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9 July 2021

Mandana Mazaheri
Resource Assessments
Department of Planning, Industry and Environment

Re: McPhillamys Gold Project - DPIE Response - GHG assessment

Dear Mandana,

The purpose of this letter is to respond to the recent request for information (RFI) received by EMM Consulting Pty Ltd (EMM) from the NSW Department of Planning, Industry and Environment (DPIE) in relation to greenhouse gas (GHG) emissions from the proposed McPhillamys Gold Project (the project).

The quantification of GHG emissions from the project is presented in the following documents:

- *McPhillamys Gold Project Air Quality and Greenhouse Gas Assessment* (EMM 2019) as part of the Environment Impact Statement (EIS) for the project; and
- *McPhillamys Gold Project Amendment Report - Revised Air Quality and Greenhouse Gas Assessment* (EMM 2020a) as part of the Amendment Report for the project.

DPIE have requested for the following information:

1. greenhouse emission intensity (per unit of production) compared before and after the project, considering best practice;
2. greenhouse emissions that would be covered by the Federal Government's Carbon Pollution Reduction Scheme (CPRS);
3. evaluation of feasibility of measures to reduce greenhouse gas emissions associated with the project, particularly emissions not covered by the CPRS.
4. identification of any cost-effective opportunities to reduce scope 3 emissions.

Individual responses to the request for information from DPIE are provided in the following sections.

1 GHG emission intensity

The RFI asks for a comparison of GHG emissions intensity before and after the project. As the project is not currently an active operation, it is not relevant or possible to calculate and compare the intensity of GHG emissions before and after the project.

Annual GHG emissions by source type and scope, as documented in the Amended Project air quality impact assessment (EMM 2020), are illustrated in Figure 1.1. Gold production from the project commences in mine year 2.

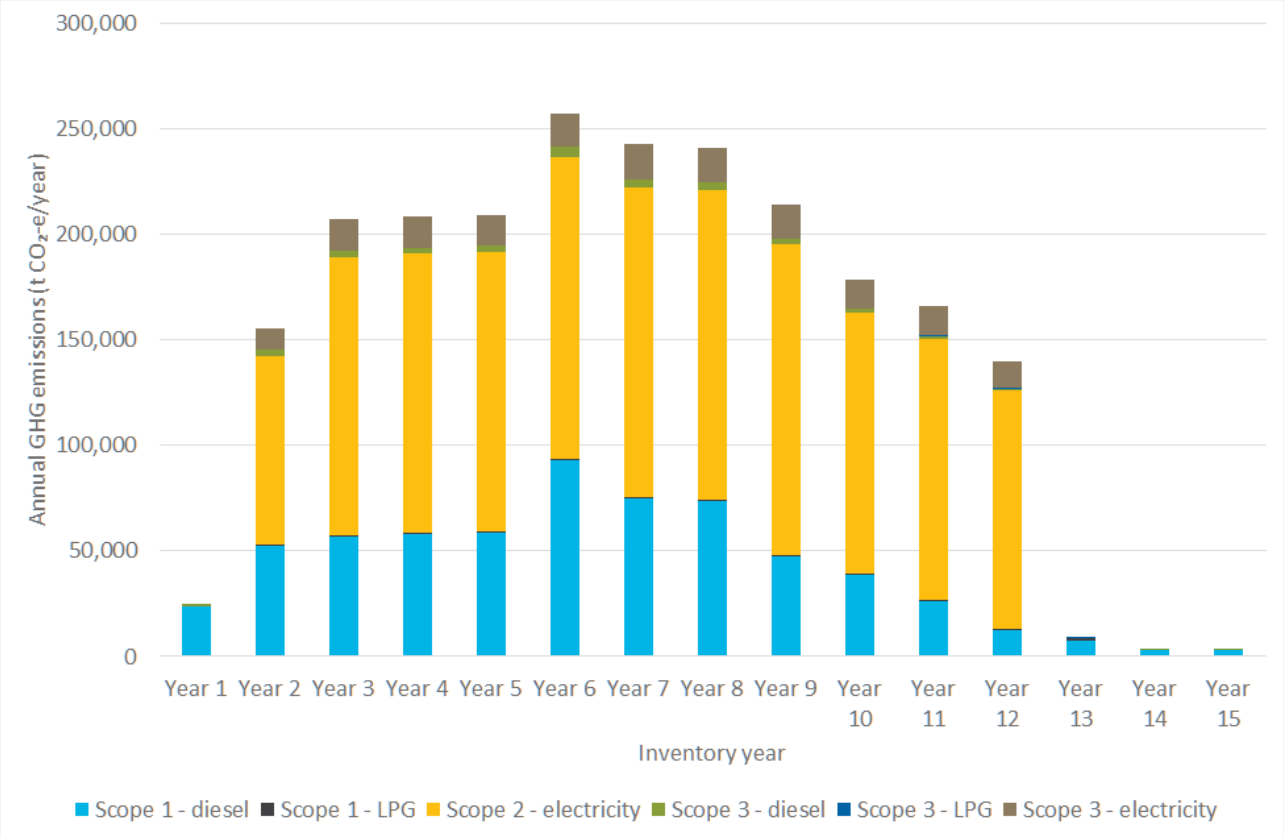

Figure 1.1 Annual GHG emissions inventory breakdown by year – Amended Project (EMM 2020)

Over the project's 15-year life, predicted annual GHG emissions are highest during the 11 years of material extraction and processing (year 2 to year 12). Overall, scope 1, 2 and 3 GHG emissions from the project are dominated by electricity consumption (scope 2) and diesel combustion (scope 1).

The intensity of GHG emissions (scope 1 and 2) from the project relative to the annual projected gold production were calculated. The emissions intensity ranges from 0.62 to 2.81 kg CO_2-e/oz gold produced by the project, with an annual average intensity across the life of the project of 1.25 kg CO_2-e/oz gold produced. Emissions intensity is greatest from the project during years 6 to 8 due to an increase in the rate of waste rock extraction relative to gold production, and the associated diesel consumption by the mining fleet and haul trucks.

To provide context to the significance of the GHG emissions from the project in relation to the metalliferous mining industry in Australia, data for GHG emissions by industry were collated from the Australian Government Clean Energy Regulator. The most recent available data is related to the 2015-2016 year[1]. The following points were noted from the analysis conducted:

- annual scope 1 GHG emissions from the metal ore mining sector in 2015-2016 were 11,358,788 t CO_2-e, generated by 226 facilities;
- this equated to an Australian metal ore mining industry average of 50,260 t CO_2-e per facility; and
- based on the data in Table 2.2 of EMM 2020, the annual average scope 1 emissions for the project are 54,525 t CO_2-e, which is considered comparable to the Australian metal ore mining industry.

[1] http://www.cleanenergyregulator.gov.au/NGER/National%20greenhouse%20and%20energy%20reporting%20data/a-closer-look-at-emissions-and-energy-data/australia%E2%80%99s-scope-1-emissions-by-industry-for-nger-reporters

Finally, annual average scope 1 and 2 GHG emissions generated by the project represent approximately 0.101% of total GHG emissions for NSW and 0.026% of total GHG emissions for Australia, based on the National Greenhouse Gas Inventory for 2019[2].

2 CPRS reporting

The second request relates to the identification of the GHG emissions from the project that would be covered under the Federal Government's CPRS.

It is noted that the CPRS, while proposed for implementation in 2010, was never introduced in Australia.

As identified in Section 9.6 of EMM 2020, the predicted annual average scope 1 and 2 emissions from the project are greater than the National Greenhouse Emissions Reporting (NGER) Scheme facility reporting threshold of 25,000 tpa CO_2-e. Consequently, Regis will measure energy consumption, and calculate and report scope 1 and 2 GHG emissions in accordance with the requirements of the *National Greenhouse and Energy Reporting Act 2007* (the NGER Act).

3 GHG mitigation measures

The third request asks for details on the proposed GHG mitigation measures for the project, concentrating on emissions not covered by the CPRS. Firstly, it is noted again that the CPRS was never introduced in Australia.

As illustrated in Figure 1.1, the GHG emissions from the project are principally associated with on-site energy consumption, specifically diesel combustion by mobile mining equipment and plant and the consumption of purchased electricity by the processing plant.

The proposed mining development features conventional drill, blast and haul techniques, which are largely dependent on the use of diesel-powered equipment. Regis is currently investigating the feasibility of an electricity-powered fleet to reduce the amount of diesel fuel required annually by the project.

Other diesel-related management measures proposed by Regis for the project include:

- where feasible, equipment compliant with a more recent emission standard than USEPA Tier 2 will be sourced;
- open-cut pit haulage ramps will be designed to reduce the gradient of travel where feasible;
- haul roads will be routinely maintained to reduce truck tyre rolling resistance;
- the distance of material haulage to run-of-mine pad and waste rock emplacements will be minimised where feasible;
- all equipment will be routinely serviced and maintained according to the manufacturers' specifications;
- idling of diesel equipment will be minimised where feasible.

To manage scope 2 emissions associated with the consumption of purchased electricity, Regis commits to sourcing electricity from renewable energy suppliers to meet project electricity demands, as much as is practicable to do so. By using electricity from renewable sources, annual scope 2 GHG emissions could be significantly reduced.

[2] https://ageis.climatechange.gov.au/

Regis also commits to the following measures to reduce electricity consumption:

- Regis' technical specifications for the project require that the electric motors in crushing and processing plant to be high efficiency compliant with Minimum Energy Performance (MEPS) requirements as set out in AS/NZS 1359.5;
- the use of energy efficient equipment in fixed plant across the project site where it is practical to do so;
- adopting the use of energy efficient lighting, hot water systems and air conditioning systems where practical;
- conducting periodic audits and reviews of the amount of material used, as well as the amount of mine waste and non-mine waste generated and disposed; and
- investigating opportunities for improving energy efficiency throughout the life of the project, with outcomes documented in project annual environmental reports.

4 Scope 3 emission management

As illustrated in Figure 1.1, the predicted annual scope 3 emissions are relatively minor in comparison to scope 1 and 2 emissions from the project. Furthermore, scope 3 emissions are outside the control of Regis, limiting the potential for mitigation measures to be implemented.

Wherever possible, Regis will source upstream materials, employees and services from the local region to reduce the distance of travel to site and associated scope 3 emissions. As described in EMM 2019 and in the Amendment Report (EMM 2020b), Regis' intent is for the operational workforce to reside within an approximate 1-hour commute to the mine. This will maximise the socio-economic benefits of the project to the local region as well as minimising travel distances and associated scope 3 emissions.

Finally, it is noted the measures discussed above for the reduction of scope 1 and scope 2 emissions generally relate to the reduction of energy consumption (ie diesel or purchased electricity). Scope 3 emissions associated with the consumption of diesel and purchased electricity are calculated using emission factors that are linked to the rate of energy consumption (eg scope 3 diesel emissions are calculated using an emission factor with units kg CO_2-e/kL of diesel). Consequently, the measures proposed to reduce scope 1 and 2 emissions from assorted energy (fuel and purchased electricity) consumption by the project would also serve to reduce associated scope 3 emissions.

Yours sincerely

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26 July 2021

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DPIE have requested for the following information:

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2. greenhouse emissions that would be covered by the Federal Government's Carbon Pollution Reduction Scheme (CPRS);
3. evaluation of feasibility of measures to reduce greenhouse gas emissions associated with the project, particularly emissions not covered by the CPRS.
4. identification of any cost-effective opportunities to reduce scope 3 emissions.

Individual responses to the request for information from DPIE are provided in the following sections.

1 GHG emission intensity

The RFI asks for a comparison of GHG emissions intensity before and after the project. As the project is not currently an active operation, it is not relevant or possible to calculate and compare the intensity of GHG emissions before and after the project.

Annual GHG emissions by source type and scope, as documented in the Amended Project air quality impact assessment (EMM 2020), are illustrated in Figure 1.1. Gold production from the project commences in mine year 2.

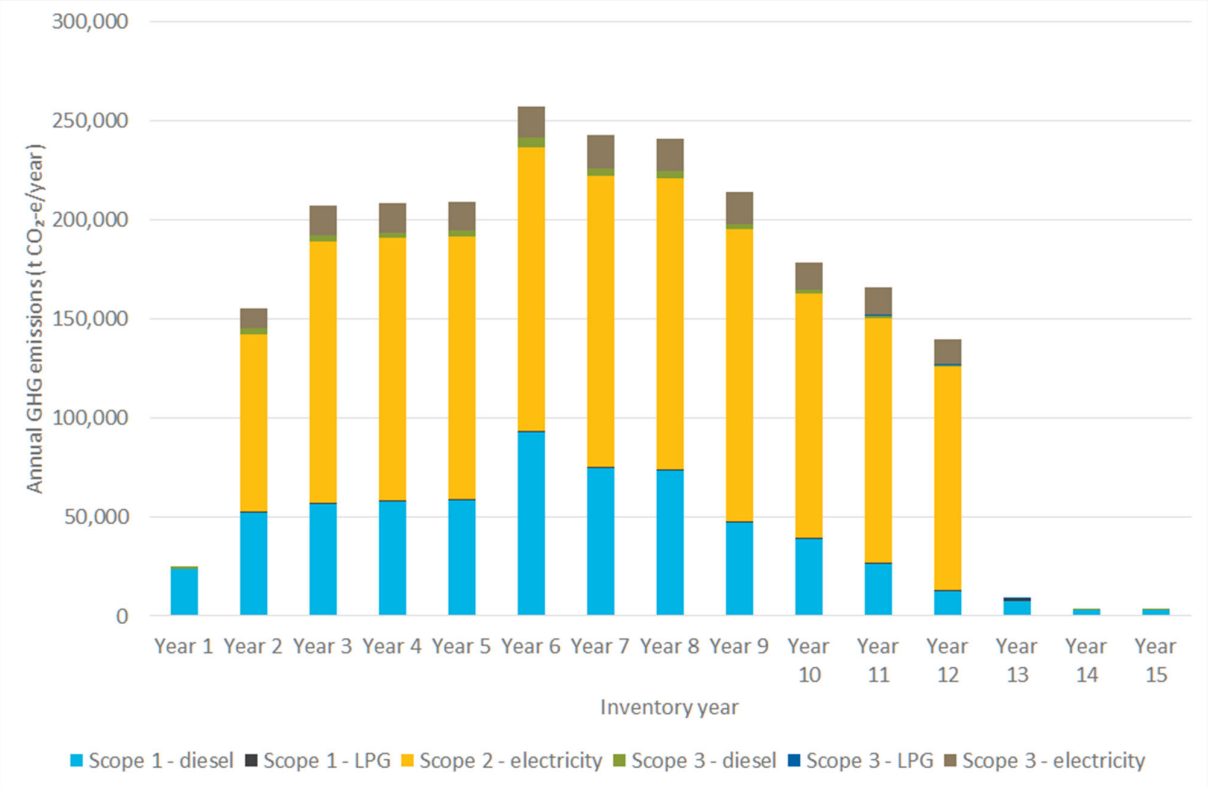

Figure 1.1 Annual GHG emissions inventory breakdown by year – Amended Project (EMM 2020)

Over the project's 15-year life, predicted annual GHG emissions are highest during the 11 years of material extraction and processing (year 2 to year 12). Overall, scope 1, 2 and 3 GHG emissions from the project are dominated by electricity consumption (scope 2) and diesel combustion (scope 1).

The intensity of GHG emissions (scope 1 and 2) from the project relative to the annual projected gold production and run of mine (ROM) ore processed were calculated. The emissions intensity for the project are:

- relative to projected annual gold production – the emissions intensity ranges from 0.62 to 2.81 t CO_2-e/oz gold produced by the project, with an annual average intensity across the life of the project of 1.24 t CO_2-e/oz gold produced.
- relative to projected annual ROM ore processed - the emissions intensity ranges from 0.02 to 0.05 t CO_2-e/t ROM ore processed by the project, with an annual average intensity across the life of the project of 0.03 t CO_2-e/oz gold produced.

Emissions intensity is greatest from the project during years 6 to 8 due to an increase in the rate of waste rock extraction relative to gold production, and the associated diesel consumption by the mining fleet and haul trucks.

To provide context for the emissions intensity of the project relative to operational gold mines in NSW, examples are taken from the Newcrest Cadia Gold Mine and the Evolution Mining Cowal Gold Mine. It is noted that in comparison to the project, which is a proposed open cut mining operation, the example mines are as follows:

- the Cadia mine is predominately an underground mining operation with the existing open cut in care and maintenance since 2012[1];

- the Cowal Gold mine, an existing open cut gold mining operation.

A comparison of emissions intensity between the project and the two example NSW gold mining operations is presented in Table 1.1.

Table 1.1 Emissions intensity comparison – McPhillamys Gold Project vs operational NSW gold mines

Mining operation	Annual emissions intensity	
	Relative to gold production (t CO_2-e/oz Au)	Relative to ROM ore processing (t CO_2-e/t ROM ore)
McPhillamys (annual avg)	1.24	0.03
Cadia (FY19)[2]	0.67	0.03
Cowal Gold (FY19)[3]	1.09	0.03

From the data presented in Table 1.1, it can be seen that the projected annual average emissions intensity for the project relative to annual gold production is comparable to Cowal and higher than Cadia (due predominantly to the underground block caving mining method used at Cadia resulting in minimal waste and the transport of ore using conveyors over shorter distances), while being equivalent to both Cadia and Cowal relative to ROM ore processing.

To provide context to the significance of the GHG emissions from the project in relation to the metalliferous mining industry in Australia, data for GHG emissions by industry were collated from the Australian Government Clean Energy Regulator. The most recent available data is related to the 2015-2016 year[4]. The following points were noted from the analysis conducted:

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Finally, annual average scope 1 and 2 GHG emissions generated by the project represent approximately 0.101% of total GHG emissions for NSW and 0.026% of total GHG emissions for Australia, based on the National Greenhouse Gas Inventory for 2019[5].

[1] Newcrest Mining Ltd 2020, *Cadia Modification 14 Processing Rate Modification – Modification Report* https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=MP06_0295-MOD-14%2120201210T102417.144%20GMT

[2] Newcrest Mining Ltd 2019, *2019 Sustainability Report*, https://www.newcrest.com/sites/default/files/2019-11/191108_Newcrest_2019_Sustainability_Report%20%281%29.pdf

[3] Evolution Mining 2021, Sustainability Reporting page on public website https://evolutionmining.com.au/compliance/#sustainability-reporting and FY 2019 quarterly reports https://evolutionmining.com.au/reports/

[4] http://www.cleanenergyregulator.gov.au/NGER/National%20greenhouse%20and%20energy%20reporting%20data/a-closer-look-at-emissions-and-energy-data/australia%E2%80%99s-scope-1-emissions-by-industry-for-nger-reporters

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