



Note

Sensitivity Note - Response to Dfl modelling Requests



1 Introduction

- 1.1 Quod and DGL have worked with the NI Government's economists in DfI/DfE to explain and where possible agree the economic modelling.
- 1.2 This includes a series of meetings held from August 2016 to July 2017 and responses to consultations (letter dated 14/10/20, titled "LA10/2017/1249/F Dalradian Gold Ltd – Minerals Planning Application").
- 1.3 Through that engagement NIG officials raised questions about the methodology and in particular around sensitivities. The process included a detailed explanation of the bespoke multipliers, why they were being used and how they differed from standard mining multipliers.
- 1.4 We felt this was accurately reflected in Appendix 4 – the DfI Economics Branch Response – of the DfI's SoC in particular paragraphs 12 (displacement); 13 (impact on other sectors); 15 (leakage) and 17/18 (multipliers). Appendix 4 concludes by saying the overall methodology is reasonable.
- 1.5 In addition the Appendix noted (paragraph 9) that a higher gold price and lower exchange rate would increase the benefits which the Applicant may wish to substantiate during the Inquiry.
- 1.6 Appendix 4 concludes by saying even if net impacts were assessed it is unlikely that the DfI's overall position would change and the Proposed Development would be of substantial benefit to the local and regional economy (paragraph 23). Finally (at paragraph 24) it states that an updated assessment is not required, but should key assumptions have changed there may be merit in requesting it.
- 1.7 We have reviewed the DfI's rebuttal which now states that there is uncertainty surrounding the exact scale (paragraph 3.13) and that the supporting evidence remains limited (Appendix 9 paragraph 2).
- 1.8 We are not clear what has changed between the Statement of Case and the Rebuttal, but nevertheless thought it would be helpful to the DfI if we re-provided the detail and addressed the stated concerns directly in an attempt to reach common ground on the likely sensitivities of our modelling.
- 1.9 In particular we are concerned that paragraph 2 now states that the Quod assessment offers an overly optimistic view which is a significant change compared to paragraph 9 of the Appendix to the SoC which noted that the benefits may be higher than assessed.
- 1.10 We hope that we can reach agreement on these matters in advance of the Hearing opening and certainly ahead of the socio-economic sessions in mid-March.
- 1.11 This note sets out the sensitivities around the following issues for the potential impacts:
 - Loss of agricultural land;
 - Loss of activity in other sectors (due to demand for labour);
 - Loss of tourism;
 - Leakage; and
 - Other costs (including carbon).
- 1.12 The note then sets out the sensitivities around the following issues for the indirect impacts
 - Use of NISRA multipliers;



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- Leakage of supply chain spending; and

1.13 It then addresses some of the other new points raised:

- Phasing/variation of output over time; and
- The discount rate.

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2 Direct Impacts

Introduction

- 2.1 The Dfl position is that there are additional costs that should have been included in the assessment which reduce the overall net benefits.
- 2.2 This section sets out what those costs might be on the basis of the Dfl's /FODC positions (which the Applicant does not accept but is providing an estimate of in order to provide a sensitivity test to Dfl).
- 2.3 In this section, these costs are limited to the direct economic benefits, indirect effects are dealt with in the following section.
- 2.4 The GVA and jobs arising from the scheme are based on an average of estimated output across 23 years of operation and are not discounted.

Loss of Agricultural Land

- 2.5 The mine occupies around 280ha and about half of that is bog land and not suitable for agriculture. That leaves around 140ha theoretically capable of being farmed.
- 2.6 According to the Farm Census there is 11,796ha of agricultural land on 258 farms in the Owenkillew ward. The theoretical loss of 140ha would therefore be 1.2% of agricultural land in the ward¹.
- 2.7 The Farm Census reports an average annual output of €27,000 (approximately £22,100) per farm in the ward, in 2019 prices. Uprating this to 2024 prices equates to £26,573 per farm. This then translates to approximately £581 per hectare. On this basis, the lost agricultural land could have a standard annual output of approximately £82,000, using Input Output tables to estimate GVA as a share of output (approximately 55%) this translates to an annual GVA of £44,900.
- 2.8 Furthermore, the Farm Census indicates that there is overall agricultural employment of 441 jobs in the ward. This equates to 0.04 jobs per ha. If this is applied to the 140ha taken by the project, it would support approximately 5 jobs.
- 2.9 As such, the deadweight losses are estimated at **5 agricultural jobs** and approximately **£44,900 of GVA** annually.
- 2.10 Conversely, the project has a very high GVA per worker, of £480,600 per worker for the Curraghinalt Project, or £2.4 million for the equivalent number of workers to those lost in agriculture. Therefore if there are jobs losses in agriculture they would be replaced by significantly higher productivity jobs.
- 2.11 The agricultural potential estimated here is likely to be an overestimate because of the low quality of the land. However, even at £44,900 of GVA that is tiny in comparison to the value of the project.

¹ The loss as a share of FODC's agricultural land (211,179ha) is 0.07%.



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- 2.12 We think that this addresses paragraph 21 of the DfI Rebuttal that says “the assertion that the land could not be used for any other economic activity appears overly broad and lacking in any robust evidence.” Agricultural use is possible, but its economic contribution would be tiny and have no material impact on the assessment of the Project’s benefits.

Loss of Tourism Activity

- 2.13 Similarly, there are potential theoretical impacts on tourism (e.g. because of landscape effects). We do not accept that there will be effects, but in the interests of providing sensitivity tests has sought to quantify what they might be.
- 2.14 Tourism spend in FODC is £82.7m of which, £43.0m is its contribution to GVA, supporting 3,831 jobs.
- 2.15 The Fermanagh and Omagh Tourism NI Visitor Attitude Survey (2018) reports the most popular tourist sites as a proportion of overall visitors. The Sperrin AONB itself is not reported as being one of these. The only tourist attraction identified is the Ulster-American Folk Park, which will not be affected by the Curraghinalt Project.
- 2.16 The least popular site attracts 15% of visitors. Therefore, the maximum share of visitors that the Sperrin AONB attracts is also 15%. That means an absolute maximum of 575 jobs and £6.5m of GVA is linked primarily to the Sperrin AONB.
- 2.17 The impact of the scheme is limited to a relatively small area and there are very few tourism assets (either visitor attractions or accommodation) there. Assuming a 2km radius is affected, that would be approximately 4% of the area of the AONB that lies within Fermanagh and Omagh. The area around the mine has very few tourism assets so there is no reason to think that the impact would be disproportionate to the scale of the area affected. If 5% of the maximum 575 tourism jobs were lost (i.e. slightly larger than the area affected), that would equate to approximately **29 jobs** and **£327,000** of annual GVA lost.
- 2.18 This compares to an equivalent annual GVA enabled by 29 workers on the Project of £13.9 million. The potential losses to tourism and again tiny in comparison to the Project’s benefits and even if there are jobs losses in tourism they would be replaced by significantly higher productivity jobs.

Loss of Activity in Other Sectors Because of Demand for Labour

- 2.19 Based on paragraphs 3 and 21, the DfI seems to be asserting that there are potential impacts on the wider economy through competition for labour based on Census data. It is not clear what this data is, or what the scale of any labour market constraint is, or what definition of displacement the DfI is using.
- 2.20 It is the Applicant’s position, based on the HM Treasury Green Book that people changing jobs does not constitute displacement. It is also the Applicant’s position that policy is to create more jobs and in particular high productivity jobs.



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- 2.21 The project will create 350 jobs during operation. There are currently 53,700 economically active people in FODC (Census 2021) and 44,300 (BRES, 2022) jobs. The project therefore represents a 0.79% increase in jobs.
- 2.22 The number of jobs in Fermanagh and Omagh has changed over time; from 2018 to 2022, FODC added approximately 600 jobs per year:

Table 2-1: FODC employment growth

Year	Jobs	Growth
2018	41,860	-
2019	42,458	598
2020	43,029	571
2021	43,687	658
2022	44,264	577

- 2.23 This is therefore an economy that can grow and add jobs and it is reasonable to believe that there is not a hard labour market constraint.
- 2.24 There are currently 1,700 unemployed people in FODC and up to an estimated 3,100 people who are inactive but who want to work. Again, indicating that there is spare capacity in the labour market, even if this is lower than at other points in time.
- 2.25 The likelihood that recruitment by the project will lead to economic losses (not just job vacancies) is therefore very small.
- 2.26 However, an impact has been estimated assuming that there is a theoretical possibility that some jobs would be lost if people left to work at the project.
- 2.27 There is no guidance on the likely extent of labour market displacement, the only example in the HCA Additionality Guide gives is 10%.
- 2.28 Assuming **32 jobs are lost** (i.e., 10% the 350 operational jobs less the jobs lost in the agriculture and tourism sectors, to avoid double counting) at the average GVA per worker in FODC this would equate to **£1.7m** of annual GVA.
- 2.29 This compares to an equivalent annual GVA enabled by 29 workers on the Project of £15.2 million. Again, this does not materially change the assessment of overall benefits. The Applicant is therefore confident that the DfI's position as set out in paragraph 12 of Appendix 4 of the DfI SoC that displacement may not be zero but it is "not a major concern" is sound.

Leakage

- 2.30 The FODC SoC references the HCA's Additionality Guide. This states clearly that "Where there is no specific target beneficiary then leakage will be zero". In this case, as a private sector scheme with no policy objectives, there is no target beneficiary so leakage is zero.



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- 2.31 Even if the policy objectives were assumed to be those of the NI Government or FODC, then the policy target is more and better jobs, not an increase in the employment rate of FODC or NI residents. Again therefore, leakage would be zero.
- 2.32 However, DfI and FODC are asserting that there is leakage as a result of jobs being taken by people from outside FODC or NI and of spending going elsewhere. They assert that there is therefore potential for leakage in terms of direct employment benefits and indirect (multiplier) effects. Again, in the interest of providing DfI with sensitivity tests, we are assessing what difference an allowance for leakage would make.
- 2.33 Leakage of jobs has been estimated at FODC and Northern Ireland levels, in line with Census 2021 Origin-Destination data (which gives where people live and where they commute to for work).
- 2.34 There are total of 47,439 people working in FODC, of which just over 90% also live in FODC, just under 8.5% live elsewhere in NI and just over 1.5% live in the Republic of Ireland i.e. just over 90% of FODC jobs are taken by FODC residents and just under 10% by people from elsewhere. It is therefore reasonable assume that 10% of the jobs at the project would go to non-FODC residents, of which 1.5% would be from the Republic of Ireland.
- 2.35 This means (if we accept the DfI/FODC logic) there is an employment leakage level of **10%** at the FODC level and **1.5%** at the NI level.
- 2.36 It is therefore estimated that 10% of jobs (35) will accrue to individuals who live outside of Fermanagh and Omagh, and within that 1.5% of operational jobs (5) will accrue to individuals who live outside of Northern Ireland.
- 2.37 On this basis, it is therefore estimated that 315 of the Curraghinalt Project's jobs will accrue to individuals who live in Fermanagh and Omagh, and 345 will accrue to individuals who live in Northern Ireland.
- 2.38 GVA cannot be affected by leakage – it is created where the value is added, which in this case is at the mine itself.

Carbon Costs

- 2.39 Both DfI and FODC say that the assessment should have considered the cost of carbon emissions.
- 2.40 The mine will be carbon neutral and the cost of achieving that is included in the cost plan at an estimated \$14m over the lifetime of the mine.
- 2.41 FODC has used the Government's abatement cost of carbon but this is double counting given that the cost of carbon offsets are included in the scheme's costs. However, even if that were included in the assessment it would reduce the net benefits by an average of **£8.7m** per year.

Direct impact summary

- 2.42 The table below sets out and summarises the direct impacts in terms of jobs (at both FODC and NI levels) and GVA.



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2.43 As displayed, even in the unlikely event that there is labour market displacement and tourism impacts, 80% of the jobs will be retained at a NI level, 71% will be retained at a FODC level, 99% of the GVA impact will be retained, and 94% of the benefits will be retained after accounting for carbon emissions.

Table 2-22-3: Direct impact summary

Indicator	Jobs (NI-level)	Jobs (FODC-level)	Indicator value
Gross direct annual benefits	350	350	£168.2m
Leakage	-5	-35	-
Loss of agricultural land	-5	-5	-£0.045m
Displacement	-32	-32	-£1.7m
Loss of tourism	-29	-29	-£0.327m
Additional jobs/GVA	279	249	£166.1m
Retention of gross jobs/GVA	80%	71%	99%
Carbon costs	-	-	-£8.7m
Additional jobs/benefits	279	249	£157.5m
Retention of gross jobs/benefits	80%	71%	94%

2.44 We hope that this addresses the uncertainty that the DfI has raised in its rebuttal.

2.45 Furthermore, as the DfI has acknowledged, changes in the gold price and exchange rates mean the benefits could be higher so the submitted assessment sits between the worst case set out above and the potential higher benefits that the DfI has acknowledged.



Note continued

3 Indirect Impacts

Introduction

- 3.1 The DfI position is that leakage should be assessed for supply chain impacts, supply chain impacts should be estimated using NISRA Input-Output table multipliers, and that impacts should be estimated at both the FODC and NI levels.
- 3.2 This section sets out the scale of the indirect impacts when those factors are considered.

Leakage and application of NISRA input-output table instead of bespoke multipliers

- 3.3 The detail underlying the bespoke multipliers have previously been shared with and explained to DfI economists. This led to the position set out in paragraphs 17 and 18 of Appendix 4 of the SoC which states that

“previous discussions with the Applicant have been helpful in establishing that the approach taken is generally reasonable in the context of the Proposed Development”

- 3.4 Paragraph 18 then goes on to say that the Applicant has acknowledged that leakage would reduce indirect and induced impacts.
- 3.5 It is not clear why the DfI now thinks it does not now feel it has sufficient clarity on the bespoke multipliers. We would be happy to explain them again.
- 3.6 Setting that aside, there are two further points raised by DfI in the Rebuttal – the changes in the Applicant’s assessment and the comparison with NISRA standard multipliers.

Changes in the Applicant’s Assessment

- 3.7 The bespoke multipliers are based on an assessment of the specific sectors from which the project expects to buy supplies. The estimate of multipliers has changed due to changes in the underlying data (ONS Input-output tables and regional data within the ONS’ Annual Business Survey) used to calculate the bespoke multiplier effects. The updates to these datasets indicated that a greater proportion of the Curraghinalt Project’s spending would be allocated to industries with relatively low turnover per job ratios, and that the employment multiplier effect would be larger than previously estimated at the time of the original submission.

Comparison with NISRA Multipliers

- 3.8 We have focused on the mining multipliers as the operational phase accounts for most of the benefits and have used the 2019 GVA and employment multipliers for the mining sector provided in the DfI Rebuttal.
- 3.9 We have used the same NISRA multipliers to estimate the indirect effects of the potential/theoretical losses in the agriculture and tourism sectors and the wider economy. We have separated out these out because of the very different levels of GVA per workers in different sectors. For example, the deadweight losses are estimated at 5 agricultural jobs and GVA of approx. £42,000. For the project, 5 jobs generates £2.4m of GVA.
- 3.10 We have separately estimated leakage for indirect and induced GVA and employment effects by subtracting Type I multipliers from Type II multipliers to isolate induced affects.



Note continued

- 3.11 The first stage is to allow for leakage at NI-level in the estimate of jobs and GVA from the project. The gross effects are 350 jobs and £168.2m of GVA. Leakage estimates are based on the proportion of jobs and supply chain spending that will go outside of Northern Ireland. This is estimated at 1.5% of jobs and 31% of supply chain spending. Net of leakage, these are reduced to 345 jobs and £116.5m of GVA.
- 3.12 For both GVA and employment, Type I multipliers are applied to the GVA net of supply chain leakage (31%) and the induced is applied net of employment leakage (1.5%). For employment, the NISRA Type II multiplier is also used.
- 3.13 We have used the 2019 NISRA Type I multipliers for mining net of leakage for employment (10%) and supply chain spending outside of NI (31%) to calculate indirect effects. We have then calculated the difference between the NISRA Type I and Type II mining multipliers in order to estimate induced effects of both employment and GVA. These multipliers are set out in Table 3-2 below.
- 3.14 For the potential lost activity in other sectors, we have applied the NISRA Type II multipliers to the loss of potential agriculture on site (5 jobs, £42k GVA) using the NISRA agriculture Type II multiplier. For potential job losses in the wider economy (reflecting competition for labour) we have taken the average NISRA multiplier across all sectors of the economy. For potential losses of tourism we have used a weighted average of the NISRA multipliers for the accommodation, F&B, transport, and sports & leisure sectors. As such, the following multipliers have been used:

Table 3-1: Multiplier summary (Source: NISRA Input-Output tables, 2019)

Other multipliers	Jobs	GVA
Agriculture	3.012	2.736
Tourism (weighted average of accommodation, F&B, transport, sport/leisure)	1.521	2.030
Whole economy	2.040	2.155



Note continued

3.15 The following table summarises the effects

Table 3-2: Summary

		Jobs		GVA
Gross		350		£168.2m
Leakage	1.50%		31%	
Local		345		£168.2m
Mining	Multiplier		Multiplier	
Type I	0.423	102	0.412	£47.8m
Induced	0.717	247	0.737	£122.0m
Total benefits		699		£338.1m
Agriculture	Direct	5		£0.04m
Type II	2.012	11	1.736	£0.08m
Tourism	Direct	29		£0.3.m
Type II	0.521	15	1.030	£0.34m
Wider economy	Direct	32		£1.7m
Type II	1.040	33	1.155	£1.9m
Direct losses		66		£2.04m
Indirect losses		58		£2.32m
Direct & indirect benefits		570		£333.7m



Note continued

- 3.16 The following table summarises the position using the bespoke multipliers from 2017 that were discussed with DfI, together with the 2024 update and the estimates using the NISRA multipliers. It shows that the NISRA multipliers produce lower employment numbers but higher GVA numbers.

Table 3-3: Comparison

	2017	2024	NISRA gross	NISRA Net
Direct jobs	350	350	350	279
Indirect Jobs	620	660	349	290
Total	1,010	1,010	688	570
Direct GVA	£133m	£168m	£168.2m	£166.2m
Indirect GVA	£23m	£42m	£169.9m	£167.5m
Total	£156m	£210m	£338.1m	£333.7m

- 3.17 For the reasons set out above, the Applicant believes that its own bespoke multipliers are a more reliable guide to likely indirect impacts. Using the NISRA multipliers significantly increases the indirect GVA and reduces the indirect jobs. This is because the NISRA multipliers assume standard patterns of supply chain spending, whereas the bespoke multipliers are based DGL's actual likely spend. Because different sectors have different levels of GVA per worker, assumptions about which sectors are in the supply chain will affect estimates of indirect GVA and employment.
- 3.18 There are no NISRA estimates of multipliers at FODC level. The HCA Additionality Guide has a ratio of regional to local of 1.5:1.1 so at an FODC level the multiplier effect would be around 20% of the NI-level assessment.
- 3.19 As set out above, these are annual figures using average annual GVA over 23 years of operation of the mine.
- 3.20 In terms of discounted lifetime figures, using the NISRA multipliers would increase the discounted lifetime GVA of the mine from **£3.343bn** (as reported in Table 5.3 of the Economics Technical Report submitted as part of the Applicant's Statement of Case) to **£5.217bn**. This takes account of the same assumed impacts on agriculture, tourism and the wider economy.



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4 Other Factors

- 4.1 The Dfl response raises a number of other issues. These are dealt with briefly below. Again, we hope that we might reach common ground on some of these issues and save the Inquiry time.

Phasing/variation over time

- 4.2 Paragraphs 5, 9 and 18 raise the issue that employment and output might fluctuate over time.
- 4.3 The Applicant does not anticipate that it will.
- 4.4 As set out above, the annual benefits calculations are done on an average year across 23 years of operation. For the lifetime estimate, it assumes sales values above £250m per year for the first ten years, then between £200m and £250m for the next ten years and declining to £195m in the final years. This information has been presented to the Dfl previously.
- 4.5 To the extent that there is technological advancement it is likely to be in remotely operated mining equipment that would replace underground workers with people operating equipment from the surface.
- 4.6 A breakdown of likely roles was included in Appendix 2 of ES Volume 3, document C13 Statement of Economic Impacts.

Relationship of Employment and GVA

- 4.7 Paragraph 6 states that local employment drives GVA. That is not how the model works – the GVA is created at the mine irrespective of where the workers come from. Some benefits would leak out of NI if some of the workforce lives in the Republic – this has been estimated above.
- 4.8 Paragraph 16 seeks clarification on what has driven the changes in estimated benefits between 2017 and 2024. This is explained in paragraphs 5.10 to 5.14 of the Technical Report. Changes in direct effects are mainly driven by changes in the gold price and exchange rate – the increase in other metals contributes a relatively small amount. The updated Input Output tables have also further increased the multiplier effects.

Discount rate

- 4.9 Paragraphs 23-25 query the use of a 3.5% discount rate for a mining project. The discount rate is the standard one from the Green Book to account for the Social Time Preference Rate (i.e. £1 today is more valuable than £1 in a year's time). It has nothing to do with the sector or the level of risk. There is therefore no need to make any adjustment to account for that.

Environmental and regulatory concerns

- 4.10 As acknowledged in paragraph 26 the costs of monitoring and oversight are likely to be small and would not make a material difference to the assessment. To the extent that they are a requirement of the planning consent they would be paid by the Applicant.
- 4.11 Paragraph 27 references wider costs such as policing. Again these would be relatively small so would not make a material difference to the assessment. They are likely to be funded through general taxation (to which the Corporation Tax from the project makes a significant contribution) or by the suppliers which need to transport explosives to the mine.