«APPROVE»
Deputy Director
of «Navoi TPP»JSC

_____ N.N. Bobokandov

«____» _____ 2015.

Construction of the third line of the underground gas pipeline from "GDS-2" to "Navoi TPP" JSC 15.53 km long on the territory of Karmaninsky district of Navoi region

Draft environmental impact statement (DEIS)

DEVELOPED:
Navoi Regional Branch of NIPTI "ATMOSFERA"

Director **B.R. Ruziyev**

Navoi – 2015.

CONTENT

Annex № 1

1. INTRODUCTION

PURPOSE AND JUSTIFICATION OF THE NECESSITY OF CONSTRUCTION

This draft environmental impact statement (DEIS) was developed for the construction of the third line of the underground gas pipeline 15.53 km long, from GDS-2 to Navoi TPP JSC on the territory of Karmaninsky district, Navoi region

The gas pipeline is designed for uninterrupted supply of natural gas, which does not contain sulfur compounds, to the projected second steam-gas-turbine unit (CCGT), belonging to Navoi TPP OJSC and for increase in the plant capacity.

The gas pipeline will be laid parallel to the second line, which runs through "Uyrot" rural gathering and "Datura" rural gathering of Karmaninsky district.

The diameter of the gas pipeline under construction is 720 mm. The gas pipeline will pass through land plots with total area of 23.71 hectares, of which:

- 17,12 ha- sowing fields;
- 1,95 ha- garden;
- 0,26 ha- vineyard;
- 1,52 ha- pasture fields;
- 0,81 hectares of underwater land (crosses several channels and collectors);
- 0,61 ha under the road (crosses several on-farm roads and highway M-37);
- 1,44 ha-land not used in agriculture.

The connection point of the projected gas pipeline is the existing gas distribution station (GDS) "Navoi-2". The gas pipeline is connected to the existing gas distribution station "Navoi-2" through shut-off valves and valve assembly with one-way blowdown, DN 219 mm.

The project provides construction of:

- Underground gas pipeline with diameter of 720 x 10 mm and length of 15.53 km, which is connected to existing GDS “Navoi -2”.
- The gas pipeline is connected through shut-off valves from existing GDS "Navoi-2" to the existing gas pipeline of JSC "Navoi TPP" with diameter of 730 mm.

The section of the detailed design "Assessment of the environmental impact" is carried out in accordance with the requirements of ShMK 1.03-06-03. and the Regulation on the State Ecological Expertise in the Republic of Uzbekistan. At the first design stage, as part of the detailed design documentation,"Draft Environmental Impact Statement" (DEIS) is developed, which is the first stage of EIA procedure.

The main tasks of this work are:

- assess the degree of negative environmental impact during the gas pipeline operation;
- conduct environmental analysis of the design solution, while determining the types, objects and nature of the impact;

The assessment of the environmental impact during gas pipeline operation was based on the analysis of the current natural environmental condition, operating

equipment, vehicles, and identification of sources of emissions, discharges and waste.

The level of air pollution from the gas pipeline emissions was calculated after the implementation of the proposed in the draft solution and its compliance with the requirements of the State Environmental Committee was determined.

When performing the work, we were guided by the "Regulations on the State Environmental Expertise in the Republic of Uzbekistan", Resolutions of the Cabinet of Ministers of the Republic of Uzbekistan No. 491,152 dated 31.12.01. and dated 05.06.2009, defining the composition and scope of the presented section of the environmental impact assessment.

Determining the enterprise category by environmental impact

In accordance with the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan. dated December 31, 2001 No. 491 (Annex No. 2) "On approval of the Regulation on state environmental expertise in the Republic of Uzbekistan" and in accordance with the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan, dated June 05, 2009 No. 152 this object refers to 3 category of environmental impact.

2. Environmental condition in the construction area

Location – Navoi region, Karmaninsky district, "Uyrot" rural gathering and "Durman" rural gathering, length - 15.53 kilometers.

The gas pipeline is being laid in the territory of Karmaninsky district parallel to the existing second line of the gas pipeline at a distance of 25 meters.

The laid gas pipeline is bordered on all sides with the pasture areas of Karmaninsky district.

The gas pipeline will be laid underground from GDS-2 to Navoi TPP JSC, through the sowing fields towards the north, crossing Dam Khadzha water pipeline, the Amu Navoi and Durman canals, Navoi-Uchkuduk railway, highway M -37 ", as well as several on-farm roads and collectors. The gas pipeline will be laid through canals and collectors in their upper part, and through on-farm roads under the highway.

The gas pipeline will run under Navoi-Uchkuduk railway and under M-37 highway, using horizontal drilling technology with push-through of a sleeve with diameter of 1000 mm.

The total depth from the top of the roads to the gas pipeline is 3.0 meters. For drilling, it is necessary to obtain a permit from the relevant departments.

3. BRIEF PHYSICAL- GEOGRAPHICAL AND CLIMATIC CHARACTERISTICS OF THE AREA

The climate has features common to all Uzbekistan and its own specific features. In the annual wind rose, eastern direction is predominant, however, its distribution throughout the year varies, for example, in the summer months the frequency of winds of northern and north-eastern directions increases, and in winter, it decreases sharply.

From November to February, frequency of eastbound wind does not exceed 52% of all other directions. In May and June, it decreases to 26-33%; in July and August, it is only 16%, while frequency of occurrence of northeastern and northern directions increases to 28-37%. Since September, frequency of occurrence of eastern direction increases again and sharply decreases in northeastern and northern directions.

One of the meteorological factors that determine the conditions for dispersion of pollutants in the atmosphere is wind speed. In the study area, the average wind speeds throughout the year vary from 1.9 to 3.5 m / s. Their highest values are in March, and the lowest- in September. The average annual wind speed is 2.4 m / s.

The combination of calm winds with ground inversions causes stagnation and increases the accumulation of impurities around low emission sources. The recurrence of ground inversions is 42%, stagnant situations- 19.0 %.

Repeatability in the city of winds with speed of 2-3 m / s and 4-5 m / s is great, which is 33.5% and 20%, respectively. Strong winds (over 8 m / s) are extremely rare (0.2 %).

Location of the study area in the depth of the continent determines its climate: sharply continental, warm, very dry in summer and humid, relatively cold in winter, as well as significant annual and daily fluctuations in air temperature. The average annual air temperature in the region is 15.7°C. The coldest month is January (4.1°C), the hottest is July (28.5°C).

The sharpest increase in temperature is observed in April: the difference between the average monthly temperature of April and March is 7.3°C. In the following months, the temperature differences between following months are 2.1-2.4 ° C. Starting from August, there is a decrease in temperature, especially sharp in October, when the difference between the average month temperature of September and October, as well as of spring months, is 6.5˚C.

The absolute minimum air temperatures in the cold season reach -28°C. The absolute maximum is observed in the period from May to August and rises to 46°C.

The annual distribution of precipitation is characterized by the highest moisture in the spring-winter period and the lowest moisture in the summer. The minimum falls in September. Fogs are very rare, the average annual number of days is 11, the largest number of days is 24. Most often fogs are observed in the winter months, average frequency of fog does not exceed – 0.5%.

Fluctuations in the amplitude of absolute marks do not exceed 0.5 – 1.0 m

Climatic data

№	Characteristic	Unit of measurement	Value
1	Coefficient A, depending on the temperature stratification of the atmosphere and determining the conditions for the dispersion of	-	200

	pollutants in the atmospheric air		
2	Average temperature of the hottest month (July)	°C	28,5
3	Average temperature of the coldest month (January)	°C	4,1
4	Average annual temperature	°C	15,7
5	Average annual frequency of wind directions for 8 points:		
	N	%	2
	NE		18
	E		30
	SE		18
	S		3
	SW		9
	W		10
	NW		10
	No wind		15
6	The highest wind speed, exceeding which will be 5%, U*	m/s	8.0

4. CHARACTERISTIC OF THE CURRENT ENVIRONMENTAL CONDITION

4.1. Existing atmospheric air condition

In the area of the gas pipeline construction, there are no existing sources of environmental impact, a small impact may be from large enterprise JSC "Navoi TPP" located on eastern side of railway "Navoi-Uchkuduk" and a number of highways.

Natural sources of pollution of the atmosphere, soil and vegetation at high wind speeds include dry underlying surface

4.2. Surface and groundwater

The main waterway of the area is the river Zarafshan.

The main water receiver of the surface and ground runoff, drained through the collection-drainage network, is also the river Zarafshan.

With regard to the classification of groundwater deposits, the study area refers to group 3 with complex hydrogeological conditions due to the variability of thickness, structure of the aquifer and filtration properties of water-bearing rocks. Groundwater is opened at a depth of 2.5-3.0 m. In terms of chemical composition, groundwater is sulfate-chloride, sodium-calcium with dry residue from 2.0 to 5.0g/l.

4.3. Soils, vegetation and wildlife

The gas pipeline will be located on the even land of the Zarafshan Valley. Fluctuations in the amplitude of absolute marks of the territory does not exceed 0.1 - 0.2 m. Quaternary deluvial-proluvial deposits, represented by macrofragmental soils with interlayers of loam, are present in the geological structure.

Soils - The surface of the district soil is composed of gray soils, which are the original soil type. On typical gray soils, formed mainly on the underlying loess-like rocks, dry land farming is developed.

The period of the most intense and deep soil-forming processes falls on spring and part of winter. When maximum moisture is reached, determining quite deep leaching of easily soluble salts and accumulation of carbonates in the middle part of the soil profile. Exuberant vegetation contributes to the formation and accumulation of organic matters, as well as the main elements of plant nutrition.

Uniform development of the humus horizon is observed, its thickness is 30-40 cm. Content of humus is 3-6%, nitrogen – 0. 2-0.7 %.

Soils are weakly alkaline: pH varies insignificantly over the area: from 7.5 to 8.5 and for most of the territory is 8.

Content of toxic elements in ground and soils does not exceed the background value for the soils of the region.

On the allocated area, before the start of construction, **top soil 20 cm (0.2 m) thick is removed**. The soil is temporarily stored in a dump at the border of the site. After the completion of construction work, the soil is transported to the nearest cultivated fields for planting green spaces, and part of it is used for reclamation of the construction site.

Among the animals of the area under consideration, which is highly dusty and noisy, it is possible to name only groups that can hide from noise exposure, in the soil - these are insects and reptiles (desert lidless skink, rapid fringe-toed lizard, tessellated water snake, Central Asian turtle), or species that can quickly leave unfavorable areas - birds (tree sparrow, Senegal turtle dove, common starling, European swallow, red-rumped swallow, black swift, myna, magpie). Amphibians - toads and frogs - settle in areas with stagnant or running water. Among mammals, the house mouse, mole vole, common bat, tamarisk gerbil, eared hedgehog, and pygmy shrew are ubiquitous.

On the area of laying the gas pipeline through the garden and vineyard, cutting down of previously planted trees will be carried out only with the written permission of the Khokimyat of Karmaninsky district and Navoi regional Committee for conservation of nature.

4.4. Assessment of current environmental condition

Ecological state in the considered location area is determined by natural conditions and the nature of the environmental components impact from anthropogenic sources of impact.

The natural conditions of the region are characterized by sharply continental climate and extremely unfavourable conditions, characterized by high air pollution potential.

Soil pollution in the area in question is caused by intensive irrigation farming using mineral fertilizers and chemicals.

According to the totality of factors characterizing anthropogenic impact, the state of the environment in the area under consideration is assessed as acceptable.

5. ENVIRONMENTAL ANALYSIS OF THE DESIGN SOLUTION

Technological process

The project envisages construction of:

- Underground gas pipeline with diameter of 720 x 10 mm and length of 15.53 kilometers, which is connected to existing GDS "Navoi -2".

The gas pipeline is connected through shut-off valves from existing gas distribution station "Navoi-2" to the existing gas pipeline of NTPP with diameter of 730 mm.

The projected pipeline has the following basic characteristics:

- gas pipeline - Metal pipe;
- gas pipeline diameter - 720 mm;
- thickness of the pipe wall - 10 mm;
- pressure - 12 kgf/cm^2;
-length - 15,53 km;
- 2 pcs of shut-off valves are installed on the gas pipeline. (at the beginning and at the end of the object DN 700 mm.);
- capacity - 350000 nm^3/hour;
or 3066000 thousand m3/year.

The gas pipeline branch is laid underground at depth of 2.0 m, the width of the trench along the bottom is 1.0 m. Bitumen insulated pipes 10 meters long are used for laying the gas pipeline, and electric welding is used to connect them.

The project also provides for the possibility of blowing the measuring strands of DN 219 pipelines by bringing it to the purge plug DN 219 mm

The safety valves assembly consists of a switching device and two safety valves DN 219 mm. The assembly is designed to protect against an increase in gas pressure, from the given pressure at the outlet of the gas distribution station. When the gas pressure rises, gas is released through the purge plug DN 219 mm.

6. IMPACT DURING CONSTRUCTION

Installation and piping of the main auxiliary equipment, pipelines and instrumentation and control equipment in safe and organized manner will be carried out by specialized divisions of the enterprise.

Excavation, concrete or other construction and installation works have negligible impact on the environment.

In general, no adverse impact on air quality, water quality, soil and groundwater pollution during construction is expected.

7. TYPES AND LEVELS OF ENVIRONMENTAL IMPACT AFTER COMMISSIONING

According to the project, 180 days are allotted for the construction work of the third line of the underground gas pipeline with a length of 15.53 km, from "GDS-2" to JSC "Navoi TPP"

7.1. Characteristics of the facility as a source of atmospheric pollution

Calculations of emissions of harmful substances into the atmosphere are given in Annex No. 1. According to the calculations, 8 types of hazardous substances are emitted from gas pipelines into the atmospheric air during an annual period of time in the amount of 226.05245 t / year (taking into account welding emissions).

Name of the emitted substance	Emissions t/year
Methane	216,0857
Sum of methane and ethylene	7,909
Sum of propane and propylene	1,5031
Butane	0,3932
Pentane	0,1156
Odorant NMM (Natural Mercaptans Mixture)	0,037
Iron oxide	0,00758
Manganese oxide	0,00127
Total:	**226,05245**

According to the calculations made during an annual time interval, 226.0439 tons of hazardous substances of 6 names (excluding emissions during welding) are emitted from gas pipelines into the atmospheric air, of which salvo emissions are 20.6238 tons / year.

Sources of air pollution at the projected facility will be:

Emissions during commissioning of new branch gas pipelines DN-720 and during cleaning of the branch gas pipelines;

Leakage of connecting nodes and elements in the gas pipeline system;

During electrical welding.

All sources of release and emissions of harmful substances into the atmosphere are subdivided into permanent, periodically technological and inevitable. The first group includes gas leaks from the gas pipeline.

Thus, emissions of periodic sources are classified as salvo emissions.

The projected gas pipeline has 3 emission sources, of which, source No. 2 is permanent, source No. 1 is salvo or emergency, and one more unorganized source (source No. 3) when conducting electric welding works.

When calculating the fields of dissipation of harmful substances, salvo and emergency (blowdown) emissions and temporary emissions that are formed during electric welding work are not taken into account.

The calculation of the harmful substances dissipation in the ground layer of the atmosphere is carried out only for sources of constant action.

Calculations and analysis of the results of calculating the dissipation of surface concentrations of harmful substances in the atmosphere

Calculation results Cm, Mm, Xm for emissions of harmful substances, performed on a computer. Where:

Cм- maximum surface concentration of harmful substances in fractions of maximum allowable concentration.

Mм – dangerous wind speed, m / s.

Xм - distance from the emission source at which the maximum surface concentration is observed in m.

All initial data are entered into the electronic computer. The calculation of the dissipation of harmful substances in the atmosphere contained in emissions was carried out in accordance with the "Methodology for calculating the concentration of harmful substances in the atmospheric air contained in emissions from enterprises" (IND-86).

Calculation was carried out on the computer of "PENTIUM-4" type using "Rainbw" program recommended by the bodies of the State Environmental Committee of the Republic of Uzbekistan

In the calculation, master site layout was used on a scale 1:50000.

Size of the calculated rectangle is 12000 x 9000 meters.

Emission sources are placed in the center of the calculated rectangle. The computational grid spacing is taken as 500 m.

Dangerous wind speed and dangerous wind direction are automatically selected by the computer. Spacing of selecting dangerous wind direction is 45 degrees.

The main criterion for assessing the impact on the environment for sources of emissions of pollutants into the atmosphere is the ratio:

$$\frac{C}{MAC} < K$$

where: MAC – maximum allowable concentration of a harmful substance, mg/m^3

C – calculated concentration of harmful substances in the surface air layer from all emission sources at the border of the sanitary protection zone.

Quota, which should not exceed the established norms at the border of the sanitary protection zone.

To assess the impact of emissions, quotas were used, adopted in accordance with the "Quotas for pollutants emitted into the atmosphere by enterprises of the Republic of Uzbekistan."

At that, its territorial location (Navoi region) and the hazard class of harmful substances emitted into the atmosphere were taken into account.

For substances for which the hazard class was not determined, the quota was adopted based on the value of established SRLI. Quotas for all ingredients are shown in the tables below.

Calculation of the dissipation of surface concentrations was made only for source No. 2. Sources 1,3 are salvo and temporary emissions.

7.2. Water supply and drainage

Water is imported and it will be required only during construction of the gas pipeline. Water is not required when operating the pipeline.

Drinking water is stored in a mobile tank 2.0 m^3 that meets sanitary requirements. The tank is filled periodically with the help of special water carriers. Drinking water is used only for household needs.

Drinking water consumption

Estimated calculation of water consumption for household needs was carried out according to SNiP 2.04.01 - 85.

Water consumption per worker is 25 l / day.

25 l/day * 10 workers = 250 l/day.

According to the project, the number of working days for the construction of utilities is 180 days per year.

180 * 250 = 45000 l/year, or 45 m^3 /year

where: 180 – number of working days per year.

Household effluents are generated in small quantities and are safe for the environment. Effluents are used for irrigation of agricultural plants.

7.3. Generation and disposal of production and consumption waste

During the installation and operation of the gas pipeline branch, the following production wastes are generated:

- gas pipeline branch cleaning sludge;
- waste of electrodes ANO-3.

Sludge when cleaning a gas pipeline branch

According to data of JSC "UZTRANSGAZ", during cleaning of the gas pipeline 0.2 t / year of sludge is formed.

The inner surface of the gas pipeline is cleaned twice a year using a cleaning device.

When conducting electric welding works, wastes of electrodes (cinders) ANO-3 are generated in the amount of 150 kg or 0.15 tons

Household waste

Solid household waste is formed during human processes, calculated according to the formula:

M = N x 50,

Where: N – list-based number of employees, engaged in construction work, people;

50 – annual waste generation rate, kg/person.

Construction work is carried out for 6 months a year.

50:2 = 25 kg from 1 worker M_1= 10 x 25 /1000 = 0,25 t/year.

Household waste is sent to the landfill of Karmaninsky district. Waste from the outdoor toilet is buried at the place of formation in the steppe zone.

8. ASSESSMENT OF EMERGENCY SITUATIONS

Emergency situations include a gas pipeline break-off caused by wear of the gas pipeline metal, failure or malfunction of shut-off valves and pipelines for transporting natural gas and possibility of injury and burns during purging and other construction work.

In this case, natural gas is emitted into the atmospheric air and explosive mixture is formed.

The radius of the blast wave action with gas pipeline diameter of 720 mm is 50-60 meters.

In the event of damage to the gas pipeline, it is necessary to stop the technological process and, with the help of shut-off valves, stop the supply of natural gas to the section where the emergency occurred.

When being injured or burnt, it is necessary to stop the process of supplying (blowing) natural gas, provide first aid and call an ambulance. Fire protection is carried out according to the approved instruction containing specific fire-fighting measures, as well as determining for it the number and place of storage of primary fire-extinguishing means and firefighting equipment.

The specified instruction must be agreed with the fire authorities.

9. Measures for environmental protection

Environmental protection measures for all types of construction and installation work should be carried out in accordance with the method statement (MS), agreed with the local environmental authorities.

In order to reduce environmental intervention, all construction and installation work must be carried out exclusively within the easement area

Pipe laying should be carried out within right-of-way:

• enlargement and increase of technological readiness of structures and materials should be widely used, including carrying out in basic conditions of welding of pipe sections;

• preparation and sealing of pipe edges for orbital welding;

• installation, insulation of in-line valve assemblies and gate valves;

• cleaning and protection of the inner cavity of pipe sections and equipment from the ingress of foreign objects, soil, dirt and snow.

When performing construction and installation work, it is necessary to reclaim lands with bringing them to the state suitable for further use and to take measures to preserve and restore the vegetation cover.

After completion of construction work at the construction site, all construction and auxiliary waste, artificial protective materials are transported to the solid household waste landfill in Navoi.

10. CONTROL SYSTEM

During the operation of the gas pipeline, periodic monitoring of atmospheric emissions from gas pipelines is carried out. Control is carried out by the relevant services after the construction of the facility and after the development of the draft Statement of environmental effects.

11. FORECAST OF THE ENVIRONMENTAL CONDITION AFTER PROJECT IMPLEMENTATION

Assessment of environmental changes as a result of the pipeline commissioning showed the following results.

11.1. Atmospheric air

Emissions of hazardous substances of natural gas components will be continuous, mostly they will have volley (salvo) character, however, supply of hazardous substances at the construction and operation site will not create concentrations exceeding those permitted by the State Environmental Committee of the Republic of Uzbekistan.

According to the calculations carried out to determine surface concentrations using "Rainbow" program, there is excess of the established quota for the substance: odorant NMM (natural mercaptans mixture).

- odorant NMM, at the work border 3.119 MAC, instead of 0.25 MAC.

The above-mentioned excess quota of harmful substances is contained in natural gas, and emissions are carried out mainly during the operation of the gas pipeline from different points.

"Rainbow" program calculates the emission of harmful substances at one point, therefore, it exceeds quotas; these emissions are actually emitted from different points along the gas pipeline. For this, in fact, the maximum one-time and average daily concentration of the above substances does not exceed established permissible norms (quotas) for the residential area and will not have a significant impact on the environment and public health.

The state of atmospheric air will not change and will remain acceptable.

11.2. Surface water

During the operation of the gas pipeline, industrial effluents are not generated. Therefore, changes in the composition of surface waters will not occur. The operation of the gas pipeline will not affect the quality of surface water.

11.3. Ground and groundwater

Construction of the gas pipeline will not affect the quality of soil and groundwater.

11.4. Production waste generation

During the operation of the gas pipeline, industrial waste is generated - 0.2 tons of sludge per year. The sludge is delivered to ACMP for mixing with inert materials in the production of asphalt concrete.

11.5 Soil

During normal operation, the deposition (fallout) of harmful substances from the atmospheric air into other media is insignificant. After the gas pipeline is put into operation, the soil condition will remain unchanged.

11.6. Vegetation

During normal operation, the deposition of harmful substances from the atmospheric air into another environment is negligible. After construction of the gas pipeline, felled areas of the garden will be re-planted with trees and vineyards.

11.7. Wildlife

Comparison of the types and level of environmental impact before and after this project implementation shows that the environmental risk during the implementation of the project is minimized.

Thus, construction of the gas pipeline will not cause changes in the environment and will not have a negative impact on the environment.

CONCLUSION

Emissions of hazardous substances, consisting of natural gas, will be continuous, mostly they will have salvo character, however, supply of hazardous substances to the construction and operation site will not create concentrations exceeding those permitted by the State Environmental Committee of the Republic of Uzbekistan.

After commissioning of the pipeline, maximum concentrations of harmful substances on the border of the pipeline will be:

- Methane – 0,0176 MAC;
- Sum of ethane and ethylene – 0,01 MAC;
- Propane – 0,002 MAC;
- Butane– 0,000008 MAC;
- Odorant NMM – 3,119 MAC;
- Pentane – 0,000004 MAC;

According to the calculations for determining the surface concentrations using "Rainbow" program, there is an excess of the established quota for the substance odorant NMM (natural mercaptans mixture).

- odorant NMM is 3.119 MAC at the border of work instead of 0.25 MAC

The above-mentioned excess quota of harmful substances is contained in natural gas, and emissions are carried out mainly during the operation of the gas pipeline from different points.

"Rainbow" program calculates the emission of harmful substances at one point, therefore, it exceeds the quotas; these emissions are actually emitted from different points along the gas pipeline. For this, in fact, one-time maximum and average daily concentration of the above substances does not exceed the established permissible norms (quotas) in the residential area and will not have a significant impact on the environment and public health.

Waste of electrodes in the amount of 0.15 tons (during the installation of the gas pipeline) is temporarily stored in the allotted place and then handed over to "Vtorchermet" of Navoi.

Waste generated during cleaning of the gas pipeline is temporarily stored in the specially designated place and handed over to ACMP of Karmaninsky district.

Household waste in the amount of 0.25 tons is sent to the landfill of Karmaninsky district. Waste from the outside toilet is buried at the place of formation in the steppe zone.

Generated industrial and household waste will not have significant impact on the environment.

BIBLIOGRAPHY

1. Resolution of the Cabinet of Ministers of the Republic of Uzbekistan. No. 491 dated December 31, 2001 "Regulations on the State Ecological Expertise of the Republic of Uzbekistan".

2. Methodological instructions for the ecological and hygienic zoning of the territories of the Republic of Uzbekistan. according to the degree of danger to public health. Ministry of Health of the Republic of Uzbekistan, Tashkent, 1995.

3. Tishchenko N.F. Protection of atmospheric air. Reference book. Calculation of the content of harmful substances and their distribution in the air. Moscow. Chemistry. 1991.

4. IND-86. Goskomgidromet. "Methodology for calculating the concentration in the atmospheric air of harmful substances contained in the emissions of enterprises." Leningrad. Hydrometeoizdat.

5. Koroleva N.V., Ishmukhamedova T.R. "Handbook of the Ecologist-Expert", Tashkent, 2009.

7. Instruction on inventory of pollution sources and regulation of emissions of pollutants into the atmosphere for enterprises of the Republic of Uzbekistan.2005.

8. Methodology for calculating specific indicators of pollutants in emissions into atmosphere at gas facilities. "GIPRONIIGAZ"1996.

9. Methodology for calculating natural gas used for operational and technological needs and losses during transportation and distribution of gas through networks with pressure of up to 1.2 MPa. RH 39.5-68:2010

To the Chairman of
Navoi Regional Committee
for the Conservation of Nature
Sh.Zh. Khudoikulov

Navoi Thermal Power Plant JSC asks you to consider and issue environmental impact statement (conclusion of the State environmental expertise) for completed DEIS work for the construction of the underground gas pipeline from Navoi-2 GDS to Navoi Thermal Power Plant JSC 15.53 km long in Karmaninsky district of Navoi region.

Payment is guaranteed.

Our details:
Address: Karmana, «Yangi Arik» rural gathering.
Tel: 8-436-227-86-80, 227-86-23
A/c: 20210000900305993001
at Sanoat Kurilish Bank in Navoi
MFO: 00207
TIN: 200850647
OKONKh: _____

Deputy Director
Navoi TPP JSC **N.N. Bobokandov**

Annex № 1

Source № 1
Calculation of emissions when purging gas pipelines

D, m	N, m	W, m/s	V, m^3/s	T, ^0C	Source type
0,05	4,0	59,1	0,116	20,0	Organized point source

After completion of construction and installation work and filling of gas pipelines, in the process of putting them into operation, it becomes necessary to purge or release the pipe from gas.

Emitted into the atmospheric air: natural gas.

Length of the gas pipeline 15,53 km.

Emission duration 45.0 min.

Natural gas components:

Name	Indicator	Average
Methane	93,41 – 93,47	93,44 %
Sum of ethane and ethylene	3,40 – 3,43	3,42 %
Sum of propane and propylene	0,64 – 0,65	0,65 %
Butane	0,16 – 0,17	0,17 %
Pentane	0,04 – 0,05	0,05 %
Odorant NMM (mixture of natural mercaptans)	0,016 g/m^3	0,016 g/m^3

Gas loss calculations were made according to L.9.

The volume of gas Vin m required for purging and filling with gas of the external gas pipeline, medium and high pressure, is taken not more than 100000 Pa.

Calculation of one-time gas volumes required for purging and filling gas pipelines during their commissioning after the completion of construction and installation work is determined by the formula:

The nature of the emission is salvo.

$$V_p = \frac{0{,}0036 \times V_c \times (P_a + P_r)}{273{,}15 + t_r}, \ m^3$$

Geometric volume:

$$V_c = \frac{\Pi \times d^2}{4} \times L = \frac{3{,}14 \times 0{,}72}{4} \times 15530 = 5973{,}6 \ m^3$$

$$V_p = \frac{0{,}0036 \times 5973{,}6 \times (97000 + 100000)}{273{,}15 + 20} = 14451{,}57 \ m^3$$

Total for gas pipelines upon commissioning – 14451,57 m^3

Emission can occur during commissioning and testing of the gas pipeline or during the technical examination of the gas pipeline, which is carried out 2 times a year, and pre-valves popping is carried out periodically.

In this regard, the volume of gas from the source is equal to 14451,57*2= 28903,14 m^3/year.

The average annual amount of pollutants, emitted into the atmosphere, is calculated by the formula:

$$\mathbf{Gyear = V_p * R * J * 10^{-3} \quad t/year.}$$

Where: $\mathbf{V_p}$ - gas consumption for purging gas pipelines and gas equipment, m3 / year.

R - gas density, kg / m^3 R = 0,73

J - average proportion of pollutants in gas composition, %

During the annual time interval, it is emitted from the source in t / year:

Наименование вредных веществ	Потери газа, м3/год	Плотность газа, кг/м3	Состав газа, %	Выброс в т/год
Метан	28903,14	0,73	93,44	19,7152
Сумма метана и этилена			3,42	0,7216
Сумма пропана и пропилена			0,65	0,1371
Бутан			0,17	0,0359
Пентан			0,05	0,0105
Одорант СПМ (смесь природных меркаптанов)			0,016	0,0034

Name of dangerous substances	**Gas losses, m^3/year**	**Gas density kg/m^3**	**Gas composition, %**	**Emissions in t/year**
Methane	28903.14	0.73	93.44	19.7152
Sum of ethane and ethylene			3.42	0.7216
Sum of propane and propylene			0.65	0.1371
Butane			0.17	0.0359
Pentane			0.05	0.0105
Odorant NMM (mixture of natura mercaptans)			0.016	0.0034

Maximum amount of pollutants emitted into the atmosphere is calculated using the formula:

$$\mathbf{V_{sec} = V_p / T^* \ m3/sec}$$

Where: **T** – emission time, seconds (T = 45*2=90,0 min/year * 60 sec. = 5400 sec./year).

$\mathbf{V_p}$ - gas consumption for purging gas pipelines and gas equipment, m^3 / year

The amount of emissions of harmful substances in g / sec is determined by the formula:

$$\mathbf{G = V_{sec} \ x \ g \ x \ C \ x10 \ g/sec}$$

Where: **g** - gas density, kg/m^3

C - percentage of harmful substances by weight in the composition of natural gas.

It is emitted from the source in g / sec:

Name of dangerous substances	Gas losses, m^3/year	Gas density kg/m^3	Gas composition, %	Emissions in t/year
Methane	5.352	0.73	93.44	3650.6634
Sum of ethane and ethylene			3.42	133.6180
Sum of propane and propylene			0.65	25.3952
Butane			0.17	6.6418
Pentane			0.05	1.9535
Odorant NMM (mixture of natura mercaptans)			0.016	0.6251

Source № 2
Natural gas leakage emissions calculation
(through leakage of flange and threaded connections, in glands)

D, m	N, m	W, m/s	V, m^3/s	T, ^{0}C	Source type
0,5	2,0	2,4	0,471	28,5	Unorganized point source

The source of emission is the leakage of gas pipelines under normal operating conditions (through leakage of flange and threaded connections, in the glands).

Emitted into the atmospheric air: natural gas.

Duration of emission 24 hours a day, 365 days a year.

Natural gas components:

Name	Indicator	Average
Methane	93,41 – 93,47	93,44 %
Sum of ethane and ethylene	3,40 – 3,43	3,42 %
Sum of propane and propylene	0,64 – 0,65	0,65 %
Butane	0,16 – 0,17	0,17 %
Pentane	0,04 – 0,05	0,05 %
Odorant NMM (mixture of natura mercaptans)	0,016 g/m^3	0,016 g/m^3

Gas losses in gas pipelines and structures associated with leakage of gas pipelines under normal operating conditions (through leakage of flange and threaded connections, in glands)

Calculation of gas losses through non-density of flange and gland connections of gas pipelines.

Determining gas losses G, g/s, and gas volume V, m^3/h lost through leakage of gas pipeline flange connections.

Inner diameter of the blow-off gas pipeline, d	0,7 м.
Gas pipeline length, ll	15530 м.
Excessive gas pressure in the gas pipeline, $P_г$	120000 Pa.
Absolute gas temperature, $T_г$ (273,15 + 20^0C)	293,15 K.
Safety factor, ή	2
Non-tightness (leakage) factor, m	0,002
Gas density, ρ	0,73 kg/m^3.
Molecular weight of methane, M	16,043 kg/kmol

The volume of the gas pipeline cavity V, m3, between the disconnecting devices is determined by the formula (7) and is:

$$V_{г1} = \frac{\pi \times d^2}{} = \frac{3,14 \times 0,7^2}{} \times 15530 = 5973,6$$

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Gas losses G, g / s, released through leakage of the gas pipeline flange joints, is determined by the formula (21) and is:

$$G = 3,57 \times 0,278 \times 10\text{-}5 \times \eta \times P_г \times m \times Vx \sqrt{\frac{M}{T}} =$$

$$= 3,57x0,278x10^{-5}x2x12,0x10^{5}x0,002x5973,6 \times \sqrt{\frac{16,043}{293,15}} = 6,657$$

The volume of gas losses released through leaks of flange connections of gas pipelines V, m3 / h, is determined by the formula (22) and is:

$$V = \frac{G}{\rho_г} = \frac{6,572 \times 3600}{0,73 \times 1000} = 32,83 \text{ m}^3\text{/hour}$$

Determining gas consumption, Q_{leak}, $1x10^3$ m^3/month, lost with losses through leaks of shut-off valves joints.

For gland joints:

Gas leakage through gland leaks, q_{leak}	0,021 kg/h
Working time fund (load factor) for the analyzed period, τ	730 h
Percentage of joints (seals) that have lost their tightness, a	0,293
Gas density, ρ	0,73 kg/m^3
Number of shut-off and control valves, b_1	2
Number of flanges per valve, b_2	2

$$Q_{leak} = \frac{Q_{leak} \times т \times a \times b_1 \times b_2 \times 10^{-3}}{\rho} = \frac{0,021 \times 730 \times 0,293 \times 2 \times 2 \times 10^{-3}}{0,73} = 0,0246 \text{ thousand m3/month}$$

$$Q_{leak} = \frac{0,0246 \times 1000 \times 12}{365x24} = 0,0337 \text{ m}^3\text{/hour.}$$

Total gas losses in gas pipelines and structures associated with leakage of gas pipelines under normal operating conditions (through leaks in flange and threaded connections, in glands)

Q_{leak} = 32,83+0,0337=32,8637 м^3/час или 32,8637x365x24=287886,012 m^3 /year.

Average annual amount of pollutants emitted into the atmosphere is calculated by the formula:

$$G_{year} = V_p * R * J * 10^{-3} \quad \text{t/year.}$$

Where: V_{leak}- total volume of gas leakage entering the atmosphere, m3 / year.

R - gas density, kg/m3 R = 0,73
J - average proportion of pollutants in gas composition, %

During the annual time interval, it is emitted from the source in t / year:

Name of dangerous substances	**Gas losses, m^3/year**	**Gas density kg/m^3**	**Gas composition, %**	**Emissions in t/year**
Methane	287886.012	0.73	93.44	196.3705
Sum of ethane and ethylene			3.42	7.1874
Sum of propane and propylene			0.65	1.3660
Butane			0.17	0.3573
Pentane			0.05	0.1051
Odorant NMM (mixture of natural mercaptans)			0.016	0.0336

The maximum amount of pollutants emitted into the atmosphere is calculated using the formula:

$$V_{sec} = V_p / T^* \ m^3/sec$$

Where: **T** – emission time, seconds (T = 8760 h/year * 3600 sec. = 3153600 sec/year).
V_{leak} - total volume of gas leakage entering the atmosphere, m3 / year.

The amount of emissions of harmful substances in g / sec is determined by the formula:

$G = V_{sec} \times g \times C \times 10$ g/sec

Where : g- gas density, kg/m3
C- percentage of harmful substances by weight in the composition of natural gas.
Emitted from the source in g / sec:

Name of dangerous substances	**Gas losses, m^3/year**	**Gas density kg/m^3**	**Gas composition, %**	**Emissions in t/year**
Methane	0.0091	0.73	93.44	6.2072
Sum of ethane and ethylene			3.42	0.2272
Sum of propane and propylene			0.65	0.0432
Butane			0.17	0.0113
Pentane			0.05	0.0033
Odorant NMM (mixture of natural mercaptans)			0.016	0.0011

During the installation of gas pipelines, electric welding works are carried out.

Calculation of emissions of harmful substances into the atmosphere during electric welding

Calculation of the emission of harmful substances during the production of electric welding works is carried out according to the formula:

$$M = K * q * 10^{-6} \text{ t/year}$$

$$M = K * q / T / 3600 \text{ g/s}$$

Where: K – specific indicator of the formation of harmful substances, g / kg

q – mass of consumable materials, kg / year

T – duration of work, year.

Source № 3

1. Source parameters:

D, м	N, м	W, m/s	V, m^3/s	T, ^0C	Source type
0,5	2,0	2,4	0,471	28,5	Unorganized flat source

2. Emission source is a mobile welding machine.

3. Emitted into the atmospheric air: iron oxide, manganese oxide.

4. Welding machine works - 8 hours a day 180 days a year or 1440 hours a year.

Electrodes ANO-3 are used for electric welding.

Calculation of emissions of harmful substances is summarized in the table

№	Electrode type	Name of the emitted substance	Specific emissions g / kg	Material consumption in kg.		Working time, hour		Emissions	
				Per year	Per day	Per year	Per day	g/sec	t/year
1	ANO-3	Iron oxide Manganese oxide	5,05 0,85	1500	8,33	180	8	0,00146 0,000246	0,00758 0,00127