 0,0024 gram/second (E_{year} = 16 x 300000 x10^{-6} = 4,8tons/year)

$E_{sec\ hydrogen\ sulfide}$ = 4,4 x 150ts x 10^{-6} =0,000666 gram/second (E_{year} = 4,4 x 300000 x10^{-6} = 1,32tons/year)
$E_{sec\ phenol}$ = 0,4 x 150ts x 10^{-6} =0,00006 gram/second (E_{year} = 0,4 x 300000 x10^{-6} = 0,12tons/year)
$E_{sec.\ ald.prop.}$ = 2,2 x 150ts x 10^{-6} =0,00033 gram/second (E_{year} =2,2 x 300000 x10^{-6} =0,66 tonnes / year)
$E_{sec.\ acid.kapr}$ = 2,5 x 150ts x 10^{-6} =0,0004 gram/second (E_{year} = 2,5 x 300000 x10^{-6} =0,75 tonnes / year)
$E_{sec\ metylmerkap..}$ = 0,4 x 150ts x 10^{-6} =0,00006 gram/second (E_{year} = 0,4 x 300000 x10^{-6} = 0,12 tonnes / year)
$E_{sec\ dymetylsulfat.}$= 3,8 x 150ts x 10^{-6} = 0,0006 gram/second (E_{year} = 3,8 x 300000 x10^{-6} =1,14 tonnes / year)
$E_{sec\ dymetam.}$ = 8,8 x 150ts x 10^{-6} = 0,001 gram/second (E_{year} = 8,8 x 300000 x10^{-6} = 2,64т/ year)
$E_{sec\ dust}$ = 180 x 150ts x 10^{-6} =0,027 gram/second (E_{year} = 180 x 300000 x10^{-6} = 54 tonnes / year)

Emissions resulting from harvesting, storage, and use of manure:

Methane 1 x x 1,520,035 x 0.75 x 10-3 = 1140 tonnes/year
1 x 4164.48 x 10-3 0.75 x 3600 = 8.7 grams / second

Gross emissions of polluting substances from stationary projected pollution sources (8 areas for whole factory)

N	Sub. code	Substance name	Emission for factory		MCL
			g/s	t/year	mg/m3
1	2	3	5	6	7
1	183	Metallic Mercury	0,00001688	0,0002736	0,003
2	301	Nitrogen dioxide	1,0284	16,616	0,2
3	303	Ammonia	0,6944	19,80217704	0,2
4	304	Nitrogen oxide	0,001688	0,02736	0,4
5	333	Hydrogen sulphide	0,005184	0,16368168	0,008
6	337	Carbon monoxide	3,806424	61,50616472	5,0
7	410	Methane	2,612392	6,847192	50,0
8	1071	Phenol	0,244576	0,04262088	0,01
9	1707	Dimethyl sulphide	0,01224	0,38682592	0,08
10	1849	Monomethylamine	0,007896	3,55625168	0,004
11	3000	Hard suspended particles unidefferntiated by the content	1,8312	43,6747768	0,5
		Total	10,24441688	152,6233243	

<u>Determining the feasibility of calculating ground-level concentrations pollutants object of the design activity excluding emissions from existing farm.</u>

According to OND-86 (p.5.21) the calculation of ground-level concentrations at the plant is carried out for harmful substances released under the following condition: the calculation of ground-level concentrations of the components is performed if the emissions from all sources referred to the MPC over the parameter F, according to the requirements of paragraph 5.21 OND-86.

M / remote> F, F = 0.01 x H when H> 10m, F = 0.1, when H <10m, F = 0.1, where:

M - the total value of output from all sources of enterprise in the most adverse conditions of installed output, including air source and fugitive emissions, grams / second.,

MPC - maximum single maximum permissible concentration, mg/m3;

H - height of emission sources m.

The amount of ammonia emission from each of the hatchery is 0,12 tonnes per year and 0,00006 grams/second.

The amount of nitrogen dioxide emission from each of the hatchery is 0,185 tonnes per year and 0,024 grams/second.

The amount of N_2O emission from each of the hatchery is 0,00025 tonnes per year and 0,000025 grams/second.

The amount of methane CH_4 emission from each of the hatchery is 28,5 tonnes per year and 0,2175 grams/second.

Buildings for the duck breeding will have no negative impact on the aquatic environment. Noise load in hatchery will be 65 dB and outside it will not exceed 40 dB. Production waste (manure) in the amount of 91 250 tonnes/year (farm capacity is 5,4 million ducks per year) will be regularly removed and delivered to biogas unit through the underground sewage.

Code substance	Substance	Emissions		MAC, OBRD mg/m3	M / MAC (OBRD)	expediency relatively F = 0.10
		grams/second	tonnes/year			
303	ammonia	0,0024	4,8	0,2	0,012	inappropriate
333	hydrogen sulfide	0,00066	1,32	0,008	0,08	inappropriate
1071	phenol	0,00006	0,12	0,01	0,006	inappropriate
1531	caproic acid	0,0004	0,75	0,01	0,04	inappropriate
1707	dimetylsulfid	0,00006	0,14	0,08	0,0075	inappropriate
1715	metylmerkaptan	0,0006	1,14	0,0001	6	It is advisable
1314	propionic aldehyde	0,00033	0,66	0,01	0,033	inappropriate
1819	dimetylamin	0,001	2,64	0,005	0,2	It is advisable
2920	dust fur	0,027	54	0,03	0,9	It is advisable
Greenhouse gases						
410	methane	8,7	1140	50	0,17	It is advisable
microorganisms						
11708	microorganisms-producers	26,25thous. kl/second	52,5	$5*10^2$/м^3	5,25	It is advisable

Calculation of pollutant emissions by moving vehicles on the premises

Number of constantly moving at the farm transport:

- 4 tractors with trailers for ducks delivering to slaughterhouse
- 1 truck for ducklings delivery from the hatchery to fattening halls
- 3 feed trailers for the fodder delivery from the fodder plant to fattening halls
- 1 garbage truck for the wastes
- 1 truck for the fallen ducks delivery to slaughterhouse

According to VNTP-SgiP-46-16.96 the amount of pollutants released into the atmosphere by moving vehicles on the premises is determined by the formula:

Mj = 10-6 n * qj * L * Aj * Kc * D,

Where Mj - mass ejection j pollutant, tonnes

n - number of types automobile (diesel), established technological part of the n = 3

qj - j-specific emissions of that pollutant j-one vehicle of the type with regard to age and technical condition of the fleet to the current year, grams / km according to tabl.69 (VNTP-SgiP -46-16.96):
qco = 17,0 grams / km,
qcn = 7.7 grams / km,
q No = 6,8 grams / km
L - conditional ran one car per cycle on the premises by the time triggering engines, driving on the premises, work in parking areas under tabl.70 L = 0,1 km
Aj - exploitation of cars parked on the basis of factor of production (number of vehicles entering the area of technical and maintenance obsluhohuvannya) established the technological part of the project Aj = 1
Kc - coefficient taking into account the impact of motion mode (speed) of the car from the table. 71 (VNTP-SgiP -46-16.96):

K_{CO}=1,4; K_{CH}=1,2; K_{NO}=1,0

D - number of working days per year: 300 days

Thus, the amount of the emission from the abovementioned transport and routes is:

Mco=10 -6*3*17.0*0,1*1,4*300=0,0021tons
M_{CH}=10-6*3* 7.7*0,1*1,2*300=0,00083 tonnes
MNo=10 -6*3*6,8*0,1*1,0*300=0,00061 tonnes

Calculation of the second maximum emissions:

Mj = 10-3Σqj * L * Aj * Kc * D / tb * 3,6
Where Mj - mass ejection j-pollutant, grams / second
tb-return vehicle in hours tb = 8 hours

M_{CO}=10^{-3} 3*17.0*0,1*1,4*300/8*3,6=0,963grams/second
M_{CH}=10^{-3} 3* 7.7*0,1*1,2*300/8*3,6=0,374grams /second
M_{NO}=10^{-3}3*6,8*0,1*1,0*300/8*3,6=0,275grams / second

Calculation of dispersion of pollutants in the surface air is performed on a computer program "EOL-plus", recommended by the Ministry of Environment of Ukraine. Algorithm designed with a respect to the "Methodology of calculation of concentrations of pollutants, contained in the emissions of companies in ambient air" - OND - 86.

The "EOL Plus" makes the calculation of the concentrations of pollutants in the surface layer of the atmosphere and can solve the problem of normalization values of pollutant emissions from industrial sources and the establishment of maximum permissible emissions. The degree of danger of air pollution at the same time is characterized by the highest value of concentration corresponding to the unfavorable dispersion conditions, including unsafe speed.

Calculation of dispersion of pollutants made on the basis of background contamination.

Background concentrations of the substances taken 0.4 RC under "Procedure for determining the amounts of background concentrations (Ministry of Ecology and Natural Resources of Ukraine of 30 July 2001 № 286)

The results of calculations of dispersion presented in tabular form, and scattering maps as contour concentrations of pollutant materials (see annex). Step computational grid - 50m.

The maximum ground-level concentration of pollutants into the sanitary - protective zone is:

- Nitrogen dioxide - 0.18 mg/m3 or 0.9 MAC
- Carbon monoxide - 2.5 mg/m3 or 0.50 MAC
- Hydrocarbons - 2.15 or 0.43 mg/m3 MAC
- Formaldehyde - .0147 or 0.42 mg/m3 MAC

Defining the boundaries of the buffer zone

Dimensions of the sanitary protection zone (SPZ) should be revised for different wind directions depending on air pollution and average wind roses formula (Section 88.2 OND - 86):

$$L = Lo \times \frac{P}{Po};$$

where L (m) - the estimated size of the buffer zone;

Lo (m) - the estimated size of the plot area in this direction, where the concentration of pollutants, taking into account the background from other sources exceeds the MCL;

P (%) - average frequency of wind direction rumba in question;

Po (%) - repeat winds a rumba group in the corner of the winds. In the settlement area of maximum concentration CL considering background concentrations.

Based on the fact that the ratio of emissions to less than the MCL parameter F = 0.1, from which it follows that the maximum concentration of CL shall not exceed 0.1 MAC, not to exceed 1.0, ie, Lo = 0..

$$L = Lo \times \frac{P}{P_o} = 0$$

4.4. Protection land resources, wildlife plants, and waste disposal

4.4.1. Protection of Land Resources

Project foresees a reconstruction of the existing site, thus no removal of the topsoil will be carried out.

Removal of the topsoil on the area of construction works is done according to the current regulations.

During operation no chemical factors, biological and radioactive contamination, significant vibrations that can affect bowels, additional measures to reduce the impact of the object on the subsoil were provided.

Impact of the proposed activity on the state of soil and land resources is absent, activities and capital expenditures for the implementation of measures to protect land resources are not provided.

4.4.2. Protection of fauna and flora

No negative impact on the flora and fauna due to the production activities will take place due to the fact that emissions of air pollutants after scattering does not result in the formation of ground-level concentrations in excess of the MCL standards, environmental standards, waste facility utilized.

In the area of influence of missing objects of natural reserve fund and areas for conservation perspective (reserved for this purpose), land, water and air migration routes of animals.

The plan of planting foresees the planting of 1375.15 m^2 of land.

Removal of vegetation is not expected.

There are no valuable green spaces on the enterprise.

4.4.3. Decisions concerning the usage of the low- and waste-free processes.

The waste-recycling Installation is, first of all, used for the qualified disposal of the waste products of the slaughter, which could not be sold as the edible product.

Ending product of the waste recycling (animal dust and animal fat) could be reused as the fodder for non-mandatory and other then slaughtered types of animals according to the EU normatives.

For the ranges of Pet food (dog and cat fodder etc.) it is most notably.

Animal fat is often used in the chemical and cosmetic field as an basic material or component.

The Plant is a complex and mostly closed system.

The Plant includes the following main plots:

- Acceptance of the raw material
- Processing
- Condensation
- Processing of the wasted air

Acceptance of the raw material

Wastes are brought to the raw material silos (item. 1.01) through the waste separators (item 7.09). Wastes are than brought from the silos (item 1.01 .) to

sterilizers (item 2.01), which are simultaneously driers, through different auger conveyors (item 1.02 i 1.03).

The blood is gathered in the tank (item 1.05) with mixer. The blood can be brought in a dozed manner from the tank to the blood pump (item 1.06) and dry blood melting apparatus.

Processing

Raw material is warmed up to minimum 133 ° C in the sterilizers (item. 2.01) with the excessive pressure 2 bars and stored for minimum 20 minutes (EU normative).

All the bacteria and germs die in this process.

After this the process of drying is started with the temperature of about 100 ° C. The water is remove from the material through the boiling, resulting in the water content of 5-6%.

The body is now farinaceous, partly greasy.

After this the farinaceous product is de-greased in the masher (item. 2.08 .) and cooled in the auger conveyor transporters (item. 2.09).

Animal dust is packed in the sacks after the milling (item 2.10), fat is cleaned in the clarifying tank (item 3.02) and folded for the one day.

Condensation

Steam emerged while the drying is firstly brought to the cyclone (item 4.02) through the pipe-lines for the separation of the solid elements before it gets to the condenser (item 4.03-4.09) with the cooled air, which is located outside the building. The warm steam is cooled there and a condensate could be than brought to the waste water collector and to the waste water cleaning installation afterwards.

The amount of waste water is approx. 60-65 % from the input raw material.

(In this project approx. $1m^3$/hour)

Processing of the wasted air

To avoid the emergence of odor the Plant is rigged with the air drawing-off device. The air is drew-off directly from the critical parts and brought to the biological filter through the air cleaning device (item 6.02). The influence of the foul smell is statistically reduced by 99%.

A major control cabinet (item 5.01) manages the whole Plant, controlling and adjusting all the machinery and measuring devices. Necessary cables are also a part of the supply. Bulk materials and pipe-lines are supplied for the assembling of the Plant.

Steam is necessary throughout the Plant, particularly in the drier. The need of steam is satisfied by the boiler station. There is a steam separator with an reducing module (item 5.05) for the separation of the steam and reduction of the pressure.

Thus, the Plant is complex and closed.

Ecological assessment of the Plant:

Waste recycling significantly contributes to the improvement of the state of the environment.

1. Unprocessed slaughter wastes do not get into the nature, preventing the soil and groundwater pollution.

2. Due to the reuse of the slaughter wastes in the form of animal dust and animal fat as a fodder for the animals, the ecological line is closed.

3. Waste water (steam condensate emerging when boiling) are brought to the waste water cleaning device. Waste water is cleaned there and can be released to the nature.

4. The ambient air in the Plant is changed due to the drawing-off (ventilation) 5-10 times per hour (depending on the loading of the room).

The air is humidified and brought to biological filter. The loading of the air is nearly unnoticeable if the Plant is properly operated.

Technical data and parameters of the waste recycling of the Plant:

Plant capacity: real: 30 tonnes / day

maximum: 36 tonnes / day

Consumption: electricity 190 kWt / hour

(additional capacity 290 kWt)

water 2 m ³ / hour (Maximum)

(mainly for cleaning)

Air pressure 6 bars (minimum need for the operating valve control)

steam ~ 1500 kg / hour (10 bars).

The project provided a waste-free technology that provides the exclusion of pollution from direct contact with the effluent.

Collection of waste, packaging and auxiliary materials is held. Waste collected in special containers and delivered to the recycling along with the domestic wastes.

List of wastes	Unit of measurement	Quantity of wastes		Class of danger	Method of utilization	
		Per shift	Per year		During production	Outside of production line
1	2	3	4	5	6	7
1.Wastes of incubation	kg	66,0	6600,0	IV	Collection into container	Special enterprise
2.Paper bags	kg	0,6	60,0	IV	Same	Collection point
3.Rags	kg	0,5	50,0	IV	«	Remove to dump
4. Luminescent electric lamps	nos	–	50	I	«	Special enterprise
5. household wastes 7720.3.1.01	tonnes/year	0,026	28,875	IV	Containers and on special provided	Remove to village dump,
6. Manure 6000.2.8.20	tonnes/year	250	91 250	III	Regular cleaning with further removing	Removed to existing manure storage for further production of biogas

4.4.4. Assessing the impact of planned activities on environment

Due to the high technical level applied in the working design of the process equipment, provided by the working draft of the measures to ensure production engineering, safety and industrial sanitation, fire safety, proper level of decoration and beautification industrial site construction the subsequent business is safe from the both technical and environmental sides.

5. Assessment impact of planned activity on health of population and social environment

Agricultural complex as a whole is an object to high environmental risk, but improvements, automatization and mechanization of processes, introduction of new waste technologies are eliminating the impact of negative factors on human health. Growing ducks, unlike chickens, has a number of peculiarities: the production cycle including incubation period takes two months and a half, ducks are more resistant to various diseases (chickens have 12 anti-hepatitis vaccinations and ducklings have only one), ducks are the source of feather and fluff raw materials, they quickly gain muscle mass, meat is useful and have balanced nutritional value.

But atmosphere of poultry farm is polluted by gaseous products formed during ducks life activity, as well as the decomposition of organic substrate: manure, litter, feed stuff, etc. also the workplace contains vegetable (corn, wheat) and animal (fluff, ducks' feather, epidermis flakes, etc.) dust. These substances are allergenic and fibrogenic properties and can cause the development of bronchopulmonary diseases. Thus, one of the regulatory measures aimed at protecting the environment is to install air filters to protect environment and staff of this adverse effect.

The total content of microorganisms in the air of poultry farm working area is ranged from 4,000 colonies forming units/m3 (hatching area) to 8000 colony forming units/m3 (parent stock area) and is presented by saprophytes and conditionally pathogenic microflora if pathogens are absent. Thus, it is expected to use disinfectants to minimize the quantity of bacteria.

The microclimate of industrial areas complied with hygienic standards.

In the area of object allocation of supposed activity there are no objects of sport and fitness, resort and recreational purpose.

Basic social and household living conditions of local people in the affected area of the supposed activity are not changing.

Operation of the enterprise of supposed activity has a positive impact on the social conditions of life of the local population in terms of its activity - jobs.

On farm workers will work on following schedule:

- fattening site – schedule of work in one shift without days off
- hatchery - schedule work in one shift five days in a week
- fodder plant – schedule of work twenty-four-hour five days in a week

- slaughterhouse – schedule work in one shift five days in a
- biogas complex - schedule work in one shift on flextime without days off

Services of power supply and guard – twenty-four-hour without days off

Planned activities have a positive impact on the social environment, expressed as follows: stimulating the agricultural sector, the creation of stable employment - planned economic activity ensures creation of additional work places for local residents.

Increasing of income part of local budget, increasing of tax deductions to social funds, improving of the socio-economic atmosphere of the region.

Analysis of impacts on soils, water environment, and air environment suggests that there is no negative impact of the projected object on the health of the local population.

6. ASSESSMENT OF IMPACTS ON ANTROPOGENIC ENVIRONMENT

In the area of impact of planned activities there are no industrial, housing and public facilities, monuments of architecture, history and culture, aboveground and underground structures and other elements of anthropogenic environment. Measures to ensure their operational reliability and preservation are not provided. There are no objects of the anthropogenic environment, which may affect the planned activities.

7. COMPREHENSIVE MEASURES CONCERNING ENSURING OF NORMATIVE STATE OF ENVIROMENT AND ITS SAFETY

All objects of farm are located on separate sites with observance of sanitary zones. On each site is foreseen independent water supply from wells. On fattening site for administrative premises are foreseen domestic treatment systems, and duck manure by underground pipe lines is pumped to biogas unit for utilization. On slaughterhouse water after utilization unit and washing of feather is cleaned through treatment facilities, part of water after treatment goes back to process of feather washing. On fodder plant and hatchery also are foreseen local treatment facilities.

On each object is foreseen own local heating – in buildings of fattening it is gas heaters, in production workshops heating from individual boiler rooms.

Purpose of this work «Project of fattening of duck-broiler, biogas unit, hatchery, slaughter line and carcass processing, fodder plant and elevator on territory of Evmynka village council and Osterska city council of Kozeletskyi district of Chernigiv region». In work project is foreseen usage of up-to date technological equipment that is significantly increase productivity, and also secures minimization of negative impact on all components of environment and guarantee safety of population.

Project foresees:

– construction of farm on growing and processing duck-broiler, and also construction of slaughterhouse, forty production buildings, fodder plant for

production of fodder, four hatchers and biogas unit.

- Full complex of works of engineering providing of production and connection to existing networks of industrial site;
- measures on external and inside finishing of building, fencing and accomplishment of territory;
- set of measures on labor safety, production sanitary, fire prevention.

The moniroting of the environment on the farm during the operation period will be carried out by the State Ecological Inspectorate of Ukraine in Chernigiv region. Environmental Service controlling the region issues a permit (Dozvil) for the pollutant emissions from the immovable sources for a period of 5 years. This Service carries out the control once a year.

The control of emissions is made through the analysis of all components of the environment (air, water, soil sampling, research of it for further definition of the chemical, biological and other types of pollution) on the basis of MPC (maximum permissible concentrations). Since all the potential sources of environmental impact are equipped with special purification plants the impact on the environment from the immovable sources is expected to be slight.

The expediency of construction of object, ways and means of compliance of ecological safety requirements are determined by the conducted assessment of environmental impact.

8. ASSESSMENT OF POSSIBLE NOICE LOADING

One of kind of environmental impact during operation of the designed object is noise from the equipment.

In order to reduce noise and vibration to the level which does not exceed the permissible values following measures are foreseen:

- General measures to reduce noise level in a way of external fencing with sound insulation properties;
- Sealing along the perimeter of door way and window openings;
- Soundproofing of passage points by network of fencing structures.

From sanitary technical equipment:

- A careful balancing of fans before their operation;
- Connection of all fans with ducts through flexible inserts;
- Fans installation on vibro-isolation basis.

Levels of vibration of mechanisms do not exceed the allowable standard values, in accordance with requirements SSR3.3.6.039-99 "State Sanitary Rules of overall production and local vibration."

On permanent work places and work areas hatchery, sound pressure level in decibels in octave frequency bands, sound levels and equivalent sound levels in

decibels on scale A should not exceed permissible values under GOST 12.1.003-83.

According to SSR 3.3.6.037-99 (Decision of Ministry of Health Protection of Ukraine № 37 dated 01.12.1999) "Sanitary rules of industrial noise, ultrasound and infrasound" acceptable equivalent sound level in the workplace and the enterprise territory does not exceed 83 decibel equivalent.

9. ASSESSMENT OF POSSIBLE ELECTROMAGNETIC AND IONIZING EMMISSIONS

Electromagnetic emission can be considered as one of the types of energy contamination due to the fact that it has a negative effect on humans' organism, other living organisms and adversely affects the ecological systems.

Electromagnetic emission has both thermal and specific action, accompanied by all sorts of malfunction of the function of nervous, cardiovascular, endocrine systems of the occurrence of various physiological and biochemical processes.

Due to the low frequency, electric and magnetic components of the electromagnetic field are characterized by the values of different orders.

At present, the magnetic component of the electromagnetic field of industrial frequency of 50 Hz for the population is not standardized, so below refers to the electrical component of this field, called the field of industrial frequency.

Safe for humans intensity levels of electromagnetic emission prescribed by "State standard rules and regulations for people protecting from impact of electromagnetic emissions" approved by order of the Ministry of Health of Ukraine 01.08.96 № 239

In a production conditions, depending on the residence time of staff in the electric field, its value varies widely.

Standards of electromagnetic irradiation in a production conditions are given in the table.

Item №	Frequency, Hertz	dimension	Irradiation conditions	Standard
1	50	В/м	Without limitation	0,5*e3
2	50	В/м	2 hours\day	5*e3
3	50	В/м	0,5 hours\day	12*e3
4	50	В/м	Episodical occurrence	15*e3

Designing object by the nature of the technological process and the degree of reliability of power supply belongs to the first category of consumers of electricity.

Electric supply of the object provided by voltage of 380 \ 220V of AC voltage.

The total fixed power of electric equipment of the object makes 530 kW.

There is no equipment on the territory of the object, which is the source of electric emission, so there is no need to protect the public from impact of electric field.

Designed object is not a source of harmful electromagnetic and ionizing emissions, resulting that measures to protect from not foreseen by object.

10. ASSESSMENT OF POSSIBILITY OF ORIGINATION AND DEVELOPMENT OF EMERGENCY SITUATIONS

Assessment of possibility of arising and development of accidents is conducting, especially in view of the activity of technological and heating equipment of enterprise.

Possible emergency situations may be:

- Violation of the modes of operation of process equipment;
- Violation of the integrity of equipment and pipelines;
- Errors of staff;
- Fire as a result of violations of fire safety rules or occurred sources of ignition.

In order to prevent accidents by project system, technical and organizational security measures are aimed to prevent accidents, prevent their development, limiting the scope and consequences of accidents including:

- support design and technological mode of the operation of equipment within established guidelines;
- conducting of regular monitoring of the tightness of process equipment and piping;
- full control of process parameters, alarm systems and system shutdown of equipment in case of accidents;
- improvement of lightning protection and grounding system of the building;
- operation of gas equipment in the presence of staff;
- equipment of gas heating modules of required automatic safety;
- passing during emergency situations of network to an autonomous power source - diesel electric station;
- the application of electrical cable wiring for equipment and lighting including categories of premises for the fire safety;
- Prohibit the use of open flames;
- Prohibit the use of materials liable to spontaneous combustion;
- Strict observance of technological discipline and safety requirements;
- Development of emergency measures in the event of natural disasters;
- Providing the primary means of extinguishing.

Thanks to the made technological solution by the project and organizational measures, development of emergency and transition state of the object from the emergency stage to stage accidents, which can result in danger to the life of staff and the environment, almost reduced to a minimum.

11. Analysis of alternatives
Alternative variants of made design decisions

The work related to the implementation of this project is conducted on the territory which is provided for enterprise by local authorities. Thus alternative variants of location of design activity are not expected. Also, the territory where is planning implementation of design decisions has all necessary access roads ways required for association of enterprises with the suppliers of raw materials and with consumers of finished products.

Countervailing measures

Exploitation of the working project is accompanied by the emission of air pollutants in a number of additional expected volumes.

Penalties for environmental pollution are determined according to:

- Law of Ukraine "On Environmental Protection";

- Law of Ukraine "On Air Protection";

- Tax Code of Ukraine, dated December 2, 2010 № 2755- VI amended by Law of Ukraine, dated December 23, 2010 N 2856- VI.

Penalty for environmental pollution for working project in accordance with Article 242 TCU shall be calculated by:

- quantities and types of pollutants emitted into the atmosphere from stationary sources;

- quantities and types (classes) of waste placed in specially designated areas.

The tax levied by the air emissions of pollutants from stationary sources of pollution (Pe) calculated by tax payers

based on emission quantity and tax rates as follows :

$Pes = \Sigma Mi \times Tr$ (UAH), where

Mi – quantity of emission of pollutant in tons (t);

Tr – tax rate in the current year per ton of pollutant in UAH and kopecks, implied under Article 243 of TCU.

According to Section 5, Chapter XX "Transitional Provisions" TCU for tax obligations under environmental tax that were validated:

- from January 1, 2011 to December 31, 2012 thru tax rates are 50 per cent of the rates specified in Articles 243, 244, 245 and 246 of the Code;

- from January 1, 2013 to December 31, 2013 thru tax rates are 75 per cent of the rates provided in Articles 243, 244, 245, 246 of the Code;

- from January 1, 2014 the tax rates are 100 percent of the rates provided in Articles 243, 244, 245 and 246 of the Code.

The results of tax calculation for environmental pollution are provided in the following table.

Name of the substance	Polluting substance emission volume, t/year	Initial standard, UAH/t	Tax amount, UAH
Metallic Mercury	0,00001688	56363,37	15,42102
Nitrogen dioxide	1,0284	1329,67	22093,8
Ammonia	0,6944	249,38	4938,3
Nitrogen oxide	0,001688	1329,67	36,38
Hydrogen sulphide	0,005184	4273,24	699,46
Carbon monoxide	3,806424	75,14	4621,57
Phenol	0,244576	6035,24	257,23
Dimethyl sulphide	0,01224	75,14	29,07
Monomethylamine	0,007896	2178	7745,52
Hard suspended particles unidefferntiated by the content	1,8312	50.09	2187,67
Carbon Dioxide	418,16	0,22	92
Total	10,24441688		42715,4

12. CONCLUSIONS

From conducted assessment of environmental impact we make conclusion that construction of farm on growing and processing of duck-broiler, containing the slaughterhouse, forty production buildings, fodder plant for fodder production, hatcher and biogas unit will not worse state of environment in area of object location.

Measures which are foreseen by working project will permit to keep safe ecological balance in object area, decrease impact of negative factors which influence the soils, water and air basins and other nature components during operation of enterprise.

Agreed:

s.p._____

(organ of local self-government,, post, initials, surname of head, date)

s.p._____

(State administration of natural environment protection, post, initials, surname of head, date)

s.p._____

(district organ of sanitary-epidemiological inspection, post, initials, surname of head, date)

DECLARATION OF INTENT

1. Investor (customer) LLC «Regionproduct-Ukraine»_____

2. Place of location of sites (roads)of construction) (variants Chernigiv region, Kozeletskyi district, on territory of Evmynka village council

Characteristic of activity (of object) production of meat products in form of ducks broilers

(approximately on objects- analogues, belonging

impact is absent_____

to objects that present increased ecological danger,presence of transboundary impact)

Technical and technological data Project of fattening of duck-broiler, biogas unit, hatchery, slaughter line and processing of carcasses, fodder plant and elevator on territory of Evmynka village council of Kozeletskyi district of Chernigiv region

(types and volumes of products which produced, life time)

4. Social and economic necessity of planned activity decision of issue of slaughter and processing of ducks_____

5. Resources requirement during construction and operation:

land ____100,00 ha

(area of lands that are assigned in temporary and regular usage, type of usage)

raw material feed for ducks

(types, volumes, place of elaboration and extraction, sources of obtaining)

energetic (fuel, electric power, heat) _electric power - _____

(types, volumes, sources)

water _____projected water intake wells

(volumes, necessary quality, sources of water supply)

labour ___- 100 persons_____

6. Transport provision (during construction and operation) __motor transport_____

7. Ecological and other restrictions of planned activity under variants _____C33 1000

8. Necessary ecological-engineer preparation and protection of territory under variants____none_____

9. Possible impacts of planned activity (during construction and operation) on environment:

Climate and microclimate___none_____

air hazardous substances, which form during growing and slaughter of ducks, and also exhalations from manure

water ____waste waters_____

soil____none_____

vegetable and animal kingdom, protection objects ___none_____

social environment (population) __none_____

anthropogenic environment __none_____

10. Production wastes and possibility of their reuse, utilization, destruction or safe disposal_none_____

11. Scope of fulfillment of ESIA ____ in full volume according to ДБН А.2.2-1-2003_____

12. Participation of community familiarization with project materials, ESIA, presenting of proposals and remarks

(address,telephone and time of familiarization with project materials and ESIA, presentation of proposal)

CUSTOMER:
Director of LLC «Regionproduct-Ukraine»

Suvorov D.M. _____

EXECUTOR OF ESIA:
Chief Engineer of Project
of LLC «Interproject GMBH»
Nerekov V.O. _____

STATEMENT ABOUT ENVIRONMENTAL CONSEQUENCES OF SUPPOSED ACTIVITY.

> ***Data about supposed activity, purpose and ways of its performance.***

Working project «Project of fattening of duck-broiler, biogas unit, hatchery, slaughter line and carcass processing, fodder plant and elevator on territory of Evmynka village council of Kozeletskyi district of Chernigiv region».

Plot of land of construction is located on territory of Evmynka village council of Kozeletskyi region of Chernigiv region.

Area of plot for placing of the object of projected activity – 100,00 ha.

Territory – industrial.

Category of lands and end use – agricultural lands.

Production capacity of enterprise – 5000 heads of ducks per hour.

> ***Essential factors which influence on state of environment.***

Impact is carried put in period of technological operations of production process.

- On atmospheric air – impact during operation of technological equipment, maximal expected levels of air pollution on line of Sanitary Protective Zone of enterprise – in limits determined of Limiting Permitted Concentration taking into account background concentrations;
- Water – discharge of household, production waste waters and storm water – to relevant local treatment units;
- Soils – impact is absent;
- Wastes and their treatment:

List of wastes	Unit of measurement	Quantity of wastes		Class of danger	Method of utilization	
		Per shift	Per year		During production	Outside of production line
1	2	3	4	5	6	7
1.Wastes of incubation	kg	66,0	6600,0	IV	Collection into container	Special enterprise
2.Paper bags	kg	0,6	60,0	IV	Same	Collection point
3.Rags	kg	0,5	50,0	IV	«	Remove to dump
4. Luminescent electric lamps	nos	–	50	I	«	Special enterprise
5. household wastes 7720.3.1.01	tonnes/year	0,026	28,875	IV	Containers and on special provided	Remove to village dump,
6. Manure 6000.2.8.20	tonnes/year	250	91 250	III	Regular cleaning with further removing	Removed to existing manure storage for further production of biogas

> Quantitative and qualitative values of assessment of ecological risks levels, and also measures which secure normative state of environment, including system of observation and control.

> List of residual impacts: emissions to atmosphere on limit of sanitary protective zone do not exceed Limiting Permitted Concentrations

Maximum surface concentration of harmful substances on limit of sanitary protective zone makes:

- nitrogen dioxide – 0,18 mg/m3 or 0,9 LPC
- carbon oxide – 2,5 mg/m3 or 0,50 LPC
- hydrocarbon – 2,15 mg/m3 or 0,43 LPC
- formaldehyde – 0,0147 mg/m3 or 0,42 LPC

Measures which are taken for information of public concerning supposed activity.

Publishing of Statement about ecological consequences of activity in mass media.

- ***Obligations of customer concerning conducting of project decisions in accordance with norms and rules of environment protection and requirements of ecological safety on all stages of construction and operation of the object of projected activity.***

This enterprise guarantees fulfillment of measures on environment protection foreseen by working project on all stages of construction and operation.

APPROVED

Director of LLC «Регіонпродукт-Україна»
_____ Suvorov D.M.
«___»_____ 2013

TASK FOR ELLABORATION OF MATERIALS OF ESIA

Name of object	«Project on fattening of duck-broiler, biogas unit, hatchery,slaughter line and carcass processing, fodder plant and elevator on territory of Evmynka village council of Kozeletskyi district of Chernigiv region»
General contractor	
General projector	LLC "INTERPROJECT GMBH", Kyiv, Pivnichno-Syretska str., 3.
Character of constructionp	Construction of production premises
Place of location	Ukraine, Chernigiv region, Kozeletskyi district, on territory of Evmynka village council
Stage of projection	Working project
List of contaminants	harmful substances which forming during growing and slaughter of ducks, and also exhalations from manure
List of components of environment on which impacts are assessed	Air environment.
Additional requirements	Main component is air environment that is why it is necessary to make corresponding calculations of surface concentrations on PECM according program approved by Ministry of safety of Ukraine and make analysis of calculations; to conduct ESIA according to requirements of ДБНА.2.2.-1-2003
Order of conducting and terms of preparation of ESIA materials	To make ESIA materials on basis of project materials till 22.06.2013.

General projector:
Director
LLC "INTERPROJECT GMBH"
Kun I.P .