JOINT IMPLEMENTATION PROJECT DESIGN DOCUMENT FORM
Version 01 - in effect as of: 15 June 2006

CONTENTS

Annexes

SECTION A. General description of the project

A.1. Title of the project:

Title of the project: "Utilization of associated petroleum gas on Talakan oil and gas condensate field, Russian Federation"

The sectoral scope(s): (10) Fugitive emissions from fuels (solid, oil and gas).

PDD Version: 1.2

Date: 04/04/2012

A.2. Description of the project:

Brief description of the project

The project involves construction of a compressor station (hereinafter CS) for utilization of associated petroleum gas (hereinafter APG) on Talakan oil and gas condensate field in the Sakha Republic (Yakutia), Russian Federation. In order to be utilized APG will be pumped by CS into the gas cap of the oil pool through forcing wells. The main purpose of APG injection is avoiding of its combustion in flares but the injection also has an additional minor purpose - to maintain seam pressure. The injected APG will be stored in the gas cap for a long-term period, at the moment of PDD creation[1] there were no plans for extraction of the APG in the foreseen future. The PDD assumes that in remote future the injected APG can be extracted only for use as a fuel thus, substituting other fossil fuels. Implementation of the project allows OJSC "Surgutneftegas" to save valuable natural resource – APG and avoid pollution of the environment by combustion residues.

Purposes of project implementation

The main purposes are:

- Increase APG utilization level;
- Save natural resources for the next generations;
- Improve environmental situation near the oilfields;
- Reduce greenhouse gas (GHG) emissions.
- Substitute water injection based seam pressure maintenance;

Situation existing prior to the starting date of the project

Prior to the project implementation associated petroleum gas was combusted mainly in flare units. Only small quantities of APG were used for internal needs. APG was flared under suboptimal conditions, i.e. part of APG was not duly oxidized and was released into the atmosphere (also known as soot flaring). At the time of decision making to implement the project[2], APG flaring was common practice at remote oilfields in Russia. The additional impact of the project implementation such as seam pressure maintenance could be supported by means of water injection. The capacity of water injection equipment at the site was enough to provide the same level of oil extraction as in the presence of the project.

Baseline scenario

The baseline scenario can be described as follows; in the absence of the project, APG utilized by the compressor station would be flared. Seam pressure at Talakan oil and gas condensate field would be maintained by means of water injection.

The main source of emissions in the baseline scenario is CO_2 emissions from combustion of hydrocarbon contents of the APG. The baseline scenario also includes fugitive emissions of hydrocarbons due to incomplete combustion of APG in flare units. Among other hydrocarbons, methane is indicated by the

[1] December 2011

[2] 2006

UNFCCC as a greenhouse gas. Thus, fugitive methane emissions from incomplete combustion of APG are included in the baseline scenario.

Expected results of the project:

- Increase of APG utilization level;
- Decrease of water consumption for purposes of seam pressure maintenance;
- Preservation of the valuable natural resource – APG which consists mainly of methane.APG will not be wasted in flare units but saved and stored for further use;
- Environmental conditions near the flare units will be improved;
- Mitigation of negative environmental impacts, including reduction of GHG emissions by average 777,857 tonnes of CO_2e/year.

Project scenario

Under the project scenario, a compressor station was build near Talakan oil and gas condensate field developed by OJSC "Surgutneftegas" in Sakha Republic. The compressor station is designed for pretreatment, compressing, drying and transportation of the APG to the injection wells of the Talakan oil and gas condensate field. APG will be pumped into the gas cap of the oil pool for the purposes of seam pressure maintenance. The injected APG will be stored in the gas cap for a long-term period.
The raw material for the compressor station is associated petroleum gas from Talakan oil and gas condensate field. The CS is powered by a located nearby gas turbine power plant which uses APG from the same oil and gas condensate field as the project itself. Implementation of the project will lead to a significant increase of APG utilization level and saving of fossil natural resources.

The total amount of the pumped APG will amount approximately 849 mln. m^3 for the period 2010-2012.

Brief history of the Project (including its JI component)

In 2004 OJSC "Surgutneftegas" obtained a license for the development of Talakan oil and gas condensate field. In 2005 the company started drilling exploration wells and developing basic infrastructure such as roads, power generation and supply, worker accommodation, etc. necessary for further field exploration as well as core oil processing and transportation infrastructure.

In early 2006 the company's Environmental and corrosion control department conducted analysis of the situation with Joint Implementation mechanism in Russia[3]. It took into account experience from gas turbine and gas piston power station APG utilization projects developed under JI framework which started in 2001 and 2005 respectively. Report suggested that despite lack of economic incentives and significant capital expenditure requirements, APG utilization at Talakan oil and gas condensate field can be co-financed through JI mechanism.

Technical parameters of the APG utilization project were initially discussed in April 2006 at the Technical Council meeting chaired by the Chief Engineer of OJSC "Surgutneftegas". In September 2006 Chief Engineer approved an assignment for the project design development. By the end of 2007 the company received completed project design developed by OJSC "UkrKhimProject", received all necessary state approvals (Glavgosexpertiza) and started construction of the compressor station[4]. Construction and commissioning were completed in October 2010 as evidenced by the Construction Completion Act[5].

In early 2010 when regulatory regime became more transparent and Sberbank announced the first contest for host-country JI project approval, OJSC "Surgutneftegas" and Gazprom Marketing & Trading Ltd. (GM&T) started cooperation on commercializing of carbon credits generated by the company's APG utilization JI projects. 9th June 2011 OJSC "Surgutneftegas" and Gazprom Marketing & Trading Ltd. (GM&T) concluded an Emission Reduction Purchase Agreement and commenced development of

[3] Confirming documents have been provided to verifiers.

[4] Relevant documents have been provided to verifiers.

[5] Construction Completion Act has been provided to verifiers.

Project Design Documentation on this project titled “Utilization of associated petroleum gas on Talakan oil and gas condensate field, Russian Federation”.

A.3. Project participants:

Party involved	Legal entity project participant (as applicable)	Please indicate if the Party involved wishes to be considered as project participant (Yes/No)
Party A: Russian Federation (Host Party)	Legal entity A1: Open Joint Stock Company “Surgutneftegas”	No
Party B: United Kingdom	Legal entity B1: Gazprom Marketing&Trading Ltd	No

Open Joint Stock Company “Surgutneftegas”

Oil and gas producer Surgutneftegas is one of the largest companies in the Russian oil sector. It accounts for almost 13% of the country’s crude output and 25% of gas produced by domestic oil companies[6].

Key lines of the company’s business are:

- Hydrocarbon exploration and production;
- Gas processing and power generation;
- Output and marketing of oil products, sales gas, and gas products;
- Petrochemical production.

Gazprom Marketing & Trading

Based in London, Gazprom Marketing and Trading is a global business that provides customers with integrated energy solutions. Gazprom Marketing and Trading is wholly owned by the investment and holding company Gazprom Germania GmbH. This in turn is a 100% subsidiary of Gazprom Export – the export arm of OAO Gazprom, the world’s largest gas producer.

A.4. Technical description of the project:

A.4.1. Location of the project:

The Russian Federation, Sakha (Yakutia) Republic

A.4.1.1. Host Party(ies):

The Russian Federation

A.4.1.2. Region/State/Province etc.:

Sakha (Yakutia) Republic

[6] http://www.surgutneftegas.ru/en/about/today/

A.4.1.3. City/Town/Community etc.:

Yakutsk city

A.4.1.4. Detail of physical location, including information allowing the unique identification of the project (maximum one page):

The project activity involves the construction of the compressor station near the Talakan oil and gas condensate field. Talakan oil and gas condensate field is located in the southwest of Sakha Republic in the middle reaches of the Lena river, 300 km from the city Kirensk. Location of oil fields and GTPPs is presented at the map below.

Geographical coordinates: latitude - 59°47′N, longitude - 110°52′E [7].

[7] Geographical coordinates of the project have been provided by OJSC "Surgutneftegas". There are no public sources of the geographical coordinates of the project.

A.4.2. Technology(ies) to be employed, or measures, operations or actions to be implemented by the project:

Brief description of the project

The project involves construction of the compressor station near Talakan oil and gas condensate field developed by OJSC "Surgutneftegas" in Sakha Republic.

The compressor station is designed for pretreatment, compressing, drying and transportation of the APG to the injection wells of the Talakan oil and gas condensate field. APG will be utilized by means of its pumping by the CS into the gas cap of the oil pool through forcing wells for the purposes of seam pressure maintenance. The raw material for the compressor station is associated petroleum gas from Talakan oil and gas condensate field.

The compressor station contains 4 identical compression lines. 3 lines are operational and one is in reserve. The compression capacity of one line is 500 mln. m^3 of APG in a year.

Technological solution is based on installment of gas compressor engines with three stages of compression. The heated gas is cooled after the compression in gas coolers and purified from liquid content in separators. Drying and cleaning of APG from the sulfur-containing impurities is carried out through adsorption by zeolite NaA with the subsequent regeneration of the zeolite.

The compressor station includes the following major objects:

- receiving separator with a system of condensate collecting and pumping;
- building for the compressor units;
- technological site for adsorbers and heaters;
- fuel gas site;
- flaring system;
- warehouses;
- pumping station of foam extinguishing;
- distributing device 6 kV;
- complete transformer substations KTP - 6/0.4 kV;
- fencing;
- check-point;
- office block;
- External engineering networks.

APG is injected by compressors with gas turbine drives which use APG as a fuel. The main technical characteristics of compressors are presented in the table A.4.2-1 below.

Table A.4.2-1 Technical characteristics of one compression unit

Parameter	Value
Producer	OJSC "Sumy Frunze Machine-building Science-and-Production Association"
Compressor type	centrifugal
Stages of compression	three stages
Gear	gas turbine engine
Fuel gas	9270 m^3 / hour
Oil consumption	0.4 kg / hour
Temperature of fuel gas	70°C - 90°C
Designed pressure (excessive) at the compressor inlet	0.3 MPa
Work pressure (excessive) at the compressor inlet	0.3 – 0.5 MPa
Pressure (excessive) at the compressor outlet	14 MPa
Producing capacity	500 mln m^3 / year
Operating environment (fuel type)	associated petroleum gas

Table A.4.2-2 APG consumption by the compressor station for the purposes of APG injection

Year	Unit	Factual/planned value	Value
2008	mln. m^3	factual	0
2009	mln. m^3	factual	0
2010	mln. m^3	factual	34.911845
2011	mln. m^3	planned	38.246
2012	mln. m^3	planned	56
Total	mln. m^3		129.157845

Each compression line includes the following major components:
- gas turbine engine covered with soundproof shelter together with necessary technological systems which ensure efficient operation of the engine;
- multiplier with all the necessary technological systems which ensure its efficient operation;
- compressor unit with all necessary technological systems which ensure its efficient operation;
- aerial cooler apparatus;
- interim separators;
- technological pipelines, shut-off valves with flanges, intelligent heating cable «Raychem» with subsequent thermal insulation;
- ramps, servicing platforms, stairs;
- automatic control system;
- gas pollution detection system;
- fire detection system;
- automatic fire extinguishing system;
- low-voltage device with a 0.4 kW uninterruptible power supply for electrical equipment and systems of the compression line.

Energy solutions applied in this project include the laying of the optimal power supply networks, the use of luminaries with gas-discharge lamps, lamps with high luminous efficiency, automatic control of outside lighting and the use of building frame structures with effective insulation.

The compressor station is supplied with electricity from the Talakan GTPP/GPPP located nearby. The CS does not have any reserve power supply i.e. the station is not connected to the Integrated Power System of Russia or other electricity sources.

APG is injected by APG fuelled compressors (with turbine engine) and electricity consumed by the compressor station is used only for auxiliary needs. The only source of electricity is an APG fuelled gas turbine power plant and gas piston power plant located nearby. The project will not affect other power consumers of the GTPP and GPPP as they have total power capacity of 156.6 MW and the maximal load in 2011, including power consumption by the compressor station, was 43.5 MW. Thus, about 113.1 MW of power capacity are in reserve. The designed electricity consumption of the compressor station is 16,490 MWh with three compression lines operating at full capacity. The factual and planned power consumption values adjusted to factual volumes of processed and pumped APG are presented in the table A.4-2 below.

Table A.4-3. Power consumption of the compressor station.[8]

Year	Unit	Factual/planned value	Value
2008	MWh	factual	0
2009	MWh	factual	1,454.1
2010	MWh	factual	6,046.9
2011	MWh	planned	6,190.1
2012	MWh	planned	5,691.7
Total	MWh		19,382.9

The common method of seam pressure maintenance at oilfields developed by OJSC "Surgutneftegas" is water injection. Talakan oilfield is equipped with 9 water pumps with total pumping capacity 2,520 m^3 / hour or 60,480 m^3 / day. Water pumping capacity of the installed equipment is sufficient for maintenance of seam pressure without APG injection. About 129.87 m^3 of APG should be injected instead of 1 m^3 of water to maintain the same pressure level[9].The maximal annual amount of APG which is expected to be injected is 562 mln. m^3 of APG[10] or 1.5 mln. m^3 of APG per day. This amount equals injection of around 11,935 m^3 of water per day what is significantly lower than total water injection capacity of the installed equipment.
APG injection will partially substitute water injection and after implementation of the project water injection will be continued. The volume of water injection will decrease as a result as APG injection will partially substitute injection of water. In 2011 around 4,294.18 ths. m3 of water was injected. The amount of water separated from the crude oil emulsion is very small, and the biggest share of injected water was extracted from water supply wells (more than 98%). In the absence of the project, the amount of water extracted from water supply wells would be even higher. It means that the project allows avoiding extraction and re-injection of fresh water. This impact is considered as a positive environmental impact.
The amount of APG supplied to injection wells and its composition is presented in the table below.

Table A.4-4. Actual and forecasted APG volumes injected by the CS and average APG compositions used for ex-ante calculations

Parameter	Unit	Factual values[11]			Forecasted values	
		2008	2009	2010	2011	2012
APG injection	mln. m^3	0	0	146.404	271.769	431
Methane (CH_4)	% vol.	73.97	77.13	73.34	74.81	74.81
Ethane (C_2H_6)	% vol.	13.35	11.77	12.29	12.47	12.47
Propane (C_3H_8)	% vol.	6.54	6.4	6.96	6.63	6.63
i-butane (methylpropane; C_4H_{10})	% vol.	0.94	0.39	0.41	0.58	0.58

[8] Data provided by OJSC "Surgutneftegas".

[9] Information provided by OJSC "Surgutneftegas"

[10] 562 mln. m^3 of APG[10] is planned to be injected in 2016

[11] Annual average values are used for ex-ante calculations

n-butane (C_4H_{10})	% vol.	1.78	1.2	1.55	1.51	1.51
i-pentane (methylbutane; C_5H_{12})	% vol.	0.39	0.22	0.22	0.28	0.28
n-pentane (C_5H_{12})	% vol.	0.41	0.23	0.33	0.32	0.32
C_6+ (Hexanes and higher)	% vol.	0.28	0.16	0.17	0.20	0.20
Carbon Dioxide (CO_2)	% vol.	0	0	0.08	0.03	0.03
Nitrogen (N_2)	% vol.	2.34	2.5	4.66	3.17	3.17

Training program

A comprehensive training program was conducted for a selected number of the Employer's shift engineers, operation and maintenance personnel. The training programme included the following main courses:

- Compressor operator;
- Gas turbine operator;
- Process unit operator;
- Processing unit repairman;
- Gas and steam equipment repairman;
- Gas equipment maintenance technician;
- Maintenance technician;
- Check meter and automatics maintenance technician;
- Electrician;
- Rigger.

Human Resources Division of OJSC "Surgutneftegas" is responsible for proper training and qualification of employees involved in the project. In general about 50 persons were trained.

Table A.4.2-5. Implementation schedule of the project

Milestones	Starting date of construction	Commissioning date[12]
Construction of the gas compressor station	21 December 2007	20 October 2009
Construction of the industrial-administrative building	21 December 2007	20 October 2009
Construction of the machinery and repair shop	21 December 2007	20 October 2009
Construction of the foam extinguishing pumping station	21 December 2007	20 October 2009
Construction of the control filter post	21 December 2007	20 October 2009
Installation of the video surveillance system	1 August 2009	30 October 2009
Construction of the gas compressor station (extension)	21 December 2007	30 September 2010

A.4.3. Brief explanation of how the anthropogenic emissions of greenhouse gases by sources are to be reduced by the proposed JI project, including why the emission reductions would not occur in the absence of the proposed project, taking into account national and/or sectoral policies and circumstances:

Generally, implementation of the project will lead to reduction of GHG emissions, out of which the primary ones are CO_2 and CH_4.

Reduction of GHG emissions as a result of the project realization will occur due to:

- Reduction of CO_2 emissions from burning of APG in flare units;
- Reduction of fugitive CH_4 emissions from incomplete combustion of methane in flare units.

[12] According to acts of commissioning

Without participation in the Kyoto protocol mechanisms and registration of the project as JI activity, the construction of the compressor station is unlikely, since:

- Implementation of the project is not financially attractive;
- OJSC "Surgutneftegas" could continue to flare APG in flare units as there are no restrictions for the flaring or major incentives to invest in APG utilization projects;
- No additional investments are necessary to continue burning of APG in flare units;
- No significant changes in the Russian environmental legislation are foreseen, which could force OJSC "Surgutneftegas" to discontinue APG flaring;
- There are no limitations on the GHG emissions for the companies in Russia and none are expected till 2012.

For more information please refer to Section B.2 below.

The project will also lead to decrease of atmospheric pollutions such as emissions of nitrogen dioxide, nitrogen monoxide, sulphur dioxide, carbon monoxide, hydrocarbons and soot[13]. Therefore, the ecological situation near the flare units will improve considerably.

A.4.3.1. Estimated amount of emission reductions over the crediting period:

	Years
Length of the crediting period	3
Year	Estimated annual emission reductions in tonnes of CO_2 equivalent
2010	397,766
2011	749,090
2012	1,186,716
Total estimated emission reductions over the crediting period (tonnes of CO_2 equivalent)	2,333,572
Estimated average annual emission reductions over the crediting period (tonnes of CO_2 equivalent)	777,857

A.5. Project approval by the Parties involved:

According to the Russian legislation, the letter of approval for the project will be issued by the Russian Government based on an expert statement issued by the AIE. Once the Approval is received, both the PDD and the determination report will be updated and the determination will become final.

Project approval from Party B: United Kingdom will be received after approval of the project by the Host party.

[13] This statement is based on results of environmental impact assessment (a part of a project design). For more details please refer to the Section F below.

SECTION B. Baseline

B.1. Description and justification of the baseline chosen:

According to paragraph 9 of the "Guidance on criteria for the baseline setting and monitoring", version 03 (hereinafter referred to as "Guidance"), the project participants may select either:

(a) An approach for baseline setting and monitoring developed in accordance with appendix B of the JI guidelines (JI-specific approach); or

(b) A methodology for baseline setting and monitoring approved by the Executive Board of the clean development mechanism (CDM), including methodologies for small-scale project activities, as appropriate, in accordance with paragraph 4(a) of decision 10/CMP.1, as well as methodologies for afforestation/reforestation project activities; or

(c) An approach for baseline setting and monitoring already taken in comparable JI cases.

Project participants have chosen Option (a) - JI specific approach to establish a baseline scenario for the current project. Baseline is set up in accordance with the Decision 9/CMP.1, Guidelines for the implementation of Article 6 of the Kyoto Protocol. FCCC/KP/CMP/2005/8/Add.2. 30 March 2006 and on the basis of "Guidance on criteria for baseline setting and monitoring", Version 03.

In order to justify the most plausible and realistic baseline scenario, detailed analysis of plausible alternatives are carried out below.

Application of the approach chosen - Identification of a baseline based on the selection of the most plausible alternative scenario

Identification and listing of plausible baseline scenarios

The proposed project involves construction of the compressor station with the total installed treatment and pumping capacity 1,500,000 m^3 of APG per year. In order to be utilized APG will be pumped by CS into the gas cap of the oil pool through forcing wells. Although the main purpose of APG injection is avoiding of its combustion in flares, the injection also has an additional minor purpose - to maintain seam pressure. The injected APG will be stored in the gas cap for a long-term period. Once re-injected APG will not be re-extracted again as there are no viable options of processing or usage of the APG instead of its flaring. Sakha (Yakutia) Republic is the largest subnational province in the world with an area of 3,103,200 km^2 which is just slightly smaller than India (which covers an area of 3,287,240 km^2). At the same time the Republic has a population of less than one million. Sakha (Yakutia) Republic is one of the most uninhabited regions in the world, which predetermines absence of significant gas consumers or gas processing capacities in the region. The only way to use APG is flaring or utilizing it on-site. Plausible alternatives of APG utilization are indicated and discussed below.

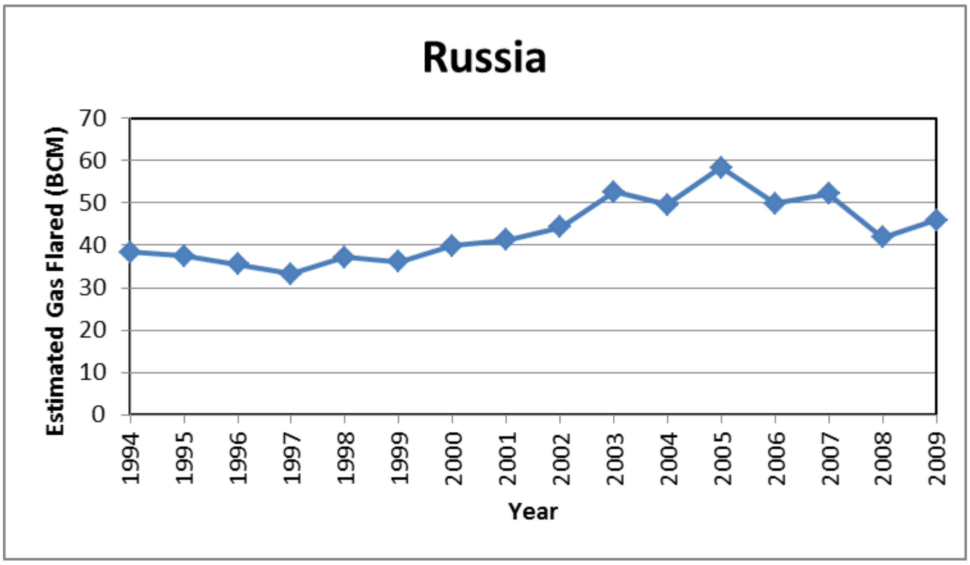
The compressor station consumes electricity from the located nearby GTPP/GPPP which is fuelled by the same APG as the compressor station itself. If the compressor station would not be built, electricity would not be consumed and APG, used for electricity generation, would be flared in flare units. The project will not affect other power consumers of the GTPP/GPPP as they have total power capacity of 156.6 MW and the maximal load in 2011, including power consumption by the compressor station, was 43.5 MW. Thus, about 113.1 MW of power capacity are in reserve. As the GTPP/GPPP is located outside the project boundary and the project does not affect other power consumers, APG consumption by GTPP/GPPP is not considered in the alternatives below.

Project emissions of this kind were excluded from the project boundary together with the baseline emissions from flaring of the same amount of APG. This approach corresponds to conservatism principles and allows simplifying calculations.

Prior to the project implementation the full amount of APG currently used by the compressor station was flared. The raw material for the compressor station is associated petroleum gas from Talakan oil and gas condensate field. Implementation of the project will lead to a significant increase of APG utilization level and preservation of natural fossil resources.

Venting of APG is prohibited in Russia. The cheapest and the most wide-spread method of APG utilization in Russia is its flaring. In 2006 APG flaring was the common practice in Russia, especially in remote locations, such as Sakha (Yakutia) Republic. According to the data of National Geophysical Data Center, more than 50 bln. m^3 of APG were flared in Russia in 2006. Moreover, as it seen from the Diagram B.2-1 below the amount of flared APG was growing not only before the start of the project implementation, but also afterwards.

Diagram B.2-1 –APG flaring level in Russia[14].



Utilization of associated petroleum gas does not yield profit for oil companies because of the low price of APG. APG prices are regulated by the Ministry of Economic Development and Trade of the Russian Federation and remain downright low. The price for APG in the end of 2006 was 759[15] RUB/ths. m^3 whereas the price for natural gas in the same time period was about 1582[16] RUB/ths. m^3. The Governmental Decree #59 dated 09.02.2008 cancels state regulation of tariffs for APG which is supplied for processing at APG processing plants. This change does not affect the project as there was no possibility to use APG from Talakan oilfield at any APG processing plants because of the location of the oilfield. Besides, oilfields are usually located far away from end consumers in rural undeveloped areas and it is unreasonable for oil companies to invest in the required infrastructure for gas preparation and transportation. Taking into account that oil price was constantly growing[17] oil companies in Russia prefer to invest in their core business – oil extraction and processing rather than in development of APG utilization facilities.

APG utilization is not financially attractive for oil companies in Russia and there are no distinct legislative restrictions which can push the oil companies to develop APG utilization. Fees and penalties for pollutant emissions into the atmosphere are very small. Until 01 July 2005 the fee for emission of methane was 0.05 RUB per tonne of methane. According to the decree #410 dated 01 July 2005[18]. The fee was increased to 50 RUB per tonne of methane in the limits of MPE. Only from 2012 onwards the fee for flaring the amount of APG which is lower than 95% APG utilization level is set to 250 RUR/t. of

[14] http://www.ngdc.noaa.gov/dmsp/interest/flare_docs/Global_BCM_20100917.xls

[15] http://www.gks.ru/free_doc/new_site/prices/prom/CENA-PR.xls

[16] http://www.gks.ru/free_doc/new_site/prices/prom/Cena-TER.xls

[17] http://www.gks.ru/free_doc/new_site/prices/prom/Cena-TER.xls

[18] Efficient as of 20 July 2005.

methane. Even this increased fee which equals to 6.4 EUR/t. of methane is not significant to bring Russian oil companies to invest in APG utilization.

As the proposed project activity includes two purposes, outputs of which are not comparable between themselves: utilization of APG and maintenance of seam pressure, scenarios for each of them will be identified separately. A combination of most plausible alternatives for utilization of APG and for maintenance of seam pressure will be identified as a baseline for this project.

Alternative scenarios available for the project owner and which can be defined as plausible scenarios for utilization of APG are listed below:

Alternative Scenario A1: Continuation of APG flaring;

Alternative Scenario A2: Construction of APG fuelled Gas Piston Power Plants or Gas Turbine Power Plants;

Alternative Scenario A3: Transportation and sale of APG to end users;

Alternative Scenario A4: Processing of APG at APG processing plant or construction of a new processing plant;

Alternative Scenario A5: Implementation of the project without involving of JI mechanism. Utilization of APG by means of its injection into the gas cap of the oil pool.

Identification of the most plausible alternative scenario for utilization of APG

Alternative scenario A1: Continuation of APG flaring. When the decision to implement the project was made, APG flaring was the common practice in Russia and the historical practice at oilfields developed by OJSC "Surgutneftegas". The continuation of APG flaring was not prohibited by Russian law or national policies and there were no legislation which encouraged Russian oil companies to invest in APG utilization. Russian oil and gas industry anticipates that only from 2012 the level of level of environmental fees and fines may increase. Licenses for Talakan oilfield development did not include any obligations to utilize APG[19] nor they offered any incentives which could encourage OJSC "Surgutneftegas" to utilize APG. This scenario can be considered as business-as-usual scenario as prior to the project realization APG was historically flared, flaring does not need any investments as compared with the other listed alternatives and there were no technical or legislative barriers for continuation of that business-as-usual scenario.

Conclusion

Based on the analysis above, analysis of other alternatives below and investment analysis presented in Section B.2 it is considered that Alternative Scenario A1 is the most plausible and credible scenario for utilization of APG.

Alternative Scenario A2: Construction of APG fuelled Gas Piston Power Plants (hereinafter GPPPs) or Gas Turbine Power Plants (hereinafter GTPPs). According to this alternative, Gas Piston or Gas Turbine power plants would be built instead of the compressor station. GPPPs/GTPPs would cover on-site power demand of Talakan oil and gas condensate field. Same as in the project scenario, construction of GPPPs/GTPPs would lead to significant increase of APG utilization level. This alternative cannot be considered as a plausible alternative scenario for the project because of the following reasons:

1. There are already a GTPP and a GPPP located near the Talakan oil and gas condensate field and which are fueled by the same APG as the compressor station itself. The total power capacity of the plants is approximately 156 MW, what is more than enough to fully cover the power needs of the Talakan oilfield. Thus construction of surplus power generation capacities is not justified as there are no consumers of the generated electricity. There is a theoretical possibility to produce and supply electricity to power consumers located outside the oil and gas condensate field but as the field is located in one of the most inhabited regions in the world there are no significant power consumers which can be accepters of the generated by GTPPs/GPPPs electricity;

[19] The license for Talakan oilfield operated by OJSC "Surgutneftegas" confirming that APG utilization was not mandatory has been provided to verifiers.

2. The power plants located near the Talakan oilfield are also being implemented as JI projects. Power stations developed and constructed as JI projects by the same entity as the compressor station itself an which have the same location, cannot be considered as a plausible alternative for the project;
3. APG-fired GPPPs/GTPPs constructed in the same or bordering regions are commonly constructed with involving of Kyoto mechanism[20]. As the common practice shows that GPPPs running on APG are commonly implemented as Kyoto projects they cannot be considered as the alternative for the project.

Conclusion

Based on the analysis of this and other alternatives and investment analysis presented in Section B.2 it is considered that construction of APG fuelled Gas Piston Power Plants or Gas Turbine Power Plants can't be considered as a most plausible and credible alternative scenario for utilization of APG.

Alternative Scenario A3: Transportation and sale of APG to end users. This alternative cannot be considered as plausible because of the project's location. Sakha Republic is the largest subnational governing body by area in the world at 3,103,200 km^2 just slightly smaller than India which covers an area of 3,287,240 km^2. In the same time the Republic has a population of less than one million. Sakha (Yakutia) Republic is one of the most uninhabited regions in the world, what predetermined that there are no significant gas consumers in the region. At the time of the decision making to implement the project the Sakha Republic was not gasified thus there was no infrastructure for distributing of the gas. This alternative is not a plausible alternative for the project scenario as the analysis showed that it is impossible to use APG in areas distinct from the project site.

Conclusion

Based on the analysis of this and other alternatives and investment analysis presented in Section B.2 it is considered that transportation and sale of APG to end users cannot be considered as a most plausible and credible alternative scenario for utilization of APG.

Alternative Scenario A4: Processing of APG at an existing APG processing plant or construction of a new processing plant. Processing of APG at an existing APG is impossible due to the following reasons:

1. OJSC "Surgutneftegas" is the owner of Surgut Gas Processing Plant (hereinafter SGPP) and historically supplied some part of extracted APG to SGPP (from other than Talakan oilfields). After processing at SGPP light fractions from APG are supplied to Surgut Districts Power Plants. According to the policy of OJSC "Surgutneftegas" the first-priority option for APG handling is processing of APG at SGPP. Following this priority SGPP was 100% loaded starting from 2001 up to 2011. As SGPP is fully loaded there were no possibilities to direct the APG consumed by the project to SGPP;
2. Surgut Gas Processing Plant is located more than 2000 km away from the Talakan oil and gas condensate field and there are no supplying pipelines for APG. Construction of such pipelines was not considered by the project owners because of extremely high costs and technical complexity.

Construction of a new APG processing plant is not a plausible alternative to the project scenario due to the following reasons:

1. APG processing plants are treating mainly hydrocarbons other than methane. Methane itself is usually separated from other fractions and supplied as a fuel to consumers. As it is shown in analysis above there are no consumers of methane (i.e. so-called natural gas) in the region;

[20] http://www.bureau-veritas.ru/wps/wcm/connect/8da051804e4747508911ab7cc78c87dd/VP-PDD-Ver%5B2%2C3%5D.pdf?MOD=AJPERES&CACHEID=8da051804e4747508911ab7cc78c87dd

http://www.bureau-veritas.ru/wps/wcm/connect/886d43804f5bd142a9e3a904ded6671c/%D0%9E%D1%82%D1%87%D1%91%D1%82+%D0%BE+%D0%BC%D0%BE%D0%BD%D0%B8%D1%82%D0%BE%D1%80%D0%B8%D0%BD%D0%B3%D0%B5_v2_En.pdf?MOD=AJPERES&CACHEID=886d43804f5bd142a9e3a904ded6671c

2. Construction of APG processing plants is a very expensive alternative. Apart of construction of such plant itself huge investments should be made in creation of logistics and organization of products distribution. As there are no consumers or customers in the region in which the project is implemented construction of and APG processing plant would have been too expensive and too complicated in terms of organization. This alternative cannot be considered as plausible as it is not comparable with the project in terms of investments and organizational complexity;
3. The most of APG processing plants constructed in the same or border regions are implementing as Kyoto projects[21] and thus construction of a new APG processing plant cannot be considered as an alternative for the project scenario.

Conclusion

Based on the analysis of this and other alternatives and investment analysis presented in Section B.2 it is considered that processing of APG at an existing APG processing plant or construction of a new processing plant cannot be considered as a most plausible and credible alternative scenario for utilization of APG.

Alternative Scenario A5: Implementation of the project without involving of JI mechanism. Implementation of the project without involving of JI mechanism. Utilization of APG by means of its injection into the gas cap of the oil pool. Realization of the project without involving of JI mechanisms is not a most plausible and credible alternative for utilization of APG because this alternative is not financially attractive. Please refer to the Section B.2 below for the details of financial analysis.

Description of the most plausible alternative for utilization of APG

Based on the analysis above it was concluded that the most plausible and credible alternative scenario for utilization of APG is alternative scenario A1 i.e. continuation of APG flaring.

Alternative scenarios available for the project owner and which can be defined as plausible scenarios for seam pressure maintenance are listed below:

Alternative Scenario B1: Seam pressure maintenance by means of water injection;

Alternative Scenario B2: Implementation of the project without involving of JI mechanism. Construction of the CS and seam pressure maintenance by means of APG injection.

Identification of the most plausible alternative scenario for seam pressure maintenance

Alternative scenario B1: Seam pressure maintenance by means of water injection. The common method of seam pressure maintenance at oilfields developed by OJSC “Surgutneftegas” is water injection. Talakan oilfield is equipped with 9 water pumps with total pumping capacity 2,520 m^3 / hour or 60,480 m^3 / day. Water pumping capacity of the installed equipment is sufficient for maintenance of seam pressure without APG injection. About 129.87 m^3 of APG should be injected instead of 1 m^3 of water to maintain the same pressure level[22].The maximal annual amount of APG which is expected to be injected is 562 mln. m^3 of APG[23] or 1.5 mln. m^3 of APG per day. This amount equals injection of around 11,935 m^3 of water per day what is significantly lower than total water injection capacity of the installed equipment.

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[21] 1) The utilization of associated petroleum gas of the Sugmut oilfield of JSC “Gazpromneft - Noyabrskneftegaz”

2) Utilization of Associated petroleum gas (APG) at the Romanovskoye oil-field, Yamalo-Nenetzky autonomous okrug, Tumen oblast’, Russian Federation;

3) Utilization of Associated Petroleum Gas from Zapadno-Salymskoe and Nizhne-Shapshinskoe oil fields, Khanty-Mansiysk Yugra autonomous district Region, Russia

[22] Information provided by OJSC “Surgutneftegas”

[23] 562 mln. m^3 of APG[23] is planned to be injected in 2016

Water injection is a common and available for the project owner method of seam pressure maintenance and thus can be considered as a most plausible alternative scenario for seam pressure maintenance.

Alternative Scenario B2: Implementation of the project without involving of JI mechanism. Construction of the CS and seam pressure maintenance by means of APG injection. Realization of the project without involving of JI mechanisms is not a most plausible and credible alternative for seam pressure maintenance because this alternative is not financially attractive. Please refer to the Section B.2 below for the details of financial analysis.

Description of the most plausible alternative for utilization of APG

Based on the analysis above it was concluded that the most plausible and credible alternative scenario for seam pressure maintenance is alternative scenario B1 i.e. seam pressure maintenance by means of water injection.

Description of the chosen baseline scenario

Based on the results of the analysis above it can be concluded that the most plausible baseline scenario for current project is combination of Alternative scenario A1 and B1. The baseline scenario can be formulated as follows; in the absence of the project, APG utilized by the compressor station would be flared in flare units. Seam pressure would be maintained by means of water injection.

The main source of emissions in the baseline scenario is CO_2 emissions from flaring of hydrocarbon contents of the APG. The baseline scenario also includes fugitive emissions of hydrocarbons due to incomplete combustion of APG in flare units. Among other hydrocarbons, methane is indicated by UNFCCC as a greenhouse gas. Thus, fugitive methane emissions from incomplete combustion of APG are included in the baseline scenario.

The baseline emissions (BE_y) comprise CO_2 emissions from associated petroleum gas flaring and CH_4 emissions from underburning of methane in flare units. The baseline emissions are calculated as follows:

$$BE_y = BE_{flaring,y} + BE_{CH4,y} \quad (B.1\text{-}1)$$

Where:

BE_y – Baseline emissions in year y (t.CO_2);

$BE_{flaring,y}$ – Emissions due to flaring of APG in flare units (t. CO_2);

$BE_{CH4,y}$ – Emissions due to underburning of methane in flare units (t. CO_2).

$$BE_{flaring,y} = \sum_m (V_{APG,\ injection,\ m} * W_{h,\ Injection,\ m}) * (1 - \eta_{flare}) * p_h * SMF_h) * 10^3 \quad (B.1\text{-}2)$$

Where:

$V_{APG,\ injection,\ m}$ – Volume of associated petroleum gas pumped by the compressor station into injection wells for the purposes of the seam pressure maintenance in a month m (mln. m^3). This is a monitored parameter;

$W_{h,\ Injection,\ m}$ – Volumetric fraction of hydrocarbon of type h in associated petroleum gas pumped by the compressor station into injection wells in a month m (%). This is a monitored parameter;

η_{flare} – Underburning factor for combustion of APG (3.5%). This parameter is taken constant, for the whole crediting period (not monitored parameter). For more details please refer to a table below;

p_h – Density of hydrocarbon of type h used to convert volume to mass. This parameter is taken constant, for the whole crediting period (not monitored parameter). For more details please refer to a table below;

SMF_h – Mass ratio of CO_2 produced from full combustion of one unit mass of a hydrocarbon (t. CO_2 eq. / t. of a hydrocarbon). This parameter is taken constant, for the whole crediting period (not monitored parameter). For more details please refer to a table below.

$$BE_{CH4,y} = \sum_m ((V_{APG,\ injection,\ m} + V_{APG,\ fuel,\ m}) * W_{h,\ Injection,\ m}) * \eta_{flare} * p_{CH4} * GWP_{CH4} * 10^3 \quad (B.1\text{-}3)$$

$V_{APG, injection, m}$ – Volume of associated petroleum gas pumped by the compressor station into injection wells for the purposes of the seam pressure maintenance in a month *m* (mln. m^3). This is a monitored parameter;

$V_{APG, fuel, m}$ – Volume of associated petroleum gas pumped by Volume of associated petroleum gas used by the compressor station as a fuel in a month *m* (mln. m^3). This is a monitored parameter;

$W_{h, Injection, m}$ – Volumetric fraction of methane in associated petroleum gas pumped by the compressor station into injection wells in a month *m* (%). This is a monitored parameter;

η_{flare} – Underburning factor for combustion of APG (3.5%). This parameter is taken constant, for the whole crediting period (not monitored parameter). For more details please refer a table below;

p_{CH4} – The density of CH_4 used to convert volume of CH_4 to mass of CH_4 (0.67 kg/m^3). This parameter is taken constant, for the whole crediting period (not monitored parameter). For more details please refer to a table below;

GWP_{CH4} –Global warming potential of methane (21 tCO_2e/tCH_4). This parameter is taken constant, for the whole crediting period (not monitored parameter). For more details please refer to a table below.

The theoretical description of the monitoring plan together with formulae used for emission reductions calculations are provided in the Section D below.

Key information and data used to establish the baseline

Monitored parameters

Data/Parameter	$V_{APG, injection, m}$	
Data unit	mln. m^3	
Description	Volume of associated petroleum gas pumped by the compressor station into injection wells for the purposes of the seam pressure maintenance in a month *m*	
Time of determination/monitoring	Monitored continuously	
Source of data (to be) used	Volume of APG is monitored continuously by certified meters	
Value of data applied (for ex ante calculations/determinations)	**Year**	**Volume of pumped APG[24] (mln. m^3)**
	2010	146.404226
	2011	271.769
	2012	431
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The volume of pumped APG is measured by certified and duly calibrated meters.	
QA/QC procedures (to be) applied	All measurements are implemented only with certified and duly calibrated equipment.	
Any comment	Preliminary ER calculations are made on the basis of average APG compositions in 2008 - 2010.	

Data/Parameter	$V_{APG, fuel, m}$
Data unit	mln. m^3

[24] 2010 – factual data, 2011-2012 – forecasted data. The data is provided by OJSC "Surgutneftegas"

Description	Volume of associated petroleum gas used by the compressor station as a fuel for pumping of APG in a month *m*
Time of determination/monitoring	Monitored continuously
Source of data (to be) used	Volume of APG is monitored continuously by certified meters
Value of data applied (for ex ante calculations/determinations)	**Year** / **Volume of fuel APG[25] (mln. m^3)**: 2010 – 34.911845; 2011 – 38.246; 2012 – 56
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The volume of fuel APG is measured by certified and duly calibrated meters.
QA/QC procedures (to be) applied	All measurements are implemented only with certified and duly calibrated equipment.
Any comment	Preliminary ER calculations are made on the basis of average APG compositions in 2008 - 2010.

Year	Volume of fuel APG[25] (mln. m^3)
2010	34.911845
2011	38.246
2012	56

Data/Parameter	$W_{h,\ Injection,\ m}$
Data unit	%
Description	Volumetric fraction of hydrocarbon of type *h* in associated petroleum gas pumped by the compressor station into injection wells for the purposes of the seam pressure maintenance in a month *m*
Time of determination/monitoring	Monitored monthly
Source of data (to be) used	Volumetric fractions of hydrocarbons in APG are monitored monthly. The fractions are determined by certified laboratories of OJSC “Surgutneftegas”.
Value of data applied (for ex ante calculations/determinations)	see table below

Type of APG components (types *h* of hydrocarbons)	**Volumetric fraction of hydrocarbons of type *h* (%)**	
	2010	2011-2012[26]
Methane (CH_4)	73.34	74.81
Ethane (C_2H_6)	12.29	12.47
Propane (C_3H_8)	6.96	6.63
i-butane (methylpropane; C_4H_{10})	0.41	0.58
n-butane (C_4H_{10})	1.55	1.51
i-pentane (methylbutane; C_5H_{12})	0.22	0.28
n-pentane (C_5H_{12})	0.33	0.32
C_6+ (He anes and higher)	0.17	0.20

[25] 2010 – factual data, 2011-2012 – forecasted data. The data is provided by OJSC “Surgutneftegas”

[26] The average composition for 2008-2010 is used as a forecasted composition for the period 2011-2012.

Justification of the choice of data or description of measurement methods and procedures (to be) applied	Volumetric fractions of hydrocarbons are measured by the laboratories with certified and duly calibrated equipment.
QA/QC procedures (to be) applied	All measurements are implemented only with certified and duly calibrated equipment.
Any comment	Preliminary ER calculations are made on the basis of average APG compositions in 2008 - 2010.

Parameters not monitored

<table>
<tr><td>Data/Parameter</td><td colspan="3">LE_y</td></tr>
<tr><td>Data unit</td><td colspan="3">%</td></tr>
<tr><td>Description</td><td colspan="3">Leaks coefficient comprises fugitive methane leaks (so called “process losses”) from the equipment installed at the compressor station.</td></tr>
<tr><td>Time of determination/monitoring</td><td colspan="3">Determined at the stage of the PDD preparation and fixed ex-ante.</td></tr>
<tr><td>Source of data (to be) used</td><td colspan="3">This parameter is calculated by the Russian State University of Oil and Gas (named after Gubkin) and adopted annually by the Ministry of Energy of the Russian Federation. Only values adopted by the ministry are subjects for monitoring.</td></tr>
<tr><td rowspan="4">Value of data applied
(for ex ante calculations/determinations)</td><td>Leaks coefficient</td><td>Year</td><td>Source[27]</td></tr>
<tr><td>0.287%</td><td>2010</td><td rowspan="3">Coefficients for each year were adopted by the Ministry of Energy of the Russian Federation</td></tr>
<tr><td>0.093%</td><td>2011</td></tr>
<tr><td>0.093%</td><td>2012</td></tr>
<tr><td>Justification of the choice of data or description of measurement methods and procedures (to be) applied</td><td colspan="3">Values are adopted by official Russian authority - the Ministry of Energy of the Russian Federation. This source is the most reliable option for determining this parameter.</td></tr>
<tr><td>QA/QC procedures (to be) applied</td><td colspan="3">Not applicable</td></tr>
<tr><td>Any comment</td><td colspan="3">As leaks coefficients for all years during the crediting period are already adopted (by the time of PDD development), this parameter was indicated in the PDD as fixed ex-ante.</td></tr>
</table>

Data/Parameter	n_{flare}
Data unit	%
Description	Underburning factor for combustion of APG
Time of determination/monitoring	Determined at the stage of the PDD preparation and fixed ex-ante.
Source of data (to be) used	Methodology for calculation of emissions into the atmosphere

[27] Documental evidences confirming used parameters for 2010-2012 have been provided to verifiers.

	by burning of associated petroleum gas in flare units", approved in 08.04.1998, order № 199 by Russian Federation State Committee for Environmental Protection
Value of data applied (for ex ante calculations/determinations)	3.5 %
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The value is recommended as default by the methodology
QA/QC procedures (to be) applied	Not applicable
Any comment	

Data/Parameter	ρ_h
Data unit	10^{-6} Gg /m^3 (kg/m^3)
Description	This is the density of a hydrocarbon of type *h*. This parameter converts volume of a hydrocarbon to mass of a hydrocarbon.
Time of determination/monitoring	Determined at the stage of the PDD preparation and fixed ex-ante.
Source of data (to be) used	The density for each type of hydrocarbon is calculated based GOST 31369-2008, Intergovernmental Standard "Natural gas. Calculation of calorific values, density, relative density and Wobbe index from composition"[28]
Value of data applied (for ex ante calculations/determinations)	see table below
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The values are calculated on the basis of adopted official standard GOST 31369-2008. The excel spread sheet with calculations was provided to verifiers for review.
QA/QC procedures (to be) applied	Calculation of the densities for each type of hydrocarbon is provided to verifiers in form of an excel spreadsheet. The exact references on formulae or data from the GOST are given in the excel spreadsheet.
Any comment	The density is taken at 20°C and 101.325 kPa (standard conditions).

Type of APG components (types *h* of hydrocarbons)	**Density of real gas (kg/m3)**
Methane (CH_4)	0,67
Ethane (C_2H_6)	1,26
Propane (C_3H_8)	1,86
i-butane (methylpropane; C_4H_{10})	2,49
n-butane (C_4H_{10})	2,50
i-pentane (methylbutane; C_5H_{12})	3,15
n-pentane (C_5H_{12})	3,17
C_6+ (Hexanes and hig er)	3,90

[28] http://www.gazanaliz.ru/standards/gost_gasGC_2008/GOST_31369-2008/gost_31369-2008.html

<table>
<tr><td>Data/Parameter</td><td>SMF_h</td></tr>
<tr><td>Data unit</td><td>t. CO_2 eq. / t. of hydrocarbon of type h</td></tr>
<tr><td>Description</td><td>Stoichiometric Mass Factor - mass ratio of CO_2 produced from full combustion of unit mass of hydrocarbon of type h.
The factor is calculated as follows:
SMF_h = molar mass of CO_2 (44 g./mol) * the amount of atoms of carbon in hydrocarbon of type h (2 for ethane, 3 for propane, etc.) / molar mass of hydrocarbon of type h (molar masses were taken from GOST 31369-2008)</td></tr>
<tr><td>Time of determination/monitoring</td><td>Determined at the stage of the PDD preparation and fixed ex-ante.</td></tr>
<tr><td>Source of data (to be) used</td><td>The Stoichiometric Mass Factor for each type of hydrocarbon is calculated based GOST 31369-2008. The excel spread sheet with calculations was provided to verifiers for review.</td></tr>
<tr><td>Value of data applied
(for ex ante calculations/determinations)</td><td>
<table>
<tr><th>Type of APG components (types h of hydrocarbons)</th><th>Stoichiometric Mass Factor (t./t.)</th></tr>
<tr><td>Methane (CH_4)</td><td>2.75</td></tr>
<tr><td>Ethane (C_2H_6)</td><td>2.93</td></tr>
<tr><td>Propane (C_3H_8)</td><td>2.99</td></tr>
<tr><td>i-butane (methylpropane; C_4H_{10})</td><td>3.03</td></tr>
<tr><td>n-butane (C_4H_{10})</td><td>3.03</td></tr>
<tr><td>i-pentane (methylbutane; C_5H_{12})</td><td>3.05</td></tr>
<tr><td>n-pentane (C_5H_{12})</td><td>3.05</td></tr>
<tr><td>C_6+ (Hexanes and higher)</td><td>3.06</td></tr>
</table>
</td></tr>
<tr><td>Justification of the choice of data or description of measurement methods and procedures (to be) applied</td><td>Stoichiometric Mass Factors are calculated on the basis of well-known molar masses of carbon (C), hydrogen (H), Oxigen(O) and data from GOST 31369-2008. The excel spread sheet with calculations of molar mass of each hydrocarbonwas provided to verifiers for review.</td></tr>
<tr><td>QA/QC procedures (to be) applied</td><td>Stoichiometric Mass Factors are calculated on the basis of well-known molar masses of carbon (C), hydrogen (H), Oxigen(O) and data from GOST 31369-2008. QA/QC procedures are not required. The excel spread sheet with calculations of molar mass of each hydrocarbonwas provided to verifiers for review.</td></tr>
<tr><td>Any comment</td><td></td></tr>
</table>

Data/Parameter	GWP_{CH4}
Data unit	-
Description	Global Warming Potential of methane
Time of determination/monitoring	default
Source of data (to be) used	According to UNFCCC Global Warming Potentials, http://unfccc.int/ghg_data/items/3825.php
Value of data applied (for ex ante calculations/determinations)	21

Justification of the choice of data or description of measurement methods and procedures (to be) applied	Decisions under UNFCCC and the Kyoto Protocol (a value of 21 is to be applied for the first commitment period of the Kyoto Protocol
QA/QC procedures (to be) applied	Not applicable.
Any comment	

B.2. Description of how the anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the JI project:

According to the paragraph 2 of the Annex I to the "Guidance on criteria for baseline setting and monitoring" version 03, additionality can be demonstrated, inter alia, by using one of the following approaches:

(a) Provision of traceable and transparent information showing that the baseline was identified on the basis of conservative assumptions, that the project scenario is not part of the identified baseline scenario and that the project will lead to reductions of anthropogenic emissions by sources or enhancements of net anthropogenic removals by sinks of GHGs;

(b) Provision of traceable and transparent information showing that the same approach for additionality demonstration has already been taken in cases for which determination is deemed final and which can be regarded as comparable, using the criteria outlined for baseline determination in paragraph 12 of the Guidance;

(c) Application of the most recent version of the "Tool for the demonstration and assessment of additionality" approved by the CDM Executive Board (allowing for a grace period of eight months when the PDD is submitted for publication on the UNFCCC JI website), or any other method for proving additionality approved by the CDM Executive Board.

Approach (c) is used here to demonstrate additionality of the project. The version, 05.2.1, of the "Tool for the demonstration and assessment of additionality" (further referred as "the Tool") is applied. Clause 44 (c) of Guidance on criteria for baseline setting and monitoring version 3 allows for a grace period of eight months.

The following steps are stipulated by the tool:

- Step 1: Identification of alternatives to the project activity consistent with current laws and regulations;
- Step 2: Investment analysis (including the sensitivity analysis);
- Step 3: Barrier analysis (optional);
- Step 4: Common practice analysis.

Steps 1,2 and 4 are applied here to assess additionality of the project according to the Tool.

Step 1. Identification of alternatives to the project activity consistent with current laws and regulations.

Sub-step 1a: Define alternatives to the project activity:

As the proposed project activity includes two purposes, outputs of which are not comparable between themselves: utilization of APG and maintenance of seam pressure, scenarios for each of them will be identified separately. A combination of most plausible alternatives for utilization of APG and for maintenance of seam pressure will be identified as a baseline for this project.

Alternative scenarios available for the project owner and which can be defined as plausible scenarios for utilization of APG are listed below:

Alternative Scenario A1: Continuation of APG flaring;

Alternative Scenario A2: Construction of APG fuelled Gas Piston Power Plants or Gas Turbine Power Plants;

Alternative Scenario A3: Transportation and sale of APG to end users;

Alternative Scenario A4: Processing of APG at APG processing plant or construction of a new processing plant;

Alternative Scenario A5: Implementation of the project without involving of JI mechanism. Utilization of APG by means of its injection into the gas cap of the oil pool.

Alternative scenarios available for the project owner and which can be defined as plausible scenarios for seam pressure maintenance are listed below:

Alternative Scenario B1: Seam pressure maintenance by means of water injection;

Alternative Scenario B2: Implementation of the project without involving of JI mechanism. Construction of the CS and seam pressure maintenance by means of APG injection.

Sub-step 1b: Consistency with mandatory laws and regulations:

There are no special national and/or sectoral policies and circumstances which seriously influence the alternatives listed above. Implementation of all alternatives including the project scenario itself involves acquisition of various legislation approvals, licenses or permits but none of that permission documentation can be considered as obstructive or prohibitive. All the documents can be obtained in a common business-as-usual way.

There are also no special national and/or sectoral policies and circumstances which restricts flaring of APG to OJSC "Surgutneftegas". The main documents which regulate flaring of APG are:

- Subsoil Law of the Russian Federation from 21.02.1992 N 2395-1;
- Licenses for oilfields exploitation (Licenses are issued by Ministry of Natural Resources of the Russian Federation)[29];
- Federal law #7 "Environmental protection" from January 10, 2002

None of these documents contain direct restrictions for APG flaring. At the time of the decision making to implement the project the license for development of the Talakan oilfield did not contain any obligations for utilization of APG.

Step 2. Investment analysis

According to the Tool, it should be determined whether the proposed project activity is not:

a) The most economically or financially attractive; or
b) Economically or financially feasible, without the revenue from the sale of Emission Reduction Units (ERUs).

Option (b) is selected. Investment analysis is implemented here to prove that without ERU revenues the project is not financially attractive.

Sub-step 2a: Determine appropriate analysis method

According to the Tool, during this step of proving the project additionality, the project participant can use one of the following types of analysis: simple cost analysis (Option I), investment comparison analysis (Option II) or benchmark analysis (Option III). The simple cost analysis is not applicable for this project, since the project activity and the alternatives identified in Step 1 generate financial benefits other than JI related income.

Project participants decided to use Benchmark analysis (Option III) which is in compliance with the Tool.

Economy due do decrease of payments for APG flaring and due to decrease of water injection are considered as revenue of the project.

[29] The license for development of Talakan oil field together with additional agreements have been provided to verifiers for review.

Sub-step 2b: Option III. Apply benchmark analysis

The Net Present Value (NPV) was chosen as a financial indicator. Positive NPV is considered as a benchmark of financially attractive project. Negative NPV indicates that the project is not financially feasible.

Sub-step 2c: Calculation and comparison of financial indicators

Parameters used in the financial analysis

The parameters, used in the financial analysis, are based on the figures provided by OJSC "Surgutneftegas" as of the moment when the final decision to implement the project was taken. Major figures are presented in detail in table B.2.1 below:

Table B. 2-1. Parameters used in the financial analysis

Item	Unit	Value	Data source
Total investments	kRUB	3,448,329	Certificates of construction completion[30]. Investments taken from the certificates allow achieving high accuracy of the investment analysis.
Discount rate	%	15	The discount rate was taken equal to the discount rate used for JI project ("Construction of gas turbine power plants for utilization of associated petroleum gas at thirteen oilfields developed by OJSC "Surgutneftegas" in Khanty-Mansiysk Autonomous Okrug, Russian Federation") for which the determination was deemed final.
Time horizon of the investment analysis	Year	12	The Tool refers to the "Guidelines on the assessment of investment analysis" version 05. According to the clause 3 of the guidelines, project participants may use from 10 to 20 years time horizon for investment analysis. The period 12 years (from 2009 to 2020) was chosen by project participants.
Property tax	%	2.2	Property tax rates are established by Constituents (subjects) of Russian Federation and cannot exceed 2.2 per cent (Article 380 of the Tax Code of the RF)
Profit tax	%	20.00	Article 284 of the Tax Code of the RF

[30] Certificates of construction completion have been provided to verifiers for review.

Inflation rate (for industrial articles)	%	11.53%	An average inflation rate for 2003-2005 was taken[31].
Operation expenses	kRUB		Factual operation costs were taken for 2009-2011. Inflation adjusted operation costs were taken for 2012-2020[32].
Depreciation period	years	6	Depreciation period is taken according to the governmental decree #1 dated 01.01.2002 "About classification of main depreciation groups"[33]. Main equipment of the compressor station are pumps and compressors which belongs to the third depreciation group[34].
Revenue generated by the project	kRUB		Implementation of the project allows OJSC "Surgutneftegas" to decrease payments for flaring of APG and partially replace water injection for the purposes of seam pressure maintenance. As in the absence of the project the APG injected by the CS would be flared and some amount of water would be injected for the purposes of seam pressure maintenance, implementation of the project allows OJSC "Surgutneftegas" to decrease environment payment for flaring of the APG and decrease expenses attributed to water injection. As such decrease in environment and water use payments is achieved only because of the project implementation, such economy was considered as revenues generated by the project.

Table B.2-2 Economic indicators of the project

[31] Data of Federal State Statistic Service of the Russian Federation was taken.

http://www.gks.ru/free_doc/new_site/prices/potr/2010/I-ipc.htm

[32] Document confirming factual operation costs for 2009-2011 has been provided to verifiers.

[33] http://www.n-kodeks.ru/legislation/acts/1171/7648/

[34] Third depreciation group - useful life 3-5 years according to the Tax code of Russian Federation http://www.n-kodeks.ru/legislation/codecs/1947/16359/

Data name	Unit	Project activity
Investments	kRUB	3,448,329
NPV	kRUB	-1,230,907

Sub-step 2d: Sensitivity analysis

Sensitivity analysis was carried out on basis of fluctuation of the following factors:

- Investment expenditures level;
- Discount rate;
- Inflation rate;
- Operation costs.

The project sensitivity to changes in the main parameters is analyzed below (see Tables B.2-3 – B.2-5)

For carrying out and estimating the sensitivity analysis, the key factors affecting the project were selected. They include: alteration of investment amount, discount rate, inflation rate and operation costs. The variation interval is taken from -10% to +10% with the 5% step.

Table B.2-3. Economic indexes of sensitivity analysis during variation of the investment expenditures level and discount rate

Variation rate		-10%	-5%	0%	5%	10%
Investments (kRUB)		3,103,496.1	3,275,912.55	3,448,329.00	3,620,745.45	3,982,819.00
Discount rate	13.50%	-646,450	-808,511	-970,573	-1,132,634	-1,472,964
	14.25%	-777,730	-941,214	-1,104,698	-1,268,182	-1,611,497
	15.00%	-901,327	-1,066,118	-1,230,908	-1,395,698	-1,741,757
	15.75%	-1,017,764	-1,183,754	-1,349,744	-1,515,734	-1,864,314
	16.50%	-1,127,522	-1,294,615	-1,461,708	-1,628,801	-1,979,696

Table B.2-4. Economic indexes of sensitivity analysis during variation of the operation costs and discount rate

Variation rate		-10%	-5%	0%	5%	10%
Operation costs (kRUB)		402,407.1	424,763.05	447,119.00	469,474.95	516,422.45
Discount rate	13.50%	-765,065	-867,819	-970,574	-1,073,328	-1,289,113
	14.25%	-908,270	-1,006,484	-1,104,699	-1,202,913	-1,409,163
	15.00%	-1,043,050	-1,136,979	-1,230,908	-1,324,838	-1,522,089
	15.75%	-1,169,980	-1,259,863	-1,349,745	-1,439,627	-1,628,381
	16.50%	-1,289,592	-1,375,650	-1,461,709	-1,547,767	-1,728,490

Table B.2-5. Economic indexes of sensitivity analysis during variation of the inflation rate and discount rate

Variation rate		-10%	-5%	0%	5%	10%
Inflation rate (%)		10.38%	10.95%	11.53%	12.11%	13.32%
Discount rate	13.50%	-897,499	-933,453	-970,419	-1,008,426	-1,091,757
	14.25%	-1,035,524	-1,069,562	-1,104,552	-1,140,521	-1,219,364
	15.00%	-1,165,389	-1,197,631	-1,230,770	-1,264,829	-1,339,468

	15.75%	-1,287,651	-1,318,210	-1,349,613	-1,381,884	-1,452,583
	16.50%	-1,402,829	-1,431,808	-1,461,584	-1,492,176	-1,559,181

Conclusion on Step 2

As shown on the tables above, within the variation of the selected parameters, the project activity is unprofitable for the company and the NPV remains negative. Thus, the project activity is not a financially attractive alternative.

Step 3. Barrier analysis

Not applicable to the project activity.

Step 4. Common practice analysis

Sub-step 4a: Analyze other activities similar to the proposed project activity:

No similar projects can be observed in the Sakha Republic (Yakutia), Russian Federation. There are other types of projects in the same or in the neighboring regions also aimed at utilization of APG, e.g. construction of gas turbine or gas piston power plants but the main part of such projects are being implemented considering JI mechanisms[35]. Other APG utilization projects implemented in Khanty-Mansiysk Autonomous Okrug and located nearby Yamal Nenets Autonomous Okrug are also implemented as JI projects[36]. As per the Tool, other JI activities are not to be considered in the common practice analysis.

Thus, it can be concluded that the project activity is not the common practice in the Sakha Republic (Yakutia).

Sub-step 4b: Discuss any similar Options that are occurring:

As it is said in Sub-step 4a, the project activity is not the common practice and similar activities in the region are being implemented as JI projects.

Conclusion

Based on the analysis above it can be concluded that the project activity is additional.

B.3. Description of how the definition of the project boundary is applied to the project:

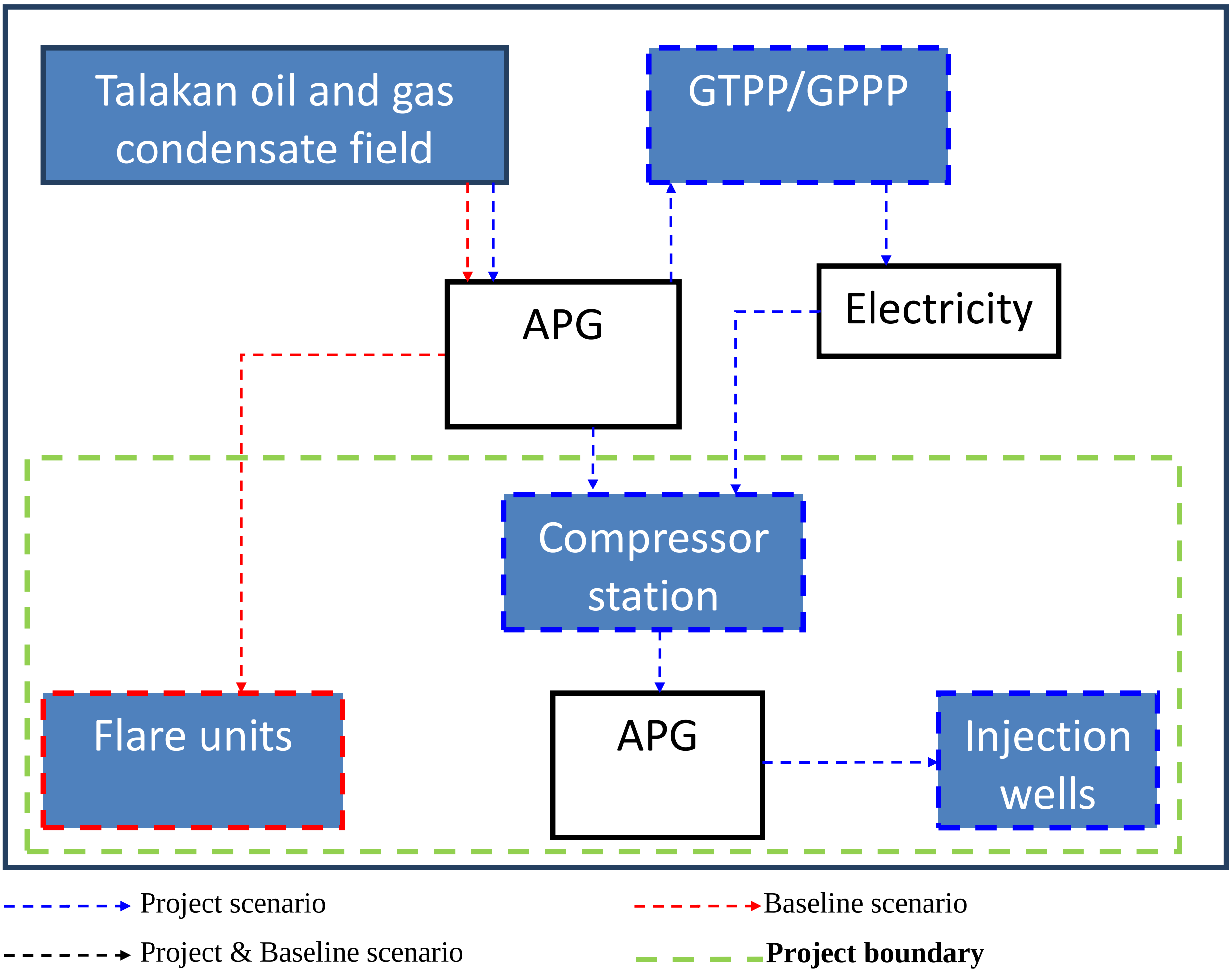
Sources of emissions included or excluded from the project boundary are presented in the Figure B.3-1 and the Table B.3-1 below.

Figure B.3-1 Project boundary.

[35] http://ji.unfccc.int/JI_Projects/DeterAndVerif/Verification/PDD/index.html JI projects 41, 52, 90, 108, 114, 142, 160, 171 and 184.

[36] http://www.bureau-veritas.ru/wps/wcm/connect/bv_ru/local/home/news/news-ghg-yugragasprocessing?presentationtemplate=bv_master/news_full_story_presentation

http://www.bureau-veritas.ru/wps/wcm/connect/bv_ru/local/home/news/news-ghg-gazpromneft?presentationtemplate=bv_master/news_full_story_presentation



The compressor station consumes electricity from located nearby Talakan GTPP and GPPP which are fuelled by the same fuel - APG as the compressor station itself. If the compressor station were not built, the electricity necessary for its operation would not have been consumed. APG which is used for generation of the electricity at the GTPP/GPPP would not have been supplied to the GTPP but instead would have been flared in flare units. Emissions from combustion of APG in flare units are higher than emissions from combustion of APG in GTPPs/GPPPs because of more complete combustion of the gas in gas turbine units. Following the principle of conservatism and providing simplicity of calculations both project emissions from power consumption and baseline emissions from flaring of the APG, which is used for power generation in the project, were excluded from the project boundary.
The baseline scenario also includes fugitive methane emissions due to incomplete combustion of APG in flare units. This means that not all methane in the APG will be converted into CO_2, and thus is released to the atmosphere uncombusted.
Apart of power consumption, the compressor station consumes some amount of APG as a fuel for compressors. The situation is similar to power consumption; if the compressor station were not built the APG would not have been consumed as a fuel and instead would have been flared in flare units. Emissions from combustion of APG in compressor units are higher than emissions from combustion of APG in flare units because of more complete combustion of APG in gas turbine engines of the compressors. As baseline emissions from underburning of APG used as a fuel are included in the project boundary, project emissions from full oxidation of hydrocarbons which would be underburned in the baseline scenario are also included.
Sources of emissions included or excluded from the project boundary are presented in the Table B.3-1 below.

Table B.3-1 Emission sources included or excluded from the project boundary

	Source	Gas	Included?	Justification/Explanation
Baseline scenario	**Associated Petroleum gas flaring**	**CO_2**	**Included**	**Main source of emissions.**
		CH_4	**Included**	**Emissions due to incomplete combustion of CH_4 in flare units.**
		N_2O	Excluded	Considered to be negligibly small.
	Power consumption for seam pressure maintenance before implementation of the project	CO_2	Excluded	Before implementation of the project, seam pressure was being maintained by the method of water injection. Power consumption was the main source of emissions. This kind of emissions was excluded from the project boundary following the principle of conservatism.
		CH_4	Excluded	
		N_2O	Excluded	
Project activity	Emissions from electricity consumption for the purposes of APG injection	CO_2	Excluded	The compressor station consumes electricity from the located nearby GTPP/GPPP which is fuelled by the same APG as the compressor station itself. If the compressor station would not be built, electricity would not be consumed and APG, used for electricity generation, would be flared in flare units. Project emissions of this kind were excluded from the project boundary together with the baseline emissions from flaring of the same amount of APG. This approach corresponds to conservatism principles and allows simplifying calculations.
		CH_4	Excluded	
		N_2O	Excluded	
	Emissions from APG consumption as a fuel	**CO_2**	**Included**	**Main source of emissions.** CO_2 emissions from APG combustion both in the baseline and in the project scenario are almost equal. Only additional CO_2 emissions due to full oxidation of hydrocarbons which would be underburned in the baseline scenario are included here.
		CH_4	Excluded	Excluded as such emissions are negligibly small.
		N_2O	Excluded	Excluded as such emissions are negligibly small.

	Source	Gas	Included?	Justification/Explanation
	Emissions from methane leaks (process losses)	CO_2	Excluded	Not applicable as this is direct fugitive methane emissions.
		CH_4	**Included**	**Main source of emissions.**
		N_2O	Excluded	Not applicable as this is direct fugitive methane emissions.

B.4. Further baseline information, including the date of baseline setting and the name(s) of the person(s)/entity(ies) setting the baseline:

Date of baseline setting: 26/12/2011

The baseline was developed by Gazprom Marketing&Trading Ltd.

Tel.: +44 (0) 207 756 0000

E-mail: emissions@gazprom-mt.com

Gazprom Marketing&Trading Ltd. is a project participant listed in Annex 1.

SECTION C. Duration of the project / crediting period

C.1. Starting date of the project:

09/07/2006 (date of contract signing for supplying of equipment for compressor station)

C.2. Expected operational lifetime of the project:

25 years / 300 months (The operational period of the main equipment)

C.3. Length of the crediting period:

3 incomplete years / circa 36 months. 02/01/2010 – 31/12/2012.

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

The JI specific approach is chosen to establish the monitoring plan for the project, taking into account the requirements of "Guidance on criteria for baseline setting and monitoring" and given the requirements of Decision 9/CMP.1, Appendix B "Criteria for baseline setting and monitoring".

The monitoring plan is designed to calculate and record the GHG emission reductions at the compressor station operated by OJSC "Surgutneftegas" in a full and transparent manner. Monitoring plan is based on and created in accordance with the company's existing fuel and energy metering systems and environmental impact assessment. Three major divisions are responsible for implementation of the monitoring plan:

1. Environmental Safety and Environmental Management Division;
2. Intra-field Petroleum Gas Gathering and Utilization Division (hereinafter IPGGUD);
3. Technical Services Division.

The monitoring process will not require introduction of any changes in the existing system of data collection and storage. All necessary data is processed and registered in course of business-as-usual operation of the compressor station. The monitoring plan data should be stored for at least 2 years after the last transfer of ERUs for the project.

Short description regarding of the project and baseline scenarios and components to be monitored are presented below:

I. Project scenario description

The project involves construction of compressor station near Talakan oil and gas condensate field developed by OJSC "Surgutneftegas" in Sakha Republic. The compressor station is designed for pretreatment, compressing, drying and transportation of the APG to the injection wells of the Talakan oil and gas condensate field. APG will be pumped into the gas cap of the field for the purposes of seam pressure maintenance. The injected APG will be stored in the gas cap of the oil pool for a long-term period, at least until 2013. The raw material for the compressor station is associated petroleum gas from Talakan oil and gas condensate field.

APG is a co-product of crude oil extraction. Once re-injected in the gas cap of the oil pool APG will be stored there for a long-term period as there will be no need in the forecasted future to re-extract APG for any purposes excluding energy generation. Talakan oil and gas condensate field is located far away from any big cities, gas processing capacities or other possible consumers of APG, thus there is no chance that the re-injected APG will be re-extracted in the foreseen future.

The compressor station is supplied of electricity from the Talakan GTPP/GPPP located nearby. According to the approach elaborated in the Section B.3 emissions from generation of electricity at Talakan GTPP/GPPP are excluded from the project boundary.

Project Emissions are based on the following parameters required to be monitored:

- Volume of associated petroleum gas pumped by the compressor station into injection wells for the purposes of the seam pressure maintenance (mln. m^3);

- Volume of associated petroleum gas used as a fuel for the purposes of APG pumping (mln. m^3);
- Volumetric fraction of hydrocarbon of type *h* in associated petroleum gas pumped by the compressor station into injection wells (%).

II. Baseline description

Baseline scenario represents continuation of the common practice prior to the project realization, i.e. APG would be flared and seam pressure would be maintained by the method of water injection.

Baseline Emissions are based on the following parameters required to be monitored:

- Volume of associated petroleum gas pumped by the compressor station into injection wells for the purposes of the seam pressure maintenance (mln. m^3);
- Volume of associated petroleum gas used as a fuel for the purposes of APG pumping (mln. m^3);
- Volumetric fraction of hydrocarbon of type *h* in associated petroleum gas pumped by the compressor station into injection wells (%).

Key factors, determining the GHG emissions

The key factors, determining the GHG emissions are:

- Combustion of APG in flare units;
- Fugitive methane leaks from equipment installed at the compressor station;
- Emissions due to underburning of methane while flaring in flares in the baseline scenario and emissions due to complete oxidation of hydrocarbons in the project scenario.

There are no special national monitoring standards applicable to the project except federal law #102-FZ dated 11.06.2008 "about standardisation of measurements" and various federal standards (GOSTs) and methodologies for meters calibration. All legislation requirements prescribed are fulfilled.

D.1.1. Option 1 – Monitoring of the emissions in the project scenario and the baseline scenario:

D.1.1.1. Data to be collected in order to monitor emissions from the project, and how these data will be archived:

ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
1. $V_{APG, injection, m}$	Volume of associated petroleum gas	IPGGUD	mln. m^3	m	continuously	100%	Electronic	Volume of APG pumped by the

	pumped by the compressor station into injection wells for the purposes of seam pressure maintenance in a month *m*							compressor station is measured directly.
2. $V_{APG, fuel, m}$	Volume of associated petroleum gas used by the compressor station as a fuel for pumping of APG in a month *m*	IPGGUD	mln. m^3	m	continuously	100%	Electronic	Volume of APG used as a fuel is measured directly.
3. $W_{h, Injection, m}$	Volumetric fraction of hydrocarbon of type *h* in associated petroleum gas pumped by the compressor station into injection wells in a month *m*	IPGGUD	%	m	monthly	100 %	Electronic and paper	Determined by laboratory tests once per month
4. LE_y	Leaks coefficient comprises fugitive	the Russian State University of Oil and Gas	%	e	fixed ex-ante	-	-	For the applied values please refer to a table in Section B.1

	methane leaks (so called "process losses") from the equipment installed at the compressor station.							above.
5. n_{flare}	Underburning factor for combustion of APG	Methodology for calculation of emissions into the atmosphere by burning of associated petroleum gas in flare units", approved in 08.04.1998, order № 199 by Russian Federation State Committee for Environmental Protection	%	e	fixed ex-ante	-	-	For the applied value please refer to a table in Section B.1 above.
6. p_{h}	This is the density of a hydrocarbon of type *h*. This parameter converts volume of a	GOST 31369-2008, Intergovernmental Standard "Natural gas. Calculation of calorific	10^{-6} Gg /m^3 (kg/m^3)	e	fixed ex-ante	-	-	For the applied values please refer to a table in Section B.1 above.

	hydrocarbon to mass of a hydrocarbon	values, density, relative density and Wobbe index from composition”						
7. SMF_h	Stoichiometric Mass Factor - mass ratio of CO_2 produced from full combustion of unit mass of hydrocarbon of type *h*.	GOST 31369-2008	t. CO_2 eq. / t. of hydrocarbon of type *h*	e	fixed ex-ante	-	-	For the applied values please refer to a table in Section B.1 above.
8. GWP_{CH4}	Global warming potential of methane	UNFCCC Global Warming Potentials, http://unfccc.int/ghg_data/items/3825.php	tCO_2e/tCH_4	e	fixed ex-ante	-	-	For the applied value please refer to a table in Section B.1 above.

D.1.1.2. Description of formulae used to estimate project emissions (for each gas, source etc.; emissions in units of CO_2 equivalent):

The project emissions (PE_y) include fugitive CH_4 emissions from process losses and CO_2 emissions from complete oxidation of hydrocarbons (methane, ethane, butane, propane, hexane and higher) and are calculated as follows:

$$PE_y = PE_{OX,y} + PE_{losses,y} \qquad (D.1.1.2\text{-}1)$$

Where:

PE_y – Project emissions in year *y* (t. CO_2);

$PE_{OX,y}$ – CO_2 emissions from complete oxidation of hydrocarbons in year *y* (t. CO_2). This type of emissions occurs due to full combustion of hydrocarbons in compressors. Prior to the project realization this amount of hydrocarbons would be emitted into the atmosphere uncombusted. These emissions are calculated using the formula D.1.1.2-2 below;

$PE_{losses,y}$ – CH_4 emissions from process losses ($t.CO_2$-e). This type of emissions occurs due to fugitive CH4 emissions from compressors starts/stops, fugitive emissions through sealant materials, emergency APG release, etc. Such losses are very small and cannot be measured directly. This kind of emissions is calculated on the basis of losses coefficient adopted by the Ministry of Energy of the Russian Federation.

$$PE_{OX,y} = \sum_m \sum_h (V_{APG,\ fuel,\ m} * W_{h,\ Injection,\ m} * p_h * \eta_{flare} * SMF_h) * 10\char`^3 \quad (D.1.1.2\text{-}2)$$

Where:

$PE_{OX,y}$ – CO_2 emissions from complete oxidation of hydrocarbons in year *y* (t. CO_2)

$V_{APG,\ fuel,\ m}$ – Volume of associated petroleum gas used by the compressor station as a fuel in a month *m* (mln. m^3). This is a monitored parameter;

$W_{h,\ Injection,\ m}$ – Volumetric fraction of hydrocarbon of type h in associated petroleum gas pumped by the compressor station into injection wells in a month *m* (%). This is a monitored parameter;

p_h – The density of hydrocarbon of type *h* used to convert volume of a hydrocarbon to mass of a hydrocarbon (kg/m^3). This parameter is taken constant for the whole crediting period. For more details please refer to the Section B.1 above;

η_{flare} – Underburning factor for combustion of APG (3.5%). This parameter is taken constant, for the whole crediting period (not monitored parameter). For more details please refer to the Section B.1 above;

SMF_h – Mass ratio of CO_2 produced from full combustion of one unit mass of a hydrocarbon (t. CO_2 eq. / t. of a hydrocarbon). This parameter is taken constant, for the whole crediting period (not monitored parameter). For more details please refer to the Section B.1 above.

$$PE_{losses,y} = \sum_m((V_{APG,\ injection,\ m} + V_{APG,\ fuel,\ m}) * W_{h,\ Injection,\ m}) * LE_y * p_h * GWP_{CH4} * 10^3 \quad (D.1.1.2\text{-}3)$$

Where:

$PE_{losses,y}$ – fugitive CH_4 emissions from process losses in a year *y* ($t.CO_2$-e);

$V_{APG,\ injection,\ m}$ – Volume of associated petroleum gas pumped by the compressor station into injection wells for the purposes of the seam pressure maintenance in a month *m* (mln. m^3). This is a monitored parameter;

$V_{APG,\ fuel,\ m}$ – Volume of associated petroleum gas used by the compressor station as a fuel in a month *m* (mln. m^3). This is a monitored parameter;

$W_{h,\ Injection,\ m}$ – Volumetric fraction of methane in associated petroleum gas pumped by the compressor station into injection wells in a month *m* (%). This is a monitored parameter;

LE_y – Leaks coefficient in a year *y* (%).This parameter is fixed ex-ante (not monitored parameter). For more details please refer to the Section B.1 above.

p_{CH4} – The density of CH_4 used to convert volume of CH_4 to mass of CH_4 (0.67 kg/m^3). This parameter is taken constant, for the whole crediting period (not monitored parameter). For more details please refer to the Section B.1 above;

GWP_{CH4} – Global warming potential of methane (21 tCO_2e/tCH_4). This parameter is taken constant, for the whole crediting period (not monitored parameter). For more details please refer to the Section B.1 above.

D.1.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions of greenhouse gases by sources within the project boundary, and how such data will be collected and archived:								
ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
9. $V_{APG, injection, m}$	Volume of associated petroleum gas pumped by the compressor station into injection wells for the purposes of seam pressure maintenance in a month *m*	IPGGUD	mln. m^3	m	continuously	100%	Electronic	Volume of APG pumped by the compressor station is measured directly.
10. $V_{APG, fuel, m}$	Volume of associated petroleum gas used by the compressor station as a fuel for pumping of APG in a month *m*	IPGGUD	mln. m^3	m	continuously	100%	Electronic	Volume of APG used as a fuel is measured directly.

11. $W_{h,Injection,m}$	Volumetric fraction of hydrocarbon of type *h* in associated petroleum gas pumped by the compressor station into injection wells in a month *m*	IPGGUD	%	m	monthly	100 %	Electronic and paper	Determined by laboratory tests once per month
12. LE_y	Leaks coefficient comprises fugitive methane leaks (so called "process losses") from the equipment installed at the compressor station.	the Russian State University of Oil and Gas	%	e	fixed ex-ante	-	-	For the applied values please refer to a table in Section B.1 above.
13. n_{flare}	Underburning factor for combustion of APG	Methodology for calculation of emissions into the atmosphere by burning of associated petroleum gas in flare units", approved in 08.04.1998, order № 199 by Russian Federation State Committee for Environmental Protection	%	e	fixed ex-ante	-	-	For the applied value please refer to a table in Section B.1 above.

14. p_h	This is the density of a hydrocarbon of type *h*. This parameter converts volume of a hydrocarbon to mass of a hydrocarbon	GOST 31369-2008, Intergovernmental Standard "Natural gas. Calculation of calorific values, density, relative density and Wobbe index from composition"	10^{-6} Gg /m^3 (kg/m^3)	e	fixed ex-ante	-	-	For the applied values please refer to a table in Section B.1 above.
15. SMF_h	Stoichiometric Mass Factor - mass ratio of CO_2 produced from full combustion of unit mass of hydrocarbon of type *h*.	GOST 31369-2008	t. CO_2 eq. / t. of hydrocarbon of type *h*	e	fixed ex-ante	-	-	For the applied values please refer to a table in Section B.1 above.
16. GWP_{CH4}	Global warming potential of methane	UNFCCC Global Warming Potentials, http://unfccc.int/ghg_data/items/3825.php	tCO_2e/tCH_4	e	fixed ex-ante	-	-	For the applied value please refer to a table in Section B.1 above.

D.1.1.4. Description of formulae used to estimate baseline emissions (for each gas, source etc.; emissions in units of CO_2 equivalent):

The baseline emissions (BE_y) comprise CO_2 emissions from associated petroleum gas flaring and CH_4 emissions from underburning of methane in flare units. The baseline emissions are calculated as follows:

$$BE_y = BE_{flaring,y} + BE_{CH4,y} \quad \text{(D.1.1.4-1)}$$

Where:

BE_y – Baseline emissions in year *y* ($t.CO_2$);

$BE_{flaring,y}$ – Emissions due to flaring of APG in flare units ($t. CO_2$);

$BE_{CH4,y}$ – Emissions due to underburning of methane in flare units ($t. CO_2$).

$$BE_{flaring,y} = \sum_m (V_{APG, injection, m} * W_{h, Injection, m}) * (1 - \eta_{flare}) * p_h * SMF_h) * 10^3 \quad (D.1.1.4\text{-}2)$$

Where:

$V_{APG, injection, m}$ – Volume of associated petroleum gas pumped by the compressor station into injection wells for the purposes of the seam pressure maintenance in a month *m* (mln. m^3). This is a monitored parameter;

$W_{h, Injection, m}$ – Volumetric fraction of hydrocarbon of type *h* in associated petroleum gas pumped by the compressor station into injection wells in a month *m* (%). This is a monitored parameter;

η_{flare} – Underburning factor for combustion of APG (3.5%). This parameter is taken constant, for the whole crediting period (not monitored parameter). For more details please refer to the Section B.1 above;

p_h – Density of hydrocarbon of type *h* used to convert volume to mass. This parameter is taken constant, for the whole crediting period (not monitored parameter). For more details please refer to the Section B.1 above;

SMF_h – Mass ratio of CO_2 produced from full combustion of one unit mass of a hydrocarbon (t. CO_2 eq. / t. of a hydrocarbon). This parameter is taken constant, for the whole crediting period (not monitored parameter). For more details please refer to the Section B.1 above.

$$BE_{CH4,y} = \sum_m ((V_{APG, injection, m} + V_{APG, fuel, m}) * W_{h, Injection, m}) * \eta_{flare} * p_{CH4} * GWP_{CH4} * 10^3 \quad (D.1.1.4\text{-}3)$$

$V_{APG, injection, m}$ – Volume of associated petroleum gas pumped by the compressor station into injection wells for the purposes of the seam pressure maintenance in a month *m* (mln. m^3). This is a monitored parameter;

$V_{APG, fuel, m}$ – Volume of associated petroleum gas pumped by Volume of associated petroleum gas used by the compressor station as a fuel in a month *m* (mln. m^3). This is a monitored parameter;

$W_{h, Injection, m}$ – Volumetric fraction of methane in associated petroleum gas pumped by the compressor station into injection wells in a month *m* (%). This is a monitored parameter;

η_{flare} – Underburning factor for combustion of APG (3.5%). This parameter is taken constant, for the whole crediting period (not monitored parameter). For more details please refer to the Section B.1 above;

p_{CH4} – The density of CH_4 used to convert volume of CH_4 to mass of CH_4 (0.67 kg/m^3). This parameter is taken constant, for the whole crediting period (not monitored parameter). For more details please refer to the Section B.1 above;

GWP_{CH4} –Global warming potential of methane (21 tCO_2e/tCH_4). This parameter is taken constant, for the whole crediting period (not monitored parameter). For more details please refer to the Section B.1 above.

D. 1.2. Option 2 – Direct monitoring of emission reductions from the project (values should be consistent with those in section E.):

This option is not applicable to the monitoring of the project.

D.1.2.1. Data to be collected in order to monitor emission reductions from the project, and how these data will be archived:

ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

D.1.2.2. Description of formulae used to calculate emission reductions from the project (for each gas, source etc.; emissions/emission reductions in units of CO_2 equivalent):

This option is not applicable to the monitoring of the project.

D.1.3. Treatment of leakage in the monitoring plan:

D.1.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project:

ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

D.1.3.2. Description of formulae used to estimate leakage (for each gas, source etc.; emissions in units of CO_2 equivalent):

The leakage equals zero for this project.

D.1.4. Description of formulae used to estimate emission reductions for the project (for each gas, source etc.; emissions/emission reductions in units of CO_2 equivalent):

The following formula is applied to estimate emission reductions generated by the project:

$$ER_y = BE_y - PE_y \qquad \text{(D.1.4-1)}$$

Where:

BE_y – Baseline emissions in year y (t.CO_2);

PE_y – Project emissions in year y (t.CO_2).

D.1.5. Where applicable, in accordance with procedures as required by the host Party, information on the collection and archiving of information on the environmental impacts of the project:

The Department of Environmental Safety and Management at OJSC "Surgutneftegas" is responsible for the company's operations in terms of environmental protection and monitoring. The department has well-trained staff, all required technical equipment and is capable to handle information on the environmental impacts of the project. The Company's Central Base Laboratory for Ecoanalytical and Process Studies responsible for general environmental monitoring is accredited by the Standardization, Metrology and Certification Committee (GosStandart) of Russia to perform analysis of 707 parameters, including 365 ecological and 47 radiological parameters. Surgutneftegas ecological management system involves all the Company's divisions. Within environmental policy of the Company staff liabilities and responsibilities are specified throughout the entire management structure. There are detailed procedures to define primary ecological aspects which constitute the basis for environmental activity planning.

The Company has eleven laboratories to perform in-house monitoring of water and soil quality, and ambient air, as well as environmental impact of emission and discharge sources, and disposal sites. The unique laboratory facilities carry out a wide range of research and analysis activities, including determination of heavy metals, carcinogenic and polluting substances, and natural radionuclides in all media. Research is conducted by trained engineering and laboratory personnel using up-to-date instrumentation such as chromato-mass-spectrometers, gas and liquid chromatographs, and spectrophotometers.

The list of major official statistical forms which Surgutneftegas submits according to Russian Legislation:

- 2-TP (air). *Annual data on the atmospheric air protection*, including the information on the amount of the collected and neutralized atmospheric pollutants, detailed emissions of specific contaminants, number of emission sources, measures for reduction of emissions into the atmosphere and emissions from separate groups of contamination sources, (prepared according to the resolution of the Russian State Statistical Committee date

September 17th of 2010 # 319 "On the establishment of the statistical tools for the arrangement of statistical monitoring over the environment and agriculture"(version from 23.03.2011)[37]);

- 2-TP (water management) *Data on the water usage,* including the information on the water consumption from natural sources, discharge of waste water and content of contaminants in the water, capacity of water treatment facilities etc. (prepared according to the resolution of the Russian State Statistical Committee dd. October 19th of 2009 # 230 "On the establishment of statistical tools for the arrangement by the Federal Water Resources Agency of the statistical monitoring of water usage"[38]);
- 2-TP (wastes) Data on the generation, use, neutralization, transportation and emplacement of production and consumption wastes, including the annual balance of the wastes management separately for their types and hazard classes, (prepared according to the resolution of the Russian State Statistical Committee dd. January 28th of 2011 #17 "On the establishment of statistical tools for the arrangement by the Federal Service for Supervision of Natural Resource Usage of the statistical monitoring of production and consumption wastes [39]).

The Company's environmental activity is in line with nature protection plans developed under the comprehensive Ecology Program with a view of systematic planned mitigation of industrial impact on the environment. Principal areas of the Ecology Program are as follows:
- construction of nature protection facilities;
- land conservation, management and rehabilitation;
- air protection;
- water resources protection;
- natural environment and production facilities monitoring;
- pipeline accident prevention and clean-up;
- industrial waste neutralization and utilization;
- environmental training;
- R&D activity.

D.2. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored:		
Data *(Indicate table and ID number)*	Uncertainty level of data (high/medium/low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.

[37] The document is available here http://base.consultant.ru/cons/cgi/online.cgi?req=doc;base=LAW;n=112162. Free access to the document may be limited.

[38] The document is available here http://base.consultant.ru/cons/cgi/online.cgi?req=doc;base=LAW;n=93393. Free access to the document may be limited.

[39] The document is available here http://base.consultant.ru/cons/cgi/online.cgi?req=doc;base=LAW;n=109918. Free access to the document may be limited.

D.1.1.1 and D.1.1.3 - $V_{APG, injection, m}$	Low	Amount of APG injected by the compressor station is measured continuously by APG measuring complexes installed at the station. Only certified meters and equipment are used. All certified meters have factory calibration. Calibration and checking will be done on terms prescribed by meters passports by specialized accredited metrology organizations. A calibration schedule will also be established.
D.1.1.1 and D.1.1.3 $V_{APG, fuel, m}$	Low	Amount of APG used as a fuel is measured continuously by APG measuring complexes installed at the station. Only certified meters and equipment are used. All certified meters have factory calibration. Calibration and checking will be done on terms prescribed by meters passports by specialized accredited metrology organizations. A calibration schedule will also be established.
D.1.1.3 - $W_{h, Injection, m}$	Low	A specialized laboratory is responsible for analysis of APG and measuring of hydrocarbons fractions in the APG. The laboratory is equipped with gas-analyzing equipment and chromatograph. Only certified meters and equipment are used. All equipment used is calibrated and checked in full compliance with Russian legislation.

D.3. Please describe the operational and management structure that the project operator will apply in implementing the monitoring plan:

Despite of the fact that the project is first of its kind in general, it consists of common technologies such as compressor equipment, measurement equipment, turbine equipment, pipes, electrics, etc. Running of such equipment is a routine task for OJSC “Surgutneftegas”, no additional guidance, procedures or specific national standards are required to run the compressor station. The monitoring plan and control structure fully correspond to the already existing production monitoring and control system at the OJSC «Surgutneftegas». Monitoring of such parameters as amount of APG used as a fuel, amount of pumped associated petroleum gas and grid power consumption is carried out by on-duty engineers and power engineers. Detection of volumetric fraction of methane and other hydrocarbons in associated petroleum gas is carried out by certified meters.

Only certified and duly calibrated and checked equipment is used for measuring of parameters included in the monitoring plan. All equipment is subject for timely calibration and checking according to the Russian standards and regulation and internal calibration schedules. Normally, meters and equipment are checked and calibrated in the periods of scheduled shutdowns. But in the case when a meter should be taken off for checking and calibration during the operation time this meter can be replaced with a reserve one. Not calibrated meters and equipment will not be used for monitoring of parameters included in the monitoring plan.

The following procedure should be applied in a case when a monitored parameter cannot be measured by an appropriately calibrated device. This procedure should be applied only for long-term interruptions in measurements. Short term interruptions up to 1 day can be replaced by calculations on the basis of other data. The inaccuracy in such cases is too small to influence annual figures and can be neglected. Long term interruptions (more than 1 day) in measurements should be treated individually on case by case basis. In any case the principle of conservativeness should be applied on the first place. Few main options can be applied for calculation of data which is impossible to measure with calibrated devices:

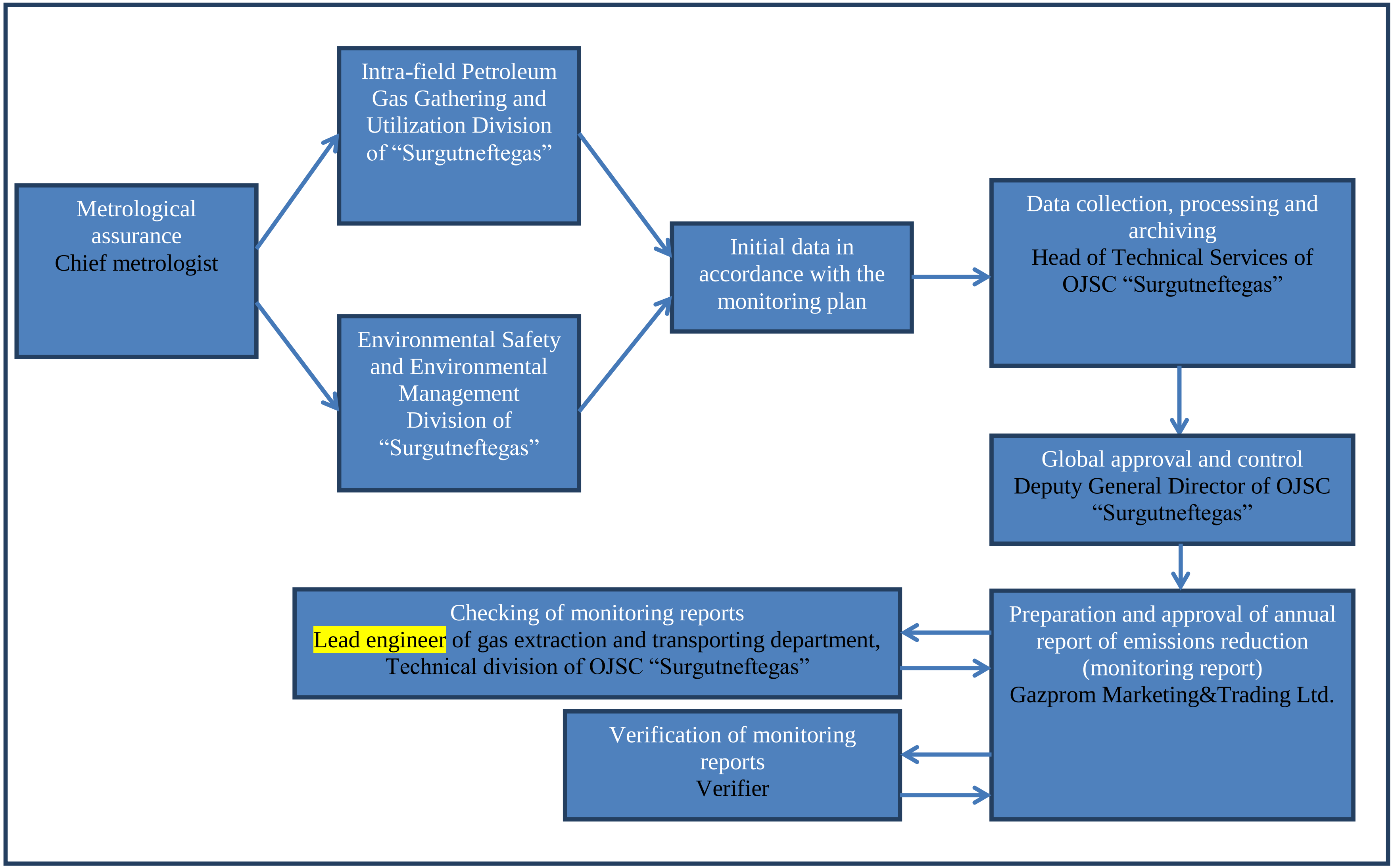
1) Calculate parameters on the basis of other manufacturing parameters. This option should be applied when it is possible to calculate a measured parameter on the basis of other directly measured parameters.
2) Take the most conservative data from a past period. This option can be applied to establish APG composition;
3) Exclude emission reductions for such period from monitoring reports.

The main monitored parameters are:

- Volume of associated petroleum gas pumped by the compressor station into injection wells for the purposes of the seam pressure maintenance (mln. m^3);
- Volume of associated petroleum gas used as a fuel for the purposes of APG pumping (mln. m^3);
- Volumetric fraction of hydrocarbon of type *h* in associated petroleum gas pumped by the compressor station into injection wells (%).

OJSC "Surgutneftegas" provides all data according to the monitoring plan to Gazprom Marketing&Trading Ltd. which is responsible for monitoring report preparation and verification tasks. The monitoring data should be stored for at least 2 years after the last transfer of ERUs for the project.
The basic management structure is shown below in the fig. D.3-1.

Figure D.3-1 The operational and management structure


Metrological assurance
Chief metrologist
Intra-field Petroleum Gas Gathering and Utilization Division of “Surgutneftegas”
Environmental Safety and Environmental Management Division of “Surgutneftegas”
Initial data in accordance with the monitoring plan
Data collection, processing and archiving
Head of Technical Services of OJSC “Surgutneftegas”
Global approval and control
Deputy General Director of OJSC “Surgutneftegas”
Preparation and approval of annual report of emissions reduction (monitoring report)
Gazprom Marketing&Trading Ltd.
Checking of monitoring reports
Lead engineer of gas extraction and transporting department, Technical division of OJSC “Surgutneftegas”
Verification of monitoring reports
Verifier

D.4. Name of person(s)/entity(ies) establishing the monitoring plan:

Date of the monitoring plan setting: 30/10/2011

Monitoring plan was developed by Gazprom Marketing & Trading Ltd.

Tel.: +44 (0) 207 756 0000

E-mail: emissions@gazprom-mt.com

Gazprom Marketing & Trading Ltd. is a project participant listed in Annex 1.

SECTION E. Estimation of greenhouse gas emission reductions

E.1. Estimated project emissions:

The project GHG emissions comprise CH_4 emissions due to process losses and due to complete oxidation of hydrocarbons in compressor engines are presented in the Tables E.1-1 – E.1.2 below.

Table E.1-1. Project GHG emissions due to process losses over the crediting period, t CO_2e

Year	GHG emissions under the project
2010	5,370
2011	3,035
2012	4,767
2010-2012	13,172

Table E.1-2. Project GHG emissions due to complete oxidation of hydrocarbons in compressor engines over the crediting period, t CO_2e

Year	GHG emissions under the project
2010	2,946
2011	3,273
2012	4,792
2010-2012	11,010

Table E.1-3. Total project GHG emissions over the crediting period, t CO_2e

Year	GHG emissions under the project
2010	8,316
2011	6,308
2012	9,559
2010-2012	24,182

E.2. Estimated leakage:

The leakage for this project equals 0.

E.3. The sum of E.1. and E.2.:

The sum of E.1 + E.2 is presented in the Table E.3-1 below.

Table E.3-1. The sum of E.1 + E.2 over the crediting period, t CO_2e

Year	The sum of E.1 + E.2
2010	8,316
2011	6,308
2012	9,559
2010-2012	24,182

E.4. Estimated baseline emissions:

The baseline GHG emissions comprise emissions due to flaring of APG and underburning of methane in flare units. Baseline CO_2 emissions are presented in the Tables E.4-1 – E.4-3 below.

Table E.4-1. Baseline GHG emissions from flaring of APG over the crediting period, t CO_2e

Year	GHG emissions from APG flaring under the baseline

2010	340,596
2011	641,183
2012	1,016,856
2010-2012	1,998,635

Table E.4-2. Baseline GHG emissions from underburning of methane in flare units over the crediting period, t CO_2e

Year	GHG emissions from underburning of methane under the baseline
2010	65,485
2011	114,215
2012	179,420
2010-2012	359,120

Table E.4-3. Total baseline GHG emissions over the crediting period, t CO_2e

Year	GHG emissions under the baseline
2010	406,081
2011	755,398
2012	1,196,275
2010-2012	2,357,754

E.5. Difference between E.4. and E.3. representing the emission reductions of the project:

Emission reductions generated by the project are presented in the Table E.5-1 below.

Table E.5-1. Estimated GHG emission reductions over the crediting period, t CO_2e

Year	Estimate of annual emission reductions in tons of CO_2e
2010	397,766
2011	749,090
2012	1,186,716
Total estimated emission reductions over the crediting period (tonnes of CO_2e)	2,333,572

E.6. Table providing values obtained when applying formulae above:

Year	Estimated project emissions (tonnes of CO_2 equivalent)	Estimated leakage (tonnes of CO_2 equivalent)	Estimated baseline emissions (tonnes of CO_2 equivalent)	Estimated emission reductions (tonnes of CO_2 equivalent)
2010	8,316	8,316	406,081	397,766
2011	6,308	6,308	755,398	749,090
2012	9,559	9,559	1,196,275	1,186,716
Total (tonnes of CO_2	24,182	24,182	2,357,754	2,333,572

equivalent)				

SECTION F. Environmental impacts

F.1. Documentation on the analysis of the environmental impacts of the project, including transboundary impacts, in accordance with procedures as determined by the host Party:

Environmental impact assessment of the compressor station was carried out according to the following major Russian legislative documents:

- Federal Law #7 "On Environmental Protection" dated 10.01.2001;
- Construction Code of the Russian Federation;
- Federal Law #174 "On the Environmental Expertise" dated 23.11.1995.

Before February 2007 all capital construction objects i.e. compressor stations were subjects for two major state expertise assessments: environmental expertise and state expertise. In 2006 changes to the Federal Law #174 "On the Environmental Expertise" were adopted and environmental expertise became mandatory only for a row of projects described in the Article 49 of the Construction Code of the Russian Federation. Starting from 2007 the compressor station stopped to be a subject for the environmental expertise. Environmental Impact Assessment of the compressor station was carried out in course of the state expertise. Among other technical and other parts ,the part of the project design called "Environmental impact assessment" was studied by Omsk branch of Glavgosexpertiza of Russia. As a result the positive state expertise conclusion # 365-07/OGE-0838/02 was obtained on 17th December 2007.

OJSC "Surgutneftegas" obtained all necessary permissions on emissions and during the project implementation the analytical control over various kinds of environmental impacts, will be carried out in compliance with the existing regulations. The plant shall submit the following statistical forms: 2-TP (air), 2-TP (water management), 2-TP (wastes). Rostekhnadzor regularly checks these documents for compliance with rules and regulations.

Permissions for emission of pollutants into the atmosphere were obtained for all for the whole crediting period. The list the permissions, their numbers, periods of validity and names of authorities issued the permissions are presented in the Table F.1-1 below.

Table F.1-1 Permissions for pollutant emissions into the atmosphere

#	Number of permission for pollutant emission into the atmosphere	Date of issuing	Responsible authority	Validity period
1	# PDV-073/383	26 October 2007	Sakha Republic Federal Service for Ecological, Technological and Nuclear Supervision	1 January 2008 – 31 December 2011
2	# PDV-10/167	21 September 2010	Lensk branch, Sakha Republic Federal Service for Ecological, Technological and Nuclear Supervision	21 September 2010 – 31 December 2014

After the start of the project implementation, water injection for the purposes of seam pressure maintenance was not stopped. E.g. only in 2011 - 4,294.18 ths. m^3 of water was injected for the purposes of seam pressure maintenance. More than 98% of the injected water was extracted from water supply wells and the share of water separated from the crude oil emulsion was negligibly small. In the absence of the project, huge amount of water should have been injected instead of APG to maintain the seam pressure at the same level. As the share of water separated from the crude oil was negligibly small, the amount of water which should have been injected in the absence of the project would have been extracted from water supply wells. Thus, the project allows avoiding extraction of fresh water what is considered as a positive environmental impact of the project realization.

The project includes some fugitive hydrocarbon emissions from process losses. Such emissions are lower than 0.3% (please refer to the table with coefficients of process losses in the Section B.1 above) and are significantly lower than 3.5% of fugitive emissions of hydrocarbons due to inefficient flaring of APG in flare units in the baseline scenario. This means that the project allows reducing fugitive APG emissions.

The negative impact on the environmental will be significantly reduced as a result of the project implementation. The reduction of emissions will be achieved mainly due to discontinuation of APG flaring practice. The project allows stopping environment contamination by combustion products and uncombusted hydrocarbons. The project allows decreasing emissions into the atmosphere of the following contaminants:

- hydrocarbons (methane – hexanes and higher)
- nitrogen dioxide (NO_2);
- nitrogen oxide (NO);
- hydrocarbons C1 - C5;
- carbon monoxide (CO);
- benz a pyrene;
- soot.

Documents concerning impacts on environment are listed below[40]:

1. Project designs (explanatory notes);
2. Environmental impact assessments (parts of the project designs);
3. Positive state expertise conclusion # 365-07/OGE-0838/02;
4. Permissions on emissions into the atmosphere # PDV-073/383 and # PDV-10/167;
5. Sanitary-and-epidemiologic resolution.

F.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to supporting documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

As it is shown in Section F.1 above, the project leads to a significant decrease of pollutants emissions into the atmosphere. For references to relevant supporting documentation please refer to Section F.1 above.

[40] The documents have been provided to verifiers for review.

SECTION G. Stakeholders' comments

G.1. Information on stakeholders' comments on the project, as appropriate:

Russian Federal Law 7-FZ "On Environmental Protection" cl. 13 para 2 requires stakeholders' comments to be considered in decision making process to start any activity potentially causing adverse environmental effect.

Information on the proposed project activity was made publicly available through the official web site and was widely covered in mass media[41]. Comments were invited through the web.

[41] http://www.surgutneftegas.ru/press/news/item/346/

http://www.vsluh.ru/news/digest/153164?mobile=1

Annex 1

CONTACT INFORMATION ON PROJECT PARTICIPANTS

Organisation:	Open Joint Stock Company "Surgutneftegas"
Street/P.O.Box:	Grigoryi Kukuevitskiy street
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Fax:	+7 (3462) 42-70-09
E-mail:	Egorov_EP@surgutneftegas.ru
URL:	http://www.surgutneftegas.ru/
Represented by:	
Title:	Deputy Head of engineering office - Chief of engineering department
Salutation:	Mr.
Last name:	Egorov
Middle name:	Petrovitch
First name:	Eduard
Department:	
Phone (direct):	+7 (3462) 42 68 05
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Mobile:	
Personal e-mail:	Egorov_EP@surgutneftegas.ru

Organisation:	Gazprom Marketing&Trading Ltd.
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State/Region:	London
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Country:	United Kingdom
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Fax:	+44 (0) 756 9740
E-mail:	global_carbon@gazprom-mt.com
URL:	http://www.gazprom-mt.com
Represented by:	
Title:	Head of Trading and Portfolio
Salutation:	Mr.
Last name:	Ignacio
Middle name:	
First name:	Gistau
Department:	Clean Energy
Phone (direct):	+44 2077560052
Fax (direct):	
Mobile:	+44 7525906248
Personal e-mail:	ignacio.gistau@gazprom-mt.com

Annex 2

BASELINE INFORMATION

Summary of key elements of the baseline is presented in table below[42]:

Parameter	Monitored/not monitored parameter	Value	Data unit	Description
$V_{APG, injection, m}$	Monitored	-	mln. m^3	Volume of associated petroleum gas pumped by the compressor station into injection wells for the purposes of the seam pressure maintenance in a month *m*
$V_{APG, fuel, m}$	Monitored	-	mln. m^3	Volume of associated petroleum gas used by the compressor station as a fuel for pumping of APG in a month.
$W_{h, Injection, m}$	Monitored	-	%	Volumetric fraction of hydrocarbon of type *h* in associated petroleum gas pumped by the compressor station into injection wells for the purposes of the seam pressure maintenance in a month *m*
η_{flare}	Not monitored	3.5	%	Underburning factor for combustion of APG
p_h	Not monitored	-	-	This is the density of a hydrocarbon of type *h*. This parameter converts volume of a hydrocarbon to mass of a hydrocarbon. For exact values of the factor for different types of hydrocarbons please refer to the Section B.1 above.
SMF_h	Not monitored	-	-	Stoichiometric Mass Factor - mass ratio of CO_2 produced from combustion of unit mass of hydrocarbon of type *h*. For exact values of the factor for different types of hydrocarbons please refer to the Section B.1 above.
GWP_{CH4}	Not monitored	21	-	Global Warming Potential of methane

[42] Sources and additional details are provided in Section B and Section D above.

Annex 3

MONITORING PLAN

Please refer to the Section D.