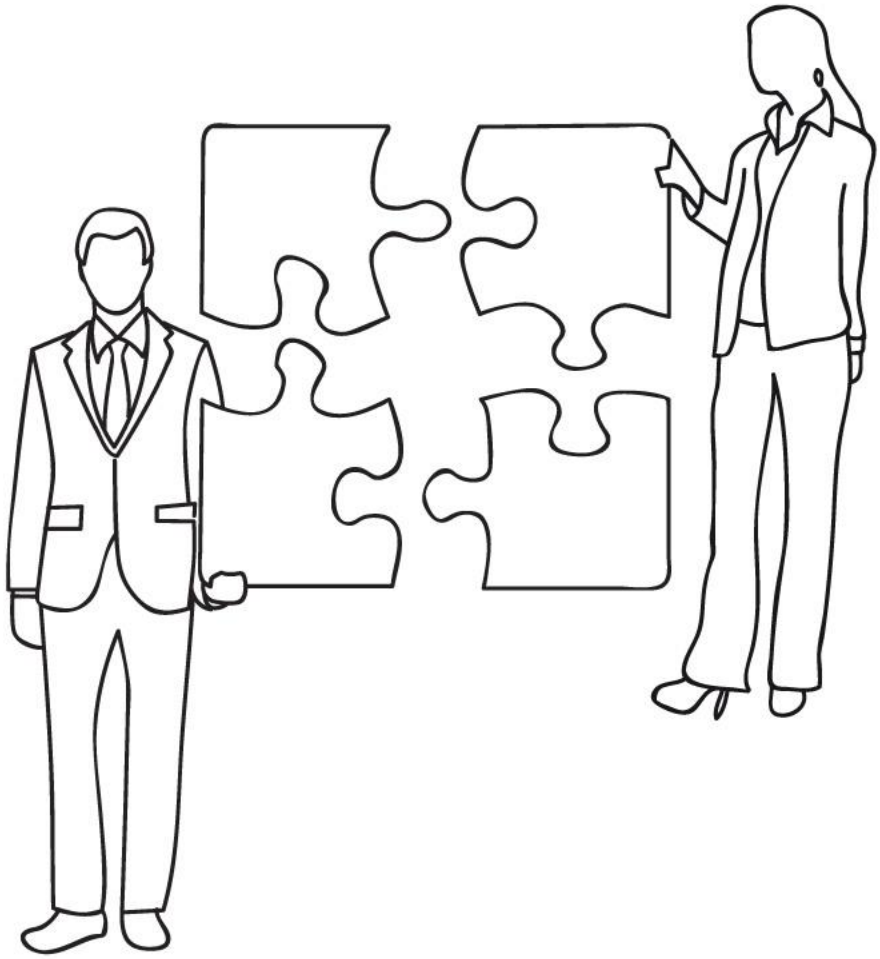
Report

2017 Annual Environmental Report - OCTP Phase 2



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PREPARED BY:	**CHECKED BY:**	**REVIEWED BY:**	**APPROVED BY:**
Serwaa Akpene Anaglate HSE Engineer	Margarita Kuzmina Env. Coordinator	Murad Khan HSEQ Manager	Ruiu Giancarlo Managing Director

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REVISION SHEET

Rev.	Date	N. pages	Change Description	Prep.	Checked	Reviewed	Apr.
0	03/04/2017	38	First issue	S. Anaglate	M. Kuzmina	M. Khan	G. Ruiu

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1 OBJECTIVE

This report is in accordance with the requirements of the following documents:

- Environmental Protection Agency (EPA) Permit to continue the Construction of the Onshore Receiving Facility, Installation and Commissioning of infrastructure for the Offshore Cape Three Points (OCTP) Phase 2 project at Sanzule issued on 1st March 2017 (Permit no. CE00217801181);
- Regulation 25 of the Environmental Assessment Regulations 1999 (LI 1652).

2 SCOPE

Eni Ghana Exploration & Production ("Eni Ghana") has issued this Annual Environmental Report (AER) to cover its environmental activities from January through December 2017 for Phase 2 of the OCTP project.

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3 REFERENCES

[Ref.A1]	"Eni Ghana IMS"
[Ref.A2]	Environmental and Social Impact Assessment Doc. 000415_DV_CD.HSE.0304.000_00
[Ref.A3]	pln ms hse 020 eni Ghana r00 - Environmental Management Plan
[Ref.A4]	ESL's Environmental Monthly Report for Onshore
[Ref.A5]	GWS Monitoring Reports
[Ref.A6]	EPA - Environmental Permit: CE00217801181

4 ACRONYMS

AER	Annual environmental reports
bbl.	Barrel
CLO	Community Liaison Officer
EIA	Environmental Impact Assessment
EMS	Environmental Management System
EPA	Environmental Protection Agency
EPC	Engineering Procurement Construction
EPIC	Engineering Procurement Installation Construction
ERP	Emergency Response Plan
ESAP	Environment & Social Action Plans
FPSO	Floating Production Storage Offloading
GES	Gas Export Sealine
GNGC	Ghana National Gas Company
GNPC	Ghana National Petroleum Corporation

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HDD	Horizontal Directional Drilling
HSE	Health, Safety and Environment
HSEQ	Health, Safety Environment and Quality
IMS	Integrated Management System
ISO	International Standard Organization
JV	Joint Venture
LTE	Landfall End Termination
MoU	Memorandum of Understanding
NAG	Non Associated Gas
OCTP	Offshore Cape Three Points
ORF	Onshore Receiving Facility
OSRL	Oil Spill Response Limited
POD	Plan of Development
PTW	Permit to Work
TBTs	Tool Box Talks
TTIP	Takoradi-Tema Interconnecting Project
WTN	Waste Transfer Note
WBG	World Bank Group

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5 DEFINITIONS

Company	Eni Ghana employees & assets engaged in the oil & gas operations
Contractor	An outside Company awarded a contract by the Company to perform a defined portion of work or to provide services or facilities
Environmental aspects	Elements of an organization's activities or products or services that can interact with the environment
Environmental impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects
ESHIA	Environmental, Social, Health Impact Assessment. Process for predicting and assessing the potential environmental social and health impacts of a proposed project, evaluating alternatives and designing appropriate mitigation, management and monitoring measures
Incident	Any accident or injury that disrupt the normal operations development. In this definition "near misses" are included.
Near Miss (NM)	An unplanned or uncontrolled event or chain of events that has not resulted in a recordable injury, illness or physical damage or environmental damage but had the potential to do so in other circumstances.

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6 INTRODUCTION

The Offshore Cape Three Points (OCTP) development license is located approximately 60 km off the coast of the Western Region of the Republic of Ghana.

The license is for developing oil and gas and the joint venture (JV) is composed of Eni Ghana Exploration and Production Limited ("Operator") holding 44.444% participating interest (PI) Vitol Upstream Ghana Limited ("Vitol") holding 35.556% (PI), and Ghana National Petroleum Corporation (GNPC) holding 20% (PI) with 15% carried and 5% paid.

Figure 1 presents a schematic of the overall development and approximate location (Phase 2 elements in yellow).

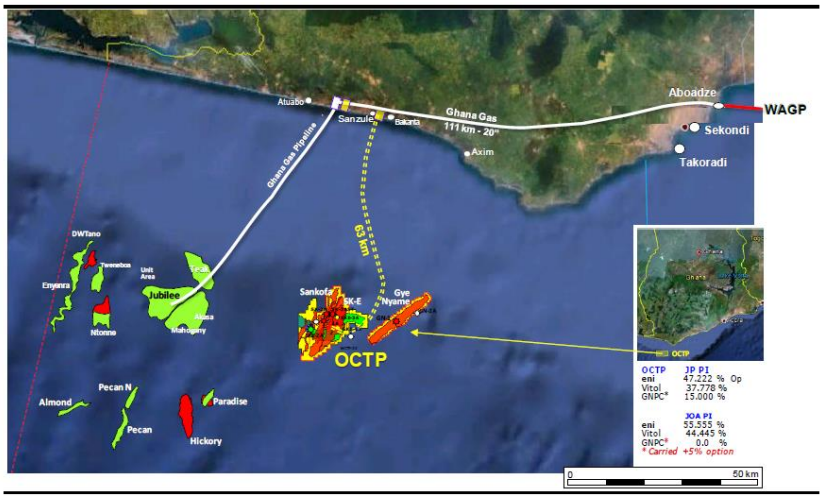

Figure 1: OCTP Block Area

The JV made three non-associated gas (NAG) discoveries: Sankofa Main Field in 2009, Gye Nyame Field in 2011, and Sankofa East Field in 2012. In addition, two oil discoveries were made: Sankofa East Field Cenomanian and Sankofa East Campanian, both in 2012 ("Oil Discoveries"). The estimated volumes in place associated with the discoveries are some 480 MMbbls of oil and 1.5 Tcf of non-associated gas.

The POD approved by the Petroleum Ministry on 30th December 2014 and its amendment approved on 11th May 2015 considered the integrated development of both oil and non-associated gas in 2 Phases:

- Phase 1: Oil Development Project. This phase consists of 14 subsea wells (8 oil producers, 3 water injectors and 3 associated gas injectors), subsea facilities, and

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a new conversion, double-hull floating production, storage and offloading (FPSO) unit that will be located about 60 km offshore, south of Sanzule;

- Phase 2: Non Associated Gas (NAG) Development Project. This phase consists of five (5) subsea wells, subsea facilities, gas treating facilities located on the FPSO unit, 63 km subsea gas pipeline, an Onshore Receiving Facility (ORF), and other associated onshore components. During operations, well fluids will be collected at a dedicated production manifold located on the FPSO where the multiphase fluids will be sent to a slug catcher for initial separation. The gas separated from the other fluids (mainly condensates and water) will then be routed to a dew point control system to achieve the required export specification ensuring no flow assurance problems. The treated gas will then be exported to shore via a new subsea pipeline. Onshore, the gas will be received at an ORF and then sent to the existing Ghana National Gas Company (GNGC) sales pipeline.

The Phase 2 Gas Development Project Environmental Impact Assessment (EIA) process was undertaken by ERM. Submission of the Final EIS to Ghana Environmental Protection Agency (Ghana EPA) was done on July 8th 2015 and the first Environmental Permit for the Phase 2 Development released on July 24th 2015. The permit was renewed on 1st March 2017.

This AER provides the description of the Eni Ghana's environmental activities in 2017 for Phase 2 of the OCTP project.

6.1 ONSHORE RECEIVING FACILITY (ORF)

After the NAG treatment in the FPSO (i.e. dew point control) gas will then be sent to the "ORF". The ORF is located in the Sanzule area of the Ellembelle district in the Western Region will be designed to compress a maximum of 405 MMSCFD, to handle the gas from the FPSO (190 MMSCFD plus 10% overdesign) in addition to gas potentially arriving into the export sealine from other pipelines under the charge of other potential operators. The ORF will be designed to receive and compress also lean gas coming from the GNGC Atuabo gas plant, through the existing pipeline that will be commingled at Sanzule and sent again to the GNGC pipeline, allowing the necessary pressure to arrive at Aboadze Power Plant.

Eni Ghana's activities in 2017 were covered by two (2) Environmental permits. The Permits are:

Existing Permits in 2017

- Environmental Protection Agency (EPA) Permit to undertake the proposed

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Construction, Installation and Commissioning of Offshore and Onshore (Gas Receiving Facility) infrastructure for the OCTP Block Phase-2 Development issued on July 24th, 2015 with validity until 28th February 2017 (Permit no. CE00217801152);

New Permit acquired in 2017

- Environmental Protection Agency (EPA) Permit to continue the Construction of the Onshore Receiving Facility, Installation and Commissioning of infrastructure for the Offshore Cape Three Points (OCTP) Phase 2 project at Sanzule issued on 1st March 2017 and valid till 27th August 2018 (Permit no. CE00217801181).

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8 OPERATIONAL SUMMARY AND EVENTS

8.1 STATUS OF ORF CONSTRUCTION

The Early Works were completed and the EPIC Contractor, Technip mobilized at site in January 2017. Civil work and piperack and steel structures erection were started and remain ongoing, electrical works started in December 2017. Compressors for Train 1 and 2 were delivered at site respectively on 15th November 2017 and 24th September 2017, both already installed on relevant foundations. Train 3 compressor was delivered to Siemens in the Netherlands for skid assembly, planned to be at site in July 2018.

The project experienced about 4 months delay in the preliminary stages (2 waiting for GNPC comments on the FEED and 2 for the final decision of the Authorities/GNGC on whether the 3rd compression Train was part of the firm layout or not). Current productivity in construction activities is much lower than expected and huge effort from EPIC Contractor and Subcontractors, as well as, higher skilled manpower mobilization is required in order to catch up the delay accumulated and cope with the project targets.

Permanent camp (not critical for First gas but only for logistics reasons) is also in delay respect to the original plan.

First gas is expected within 2Q 2018. Figure 2 below shows the current status of the ORF.

Figure 2: Overview of ORF

8.2 STATUS OF OTHER WORKS RELATED TO PHASE 2

- **Gas Export Sea-line supply**

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All line pipes (~64 km) completed, including the concrete coating at the plant assembled in Takoradi. Last buckle arrestors will be delivered in Ghana in January 2018. Coating plant being disassembled and shipped back to Brazil.

- **Sea-line (Transportation and Installation)**

Pipeline End Termination (PLET) fabrication and hydrotest completed, preparation for SIT in progress. Jumper fabrication completed, preparation for shipment was performed by end 2017 and will continue in 2018. Fabrication of Pig launcher/receiver was ongoing as per plan. Main Construction Vessel "Star Centurion" and Light Construction Vessel "Simar Esperanca" started their "sail away" in December 2017 and was on site in January 2018.

Horizontal Directional Drilling (HDD) for shore approach started on 21st December, as of end of December, 204 m (out of 1,020 m) were drilled, activities are planned to be completed by early 2018.

- **Takoradi - Tema interconnecting project (TTIP)**

EPC contract awarded on 1st August 2017. Surveys in the 3 sites completed, engineering work was ongoing in December 2017 and it is supposed to be closed in April 2018.

The TTIP works is covered by GNGC and WAPCO environmental permits.

8.3 COMPLETIONS ACTIVITIES OF NAG WELLS

Completion activities of 4 NAG wells is covered under Environmental Permit to continue the Construction of the Onshore Receiving Facility, Installation and Commissioning of infrastructure for the Offshore Cape Three Points (OCTP) Phase 2 project at Sanzule issued on 1st March 2017 (Permit no. CE00217801181) whereas completion activities on remaining 14 wells were covered under Environmental Permit obtained for Phase 1 of the OCTP project (Permit nos. CE00217801146, CE00217801179 & CE0021780218). The main data of the NAG wells operations for 2017 are summarized in the table below:

Name	Type	Reservoir	WD [m]	Start date	Deviated/ Vertical	Total depth [mMD]
SNK-D (XT installation)	Gas Producer	Campanian	959	2nd October 2017	Deviated	2,908
SNKE-D (XT installation)	Gas Producer	Campanian	943.6	4th October 2017	Deviated	2,808
SNKE-C (XT installation)	Gas Producer	Campanian	820.6	28th October 2017	Deviated	2,755

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Name	Type	Reservoir	WD [m]	Start date	Deviated/ Vertical	Total depth [mMD]
SNK-2A ST2 (XT installation)	Gas Producer	Campanian	864	29th October 2017	Deviated	2,787

Table 1: Status of NAG wells

The drillship used was the Maersk Voyager. Figure 3 illustrates the OCTP Phase 2 schematic layout.

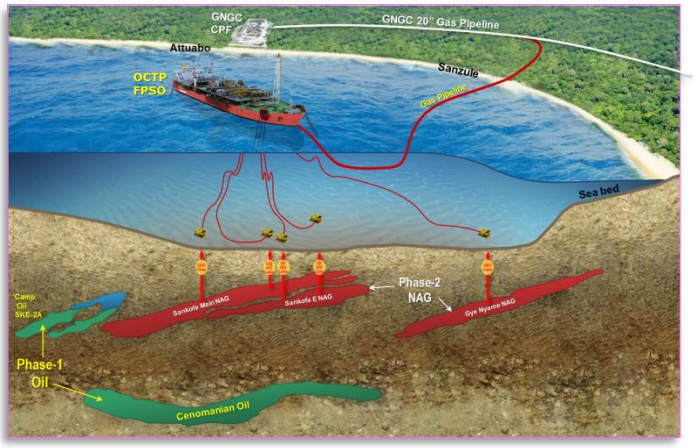

Figure 3: Schematic Layout-Phase 2

Completion activities so far were conducted without any environment related incident.

8.4 DRILLING EQUIPMENT

The drillship, Maersk Voyager which started operations in July 2015, continued completion activities in 2017. It is a double derrick dynamically positioned drilling ship. Its position and location is guaranteed by thrusters and GPS systems. A picture and a summary of the specifications of the drillship are provided in Figure 4 below.

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Name	Owner	Rig Type	Maximum Rated Water Depth (m)	Maximum Drilling Depth (m)
Maersk Voyager	Maersk	Drilling Ship	3, 657	12, 190

Figure 4: Maersk Voyager

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9 ENVIRONMENTAL MANAGEMENT

9.1 ENVIRONMENTAL MANAGEMENT STRUCTURE

Eni Ghana is committed to follow and comply with all applicable legal and regulatory requirements on its operations. Above that, Eni Ghana considers environmental protection as an engine of a continuous improvement process that guarantees achievements over time. For this reason, Eni Ghana has developed a set of guidelines that clearly include Company's principle on managing Environmental matters. The HSE Department is in charge of Environmental Management. In order to manage environmental related risks, the Company implements a series of practices from the identification of risks and assessment of impacts to developing appropriate standards, the implementation of environmental management plans, procedures, work instructions and control of effectiveness of these through continual monitoring and periodic auditing and inspections of procedures and operational sites to ensure compliance, communicate responsibilities and monitoring.

The environmental management plans are implemented through the Company's HSE Integrated Management System (IMS). Eni Ghana's HSE IMS is applicable to all Company's activities and within this framework, all Environmental Impact Assessment (EIA) studies, Environmental Management Plans and programmes (including specific procedures and plans) and other formal documentation are implemented in order to assure that all requirements contained in these documents are adequately managed. Since December 2010, Eni Ghana has been certified in accordance with the Environmental Management System-EMS (ISO 14001) standard. ISO 14001, is an internationally agreed standard that sets out the requirements for an environmental management system and helps organizations improve their environmental performance. This permits Eni Ghana to implement proactive environmental objectives and manage activities through the best practice tools. The EMS regularly confirms compliance by an independent authorized certification body which verifies and endorses full alignment with the requirements of international standards for Environmental Management. In 2017, a surveillance audit for verifying if the system is still in compliance with ISO 14001 requirements was conducted. Moreover the system is being upgraded to adapt to new version of version 2015.

Further, in 2017, top management provided leadership and direction to ensure the Company was operating in an environmentally responsible manner.

A number of management plans have been developed for specific environmental issues. In

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2017, majority of these plans were extensively implemented in 2017. Some of these plans include:

- Environmental Management Plan;
- Onshore Pollution Prevention and Control Management Plan;
- Bushmeat Action Plan;
- Traffic Management Plan;
- Water Management Plan;
- Environmental Monitoring Program;
- Biodiversity Management Plan;
- Avian Biodiversity Action Plan;
- Sea Turtles Biodiversity Action Plan;
- Flora Conservation Plan;
- Reinstatement and Revegetation Standard;
- Prevention & Control of Alien Invasive Species;
- Topsoil Management Plan; and
- Waste Management Plan.

Among others, these plans generally deal with the below listed environmental issues:

- Water Pollution;
- Traffic Management;
- Sea Turtles;
- Emissions (air, Noise etc.);
- Traffic issues;
- Biodiversity Management;
- Wildlife Protection;
- Waste Management;
- Oil and chemical spills.

Although a Hydrotest Water Disposal Management Plan was developed, implementation of the plan is not foreseen until 2018 as the scope of this plan (Hydrotest activity of the 63 km Gas Export Pipeline will be done in 2018).

9.2 ENVIRONMENTAL MONITORING

Eni Ghana's operations have environmental aspects that have associated environmental impacts which have to be adequately monitored to ensure local environmental quality and

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ecological conditions are preserved. Monitoring programs were necessary to ensure discharges and emissions from operational activities meet regulatory limits for various environmental parameters and where there are exceedances, measures are put in place to achieve compliance. In order to efficiently carry out this essential environmental function, two contractors were in place to conduct offshore environmental monitoring. This was done in order to ensure compliance with regulatory requirements, comply with WBG requirements as well as evaluate the effectiveness of operational controls and other measures intended to mitigate potential impacts.

In 2017, monitoring focused on:

- Groundwater quality;
- Surface water quality;
- Sewage Discharge;
- Waste management;
- Wildlife Management;
- Air emissions;
- Noise emissions;
- Conservation of flora and fauna;
- Topsoil Management;
- Traffic Management

This was done in order to evaluate the effectiveness of operational controls and other measures intended to mitigate potential impacts associated to the project as well as to ensure compliance with regulatory requirements.

9.2.1 Ecosystem Services Monitoring (Flora Conservation)

To ensure that construction activities do not unduly disrupt ecosystem provisioning services, Eni Ghana conducted monitoring of ecosystem services of the ORF and associated infrastructure through its Contractor ESL. The main objectives of this activity were to ensure that:

- Collection and/or selling of plant specimens by employees of the Company are forbidden.
- Community has access to the ecosystem services that is, provisioning services and regulating services (e.g. access water and harvesting wood within the Concession area).
- Trees of economic value that will be cleared along the footprint area are managed

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in accordance with the Ghanaian Legislation (Timber Resource Management Act, 1997 – Act 547).

- The removed vegetation and biomass will be set aside as to not disturb the preliminary site preparation activities and will be made available to the community for use through traditional leaders.

9.2.1.1 Nursery

As part of the Reinstatement and Revegetation Plan (RRP), a nursery was constructed. The methodology for the nursery was a monitoring exercise that entailed collection of seeds and making of cuttings of endangered species which were in the concession during the preconstruction survey. Seeds of Carpolobia lutea, were collected and cuttings also made from its soft tissues. Other shrubs whose seed were collected were Rauvolfia cumminsii, Carpolobia lutea, Baphia pubescens , Smeathmania pubescens, Syzygium guineense. These were taken from the Secondary thickets or secondary forest reference within the concession.

Currently, about five hundred propagules (Seeds/Cuttings /Seedlings) are being nursed at the Botanical Gardens of the University of Ghana.

The well-constructed Nursery covers an area of approximately one hundred and nineteen square meters. It has fixed shelves, which can take approximately one hundred and forty-four seedlings per pallet. Below are some pictures from the nursery.

Figure 5: Cuttings of varied species that have developed leaves

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Figure 6: A view from the nursery

9.2.2 Topsoil Management

Topsoil condition were monitored to ensure suitability for reinstatement as well as assess the potential evolution of erosion sources and processes, and to observe and record loss of natural vegetation and habitats in the Project area. The figure below shows monitoring activities being done on the topsoil.

Figure 7: Topsoil Management

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9.2.3 Avian Monitoring

The Amanzuri IBA in which the project is situated is an important wintering grounds for several birds including the Sanderlings. During the Avian Pre-construction Survey (2015), a large congregation of birds was observed at Amanzuri River Estuary. In a quest to monitor the impact of Eni Ghana's activities on the large population of birds that are present around the concession area, Ghana Wildlife Society was contracted to perform periodic avian activities.

9.2.4 Avian Monitoring

Ghana Wildlife Society (GWS) was contracted by Eni Ghana Exploration and Production Ltd. to monitor the impacts of the company's activities on sea turtles. This monitoring was conducted periodically and it involved the following aspects:

- Beach monitoring activities throughout the peak nesting season (between late August and February with an extension to June);
- Monitoring just after sunrise for best viewing of crawls as turtle track signs begin to deteriorate as the sun dries up the sand;
- Undertaking night patrols to collect data and also to deter poachers and record any of their activities;
- Counting and photographing all crawls regardless of age. Photographs taken of adult females to confirm identification (care taken not to alter nesting behaviour and use of camera flash must be avoided);
- Movement by volunteers along the beach at the level of the last high tide;
- Marking crawls that have been recorded by sweeping feet across the tracks. This will avoid double counting in subsequent days; and
- Ground truthing to be undertaken by a competent sea turtle specialist.

9.2.5 Air Quality Monitoring

The following tables below illustrates values of air quality monitoring performed each month during the 2nd half of 2017 as well as emissions generated as a result of diesel consumption at the ORF. Further, during the reporting year, hydrocarbons used for power generation at the ORF was monitored. Emissions generated as a result of fuel consumption were calculated using SHERPA, an excel based tool developed by the Eni Upstream for accounting air emissions.

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The SHERPA tool is to collect, manage and consolidate air emissions allowing accounting for GHG emissions, in addition to other air pollutants (SOx, NOx).

Site	Emission Source	Parameter (t)					
		NOx	CO_2	CH_4	CO	nmVOCs	SO_2
ORF	Generator	13	964	0	0	0	7

Table 2: Emissions Data

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June						
Parameter	24-hr Average Concentration				Ghana EPA (1) (24hour time weighted average)	WBG/IFC Guidelines (2007)
	ORF	Accommodation	Helipad	Pipeline		
NO2 (µg/m3)	30.19	37.10	0.63	31.11	150 (24-hour)	40 (annual) 200 (1-hour) -
SO2 (µg/m3)	25.5	77.27	106.42	25.43	150 (24-hour)	20 (24-hour) 500 (10-minute) -
PM10 (µg/m3)	5.53	21.49	4.35	11.21	70 (24-hour)	20 (annual) 50 (24-hour)
TSP (µg/m3)	3.72	23.63	2.53	8.12	150 (24-hour)	-
VOC (ppm)	0.00	0.00	0.00	0.00	-	-

July					
24-hr Average Concentration				Ghana EPA (1) (24hour time weighted average)	WBG/IFC Guidelines (2007)
Parameter	Accommodation	Sanzule cemetery	Anwolakrom		
NO2 (µg/m3)	26.86	24.77	1.42	150 (24-hour)	40 (annual) 200 (1-hour) -
SO2 (µg/m3)	43.67	22.39	15.27	150 (24-hour)	20 (24-hour) 500 (10-minute) -
PM10 (µg/m3)	3.83	17.78	18.44	70 (24-hour)	20 (annual) 50 (24-hour)
TSP (µg/m3)	5.92	25.52	26.11	150 (24-hour)	-

August							
Parameter	24-hr Average Concentration					Ghana EPA (1)	WBG/IFC Guidelines (2007)
	Accommodation	ORF	Helipad	Sanzule Cemetery	Anwonakrom	(24hour time weighted average)	
NO2 (µg/m3)	4.94	22.98	19.45	0	0	150 (24-hour)	40 (annual)
							200 (1-hour)
SO2 (µg/m3)	18.23	13.85	0	10.55	1.99	150 (24-hour)	20 (24-hour) 500 (10-minute)
PM10 (µg/m3)	5.53	6.05	4.6	10.27	9.02	70 (24-hour)	20 (annual) 50 (24-hour)
TSP (µg/m3)	8.05	8.85	14.18	14.21	12.4	150 (24-hour)	-

Table 3: Data from Air Quality Monitoring 1

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September							
Parameter	24-hr Average Concentration					Ghana EPA (1) (24hour time weighted average)	WBG/IFC Guidelines (2007)
	Accommodation	ORF	Helipad	Sanzule cemetery	Anwolakrom		
NO2 (µg/m3)	3.58	0.59	0	3.89	12.84	150 (24-hour)	40 (annual) 200 (1-hour) -
SO2 (µg/m3)	23.79	10.64	14.66	27.44	50.51	150 (24-hour)	20 (24-hour) 500 (10-minute) -
PM10 (µg/m3)	9.11	24.38	12.77	45.01	45.72	70 (24-hour)	20 (annual) 50 (24-hour)
TSP (µg/m3)	6.17	12.28	8.85	39.51	32.08	150 (24-hour)	-

October						
Parameter	24-hr Average Concentration				Ghana EPA (1) (24hour time weighted average)	WBG/IFC Guidelines (2007)
	ORF	Helipad	Sanzule cemetery	Anwolakrom		
NO2 (µg/m3)	6.4	3.578	11.16	16.25	150 (24-hour)	40 (annual) 200 (1-hour) -
SO2 (µg/m3)	26.64	13.54	43.33	113.64	150 (24-hour)	20 (24-hour) 500 (10-minute) -
PM10 (µg/m3)	6.82	7.78	16.13	15.15	70 (24-hour)	20 (annual) 50 (24-hour)
TSP (µg/m3)	16.7	18.06	31.4	30.04	150 (24-hour)	-

November							
Parameter	24-hr Average Concentration					Ghana EPA (1) (24hour time weighted average)	WBG/IFC Guidelines (2007)
	ORF	Helipad	Workshop	Sanzule Cemetery	Anwonakrom		
NO2 (µg/m3)	4.76	2.68	24.75	2.49	3.20	150 (24-hour)	40 (annual) 200 (1-hour)
SO2 (µg/m3)	9.69	11.91	18.78	19.68	16.44	150 (24-hour)	20 (24-hour) 500 (10-minute)
PM10 (µg/m3)	4.24	3.80	12.82	11.61	23.81	70 (24-hour)	20 (annual) 50 (24-hour)
TSP (µg/m3)	10.85	9.76	20.44	26.33	35.21	150 (24-hour)	-

December							
Parameter	24-hr Average Concentration					Ghana EPA (1) (24hour time weighted average)	WBG/IFC Guidelines (2007)
	ORF	Helipad	Workshop	Sanzule Cemetery	Anwolakrom		
NO2 (µg/m3)	0.46	0.00	2.93	0.03	1.41	150 (24-hour)	40 (annual) 200 (1-hour)
SO2 (µg/m3)	9.69	11.91	18.78	19.68	16.44	150 (24-hour)	20 (24-hour) 500 (10-minute)
PM10 (µg/m3)	19.31	13.07	28.28	19.27	20.73	70 (24-hour)	20 (annual) 50 (24-hour)
TSP (µg/m3)	39.67	24.03	64.48	51.29	29.97	150 (24-hour)	-

Table 4: Data from Air Quality Monitoring

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9.2.6 Groundwater Quality Monitoring

Parameter	pH	Temperature	Conductivity	Salinity	Resistivity	ORP	Turbidity	TDS	DO
Unit	pH units	°C	µS/cm	PSU	Ωcm		NTU	mg/l	mg/l
June									
GW 02	7.65	27.8	2099	1.06	476	124	< 1.00	1049	2.99
GW 03	7.49	28.7	1854	0.93	539	141	< 1.00	927	2.77
July									
GW 02	7.95	27.9	1514	0.76	661	795	< 1.00	757	3.51
GW 03	7.42	28.2	1224	0.6	817	189	< 1.00	612	2.77
August									
GW 02	7.35	28	1378	0.68	726	141	< 1.00	689	3.55
GW 03	7.7	28.14	1236	0.61	809	85.3	< 1.00	618	3.6
September									
GW 02	7.67	28	1451	0.72	689	124	< 1.00	726	4.05
GW 03	7.72	28.1	1413	0.7	708	128	< 1.00	706	2.91
October									
GW 02	7.74	28.2	1433	0.71	698	115	< 1.00	717	1.4
GW 03	7.37	28.4	1742	0.88	573	110	< 1.00	873	1.39
November									
GW 02	7.65	28.5	1370	0.7	720	420	< 1.00	625	2.4
GW 03	7.37	28.4	1650	0.82	905	195	< 1.00	825	1.55
December									
GW 02	7.4	29.1	933	0.50	1064	206	< 1.00	597	2.96
GW 03	7.58	29.1	726	0.40	1344	227	< 1.00	465	2.85

Table 6: Groundwater Quality Monitoring

A map showing the precise location of all monitoring points is illustrated in the figure below:

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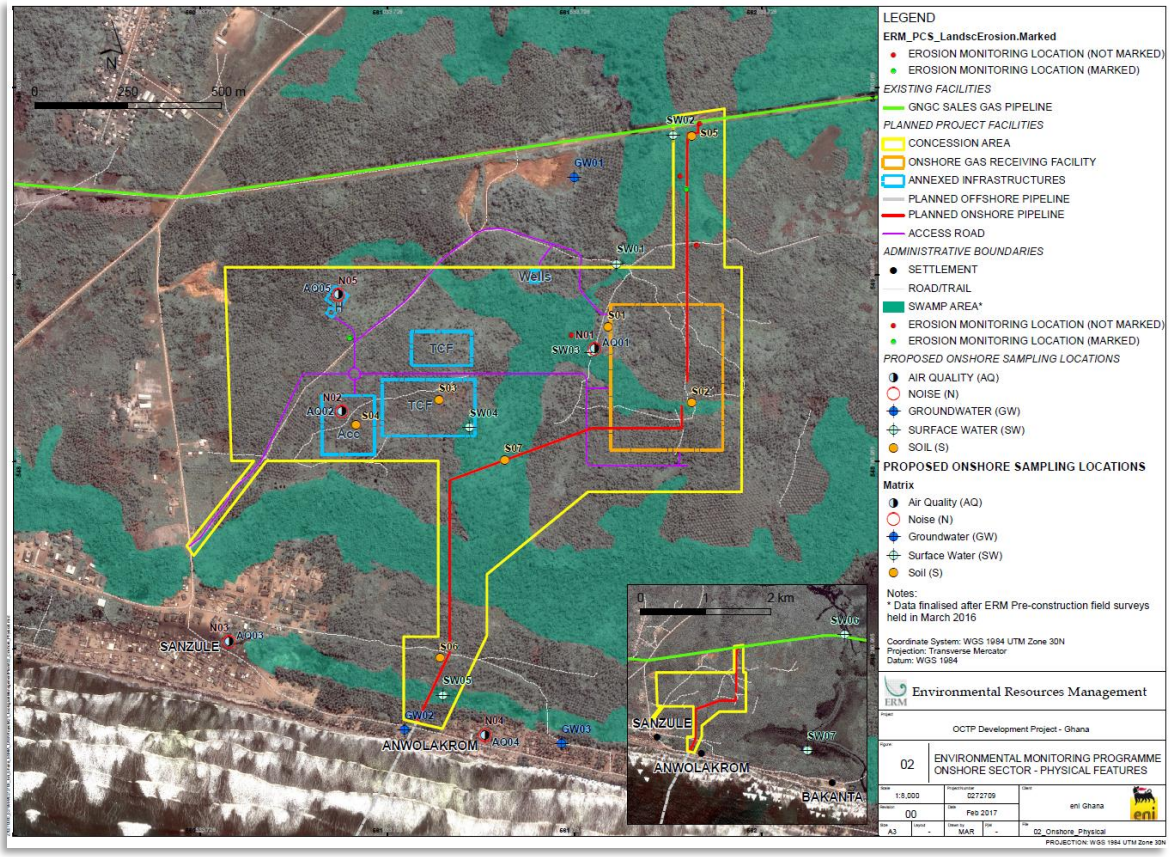

Figure 8: Map of ORF sampling points

9.2.7 Water Used & Discharged

Table 6 & 7 below illustrates quantities of water used, purpose of use, source of withdrawal and discharged volumes at the ORF.

Use	Source	Volume of Water Used (m^3)
Domestic	Company Water Wells	3053.31
Construction	Company Water Wells	1148.73
Domestic & Construction	Municipal Water (Purchased)	476
Dust Suppression	Company Water Wells	9097
Dust Suppression	Surface Water	268

Table 7: Water Used

Type	Water Quantity Generated (m^3)	Disposal Option
Waste Water	317	Treatment
Septic Waste	851.84	Treatment

Table 8: Waste Water Treated

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9.2.8 Waste Management

Waste generated during 2017 was managed as stated in the Technip's Waste management. The primary aim of Technip's waste management strategy is to protect the environment and human health against the potentially harmful effects of waste generated as a result of its activities. The strategy is based on key principles of pollution prevention such as:

- Reduction at source: the initial material is provided in precise quantity to avoid any production of waste;
- Re-use: the waste is re-used for another activity;
- Return: the waste is sent back to the vendor/supplier who will reuse or recycle it;
- Recycling: the waste is sent to be transformed for another use; and
- Treatment or disposal: ultimately the waste is disposed in an environmentally friendly manner by an approved 3rd Party waste contractor to approved waste disposal facility

Technip employed a practice of segregating waste into six (6) waste categories i.e. (hazardous, general, plastic, wood waste and metal scrap and spill kit). To ensure effectiveness of the waste management strategy, appropriate identification and segregation of waste streams was adhered to. To facilitate this, color coded containers as described in the figure below was at all operational sites.

Colour	Collection Location
	GENERAL WASTE
	HAZARDOUS
	SCRAP METAL
	WOOD
	PLASTIC WASTE
	SPILL KIT

Figure 9: Colour Coding for Waste Management

9.2.8.1 Waste Quantities Generated and Discharged

At the ORF, waste produced are stored temporarily in suitable bins placed at vantage points. The Contractor HSE supervisor on-site prepares Waste Transfer Note (WTN) which is then verified by the Company HSE Supervisor. The WTN prepared has the following

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details:

- Description of the waste (plastic, paper, source of waste);
- Name and signature of Contractor HSE Representative;
- Name and signature of waste disposal Company Representative;
- The quantity of waste transported (directly measured/estimated in volume (m3));
- Transportation Vehicle No.

The waste is hauled from site by the waste management contractor (a task which was previously completely done by Zoomlion Ghana Ltd. Currently however, Zoomlion is in charge of cleaning of the portable toilets whereas Zeal is in charge of collection and treatment of all other forms of waste) for final disposal/treatment. Main treatment options used were:

- Recycling;
- Re-use;
- Disposal to Landfill;
- Treatment.

A waste register (waste log) and copies of all WTNs that have been produced from the site are maintained by Contractor HSE personnel (Environmental Officer) and verified by on-site Company HSE representative.

Sewage and waste water from all facilities are collected once every week by the Waste Management Contractor and sent to a Sewage Treatment Facility within the Western Region for treatment. All sewage discharges are recorded in a Sewage record book.

Waste Type	Quantity Generated	Unit	Treatment Option	Contractor In Charge of Disposal
Hazardous Waste	364	kg	Treatment	Zeal Env. Services
Plastics Waste	18691.2	kg	Recycling	Zoomlion
Mixed Domestic Waste	48985.9	kg	Disposal to Landfill	Zoomlion
Scrap Metal	10.22	tons	Re-used	-
Septic Waste	851.84	m^3	Treatment	Zoomlion/Zeal Env. Services
Waste Water	317	m^3	Treatment	Zoomlion/Zeal Env. Services
Wood Waste	1821	kg	Re-used	-
Concrete & Const. Waste	18.78	kg	Disposal to WMP contractor	Zoomlion/Zeal Env. Services
Waste Oil	0.2	m^3	Treatment	Zeal Env. Services
Other Non-Hazardous Waste	135071.4	kg	Disposal to Landfill	Zoomlion/Zeal Env. Services

Table 9: Waste Generated

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9.3 ENVIRONMENTAL INITIATIVES

In 2017, new initiatives and additional managerial efforts were implemented to affect positively environmental aspects. These initiatives included:

- Oil Spill Response Tactical Maps Development – Completed during the year involving Oil spill Response Limited (OSRL) UK;
- Oil Spill Response Trainings were carried out for both employees and some regulatory staff;
- Environmental Coordinator employed and in place;
- Development of Spatial bird map by GWS as per Avian BAP;
- Replaced original landfall construction methodology consisting of an open trench due the impacts on the environmental and social receptors in the surrounding area. The trenchless Horizontal Directional Drilling (HDD) option would eliminate disturbance to swamp (i.e. closest to existing LTE), no loss to the nesting habitat of the sea turtles. The HDD option will further minimize noise and access path disruption to the communities nearby as well as minimizing adverse environmental effects from conventional trenching/dredging operations;
- Extensive environmental awareness sessions were conducted for all project personnel;
- Two (2) Environmental Monitoring Contractors were in place to conduct periodic environmental monitoring;
- Minivans introduced for personnel transportation – This initiative served to minimize the number of vehicles on roads and thus minimized fuel consumption and GHG emissions;
- All aged (old) vehicles were replaced with newer ones which are fuel efficient;
- HSE observation and stop work cards system also introduced; and
- Effective utilization of IVMS (In-Vehicle Monitoring System) – This allowed good control of vehicles by reducing unnecessary km driven thereby reducing the fuel consumption, dust generation and emissions.

9.4 INSPECTIONS AND AUDITS

In line with ESHIA Phase 2, Eni Ghana provided periodic audits and inspections. Eni Ghana carried out periodic audits and inspections. HSE inspections were conducted on a regular basis at the ORF site. These included both physical condition inspections as well as procedural audits. Eni Ghana assigned a dedicated HSE team at the ORF to ensure that Eni's expectations, compliance activities, and HSE procedures were adhered to onsite. Below are the tasks performed by the HSE team at the ORF:

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- Ensure that Tool-Box Talk are properly carried out, recorded and filed by Contractor;
- Responsible for inducting all Company personnel, visitors and direct company sub-contractors on their first visit to the ORF as well as proper use, storage and record of PPE;
- Ensure that only qualified and competent people, as well as certified lifting equipment are used on-site;
- Review of Permit to Work (PTW) and Job safety Analysis (JSA)/Risk assessment (RA) prepared by the contractor before works are executed;
- Audit of the issued permits on-site to ensure enforcement/implementation of all outlined control measures at the operational areas;
- Area inspections conducted on a daily basis at all areas (LTE area, Water Well, Helipad, Main access road, ORF, Accommodation area). Issues identified were communicated to Contractor HSE for immediate rectification;
- Enforce and ensure the implementation of all outlined standards in the Contractor HSE Plan, Waste Management Plan, Emergency Response Plan (ERP), Traffic Management Plan, Environmental Management Plans;
- Prepare daily & monthly HSE reports on operations at the ORF;
- Incidents reporting, investigation and implementation of corrective and preventive actions;
- Conduct Weekly HSE meetings with Contractor;
- Ensuring good housekeeping on-site;

9.4.1 Internal Audit

The following internal audits were conducted in 2017:

- Waste Management Audit on Technip – September, 2017
- HSE Audit on Technip at the ORF –September 2017;
- Legal & Compliance Review for ORF - November 2017;
- HSE Audit performed on all SRI EMAS facilities – November 2017.

9.4.2 External Audits

- In May 2017, Eni HQ carried out an HSE assessment of the ORF in Sanzule;
- In September 2017 Eni HQ TEAM performed an EMERG operational Audit

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to assess the Emergency Preparedness & Response of eni Ghana

- In November 2017, RINA surveillance audit (ISO 14001 & OHSAS 18001) was conducted for the ORF.
- In February & September 2017, WBG independent auditors conducted 2 audits of OCTP project.

10 ENVIRONMENTAL INCIDENTS

No environmental incidents occurred during the reporting 2017.

11 SAFETY EXCLUSION ZONE

Consistent with industry practice and acquired Environmental Permits, a 500m radius safety exclusion zone was established around the FPSO and Rig during operational activities. However, the safety exclusion zone was not kept clear of fishermen. There were several instances where fishing boats using fishing lines were spotted at both starboard and port side. Recording of boats were done in the morning and evening. Eni Ghana with the support of its chase vessels, is trying to keep these Fisherman boats out of the safety exclusion zone. Discussions are ongoing in an attempt to draw up a Memorandum of Understanding (MoU) with the Ghana Navy.

12 EMERGENCY PREPAREDNESS

In 2017, Eni Ghana put in place an Emergency Response Plan to:

- Minimise negative consequences to human life, environment, eni ghana assets and business in case of an emergency situation, and eni reputation by an effective and efficient response;
- Ensure the availability of adequate information on emergency situations through a good communication system and at all levels;
- Ensure efficient management of the emergency through all available and dedicated resources.

The ERP covers all stages and phases of the emergency response, from initiation until the emergency is over and the normalization phase has started.

The Oil Spill Contingency Plan (OSCP) was also in place to offer guidance on the necessary actions to prevent and/or minimise any oil spillages and to mitigate any negative effects. Eni Ghana also utilized the services of Oil Spill Response Limited (OSRL) to carry out

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training exercises and inspections to further improve oil spill awareness and capability for both in house personnel, third party contractors, regulatory bodies and community members. Below is a summary of activities conducted on oil spill response during 2017:

- Ariel surveillance/oil quantification;
- IMO3;
- IMO2;
- Dispersant Package training;
- 3Ter (vessel tracking);
- Oil Spill Contingency and Response (OSCAR)

13 SUSTAINABILITY & COMMUNITY ENGAGEMENT ACTIVITIES

In 2017, Eni Ghana was committed to operating and acting in accordance with laws, rules of fair competition, honesty, integrity, transparency and good faith, with due respect to the legitimate interests of its employees, shareholders, commercial and financial partners, industry associations, communities and legitimate institutions, governments and their agencies. A fundamental value exhibited in 2017 was respecting the local communities and people impacted by its business. Proper management of the social impacts of its operations was critical to the growth and sustainability of the business. Broadly, milestones achieved in 2017 are listed below in the sections.

13.1 COMMUNITY ENGAGEMENTS

A series of interactions with communities' key influencer groups, individuals and institutions in Accra and Takoradi were made providing the possibility for stakeholders to become acquainted with the project, to understand its potential impacts and proposed mitigation and management measures and finally for the affected community and interested public, to raise concerns and issues.

13.2 LIVELIHOOD RESTORATION PLAN

The Livelihood Restoration Plan food distribution was re-aligned in the first quarter of 2017 to focus only on 200 Project Affected Persons in Sanzule community. The period under review saw the distribution of more than 56 tons of food to affected households (HHs) aimed at sustaining their livelihoods and preventing impoverishment as a result of the land take for the Onshore Receiving Facilities (ORF) in Sanzule. LRP Food support was delivered

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in January and March and not in February because the distribution period in this month coincided with the final funeral rites of the late Chief of Sanzule, Nana Asafo Boakye II and Abusua Kpanyinli Allan Gyimah.

The Livelihood Restoration Plan food distribution was then re-aligned in the second quarter of 2017 to focus only on 204 Project Affected Persons in Sanzule community. The period under review saw the distribution of more than 65 tons of food to affected HHs aimed at sustaining their livelihoods and preventing impoverishment, as a result of the land take for the Onshore Receiving Facilities (ORF) in Sanzule.

The Livelihood Restoration Plan food distribution continued into the third quarter of 2017. In total, 204 Project Affected Persons in Sanzule community continued to benefit from the food distribution package. Transitional Food distribution for July and August saw the distribution of more than 43.5 tons of food to affected HHs aimed at sustaining their livelihoods and preventing impoverishment as a result of the land take for the Onshore Receiving Facilities (ORF) in Sanzule.

The Livelihood Restoration Plan food distribution continued into the fourth quarter of 2017. In total, 204 Project Affected Households (PAHs) in Sanzule community continued to benefit from the food distribution package. Transitional Food distribution for October, November and December 2017 saw the distribution of more than 65.268 tons of food to affected households aimed at sustaining their livelihoods and preventing impoverishment as a result of the land take for the Onshore Receiving Facilities (ORF) in Sanzule.

13.1 COMMUNITY INVESTMENT STRATEGY

Community Investment Strategy document has been prepared and approved by Eni Ghana, Vitol and WBG in order to presents an outline of the OCTP community investment projects to be implemented in the Project area.

In parallel some Quick Impact Projects (i.e. projects for fast track execution) have been defined as first building block for the Community Investment Strategy in order to contribute and support the affected communities close to the Project area. Water and sanitation quick impact projects have been identified in order to suit one of the primary needs of the communities in the Project area.

Community Water Scheme is the first of the Quick Impact Projects. The project seeks to:

- Assist Sanzule, Krisan and Bakanta in developing sustainable safe and affordable

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drinking water supply for the community.

- Implement pilot potable water schemes through construction, test running, commissioning and handing over to Sanzule, Krisan and Bakanta Local Authorities.

13.2 FISHERIES MANAGEMENT PLAN

The preparation of Fisheries Management Plan (FMP) was initiated to address impacts of livelihoods on fisher folk in Sanzule and Anwolakrom. Socio-economic fisheries survey and organization of fish landing catch participatory survey was conducted from 22nd to 31st March, 2017. The process involved engaging eight fishing companies and over 400 fishermen, fish mongers, coastal gatherers and canoe owners to enable Eni Ghana understand the context of potentially affected communities, capturing specific needs to be considered to address impacts to local people and their livelihoods as a result of the shore line gas pipeline construction. In addition, Eni Ghana is assessing low impact technology i.e. "direct piping" horizontal drilling, as alternative project option to beach trenching for gas pipeline construction.

Fisheries Management Plan was finalized and signed for disclosure in May 2027. The FMP was then cascaded internally to various departments (Development, HSE, Operations and Security) and disclosed to all communities that may be impacted. The Plan was also cascaded to the Operations contractors working on site in Sanzule. An action plan to implement the commitments in the FMP was subsequently developed from November to December 2017, and is under implementation.

13.3 FINANCIAL MANAGEMENT TRAINING

Although land take compensation was paid in October 2015, Financial Management Training (FMT) was carried out in March 2017, aimed at assisting HHs who would be partaking in LRP Support Services by providing each HH with the necessary tools and skills to manage their cash. FMT opening session and orientation started on Monday, March 13, 2017 and continued with training/ classroom instruction the following day until Friday March 24, 2017. Three (3) sessions of classes were organized each day; Morning sessions 8:00 – 10:00am, Afternoon 12:00 – 2:00pm and Evening sessions 4:00 – 6:00pm. An average of 510 people from the PAHs and HHs compensated for disturbance participated.

Monitoring of the first FMT took place in May 2017. The rationale for the monitoring being conducted by the contractor was to elicit the challenges encountered in putting into practice the tools and knowledge received during the first session of the training. These challenges

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would then be factored into making the second refresher training better for the Project Affected Persons.

The first Monitoring and Evaluation Visit of the FMT ended in July, 2017. Although land take compensation was paid in October 2015, the FMT was delayed. The Monitoring and Evaluation visit was aimed at receiving feedback from the beneficiaries of the training in March, 2017 to inform any changes in content and approach for the refresher training to be organized.

The refresher course of the FMT occurred from November 6th to 10th, 2017. The refresher training course was aimed at highlighting major issues and reviewing the content of the first training conducted in March 2017.

13.4 GRIEVANCES MECHANISM

Eni Ghana has in place a grievance mechanism. Project-related grievances (written and verbal) received from communities and stakeholders affected at by the project were evaluated and addressed. The Community Liaison Officers (CLOs) received and examined complains and provided rapid responses to the complainant. In instances where the CLOs could not resolve grievances, the grievances are escalated to the Local Content & Sustainability Manager to further handle the issue. The Grievance Committee is brought into the grievance management only when grievances are escalated at the Managerial level. Figure 7 below shows the Grievance mechanism employed in Eni Ghana.

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Figure 10: Grievance Mechanism

Thirty-five (35) grievances were received in 2017, of which eighteen (18) were labor-related, seven (7) were related to the Livelihood Restoration Plan (LRP), and ten (10) were general grievances (not related to LRP or labor). Out of the 35 grievances received, thirty-one (31) were closed and four (4) are pending

14 CONCLUSION

In 2017, Eni Ghana worked to:

- Decrease the negative impact and/or reasonably minimize environmental impacts from operations onshore,
- Maximize safety for its personnel,
- Comply with EPA permit conditions and apply other international best practice; and
- Implementation of Environment & Social Action Plans (ESAP) and compliance with Project Environmental and Social (E&S) commitments.

A wide range of environmental monitoring activity will be conducted throughout 2017.

Eni Ghana worked with a number of regulators and parastatal organisations to further improve capacity in relation to the oil industry.

Several construction activities started in 2017. Among them are construction of the ORF,

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accommodation camps, helipad area. Construction works on the Gas Export Sealine (GES) was started.

15 PLANNED ENVIRONMENTAL ACTIVITIES FOR 2018

Activities to be undertaken on 2018 which will aim at ensuring the Company compliance with environmental regulations and maintaining a good environmental performance within Company´s operations. These will include following:

- Continue with onshore environmental monitoring to help build a strong database and monitor key performance indicators in regards to impacts to the gas project;
- Maintain active engagement with Ghana EPA in relation to environmental matters;
- Undertake environmental awareness campaigns for company staff and contractors;
- Continue with Biodiversity Monitoring as well as monitoring of other environmental aspects
- Adapt and fully migrate unto Environmental Management System, ISO 14001-2015;

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