



**Monitoring report form for CDM project activity**  
**(Version 07.0)**

*Complete this form in accordance with the instructions attached at the end of this form.*

**MONITORING REPORT**

<b>Title of the project activity</b>	Associated Gas Recovery and Utilization at Block 9	
<b>UNFCCC reference number of the project activity</b>	6817	
<b>Version number of the PDD applicable to this monitoring report</b>	6.0	
<b>Version number of this monitoring report</b>	01	
<b>Completion date of this monitoring report</b>	08/06/2020	
<b>Monitoring period number</b>	4 <sup>th</sup> monitoring period	
<b>Duration of this monitoring period</b>	16/11/2019-31/12/2019	
<b>Monitoring report number for this monitoring period</b>	n/a	
<b>Project participants</b>	The Government of the Sultanate of Oman, represented by the Ministry of Oil & Gas Oman Trading International	
<b>Host Party</b>	Oman	
<b>Applied methodologies and standardized baselines</b>	AM0009 "Recovery and utilization of gas from oil wells that would otherwise be flared or vented" (Version 06.0.0)	
<b>Sectoral scopes</b>	Sectoral scope 10: Fugitive emission from fuels (solid, oil, gas).	
<b>Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period</b>	<b>Amount achieved before 1 January 2013</b>	<b>Amount achieved from 1 January 2013</b>
	0 tCO <sub>2</sub> e	48,915 tCO <sub>2</sub> e
<b>Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD</b>	55,443	

## **SECTION A. Description of project activity**

### **A.1. General description of project activity**

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The Associated Gas Recovery and Utilization at Block 9 project (hereafter referred to as the Project) is located at Safah oil field, A'Dhahirah Region, The Sultanate of Oman. The project is operated by Occidental of Oman Inc. under a development and production sharing agreement with the Ministry of Oil and Gas.

The purpose of the project activity is to deliver recovered gas to the national gas pipeline to meet energy needs of end-users, and also to reduce local air pollution due to flaring.

The recovery process comprises three main stages including the separation stage where gas is separated from oil and water, the compression stage where gas is compressed for transportation to gas plant, and the processing stage where gas is processed to fit with conditions of gas pipeline for further transportation to end-users. Main equipment necessary for the proposed project activity comprises electric motor-driven reciprocating and screw compressors installed at several locations on site, and a network of pipelines for gas transportation.

The scenario existing prior to the start of the implementation of the proposed project activity is flaring of associated gas at the oil production site, the operation of the existing oil and gas infrastructure without processing of any recovered associated gas, and the use of gas-lift gas from the same source and quantity as under the project activity in the gas-lift system. The baseline scenario is the same as the scenario existing prior to the start of implementation of the proposed project activity. The project reduces greenhouse gases emissions as the utilization of recovered gas displaces the use of non associated gas or other fossil sources at end-users.

The total estimated amount of associated gas to be recovered during crediting period is about 2.1 billion m<sup>3</sup> while average methane content is estimated at about 70%. The project activity is expected to reduce emissions by approximately 775,250 tonnes of CO<sub>2</sub> equivalent annually over the crediting period.

The date of the project construction started is 14 May 2009 and the project start operation on 08 Dec 2009, the project was fully commissioned on 29 Oct 2010.

The Project processes 16,968,775 Nm<sup>3</sup> associated gas and the total emission reduction is 48,915 tCO<sub>2</sub>e in the monitoring period (16/11/2019-31/12/2019).

### **A.2. Location of project activity**

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The proposed project is located at Block 9, Safah oil field in A'Dhahirah Region of Northern Oman. Approximate coordinates of Safah gas processing plant are east longitude of 55°27'40" and north latitude of 23°11'20". The project includes four other locations: Far West (23°09'11"N, 55°27'03"E), Satellite (23°10'39"N, 55°29'52"E), Jalal (22°55'50"N, 55°48'16"E), and Wadi Latham (22°52'50"N, 55°48'16"E).



Figure 1 Location of the project

### A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Oman (Host)	The Government of the Sultanate of Oman, represented by the Ministry of Oil & Gas	No
United Arab Emirates	Oman Trading International	No
Netherlands	Carbon Rooster Advisory Services B.V.	No

### A.4. References to applied methodologies and standardized baselines

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AM0009: Recovery and utilization of gas from oil wells that would otherwise be flared or vented (Version 06.0.0);

Tool to calculate baseline, project and/or leakage emissions from electricity consumption (Version 1);

Tool for the demonstration and assessment of additionality (Version 06.1.0).

For more information, please refer to:

<http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>.

**A.5. Crediting period type and duration**

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The project has been registered on 31 Dec 2012.

The fixed crediting period is chosen by the project which is from 31/12/2013 to 30/12/2020.

The first monitoring period is: 31/12/2013 – 31/12/2018.

The second monitoring period is: 01/01/2019 – 30/06/2019.

The third monitoring period is: 01/07/2019 – 15/11/2019.

The fourth monitoring period is: 16/11/2019 – 31/12/2019.

**SECTION B. Implementation of project activity****B.1. Description of implemented project activity**

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The proposed project activity aims to recover associated gas flow that was before flared at 5 different locations in Safah oil field. When oil is extracted from the wells, it comes to the surface together with sands, water and gas. The mixture is then stored into tanks to rest for a period so that through gravity, oil, water and sands are recovered from the bottom of the tank and gas is recovered from the top of the tank. This is called the phase separation. Only oil, gas, sands and water are recovered during phase separation at each location. After that gas is compressed and transported to a processing plant on-site owned by onsite operator where it will be processed then further transported and sold by onsite operator to National Gas pipeline. Part of the gas is consumed onsite to provide electricity to the project activity. Expected annual gross gas volumes to be recovered as part of the project activity are on average 41.13 mmscfd over its lifetime. On average about 1.78 mmscfd of the recovered gas will be used annually in captive power plant on-site to supply electricity to the project activity. The captive gas power plant is owned and operated by on-site operator and the gas is delivered free of charge to the power plant. Expected average net gas volumes delivered to National pipeline is 37.02mmscfd after deduction of onsite gas consumption due to project activity and deduction of a shrinkage factor due to gas treatment at gas plant for the purpose of meeting the specifications of the National pipeline.

**Table 1 project implementation timeline**

Location	Number of compressors	Start construction	Full commissioning
CPF	4	14-May-2009	08-Dec-2009
FW	2	02-Jan-2010	03-Jul-2010
SAT	1	14-Jan-2010	03-Sep-2010
JAL	1	19-Jan-2010	08-Aug-2010
WL	3	07-Jan-2010	29-Oct-2010

The project activity mainly comprises the installation of compressor packages at five different locations, including compressor, motor, scrubbers, suction and discharge bottles, coolers, as well as installation of a pipeline network. Technology employed by the proposed project activity mainly includes the following equipment:

- Purchase and installation of a vapour recovery unit (VRU) for the central production boot flare (CPF) in Safah. The VRU package includes 4 screw compressors (2 prime units & 2 stand-by units) with associated knock out drums, lube oil systems and air coolers. The boot flare will be re-routed to the vapour recovery unit which will recover gas from the crude tank degassers and various other low pressure sources currently flared. The recovered gas will be sent to the gas plant for processing.
- Reduction of the Far West (FW) flare by a series of new pipelines and re-routes.
- Addition of electrical driven reciprocating compressor at the Satellite (SAT) facility as well as electrical infrastructures including transformers and relays to support the high voltage and low

voltage demands of the compressor. A new motor control center and switch gear room will be installed. The recovered gas will be sent to the gas plant for processing.

- Addition of electrical motor driven reciprocating compressor at Jalal (JAL) as well as electrical infrastructure including transformers and relays to support the high voltage and low voltage demands of the compressor. The recovered gas will be sent to the gas plant for processing.
- Addition of electrical motor driven reciprocating compressors at Wadi Latham (WL) as well as electrical infrastructure including new motor control center and switch gear building, transformers and relays to facilitate the high voltage and low voltage demands of the compressors. The recovered gas will be sent to the gas plant for processing.
- Addition of electrical motor driven reciprocating compressors at Far West (FW) facility. The recovered gas will be sent to the gas plant for processing.
- The pipeline system mainly consists of a 16" 93.8km line from Safah to National pipeline and a 12" 58.2km line from Wadi Latham to Far West; 12" 4km line from Satellite to Central Production Flare; 16" 4.2km line from Far West to Central Production Flare; and 4" 2km line from Jalal connected to Wadi Latham-Far West line.

The below figure provides an overview of the network.

**Figure 2 Pipeline network of the project**

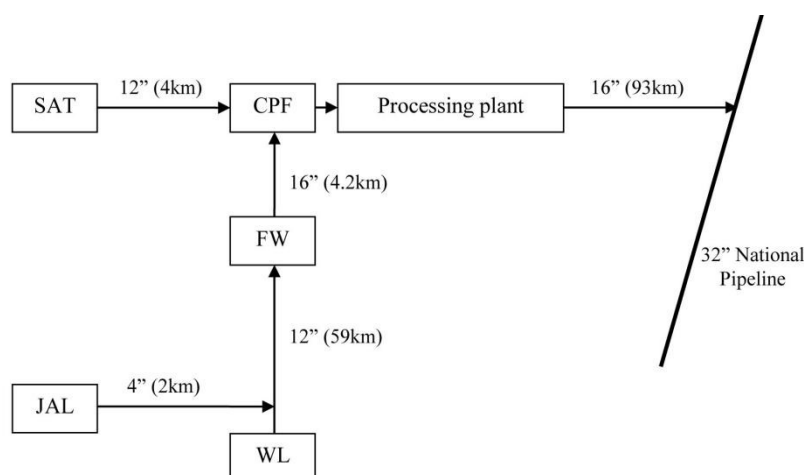


Figure 3 Flow diagram of the project boundary

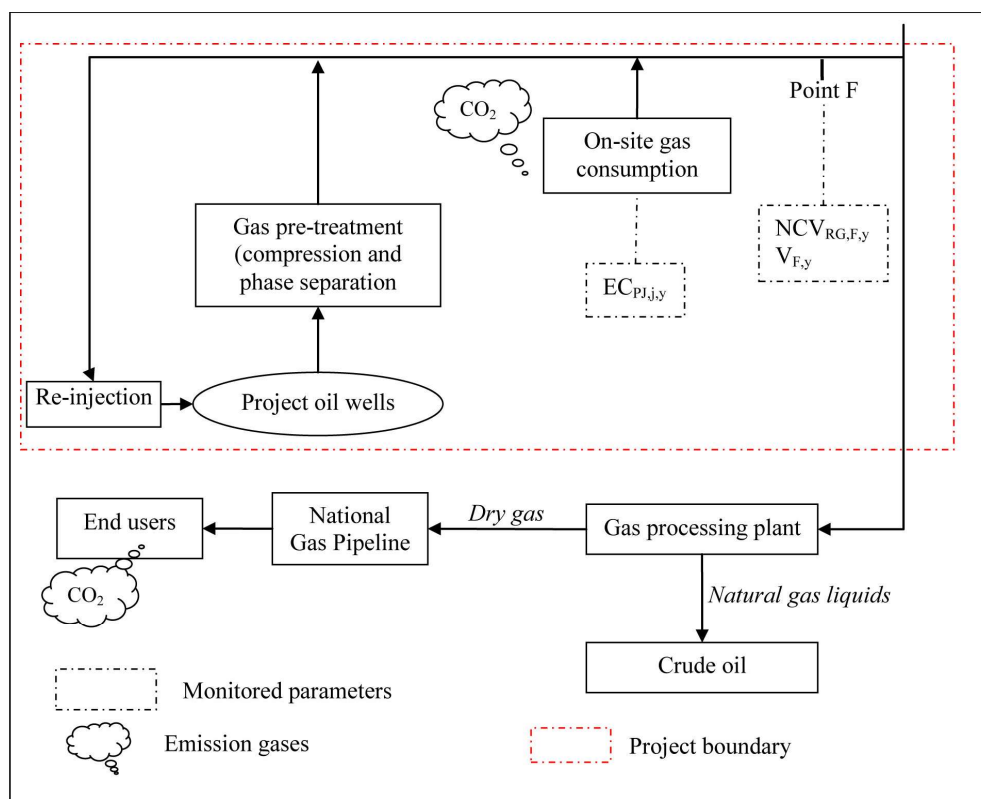


Table 2 Main equipment and technical parameters in the project

Location	Parameter	Value
CPF	Capacity (MMSCFD)	4 * 5.399
	Manufacturer	Vilter
	Type	VSG-2101
	Rated Power (BHP)	541
FW	Capacity (MMSCFD)	2 * 12.5
	Manufacturer	Ariel Corporation
	Type	JGK/4
	Rated Power (BHP)	2540
SAT	Capacity (MMSCFD)	1 * 30
	Manufacturer	Ariel Corporation
	Type	JGD/4
	Rated Power (BHP)	4140
JAL	Capacity (MMSCFD)	1 * 12.5
	Manufacturer	Ariel Corporation
	Type	JGC/4
	Rated Power (BHP)	4140
WL	Capacity (MMSCFD)	3 * 12.5
	Manufacturer	Ariel Corporation
	Type	JGC/4
	Rated Power (BHP)	4140

**Table 3 Milestone of the Project**

No.	Date	Milestone
1	14/05/2009	The Project construction started
2	08/12/2009	Operation started
3	29/10/2010	Fully commissioning
4	31/12/2012	Registered as a CDM project
5	31/12/2013 – 31/12/2018	The first monitoring period
6	01/01/2019 – 30/06/2019	The second monitoring period
7	01/07/2019 – 15/11/2019	The third monitoring period
8	16/11/2019 – 31/12/2019	The fourth monitoring period

**B.2. Post-registration changes****B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents**

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Not applicable.

**B.2.2. Corrections**

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Not applicable.

**B.2.3. Changes to the start date of the crediting period**

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The crediting period was changed from 01/01/2013 - 31/12/2019 to 31/12/2013 - 30/12/2020 (Fixed)

**B.2.4. Inclusion of monitoring plan**

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Not applicable.

**B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents**

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Not applicable.

**B.2.6. Changes to project design**

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Not applicable.

**B.2.7. Changes specific to afforestation or reforestation project activity**

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Not applicable.

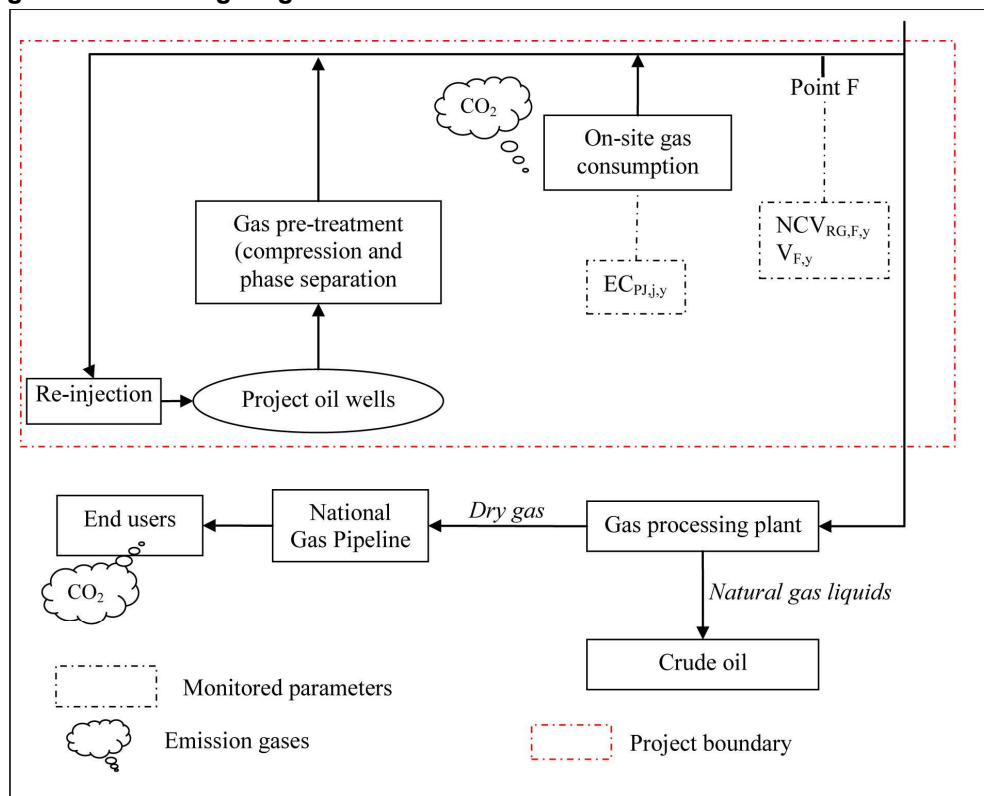
**SECTION C. Description of monitoring system**

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The monitoring of the emission reductions will be carried out according to the scheme shown in below Figure 4. The overall responsibility for the monitoring process will be held by the Monitoring Officer which will be selected among senior staff of the operating entity on-site. Some of the monitoring tasks will be delegated as indicated Figure 4. Measurements of the associated gas

volumes recovered and project electricity consumption will fall under the responsibility of lead operators at each location who report to the Central Production Facility.

**Figure 4 Monitoring diagram**



The monitoring officer will be responsible for collecting and performing plausibility check of the measurements. The monitoring reports and calculation of emission reductions will be prepared by experienced CDM consultant. The selection procedure, tasks and responsibilities of the monitoring officer are detailed as below:

#### **Selection procedure:**

The monitoring officer will be appointed by the general manager of the entity operating the project. The monitoring officer will be selected from among the senior technical or managerial staff.

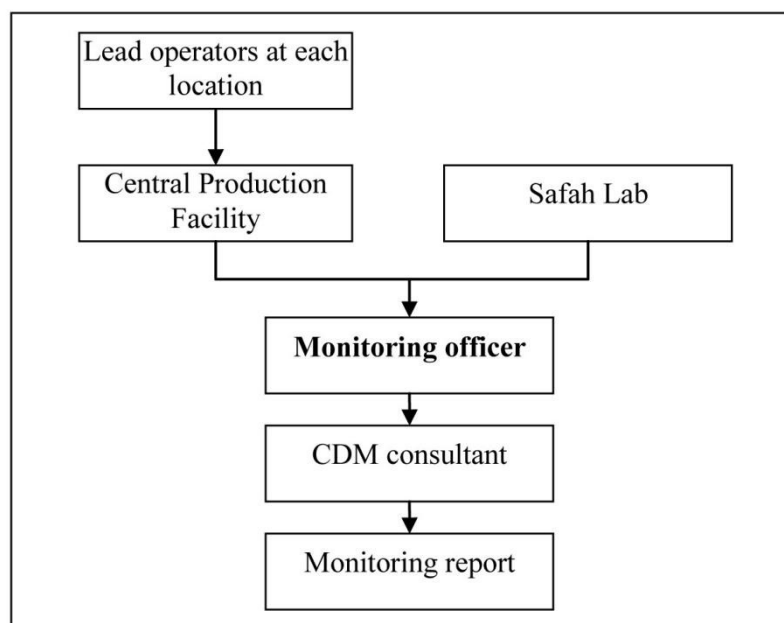
#### **Tasks and responsibilities:**

The monitoring officer will be responsible for carrying out the following tasks:

- **Supervise and verify metering and recording:** The monitoring officer will coordinate with the lead operators at each location to ensure and verify adequate metering and recording of volumes of gas recovered at each location. The monitoring officer will also coordinate with the lab at Safah gas plant to ensure proper measurement of net calorific values of recovered gas.
- **Collect data:** The monitoring officer will collect volumes of recovered associated gas and net calorific values.
- **Monitoring report:** The monitoring officer will coordinate with CDM consultant to prepare periodic monitoring reports including calculation of emission reductions on the basis of measured results. The monitoring officer will be provided with a calculation template in electronic form by the project's CDM advisors



Figure 5 Responsibilities for measurements and reporting emission reductions

**Emergencies:**

In case of emergencies, the project entity will not claim emission reductions due to the project activity for the duration of the emergency. The project entity will follow the following procedure for declaring the emergency period to be over:

1. The project entity will ensure that all requirements for monitoring of emission reductions have been re-established.
2. The monitoring officer will sign a statement declaring the emergency situation has ended and normal operations have resumed.

**Monitoring of volume of recovered gas ( $V_{F,y}$ )**

Gas flow meters ( $FM_{CPF}$ ,  $FM_{FW}$ ,  $FM_{WL}$ ,  $FM_{JAL}$ ,  $FM_{SAT}$ ) at each location: CPF, FW, WL, JAL, SAT will measure the volumes of recovered gas after pre-treatment and after part of the recovered gas is used on-site. The total value for parameter  $V_{F,y}$  will be equal to the sum of volumes of recovered gas at each location.

The recorded gas volume is automatically converted to the national standard condition, namely 101.325kpa, 25°C follow ISO 6976.

The results from the gas flow meters are recorded by the lead operators for each month at each location and report to monitoring officer. The monitoring officer aggregated those data and reported them to Manager who would check and archive them, as well as manage the regular data back-up. All data collected as part of monitoring should be archived electronically and be kept at least for 2 years after the end of the last crediting period.

The calibration for the gas meters was conducted annually according to the national measurement standard and regulation by the qualified measurement technology verification institution authorized by the Oman government.

In summary, all the meters have been working normally and calibrated according to the registered monitoring plan and relevant national standards.

During this monitoring period, only CPF and WL recovered gas, therefore, the parameter of  $V_{F,y}$  was monitored and calculated only for CPF and WL location during this monitoring period, which is consistent with the estimation in the registered PDD.

**Monitoring Net calorific value of recovered gas ( $NCV_{RG,F,y}$ )**

The net calorific value (volume based) of the recovered gas in TJ/standard cubic meter will be calculated according to the following method:

$$NCV_{RG,F,y} = \frac{\sum(X_i \times NCV_i)}{\sum(X_i)}$$

$X_i$  = molar fraction of the individual component  $i$  in the recovered gas sample at least monthly.

$NCV_i$  = Net Calorific Value (volume based) of the individual component  $i$  as per ISO/DP 6976:1995 standard for a combustion reference temperature of 25°C and the same metering reference condition used for parameter  $V_{F,y}$ .

Gas composition measurements are undertaken in line with international fuel standards under the responsibility of the on-site lab located at Safah gas plant. Samples are taken monthly through chromatography gas analyzer. Calibration frequency of the chromatography gas analyzer is every 6 months under ISO 17025.

$NCV$  will be calculated as the sum of molar fraction of each individual component in the natural gas sample multiplied by net calorific value of each individual component in the natural gas sample as referenced in ISO/DP 6976:1995 standard for a combustion reference temperature of 25°C. The average  $NCV$  during the period  $y$  is defined as the arithmetic average of  $NCV$  for the samples taken during the same period.

During this monitoring period, only CPF and WL recovered gas, therefore, the parameter of  $NCV_{RG,F,y}$  was monitored and calculated only for CPF and WL location during this monitoring period, which is consistent with the estimation in the registered PDD.

**Monitoring of electricity consumption  $EC_{PJ,i,y}$** 

Electricity meters will measure electricity consumed by equipment at each project location. The total value for parameter  $EC_{PJ,i,y}$  will be equal to the sum of electricity consumption at each location.

$EC_{PJ,i,y}$  is continuous measured by the lead operators for each month at each location and report to monitoring officer. Calibration is performed annually.

During this monitoring period, only CPF and WL recovered gas, therefore, the parameter of  $EC_{PJ,i,y}$  was monitored and calculated only for CPF and WL location during this monitoring period, which is consistent with the estimation in the registered PDD.

**SECTION D. Data and parameters****D.1. Data and parameters fixed ex ante**

(Copy this table for each data or parameter.)

<b>Data/Parameter</b>	EF <sub>CO2,Methane</sub>
<b>Unit</b>	tCO <sub>2</sub> /TJ
<b>Description</b>	CO <sub>2</sub> emission factor for methane

Source of data	Calculated in line with procedures and data presented in ISO 6976:		
	Unit	Value	Source
	Carbon Content of Methane	12,011 kg/kmol	ISO 6976: Table 1
	CO <sub>2</sub> Emission Factor for Methane	44.01 kg/kmol	ISO 6976: Table 1
	NCV of Methane (at 25°C)	802.60 kJ/mol	ISO 6976: Table 3
Value(s) applied	54.834 tCO <sub>2</sub> /TJ		
Choice of data or measurement methods and procedures	ISO 6976:		
Purpose of data/parameter	Calculation of baseline emissions		
Additional comments	---		

<b>Data/Parameter</b>	TDL <sub>j,y</sub>
Unit	-
Description	Average technical transmission and distribution losses for providing electricity to source j year y
Source of data	"Tool to calculate baseline, project and/or leakage emissions from electricity consumption";
Value(s) applied	0
Choice of data or measurement methods and procedures	Scenario B "Electricity consumption from an off-grid captive power plant" of the "Tool to calculate baseline, project and/or leakage emission from electricity consumption" applies.
Purpose of data/parameter	Calculation of project emissions
Additional comments	---

<b>Data/Parameter</b>	EF <sub>EL,j,y</sub>
Unit	tCO <sub>2</sub> /yr
Description	Emission factor for electricity generation for source j in year y
Source of data	"Tool to calculate baseline, project and/or leakage emissions from electricity consumption";
Value(s) applied	1.3
Choice of data or measurement methods and procedures	Scenario B, Option B2 is applied as per registered PDD.
Purpose of data/parameter	Calculation of project emissions
Additional comments	---

## D.2. Data and parameters monitored

(Copy this table for each data or parameter.)

<b>Data/Parameter</b>	V <sub>F,y</sub>
Unit	Nm <sup>3</sup>
Description	Volume of the total recovered gas measured at point F in methodology Figure 2 in year y.
Measured/calculated/default	Measured by gas flow meters
Source of data	Gas flow meters (FM <sub>CPF</sub> , FM <sub>FW</sub> , FM <sub>WL</sub> , FM <sub>JAL</sub> , FM <sub>SAT</sub> ) installed at point F of each location

Value(s) of monitored parameter	16,968,775
Monitoring equipment	Volume of gas is metered through a differential pressure flow meters (FM <sub>CPF</sub> , FM <sub>FW</sub> , FM <sub>WL</sub> , FM <sub>JAL</sub> , FM <sub>SAT</sub> ) installed at point F of each location.
Measuring/reading/recording frequency	Data will be measured continuously and recorded monthly.
Calculation method (if applicable)	The total value for parameter $V_{F,y}$ will be equal to the sum of volumes of recovered gas at each location.
QA/QC procedures	<p>Gas flow meters calibration frequency is annual. The calibration for the gas meters was conducted annually according to the national measurement standard and regulation by the qualified measurement technology verification institution authorized by the Oman government.</p> <p>Gas flow meters accuracy is 0.04%.</p> <p>Lead operators at each location are responsible for monitoring and reporting to Central Production Facility.</p> <p>Please reference to Table 4 for the details of gas flow meters.</p> <p>The total recovered gas volume is crosschecked with commercial data.</p>
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	--

<b>Data/Parameter</b>	NCV <sub>RG,F,y</sub>
Unit	TJ/Nm <sup>3</sup>
Description	Average net calorific value of recovered gas at point F in methodology Figure 2 in year y
Measured/calculated/default	On site measurement and calculated
Source of data	<p>Gas composition measurements are undertaken in line with international fuel standards under the responsibility of the on-site lab located at Safah gas plant. Samples are taken monthly through chromatography gas analyser.</p> <p>Monthly NCV will be calculated as the sum of molar fraction of each individual component in the natural gas sample multiplied by net calorific value of each individual component in the natural gas sample as referenced in ISO/DP 6976:1995 standard for a combustion reference temperature of 25°C. The average NCV during the period y is defined as the arithmetic average of NCV for the samples taken during the same period.</p>
Value(s) of monitored parameter	Please refer to the ER sheet for more detail.
Monitoring equipment	Samples are taken monthly through chromatography gas analyser.
Measuring/reading/recording frequency	Sampling and compositional analysis and calculation of net calorific value monthly.
Calculation method (if applicable)	<p>Monthly NCV will be calculated as the sum of molar fraction of each individual component in the natural gas sample multiplied by net calorific value of each individual component in the natural gas sample as referenced in ISO/DP 6976:1995 standard for a combustion reference temperature of 25°C.</p> <p>The average NCV during this monitoring period is defined as the arithmetic average of NCV for the samples taken during the same period.</p>

QA/QC procedures	Measurements are done as per ISO10715; Compositional analysis is in accordance with ISO 6974; Routine maintenance and calibration in accordance with ISO 10723; Calibration of the chromatography gas analyser is performed every 6 months, as per ISO 17025 and ISO6141.
Purpose of data/parameter	Calculation of baseline emissions.
Additional comments	---

<b>Data/Parameter</b>	$EC_{PJ,j,y}$
Unit	MWh/yr
Description	Quantity of electricity consumed by the project electricity consumption source j in year y
Measured/calculated/default	$EC_{PJ,j,y}$ will be equal to the sum of electricity consumption at point F of each location.
Source of data	Electricity meters installed at point F of each location.
Value(s) of monitored parameter	2,207
Monitoring equipment	Electricity meters.
Measuring/reading/recording frequency	Continuous measurement and monthly recorded
Calculation method (if applicable)	$EC_{PJ,j,y}$ will be equal to the sum of electricity consumption at point F of each location.
QA/QC procedures	Accuracy is 0.5s.  Electricity meters will be calibrated annually in accordance with local requirements.  The total consumed electricity is crosschecked with confirmation letter.
Purpose of data/parameter	Calculation of project emissions
Additional comments	--

### D.3. Implementation of sampling plan

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Not applicable

## SECTION E. Calculation of emission reductions or net anthropogenic removals

### E.1. Calculation of baseline emissions or baseline net removals

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According to the methodology AM0009 Version 06.0.0, the emissions reduction by the project is calculated as follows:

$$BE_y = V_{F,y} \times NCV_{RG,F,y} \times EF_{CO_2,Methane}$$

Where:

$BE_y$  = Baseline emissions in year y, (tCO<sub>2</sub>e)

$V_{F,y}$  = Volume of total recovered gas measured at point F, in year y, (10<sup>4</sup>Nm<sup>3</sup>)

$NCV_{RG,F,y}$  = Average net calorific value of recovered gas at point F in year y, (TJ/Nm<sup>3</sup>)

$EF_{CO_2,Methane}$  = CO<sub>2</sub> emission factor for methane (tCO<sub>2</sub>/TJ)

$EF_{CO_2,Methane}$  is ex-ante determined in the registered CDM-PDD which is 54.834 tCO<sub>2</sub>/TJ. The average  $NCV_{RG,F,y}$  during this monitoring period is defined as the arithmetic average of NCVs for

the samples taken during the same period.

## E.2. Calculation of project emissions or actual net removals

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*Project emissions are calculated as follows:*

$$PE_y = PE_{CO_2, \text{fossil fuels}, y} + PE_{CO_2, \text{elec}, y}$$

*Where:*

$PE_y$  = Project emissions in year y, (tCO<sub>2</sub>e)

$PE_{CO_2, \text{fossil fuels}, y}$  = CO<sub>2</sub> emissions due to consumption of fossil fuels for the recovery, pre-treatment, transportation, and if applicable, compression of the recovered gas up to the point F in year y (tCO<sub>2</sub>e)

$PE_{CO_2, \text{elec}, y}$  = CO<sub>2</sub> emissions due to the use of electricity for recovery, pre-treatment, transportation and if applicable, compression of the recovered gas up to the point F in year y (tCO<sub>2</sub>e)

According to PDD section B.6.1, there is no direct consumption of fossil fuels as part of the Project activity therefore above equation can be simplified as:

$$PE_y = PE_{CO_2, y} = PE_{EC, y}$$

$$PE_{EC, y} = \sum_j EC_{PJ, j, y} \times EF_{EL, j, y} \times (1 + TDL_{j, y})$$

Average technical transmission and distribution losses for providing electricity to source j in year y ( $TDL_{j, y}$ ) is set at 0% as the project consumes electricity from an off-grid captive power plant, and  $EF_{EL, j, y}$  is set at 1.3tCO<sub>2</sub>/MWh as it is a project electricity consumption source, which is the conservative default value set in the tool.

## E.3. Calculation of leakage emissions

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According to the registered PDD, there is no leakage emission considered, thus  $LE_y = 0$ .

## E.4. Calculation of emission reductions or net anthropogenic removals

	Baseline GHG emissions or baseline net GHG removals (t CO <sub>2</sub> e)	Project GHG emissions or actual net GHG removals (t CO <sub>2</sub> e)	Leakage GHG emissions (t CO <sub>2</sub> e)	GHG emission reductions or net anthropogenic GHG removals (t CO <sub>2</sub> e)		
				Before 01/01/2013	From 01/01/2013	Total amount
<b>Total</b>	51,785	2,870	0	0	48,915	48,915

## E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Amount achieved during this monitoring period (t CO <sub>2</sub> e)	Amount estimated ex ante for this monitoring period in the PDD (t CO <sub>2</sub> e)
48,915	55,443

**E.5.1. Explanation of calculation of “amount estimated ex ante for this monitoring period in the PDD”**

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The amount estimated ex ante for this monitoring period is calculated as: 55,443 tons.

**E.6. Remarks on increase in achieved emission reductions**

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The actual ERs is less than estimated in the PDD.

**E.7. Remarks on scale of small-scale project activity**

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Not applicable.

## Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
07.0	31 May 2019	Revision to: <ul style="list-style-type: none"> <li>• Ensure consistency with version 02.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN);</li> <li>• Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period;</li> <li>• Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes;</li> <li>• Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods;</li> <li>• Make editorial improvements.</li> </ul>
06.0	7 June 2017	Revision to: <ul style="list-style-type: none"> <li>• Ensure consistency with version 01.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN);</li> <li>• Make editorial improvements.</li> </ul>
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> <li>• Include provisions related to delayed submission of a monitoring plan;</li> <li>• Provisions related to the Host Party;</li> <li>• Remove reference to programme of activities;</li> <li>• Overall editorial improvement.</li> </ul>
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> <li>• Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0));</li> <li>• Include provisions related to standardized baselines;</li> <li>• Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1;</li> <li>• Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>;</li> <li>• Editorial improvement.</li> </ul>
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB 70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01.0	28 May 2010	EB 54, Annex 34. Initial adoption.



<i>Version</i>	<i>Date</i>	<i>Description</i>
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