	<b>PROJECT: AMULSAR GOLD PROJECT</b> <b>PROJECT LOCATION: VAYOTS DZOR PROVINCE, ARMENIA</b>	Lydian Doc #	0-00-RPT-ENV-82336	
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### Introduction and background

This report presents data relating to Greenhouse Gas (GHG) emissions for the Amulsar Project in 2017.

During 2017, construction of the Project accelerated using a range of national contractors, and towards the end of the reporting period elements of the Project operations mining fleet were commissioned and used to support site activities. The following main contractors were engaged in site activities:

- Road Transport Cars (RTC) - earthworks contractors;
- Chanaparh – earthworks contractors;
- Azurit – earthworks contractors;
- Renco LLC – construction contractor;
- Arpa Sevan CJSC – construction and earthworks contractors;
- Haek-Shin - construction and earthworks contractors;
- ENC/EnergyNet Construction LL – electrical supply system implementing, construction and earthworks contractors; and
- AAB – earthworks contractors.

### Methods

The GHG reporting for the Project has been carried out in accordance with the World Business Council for Sustainable Development (WBCSD) and World Resource Institute (WRI) 'Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2013). Direct (Scope 1) and Indirect (Scope 2) emissions have been calculated, along with those not controlled by Lydian (Scope 3).

The GHG reporting is based on the methodology provided in the WBCSD and WRI GHG protocol. The GHG emissions have been estimated using the activity data, i.e. information relating to combustion and other processes such as units of electricity or fuel used for plant and machinery, and the emission factors provided by IPCC/WRI for each activity. The IPCC GHG conversion factors have been considered for the reporting of GHG emissions. Where an emission factor was not available in the IPCC database, appropriate emission factors from other government sources have been adopted (Table 1).

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Table 1. Assumptions for emission related activities

Emission related activity		Source of Information
<b>SCOPE 1 – DIRECT EMISSIONS</b>		
a	Onsite Fuel usage	Fuel receipts from Lydian International and all its contractors
b	Use of explosives	Explosive amounts are based on blast design
<b>SCOPE 2 – INDIRECT EMISSIONS</b>		
2	Electricity used	Based on electricity bills provided by Lydian International for the reporting period
<b>SCOPE 3 - EMISSIONS NOT CONTROLLED BY THE COMPANY</b>		
a	Transportation of raw materials	<p>The emissions from transportation of raw materials has been estimated based on the total quantity of material to be transported over the total distance.</p> <p><i>Fuel (Diesel &amp; Petrol)</i>- Emissions estimated considering the total quantity of fuel used onsite and an average distance of 200 km for diesel and 180 km for petrol from supplier’s location to delivery at site/contractor’s office(one-way).</p> <p><i>Cement/Construction Materials</i> – Emissions estimated based on the total quantity of cement/construction material used onsite and an average distance of 160 km for cement and 180 km for construction materials from supplier’s location.</p>
b	Employee Commuting	Based on travel receipts provided by Lydian International
c	Electricity used for workers’ accommodation	Based on electricity bills for hotels/rented accommodation provided by Lydian International

## Results


Based on data obtained from Lydian procurement department and contractors involved in construction, the Project resulted in a total of 32600 tonnes of carbon dioxide equivalent (CO<sub>2</sub>e) direct and indirect GHG emissions during 2017. Details are provided in Appendix 1. This total exceeds the previous highest annual total estimated emissions for the Project and reflects the significant increase in site construction activity, shipping and travel due the ramp up to full construction effort.

The 2017 estimate gives a cumulative total of 40,546 tCO<sub>2</sub>e for the Project to date.

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### Appendix 1: Greenhouse Gas Emissions (2017)

Emission	Notes	Total Quantity	Unit	tCO2e	Unit	GHG Emissions Tonnes of CO2e	Source of EF
<b>1</b>	<b>SCOPE 1 EMISSIONS (DIRECT EMISSIONS)</b>						
<b>1.1</b>	<b>Emissions from combustion of fuel</b>						
a	Use of diesel	Considers the total quantity of fuel used by Lydian and all its construction contractors for onsite power generation and for use in construction equipment and machinery	4952274	litres	0.002685486	Tonnes of CO <sub>2</sub> e/litre	GHG Protocol - available at: <a href="http://www.ghgprotocol.org/">http://www.ghgprotocol.org/</a> IPCC Guidelines for National Greenhouse Gas Inventories - available at: <a href="http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html">http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html</a>
b	Use of petrol		282938	litres	0.002279955	Tonnes of CO <sub>2</sub> e/litre	
<b>1.2</b>	<b>Emissions from use of explosives</b>						
a	ANFO	Considers the total quantity of ANFO used by construction contractors	101387.9	Tonnes	0.17		<a href="http://www.epa.wa.gov.au">http://www.epa.wa.gov.au</a>
<b>2</b>	<b>SCOPE 2 EMISSIONS (INDIRECT EMISSIONS)</b>						
2.1	Energy imported from grid	Considers the total quantity of electricity purchased by Lydian and all its construction contractors	1031832	kWh	0.000123392	Tonnes of CO <sub>2</sub> e/kWh	127.32 IEA (2013), "Emissions per kWh of electricity and heat output", IEA CO <sub>2</sub> Emissions from Fuel Combustion Statistics (database).
<b>Total Scope 1 &amp; 2 Emissions</b>						<b>31307.61</b>	

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<b>3 SCOPE 3 EMISSIONS</b>								
<b>3.1 Transportation and Distribution</b>								
<i>Transportation of raw materials</i>								
a	Diesel	Considers total quantity of fuel transported over a	4952.274	tonnes.km	0.0001143	Tonnes of CO <sub>2</sub> e/tonnes.km	0.01	UK' Government's emission factors for GHG reporting
b	Petrol	Considers total distance travelled for all the trips required to transport the total quantity imported considering an average travel distance of 180 km	282.938	tonnes.km	0.0001143	Tonnes of CO <sub>2</sub> e/tonnes.km	0.00	
c	Cement		3560	tonnes.km	0.0001143	Tonnes of CO <sub>2</sub> e/tonnes.km	0.01	
d	Construction Materials	Considers total distance travelled for all the trips required to transport the total quantity imported considering an average travel distance of 180 km	153450	tonnes.km	0.0001143	Tonnes of CO <sub>2</sub> e/tonnes.km	0.27	
<b>3.2 Staff Commuting</b>								
	Overseas staff travel		142	trips	7.9935	Tonnes of CO <sub>2</sub> e/landing - take off cycle	1135.08	IPCC emission factors - Aircraft Emissions <a href="http://www.ipcc-nggip.iges.or.jp/public/gp/bgp/2_5_Aircraft.pdf">http://www.ipcc-nggip.iges.or.jp/public/gp/bgp/2_5_Aircraft.pdf</a>
	Staff travel - Home		746290	km	0.00018695	Tonnes of CO <sub>2</sub> e/km	139.52	UK' Government's emission factors for GHG reporting
3.3	Energy imported for worker's accommodation		144000	kWh	0.000123392	Tonnes of CO <sub>2</sub> e/kWh	17.77	
<b>Total Scope 3 Emissions</b>						<b>1292.65</b>		
<b>Total Emissions (Scopes 1, 2 &amp; 3)</b>						<b>32600.26</b>		